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Leveraging Environment and Climate Change Initiatives for Corporate Excellence

Venkatachalam Anbumozhi,
Mari Kimura, and Kumiko
Isono

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Venkatachalam Anbumozhi is the Capacity Building Specialist in Asian Development Bank Institute. Mari Kimura is a Research Associate, at ADBI and Kumiko Isono is a staff of McKinsey currently on internship at ADBI. This paper served as the background paper for the Regional Workshop on Corporate Environmental Management: From Policy to Practice, 3-6 May 2010, Indian Institute of Management, Bangalore, India. All views are personal.

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Please contact the authors for information about this paper.

Email: vanbumozhi@adbi.org

Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

As an integral part of sustainable development, the impacts from climate change, including increasing water stress, more extreme weather events, the potential for high levels of migration and the disruption of international markets are critical challenges for all Asian countries. With rapid economic growth and modernization, the countries in the region are increasing production and consumption, calling for critical adaption measures. With the Asian countries and the energy sector exceedingly accounting for a large share of CO_2 and GHG emissions, businesses in Asia need to increase efficiency in energy use, offset emissions, and use more low carbon or renewable energy resources. Businesses are no longer considered part of the environmental problem as they are progressively becoming part of the solutions, and if furthered by an ideal regulatory disposition this would encourage corporations to strive for zero emissions. To address these issues, this paper reviews selected initiatives taken by Asian countries to comply with emerging global sustainability standards, reporting, and management systems, and tracks the response of Asian businesses to global environmental concerns, examines market based innovations including new regulations that augmented corporate excellence, and identifies future directions for business that lead low carbon society. It recommends governments and business to join forces in supporting low carbon initiatives, drawing upon market mechanisms through reconfiguring national environmental policies and strategies.

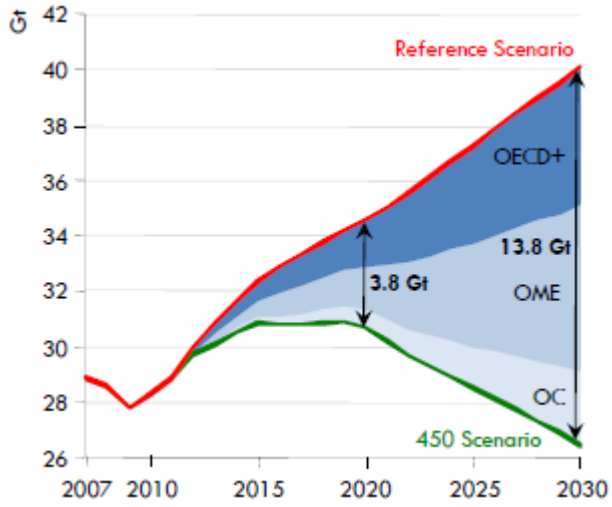
JEL Classification: M19, Q3, Q48, Q56

Contents

1. INTRODUCTION: LOW CARBON SOCIETY IN REGULATORY AND BUSINESS TERMS

According to the consensus among climate science practitioners, a business-as-usual (BAU) path would raise carbon concentration to 1,000 ppm CO_2 by 2050, possibly instigating a global temperature rise of about 6°C (IPCC 2007). Adaptation to climate change is a critical challenge for all Asian countries, particularly for developing countries in the Asia-Pacific that will be hit hardest and earliest, and in all business sectors. Even if Greenhouse Gases (GHG) concentrations are stabilized in the coming years, some impacts from climate change are unavoidable. These include increasing water stress, more extreme weather events, the potential for high levels of migration, and the disruption of international markets. These challenges cannot be separated from the challenges of sustainable development.

Figure 1: World's Historical and Projected Energy-Related CO_2 Emissions for Reference Scenario and 450 Scenario[1]



Source: World Energy Outlook 2008

To limit the temperature rise outlined above, energy-related CO_2 emissions would have to peak just before 2020 at 30.9 Gt and decline steadily thereafter, reaching 26.4 Gt in 2030 and fall 15 Gt in 2050, as indicated in Figure 1 (WEO 2008). The concomitant pace of the decline in energy-related CO_2 emissions is about 1.5% per year in the period 2020–2030, but the annual pace of reduction has to double to around 3% during 2030–2050. At the heart of the transformative targets for a low carbon society is the energy sector. It accounts for over four-fifths of total CO_2 emissions and just under two-thirds of the world's GHG emissions. (IPCC, 2007) In the coming decades, the average rate of growth in emissions from energy is expected to be 1.5% per year, much faster than the

[1] *450 scenario assumes that CO2 concentration is held at 450 ppm – CO2 eq, which is considered to result in a temperature rise of around 2°C.*

average growth rate of 0.3% per year of other GHGs. All major sectors will see growth in energy-related CO_2 emissions over the next two decades with power generation and aviation being the fastest-growing sectors, although the latter is from a relatively small base in absolute terms. The power sector accounts for over half the increase in emissions from 2007–2030, with a 60% increase from coal-fired generation.

The investment and efforts that would be required from 2007–2030 has the transitional goal of cutting aggregate emissions by about 8%, as opposed to a "do-nothing" scenario where there would be an increase in global emissions of almost 40%. A breakdown of the additional worldwide investment required of US$ 10.5 trillion during 2010–2030 is quite revealing, with the share of developing countries, including India, but excluding the People's Republic of China (PRC), at US$ 1.9 trillion. The large costs are due to the long life of the capital assets used in energy sector lock-in and the even longer durability of CO_2 in the atmosphere. In terms of share to GDP, incremental costs are projected to rise from 0.5% in 2020 to 1.1% in 2030 (WEO 2009).

Accounting for the scientific perspective above, multi-governmental efforts to reduce CO_2 is under way. Table 1 expresses emission reduction target by 2020, pledged by countries at the 2009 United Nations Climate Change Conference (COP 15), to be included in the Copenhagen Accord. This time, growing numbers of developing economies also indicate their national emission reduction target, though most of them are based on emissions relative to GDP. Planned actions of each country to achieve their reduction targets, as summarized in Table 1, indicates that most of the planned measures will have implications for the private sector as well.

Table 1: Quantified Economy-wide Emissions Targets for 2020/ Nationally Appropriate Mitigation Actions (NAMAs) from Copenhagen Accord

Country	Emission reduction target by 2020, and mitigation actions	Base Year
Australia	-5% or -15% or -25% depending on the extent to which the world including developing countries commit to the reduction target	2000
EU	-20% or -30% if other developed nations commit to comparable target and major developing nations contribute adequately	1990
Japan	-25%, premised by fair and effective international framework with all major economies is established	1990
US	In the range of 17%. Long term target is 30% by 2025, 42% by 2030 and 84% by 2050	2005
PRC	Endeavor to lower CO_2 emissions per unit of GDP by 40-45% by 2020 through - Increase the share of non fossil fuels in primary energy consumption to 15% - Increase forest coverage by 40 million hectares - Increase Forest stock volume by 1.3 billion m^3, etc	2005
India	Endeavor to reduce the emission intensity of its GDP by 20–25%	2005
Indonesia	-26% through 1) Sustainable peat land management, 2) Reduction in rate of deforestation and land degradation, 3) Development of carbon sequestration projects in Forestry and Agriculture, and 4) Promotion of energy efficiency etc.	n/a, BAU
Republic of Korea	-30% reduction	n/a, BAU
Singapore	-16% reduction	n/a, BAU

Source: http://unfccc.int/home/items/5265.php

Table 2: Major Policies and Strategies by Asian Countries[2] for Emission Reduction

Country	Major policies and strategies
Japan	Continuously enforce ongoing plan for emission reduction. Major strategies include: - Promotion of energy efficient utilities and cars - Support of renewable energy and smart grid - Promotion of green building and green transportation - Active use of market mechanism
People's Republic of China	PRC's Policies and Actions for Addressing Climate Change, 2008, promises to - adjust the economic structure to promote the optimization (e.g., Opinions on Accelerating of the Development of the Service Industry in 2007) - strive to save energy and improve energy efficiency (e.g. issued the Plan and Method Regarding the Monitoring of Energy Conservation, Emission Reduction and Evaluation) - develop renewable energy and optimize energy mix (e.g., continue to promote hydropower)
India	24 initiatives are under way, including - Set up Indian National Network for Climate Assessment (INCCA) - Develop Emissions inventory - Establish State Action Plan - National Missions under National Action Plan on Climate Chang - Approve National Policy on Biofuel
Indonesia	Established National Climate Change Action Plan in 2007. Ongoing and planned activities include: - Develop the Second National Communication to coordinate efforts and programs - Monitor & develop the pilot project in household and rural area - National Management System for the development of GHG inventory in industry
Republic of Korea	The government is implementing national green growth strategy and 5-year action plan with investment oh 86 mill USD over 5 years. The plan is anticipated to yield production value of 165 billion USD and create more than 1.5 mil new jobs
Singapore	Ongoing implementation of existing National Climate Change Strategy mainly through financial incentives and standard setting - Increase energy efficiency - use less carbon intensive fuel - increase carbon sink such as forest cover

Source: Japan: Ministry of Environment 2010, http://www.env.go.jp

People's Republic of China: PRC Climate Change Info-Net 2010, http://www.ccchina.gov.cn/

India: Ministry Of Environment & Forests, Government of India 2010, http://india.gov.in/

Indonesia: State Ministry of Environment 2007, http://climatechange.menlh.go.id/

Republic of Korea: Korea Energy Management Corporation 2010

Singapore: Ministry of Environment and Water Resources, Singapore 2007, http://app.mewr.gov.sg/web/Common/homepage.aspx.

[2] *Only Annex I country and non-Annex I countries which submitted NAMAs*

The scope of the pledged actions on climate change leaves many within the policymaking community pondering on how they should act. What can a country possibly do? But the option of not acting is less attractive from a business perspective, considering the emerging regulatory action, growing recognition of business risks and the benefits of action, such as brand impacts and early mover advantages.

Business has been the engine of much of Asia's recent economic growth, while Asia's growth has kept the entire world growing. Unfortunately, this growth has also become the main source of serious environmental woes in the region. As modernization and globalization of Asia proceed, business corporations have become more influential through expanding mass production and consumption, which have been the primary causes of environmental degradation. Paradoxically, business also provides technologies and other solutions to environmental problems. Business, in partnership with governments, international organizations, and civil society plays an important role in achieving the Millennium Development Goals (MDG). From an environmental perspective, business used to be seen as nothing more than the cause of the problem, but this view is changing: "Business is at worst only part of the problem and at best can be only part of the solution. But within a multi-stakeholder framework facilitated by the public sector, great opportunities exist to make use of the energies of the private sector to a far greater extent than has been contemplated" (WEF 2005). Especially for issues which require complex and collaborative solutions, "it is increasingly in the interests of business to be part of the solution rather than part of the problem" (UNDP 2003).

As insurers and institutional investors have grown to appreciate the strategic business risks associated with climate change, they too have engaged actively in the debate and started to propel companies to analyze their portfolios toward public disclosure of these risks and of their carbon emissions. Collective efforts such as UNEP's Finance Initiative, the Investor Network on Climate Risk (INCR), and the Carbon Disclosure Project (CDP) have played an important catalytic role in this process. INCR, for example, has grown from a coalition of 10 investors managing $600 billion in assets when it was launched in November 2003, to over 60 investors managing $5 trillion of assets by June 2008. Likewise, the CDP, which acts as a coordinating secretariat for institutional investors with a combined US$57 trillion in assets under management, catalyzed public disclosures on carbon emissions from some 3,000 major corporations in 2008, compared with less than 200 in its first year of operation in 2002.

A decision to act on climate change can raise more questions than it answers. What should sectoral or company priorities be? Are a series of climate policies sufficient, or is climate change significant enough to business operations to warrant a strategic focus? What should a corporate climate change strategy focus on? Why? And how? Would climate change action protect a company from erratic energy prices, assist in anticipating regulation, meet emerging shareholder expectations, keep insurance rates low, maintain license to operate or be responsive to stakeholder issues? If so, how can integrated action be undertaken across governmental policies and corporate functions to address emissions and pollutions?

Understandably, today governments and companies are overwhelmed by a wide range of choices regarding climate change initiatives. The array of options underscores the importance of stepping back and thinking strategically about how to move forward on low carbon societal change responses. Countries and companies need to be forward-looking and strategically consider how to address a changing climate. While small-scale programs and philanthropy are important, broader scale and audacious thinking is now needed. The corporate goal of zero emissions is the core of what should be considered,

given scientific evidence, the emerging regulatory context, and growing awareness. The goal of zero emissions is driven by climate change models that show a need to decrease global emissions by about 70%, a goal that becomes even more significant given the projected annual growth rates in carbon emissions from the US (1.5%), the PRC (3.4%) and India (3.0%) over the next 20 years. Research has increasingly highlighted the "positive feedback loops"—in which one consequence of climate change accelerates other dynamics, for example ocean current changes due to differential amounts of salinity are leading to a faster pace of climate change than anticipated (Kalirajan et al. 2010).

While specific changes in corporate culture and identity will need to be tailored for each company, the actions pursued across all companies will include the full spectrum of

- increasing the efficiency of current energy use,
- securing offsets of emissions, and
- sourcing less carbon-intensive, and increasingly renewable based energy.

These three elements offer a complementary set of tiered efforts, all of which are important. To mitigate the business risks associated with climate change, however, it is clear from climate modeling that each of these strategies in isolation are inadequate. Instead, real gains can be made through synergies across these three areas of work and by integrated strategic planning throughout all aspects of business.

Enabling conditions for creating "win-win" relationships should be sought (WBCSD 2001). In that sense, innovation is the most important element for companies to deliver goods and services in a competitive market. To make innovation contribute to sustainable development, however, market conditions need to be significantly modified.

What will be the future directions for sustainable business? Will environmentally sound, low carbon business offer future growth prospects? Eco-efficient products might appear to be a solution, but if such products are consumed in large numbers, they may still cause negative environmental effects. Renewable energy technologies might contribute to the reduction of greenhouse gas emissions, but they will not be able to meet all the growing energy demands and might even generate negative energy amounts once the whole life cycle is analyzed. Even though human welfare and the volume of products or services consumed do not have a linear relationship, it is generally accepted that goods and services provided through the market will help enhance welfare levels. It is important to understand that the economy is only a means to achive the goals of societies, not the goal of societies in themselves (Drucker 2002). To address these issues, this paper reviews selected initiatives taken by business in response to global environmental concerns, examines market based innovations including new regulations that augumented corporate excellence, and identifies future directions for business that lead a low carbon society. It recommends governments and business to join forces in supporting low carbon initiatives, drawing upon market mechanisms through reconfiguring national environmental policies and strategies.

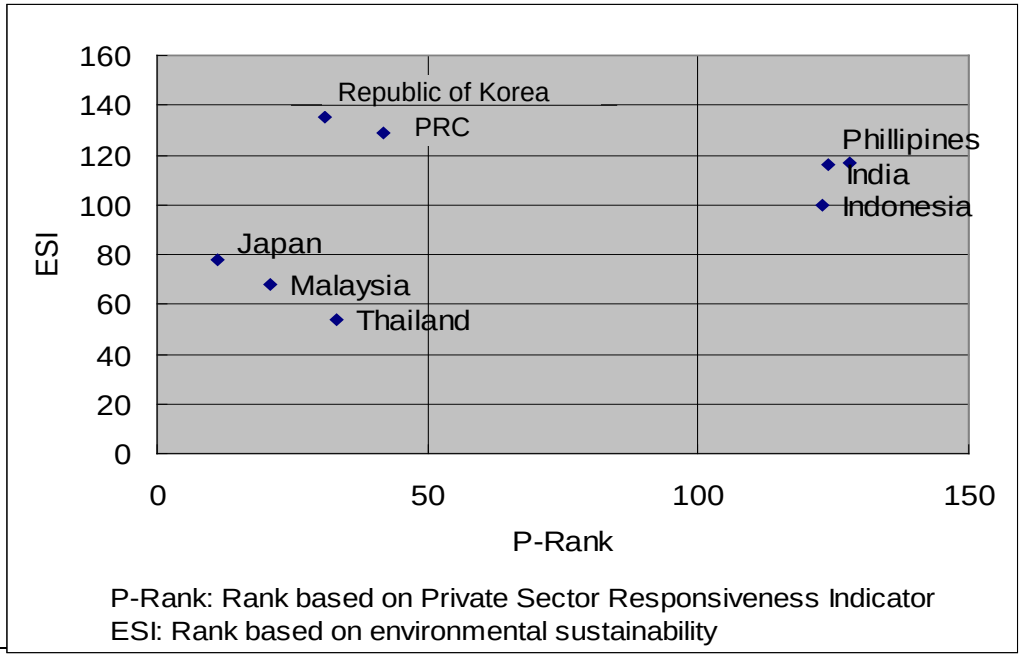
2. GLOBAL SUSTAINABILITY STANDARDS AND ASIAN CORPORATE RESPONSES

2.1 Sustainability Indicators and Country Clusters

Sustainable development issues differ greatly from country to country and are so complex that there are no common indicators. To measure sustainability, various types of indicators have been proposed. A WEF (2002) study shows that countries can be classified into five clusters, based on criteria developed around components of environmental systems, reducing stresses, reducing human vulnerability, social and institutional capacity, and global stewardship. It also developed an Environmental Sustainability Index (ESI), which discloses the performance ranking and evaluation of 142 countries. This integrated index consists of 68 indicators, five of which come under "private sector responsiveness,"[3] reflecting the level of voluntary corporate activities. One ratio is the number of International Organization for Standardization (ISO) 14001-certified companies per unit of gross domestic product (GDP); another is the percentage of eligible companies in the Dow Jones Sustainability Group Index (DJSGI).

Figure 2 shows the relationship between "private sector responsiveness" (P-rank) and the Environmental Sustainability Index (ESI) for major Asian countries. The smaller the P-rank and the ESI, the better the performance of the country's business sector. In this way, major economies of the region may be categorized into three groups: one group consists of the Philippines, India, and Indonesia; another includes the Republic of Korea and the PRC, and the third group contains Japan, Malaysia, and Thailand. In India, the Philippines, and Indonesia, development of voluntary activities in the private sector has been limited, and that partly has resulted in serious environmental degradation.

Figure 2: Environmental Sustainability Index and Ranking of Major Asian Countries



[3] *In this paper, ranking of the private sector responsiveness is expressed as "P-rank".*

On the other hand, voluntary activities in the private sector have been higher in the Republic of Korea, the PRC, Japan, Malaysia, and Thailand. However, overall environmental degradation, such as industrial pollution, energy use, and emissions remains severe in the Republic of Korea and the PRC, where future issues that need to be addressed include enhancing the environmental capacity of business corporations.

2.2 Corporate Management Systems for Sustainability

There are four broad types of corporate environmental management systems, and companies need to respond to these requirements according to different local situations. The concept of a "triple bottom line" (TBL) in corporate sustainability management seeks to integrate the three aspects of corporate activities: environment, society, and economy. Environmental management systems (EMS) focuses directly on the environment, it needs to be integrated with other management systems. While EMS addresses the environmental aspect, corporate governance (CG) deals with the economic aspect. As for the "social" aspect, there are two systems being actively debated: corporate social responsibility (CSR) and corporate responsibility (CR). CSR originated from corporate philanthropy, while CR has developed from consumer movements.

Table 3: Basic Concepts of Corporate Management Systems

Concept	Major aspects concerned
Environmental Management Systems (EMS)	Natural Environment
Corporate Governance (CG)	Economic Corruption and Ethics
Corporate Social Responsibility (CSR)	Social Adherence
Corporate Responsibility (CR)	Consumer Protection

Source: Authors

As summarized in Table 3, the four systems are considered complementary to each other for the promotion of sustainable practices by business.

To date, Asia has responded relatively well to the requirements of EMS (as detailed in the next section). Now greater attention needs to be directed to the other three management systems. CG has played a central role in corporate management long before EMS was created. The global financial crisis triggered significant media coverage, which turned public attention to the appropriateness of internal management of corporations. Against this backdrop, many organizations developed guidelines for corporate governance which urge companies to take into account the public interest and needs of local communities. Initially, the central issue of CG was to fight against irregularities, as it had become a major concern. However, as the role of corporations has become more significant in achieving sustainability, CG was expanded progressively to cover "non-financial" issues. Consumer consciousness expanded from the products or services that companies provided, to the conduct of companies as a whole. Corporate brands are important assets of companies and can be developed only through dealing properly with non-financial issues, such as safe working conditions, job creation, greenhouse gas emissions, and resource productivity.

In contrast, major issues under CSR differ from country to country: "human rights" in the US, "full employment" in Europe, and "safe working conditions" in Japan. In Europe, CSR is regarded as one of the key issues for raising competitiveness. The Lisbon summit in March 2000 set the strategic goal for the European Union (EU) to become the most inclusive and competitive society in the world and made an appeal to companies to assume their social and economic responsibilities. Even though CSR is basically an

issue for micro-level actions, its cumulative effects extend to the national level and can raise the competitiveness of economies.

Table 4: Chronology of TBL Integration and Corporate Management

Year	Events
1976	OECD Multinational Enterprise Guidelines (1st version) developed (revised 1984, 1991, 2000)
1992	UNCED (Earth Summit) held
1996	ISO14001(1st Version) issued and is currently being revised
1997	Global Reporting Initiative (GRI) was started.
1999	OECD Corporate Governance Principles (1st version) issued; Dow Jones Sustainability Indexes (DJSI) started (revised in 2004)
2000	GRI Sustainability Reporting Guidelines (1st Version) developed, and United Nations Global Compact started. (revised in 2002)
2001	EC green paper on CSR issued FTSE4Good Index started.
2002	World Summit on Sustainable Development - Johannesburg held
2004	ISO started developing CR guidelines.
2007	SA guidelines

Source: Authors

The focus of CR is the protection of consumers, and it is obviously important for Asia as it has the largest number of consumers in the world. ISO has already started the standardization process of CR in its Consumer Policy Committee. Industry took the lead in developing ISO 14001 for EMS, while consumer groups are taking the lead as far as CR is concerned.

There has been development of integrated indices for evaluation of companies according to the four management systems elaborated above. Indices also measure corporate sustainability for the global financial market. New York based Dow Jones has introduced the "Dow Jones Sustainability Index (DJSI)" and London based FTSE followed with the "FTSE4Good." Table 4 describes the chronology of development of these indices, while Table 5 shows the number of companies for which these indices have been calculated. It reveals that except in Japan, very few companies are subject to such evaluation in Asia, partly reflecting the global reach of many Japanese companies.

Table 5: Corporate Sustainability Indices

Index	Hong Kong, China	Japan	Malaysia	Singapore	Total	World Total
DJSI	4	35	2	0	41	317
FTSE4Good	4	184	0	3	191	932

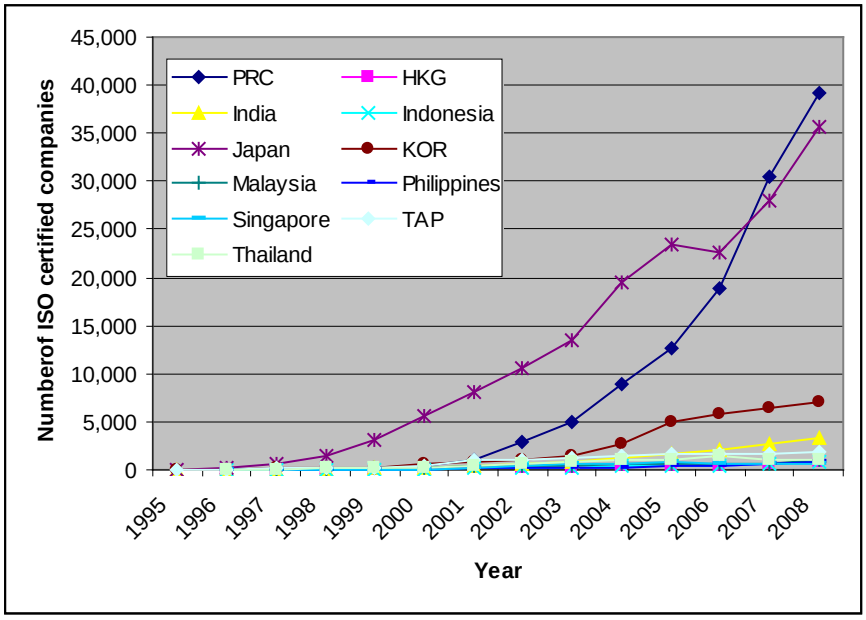
Source: Authors

Although there may be as many as 50 million small and medium enterprises (SME) in Asia, EMS and the other initiatives elaborated on above have only captured a tiny fraction of them. Without changing the behavior of these companies, there can never be sustainable societies in Asia. Changes may be gradual at first, but they will accelerate at some point, as in the case of EMS based upon ISO 14001. Certainly, Asian companies will have to catch up with these worldwide trends.

3. ENVIRONMENTAL MANAGEMENT SYSTEM FOR INDUSTRIES

There are various standards and guidelines for EMS, which include ISO14001, EMAS, and national/local EMS. An EMS serves as an overall system to continuously improve environmental performance of a company. EMS has incorporated important tools to achieve its objectives, including life-cycle assessment (LCA), environmental reporting, and environmental accounting. ISO14001 is only one possible EMS, but it has become the most commonly used and is now a good indicator for analyzing the global and Asian trends. Figure 3 shows that EMS is growing rapidly in Asia. The PRC recently surpassed Japan to rank 1 in terms of the number of ISO certificates with 39195, still closely followed by Japan (35,573). The Republic of Korea (7,133) ranks a distant third, and also ranks in the top 10 countries of the world. Taipei,China; India; and Malaysia have increasing numbers of ISO-certified companies. Although the number of companies with the ISO14001 certificate in Asia is still on the increase, the annual growth rate of the world total has flattened after several years of decrease, suggesting that reaching the predominant SMEs is problematic.

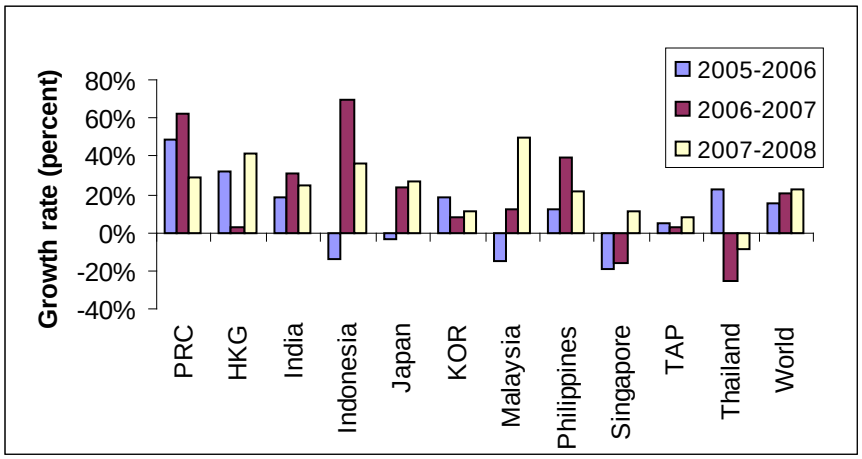
Figure 3: Number of ISO Certified Companies in Major Asian Countries



Notes: *PRC: People's Republic of China; HKG: Hong Kong, China; KOR: Republic of Korea; TAP: Taipei,China
Source: 1995–2000: The ISO Survey of ISO 9000 and ISO 14000 Certificates—Tenth cycle: up to and including 31 December 2000
2001–2005: The ISO Survey – 2005
2006–2007: The ISO Survey – 2007
2008: The ISO Survey – 2008

The latest data for the period 2007–2008 (Figure 4) show an increase of 22%, which has been relatively stable considering the previous two years, but much lower than 5–10 years ago at an average of more than 30% or even higher. The PRC and Japan have seen a period of dramatic growth, and other countries appear to be following that trend.

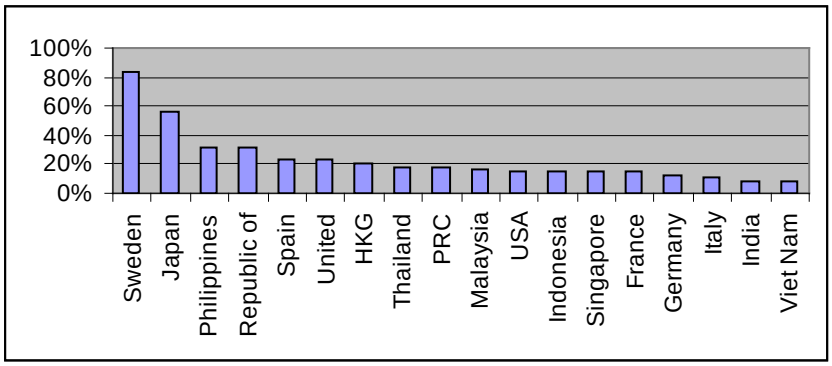
Figure 4: Growth Rate of ISO Certified Companies in Asia



Notes: *PRC: People's Republic of China; HKG: Hong Kong, China; KOR: Republic of Korea; TAP: Taipei,China
Source: 2005: The ISO Survey of ISO 9000 and ISO 14000 Certificates—Tenth cycle: up to and including 31 December 2005 -
2006–2007: The ISO Survey – 2007
2008: The ISO Survey – 2008

Figure 5 shows a marked divergence in of the adoption of ISO14001 certificates, the *de facto* EMS standard, and ISO 9001, the main quality management system (QMS) standard, in most countries. Although ISO14001 certified companies drastically increased in recent years, there is still a huge gap between the two.

Figure 5: Ratio of ISO 14001 and ISO 9000 Certified Companies

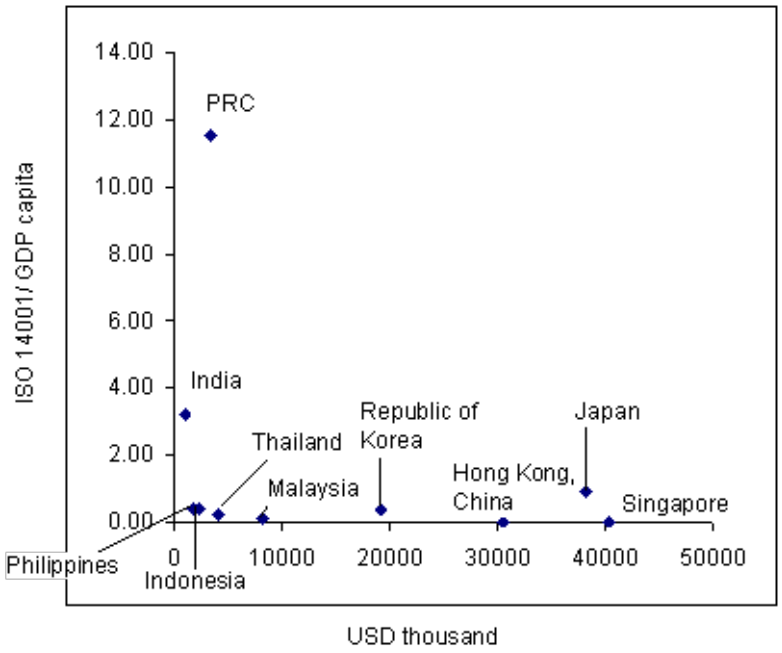


This indicates the potential for Asian countries to adopt both EMS and QMS. Even Japan, the top country for EMS, could double the number of companies with ISO 14001.

Figure 6 illustrates that there is a clear relationship between the level of economic development and the adoption level of EMS, indicating that the ISO certificates per capita ratio is roughly proportional to the level of globalization, which is also proportional to GDP per capita. However caution should be taken in interpreting Figure 5 as there are

various types of EMS besides ISO14001, and companies may have "multiple certifications."[4]

Figure 6: Relationship between GDP and ISO Certification (2008)



Source: Authors

[4] *Both on ISO14001 and ISO9001, organizations with multiple sites have a choice to make in terms of whether they get a single-site certificate for each site or a multi-site certificate for multiple sites.*

Table 6: Number of Companies Participating In the Global Compact Initiative

Country	Number of organizations (all)	Number of organizations (Business)
People's Republic of China	293	161
India	218	145
Republic of Korea	177	122
Indonesia	163	110
Japan	112	105
Pakistan	82	63
Singapore	73	62
Malaysia	60	55
Philippines	43	9
Sri Lanka	35	26
Thailand	26	21
Nepal	23	18
Hong Kong, China	13	6
World total	8,274	5,973

Note: Last updated in June 2009

Source: www.unglobalcompact.org

Although developed countries have a higher rate of EMS-certified companies, it does not necessarily mean that companies in the more developed countries of the Asian region have responded more to global issues. Table 6 illustrates this point well. The number of Japanese and Korean companies participating in the Global Compact Initiative (GCI) is relatively low in comparison with the PRC, India, and Indonesia. This may be due to the nature of the initiative itself, which is voluntary and less rigorous. Indeed, many companies in Japan and Republic of Korea may think that it is less useful.

3.1 Environmental Performance of Small and Medium Enterprises

The evidence presented above indicates that many Asian corporations already recognize the benefits of EMS. But how to encourage the millions of SMEs in the Asia-Pacific region to adopt EMS remains a major challenge. Even though in Japan the number of ISO14001 certified companies has increased at an accelerated pace, participation by SMEs is not very high. To address this lacuna, several initiatives are being undertaken by national and local governments. In Japan, the Ministry of Environment has developed a set of guidelines for SMEs and formulated a registration and certification program called “Eco-action 21”. (http://ea21.jp)

As a region wide effort to assist the corporate sector to move towards sustainability, ADB (2005) suggested that “greening” of the supply chain should be a key strategy to improve the environmental performance of SMEs in Asia. As many SMEs in Asia supply parts or products to big multinational corporations based in the United States (US) and Europe, pressure from these large companies to improve environmental performance may be the most effective way to reach SMEs. Towards that end, corporate environmental goals are introduced to the SMEs as a condition for their participation in the supply chain and regular monitoring of performance is conducted. While the costs for meeting environmental goals and conducting monitoring could be a substantial burden

on SMEs, their counterpart corporations in the advanced economies can help them by providing access to hardware such as pollution abatement technologies or specific technical guidance to help identify “win-win” situations.

Generally, however, SMEs in developing Asia might be more familiar with the concept of CSR than EMS. In local economies, economic entities get to know each other well and business is conducted not just toi maximize profits, but to establish a long-term, stable operation as a valued member of a local community. Often SMEs will have taken local society and local environmental quality into consideration without being aware of CSR or EMS explicitly. A report by the United Nations Industrial Development Organization calls this phenomenon “silent responsibility” and addresses the importance of turning CSR debates from a Northern hemisphere preoccupation into a truly global agenda that includes developing Asia (UNIDO 2002).[5]

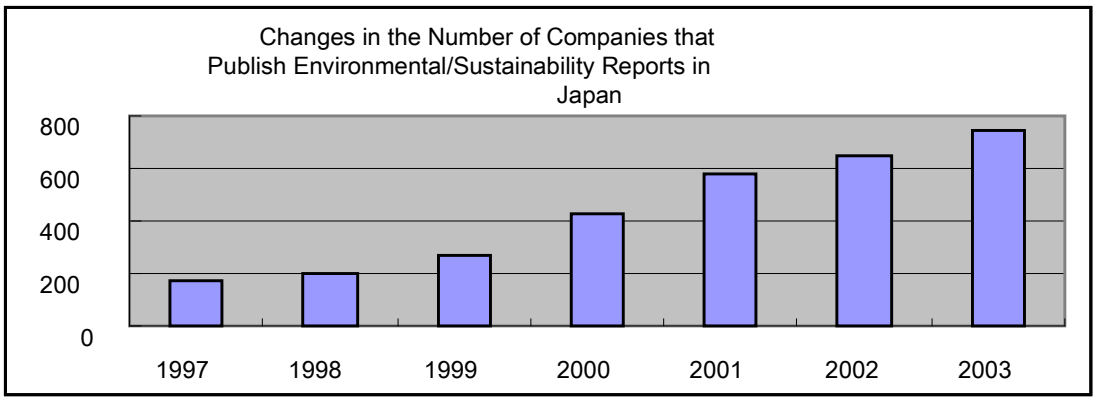
4. INFORMATION DISCLOSURE AND SUSTAINABILITY REPORTING

Environmental reports or sustainability reports are becoming important ways to ensure access to information regarding environmental and social performance of a company. They evaluate companies based upon information collected by various means, which include questionnaire surveys or interviews, as well as direct input from company management. Environmental or sustainability reports are often the most basic information source, important for the public and local authorities to monitor progress made by a company to meet its voluntary environmental goals. These reports are also vital for promoting market-based eco-initiatives such as green products, and to attract green investment funds.

Recognizing their importance, in Japan, the Ministry of the Environment, developed environmental reporting guidelines in 1997, and revised them in 2001 and 2004. The Ministry for Economy, Trade and Industry also issued similar guidelines in 2001, keeping in mind the different needs of various stakeholders. Specific guidelines were developed for SMEs. Figure 5 shows a steady increase in the number of environmental reports prepared in Japan. However, attention to environmental reports is still not high enough. Awareness should be raised regarding the importance and usefulness of such reporting.

[5] *“Silent responsibility" that may take a less overt or reported approach and is more paternalistic in nature, is more characteristic of CSR in developing countries and more closely linked with how a business operates on a day-to day basis.*

Figure 7: Increase in the Number of Companies Publishing Sustainability Reports



Source:

As mentioned above, the Global Reporting Initiative (GRI) has developed guidelines for companies and other organizations (including public agencies) for preparing a sustainability report and how to disclose it to the public. As a result of these efforts, the number of organizations that have published a sustainability report is on the increase. Table 7 shows a sharp increase in the number of organizations that produced a sustainability report over the period of August 2004 to March 2005 (from 507 to 645).

The Asian market is dominated by Japanese MNCs. Among the 145 Asian companies submitting sustainability reports, only one company prepared their report at the strictest level of "in accordance with the GRI guidelines." This may indicate that, despite development of the guidelines involved, many stakeholder's concerns by Asian companies may have not been adequately reflected in the guidelines, or that there is not yet sufficient awareness of this initiative in Asia.

Table 7: Number of Sustainability Reports Registered at the GRI Reports Database

Time, as of	PRC	India	Japan	Republic of Korea	Malaysia	Thailand	Total	World Total
Aug 9, 2004	4	3	88	5	2	2	104	507
Mar 28,2008	5	6	122	6	2	3	144	645

Source: *www.globalreporting.org*

Asian countries could be expected to develop their own guidelines reflecting corporate practices in each country. Alternatively, a time may come when Asian companies become fully aware of the global initiatives, mainly due to the pressure coming from multinational enterprises. Participation in global voluntary reporting initiatives may not be sufficient anyway. Global voluntary initiatives such as Global Compact or UNEP-FI provide opportunities for a company to demonstrate to the world its proactive stance on the environment and sustainable development. Nevertheless, Asian companies are not particularly responsive to these initiatives, compared with their European and American counterparts. As information plays a critical role in the market, financial institutions need to have objective evaluation of companies to take investment decisions. Balance sheets are one basic information source, but additional information is clearly necessary to evaluate environmental performance. To meet this need some companies have introduced "environmental accounting" as a management tool to identify the costs and effects of environmental conservation, and to measure them quantitatively, where

possible. Evaluating a company is like evaluating a person. There is no ideal methodology to conduct company evaluation, and a certain amount of diversity should always be allowed for. In this regard, third party verification (Box 1) is also becoming popular in countries like Japan.

Box 1: Third-party verification of corporate environmental/sustainability reports

Third-party verification is a globally accepted system for corporate financial reports. Auditing companies check financial details of the report and issue a certificate or note any exceptions. A similar verification system may be developed for environmental/sustainability reports. However, unlike financial reports, readers of environmental/sustainability reports are not limited to shareholders. Target readers include government officials, the media, NGOs, the general public, and company employees. Thus environmental/sustainability reports have to meet the company's accountability requirements, to raise the company's brand image, to promote communication with stakeholders, and to educate employees. Also, indicators to measure environmental/sustainability performance of companies are not well established. Global and national guidelines on environmental/sustainability reporting have been developed, but there is still a clear need to improve ways to consistently calculate scores.[6] Despite these problems, third-party verification is on the increase in Japan. There seem to be two directions in which third-party verification is heading: one is to assure the accuracy of the report and the other is to make comments on the performance of the company. This indicates a need to standardize basic rules regarding third-party verification.

From the above discussion, one might conclude that voluntary initiatives have become an important tool for integrating the economy and the environment. However, the effectiveness of voluntary initiatives remains weak in Asia. Only a few big businesses have committed to voluntary initiatives and this approach is not yet accepted by millions of SMEs. There are few strong incentives for businesses in the region to adopt potentially costly initiatives when the market place is not demanding improved performance. Hence there is a need for developing national or sub-regional systems so that companies that have provided information on their environmental and social performance are rewarded with appropriate incentives (such as green procurement contracts).

[6] *The GHG protocol, an initiative of WBCSD and WRI etc, has developed guidelines on corporate greenhouse gas accounting and reporting. However, national guidelines on corporate greenhouse gases are still underdeveloped.*

5. MARKET BASED INNOVATIONS AND NATIONAL PUBLIC POLICY FRAMEWORKS

5.1 Development of Green Product Markets in Asia

The market for environmentally-sound goods and services has expanded in many Asian countries. Originally introduced in Germany in 1978, eco-labeling or environmental labeling has played an important role in this expansion. Now many countries are promoting environmental labeling in accordance with the basic standards set out in ISO 14020, developed in the late 1990s. There are three types of environmental labeling, but the most familiar scheme for consumers is Type I.[7] Type I schemes are designed by each country with a symbol easily recognized by consumers. As shown in Table 8, the environmental labeling program is being widely promoted in many Asian countries, but has yet to gather sufficient momentum. The effectiveness of eco-labeling schemes in Asia needs to be improved further, mainly by increasing awareness on the part of consumers as well as strengthening the enabling policy environment.

[7] *ISO14020 defines Type I as "a voluntary, multiple-criteria based, third party program that awards a license that authorizes the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations".*

Table 8: Environmental Labeling Programs in Asian Countries

Location of managing organization	Programme(s) delivered	Member Organization (s) Involved	Voluntary standards/ criteria sets	Licenses issued to companies	Certified products/ services
India	Ecomark Scheme of India	Central Pollution Control Board (CPCB)	16	15	20
Taipei,China	Green Mark	Environment and Development Foundation (EDF)	105	856	3766
Hong Kong, China	Hong Kong Green Label	Green Council	54	30	61
Hong Kong, China	Environment Label Certification	Hong Kong Federation of Environmental Protection (HKFEP)	21	36	195
Japan	Eco Mark Program	Japan Environment Association --JEA	48	1576	4193
Republic of Korea	Environmental Labeling Program	Korea Eco-Products Institute -KOECO	122	1158	5105
Singapore	Green Label	Singapore Environment Council	36	87	500
Thailand	Thai Green Label Program	Thailand Environment Institute TEI	39	30	161

1 GEN members may be involved in the delivery of one or more ecolabeling programs/schemes. In some cases, the GEN member is solely responsible; in other cases, non-GEN ecolabeling organizations may also be involved in management, operations, and/or administration aspects.

* Information unavailable and/or not provided.

Source: Global Ecolabeling Network (GEN), Annual Report 2007

Environmentally-sound products often cost more than conventional products, simply because additional costs are incurred to make products or processes more environmentally-sound. The added costs of environmentally-sound products basically reflect "external costs".[8] Therefore, consumers may resist purchasing environmentally-sound goods on price grounds. Even environmentally-conscious consumers often choose low cost products, because there is no obvious difference between environmentally-sound products and conventional ones. To fill this cost gap, subsidies could be introduced. However, they should be introduced only for innovations and for a limited duration, because a long-term subsidy program will not contribute to reducing costs of the product. Instead of subsidizing environmentally-sound products, the basic solution is more likely to come from eliminating perverse subsidies for virgin materials, and internalizing environmental externalities into the product price.

A few countries in Asia have introduced policies to encourage the purchase of environmentally-sound products, and to help narrow the cost difference. Japan enacted the Law on Promoting Green Purchasing[9] in 2000. This law targets the consumption

[8] *External cost is the cost imposed on society which is not internalized by the producers for utilizing natural resources. The aesthetic cost of strip mining, health risks associated with stream water pollution are examples of external costs. Conventional markets have ignored these costs assuming that natural resources are abundant and private goods.*

[9] *Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities.*

power of public entities, and requires the national government, its affiliated organizations, and local governments to purchase more environmentally-sound products by setting up procurement plans every year. Companies and people are also encouraged to choose environmentally sound products. The list of environmentally-sound products is prepared by the national government, consolidating information from manufactures and environmental labeling organizations. The list ranges from typical goods and services such as recycled paper and renewable energy, to certain types of public works.[10] The Korean government is in the process of legislating a similar "Green Purchase Act" (Sook, 2003). Prior to that, the Seoul Metropolitan Government started enacting its own initiative starting in 2004 (KELA 2003).

At the same time, consumers' awareness for purchasing environmentally-sound products seems to be growing in Japan. The Green Purchasing Network (GPN) was established in 1996. GPN consists of corporations, local governments, and consumer organizations, and provides information on environmentally-sound products through printed materials and a web-based database, as well as by holding seminars. Membership has now grown to 2,889 organizations, and local GPNs are emerging in some parts of Japan. The Republic of Korea formed a GPN in 1999, and Malaysia established one in 2003. Taipei,China and Thailand are making preliminary arrangements for setting up a GPN, further illustrating policy convergence in this area. Networking of national GPNs, such as the recently established international GPN, is underway, which is expected to build on and further accelerate the GPN movement in Asia.

While these are important policy measures to promote environmentally sound products, product level evaluation alone is not enough, and it should be complemented by corporate level evaluation. Globally such systems (e.g., Dow Jones Sustainability Indexes) have been developed and put into practice, though their application is still limited. In Asia, company evaluation is more limited and hence governmental intervention may be necessary. In many countries, the government is the largest consumer, and its purchasing power should be fully utilized. Green procurement programs should be expanded to include not only to the Business to Government (B2G) relationship but also the Business to Business (B2B) and the Business to Consumer (B2C) relationships.

5.2 Potential for Green Investment in Asian countries

Business stakeholders and consumers are increasingly interested in the environmental behavior of the corporations they wish to invest in. Socially Responsible Investment (SRI) is investment which allows investors to take into account wider concerns, such as social justice, economic development, peace or a healthy environment, as well as conventional financial considerations. As a result, SRI funds exclude companies with poor environmental performance from funding, and instead reward green companies. In the US and Europe, SRI has been practiced mostly by mutual funds, institutional funds such as pension funds, and insurance funds (SIF 2003). SRI is now emerging in some Asian countries. In Japan, there are 12 SRI mutual funds as of November 2003: seven funds targeting domestic corporations and five funds investing in international

[10] *The environmentally-sound products designated by the law are categorized into the following 15 items: paper, stationery, machinery, OA appliances, home appliances, air conditioner, water heater, lighting apparatus, motorcars, uniforms, interior, working gloves, other textiles, facilities, public work.*

corporations. The first Japanese SRI fund started operation in 1999, and the number of SRI funds gradually increased between 1999 and 2001, though little progress has been made since then. Total assets of SRI funds amounts to 71 billion yen (ASrIA 2003), which accounts for less than 0.01% of the Japanese market, a very small figure compared with 15% in the US and 12% in the United Kingdom (SiRi 2004). The number of SRI funds in other Asian countries is very small, except for six in Hong Kong, China. However, awareness seems to be growing in Asian countries.

Pension funds seem to have a great potential to engage in SRI because of the growing ageing population in Asia. The US-based California Public Employees' Retirement System (CalPERS) is an example that could be emulated. It takes into account social and environmental performance of a company in its fund management decisions. In the UK, SRI became active after the government revised the Pension Act so that trustees of pension funds must disclose information on the extent to which social and environmental considerations are taken into account in the selection of investments. In Japan, some pension funds have also started the same practice for fund management, by setting up shareholder voting-rights and investment policies. Caution should be adopted, however, when comparing the behavior of pension funds between countries, as pension systems vastly different from one country to another.

SRI is closely related to operation of security, banking, and insurance sectors. Table 9 indicates the extent to which financial institutions in Asia have committed themselves to finance for sustainable development. UNEP started its financial institutions initiative by adopting the "UNEP Statement by Banks on the Environment and Sustainable Development" in 1992, and its insurance industry initiative in 1995 by adopting the "UNEP Statement of Environmental Commitment by the Insurance Industry". The Statements expect signatories to conduct internal reviews and measure their activities against their environmental goals, and share information with customers and other stakeholders.

Table 9: Signatories of UNEP-Finance Initiative

Initiative	PRC	India	Japan	Philippines	Republic of Korea	Thailand	World Total
Financial Institutions Initiative	1	1	9	8	2	1	163
Insurance Industry Initiative	0	0	6	0	1	1	68

Source: www.unepfi.org

Moreover, project financing plays an important role in the sustainable development of Asia. Recognizing their role as financiers affords them significant opportunities to promote responsible environmental stewardship and socially responsible development. As an industry approach for financial institutions in determining, assessing, and managing environmental and social risk in project financing, the "Equator Principles"—a voluntary set of guidelines—were developed in October, 2002 by the World Bank (www.euator-principles.com). As an adoptive measure, the participating financial institutions will require their customers to demonstrate in their environmental and social reviews, and in their environmental and social management plans, the extent to which

they have met the applicable sector-specific pollution abatement guidelines and safeguard policies, or to justify exceptions to them. Then, financial institutions will insert into the loan documentation for high and medium risk projects covenants for borrowers to comply with their environmental and social management plans. If those plans are not adhered to, and if deficiencies are not corrected, financial institutions will have the ability to declare the project loan in default.

The absence of major Asian banks from the list of signatories is problematic. It is possible that major public and private financial institutions in developing countries like India and the PRC are under no pressure to factor environmental considerations into their lending activities because most people are not aware of the Equator Principles. But, the adoption of the Equator Principles or other guidelines by Japanese and Korean financial institutions, including private banks (which are also major players in the funding of infrastructure projects at a global level and within the region), would have given a major fillip to their nation's environmental initiative in project financing all industry sectors, including mining, oil and gas, and forestry.

6. POLICY INSTRUMENTS FOR CORPORATE ENVIRONMENTAL MANAGEMENT

The environment has long been regarded as an impediment to business, since environmental regulations impose additional costs on business. But many empirical studies have suggested that environmental regulations strengthen competitiveness of companies through stimulating technological innovation (Lopez 2004). Although not all regulations contribute to innovation, there are innovation-friendly policies (Porter 1995). Governments are encouraged, therefore, to demonstrate leadership in providing a conducive policy environment, in which innovation for sustainability is promoted (Porter 2005).

Pollution control started in the 1970s with regulatory measures. Emission standards were originally introduced to regulate emission of pollutants from point sources. Although regulation can yield the prescribed results, it usually requires substantial costs for proper implementation and enforcement. Partly because of these difficulties, and partly because of changes in the perceived nature of environmental issues, new policy instruments were gradually introduced into many countries. They include "economic instruments", "voluntary approaches", and "informational regulation". These new instruments are effective in dealing with certain environmental problems, but they also have their own limitations. Therefore, an appropriate mix of various policy instruments becomes important and these new instruments should be seen as supplementing command and control regulations, not replacing them.

Voluntary approaches include "voluntary agreements", usually a contract between a company and the government, either local or central, or directly with an affected community. The voluntary agreement makes a company commit to taking voluntary actions to reduce emissions, in many cases beyond compliance levels. Where the voluntary agreement and related regulations are based on the relationship between government and the private sector, voluntary agreements can be easily changed into regulation. Many of the voluntary agreements are, therefore, underpinned by implicit or explicit threats of increased regulation.

Equally powerful are market mechanisms that could become a driving force to promote sustainable development, if proper policies are introduced to incorporate environmental

externalities. Informational regulation involves a public right to access environmental information. If affected communities are given access to information regarding pollution or other environmental degradation, they will apply pressure on the firm responsible to change its behavior.

6.1 Public Policies and Environmental Governance

Discussions above demonstrated an emerging trend that business can self-regulate with respect to its social and environmental performance. This trend is obvious in Japan, but it is not yet taking place in other countries in Asia. Governments of developing countries in Asia have often found it difficult to make firms comply with existing regulations, mainly due to (i) a lack of regulatory resources to enforce standards (ii); uncertain laws, with few penalties for non-compliance (iii); corruption (iv); inadequate infrastructure and human resources to collect evidence for non-compliance by industries (ADB 2005). This situation needs to be reversed. There is certainly an important role to be played by the private sector. In fact, the Asian Development Bank (ADB, 2005) observes that the industry-led “new regulations” are part of an emerging policy focus in many Asian countries to improve environmental sustainability.

But there is still significant room for companies and regulatory agencies to explore win-win solutions. This potential is greater in developing countries as their industrial management systems are obsolete. It is, therefore, strategically important for countries in Asia to create policy conditions to help implement more win-win solutions. To further promote sustainable corporate practices, governments should provide tangible incentives. They could include such measures as tax exemption, seed financing subsidy, low-interest financing, or favorable treatment in public bidding. Even stronger motivation can be given to companies if such incentives are linked to quantitative goals regarding energy and resource efficiency.

6.2 Globalization, Climate Regimes, and Environmental Regulations

As globalization proceeds, the international implications of low carbon environmental policies have received increasing attention. Concerns about "pollution havens" were raised in the early 1970s (World Bank, 2000). Companies in developed countries, in which strong environmental policies were introduced, considered relocating to developing countries where environmental standards were lax, to save capital investment in environmental management (Box 2). Heavy industries such as iron and steel, nonferrous metals, industrial chemicals, pulp and paper, and nonmetallic minerals were among those, for which such concerns were high.

Box 2: Pollution Havens and Business Investment

One of the most contentious issues debated today is whether pollution-intensive industries from rich countries will relocate their factories to poor countries with weaker environmental standards, turning them into "pollution havens". An empirical study of 2,866 manufacturing joint venture projects in the PRC shows that environmental stringency does affect location choice, but not in the manner expected. All source countries go into provinces with high concentration of foreign investment, relatively abundant stock of skilled labors and low environmental levies. Low environmental levies are a significant attraction for foreign direct investment (FDI) in highly polluting industries with partners from Hong Kong, China; Macao; and Taipei,China. In contrast, joint ventures with partners from OECD sources are not attracted by low environmental levies. It suggests that the attraction of weak environmental regulation depends on the technological sophistication of firms within a given industry.

The findings of the study have important policy implications. If FDI from industrial countries provides cleaner technology and seeks rather than avoids high regulatory standards, investment by high income countries in developing Asia has the potential to improve environmental outcomes in host countries.

Source: Dean et al. 2005

In the 1980s, "exporting harm" became an international issue (BAN 2002). Wastes produced in developed countries sent for "recycling" to developing countries sometimes caused environmental problems in developing countries. Against this background, in 1989 the Basel Convention was developed—international agreement on the trans-boundary movements of hazardous waste and its disposal. As of 2005, 162 countries and the EC had ratified the treaty, including most Asian countries.

However, the Basel Convention tends to function as a barrier to international trade of recyclables. This has become more conspicuous as globalization proceeds and demand for recyclable materials sharply expands in countries such as the PRC. The Basel Convention distinguishes hazardous materials from non-hazardous, and regulates hazardous materials only. However, recyclable products such as used computers, for example, often contain hazardous materials. Innovative mechanism need to be called for to prevent pollution and emissions resulting from trans-boundary movement of hazardous waste, while promoting trade in recyclables.

Moreover, in recent years, the EU has tightened its regulations on chemical substances. The directive on waste electrical and electronic equipment (WEEE), and the directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) were adopted in 2003. These directives prohibited the use of toxic substances such as lead, mercury, and cadmium for electric and electronic equipments from 1 July 2006 (Box 3).

Box 3: An example of innovation through WEEE regulation

Solder is not a new material; it has been in use for 5,000 years. Throughout this period it has contained lead. The dawn of lead-free solder was a revolutionary event. Matsushita's lead-free solder project was launched in June 2000, about 1,000 days before their self-imposed deadline. Team members began their work by checking all their products, since no single person really knew everything about which parts of their products contained solder. On 31 March 2003, Matsushita finally eliminated lead-based solder from all Panasonic and National brand products produced around the world. This was the world's first achievement, affecting more than 12,000 products. Soldering is a basic technique, and many other technologies depend on it. Re-doing such a basic process was like plunging a scalpel into the backbone of Matsushita's manufacturing process.

(*Source: Matsushita Electric Group)*

In Asia, countries like the PRC have started introducing similar directives. The EU introduced another regulation in the same year, i.e., Registration, Evaluation and Authorization of Chemicals (REACH) to produce sufficient information about the effects of chemicals on human health and the environment, and at the same time to promote research and innovation in EU chemical industries. Although these are non-Asian based regional regulations, their impacts will be felt by many manufacturers in Asian countries. Hence, Asian businesses and governments urgently need to participate in the international policy dialogue.

7. FUTURE DIRECTIONS OF LOW CARBON SOCIETY AND THE ROLE OF BUSINESS

The speed, enormity, and seriousness of tackling climate change and environmental degradation are big challenges for business and governments in Asia. Looking to the future there are very different plausible scenarios: a) towards a society which seeks continual growth through market economy and technology development; b) towards a society which does not seek growth but sustainability; and c) towards a society which is longer more sustainable, but focuses on survival (Naito and Gunjima 2003). Some people believe that the type "a" scenario will lead to a low carbon society, while others have different opinions. A wide range of futurists have examined what kinds of economy would follow the industrial economy. Many believe that the post-industrial economy will be a knowledge-based economy, in which excessive materialism will be gradually reversed. From an environmental point of view, the following two possible economies are worthy of particular attention. One is a service- oriented economy which has high material resource productivity, and the other is a self-reliant local economy which does not depend much on national or global economies.

7.1 Service Oriented Economy

Asia has by far the largest population in the world, and it is still growing. Resources available for Asia on a per capita basis are already limited, as demonstrated by many serious environmental stresses observed in various countries of the region. Therefore, Asia has no option but to develop less energy and resource intensive economies by, for

example, adopting cleaner production technologies, and moving away from production of goods towards provision of services or integrating both.

So far this paper has examined a number of emerging trends or management options to promote low carbon production. They are all important, but cannot be very effective, unless the other side of the coin is addressed, i.e., greening the consumption patterns. In 1999, the United Nations Guidelines for Consumer Protection were expanded to accommodate sustainable consumption (UNEP and CI, 2004). Also important is the concept of product service system (PSS), which is related to sustainable consumption (Inaba 2005). PSS can be defined as "a marketable set of products and services capable of jointly fulfilling users' needs" (Stoughton and Anbumozhi, 2010). The environmental implications of PSS are still not clear because of rebound effects, but its potential is recognized in various studies. Also, sustainable consumption is not just for developed countries, but it is also important for developing countries, as the latter become more integrated into the process of economic globalization.

By integrating production and consumption using such models, the traditional linear (or throughput) society may be changed into a circular one. Used goods and products would be automatically returned to leasing companies (possibly attached to the manufacturers), which would be obligated to re-use or recycle them. A service oriented economy based upon leasing may be considered better in building a circular economy than the current economy in which products are sold to and owned by consumers. In a service oriented economy, maintenance could be one of the most important businesses. In the short term, the principle of extended producer responsibility (EPR) should be applied to an increasing number of products, including container/packaging materials, home electric appliances, and automobiles.

7.2 Self-Reliant Local Economy and Entrepreneurship

Although local societies have been marginalized as industrialization progresses, economic globalization seems to have paradoxically stimulated localization at the same time, particularly in developed countries. With regard to this local regeneration, two different scenarios are presented. One is a scenario based on market principles, which is typical in Anglo-American societies. The other scenario is not based on market principles, but builds on local culture and environment, which is typical in Europe (Jinno 2002), but is also highly relevant to developing Asia.

Faced with de-industrialization accompanied by economic stagnation and unemployment, the EU introduced policies to promote "social economy" and "regional development", both of which aimed at empowering local societies. One of the objectives of the former policy was to develop "social enterprises" such as co-operatives, mutual associations and foundations. Such enterprises were different in that they not only sought economic gains for their members, but also address social, environmental and other local concerns (COM 2004). Co-operatives are, for example, expected to contribute to job creation and rural/regional development, because co-operatives are rooted in local communities. Regional development stimulated local initiatives by introducing "structural funds", thereby strengthening the unity between urban and rural economies. Environmental concerns were well integrated into overall local policies.

Such locally rooted companies have significant potential in promoting sustainable societies. They could contribute to building the "sound-material cycle society" or "zero-waste society". A small material cycle promoted by them could minimize resource use and carbon dioxide emissions. An additional strength is the ability to maximize the use of

local natural resources. Biomass, sunlight, wind, and water are all local in nature, and can be better utilized to produce energy at the local level. Mobilization of local business along these lines will not only improve the local environment and the economy, but also create employment. To augment such locally based initiatives, various policy measures should be introduced, including promotion of local currencies (such as the eco-currency in Japan), establishing micro-finance schemes, and strengthening public-private partnerships. There are many other local initiatives like this in Asia, but they need to be further promoted to build more sustainable local societies.

8. TOWARDS LOW CARBON ECONOMY IN ASIA: IMPLICATIONS FOR CORPORATE MANAGERS

Sustainable development, and ways to address climate change more specifically, has become increasingly strategic and constructive at the level of both individual companies and collective initiatives. There is a growing business case to be made from more rigorous analysis, and management of the potential physical, operational, financial, and regulatory and litigation risks.

Companies, especially those operating globally, also need to face the changing stakeholder expectations of their role in society. Consumers, employees, environmental and human rights activists, development experts, politicians, and the general public are looking more and more to business to be a proactive "part of the solution". There are growing public campaigns against those companies deemed to be "part of the problem". In a connected, Internet-enabled world, corporations that are perceived to be directly causing climate change or exacerbating the vulnerability of poor countries and communities in dealing with these threats are likely to face increasingly sophisticated activism and reputation risks. Global corporations also need to increasingly consider and plan for more systemic shocks, such as serious disruptions to supply chains and international markets. And at a minimum, many companies are likely to face an increase in climate-related operating costs, ranging from higher commodity prices and raw material costs, to growing insurance and security costs. For certain industries and for certain adaptation challenges, there are also new business opportunities and potential markets to be harnessed.

Successful organizations attained excellence through:

(i) *Harnessing core corporate competencies and individual value chains***:** for example, developing and disseminating commercially viable products, services and technologies, and sharing risk management, scenario planning and disaster preparedness tools along corporate value chains, to increase climate change resilience in developing country enterprises and communities.

(ii) *Investing in innovative public-private and hybrid financing mechanisms:* ranging from multi-million dollar donor-led global funds and project co-investments to climate adaptation insurance products for the poor, voluntary corporate carbon offset projects, investments in social entrepreneurs, and corporate philanthropy contributions.

(iii) Partnering strategically with civil society—strategic alliances between business, NGOs, research institutes, and community organizations.

(iv) Creating industry-wide sector initiatives—working with competitors to establish common standards and spread technology and good practices.

(v) Engaging in public policy, global standard advocacy and corporate community dialogues—corporate efforts to strengthen public governance and institutions for adaptation at global, national, and city levels.

The following could be implications for adopting those strategies in a business organization context:

(i) Initiate change before the policy threat becomes severe: Scientific consensus has to emerge—as climate change is underway and action must be taken within the next few years to avert projected scenarios.

(ii) Allow sufficient time and resources for implementation, particularly in relation to core changes in energy and resource uses: As evident from the range of activities covered in this paper, low carbon strategies can affect almost every aspect of the operations of a company. As with all organizational change, a phased approach with strong leadership and regular check-ins is necessary.

(iii) Build a broad base of change agents and alter work processes to establish changes: Offer professional development and educational opportunities to employees across a range of functions and business units. Select individuals with strong leadership skills, or else leadership can be harnessed via education and self-motivation. As corporate environmental strategies move to be implemented in stages, it is likely that, particularly in the short-term, companies will have to consider a shift in how they think about energy costs for production, processes, and services. More comprehensive data management will be required over the short term, more flexibility in energy budgeting over the medium term, and increased re-investments for technological improvements over the longer term.

(iv) Foster a culture that empowers people: Motivating people or change them without empowering them to effect change is one of the most common obstacles to effective change management. Line managers who are empowered to enhance data management can take control of their energy use, predict future energy requirements, and manage peak energy usage.

(v) Build internal capacity, and avoid long-term dependence on external entities: Partnering with external entities, is a good idea for companies newer to managing climate risk. External partners should be engaged with the intent to build capacity among company managers to ensure that employees feel in control and are enabled to innovate to create new competitive advantages for the company.

(vi) Seek to support and inform change initiatives through existing professional networks: The climate regime is rapidly changing. Perhaps the most efficient way to keep employee leaders up to speed is through existing professional networks. Major business associations now have climate change working groups, including the Business Roundtable's. Industry groups are forming their own task forces, such as those supported by institutes like UNEP FI, ADBI, etc. A number of training curricula have emerged specifically for corporate directors, senior executives, middle mangers and office workers.

(vii) Expand on established routines and competencies: Organizational change is most effective when upheaval to other business processes is minimized. Rather than overlaying new initiatives and programs, tweak current processes and practices so that the default for business practice is zero emissions. Doing so will allow a company to take advantage of the finely-tuned processes that have won it past success.

(viii) Communicate early, fully, and frequently: By embedding climate change goals and targets into regular communications with commercial and retail customers, a company both builds trusting relationships and empowers customers to undertake their own climate change related decisions in an informed manner.

9. CONCLUSIONS

The overview presented in this paper leads to the conclusion that business has the key role in building low carbon Asia, and making sure that economic growth can continue with environmental security. The most promising path is for business, governments, and local communities to make concerted efforts to find new ways of responding to a range of positive market forces, promote voluntary initiatives, and reconfigure traditional environmental policies. These strategic approaches can be successful only in the context of a robust partnership. In that context, the following points will support developing appropriate policy measures:

i) Concerted efforts are needed in implementing more win-win solutions so that low carbon economic development can take place. Unfortunately, there will be more trade-off situations in the short run, because strong corporate initiatives are not yet pervasive in most parts of developing Asia. In order to further promote sustainable corporate practices, governments should provide tangible incentives through such measures as tax exemptions, seed financing subsidies, low-interest financing, and favorable treatment in public bidding. Even stronger motivation will be given to companies if these incentives are linked to quantitative targets to attain energy efficiency, expanding renewable energy sources and carbon offsets. In addition, as the largest consumers, the governments of Asia need to find new ways to respond to positive market forces such as green purchasing and investment. Traditional environmental polices need to be reconfigured to expand the green procurement through Business to Government, Business to Business and Business to Consumer relationships.

ii) An essential need is for Asian business to participate actively in development of global guidelines and standards for corporate environmental management, corporate governance, corporate responsibility, and sustainability reporting. Had more Asian companies participated in early efforts, their concerns could have been more properly reflected. This would make industries in the region more committed to resulting standards and guidelines. Incidentally, active participation needs capacity building and awareness-raising on the part of Asian business. Likewise, companies in Asia need to respond substantially to global voluntary initiatives such as the Global Compact, Equator Principles or CDP, as they provide good opportunities for Asia to demonstrate to the world its proactive stance on environment and sustainable development.

iii) As a region-wide effort to make business move towards sustainability, “greening” of the supply chain should take place to improve the environmental performance of SME in Asia. While the costs for meeting such goals could be a substantial burden on SMEs, their counterpart corporations in the advanced economies can help them by providing hardware such as pollution abatement technologies or specific technical guidance to help identify win-win situations.

iv) Asian governments have to develop national guidelines on corporate environmental/sustainability reporting so that companies that have provided information on their environmental and social performance are appreciated by society and rewarded accordingly by the market. The few global guidelines developed so far have not

appropriately reflected the business environment unique to Asian countries. Therefore, country specific guidelines, which are relevant to companies operating nationally, are essential.

v) Government interventions are needed to promote more holistic corporate evaluation. For example, a company producing eco-labeled products might still be selling environmentally destructive products as its core business. This may indicate the need to move from product based approaches to company based ones, and from environmentally based approaches to sustainability based ones. Government interventions of this kind will be more effective if they are linked to partnerships with other non-governmental actors.

vi) National policies and strategic business actions that promote service oriented economies and/or self-reliant local societies are also required. In this respect, innovative models have potential to be more widely applied to Asia, when suitable support systems are established. Also of great potential are promotion of local currencies, establishment of micro-finance schemes, and strengthening of public-private partnerships.

vii) While the risk management aspects of the climate challenge remain paramount to most major corporations and financial institutions, the venture capital community and a vanguard of innovative companies have more recently started to focus on the new markets and business opportunities that will emerge in a carbon constrained economy. To date, the vast majority of this private sector attention has been focused on mitigation efforts in the industrialized economies. The emphasis has been on improving energy end-use and supply chain efficiency, development and adoption of low carbon technologies, consumer awareness campaigns, experimentation with corporate and public emissions trading schemes, and the development of common metrics, indicators and reporting protocols. With a few notable exceptions, the climate adaptation challenge, and the links between climate change, economic growth, and poverty alleviation, has not been high on the corporate agenda. The situation is starting to change, although much still needs to be done to more actively engage the private sector in the adaptation agenda.

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