

Importance of the 3Rs, 2Rs, and Circular Economy as a Governmental Policy

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**CASE STUDY OF JAPAN
SANITARY WASTE MANAGEMENT TO
THE 3RS**

Question 1

- Japan in the 1960s to 1970s experienced rapid economic growth and urbanization. This resulted in huge increase in household waste generation. In the 1960s, 40 % of municipal waste were treated with unlined landfill and dumping to mountain area. The burying of untreated waste in Japan, with its climate of high temperature and humidity, resulted in sanitary problem of flies and mosquitoes.
- At the same time, since Japan is with a limited land space, it became crucial on how to save landfill capacity.
- *How do you think that Japanese municipalities and government respond to this challenge?*
- *If you are mayor or governor and his/her staff, what would you do?*

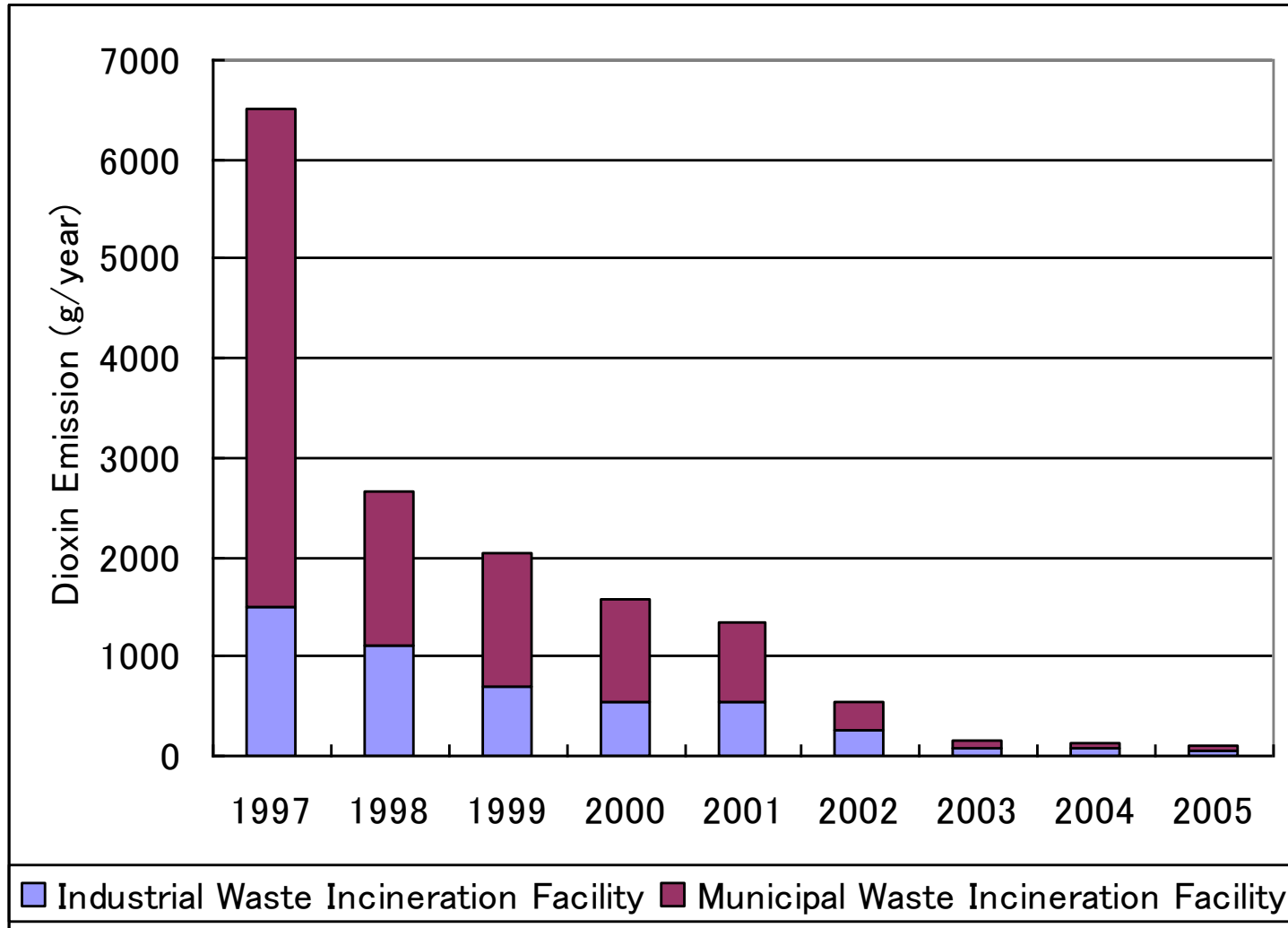
Comparison of Waste Management in OECD countries (early 1990s)

	Germany (1993)	Netherlands (1993)	Sweden (1991)	United States (1993)	Canada (1992)	Japan (1993)
Total Waste Generation (thousands tons/ year)	43,500	12,000	3,200	207,000	23,200	50,300
Incineration rate	25%	23%	55%	16%	5%	74%
Landfill rate	45%	50%	27%	62%	84%	15%
Incineration facilities	53	11	21	148	17	1,854
Incineration amount/number of facilities	208	255	81	223	71	20

Question 2

- Japan in the 1980s continued its rapid economic growth and urbanization(bubble economy). This resulted in increasing volume and varieties of wastes. Especially, plastic waste increased rapidly.
- Plastic waste was difficult to separate (many types). It can generate hazardous pollutants by incineration. 90% of dioxin generated in Japan was from incineration. Some plastics are inflammable and not suitable for incineration.
- In the early 1990s, dioxin pollution from incineration got
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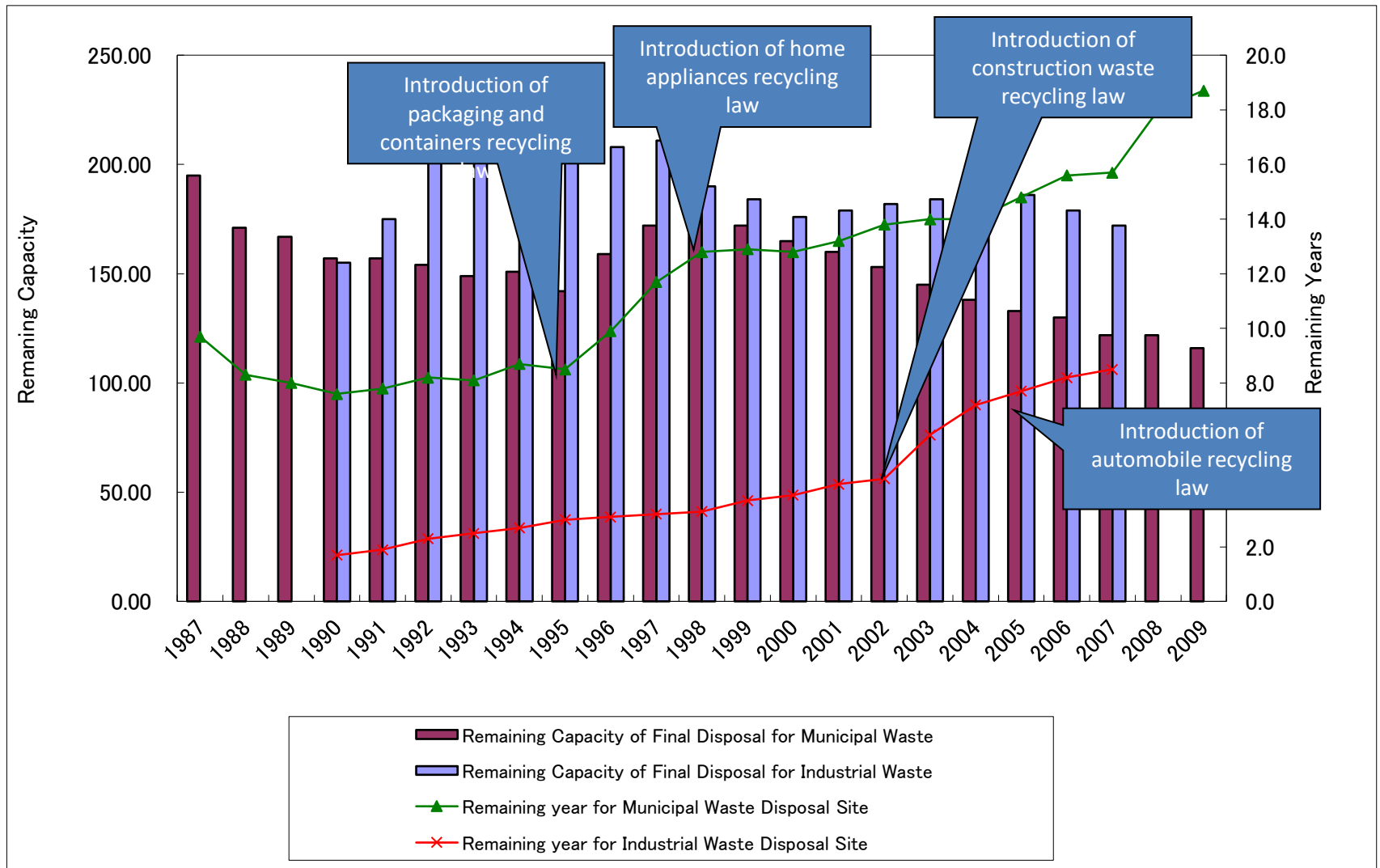
Dioxin issues from waste incineration facilities



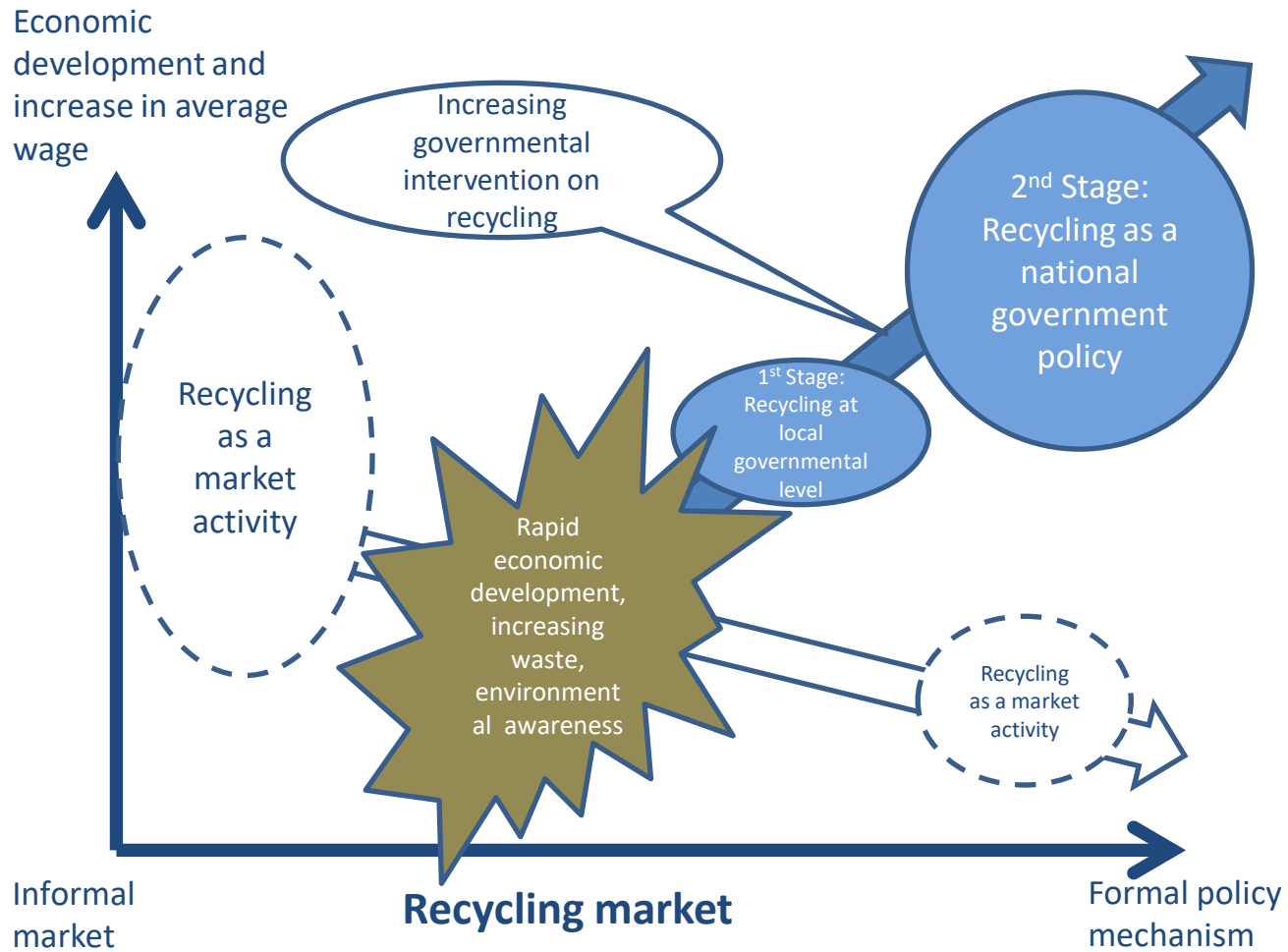
Question 3

- Japan in the 1990s, the incineration facilities have become large-scale facility for mass-incineration in high temperature with 24 hours continuous operation.
- To operate this large-scale incinerators, Japanese municipalities have to collect wastes in mass-scale in continuous manner.
- At the same time, rebuilding of old facilities into new large-scale facilities and its running/operating cost has become very expensive.
- *How do you think that Japanese municipalities and government respond to this challenge?*
- *If you are mayor or governor and his/her staff, what would you do?*

Capacity of final disposal site



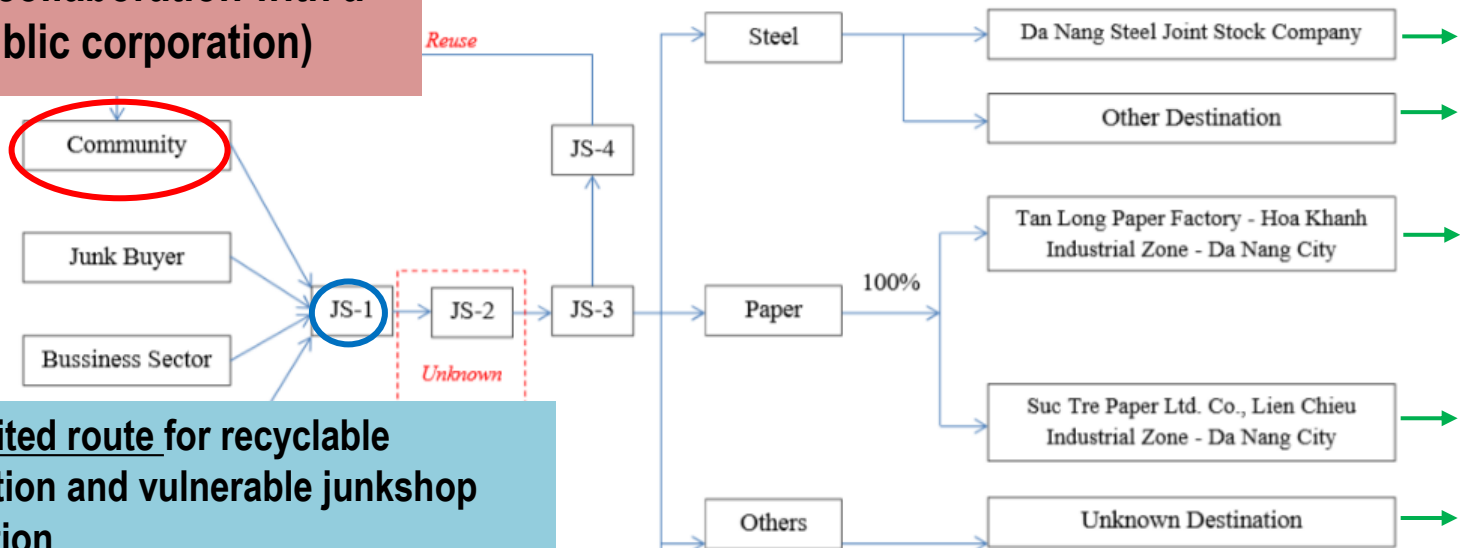
CASE STUDY OF PROMOTING RECYCLING AS A POLICY



Challenges typically faced by cities in developing Asia (Da Nang: 3rd largest city in Viet Nam)

1. Limited option for recyclable collection (Only community-based collection and collaboration with a public corporation)

4. Low proportion of plastics as recyclables (6-10%) and relatively low value other than PET



2. Limited route for recyclable collection and vulnerable junkshop operation (Only community-junkshop route)

JS-1: Intermediaries purchasing -Level-1 Junkshop (Sale to Level-2 Agent); JS-2: Intermediaries purchasing -Level-2 Junkshop (Sale to Level-3 Agent); JS-3: Intermediaries purchasing -Level-3 Junkshop (Sale to Recycling Factory); JS-4: Recycling directly at Shop

3. Unclear recyclable material flow (Type, Amount & Fate) in each process. Plastics are not likely to be recycled locally but to send to Ho Chi minh or beyond the borders

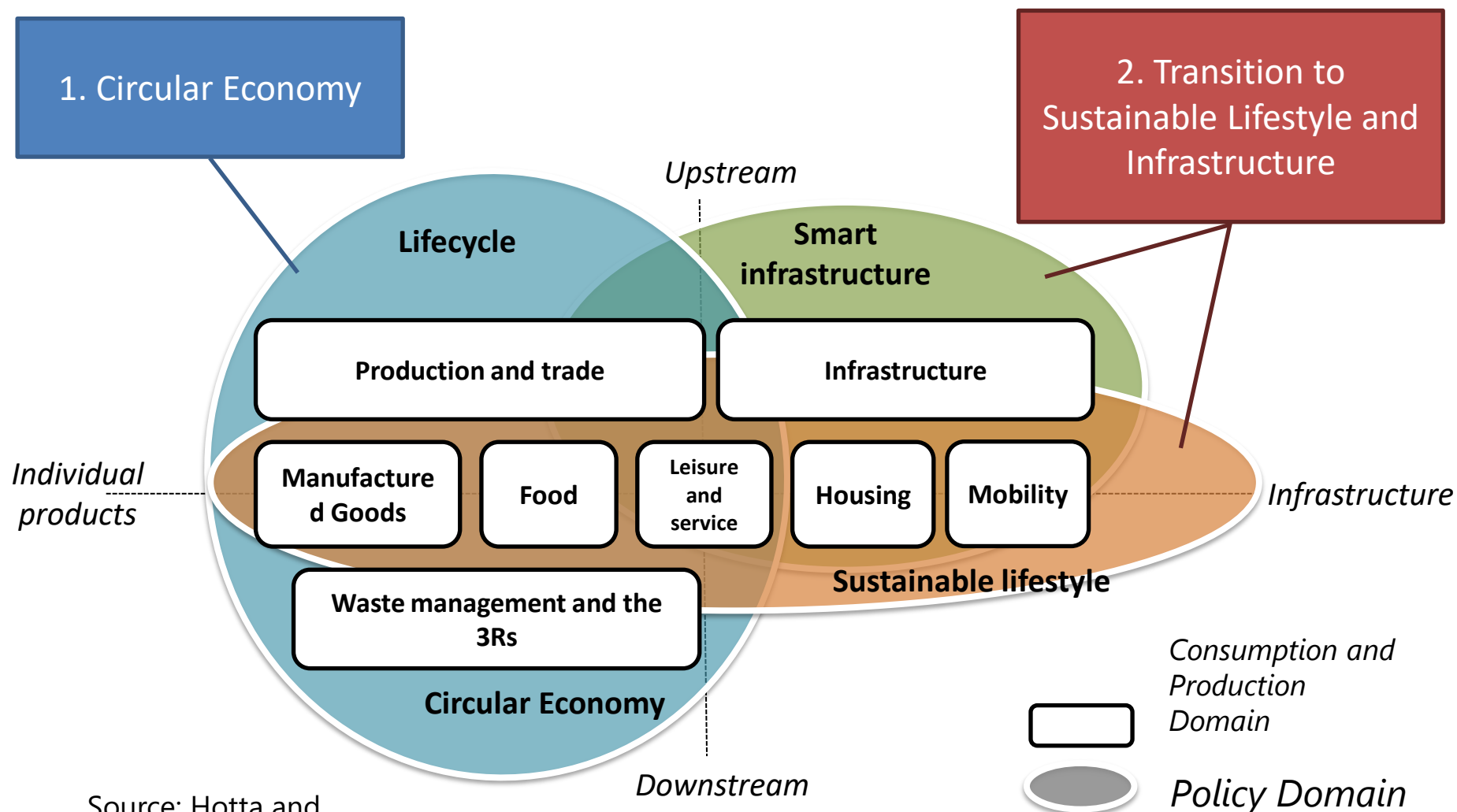
Source: IGES (2019), JICA Partnership Program on Solid Waste Management Project for Promoting Segregation and Recycling in Da Nang City

Opportunities for improvement

- Setting clearer strategy and policy objectives, and its follow-up
- Coordination among different ministries and local governments
- Linking recycling policy with infrastructure development
- Collaboration among stakeholders, especially participation of citizens and awareness raising
- Establishment of stable recycling market

**NEW POLICY TREND (CIRCULAR
ECONOMY AND SCP)**

Two Domains of SCP: Circular Economy and Sustainable Transition



Source: Hotta and Koide

Shift in Discourse of Sustainability

Approaches	SCP 1.0(1980s-1990s)	SCP 2.0(Late 1990s to 2000s)	SCP 3.0 (After 2015)
Major concepts	<u>Pollution prevention</u> <u>Cleaner Production</u> (as an intermediate between SCP 1.0 and 2.0)	Industrial ecology <u>Resource efficiency</u> <u>Product lifecycles</u>	One planet living, Sufficiency, Decarbonization <u>Transition</u>
Key issues	<u>Industrial pollution</u>	<u>Climate change,</u> <u>waste,</u> environmental issues associated with consumption	<u>Well-being,</u> <u>Life-style</u> Socio-technical system
Environment- economy relationship	Separate, contradictory, confrontational	Compatible, industrialization harmonized with environmental conservation	Inclusion of social consideration, Sustainability as a key for next socio- technical innovation
Approaches	<u>Installation of end of pipe technologies</u> Technology and management for cleaner production	<u>Increasing material and energy efficiency</u>	<u>Consensus building</u> <u>Changes in infrastructure</u> <u>Changes in lifestyles</u> <u>New business models</u>
Major actors and stakeholders	Government vs. industry	Collaboration of government and market agents	Social entrepreneurship Multi-stakeholder Lifestyles of people
Attitude of policies	React and cure	Anticipate and prevent	Long-term goal setting, investment, creating business environment, creation and communication

CASE STUDY

UTILIZATION OF DX



- Utilizing IBM Block Chain Technology
- Digital Token for collecting recyclable plastics
- Can trace back the origin of recyclable plastics
- Providing food, fuel, school education, or health insurance
- Partners including SCJohnson, Henkel, AEON etc.



Source: <https://plasticbank.com/>



- Funded by Japanese Government
- Operated by UNEP in partnership with universities such as AIT
- Targeting monitoring and identification of hotspots of plastic leakages from land, river to the sea in Mekong and Ganges
- Plastic litter identification by using vision and AI such as moving-camera, fixed camera, drones, and mobile apps.

CASE STUDY

**G20 OSAKA BLUE OCEAN VISION (2019)
AND UN LEGALLY BINDING INSTRUMENT
FOR PLASTIC POLLUTION (2024?)**

Osaka Blue Ocean Vision (2019)

- G20 leaders agreed the Osaka Blue Ocean Vision **as a common global vision**
- They also called on other members of the international community to share this vision for protecting the world's oceans



"We **aim to reduce additional pollution by marine plastic litter to zero by 2050** through a comprehensive life-cycle approach that includes reducing the discharge of mismanaged plastic litter by improved waste management and innovative solutions while recognizing the important role of plastics for society."

UN Legally binding instrument for plastic pollution(2024?)

Direction of National Policy Response

1. Prevention: Product and service design for plastic-use reduction, introduction of alternatives to plastics

2. Waste Reduction: Increase in durability of products, including synthetic fiber products, tires, and paints using plastics. Washing and capture of micro-plastics before selling the products using synthetic fibers.

3. End of pipe: Introduction of filter, prevention of illegal dumping, clean-up, river management

4. Product regulation: Regulation of microbeads, single-use plastic products

5. Recycling: Harmonized technical standards for plastics, recycled plastics and plastic products, Guidelines on circularity in plastics use

But! Need to be super ambitious!

OECD Global Plastic Outlook (2022)

- OECD countries needs to be very ambitious in terms of restraining plastics demand and enhancing circularity.
- Co-ordinated and ambitious global efforts can almost eliminate plastic pollution by 2060.
- The economic consequences of the policy packages will be modest at the global level.
- Developing economies will face higher costs than the global average. Role of ODA/technology transfer/investment to infrastructure will be increased.

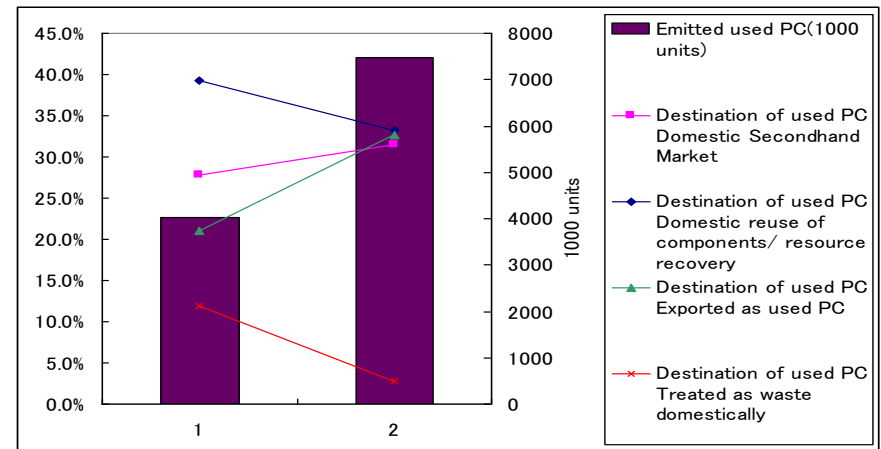
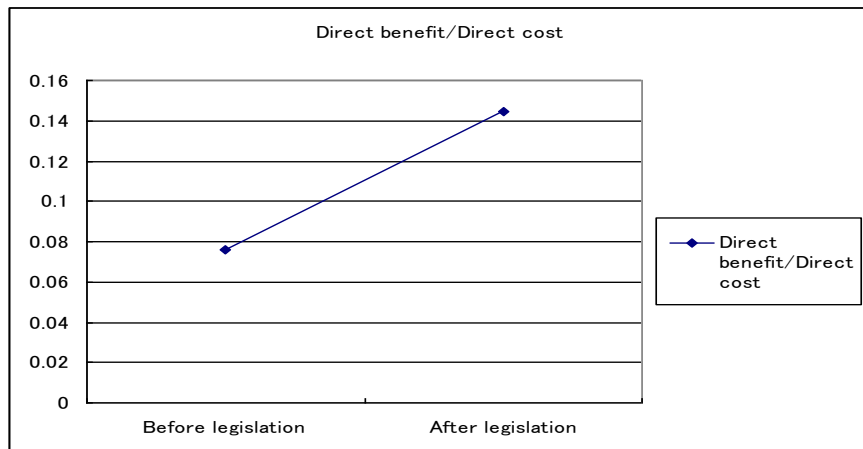
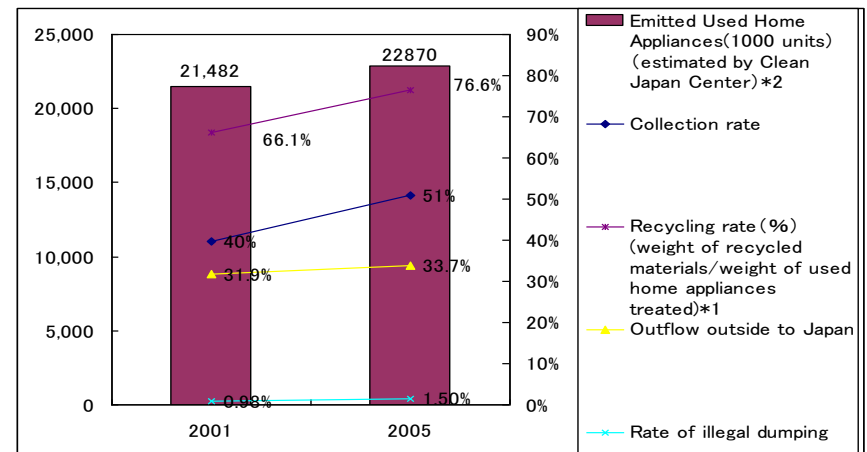
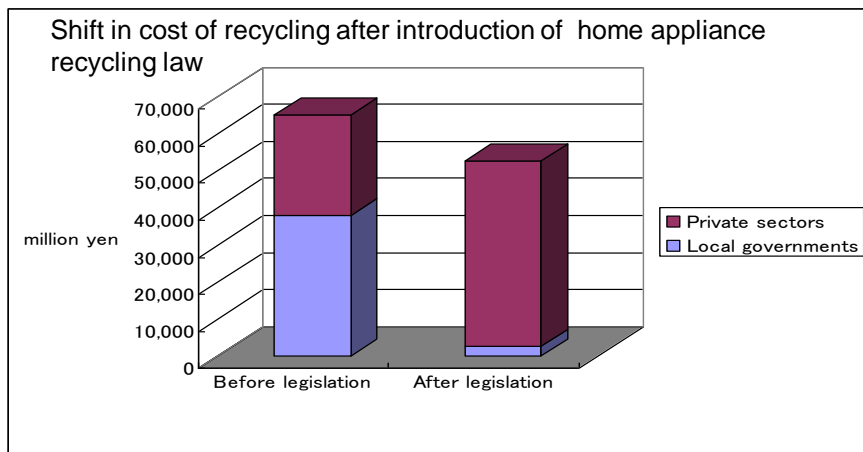


CASE STUDY

**INTERNATIONALIZATION OF CIRCULAR
ECONOMY**

Demonstration of effectiveness and limitations of introduction of EPR

- Japan's case of home appliance recycling law suggests EPR policy 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.
- However, PC's case shows that secondhand market can be a loophole for domestic recycling and resource utilization mechanisms.
- Domestically-oriented EPR-based policy 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**.



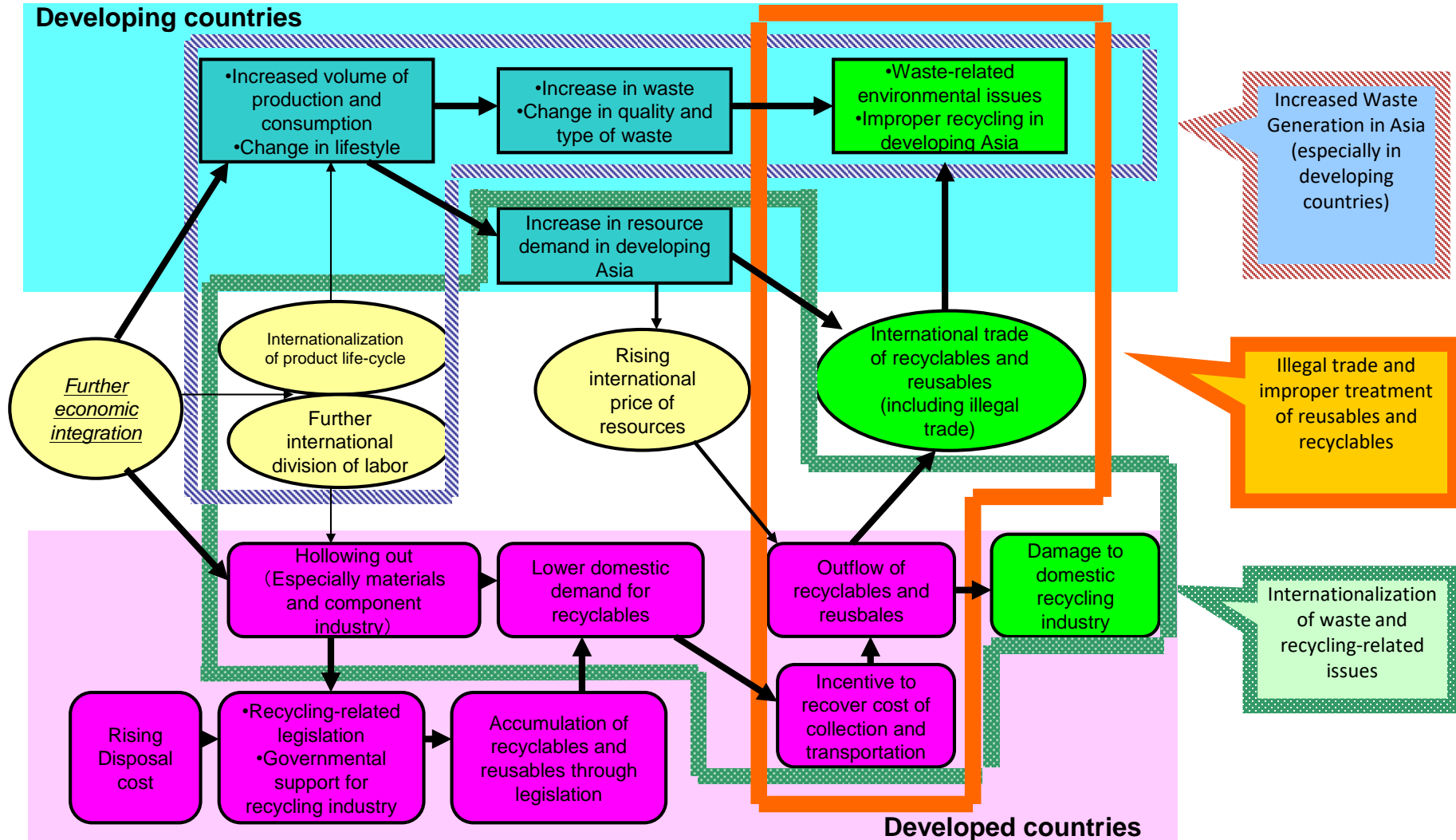
Estimate of Material Flow of Used Home Appliances in Japan

Approx. 50%: Official Route of Recycling Under the Act

Approx. 20%: Domestic Reuse Market or Informal Scrap Material Market

Approx. 30%: Export as Reuse Product or Eventually as Scrap for Recycling Purpose

Developing countries



Emerging questions for development policy circles

Transition to circular economy and utilization of Society 5.0 (Digitalization, internet of things, metaverse)

- How can we concretely utilize this vision to solve waste issues (especially plastic pollution problems) caused by industrial society (Society 3.0) type issues such as mass production, mass consumption, and mass disposal? Please propose some development project to solve issues caused by mass production, mass consumption, and mass disposal by utilizing the concept of Society 5.0 in a concrete manner.

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Development projects for realizing the G20 Osaka Blue Ocean Vision

- What kind of effective measures can be considered to realize the G20 Osaka Blue Ocean Vision by 2050 and to foster model local governments or companies in the process, especially in emerging economies in Asia and the Pacific such as Thailand, Indonesia, and Viet Nam?





Establishment of a sound material-cycle society and circular economy from an international perspective

- What kinds of international policy harmonization and collaboration are effective for building a global circular economy?

Implications for SCP Policy Design in Emerging Economy

	Conventional understanding	Near future
Infrastructure	<ul style="list-style-type: none"> Massive construction Urbanization and increasing consumption Supply-side management Physical infrastructure (road, train, port, dam, water and sewer, waste) 	<ul style="list-style-type: none"> IT/digital connectivity and online platform Inclusion of diversifying lifestyles and businesses Consumer collaboration (demand-oriented) Specific consumption and production patterns for quality of life (e.g., healthy city structure, seamless connection) 
Technology, Innovation	<ul style="list-style-type: none"> Technology transfer Cleaner production Environmental technology Efficiency 	<ul style="list-style-type: none"> Social innovative development Digitalized society/peers Connectivity & value-creation Incorporation of creative sense and well-being into SCP policy 
Industry/Business	<ul style="list-style-type: none"> Policy for product and heavy industry (strong influence of multi-nationals) Informal sector International brand 	<ul style="list-style-type: none"> Policy for service and new business model Formalization plus emerging SMEs utilizing digital connectivity Vibrant local businesses 

Implications for SCP Policy Design in Emerging economy

	Conventional understanding	Near future
Local development and SCP	<ul style="list-style-type: none"> Bangkok! Single vision Ever rising development 	<ul style="list-style-type: none"> Impact of COVID-19 A capital as a prime city and convenient and luxury suburb? Risk of concentration Congestions or efficient distribution <p>→Needs several future scenarios</p> 
Behavior/lifestyle and SCP	<ul style="list-style-type: none"> Behavioral change and awareness raising Consumer's choice informs producer Policy harmonization for market expansion/removing barriers 	<ul style="list-style-type: none"> System transition Attractive or pain-aversion lifestyle (post-COVID) Rule changes and institutional changes for behavioral change 
Focus of SCP	<ul style="list-style-type: none"> No-coordination of SCP Ver 1.0 (CP and waste management), Ver 2.0 (efficiency) and Ver 3.0 (Value-oriented/sufficiency) 	<ul style="list-style-type: none"> More coordination of the three SCP versions