

***Sound Material Cycle  
Society from Japan to Asia***  
**INTERNATIONAL GREEN TECHNOLOGY AND  
PURCHASING CONFERENCE**

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Yasuhiko Hotta, PhD

Deputy Director, SCP Group,  
Institute for Global Environmental  
Strategies



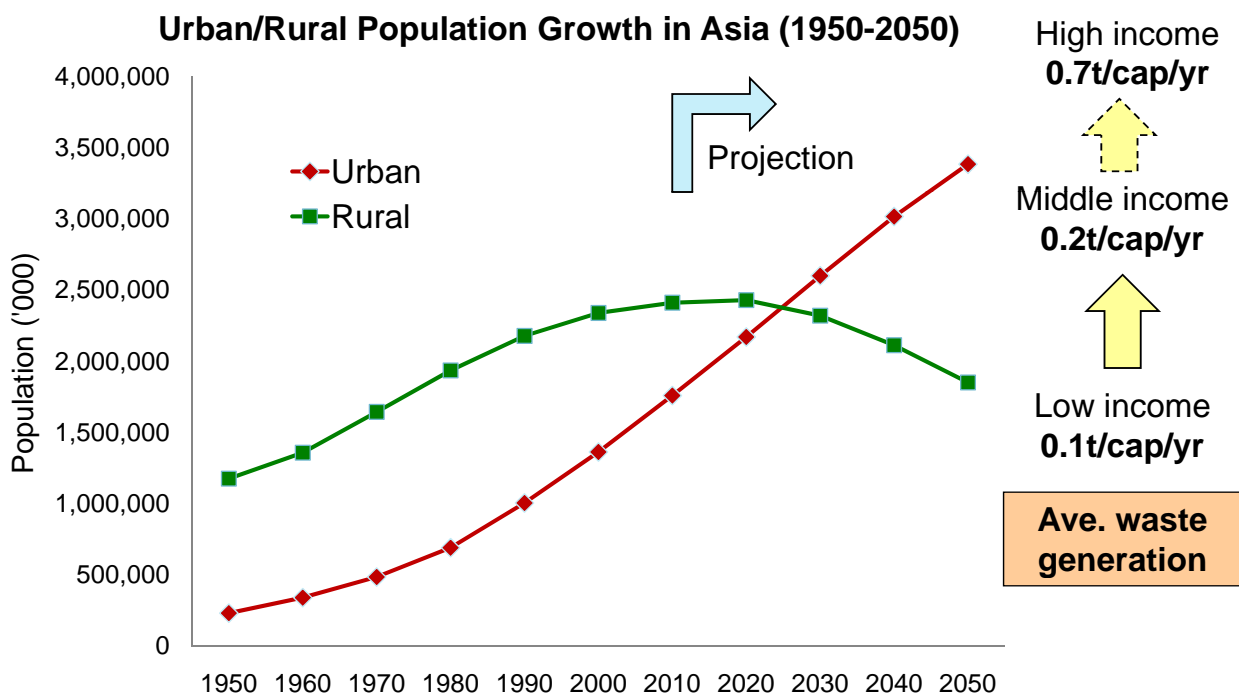
INTERNATIONAL GREEN TECHNOLOGY AND PURCHASING CONFERENCE, October 15-16, 2010  
Sound Material Cycle Society from Japan to Asia



## Outline

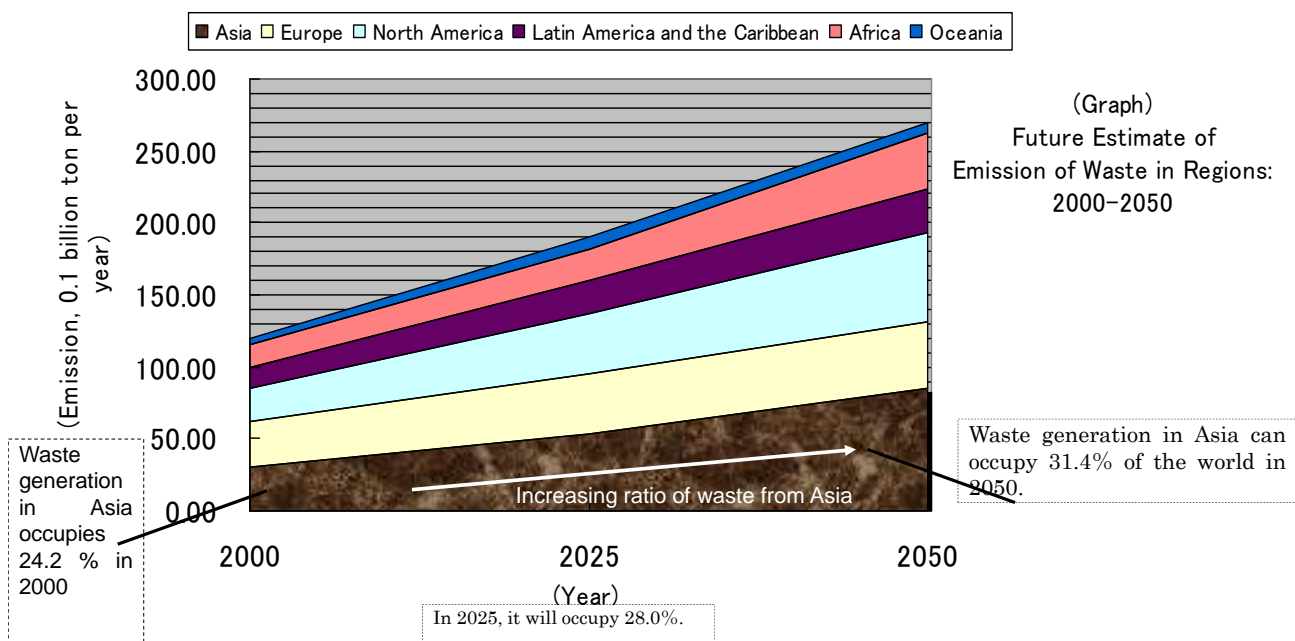
- Increasing waste issues in Asia
- Overview of 3R approach
- Japan's approach and results
- Increasing resource use and declining resource productivity of Asia
- Asian examples of 3R activities
- Challenges
- Regional 3R Forum in Asia

## Urbanization and Waste Generation in Asia



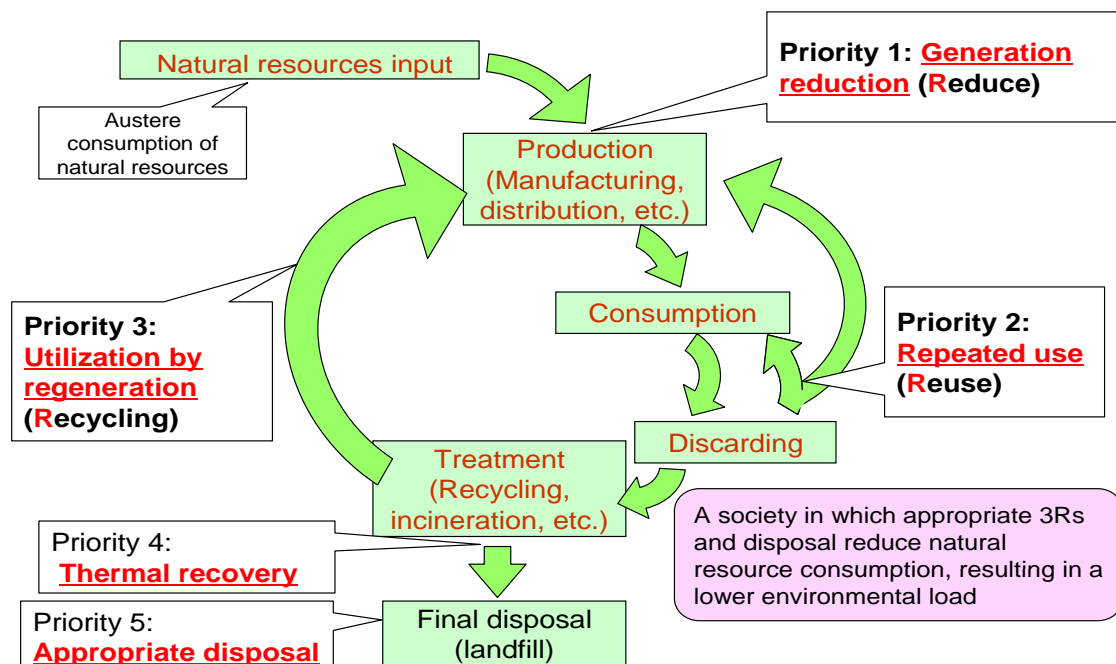
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## Increasing Waste Generation in Asia



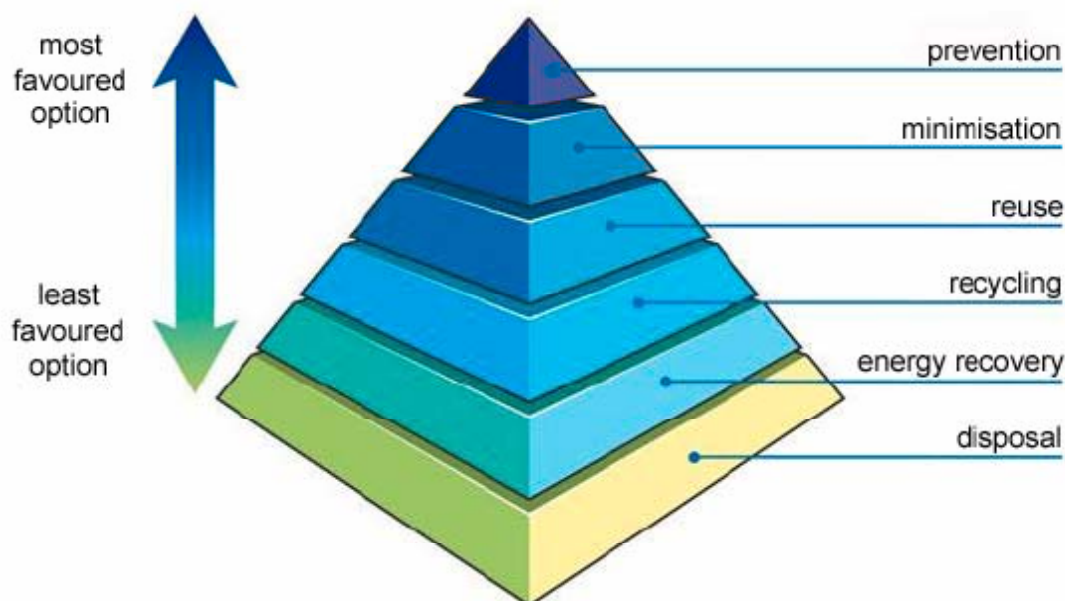
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## Overview of 3R Approach – 1



MOEJ (2008), "Discussion Paper: 3Rs", G8 Kobe Environmental Ministers Meeting 2008, Kobe, Japan, May24-26 2008

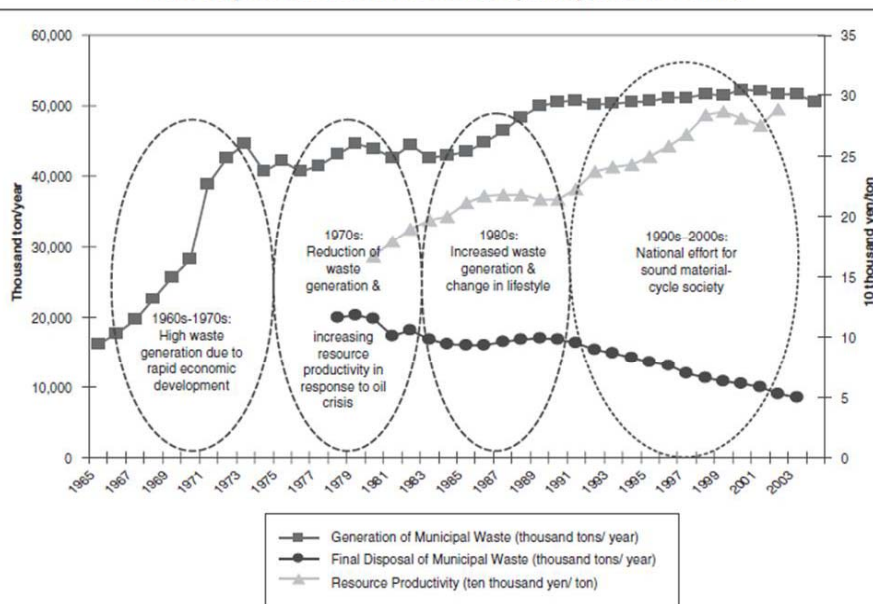
## Overview of 3R Approach – 2



Source: <http://www.wasteonline.org.uk/resources/InformationSheets/WasteDisposal.htm>

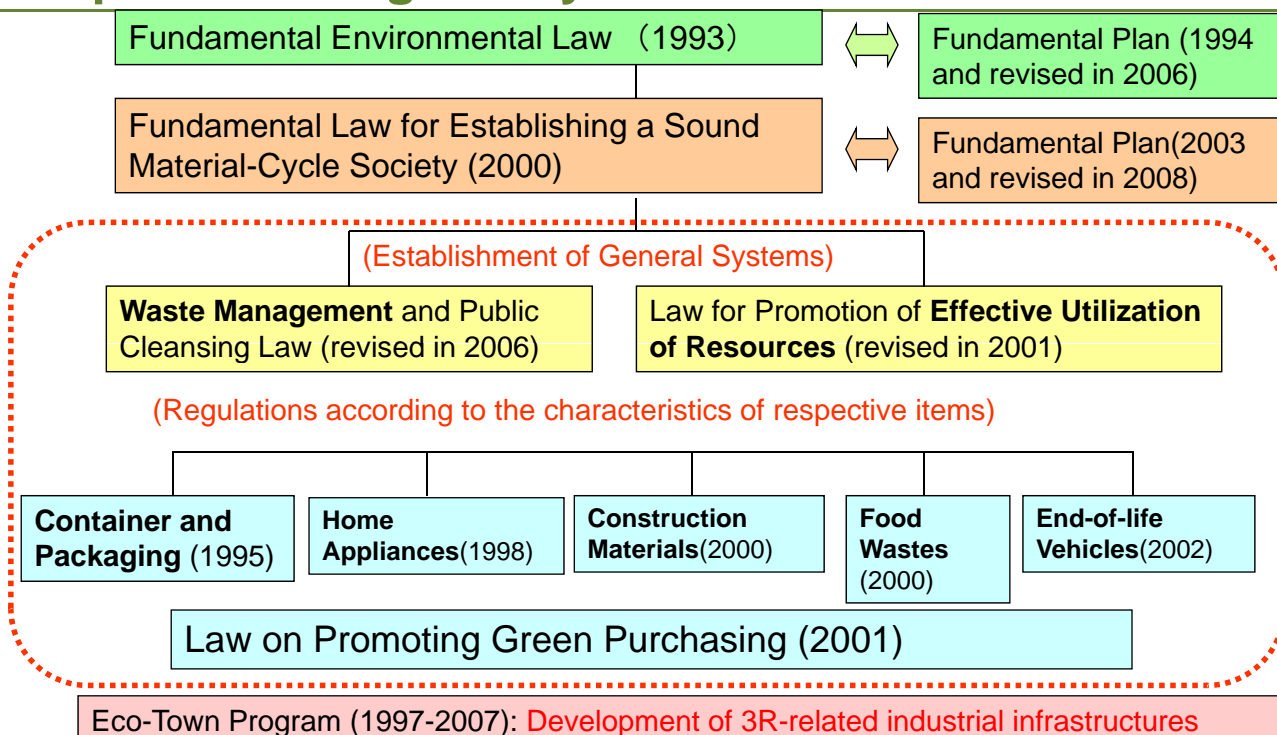
## Modernization of Japan, waste generation and resource productivity

Figure 2  
 Waste Disposal and Resource Productivity in Japan (1965 to 2004)



Source: Compiled by authors. Data on generation of municipal waste, final disposal of municipal waste, and resource productivity are based on Ministry of the Environment of Japan's Kankyo Toukei Shu (Environmental Statistics Database; <http://www.env.go.jp/doc/toukei/index.html>).

## Japan's 3R Regulatory Framework



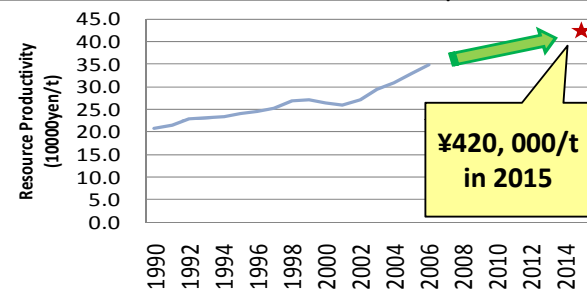
Source: Modification of Y. Moriguchi(2006), "Establishing a Sound Material Cycle Society in Asia" a presentation at Asia 3R Conference, October 30<sup>th</sup> –November 1<sup>st</sup>, 2006, Tokyo,

## Japan's Results from 3R and Resource Circulation

### Approach

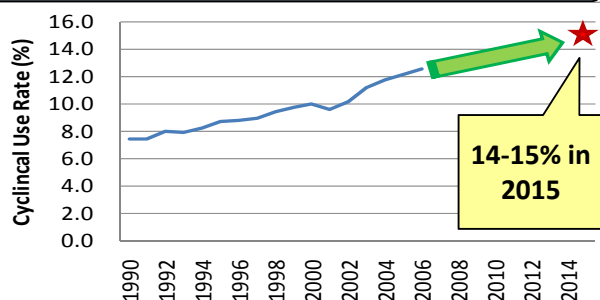
- Monitoring progress in policy implementation is essential.
- Japan introduced MFA-based indicators and policy targets for 2010 in 2003 to monitor the progress of 3R implementation at macro-level.
- Based on the progress, Japan revised its fundamental plan in 2008 and set new targets for 2015.

### "INPUT": Resource Productivity GDP/natural resource input

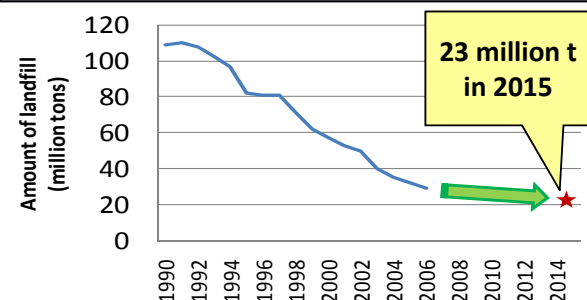


### "CIRCULATION": Cyclical Use Rate

Cyclical use amount/ cyclical use amount + natural resource input



### "OUTPUT": Final treatment of waste



## Cases of Eco-town Programme and EPR

- Japan's approach to sustainability can be characterized by emphasis on compatibility between environmental conservation and industrial competitiveness through "increasing efficiency".
- Two of the prominent approaches for sound material cycle society in Japan was "eco-town programme" and EPR-based legislation introduced in 1990s to early 2000s.

## Effectiveness of Eco-town Type Recycling Industrial Park/Facilities

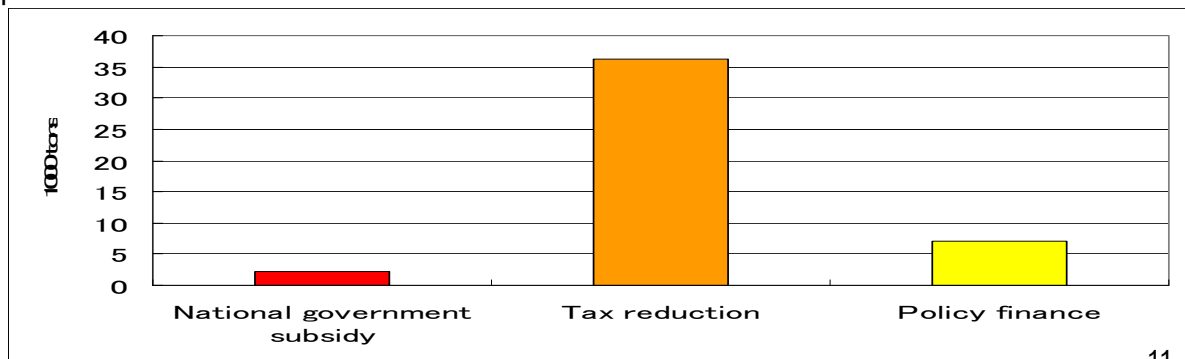
Cost for Japanese government: 94.75 billion yen

Overall effectiveness: 5.89 million tons in recycling capacity generated directly by the eco-town policy (From subsidies between 1997-2004, and tax reduction and policy finance between 2000-2004) (METI's ex post facto policy evaluation in March 2006). However, in eco-towns, there are many additional recycling facilities which were not funded under this scheme.

Japan's total recycling of materials in 2004 in national MFA: 247 million tons

Japan's national target for the overall recycling rate is 14% for 2010. Eco-towns contributed around 20% of the average annual increase in national recycling capacity. (METI's calculation)

Effectiveness of Different Policy Measures: Increase in Recycling Capacity per 100 million yen input



METI's ex post facto policy evaluation of "establishing infrastructure related to recycling" March 2006

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## Eco-town (building large-scale centralized recycling infrastructure) Costs and Effects of Eco-towns in Japan

- Kawasaki eco-town example** (one subsidized paper recycling facility, not the total eco-town area) Construction Cost: **10.56 billion yen**. Direct cost for government; **2.1 billion yen**. Cost-benefit for local government: **6.1**. Cost of business operation is about **5.7 billion yen/year** and **income is about 7.9 billion yen/year** for this facility (not whole eco-town). Economic spill over effect is calculated **9.3 billion yen/year**. (METI's calculation)
- Akita eco-town example** (one non-ferrous recycling facility; not total eco-town area ) Total investment cost: **3.09 billion yen**. Direct cost for government Cost benefit **2.7** for local government. Cost of business operation is about **0.74 billion yen/year** and **income is about 0.86 billion yen/year** for this facility (not whole eco-town). Economic spill over effect is **0.76 billion yen/year**. (METI's calculation)

## Eco-town (building large-scale centralized recycling infrastructure)-2 Costs and Effects of Eco-towns in Japan

**Kitakyushu:** over 6 years. 45 recycling and research facilities

- Investment total 650 million US dollars  
(City: 59 million, Central government 257million, Private 340 million)
- Economic spillover effect: Production 1100 million US dollars

Added value 560 million US dollars

Employment 6470.

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## Lessons from Japan's Eco-town programme

### Recycling policy

- ✓ *Large-scale recycling facilities needs constant, stable and large supply of recyclables.*
- ✓ *To utilize recyclables, you need materials industry.*

### Overall goals, industrial policy aspects

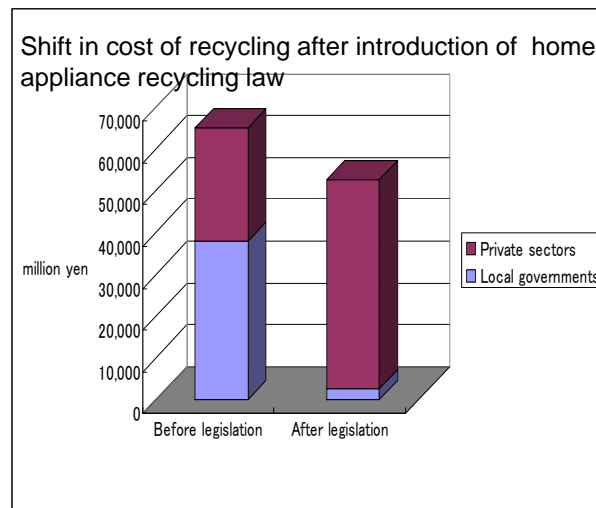
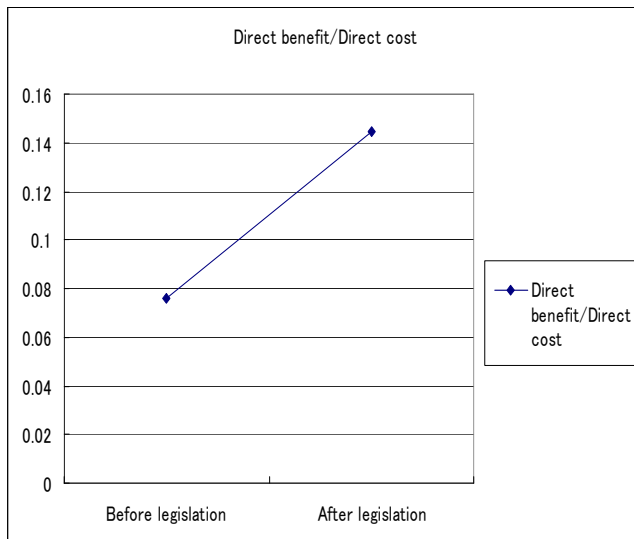
- ✓ *Not very successful as a response to hollowing out/decline of base materials and manufacturing industry*
- ✓ *Not very successful for revitalization of local economy with recycling industry as a hub of environmental industrial development*
- ✓ *Successful in developing nation-wide role sharing for wide area recycling to respond reform of waste management and recycling policy*
- ✓ *Successful in concentrating technical and technological capacity (idea of clustering)*

### Cost-effectiveness of financing methods

- ✓ *Direct cost effectiveness of subsidy mechanism for recycling capacity building was quite bad. Tax reduction was most effective to increase recycling capacity.*
- ✓ *To make tax reduction and policy finance effective, some kind of overall strategy setting and back-up from product-specific recycling legislation is necessary*

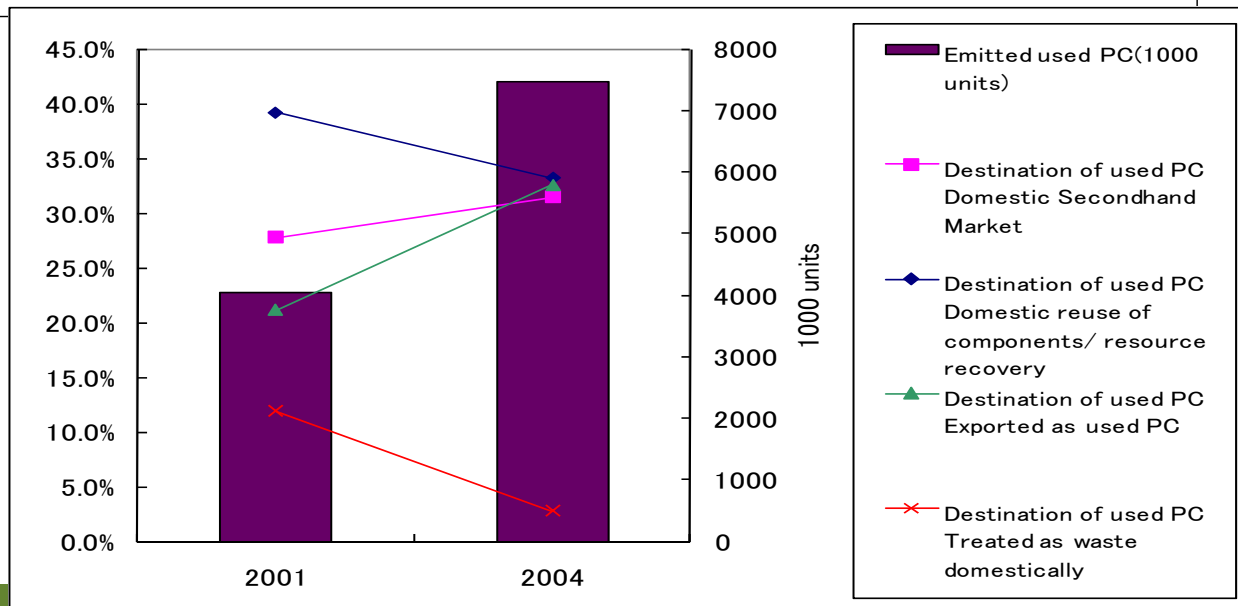
## Effects of EPR-based legislation in Japan

- Japan's case of home appliance recycling law suggests EPR-based recycling mechanism is cost effective to promote recycling. Also, the responsibility of cost sharing has shifted from local government to private sector. Also, exports of used home appliances stabilized between 2001 and 2006.



## Trade and EPR-based mechanism

- However, PC's case shows that secondhand market can be a loophole for domestic recycling and resource utilization mechanisms.
- Domestically-oriented EPR-based recycling mechanism works for durable consumer goods targeting domestic market.
- For goods which can be used as secondhand goods outside of Japan such as PC and automobiles, secondhand goods market can be a loophole.





## Lessons from Japan's EPR Policy

### EPR-based recycling policy as environmental policy

- ✓ EPR does not contribute to prevention of pollution from recycling.
- ✓ EPR needs many supporting mechanisms based on proper waste management legislation and systems.

### Cost-effectiveness of EPR for recycling

- ✓ The case of Japan's home appliance recycling law suggests that EPR policy is cost effective for increasing recycling capacity. Also, the responsibility of cost sharing has shifted from local government to private sector effectively.
- ✓ Domestically-oriented EPR-based policy works for durable consumer goods targeting the domestic market. Exports stabilize between 2001 and 2006.

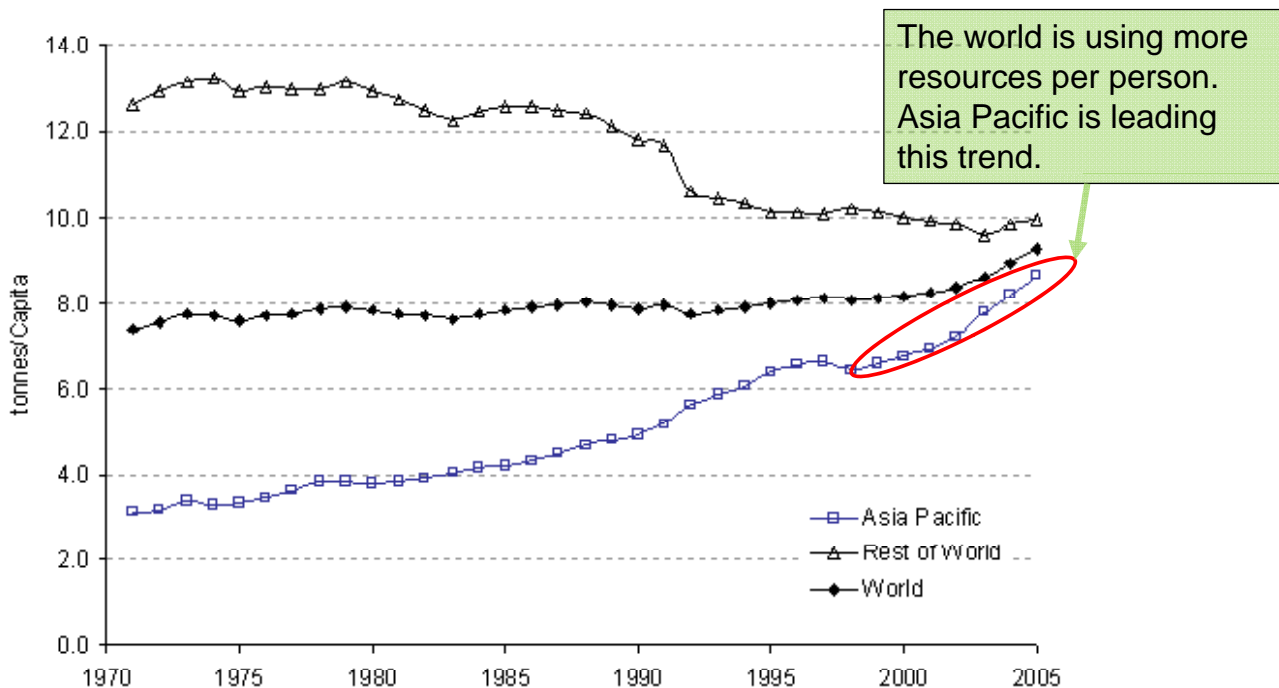
### Trade of secondary materials as loophole

- ✓ Export of secondary materials from used home appliances and secondhand goods is a loophole of EPR-based recycling policy.
- ✓ For example, the case of PCs shows that the secondhand market can be a loophole for domestic recycling and resource utilization mechanisms for goods.

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## Increasing resource use/declining resource productivity of Asia

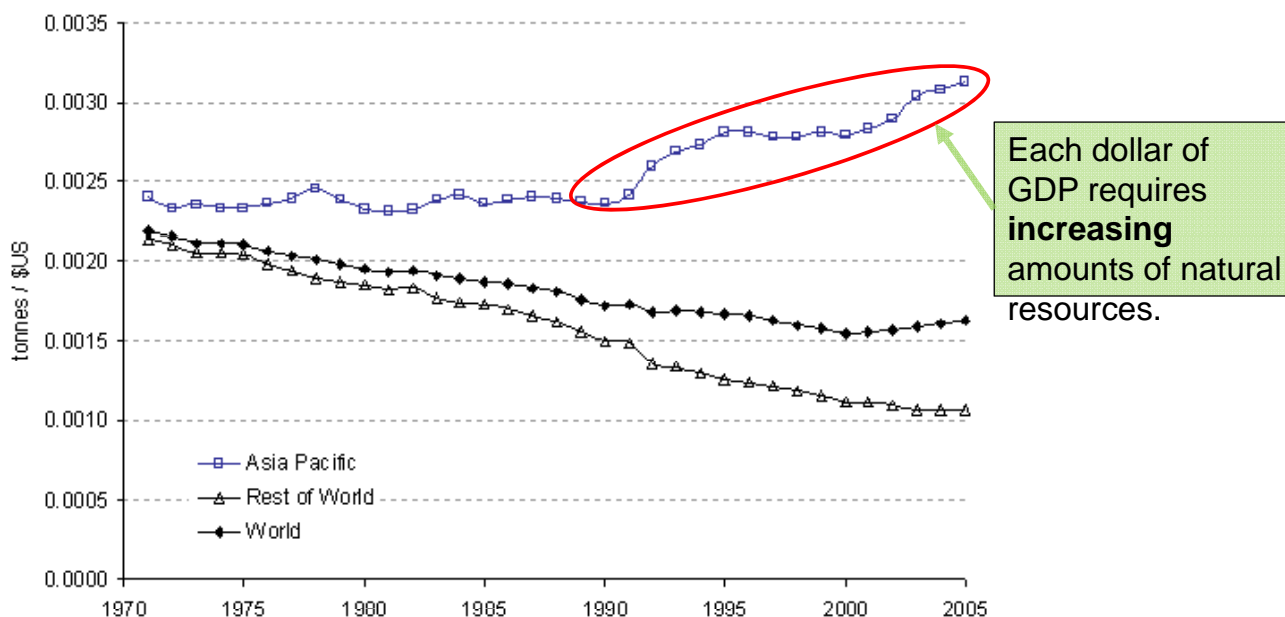
## Resource Consumption is Increasing



Per Capita Resource Use for the Asia-Pacific, Rest of World and World, for the years 1971 – 2005.

(Total Domestic Material Consumption).or.jp

## Economic Growth in Asia Pacific Requires Increasing Amounts of Resources



Material Intensity for the Asia-Pacific, Rest of World and World, for the years 1971 – 2005.

(Materials are Total Domestic Material Consumption, dollars are constant year 2000 \$US, exchange rate based)

Source: UNEP (2010, Forthcoming)

## Asian Examples of 3R Policies – 1

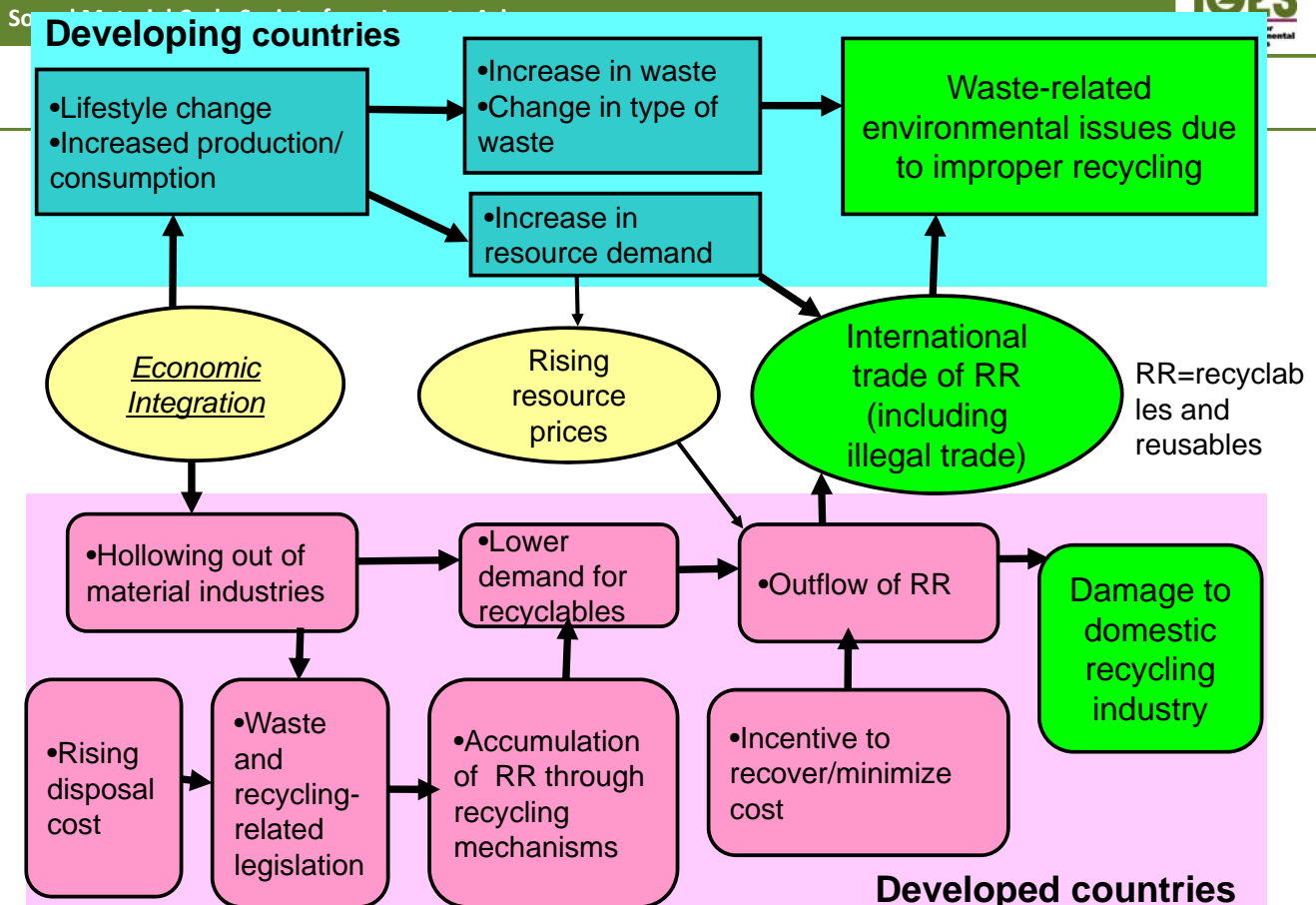
<b>People's Republic of China</b>	<b>Circular Economy Law (2009)</b> Place the Development of Circular Economy as central agenda for Chinese Government
	<b>China WEEE Law (2009 effective from 2011)</b> Strengthening e-waste management
	<b>Eco-industrial parks around the country</b> Develop about 20 national pilot eco-industrial parks. In addition, 8 national pilot regions to build regional-level circular economy.
<b>Malaysia</b>	<b>Solid Waste and Public Cleansing Management Act (2007)</b> Shifting responsibility of solid waste management from municipalities to federal government. Introducing 3R principle. Promoting privatization of waste management.
	Setting 22% recycling targets for 2020.
<b>Philippines</b>	<b>Ecological Solid Waste Management Act(2001)</b> Introduced 3R principles. Sets the mandatory waste diversion goal of at least 25% by 2006
	<b>National Solid Waste Management Commission</b> Inter-agency and multi-stakeholder coordination body for improving solid waste management at national level (established in 2001).
	<b>National Framework for the Informal Sector in Solid Waste Management in the Philippines (2009)</b> Establish an action plan to improve the situation of informal sector engaging in solid waste management

## Asian Examples of 3R Policies – 2

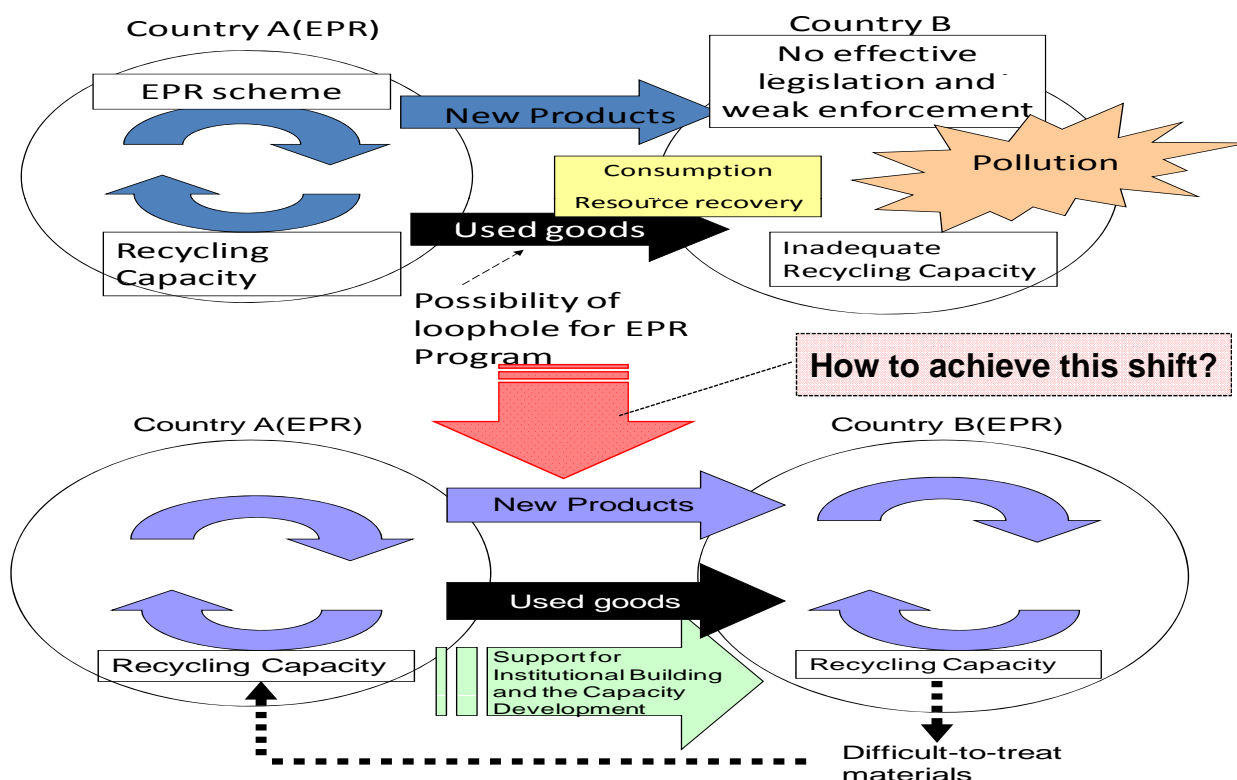
<b>Republic of Korea</b>	<b>Food-waste minimization and recycling</b> Increase in recycling rate: 2.1% in 1995, 41.1% in 2000, 93.8% in 2005 Extension of life span of the landfill site: 7 years to 11 years
	<b>Volume-based waste fee system</b> Decrease in urban solid waste generation by 0.62% from 1994 to 2004
	<b>EPR</b> Increase of recycling rate for EPR target items (WEEE and end-of-life vehicles)
<b>Thailand</b>	<b>Take-back Program for End-of-life Products</b> As of 2005, used lead-acid batteries are returned up to 85% Take-back program of fluorescent lamp has been implemented in cooperation with Government of Japan.
	<b>Initiatives of Recycling-oriented Society</b> Over 200 communities implement the 3Rs, some municipalities reduce waste up to 30-50%
	<b>Industrial Waste Exchange Program</b> Over 450 industries registered as members in 2005
<b>Viet Nam</b>	<b>3R-related Policy and Legislation</b> The 2005 Law on Environmental Protection: 14 new articles were established to promote 3R and other related activities.
	<b>The 3R National Strategy</b> 3R Targets by 2020: 30% of total collected waste volumes are recycled At-source, wastes are segregated by 30% for households and 70% for enterprises.

## Challenges

- Setting policy priorities and directions, defining role of stakeholders, and measuring results
- Shifting from establishment of regulatory and policy framework into actual implementation of policies:
  - Increasing regulatory capacity of local authorities and improved coordination between central and local governments
  - Establishing industrial infrastructure for the 3Rs
  - Using market-based instruments in combination with regulatory instruments to influence behavior of stakeholders
- Building legitimacy and support through community and private sector participation
- Information sharing for proper treatment and management of recyclables



## International cooperation is a key



## Regional 3R Forum in Asia

- Launched in November 2009 in Tokyo with 15 participating countries from Asia and 16 international organizations, including ADB.
- 2<sup>nd</sup> Meeting was held in KL Malaysia, October 4-6 2010
- Expected to function as an umbrella for regional cooperation for the 3Rs in Asia
- IGES has supported this process from its planning stage and functioned as a coordinator of international collaborative research.

Strategy dev't and implementation	Demonstration projects	Reduction of GHG emissions (Co-benefits)	3R information and research network	Prevention of inappropriate and illegal trade of waste	Int'l collaborative research
<ul style="list-style-type: none"> <li>• Support national 3R strategy dev't.</li> <li>• Share experiences in national 3R strategy development.</li> <li>• Facilitate implementation of national 3R strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop regional facility to identify demonstration projects.</li> <li>• Support demonstration projects.</li> <li>• Convene Asia Congress for Reduction of Use in Disposable Plastic Bag.</li> </ul>	<ul style="list-style-type: none"> <li>• Support co-benefits projects (reduction of GHG emission + sound waste management).</li> </ul>	<ul style="list-style-type: none"> <li>• Compile/ disseminate 3R knowledge through the 3R Knowledge Hub (3RKH).</li> <li>• Develop/ strengthen regional network among key institutions and experts.</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitate international collaboration under the existing scheme of Asia Network for the Prevention of the Illegal Transboundary Movement of Hazardous Wastes.</li> </ul>	<ul style="list-style-type: none"> <li>• Launch international collaborative research to identify strategic policy options and their effectiveness towards sustainable resource cycles in the region.</li> </ul>

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# Thank you for your attention!