Greater Mekong Sub-region (GMS) sub-regional training workshop on building capacity to deal with the illegal shipments of e-waste and near-end-of-life electronics
Technical Session 2:
Management of e-waste - policy options

E-waste Take-Back System Design

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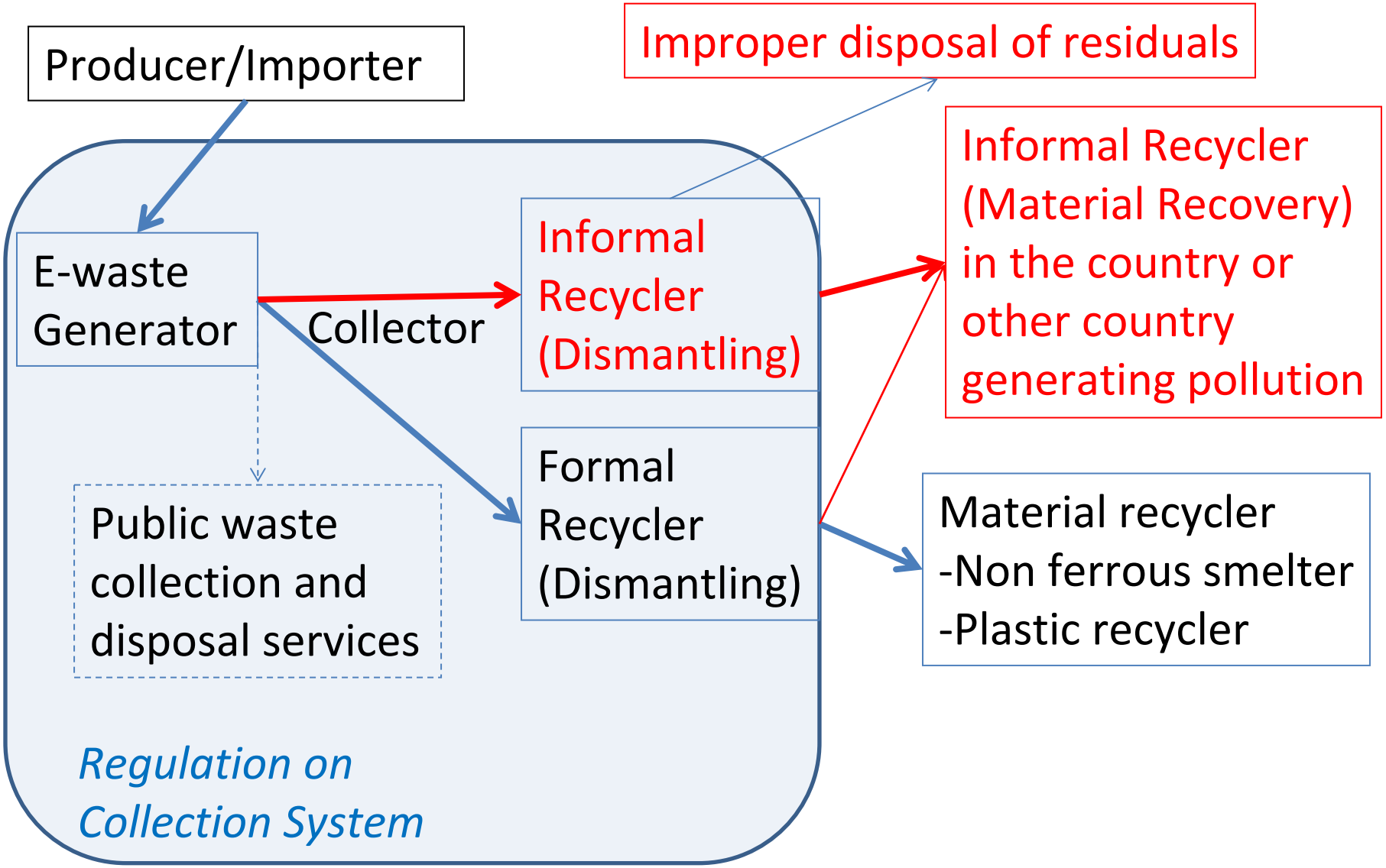
Why should the tack back system be designed? (1)

- Most of e-waste is collected in the market basis.
- Why should take back system be designed? What is problem of market-based collection?
  - E-waste collected in market basis may be sent to dirty recycler (non-ESM facility) which do not implement environmentally sound management.
    - Because of weak enforcement of pollution control regulation
  - Valueless e-waste may not be collected, which may be disposed in open dumpling site or stored in household. E-waste in open dumping site becomes a source of pollution. E-waste stored in household can be regarded as waste of resources.
    - Because of limited demand, low quality of recycled product, high transportation cost

Why should the tack back system be designed? (2)

- Examples
  - E-waste causing pollution: computer, cell phone, printed circuit board, coated wire
  - E-waste uncollected or collected limitedly: Fluorescent lump, cell battery, rechargeable battery
- If non-ESM facility and ESM facility co-exists, non-ESM facility may be able to buy e-waste in higher price than ESM facilities, because non-ESM facility do not need to bear the cost of pollution control.


Producer/Importer
Improper disposal of residuals
Informal Recycler (Material Recovery) in the country or other country generating pollution
E-waste Generator
Collector
Informal Recycler (Dismantling)
Formal Recycler (Dismantling)
Public waste collection and disposal services
Material recycler
-Non ferrous smelter
-Plastic recycler
Regulation on Collection System

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 in Japan

Who is collecting? Who should collect?

- Local government
  - Putra Jaya in Malaysia asks waste collection service company or to operate buy back center
- Stakeholders joining voluntary agreement with government
  - Hong Kong has collection programs of rechargeable batteries and e-waste, with stakeholders, such as importers, retailers and NOGs.
- Manufacturer's voluntary efforts
  - 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.
- Retailer
- Informal collector
- NGOs
  - Penang Environment Working Group conduct voluntary collection program on battery and fluorescent lump
- Manufacturer mandated by government to organize the collection program

E-waste Buyer on Street

Waste buyer on a street in Beijing, May, 2006

- Waste collector on street also buy e-waste from household or others. They bring e-waste to Junk shop.

Computer, Monitor, Color TV, Printer, Refrigerator, Washing machine, Air conditioner, Printed Circuit Board, Copy Machine, Toner, Note book, Fax machine

Drop Box Collection by NGOs

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.

Pilot collection program for cell phones in the Philippines

Metro Manila, 2007

- JICA, DTI and NSWMC in the Philippines conducted pilot collection program for mobile phone in 2007.
- They put drop box in malls and government office. The best place for collection was the Mall where tens of repair shop and secondhand shops are located.

Buy back Center

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

- Some local government and waste collection service company open the buy back center for recyclable waste including e-waste.
- Junk shop often by e-waste or dismantled parts of e-waste.

Collection Event

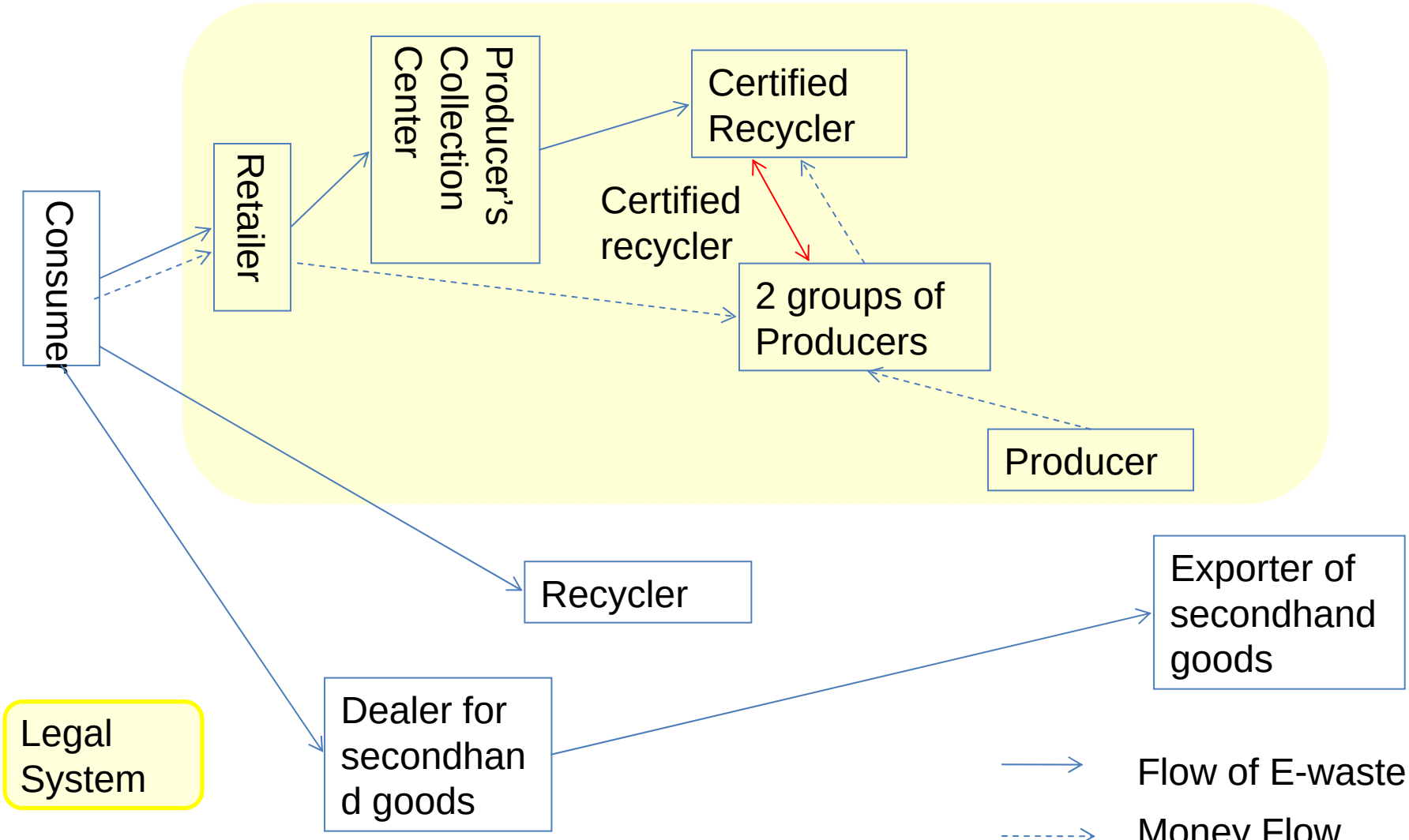
- Some Malls in the Philippines conduct collection event. Malls have contract with junk shop or e-waste recycler. Malls provide space for collection event in parking lot or other place.

Monthly collection event in parking lot of a mall in Metro Manila, Philippines, August 2009..

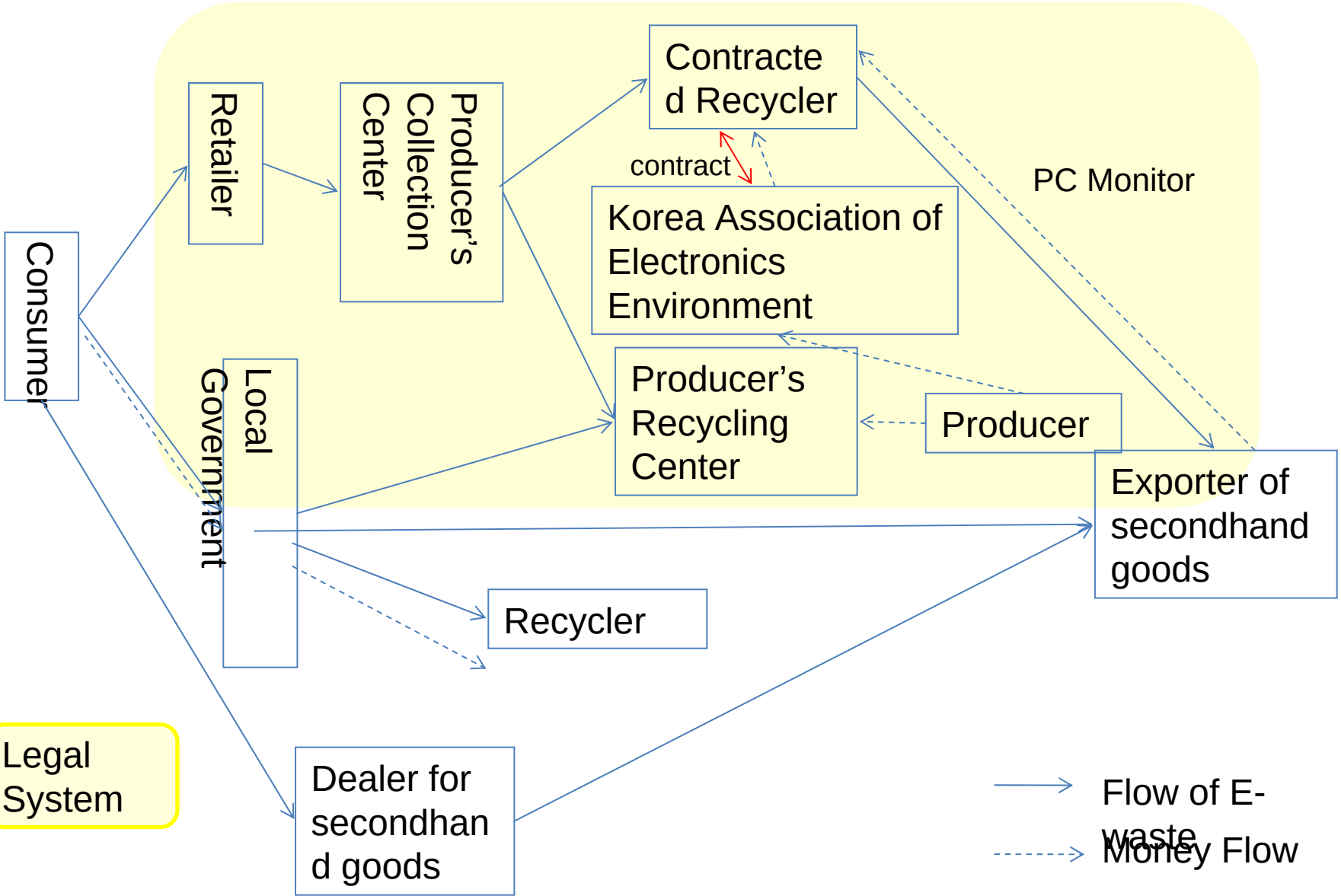
Variety of Designing Recycling System

	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.

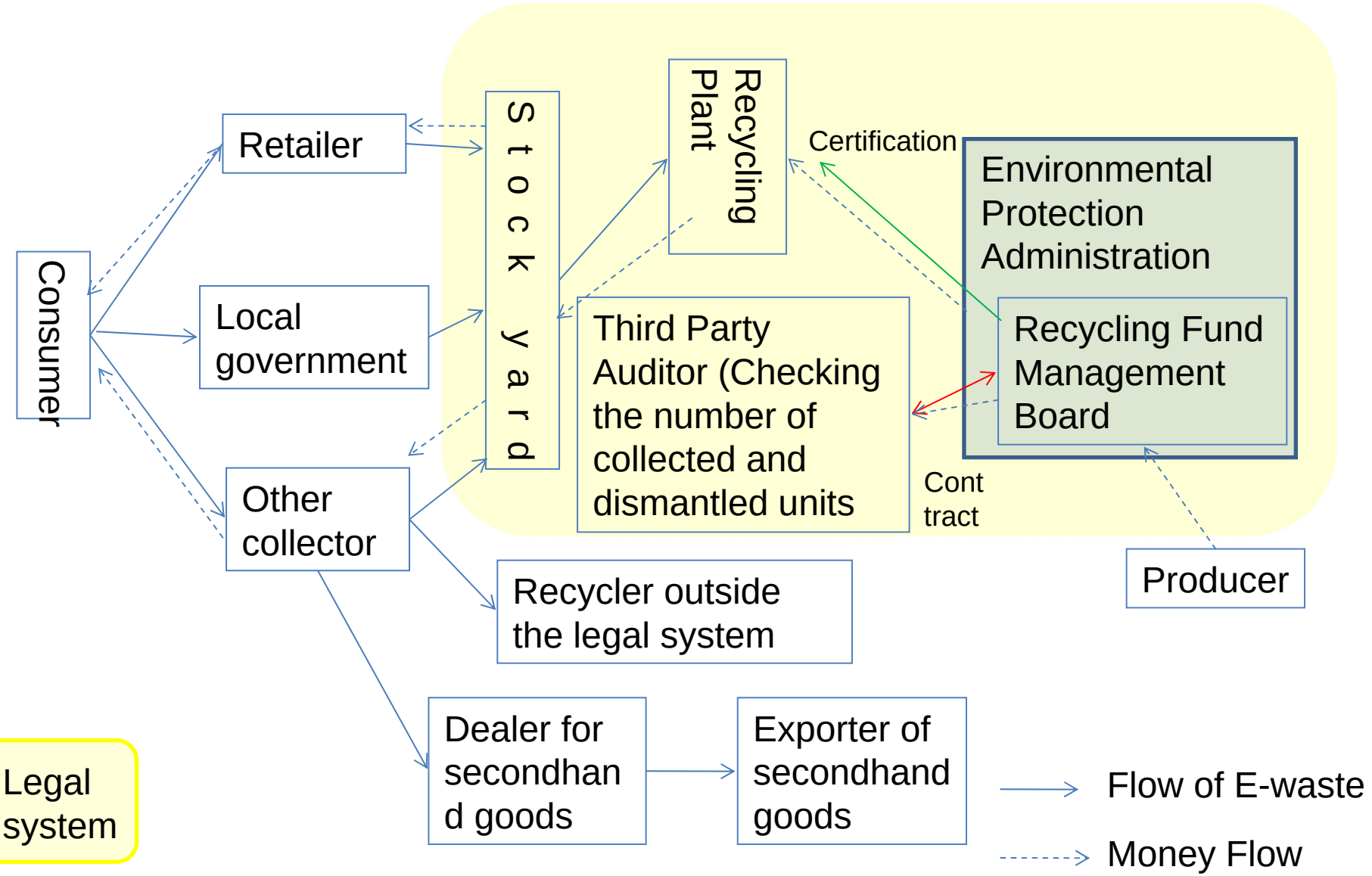
JAPAN: Big Home Appliances(TV, Air Conditioner, Refrigerator, Washing Machine)



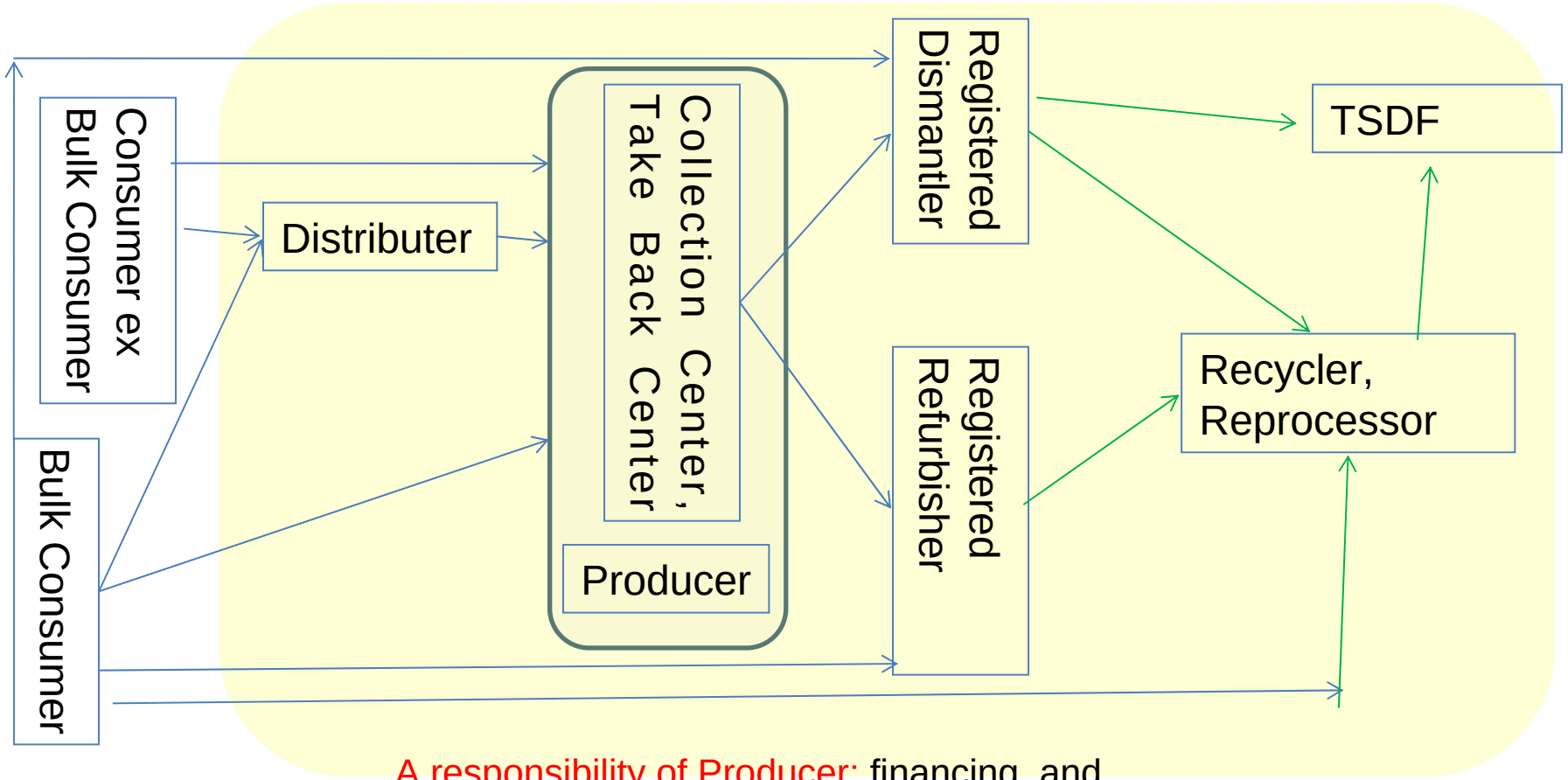
South Korea: E-waste Flow



Taiwan: E-waste Flow



India: Potential E-waste Flow



A responsibility of Producer: financing, and organizing a system to meet the costs involved in the environmentally sound management of e-waste generated from the 'end of life' of its own products and historical waste available on the date from which these rules come in to force.

Reporting Requirement

→ Flow of E-waste

Lessons for Establishing Collection System（1）

- Utilize conventional market-based collection system, if it is appropriate.
- Even if new collection system is introduced, it is necessary to understand conventional market-based collection system. The benefit of new collection system should be explained to stakeholders.
- Incentives of actors in collection system should be considered.

Lessons for Establishing Collection System（2）

- Repair shops may become a major collection points in low income developing countries.
  - To identify the destination of e-waste from repair shops. If the destination is not appropriate, it is good to consider how the government can change them.
    - Mandatory regulation
    - Financial incentive

ISSUE OF ORPHAN

Examples of Orphan(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.

Example of Orphan(2）

Probably smuggled secondhand fax machine , found in secondhand market in Guandong China. It is mentioned that customer service for this products is only provided in Japan. Transformer is put into the machine.

Volume of orphan

- It is difficult to estimate the volume of orphan.
  - According to an estimate, market share of unbranded air-conditioner, which are made by small manufacturer, is considered to be 20-30 % in Thailand.
  - A survey conducted by NIES and Kyoto University in FY 2010 shows that more than half of desk top computer used in households in South Korea are unbranded one, which were made by small shops or by consumers by themselves.

Who bear the cost of orphan, instead of producer of orphan?

- Government
  - In packaging and container recycling regulation in Japan, small scale producer using packaging and container are exempted from bearing financial responsibility of producer. In stead of small scale producer, local government bear the recycling cost, because local government pay the cost of disposal of waste packaging and container.
- Consumer
  - In computer recycling system in Japan, consumer using orphan computer should par recycling fee.

Reducing the volume of Orphan

- It is the responsibility of government to reduce some type of orphan such as smuggled products, imitated products and unregistered products, if appropriate regulation exists. One of the option is to collect recycling fee from them, if the government caught them.

ISSUE OF SCAVENGING

Scavenging

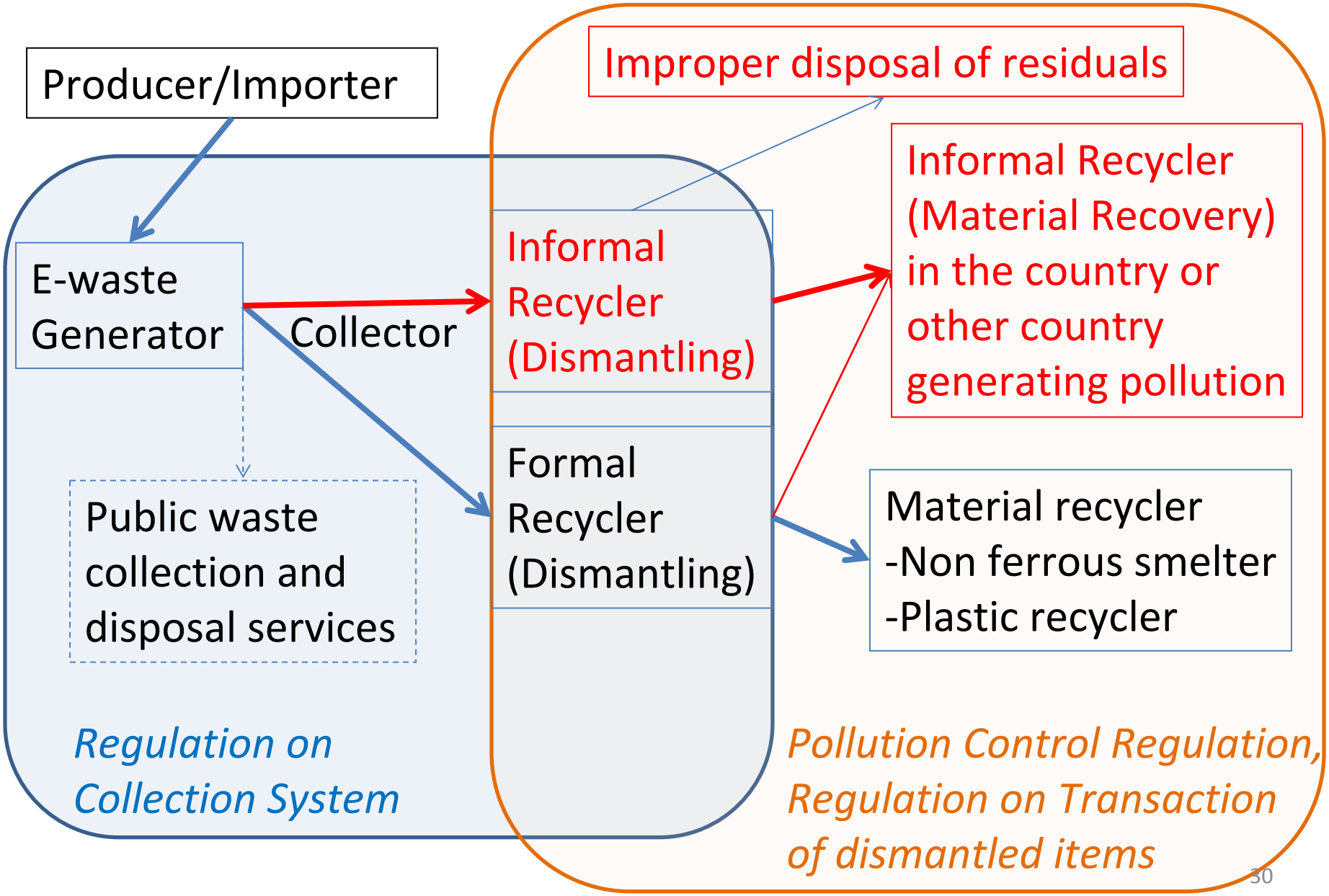
Some parts are removed from e-waste, before formal recyclers receive e-waste. (2005, Taiwan)

- E-waste collector may remove valuable parts, before e-waste is sent to formal recycling company. It is called, scavenging.
- Scavenging may reduce the benefit of formal recycler.

What kind of measures can be implemented to reduce scavenging?

- If parts removed in advance to send e-waste to formal recycler are recycled without environmentally sound technology, collection system should be carefully designed.
- Buying price of e-waste without missing parts should be higher than e-waste without some parts.

REGULATION ON TRANSACTION OF DISMANTLED ITEMS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Pollution Control Regulation, Regulation on Transaction of dismantled items

Conclusion

- *“Pollution Control Regulation” and “Regulation on transaction of dismantled items”* may be out of scope of tack-back system. But take back system can not solve the pollution in the second stage of e-waste recycling(material recycling).
- Government should enforce pollution control regulation and should regulate the destination of dismantled items.

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