UNIVERSITY OF WESTMINSTER

WestminsterResearch

http://www.westminster.ac.uk/westminsterresearch

The impact of voluntary adoption of ISO 14001 among firms in Asia

Ailu Hiew

Westminster Business School

THE IMPACT OF VOLUNTARY ADOPTION OF ISO 14001 AMONG FIRMS IN ASIA

AILU HIEW

A thesis submitted in partial fulfilment of the University of Westminster for the degree of Master of Philosophy

May 2010

Abstract

Since the late 1990s there has been an increasing awareness of the importance of understanding environmental management systems (EMS) and their relationships with sustainability, competitiveness and business practice in the West. Since its introduction in 1996 and revision in 2004, an EMS based on the ISO 14001 voluntary standard has remained the most widely implemented environmental standard implemented by the business community in Asia to pursue environmental sustainability. Multinational corporations (MNCs) have played a pivotal role in the greening of the supply chain within the region in pushing firms to conduct business in line with international standards. Widely recognised as a dependable international eco-label, firms who are certified to ISO 14001 are able to sustain their businesses within the global market by conforming to international standards as well as meeting customers' demands. This thesis aimed to fill a gap in our knowledge of how businesses across Asia tackled environmental issues and the depth of their understanding in issues relating to business and sustainability. In doing so, this thesis examined the impact of the implementation of ISO 14001 EMS among MNCs and large firms in Asia. This research aimed to determine if the implementation of ISO 14001 EMS over a period of time had brought wider benefits to firms. The methodology applied in this study was based on multiple case studies evidence on six Asian firms in different industry sectors. Evidence from the case studies had identified various internal and external benefits experienced by firms who had implemented ISO 14001 EMS for a number of years. Findings based on the case studies also demonstrated that firms who had implemented ISO 14001 EMS over a period of time were more likely to expand their environmental measures practices by adopting other voluntary initiatives.

ACKNOWLEDGMENTS

I am greatly indebted to my first supervisor, Professor John Stanworth, for his support, intellectual guidance and enthusiasm.

My deepest appreciation and sincere gratitude go to my parents for their unfailing support, patience and generosity throughout the years. I thank them for instilling the value of education in me and giving me the opportunity and privilege to pursue this path.

A special thanks goes to Catherine, my long-suffering and trustworthy supporter in my endeavours.

Lastly, I would like to thank all the staff members at the Westminster Business School who have assisted me over the years.

TABLE OF CONTENTS

Chapter 7: Results and Discussions

Chapter 8: Conclusion

BIBLIOGRAPHY

APPENDICES

GLOSSARY OF TERMS

Biodiversity (biological diversity)

The diversity of plants, animals, and other living organisms in all their forms and levels of organisation, including genes, species, ecosystems, and the evolutionary and functional processes that link them.

Certification

The procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements.

Command and Control (CaC) regulations

This is the traditional approach to environmental policy whereby regulation is prescribed directly from the government. Compliance is observed through monitoring and sanctions.

Compliance

The term applied to firms which make mandatory responses to external pressures, and / or which abide by the environmental laws and regulations affecting their business sectors. These firms do not necessarily adopt environmental management systems (EMS).

Continual Improvement

This is a key component of ISO 14001. It refers to the ongoing process of enhancing a firm's EMS to achieve improvements in its overall environmental performance that is in line with the firm's environmental policy. The process of continual improvement allows a firm's EMS to improve its ability to manage the environmental aspects of its activities, products and services in the long term.

Corporate social responsibility (CSR)

A form of voluntary practice undertaken by companies to integrate financial, social and environmental concerns in their business operations and in their interaction with their stakeholders.

End-of-pipe (EOP) technologies

The traditional means of combating pollution by using add-on measures, i.e. treatment of wastes and polluting streams, normally implemented as a last stage of a process before the stream is disposed of or delivered.

The Environment

Surroundings in which an organisation operates and interact with all living inhabitants and processes, including air, water, land, natural resources, flora, fauna and humans. (In this context, it extends from within the workplace to the global system).

Environmental Management System (EMS)

The part of an overall (voluntary) management system including structure, planning activities, responsibilities, practices, tools, procurements, processes and resources for developing, implementing, achieving, reviewing and maintaining an environmental policy. The main international EMS standard is ISO 14001.

The International Organisation for Standardisation (ISO)

Based in Geneva, the ISO is a key organisation that develops international voluntary standards. Established in 1946, its members are the most distinguished standards bodies in their countries.

ISO 14000

A series of standards from the International Organisation for Standardisation (ISO) designed to integrate with other management requirements to achieve environmental and economic goals. This set of broad standards provides any company, regardless of size, type or location, with a structure for managing environmental impacts. The documents cover a range of environmental disciplines including environmental management systems (EMS), auditing, environmental performance evaluation, labelling, life-cycle assessment, and environmental aspects in product standards.

ISO 14001

Introduced in 1996 and revised in 2004, it is a voluntary international standard for a certified EMS in the ISO 14000 series. It is the specification standard describing the core elements for certification or self-declaration of an EMS.

Multinational Corporations (MNCs)

Also known as transnational corporations (TNCs), these very large corporations span multiple nations; with offices and/or factories in different countries. They usually have a centralised head office where they coordinate global management.

Organisation

A company, firm, corporation, enterprise or institution, public or private, incorporated or not, that has its own functions and administration.

Small-to-medium sized enterprises (SMEs)

The definition of what constitutes an SME varies widely across the world and within the Asia Pacific region from country to country, according to the number of employees and the amount of invested capital or turnover. In this study, an independent company with less than 100 employees belongs to this category.

Supply chain management (SCM)

The "greening" of the supply chain i.e. by screening suppliers for environmental performance, working with suppliers on green design initiatives, and providing training and information to build suppliers' environmental management capacity. This is a practice initiated by MNCs over their local suppliers.

Third party Registrar

The independent or "third-party" registrar is an individual or organisation trained and accredited by ISO or one of its member bodies.

ABBREVIATIONS AND ACRONYMS

A21	Agenda 21 for the Travel and Tourism Industry: Towards Environmentally Sustainable Development
ADB	Asian Development Bank
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BAPEDAL	Indonesia Environmental Impact Management Agency
BSI	British Standards Institute
CEM	corporate environmental management
CO_2	carbon dioxide
CSR	Corporate Social Responsibility
EMAS	(European) Eco-Management & Audit Scheme
EMS	Environmental Management System
FAO	Food and Agricultural Organisation
FSC	Forest Stewardship Council
GATT	General Agreement on Tariffs and Trade
GEO	Global Environment Outlook
GHG	Greenhouse gases
GRI	Global Reporting Initiative
HKHA	Hong Kong Hotels Association
HKPC	Hong Kong Productivity Council
HKQAA	Hong Kong Quality Assurance Agency
IATA	International Air Transport Association
IGES	Institute for Global Environmental Strategies
ISO	International Organisation for Standardisation
MOT	Ministry of Transport, Singapore

MNC	multinational corporations
NIEs	Newly Industrialising Economies
NRE	Ministry of Natural Resources and Environment (Malaysia)
SIRIM	Standards and Industrial Research Institute of Malaysia
SME	small and medium-sized enterprises
SO_2	sulphur dioxide
SRI	Socially Responsible Investment
Susdev 21	Study on Sustainable Development for the 21st Century
TISI	Thai Industrial Standards Institute (Thailand)
UNCED	UN Conference on Environment and Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
VI	voluntary initiative
WB	World Bank
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute
WSSD	World Summit on Sustainable Development
WTTC	World Travel and Tourism Council
WWF	World Wide Fund for Nature

LIST OF TABLES

Page

LIST OF FIGURES

Page

Chapter 1

Introduction

1.1 Introduction: The Environmental Challenge to Business

Since the 1970s, firms in developed nations have come under increasing pressure to evaluate and manage their environmental impacts as these impacts reached beyond local and regional levels. The same concern has become increasingly noticeable in Asia over the past two decades as the export-oriented character of most Asian industries has compelled them to conduct their business in line with international standards. In pursuit of profitability and international competitiveness, organisations in Asia are faced with the challenge of operating 'as usual' without burdening the environment and their corporate finances.

The Asian continent is a mixture of complex cultures and this mix is reflected in their business, economic, political and legal systems. Until some 20 years ago, most Southeast Asian countries were primarily agricultural economies, in which industrial production played a limited role (Oosterveer *et al.* 2006, p. 217). As industrial production increased rapidly over the last decades, the number of newly industrialised economies (NIEs) in the region has expanded to include countries such as Indonesia, Thailand and Malaysia thus joining the more developed first generation of NIEs in neighbouring Hong Kong, Singapore, South Korea and Taiwan. Inevitably, the industrial activities over the decades in the region have brought about a number of serious environmental problems relating to energy consumption, resource use, water and air pollution, waste generation and environmental risks to biodiversity. The severity of these environmental consequences varied, depending on the technologies used in the industrial production processes, the organisations involved, the way

organisations manage their environmental impact and the power of environmental regulation systems in the individual countries.

Although environmental regulations have been active for over two decades, it is increasingly recognised that their power in controlling pollution emissions has been inhibited by a lack of appropriate monitoring and enforcement. Apart from Singapore, where the situation is unique, governments in Southeast Asia have not been able to establish effective environmental regulation systems. In Singapore's case, its comprehensive regulatory standards and investment in environmental infrastructure has enabled the city state to maintain economic growth and promote itself as a "clean, green city" (Ministry of Environment, Singapore, 1992).

One of the major problems concerning ineffective environmental regulation systems is the lack of technical expertise, manpower and financial resources among the regulators seeking to control pollution sources. When compliance with the standards is found to be lacking, it is generally acknowledged that fines and penalties are too low – compared to pollution abatement costs - to act as effective deterrents. In a study of environmental regulations in East Asian countries, O'Connor (1994) writes:

… monitoring problem is compounded by weak enforcement. In short, when violators of standards are detected, if penalised at all they often face only weak sanctions… Perhaps the most pervasive problem is that, even when fines are levied, they are frequently so low in real terms that they have little if any deterrent value…
(Dasgupta et al., 1997).

Weak environmental enforcement aside, environmental problems occur within the context of a rapidly changing world in the midst of economic, political and technological transitions which in turn provide new challenges as well as new opportunities for the environmental performance in these countries (Oosterveer *et al.* 2006, p. 218). The

management of Asian companies need to be convinced that implementation of environmental technology would eventually lead to profits, not costs. However, the idea of the environment working together with development remains a complex issue for some Asian companies and Asian governments as the kind of environmental efficiency being sought in industrialised countries is considered a luxury in developing countries. For instance, governments believe that their own (least) developed country would lose out in its competitiveness, if it insisted upon adhering to standards deemed environmental friendly to developed countries (Chor, 1998).

As the environment becomes a bigger and bigger issue worldwide, the competitiveness of the region as a whole will be partly determined by their reputation for sound environmental policies and practices (Welford, 2004, p.286). This results in firms wanting to adhere to the highest international standards in order to get access to the global markets. In the late 1990s Asian countries began looking into adopting market-based mechanisms, starting with regional government institutions such as the Association of Southeast Asian Nations (ASEAN) recognising the need to achieve sustainable development in an increasingly globalising world by supporting the use of environmental management systems (EMS) and certification schemes such as ISO 14001.

Awareness of the importance of understanding EMS and their relationships with sustainability, competitiveness and business practice has already been growing in the West since the 1990s. In particular, headquarters of foreign-owned multinational corporations (MNCs) have played an essential role in developing and transferring environmental management activities to their affiliates across Asia. Unlike governments, MNCs can impose process standards such as ISO 14001 on their suppliers in order to push them to conduct business in line with international standards. By insisting on greening the supply chain, MNCs have had more success than governments in

inducing local firms to adopt environmental–friendly practices such as certifying to ISO 14001. Since its introduction in 1996 and revision in 2004, an EMS based on the ISO 14001 voluntary standard remains the most widely implemented and recognised international standard undertaken by the business community in Asia to pursue corporate environmental protection. As a synonym for eco-friendly practices and pollution prevention (Ghisellini and Thurston, 2005, p. 773) ISO 14001 is the most recognisable badge of achievement on environmental management. By gaining ISO 14001 certification firms can demonstrate to stakeholders and interested parties that (1) they have formal EMS procedures in place to conduct business activities in an environmental friendly manner and (2) their independently verified EMS conform to international standards.

The myriad of environmental problems affecting Asian cities as a result of rapid industrialisation, modernisation and infrastructure development are well documented, but efforts made by the private sector in the region to reduce their environmental impact are less well known. This thesis planned to fill a gap in our knowledge of how businesses across Asia tackle environmental issues and the depth of their understanding in issues relating to business and sustainability.

1.2 Aim of the Thesis

This thesis aimed to examine one of the corporate responses to the environment, namely the voluntary adoption of the international standard ISO 14001 by firms in Asia with the following three objectives:

1. To focus on key aspects of the environmental management system (EMS) based on ISO 14001.
2. To determine if the implementation of ISO 14001 EMS had delivered wider benefits to the firms over a period of time.
3. To examine whether the implementation of ISO 14001 EMS over a period of time had affected firms' environmental strategies by influencing them to undertake other voluntary initiatives.

Multiple case studies evidence based on six ISO 14001 certified firms had demonstrated the overall impact of an EMS based on the standard affecting the firms over the years and the positive contributions it had brought to their business.

1.3   Thesis Outline

The aim of this thesis was to examine the impact of ISO 14001 EMS on firms. In this chapter, the thesis set the scene by presenting a background on the corporate environmental management scenario in the Asia-Pacific region, highlighting firms' responses towards environmental protection issues. Issues relating to the emergence of the ISO 14001 standard were briefly reviewed.

The literature review in Chapter 2 examined the various drivers behind the emergence of corporate environmental management with emphasis on the development and characteristics of an environmental management system (EMS) based on the ISO 14001 standard. The historical development of ISO 14001 and its evolvement were discussed; and the benefits and shortcomings of the standard evaluated. The impact of ISO 14001 EMS on firms who have implemented the system over the years was evaluated and the positive contributions of ISO EMS to firms were examined.

In Chapter 3 presented the research methodology of this thesis. Evaluation based on key findings obtained from a previous exploratory study gave an overview on the uptake of EMS and corporate environmental practices among different business sectors in the NIEs in Asia. The methodology applied in this thesis was based on multiple case study evidence on six firms. Three major case studies were presented in Chapter 4 to Chapter 6 and the remaining three were presented as mini cases in Chapter 7. Firms were selected on the basis of (1) their ISO experience i.e. the number of years in which their ISO 14001 EMS had been implemented; (2) their different levels of

EMS development and (3) their potential to undertake other voluntary environmental management practices. A further aim was to find out whether or not ISO EMS had affected firms' environmental strategies by influencing them to undertake other voluntary corporate greening initiatives.

The first case study in Chapter 4 evaluated the benefits experienced by the Hong Kong based Island Shangri-La Hotel since its certification to ISO 14001 and how the company-wide ISO EMS guidelines had enabled other hotels within the group to carry out effective environmental protection measures. The implementation of ISO EMS has also influenced the hotel group to take up CSR reporting. This case study had demonstrated that ISO EMS, when implemented for a number of years, could result in a desired effect in steering firms towards the direction of sustainable development.

As an environmental conscious firm operating in an equally environmental conscious country, Chapter 5 reviewed the proactive green measures undertaken by Singapore Airlines (SIA) in tackling pressing environmental issues affecting the commercial aviation industry such as climate change, carbon emission and noise pollution. This case study had demonstrated the amount of manpower and resources a firm was willing to put in place in order to achieve tip-top environmental performance. ISO 14001 might not be the tool to in tackle complex issues such as climate change, but evidence from this case study had demonstrated that implementing ISO EMS involved the constant review of new environmental targets and programs which had enabled all eight units within SIA to improve their environmental performance over the years. Examples of good practice undertaken by the firm showed it to be a leading company operating in an environmentally responsible manner.

Chapter 6 identified the reasons behind Jebsen & Jessen Packaging's (JJP) decision to achieving ISO 14001. As a subsidiary of a European

MNC and a major supplier of custom-designed packaging to several MNCs such as Hitachi, Honda and Sharp, JJP's decision to seek certification was a result of the greening of supply chain demands. Already certified to ISO 9001, the company anticipated similar demands from customers for it to be ISO 14001 certified. This case study demonstrated a firm's response to external stakeholders' expectations to adopt ISO 14001. By doing so it engendered greater staff involvement in environmental initiatives and enabled the firm to focus on preventative actions to reduce the negative impact its business activities had on the environment. The implementation of ISO EMS over the years had resulted in the strengthening of JJP's environment, health and safety (EHS) committee therefore enabled the company to carry out effective and continuous EHS practices across all departments.

The remaining three mini case studies were based on firms operating in the plantation (Sime Darby Plantations Sdn Bhd), tobacco (British American Tobacco and natural gas (Towngas) sectors. Profiles and information on the three firms were presented and summarised in a table. The information presented were based on data gathered form secondary sources such as the content analysis of the firm's website and the company's annual and environmental reports (and CSR reports where available). Additional information was compiled from company newsletters, press releases and articles. Like the three firms examined in the bigger case studies, these three firms were early also adopters of ISO 14001. Overall findings on these three firms indicated that it was practical as well as responsible for firms to adopt several measures in response to ongoing and emerging environmental and social issues.

Chapter 7 presented the data analysis and interpretation of the two hypotheses formed in this thesis. Data collected from the multiple cases studies research were discussed and summarised.

Chapter 8 concluded this thesis with an update on the current state of ISO 14001 across the region, an original contribution to knowledge and indications for further studies.

Chapter 2

Literature Review

2.1   Introduction

This thesis draws on two strands of literature; firstly on the emergence of corporate environmental management with emphasis on the development and characteristics of an environmental management system (EMS) based on the ISO 14001 standard, and secondly on the impact of ISO 14001 EMS on firms who have implemented the system over the years. The focus on ISO 14001 EMS is to find out why this voluntary measure has had the biggest impact on firms across Asia. This thesis will examine the positive contributions of ISO EMS to firms and whether or not it has affected their environmental management strategies by influencing them to undertake other voluntary corporate greening initiatives. The term 'ISO EMS' mentioned throughout this thesis is used interchangeably with ISO 14001 EMS.

There is an increasing recognition that society's ecological, ethical, social and health-related interests are of business' interests in developed nations. Since the late 1990s there has been an increasing awareness of the importance of understanding EMS and their relationships with sustainability, competitiveness and business practice in the West. By contrast, the key priority in Asia is development. Despite experiencing rapid economic growth in recent years, there still remain considerable gaps in economic prosperity and social well-being between countries in the region and those in the West. Furthermore, rapid industrialisation in the region has caused serious environmental damage to many cities and its citizens. Command-and-control regulations introduced in the 1970s were effective in dealing with simple but significant industrial pollution that were prevalent at the time such as water pollution and hazardous wastes disposal (Evangelinos *et al.*, 2001 p. 190). As environmental issues evolve and become

increasingly complex over time, command-and-control regulations are becoming less effective and economically efficient in dealing with wider problems such as global warming, biodiversity loss, acid rain and ozone depletion. The main criticism of command-and-control regulation lies in its bureaucracy and lack of flexibility, which in turn does not provide incentives for firms to proceed beyond compliance with environmental law (Evangelinos *et al.*, 2001, p. 190). Forced compliance, for instance, means that ineffective environmental agencies try to apply the laws to organisations that see little value in compliance and are resistant to efforts of regulatory agencies (Smith, 2000, p. 19).

The 2001 Asian Development Bank report concluded that the root cause of the sorry state of the situation in Asia was a result of a failure of policy and of institutions. The report identified a clear deterioration in environmental quality throughout the Asia and Pacific region despite the presence of an array of environmental regulations. The bank further attributed the driving forces underlying the poor environmental quality and extensive environmental degradation in the Asia and Pacific region to include population growth, urbanisation, widespread poverty, inefficient technologies, a lack of participation by civil society and weak institutions (Asian Development Bank, 2001, p. 24). Stringent environmental regulation and enforcement may be the obvious solution, but laws and policies cannot be effective unless individual plants, factories and firms have or acquire the capacity to efficiently carry out pollution prevention, clean production and waste reduction practices. A different approach is needed: voluntary environmental initiatives in the form of corporate environmental management systems.

2.2 The emergence of corporate environmental management

Understanding the role of environmental management in business decision-making requires an understanding of history (Piasecki *et al.*, 1999, p.99). The growing awareness and concern for the environment

have been influenced by a number of key events throughout the 1970s to the 1990s, beginning perhaps with the first Earth Summit in 1972, which led to the establishment of the United Nations Environment Programme (UNEP). In the same decade the Club of Rome's report 'The Limits to Growth' by Meadows *et al.* (1979) raised public fears further over the predicted dire consequences of policies aimed at continued economic growth and the putting forward of the concept of zero growth. The 1980s witnessed a general shift towards more optimistic viewpoints. The publication of the Brundtland Report - "Our Common Future" - commissioned by the United Nations World Commission on Environment and Development (UNWCED) in 1987 introduced the concept of sustainable development[1] to a much wider audience by suggesting the adoption of the concept as a solution to attain both economic and environmental goals (UNWCED, 1987, pp.1, 8). The report argued that economic development and environmental protection could be made compatible with radical changes taking place in economic practices throughout the world (Welford, 1998, p.3). Radical changes mean changes in behaviours and actions. For example, the practice of mass consumption must be curbed and today's generation must not act as if all non-renewable resources are plentiful.

Quazi *et al.*, (2001, p. 526) noted the report triggered a philosophical change from the notion of "anti-growth" by environmentalists in the 1970s to one of "sustainable development". This philosophical change is demonstrated in the three closely related issues of sustainable development mentioned in the report:

1. *Environment:* This must be valued as an integral part of the economic process and not be treated as a free good. Its stock must be protected by minimising the use of non-renewable resources together with minimal emission of pollutants. The

---

[1] Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p.8).

ecosystem needs to be protected to prevent the loss of plant and animal species.

2. *Equity:* Narrowing the development gap between the North and the South. The disputable issue of the North acknowledging the irreversible environmental damage it has caused to the planet in its pursuit for development, economic prosperity and standards of living while dissuading the South from repeating the same mistake. The South is entitled to attain the same level of socio-economic development and material wealth, and it would be hypocritical for the North to impose its sets of rules and Western values in return.

3. *Futurity:* Sustainable development requires that society, business and individuals operate on a different timescale than the one it currently operates in the economy. Business organisations are to stop seeking short-term gains but to pursue long-term goals by adopting longer planning horizon. Firms should aim to be proactive, not reactive.

(Adapted from: Welford, 1998, p.4)

Although the Brundtland report concludes the three conditions are not being met, they are, however, attainable. It calls for growth that is environmentally and socially sustainable and therefore challenges industry to produce higher outputs with lower inputs while generating less waste. The early 1990s saw the second Earth Summit in Rio de Janeiro in 1992 where leaders of many of the world's nations signed up to an ambitious agenda for addressing the environmental; economic, and social challenges facing the international community in moving towards sustainable development. Since the Brundtland report and the Rio conference, governments, business organisations and the society at large are all expected to play a part in sustainable development and pollution prevention. General optimism was further reinforced in the late 1990s with the emergence of evolved concepts such as the "sustainable business" and "sustainable global economy". Within this more optimistic frame of mind, the 1990s have been

described as a period of strategic action, during which both governments and organisations at a corporate level began to regard environmental policy and management issues from a strategic perspective, one which would deliver competitive advantages to both national economies and to individual global business organisations (Welford, 1998).

Following the optimistic trail in the 1990s, the 2002 Earth Summit or The World Summit on Sustainable Development (WSSD) held in Johannesburg became a high profile event, attracting tens of thousands of participants including heads of state, national delegates and leaders from non-governmental organisations (NGOs) and major corporations. At the summit "changing unsustainable patterns of consumption and production" (UN, 2002) was determined to be the key task for the future. Key international events and initiatives aside, firms begin to realise the need for them to address environmental issues as a result of consumer expectation; potential cost savings, legislation and ethics. Tackling these issues soon leads to the growing interest in the area of corporate environmental management.

Environmental management is considered "an emerging field, characterised by new developments and is moving fast." (Lesourd and Schilizzi, 2001, p.3) Environmental management can also be deemed as a mixture of science, policy, and socio-economic applications. It focuses on solving practical problems that human beings encounter in their interaction with nature such as exploitation of resources and production of waste. From a business perspective, management of the environment i.e. corporate environmental management relates to how its activities interact with and impact on the environment. Through better management practices, the business sector is able to play an important role in addressing environmental problems more effectively by developing cleaner and greener processes, products and services. Gouldson and Murphy (1998, p. 23) have identified a number of measures (i.e. improved product quality; increased staff commitment,

reduced risk exposure, assured presence and future compliance, reduced waste management cost etc.) for firms to become more competitive in their business operations.

Conventionally, the business sector perceives the ever increasing and stricter regulations as threats. While corporations recognise the importance of developing effective environmental policies, their motivations can be primarily reactive and dependent on the expected development of environmental legislations. As markets become more volatile, the pace of technological change in many industries has increased. There have also been numerous legislative changes, especially in the context of Europe. There is a greater expectation amongst consumer and investors that companies will behave in environmentally ethical ways (Faulkner *et al.* 2005, p.485). As firms adapt to the changing environment in which they operate, the proactive ones turn the perceived threats of stricter regulations into opportunities by implementing innovative practices. Taking into account the principles of sustainable development, anticipatory rather than reactive strategies provide competent ways for firms to deal with environmental risk issues, together with proactive management and decision-making. An environmental strategy taken by firms to tackle the business and environment issue involves 'shifting the overall direction of the firm towards the response to environmental challenges and this goes beyond merely striving for change through environmental innovations' (Lesourd and Schilizzi, 2001, p.21).

Dunphy *et al.* (2007, p.31) indentifies 5 key issues pressuring corporations to become more responsible global citizens:
1.   The first issue is poverty. There are still 1.2 billion poor people in the world.
2.   Much of the material wealth is owned by the major corporations of the developed world.
3.   The negative effects of globalisation and industrialisation are largely impacting on the developing world and are linked with

the loss of traditional localised cultures and community life. There has been a pattern of special pleading and avoidance on the part of some self-interested nations and corporations which has both limited the ability of international agreements to address these inequities and increased the social pressure on corporations to be more responsible citizens.

4. The failure of the international community of nations and individual corporations to address these concerns is now a subject of intense interest to an increasingly aware and communicative global audience. Society is less willing to take lack of scientific evidence as a reason for inaction in the cause of environmental and social well-being. A wider range of stakeholders is demanding much more from the corporation, particularly those stakeholders who have come together under the broad banner of sustainability.

5. Finally, national governments are experimenting with ways to use market and legislative mechanisms to encourage change toward more corporate accountability and innovation for sustainability.

Dodge and Welford have developed an environmental performance scale which has become known as the ROAST scale (Welford, 1995, 1998) and is now being used by others to identify aspects of corporate environmental performance. It extends the traditional environmental categorisations to include sustainable development. In order to measure improving environmental performance Dodge and Welford argue that we need to define an ultimate goal towards which the organisation must move. This goal may not be achievable but it will serve as an upper boundary of sustainable performance on a 5-point scale. This utopian form of organisation is referred to as the 'transcendent firm'. This firm will have ideals very similar to those of deep ecology and will perform in a way which is completely consistent with sustainable development.

Although the debate on a definitive definition of deep ecology and its comparison to sustainable development is far from settled, for simplicity Dodge and Welford consider the four pillars of the green philosophy and deep ecology to mix as one: ecology, grassroots democracy, social responsibility, and non-violence. It becomes quite obvious at this level of abstraction that human and animal rights, non-violent behaviour, ecological management and an emphasis on regionalism are all part of the same issue. The least environmentally sensitive measure on the ROAST scale is represented by the 'resistant organisation'; the firm's environmental performance would be represented by extremely resistive behaviour. Organisations would totally disregard ecological issues in their decision-making. The prime and ultimate motive of the organisation would be profit and the satisfaction of shareholders. The organisation would contain strong, pervasive, negative environmental values.

It is argued that an organisation's performance can be categorised as lying somewhere between the resistant firm and the transcendent firm. The 5-point ROAST scale is therefore be represented by the following interval values:

- **R**   Resistance

  (Stage I)   Total resistance to environmental values and rules.

  Organisations would be absolutely unresponsive and reactive to environmental initiatives.

- **O**   Observe & Comply

  (Stage II):   The organisation observes environmental laws but actions reflect an unwilling attitude or lack of ability to comply.

  Actions are being enforced through legislation or court decisions.

- **A**   Accommodate

  (Stage III)   Organisation begins to adapt to change.

  Early indications of proactive and responsive behaviours.

  Actions are no longer based entirely on complying with environmental legislation.

  The organisation begins to exhibit voluntary behaviour.

- **S**   Seize & Pre-empt

(Stage IV)   The organisation voluntarily seizes and pre-empts its actions with environmental concerns.

It proactively engages in setting the agenda.

It is responsive to the many external stakeholders.

The latter phases would display the attributes of sustainable development.

- **T**   Transcend

(Stage V)   The organisation's environmental values, attitudes, beliefs and culture exhibit a total support for the environment.

The organisation would proactively support and be responsive to all living things.

It would act in a way which is fully consistent with sustainable development.

Source: Bhargava & Welford ,1996,1998 p.21-2

The ROAST scale can be useful in the classification of environmental performance responses from external stakeholder groups and internal organisational functions, systems and activities. Environmental strategy has increased substantially over the last two to three years. There have been many attempts to analyse the strategy of companies and to propose workable ways forward which both maintain or increase profitability and provide for the improvement of corporate environmental performance (Bhargava and Welford, 1996 and Welford, 1998).

In recent years, a large number of ideas and proposals have emerged in bringing corporate management systems into better alignment with notions of sustainable development through the use of voluntary initiatives. Although there is considerable overlap and the categories are not mutually exclusive, they may be grouped under four broad headings:

1.   Environmental management system (EMS), which focuses mainly on natural environment issues.

2.   Corporate Governance (CG), which tends to emphasise economic and accountability factors. Recent corporate financial

scandals (e.g. ENRON, Arthur Andersen and Worldcom) triggered not only significant media coverage but also focussed public and governmental attention as never before on corporate corruption and corporate governance issues. The Organisation for Economic Co-operation and Development (OECD) developed a set of guidelines (OECD, 2000; OECD, 2004) for corporate governance.

3. Corporate Social Responsibility (CSR) emerged from the charitable sector. It may be seen as expanding the initial emphasis of CG from correcting and avoiding corruption to broader non-financial issues. The emphasis in CSR differs from country to country. It tends to centre mainly on "human rights" in the USA, "employment" in Europe, and "safe working conditions" in Japan.

4. Corporate Responsibility (CR) differs slightly from CSR in that its origin was mainly in consumers' movements and its principal emphasis is on consumer protection. ISO has begun the standardisation process of CR in its Consumer Policy Committee.

(Source: Anbumozhi, 2005, p.111)

Of the four voluntary concepts mentioned above, an EMS based on the ISO 14001 standard is by far the most popular self-regulating measure adopted by large corporations across Asia and around the world (e.g. USA) to reduce environmental impact and improve environmental performance.

2.3   The Development of EMS

EMS has existed in various forms since the 1970s (Gallagher *et al.*, 2007, p.205). A number of definitions of EMS have emerged over the years and here are a few examples:

The British Standards Institute (BSI) defined an EMS as "the organisational structure, responsibilities, practices, procedures, processes and resources for determining and implementing environmental policy". BSI (1994, p.6)

An Environmental Management System (EMS) can be defined as an "aspect of an organisation's overall management function that determines and implements the organisation's environmental policy" (Fryxell and Szeto, 2002; Tibor and Feldman, 1996).

An EMS can also be described as "a set of procedures that defines – generally in great detail – how an enterprise will manage its potential impacts to the natural environment" (Coglianese and Nash, 2001).

Stuart (2000) interpreted an EMS as "an information-based approach to managing the environmental impacts of an organisation's activity by focusing on the relationship between different kinds of work going on in the organisation".

Over the years, EMS has been used by firms as a generic system to manage their business activities in an environmental friendly manner. Most EMS share certain features and they include:

- the identification of environmental goals and targets
- the identification of an organisation's environmental impacts
- the identification of relevant legislation/regulatory structures
- the establishment of control, measurement and monitoring procedures
- the introduction of appropriate training programmes for employees
- the introduction of structured documentation systems (a prerequisite of effective environmental auditing systems)

(Source: Watson 2006, p. 280)

The roots of EMS can be traced back to the mid-eighties in the US when a need to ensure compliance in response to mounting environmental legislation became apparent (Steger, 2000, p.23). The

same concern was happening in Europe around the same time, with innovative firms developing a more proactive attitude towards environmental issues as they saw them as a business opportunity rather than an encumbrance. Their search for managerial tools that would assist them to implement environmental strategy resulted in the development of environmental audits as risk management tools, which gradually developed into management systems (Steger, 2000, p. 24). According to Bhargava and Welford (1996, p. 15), an overall theoretical framework of environmental management was demonstrated by Meima's (1994) four categorisation of the various environmental management paradigms that have emerged since the 1990's:

1.   The environment as an anthropocentric moral/ethical issue.

2.   The environment as a means to gain financial benefits thus explaining the concept of competitive strategies and competitive advantage.

3.   Environmental management as a function of quality e.g. Total Quality Environmental Management (TQEM), BS7750 (replaced by ISO 14001 in 1996).

4.   Determining ways in which industrial action can be made compatible with nature through minimising emissions and reducing waste.

A general assumption is that most large firms have some version of an EMS in place (Sarkis and Sroufe, 2004, p.5). How businesses go about implementing and managing the system differs from one firm to the next because each individual firm sets their own environmental policy and targets. Most importantly, the EMS implemented must enable the firm to improve its overall environmental performance.

2.4   ISO 14001 EMS: the context

Welford (1998) has identified the dominant voluntary approach to managing environmental issues in most large firms to be the construction of an EMS, often certified to ISO 14001, associated with a

cycle of continuous improvement. The ISO 14000 series of standards on environmental management emerged as a result of the Uruguay round of the General Agreement on Tariffs and Trade (GATT) negotiations and the 1992 Rio Summit on the Environment to encourage the industry sector to improve its environmental management (Delmas, 2000 and Quality Network (UK), British Accreditation Bureau). The 1992 Rio Summit was an essential step in forming ISO 14000 with over one hundred countries attending the United Conference on Environment and Development (UNCED) committed to improving international management programmes and petitioned the ISO to adopt the cause (Delmas, 2000, p.5). Introduced in 1996, an EMS based on ISO 14001 is defined by the Geneva-based International Organisation for Standardization (ISO) as "a tool that enables an organisation of any size or type to control the impact of its activities, products or services on the natural environment (ISO/TC 207)".

Prior to ISO 14001, developments in EMS standards adopted in different countries over the past decade were: BS 7750 (1992) and EMAS (1993). BS 7750 was the world's first environmental management standard introduced by the British Standards Institution (BSI) and was a major influence on the development of ISO 14001 (Tan *et al.*, 1999). The Eco-management and Audit Scheme (EMAS), launched by the European Union a year after, was also based on BS 7750. EMAS is a Europe-wide initiative developed for the European Union to improve environmental performance in the industry sector. Under the terms of the Vienna Agreement (an agreement between the EU and the ISO) if an ISO document is ratified by the EU then all competing national standards must be withdrawn. BS 7750 was subsequently withdrawn and replaced by ISO 14001 when the EMAS scheme was launched. Table 2.1 outlines the differences and similarities of BS 7750, EMAS and ISO 14001. All three EMS standards have one thing in common: they are all voluntary.

Table 2.1   Comparison of ISO 14001, B7750 and EMAS

	BS 7750	ISO 14001	EMAS
Launch date	June 1992	September 1996 (Revised in 2004)	April 1993
Scope	Applicable to companies of all types and sizes	Applicable to companies of all types and sizes	Applicable to selected manufacturing companies Must be implemented on a site basis
Focus	Environmental performance Identification of environmental impacts must include six specified areas of concern	Environmental management Company sets its own environmental standards	Environmental performance Identification of environmental impacts must include specified areas of concern
Public reporting	Annual environmental statement not mandatory	Annual environmental statement not mandatory	Requires annual environmental statement and independent verification of the statement

Adapted from: Block (1997, p.149)

Looking at Table 2.1 EMAS appears to differ from ISO 14001 in its depth and demands with regard to commitment, transparency and environmental performance. However, the structure of the EMS under EMAS is similar to the structure detailed in ISO 14001 (Delmas, 2002). In a 1997 survey involving 140 EMAS certified sites in Europe, 47% were also ISO 14001 certified. This indicates a high correlation between then EMAS and ISO 14001 certifications. Although the implementation and adoption of requirements under EMAS is voluntary, pressure to adopt from national and regional governments in the EU is high. This is particularly evident in Germany and Austria (Steger, 2000, p.24), where EMAS registrations in both countries were among the highest in the EU. In January 2002, the number EMAS registrations in Germany and Austria were 2641 and 421 respectively (ISO World, Japan, 2000).

As an international standard, ISO 14001 represents a global blueprint for establishing, managing and maintaining environmental management systems in organisations (Balzarova and Castka 2008, p.9). The theory behind ISO 14001, which is process-based is that: (1) pollution represents resource waste; (2) rather than exclusively relying on governments' command and control regulations to mitigate pollution, firms can self-regulate; (3) if appropriate management systems are put in place, desired outcomes such as improved environmental performance will follow; and (4) auditing by external accredited auditors will create incentives for firms to adhere to program obligations (Prakash and Potoski, 2006, p.351).

Since the 1990s consultants and academics have repeatedly demonstrated that proactive environmental strategies such as EMS are good for the planet and as well as beneficial to corporate reputation and financial performance. Unlike any EMS, ISO 14001 was born with the credibility and authority that come from being a product of ISO, whose success with the ISO 9000 series of quality management standards has established it as one of the most influential standard setters in the world (Jiang and Bansal 2003, p. 1050). ISO 14001 is a voluntary standard and individual firm may or may not choose to adopt. However, firms can show their conformance to the ISO 14001 standard in two ways; self-declaration or third-party independent certification. In the first case, firms document their EMS and self-declare that they meet ISO 14001 standard by using the ISO 14001 guidelines to create or improve their existing EMS without formally certifying. In the second case, firms have a formal EMS in place that has been certified through ISO accredited independent auditors. The level of interest it has generated across Asia is very promising and should lead to further understanding of the benefits of better environmental management and greater awareness of environmental performance as a factor in succeeding in increasingly competitive markets. Since the standard is voluntary, a firm's decision

to seek certification indicates that it is trying to be environmentally and socially responsible.

According to Starkey (1996, p.77) and Visser (2009, p.154), the story of certification can be traced back to 1982 with the work of E. Edwards Deming, a pioneer in the field of quality management, with his quality management cycle of 'Plan-Do-Check-Act' (PDCA). The Deming Cycle provides a basis for the ISO 9000 standards and eventually became the backbone of the ISO 14001 approach. Based on Deming's model, an EMS uses the 'PDCA cycle' to drive the process of continual improvement in which an organisation is constantly reviewing and revising the system. In other words, continual improvement is a key component of ISO 14001 (Brouwer and van Koppen 2006, p. 2). Figure 2.1 illustrate how the PDCA process of an EMS has been organised to correspond with the four stages of the Deming Cycle. (See Appendix A for phases of EMS in relation to the PDCA process).
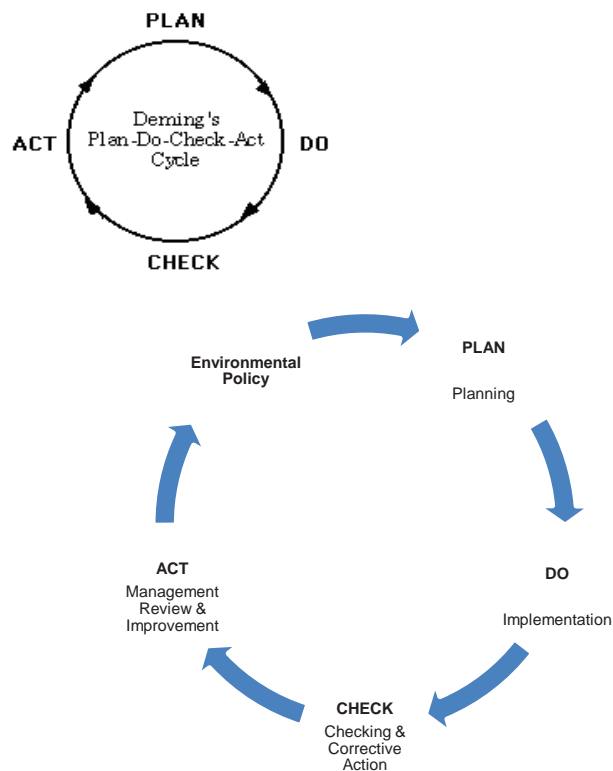
Figure 2.1 The Deming Cycle and the PDCA Cycle (Source: mcts.com and Beal, 2002)

24

The process of third party certification involves an ISO accredited independent auditor to evaluate the firm's procedures and carry out site visits to certify the firm. The main objective of certification (or registration) is to ensure that a firm's EMS is operating correctly, effectively and continually. The process of auditing also aims to help a firm spot opportunities in its EMS for further improvement. Following certification, the principal task for firms is to keep the momentum going by updating and improving their EMS as routine audits are conducted. Firms tend to undergo a full re-certification audit every 3 years. By renewing a firm's certificate, the auditor provides written assurance that its product, process, or service still conforms to the specified guidelines and requirements of ISO 14001. Ensuring effective internal process aside, ISO 14001 certified firms have a good corporate image (endorsed by an internationally recognised standard) that enables them to access new markets; boost sales in markets with high environmental standards and preserve strong stakeholder relationships with customers, employees, local communities and green pressure groups. Since the mid 1990s the use of EMS has accelerated worldwide, driven by the 1996 publication of the ISO 14001 international voluntary standard which replaced the British Standard (BS) 7750 in 1997. The level of adoption continues to rise with when the standard was revised in 2004. In December 2008, there were 188,815 ISO 14001:2004 certificates issued worldwide across 155 countries, compared to 1,491 certificates issued across 45 countries in December 1996 (The ISO Survey, 2008 and 2000).

[ISO 14001 is] the gold medal winner among EMS: liked by the market, internationally available and recognised, not too difficult to achieve (especially if you're a big company) and it satisfies the users (Hillary, 2000, p.11). In addition, the popularity of the ISO 14001 standard popularity lies largely in its flexibility. It is designed to be applicable to organisations of all types and sizes, and to accommodate diverse geographical, cultural and social conditions (Wu *et al.* 2007, p.468). The four main areas of flexibility in the ISO 14001 standard are:

1. A certified company is free to define the scope of operation whose environmental impact will be assessed.
2. The company is free to determine which of its environmental impacts are significant enough to be addressed.
3. Although the company must establish procedures for reacting and responding to external interests, it is under no obligation to actively engage them.
4. It is unclear as to what extent companies must demonstrate environmental performance improvement or even compliance to be certified.

(Anbumozhi and Kanda 2005, p.6)

Flexibility aside, firms choose to voluntarily implement ISO EMS as a result of external and internal factors (Balzarova and Castka, 2008, p.2). The authors define "external factors" as corporate image; marketing advantage, customer or network pressure/demand, relation with communities, and relation with authorities and "internal factors" as improving environmental performance and emergency readiness (ibid.). An important external factor for firms to become ISO 14001 certified is that they may attract customers that they would not have otherwise, such as General Motors and Ford, which require ISO14001 certifications from their major suppliers (Jiang and Bansal 2003, p. 1049). Evidence from a study based on 4000 facilities in OECD countries suggests that signalling to regulators and suppliers is a strong motivation for the voluntary adoption and certification of EMS among large firms (Johnstone and Labonne 2008, p.9). A study carried out on Japanese manufacturing firms discovered a positive relationship between economic performance and firms' initial adoption of ISO 14001 because better economic performance allows a firm more flexibility in financing new programs (Nishitana 2008, p.9). This further explains why MNCs are early adopters of the standard and have the ability to maintain their ISO EMS over the years.

However, critics of ISO 14001 often point out that the standard does not guarantee environmental friendliness as the actual environmental performance of a plant or company is not measured (Krut and Gleckman, 1998) and that ISO 14001 is mainly concerned with conformance, not performance (Yap, 2000, p.139). As a process, ISO 14001 EMS does not determine a firm's optimum environmental performance level but describe a system to help a firm achieve its own environmental objectives. Underlying this approach is the assumption that by helping a firm focus on each stage of its manufacturing activities, it will develop better environmental management practices and, ultimately improve its environmental performance. This assumption is acknowledged by Link and Naveh (2006) who suggest that while improvement in business performance was not achieved, the establishment of an EMS does not harm business performance and can therefore motivate firms to carefully manage their environmental issues. In this respect, the authors conclude that by following the requirements and guidelines of ISO 14001, firms could improve their environmental performance (Link and Naveh 2006, p.516). This is particularly beneficial for firms in the export business as their ISO 14001 certified products can be marketed overseas. For instance, export oriented Taiwanese firms are more likely than domestic focused firms to adopt ISO 14001 as they encounter greater pressure from MNCs (Wu *et al*. 2007, p. 486).

Findings based on a study using Japanese facility data from an OEDC survey confirm that environmental regulations and voluntary measures can work hand-in-hand (Arimura, Hibiki and Katayama 2008, p. 294). The authors recommend that the Japanese government use both the command-and-control measures and ISO 14001 EMS as an environmental policy instrument to help drive business towards undertaking sustainable practices. Despites its limitations in measuring a firm's environmental performance, an ISO EMS is able to play a role in enabling firms to achieve better environmental compliance. This measure should therefore be considered by other governments in Asia

to induce corporate environmental responsiveness among the business communities across the region. In a recent study on automotive supplier organisations in Spain by Gonzalez *et al.* (2008, p. 1033) conclude that "there is some association between EMS implementation and the implementation of other environmental practices. These results for the Spanish automotive industry support previous research showing that such a relationship exists (Rehfeld et al., 2007; Rennings et al., 2006) and is not a "ceremonial" activity (Boiral, 2007). One implication is that having certified EMS provides a supportive environment for the adoption of other environmental practices. If organizations wish to see their environmental management programs grow, especially organisations within the automotive industry certified EMS such as EMAS and ISO 14001 are good mechanisms to support this growth. Although additional environmental practice adoption may be related to certified EMS implementation, Gonzalez *et al.* (2008) have yet to test whether the adoption of these systems leads to improved environmental performance. (See Table 2.3 on p.33 for the perceived benefits and positive contributions of ISO EMS implementation to firms).

2.5   ISO EMS in practice: the impact on firms in Asia

One cannot draw generalisation about the region as a whole, as Asian countries differ substantially in their levels of economic development, political/legal systems and cultural norms (Baughn, 2007, p. 190). It is evident that in the past 30 years or so, environmental awareness has gained momentum and publicity among societies and business organisations in the West. Over the years, environmental regulations in the Asia and Pacific region have become strict (Gunatilake and De Guzman 2008, p. 23). Are similar trends happening in Asia?

The corporate sector plays a key role in economic development and the alleviation of poverty in many Asian economies (Asian Environment Outlook, 2005). For instance, commerce and industry has been the driving force behind much of Asia's recent economic growth

(Anbumozhi and Kanda, 2005, p.3). However, the progress of industrialisation has also brought about many forms of environmental damage ranging from air to water pollution, as well as soil pollution from industry and landfills. Urban expansion, also as a result of industrial growth, has greatly contributed to and increased the generation and accumulation of solid wastes in many Asian cities (Oosterveer *et al.*, 2006, p. 220). Halpern (1992, p.2) noted: "A country could not achieve economic development when its environment was degraded, nor could it restore its environment in the absence of economic development". While sustained economic growth has been widely recognised by governments throughout Asia as the key approach in achieving sustainable development, the on-going challenge is how this could be accomplished without creating additional burden on the environment in the years to come. Industry will remain the lead sector in most Asian economies in the next few decades and will most likely experience a significant expansion. So, despite the level of negative impact caused to the environment, it is believed that industry has the greatest potential to become part of the solution for the problems it has created. The export-oriented character of most Asian industries already forces them, for example, to include global environmental requirements for the industrial supply chains and their products, a pressure which is highly expected to become more intense in the near future (Oosterveer *et al.*, 2006, p.218). Access to export markets and supply chain pressure have played a considerable part in driving Asian firms to adopt ISO 14001 as demonstrated in Table 2.2 on the following page.

Table 2.2   ISO 14001 adoption in selected Asian countries: Overview and Reasons

Countries	Spending on Environment (% of GDP 2003)	Total number of ISO 14001 certified firms (2009)	Certified sectors	Reasons for ISO EMS adoption
Hong Kong	1.4%	641	Construction; Electronics, Transport, Government departments	Legislative obligations. Government encouragement Industry-driven effort led by the Private Sector Committee on the Environment. Market & Supply chain pressures. Liabilities avoidance esp. for firms with large investments in mainland China.
Malaysia	1.2%	753	Chemicals; Electronics, Food & Beverage, Metals, Rubber & Plastic	Export-oriented pressures. Legislative pressures. Private sector initiative led by SIRIM. Supply chain influence.
Singapore	1.3%	747 (Mar 2008)	Electronics, Healthcare	Access to export markets. Government support & incentives. Parent company policies. Supply chain influence.
Thailand	1.1%	1542	Paper & Pulp; Electronics, Manufacturing	Export opportunities. Supply chain influence. Government support.

Source: Department of Standards Malaysia (2009); Peglau (2007), TISI (2009), Tanner (1998).

Asia already plays a significant role as the manufacturing base for the majority of the goods and services of the world with a large part of the manufacturing activities taking place in subsidiaries of multinational corporations (MNCs) in the region. In this play of 'global development',

the region is taking on an increasingly important role in the production process as the world becomes more tightly knit, making the region a cheaper production house (Rao, 2004, p.289). With a large part of the manufacturing processes being subcontracted to local firms, foreign MNCs - to some extent - are playing a pivotal role in the greening of the supply chain in the region. Firms acting as suppliers to MNCs will have to be integrated into the production process of the big firms who are committed to protecting the environment. Therefore the MNCs have to ensure that the production processes employed by their local suppliers are environmental-friendly, non-hazardous and with minimal pollution. For instance, Taiwanese firms play a vital role in the global supply chain and are constantly faced with increasing pressure from both domestic and global stakeholders to be more environmentally responsible (Wu *et al.*, 2007, p. 485).

Responding to the mounting demand for greener goods and growing significance of environmental and social responsible business practices within the global market, MNCs and large firms based in Asia have taken proactive steps to meet these demands. "Firms that operate in international markets are more likely to adopt more innovative policies" (Fernandez *et al.*, 2006, p.268). The Asian Development Bank (2001) concluded that the root cause of the sorry state of the situation in Asia was a result of a failure of policy and of institutions and only rarely by technical constraints (Gunatilake and De Guzman, 2008, p.7). As the level of implementation of laws and regulations set by governments varies among countries, proactive organisations are looking into voluntary environmental protection instruments, in addition to command-and-control regulations to manage their environmental responsibilities. Environmental management strategies differ from country to country, business sector to business sector and above all, evolve over time. The emphasis on global environmental management has evolved from the conventional approach of command and control to the voluntary participation and avoidance approach (Wu *et al.* 2007, p. 468). Voluntary environmental

programmes are codes of progressive environmental conduct that firms pledge to adopt in order to reduce their pollution emissions and mitigate the impact of their activities on the natural environment (Potoski and Prakash 2005, p.745). Therefore, voluntary approaches to environmental protection are sometimes considered as the next generation of environmental policies (Uchida and Ferraro, 2007, Esty and Chertow, 1997).

The first model for predicting the intentions of firms to achieve the ISO 14001 standard was developed by Quazi *et al.*, (2001) in their study of the electronic and chemical industries in Singapore. Through an extensive search of the global literature on environmental management and quality management, Quazi *et al.*, identified the following eight possible variables/factors in their prediction for the motivation of organisations in adopting the ISO 14001 standard. The eight possible factors identified by the authors are: (1) cost savings, (2) top management concern, (3) employee welfare, (4) meeting environmental regulations, (5) meeting customer expectations, (6) concern over trade barriers, (7) following head office environmental practices, and (8) gaining competitive advantages. The researchers then indicated that the top four motivational factors affecting the intention of firms to adopt ISO 14001 are influenced by top management concern, head office environmental practices, environmental regulations and cost savings.

In addition to the driving forces behind the adoption of ISO 14001, much of the literature to date also describes commonly used environmental management practices and the impact of an environmental management strategy on the company's business strategy. For instance, Chin *et al.*, (1999) employed the analytic hierarchy process (AHP) to formulate a model to evaluate success factors and develop strategies to implement an ISO 14001-based EMS. Pun *et al.*, (2001) also investigated the critical processes and factors that could affect EMS planning by applying the AHP model in their

study. Daily and Huang (2001) studied human resource factors as key elements in the process of implementing an EMS. Gupta (1995) studied the impact of environmental management on operations. Garrod and Chadwick (1996) discussed the link between environmental management and business strategy, while Quazi *et al.*, (1999) discussed the impact of the implementation of EMS. In the hotel sector, Stipanuk (1996) studied how environmental issues have long been of concern to the lodging industry in the US, by identifying examples from the past. He also found that US hotel managers were somewhat less perceptive of environmental issues when compared to international managers (Stipanuk and Ninemeier, 1996).

Basically, a formal EMS does play a role in improving overall performance; it also affects the frequency with which various environmentally related options are used. A study carried out in by Melnyk *et al.*, (2002) in North America demonstrates that certification, as embodied within the ISO 14001 environmental standards, brings real benefits. The study began by exploring the question that "EMS is important because it is not only at the heart of the ISO 14001 certification process, but also integrated within operations management" (Melnyk, *et al.*, 2002. p.3). Three questions were asked: (1) How does the presence or absence of a formal EMS affect both operations performance and environmental options? (2) Does a firm derive tangible benefits from having a formal, certified environmental management system (EMS)? (3) What is the magnitude of the impact of (a) having a formal EMS and (b) having a formal and certified EMS? A limitation of the study is that environmental information is extremely hard to obtain. The results, however, showed that the presence of a formal or certified ISO EMS did bring about improved performance such as reduced costs, improved quality, waste reduction in the design and equipment selection process and reduction of lead times (Melnyk *et al.*, 2002). Table 2.2 presented the author's own deduction of benefits available to firms as a result of adopting ISO 14001 along with perceived benefits and the positive contributions of ISO 14001 EMS to

firms based on evidence from a review of relevant literature. The table aimed to indicate the actual benefits experienced by firms who have adopted the standard and that ISO 14001 was not merely a label for market recognition.

Table 2.3   Perceived Benefits vs. Positive Contributions of ISO 14001 EMS implementation to firms: Evidence from Literature Review

Benefit group	Perceived benefits	Authors	Positive Contributions	Authors
Clean & Green operations	• Waste minimisation due to improved recycling performance. • Reduced energy & material consumption. • Reduced damage to the environment i.e. pollution prevention. • Substitution of hazardous raw materials with more environmental friendly ones.	Atkinson (1999); Babakri *et al.* (2003), Darnall (2006), Delmas (2000), Hibbitt & Kamp-Roelands (2002), Hillary (2004), Melynk *et al.* (2002), Mohamed (2001), Montabon *et al.* (2006), Pun *et al.* (1998), Quazi (1999), Rasiah (1999), Rondinelli & Vastag (2000), Tan (2005), Tanner *et al.* (1997), Welford (1994), Wong (2003)	• Efficient management of the consumption of natural resources i.e. fuel, water and paper. • Some evidence that certified facilities experience larger reduction in pollution emissions and waste. • Reduction of hazardous waste and better control of hazardous waste disposal. • Reduced production of solid waste and emission of contaminated water.	Ammenberg *et al.* (2000); Bansal & Bogner (2002), Mohammed (2000), Potoski & Prakash (2005), Rasiah (1999)

	• Cost reduction through 3Rs process – reuse, reduce & recycle. • Cost saving from reduced usage in electricity; natural gas and materials.	Bansal & Bogner (2002) Rasiah (1999)
Cost effectiveness	• Reduced operating costs due to less waste & energy consumption. • Cost saving in the long term.	Babakri *et al.* (2003); Bansal & Bogner (2002), Chan & Li (2001), Chan & Wong (2005), Darling (1995), Hillary (2004), Lo *et al.* (2003), Melynk et al. (2003), Montabon *et al.* (2006), Rao (2005), Quazi *et al.* (2001), Quazi (1999), Rondinelli & Vastag (2000), Tan (2005), Tanner *et al.* (1997), Welford (1994)
Effective operations	• Increased productivity. • Improved operational safety i.e. safer working environment for employees. • Improved quality through greening of the supply chain.	Bansal & Bogner (2002); Hillary (2004), Quazi (1999), Rao (2005), Rasiah (1999), Tan (2005), Tanner *et al.* (1997), Welford (1994)

Competitive advantage	• Certified environmental friendly products/services that meet customer needs over non- certified competitors. • Being part of the green supply chain.	Bansal & Bogner (2002); Darnall (2006), Delmas (2000), Delmas & Toffel (2004), Gravender *et al.* (1999), Hillary (2004), Mohamed (2001), Neumayer & Perkins (2004), Quazi (1999), Rao (2005), Rasiah (1999), Roy & Vézina (2001), Studer *et al.* (2006), Sturm (1998), Tan (2005), Tanner *et al.* (1997)	• ISO 14001 acts as a catalyst for competitive advantage and environmental performance — González-Benito & González-Benito (2005)
Market expansion & Access to new markets	• Greater market share. • Ability to enter into markets where ISO 14001 is a requirement. • Access to markets with stringent environmental controls/regulations.	Bansal & Bogner (2002), Curkovic *et al.* (2005), Delmas (2000) Hillary (2004), Lo *et al.* (2003), Mohamed (2001), Neumayer & Perkins (2004), Sonnenfeld & Mol (2002), Sulaiman & Nok Ahmad (2002), Roy & Vézina (2001), Tan (2005), Wong (2003)	

Improved company image & reputation	• Enhanced green & ethical corporate image.	Bansal & Bogner (2002); Beal (2002), Chan & Wong (2005), Curkovic et al. (2005), Lo *et al.* (2003), Mohamed (2001), Poksinska *et al.* (2003), Quazi *et al.* (2001), Quazi (1999), Rao (2005), Sulaiman & Nok Ahmad (2002), Sayre (1996), Studer *et al.* (2006), Tanner *et al.* (1997), Welford (1994), Wong (2003)	Rondinelli & Vastag (2000)
Improved internal management	• Effective environmental practices • Improved internal communication among managers & departments with documented procedures & work instructions.	Darnall (2006); Studer *et al.* (2006), Tan (2005), Mohamed (2001), Rondinelli & Vastag (2000), Quazi (1999)	• Raised awareness and changed managers and employee attitude towards environmental protection issues.

| Compliance to laws & regulations | • More proactive towards regulatory changes/pressures.
• Liability avoidance. | Anbumozhi & Kanda (2005), Atkinson (1999), Bansal & Bogner (2002), Chan & Li (2001), Chan & Wong (2005), Curkovic et al. (2005), Darling (1995), Darnall (2006), Delmas & Toffel (2004), Fryxell & Szeto (2002), Hillary (2004), Hibbitt & Kamp-Roelands (2002), Evangelinos et al. (2001), Mohamed (2001), Quazi et al. (2001), Quazi (1999), Sturm (1998), Tan (2005), | • Improvement in organisations' compliance with government regulations.
• Reduction or elimination of violations by firms. | Potoski and Prakash (2005), University of North Carolina research (2003) |

| Preserving strong stakeholder relationships | • Greater environmental awareness & responsiveness among key stakeholders (e.g. customers, employees, community organisations, green pressure groups).
• Fulfilling social responsibility. | Bansal & Bogner (2002), Chan & Wong (2005); Curkovic et al. (2005), Delmas & Toffel (2004), Evangelinos et al. (2001), Hillary (2004), Lo et al. (2003), Neumayer & Perkins (2004), Rao (2005), Fryxell and Szeto (2002), Quazi et al. (2001), Roy & Vézina (2001), Atkinson (1999), Sturm (1998), Welford (1994) | • Involving the local community and government in firms' daily environmental activities.
• Enhanced partnership with stakeholders – government, local citizens & suppliers. | Mohammed (2000), Rasiah (1999) |

2.6   Implications of the revised ISO 14001:2004

ISO published the new ISO14001:2004 environmental management standard on November 15, 2004. This revised version cancels and replaces the old ISO14001:1996 standard and certified firms had until May 15, 2006 to make the transition to the new standard. ISO, the world's largest developer and publisher of International Standards requires that standards are reviewed every 5 years to make them up-to-date. Subsequently, the revised version of ISO 14001 was published in November 2004 and firms had a period of 18 months to adopt the new version. The progress of transition from ISO14001:1996 to ISO14001:2004 has been promising. In December 2005, the total number of ISO 14001 certificates issued in 21 countries across Asia was 46,844 of which 18,759 (40%) was of the 14001:2004 version. The world total of ISO 14001 certificates amounted to 111,162 of which 56,593 (51%) was of the ISO 14001:2004 version. In December 2008, the number of ISO 14001:2004 certifications issued across Asia had risen to 89,894 representing about 47% share of the world's total ISO 14001 certificates (The ISO Survey, 2008).

The main overall change in the new ISO 14001:2004 standard is that it is more focused on environmental performance, defined as "measurable results of an organisation's management of its environmental aspects" (International Register of Certificated Auditors (IRCA), 2005). The revised version of ISO 14001 expects an organisation to document its EMS and to continually improve it. There are no significant changes to the requirements for EMS but the language and criteria in specific elements have been updated for greater clarity. For example, throughout the standard, those elements that required that an organisation "establish and maintain," a particular element now require that the organisation "establish, implement and maintain" that element, to emphasise an EMS that is fully functional (www.bsi-india.com).

Another change seen throughout the standard is the replacement of the words "employees" or "personnel" with "persons working for or on behalf of the organisation." This distinction will ensure that contractors and volunteers are also targeted. A more subtle change replaces the term "relevant" with "applicable." The experts at IRCA have concluded that the 2004 edition of ISO 14001 aims to clarify the 1996 edition and align it more closely with the ISO 9001:2000 standard whereby there is now stronger and clearer emphasis on performance and quality management (IRCA, 2005).

2.7   Summary and Observations

ISO is not only an acronym for the International Organisation for Standardisation but is also a term that refers to its Greek meaning: "equal." The main rationale for the creation of ISO 14001 was that its worldwide acceptance should facilitate international trade by harmonising otherwise diffuse environmental management standards and by providing an internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance (Delmas, 2002). Generally speaking, the issues surrounding the implementation of ISO 14001 can be summarised as follows:

- Adoption: As an internationally accepted management system, it is capable of achieving high level of acceptance and broad and rapid adoption across firms and sectors.
- Supply chain pressure: Provided and effective means for extending the application of voluntary initiatives, particularly when backed by technical assistance by the customer.
- Certification: Provided a useful mechanism for recognition (by customers, communities) and competitive advantage from non-certified competitors.

- Demonstrated business value: SMEs need to perceive business value to justify the cost associated with certification of compliance to a formal standard.

Adapted from Anbumozhi and Kanda, (2005. p.6)

The main drawbacks highlighted by the critics of ISO 14001 are due to lack of understanding of the standard and the broad, ambiguous scope of the standard. Many organisations are unsure how some aspects of the standard could be interpreted by the auditors. As ISO 14000 underlines the minimum requirements for the organisations, according to Pullin (1998, p. 28), it thus 'blocks the way for other routes that might deliver real performance improvements and sustainable industrial development'. Also many organisations consider ISO 14001, less rigorous and stringent than its counterparts like Responsible Care and EMAS. Pullin (1998, p. 28) highlights the comment by Krut and Gleckman (1998) about the shortcoming of ISO 14001, stressing that EMAS "prevent, reduce, and as far as possible eliminate waste". In contrast, ISO 14001 talks about "standardisation in the field of environmental management tools and systems".

Post and Altman (1994) have also criticised EMS and broadly categorised the barriers experienced by organisations during environmental management process as: (a) industrial barriers (for instance technical information, capital costs, configuration of current operations, competitive pressures and industry regulations) and; (b) organisational barriers (for instance employee attitude, poor communication, past practice and inadequate top management leadership). The impediments experienced by organisations during ISO14001 adoption are summarised as follows:
- costs (training, auditor fees, audits) required in addition to implementation and certification of EMS and its maintenance;

- lack of support and resources available for SMEs;
- unclear guidelines for EMS implementation for organisations with mobile workforce, such as the construction sector;
- lack of set guidelines for setting of objectives and targets and extent of involvement of employees, suppliers and other stakeholders;
- lack of guidelines on how to accomplish 'continuous improvement' element of the standard;
- interpretation of terms present within the standard.

(Source: Zutshi and Sohal, p. 339)

The obstacles presented above indicated why there are still firms in Asia who have not achieved ISO 14001-certification. Despite experiencing rapid economic growth in recent years, there still remain considerable gaps in the economic prosperity and social well-being between countries in Asia and other developed nations in the West. Therefore, the pace in which Asian firms implement environmental management practices is fairly slow. Although ISO 14001 is entering its thirteenth year, it remains a relatively new concept in the developing world and the level of voluntary adoption varies widely within the region. The issue here is that ISO 14001 is still a new experience yet to be fully understood by the majority of firms across Asia. Awareness level and adoption of the standard may be higher in the more developed industrialised Asian economies (i.e. Hong Kong; South Korea, Malaysia, Singapore, Taiwan and Thailand) than the least developed ones. Furthermore, firms who have adopted the system for a longer period may have a more sophisticated and developed EMS process than those who have just began installing the process. While EMS processes vary considerably among firms, the standard's common elements expect firms to reduce their negative environmental impact by minimising waste emissions and improve management control by carrying out systematic

procedures in setting out their environmental goals and the appropriate means of achieving them.

A variety of policy instruments is available for environmental protection: these refer to incentives to avoid or reduce environmental damage. These instruments can be characterised as: regulation (for instance, laws to control emission sources), 'informational measures' (environmental management systems), and economic incentive mechanisms (charges, taxes, and subsidies). Informational measures such as ISO EMS help to support the implementation of regulatory standards and at the same time good environmental performance encourages environmental protection and goes beyond mandatory requirements. (Barrass and Madhavan 1996, p. 206). Environmental auditing is a technique which is still in its infancy and there is much scope for experimentation, especially in the area of measuring environmental performance (Welford and Gouldson, 1993, p.1220). Education and training are both pivotal in the long-term success or failure of the EMS.

Environmental management focuses on how a firm addresses issues ranging from energy consumption, biodiversity recycling to waste management. "The real value of an EMS is as a tool to enable effective long-term planning within the organisation's overall strategy. It should be not be used as a method only to achieve overhead cost reduction. It must not be used as a method for senior managers to abdicate responsibility in the event of a failure. As a long-term management tool it will be an institutional asset rather than a potential liability concentrating only on cost reduction". (Vivian, 1997, p. 34) Many firms have faced a similar set of issues when dealing with corporate environmental strategies for the first time. However, the priorities for action will be different depending on a number of factors; such as the

processes being operated, the markets the firm sells into, the countries where the firm is based and the geographical, political and cultural setting of the premises (Rickmann, 1995).

As mentioned earlier, the voluntary nature of ISO 14001 allows firms to choose to have an EMS in place without applying for certification. Asian conglomerates are often family owned and are diverse in their operations: the desire to "keep it in the family" reflects their hesitance in adopting emerging corporate environmental management practices such as CSR where they are required to produce a public report on their social, economical and environmental activities year after year. From this perspective, attaining ISO 14001-certification ought to be a more popular approach throughout the region, as it is not mandatory for ISO 14001 certified firms to issue a public environmental report on a yearly basis. In reality, however, the adoption of ISO 14001 is still more widespread among foreign-owned MNCs.

Chapter 3

Methodology

3.1   Introduction

The industry mix in Asia-Pacific is as diverse as its economies and countries. Major industries in the region such as tourism, chemicals, electronics, mining and metals, oil and gas and textile manufacturing are heavily dependent on natural resources and have caused a strain to the region's natural environment over time. Firms operating in different industry sectors pollute the environment in varying degrees. Their approach to managing their environmental impact also differs. Despite the level of negative impact caused to the environment, it is believed that industry has the greatest potential to become part of the solution for the problems it has created. The export-oriented character of most Asian industries already forces them, for example, to include global environmental requirements for the industrial supply chains and their products, a pressure which is highly expected to become more intense in the near future (Oosterveer *et al.*, 2006, p.218).

The literature review showed a paucity of studies on (1) the actual benefits experienced by firms as a result of ISO EMS implementation over a number of years and (2) whether ISO EMS implementation had influenced ISO 14001 certified firms to implement other voluntary corporate environmental practices. A qualitative research based on the evidence of a multiple case study research on firms in Asia was selected as the method to demonstrate how businesses had benefitted from undertaking green practices and as a result contributed towards sustainable development goals. The main advantage of the case study approach is its usefulness in exploring new processes or behaviours that are less understood (Hartley, 1994). The case studies in this thesis were

intended to further our understanding of corporate responses to environmental issues. The case studies had examined the motivations, processes and challenges involved when firms voluntarily adopted environmental protection measures.

3.2   Research objective and Hypotheses:

This research has three objectives:

1. To focus on key aspects of the environmental management system (EMS) based on ISO 14001.
2. To determine if the implementation of implementation of an ISO 14001 EMS had delivered wider benefits to the certified firms over a period of time.
3. To examine whether the implementation of ISO 14001 EMS over a period of time had affected firms' environmental strategies by influencing them to undertake other voluntary initiatives.

With these three objectives in mind, two hypotheses were developed in this thesis to form the research questions needed to be addressed in the case study research. The formation of the hypotheses was developed during the progress of undertaking the survey of literature and data collection. The second hypothesis became more apparent during the process of case study research.

The two hypotheses tested in the thesis were:

1. The implementation of ISO 14001 EMS had delivered wider benefits to firms over a period of time.
2. Firms who had implemented ISO 14001 EMS over a period of time were more likely to expand their environmental measures by undertaking other voluntary initiatives.

3.3   Choice of methodology: the multiple case study approach

The methodology applied in this study to meet the three research objectives was based on multiple case studies evidence. The case study or 'now' design involves the description of an ongoing event (e.g. organisational change) in relation to a particular outcome of interest (e.g. strategies of coping) over a fixed time in the 'here-and-now' (Brewerton and Millward, 2001, p.53). Yin (1994, p. 2) demonstrates that case studies can contribute uniquely to our knowledge of individual, organisational, social and political phenomena. Yin (1994, p.13) defined case study research as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident."

Undertaking responsible business practices such as adopting ISO EMS to manage environmental impacts was one of the steps taken by firms to show their commitment in addressing green issues. The directions taken by firms to tackle these issues vary among firms and evolve over time. The case study approach is a useful method for responding to the "how" and "why" questions about a contemporary set of events (Meyer, 2001, p.330). As pointed out by Gummesson (1988), the case study method would enable the researchers to study and interpret the different aspects of their findings, examine them in relation to each other and view the process within its total environment. Whitla *et al.*, (2006, p. 3) and (Patton, 2002) state that a multiple case study research design is deemed most appropriate when knowledge is relatively undeveloped. Examining a number of organisations enhances the accuracy, validity and reliability of the results by capturing the holistic essence of the subject studied (Mohd Noor, 2008, p.1604). This research aimed to further our understanding of the decisions, processes and long term impact of the adoption of environmental management practices by firms. The purpose of using

multiple case studies was to predict similar outcomes termed as "replication" logic by Yin (1993, 1994).

3.3.1 Selection of cases

The firms selected for the case studies were based on the sample chosen for an exploratory study undertaken several years before. A short questionnaire was sent to a total of 168 listed companies in Hong Kong, Indonesia, Malaysia, the Philippines and Singapore, most of which are multinationals and large national firms operating in various industry sectors. For the purpose of this exploratory study, "heavier polluting" industries were selected as they were deemed to have higher environmental impacts (EIA). Field (1997) identifies two "dirty" manufacturing sectors - metals and chemicals. The author describes "dirty" industries as those that discharge large amounts of pollutants. Taking this as a starting point, firms operating in the chemical; forestry, paper and pulp, oil and gas, glass, metal, mining, textile, tobacco, tires, food and brewing industries were included. Owing to a low response rate from the exploratory study with 23 respondents, a multiple case study approach was chosen to support and provide a fuller picture for the research. Case studies are in-depth studies of particular events, circumstances or situations which offer the prospect of revealing understandings of a kind which might escape broader surveys (Allison *et al.*, 1996, p. 15). The selection of firms for the case study was determined by the responses received, which were 23. During the selection process, Indonesia and the Philippines were no longer included due to limited access and poor response (and in the case of the Philippines, there was zero response). Therefore, a sample of 18 firms remained.

Data collected from the exploratory study provided some basic insight. It demonstrated that multinational corporations (MNCs) and their subsidiaries were early adopters of ISO 14001 as they already had some

form EMS process in place. In the case of MNCs and large firms, their business activities were often under greater scrutiny by legislators and pressure groups. Besides having the manpower and resources to carry out environmental protection measures, implementing ISO 14001 EMS had enabled them to be in compliance with environmental legislation and regulation. Prior to adoption, most firms cited "an enhanced corporate image" as the most important perceived benefit an ISO 14001 certification could bring. Hence, this external factor became the main driver for firms to implement formal EMS and seek certification. Other perceived benefits anticipated by firms were influenced by internal as well as external factors which included; (1) cleaner operations as a result of improved waste management and reduced pollution emission; (2) cost savings through efficient use of resources in terms of lower fuel and energy consumption, and (3) competitive advantage over non-certified competitors. Although there was no clear evidence of increased profitability, adopting ISO 14001 had indirectly played a contributory role in improving firms' profit by giving them a competitive edge over non-certified firms. Known as supply chain pressure, this trend mostly affected suppliers to MNCs as they were expected to achieve ISO certification by their major customers.

The findings on the exploratory study provided a useful background and potential for further exploration into the impact of ISO EMS on firms. Out of the 18 firms contacted, 3 agreed to participate in an interview. Without the input of primary data, an in depth study on firms would be limited. Therefore, it was decided that the multiple case studies research would consist of primary and secondary data gathered by conducting three major and three mini cases. The six selected firms operate in different industry sectors - aviation, hotel, natural gas, packaging, plantation and tobacco. The three major case studies had been based on firms in the aviation, hotel and packaging sectors as they had agreed to take part in an interview. The remaining three smaller case studies were based on

51

firms in the natural gas, plantation and tobacco industry sectors supported by relevant data gathered from secondary sources. The selected firms are located in Hong Kong, Thailand, Singapore and Malaysia; all of which are market-oriented and newly industrialised economies (NIEs) in the Asia-Pacific region. The rationale behind choosing firms operating in different sectors and countries was to explore the similarities in the outcome of their EMS processes, development and impact. Furthermore, these industry sectors provided interesting settings for the case study research because they exposed many of the conflicts that occurred between human consumption and environmental protection issues.

Firms were selected on the basis of (1) their ISO experience i.e. the number of years in which their ISO 14001 EMS had been implemented; (2) their different levels of EMS development and (3) their potential to undertake other voluntary environmental management practices. Each case study was set out to identify the steps taken, issues tackled by firms when implementing the ISO EMS process and the overall impact of the system on firms over the years. The layout of the major case studies in terms of areas explored was as follows:

- Overview of industry sectors
- Emergence of green initiatives affecting the industry sectors
- Profile of firms studied
- Implementation and development of ISO EMS
- Significant environmental achievements
- Impact and contributions of ISO EMS over the years
- Long term environmental strategy and future plans
- Summary and Observations

For the mini case studies, the areas explored were smaller although the and their attributes would be presented in a table.

3.4 Data collection procedures: interview techniques

"One of the most important sources of cases study information is the interview." (Yin, 1994, p.84) According to Kvale (1983, p. 174), the purpose of a qualitative research interview "is to gather descriptions of the life-world of the interviewee with respect to interpretation of the meaning of the described phenomena". With the growth of communication technologies, other types of interview techniques have emerged and are available to researchers. Lee (2000, p.115) notes that "few areas of research, teaching or scholarship remain untouched by developments in information technology". The interview, long used by qualitative researchers, is no exception (Bampton and Cowton, 2002). Other interview techniques, besides the most common face-to-face approach, can be conducted via the telephone and by e-mail. Telephone and face-to-face interviews are well-established methods of interviewing. Interview by e-mail or "e-interviews" as termed by Bampton and Cowton (2002) can be used as a potential research tool to complement the more established face-to-face and telephone interview methods.

The main feature of e-interviewing is the asynchronous communication of place and time between the interviewer and the interviewee, which has its disadvantages and advantages (Bampton and Cowton, 2002). The merits and shortcomings of e-interviews include:

- The delay in interaction between interviewer and interviewee could range from hours to days. This foreseeable problem could be overcome by sending reminders at an appropriate time to the interviewee.
- The lengthy delay between communications in e-interviews allowed the interviewee time to construct a response to a particular question thereby resulting in a more satisfactory answer. On the other hand, this could lead to the loss of spontaneity that could form the basis for the richness of data collected in face-to-face interviews.

- The loss of spontaneity could be an advantage in preventing awkward questions or answers, a situation that could arise during face-to-face interviews.

- Busy interviewees had the flexibility to not set aside a mutually convenient time to talk to interviewers.

- In cases where interviewees' written English surpassed their spoken English, they could be put at ease by providing clear and comprehensive written responses thus generating better results.

- It is generally poor practice to ask several questions simultaneously during face-to-face interviews. Text based e-interviews allow several questions to be posted at once, but the researcher must avoid sending too many questions at once which might lead to stalling.

- E-interviews offered significant savings in terms of time and budget constraints particularly in relation to the elimination of the need for travelling; transcribing tapes and note taking.

- E-interviews opened up the possibilities for interviewing research subjects who would ordinarily lie beyond the geographical or social reach of the interviewer.

(Adapted from: Bampton and Cowton, 2002)

In spite of the advantages offered by e-interviews, it remains a relatively new research technique with various limitations and therefore should not replace the long established face-to-face interviews approach. Bampton and Cowton (2002) consider that the two techniques could complement each other and be used together as they had done so in their own research. As the use of e-mail becomes increasingly common, the e-interview method could develop into a valued option in the field of qualitative research.

3.4.1 Designing interview questions

The primary data obtained in the case studies in this study were based on face-to-face and e-interviews. It was initially envisaged that all three interviews would be conducted face-to-face. Due to budget and time constraints, it became practical to conduct the other two interviews by e-mail. Both face-to-face and e-interview techniques were used in one case study (see Chapter 4). Additional information i.e. secondary data gathered for all six case studies were based on the content analysis of the firms' websites; company newsletters, press releases and review of relevant documents such as their annual, environmental and where available, sustainability reports.

The designing of research questions were based on the issues raised in the two hypotheses. The aim of the case study research was to determine: (1) whether the implementation of ISO 14001 EMS had delivered wider benefits to firms over a period of time and (2) whether firms who had implemented ISO 14001 EMS over a period of time were more likely to expand their environmental measures by undertaking other voluntary initiatives. The interview was the primary source of data collection and semi-structured questions were developed to cover questions raised in the hypotheses and those that were not available from the firms' websites and published reports. As the questions were targeted at senior staff members in charge of corporate environmental policies, majority of the questions were decision-making and strategy related. Questions that were too technical in nature were avoided. It was important to keep the questions open-ended with a sequence of sub-questions for further probing. Asking open-ended questions such as "how" and "why" allowed flexibility so that an answer to one question might influence the next question the researcher wishes to ask.

The aim of the interview was to establish how ISO EMS had benefitted the firms and whether or not the process had influenced them to undertake other voluntary initiatives. Questions were tailored according to the individual firms but some core questions remained and they were:

- What were the challenges encountered by you and your team during the initial certification process and did these challenges lessen as time progressed?
- How advanced is your current EMS (compared to when it was first devised and implemented)?
- How effective was the implementation of ISO 14001 EMS in enabling your company to continually improve its environmental performance over the years?
- What were the noticeable contributions of ISO 14001 on your company over the years and what will be the impact of ISO 14001 on your company in the years to come?
- What valuable experiences have you and your team gained by having a formal EMS for a number of years?
- What are the shortcomings in ISO 14001 and major improvements in the ISO 14001:2004 version?
- Will your company consider pursuing other green initiatives in the near future?
- Given the current global economic downturn, do you expect corporate environmental issues to remain high on the agenda?

Implementing and maintaining an ISO EMS is a long-term practice that requires considerable time, effort and resources. The last question not only reflected the challenging times in which the firms operate, it also signified how committed the firm was in adopting corporate environmental measures in the long run.

3.5   Application of methods

As mentioned earlier, 3 out of 18 firms agreed to participate in an interview. The fieldwork for Case Study 1 involved a face-to-face interview and direct observation while the study on Case Studies 2 and 3 were based on e-interviews. These interviews were granted after receiving e-mail replies from key personnel in charge of corporate environmental issues. The e-mail contacts of these key personnel were obtained from the individual company websites. In the e-mails requesting for an interview, a brief introduction of the researcher along with the research focus was given. It was made clear to the receiver that all information gathered from the interview would be solely used for academic purposes.

In Case Study 1, the General Manager (GM) of the hotel was approached, as there was no clear indication of which department was responsible for corporate environmental issues. A swift reply came a day later from the GM himself referring the researcher to the Director of Human Resource who was the person in charge of overseeing the ISO EMS process. A date was set and a face-to-face interview took place three weeks later. The interview lasted just under 40 minutes and was recorded to secure an accurate account of the conversation and avoid losing data. Staying at the hotel allowed the researcher to directly observe how green practices were carried out on a daily basis. This observation was carried out casually. A follow up e-mail about two months after the initial face-to-face interview requesting for further information was kindly granted. This e-interview consisted of six questions and the recipient took two days to response.

In Case Study 2, the Division Vice President of Safety, Security & Environmental Department of the airline company was contacted by e-mail. A brief reply arrived three days later agreeing to the e-interview. A set of 20 questions was sent off promptly to the recipient. Two weeks

went by with no reply. An e-mail reminder was sent which resulted in a full reply. The entire process took three weeks.

In Case Study 3, the Regional Managing Director of a packaging company was approached. An e-mail reminder was sent two weeks later as there was no reply. This resulted in a response a day later. A set of 20 questions was sent to the recipient and the full response came two days later, completed by the company's Environment, Health & Safety Manager.

Apart from Case Study 1, the e-interview process for the other two case studies took less than four weeks to complete. However, the time required for writing up was considerably longer. On average, it took four to six weeks to build the major cases from scratch. The smaller cases took two to three weeks to complete.

Yin (1984) mentions three types of case study research: exploratory, descriptive and explanatory. The three major cases were geared towards the exploratory and explanatory categories. Case Studies 4 to 6 were entirely based on data gathered from secondary sources such as company reports and websites. Hence, they were more descriptive. Although these firms had declined to be interviewed, the amount of information provided in their company and environmental reports were comprehensive and substantial for building mini case studies.

Like the three major cases before them, these mini cases provided some insight into the two hypotheses. Apart from being ISO 14001 certified, all six firms had adopted other voluntary initiatives as part of their commitment to pursue business sustainability. Implementing ISO EMS had brought actual benefits to their business. More in depth findings on the case studies were further discussed and interpreted in Chapter 7.

Chapter 4

Case Study 1: Shangri-La Hotels and Resorts

4.1 The tourism and hospitality industry: Overview

The tourism and hospitality industries are interrelated but not identical (Pizam, 2009, p.184). While the tourism industry consists of all businesses that provide goods and services to tourists, the hospitality industry is an industry that is made up of businesses that provide accommodation, food and beverage and meetings to tourists, travellers and non-tourists i.e. local residents and business travellers (ibid., p.184). The two industries share common elements and therefore support and influence each other significantly. When economies grow, levels of disposable income usually rise and a relatively large part of this income is being spent on tourism. A tightening of the economic situation on the other hand, often results in a decrease in the level of tourism spending which inevitably causes the hotel industry to suffer from fluctuations (EconomyWatch.com).

The hospitality and tourism industries have been considered as one of the largest global industries (Chung and Parker, 2006, p.273). Based on international tourism and international fare receipts, the tourism industry represents approximately 7% of worldwide exports of goods and services, and thus occupying the fourth position in the ranking after exports of chemicals, automotive products and fuels (UNWTO, 2003). For many developing countries, it is one of the major income sources and the top export category, creating much needed employment and opportunities for development (UNWTO, 2008, p.1). Total international tourist arrivals have grown from 25 million in 1950 to 903 million in 2007 - an increase of 6.6% from 2006 (UNWTO, 2008, p.1). As more destinations opened up and began investing in tourism development over the decades, modern

tourism is turning into a key driver for socio-economic progress around the world. Worldwide capacity of hotels and similar establishments reached an estimated total of 17.4 million rooms in 2001 (i.e. an increase of 37%), almost 5 million more than it was in 1990 (UNWTO, 2003). According to the UNWTO figures in 2003, the biggest share of the world's room capacity in hotels can be found in Europe (38%), followed by North America (35%) and Asia and the Pacific (22%). Hotel room capacity in the Asia and Pacific region increases on a yearly basis especially in top destinations such as China (12% a year), Malaysia (12%), Indonesia (7%) and Thailand (7%) (UNWTO, 2003).

4.2   The emergence of green initiatives

Tourist flows have environmental, social and cultural impact on both local and international levels. Often considered as one of the most 'global' in the service sector, the hotel industry may not grossly pollute the environment, but its effect on global resources is quite significant (Kirk, 1995, p.3 and Whitla, *et al.*, 2006, p. 1). Globally, the industry uses large amount of energy and water; and thus creates millions of tonnes of waste (De Marco, 2005, p.109). The most expensive and wasteful use of resources in hotels is usually found in "the consumption of non-renewable energy, excessive water use and waste generation" (Alexander, 2002, p.2). In addition to resource consumption, hotels and resorts place immense pressure on natural environments through a range of infrastructure development. In some cases these activities take place in some of the most ecologically fragile locations on the planet - coastal, montane and riverine environments (Williams and Ponsford, 2009, p.396). At the same time, hotels rely on these distinctive surroundings to act as compelling backdrops to attract guests and visitors. Paradoxically, the industry requires the protection of the ecological integrity and abundance of these resources to remain competitive (ibid., 2009, p.396). Hoteliers are therefore accountable for responsible business practices because

their continued existence is reliant on the environment which surrounds their properties (Bader, 2006, p.70).

With this in mind, hoteliers are beginning to understand that only by preserving their surroundings - the reason and source of their profit - can they truly sustain their business. Therefore, the industry has a great potential in bringing about positive and progressive environmental change by taking necessary steps in protecting the environment. Internationally, common formal environmental instruments applied by the hotel industry are codes of conduct (i.e. Agenda 21 for the Travel and Tourism Industry), best environmental practices, eco-labelling, environmental management systems (EMS) and environmental performance indicators (Ayuso, 2006, p. 208). These voluntary environmental instruments are relatively new, having emerged from the 1980s onwards. In fact, the impetus for many of the current initiatives in the tourism industry stems from Agenda 21 which refers to a wide-ranging programme of action for achieving sustainable development in the 21st century.

With increasing prominence on environmental and social responsible business practices in the global market, many large hotel chains have taken voluntary actions to tackle environmental issues. Environmental management in hotels started in the form of initiatives by various associations and activities which begun when the Prince of Wales launched the International Hotels Environment Initiative (IHEI) in 1993. Following this, hotels in Asia began to adopt green practices more proactively with the establishment of the Asia Pacific Hotels Environment Initiative (HEI) in 1994 by 16 large hotel groups which included the Shangri-La Hotels & Resorts; the Mandarin Oriental and Okura Hotels and Resorts Worldwide (Ernst & Young, 2008, p. 1).

Of the voluntary environmental instruments that have emerged in the last two decades, the ISO 14001 EMS has been a popular tool adopted among hotels across Asia since the late 1990s. As the international benchmark by which firms can voluntary develop and assess their environmental practices, many hotels across Asia have begun to implement ISO 14001 EMS systematically or informally in their operations to help minimise their environmental impact. Deluxe hotel groups such as Shangri-La Hotels and Resorts, Hotel Nikko and the Grand Stanford Inter-Continental are among the early adopters of EMS, with their properties in Hong Kong obtaining ISO 14001 certifications three years within the standard was first introduced in 1996. The Island Shangri-La (ISL) was the first hotel in the Asia Pacific region to obtain ISO 14001 certification in 1997. Hotel Nikko Hong Kong and the Inter-Continental Grand Stanford Hong Kong successfully achieved ISO 14001 certification in 1999 and 2000 respectively. Since then, each has one other hotel gaining ISO 14001-certification in different parts of Asia, e.g. Hotel Nikko Tokyo in 2003 (JAL Environmental Report 2004) and Holiday Inn Chang An West Beijing. By comparison, the Shangri-La Group actively encourages ISO 14001 certification for all its hotels as part of its corporate strategy. At present, it has a total of 28 certified hotels - 27 across Asia and 1 in the Middle East (www.shangri-la.com, 2009).

When the Inter-Continental Grand Stanford (HK) created a clear environmental vision in 1999, initiatives since then have included installation of digital thermostats in all guest rooms, water purification systems, an ISO EMS and a Building Management System. As a result, the hotel has greatly benefited from its actions. For instance, the hotel has estimated a total saving up to HK$ 6 million, (over €650,000), between 1999 and October 2005 (Bader, 2006, p.76). In addition to cost saving, it has also benefited from 'increased staff morale and dedication, and greatly improved hotel image due to the public relations value' as a result

of these actions (Ibid.). Having better corporate image aside, some studies have presented factors such as reducing the consumption of energy, water, and materials, thus reducing operating costs as the motives for hotels to adopt ISO 14001 (Forbes, 2001). These factors further indicate that the motivation for the adoption of the standard is determined more by internal forces rather than external forces. This observation is not entirely surprising: as a service industry, the hotel industry does not produce as much pollution as firms in the transport, construction and manufacturing sectors. Therefore, it is less influenced by external stakeholders such as suppliers, communities and local authorities to demonstrate their environmental awareness (Chan and Wong, 2006, p. 490). In addition, a hotel does not face trade barriers if its operations are deemed unfriendly to the global environment. Nevertheless, the hotel industry needs to be mindful of the environmental regulations that govern its operations to avoid serious penalties and hefty fines. Over the last decade, a number of international hotel chains such as Accor; Marriott, Hilton and Starwood have implemented sustainable business practices to some degree, as have an abundance of independent hotels, resorts and lodges (Bader, 2006, p.75). In 2008, 218 ibis hotels (the worldwide economy hotel brand of the Accor group) in 12 countries comply with the IS0 14001 standard (www.4hoteliers.com).

With more than 20% of the world's tourists visiting Asia Pacific in 2007 (over 185 million visitors), the region is the second most visited destination in the world (Deloitte, 2008). With fierce competition within the hospitality sector, hotels have to compete with each other on many fronts: ranging from the quality of service to the amenities they offer. A study carried out by Brandimensions (2006, p.4) revealed that hotel brands compete on their abilities to meet the high expectations of travellers as oppose to brand loyalty. As pointed out by Kirk (1995, p.3) guests who seek hospitality services are expected to be pampered with lashings of

hot water; freshly laundered and pressed linen, an ample supply of towels, copious supplies of food and drink, the availability of swimming pools and spas and the limousine to take them to and from the airport. Considering the level of comfort and extravagance expected by hotel guests, is it possible to turn luxury green?

The hospitality industry provides an interesting setting for a case study as it exposes many of the conflicts that occur between human consumption and environmental protection issues. For many hotels, environmental management consists of operations that cover aspects of energy and water consumption, food waste production, waste management and pollution emissions (Chung and Parker, 2006, p.273). This case study is based on two deluxe hotels belonging to a reputable and successful Asian hotel group. It demonstrates the way in which a hotel group uses its developed EMS template and strategically applied it for other hotels to follow and thereby manages its business activities in an environmental friendly manner. Evidence from the case study indicates that the adoption of the standard is determined by internal factors and that the EMS has made a positive contribution to the hotels such as improving managerial responsiveness, operational efficiency and employee awareness. In terms of primary data, the information gathered on one hotel of the Group was based on two interviews – one face-to-face, the second a follow up by e-mail - with key personnel involved in the process. Information gathered on the second hotel within the Group was based on secondary data sources obtained from the content analysis of the firm's website, the company's annual and environmental reports, press releases and academic source.

4.3 Firm Profile

Shangri-La Hotels and Resorts first began as a deluxe hotel in Singapore in 1971. Regarded as one of the world's finest hotel management firms, the Shangri-La Hotel Group (to be referred as "the Group" throughout this case study) has acquired international awards and recognition from prestigious publications and industry partners over the years [2]. The Group's long established Asian heritage with its consistently high service levels distinguishes its chain of hotels from most of its competitors. The Shangri-La brand is synonymous to luxurious and comfortable hotel accommodation - generous lobby areas, spacious guestrooms and grand ballrooms - fine food and caring service (www.shangri-la.com, 2009). Today, this Hong Kong-based organisation is the largest Asian-based deluxe hotel group in the region, which consists of two distinct brands – the upscale "Shangri-La Hotels and Resorts" and the business oriented "Trader Hotels". The Group now owns and/or manages 60 hotels under the deluxe "Shangri-La" and mid-market "Traders" brands, with a room inventory of over 28,000 employing more than 24,000 members of staff (Ibid.). The deluxe five-star Shangri-La hotels feature extensive luxury facilities in key cities of Asia and the Middle East, with new properties under new development in Europe and North America. Its brand of Shangri-La Hotels live up to the standards expected of high-quality five-star hotels. Its chain of Trader Hotels, on the other hand, successfully caters to mid-market business and leisure travellers looking for modern, functional accommodation.

The Group's other businesses include properties investment and managing hotels for third party owners. However, hotel operations continue to be the Group's main source of revenue and operating profits

---

[2] In July 2009, four Shangri-La Hotels have been awarded the World's 100 Best Hotels 2009 by the US based Travel + Leisure readers. In September 2008, the hotel group was voted for the eighth consecutive year as the Best Business Hotel in the Business Traveller Asia-Pacific magazine's 2008 Readers' Poll.
Source: www.4hoteliers.com

(Shangri-La Asia Ltd. Annual Report, 2008, p.12). Performance of the Group's hotels has remained strong over the decade: from a turnover of USD 684 million in 2000 to USD 1,353 in 2008 (Shangri-La Asia Ltd. Annual Report, 2004-08).

The Group's main focus is the luxury hotel market in Asia. According to the its 2004 annual report, the percentages of business generated in the Asia Pacific region were as follows: Mainland China - 19.5%, Hong Kong - 7.5%, Rest of Asia - 23.32%. The two hotels presented in this case study are located in two major cities visited by millions of tourists every year: Hong Kong and Bangkok. Between 2000 and 2008, both hotels have enjoyed room occupancy rate of over 70% (Shangri-La Asia Ltd. Annual Report, 2004 – 08). According to figures presented in an online travel report in 2006, Bangkok was the most popular international destination, followed by Hong Kong with Singapore in third place (Zuji, 2006, p. 2).

4.4   Island Shangri-La (ISL): implementation and development of the ISO EMS

The extent to which any hotel can minimise its environmental impact and contribute to long-term conservation efforts is largely dictated by where the property is situated, the physical design of the building and the location and orientation of its facilities (www.celb.org). Therefore, hotels need to consider ways to integrate environmental considerations into their day-to-day business decisions. The first step to EMS implementation is to have a clear environmental policy which includes objectives, achievable targets and good planning. To further enhance effectiveness, hoteliers should always monitor and review the system after the implementation.

The Group is very aware of these factors as well as the benefits of good environmental practices. It is also aware of the movement taking place within the service sector to self-regulate. As a founding member of the

Asia Pacific Hotels Environmental Initiative (HEI) - one of the many voluntary initiatives developed by the tourism sector to promote continuous improvement in environmental performance by the hotel industry worldwide - the Group has very much been an active leader in environmental-friendly initiatives and practices. The hotels in this case study - The Island Shangri-La (ISL) in Hong Kong and Shangri-La Bangkok (SLBK) in Thailand - were the first hotels to achieve the ISO 14001 certification in their respective countries. Both hotels have won international awards and are well established in their own rights – ISL was awarded the World's 100 Best Hotels 2009 and SLBK was named among the Top 25 City Hotels in Asia by the US based Travel + Leisure readers (www.hoteliers.com, 2009).

There are two Shangri-La hotels in Hong Kong – one on Hong Kong Island and the other in Kowloon. As the Group's flagship hotel in Hong Kong, ISL has 565 rooms and employs 850 hotel staff catering to some 600 to 700 guests. Opened in 1991, its road to environmental improvement began as early as 1993. This early effort was initiated by the General Manager who set up a "Green committee", which consists of leading personnel from each department with the aim of devising a "best practice" programme that covers five departments in the hotel: Offices, Housekeeping, Laundry, Food & Beverage and Kitchen. Under this programme, each department devises its own solution on how to "reduce, reuse and recycle" resources with minimum operational costs focusing on staff awareness and the implementation of environmental "best practices" (Tsai *et al.* 2003, p.175). Despite its good intentions, overall coordination among the five departments was missing as one department's best practice could create unnecessary problems for another. Furthermore, the practices were not documented or audited.

This unsatisfactory situation changed in 1995, when the Hong Kong Productivity Council (HKPC) began a pilot programme to introduce the ISO 14000 series of EMS standards to businesses in Hong Kong (Ibid.). ISL was the only hotel attended the HKPC programme with thirteen firms in other sectors. This further demonstrates the Group's pro-activeness in pursuing corporate environmental protection practices. During the programme, the basis of ISO 14000 series was introduced and the process towards ISO 14001 certification was explained to all participants.

After the pilot programme, the General Manager made the decision to obtain ISO 14001 certification and in July 1996 the HKPC was hired as a consultant to undertake an Initial Environmental Review (IER) for the hotel. The intention of this review was to help identify any gaps in the existing operation of ISL to achieve 14001-certification. The results were encouraging due to the already existing "best practices" being carried out in the five departments within the hotel. On paper, the required amendments were relatively minor. After a cost-benefit analysis undertaken by the hotel's top management, it was concluded that the benefits of ISO 14001 certification outweighed the costs. The decisional factors that steered the hotel to formally adopt ISO 14001 were: (1) the stability of Hong Kong's tourism industry sustaining the hotel's profitability[3]; (2) the implementation of a formal EMS would overcome the limitations of the existing "best practices" measures by allowing all procedures to be properly documented and easily controlled, and above all, lowering costs, (3) direct commitment from the General Manager and (4) being the first ISO 14001 certified hotel in the Asian market would give ISL a competitive edge over its non-certified rivals.

---

[3] Over 8 million tourists visited Hong Kong in 1995 generating US$ 7.7 million for the city (UNWTO, 2006). The number of tourist arrivals has more than doubled throughout the decade with over 17 million arrivals in 2007 (UNWTO, 2008). Total receipts from the hotels and boarding houses sector amounted to HK$20 billion in 2005.

With the full backing of top-level management, ISL submitted its application in September 1996. From then on, the management team and the HKPC began their painstaking process of developing a formal EMS for the hotel. Although the actual gap in achievement was small, the work involved was very complex. The first step was to develop an EMS manual from scratch. In devising the document, the management had to strike a balance between the high level of customer service of a five-star deluxe hotel and environmental protection. Furthermore, the manual has to address the immediate and long-term environmental impact of the hotel's operations. The final and major issue facing the management was employees' attitudes. The success of an EMS relies heavily on how the concept is perceived by the hotel's employees because without their support, the EMS could not be carried out effectively. To increase staff awareness and ensure employee participation in the long run, programmes were initiated to help staff understand the rationale behind setting up an environmental policy and the importance of implementing a formal EMS. As for new staff members, they were indoctrinated with the importance of EMS practices at ISO 14001 orientation/induction programmes. In May 1997, (eight months after the ISO 14001 standard was published), the Island Shangri-La in Hong Kong became the first hotel in the Group and in the Asia Pacific region to achieve an ISO 14001 certification.

4.5   Significant environmental achievements

Upon achieving its ISO 14001 certification, ISL revised its departmental and personnel structure to handle all the aspects related to its EMS process. The organisational structure can be summarised as follows:

- Managers from the Training and Mechanical departments were jointly appointed as EMS managers to handle all EMS related issues in their areas of expertise. The former would be responsible for the implementation and maintenance of the EMS, while the

latter would be responsible for engineering and technical aspects of the EMS. Both EMS managers would oversee internal audits on activities and operations of each department to ensure overall compliance with ISO 14001 requirements.

- Senior executives and department heads were responsible for setting up roles and responsibilities for their subordinates in steering the hotel's operations and activities in achieving its environmental goals.
- Assisted by the two EMS managers, the General Manager would be responsible for periodically reviewing and revising the EMS management structure to ensure its suitability to the hotel's business strategy.

(Source: Tsai *et al.*, 2003, p.178-9)

This top-driven, conceived and developed EMS structure is subsequently introduced and followed through in other hotels in the Group.

To maintain employees' motivation and participation in all EMS related practices, a number of refresher courses and activities were conducted. Other measures undertaken by the EMS team to boost staff morale and raise awareness include:

- Openly praising employees who actively contributed to the EMS implementation in the company's newsletters in recognition of their effort.
- Senior executives were encouraged to take part in all company "green activities" such as beach cleaning, visits to landfill areas and tree planting activities to demonstrate to employees that green awareness is a company-wide practice (Tsai *et al.*, 2003, p.181).

By implementing an EMS, ISL estimated some 10% of total cost saving from energy and water conservation, and recycling waste. A former

General Manager, who also held the position of Environmental Coordinator for the Group, stated that apart from a financial savings of HK$1.5 million (approximately US$192,000) over a two-year period (in 1996 and 1997), commitment to the community was the main reason why Shangri-La pursued ISO 14001 certification for its EMS in the first place (Environmental Protection Department, Hong Kong, 2005). Staff morale was boosted and his sales teams had an extra advantage in generating business from the increasingly environmental conscious consumers. Among the hotels' efforts to continually improve their business impact on local environment, the use of coal had been replaced by cleaner fuel such as low sulphur diesel and gas in several of its properties in Mainland China and Hong Kong.

Internal EMS measures of the hotel have been implemented mainly in areas relating to food waste; rubbish recycling, water and energy conservation. By embracing green practices, ISL has achieved some key goals that are set out in its environmental policy such as:

- ensuring compliance with all legal and regulatory requirements
- improving efficiency in the daily operation of environmental protection measures between hotel departments
- achieving a good public image
- enhancing the Shangri-La brand
- minimising utility costs by conserving energy and reducing water consumption
- attracting eco-conscious customers
- instilling environmental awareness among staff through ISO awareness training programmes

(Adapted from: www.shangri-la.com, 2009)

During the years between 1997 and 2000, environmental awareness in Hong Kong society was relatively low and there was insufficient

governmental and industry support for environmental protection. What Shangri-La and the other two ISO 14001 certified hotels in Hong Kong have done so far in the hotel industry is just a start. In August 2006, there were all together six ISO 14001 certified hotels in Hong Kong. Two newcomers achieved their ISO certifications in 2004. By December 2008, they were no longer listed as ISO 14001 certified (EPD Hong Kong, 2008). The four hotels that have continued to renew their ISO 14001 certificates are Hotel Nikko; Inter-Continental Grand Stanford, Island Shangri-La and Kowloon Shangri-La. With little increase in the number ISO 14001 certified hotels over the years; this implies that hoteliers are slow in taking up formal EMS practices in the region.

This implication is further reflected in Chan's (2008) exploratory study on the obstacles to EMS in the hotel industry in Hong Kong. The author identified (1) high implementation and maintenance costs, (2) lack of professional advice and (3) lack of knowledge and skills as the three main important factors that hindered hotels from adopting formal EMS (Chan, 2008, p. 192-3). Further to his findings, the author also discovered that ISO 14001 certified hotels, or hotels with a formal EMS in place were less hindered by the identified factors except for the implementation and maintenance costs (Chan, 2008, p. 194). The author's study seemed to imply that hotels were likely to experience the benefits related to EMS once they had adopted and implemented the system (despite the operational costs), and that the obstacles could be gradually removed over time. This finding supports the Group's belief in the long-term merits of the ISO standard. The benefits related to ISO 14001 EMS will be explored further below.

4.6   Shangri-La Bangkok (SLBK): overview of the ISO EMS

Located on the banks of the famous Chao Phraya River, SLBK comprises of two wings and occupies the largest land by the river compared to its

nearby major competitors such as Mandarin Oriental, The Peninsula and the Millennium Hilton. SLBK has a total of 799 rooms and employs around 900 staff members. It achieved its ISO 14001 certificate in January 2000, the first hotel to do so in Thailand. In maintaining its certificate, SLBK seeks re-certification every two years and the process is overseen by the Moody International Certification Group.

Following the footsteps of the "Green Committee" first set up by the former CEO of the Group (who was also the former General Manager of ISL), the Green committee at SLBK comprises of 15 EMS managers from various departments who are fully involved in ensuring the continual improvement of its ISO 14001 EMS program. By following procedures set out in the EMS manual devised by the Director of Human Resources, these EMS managers act as the hotel's internal auditors. They hold a monthly meeting to keep track of progress by identifying areas that need further improvement as well as discussing and handling any emerging environmental issues. Staff members have considered this practice to be an effective self-monitoring system which better prepares them in carrying out the major internal audit which takes place every year. ISO 14001 firmly stresses on continual improvement. The systematic internal audits exercise has enabled the Directors and EMS managers to conduct their affairs proactively and continuously and thus make improvement in the hotel's EMS programme when applicable.

Water pollution in Thailand is severe and the city of Bangkok has been developing central wastewater treatment system for over ten years to solve the problem (Kitakyushu Initiative, Japan). SLBK's location by the river means dealing with more environmental issues than hotels located in the city centre, in particular waste water management. Every two years, the ISO 14001 re-certification audit carried out by the auditors from Moody International ensures that SLBK is in total compliance with

wastewater regulations. As the Director of HR pointed out, "The auditors check that." As part of the hotel's outwards commitment to environmental protection and responsible environmental practices, it organises a "Cleaning Day" event on a yearly basis. This half-day event involves the management and staff of the hotel cleaning nearby streets and the Chao Phraya River within two kilometres of its property. This PR exercise resulted in the collection of nearly 200 kilograms of rubbish in January 2009 (www.shangri-la.com, 2009).

Given the current global economic downturn, environmental issues are still a top priority for SLBK. Despite a hotel's effort to achieve good environmental performance, there remains another side that is beyond its control. Hotel guests are the major contributors of waste production, energy and water consumption in the hotel industry (Tsai *et al.*, 2003, p.181). Whatever hotels do to conserve energy and water consumption, they can only be done either with the consent of the guests or in such a way that they do not notice any deterioration of service (Kirk, 1995, p.3). Shangri-La extends its environmental awareness to its guests to help them understand the concept of ecological friendliness and how they can contribute to protecting nature. Encouraging guests' participation in EMS has been carried out tactfully. For example, an invitation card was designed and placed in every guest room that encourages hotel guests to leave their towels on towel rails if they wish to re-use them the next day. For guests who stay longer than one night, they could request for their bed linens to be changed every other day. Such practices may seem trivial in terms of preserving nature, but when accumulated, they can help conserve a considerable amount of water and reduce the use of detergents that harms the environment in the long term. Again, these practices are voluntary. Hotel guests have no obligation to carry them out, especially for guests who expect the highest quality of luxury and comfort from a deluxe hotel. The Director of Human Resources of SLBK (who

oversees the hotel's EMS programme) clearly emphasised: "There is no compromise on services delivered to guests while the hotel pursues cost saving and energy efficiency practices. Customer satisfaction is ultimate". Therefore, the bulk of the responsibility in reducing waste and saving energy still lies with the hotel management and staff itself.

Hotels are highly dependent on successful financial performance from continuous demand and minimal operating costs. Properties that carry out sustainable measures correctly can recover their costs in a comparatively short time while benefit from long-term savings (Bader, 2006, p.70). The ISO 14001 EMS process has benefited SLBK in one particular area – reduced water consumption. In a study of water usage in 17 hotels in Hong Kong, Deng and Burnett (2002, p.64) found that effective water management goes hand in hand with energy management. Following the Group-wide EMS template, all SLBK staff members undergo an ISO awareness training programme led by their individual departmental heads, lasting a minimum of 30 minutes every two months, during which issues such as recycling, conserving water and energy are raised. For example, all staff members are strongly encouraged to turn off running taps and take the initiative to report any leaks or faults to the engineers. Not only has this practice helped reduced the hotel's utility bills, minimising water consumption is particularly relevant to its responsible environmental practices as increased water needs is putting tremendous pressure on Bangkok's water resources. Thailand ranks as one of the lowest in Asia for water availability per capita (WWF, Thailand).

4.7   ISO EMS impact and contributions over the years

During the interview, the Director of Human Resources was asked to remark on the impact of ISO 14001 EMS on SLBK over the years. The feedback given can be summarised as follows:

- Implementing the EMS has not brought about financial benefits, i.e. increased the hotel's profits, but there has been significant impact in terms of cost savings from conserving water and energy.

- After achieving certification, recycling and waste disposal practices have been stepped up. Hotel staff began carrying out waste segregation practices e.g. setting apart wet food for animal feed in the staff canteen and recycling paper in offices.

- The environmental skills required by the EMS team have developed through frequent practice and training throughout the nine years the EMS programme has been in place.

- The ISO awareness training programmes have raised employees' environmental awareness as they become more proactive in identifying potential areas of improvement and reporting problems.

- Despite the hotel's efforts, hotel guests have given very little feedback on its green initiatives and practices. (This could be the result of the hotel's established reputation for its hospitality services thus overshadowing its ISO 14001 status. Ultimately it is a hotel's first-rate services and facilities that win over customers' hearts).

Implementing ISO 14001 EMS has its merits but its main drawback is the amount of paperwork required for the internal and in particular external audits. Despite the number of personnel involved and the practice they have, the EMS team at SLBK continues to find the paperwork required fairly taxing. ISO published the new ISO14001:2004 environmental management standard on November 15, 2004. Certified firms had until May 2006 (18 months) to make the transition to the new standard. With the assistance of its consultant company, SLBK was made aware of the new version by its consultant company before its publication. With their professional assistance and further training, the EMS team underwent a transition workshop in May 2005 and the changeover was made before

the deadline. In spite of the amount of documentation required, the transition from ISO 14001:1996 to ISO 14001:2004 went smoothly because of the team's experience of the system over the years. When asked to comment on the ISO 14001:2004 version the EMS Manager observed: "The noticeable improvement in the new version is that it is more focused on results and the clarity on the standard's requirement for a company to document its EMS and to continually improve it". When asked about the foreseeable benefits ISO 14001 could bring in the years to come, the EMS Manager believed the process would continue to help the hotel "fully utilise its resources and reduce utility costs; secure future loans and insurance, maintain compliance to environmental laws and regulations, prevent accidents, meet guests' expectations and enhance its image".

4.8   Long term environmental strategy and future plans

Good housekeeping and common sense aside, the EMS team in each of its hotel has integrated the elements of their EMS into their daily business activities and keeping pace with significant changes in the hospitality industry. The Group has identified five areas in its aim to achieve environmental sustainability: (1) climate change; (2) ozone depletion, (3) waste water management, (4) waste disposal management and (5) indoor air quality. It is ramping up energy conservation initiatives so that it will reduce its 2006 group wide energy consumption figures by 12% by the end of 2008 (www.shangri-la.com, 2009).

Shangri-La's environmental efforts did not stop with ISO 14001. In 2007, the Group signed a corporate social responsibility (CSR) policy into effect and launched a two-year development strategy to enhance its existing CSR activities. A corporate CSR Committee, spearheaded by the Group's Chief Operating Officer, has been established to boost the Group's corporate and social responsibilities in five key areas: the environment;

employees and the community; health and safety; supply chain management; and stakeholder relations (www.shangri-la.com, 2009). In August 2008, the Group appointed its first CSR & Sustainability Manager in Manila (the Philippines). The manager would play a key role in (1) effective implementation of the Group's initiatives in the five areas mentioned and (2) development of awareness programmes to elevate Shangri-La's CSR approaches in the Philippines, which may then be replicated throughout the Group (following the pattern of knowledge transfer from one hotel to another with its first ISO 14001 adoption in ISL). One of the CSR & Sustainability Manager's first tasks would be training hotel employees to become CSR ambassadors. The key message conveyed at the training programme would be the linking of "the issue of sustainability to the realities of climate change" (Shangri-La Press Release, 2008).

Having achieved brand dominance in Asia Pacific and the Middle East, the Group is aiming to develop a presence in key destinations in North America and Europe by opening seven new hotels between 2009 and 2012. Enhancing its CSR policy will allow the Group prepare its new hotels to respond to emerging and different sets of social and environmental issues that occur in the North American and European markets. In other areas of CSR, the Group has established food safety benchmarks with the HACCP[4] (Hazard Analysis and Critical Control Point) System. At present, 27 hotels in the Group are HACCP certified. Suppliers are expected to be part of the system to ensure that only safe, high quality food is served in all its hotels. Eventually, the Group plans to expand its supply chain management to other areas of procurement.

---

[4] Originated in the US, HACCP is an international principle defining the requirements for effective control of food safety. It is a preventative system of hazard control based on seven principles: (1) conduct hazard analysis and identify preventative measures; (2) identify critical control points (CCP); (3) establish critical limits; (4) monitor each CCP; (5) establish corrective action to be undertaken when a critical limit deviation occurs; (6) establish a record keeping system; (7) establish verification procedures.

4.9   Summary and Observations

Twelve years have passed since the first ISO 14001-certificate was issued to the Group's flagship hotel, ISL, in Hong Kong. The Group has used its own resources to set up its first EMS and strategically applied its developed template for other hotels to follow. At present, its EMS programmes are effectively implemented across 28 of its properties.

Successful implementation and maintenance of an EMS (or any green corporate policy) within a firm cannot be achieved without three contributing factors; (1) a healthy profit, (2) top-level commitment and (3) employee support. In 2008 the Group reported a turnover of USD 1,353 million (compared to USD 1,219 million in 2007). Without top-level endorsement, the hotel's green program would not have gained any credibility among the employees; who in turn have a direct effect on the success of undertaking any EMS. Without the Group's financial wealth and manpower, the hotel could not afford to seek a formal ISO 14001 EMS in the first place. In addition to the two contributing factors, the Group's environmental management policy was clearly defined with key performance areas identified: energy efficiency, water conservation and waste management. Based on the evidence available, both ISL and SLBK have achieved these targets.

The most common criticism directed at ISO 14001 certification is that its EMS does not measure the environmental performance of a firm directly and therefore it is an inadequate tool to enable firms to achieve environmental sustainability. The experience at both Shangri-La hotels since they have adopted EMS indicates that ISO 14001 certification has brought about wider benefits to its operational and management processes. The adoption of EMS has helped the hotels save money from conserving energy and reducing water consumption – this is a measurable impact. All other positive contributions are attitudinal and

managerial, which are more difficult to quantify or even categorised as "environmental sustainability". In general, hotels do not emit huge quantities of pollutants. Their environmental management measures tend to cover aspects of energy and water consumption and waste management. As a service industry, hotels rely heavily on human resources i.e. depending on their employees to carry out their duties properly to enable them to achieve the environmental targets set out in the corporate environmental policy. The systematic ISO 14001 guidelines offer the Group the building blocks for a system that will help its hotels achieve their own environmental goals. This case study had demonstrated that ISO 14001 EMS, when implemented for a number of years, could result in a desired effect in steering firms towards the direction of sustainable development. The Group's decision to broaden its venture into more advanced areas of environmental sustainability measures such as CSR is a strong implication of this effect.

Chapter 5

Case Study 2: Singapore Airlines

5.1　Aviation industry: Overview

Air travel is a competitive and growing industry. It facilitates economic growth, world trade, international investment and tourism. Travel for both business and leisure purposes have been growing worldwide for over three decades. In the leisure market, the availability of large aircraft such as the Boeing 747 made it convenient and affordable for people to travel further to new and exotic destinations. Governments in developing countries realised the benefits of tourism to their national economies and spurred the development of resorts and infrastructure to lure tourists from the prosperous countries in Western Europe and North America. As the economies of developing countries grow, their own citizens are already becoming the new international tourists of the future. Business travel has also grown as firms become increasingly international in terms of their investments, their supply and production chains. The rapid growth of world trade in goods and services and international direct investment has also contributed to growth in business travel.

If aviation was a country, it would rank 21st in the world in terms of Gross Domestic Product (GDP), generating USD 425 billion of GDP, almost equal to that of Switzerland of Poland (OEF, 2009, p.8). The most dynamic growth is focused on the Asia Pacific region, especially Mainland China, where fast-growing trade and investment are coupled with rising domestic prosperity. In terms of total passenger trips, however, the main air travel markets will continue to be in North America (40% to 50% of the world total), Europe (around 30%) and Asia (15% to 20%) (OEF, 2009, p.9). Worldwide, the International Air Transport Association (IATA), forecasts international air travel to grow by an average 6.6% a year to the

end of the decade and over 5% a year from 2000 to 2010. (Although this forecast was made before the current global economic downturn, global air travel will continue to grow). Airlines' profitability is closely tied to economic growth and trade. During the first half of the 1990s, the industry suffered not only from world recession but travel was further depressed by the Gulf War. In 1991 the number of international passengers dropped for the first time. The financial difficulties were exacerbated by airlines over-ordering aircraft in the boom years of the late 1980s, leading to significant excess capacity in the market. IATA's member airlines suffered cumulative net losses of $20.4bn in the years from 1990 to 1994. Since then, airlines have had to recognise the need for radical change to ensure their survival and prosperity. Many have tried to cut costs aggressively, to reduce capacity growth and to increase load factors.

To meet the requirements of their increasingly discerning customers, some airlines began to invest heavily in the quality of service that they offer, both on the ground and in the air. Ticket-less travel, new interactive entertainment systems, and more comfortable seating are just some of the product enhancements being introduced to attract and retain customers. A number of factors are forcing airlines to become more efficient. In Europe, for instance, the European Union (EU) has ruled that governments should not be allowed to subsidise their loss-making airlines. Deregulation is also stimulating competition, such as that from small, low-cost carriers.

The availability of large aircraft such as the Boeing 747 made it convenient and affordable for people to travel further to new and exotic destinations. Governments in developing countries realised the benefits of tourism to their national economies and spurred the development of resorts and infrastructure to lure tourists from the prosperous countries in Western Europe and North America. As the economies of developing

countries grow, their own citizens are already becoming the new international tourists of the future. Business travel has also grown as firms become increasingly international in terms of their investments, their supply and production chains and their customers. The rapid growth of world trade in goods and services and international direct investment has also contributed to growth in business travel.

In 2006, the outlook for the air travel industry was one of strong growth. Forecasts suggested that the number of passengers would double by 2010. As mentioned previously, airlines' profitability is closely tied to economic growth and trade. Since 2008, the industry has been badly affected by the global economic downturn and is not expected to recover quickly, while the swine flu outbreak has put a further dampener on the prospects for a turnaround (www.centreforaviation.com, 2009). Major Asian airlines such as All Nippon Airways, Cathay Pacific and Singapore Airlines have all seen their profits plummeted. In June, Asia Pacific carriers recorded a 14.5% fall in passengers load compared with the same month last year and fears about swine flu (or H1N1) have also contributed to delaying any early revival in air transport (IATA, 2009). Freight demand has also dropped but when compared to the figures in May 2009 there is a slight improvement due to the improved economic conditions in a number of emerging Asian economies, such as Mainland China.

5.2   Environmental impact of commercial aviation industry

Meeting this insatiable demand for air travel will have a massive environmental impact both on a local and global scale. Policy for sustainable aviation is a highly debated area by a range of parties from environmental NGOs; airlines, airports and governments, all of which attempt to frame sustainable aviation to suit their own objectives (Walker and Cook, 2009, p.1). Aviation's adverse environmental consequences

are well documented. To begin with, aviation is the fastest growing source of transport greenhouse gases and all airplanes emit carbon dioxide (CO2) – the main cause of global climate change – which in turn affects weather patterns (i.e., rainfall, temperature, etc.) (Sewill, 2005 and IPCC, 1999). On average each air passenger throughout the world is responsible for adding 300kg of carbon dioxide each time they get on a plane, and the same again on the return journey (Sewill, 2005, p.6). Another significant environmental consequence that has emerged is stratospheric ozone depletion and the resultant increase in UV-B radiation at the Earth's surface by military aircrafts (IPCC, 1999). This case study focuses mainly on the commercial sector of the industry.

The aviation industry bears more than a heavy share of responsibility as scientific research into climatic change and on the contribution of aviation to global concentrations of greenhouse gases points to the need for a radical change in public aviation policy, both for economic and ecological reasons (Airline Business, 2005). To summarise, negative environmental impacts caused by the commercial sector of the industry relate to a number of key issues such as:

- Climate change
- Local and Global air quality
- Noise emission
- Habitat degradation
- Third party risk/safety

(Adapted from: Maughan et al., 2001, p.241)

For airlines, the future will hold many challenges. Successful airlines will be those that continue to tackle their costs, improve their products and efficiency, thereby securing a strong presence in the key world aviation markets. At the same time, the series of negative environmental impacts caused by the aviation industry cannot be ignored. Aviation accounts for 2%

of worldwide CO2 emissions from fossil fuel use (UN International Panel on Climate Change and IATA). Therefore, the aviation industry has often claimed it contributes a small part of global CO2 emissions when compared to the automotive industry. However, 80% of aviation's greenhouse gas emissions are related to commercial flights exceeding 1,500 km/900 miles, for which there is no practical alternative (Pulles, *et al.*, 2004). The environmental impact from air traffic mainly derives from three sources – fuel combustion, aircraft ground maintenance and the consumption of in-flight meals (Mak and Chan, 2006, p. 618). The aviation industry provides an interesting setting for a case study because, like the hospitality industry, it depicts the conflict between human needs and the environment. This sector makes a strong, positive contribution to economic development albeit with considerable environmental impacts. This case study examines how a national flag carrier tackles its environmental issues proactively over the years while continues to run a successful business operation. Primary data gathered for this case study was based on an e-mail interview with the Division Vice President of the Safety, Security and Environment Department of the firm. Other information presented in the rest of the case study were secondary sources based on the content analysis of the firm's website and the company's annual and environmental reports, press releases and archival records.

5.3   Firm profile

Singapore Airlines Limited (SIA), also to be referred as "the Company" throughout this case study, is the national airline of Singapore. It operates at Changi Airport and has a presence in the airline markets of Southeast Asia, East Asia, South Asia, and the competitive "kangaroo route" (a trademark owned by Qantas Airlines) between Europe and Australia and New Zealand. The early history of Singapore Airlines began on 1 May 1947 as Malayan (later Malaysian) Airlines in a joint venture between the

Malaysian and Singapore governments. When Singapore separated from Malaysia in 1965, the two governments agreed to set up separate airlines. Singapore Airlines was born in 1972 and today SIA is an internationally renowned Asian company with a fleet of 103 aircraft flying to over 90 cities in close to 40 countries (www.singaporeair.com).

The Singaporean aviation industry is a significant aerospace maintenance, repair and overhaul centre. Since 1990, Singapore's aerospace industry has grown at an average rate of 13% to become the most comprehensive maintenance, repair and overhaul (MRO) hub in Asia (www.edb.gov.sg, 2009). In 2004, the industry grew by 16% to hit a record high of S$4.5 billion. Its Changi International Airport is the sixth busiest airport and the fourth busiest air cargo hub in Asia, handling some 80 airlines and winning over 250 awards. For instance, it was ranked the third best airport in the world by passengers (Skytrax 2009 Survey). A study conducted in 2001 showed the industry, led by the country's flag carrier Singapore Airlines, contributing about 5.5%, or S$7.9 billion, to Singapore's gross domestic product (GDP). This figure has increased ever since. It provided one in 20 jobs in the country, or one in 17 jobs if the indirect impact of the sector on the rest of the economy is taken into account. A different set of measures by the Economic Development Board showed the number of people employed in the aerospace industry stood at 19,000 in 2007, up 8% from the year before (www.edb.gov.sg, 2009). An overall picture of the economic structure of Singapore is presented in the Appendices.

Being an island state, the absence of a domestic market meant that SIA has to thrive on the long haul and international markets thus competing with many global airlines. The firm has no domestic market business to fall back on. A Senior Vice President of SIA pointed out: "We don't want to be the largest company. We want to be the most profitable". (Heracleous *et al.*, 2004, p.37). To remain profitable, SIA achieves competitive

advantage with fleet renewal and pioneering business concepts such as environmental management practices. SIA's strategy is to outshine the rest by having the following assets:

- Excellent equipment.
- Distinctive and high quality service.
- Strong brand image.

For example, SIA operates one of the youngest fleets in the world: 103 of its aircraft have an average of 6.3 years (SIA Environmental Report 2008-9, p.3). With a reputation for innovation and excellent in-flight services, SIA continues to establish itself as a pioneer by pursuing its policy of fleet renewal and modernisation through bringing out a number of "firsts" to its fleet, i.e. flying the first A300 *Superbus*, the B747-300 *Big Top*, the B757 and the A310-200 in the 1980s. SIA is also the first airline in the world to operate an international commercial flight across the Pacific Ocean with the 747-400 *Megatop*. In the 1990s, SIA revolutionised its in-flight communications and entertainment through the *KrisFone* - the first global sky telephone service. SIA has consistently outperformed its competitors and the company made aviation history when it became the first airline to operate the world's largest passenger aircraft, the Airbus A380. Its inaugural commercial flight from Singapore landed in Sydney on 25 October 2007 and now has six A380s in its fleet.

As a group, SIA contributes close to 8.8% (S$15.9 billion) of Singapore's GDP. The Group employs more than 26,000 staff in Singapore. As of 31 March, 2009 the SIA Group worldwide employed 30,666 members of staff – a 0.7% increase on the previous year, with 7,433 cabin crew and 2,389 pilots (SIA Annual Report 2008-09, p.19). Together SIA and its subsidiary *SilkAir* carry over 17 million (more than 55%) airline passengers through Singapore Changi Airport. SIA accounts for 65 % of airfreight movements in Singapore and its branch company SIA Engineering Company

accounts for about 42% of the employment in Singapore's aviation engineering sector (about 11,000 jobs).

5.4 Overview of the ISO EMS implementation

Environmental management was formally established at SIA in 1992 by way of ensuring its resources are being used efficiently and pollution is minimised throughout its operations. SIA has been working since April 1996 on a comprehensive EMS across various units within the Group (SIA Annual Report, 1997-98, p.27). In Singapore, ISO 14001 has been largely government driven. The Ministry of the Environment encourages companies to adopt ISO 14001 by facilitating pilot EMS implementation programs for companies who intend to implement EMS in their business operations and provides incentives for SMEs by covering up to 50% of consultancy cost, subject to a maximum grant cap of S$5,000 (www.lowcarbonsg.com/, 2009).

As of March 2008, there are 747 ISO 14001 certified companies in the country (National Environment Agency, Singapore). With government support and endorsement from the CEO, the SIA Engineering Division became the first unit to achieve ISO 14001 certification on 23 April 1997. According to the Vice President in charge of the Safety, Security & Environment Division, the challenges encountered during the process were: (1) the interpretation of the requirements of the ISO 14001 standard which lacked clarity in some areas; (2) training of staff to enable them to fulfil their environmental responsibilities and (3) the setting up of environmental targets without any previous baseline records. Nevertheless, the challenges were overcome and to date, formal EMS are being implemented in eight ISO 14001 certified operating units in the Group. As the years progressed, the number of personnel involved in handling environmental issues increased from one full-time staff (in 1992) to 30 (in 2009).

Today, environmental management is combined with occupational health and safety management. The SIA Environmental Committee and SIA Occupational, Safety and Environmental (OSE) Committee are responsible of corporate environmental issues as well as workplace safety programmes. The two committees comprise of representatives from the firm's operational units. Environmental issues aside, they set broad objectives and targets for occupational, safety and health issues (OSHE) and performance with the aim of:

- Ensuring uniformity of performance on OSHE issues across SIA.
- Ensuring SIA conforms to international and nationals standards on these issues.
- Ensuring SIA reaches industry best practice on these issues.

(Source: SIA Environmental Report 2004-05)

Cross-functional teams are set up across the group to ensure that safety, health and environmental responsibilities are integrated with line functions. The transportation of passengers and cargo to their destinations involves numerous operations carried out in the SIA Group, which subsequently give rise to various environmental issues (SIA Environmental Report 2005-06, p.3). SIA has categorised the environmental issues into three main areas: flight operations, cabin services and ground operations. Figure 5.1 provides an overview of the environmental impacts associated with the operations carried out in the SIA Group in relation to the three main areas. It is clear to see that ground operations consume the most resources and have more environmental impact than the other two areas.

Figure 5.1 Environmental Inputs and Outputs of SIA

OPERATIONS	INPUTS	OUTPUTS
	Resources Used	Environmental Impacts
Flight Operations		
Combustion	Aviation fuel	Fuel consumption
Fuel dumping	Engine oil	Carbon dioxide
	Aircraft spares	Aircraft noise
		Cabin air quality
Cabin Service		
In-flight services	Food & beverages	Food waste
	Chlorinated water	Packaging waste (bottles,
	Magazines, newspapers	cans, plastics etc.)
	In-flight amenities	Paper waste
	Packaging	Sanitary waste
	Duty-free items	Wastewater
Ground Operations		
Catering services	Food	Energy & water
Laundry services	Water	consumption
Cargo handling	Electricity	Air emissions
Aircraft maintenance	Paper	Waste water
Ground equipment	Engine oil	Food waste
maintenance	Hydraulic oil	Packaging waste
Property and facilities	Chemicals	Paper waste
management	Office supplies	Toxic waste
		Noise

Adapted from SIA Environmental Report (2005-06, 2006-07) & IATA Environmental Review (2004)

The SIA group seeks re-certification every three years. To ensure its ISO 14001 EMS practices are carried out efficiently, the group monitors changes in environmental legislation; checks compliance and cooperates fully with environmental regulatory authorities. In 2004, the main focus of the group's environmental management had been the revision of ISO 14001:2004 standard. Since the 2004 edition was released, the OSHE

unit and environmental committees reviewed their internal operating procedures and guidelines to meet the new requirements and to prepare for re-certification to ISO 14001:2004. In preparation for the transition, a one-day course was conducted for all 46 EMS co-ordinators in the SIA Group. The transition was considered to be straightforward by the Vice President of the Safety, Security & Environment Division as there were no major changes to the standard, except the addition of a new clause on the 'Evaluation of Compliance'. The new clause requires 'the evaluation of compliance for both legal environmental requirements and other requirements to which an organisation subscribes' (ISO 14001:2004 requirements, ISO) which subsequently requires SIA to (1) ensure that adequate records are available for periodical evaluation of compliance, and (2) ensure that there is an effective process for this evaluation. SIA ensures this requirement is met by carrying out more internal auditing. Both existing and new internal auditors attend the firm's 'internal auditor training courses' from time to time so that they are kept up-to-date on the requirements.

5.5   Significant environmental achievements

With eight units already certified to ISO 14001, there are no immediate plans to extend the certification to more units in the group. "By formally adopting the standard the Company shows its commitment to continual improvement in environmental performance and taking appropriate measures to address key areas of environmental concern," says the Vice President. As the EMS in all the units have been certified for several cycles, some of the environmental programs set out by the team have achieved their objectives. The SIA Group environmental management approach is organised as follows:

- Policy, Action Plans and Targets
- Awareness Raising and Training
- Ideas and Ownership

- Auditing Performance

(Source: Adapted from SIA Environmental Report 2004-05)

There are over 30 key environmental targets in SIA environmental management programme, all of which have associated action plans. The environmental action plans cover key issues such as energy and water conservation; the reduction of paper consumption, waste reduction, recycling and pollution control. The objective to establish an electronic system for staff to have access to departmental Organisation & Procedures Manual through their computers forms a part of the company's drive to reduce paper consumption (SIA Environmental Report 2005-2006). In response to this objective, the Engineering Division has successfully implemented an electronic environmental manual that eliminates paper use and waste related to hardcopy amendments. It also provides up-to-date documents for all staff members.

As in the case in Shangri-La, the success of an EMS cannot be achieved without employee participation. Awareness raising and training are the two main methods used by SIA to ensure staff members play their part in the company's environmental improvement strategy. In 2004, a total of 550 staff attended environmental training which covered general awareness training, internal auditor training and refresher courses on the evaluation of environmental aspects and impacts. Environmental articles on paper reduction and energy conservation were published in in-house newsletters to create general awareness among staff. During the year, Environmental Committee members also made educational visits to a power and water plant to learn about the latest development in environmental technology. To further encourage staff participation in the company's green practices, SIA runs a 'Staff Ideas in Action' suggestion scheme to empower its staff members to be creative and innovative by way of submitting useful ideas into workable plans so as to improve work

systems and achieve cost savings for the company. In 2004, a total of 3,417 ideas were submitted. Out of the ideas suggested, more than 1000 submissions had received cash awards or initiative award certificates totalling S$48,000. Some of the winning ideas were related to waste reduction issues and recycling of resources.

ISO 14001 underlines the significance of continual improvement. To ensure this requirement is met, all of SIA environmental projects are regularly monitored and linked to a series of environmental audits and reviews. A total of 12 external audits were carried out on the SIA Group between 2004 and 2005. The audits reported that good environmental 'housekeeping' had been practised in many areas and that the operational units in SIA had demonstrated a commitment to continual improvement efforts in the reduction of energy and material use as well as effective management of wastewater treatment. Various operational units in SIA conducted over 63 internal audits, which are powerful tools for improving corporate performance. By carrying regular internal audits, staff members have gained the necessary skills and experience required. For instance, 15 additional employees within the group have qualified as internal environmental auditors in 2004. "The constant review of new environmental targets and programs has enabled the Company to improve its environmental performance over the years. Our employees are more aware of environmental impacts, their responsibilities and practices," says Vice President of the Safety, Security & Environment Division.

During 2004-05, SIA has managed to improve its recycling efforts significantly, achieving 20% in the amount of materials recycled. Latest recycling figures have dropped to 15.3%. This corresponds with the reduction of material use in the workplace as a result of staff reduction.

5.6   ISO EMS impact and contributions over the years

SIA believes its corporate environmental performance cannot be viewed in isolation from its economic performance as the two are intimately linked. Environmental improvement projects can bring about cost increase but they can also deliver cost savings. The Vice President of the Safety, Security & Environment Division agrees: "Resource conservation in electricity and water consumption and recycling programs has led to savings for the Company." For SIA, economic performance provides the overall context in which environmental performance must be analysed. In a marked contrast to 2003-04, the SIA group achieved a record operating profit of S$1,356 million for the year ended 31 March 2005. It nearly doubled the profits it earned in 2003-04, in spite of challenges caused by high fuel prices and a proliferation of new airline entrants in the local market (SIA Environmental Report, 2004-05).

Effective control of costs saw expenditure in the same period rise by only 17.3% to S$10,657 million (SIA Environmental Report, 2004-05). The much-improved financial performance was mirrored by an increase in operational activities which had an overall impact in a number of key environmental areas - in particular resource use and fuel consumption. In its financial year between 2004 and 2005, SIA spent $28.3 million on various environmentally-related expenses. These included utilities cost, waste disposal, upgrading of equipment and the operation of pollution control and prevention systems. This expenditure also covers training, auditing and other environmental management activities. Some of these key expenditures in 2004-05 are shown in Figure 5.2.

Figure 5.2 Key Environmental Expenditures of SIA 2004-05

General Wastes Disposal	S$ 2,906,846
Toxic Wastes Disposal	S$ 830,532
Water Consumption	S$ 3,501,888
Electricity Consumption	S$20,183,790
Wastewater Treatment	S$ 215,700
Auditing	S$ 25,000
Upgrading of environment-related equipment	S$ 608,800
TOTAL EXPENDITURE	**S$ 28,272,556**

(Source: SIA Environmental Report 2004-05, www.singaporeair.com, p. 79)

In spite of the amount of expenditure presented in Figure 5.2 above, SIA has reported significant financial savings due to reductions in the amount of resources and energy it used. Projected savings from fuel conservation measures from flight operations amounts to S$18 million (about US$10 million, 2005 exchange rate) per annum. Measures implemented for the conservation of electricity added another S$283,425 per annum to the savings. Reduction in water usage contributed a further saving of S$75,000 per annum. Overall, SIA has saved about S$2 million per annum as a result of reduced energy, water and fuel consumption. Despite the current global economic downturn, SIA will continue to adopt "green" environmental measures to achieve savings and improve its environmental performance. This case study has emphasised one key benefit relating to the adoption of ISO 14001 EMS – costs saving. By carrying out its EMS properly, SIA is rewarded with cost savings through reduced energy and resource consumption. This benefit is echoed in the case of Shangri-La hotels.

5.7   Long term environmental strategy and future plans

The issue of climate change continues to be a hot topic and the aviation sector is one of many industries that are involved in tackling climate change. Aircrafts emit CO2 which contribute to global warming indirectly through their nitrogen oxide emissions. These contribute to ozone formation (another greenhouse gas). Aircraft also emit other gases and particles high up in the atmosphere where they cause condensation trails and are thought to increase cirrus cloudiness – both of which are in turn thought to contribute to climate change. SIA's response to tackling climate change can be summarised into the following five areas:

1. Fleet modernisation – ensuring planes to be as technologically advanced and fuel-efficient as possible.
2. Flight operation - implement procedures that minimise fuel usage.
3. Maintenance programmes for both airframes and engines – thus ensuring operational efficiency and enhance fuel efficiency.
4. Route planning procedures - that ensure that SIA planes fly the most fuel-efficient routes possible.
5. Airline operations (such as use of lighter weight crockery and cargo containers) and aircraft modifications that minimize the weight of the aircraft.

(Source: SIA Environmental Reports 2005-06, 2007-08, 2008-09)

SIA's answer to reducing greenhouse gas (GHG) emissions is to improve the fuel productivity of its aircraft through more efficient use of fuel, which in turns reduces the amount of CO2 and other pollutants produced for every kilometre a passenger or kilogram of cargo is carried. (SIA calculates fuel productivity in terms of load carried and distance flown per unit of fuel consumed (Load-tonne-km/AG). The key method in achieving fuel efficiency is by operating fuel efficient aircraft. For example, SIA has planned to replace its Boeing 747-400s with Airbus A380s on long-haul routes such as the London-Singapore-Sydney sector. "The replacement

of Boeing 747s with the new Airbus A380s will result in a 20% improvement in fuel efficiency," says Marvin Tan, UK and Ireland based general manager (Sobie, 2007). The next generation aircraft e.g. Airbus A380 and Boeing 787, use less than 3 litres of fuel per 100 passenger/kilometre (78 passenger-miles per US gallon). This exceeds the efficiency of any modern compact car on the market (www.enviro.aero , 2009). Fuel productivity as measured by ltk/AG decreased by 2.9% in 2008-09 and was attributable to lower load, partially mitigated by the addition of new A380 and B777-300 (SIA Environmental Report 2008-09, p. 10). As a result, SIA added 12 new aircraft to its fleet – three A380, five B777-300ER and four A330-300, all of which are considered to be among the cleanest, least noisy and technologically advanced commercial planes in the market.

Being an environmentally responsible and proactive firm, SIA's corporate environmental practices go beyond implementing EMS. SIA is one of the pioneers of corporate environmental reporting in Southeast Asia (SIA Environmental Report 2005-2006, p.2).). Like other large Asian airlines such as All Nippon Airways (ANA), Japan Airlines (JAL) and Korean Air (KAL), SIA has published formal and standalone environmental reports on a continuous basis and winning awards along the way in recent years. From 2001, SIA has produced very comprehensive environmental reports. In 2002, its 2001-02 environmental report won the inaugural Singapore Environmental Reporting Award, instituted by the Association of Chartered Certified Accountants (ACCA), recognising SIA's outstanding efforts to measure and communicate the environmental impact of its operations and activities (SIA Environmental Report 2004-05). The emissions and impact tables in its 2002-03 environmental report indicate that the company takes environmental issues seriously and that it recognises its core impact on society, which is often seen as a principal starting point for a company from which to eventually develop an

integrated CR strategy across its operations (Roche and Webb, 2003). 'A good environmental report can demonstrate awareness, reassure stakeholders, provide other airlines with a benchmark for environmental improvement, and improve the company's image thus gaining competitive advantages in the market' (Mak & Chan, 2006, p.619). Its 2004-05 environmental report was by far the most detailed, amounting to 82 pages which reported on key environmental impacts from 'in the air' to 'on the ground' as well as the group's EMS implementation procedures. A copy of the SIA environmental policy statement was also featured in the report. Consequently, SIA's report for 2004-05 was awarded the Runner-Up Best Environmental Report in the Association of Chartered Certified Accountants (ACCA) Singapore Environmental & Social Reporting Awards in 2005.

In its 2003 report, SIA has considered the recommendations of the Global Reporting Initiative's (GRI) 2002 Sustainability Reporting Guidelines. Sustainability reporting under the GRI guidelines is voluntary and it address the 'triple bottom line' of economic, environmental and social issues affecting a business. The GRI's first Sustainability Reporting Guidelines was released in 2000 followed by its second iteration in 2002. It is a new concept and not many firms in Asia are aware of the GRI guidelines at the time, let alone practise this form of reporting. Once again, SIA has demonstrated its pioneering spirit by showing its commitment to become an environmentally responsible organisation by using the GRI guidelines in its corporate environmental forthcoming reports. On adopting the GRI guidelines the Vice President of Safety, Security & Environment Division considers the guidelines "have been beneficial in providing a consistent reporting standard for the company to adopt". Changes have been made in the format of SIA's environmental reports starting from 2007. Both the 2007-08 and 2008-09 environmental reports respectively entitled 'Caring for you and the environment' and 'Conserving the

environment for the generations to come' continue to report on the broad range of environmental indicators (i.e. aircraft emissions; fuel efficiency, electricity and water consumption) and the efforts and commitment taken by the staff to achieve better performance. The newer reports give a more holistic coverage of the company's efforts in achieving environmental sustainability as well as social responsibilities.

SIA experienced a net loss of S$307 million (USD 212 million) during its fiscal first quarter, its first quarterly loss since the SARS crisis in 2003 (Govindasamy, 2009). In its steps to control cost during the economic downturn, SIA has put a stop in hiring new staff; implemented unpaid leave, wage cuts and a deferment of non-essential projects. In spite of losses, the Company continued to add new and cleaner aircraft to its fleet. Its Chief Executive announced, "We want the planes to come in and to continue with our policy of fleet renewal," at a media and analyst briefing in May 2009. As a long-term player he added:" Our strategies are long-term so the policy of operating a young, modern fleet is an ongoing one. It isn't one that you turn on or off according to the whims and fancies of the business cycle." (www.indianasnewscenter.com, 2009). Adhering to its long-term policy in striving to lead by conducting business in an environmentally responsible manner, the Company will continue to adopt environmental measures to achieve savings and improve its environmental performance.

5.8   Summary and Observations

Air travel strongly emphasises on time saved, not miles travelled. It is human nature to conquer the sky, beginning with the Wright brothers inventing and building the world's first successful airplane. The excitement of moving around from cities to cities, countries to countries continues to appeal to all. Excitement aside, flying represents the quality of modern lifestyle, ideas and practices. National flag carriers such as Singapore

Airlines and Cathay Pacific (Hong Kong) represent the achievement and most importantly the pride and development of the individual country. To them, long term business survival is crucial. The emergence of new generation budget airlines such as easyJet, Ryanair Virgin Blue and Air Asia brings people to farther distance at an affordable price. The ability of technological and management solutions to resolve environmental problems has been the subject of considerable debate among those interested in the promotion of sustainable aviation business. As the Chief Executive of Boeing's commercial planes division pointed out: "Aircraft are 70% more efficient than they were when they were first brought into the industry half a century ago." (Madslien, 2007). Although aviation has made significant improvements in areas concerning fuel efficiency, noise and emission reduction, expansion in air travel may outpace the technological and operational improvements that can be implemented to address ongoing environmental impacts. Unless travellers worldwide decide to fly less, there are no quick fixes. In the meantime, making technological and efficiency improvements in aircrafts and implementing ISO 14001 EMS to minimise pollution seem to be the best bet.

ISO 14001 is not the right tool in the ISO 14000 series for tackling bigger and complex issues such as climate change. The relatively new ISO 14064 and ISO 14065 released in 2006 and 2007 respectively deal with GHG and related issues (Visser, 2009, p.155). However, evidence from this case study has demonstrated that implementing ISO 14001 EMS involves the constant review of new environmental targets and programs which in turn enables all eight units in the Company to improve their environmental performance over the years. This further leads to the employees becoming more aware of environmental impacts, their responsibilities and practices. Adopting the measures has also resulted in internal benefits i.e. savings for SIA by way resource conservation in electricity and water consumption and recycling programs. These are

good examples of good practice undertaken by SIA to show it is a leading company operating in an environmentally responsible manner. By undertaking corporate environmental reporting, passengers and other stakeholders are aware of and supportive of the Company's on going green initiatives.

Chapter 6

Case Study 3: Jebsen & Jessen Packaging

6.1   Packaging industry: Overview

The rise in developing Asia's share in world manufacturing during the last three decades has been significant. In particular, manufacturing output generated from the newly industrialised economies (NIEs) and ASEAN-4 has more than doubled since the 1980s, representing in 2000 to 2004 close to 14% of the world total (Felipe and Estrada, 2007, p.11) [5]. This increase has been taking place steadily in the region, with 8 to 10% growth per annum since the 1970s, compared to the rest of the world (ibid., p.11). The growth in the manufacturing sector has a significant effect on the packaging industry, upon which it depends. The more goods manufactured means the more packaging required.

The global packaging industry is worth US$ 424 billion (economywatch.com, 2009). With a value of US$114 billion, Asia accounts for 27% of the world's market share after Europe (30%) and North America (28%) (economywatch.com, 2009). Asia's packaging sector is growing at rates of between 12 to 15% on a yearly basis driven by:

- Population growth.
- Export oriented economies.
- Increasing domestic disposable incomes.
- The rapid expansion of modern retail.

(Source: www.packwebasia.com 2009)

---

[5] The NIEs are Hong Kong; Republic of Korea, Singapore and Taiwan. ASEAN-4 includes Indonesia, Malaysia, Philippines, and Thailand (Source: Asian Development Bank).

The scope of packaging industry is wide and covers far more than manufacturing simple containers. It consists of firms dealing with packaging materials; equipment, machinery, design and consultancy serving a large group of manufacturers from food and beverage to electronics. The wide range of materials used for packaging include metal, glass, wood, paper or pulp-based materials, plastics or combination of more than one materials as composites. All these materials are applied in three broad categories of packaging:

1.   Primary packaging - refers to everyday goods and taken home by consumers.

2.   Secondary packaging - covering larger packaging such as boxes for carrying large quantities of primary packaged goods.

3.   Tertiary packaging - refers to packaging used to assist transport of large quantities of goods, such as wooden pallets and plastic wrapping.

(Adapted from: Davis and Song, 2006, p. 148)

Secondary and tertiary packaging materials are normally in larger quantities and have less material variation and thus are relatively easier to collect and sort by wholesalers or retailers for recycling or reuse purposes (Davis and Song, 2006, p.148). On the other hand, primary packaging materials are more widely circulated into households: they are largely mixed, non-biodegradable or damaged and thus pose more problems in recycling or reuse purposes. Western Europe is the leading consumer of biodegradable packaging. The biodegradable packaging markets in Asia Pacific and Eastern Europe have been growing, but are relatively underdeveloped at present (Butcher, 2007).

As today's society places increasing demands upon packaging for reasons such as safety, convenience, efficiency, identification and marketing, packaging is becoming a burden to producers, consumers,

and the environment. As more and more consumers becoming environmental conscious around the world, packaging materials and methods, as well as thought processes, will need to change in order to create a lesser impact on society and the planet.

6.2   Environmental impact of packaging industry

The packaging industry has long been targeted as a waste generating medium (Sonneveld *et al.*, 2005, p.2). Concern about the environmental impact of packaging was raised due to the enormous quantities materials consumed and required. As a result, the industry has been put under immense pressure for decades to minimise its environmental impact by reduce packaging waste, over-packaging and improve recycling levels (Lewis, 2007, p.1). Internationally, the environmental impacts of packaging are subject to an increasing number of government regulations and co-regulatory agreements. For example, the EU Packaging and Packaging Waste Directive (94/62/EC) is focused on resource and waste reduction and recycling. These regulations are quite varied and in an increasingly global marketplace, firms that manufacture or use packaging need to stay up to date on regulatory trends which are driving change in the way that packaging is designed, used and recycled. Government response varies from measures such as strict regulations to voluntary agreements between stakeholders. Most of these measures are developed around the traditional '4Rs' waste management hierarchy – reduction, re-use, recycling, recovery (Sonneveld *et al.*, 2005, p.2).

One of the key changes is a shift to 'product stewardship' – the idea that companies need to share responsibility for reducing the impact of products on the environment over their total life cycle. For many companies this represents a big shift in the way that they think about packaging. It means doing more than simply ensuring that their manufacturing and distribution operations have minimal impacts on the

environment. It requires them to look at the impacts of their supply chain, and to work closely with suppliers to implement environmental improvement programs. It also requires them to design products which use materials and energy as efficiently as possible, avoid use of toxic or hazardous substances, and which are recoverable at end-of-life.

While the 'shared responsibility' model is preferred in Australia, New Zealand and the U.S., regulations which place physical or financial responsibility for waste management on producers ('Extended Producer Responsibility' or EPR) are more common in Europe. Container deposits for beverage containers and eco-taxes on all packaging materials are also common policy tools. Some current or proposed schemes, including an announcement that the Dutch Government is planning to substantially increase deposits on non-reusable containers, are being contested by the packaging industry on the basis that they will restrict internal competition in the European (EUROPEN Bulletin, May/June 2006).

A range of packaging regulations including take-back requirements, recycling targets, mandatory recycling fees or restrictions on certain materials (e.g. PS foam or PVC) have been introduced in parts of Asia including China, Japan, South Korea and Taiwan. With a large part of the manufacturing processes being subcontracted to local firms, multinational corporations (MNCs) are playing a pivotal role in the greening of the supply chain in developing environmental friendly processes, products and services to manage their corporate environmental issues in the region. This case study is based on a packaging company (located in Singapore) which is a subsidiary of a European MNC. The packaging sector is selected as a case study because of the considerable amount of resource and materials it requires and the waste generated throughout in the entire process. The existence of this industry relies heavily on the demand for goods and products; an important link in the chain of industrial production.

As a supplier to other MNCs in Southeast Asia, this case study demonstrated a company's decision to embark on ISO 14001-certification was influenced by customer expectation as part of the greening of the supply chain. In doing so, the firm had prompted greater staff participation and awareness in environmental initiatives and shifted the firms focus to more preventative actions. Primary data gathered on this case study was based on an e-mail interview with the firm's Regional Managing Director. Secondary data were based on information based on the content analysis of the firm's website and the company's annual and environmental reports, press releases and academic sources.

6.3   Firm profile

The Jebsen & Jessen Group of Companies South East Asia (JJSEA), a member of the Jebsen & Jessen Family Enterprise, dates its origins to a trading partnership formed in Hong Kong in 1895 between two Danish gentlemen, Jacob Jebsen and Heinrich Jessen. The two founders set up a trading business in Hong Kong as part of an extension of the sea-faring tradition of their respective families of ship owners and captains. Today, the Group is a highly diversified entity engaged in seven core businesses: Chemicals, Communications, Life Sciences, Marketing, Material Handling, Packaging and Technology (www.jjsea.com, 2009).

While Jebsen & Co continues to play a major role in Greater China functioning as an important trading link between China and the West, JJSEA enjoys a strong market presence in Southeast Asia. First established in Singapore and Malaysia in 1963, JJSEA has established a firm foothold in the region with more than 50 subsidiaries and associate companies located in Singapore; Indonesia, Malaysia, Philippines, Thailand and Vietnam. The Group currently has approximately 3,000 employees.

Located in Singapore, Jebsen & Jessen Packaging (JJP) - a merger of packaging interests between Jebsen & Jessen (SEA) and Broadway Industrial Group - is one of the seven core businesses under JJSEA. As a leading designer and manufacturer of moulded foam packaging, JJP designs and produces moulded foam products for the building and construction industries. It is one of the largest stockists of insulation materials in Singapore and Malaysia with an annual production output of 8,000 tonnes of packaging for over 100 customers, generating over S$25 million in revenue (Toffel, 2000, p.183). Along with two factories in Malaysia, JJP operates round-the-clock production, synchronising computer-aided scheduling with customers to offer 'just-in-time' delivery. JJP is also one of the first companies in Southeast Asia to achieve ISO 9002 certification.

With more than 30 years of packaging experience along with an excellent track record in delivering reliable and quality products and services, JJP has received awards accompanied by recognitions from satisfied major clients such as Honda, Hitachi and Sharp. In 2006, for instance, JJP (Malaysia) was awarded the 'Best Supplier Award' by Honda Autoparts Manufacturing for three consecutive years in recognition for its quality and delivery. According to Honda, JJP successfully supplied the packaging material to ensure the auto parts arrive at their destinations in pristine conditions - a challenging achievement as most of these parts are highly polished, finished components of high Japanese standards (JJSEA official e-newsletter, April 2007). JJP not only prides itself as a one-stop packaging facility offering high quality protective packaging solutions. It also produces specialty products (i.e. air-conditioners components, crash helmets and energy absorbing parts in cars) and provides design and engineering services to many of its international clients.

6.4 Overview of ISO EMS implementation

Since the launch of ISO 14001 in Singapore in 1996, the management at JJP has observed a growing trend towards certification among local subsidiaries of multinational corporations (MNCs). Several of JJP's key customers within the electronics industry had begun implementing EMS to meet the ISO 14001 standard. This trend resulted in some of the firms expecting and requiring their suppliers to become ISO 14001 certified. A similar trend had occurred several years before, when JJP was encouraged by its major clients to adopt the ISO 9002 quality management standard. Sensing that a similar situation would emerge, the management of JJP began to make preparation to achieve ISO 14001 certification as it would become a matter of customer expectation.

Prior to seeking ISO 14001-certification, all member companies of JJSEA adhered to a company-wide Environment, Health and Safety (EHS) informal policy developed by the EHS committee at JJP in 1995. As ISO 14001 requires a company's environmental policy to be available to employees and stakeholders, the EHS committee at JJP arrived at a decision that it was necessary to simplify the firm's existing EHS policy. With the endorsement from the senior management at JJP and corporate EHS department at JJSEA, the EHS committee at JJP was officially given the task to devise the existing EHS policy into a formal EHS management system to be certified to ISO 14001. As a result, the EHS committee at JJP was officially formed in 1997. In late 1998, the road to ISO 14001-certification began with JJP's Quality Manager, who was previously involved with the firm's ISO 9002 programme, heading the initiative. Drawing on its previous experience with ISO 9001, JJP looked for outside advice. A local quality management consultancy that had previously assisted JJP prepared its ISO 9001 was chosen. As the consultant's experience in the new standard was limited, this enabled JJP to obtain a competitive price for the work provided. With the full support of JJP

senior management and corporate EHS department, the EHS committee drew up a modified EHS policy which consists of eight core principals (see Appendix). As ISO 14001 requires a company's environmental policy to be available to all employees and external stakeholders, the new policy was sent to customers; suppliers, neighbouring facilities and the general public. Copies of the new policy was translated into Bahasa Malaysia (Malay) and Chinese and posted throughout JJP to ensure all employees are familiar with it.

6.5 Significant environmental achievements

Today, over 30 member companies within Jebsen & Jessen (SEA) (JJSEA) are ISO 14001 (EMS) and OHSAS 18001 (Occupational Health & Safety Management) certified. With the successful implementation of EHS management systems based on the two standards, JJSEA has moved into the next phase of EHS management, based on a regional model for a restructured surveillance and re-certification system.

Excellence in EHS has not only complemented the business objectives of the regional activities, but also provided a more pleasant working environment for staff. The Group has strengthened it EHS policies and is committed to maintaining management systems in all member companies that adhere to the following:

- Corporate Priority

To integrate EHS considerations in corporate strategy, including decisions on activities, siting and operations; to establish policies, programmes and practices for conducting operations in a manner that is environmentally sound and that protects health and safety; and to provide adequate financial and human resources to implement this policy.

- Continuous Improvement

To continue to improve EHS performance by setting objectives and targets.

- Employee Education

To educate, train and motivate employees to be aware of EHS aspects and impacts in order to conduct activities with minimal risk.

- Products and Services

To provide products and services that have no undue environmental impact and are safe in their production, transport, storage, intended use and disposal; that are efficient in their consumption of energy and natural resources; and that can be recycled, reused or disposed of safely.

- Facilities and Operations

To minimise the impact of the operations on people and the environment by implementing best management practices, including pollution prevention and resource productivity.

- Emergency Preparedness

To ensure preparedness in addressing emergencies, and to ensure that appropriate corrective measures are taken promptly in response to any accident or near-miss.

- Stakeholder Advice

To advise and, where relevant, educate customers, distributors and the public in the safe use, transportation, storage and disposal of products and services provided, and to include EHS criteria in procurement decisions.

- Promotion

To increase awareness of and commitment to responsible EHS behaviour by actively participating in dialogues among industry, government and non-profit organisations.

- Compliance and Reporting

To regularly measure and audit EHS performance in order to ensure compliance with legal requirements and the above policy commitments. (Source: Jebsen & Jessen SEA Pte Ltd, 2009)

Based on the Group's EHS policy, JJP is committed to the conservation of the environment and the health and safety of its employees. All production facilities at JJP carry out recycling activities and promote energy conservation; practices that have contributed to the company's ISO14001 and OHSAS 18001 certifications. JJP's EHS policy covers social and environment efforts that are focused on three areas: material, process and people.

1. Material

   Production material especially Expanded Polystyrene (EPS) is made from recyclable material and investment in recycling machines for the production facilities has been made for this purpose. Raw material is purchased from responsible suppliers having similar environment policies in place. In addition, the raw material is also tested for hazardous content to ensure all packaging inputs are safe and in compliance with RoHS – the European directive for the restriction of the use of certain hazardous substances in electrical and electronic equipment. This directive ensures products are free from certain hazardous substances or below allowed levels of lead, cadmium, mercury,

hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

2. Process

Continuous efforts are being made to reduce faulty product and wastage. This is made possible by stringent production control and regular machine and mould maintenance. Careful inspections are performed prior to each production run. Innovative design of the mould also ensures higher productivity and lower rejection rate. Natural resources such as air, steam and water are mainly used in the production process with minimal uses of chemicals and additives, which are RoHS compliant. To further ensure a cleaner environment, conventional fuel oil boiler systems in the production facilities have been converted to those running on natural gas.

3. People

Monthly EHS audits are performed at each production facility to ensure the safe and reasonable working environment. This includes workplace and equipment inspection and the practice of 'Total Quality Environment' in areas of Organisation, Neatness, Cleaning, Standardisation and Discipline. Staff members are well protected at work with relevant Personal Protective Equipment (PPE) such as earplugs and safety attire. Annual audiometric (ear) tests are conducted, on top of training on first aid and fire drills.

(Source: Jebsen & Jessen Packaging, 2009)

6.6   ISO EMS impact and contributions over the years

The long-standing criticism of ISO 14001 is that the standard is mainly concerned with environmental conformance, not environmental performance. In response to this argument, the EHS manager at JJP maintains that the issue of environmental performance is an integral part

of compliance and conformance to ISO EMS requirements. He therefore defines environmental performance as "measurable results of JJP's environmental aspects and significant impact" which are consistent with the company's environmental objectives and environmental targets. Over the nine years of ISO EMS implementation, the EHS manager has pointed out the following benefits the system has brought to JJP:

- Reduced negative environmental impact
- Effectiveness and ease in implementing ISO EMS through years of having the system in place.
- Significant savings in energy costs, the biggest expenditure in packaging facilities. The implementation of ISO EMS has resulted in energy efficiency opportunities in heat recovery system, optimised air compression and steam leakage control.

Implementing ISO 14001 has therefore enabled the company to improve EHS management across all departments and has ensured that tasks are assigned and accomplished in a much more systematic manner. In particular, management's periodic review and establishment of EHS objectives and targets based on EHS impacts – a new feature of the company's management system – ensures continuous improvement in the most relevant areas.

One major benefit of JJPS's implementation of ISO 14001 was that it acquired a third-party 'seal of approval' that would be used in its marketing efforts to meet the growing environmental concern of its customers within the electronics industry. According to JJPS General Manager, it was the American-based multinationals that had expressed interest in whether their suppliers are certified to ISO 14001, typically discussed in the quarterly business reviews they conduct with their suppliers. Hence, adopting ISO 14001 had enabled JJP to meet their demands.

6.7   Long term environmental strategy and future plans

JJPS continues to promote its ISO 14001 experience to its customers and suppliers to encourage their participation. Having established its region-wide Environment, Health and Safety (EHS) standards across Southeast Asia for over 10 years, JJP considered its EHS policy to be comprehensive and proactive in yielding tangible bottom-line benefits for its business. In terms of undertaking other green initiatives, the Group planned to tackle the burning issue of carbon footprint. The launching of "Carbon Neutrality Programme" in 2008 was part of the Group's efforts to implement carbon offset initiatives to ensure facilities and business processes were more environmentally friendly and energy efficient. Future investments into environmental projects were also in the pipeline.

6.8   Summary and Observations

Packaging protects goods from mechanical or transportation damage and preserves their quality from exposure to the elements. The traditional waste management hierarchy – reduction, re-use, recycling and recovery affecting packaging industry needs to be re-explored and improved in order for the industry to meet the ideals of sustainable development. Implementing ISO 14001 EMS would enable firms to better manage materials and waste but is limited in its scope in resolving the wider issues of reducing packaging waste and limit the use of unfriendly materials such as Expanded Polystyrene (EPS, commonly known as plastic foam) made from non-renewable petroleum based chemicals in all areas of packaging.

6.9   Mini case studies

The mini case studies presented were based on data gathered from secondary sources such as the content analysis of the firm's website and the company's annual and environmental reports (and CSR reports where available). Additional information was compiled from company newsletters, press releases and articles. The three firms selected were:

- Sime Darby Plantation Sdn Bhd (Palm oil plantation)
- British Malaysian Tobacco
- Towngas

All three firms were early adopters of ISO 14001 and had adopted other green initiatives. A short profile of these three firms and their corporate environmental practices are presented as follows:

Name of Firm	Sime Darby	British American Tobacco	Towngas
Sector	Plantation & Agribusiness	Tobacco	Public Utilities
Date of ISO 14001 Certification	1996	1996	1999
Emerging & Ongoing Issues Affecting Firms	land & water management; zero burning, re-plantation, palm oil effluent treatment, natural resources & material efficiency,	CO2 emissions; hazardous wastes, land management; reforestation, health & safety, business ethics, corporate governance	public safety; health & safety, air pollution, clean & green gas, waste management, supply chain management
Adoption of Other Certifications & Voluntary Strategies	CSR reporting FSC certification HACCP OHSAS 18001	AA1000 & AA1000AS GRI ISO 9001 OHSAS 18001	ISO 9001 OHSAS 18001 CSR reporting

Preliminary findings on these three firms indicated that it was practical for as well as responsible of firms to adopt several measures in response to ongoing and emerging environmental and social issues. To some extent, ISO EMS had further encouraged the firms to self-regulate further by considering and exploring other certification schemes and green initiatives.

Chapter 7

Results and Discussions

7.1 Data Analysis and Interpretation: Hypothesis 1

Hypothesis 1: The implementation of ISO 14001 EMS had delivered wider benefits to firms over a period of time.

ISO 14001 was introduced in 1996. Early adopters of ISO 14001 i.e. firms who had successfully achieved ISO 14001 certification within the first year after the standard was launched, tended to be the ones who already had some form EMS practices in place. This helped explained their willingness to voluntarily adopt the new standard at the time. One could also argue that, to some extent, the time required for these firms to increase staff awareness of the standard, undertake motivation and training measures, and complete EMS implementation activities were significantly reduced. Having the manpower and resources to undertake such a task was also a significant driving factor as the costs for both implementation and certification of ISO EMS were often high. Therefore, the decision to formally adopt the standard is not taken lightly.

Proponents of ISO 14001 have always insisted that the standard could result in actual benefits to firms, albeit over time. Various perceived and actual benefits experienced by ISO 14001 certified firms based on literature review included cost savings; good corporate image, market expansion, environmental compliance and improved stakeholder relationships. Findings based on the multiple case studies research indicated that firms had experienced benefits such as cost savings from reduced energy and material consumption, waste minimisation and

improved operational efficiency. Other actual benefits experienced by firms for having ISO EMS in place over a number of years were presented in Table 7.1 on page 118. *(Some spaces in the table had been left blank as data was not available or the benefits were not applicable to certain firms. For example, it is debatable that "enhanced green & ethical corporate image" can be associated with a company like British American Tobacco (BAT).* Adopting green measures is a long-term commitment and the advantages are not immediately apparent. Majority of the firms presented in the case studies had adopted ISO 14001 for at least 10 years.

Table 7.1 Summary of benefits of ISO EMS to firms presented in the case study

Benefit Group	Benefits of ISO EMS to firms	SIA	ISL	JJP	Sime Darby	BAT	Towngas
Clean & green operations	Waste minimisation & material efficiency	✓	✓	✓	✓	✓	✓
	Reduced energy consumption	✓	✓	✓	✓	✓	✓
	Reduced damage to the environment	✓	✓	✓	✓		
Cost effectiveness	Cost saving from less waste & energy consumption	✓	✓	✓	✓	✓	✓
	Improved operational safety	✓		✓	✓	✓	✓
Effective operations	Safer and improved working environment for employees.	✓	✓	✓	✓	✓	✓
	Improved quality through greening of the supply chain.	✓	✓	✓			✓

Competitive advantage	Having certified products/ services that meet customer needs	✓	✓	✓	✓			
	Improved market share	✓	✓	✓	✓			
Market expansion	Ability to conduct business in markets with stringent environmental controls & regulations.	✓	✓	✓	✓			
Improved company image	Enhanced green & ethical corporate image	✓	✓	✓	✓		✓	
Improvement in internal management	Promoted & Enhanced staff environmental awareness	✓	✓	✓	✓	✓	✓	✓
	Improved communication with documented procedures & work instructions	✓	✓	✓	✓	✓	✓	✓
Improved compliance	More proactive towards regulatory changes & pressures	✓	✓	✓	✓	✓	✓	✓

(Source: Compiled by author, 2009)

119

7.2   Data Analysis and Interpretation: Hypothesis 2

> Hypothesis 2: Firms who had implemented ISO 14001 EMS over a period of time were more likely to expand their environmental measures by undertaking other voluntary initiatives.

Different firms have different reasons for implementing an ISO EMS and for seeking certification. These reasons determine how the EMS was developed and how it evolves within the firm. In the case Shangri-La Hotels & Resorts, environmental improvement practices began in 1993 with the establishment of a "Green Committee" which implemented a "best practice" programme for the five main departments in the hotel - offices, housekeeping, laundry, food & beverage and kitchen – to help them reduce, reuse and recycle resources with minimum operational costs. Environmental management had been carried out since 1992 in Singapore Airlines to ensure efficient use of resources and pollution reduction throughout its operations. In the case of Jebsen & Jesssen Packaging (JJP) where the company already had a formal and certified ISO 9001 quality management system (QMS) in place, it made good business sense to adopt ISO 14001 to ensure its products and operation processes continued to conform to customers' expectation and regulatory requirements. Sime Darby Plantations Sdn Bhd first implemented eco-friendly plantation practices in the form of zero-burning technique in 1989, which contributed to a cleaner environment and enhanced soil fertility. Other good practices carried out by the firm included terracing and planting on contour to prevent soil degradation. By 1996, the firm successfully achieved ISO 14001. Other certifications followed i.e. HACCP (food safety) in 2001 and FSC in 2002. Internal green practices were sustained through organised structures, processes and controls managed by the firm's TQEMS department since 2002.

Each firm tackled different issues and overcame various challenges during their initial ISO EMS implementation process. Once they had become familiar with the EMS procedures, their EMS became more sophisticated and evolved over time. No matter how firms tailored their EMS to fit their business operations and to meet their environmental targets, their success in adopting and maintaining the standard would not be possible without three supporting factors: (1) a healthy profit, (2) top-level commitment and (3) employee support. In the interviews, three firms were asked if environmental management practices would still be high on their corporate agenda in the current unfavourable economic climate. All three replies maintained that their firms would continue to carry out environmental protection measures based on their individual EMS procedure. This did not come as a surprise as the firms would have to answer to their suppliers, stakeholders and head office should they decide to lessen their effort in environmental management practices. The purpose of this question was to find out whether the firms were committed to implementing green practices in the long-term. The answers given could be interpreted as adopters of ISO 14001 had the resources and manpower to carry out their EMS procedures as usual even in times of financial crisis.

Taking into account that adopting ISO 14001 is voluntary, the firms were indeed serious about environment protection issues. Table 7.2 on the following page presented the various corporate environmental initiatives adopted by firms. By juxtaposing emerging and ongoing environmental and socio-political issues affecting the firms, the information provided in the table aimed to identify the rationale behind firms' willingness to consider or adopt other voluntary measures in order to tackle such issues.

Table 7.2 Corporate Environmental Initiatives Undertaken By Firms: A Summary

Name of Firm	Shangri-La	Singapore Airlines	Jebsen & Jessen	Sime Darby	British American Tobacco	Towngas
Sector	Hotel	Aviation	Packaging	Plantation & Agribusiness	Tobacco	Public Utilities
Date of ISO 14001 Certification	1997	1997	2000	1996	1996	1999
Emerging & Ongoing Issues Affecting Firms	health & safety; food safety, supply chain management, stakeholder relations	air pollution & aircraft noise; climate change, greenhouse gas emissions, waste management	material efficiency; recycling, materials & waste management, health & safety,	land & water management; zero burning, re-plantation, palm oil effluent treatment, natural resources & material efficiency,	CO2 emissions; hazardous wastes, land management; reforestation, health & safety, business ethics, corporate governance	public safety; health & safety, air pollution, clean & green gas, waste management, supply chain management
Adoption of Other Certifications & Voluntary Strategies	HACCP CSR framework	GRI reporting guidelines OHSAS 18001	ISO 9001 Carbon offset Initiatives OHSAS 18001	CSR reporting FSC certification HACCP OHSAS 18001	AA1000 & AA1000AS GRI ISO 9001 OHSAS 18001	ISO 9001 OHSAS 18001 CSR reporting

122

(Source: Compiled by author, 2009)

From the information presented in Table 7.2, all firms had been proactive in their pursuit of corporate environmental management practices. On top of implementing ISO EMS, all six had taken further steps by exploring other eco-friendly initiatives. ISO 14001 broadly addresses EMS practices for firms and does not require firms to produce yearly environmental reports. Both the corporate social responsibility (CSR) and Global Reporting Initiative (GRI) frameworks take it further by addressing more specific issues relating to the 'triple bottom line': economic, environmental and social elements that affect firms' activities. Undertaking sustainability reporting practices would require firms to enlarge their environmental reports to include social and financial issues. As well as helping firms to manage their impact, sustainability reporting promotes transparency and accountability as the framework requires them to disclose information in the public domain. In doing so, stakeholders can track their performances on broader themes such as environmental performance or on labour conditions in factories.

With Shangri-La embarking on CSR programme and Singapore Airlines adopting the Global Reporting Initiatives (GRI) framework, both firms were prepared to commit to carry out sustainability reporting practices. JJP had no intention to produce environmental reports or sustainability reports because it would lead to a great deal of data collection and extensive resources. Having established its region-wide Environment, Health and Safety (EHS) standards across Southeast Asia for over 10 years, JJP considered its EHS policy to be comprehensive and proactive in yielding tangible bottom-line benefits for its business. In terms of undertaking other green initiatives, the Group planned to tackle the burning issue of carbon footprint. The launching of "Carbon Neutrality Programme" in 2008 was part of the Group's efforts to implement carbon offset initiatives to ensure facilities and business processes were more environmentally friendly and

energy efficient. Future investments into environmental projects were also in the pipeline.

7.3   Summary

Findings based on the multiple case studies research had assessed and tested the two hypotheses. The six firms examined in the case studies had implemented ISO EMS for at least 10 years. ISO 14001 EMS had indeed made some positive contributions to their business operations. Most of the benefits experienced by firms tend to become apparent over the years, as pointed out by proponents of the standard. The kind of benefits available to firms were both internal and external, ranging from internal cost savings, increased environmental awareness among staff to good corporate image and improved regulatory compliance. There was no evidence that implementing ISO EMS had enabled a firm to improve its environmental performance.

ISO EMS is process led, not performance led. The experience at both Shangri-La hotels since they had adopted ISO EMS indicated that the positive contributions of the standard were attitudinal and managerial which were not quantifiable in money terms, as pointed out by the Director of Human Resources of Shangri-La Bangkok during the interview. According to her, implementing ISO EMS had made little impact on profits. Like Shangri-La, most firms had experienced this change in attitude as their staff members became more aware of environmental issues affecting their workplace. For example, comprehensive staff training at JJP had increased participation in recycling and energy conservation initiatives, and on preventative actions to reduce risks. Although the ISO EMS auditing and re-certification process involved considerable paperwork, documentation and manpower, carrying out the internal audits as specified under the revised ISO 14001:2004 version had enabled managers and heads of department to ensure that tasks were assigned

and accomplished in a much more systematic manner across all departments. This periodic practice was which aimed to help firms achieve continuous improvement in the most relevant areas was found to be effective in enabling EMS managers and their staff at Shangri-La and SIA to identify areas for improvement and keep track of any progress made in achieve these objectives.

Implementing ISO EMS had also influenced firms to consider adopting other forms of eco-friendly practices. The firms examined in this study are big firms with significant environmental impact. The nature of their business tends to be more affected by a wide range of environmental and social issues. Being early adopters of ISO 14001, they were more familiar and proactive in tackling these issues. All six firms have adopted other voluntary measures over the years. By producing sustainability reports using the CSR and GRI frameworks, firms such as Shangri-La and SIA were already a step forward than those who just produce than producing environmental reports because , as sustainable reporting requires firms to publicly disclose economical, environmental and social issues relating to their business activities. In fact, CSR is increasingly becoming a strategic component for many MNCs today (Sjöström and Welford, 2009, p.278).

Reporting aside, some firms like JJP have decided to tackle more pressing issues such as carbon emissions and climate change. These wider and complex issues cannot be resolved by implementing ISO EMS alone. There is no "one-fit-for-all" solution. Like all systems, ISO 14001 is flawed and is not a panacea for ecological problems. Therefore, it is practical for as well as responsible of firms to adopt several measures in response to ongoing and emerging environmental and social issues. To some extent, ISO EMS has encouraged the firms to self-regulate further by considering and exploring other certification schemes and green initiatives.

Chapter 8

Conclusion

8.1   Summary and Observations

Over the past three decades, firms in developed nations in the West have come under increasing pressure to evaluate and manage their environmental impacts as these impacts reach beyond local and regional levels. The same concern is becoming apparent in Asia as globalisation pushes Asian firms to conduct their business in line with international standards. Responding to legislative pressures and global demand for environmental-friendly goods and services, some firms across Asia have undertaken necessary measures to ensure clean production and processes in recent years. Voluntary self-regulation was perceived by some government agencies (such as those in Hong Kong, Malaysia, Singapore and Thailand) as a viable way of increasing business contributions to environmental improvement. To date, the most dominant voluntary self-regulation measure undertaken by firms across Asia to achieve environmental protection is the adoption of an EMS process based on the ISO 14001 standard.

The reasoning behind environmental management and sustainable development are distilled down to the minimisation of harmful effects on the environment as a result of human activities. Voluntary corporate environmental management measures such as ISO 14001 might be proactive schemes adopted by firms to manage their environmental impact, but only in as much as they are active in reducing impact. First of all, ISO 14001 EMS standards are processes, not performance standards. In other words, implementing the standard does not guarantee that an organisation will create less pollution or meet national environmental requirements. It is equally difficult to compare the environmental

performance of two different ISO 14001 certified firms purely on the basis of their certifications. However, by covering a wide range of environmental issues and management practices, EMS based on ISO 14001 can help organisations manage their environmental impacts more effectively. An EMS is intended to address all environmental activities and issues within a firm. How businesses go about implementing and managing their EMS differ from one firm to the next. Hence the need for certification: the main objective of certification (or registration) is to ensure that a firm's EMS is operating correctly, effectively and continually. The certification process requires an independent registrar to provide written assurance that a product, process, or service conforms to specified ISO 14001 requirements. Therefore, by helping a firm focus on each stage of its manufacturing process, an ISO certified EMS process will enable the firm to develop better environmental management practices and, ultimately improve its environmental performance. Another issue to bear in mind is that the certification process is complex and expensive. Therefore, the decision to formally adopt the standard is not taken lightly.

This research set out to analyse the reasons behind the growing number of firms in Asia choosing to adopt self-regulation by basing their environmental management systems (EMS) on the ISO 14001 standard. This study had focused on key aspects of EMS in terms of firms' adoption of this voluntary system and whether the implementation of an ISO EMS had resulted in positive contributions to their business operations over the years. The study also attempted to find out if there were some association between ISO EMS implementation and the implementation of other environmental practices, i.e. whether or not ISO 14001 certified firms are more likely to expand their environmental practices by adopting other voluntary green initiatives.

ISO 14001 was launched in 1996 to encourage the industry sector to improve its environmental performance through the adoption of an EMS. Since ISO 14001 is voluntary, firms sought certification because of the advantages available to their businesses by having an ISO certificate. In addition to government support and incentives, industry-driven schemes led by the private sectors in Hong Kong and Malaysia has also played their roles in promoting the standard. An ISO 14001 certificate acts like a license to trade: registered firms are able to compete with those who are not and subsequently improving their commercial performance and status in the global market. This perceived benefit has been particularly evident in export-oriented economies such as Malaysia, Singapore and Thailand. Taking this into account, this thesis had assessed the perceived benefits and positive contributions of ISO EMS provided to firms with respect to competitive advantage. The literature review had revealed that firms adopting ISO EMS had benefited from a wide range of internal and external advantages such as cost savings; good corporate image, market expansion, environmental compliance and improved stakeholder relationships. In reference to the range of advantages already mentioned, findings from the case studies had indicated that firms had experienced cost-saving from reduced energy and material consumption; waste minimisation, improved operational efficiency along with increased environmental awareness among staff as the internal benefits of having an ISO EMS in place for a number of years.

The number of firms with ISO 14001 certificates in Asia is still on the increase. Despite the large number of ISO 14001 certification awarded to firms in Asia (89,894 registered firms in December 2008) in reality, the uptake of EMS is not as widespread, signifying that reaching the predominant SME sector in the region is problematic. Within the NIEs mentioned in this thesis, adoption of the standard is still limited to foreign-owned multinational corporations (MNCs) and large firms, who have the

full backing of the standard from the top-level management, financial capability and manpower to implement the ISO EMS process. For a system that claims to be 'flexible and applicable to organisations of all types and sizes', the outcome is far from encouraging (especially when there are still many non-adopters in the small and medium-sized enterprises (SME) sector). Therefore, the uptake of ISO 14001 across Southeast Asia is considered low, especially when compared to the number of certifications issued in developed economies like Japan and Europe. In this respect, the advancement of corporate environmental management practices in the region will be slow.

Revised in 2004, ISO 14001 enters its fourteenth year in September 2010. However, it remains a relatively new concept for many firms and therefore it is still early to draw conclusions about the effectiveness of the standard within the Asian context. Nevertheless, voluntary measures such as ISO 14001 EMS are important steps towards better environmental management in the corporate world, even though in practice, their powers to prevent global environmental problems are limited.

In reality, there is no single system or standard that will lead to absolute corporate sustainability. Each firm is different: with different challenges; goals, corporate culture, unique set of stakeholders and management practices. As pointed out by Richard Welford, asking industry to discharge zero emissions on the environment would mean having no industry at all. The pragmatic way forward is to anticipate improved environmental performance over time, achieved by a continuous cycle of improvement during business operations, which corresponds with the systematic "PDCA" approach specified in the ISO 14001 EMS.

8.2 Research Limitations and Implications for Further Study

This study contributes to knowledge in several ways. The triple bottom line of a business - economic, social, and environmental issues - affects how firms conduct their activities. Management needs to take care of social and environmental consequences of corporate activities for several reasons including cost (environmental taxes and charges must be incorporated in business strategies); environmental liability, environmental legislation, and growing public pressures at the national and international levels. It adds to the literature on corporate environmental management, an area of study that is relatively new and whose scope was set out in the works of Richard Welford. The development of ideas and concepts in his works span the study of environmental management and business strategy, environment systems and the means by which corporate environmental management will help to achieve sustainable development. The present study took the analysis of corporate environmental management systems further by focusing on specific firms and countries. Along with the works of others referred to the literature review, studies like this thesis hope to contribute to the development of the methodology for the study of environmental business strategies and the real benefits of EMS. Corporate environmental management covers a diverse field including disciplines such as economics; environmental science, technology and more functional studies such as business strategy. Advanced research in this area lacks a unified structure or theoretical base on which to build verifiable conclusions except through mass surveys and longitudinal case studies research which will require a lot of resources.

It must be stressed that EMS based on ISO 14001 is still a recent phenomenon (having only been in existence for over 13 years) and details regarding its process are still evolving. The revision of ISO 14001 began in the year 2000 with the objective of validating the standard's

requirements and to improve its compatibility with ISO 9001 therefore focusing more on environmental performance. The new ISO 14001:2004 published on 15 November 2004 provided no significant changes to the requirements for EMS, but the language and criteria in specific elements were updated for greater clarity. For instance, there is much stronger emphasis on elements relating to continual improvement and implementation to ensure the EMS is fully functional.

Although it is too early to draw conclusions as more research is needed before one could tell how EMS affects environmental performance, it is clear that ISO 14001 is currently the most recognisable badge of achievement on environmental management for firms operating in Asia. Its primary objective is to ensure that firms have the prescribed policies and procedures in place to oversee the implementation of their environmental practices. Whether or not it plays a pivotal role in allowing firms to protect the environment, in the end, ISO 14001 is very much about people and what they want. When devising environmental programmes, it is left to managers of the individual firms to determine the content of the policies and to set specific targets. The function of the system is to ensure that firms succeed in translating their environmental policies into organisational behaviours. In order to be effective and credible, ISO 14001 must facilitate the process for firms to disengage from the past and move into new directions while rewarding them with a range of benefits in the long run. The issue here is that ISO 14001 EMS is still a new experience yet to be fully understood by non-certified firms in the developing countries even though certified firms had shown they had reaped internal and external benefits from implementing ISO EMS for a number of years.

This study has been carried out to assess the impact of ISO 14001 on foreign-owned MNCs and large Asian firms in some NIEs over the years.

Findings in the case studies based on the selected firms in Hong Kong, Singapore, Thailand and Malaysia have concluded that implementing ISO 14001 EMS had indeed brought various internal and external benefits to firms involved. As early adopters of ISO 14001, the firms' willingness to voluntarily address environmental issues have, so far, indicated their ability to response to change and hence their likelihood to adopt more voluntary practices in the future. While this study has contributed towards an understanding of voluntary self-regulation in the form of ISO 14001 EMS in an Asian context, it is based on limited data. Drawing from the analysis of a relatively small sample of case studies, this study limits the precision of the findings; however, this study lays the foundation for the need for longitudinal studies on a bigger sample of firms to examine the long-term impact of ISO 14001 EMS on Asian firms in order to gain a fuller understanding of the role and the future of ISO EMS as a catalyst for emerging voluntary corporate responsibility initiatives such as CSR and SRI in the Asian region. This outlines important questions for future research.

BIBLIOGRAPHY

Alexander, S. (2002). Green hotels: opportunities and resources for success. *Zero Waste Alliance.* [online] Available from: www.zerowaste.org/ [Accessed 6 April 2006].

Allison, B., O'Sullivan, T., Owen, A., Rice, J., Rothwell, A., Saunders, C., (1996). *Research Skills for Students.* London: Kogan Page Limited, p. 15.

Anbumozhi, V. (2005). What steers business towards sustainability? Evidence, lessons and policy implications fro Asia. Sustainable Asia 2005 and beyond – in the pursuit of innovative policies. Institute for Global Environmental Strategies (IGES) White Paper. Chapter 7, 110-124. [online] Available from: www.iges.or.jp/en/pub/pdf/whitepaper/text.pdf [Accessed 31 March 2006].

Anbumozhi, V., Kanda, Y., (2005). Greening the production and supply chains in Asia: Is there a role for voluntary initiatives? Institute for Global Environmental Strategies (IGES), Kansai Research Centre, Japan, 1-19. [online] Available from: www.iges.or.jp/ [Accessed 31 March 2006].

Annandale, D., Morrison-Saunders, A., Bouma, G., (2004). The impact of voluntary environmental protection instruments on company environmental performance. *Business Strategy and the Environment.* **13**: 1-12. [online] Available from: www3.interscience.wiley.com [Accessed 5 January 2007].

Arimura, T.H., Hibiki, A. and Katayama, H. (2008). Is a voluntary approach an effective environmental policy instrument? A case for environmental management systems. *Journal of Environmental Economics and Management.* **55** (3): 281-295. [online] Available from: www.sciencedirect.com [Accessed 15 August 2008].

Asian Development Bank. (2001). Asian Environment Outlook 2001. Manila, Philippines. [online] Available from: www.adb.org/documents/reports/annual_report/2001/default.asp [24 March 2007].

Aviation: The Real World Wide Web (2009). Oxford Economics report. [online] Available from: www.oxfordeconomics.com/free/pdfs/oeaviationweb09.pdf 1-128. [Accessed 18 July 2009].

Ayuso, S., (2006). Adoption of voluntary environmental tools for sustainable tourism: analysing the experience of Spanish hotels. *Corporate Social Responsibility and Environmental Management*. **13** (4): 207-220. [online] Available from: www.interscience.wiley.com [Accessed 20 September, 2006]

Bader, E. (2005). Sustainable hotel business practices. *Journal of Retail & Leisure Property*. **5** (1): 70-77. [online] Available from: http://web.ebscohost.com [Accessed: 2 August 2006]

Balzarova, M. A. and Castka, P. (2008). Underlying mechanisms in the maintenance of ISO 14001 environmental management system. *Journal of Cleaner Production.* **16** (18): 1949-1957. [online] Available from: www.sciencedirect.com [Accessed 10 July 2008].

Bampton, R. and Cowton, C.J. (2002).The E-interview. Forum: Qualitative Social Research. **3** (2), Art. 9. [online] Available from: www.qualitative-research.net
[Accessed 16 March 2009].

Bansal, P. and Bogner, W.C. (2002). Deciding on ISO 14001: Economics, Institutions, and Context. *Long Range Planning*. **35** (3): 269-90.

Bansal, P. and Hunter, T. (2003). Strategic explanations for the early adoption of ISO 14001. *Journal of Business Ethics*. **46** (3): 289-299. [online] Available from: www.springerlink.com [Accessed 5 June 2008].

Barrass, R. and Madhavan, S., (1996). *European Economic Integration and Sustainable Development*. London: McGraw-Hill.

Basu, K. and Palazzo, G. (2008). Corporate social responsibility: A process model of sensemaking. *Academy of Management Review*. **33** (1): 122-136. [online] Available from: http://web.ebscohost.com [Accessed 27 may 2009].

Baughn, C. C.; Bodie, N. L. and McIntosh, J.C. (2007). Corporate social and environmental responsibility in Asian countries and other geographical regions. *Corporate Social Responsibility and Environmental Management*. **14**: 189-205.

Block, M. R. (1997). *Implementing ISO 14001*. Milwaukee (USA): ASQC Quality Press.

Boele, R., Fabig, H. and Wheeler, D. (2001). Shell, Nigeria and the Ogoni. A study in unsustainable development: II. Corporate social responsibility and 'stakeholder management' versus a rights-based approach to sustainable development. *Sustainable Development*. **9** (3): 121-135. John Wiley & Sons, Ltd and ERP Environment.

Boiral, O. (2007). Corporate greening through ISO 14001: a rational myth? *Organization Science*. **18** (1): 127-46. [online] Available from: http://web.ebscohost.com [Accessed 6 March 2009].

Brewerston, P. and Millward, L. (2001). *Organizational Research Methods: A guide for students and researchers*. London, Thousand Oaks, New Delhi: Sage Publications.

Brouwer, M.A.C. and van Koppen, C.S.A. (Kris) (2006). The soul of the machine: continual improvement in ISO 14001. *Journal of Cleaner Production.* **16** (4): 450-457. [online] Available from: www.sciencedirect.com [Accessed 9 August 2007].

Butcher, D. R. (2006). Unwrapping the Packaging Industry. *ThomasNet News* December 12. [online] Available from: http://news.thomasnet.com/ [Accessed 17 July 2009].

Casadesus, M., Marimon, F. and Heras, I. (2008). ISO 14001 diffusion after the success of the ISO 9001 model. *Journal of Cleaner Production*. **16** (16): 1741-1754. [online] Available from: www.sciencedirect.com [Accessed 20 October 2008].

le Clue, S. (2005). ISO 14001:2004 What do investors need to know? *ASrIA Brief 003*, ASrIA Publications. 1-13. [online] Available from: www.asria.org/publications/lib/050505_iso14001.pdf [Accessed 22 September 2005].

Chan, E. S.W. (2008). Barriers to EMS in the hotel industry. *International Journal of Hospitality Management*. **27** (2): 187-196. [online] Available from: www.sciencedirect.com [Accessed 6 May 2008].

Chin, K. and Pun, K. (1999). Factors influencing ISO 14000 implementation in printed circuit board manufacturing industry in Hong Kong. *Journal of Environmental Planning and Management*. **42**(1): 123-134.

Chor, S. (1998) DOE's Environment Preservation Strategies. *New Strait Times*, 12 August, p.4.

Chung, L.H. and Parker, L.D. (2008). Integrating hotel environmental strategies with management control: a structuration approach. *Business Strategy and the Environment*. **17** (4): 272-286. [Published online 16 May 2006] Available from: http://www3.interscience.wiley.com/ [Accessed 31 October 2007].

Coglianese, C. and Nash, J. (ed.) (2001). Environmental management systems and the new policy agenda. *Regulating from the inside*. Washington: Resources for the Future.

Daily, B.F. and Huang, S. (2001). Achieving sustainability through attention to human resource factors in environmental management. *International Journal of Operations & Production Management*. **21** (12): 1539-52.

Darnall, N. (2006). Why firms mandate ISO 14001 certification. *Business & Society*. **45** (3): 354-381. [online] Available from: http://bas.sagepub.com [Accessed 11 September 2006].

Darnall, N. Henriques, I. and Sadorsky, P. (2008). Do environmental management systems improve business performance in an international setting? *Journal of International Management*. 1-13, in Press, Corrected Proof. [online] Available from: www.sciencedirect.com [Accessed 24 October 2008].

Dasgupta, S., Laplante, B., Mamingi, N., (October 1997). Pollution and Capital Markets in Developing Countries. Development Research Group. The World Bank. [online] Available from: www.worldbank.org/nipr/work_paper/ [Accessed 17 September, 2007]

Davis, G. and Song, J.H. (2006). Biodegradable packaging based on raw materials from crops and their impact on waste management. *Industrial Crops and Products*. **23** (2): 147-161. [online] Available from: www.sciencedirect.com [Accessed 17 July 2009].

Delmas, M., (2002). The diffusion of environmental management standards in Europe and in the United States: An institutional perspective. *Policy Sciences, 2002*. Netherlands: Kluwer Academic Publishers. **35**: 91-119.

Delmas, M., (2002). Environmental Management Standards and Globalisation. University of California International and Area Studies Digital Collection (UCIAS). **1** (6).

Delmas, M., (2000). Barriers and Incentives to the adoption of ISO 14001 by firms in the United States. *Duke Environmental Law & Policy Forum*, Fall 2000.
11 (1): 1-31.[online]
www.law.duke.edu/shell/cite.pl?11+Duke+Envtl.+L.+&+Pol'y+F.+1

De Marco, L. (2004). A sustainable travel and tourism industry through partnership: the role of the International Tourism Partnership. *Tourism/SIDS*. 107-09. [online] Available from: www.sustdev.org [Accessed 9 December 2008].

Deng, S. and Burnett, J. (2002). Water use in hotels in Hong Kong. *International Journal of Hospitality Management*. **21** (1): 57-66. [online] Available from: www.sciencedirect.com [Accessed 7 July 2009].

Dunphy, D.C. (2007). *Organizational change for corporate sustainability: a guide for leaders and change agents of the future*. London: Routledge.

Ernst & Young. (2008). Global Hospitality Insights – Hospitality going green. [online] Available from:
www.hotelnewsresource.com.pdf8/e_y/20408.pdf
[Accessed 1 May 2009].

Esty, D.C. and Chertow, M.R. (1997). Thinking ecologically: An introduction. In: M.R. Chertow and D.C. Esty (eds.), *Thinking ecologically: The next generation of environmental policy*. New Haven: Yale University Press.

Evangelinos, K.I., Kassinis, G. I., Piperopoulou, H., (2001). Environmental Management Systems Standards: Implications for companies, consumers and governments. *Scientific Reference COSMOS*, September 2001, 189-197. [online] www.ath.aegean.gr/srcosmos/showpub.aspx?aa=4263 [Accessed 10 July, 2008]

Faulkner, D., Carlisle, Y.M. and Viney, H.P. (2005). Changing corporate attitudes towards environmental policy. *Management of Environmental Quality: An International Journal*. **16** (5): 476-489. [online] Available from: www.emeraldinsight.com [Accessed 22 October 2008].

Felipe, J. and Estrada, G. (2007) Benchmarking developing Asia's manufacturing sector. ERD Working Paper No. 101. 1-48. Asian Development Bank. [online] Available from: www.adb.org/Documents/ERD/Working_Papers/WP101.pdf [Accessed 20 January 2009].

Fernandez, E., Junquera, B., and Ordiz, M., (2006). Managers' Profile in Environmental Strategy: A Review of the Literature. *Corporate Social Responsibility and Environmental Management*. **13** (5): 261-274. [online] Available from: www.interscience.wiley.com [Accessed 13 March 2007].

Field, B. C. (1997). *Environmental Economics: An Introduction*. 2nd ed. The McGraw-Hill Companies, Inc.

Forbes, S. P. E. (2001). Environmental Compliance and Management Benefits. Forbes Environmental Engineering, Transformation Strategies. [online] Available from: www.trst.com/IsoArticleSF.htm [Accessed 22 September 2006].

Franzen, A. (2003). Environmental Attitudes in International Comparison: An analysis of the ISSP surveys 1993 and 2000. *Social Science Quarterly*. **84**(2): 297-308. [online] Available from: http://web.ebscohost.com [Accessed 22 October 2008].

Fryxell, G.E., Lo, C.W. and Chung, S. (2004). Influence of motivations for seeking ISO 14001 certification on perceptions of EMS effectiveness in China. *Environmental Management*. **33** (2): 239-251. [online] Available from: www.springerlink.com/content/b0jm75e7re5gk797/fulltext.pdf [Accessed 7 August 2008]

Fryxell, G. E. and Szeto, A. (2002). The Influence of motivations for seeking ISO 14001 certification: an empirical study of ISO 14001 certified facilities in Hong Kong. *Journal of Environmental Management*. **65** (3): 223-238. [online] www.sciencedirect.com [Accessed 11 July, 2008]

Gallagher, D.R., Andrews, R.N.L., Chandrachai, A. and Rohitratana, K. (2007). Environmental management systems in the US and Thailand: A case comparison. Sroufe, R. and Sarkis, J. (eds.) *Strategic Sustainability: The state of the art in corporate environmental management systems*. Sheffield: Greenleaf Publishing, pp. 205-221.

Garrod, B, and Chadwick, P. (1996). Environmental management and business strategy towards a new strategic paradigm. *Futures*.

Glenn, G. M. and Orts, W. J. (2001). Properties of starch-based foam formed by compression/explosion processing. *Industrial Crops and Products*. **13** (2): 135-43.
[online] Available from: www.sciencedirect.com [Accessed 14 August 2009].

Ghisellini, A. and Thurston, D.L. (2005). Decision traps in ISO 14001 implementation process: case study results from Illinois certified companies. *Journal of Cleaner Production*. **13** (8): 763-777. [online] Available from: www.sciencedirect.com [Accessed 23 January 2009].

Global Green Standards: ISO 14000 and Sustainable Development. (1996). Canada: International Institute for Sustainable Development. [online] Available from: www.iisd.org/pdf/globlgrn.pdf [Accessed 9 August 2008].

Gonzalez, P., Sarkis, J. and Adenso-Diaz, B. (2008). Environmental management system certification and its influence on corporate practices: Evidence from the automotive industry. *International Journal of Operations & Production Management*. **28** (11): 1021-1041. [online] Available from: www.emeraldinsight.com/10.1108/01443570810910179 [Accessed 19 August 2009].

González-Benito, J. and González-Benito, O. (2005). An analysis of the relationship between environmental motivations and ISO 14001 certification. *British Journal of Management*. **16** (2): 133-148. [online] Available from: http://web.ebscohost.com [Accessed 26 November 2008].

Gouldson, A. and Murphy, J. (1998). *Regulatory realities: the implementation and impact of industrial environmental regulation*. London: Earthscan.

Gummesson, E. (1988). *Qualitative methods in management research: case study research, participant observation, action research/action science, and other qualitative methods used in academic research and management consultancy.* Bromley: Chartwell-Bratt.

Gunatilake, H. and De Guzman, F.D. (2008). *Market-Based Approaches for Managing the Asian Environment: A Review*. ADB Economics Working Paper Series No. 124, Asian Development Bank, pp. 1-36. [online] Available from: www.adb.org/Documents/Working-Papers/2008/Economics-WP124.pdf [Accessed 8 October 2008].

Halpern, S. L., (1992). United Nations Conference on Environment and Development: Process and Documentation, Introduction. *The Centre for International Earth Science Information Network*. [online] Available from: www.ciesin.columbia.edu/docs/008-585/unced-intro.html [Accessed 4 August 2000].

Hartley, J. (1994). Case studies in organisational research. *Qualitative Methods in Organisational Research*. London: Sage Publication.

Heracleous, L., Wirtz, J. and Johnston, R. (2004). Cost effective service excellence: lessons from Singapore Airlines. *Business Strategy Review*. **15** (1): 33-8. [online] Available from: http://www3.interscience.wiley.com/ [Accessed 7 August

Hertin, A., Berkhaout, F., Wagner, M. and Tyteca, D. (2008) Are EMS environmentally effective? The link between environmental management systems and environmental performance in European companies. *Journal of Environmental Planning and Management*. **51** (2): 259 – 283. [online] Available from: www.swetswise.com [Accessed 6 November 2008].

Hotel Branding: Using online research to drive innovation (2006). *Brandimensions Inc.*, January, 1-8. [online] Available from: www.hotelmarketing.com/images/brandimensions_0106.pdf [Accessed 22 September 2006]

Hillary, R. (ed.) (2000). *ISO 14001: Case studies and practical experiences.* Sheffield: Greenleaf Publishing.

Occupancy declines hit Thai markets, rates are steadier. *HNN Newswire,* 27 April 2009. [online] Available from: www.hotelnewsnow.com [Accessed 2 June 2009].

International Organisation for Standardisation (ISO), 2007. *The ISO Survey – 2007.* [online] Available from: www.iso.org/survey2007.pdf [Accessed 26 November 2008].

International Organisation for Standardisation (ISO), 2008. The ISO Survey – 2008. [online] Available from: www.iso.org/survey2008.pdf [Accessed 3 February 2010].

The Intergovernmental Panel of Climate Change (IPCC) (1999). IPCC Special Report. Aviation and the Global Atmosphere: Summary for Policymakers. [online] Available from: www.ipcc.ch/ipccreports/sres/aviation/index.php?idp=3 [Accessed 7 August 2009]

Jabbour, C.J.C. and Santos, F.C.A. (2008). Relationships between human resource dimensions and environmental management in companies: proposal of a model. *Journal of Cleaner Production.* **16** (1): 51-58.

www.jal.com/en/environment/report/2004/ Japan Airlines (JAL) Group Environmental Report 2004

http://jjsea.com/rhapsody_index.asp Jebsen & Jessen (SEA)

Jiang, R.J. and Bansal, P. (2003). Seeing the need for ISO 14001. *Journal of Management Studies*. **40** (4): 1047-1067. [online] Available from: www3.interscience.wiley.com [Accessed 15 August 2008].

Johnstone, N. and Labonne, J. (2008). Why do manufacturing facilities introduce environmental management systems? Improving and/or signalling performance. *Ecological Economics*. Article in Press, Corrected Proof. [online] Available from: www.sciencedirect.com [Accessed 29 July 2008].

Kasim, A. and Scarlat, C. (2007). Business Environmental Responsibility in the Hospitality Industry. *Faculty of Management Koper Management journal.* University of Primorska. **2** (1): 5-23. [online] Available from: www.fm-kp.si/eng [Accessed 5 June 2008].

Kirk, D. (1995). Environmental management in hotels. International Journal of Contemporary Hospitality Management. **7** (6): 3-8. [online] Available from: www.emeraldinsight.com [Accessed 28 September 2006].

Krut, R. and Gleckman, H. (1998). *ISO 14001: A missed opportunity for global sustainable development*. London: Earthscan Publications.

Kvale, S. (1983). The qualitative research interview: A phenomenological and a hermeneutical mode of understanding. *Journal of Phenomenological Psychology*. **14**: 171-196.

Lee, R. M. (2000). *Unobtrusive methods in social research*. Buckingham: Open University Press.

Lewis, H., Fitzpatrick, L., Verghese, K., Sonneveld, K. and Jordon, R. (2007). Sustainable Packaging Redefined. Sustainable Packaging Alliance. 1-26. [online] Available from: www.sustainablepack.org/research/subpage.aspx?id=7&PageID=10 [Accessed 18 September 2009]

Lesourd, J. and Schilizzi, S. (2001). *The Environment in Corporate Management: New directions and economic insights*. Cheltenham, UK, Northampton, USA: Edward Elgar.

Ling, D. and Chan, B. (2009). 2009 Asia Hotel Valuation Index (HVI). *HVS Hospitality Services - Asia*. 1-8. [online] Available from: www.hotelnewsresource.com/pdf8/AsiaHotelValuationIndex2009.pdf [Accessed 28 April 2009].

Link, S. and Naveh, E. (2006). Standardization and Discretion: Does the environmental standard ISO 14001 lead to performance benefits? *IEEE Transactions on Engineering Management*. **53** (4): 508-519. [online] Available from: http://ieeexplore.ieee.org [Accessed 11 November 2008].

Lloyd-Jones, G. (2003). Design and control issues in qualitative case study research. *International Journal of Qualitative Methods*. **2** (2). Article 4. [online] Available from: http://www.ualberta.ca/~iiqm/backissues/2_2/html/lloydjones.html [Accessed 31 October 2008].

Madslien, J. (2007) Planemakers confront green issues. *BBC News online*. Available from: http://news.bbc.co.uk/1/hi/business/6223834.stm [Accessed 15 October 2007].

Mak, B. and Chan, W.W., (2006). *Environmental Reporting of Airlines in the Asia Pacific Region*. Journal of Sustainable Tourism, 2006. **14** (6): 618-628. [online] <www.channelviewpublications.net/jost/014/0618/jost0140618.pdf> [Accessed 8 February, 2007]

Maughan, J., Raper, D., Thomas, C., Gillingwater, D., (2001). Scan-UK – A Network Approach to Environmental Best Practice in the Aviation Industry. *Eco-Management and Auditing*. **8**: 240-247.

Meima, R. (1994). Making sense of environmental management concepts and practices: a critical exploration of emerging paradigms. *Proceedings of the 1994 Business and the Environment Conference*. The University of Nottingham.

Mohd Noor, K. B. (2008). Case study: a strategic research methodology. American Journal of Applied Science. **5** (11): 1602-4.

Melnyk, S.A., Sroufe, R.P., Calantone, R., (2002). Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management*. **336**: 1-23. [online] Available from: www.sciencedirect.com [Accessed 7 January, 2008]

Meyer, C.B. (2001). A case in case study methodology. *Field Methods*. **13** (4): 329-352. [online] Available from: http://fmx.sagepub.com/cgi/content/abstract/13/4/329 [Accessed 30 October 2008]

Nishitani, K. (2008). An empirical study of the initial adoption of ISO 14001 in Japanese manufacturing firms. *Ecological Economics*. Article in Press, 1-11, Corrected Proof 2008. [online] Available from: www.sciencedirect.com [Accessed 15 August 2008].

Oosterveer, P., Kamolsiripichaiporn, S. and Rasiah, R., (2006). The "Greening" of Industry and Development in Southeast Asia: Perspectives on Industrial Transformation and Environmental Regulation; Introduction. *Environment, Development and Sustainability*. **8** (2): 217-227. [online] Available from: www.springerlink.com [Accessed 11 September 2006].

Packaging World Magazine, October 2002. [online] Available from: www.packworld.com/issue1002 [Accessed: 14 August 2009].

Patton, M.Q. (2002). *Qualitative Research & Evaluation Methods*. 3rd ed. Sage: London.

Perotto, E., Canziani, R., Marchesi, R. and Butelli, P. (2008). Environmental performance, indicators and measurement uncertainty in EMS context: a case study. *Journal of Cleaner Production*. **16** (4): 517-530. [online] Available from: www.sciencedirect.com [Accessed 14 August 2008].

Piasecki, B.W., Fletcher, K.A., Mendelson, F.J., (1999). *Environmental Management and Business Strategy: Leadership skills for the 21st century*. United States of America: John Wiley & Sons.

Pizam, A. (ed.) (2009). What is the hospitality industry and how does it differ from the tourism and travel industries? *International Journal of Hospitality Management*. **28** (2): 183-184. [online] Available from: www.sciencedirect.com [Accessed 26 May 2009].

Porter, M.E., van der Linde, C. (1995). Green and competitive: ending the stalemate. *Harvard Business Review*. **73** (5): 120-34. [online] Available from: http://web.ebscohost.com/ [Accessed 19 August 2009].

Post, J.E. and Altman, B.W. (1994). Managing the environmental change process: barriers and opportunities. *Journal of Organisational Change Management*. **7** (4): 64–81.

Potoski, M. and Prakash, A. (2005). Covenants with Weak Swords: ISO 14001 and facilities' environmental performance. *Journal of Policy Analysis and Management*. **24** (4): 745-769. [online] Available from: www.interscience.wiley.com [Accessed 31 July 2008].

Prakash, A. And Potoski, M. (2006). Racing to the Bottom? Trade, Environmental Governance, and ISO 14001. *American Journal of Political Science*. **50** (2): 350–364. [online] Available from: http://web.ebscohost.com [Accessed 23 February 2009].

Pulles J.W. *et al.*, (2004). AERO modelling system. Enviro.aero: facts and figures. [online] Available from: www.enviro.aero/aviationenvironmentfactsfigures.aspx [Accessed 19 August 2009].

Pullin, J. (1998). Green stamp giveaway. *Professional Engineering*. **16** (16): 28.

Pun, K. F. and Hui, I. K., (2001). An analytical hierarchy process assessment of the ISO 14001 environmental management system. *Integrated Manufacturing Systems, 12/5. Ingenta Journals*. 333-345. [online] Available from: http://gottardo.ingentaselect.com [Accessed 9 January 2008]

Quazi, H., Khoo, Y., Tan, C., Wong, P., (2001). Motivation for ISO 14000 certification: development of a predictive model. *Omega: The International Journal of Management Science.* **29**: 525-542. [online] www.elsevier.com [Accessed 8 January 2009]

Quazi, H., Yeo, S., Koh, P., Yip, C. (1999). Measuring the impact of the implementation of environmental management system: the behaviour of cost-benefit curves. *Proceedings of the third Asian academy of management conference.* 16–17 July, 491–496. Kuala Terengganu, Malaysia.

Rao, P. (2005). The Greening of Suppliers – in the South East Asian Context. *Journal of Cleaner Production.* **13** (9): 935-945. [online] Available from: www.sciencedirect.com [Accessed 10 June 2005].

Rao, P. (2004). Greening production: a South-East Asian experience. *International Journal of Operations & Production Management.* **24** (3): 289-320. [online] Available from: www.emeraldinsight.com/0144-3577.htm [Accessed 7 November 2006].

Rehfeld, K-M., Rennings, K., Ziegler, A. (2007). Integrated product policy and environmental product innovations: an empirical analysis. *Ecological Economics.* **61** (1): 91-100.

Rennings, K., Ziegler, A., Ankele, K., Hoffmann, E. (2006). The influence of different characteristics of the EU Environmental Management and Auditing Scheme on technical environmental innovations and economic performance. *Ecological Economics.* **57** (1): 45-59.

Rickmann, A., (1995). The Role of Industry in Environmental Protection. *Eco-Management and Auditing.* **2** (1): 47-51.

Rondinelli, D. and Vastag, G., (2000). Panacea, Common Sense, or Just a Label? The value of ISO 14001 environmental management systems. European Management Journal, October 2000. **18** (5): 499-510. [online] Available from: www.sciencedirect.com [Accessed 7 January 2005]

Sarkis, J. and Sroufe, R. (2004). Strategic Sustainability: The state of the art in corporate environmental management systems. *Greener Management International*. **46**: 5-9 [online] Available from: www.greenleaf-publishing.com [Accessed 14 August 2006].

Sewill, B., (2005). *Fly Now, Grieve Later: How to reduce the impact of air travel on climate change*. Aviation Environment Federation, June 2005. [online]

Sim, H. (2009). Thailand Economy: Thailand GDP and Thai Tourism Plummeting Thanks to Political Violence. *EconomyWatch.com,* 15 April. [online] Available from: www.economywatch.com [Accessed 28 May 2009].

Sjöström, E. and Welford, R. (2009). Facilitators and Impediments for Socially
Responsible Investment: A Study of Hong Kong. *Corporate Social Responsibility and Environmental Management*. **16**: 278–288.

Smith, T.B., (2000). Evolving Strategies for Environmental Management Asia: from Command-and-Control to Voluntary Compliance. *Asian Journal of Publication Administration*. **22** (1): 3-32. [online] http://sunzi1.lib.hku.hk/hkjo/view/50/5000034.pdf [Accessed 11 September, 2008]

Sobie, B. (2007). SIA talks up A380 and environment. [online] Available from: http://www.flightglobal.com/blogs/airline-business/2007/02/sia-talks-up-a380-and-environm.html [Accessed 14 August 2009]

http://plantation.simedarby.com/default.aspx Sime Darby Plantantion Sdn Bhd (Malaysia)

www.shangri-la.com/en/corporate/aboutus/socialresponsibility Shangri-la Hotels and Resorts: Corporate Social Responsibility

www.ir.shangri-la.com/en/annualreports/ Shangri-La Asia Limited: Annual reports 2004-2008

www.singaporeair.comsaa/en_UK/content/company_info/investor/annual_report.jsp Singapore Airlines: Annual reports 2004-2008

www.singaporeair.com/ The SIA Environmental Reports: 2004-2009

Sonnenfeld, D.A. and Mol, P.J. (2006). Environmental Reform in Asia: Comparisons, challenges, next steps. *The Journal of Environment & Development.* **15** (2): 112-137. [online]
Available from: http://jed.sagepub.com/cgi/content/abstract/15/2/112 [Accessed 30 October 2008].

Sonneveld, K., James, K., Fitzpatrick, L. and Lewis, H. (2005). Sustainable packaging: how do we define and measure it? Sustainable Packaging Alliance (SPA) paper. [online] Available from: www.sustainablepack.org [Accessed 18 July 2009]

Starkey, R. (1996). The Standardisation of Environmental Management Systems. *Corporate Environmental Management Systems and Strategies*. London: Earthscan Publications Ltd. pp. 59-91.

Steger, U., (2000). Environmental Management Systems: Empirical evidence and further perspectives. *European Management Journal*. **18** (1): 23-27. [online] <www.sciencedirect.com/> [Accessed 7 January, 2003]

Stipanuk, D.M. (1996). The US lodging industry and the environment: an historical view. *Cornell Hotel and Restaurant Administration Quarterly*. **37** (5): 39-45.

Stipanuk, D.M. and Ninemeier, J.D. (1996). The future of the US lodging industry and the environment. *Cornell Hotel and Restaurant Administration Quarterly.* **37** (6): 74-83.

Stuart, R. (2000). Environmental management systems in the 21st century.
Chemical Health and Safety. **7** (6): 23-25.

Sumiani, Y., Haslinda, Y. and Lehman, G. (2007). Environmental Reporting in a Developing Country: a case study on status and implementation in Malaysia. *Journal of Cleaner Production*. **15** (10): 895-901. [online] Available from: www.sciencedirect.com [Accessed 3 June 2008].

Sustainable Tourism Stewardship Council (2002).
http://www.rainforest-alliance.org/tourism/documents/stsc-se-asia-results.pdf

Tan, A., Ofori, G., Briffett, C. (1999) ISO 14000: Its relevance to the construction industry of Singapore and its potential as the next industry milestone. *Construction Management and Economics*.**17**: 449.

Tanner, D., (1998). Updates and trends on ISO 14000 Implementation in Asia. *Corporate Environmental Strategy*. **5** (3): 71-76.

Tellis, W. (1997). Application of a Case Study Methodology. *The Qualitative Report*. **3** (3). [online] Available from: www.nova.edu/ssss/QR/QR3-2/tellis1.html [Accessed 5 June 2008].

Tibor, T. and Feldman, I., (1996). *ISO 14000: A Guide to the New Environmental Management Standards*. Chicago: Irwin Professional Publishing.

Tilley, F., (2000). *Small firms' environmental ethics: How deep do they go?* Small and Medium-Sized Enterprises and the Environment: Business Imperatives. UK: Greenleaf Publishing, pp. 35-48.

Toffel, M. W. (2000). Anticipating Greener Supply Chain Demands: One Singapore company's journey to ISO 14001. *ISO 14001: Case studies and practical experiences*. Hillary, R. (ed.) Sheffield: Greenleaf Publishing, pp. 182-99.

Tsai, T.; Chan, L., Chou, K., Schultz, M., Heike, F., Yeung, K., (2003). Island Shangri-La's Environmental Management System: A long way to go! *Asian Case Research Journal*. **7** (2): 173-194.

Uchida, T. and Ferraro, P.J. (2007). Voluntary development of environmental management systems: motivations and regulatory implications. *Journal of Regulatory Economics*. **32** (1): 37-65. [online] Available from: www.springerlink.com [Accessed 5 June 2008].

VanWynsberghe, R. and Khan, S. (2007). Redefining case study. *International Journal of Qualitative Methods*. **6** (2), Article 6. [online] Available from: http://www.ualberta.ca/~iiqm/backissues/6_2/vanwynsberghe.htm [Accessed 31 October 2008].

Vastag, G. (2004). Revisiting ISO 14000 diffusion: A new "look" at the drivers of certification. *Production and Operations Management*. **13** (3): 260-267. [online] Available from: http://web.ebscohost.com/ [Accessed 3 September 2008].

Visser, W. (2009). *Landmarks for Sustainability: Events and initiatives that have changed our world*. Sheffield: Greenleaf Publishing Ltd.

Vivian, B., (1997). Environmental Management Systems: Asset or Liability? *Eco-Management and Auditing*. **4** (1): 32-34.

Walker, S. and Cook, M. (2009). The contested concept of sustainable aviation. *Sustainable Development*. **17** (6): 378-390. [online] Available from: http://www3.interscience.wiley.com/ [Accessed 18 July 2009]

Watson, M. (2006) Protecting the environment: the role of environmental management systems. *The Journal of the Royal Society for the Promotion of Health*. **126** (6): 280-284. [online] Available from: http://rsh.sagepub.com [Accessed 6 November 2008].

Watson, M. and Emery, A. (2004). Law, economics and the environment: A comparative study of environmental management systems. *Managerial Auditing Journal*. **19** (6): 760-773. [online]
Available from: www.emeraldinsight.com/10.1108/02686900410543877 [Accessed 19 August 2009].

Welford, R. (2004). Business and Environmental Protection: A View from Asia. Human Ecology Review. **11** (3): 285-287.

Welford, R. (2000). *Corporate Environmental Management: Towards Sustainable Development*. London: Earthscan Publications Ltd.

Welford, R. (ed.) (1998). *Corporate Environmental Management 1: Systems and Strategies*. 2nd ed. London: Earthscan Publications Ltd.

Welford, R. (ed.) (1996). *Corporate Environmental Management: Systems and Strategies*. London: Earthscan Publications Ltd.

Welford, R. and Gouldson, A. (1993). *Environmental Management and Business Strategy*. London: Pitman Publishing.

Whitla, P., Walters, P. G. P. and Davies, H. (2007). Global strategies in the international hotel industry. *Hospitality Management*. **26** (4): 777-792. [online] Available from: www.sciencedirect.com [Accessed 26 April 2008].

Wu, S.Y., Chu, P.Y. and Liu, T.Y. (2007). Determinants of firms' ISO 14001 certification: an empirical study of Taiwan. *Pacific Economic Review*. **12** (4): 467-487.

Yap, N. T., (2000). Performance-based ISO 14001 Case Studies from Taiwan. *ISO 14001: Case studies and practical experiences*. Hillary, R. (ed.) Sheffield: Greenleaf Publishing, pp.138-147.

Yin, R. K. (1994). *Case Study Research: Design and Methods*. 2nd ed. London, Thousand Oaks, New Delhi: Sage Publications.

Yin, R. (1993). *Applications of case study research*. Newbury Park, California: Sage Publishing.

Yin, R.K. (1984). *Case Study Research: Design and Methods*. Newbury Park, California: Sage Publishing.

ZUJI Online Travel Report Q2 2006. (2006). Online hotel and flight booking trends. [online] Available from:
www.hospitalitynet.org/file/152002749.pdf
[Accessed 24 November 2006].

Zutshi, A. and Sohal, A. (2004) Environmental management system adoption by Australasian organisations: part 1: reasons, benefits and impediments. Technovation. **24** (4): 335-357. [online] Available from:
www.sciencedirect.com
 [Accessed 24 February 2009].

Online Data Sources

http://sc.info.gov.hk/gb/www.epd.gov.hk/epd/english/how_help/tools_ems/iso14001.html
Hong Kong: Environmental Protection Department

www.standardsmalaysia.gov.my/v2/index.php?option=com_content&task=view&id=63&Itemid=88
Malaysia: Department of Standards Malaysia

http://app.nea.gov.sg/cms/htdocs/category_sub.asp?cid=146
Singapore: National Environment Agency

www.tisi.go.th/syscer/14000.html
Thailand: Thai Industrial Standards Institute (TISI)

www.adb.org/ Asian Development Bank (ADB)

www.adbi.org/ Asian Development Bank Institute (ADBI)

www.adb.org/environment/aeo/ Asian Environment Outlook 2005

http://law.nus.edu.sg/apcel/ Asia-Pacific Centre for Environmental Law (APCEL)

www.asiatraveltips.com ASIA Travel Tips.com

www.asria.org Association for Sustainable & Responsible Investment in Asia (ASrIA)

www.batmalaysia.com/ British American Tobacco (Malaysia)

www.bsigroup.com / The British Standard Institute (BSI)

www.conservation.org/sites/celb/Pages/main.aspx Center for Environmental Leadership in Business (formerly www.celb.org)

www.enviro.aero established by the commercial aviation industry body, the Air Transport Action Group (ATAG) (Geneva)

www.ecology.or.jp/isoworld/english/analy14k.htm ISO World (Japan)

www.edb.gov.sg The Economic Development Board (Singapore)

www.irca.org/downloads/IRCA231.pdf EMS auditor transition requirements (IRCA/231), The International Register of Certificated Auditors (IRCA)

www.unep.org/geo/yearbook/yb2007/PDF/5_Overview72dpi.pdf GEO Yearbook 2007

www.greenbiz.com/ GreenBiz.com

www.hoteliers.com Online hotel booking website (Amsterdam)

www.hotelnewsresource.com Hotel News Resource

www.hospitalitynet.org Hospitality Net

www.iges.org/home.html Institute for Global Environmental Strategies (IGES), Japan

www.ih-ra.com International Hotel and Restaurant Association

http://www.irca.org/home.html International Register of Certified Auditors (IRCA)

www.iso.org/iso/home.htm International Organisation for Standardisation

www.iso.org/ims ISO Management Systems Special Report (May-June 2007)

www.iso.ch The ISO Survey of ISO 9000 and ISO 14001 Certificates: Ninth Cycle, 1999

www.iso.ch/iso/en/iso9000-14000/pdf/Survey10thcycle.pdf
The ISO Survey of ISO 9000 and ISO 14001 Certificates: Tenth Cycle, 2000

www.iso.ch/iso/en/iso9000-14000/pdf/Survey12thcycle.pdf
 The ISO Survey of ISO 9000 and ISO 14001 Certificates: Twelfth Cycle, 2002

www.iso.org/iso/survey2006.pdf The ISO Survey for 2006 - Principal findings

www.lowcarbonsg.com/ Low Carbon Singapore

www.packaging.org.sg/packaging_industries.asp
Packaging Council of Singapore

www.oef.com Oxford Economics

www.praxiom.org Praxiom Research Group Limited

www.rainforest-alliance.org/tourism.cfm?id=main Rainforest Alliance: sustainable tourism, New York

www.sciencedirect.com/ ScienceDirect, Digital Library

www.sgc.org.sg/ Singaporean-German Chamber of Industry (SGC), Singapore

www.ie.sgs.com/iso_14001_update_information.pdf
ISO 14001 update information, SGS (Ireland)

www.spring.gov.sg/portal/main.html SPRING Singapore (Standards, Productivity and Innovation Board), Singapore

www.sustainablepack.org/ The Sustainable Packaging Alliance (SPA)

www.unep.org/ United Nations Environment Programme

www.unrisd.org The United Nations Research Institute for Social Development

www.interscience.wiley.com Wiley InterScience

www.worldbank.org The World Bank

www.worldpackaging.org World Packaging Organisation (WPO)

www.zuji.com.sg ZUJI Singapore, Corporate and Social Responsibility page

APPENDICES

<u>APPENDIX A</u>

Phases of the environmental management system

Phases	Definition
Environmental policy	The environmental policy is a declaration of an organization, where its intentions and principles related to its global environmental performance are shown, as well as its structure for action and the definition of its environmental objectives and targets (Barbieri, 2004). For Daily & Huang (2001), top management has to guarantee that the environmental policy: (a) is appropriate to the magnitude of the environmental impacts of the company's activities; (b) respects the current legislation; (c) carries out effective revision of the environmental objectives and targets; (d) agrees with the continuous search for pollution prevention and global environmental performance; and (e) is documented, implemented and communicated to all employees and to the public in general.
Planning	In this phase, a plan is formulated in order to follow the environmental policy in the following items: (a) legal demands; (b) environmental objectives and targets; (c) identification of the environmental aspects; and (d) structuring of the program of environmental management (Seiffert, 2005).
Implementation and operation	Effective implementation requires that an organization develops the empowerment of its resources and the necessary mechanisms for implementing its policy, its environmental objectives and targets (Donaire, 1999). For Daily and Huang (2001), there must be an optimal integration among the physical, human and financial resources that are going to support the effectiveness of the environmental policy of a company.
Checking and corrective actions	In this phase: (a) the environmental performance is measured and monitored; (b) corrective actions are carried out; (c) the activities of the environmental management system are registered; and (d) the environmental auditors check the whole process (Daily & Huang, 2001).
Management review	The analysis has to consider an eventual need of changing the policy, the objectives and other elements of the EMS, in view of the results of the audit of the management system, changes in circumstances and commitment to continuous improvement (Barbieri, 2004). According to Seiffert (2005), it is recommended that top management carry out a revision of the EMS at least twice a year.

(Source: Jabbour & Santos (2008) p.52)

APPENDIX B

Interview 1: face-to-face

Interviewee: Director of Human Resources
Organisation: Shangri-La Hotel, Bangkok   **Date:** Wednesday 1 April 2009

Q.1   When did your hotel first achieved ISO 14001 certification?

A: 8 years ago. We are the first hotel in Thailand to achieve ISO 14001 certification. We recertify every 2 years by the Moody International Certification Group. We also recertify to HACCP yearly. The hotel receives a discount by certifying to ISO 14001 and HACCP by the same auditor. Certification fees are quoted in £ from the UK and is costly. It is a long-term commitment.

Q.2   What are your views on the ISO 14001 process?

A: It is a continuous job we cannot stop. It is a continual improvement and we have to push ourselves all the time. It is a self-checking and the system is very good. Just have to be ready for the audit and be on top of things. Audits are carried out every year. Staff members have to be on top of problem. Monthly internal audits are carried out by EMS managers. So, it is a very active practice.

Q.4   Which department deals with the hotel's environmental issues?

A: Every department is concerned with the environment. EMS is top driven by the GM. We have to build awareness first. The HR department trains and builds awareness among staff and HR drives the Engineering Dept. Committee has two EMS managers: Area Director of Training and Director of Engineer. They are the two key persons driving this Committee.

Q.5   **Who are your EMS managers?**

A: EMS managers tend to be Directors of HR, Directors of Training or Head Engineer. Director of HR devised the EMS manual. 12 copies distributed to all department concerned. Hotel will continue to renew its ISO 14001 EMS certificate.

Q.6   **Undertaking ISO 14001 requires a lot support; not just from top managers like you and the rest of the staff. Are they well-informed about ISO 14001 and what it involves? Are they supportive of the system?**

A: We have a rule – staff must achieve a minimum of ISO training; ½ hr every two months. All staff must undergo this training under the topic of ISO 14001. Departmental heads are responsible of that. During orientation of new staff, they have a few booklets given out to staff informing of the policy, waste. Staff members carry out waste segregation practices, for example separating wet food in canteen to sell to suppliers for animal feed and paper recycling in offices. All this took place *after* achieving ISO 14001.

Q.7   **Is achieving ISO14001 certification still the mainstream approach for your hotel to achieve its environmental objectives as well as demonstrating its achievements to stakeholders and the society at large?**

A: In the area of environmental sustainability, the hotel group's focus is primarily in five areas: climate change, ozone depletion, waste water management, waste disposal management, and indoor air quality.

Q.8   **What are the noticeable benefits or impacts of ISO 14001 EMS over the years?**

A: Some of our clients are more aware of ISO. Our letterheads bear the ISO and HACCP logos and in that sense it brings benefits to marketing and good PR. Not many hotels in Bangkok are ISO 14001 certified, mostly ISO 9001 certified which is smaller in scale and smaller in scope. Not as much in money terms. Obvious costs saving from conserving water and energy; reduced utility costs, but not in terms of increase in profitability. Clients and guests are aware of the Group's ISO certification in terms of good PR and marketing. Attract eco-conscious guests.

Q.9   **Could you tell me more about the 2-year CSR (corporate social responsibility) strategy initiated in 2007?**

A: A number of charity and social activities/campaigns to help the community. Hotel staffs take part in the annual river cleaning project. Money raising campaigns, donations to schools. Staff well-being, encouraging staff members to give up smoking. Separate CSR budget and CSR manager does all the planning. The CSR manager reports to the GM.

Q.10   **Have hotel guests shown interests in, commented or praised the hotel's green policies over the years?**

A: Very little feedback on this area.

Q.11   **How effective or important is it to persuade hotel guests to adopt eco-friendly practices?**

A: No compromise on services delivered to hotel guests while achieving cost saving and energy efficiency practices. Customer satisfaction is ultimate.

Q.12 What are the green initiatives taken by the hotel over the years?

A: EARTH HOUR 28 March 2009 – supporting this for the 1st time, will be a long-term practice as most hotels and organisations in Thailand are participating, we are doing brain-storming right now on this. Other areas are energy saving programmes such as conserving electricity. It has already been in place for a number of years since the hotel achieved ISO 14001.

Q.13 Your hotel is undergoing major renovation at the moment. What are the environmental impacts? What is the arrangement made for waste?

A: Outside contractors and suppliers are made aware of the hotel's best practices. In terms of waste management, there is not much we can do. ISO auditors had communications with head contractor when they were carrying out the audit.

Q.14 Given the current global economic downturn, do you expect corporate environmental issues to remain high on the agenda?

A: Still top priority. Achieving ISO 14001 will continue to help hotel reduce its utility bills and achieve energy efficiency. Thai regulation is an important influence especially for hotels by the Chao Phraya River, esp. waste water management. Auditors check that. Hotels located by the river have more issues to deal with than the ones in the city. Shangri-la has the biggest land by the river. So, the hotel has more issues to deal with.

APPENDIX C

Follow up to Interview 1 in April

Interviewee: Area Director of Training, EMS Manager

Organisation: Shangri-La Bangkok   **Date:** 26 June 2009 by e-mail

Q.1   ISO 14001 strongly emphasises on *continual improvement*. In your view, how advanced or improved is your current EMS manual (compared to when it was first devised in 2001)?

A: As per our mission to improve our program continually, I would say that our success is on the awareness of our staff and people who work and associate with our Hotel. We have managed to make the program as part of their life. They continuously perform and practice without the second thought or not feel as barriers for their work life.

Q. 2   What are the noticeable weaknesses in the ISO 14001 standard?

A: The noticeable weaknesses are the high level of document control and paper documents required for the audit.

Q. 3   ISO published a new version of 14001 in 2004. When did your hotel undergo this transition?

A: We are made aware of the new version of ISO 14001 right before it's published. As we have the consultant company, ERM CVS, who have helped and trained our concerned staff on this new version. We had the Transition Workshop on May 2005.

Q. 4 **How many staff members are in your team and are they all responsible in handling environmental issues on behalf of Shangri-La?**

A: Regarding to your questions, we are proud to present that all 900 staff are fully responsible for the program. However, we have set up our Green Committee comprised of 15 members from various departments who are fully involved in keeping the continual improvement of the program. These members are also our internal auditors. We will have a meeting once a month to keep track of our progress and identify area for further improvement as well as to discuss and handle any environmental issues.

Q. 5 **Implementing an ISO 14001 EMS involve a lot of paperwork. How straightforward or difficult was the transition from ISO 14001:1996 to ISO 14001:2004 for you and your team?**

A: As mentioned that paperwork is one of the difficulties found in implementing an ISO 14001. However, we had quite number of years experiencing this system, so the transition went well with our team.

Q. 6 **What are the noticeable improvements in the ISO 14001:2004 version?**

A: The noticeable improvements in the new version would be the focus more on results, the improving the clarity of the standards in some parts and the test changes that help clarify some of the requirements.

Q. 7 **In your view, what other foreseeable benefits can ISO 14001 offer to your hotel in the years to come?**

A: Other foreseeable benefits from this program would be:
- Fully-utilise resources & reduce utility cost
- Creditability for loans & insurance
- Compliance to environmental legislation
- Prevent accidents
- Meet guest expectation
- Enhance public image

APPENDIX D

Interview 2: E-interview by e-mail

Interviewee: Division Vice President, Safety, Security & Environment Dept

Organisation: Singapore Airlines   **Date:** 9 July 2009

Q.1   Under your direction, how long has your division been in charge with handling the Group's environmental issues?

A: 15 years.

Q.2   How many employees do you currently employ?

A: SIA Group staff strength: 30,666 as at 31 Mar 2009

Q.3   Out of these employees, how many are responsible primarily with corporate environmental issues?

A: The SIA Environmental Committee and SIA Occupational, Safety and Environmental Committee are responsible with corporate environmental issues. There is about 30 staff in these two Committees.

Q.4   To what extent does top-level management influences the Group's corporate environmental policies?

A: The SIA Environmental Policy is endorsed by the CEO.

Q.5   The SIA Engineering Division was the first department within the Group to receive an ISO 14001 certification in 1997. What were the challenges encountered by you and your team during the process?

A: Some of the challenges encountered were:-

   a) Interpretation of the requirements of the new ISO 14001 standard which lacked clarity in some areas.

   b) Training of staff to enable them to fulfil their environmental responsibilities.

c) Setting environmental targets in the programs without any previous baseline records.

Q.6 **How important was government support at the time?**

A: The Government was supportive of companies intending to put in place an EMS by facilitating a pilot EMS implementation program.

Q.7 **Certifying to ISO 14001 is totally voluntary. What motivated the Group to formally adopt this standard?**

A: By formally adopting the standard is a demonstration of the Company's commitment to continual improvement in environmental performance and taking appropriate measures to address key areas of environmental concern.

Q.8 **There are currently eight ISO 14001 certified operating units in the Group. Will there be more units seeking certifications in the future?**

A: No immediate plans to extend it to more units.

Q.9 **How often do the units renew their ISO certificates?**

A: The ISO certification is valid for a period of 3 years.

Q.10 **In your view, how advanced is your current EMS (compared to when it was first devised and implemented)?**

A: The EMS in all the units have been certified for several cycles and some of the environmental programs have achieved their objectives. New programs been introduced for continual improvement of the EMS.

Q.11 **What are the major improvements in the ISO 14001:2004 version?**

A: The main improvements of the ISO 14001:2004 version are in the clarity of the some requirements and its alignment with other systems such as the ISO 9001: 2000.

Q.12 In your view, how straightforward was the transition from ISO 14001:1996 to ISO 14001:2004?

A: The transition was quite straightforward as there were no major changes to the standard – the most significant being the addition of a new clause on the Evaluation of Compliance.

Q.13 How effective was the implementation of ISO 14001 EMS in enabling the Group to continually improve its environmental performance over the years?

A: The constant review of new environmental targets and programs has enabled the Company to improve its environmental performance over the years.

Q.14 In your view, what are/will be the noticeable contributions and impact of ISO 14001 on the Group's operations over the years and in the years to come?

A: The ISO 14001 standard has provided a formal framework to enable the company to continually review and improve its environmental performance. Our employees are more aware of environmental impacts, their responsibilities and practices.

Q.15 What are the shortcomings?

A: No significant shortcomings.

Q.16 Did it bring about financial benefits such as an increase in profits?

A: Resource conservation in electricity and water consumption and recycling programs have led to savings for the Company.

Q.17 What are passengers' opinions on the company's green initiatives over the years?

A: Passengers and other stakeholders are supportive of the Company's green initiatives over the years as it has helped to reduce its carbon intensity footprint and improvement in its environmental performance.

Q.18 **How has the adoption of GRI guidelines into the company's environmental reports been beneficial?**

A: The GRI guidelines have provided a consistent reporting standard for all companies to adopt.

Q.19 **Given the current global economic downturn, do you expect corporate environmental management practices to remain high on the agenda?**

A: The Company will continue to adopt "green" environmental measures to achieve savings and improve its environmental performance.

Q.20 **Is there anything you consider that might be relevant which this e-mail interview has not covered?**

A: Nil.

Thank you very much for your time.

APPENDIX E

Interview 3: E-interview

Interviewee: Regional Managing Director

Organisation: Jebsen & Jessen Packaging, Singapore   **Date:** 7 September 2009

Q.1 **Your company first achieved ISO 14001 certification in 2000. Are there other ISO 14001 certified divisions in the SE Asia region? Did they achieve ISO 14001 certification relatively quickly afterwards?**

A: Our Singapore plant obtained certification in 2000. Our plants in Malaysia and Vietnam had a shorter time span in the implementation and certifications. We exported our knowledge (from the Singapore certification) in the system requirements and implementation, as all the plants had similar environmental aspects. System adjustment focused mainly on local legal and other requirements.

Q.2 **How many members of staff are involved in your company's EHS committee? For how long has the committee been in charge with corporate environmental issues?**

A: We have 10 members from various department or section in the EHS committee. The EHS committee was first established in year 1997.

Q.3 **What were the challenges encountered by you and the committee during the initial certification process and did these challenges lessen as time progressed?**

A: Acquiring the knowledge and thereafter identifying relevant legal and other requirements were probably the major challenges we need to overcome. The implication of legal and other requirements to our operation activities changes as these are revised from time to time by the local authority.

Q.4 **In your opinion, what are the shortcomings with ISO 14001?**

A: Lack of performance related requirements. There is no mentioned of minimum performance indicators.

Q.5 **How often does your company and divisions renew their ISO certificates?**

A: Routine surveillance once every 12 months and certificates renewal once every 3 years.

Q.6 **Has the government played an important role in encouraging your company to seek certification?**

A: Various incentive schemes are provided by government, such as:

1. Tax Incentive Scheme For Highly Efficient Pollution Control Equipment
2. One year accelerated depreciation allowance for energy efficient equipment and technology.

Q.7 **In your opinion, how advanced is your company's current EMS (compared to when it was first devised and implemented in 2000)?**

A: Manuals, procedures and records which used to be filed in hardcopy are now electronically stored. All related documents are now easily accessible and retrievable with a touch of a button.

Q.8 **What valuable experiences have you and the EHS committee gained by having a formal EMS for a number of years?**

A: Related competency had been developed for each member of the committee. It had led us to a more reliable and predictable environmental performance which can reduce or limit the severity of incidents.

Q.9 **In your opinion, was the revision of ISO 14001 necessary and what are the major improvements in the ISO 14001:2004 version?**

A: The scope or boundary of the EMS is now clearly defined and documented, allowing a better interaction between activities and requirements.

Q.10 **How straightforward was the transition from ISO 14001:1996 to ISO 14001:2004?**

A: It took us about 3 months for transition from version 1996 to version 2004.

Q.11 **How has the implementation of ISO 14001 EMS helped your business achieve environmental friendly strategies and practices?**

A: It provides us with measurable objectives and targets that are consistent with the environmental policy.

Q.12 **Critics of ISO 14001 often point out that the standard is mainly concerned with environmental conformance, not environmental performance. Do you share this view?**

A: We cannot talk about environmental performance without being in compliance or conformance with the system requirements. Perhaps the standards should define a set of key environmental indicators for both generic and industry-specific organisation. This could be incorporate in the element on continual improvement.

Q.13 **How would you define environmental performance?**

A: Managing measurable results of our environmental aspects and its significant impact. These are translated into environmental objectives and environmental targets.

Q.14 **In your opinion, what have been the noticeable contributions and benefits of ISO 14001 to your business operations over the years?**

A:

- It helps the organisation to reduce the negative impacts its business activities might be having on the environment.
- Procedures implemented as part of the ISO 14001 process had made job significantly easier.
- Attained compliance with statutory regulations.

Q.15 **Has your business gained any financial benefits such as an increase in profits after implementing ISO 14001?**

A: Energy costs is one of the biggest proportion of our packaging facilities. Implementation of energy efficiency opportunities such as heat recovery system, optimization of air compressors, steam leakage control program had to some extends generated saving in energy costs.

Q.16 **In your opinion, what will be the impact of ISO 14001 in the years to come?**

A: A new paradigm for cooperation between regulators and industry as key policy-makers and industry both appear to be looking to the standards as a key component. Issues such as energy usage and climate change will be main focus in coming years.

Q.17 **Given the current global economic downturn, are corporate environmental management practices still high on the company's agenda?**

A: Our EHS initiatives and practices had been both economically competitive and affordable. We will continue to take practical steps to protect the communities at large from the risk of pollution and ill-health.

Q.18 **Will your company consider pursuing other green initiatives in the near future?**

A: Reducing our carbon footprint will be one green initiative we will use to fight against climate change.

Q.19 **Does your company have plans to produce sustainability or environmental reports in the future?**

A: Our business model incorporates high standards of integrity, legal compliance, governance practices and management control systems. We do not see a need to produce detailed report in accordance with reporting guidelines and indicators as vast amount of data collection require extensive resources.

Q.20 **Is there anything you consider that might be relevant which this e-mail interview has not covered?**

A: Your questionnaires had been well thought and I do not need to enhance it further.

Thank you very much for your time.