

“Overview of Economics of Waste  
Disposal and Recycling in Japan:  
Toward a Circular Economy”

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# Contents

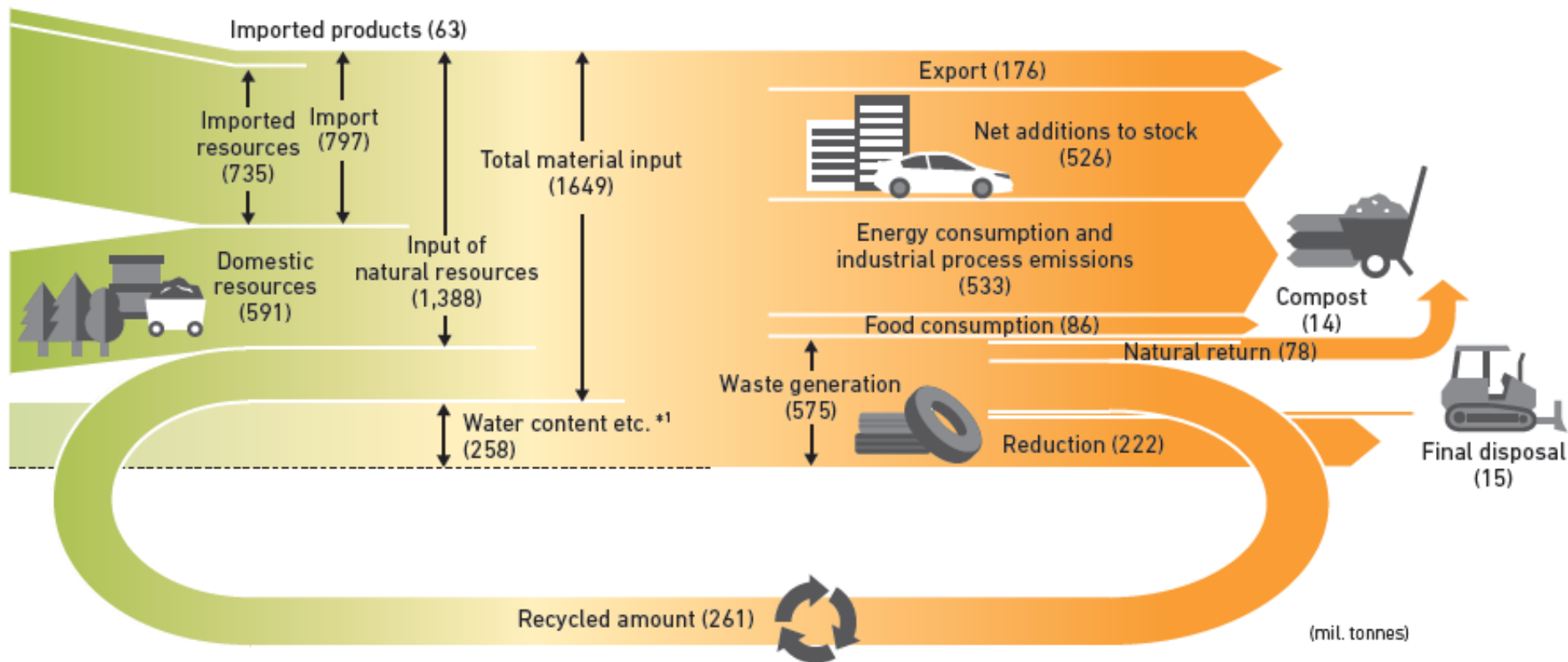
1. Present circumstances of waste disposal and recycling in Japan
2. International aspects of waste disposal and recycling
3. Circular Economy: A New Trend
4. Concluding remarks: Future of a circular economy

# 1. Present circumstances of waste disposal and recycling in Japan

\*1 Water content: water contents of wastes (sludge, livestock waste, night soil, waste acid, waste alkali) and sediments dumped in association with the process of economic activities (sludge in mining, construction and in waterworks as well as slag)

FY2014

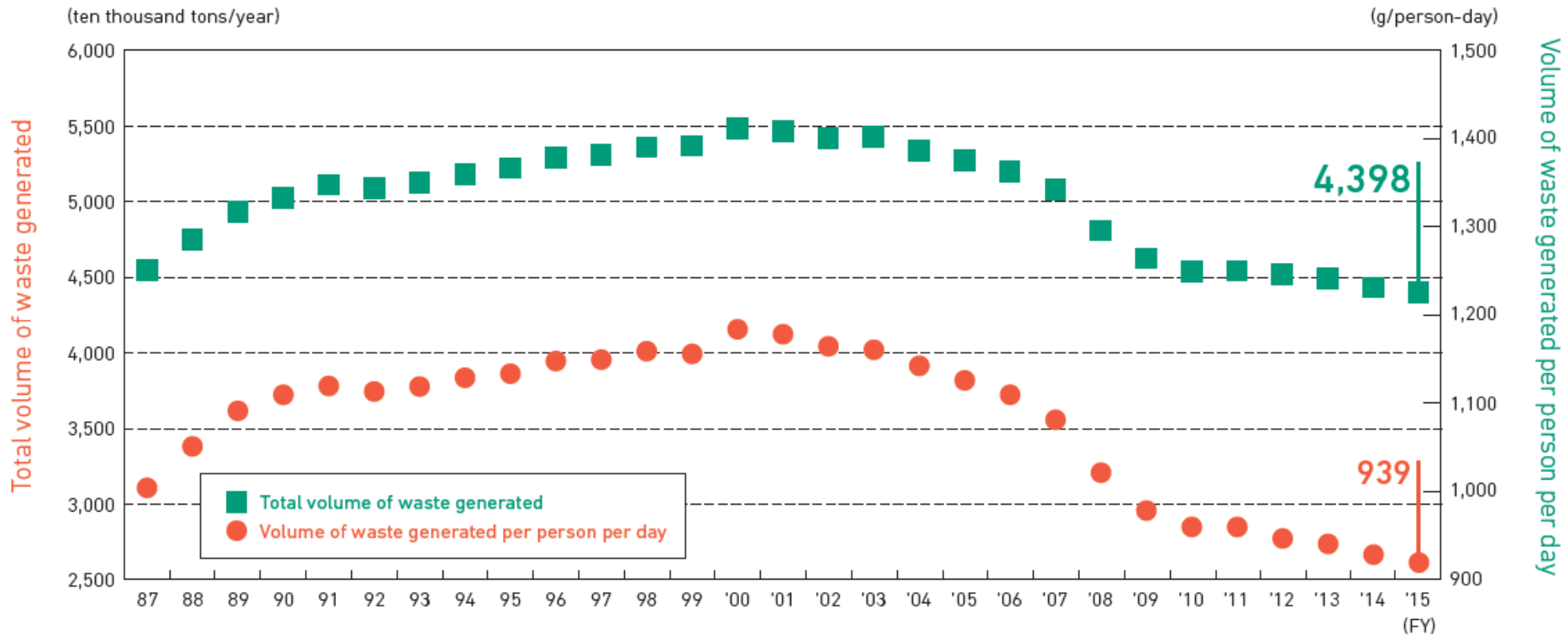
# Material flow in Japan



# Trend of discharge of MSW

## Total Volume of Waste Generation and Waste Volume Per Person Per Day

Total generated waste and waste generated per person per day are declining year by year.

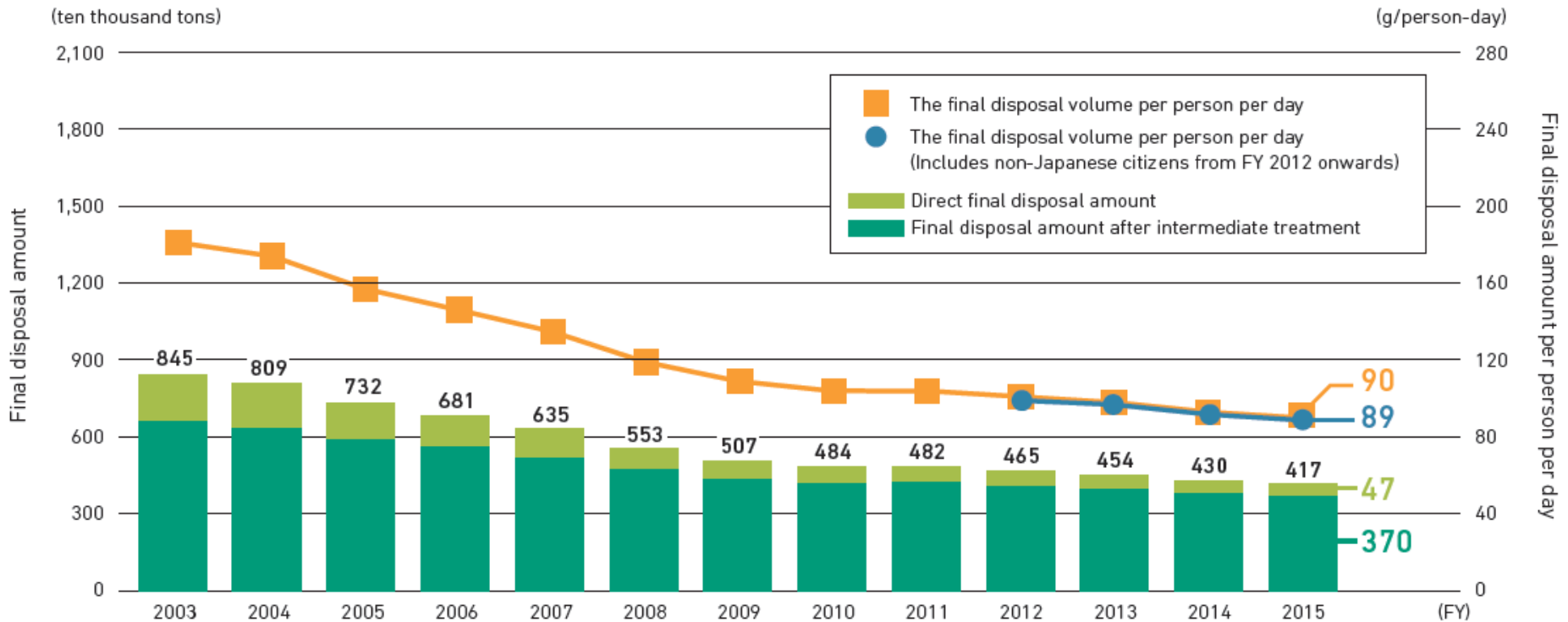


Source: Ministry of the Environment

# Landfill of municipal solid waste

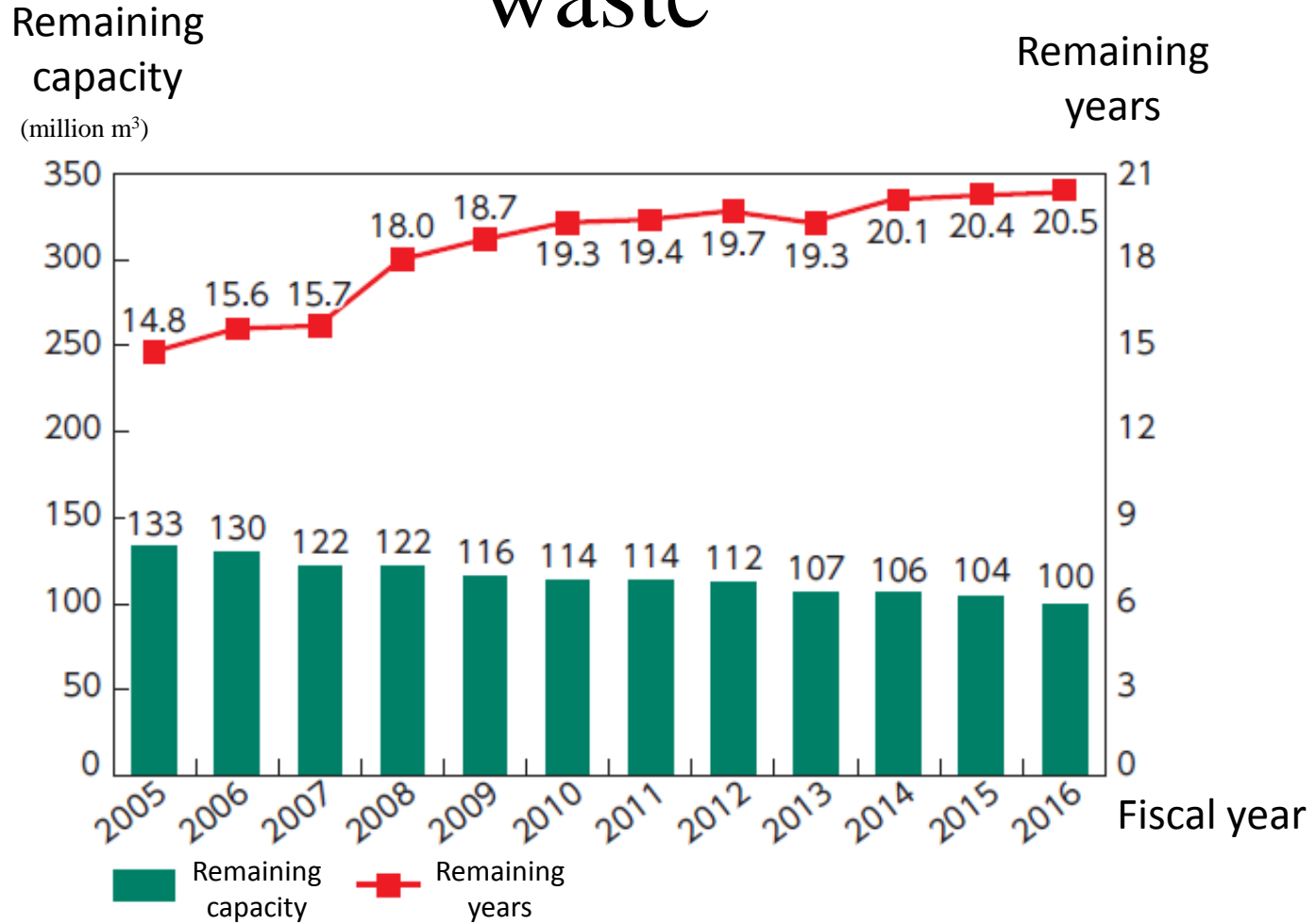
## Final Disposal Amount and Final Disposal Amount Per Person

Final disposal amount of waste and final disposal amount per person per day are trending downwards.



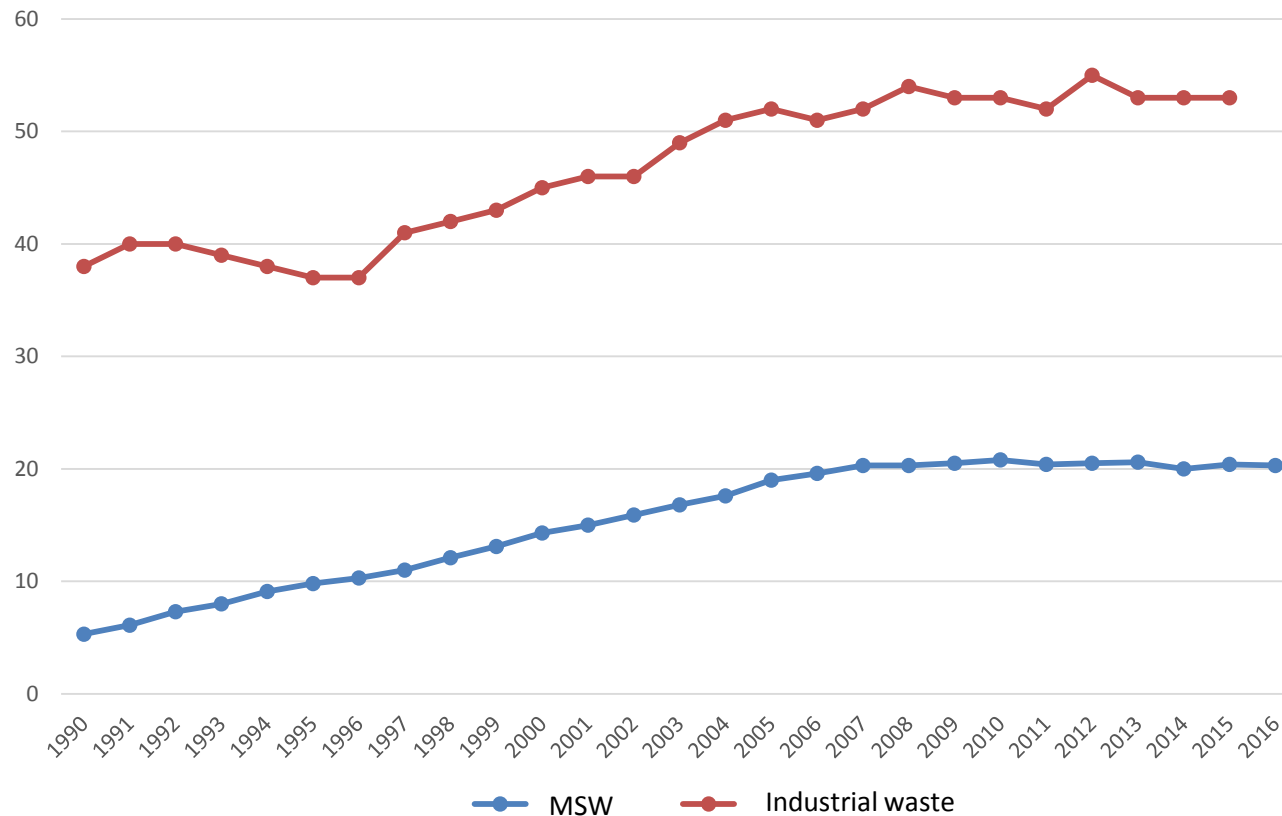
Source: Ministry of the Environment

# Capacity of landfill for municipal solid waste



Source: Ministry of Environment

# The trend of recycling rates





# Legal System to establish a Sound Material-Cycle Society

**The Basic Environment Law**

**Basic Environment Plan**

**Basic Act on Establishing a Sound Material-Cycle Society (the Basic Framework Law)**

Securing material circulation in society  
Reducing natural resource consumption  
Reducing environmental loads

Fundamental Plan for Establishing a Sound Material-Cycle Society: bases for central government's other plans

<Proper treatment of wastes>

<Promotion of regeneration>

**Waste Management and Public Cleansing Law**

**Law for Promotion of Effective Utilization of Resources**

Regulation according to the character of individual products

**Law for Promotion of Sorted Collection and Recycling of Containers and Packaging**



**Law for Recycling of Specified Kinds of Home Appliances**



**Law on Recycling Food Wastes**



**Law Concerning Recycling of Materials for Construction Works**



**End-of-Life Vehicles Recycling Law**

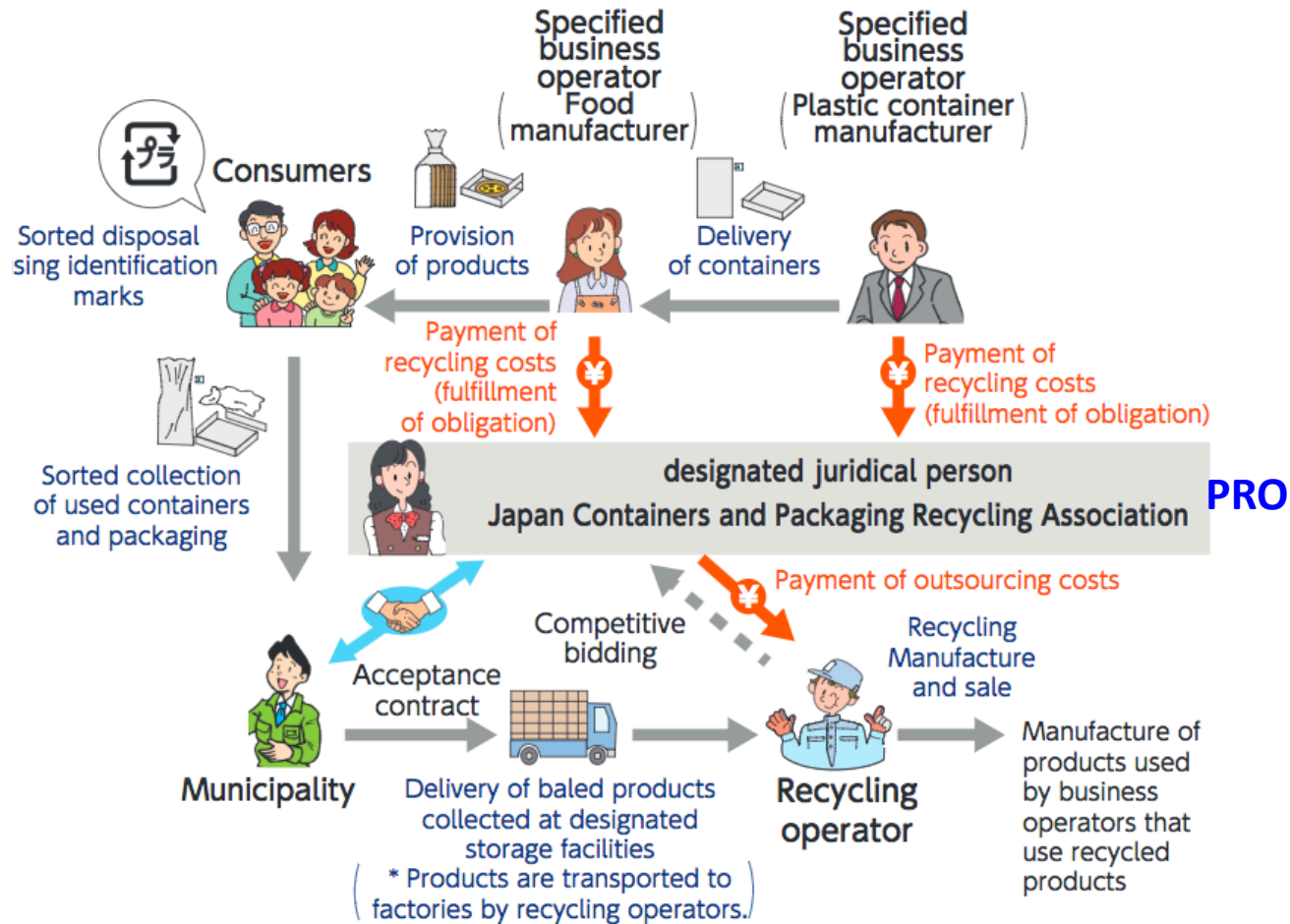


**Law for Recycling of Small Electric & Electronic Appliances**



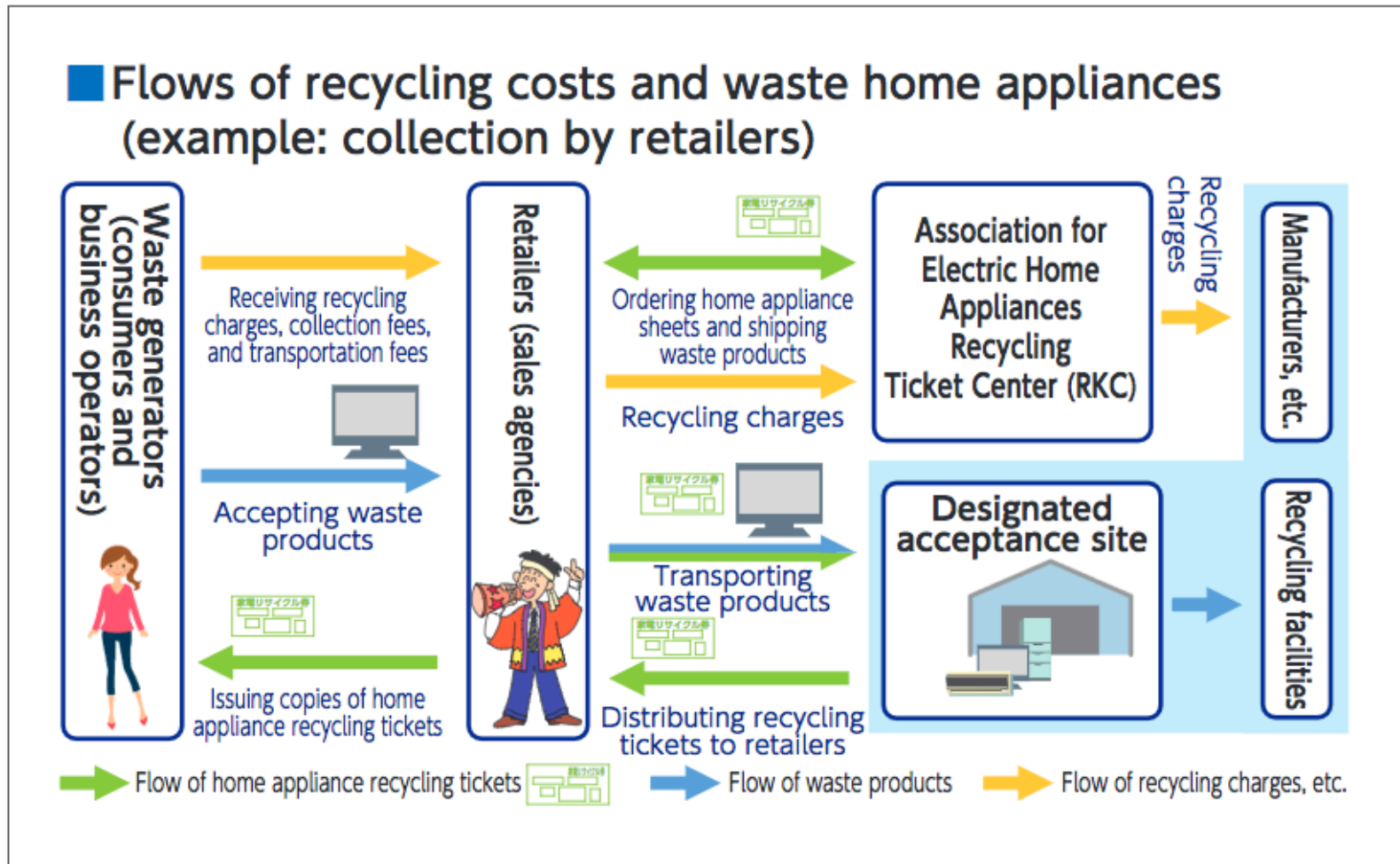
**Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (the central government taking initiatives in procurement of recycled products)**

# Containers and Packaging Recycling Act



Source: Compiled from a figure on the website of the Japan Containers and Packaging Recycling Association

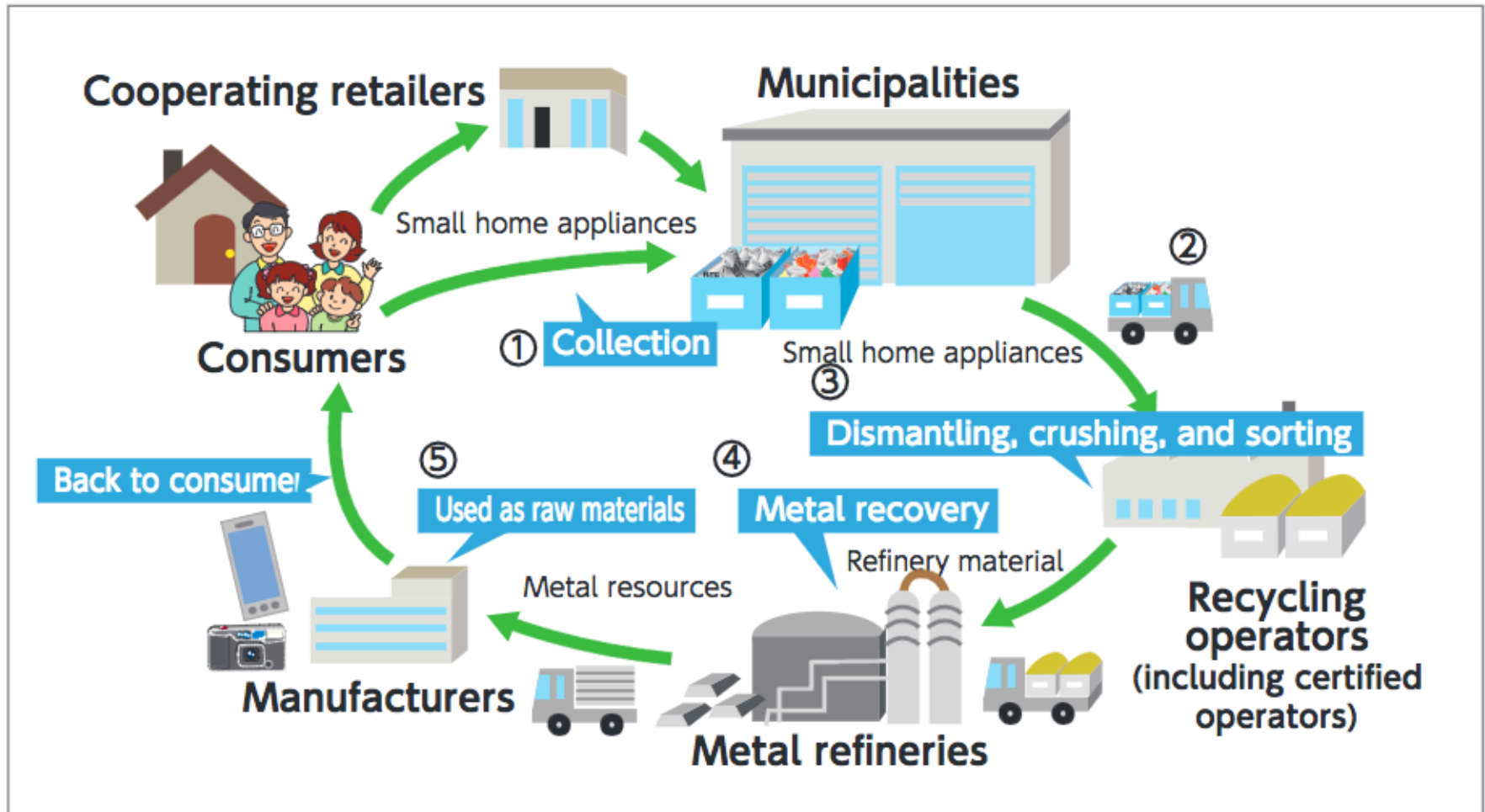
# Home Appliance Recycling Act



Source: Compiled from a diagram on the website of the Association for Electric Home Appliances



# Small Home Appliance Recycling Act



Source: Compiled from a figure in the pamphlet MOE and METI, Small Home Appliance Recycling Act Put into Effect

## 2. International aspects of waste disposal and recycling

# A new trend of material circulation: international perspective

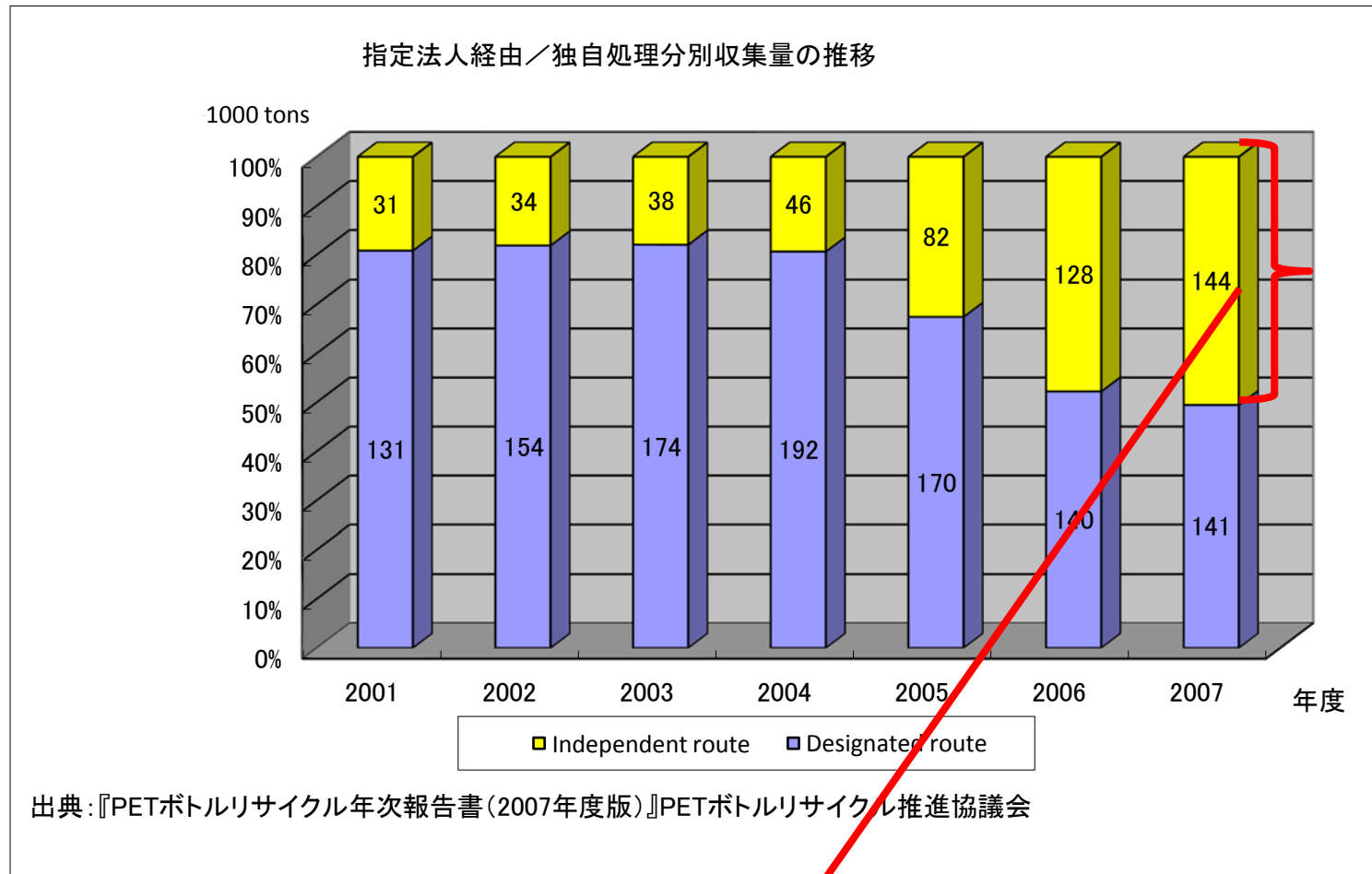
- Asian countries such as China, Vietnam, Thailand and so on are developing and growing fast.
- They are absorbing not only natural resources but used products, parts and materials, in order to extract resources substitutable for natural resources.
- As a result, those countries import used products, parts and materials from Japan, EU and other developed countries.

# Problems in trans-boundary recycling

- Some of developing countries do not have equipment with which they can promote recycling without pollution, so that pollution potential of waste may be easily realized.
- Legal systems are different among countries, so that waste often is transacted among them, against the Basel Convention.
- The Basel Convention restricts trans-boundary transport of hazardous/toxic waste, but it is often ignored.

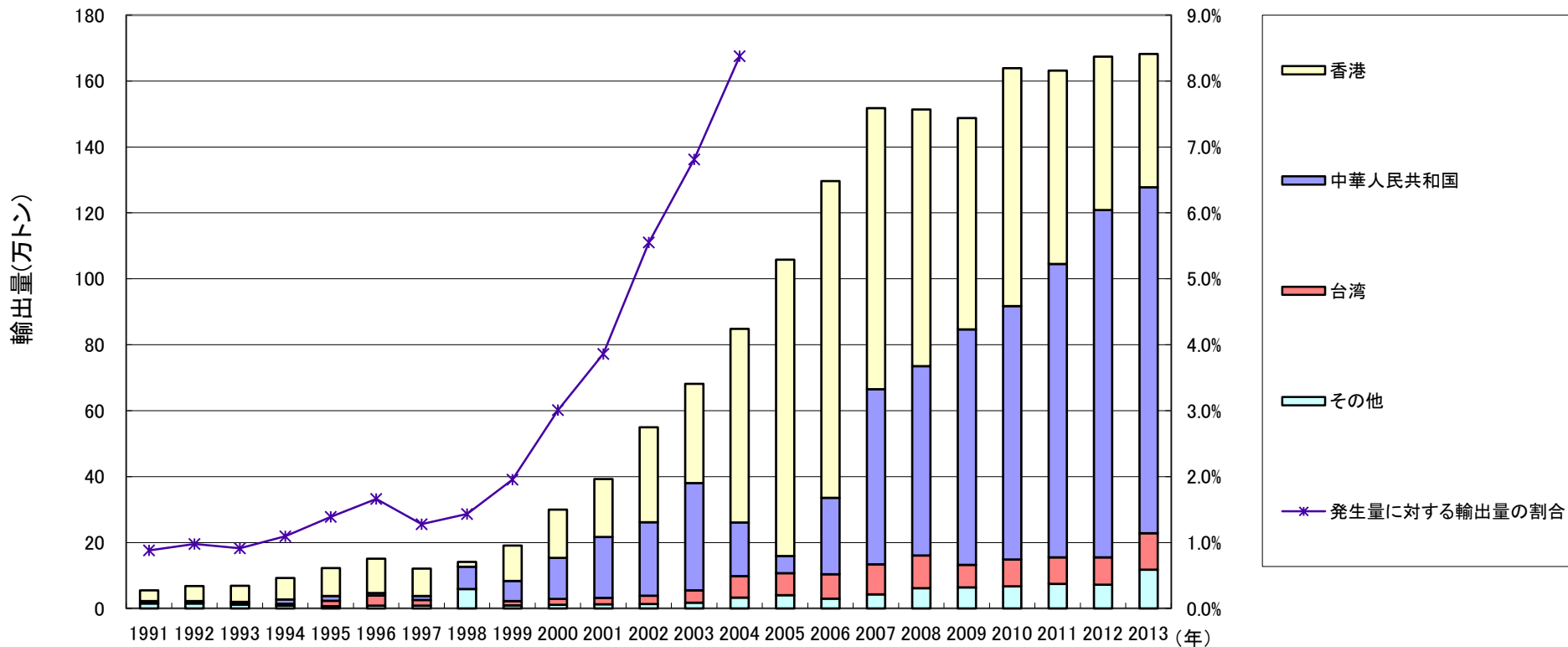


# Used PET bottles recycled out of the framework of the law

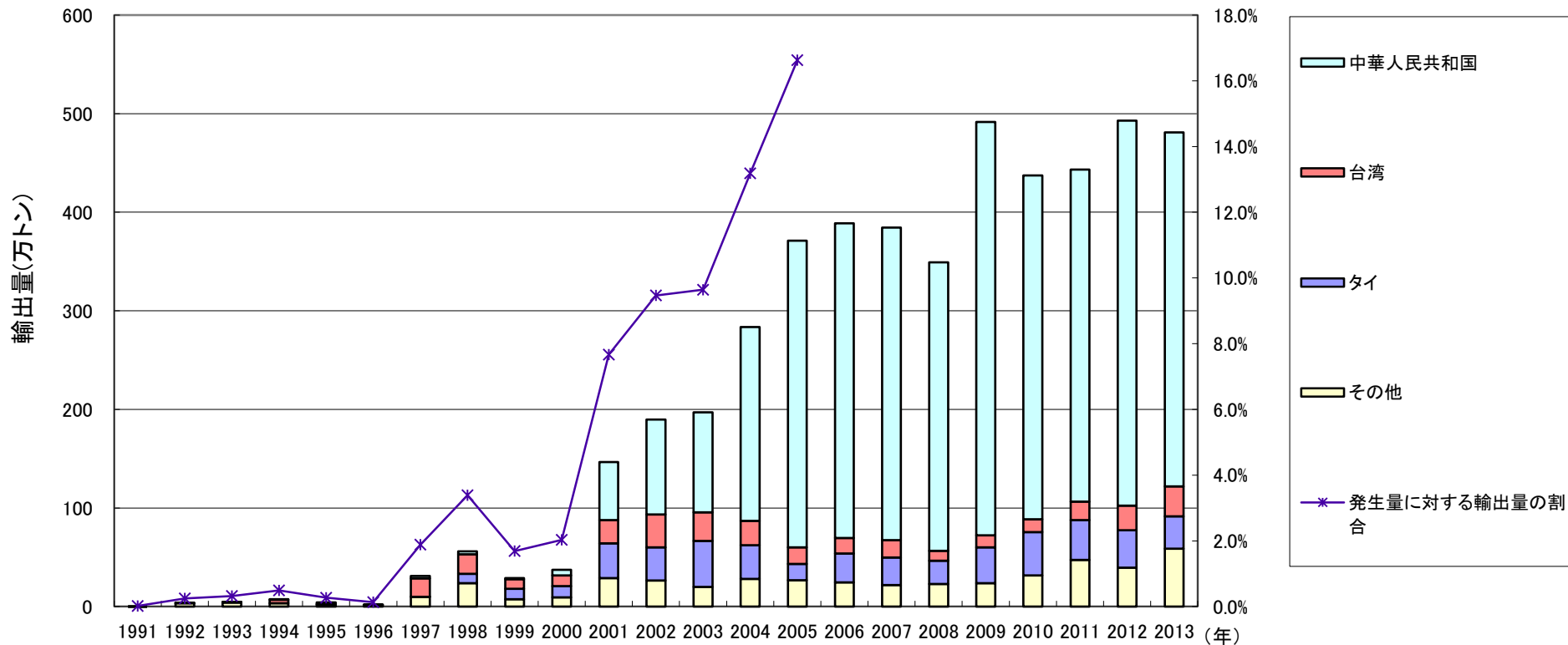


*Most of these bottles are anticipated to go abroad.*

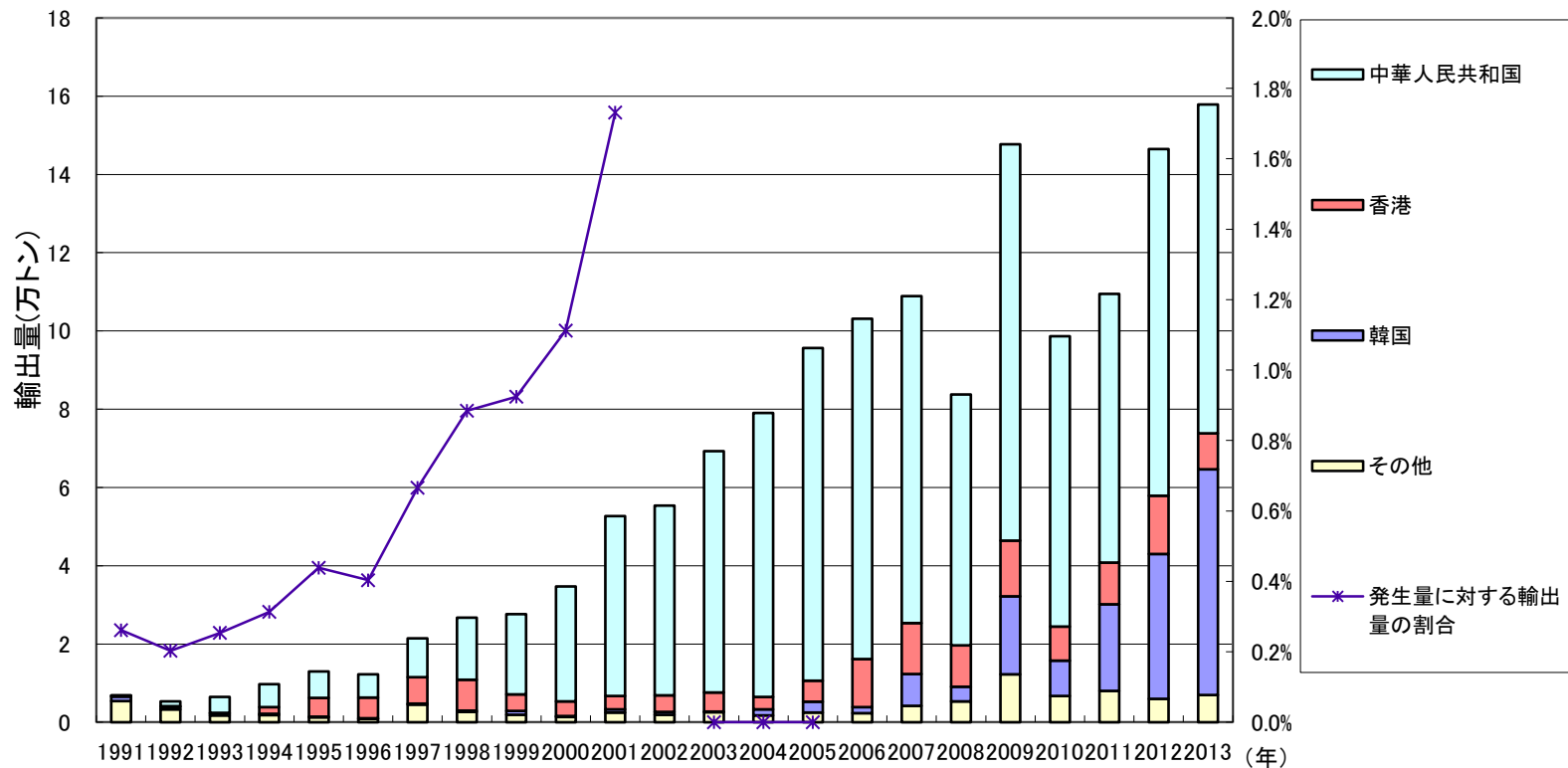
# Export of used plastic from Japan



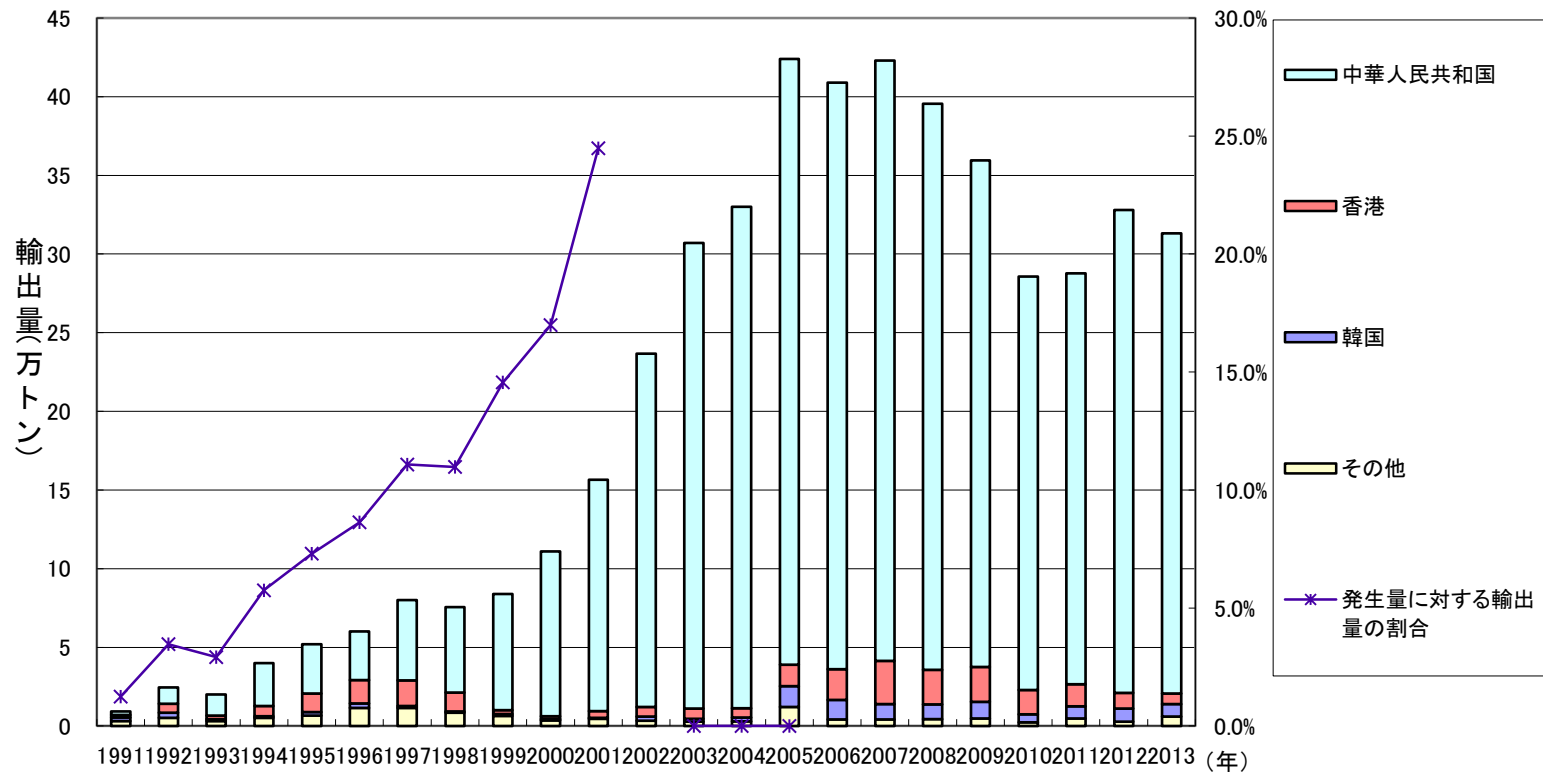
# Export of used paper from Japan



# Export of scrap aluminum from Japan



# Export of scrap copper from Japan



# Illegal incineration in China



# A new trend of the trans-boundary recycling

- China has recently banned imports of end-of-use products, parts and materials by so-called Green Fence and National Sword policies.
- Other East Asian countries are following this action.
- As a result, waste plastics are piling up in stock-yards in Japan, EU and other developed countries.

# To promote sound recycling in an international perspective

- Flows of waste from advanced countries to developing countries must be controlled and accountable.
- A legal system to promote sound recycling must be arranged in each developing country.
- Transfer of recycling technology with high quality must be made between developed and developing countries.



# Basel Convention

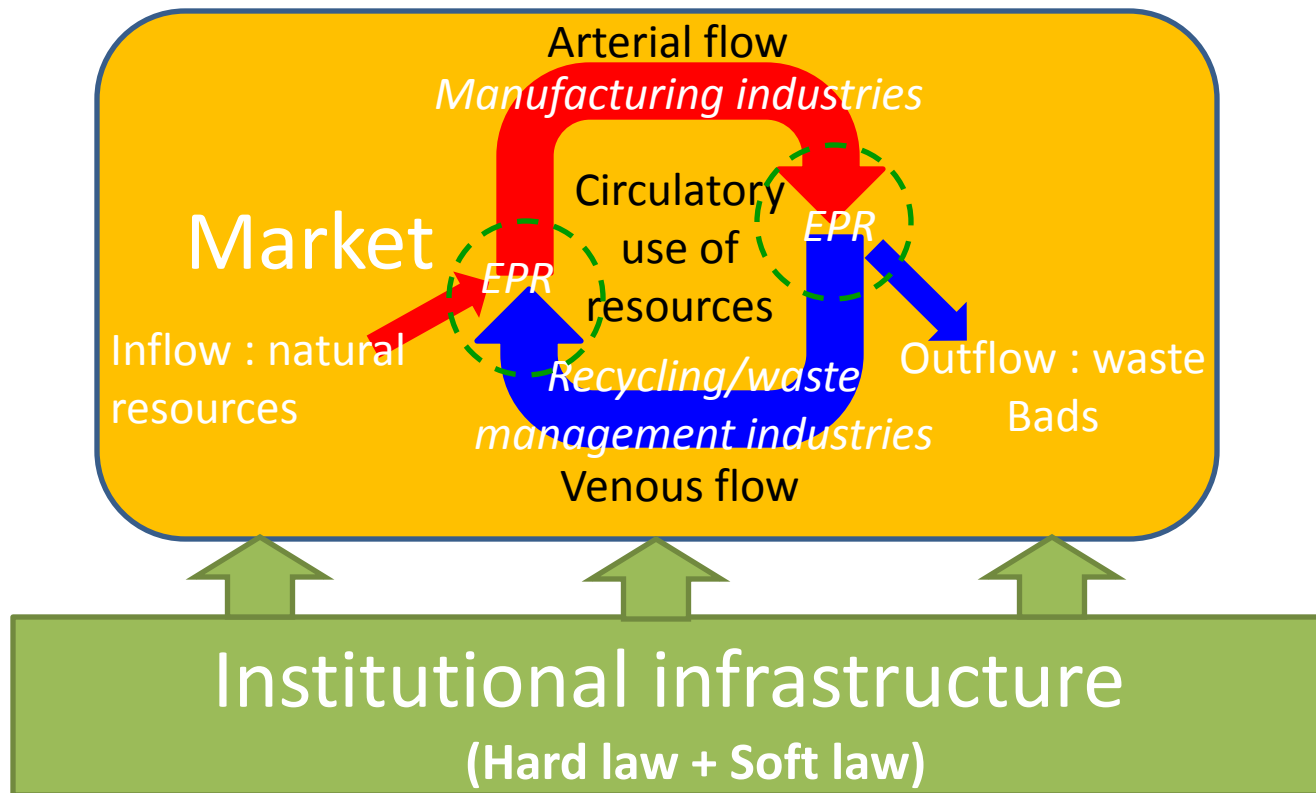
- Trans-boundary transport of used products, parts and materials must be restricted.
- Particularly, it must basically be prohibited between developed and developing countries.
- To observe the convention, it is crucial that activities of informal sectors are strictly controlled.

# 3. Circular Economy: A New Trend

# Market and institutional infrastructure

- To promote effective and efficient material circulation, we must construct a well-designed institutional infrastructure to support markets for circulatory use of resources.
- A market without any environmental constraint should never realize a sound circular economy.
- Here, institutional infrastructure is defined as the whole of legal system, administrative apparatus, social norm, moral codes, business customs, and so on, which regulate human behavior.

# The relationship of between material circulation and institutional infrastructure



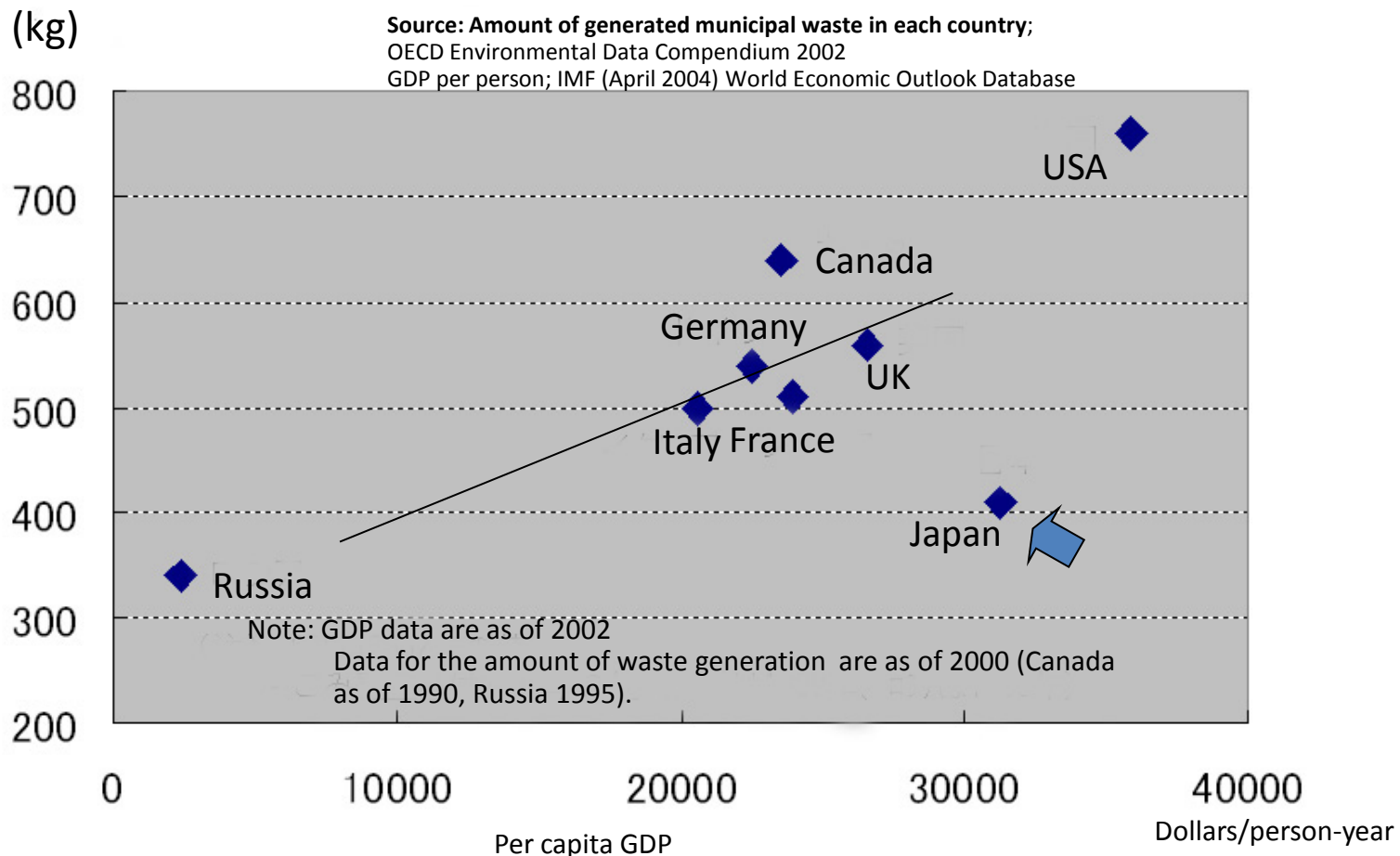
# The role of industries

- Without well-designed institutional infrastructure, it should be hard to promote smooth circulatory use of resources.
- To connect arterial and venous flows, policies such as EPR must be wisely used, so that manufacturing industries pursue more efficient use of resources on one hand and further reduction of waste on the other.
- At the same time, recycling/waste management industries are required to promote proper treatment of waste and to upgrade recycling.

# A key issue

- A crucial matter in a sound circular economy is to make a society in which as much waste as is transformed into goods with reasonable costs, so that the amount of landfill is minimized.
- Extended producer responsibility is one of the important policy concepts for constructing a circular economy.
- Voluntary action based upon so-called *soft law* is also important for construction of a sound circular economy.

# Per capita GDP and the amount of waste generation in major countries

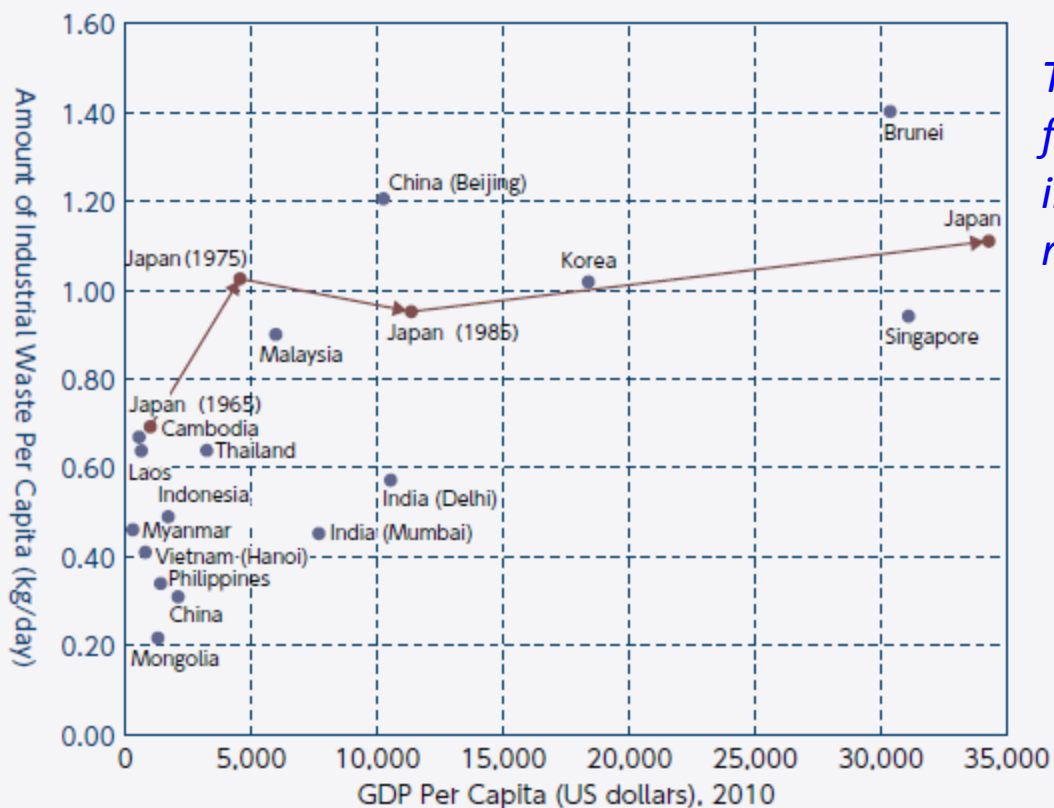


The amount of waste generation in Japan is relatively small considering the size of its GDP.

Source: Ministry of Environment

# International comparison of per capita industrial-waste emission

Figure 1-3-3 Relationship between the Amount of Industrial Waste Per Capita and GDP Per Capita



*There is room for further efforts on industrial sides to reduce waste.*

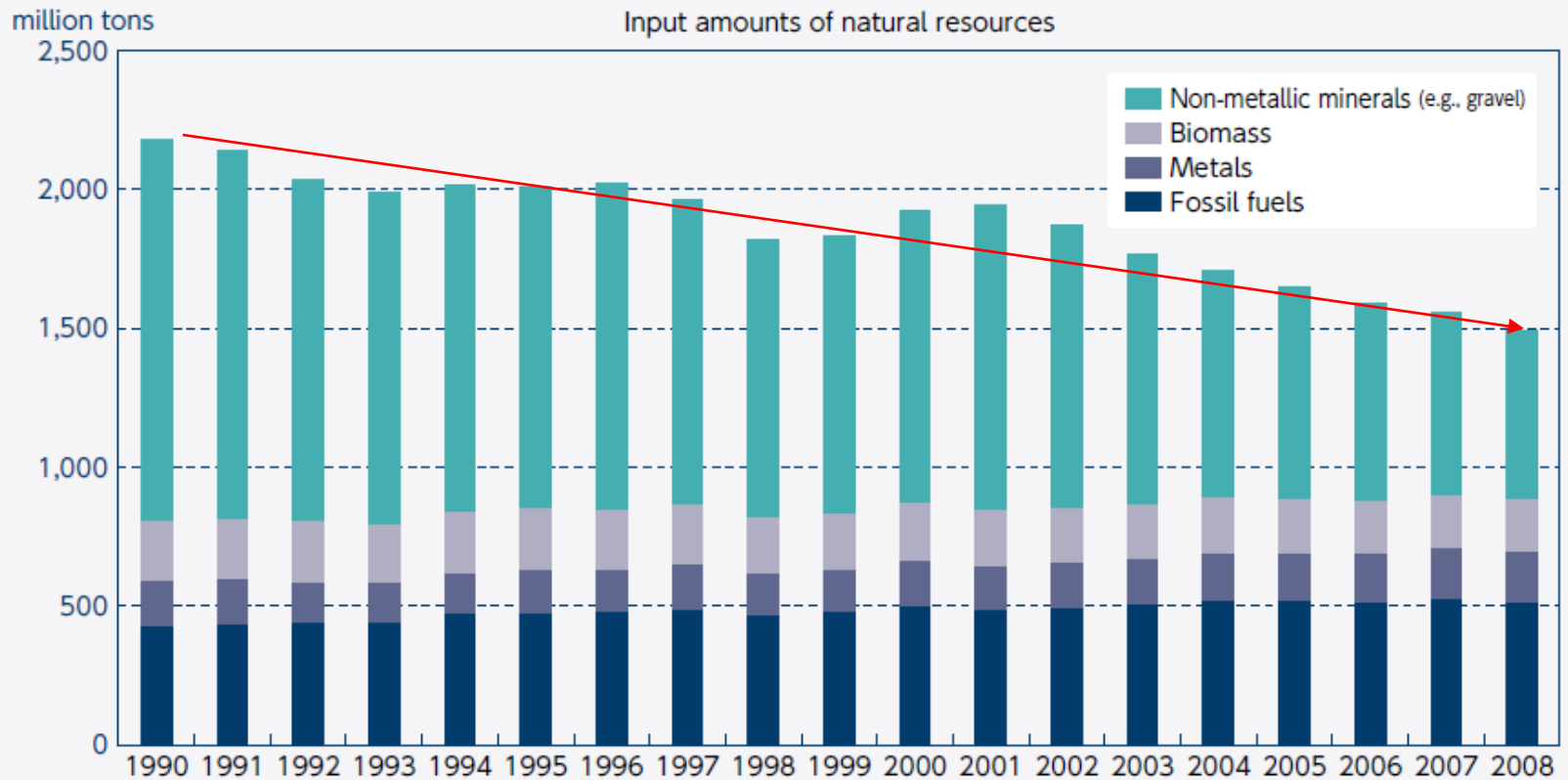
Source: Ministry of the Environment

Source: Annual Report on the Environment, the Sound Material-Cycle Society and the Biodiversity in Japan (2012)



# Input of natural resources in Japan

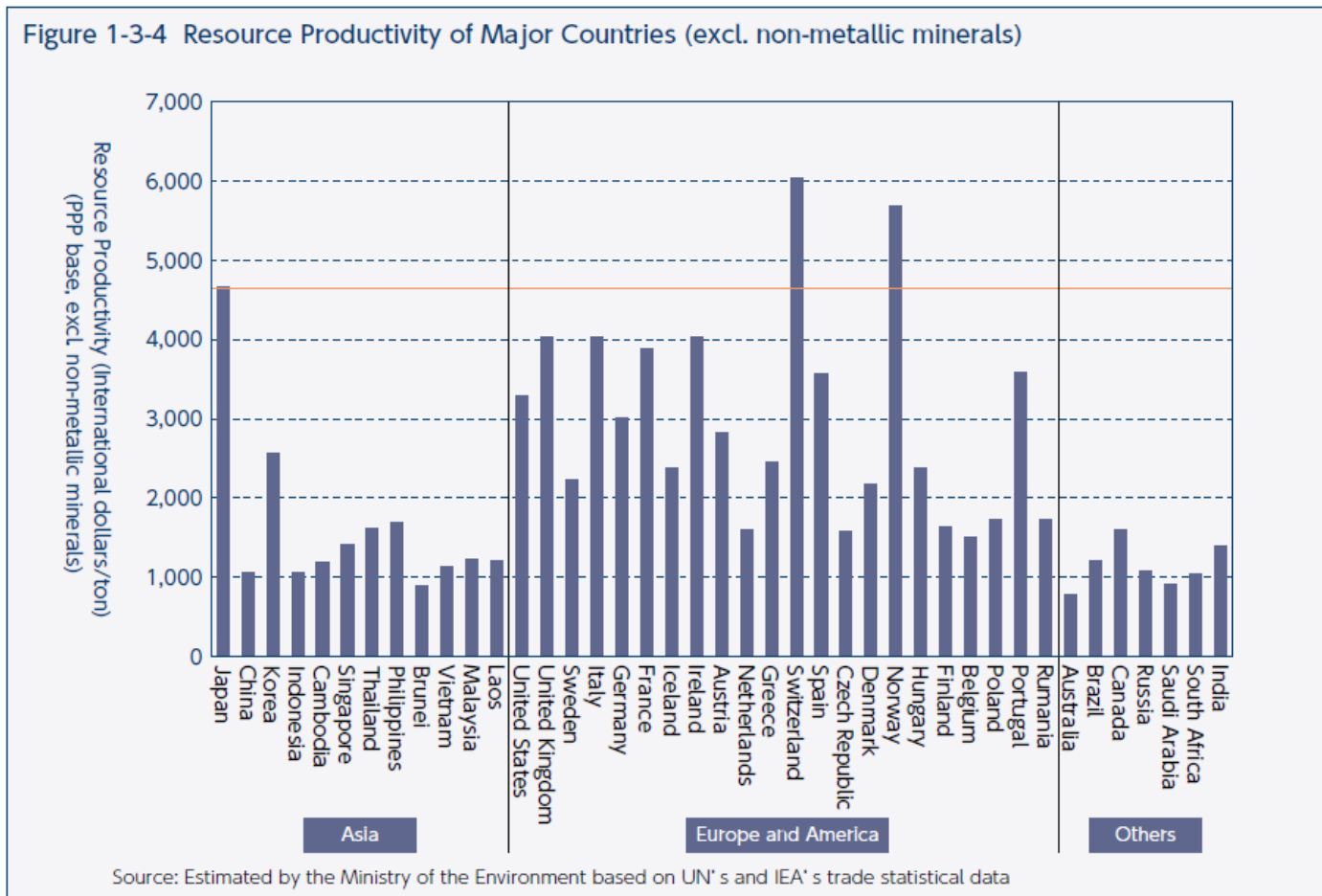
Figure 1-3-6 Input Amounts of Natural Resources in Japan



Source: Trade Statistics, Statistics of Natural Resources and Energy

Source: Annual Report on the Environment, the Sound Material-Cycle Society and the Biodiversity in Japan (2012)

# International comparison of resource productivity



Source: Annual Report on the Environment, the Sound Material-Cycle Society and the Biodiversity in Japan (2012)

# 4. Concluding remarks

# Concluding remarks (1)

- We will soon get into the declining stage of natural resources.
- On the other hand, we are running out of landfill space.
- We must promote circulatory use of natural resources in an effective and efficient way, transforming as much as bads into goods.
- To do this, we should construct a well-designed institutional infrastructure which supports market transaction of natural and venous resources.

# Concluding remarks (2)

- Following the spirit of EPR, manufacturing industries must pursue saving of natural resource input on one hand, and contribute to reduction of waste generation on the other.
- Recycling and waste management industries are encouraged to be more efficient and more matured, so that they could enhance circulatory use of resources further.
- We should make a sound circular economy in an East Asian region.

# Concluding remarks (3)

- To construct a circular economy, we have to make a step further, introducing policy concepts such as resource efficiency and end-of-waste.
- EU has already proceeded in this direction.
- Other advanced countries, including Japan, possibly follow the course.