



# Trade of Secondhand Electrical and Electronic Equipment (SH-EEE) in Asia

*focusing on actors in reuse markets*

*& the Need for deepened Actor Analysis and Integrated Sustainability Assessment*



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# Outline

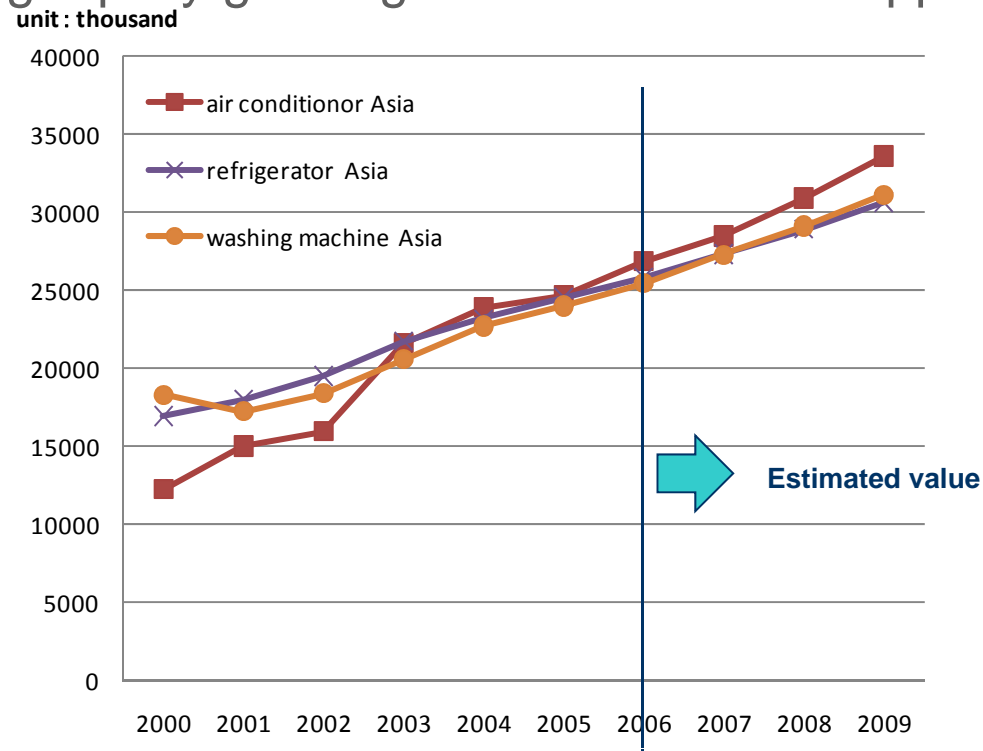
- Review of problem backgrounds
  - Pull & Push factor of the trade
- Categorising types of issues associated with SH-EEE trade
- Social aspects and environmental problems in reuse Markets
- On-going Efforts to address issues of SH-EEE trade
  - Developing, Japan and the Basel Convention
- Overall Recommendation
- (Deepened Actor Analysis and Recommended measurements for each actor)
- Research challenges

# Pull factor

## which facilitates the trade of second hand EEE

- Pull

- Satisfying rapidly growing demand for home appliances



**Figure1. Estimated Demand/Sales for EEE in Asia (14 countries except for Japan)**

Source: compiled by IGES based on JEMA(2006)

# A certain % of citizens in lower income class select SH-EEE

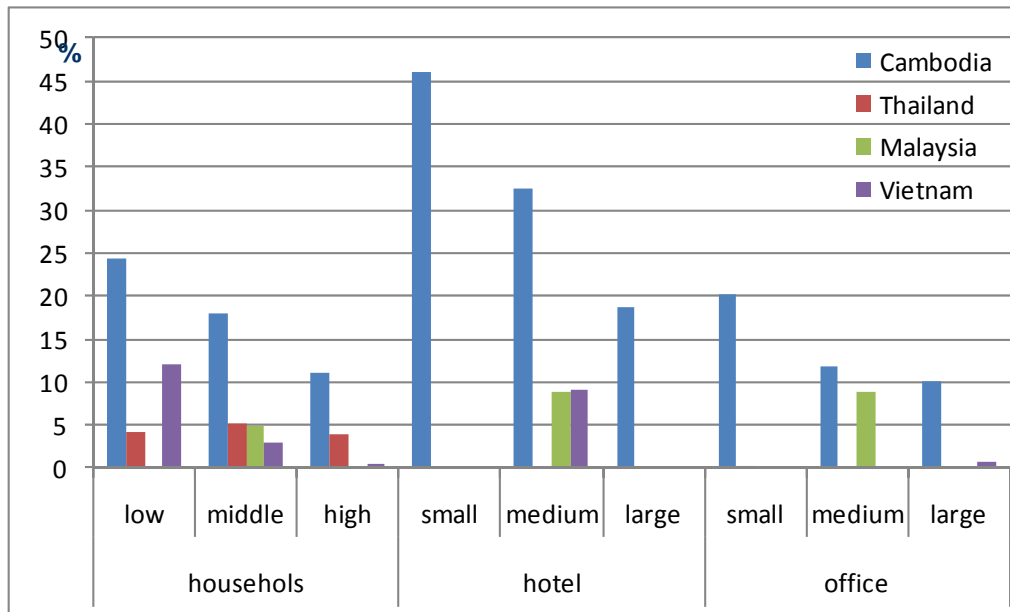
## Quantitative Impacts of SH EEE market in four Asian countries

- Cambodia

- About 25(low income), 15(middle income), 10(high income) % of households
- About 45 % of small size hotel

- Viet Nam

- More than 10 % of low income households



- Data of Malaysia
  - No classification of income level /size
  - Not the results of middle / medium class
- N.A. :
  - Thailand
    - Hotel
    - Medium & large size of office
  - Viet Nam
    - Small & large size of hotel
    - Small & medium size of office
- GDP/capita (current US\$, year 2009) (WDI)
  - Cambodia: \$ 677
  - Thailand: \$ 3,894
  - Malaysia: \$ 6,975
  - Viet Nam: \$ 1,052

**Figure 1: % of households, hotel and office who purchase second hand EEE in each income level / size**

Source: compiled by author based on data on e-waste inventory project (purchase and use pattern) of Basel Convention

# Push factor which facilitates the trade of second hand EEE

- Loophole of EPR system for home appliances
  - Incentives to avoid the route under EPR system
    - Sell / export as second hand

- Ex1:Japan

- Consumer has to pay for collecting/ recycling fee
- Not cover SH-EEE
  - Home appliances recycling law
  - Also, covers 4 appliances

- Ex2:Korea

- Exporting second hand EEE can be counted as the achievement of "re-utilization rate"
  - Manufacturer's responsibility

Flow of Recycling of Used Home Appliances

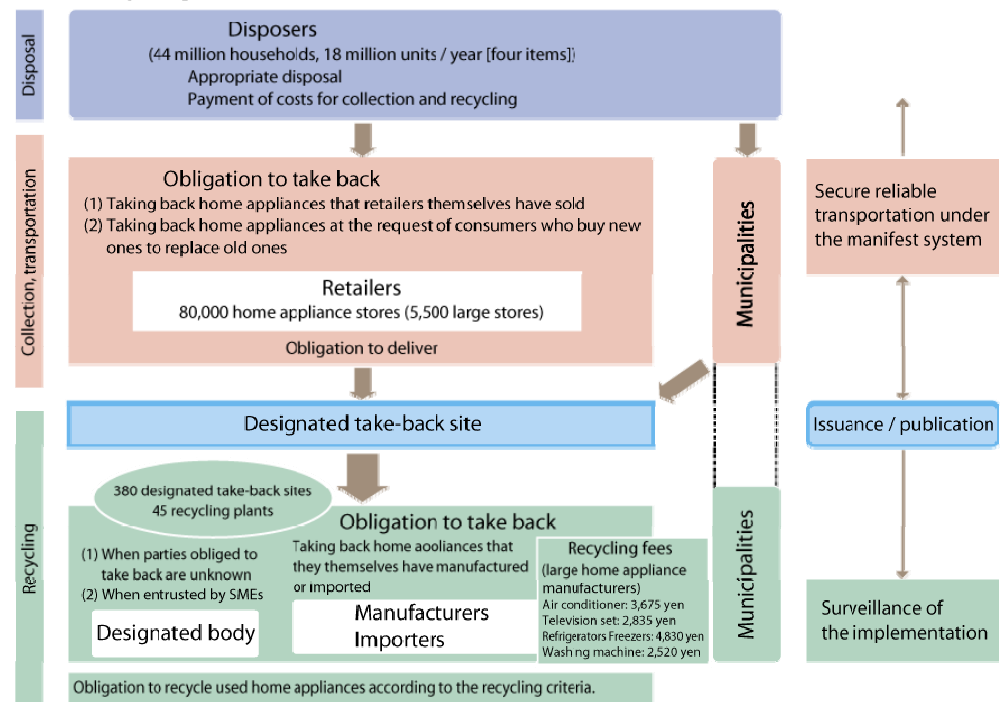


Figure 2: The system of Japanese Home appliances recycling law

Source: METI

## Japan exports SH-EEE to China and south-east Asia

Table1: The Export of SH-EEE from Japan to other Asian countries (2008)

	Air conditioner	Refrigerator	Washing Machine	CRT-TV	TV (liquid-crystal, plasma, others)	GNI/capita (\$)
Sri Lanka		779	676	1,483	661	131
Philippines	1,185	5,678	674	13,331	474,192	139
Cambodia	2,526	663	3,073	27,272	108,736	490
VietNAM	2,173	2,180	10,761	1,736,750	778,391	700
Pakistan	8	1,094		3,699	1,805	800
India	6			7,097	68	820
Macao		7		9,065	564,803	1,000
Indonesia				13,459	27,259	1,420
China	739	15,314	939	1,425,988	196,741	2,000
Thailand	1,013	1,155	1	63,057	16,839	3,050
Malaysia	13			59,924	323	5,620
Hong Kong	31,648	54,217	9,477	1,630,346	73,785	29,040

Source: compiled by IGES based on MOF Japan

- Based on HS code which applied since Jan. 2008 in Japan
- The figure does not include disguised or smuggled trade.
- The figure could include the amount other than SH-EEE (but not brand-new EEE)
- North Korea, Taiwan, Myanmar, Afghanistan are also importing SH-EEE from Japan.

## 4 types SH-EEE related issues

types	Problems	Env. impacts
Type 1: Unusable / non-repairable end of life EEE (e-waste problem)	<ul style="list-style-type: none"> <li>• <u>Disguised, traded</u> as second hand</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate proper recycling / disposing facilities in developing countries</li> <li>• Environmental pollution / health hazards</li> </ul>
Type 2: Second hand EEE which are almost Unusable / non-repairable end of life EEE	<ul style="list-style-type: none"> <li>• <u>Short remaining life</u> or <u>unstable/unsafely products</u> due to insufficient repair</li> <li>• They become e-waste, very soon.</li> </ul>	
Type 3: “Real” end of life of usable / repairable SH-EEE	<ul style="list-style-type: none"> <li>• Repaired, sold and used in imported country</li> <li>• It comes to real end of life, and then discarded in the area of end-user</li> </ul>	
Type 4: Usable / repairable but energy inefficient SH-EEE	<ul style="list-style-type: none"> <li>• Could be repairable / usable as second hand EEE but less energy efficient than brand new EEE</li> </ul>	<ul style="list-style-type: none"> <li>• Increased emissions of <b>GHG</b> through the usage of inefficient SH-EEE</li> </ul>

## Social Benefits? in Reuse Market

- Affordable Price & Increasing choice of products
  - BUT, disturbing domestic manufacturing?

- Employment

- But no license is required for shop-owners in Hanoi
- Repairers are graduated from technical school, skilled labor force



- Material Resource Saving?

- Longer life of products
  - But Not Energy Resource Saving?
    - Energy for trade
    - Energy inefficiency
      - Year 1995 AC-(1492kwh/y, 676CO2kg/y)
      - Year 2008 AC-(858kwh/y, 389CO2kg/y)
- (data source: MOEJ)



photo by Hotta, Aoki of IGES



## Environmental impacts in Repairing & After reuse....

- Inappropriate treatment of Residues of repaired products
  - Collected as municipal waste (in Hanoi) → landfill
  
- Still, treatments after reuse is challenge (type 3 issue)
  - Secondhand EEE, either legally or illegally imported, becomes the end of life EEE at the end.
  - Likely to be collected by informal actors and recycled/disposed improperly.
  
  - EPR-based recycling system cannot be simply applied to SH-EEE (Kojima et al., 2008)
    - difficult to define responsible actor of end-of-life products
    - Illegally imported second hand , repaired goods composed of several makers' parts, counterfeit products



## On-going Efforts at National level (Developing Asia )

- incl. international cooperation

types	On-going Efforts	Challenges
Type 1: Unusable / non-repairable end of life EEE (e-waste problem)	<ul style="list-style-type: none"> <li>• Strengthen border control</li> <li>• Trade/import regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Low capacity and corruption in customs</li> <li>• Illegal traders tend to chose smaller ports with ineffective inspection in local area</li> </ul>
Type 2: Second hand EEE which are almost Unusable / non-repairable end of life EEE	<div style="border: 2px dashed black; border-radius: 15px; padding: 10px; text-align: center;"> <ul style="list-style-type: none"> <li>• Developing recycling policies on e-waste (ex. China, Thailand, India, Malaysia and Vietnam)</li> </ul> </div>	<ul style="list-style-type: none"> <li>• Still in/before processing (except for China)</li> </ul>
Type 3: “Real” end of life of usable / repairable second hand EEE		<ul style="list-style-type: none"> <li>• Few countries are incorporating reuse market into policies</li> <li>• Not touching on quality of SH-EEE and negative impacts on repair markets</li> <li>• But, some actions (explained later)</li> </ul>
Type 4: Usable / repairable but energy inefficient used EEE	<ul style="list-style-type: none"> <li>• Trade regulation (year of production)</li> </ul>	<ul style="list-style-type: none"> <li>• Low capacity and corruption in customs</li> </ul>

# Various import regulations in Asian countries

- Some countries ban, others permit.
  - Contained substances, Year of production, Functioning condition
- Reflecting various stances of Asian countries on the loss and benefits of the trade

**Table 2: Import regulation in Asian countries**

Countries	Current status of trade regulations for used electronics		
	Waste	Secondhand	Major references of trade regulations
China	Ban	Permit	<i>the Catalogue of Solid Waste Forbidden to Import in China (Announcement No. 11, 2008)</i>
HK	Permit	Permit	<i>Advice on Import and Export of Used Electrical and Electronic Appliances having Hazardous Components or Constituents</i>
Thailand	Permit	Permit	<i>Notification of Department of Industrial Works on the Criteria for the Approval of the Import of Used. Electrical and Electronic Equipment into the Kingdom of Thailand</i>
Viet Nam	Ban	Ban	<i>the Implementation Rules for the Law on Trade (No.12/2006/ND CP) in Jan. 2006, the Vietnamese Ministry of Post and Telecommunications issued in 2006</i>
Indonesia	Ban	Ban	<i>Decree No. 756/MPP/Kep/12/2003 on Import of Non-new Capital Goods Decree No. 610/MPP/Kep/10/2004 Regarding Amendment of No. 756/MPP/Kep/12/2003</i>
Malaysia	Permit	Permit	<i>The Guidelines for the Classification of Used Electrical and Electronic Equipment</i>
Philippines	Permit	Permit	<i>DENR (Department of Environment and Natural Resources) Administrative Order (DAO) 94-28 "Interim guidelines for the importation of recyclable materials containing hazardous substances"</i>
Cambodia	Permit	Permit	-

Source: compiled by Author based on several sources

# Examples: Incorporating reuse market into policies

Country	E-waste recycling / EPR policy
China	<p><b>Quality assurance and labeling on Second hand EEE</b></p>
	<p>Article 12 :Recovered electrical and electronic products which are repaired to be sold again shall <u>meet the compulsory requirements of relevant national technical specifications</u> to guarantee personal health and ensure safety of person and property, and they shall be <u>marked at appropriate place with a secondhand sign</u>.</p>
	<p><i>Regulations on the Management of the Recovery and Treatment of Waste Electric and Electrical Products</i></p>
	<p><a href="http://www.chinaenvironmentallaw.com/wp-content/uploads/2009/03/regulations-on-waste-electric-and-electronic-products-chn-eng.pdf">http://www.chinaenvironmentallaw.com/wp-content/uploads/2009/03/regulations-on-waste-electric-and-electronic-products-chn-eng.pdf</a></p>
India	<p><b>Defining Responsibilities of refurbisher on their residues, waste transportation</b></p>
	<ul style="list-style-type: none"> <li>•Responsibility of Waste collecting, transporting</li> <li>•Ensuring they transported waste to authorised recyclers</li> <li>•Obligation of registering, filing sales and recording the amount of e-waste they generated</li> </ul>
	<p><i>the draft e-waste (Management and Handling) Rules, 2010</i></p>
<p><a href="http://moef.nic.in/downloads/public-information/Draft%20E-waste-Rules%2030.3.10.pdf">http://moef.nic.in/downloads/public-information/Draft%20E-waste-Rules%2030.3.10.pdf</a></p>	
Thailand	<p><b>Defining importer’s qualification for repairing ability</b> (in case of import for repair and refurbish purpose)</p>
	<p>Article 6.2.2 Importer shall operate a licensed factory with efficiency and capacity corresponding with ability to repair or refurbish such imported parts.</p>
	<p><i>Notification of Department of Industrial Works Re: Importing conditions for used electrical and electronic equipment which is hazardous substance into the Kingdom of Thailand. (Unofficial Translation, Only the Thai version of the texts is legally binding.)</i></p>
<p><a href="http://www.env.go.jp/en/recycle/asian_net/legislative/Thailand/Importing%20conditions%20for%20used%20electrical.pdf">http://www.env.go.jp/en/recycle/asian_net/legislative/Thailand/Importing%20conditions%20for%20used%20electrical.pdf</a></p>	

## On-going Efforts at National level (case of Japan)

types	On-going Efforts	Challenges
Type 1: Unusable / non-repairable end of life EEE (e-waste problem)	<ul style="list-style-type: none"> <li>Strengthen the controlling informal collector/traders →</li> </ul>	<ul style="list-style-type: none"> <li>Still struggling with catching the whole picture of <b>informal actors</b></li> <li>Difficulties to figure out licensed or not</li> </ul>
Type 2: Second hand EEE which are almost Unusable / non-repairable end of life EEE	<ul style="list-style-type: none"> <li>Strengthen Border control →</li> </ul>	<ul style="list-style-type: none"> <li><b>Impossibilities of perfect inspection</b></li> <li><b>Documents:</b> <u>Pictures of containers</u> have to be attached, but exporter could be <u>replaced</u>.</li> <li><b>Inspection:</b> Authorities also <u>conduct x-ray or open inspections</u>, BUT <u>randomly selected</u>.</li> </ul>
Type 3: “Real” end of life of usable / repairable second hand EEE		<ul style="list-style-type: none"> <li><i>Increased burden and less priority in Customs?</i></li> </ul>
Type 4: Usable / repairable but energy inefficient used EEE	<ul style="list-style-type: none"> <li>Developing guideline to distinguish reusable and non-reusable →</li> </ul>	<ul style="list-style-type: none"> <li><b>Not cover all</b> traded secondhand electronics.</li> <li>Audio, Sewing Machine, Fixed phones,,,</li> <li>For trader: CRT TV only (CRT monitor is under consideration)</li> <li>(For consumer , retailer: TV, AC, Washing machine, refrigerator)</li> </ul>

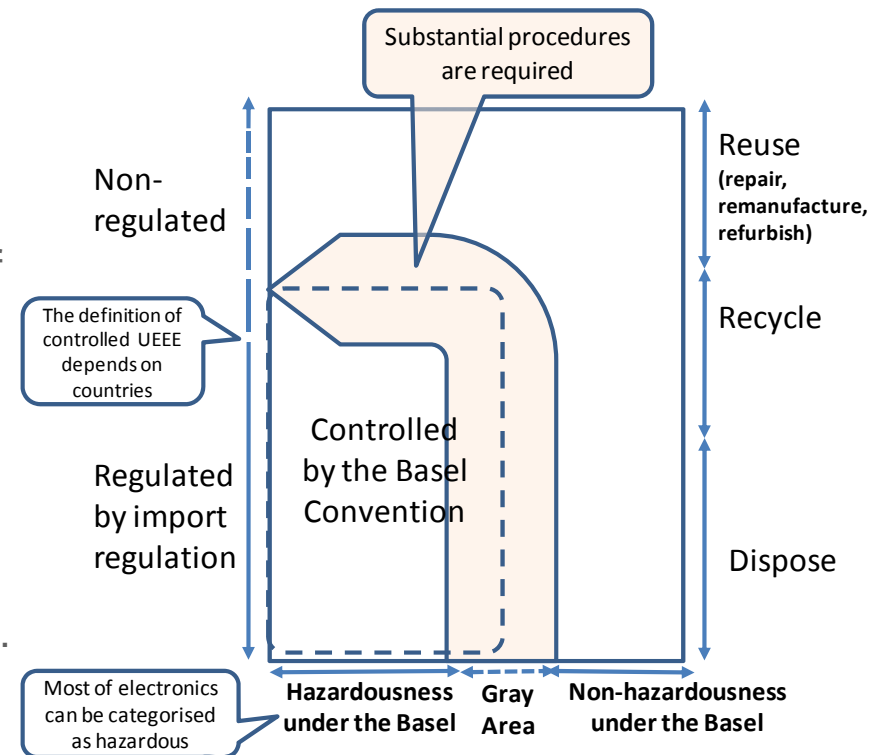
# On-going Efforts at Basel Convention

types	On-going Efforts	Challenges
Type 1: Unusable / non-repairable end of life EEE (e-waste problem)	<p><b>Developing Technical Guidelines on Transboundary Movements of E-waste and the Distinction Between Waste and Non-Waste</b></p> <ul style="list-style-type: none"> <li>•SH-EEE: not covered by the Basel convention</li> <li>•But the guidelines make much efforts to avoid improper trade disguised as SH-EEE</li> <li>•For <b>direct reuse: proper testing for “Economic operators”</b>, <b>recording and packaging</b> are recommended</li> <li>•For <b>repair or refurbishment: voluntary notification procedure</b> is recommended</li> </ul>	<ul style="list-style-type: none"> <li>•Problems on waste/recyclables originated from SH-EEEs which were properly traded</li> <li>•Complexity in trade procedures – relationships with import regulations (explained next slide)</li> </ul>
Type 2: <b>Second hand EEE which are almost Unusable / non-repairable end of life EEE</b>		
Type 3: “Real” end of life of usable / repairable second hand EEE		
Type 4: Usable / repairable but energy inefficient used EEE		

## Increased complexity in trade procedures

### Challenges in the Basel Convention - Relationship with national import regulations

- National trade regulation information; not effectively compiled at SBC,,,,
  - Reporting duties to inform national trade regulation (incl. regulation for SH-EEE) (Article 3, 4 and 13 )
    - Some countries have, others not
    - Not all countries informed to SBC,(less capacity )
  - If complied, **Exporting developed countries** could **stop** inappropriate trade in advance
  
- Low capacity / less human resources of developing countries
  - To handle both Basel & import regulations
  - Split up among various ministries
  
- Trade between developing countries
  - Between inadequate trade management....
  - Laos ↔ Cambodia ↔ Vietnam  
↔ China ↔ Nepal ↔ India



**Figure 3: Complexity of distinction on used electronics under the Basel Convention**

Source: Developed by author

## Summary

- The trade of SH-EEE is one of causes to increase e-waste and related negative environmental impacts due to inappropriate recycling etc..
  - Many efforts have been addressed.
  
- Reuse(refurbish/repair) market is existing in many countries
  - Not all the trade are illegal, improper.
  - Could provide affordable price products, employment opportunities and etc..
  - But some concerns on environmental negative impacts in repair markets and after reuse
  
- Increased complexity in trade procedures causes inadequate implementation of trade management
  - Basel Convention and National import regulation
  - Low capacity to handle in developing countries
  - Increasing Trade between developing countries



# Policy Recommendation - Looking at actors in reuse trade & markets -Focusing on Type 2 & 3 issues

- Government’s intervention, minimise negative environmental impacts, incorporating the existence of SH-EEE market
  
- Development **recycling & importing policies** which also define repairer & importer of SH-EEE roles
  - With the guidelines of traded SH EEE, harmonisation with domestic Basel Law
    - To promote appropriate trade
    - To reduce environmental impacts originated from reuse markets

Examples of responsibilities	
Repairer	<ul style="list-style-type: none"> <li>● Appropriate treatment of residues (ensuring proper transportation to formal recycler)</li> <li>● Quality assurance</li> <li>● Monetary Contribution to promoting formal recycler ← depends on the size of repairing market</li> </ul> <p style="text-align: center;"><i>##Low capacity to implement: household size business → needs an association?##</i></p>
Importer	<ul style="list-style-type: none"> <li>● Monetary Contribution to promoting formal recycler</li> <li>● Reporting about business partner</li> </ul>

# Policy Recommendation

- Looking at actors in reuse trade & markets -Focusing on Type 2 & 3 issues

- Alleviating complexity of trade procedures
- International discussion to develop common format/template and regulatory information exchange for the policies and guidelines
  - With combination of Good DB for easier information sharing among related authorities
    - based on the common format
  - NOT necessary to set international common standards,
    - respect each country's stance on the benefit/loss of the trade
  - In Asia case, "Regional 3R Forum in Asia" would be suitable platform to discuss
    - Common format on policy, incl. international support for policy development & Good DB
    - Import regulation/guideline, related authorities collaboration; The Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes
  - Or the secretariat of Basel Convention would be ....
    - Need extension/change of its function?

# Actor analysis and integrated assessment

- Key Actors

Location	Actor	Challenges to be solved
Both (Im & Ex)	Traders, brokers	Tackle with improper trade
Importing	Refurbisher / Repairer, Collector & recycler	Control negative impacts due to SH EEE
Exporting	Household / Office which discards used EEE	Avoid informal sector As long as end-user send to formal recyclers in their countries, used EEE are properly recycled, not be exported illegally.

- Recommended measurements for each actor

Way to balance between Enhancing/Keeping benefits and Minimizing negative impacts?



## Recommended measurements for trader, broker

- Further development of international cooperation
  - Cooperation for strengthening Border control
    - Difficult to change the situation immediately,,,
    - Institutional and Capacity Development in longer term
    - Exporting developed countries should have primary responsibility
    - Extending information sharing role of the Secretariat of Basel convention
      - Secondhand EEE trade info. should be also shared, even it is not covered
  - Development of Secondhand EEE trade statistics
    - Japan applied HS code to Secondhand EEE

- Support the development of E-waste management
  - Any cost sharing system between export and import countries
    - International producer organization: Extension of EPR
      - Producer would pay depending on the amount of exported secondhand
    - Extended exporter responsibility(Yoshino, 2008):Exporting country would provide money through (ODA etc...) depending on the amount of exported secondhand

## Recommended measurements for refurbisher/repairer, collector & recycler

- Institutional development which incorporates reuse market
  - Defining the responsibility of refurbisher / repairer
    - Waste collection systems in the repairing market
    - Strict environmental standards on the emission from repair market
      - Training and awareness raising
  - Quality evaluation system for second hand
    - To avoid short-remaining life secondhand
  - Proper collection and recycling by formal actor for End of life EEE originated from refurbished / repaired secondhand
    - to which EPR is not easily applied
    - Formalisation of informal sector
      - discourage informal sector

## Recommended measurements for recycler / collector

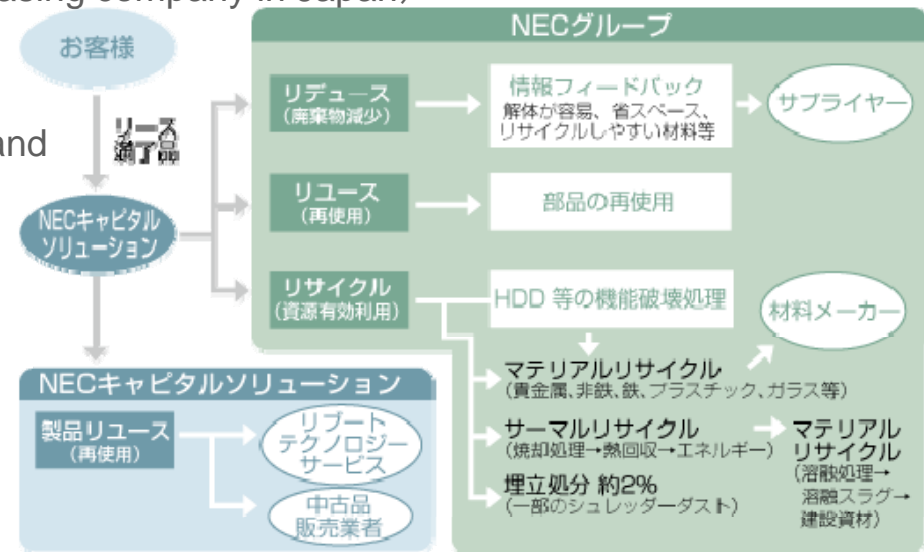
- Promoting the formalization of informal sector
  - Promoting intermediate organisation (NGOs)
    - Between governments and informal sector
    - Providing stable salary and better working environment
      - Intermediate organization (NGO etc..) between authorities and informal actor is effective
      - Provide incentives informal actors, such as safety work environment or stable & regulatory salary
  - Institutional development which discourage informal activities
    - Ex: conditions for disqualification
      - Close cooperation with police
  - Cooperation with customs and police
    - Information sharing informal actors (incl. mafia?)
    - Inviting police in waste management division
      - Regular check and control of informal waste management by police OB

## Recommended measurements for household/office in exporting country

- Source control in developed countries
  - Ensuring formal collection from household
    - Economic incentives, for example deposit-refund systems
    - More convenient collection system
    - System to easily identify reliable collectors

### - Offices Ex: NEC Capital Solutions (a leasing company in Japan)

- Lease = easy to secure collection from Office
- Exported Off-lease PC as Second hand after Quality Check
  - Asia and Africa
  - Less quality off-lease PC  
→ properly recycled / reused (parts)
- Develop traceability
  - secure legal trade
  - Data Base of 1st and 2nd broker in importing country is developed



# Challenges for future Research

- Other OECD countries (EU, USA), Big manufacturing countries (Korea and China), Between developing countries
- Quantitative information on loss and social and economical benefits / influence
  - Support information for international policy process
    - Material resource consumption is not one country matter, but international matter (Industrial development issues, Transboundary problems).
  - MFA: e-waste inventory, second hand inventory
  - Environmental impact on international trade of SH EEE
  - Trade statistics: Need to be more improved, HS code.....
  - Price of SH EEE
  - The size of repairing market (Number of employee, sales etc...)
  - Poverty indicator (GDP/capita, purchasing power etc..), employment etc..



# Thank you.

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