

Experiences of Research Community

Regulation for Recycling E-waste / WEEE

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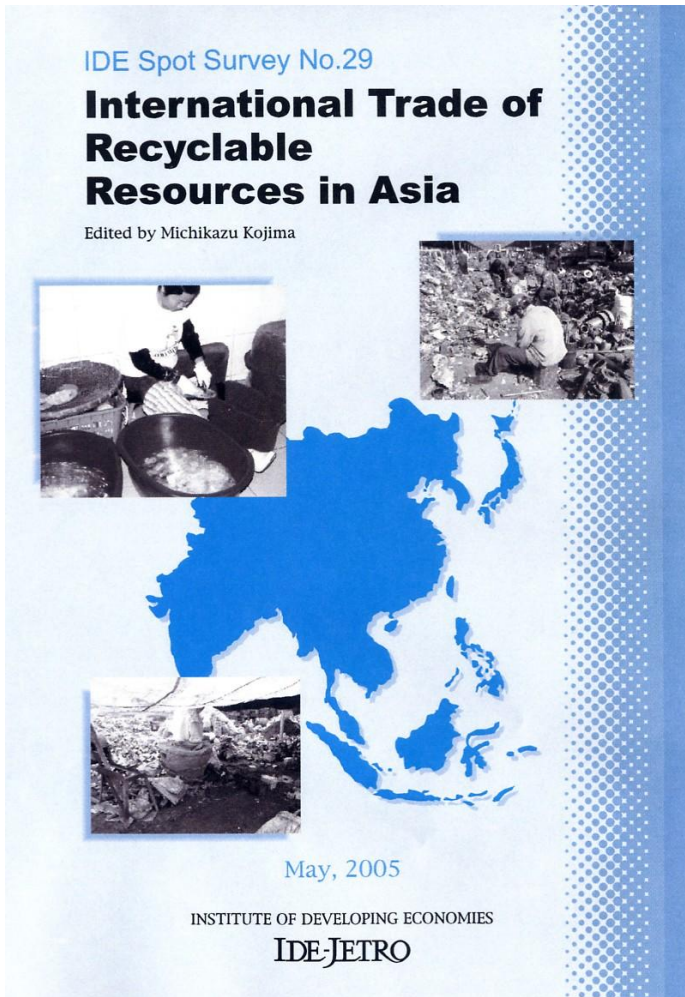
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Self Introduction.

Senior Research Fellow of Institute of Developing Economies, JETRO.

- A member of Working Group on Enhancing International Recycling in Industrial Structure Council. (June 2004 to June 2005.)
- An expert contributing to Recycling Based Economy Project conducted by APEC Human Resource Development WG. (2004-2005)
- A member of expert committee on Formulating International Sound-Material Cycle Society in Central Environmental Council (Nov. 2005-)
- A member of Supporting Committee of JICA's Study on Recycling Industry Development in the Philippines (Jun. 2006-March 2008)
- A resource person for UNCRD's project to support development of Vietnam 3R National Strategy (Jan 2008 – March 2009)



Why is regulation on e-waste needed?

- Different backgrounds of e-waste recycling regulation can be observed
 - Increase of treatment cost by local government
 - Packaging waste. E-waste in Japan.
 - Pollution from recycling process
 - E-waste recycling in Taiwan in various developing countries
 - Improper treatment of residues
 - CFC from air conditioner and refrigerator
- Regulations try to change responsibilities of stakeholders, cost sharing mechanism, and design of products, such as change of materials.

Regulation on Responsibilities of Stakeholders

Producer/Importer

E-waste
Generator

Collector

Public waste
collection and
disposal services

*Regulation on
Collection System*

Informal
Recycler
(Dismantling)

Formal
Recycler
(Dismantling)

Improper disposal of residuals

Informal Recycler
(Material Recovery)
in the country or
other country
generating pollution

Material recycler
-Non ferrous smelter
-Plastic recycler

*Pollution Control Regulation,
Regulation on Transaction
of dismantled items*

Objectives of Regulations

- Regulation on collection system
 - If market-based collection system is not working well, especially if e-waste is transported to informal dismantler, regulation on collection system may need to be created.
- Pollution control on dismantler and material recycler : to treat e-waste with environmentally sound technology by dismantler and material recycler.
- Regulation on transaction of dismantled items : to prevent movement of dismantled items destined for informal recyclers and improper dumping of residuals.
- Regulation on cost sharing mechanism: to change the economic incentives of stakeholders

COLLECTION SYSTEM

Design of Collection System: How to collect?

- There are several types of collection systems for e-waste
 - Fully market based
 - Buy-back center and collection center
 - Collection event
 - Curb-side collection by local government
 - Drop box : mobile phone, rechargeable battery
 - Postal service : PC in Japan
 - Retailers should take back discarded one, when they deliver new one to customer, if customer want to discard old one : TV, Refrigerator, Air Conditioner, Washing Machine

Who collect?

- Local government
 - Putra Jaya in Malaysia asks waste collection service company or to operate buy back center
- Voluntary agreement with stakeholders and government
 - Hong Kong has collection programs of rechargeable batteries and e-waste, with stakeholders, such as importers, retailers and NOGs.
- Some of the voluntary efforts of manufacturer have been started.
 - HP collects waste computers from business customers in China and other countries.
 - Dell collect waste computers from customers who buy Dell computers in Malaysia and Singapore.
 - Fujitsu started take back program for their IT products in Singapore, Thailand and the Philippines in 2007.
- NGOs
 - Penang Environment Working Group conduct voluntary collection program on battery and fluorescent lamp

Drop Box Collection by PEWOG



Box for collecting waste fluorescent lumps and cell batteries (December 2005)

- PEWOG(Penang Environment Working Group)
 - Formed in 2000 by State Local Government of Penang, Malaysia.
 - Community Based Recycling Program (Collecting recyclable waste in more than 200 communities in 2005.)
 - Collection program of fluorescent lumps and cell batteries. Drop box is set at the entrance of shopping center and market.

Collection System

Buy back Center in Putra Jaya, Malaysia, January 2010.



Monthly collection event in parking lot of a mall in Metro Manila, Philippines. Junk shops buy e-waste.



***POLLUTION CONTROL REGULATION FOR
DISMANTLER AND MATERIAL RECYCLER***

Requirement to Dismantler and Material Recycler

Dust collection is installed in home appliance dismantling facility in Tokyo, Japan, 2007.



- Philippines and Malaysia : e-waste dismantler need permit for hazardous waste treatment.
- Special requirement to dismantler is imposed by government or producers such as CFC collection and destruction.

CFC collection from Air Conditioner, Akita, Japan, September 2009.



Copper Cable Recycling



Open burning of plastic-coated wire to extract copper. Vietnam, August 2009.

Nagget system to separate copper and plastics. (Dec, 2004)



Stripping Machine for Cable.(Dec. 2004)

Pollution from Recycling of Imported Waste

→ Electrolysis facility to recover copper. December 2009, Guiyu, China 2009.



↑ Acid bath to take metals from PCB, Guiyu, China, 2004.

→ Centrifugation plant to recover gold and silver. December 2009, Guiyu, China 2009



***REGULATION ON TRANSACTION OF
DISMANTLED ITEMS***

Manifest or Consignment Note

- Dismantler may need to follow hazardous waste regulation including issue of manifest and consignment note, if dismantler sends dismantled parts containing hazardous substances to other facilities.
 - In some countries, it is not clear that government check the destination of dismantled parts.
- If dismantled parts are hazardous waste, international trade of dismantled parts should be under control of the prior notice and consent in the Basel Convention.

Reporting Systems

- WEEE Forum in EU
 - WEEE forum, which is European Association of Electrical and Electronic Waste Take Back Systems, develops reporting tool. Dismantler should submit the information on downstream material recyclers and recovery plants. Material recyclers and recovery plants should put information on how it is treated.
- South Korea also applies similar reporting system.

***REGULATION ON RESPONSIBILITIES OF
STAKEHOLDERS***

Types of Cost and Responsibility Sharing

- Regulation can define the primarily responsible actor among stakeholders, such as local government or producer. The primarily responsible actor responsibility should arrange collection system, recyclers and others.
- Alternatively, regulation can defines responsibility of each stakeholders, including consumer, retailer, producer, dismantler and local government.

Responsibilities

- Financial Responsibility
 - Who should pay recycling fee and when?
 - Who and how to manage collected recycling fee?
- Physical Responsibility
 - Collection target
 - Recycling target
 - Who give permit to dismantling facilities?
- Information Responsibility
 - labeling of substances

Variety of Designing Recycling System

	Japan: Home Appliance	South Korea: Producer Responsibility	Taiwan: Recycling Fund Management Board
Major target stakeholder	Manufacturer, Retailer	Manufacturer	Manufacturer
Target product or waste	TV, Air Conditioner, Refrigerator, Washing Machine	Home appliances, IT products, automobile, Packaging and container	Home appliances, IT products, automobile, Packaging and container
Financial Responsibility	Collect recycling fees from consumer at discarding and allocate the fund	No collection of explicit recycling fee from consumer.	Manufacturer should pay recycling fee, based on the sales in the market
Physical Responsibility	Take back and dismantle waste home appliances. Satisfy minimum recycling rate. Retailer collect discarded appliances.	Free take back when selling new one. Satisfy minimum collection rate and recycling rate	No Physical Responsibility for producer.

DIFFICULTIES TO IMPLEMENT EPR IN DEVELOPING ASIAN COUNTRIES

Does EPR solve the problem? (1)

To implement EPR, it is necessary to identify producer or importer of goods. But if smuggled good, imitated products and no brand products dominates market, it may be difficult to put responsibilities to all of producers and importers.



Probably, faked products, which design are same, but have LG logo and Sony logo. July 2007, in Vietnam.



No brand TV which are made from used TV monitor with new casing. Customer can choose brand name. January 2007, in China.

Does EPR solve the problem? (2)

- If the amount of smuggled goods, imitated goods and no-brand product are significant amount in the market, governments need to find other sources of funding for recycling these orphans.
- If informal recycler is not controlled, producer or formal recycler should buy e-waste. The stricter enforcement of pollution control on informal recycling can reduce the cost of formal recyclers on buying e-waste.
- The collection program based on voluntary agreement with producer and retailer is another option to start activities for formalizing recycling system.

References (1)

- Michikazu KOJIMA(ed.) [2005] *International Trade of Recyclable Resource in Asia*, Institute of Developing Economies, downloadable from <http://www.ide.go.jp/English/Publish/Download/Spot/29.html>
- Kojima(ed.) *Promoting 3Rs in Developing Countries: Lessons from the Japanese Experience*, Institute of Developing Economies, downloadable from <http://www.ide.go.jp/English/Publish/Download/Spot/30.html>.

References (2)

- Kojima, Michikazu, Aya Yoshida and So Sasaki [2009] “Difficulties to apply extended producer responsibility in developing countries: Cases of e-waste recycling in China and Thailand” *Journal of Material Cycles and Waste Management*, Vol.11, pp.263-269.
- CHUNG, Sungwoo and Michikazu Kojima [2010] “Design of E-waste Recycling Indicators in East Asia” in Kojima and Damanhuri (ed.) *3R Policy in Southeast and East Asia* vol. 2, a report submitted to ERIA.