



# 3R Policy Brief

## Fostering Sound Recycling Industries in Asia

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### Introduction

Throughout Asia, recycling is being vigorously practiced based on market mechanisms, and recyclable resources are being imported from the United States, Europe, and other regions. At the same time, however, various recycling-related environmental problems and occupational health hazards are being reported. Among them are problems concerning the health and safety of “waste pickers” who recover items of value from landfill sites, pollution resulting from the recycling of electronic waste, water pollution emanating from wastepaper recycling plants, and the illegal dumping of waste by industrial waste collection businesses. In addition, some recycled products do not meet standards for safety and other concerns, a situation that in some cases has led to accidents and health hazards. As incomes rise with economic development, demand for low-quality products made from recyclable resources may decline. Thus, improving the quality of recycled products is important from the standpoint of maintaining sustainability in resource recycling.

Preventing these problems requires investment in occupational health measures, environmental measures, and product quality improvement. However, the increase in cost that such investment entails can hamper the competitiveness of businesses that choose to make it. Compared to businesses that do not make such an investment, investing businesses are forced to lower what they pay to purchase recyclable resources due to higher production costs. As a result, they may not be able to obtain sufficient recyclable resources in some cases.

With the above structure as a backdrop, this policy brief will present recommendations concerning the kinds of policy that should be implemented to promote occupational health measures, environmental measures, and better product quality and to foster proper recycling industries.

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#### Policy Brief from Asia Resource Circulation Policy Research Group

This project is conducted by the Asia Resource Circulation Policy Research Group, a collaborative research group focused on policy research on 3R promotion in Asia; coordinated by IGES with the participation of researchers from IGES, IDE-JETRO, NIES, University of Malaya, Asia Institute of Technology, Bandung Institute of Technology, Tokyo Institute of Technology and UNCRD.

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## 1 Sound recycling industries

This brief will make no attempt to strictly define “sound recycling businesses” or the “proper recycling industries” that are aggregations of those businesses. This is because the types of environmental measures and occupational health measures that are required vary depending on the stage of economic development and kinds of recyclable resources handled, and because market needs vis-à-vis recycled products differ. When there is a shortage of recycling businesses that observe the environmental and occupational health measures that are established by law, the challenge becomes to foster recycling businesses that meet legally established minimum standards. And when almost all companies are capable of meeting minimum legal standards, the challenge then becomes to foster recycling businesses that not only implement environmental and occupational health measures but also strive to improve resource recovery efficiency as well as product quality.

Heretofore, the concept of “environmentally sound management” as it pertains to waste and its treatment and disposal, which includes recycling, has been internationally defined by the Basel Convention and other agreements, and guidelines have been prepared and political policies hammered out for putting such management into practice. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (provisions agreed upon in 1989, treaty put into force in 1992) defines environmentally sound management (ESM) of hazardous wastes and other wastes as follows:

“Environmentally sound management of hazardous wastes or other wastes” means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner which will protect human health and the environment against the adverse effects which may result from such wastes”

The OECD also prepared a Guidance Manual on Environmentally Sound Management of Waste in 2007 (OECD, 2007). The manual states that discussions of ESM have moved forward based on the following “working definition”:

“(ESM is) a scheme for ensuring that wastes and used and scrap materials are managed in a manner that will save natural resources, and protect human health and the environment against adverse effects that may result from such wastes and materials”.

Both the Basel Convention’s definition and the OECD’s definition presented here focus on impact on the environment and human health. Several certification systems concerning ESM by recycling businesses are already in place. Their requirements for certification are attached to this brief. (Attachment 1 in page 8.) Some of those systems mention recycled product quality; however, by and large, this is a field that has received scant attention in discussions of ESM within the contexts of the Basil Convention and other forums.

## 2 Policies for fostering proper recycling industries

It is not enough to consider policies to foster sound recycling businesses and proper recycling industries in terms of “recycling businesses” and “recycling industries” only. It will be important to execute policies that develop the abilities of individual stakeholders, including industries and consumers that generate wastes and recyclable resources and consumers who use recycled products, and reinforce the ties linking those stakeholders (see Figure 1). The following approaches this topic from two perspectives: reinforcing the formulation and enforcement of environmental regulations and implementing more non-physical infrastructure-based support measures.

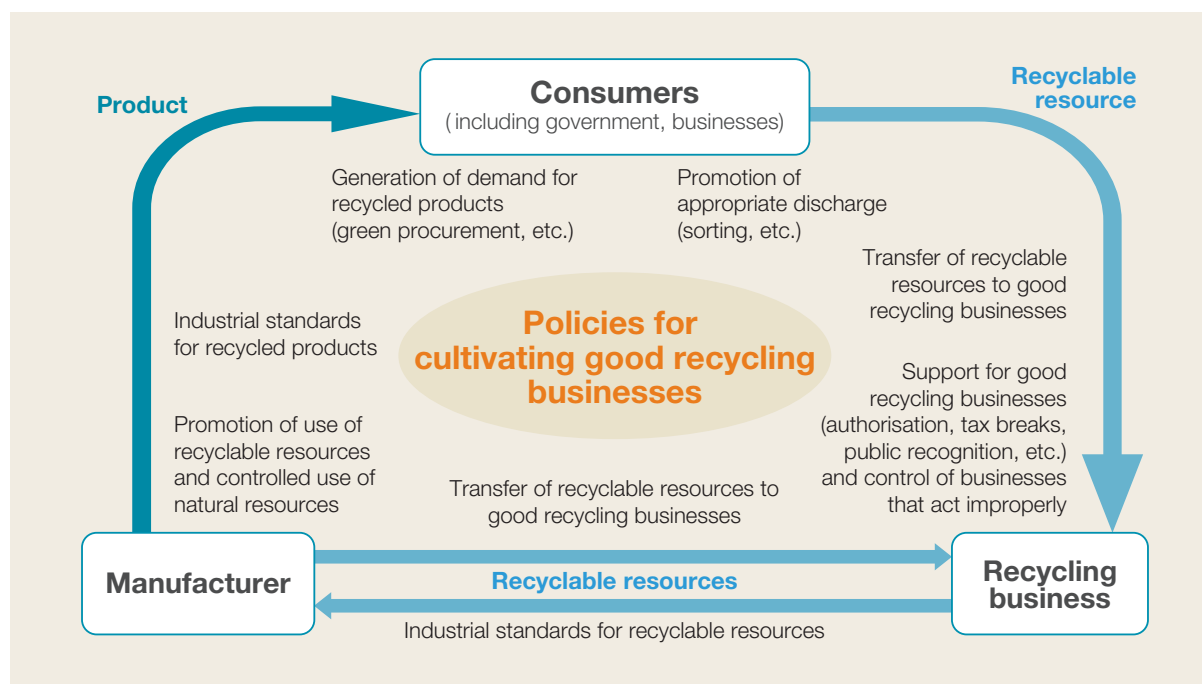


Figure 1: Policies for fostering proper recycling industries

Source: Prepared by the author

## 1. Reinforcing the formulation and enforcement of environmental regulations

One policy needed to foster sound recycling businesses is the development of various laws and clarification of stakeholders' responsibilities.

The foundation for fostering sound recycling businesses starts with clarification of recycling businesses' responsibilities vis-à-vis pollution (e.g., prevention of water and air pollution) and the health and safety of workers. It is also important to clarify the responsibilities of those who produce industrial waste and hazardous waste. For cases in which a waste generator entrusts the treatment and disposal (including recycling) of its hazardous wastes to another business, it is important to establish regulations making it the generator's responsibility to hire that business after confirming that the business has the ability to treat and dispose of the waste appropriately. With regard to products discarded by ordinary

consumers, ensuring that those consumers who are the waste generators appropriately treat and dispose of their waste in a manner similar to industrial waste is difficult. Thus, the standard approach is to have local governments take responsibility for collection, treatment and disposal. Another approach concerning electronic appliances and packaging is to have their producers (including importers) take responsibility for their collection and recycling.

Next, to make it easier for waste generators to check the capabilities of waste treatment and disposal businesses, it is important to establish a notification and authorisation system for those businesses and to make a list of authorised businesses publicly available. It then becomes possible to use the authorisation system as the basis for stopping the operations of treatment and disposal business that act improperly. Authorisation will require the execution of evaluations to determine if a business's disposal plant is properly located, if the business takes appropriate environmental measures, and other matters based on a previously

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established inspection scheme (such as an environmental impact assessment scheme, etc.).

Measures that, for example, require management that is based on a manifest system or GPS-tracking of transport trucks will be required in order to confirm that industrial/hazardous waste is actually transported from the producer to an authorised business. Other necessary measures include preparing regulations concerning markings that indicate the transport of hazardous waste as well as procedures for handling accident (including driver training).

National governments must supervise waste generators, treatment and disposal businesses, and collection and transport businesses based on the above points. They are responsible for enforcing regulations. Measures toward this end are of course implemented in developed countries. However, in developing countries, laws do not always function properly even if they are in place because enforcement is lacking. And if enforcement is lacking, then it becomes more difficult to foster sound recycling businesses.

Moreover, governments can apply the concept of extended producer responsibility to change conventional recovery and recycling flows and encourage individual stakeholders to take environmental and occupational health measures. The responsibilities that governments can place on producers come in various forms. Generally speaking, they can be classified into physical responsibility, economic responsibility, and informative responsibility. Physical responsibility refers to the establishment of recovery-related systems, achievement of a certain recovery rate, achievement of a certain recycling rate, and execution of appropriate hazardous waste disposal. Economic responsibility can take the form of having producers take responsibility for economic aspects needed to fulfill physical responsibility, or of having them take responsibility for collecting and managing recycling fees from consumers or paying recycling fees to a recycling fund run by the government. If producers are given obligations concerning recovery (for example, if they are required

to recover a certain amount of waste that corresponds to their past domestic sales) and if the disposal of recovered end-of-life products and packaging at recycling plants that meet certain standards in terms of environmental measures, occupational health measures, etc., is required, then ensuring the appropriate disposal of end-of-life products and packaging becomes possible.

## 2. Support for sound recycling businesses

### *a. Recycling industrial complexes*

Recycling industrial complexes that bring together recycling industries are also being built. They have the advantage of concentration, as they make it easier for one recycling business to use the waste generated by other recycling businesses. This can have effects in terms of business-related and environmental aspects; for example, they can help expand the size of recycling businesses and make it possible to jointly implement anti-pollution measures.

In Japan, the Ministry of the Environment and Ministry of Economy, Trade and Industry have been promoting the nation's recycling industries under the name "Eco-Town" since 1997. Through this programme, the ministries provide support not only to the construction of advanced facilities but also to environmental education, the implementation of feasibility studies related to the recycling business, and the building of international networks. Recycling industrial complexes that concentrate recycling industries into a single place are being created in eight locations, among them Tokyo, Kawasaki, Kitakyushu and Minamata. These complexes accept various types of waste as recyclable resources and recycle them. Additionally, efforts are being made to utilise waste that is generated at individual recycling plants within the complex.

Decisions on where to locate a recycling industrial complex must consider where recyclable resources are generated; the locations of industrial sectors that process those resources, convert them into raw materials for products, and process them into products; and transport costs.

*b. Quality standards for recyclable resources and recycled products, green purchasing and procurement*

Industrial standards can reduce the amount of detailed information on products that is exchanged by sellers and buyers. They are thus effective in reducing the costs of transactions.

If recycled products are of the same quality as ordinary products and meet already existing industrial standards, then there is no need to prepare separate industrial standards for them. If, on the other hand, recycled products do not meet ordinary industrial standards or have characteristics that make them different from conventional products, then transaction costs for those recycled products can be lowered by preparing industrial standards especially for them. Specifying industrial standards for recycled products in, for example, public-sector procurements can stimulate demand for those products.

In the case of recyclable resources, there are instances where businesses attempt to gain money from weight added by, for example, mixing rocks with wastepaper or watering down paper. Such acts can have a negative impact on the profitability of manufacturers that use recyclable resources and upset the foundation upon which an entire recycling industry stands.

Give this, affixing “eco labels” to recycled products and making them part of “green procurement” by government organisations can also stimulate demand.

*c. Tax incentives, subsidies and low-interest financing*

If a business that collects recyclable resources is distant from recycling industries, lowering the costs of transporting resources becomes an important factor in its efforts to secure profitability. To do this, it must invest in machinery that reduces the bulk of recyclable resources, such as bearing machines and crushers. If the business successfully lowers its transport costs, it can then collect recyclable resources at a higher price and recycle more of them. It can also apply a portion of its profits to occupational health and safety measures. At the same time, resource recyclers must invest not only in processes connected with resource recycling but also in occupational health and safety

measures as well as measures to prevent air and water pollution. These investments will deliver benefits in such forms as higher recycling rates, longer serviceable life of waste disposal sites, acquisition of resources, and maintenance of worker health.

National governments can do more than just regulate in accordance with law. They can also provide tax reductions and exemptions for investments in recycling-related equipment as well as low-interest financing for pollution control investments. Such steps can result in lower waste treatment costs and also be beneficial to government coffers.

At the same time, governments must reconsider their use of tax systems and subsidies to manufacturers in order to check their use of natural resources and promote their use of recycled resources. Tying subsidies to the development of natural resources alone could hinder use of recyclable resources.

*d. Public recognition systems*

Thailand’s Department of Industrial Works has established an awards system for facilities that meet superior industrial waste treatment standards. The standards apply to facilities involved in the treatment and disposal of industrial waste that are classified under the industrial classifications 101 (centralised waste treatment [wastewater treatment, incineration, etc.]), 105 (industrial waste separation or landfill), and 106 (reuse and recycling).

The department presents awards to facilities at three levels: gold, silver and bronze. In 2010, 20 facilities received awards. This number grew to 37 in 2011 and 45 in 2012. This kind of recognition system can serve as a source of information for waste generators who wish to find a better industrial waste treatment business.

**3** **Strategy for Formulating Effective Policy**

If governments are to effectively promote the kinds of policies described above amid limited budgets and

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authority, they must formulate them in a strategic manner.

## 1. When implementing comprehensive initiatives is difficult

The best approach is to implement the items mentioned in Section 2 in a comprehensive manner. However, there are times when underdeveloped laws and ordinances, the size of the government's budget, or limited ability to enforce regulations make it difficult to promote comprehensive initiatives for all recyclable resources and stakeholders. In such cases, an approach that involves focusing on particular recyclable resources, stakeholders or regions; making necessary improvements; and then gradually expanding to a broader scope should be considered.

### *a. Narrow down targeted items.*

Here it is best to focus attention on waste items and recyclable resources that are considered important and then to work to improve the recycling and supply chain.

The first necessary step is to confirm how the waste being targeted is generated, collected and treated. Understanding the problems that occur at each of the stages of generation, collection, resource recycling and product manufacturing is the first step toward enacting effective measures. What is then required are stronger enforcement of regulations, provision of technical information on pollution control, assistance in the form of low-interest loans and other measures, and assistance (including regulations) for the creation of mechanisms that ensure the appropriate collection of waste and its proper transport to disposal businesses.

### *b. Pay attention to specific stakeholders.*

It is also important to fix attention on specific stakeholders and move forward with occupational health and safety measures and environmental measures for them.

Among such stakeholders are “waste pickers” who recover items of value from waste disposal sites and

people who buy and collect recyclable resources in towns. Traditionally, these people have been considered to be in the “informal sector” and have not been a central part of waste policy. Nonetheless, they are susceptible to health hazards, as measures to secure their occupational health and safety are insufficient. Given that their presence in the recovery and recycling of recyclable resources cannot be ignored, these stakeholders must be properly positioned within the waste processing flow and receive support in such fields as occupational health and safety (see GIZ, 2011).

Thus, there is a need to ascertain where the various stakeholders—which include the consumers and manufacturers mentioned in the previous section—face problems and then to execute appropriate countermeasures.

### *c. Begin with specific regions.*

It is also important to begin initiatives by narrowing down the regional focus. Even if a sorted collection programme is started on the national level, there are cases where sorted waste is not recycled. Transport costs money, and thus sometimes recyclable resources that are saleable in urban centres are not recycled in remote areas because of that cost. Moreover, even if the public is asked to sort its waste, sometimes those wastes remain unsorted at the collection stage or are processed and disposed of without consideration for sorting. Thus, sorting programmes should be implemented by looking at the locations of the recycling plants that will receive recyclable waste.

## 2. Cooperation among concerned government bodies

In many countries, it is common to see different ministries or agencies placed in charge of environmental regulations, occupational health and safety regulations, and industrial promotion. Although organisational names vary from country to country, in general the environment ministry is placed in charge of environmental regulations, the labour ministry handles

occupational health and safety measures, and the industrial affairs ministry takes charge of fostering industrial sectors. As for waste administration by local governments, this field is placed under the jurisdiction of the construction ministry or public works ministry, or is handled by the ministry in charge of local governments or the environment ministry. In some cases, industrial standards are handled by the government body in charge of industrial affairs or an independent standards body. When it comes to fostering sound recycling businesses, there are aspects that cannot be covered by one body alone. Consequently, it is necessary to pursue this goal through coordination among multiple government bodies that is based on a clear understanding of the roles of those bodies.

### 3. The necessity of wide-area initiatives

One of the first challenges that must be addressed when attempting to foster a sound recycling businesses in developing countries is securing the necessary volume of recyclable resources for processing. When the industry is not fully developed or when income levels are low, sound recycling businesses can have trouble securing the quantity of recyclable resources they need for sustainable operation if the amount of available resources is small or they cannot compete with the informal sector. And even if sufficient recyclable resources appear to be available in a country, sound recycling businesses may still have problems obtaining those resources if

transport infrastructure is insufficient or the transport industry is underdeveloped.

The Basel Convention's prior notice and consent procedure is a system that allows imports in the case of sound recycling businesses and processing facilities and does not in other cases. This could be used as one means for fostering sound recycling businesses.

## 4 Conclusion

A variety of support steps are required to foster sound recycling businesses that can supply quality products without causing environmental pollution or health hazards. Included among them are the establishment of various environmental regulations and occupational health measures, the formation of recycling industrial complexes, and the development of industrial standards for recycled products.

To ensure their effective execution, these policies must be first focused on particular waste products and regions and then later gradually expanded. Additionally, because the collection of recyclable resources can be a drag on business operations, certain measures must be put in place. They include giving priority to good businesses when sending out recyclable waste generated in the government sector and allowing procurement of recyclable resources from other countries. Quick coordination with concerned parties at home and abroad is required.

### References

- Basel Convention, 1994, "Guidance Document on the Preparation of Technical Guidelines for the Environmentally Sound Management of Wastes Subject to the Basel Convention", downloaded from <http://www.basel.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/AdoptedTechnicalGuidelines/tabid/2376/Default.aspx>
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 2011. *Recovering Resources, Creating Opportunities: Integrating the Informal Sector into Solid Waste Management*.
- Hotta, Y., Bengtsson, M., Totoki, Y., Hayashi, S., Aoki, C., Murakami (Suzuki), R., 2013, *Ajia Chiiki-dai ni okeru Risakuru Ninsho Seido no Donyu Kanosei ni kan-suru Kenkyu* (study on possibilities for introducing a recycling certification system for all of Asia) (FY 2012 Environment Research and Technology Development Fund, Integrated Research Report)
- Kojima, Michikazu, 2014, *Policy for Fostering "Sound" Recycling Industries*, Institute of Developing Economies-JETRO and Institute for Global Environmental Strategies.
- OECD, 2007, *Guidance Manual for the Implementation of the OECD Recommendation C(2004)100 on Environmental Sound Management (ESM) of Waste*.

	Certification point	Condition or requirement
Items concerning environmental and occupational safety management	Legal compliance	The business complies with requirements and standards set by national or local governments or in international agreements.
	Introduction of environmental management system	The business voluntarily sets environmental policies and targets in its facility management, and has introduced and is operating a system toward achieving them.
	Specification and handling of hazards and risks	The business specifies and manages waste hazards and their impact on the environment. When necessary, the business removes hazardous substances and components containing hazardous substances.
	Establishment of occupational health standards	The business takes steps to minimize risks to workers' health and safety.
	Worker education and consciousness-raising	The business's workers understand the hazards and risks associated with hazardous waste and take measures to appropriately handle them.
	Monitoring, recording, and reporting system	The business has a grasp of the material flow and pollution circumstances (exhaust, wastewater, etc.) and appropriately manages information on them.
	Emergency response	The business has prepared response strategies and plans for dealing with unforeseen situations that have negative impacts on the environment.
	Financial resources for contingencies (accident insurance coverage)	The business has secured financial resources for dealing with unforeseen circumstances (such as by purchasing insurance, etc.)
Items concerning proper transactions and trade	Securing of evidence of proper use/processing	The business can guarantee processing conditions in downstream areas of the recycling chain that begins at its facilities as well as appropriate processing at transboundary destinations.
	Domestic traceability	From the business's receipt of waste and recyclable resources to final disposal, traceability is ensured for the processing flow and the quantity traded, including post-processing residue.
	International traceability	Traceability is ensured for the waste and recycled resource flow and quantity traded, from their export to final disposal, in the business's international trade (exports and imports).
Items concerning cultivation and development of the recycling industry	Quality management for recycled materials	The business manages the quality of recyclable resources.
	Reuse	The business has rules and regulations concerning the reuse of parts and components.
	Storage	The business appropriately stores collected products.
	Sorted recovery and classification	The business practices appropriate classification and sorted recovery.
	Data erasing	If data remains stored (in some electronic or electric devices, etc.), the business destroys and erases that data.

### Attachment 1: Points evaluated in certification systems targeting recycling businesses

Source: Compilation and rearrangement of items pertaining to hazardous materials using Hotta et al. (2013) as a reference

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