

# **Part One: Introduction and Summary of the Findings and Recommendations**

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## **1. Introduction**

The Report focuses on the Environmental Industry (EI) in four selected countries of the Asia-Pacific Region. The countries selected are: the People's Republic of China (China), India, the Republic of Indonesia (Indonesia) and the Republic of Korea (ROK), representing different stages of EI development. The Report outlines and assesses the current state of environmental deterioration in these four countries, the current stage of EI development, major government policies for EI development, major contributions to EI development by external bilateral and multilateral donors and by multinational corporations (MNCs).

EI in this Report refers to: 1) Environmental technology and processes (software), 2) Environmental products, equipment and instruments (hardware), and 3) Environmental management systems at corporate level. And all these three categories are applied to three environmental market segments: air, water, and soil pollution, including waste treatment and disposal.

EI in the Asia-Pacific region, and especially in the four selected countries which represent a wide range of economic, social, political and ecological conditions, is critical to sustainable development not only in the region but also in the whole world because of their sheer size of land-mass and population and their rapid economic growth and environmental deterioration and to enabling those countries to attain the Millennium Development Goals (MDGs) and to realize the Johannesburg Plan of Implementation by 2015.

How the domestic and external factors such as bilateral donors, international organisations and MNCs, contribute to the development of EI in the four selected countries of the Asia-Pacific region is the focus of the Report. The role of the external factors is assessed in the context of domestic policies and institutions that facilitate or impede the effective contribution by bilateral and multilateral donors and MNCs to EI development.

Structurally, the Report consists of three parts. Part I presents an Introduction, Major Findings and Recommendations. Part II consists of country studies, i.e., a chapter each on China, India, Indonesia and ROK, and a chapter on the role of small and medium enterprises (SMEs) in EI development in the Asia-Pacific region. Part III deals with the role of external partners in the development of EI in Asia, and consists of a chapter on the role of Japanese Official Development Assistance (ODA) and Japanese MNCs in the development of EI in the four selected Asian countries, a chapter on the inter-city environmental cooperation by Kitakyushu City, and a chapter on the contribution of bilateral (except Japan) and multilateral donors and MNCs in the four selected Asian countries.

The information and data used in the Report are derived from hard cover publications, electronic/website reports and data available at the Institute for Global Environmental Strategies (IGES) and elsewhere at no cost, and personal communications. Proprietary reports and information have also been identified during the research but have not been accessed and/or obtained due to significant costs involved.

Methodological issues exist with respect to projected investment and/or market value of EI in the four selected Asian countries based on the data examined. Classification and definition of environmental market segments and of the environmental technologies and services differ from country to country and at times between different industries even within countries. Likewise, the base years for which data is available vary. However, these elements do not affect the thrust of the analysis and the major conclusions and recommendations.

Lastly, the Report has benefited from the rich discussion at IGES International Workshop first on 1-2 December 2002 and second on 14 and 15 June 2003, especially the specific suggestions made by all the participants on each of the chapters included in the Report. It

is also to be noted that the papers submitted to the three sessions of the Tripartite Roundtable Meeting on Environmental Industry organized by the governments of China, Japan and ROK during the last three consecutive years 2001-2003 have enriched the discussion on environmental industry development in respective countries. As director of the Environment Industry Project at IGES and as editor of this Report, I am indebted to all the research collaborators and research secretaries on the EI project for their excellent cooperation.

## **2. Major Findings and Recommendations**

### **A. Findings**

1) The Asia Pacific Region is the leader in EI among developing countries. It is positioned to take off as an effective competitor with industrial countries in domestic and international EI markets. Moreover, EI could be a locomotive for economic growth and sustainable development.

2) The potential growth of EI is substantial, with estimates ranging from 10 percent to 20 percent (US\$1.5 billion to US\$3 billion) annually and, even higher in some segments, in the next five years. While environmental products have been the largest single market in all the selected countries of the region, the fastest growth is expected in environmental technology and service sectors. Exports of EI products, technology and services particularly from China, India and ROK, together with those from Japan, are also projected to grow fast.

3) R&D in sophisticated and high-tech environmental products and technologies sector, however, is not adequate to support the projected growth of EI. Moreover, the Global Environment Facility (GEF), Clean Development Mechanism (CDM), and the Multilateral Fund of the Montreal Protocol (MFMP) are not being used effectively to promote EI development in the region. Likewise the World Bank/International Finance Corporation (IFC), the Asian Development Bank (ADB) and the United Nations Development Programme (UNDP) have not in the past explicitly included development of EI as a specific objective of their programmes and lending activities.

4) Air and water pollution prevention and control equipment are the two EI segments with greater growth potential, including renewable energy, clean coal technologies and energy efficiency, water use efficiency and treatment of wastewater, together with advanced engineering consulting and environmental technology services. Another growth sector, especially in China and Korea, is recycling and reutilization of waste, including industrial solid waste, waste liquids and waste gas.

5) A wide diversity exists among the four selected Asian countries in the nature and extent of environmental deterioration, its major sources, government policies in dealing with it in terms of the nature and range of concrete measures, timing and implementation successes and failures, and the contribution of bilateral and multilateral donors and MNCs to the development of EI. While environmental deterioration in ROK, as in developed countries, has stemmed mainly from industry, offices, transportation and household activities in urban areas, that in China, India and Indonesia has been caused partly from depth of poverty in rural areas and partly from rapid rate of industrialization and urbanization.

6) Regardless of country, these governments in the Asia-Pacific region have resorted initially to legislative and administrative measures to cope with growing environmental deterioration. However, they have not been able to solve it due partly to their inadequate human and institutional capacities to implement those measures, and to the lack of environmental awareness among different segments of the population including public and private sectors and individual households. According to experiences of Japan, ROK and other developed countries and more advanced developing countries such as Singapore, their environmental policies tend to be strengthened and become more effective in fighting against environmental deterioration, when people, reaching a moderate level of income and consumption, become keenly aware of the critical importance of such policies to their health and future generations and pressure governments ceaselessly to adopt more effective measures to deal with it.

7) Having found difficulties in redressing environmental deterioration by legislative and administrative measures alone, most governments of the Asia-Pacific region have been adding in recent years to their anti-environmental arsenal those pricing policies, financial and fiscal incentives and disincentives to assist the stakeholders in the adoption of individual and collective measures to deal more effectively with environmental

deterioration. Command-and-Control (CAC) system is being steadily replaced by Community-Regulatory-Market (CMR) system.

8) Most prominent among these economic incentives are government direct subsidies and preferential credit and tax measures to install anti-environmental technology and equipment in private sector production and distribution activities and household consumption. Instead of end-of-pipe (EOP) environmental technologies, many private sector enterprises have installed cleaner production processes including the use of environmentally sustainable industrial raw materials, cleaner energy and environmentally friendly technologies, as well as more effective waste management system. In turn, many private sector retail stores have also adopted some kind of deposit schemes to reuse, reduce and recycle household wastes. Many governments in the Asia-Pacific region have also been trying to reduce traffic congestion and resultant CO<sub>2</sub> emission by building mass rapid transit system such as subways and overhead monorails. City centre traffic control scheme as introduced by Singapore and the “stop the engine-idling” at the cross roads widely practiced in Japan are being replicated by other metropolitan authorities in the Asia-Pacific region.

9) In response to the installation of the CMR system in the Asia-Pacific region, the role of MNCs is steadily expanding, contributing to more rapid development of EI in technology, equipment and products, and environmental management systems in all the four selected Asian countries. While EI development is rather slow in Indonesia, increased private sector participation in environmental management has been observed and is further anticipated, especially in China, India and ROK, utilizing an integrated project management approach. This approach integrates engineering, procurement, construction and operation (financing in some instances) and results in Build-Own-Operate (BOO) and/or Build-Own-Operate and Transfer (BOT) projects.

10) Japan, U.S., and Germany are the three major bilateral donors, contributing to the development of EI in these four selected Asian countries through their bilateral ODA programs as well as through their respective MNCs. Canada, France and the UK are also making significant contribution.

11) Filling in gaps in the regulatory frameworks and performance-based standards and streamlining/consolidating the administrative/institutional arrangements, while being

steadily improved in China and ROK, will result in more effective monitoring and compliance in all these Asian countries, particularly in India and Indonesia, with regulatory requirements, norms and standards, especially in the rural areas and remote provinces where they are now lagging behind. It will also create more efficient conditions for MNCs and national companies to enter the growing EI market in these countries and elsewhere.

12) Small and medium size enterprises in the Asia-Pacific region require special attention since they are significant contributors to industrial pollution and the future growth of EI through their subcontracting activities in both software and hardware production as well. Three million SMEs in India, for example, generate about 40 percent of the national GDP and account for 60 percent of all industrial pollution, and so with SMEs in China, Indonesia and ROK.

13) China and ROK, having already adopted the Euro I standard, are likely together with India<sup>1</sup> to adopt the Euro II standard for emissions before the 2008 Olympics in Beijing and at the same time to expand substantially the fleet of buses and taxis fueled by compressed liquid gas and fuel cells, as the latter technologies should become more widely available and accessible at lesser cost in the near future. Here again, the introduction of more economic and fiscal incentives and wider use of them by national enterprises and MNCs is anticipated as the use of command and control systems declines.

14) Greater availability of environmental soft loans such as the ASEAN-Japan Development Fund (AJDF) operated through its Japan Bank for International Cooperation (formerly, Overseas Economic Cooperation Fund) for Pollution Abatement Equipment (JBIC-PAE) in Indonesia and of the Private-Public Partnership (PPP) of the German government to encourage private sector participation in EI in China are expected to expand throughout the Asia-Pacific region where suitable conditions already exist or will be created in the future. Recent European legislation that encourages Pension Funds to invest in EI and the growth of various ECO-funds in all developed countries targeting their loan and equity investment at environmentally sustainable projects and corporations are also expected to contribute to this effort.

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<sup>1</sup> India may adopt in some major cities the EURO II standard by 2005

## **B. Recommendations\***

To National governments in the Asia-Pacific region, especially in China, India, Indonesia and the Republic of Korea

- 1) Streamline and perfect the regulatory framework and standards with improved environmental management instruments and target inspections and audits on potential trouble spots and worst offenders.
- 2) Reduce the multiplicity of agencies and bureaucratic levels involved in the approval/licensing of EI initiatives and in administering and monitoring compliance with standards and regulations – “One Stop Shop.”
- 3) Reduce dependence on command and control mechanisms and increase reliance on market-driven and “bottom line” business incentives and performance.
- 4) Improve compliance and monitoring in rural areas and increase automation and related telemetering systems for monitoring in urban and metropolitan areas as well as more widely.
- 5) Expand institutional capacity and the size of qualified personnel to monitor compliance, which will require increased budgetary allocations.
- 6) Strengthen public and private R&D about environmental technology and products, and motivate MNCs to participate in this endeavor. R&D in China, India, and ROK may also include developing a hydrogen energy economy and fuel cell production for the energy (stationary fuel-cells) and transportation sectors.
- 7) Simplify and expand economic and fiscal incentives and their transparency, and make them more user friendly to small and medium size enterprises.

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\*The recommendations listed below require immediate action. However, some such as R&D, capacity development, and establishment of credible databases and information systems will require longer timeframes.

8) Develop capacity to access and use effectively the opportunities provided by the Clean Development Mechanism – “One Stop Shop.”

9) Expand availability of and access to information about EI through credible and user-friendly databases and information systems, which may also include sub regional and regional action.

To Bilateral and Multilateral Donors and MNCs operating in and concerned with EI development in the Asia-Pacific region:

1) Substantially increase the participation by private sector in EI, including that which is financed by international organisations, especially IFC and GEF.

2) Expand availability and access to soft loan financing and grants for EI by Japan and other bilateral donors as well as the World Bank and the Asian Development Bank.

3) Promote international environmental standards for major industrial sectors and corporate environmental management systems for MNCs, which should be applicable to all private sector corporations operating not only in the Asia-Pacific region but also outside this region. IGES concerned with environmental sustainability particularly in the Asia-Pacific region could expand its research activities on environmental industry development and corporate environmental management to provide such services regionally in collaboration with national research centres in various countries of the Asia-Pacific region.

4) Establish a clearing-house either regionally or globally for environmental technology and services that is readily accessible and user friendly to public and private sectors in the Asia-Pacific region. IGES concerned with environmental sustainability particularly in the Asia-Pacific region could expand its current activities on information and capacity building to provide such services regionally in collaboration with national research centres in various countries of the Asia-Pacific region.



5) Expand ratings of MNCs and national companies about their sustainability performance (environmental and social responsibility) already provided by services such as Innovest and Dow Jones. IGES could expand its research activities on corporate environmental management to provide such services regionally in collaboration with national research centres in various countries of the Asia-Pacific region.

6) Standardize consistent and comparable internal reporting by MNCs and national corporations about their sustainability performance, as about fifty members of the World Business Council for Sustainable Development (WBCSD) is already doing it. IGES could expand its research activities on corporate environmental reporting to provide such services regionally in collaboration with national research centres in various countries of the Asia-Pacific region.

7) The current arrangement of the Tripartite Roundtable Meeting on Environmental Industry organized by China, Japan and ROK could be expanded, with a view to accelerating the development of environmental industry in the Asia-Pacific region, to include the participation of other interested countries of this region under the auspices of the ECO-ASIA or other similar arrangements already present. The agenda of such expanded Roundtable Meeting could include among others the specification of regional environmental industry standards including technical and management standards, further exploration into effective national and regional financial mechanisms to facilitate environmental industry development including R & D in environmental technology, and better utilization and, if necessary, expansion of the existing national and regional institutions for human resources development specialized in various disciplines for environmental sustainability.

