



APFED Policy Dialogue Working Paper Series No. 2



## **3Rs in Asia**



**April 2006**

**Institute for Global Environmental Strategies (IGES)**

## **APFED Policy Dialogue**

As economic activities intensify, their impacts on the environment have been being multiplied in an accelerated pace. The challenges in promoting effective environmental management and achieving sustainable development thus have become increasingly complex and in need of enlarged multi-faceted actions.

The Asia – Pacific Forum for Environment and Development (APFED) launched in its second phase multi-stakeholder policy dialogues as a part of its main activities in response to the APFED phase one recommendations contained in the APFED Final Report of 2004. The APFED policy dialogue is intended to promote mutual understanding of policy challenges on major environmental and sustainable development issues, forge consensus building and foster partnership development with a view to facilitating the development and implementation of enabling policies for promoting effective environmental management and achieving sustainable development in Asia and the Pacific.

The APFED Policy Dialogue Series is aimed to provide the outcome of the APFED Policy Dialogue and related background documents for supporting the relevant policy processes and pursuing common policy goals in collaboration with a wide range of stakeholders and partners.

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*3Rs in Asia*

*Institute for Global Environmental Strategies*

*2108-11, Kamiyamaguchi, Hayama, Kanagawa 240-0115 Japan*

*April 2006*

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**APFED Expert Meeting on the 3Rs in Asia**  
**March 5, 2006**  
**Tokyo, Japan**

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**Co-chairs' Summary**

APFED Expert Meeting on the 3Rs in Asia was held in Tokyo, Japan on March 5, 2006 with a view to promoting multi-stakeholder policy dialogue on the 3Rs and providing useful inputs for the Senior Officials' Meeting on the 3Rs to be held in Tokyo from March 6 – 8, 2006.

Aside from the selected APFED (Asia Pacific Forum for Environment and Development) members, the meeting was attended by 40 experts and representatives including those from national governments, research institutes, private sector, NGOs and international organizations.

Four co-chairs were elected for the meeting, namely, Prof. Dr. Kim Myung-ja, former Environment Minister of the Republic of Korea, Dr. Tongroj Onchan, President of the Mekong Environment and Resources Institute, Dr. Cielito Habito, Professor and Director of the Ateneo Center for Economic Research and Development of the Philippines, and Professor Itaru Yasui, Vice Rector of the United Nations University. They facilitated the discussions based on the presentations made by the participants as outlined in the Meeting program (Annex 1).

This Co-chairs' Summary is intended to reflect the thrust of discussions highlighting key issues, finding and recommendations that emerged at the Meeting.

**1. 3R Initiative Implementation in Asia and the Pacific**

A number of driving forces compel countries to reduce waste and promote the 3Rs, including the increasing cost of waste disposal, limited space for landfills, a need to reduce dioxin emissions and greenhouse gases, and enhanced public awareness. The policies for promoting the 3Rs or the circular economy will become increasingly important as countries expand their economies.

While waste generation is still on the rise in many countries, some of them have succeeded in reversing the increase in waste generation and raising the recycling ratio by identifying the convergence of economic and environmental benefits. Wastes range widely from country to country and span the entire spectrum from containers and packages, electronic appliances, construction materials, food wastes, end-of-life vehicles, clinical wastes, and agricultural wastes. National strategies, policy instruments, and pilot programmes have in some countries shown positive effects.

**Policy measures**

- (1) Basic laws, action plans, and master plans for promoting the 3Rs,
- (2) Sector-specific regulatory measures (laws for recycling various categories of products, hazardous substance control, dumping prohibitions and landfill controls),
- (3) Laws on green purchasing,
- (4) Decentralization of waste management and 3R promotion,
- (5) Initiatives by local authorities, including community-based initiatives,
- (6) Promotion of EPR (Extended producer responsibility),
- (7) City planning for a circular society (e.g., eco-towns, eco-industrial parks, craft villages),

**Institutional arrangements**

- (8) Institutional capacity development of governmental agencies and non-governmental/civil society organizations,

- (9) Inter-agency collaboration (horizontally or vertically, especially between the Ministry of the Environment and other ministries),

### **Market-based measures**

- (10) Waste disposal charges and collection fees, whether paid at time of purchase or at time of disposal,
- (11) Deposit and refund schemes,
- (12) Privatization of the waste management and recycling sectors,
- (13) Programs for promoting sound waste management and disposal,

### **Voluntary actions**

- (14) Voluntary agreements and initiatives of producers and users for promoting the 3Rs (Design for Environment/Recycling, product certificates, and other collaboration),
- (15) Rating/labelling corporations based on level of compliance with waste management, environmental standards, and support for recycling,
- (16) Centralized composting systems,
- (17) Promotion of green supply chains and compliance with regulations governing export markets, such as those of the European Union,

### **Partnership building and stakeholder involvement**

- (18) Public-private partnership on 3Rs,
- (19) Sharing information on good practices,
- (20) Award programs for good practices,
- (21) Awareness raising and education programs (national recycling day and school/public education), and
- (22) Dialogue and networking forums for multi-stakeholders.

In promoting 3R implementation and sound waste/material management, there are various challenges that exist in many countries, including:

- (1) Mainstreaming the 3Rs in development policy,
- (2) Policy coherence (incineration vs. atmospheric pollutant emission controls),
- (3) Phasing out unsustainable schemes,
- (4) Enhancing institutional and community capacities for segregating waste and recyclables
- (5) Cost/burden sharing by producers and consumers (EPR vs. treatment and disposal charges to be paid by consumers),
- (6) Monitoring capacity and data availability,
- (7) Accessing information on 3R issues,
- (8) Securing human resources such as those in public administration and recycling/e-waste management sectors,
- (9) Financing mechanisms and financial resources,
- (10) Reducing public reluctance to purchase recycled or reused goods, and
- (11) Enhancing understanding on the internalization of environmental costs.

## **2. International Cooperation for Promoting the 3Rs in Asia**

Various international agencies and bodies have been supporting programs and activities conducive to promoting the 3Rs.

### **Secretariat of the Basel Convention**

The Basel Convention contributes to the promotion of the 3Rs through application of

environmentally-sound management of hazardous and other wastes. International cooperation for promoting the 3Rs in Asia under the Basel Convention is implemented by partnership programs focusing on integrated management and the life-cycle approach. A number of initiatives now undertaken to promote environmentally sound management of hazardous wastes in Asia include (1) 2005-2006 Global Partnership Programme on e-Waste, (2) Partnership Programme on Environmentally Sound Management of Electronic and Electrical Wastes in Asia and the Pacific, and (3) Mobile Phone Partnership Initiative.

### **UNEP**

The United Nations Environment Programme (UNEP), in close collaboration with other partners, promotes various initiatives relevant to the 3Rs including, for instance, the organization of sub-regional policy dialogues, the development of sub-regional/national strategies and information management and sharing systems.

### **UNCRD**

The United Nations Centre for Regional Development (UNCRD) plans to enhance its 3R-related portfolio by assisting selected countries in the region to develop national strategies, and to implement pilot projects in collaboration with national and international partners.

### **ESCAP**

The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) promotes Green Growth aiming at, *inter alia*, the improvement of *in* order to improve eco-efficiency of economic development patterns. ESCAP conducts and promotes (1) analytical work on consumption patterns, and (2) regional policy dialogue, (3) the Seoul Initiative for Green Growth, and (4) the Kitakyushu Initiative for a Clean Environment.

### **ADB**

Among other initiatives, the Asian Development Bank (ADB) supports dialogues, a knowledge hub, pilot project on the 3Rs, and environment investment for projects such as, urban solid waste management including sanitary landfills, cleaner production, efficient water management, energy efficiency and CDM enabling the generation of carbon credits.

## **3. Promoting the 3Rs in Asia**

A number of recommendations have been made to promote 3R implementation in Asia, including:

### **Policy measures**

- (1) Mainstreaming 3R policies and integrated and life-cycle approaches through relevant policy development, adoption, information sharing, and fiscal support,
- (2) Establishing concrete numerical targets, for instance, on the improvement of recycling ratios,
- (3) Developing 3R policies capitalizing on comparative advantages among countries/communities (e.g., technological capacity, labor availability, access to markets),
- (4) Addressing both downstream waste management and upstream cleaner production, taking into account comprehensive material flows,
- (5) Linking the 3Rs to poverty reduction/alternative livelihood development,

### **Institutional arrangements**

- (6) Strengthening institutional capacities for 3R implementation including those for monitoring, data collection and assessment,
- (7) Promoting decentralization,
- (8) Coordinating policies both horizontally (e.g., between the ministries in charge of environmental and industrial policies) and vertically,

### **Market-based measures**

- (9) Cultivating the perception of 3R-related business practices as business opportunities,
- (10) Promoting economic instruments (fees, surcharges, carbon credits, etc.) more widely and more effectively,
- (11) Optimizing the level of charges to be levied on consumers for waste disposal/recyclables
- (12) Developing mechanisms suitable to the socio-economic conditions particular to countries and communities (e.g., prior payment of cost of treatment and disposal vs. end-of-life payment),
- (13) Integrating the informal sector into recycling systems,
- (14) Creating policy frameworks which enable emerging recycling/eco-business,
- (15) Making currently unmarketable wastes into marketable ones through the remediation of market deficiencies and treatment capacity insufficiencies

### **Research and technology development**

- (16) Bolstering research and development on policies, field implementation and technological application for promoting the 3Rs,

### **Partnership building and stakeholder involvement**

- (17) Promoting holistic viewpoints and integrated approaches among stakeholders with interest in particular aspects of 3R-related issues (e.g., waste reduction, reuse of materials, environmental education, community development) by identifying mutual benefits (benefits for local communities, the global environment, and the private sector),
- (18) Facilitating access to information on the 3Rs,
- (19) Bolstering human resource development,
- (20) Linking community development with the support of local communities and stakeholders,

### **International collaboration**

- (21) Developing a guideline for the Asia region that promotes the harmonization of waste and recyclables categorization and procedures for trading/treatment,
- (22) Establishing a regional market for recyclables, including hazardous wastes, with transparency and traceability,
- (23) Promoting public-private, civil society, and other partnerships internationally,
- (24) Fostering 3R-related collaboration between exporting and importing countries, including in free trade agreements (FTAs),
- (25) Facilitating the exchange of information and experiences among stakeholders at the regional and international levels, with knowledge hubs supporting dissemination of information including the outcome of research, and
- (26) Promoting MEA implementation to facilitate policy processes on environmentally-sound waste/material management, information disclosure, policy harmonization, and capacity development.

**ASIA-PACIFIC FORUM FOR ENVIRONMENT AND DEVELOPMENT (Second Phase)**

**Expert Meeting on the 3Rs in Asia**

**5 March 2006**

**Tokyo, Japan**

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**Background Document for the APFED Expert Meeting on the 3Rs in Asia<sup>1</sup>**

**1. Introduction**

The mass production, mass consumption, and mass waste generation that became prevalent in 20<sup>th</sup> Century contributed to the material improvement of the people's livelihood. Yet, the increase in resource use and waste generation, that are the other half of the material improvement, has exacerbated the environment and ecosystem balance around the world. The Johannesburg Plan of Action in Paragraph 22 called for greater efforts to be made toward waste reduction, reuse and recycling through multi-stakeholder partnership. It highlighted in Paragraph 22(a) the importance of encouraging small-scale waste-recycling initiatives and the production of reusable consumer goods and biodegradable products.

Policies that advocated resource-use efficiency and recycling have emerged as the so-called the "3R Initiative" that was endorsed at the G8 Summit held at Sea Island, U.S.A in June 2004. The 3R initiative is to promote the idea of "reduce, reuse, and recycle" for materials across different sectors. The 3R Initiative was launched as an international programme at the Ministerial Conference on the 3R Initiative held in Tokyo in April 2005. The G8 leaders noted in the Gleneagles Plan of Action (adopted in Gleneagles, UK in July 2005,) that the 3R Initiative was launched as an important step towards encouraging the more efficient use of resources and materials, which increases economic competitiveness whilst decreasing environmental impacts.

The Asia-Pacific Forum for Environment and Development (APFED)<sup>2</sup> (established with 26 members from the region in 2001,) adopted the Final Report in December 2004 that set out various policy recommendations. The Final Report states, the "reduction, reuse and recycling (3Rs) of waste, in particular at the source, are critical elements of urban solid waste management." The Final Report advocated exploring and implementing the concept of a "resource circulating society" that would have a potential to achieve higher resource-use efficiency through reducing the demand for raw materials and energy sources and minimizing waste generation. The Final Report also stated that "extended producer responsibility (EPR)" should be understood as the basic principle for promoting 3Rs while noting the protracted introduction of EPR policies in the region.

The environmental ministers of the region reiterated, (in the Ministerial Declaration adopted at the Ministerial Conference on Environment and Development in Asia and the Pacific in Seoul, Republic of Korea in March 2005,) the importance of the 3R Initiative stating, "we seek to improve environmental sustainability while addressing poverty by reducing the pressure of unsustainable economic growth on the environment by, among others, promoting 3Rs, that is, waste reduction, reuse and recycling of material and

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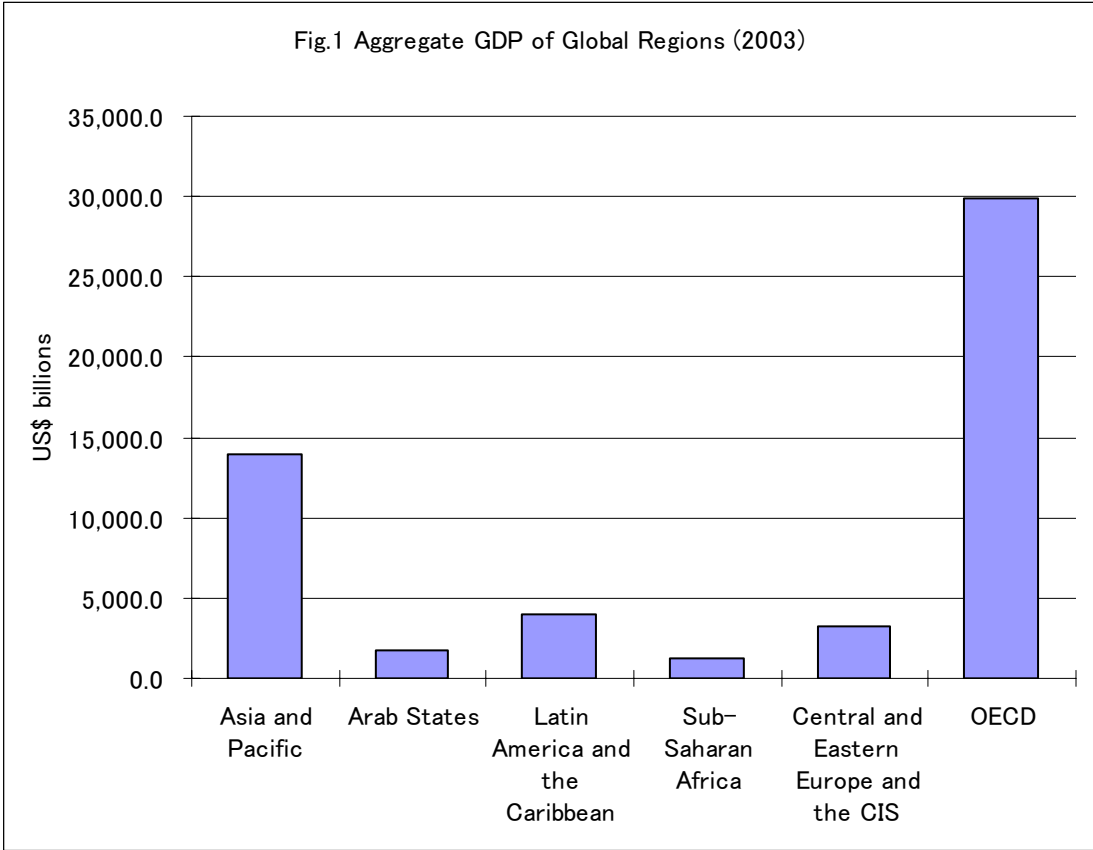
<sup>1</sup> This background document was prepared by a team of Mr. Hideyuki Mori, Project Leader, Mr. Masanori Kobayashi, Senior Policy Researcher, Mr. Toru Hashi, Senior Policy Researcher, Dr. Daisuke Sano, Policy Researcher, and Dr. Yasuhiko Hotta, Researcher of Long-term Perspective and Policy Integration, Institute for Global Environmental Strategies (IGES).

<sup>2</sup> The APFED was chaired by Mr. Ryutaro Hashimoto, former Prime Minister of Japan during the First Phase from 2001 – 2005. APFED entered the second phase in mid-2005 and its first meeting held in November 2005 was chaired by Ms. Yoriko Kawaguchi, former Foreign and Environment Minister of Japan.

products in production and consumption, in order to minimize natural resource consumption as well as waste and pollutant generation.”

Prof. Wangari Maathai, 2004 Nobel Laureate and Assistant Minister for Environment, Natural Resources and Wildlife of Kenya started promoting the “Mottainai” Campaign in February 2005. “Mottainai” is a Japanese phrase which means “what a waste!” Mottainai captures the concept of the 3Rs and Prof. Maathai calls for world-wide support for the Mottainai Campaign at various occasions including the commemoration of the International Women’s Day held in New York on 4 March 2005.

Developing Asia shares 26 per cent of the world GDP. With the inclusion of 4 OECD countries in Asia and the Pacific, Asia shares 35 per cent of the world GDP. The percentage will be a few points higher with the inclusion of the Central Asian countries. As Asia is estimated to continue to achieve the highest economic growth rate in the world, its significance to the global economy outweighs that of other global regions. Asia’s population accounts for approximately half of the world total, and will remain to do so over the next few decades. Therefore, the sustainable economic development of the region remains critical to the state of the global economy and environment.



Source: UNDP (2005)

Note: Central Asia is included in the CIS in this statistics.

In light of the importance attached to the promotion of 3R Initiative implementation, particularly in Asia and the Pacific, it is proposed to convene the APFED Policy Dialogue on the 3Rs on 5 March 2006 in Tokyo, Japan in conjunction with the 3R Senior Official Meeting (SOM) scheduled to take place thereafter from 6-8 March 2006. The APFED Second Phase (APFED II) has a component of policy dialogue that



facilitates multi-stakeholder dialogue on policy issues vital to promoting sustainable development and effective environmental management. The 3R SOM is aimed at discussing measures for promoting world-wide 3R implementation as a follow-up to the 2005 3R Ministerial Conference. The APFED Policy Dialogue on the 3Rs is, therefore, intended to promote the exchange of information and views with respect to the advancement of 3R Initiative implementation in the region, and to provide a useful contribution to the following SOM.

## 2. Conceptual Framework of the 3Rs

The key outline of the 3R Initiative was set out by the 3R Action Plan adopted at the 2004 G8 Sea Island Summit that was mentioned in the previous section. It consists of 5 key elements as summarized in Box 1 below.

The definition of recyclable resources and wastes vary substantially between various countries. Some countries import plastics and metals that are disposed in the other countries. Some countries restrict second hand automobiles, for instance, on the ground of environmental consideration. Many countries regard remanufactured products as valuable materials and non-wastes although their tariff classification differs between some countries.

### **Box 1: Reduce, Reuse, and Recycle Initiative**

We will launch the Reduce, Reuse, and Recycle (“3R”) Initiative at a Ministerial Conference in spring 2005 hosted by the Government of Japan. In cooperation with relevant international organisations such as the OECD, we will seek through this initiative to:

- Reduce waste, Reuse and Recycle resources and products to the extent economically feasible;
- Reduce barriers to the international flow of goods and materials for recycling and remanufacturing, recycled and remanufactured products, and cleaner, more efficient technologies, consistent with existing environmental and trade obligations and frameworks;
- Encourage cooperation among various stakeholders (central governments, local governments, the private sector, NGOs and communities), including voluntary and market-based activities;
- Promote science and technology suitable for the 3Rs; and
- Cooperate with developing countries in such areas as capacity building, raising public awareness, human resources development and the implementation of recycling projects.

Source: G8 Action Plan on Science and Technology for Sustainable Development: 3R Action Plan and the Progress of its Implementation (Excerpt), 10 June 2004

Fig.2 illustrates in a simple manner the scope of waste and non-waste. The figure also raises the issue of hazardous and non-hazardous wastes. The Basel Convention (on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, adopted in 1989 and entered into force in 1992) regulates the movement of hazardous wastes. The extent of the Convention implementation and compliance by different countries need to be examined.

Fig.3 shows the major trade flows of e-waste that involve Asian recycling sites and ports. The e-waste flows into Asian cities from other Asian cities as well as Europe and North America.



### 3. 3R Initiative Implementation in Asia and the Pacific

#### (1) 3R Initiative implementation in Asia and the Pacific

Some countries have adopted and are implementing policy and legislative measures for promoting 3R initiatives with the specific target of reducing waste and achieving recycling rates. Japan, Singapore and Thailand are among those countries that have set out numerical targets for waste reduction and recycling promotion in the timeframe up to 2009 - 2012. Others have yet to follow suit.

Policy measures and activities promoted by governments and NGOs include eco-labeling, green purchasing, public awareness raising and environmental education.

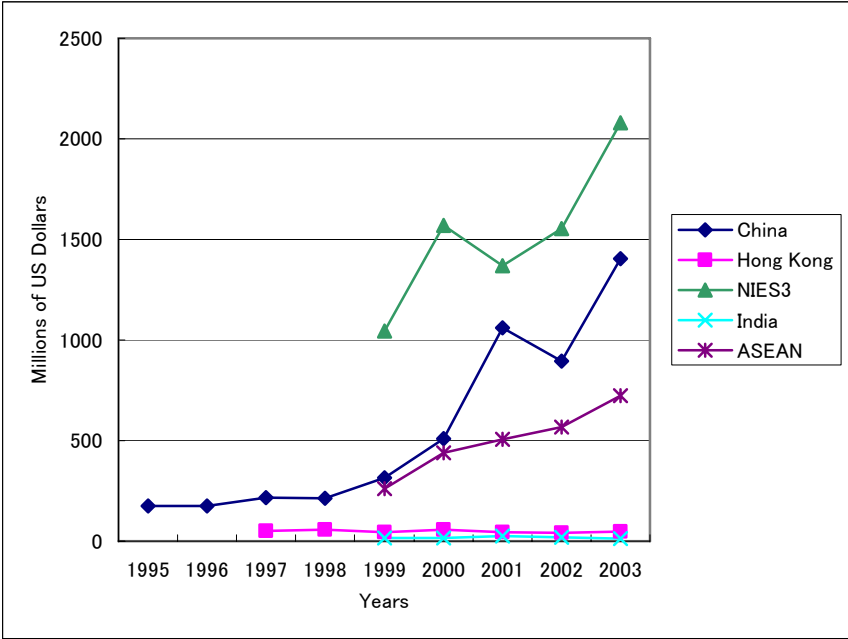
The following types of wastes are considered as important in promoting 3R initiatives:

- (i) Organic waste: many countries rely on conventional measures of incineration and landfill for organic waste disposal; composting and methane fermentation have started being practiced in some countries.
- (ii) Medical waste: it is still common for medical waste to be disposed without any treatment such as incineration or autoclaving; the disposal of untreated medical waste causes a risk of infectious disease outbreak or soil/water contamination.
- (iii) Waste electrical and electronic equipment (WEEE): WEEE is traded between countries as WEEE is considered a recyclable material. On the other hand, WEEE, in most of cases, contains hazardous materials and requires disposal systems to avoid a risk of environmental pollution.
- (iv) End-of-life vehicles: Like WEEE, end-of-life vehicles contain hazardous materials that require disposable systems to contain a risk of environmental pollution.

In order to promote 3R Initiative implementation particularly in Asia and the Pacific, the following measures are suggested:

- (i) Legislative measures and policy target setting,
  - (ii) Creating enabling policy environment and institutional frameworks through, for instance:
    - Reinforcing or establishing financing mechanisms favorable to the facilitation of 3R Initiative implementation,
    - Raising public awareness,
    - Facilitating information exchange and provision,
    - Promoting capacity development such as human resource and institutional strengthening,
    - Innovative measures for offsetting the cost for internalizing the externalities of the 3R implementation.
  - (iii) Forging environmentally sound waste management and its convergence with the 3Rs
- (2) Promotion of the 3Rs at the regional and international levels

As the economies become interwoven across borders through the globalization process, the international movement of recyclable materials and wastes are being intensified. Fig.4 shows, for instance, the import volume of iron/steel waste in Asia. The aggregate volume of ferrous waste of the NIES3 (the Republic of Korea, Singapore and Taiwan Province of China) has exceeded US\$2 billion in 2003. The ferrous waste import of China alone was already close to US\$1.5 billion. The aggregate ferrous waste import of ASEAN countries is about US\$700 million. In general, there is an acute trend that the major developing economies in Asia have been increasing the ferrous waste import to meet the demand of metal. Similar trends are also found in the trade patterns of plastic, paper and clothes waste.



**Fig.4: Import Volume of Ferrous Waste, Scrap and Remelted Scrap Ingots**

Source: World Trade Atlas and Hashi et al. (2005)

(Note: NIEs3 are the Republic of Korea, Singapore and Taiwan Province of China; the classification of the countries and provinces in this figure follows what is presented in the data source for statistical purposes.)

Developed countries have substantive interests in lowering tariffs and non-tariff barriers on the trade of recyclable materials. The liberalizing trade of recyclable materials is believed to contribute to the promotion of the 3Rs. The trade liberalization of recyclable materials is a part of the WTO Doha Mandate for further negotiations.

While some developing countries have interests in importing recyclable materials to meet increasing demand for raw materials at inexpensive cost, the view prevails in many developing countries that the reduction of trade barriers on the trade of recyclable material will lead to the increase in import of waste and will turn their countries into waste dumping sites for developed countries.

It is proposed to ban the export of hazardous wastes for final disposal from developed countries to developing countries, as set out in the 1995 Ban Amendment to the Basel Convention. However, the Amendment has not yet entered into force as described in Box 2 below.

### **Box 2: The Basel Ban**

At the Second Meeting of the Conference of the Parties (COP-2) to the Basel Convention in March 1994, Parties agreed to an immediate ban on the export from OECD to non-OECD countries of hazardous wastes intended for final disposal. They also agreed to ban, by 31 December 1997, the export of waste intended for recovery and recycling (Decision II/12). However, because Decision II/12 was not incorporated in the text of the Convention itself, the question arose as to whether it was legally binding or not. Therefore, at COP-3 in 1995, it was proposed that the Ban be formally incorporated into the Basel Convention as an amendment (Decision III/1). As of January 2006, 61 countries have ratified the Amendment. The number of ratifications still falls short for the Amendment to enter into force.

Source: Secretariat of the Basel Convention (March 2006)

A number of points are suggested for future actions to promote and effectively manage the international trade of recyclable materials through various measures including such as:

- (i) Reinforcing the compliance of a basic principle that waste shall be managed in the generating countries; necessary policy measures should be undertaken such as capacity development, recycle industry sector development, economic instrument development and application, and regional and international cooperation,
- (ii) Promoting the application of the extended producer responsibility (EPR),
- (iii) Introducing tracing and certification systems for recyclable materials,
- (iv) Raising the level of compliance with the Basel Convention.

### (3) International Cooperation for Promoting the 3Rs

The 3R projects in developing countries have been introduced in cooperation with various international organizations such as UN agencies, and bilateral and multilateral organizations. Assistance is provided for supporting the establishment of legal frameworks and national strategies, and the installation of an infrastructure and technologies for cleaner production at factory and plant levels.

In order to enhance the capacity of developing countries to promote the 3Rs, the principle of “country-driven” and “issue-specific” is highlighted. In the process of promoting international cooperation on 3Rs, the following three points are identified as important components:

- (i) Collection and dissemination of good practices  
There is a tendency put emphasis on waste management rather than reducing waste and recycling materials. The effectiveness of the 3Rs in waste management and resource recycling needs to be illustrated by documents and demonstrated in statistics to raise public awareness and promote information exchange. Education on the 3Rs in schools is suggested.
- (ii) Supporting the establishment of legal frameworks and strategies  
In order to reinforce a comprehensive and holistic approach, supporting the establishment of legal frameworks, national strategies and policies for 3R implementation is suggested.
- (iii) Pilot project implementation  
Pilot project development and implementation are also deemed useful to promote the 3Rs as a part of international technical assistance programmes. It is suggested that the following elements are addressed in such pilot projects:
  - Providing economic incentives to attain dual gains of environmental and economic benefits,
  - Promoting the transfer of clean technologies,

- Establishing/reinforcing an information clearing house that disseminates information of recycling and eco-labeling,
- Promoting composting through public participation,
- Improving the management of medical waste and hazardous materials such as heavy metals,
- Promoting the traceability of wastes and recyclable materials, and
- Supporting training on the management of trade, transportation, storage, and handling of wastes and recyclable materials.

The lessons learned (including unsuccessful cases) should be distributed as an important part of information sharing in order to highlight precautions.

Economic development, environmental protection and social equity form an important basis for developing international cooperation programmes. Policies for alleviating poverty converge with the 3R Initiative, which is in part expected to acknowledge the role of the informal sector and develop a legitimate business model for promoting the collection and recycling of materials through multi-stakeholder involvement.

The management of the legitimate trade of recyclable materials needs to be strengthened to ensure compliance with national legislation and international agreements to promote the legitimate trade of recyclable materials and to enforce the ban on the illegal trade of such materials (including those that contain hazardous wastes and materials detrimental to the environment.) Assistance for capacity development in this respect is suggested.

#### (4) Multi-stakeholder cooperation

The central government authorities are expected to take initiatives in setting goals and formulating policies. It is noted that making the 3R recognized as a priority issue is still challenging in many developing countries.

Provincial governments can facilitate activities to support the formulation of a cyclical society through involving recycling industries and bolstering recycle markets with green purchasing. The expansion of the recycling market can offer additional employment and income generating opportunities for local communities with the proper labor and employment standards, which are not guaranteed in the informal sectors.

The private sector can promote the 3Rs through promoting the extended producers responsibility (EPR), particularly technological development, investment, and product information disclosure. The industry can also take the initiative of promoting the ERP, thereby physically or financially recycling the products. Undertakings such as eco-industrial parks and zero-waste/zero-emission factories are observed in developed countries. In Japan, “eco-towns” are promoted to improve environmental efficiency in cooperation with various industries.

Local communities and NGOs can undertake 3R activities and participate in policy dialogue. NGOs can play a role in raising public awareness, and monitoring actions and their progress. Waste and recycling systems vary between urban cities and rural areas, and the characteristics of cities and communities need to be well noted in developing 3R activities.

Environmental education and the disclosure of environmental information are essential to develop capacity in each sector and promote inter-sectoral collaboration. The supporting activities in this respect include the disclosure of information on polluters, technology development, and eco-labeling.

In order to curb the illegal transactions of recyclable materials and wastes, it is essential to promote information sharing and to support the establishment of an information clearing house. The information clearing house can be operated by the government, civil society organizations or their partnership in interaction with the international communities.

#### (5) Technological development

With respect to the technological aspects of the 3Rs, the following are identified as policy challenges:

- (i) Development of clean technology for reducing waste, and recycling and reusing resources,
- (ii) Development of environmentally sound designs conducive to improving resource efficiency (e.g., Design for the Environment),
- (iii) Application of new technologies such as nano-technology and bio-technology,
- (iv) Development of a 3R research network, clean technology centers, exhibition of technology, database of good practices and technologies, and
- (v) Financial incentives for research and development in the 3Rs.

Development of clean technology mentioned above is classified into categories such as basic technologies for each step of the recycling process, applied/combined technologies for treating each type of waste, and the integrated recycling management systems for treating multiple types of waste. To promote 3Rs, the developing countries need technologies for recycling, particularly separating recyclables from wastes. The promotion of technological application should be supported by not only the infrastructure and hardware installation, but also the provision of technical support and operating know-how.

Environmentally sound designs (Design for the Environment – DfE, Design for Recycling – DfR, and Design for Dismantling – DfD) are promoted by the private sector and subject to patent protection. As both developed and developing countries hold common interests in promoting more environmentally sound and cleaner production, a wide ranging partnership is required, involving various partners in different industries, research institutes, universities, and the public sector and also governments. This particularly the case where the costs of R&D and the dissemination of technological applications are estimated to be high. The involvement of small and medium-sized enterprises in such partnerships also remains important.

Appropriate national and international mechanisms are also required to effectively trace the trade and international movement of various recyclable materials through systems such as coding, labeling, and certification.

#### **4. Case Studies – RISPO Good Practices**

There have already been a number of successful undertakings in the area of promoting recycling in Asia and the Pacific. The Institute for the Global Environmental Strategies (IGES), serving as the APFED Secretariat, has undertaken research called “Research on Innovative and Strategic Policy Options (RISPO)” from 2002 – 2004 analyzing concrete policy measures (strategic policy options) and successful practices (good practices) in 8 priority sectors of environmental management, mainly in Asia and the Pacific.

The analysed good practices are currently installed in the IGES/RISPO Database.<sup>3</sup> The RISPO Data Base will be promoted along with another important component of the APFED II activities — the “Knowledge Initiative”— which will be promoted over the coming years.

In the RISPO Data Base, 23 cases are listed in the category of recycle and 38 cases are listed in the category of waste management. It is deemed useful to draw lessons from the analysed good practices both in Asia and the Pacific and other regions under RISPO, as summarised in the Annex II. These are extracts of the analysed good practices. The full texts are available on the afore-mentioned website.

#### **5. Suggested Points of Discussion**

The preceding sections have provided key elements for evaluating the current policies and their impacts, and exploring the desired orientation of future policies with a view to advancing the implementation of the 3R Initiative particularly in Asia and the Pacific. The following is the list of suggested discussion/consideration points.

##### 3R Implementation at the national level

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<sup>3</sup> <http://www.iges.or.jp/APEIS/RISPO/index.html>

- What are the key features for successful 3R implementation?
- What are the effective measures/tools for overcoming prevalent constraints?
- How can extended producer responsibility be better promoted and more widely and effectively implemented?
- How can the nexus of sound environmental waste management and the 3Rs be pursued?
- What kind of frameworks and incentives can be provided to enable multiple stakeholders to be more effectively involved in the advancement of the 3Rs?
- What modalities of partnership can be pursued for effective the development and implementation of 3R initiatives?

### 3R promotion at the regional and international levels

- What are the potential merits and risks involved in the transboundary movement of recyclable resources?
- What policies and measures are required to minimize the risks and maximize the benefits?
- What regional/international mechanisms are required for cooperation?

### International cooperation for promoting the 3Rs

- What is required to enhance the effectiveness of international cooperation for promoting the 3Rs?
- How can the 3R Initiative be linked with other policy goals such as poverty reduction or climate change mitigation?
- How can developed and developing countries collaborate on the trade of recyclable materials?
- What type of assistance can be given to developing countries in improving the treatment of residuals from 3R implementation?

## **6. Notes**

Numerous distinguished speakers will address this Expert Meeting on the 3Rs and interact with APFED members and other participants. The provisional programme is sent to the participants separately and the final programme shall be distributed on the day of the meeting.

It is expected that the participants shall conduct fruitful discussions and generate useful inputs to the following SOM for supporting the development of policies conducive to the advancement of 3Rs.

### **Referred documents**

UNDP. 2005. Human Development Report.

Kojima, M. 2005. Transboundary Movements of Recyclable Resources in Southeast Asia. *International Trade of Recyclable Resources in Asia*. IDE (Institute of Developing Economies) Spot Survey No.29.

UNEP. Vital Graphics: E-waste – the Great E-waste Recycling Circus at <http://www.vitalgraphics.net/waste/download/waste3637.PDF> (Feb. 2006)

Hashi, T and Mori, H. 2005. Networking International Recycling Zones in Asia. IGES Policy Brief No.1.



## Annex I: Status of 3R related Legislations and Policies in Asian countries

	Examples of waste treatment related legislation	Examples of 3Rs-related legislation					Examples of regulations on transboundary movement of recyclable resources	
		Basic Law	Packaging	WEEE	End-of-life vehicle	Others	Waste and recyclable resources	Secondhand goods
<b>China</b>	Sold Waste Law (1995)	Interim Provisions Concerning Certain Questions on the Multipurpose Utilization of Resources (1985), Law on the Promotion of Clean Production (2003) Basic Law on the Promotion of the Development of Circular Economy (to be introduced in 2007)	Provisional Rule for Management of Recycling Packaging Resource (1998)	Under consideration	Under consideration	Administrative Regulation on Scrap Tire Recycle and Utilization(drafting process has started), "China RoHS" (to be introduced in 2006)	Interim Provisions for the Administration of Environmental Protection regarding the Import of Waste Materials(1996)	
<b>India</b>	HW Rules (1989, 2003)							
<b>Indonesia</b>	Government Regulation concerning Hazardous and Toxic Waste Management (1994)						Government Regulation concerning Hazardous and Toxic Waste Management (1994) Decree of Head of Environment Impact Management Agency (1995)	Decision of Minister of Indonesia and Trade (regulation of Import of Used Car and Bus)

<b>Japan</b>	Waste Disposal and Public Cleansing Law (1970)	Basic Law for Establishing the Recycling-Based Society (2000),	Law for Promotion of Sorted Collection and Recycling of Containers and Packaging (1995)	Law for Recycling of Specified Kinds of Home Appliances (1998)	End-of-life Vehicle Recycling Law (2002)	Construction Waste Recycling Law (2000)	Law for the Control of Export		
		Law for the Promotion of Effective Utilities of Resources (1991)					Food Recycling Law (2000)		Import and Others of Specified Hazardous Wastes and Other Wasted (1992)
									Waste Disposal and Public Cleansing Law (1970)
<b>Malaysia</b>	Environmental Quality (Scheduled Wastes) Regulations (1989)						Customs (Prohibition of Export) Order (1998)		
							Customs (Prohibition of Import) Order (1998)		
<b>Philippines</b>	Ecological Solid Waste Management Act (2001)						Toxic Substances and Hazardous and Nuclear Waste Control Act (1990)		
	Toxic Substances and Hazardous and Nuclear Waste Control Act (1990)						Republic Act 4653 (1996)		

<b>Republic of Korea</b>	Waste Management Law (1986)	Act on the Promotion of Saving and Recycling of Resources (1992)	Ordinance on the Standards of Packaging Methods and Material (1993)	Regulation on Home appliances recycling (1993)	Under consideration	Regulation on Food Recycling (2003)	Act Relating to the Transboundary Movement of Waste and its Disposal (1995)	
	Act on the Promotion of Construction Waste Recycling(2003)							
	Act on the Promotion of Green Product Purchase(2004)							
<b>Singapore</b>	Environmental (Public Health) Act (1969)						Hazardous Waste (Control of Export, Import and Transit) Act(1998)	
<b>Thailand</b>	Factory Act(1992)						Hazardous Substance Act (1992)	Regulation to Import Used Electrical Appliances and Electronics Equipments (2003)
<b>Vietnam</b>	Environmental Protection Law (1994)						Decision of Ministry of Science, Technology and Environment (2001)	Decision of Ministry of Science, Technology and Environment (2001)
	Regulation on Hazardous Waste Management(1999)							

Source: developed by information obtained from the corresponding government authorities in each country.

## Annex II

## RISPO Good Practices Selected Cases on Recycle

### (1) Beyond Recycling with Asset Management and De-manufacturing in Sta. Rosa, Laguna, Philippines

#### Background

Technology innovation and fast-changing customer preferences result in the rapid obsolescence of products and equipment, especially electronic products. Most of these are eventually dumped into landfills, incinerated, or exported as hazardous waste. Improper handling of these excess products, recyclable materials, and reusable waste leads to larger than necessary volumes of waste, including hazardous wastes. For electronic-wastes - or e-waste, improper handling also means an increase in the manufacturing of electronic chips, which in itself involves toxic materials and larger numbers of discarded computers, including hazardous cathode ray tubes (CRTs), in the waste stream.

At present, there is no clear understanding as to when an excess electronic product legally becomes a “hazardous waste.” Regulations are unclear, inconsistent or not effectively enforced. The complex supply chain that supports Original Equipment Manufacturers (OEMs) makes the standardization for design, recovery and disposal of electronic components more difficult. Retailers seem to ignore the problem or are just uninformed about it.

#### Objectives

HMR Envirocycle aims to:

- Maximize the economic life of products,
- Divert hazardous waste-bearing products from illegal disposal,
- Establish appropriate work standards for electronics recycling, and
- Establish a network of reliable recycling partners locally and overseas.

#### Activities

Electronic equipment that is too old to be reused or is broken beyond repair can be sent to a capable recycler that specializes in disassembling electronics, salvaging parts, and selling reclaimed materials. This strategy is more environmentally-sound than disposal of complete units, even in a sanitary landfill. Equipment which cannot be reused as a complete system usually contains valuable components that can be disassembled and reused as spares in other equipment or in a production process.

In the Philippines, HMR Envirocycle is the first company to have an e-waste recycling capability that complies with international standards. The method it adopts for recovering components for reuse and for reclaiming precious and base materials from electronic equipment is called de-manufacturing. The process can be pictured as the reverse of a production or assembly process. This operation has been identified both in Europe and North America as the most appropriate way of handling complex and multi-material products, such as electronic equipment.

#### Impacts

Between 70 to 90 percent of the material in scrap computer equipment is potentially recyclable or reusable. Structural components made of metals (including aluminum and steel) and plastic comprise 35 and 23 percent by weight, respectively. In general, the recycling of metals saves 70 to 95 percent of the energy that is normally required in mining raw materials. Recycling of metals can thus be a major contributor to the reduction of global greenhouse gas emissions arising from these processes.

However, in an environmentally-sound asset management plan, reuse, rather than disposal is still the preferable alternative for managing obsolete equipment. Extending a product’s life through reuse can conserve the energy and raw materials used in the manufacture of new products. Thus, reuse reduces the environmental impact associated with the extraction, processing, and transportation of raw materials. It also reduces the amount of hazardous substances that may enter the environment through disposal.

#### Lessons learned

Although HMR Envirocycle’s asset management strategy, with its reverse logistics or de-manufacturing services, has achieved some measure of success, better take-back and collection strategies still remain to be developed for the electronics recycling industry to thrive. Large quantities of e-waste and allied products still remain unavailable from corporate end-users, scrap dealers and dumpsites. The majority of the public, including business companies, are still uninformed about the issues and the economic returns from e-waste.

There are still not enough manufacturers of electronic equipment who have adopted take-back programs, which could demonstrate proper product stewardship. It seems that these original equipment manufacturers – OEMs- would rather

market new and better computer products rather than promote reuse of their old products. And when any of these OEMs do have take-back programs, it is still not clear what happens to the old products they take back.

Collection and drop-off sites for e-waste have yet to be established. Public awareness campaigns, that aim to inform the public on the environmental impacts of e-waste and other types of waste or the availability of a recycler that can handle e-waste, are still minimal. The Philippine Business for the Environment (PBE) has started to include e-waste recycling in its Integrated Waste Exchange Program (IWEP) program but its resources for promotion are limited.

## (2) Material Exchange Center (MEC) in Bangkok, Thailand

### Background

The Energy, Industry and Environment Program of the Thailand Environment Institute established the Material Exchange Center (MEC) in 2001. MEC receives its budget from the Energy Policy and Planning Office (EPPO), Ministry of Energy, Royal Thai Government. MEC serves as a neutral body in coordinating the needs of factories or companies that have waste or discarded recyclable materials and those in need of the materials. In addition, MEC acts as a main focal point for spreading waste recycling information and transferring waste recycling technologies to factories and other interested parties. The activities of MEC are anticipated to promote waste reduction and reduce wasteful and inefficient energy consumption while carefully managing natural resources and sustainable development.

There are 601 members and 787 users in MEC while material exchange activities continue to grow, with 148 members registered. The exchanged recycled materials at MEC are of several types, including used oil, powdered steel, rubber, plastic, chemical waste, foam and leather.

### Objectives

- (i) The MEC serves as a link between producers or companies that have materials available and those that are in need of such materials. MEC assists factories in reducing energy needed during the manufacturing processes and waste disposal costs by providing a forum for the exchange of energy efficient technologies and discarded materials, a concept that helps businesses and companies transform energy and waste disposal costs into profits.
- (ii) Providing information for factories or companies that have materials available and for those in need of such materials.
- (iii) Spreading suitable energy efficient waste recycling and waste management technologies to industries, companies or other interested parties.
- (iv) Providing and organizing training programs on pollution prevention.

### Activities

MEC focuses its activities to provide free consultation and recommendation services, and connect reliable advisors or experts in many fields, for example, waste recycling, health and safety, structural engineering, and environmental law, etc. As mentioned above, MEC activities are driven by a moral obligation to benefit society and also to significantly reduce the large amount of waste which is generated.

The services provided by MEC are described below.

- (i) For Members: MEC will (a) distribute information concerning environmental management and recycling to factories, companies and those who are interested in applying for membership, and (b) emphasize the dissemination of the center's activities to encourage its members to become a "USER" of the center.

For Users: All listings of users and information concerning users are confidential. MEC will not release any company names, location/address, production information, or types of waste available. MEC will consider a company's profile and other information concerning the types of waste or discarded materials being made available before it recommends a suitable customer(s).

### Impacts

#### (i) Economic:

- Reduce disposal costs: MEC activities have helped reduce the majority of waste, providing reuse and recycling, lessening the government task in disposal, using less area for landfill disposal and reducing disposal cost for industry.
- Reduce production costs: After the exchange, the factory that needs recyclable materials can use them instead of raw material to produce primary raw material, which reduces new production costs.
- Increase waste value, or recyclable materials: Some types of waste material can be recycled into raw material, for example, slag, powdered steel, and used oil, that can be sold to companies that need waste

- materials. They can add value and profit to the companies that generate them.
- Create jobs and income: Some types of waste materials such as leather and cloth scraps can be recycled. Homemakers in several communities can produce and sell products, a function that creates jobs and income for them.

(ii) Social:

- Encourage awareness about reducing the quantity of rubbish and waste by recycling waste materials to produce new products. MEC activities encourage factories to be aware of the importance of resources and the environment.

(iii) Environmental:

- Maximizing resource use: Due to materials exchange, national resource use can be reduced the resources used can be used to maximum extent possible.
- Sustainable solid waste management: MEC activities that encourage recycling can be considered as sustainable solid waste management. As well, MEC reduces the quantity of solid waste and resource use and decreases environmental problems.

### Lessons learned

MEC serves as a waste exchange hub between waste generators and waste users who need those wastes as raw materials or fuels for manufacturing processes. But it is also necessary to be concerned about appropriate recycling methods that produce the least environmental impacts. MEC has become a well-accepted disseminator of information on waste utilisation, such as recycling technologies and recycling information databases, in supporting and leading progress toward more effective waste utilization.

### (3) Achieving Social and Environmental Benefits by formalising Waste Pickers through Partnerships in Belo Horizonte City, Brazil

#### Background

As in other cities of developing countries, Belo Horizonte city is faced with various social and environmental problems: rapid urbanization, inequitable distribution of wealth, poor social and living conditions for the poorer sector, a large number of slum residents, many street dwellers, poor public services including inadequate waste management services, a large informal market (black market), a large number of scavengers with their unhealthy organic waste sorting activities in the streets, etc.

Amongst those who work in the streets of Belo Horizonte city, the waste pickers have been engaged in the informal collection of recyclable materials for more than 50 years. These scavengers work hard regardless of weather conditions, risking themselves in traffic, working without the minimum hygienic conditions... Because they lack a proper work place, they sort recyclables from waste bags on the streets. As such, they are often treated as people who dirty the city, stigmatised as vagrants and not socially recognised.

The process of organising the waste pickers in Belo Horizonte began in August of 1988, with the support of "Street Pastoral" ("Pastoral de Rua") a Catholic Church group that works with street dwellers. In May 1990, the Waste Pickers Association (ASMARE) was created and has been striving to improve the working conditions of waste pickers and rehabilitate their reputation as collectors of recyclables.

#### Objectives

When the municipal government initiated SLU, a city clean-up programme, special attention was given to both the social and environmental problems of the city. The municipality created a partnership with the waste pickers, who were an informal sector but who in fact had already been practicing waste separation and collection. This partnership attempted to focus on the following objectives:

- Implementation of a comprehensive scheme for collection in the municipality
- Assist in generating income and improving the professional qualification of waste pickers by engaging them in the municipal waste collection scheme
- Improvement of the waste pickers' working conditions
- Reduction in the number of street dwellers
- Improvement of waste pickers' quality of life
- Improving the cleanliness and environmental quality of the city
- Raising the consciousness of people towards the environment, waste issues, and social solidarity

#### Activities

In order to support a new model for waste management, SLU created a "Social Mobilisation Department," which is a multidisciplinary team responsible for the environmental education and mobilisation of the population in waste

management. This team consists of 29 full-time sociologists, psychologists, pedagogues, geographers, artists, architects and engineers as well as 30 trainee students.

This team is responsible for activities with multiplying agents (key people capable of putting the message across to a larger audience) in the whole spectrum of the social sector such as schools, churches, public and private institutions, through training sessions and entertainment activities. Some designated members of the team provide permanent support to the waste pickers institutions and capabilities in order to catalyse new partnerships between them and the civil society.

ASMARE then proceeded to formalise, shape and set up managerial and administrative structures for the organisation through associates who pursue a self-supporting business in the recycling field. At present, there are 255 associates whose benefits affect around 1000 people including associates' families. ASMARE also includes seven committees: Infrastructure, Health, Religion, Social Communications, Finances, Environment, and Education/Culture/Entertainment.

ASMARE engages in various executive partnerships that contribute to the strengthening of its own functions. Some of the important contributions of these partnerships were the acquisition of equipment for the recycling warehouses (scales, furniture), and the payment of social educators, mostly through Caritas Swiss and Caritas Regional. The Municipal Association of Social Service (AMAS) joined as another partner for the "Bolsa-escola" project, helping families with children between 7 and 14 years old by giving them the equivalent of a minimum wage, so that their children can continue with their school education.

### Impacts

Improvement of working conditions of ASMARE's associates is the most obvious impact, since waste pickers no longer sort and/or store their recyclables on the street and utilise the recycling warehouses now available for their activities. In addition, an increase in the membership of ASMARE was recorded. On May 1993, when the partnership with the local government began, ASMARE had 31 associates; this number had gone up to 255 by August 2000. ASMARE's production also increased from an average of 15 tonnes per month to 500 tonnes. The income of the waste pickers has also increased. In the beginning, their average income was about the equivalent of one minimum wage. Now, 54 percent of them earn the equivalent of two minimum wages, 40 percent from two to four minimum wages and 6 percent above 5 minimum wages (data from May 1988).

The social impact is also worth noting. A significant reduction in alcoholism, robbery and aggressive behaviour was observed. The waste pickers were now motivated to improve their personal capacity and their personal life style. An increasing number of them attend special literacy courses. As other residents of the city began to recognise their social and environmental importance, waste pickers themselves could feel more empowered as citizens, and found a renewed sense of self-esteem that they had always lacked before.

### Lessons learned

The case of Belo Horizonte city demonstrates the potential for income generation by improving waste and recycling schemes. In most developing countries of Asia, recycling activities rely heavily on uncontrolled work by scavengers and waste pickers. The complexity and intensity of scavenging activities may vary from place to place, but the inhumane working conditions, the strong bias from other local populations, and a lack of support from public administrations are common elements.

In the situation of Bel Horizonte, the type of multi-partnerships created for ASMARE is unique. There are many important lessons worth noting. First, the strong commitment made by different stakeholders with a clear definition of each partner's role helped establish ASMARE as a legitimate operational body in the city's separate collection system.

## (4) Establishment of the Dual System for Packaging Waste Recycling in Germany

### Background

In 1991, Germany established the Ordinance on the Avoidance of Packaging Waste (Packaging Ordinance). The Ordinance obliges manufacturers and distributors to take back used packaging free of charge and forward it for recycling. According to the Packaging Ordinance, domestic and foreign manufacturers and distributors are required to take back all transport packaging such as crates, drums, pallets and styrofoam containers (i.e., primary packaging) to either recycle or reuse these materials.

In 1992, the Ordinance was amended to include all secondary packaging as well. Accordingly, manufacturers, distributors, and retailers were required to take back and recycle secondary packaging from consumers. After 1993, the Ordinance was further expanded to include all types of consumer packaging used to contain and transport goods

from the points of sale to consumption. The most recent regulations also provide exemptions for producers to transfer the obligations of the dual system to the public waste collection system. The new packaging laws in Germany have been successful in reducing the amount of waste products and encouraging the use of recycled and refillable packaging.

#### Objectives

Although the Dual System operates as a response by industry and trade associations to avoid individual take-back obligations, its overall goal is to prevent excess and unnecessary waste. In this regard, the system acts as an incentive for manufacturers to reduce the amount and improve the design of packaging they use for their products.

#### Activities

The Dual System of Germany (Duales System Deutschland AG) was established as a non-profit organisation to collect, sort, and recycle post-consumer packaging from both households and small businesses throughout the country. By participating in the Dual System program, manufacturers may attach the Green Dot label to their products. A Green Dot indicates to the consumer that the manufacturer of the product is a participant in the program, and that instead of returning the packaging to the manufacturer or distributor, the packaging should be collected, sorted, and recycled through the Dual System program.

As an umbrella organization for the recycling of sales packaging that is marked with the Green Dot in accordance with the provision of the Packaging Ordinance, the Dual System neither owns nor operates any sorting or recycling facilities. On the other hand, it organises the collection, sorting and recycling of returned packaging with the support of about 400 waste management partners.

#### Impacts

Direct impact on recycling rates - Statistics show that packaging collected in 2003 exceeded the targets set in accordance with the Packaging Ordinance. The amounts of waste passed on for recycling are presented below, classified by type.

<b>DSD Packaging Recycling Data (2000-2003)</b>						
Types of waste	Quantities passed on for recycling (million tonnes)				Packaging Ordinance <b>target</b>	<b>Recycling Target achieved in 2003</b>
	2003	2002	2001	2000		
Glass	2.27	2.51	2.5	2.67	75%	99%
Paper/cardboard	1.41	1.44	1.48	1.51	70%	161%
Plastic	0.60	0.64	0.59	0.57	60%	97%
Tinplate	0.33	0.31	0.31	0.32	70%	74%
Aluminum	0.036	0.041	0.043	0.041	60%	121%
Compounds	0.296	0.379	0.368	0.376	60%	128%

**Sources: Duales System Deutschland AG, Europe Goes Green Dot 2004/2005 and Annual Report, 2003**

A valuable contribution to the conservation of resources, the saving of energy and climate protection - To this end, the Dual System has developed a new instrument: the resources balance, which clearly illustrates how package recycling can help to conserve natural resources. The resources balance for the year 2000 initially was limited to an energy efficiency analysis of plastic recycling within the framework of the Dual System. The objective was to determine the average energy saved as a result of recycling plastic packaging marked with the Green Dot. The resulting report was based on the amount of primary energy required to produce new goods which are replaced by recycled products.

Thanks to the recycling of 589,000 tonnes of plastic packaging, approximately 20 billion megajoules (MJ) of primary energy were saved in Germany in the year 2000: This is equivalent to 34.4 MJ per kilogram. All private households in Berlin could be supplied with electricity for about 130 days with the energy saved in this way. The figures also showed that the energy saving target of 40 MJ/kg set for itself was a thoroughly realistic goal for the Dual System. In future, the Dual System intends to include further ecological parameters and all other packaging materials in the resources balance. For instance, the assessment will then include the CO<sub>2</sub> reduction potential in order to show how recycling contributes to climate protection.

Promoting ecological development and innovations - In the plastic sector, the Dual System is actually promoting process and product innovations in order to lower costs while improving the ecological standards. What is decisive for the selection of a specific recovery channel is its ecological benefit. To this end, life cycle assessments reveal that recycling is far more environmentally friendly than energetic disposal in waste incineration plants.

#### Lessons learned

Producer responsibility is important. The Green Dot operates as a response by industry and trade associations in order to avoid individual take-back responses. Its overall goal is the prevention of excess and, unnecessary waste. In this regard the Green Dot fee structure acts as an incentive for manufacturers to reduce the amount of packaging.



Consumer behavior has been further influenced by financial incentives. For example, German consumers are charged for waste collection on the basis of volume produced and frequency of collection. Products that fill the bin are thus unpopular. Because the Packaging Ordinance requires retailers to take back transport and secondary packaging, it allows consumers to leave those materials in the stores. As a result, many products have been redesigned to decrease transport and secondary packaging.

The biggest challenge is to promote behavioral change and overcome attitudes that are set in the past. This can be learned from experiences of Germany in implementing the Dual system, and it is also recognized that recycling is not the answer unless waste is minimized at the source as well. The real challenge is to start talking about resource management instead of waste management.

## (5) Kitakyushu Eco-Town Project in Kitakyushu City, Japan

### Background

The Eco-Town Project in Japan has been introduced by the Ministry of Industrial trade and Industry (MITI, transferred to the Ministry of Economic, Trade and Industry in 2001(METI)) in 1997, aiming at promoting the Zero Emission Society in local and national level by creating new environmental town in local level with introducing advanced technology for recycling. METI has been promoting this project to local government, providing subsidies such as assistance for the construction of high-tech model recycling facilities and for environmental industry marketing efforts. METI has already approved Eco-Town project in 14 municipalities.

Kitakyushu Eco-Town Project, located at the entire eastern area of the Hibiki landfill area in the city of Kitakyushu, is the first project of these approved projects and the most symbolic practice of them. This project is composed of Comprehensive Environmental Industrial Complex, Hibiki Recycling Area, and Practical Research Area.

### Objectives

Specifically, the project aims to:

- Develop and promote environmental industry particularly in the recycling business as a new industry in the city, and
- Establish the material-cycle-society by collaboration among industries, local government, and consumers.

### Activities

The site of Kitakyushu Eco-Town Project is located at the entire eastern area of the Hibiki landfill area in the city of Kitakyushu, which is in front of Hibiki Nada Sea. It is the basic strategy for fostering environmental industries in the city that the academic research, the demonstration and the applied research, and the environmental industry business are linked each other in order to promote environmental industries effectively. The Eco-Town Project has covered the demonstration and the applied research, and the environmental industry business. In this regard, the project consists of several component areas and sites as follows:

#### (i) The Comprehensive Environmental Industrial Complex

This area located at Hibiki-Nada area in coastal zone of the city aims to create circle-system for energy and materials by concentrating the recycling-industries into this site.

#### (ii) Hibiki Recycling Area

This area located next the Comprehensive Environmental Industrial Complex aims to support small and medium sized recycling companies advance to environmental industries by renting land to them for a certain term.

#### (iii) Practical Research Area

This area aims to promote the research and development on cutting-edge environmental technologies, by concentrating various research organizations for demonstrating the technologies concerning recycling and wastes treatment.

#### (iv) Kitakyushu Eco-Town Centre

The environmental learning centre was established in June 2001 to promote dissemination of the Eco-Town's Activities and raising awareness for material circulate society, utilizing the Eco-Town Projects as educational material.

(v) 2nd Stage Plan area

In August 2002, the “Eco-Town Project 2nd stage Plan” was adopted to further endeavors toward material circulate society. The feature of this plan is that its emphasis is promotion of reuse rather than recycling.

(vi) General Recycling Port Construction

In May, 2002, Kitakyushu Port (Hibikinada Area) was designated as a recycling port by the Ministry of Land, Infrastructure, and Transport.

- Provision of guideline for dealing with recyclable materials in ports; there are some difference of criteria and/or procedure in treatment of recyclable materials among authorities of ports and local governments.
- Promotion of linkage between public and private sector; the Recycle Port as a material-cycle base needs concentration of various kinds of companies such as manufacture, transportation business and various manufactures.
- Promotion of development of facility for recycling in the designated port; the Ministry provides support to private company’s development of incidental port facility such as trans-shipment and storage for recyclable materials.

(vii) The Core facility for Zero-Emissions in the Environmental Industrial Complex

Industrial waste – mainly residual substances from recycling and automobile shredder dust – discarded by enterprises in the Eco-Town area, are appropriately processed. In this process, molten material is recycled, and power generated during the process is supplied to enterprises in the Eco-Town area. (Operated by: Kitakyushu Eco Energy Co., Ltd)

### Impacts

- Zero Emissions Environmental Industries  
As shown in the previous section, considerable numbers of organizations engaged in the environmental industries have been concentrated into the site. Since individual organization has the advanced technology or excellent capability of R&D, the site has become the largest and cutting-edge Eco-Town in Japan. It can be said that Kitakyushu city has been successfully transforming from the former major area of heavy industry into the leading city of environmental industry. From viewpoint of policy for establishing the resource-circulate-society, it should be said that further efforts to creation of interaction between various organizations located in the site are needed to establish the recycling flow among the organizations as well as the linkage between business and R &D.
- Symbol Project of the City  
Kitakyushu City has been promoting international environmental cooperation among major cities in Asia, utilizing wisdom and experiences in which the city has tackled and overcome serious environmental pollution. Thus, Kitakyushu City has weighed the environmental policy conventionally, and has been establishing a kind of brand for an environmental sound city. Since the Eco-Town Project attracted much attention, both domestic and foreign, the reputation of the city has been further strengthened as an environmentally sound city. From the viewpoint of economic impact, the grand total of investment came to 50,200 million Japanese Yen of which seventy percent was private investment, and the creation of employment has been over 1,000 jobs. 109,300 million Japanese Yen has been observed as a tangible economic impact from FY1998 to FY2003.

### Lessons learned

The concept of this eco-town project includes the promotion of environmental industry, the R & D concerning environmental technology, and the networking for international resource recycling. It may be said that this project was well designed and established with a good combination of the above concepts, utilizing the special conditions of the city that used to be a major area of heavy industry and had experience of overcoming serious environmental pollution. This brought a kind of advantage for fostering the environmental industry in the city. Specifically, heavy industry has a huge potential supply capacity for recyclable materials, and the heavy industry itself has potential demand for recyclable materials. Conventionally, enterprises which have engaged in heavy industry know very well what kind of recyclable materials are needed or generated, and where such recyclable materials are supplied or required. In short, they have located the best position for obtaining market information concerning recyclable materials. The recognition of such an advantage has also encouraged other cities which have faced stagnation of the heavy industry. In this respect, it is considered that similar cities in developing countries can incorporate the same form of project.

Although the combination of the promotion of environmental industry, R & D for environmental technologies, and the networking for international resource recycling was very beautiful idealistically, the actual linkage between the

three sectors has not yet become truly co-operative among the companies on the site. Challenges regarding the further enrichment of this project remain, not only between sectors, but also within companies in the comprehensive environmental industrial complex, Hibiki Recycling Area, and the Practical Research Area.

**4 March 2006 (rev.2)**

**ASIA-PACIFIC FORUM FOR ENVIRONMENT AND DEVELOPMENT (Second Phase)**

**Expert Meeting on the 3Rs in Asia**

**Sunday, 5 March 2006**

**Elizabeth Rose Conference Hall, 5th Floor, UNU House, Tokyo, Japan**

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**Agenda and programme of work**

- 09:00 Registration**
- 09:30 Opening Remarks (10 min.)**  
by **Prof. Akio Morishima**, Chair of the Board of Directors, Institute for Global Environmental Strategies
- 09:40 Adoption of Agenda/Program (5 min.)**
- 09:45 Session I: Regional Initiatives to Promote the 3Rs in Asian Countries**  
**Co-Chair: Dr. Kim Myung-ja**, Former Minister of Environment, Republic of Korea
- Opening Presentation: Experience of the 3Rs in Japan (15 min.)**  
by **Mr. Saburo Kato**, President, Research Institute for Environment and Society / Chairperson, Japan Association of Environment and Society for the 21st Century (JAES21) / President, Japan Forum for the Promotion of 3R Activities
- Presentation I: Status and Challenges in the Promotion of the 3Rs in China(10 min.)**  
by **Dr. Feng Dongfang**, Chief, Division of Environmental Policy, Policy Research Center for Environment and Economy, State Environmental Protection Administration, People's Republic of China
- Presentation II: Status and Challenges in the Promotion of the 3Rs in Korea (10 min.)**  
by **Dr. Oh, Gil Jong**, Director, Resource Recirculation Division, Environmental Diagnostics Research Department, National Institute of Environmental Research
- Discussion (20 min.)**
- Discussants:**  
**Mr. Yoshinori Tamade**, Chairman, Technical Committee, Japan Environmental Facilities Manufacturers Association (JEFMA) / General Manager, Tokyo Technology Research & Planning Dept., Energy and Environmental Technology Division, TAKUMA CO., LTD.  
**Dr. Philipp Schepelmann**, Senior Fellow, Research Group "Material Flows and Resource Management" Wuppertal Institute
- 10:40 Photo Session and Coffee Break (30 min.)**
- 11:10 Session I: Regional Initiatives to Promote the 3Rs in Asian Countries (cont'd)**  
**Co-Chair: Prof. Dr. Tongroj Onchan**, President, Mekong Environment and Resources Institute
- Presentation III: Status and Challenges in the Promotion of the 3Rs in Malaysia (10 min.)**  
by **Ms. Jenny Tan Suat Eam**, Executive Director, Centre for Environmental Technologies (CETEC)

**Presentation IV: Status and Challenges in the Promotion of the 3Rs in Thailand (10 min.)**  
by **Dr. Chaoyod Bunyagidj**, Vice President, Thailand Environment Institute

**Presentation V: Status and Challenges in the Promotion of the 3Rs in Viet Nam (10 min.)**  
by **Assoc. Prof. Dr. Nguyen The Chinh**, Dean of Faculty of Urban Environmental Economics and Management, National University of Economics

**Presentation VI: Status and Challenges in the Promotion of the 3Rs in the Philippines (10 min.)**  
by **Dr. Olivia la O' Castillo**, UN Sec. Gen. Kofi Annan Water and Sanitation Advisory Board Member / Chair and President, Asia Pacific Roundtable for Sustainable Consumption and Production (APRSCP)

**Presentation VII: Status and Challenges in the Promotion of the 3Rs in Indonesia (10 min.)**  
by **Mr. Dana A. Kartakusuma**, Assistant Minister, Technology and Sustainable Development, Ministry of Environment, Republic of Indonesia

**Discussion (30 min.)**

**Discussants:**

**Dr. Tomohiko Ishiguro**, Director, International Cooperation Office, Planning Department, Japan Environmental Sanitation Center

**Mr. Kimihisa Furuichi**, Managing Director, Japan Waste Management Foundation

**Prof. Shinichi Sakai**, Professor, Kyoto University

**Mr. Yasuo Nakashima**, Group Senior Vice President, Living Environment & Digital Media Equipment, Mitsubishi Electric Corporation

**12:30 Lunch Break (60 min.)**

**13:30 Session II: International Initiatives to Promote the 3Rs in Asia**  
**Co-Chair: Prof. Dr. Itaru Yasui**, Vice-Rector, United Nations University

**Presentation I: Status and Challenges in the International Flow of Recyclable Materials and Goods (10 min.)**  
by **Mr. Michikazu Kojima**, Research Fellow, Institute of Developing Economies, JETRO

**Presentation II: Role of the Basel Convention for Promotion of the 3Rs (10 min.)**  
by **Ms. Sachiko Kuwabara-Yamamoto**, Executive Secretary, Secretariat of the Basel Convention

**(40 min.) Presentation III: Future Activities for Promotion of the 3Rs in Respective Organisations**

by **Mr. Surendra Shrestha**, Regional Director and Representative, Regional Office for Asia and the Pacific, United Nations Environment Programme

by **Mr. Kazunobu Onogawa**, Director, United Nations Centre for Regional Development

by **Mr. Masakazu Ichimura**, Chief, Environment Section, Environment and Sustainable Development Division, United Nations Economic and Social Commission for Asia and the Pacific

by **Dr. Bindu N. Lohani**, Director General and Chief Compliance Officer, Regional and Sustainable Development Department, Asian Development Bank

**Discussion (60 min.)**

**Discussants:**

**Mr. Masao Yamada**, President, Environment & Recycling Company, DOWA Mining Co.,Ltd.

**Mr. Shinro Urabe**, President, Urban System Integration Inc.

**Prof. YAMAMOTO, Kazuo**, D.ENG, Director, Professor, Environmental Science Center, The University of Tokyo

**15:30 Coffee Break (15 min.)**

**15:45 Session III: Future Challenges to Promote the 3Rs in Asia**

**Co-Chair: Prof. Dr. Cielito Habito**, Professor and Director, Ateneo Center for Economic Research and Development

**Discussants:**

**Prof. Masaru Tanaka**, Professor, Okayama University

**Mr. Dana A. Kartakusuma**, Assistant Minister, Technology and Sustainable Development, Ministry of Environment, Republic of Indonesia

**Dr. Corazon PB. Claudio**, Adviser and Founding President, Philippine Environmental Industry Association

**Dr. Bindu N. Lohani**, Director General and Chief Compliance Officer, Regional and Sustainable Development Department, Asian Development Bank

**Ms. Yuko Sakita**, Journalist / Environmental Counselor / President, NPO GENKI Net for Creating a sustainable Society

**17:00 Closing**

by **Prof. Akio Morishima**, Chair of the Board of Directors, Institute for Global Environmental Strategies

**19:00 Reception (Cocktail Party at the AKASAKA EXCEL HOTEL TOKYU)**

**4 March 2006 (rev.1)**

**ASIA-PACIFIC FORUM FOR ENVIRONMENT AND DEVELOPMENT (Second Phase)**

**Expert Meeting on the 3Rs in Asia**

**Sunday, 5 March 2006**

**Elizabeth Rose Conference Hall, 5th floor, UNU House, Tokyo, Japan**

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**List of Participants**

**APFED Members**

1. Prof. Dr. Cielito Habito, Professor and Director, Ateneo Center for Economic Research and Development
2. Dr. Kim Myung-ja, Former Minister of Environment, Republic of Korea
3. Prof. Akio Morishima, Chair of the Board of Directors, Institute for Global Environmental Strategies
4. Prof. Dr. Tongroj Onchan, President, Mekong Environment and Resources Institute

**Experts from Asian Countries**

1. Dr. Chaiyod Bunyagidj, Vice President, Thailand Environment Institute
2. Dr. Olivia la O' Castillo, UN Sec. Gen. Kofi Annan Water and Sanitation Advisory Board Member, Chair and President, Asia Pacific Roundtable for Sustainable Consumption and Production (APRSCP)
3. Assoc. Prof. Dr. Nguyen The Chinh, Dean of Faculty of Urban Environmental Economics and Management, National University of Economics
4. Dr. Corazon PB. Claudio, Adviser and Founding President, Philippine Environmental Industry Association
5. Dr. Feng Dongfang, Chief, Division of Environment Policy, Policy Research Center for Environment and Economy, State Environmental Protection Administration, People's Republic of China
6. Mr. Dana A. Kartakusuma, Assistant Minister, Technology and Sustainable Development, Ministry of Environment, Republic of Indonesia
7. Dr. Gil Jong Oh, Director, Resource Recirculation Division, Environmental Diagnostics Research Department, National Institute of Environmental Research
8. Ms. Jenny Tan Suat Eam, Executive Director, Centre for Environmental Technologies (CETEC)

**Experts from Japan**

1. Mr. Kimihisa Furuichi, Managing Director, Japan Waste Management Foundation
2. Dr. Tomohiko Ishiguro, Director, International Cooperation Office, Planning Department, Japan Environmental Sanitation Center

3. Mr. Saburo Kato, President, Research Institute for Environment and Society / Chairperson, Japan Association of Environment and Society the 21st Century (JAES21) / President, Japan Forum for the Promotion of 3R Activities
4. Mr. Michikazu Kojima, Research Fellow, Institute of Developing Economies, JETRO
5. Mr. Yasuo Nakashima, Group Senior Vice President, Living Environment & Digital Media Equipment, Mitsubishi Electric Corporation
6. Prof. Shinichi Sakai, Professor, Kyoto University
7. Ms. Yuko Sakita, Journalist / Environmental Counsellor / President, NPO GENKI Net for Creating a sustainable Society
8. Mr. Yoshinori Tamade, Chairman, Technical Committee, Japan Environmental Facilities Manufacturers Association (JEFMA) / General Manager, Tokyo Technology Research & Planning Dept., Energy and Environmental Technology Division, TAKUMA CO., LTD.
9. Prof. Masaru Tanaka, Professor, Okayama University
10. Mr. Shinro Urabe, President, Urban System Integration Inc.
11. Mr. Masao Yamada, President, Environment & Recycling Company, DOWA Mining Co.,Ltd.
12. Prof. Kazuo Yamamoto, D.ENG, Director, Professor, Environmental Science Center, The University of Tokyo

#### **Experts from International Organisations**

1. Mr. Masakazu Ichimura, Environment Section, Environment and Sustainable Development Division, United Nations Economic and Social Committee for Asia and the Pacific
2. Ms. Sachiko Kuwabara-Yamamoto, Executive Secretary, Secretariat of the Basel Convention
3. Dr. Bindu N. Lohani, Director General and Chief Compliance Officer, Regional and Sustainable Development Department, Asian Development Bank
4. Mr. Kazunobu Onogawa, Director, United Nations Centre for Regional Development
5. Mr. Surendra Shrestha, Regional Director and Representative, Regional Office for Asia and the Pacific, United Nations Environment Programme
6. Prof. Dr. Itaru Yasui, Vice-Rector, United Nations University

#### **Experts from Europe**

1. Dr. Philipp Schepelmann, Senior Fellow, Research Group “Material Flows and Resource Management” Wuppertal Institute

#### **Observers**

1. Mr. Kuniaki Makiya, Senior Researcher, United Nations Centre for Regional Development
2. Mr. Takashi Matsumura, Senior Fellow, United Nations University
3. Mr. David S. McCauley, Senior Environment Economist, Environment and Social Safeguard



Division, Asian Development Bank

4. Mr. Takashi Miyagawa, Division Head, International Cooperation Office, Planning Department, Japan Environmental Sanitation Center
5. Mr. Choudhury Rudra Charan Mohanty, Environment Programme Officer/Coordinator, United Nations Centre for Regional Development
6. Mr. Hiroshi Nishimiya, United Nations Environment Programme
7. Mr. Takashi Ohmura, Environment Specialist, Asian Development Bank
8. Mr. So Sasaki, Research Fellow, Japan Society for the Promotion of Science / Visiting Research Fellow, Faculty of Political Science, Chulalongkorn University
9. Mr. Ibrahim Shafii, Scientific/Technical Officer, Secretariat of the Basel Convention
10. Mr. Hajime Shoji, The Japan Forum for the Promotion of 3R Activities
11. Ms. Hyun Sook Sung, Policy Advisor to Honorable Myung Ja Kim

#### **Ministry of the Environment, Japan**

1. Mr. Hideto Yoshida, Director General, Department of Waste Management and Recycling Department
2. Mr. Hideka Morimoto, Director, Policy Planning Division, Waste Management and Recycling Department
3. Mr. Naohisa Okuda, Senior Policy Coordinator, Global Environment Bureau
4. Mr. Hiroaki Takiguchi, Deputy Director, Policy Planning Division, Waste Management and Recycling Department
5. Ms. Mimi Nameki, Deputy Director, Global Environment Bureau, Policy and Coordination Division
6. Mr. Takuya Nomoto, Policy and Coordination Division, Global Environmental Bureau

#### **Institute for Global Environmental Strategies (IGES)**

1. Mr. Hideyuki Mori, Project Leader, Long-term Perspective and Policy Integration (LTP) Project
2. Mr. Toru Hashi, Senior Policy Researcher, LTP Project
3. Mr. Masanori Kobayashi, Senior Policy Researcher, LTP Project
4. Dr. Xuemei Bai, Senior Policy Researcher, Urban Environment Project
5. Dr. Martin Medina, Senior Policy Researcher, Kitakyushu Office
6. Dr. Daisuke Sano, Policy Researcher, LTP Project
7. Dr. Mariko Hara, Researcher, LTP Project
8. Dr. Yasuhiko Hotta, Researcher, LTP Project
9. Mr. Masato Morishita, Section Director, Kitakyushu Office
10. Mr. Samuel Adamson, Intern, Research Supporting Department
11. Ms. Tomoko Ishikawa, APFED Secretariat