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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Sustainable Consumption and Production Group
IGES
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

Figure 1. 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

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

- 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
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

Table 1: The Export of SH-EEE from Japan to other Asian countries (2008)

<table>
<thead>
<tr>
<th></th>
<th>Air conditioner</th>
<th>Refrigerator</th>
<th>Washing Machine</th>
<th>CRT–TV (liquid-crystal, plasma, others)</th>
<th>TV (other)</th>
<th>GNI/capita ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sri Lanka</td>
<td>779</td>
<td>676</td>
<td>1,483</td>
<td>661</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>1,185</td>
<td>5,678</td>
<td>674</td>
<td>13,331</td>
<td>474,192</td>
<td>139</td>
</tr>
<tr>
<td>Cambodia</td>
<td>2,526</td>
<td>663</td>
<td>3,073</td>
<td>27,272</td>
<td>108,736</td>
<td>490</td>
</tr>
<tr>
<td>VietNam</td>
<td>2,173</td>
<td>2,180</td>
<td>10,761</td>
<td>1,736,750</td>
<td>778,391</td>
<td>700</td>
</tr>
<tr>
<td>Pakistan</td>
<td>8</td>
<td>1,094</td>
<td>3,699</td>
<td>1,805</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>6</td>
<td>7</td>
<td>7,097</td>
<td>68</td>
<td>820</td>
<td></td>
</tr>
<tr>
<td>Macao</td>
<td>7</td>
<td>50</td>
<td>9,065</td>
<td>564,803</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>13,459</td>
<td>9,477</td>
<td>1,425,988</td>
<td>196,741</td>
<td>490</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>739</td>
<td>15,314</td>
<td>939</td>
<td>1,425,988</td>
<td>196,741</td>
<td>2,000</td>
</tr>
<tr>
<td>Thailand</td>
<td>1,013</td>
<td>1,155</td>
<td>1,630,346</td>
<td>73,785</td>
<td>29,040</td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>13</td>
<td>59,924</td>
<td>63,057</td>
<td>16,839</td>
<td>3,050</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>31,648</td>
<td>54,217</td>
<td>1,155</td>
<td>1,630,346</td>
<td>73,785</td>
<td>29,040</td>
</tr>
</tbody>
</table>

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 brad-new EEE)
- North Korea, Taiwan, Myanmar, Afghanistan are also importing SH-EEE from Japan.
### 4 types SH-EEE related issues

<table>
<thead>
<tr>
<th>Types</th>
<th>Problems</th>
<th>Env. Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1: Unusable / non-repairable end of life EEE</td>
<td>• Disguised, traded as second hand</td>
<td>• Inadequate proper recycling / disposing facilities in developing countries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Environmental pollution / health hazards</td>
</tr>
<tr>
<td>Type 2: Second hand EEE which are almost Unusable / non-repairable end of life EEE</td>
<td>• Short remaining life or unstable/unsafely products due to insufficient repair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• They become e-waste, very soon.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3: “Real” end of life of usable / repairable SH-EEE</td>
<td>• Repaired, sold and used in imported country</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• It comes to real end of life, and then discarded in the area of end-user</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 4: Usable / repairable but energy inefficient SH-EEE</td>
<td>• Could be repairable / usable as second hand EEE but less energy efficient than brand new EEE</td>
<td>• Increased emissions of GHG through the usage of inefficient SH-EEE</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Types</th>
<th>On-going Efforts</th>
<th>Challenges</th>
</tr>
</thead>
</table>
| Type 1: Unusable / non-repairable end of life EEE (e-waste problem) | - Strengthen border control  
- Trade/import regulation | - Low capacity and corruption in customs  
- Illegal traders tend to choose smaller ports with ineffective inspection in local area |
| Type 2: Second hand EEE which are almost Unusable / non-repairable end of life EEE | - Developing recycling policies on e-waste (ex. China, Thailand, India, Malaysia and Vietnam) | - Still in/before processing (except for China)  
- Few countries are incorporating reuse market into policies  
- Not touching on quality of SH-EEE and negative impacts on repair markets  
- But, some actions (explained later) |
| Type 3: “Real” end of life of usable / repairable second hand EEE | | |
| Type 4: Usable / repairable but energy inefficient used EEE | - Trade regulation (year of production) | - Low capacity and corruption in customs |
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

<table>
<thead>
<tr>
<th>Countries</th>
<th>Current status of trade regulations for used electronics</th>
<th>Major references of trade regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Ban, Permit</td>
<td>the Catalogue of Solid Waste Forbidden to Import in China (Announcement No. 11, 2008)</td>
</tr>
<tr>
<td>HK</td>
<td>Permit, Permit</td>
<td>Advice on Import and Export of Used Electrical and Electronic Appliances having Hazardous Components or Constituents</td>
</tr>
<tr>
<td>Thailand</td>
<td>Permit, Permit</td>
<td>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</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Ban, Ban</td>
<td>the Implementation Rules for the Law on Trade (No.12/2006/NĐ CP) in Jan. 2006, the Vietnamese Ministry of Post and Telecommunications issued in 2006</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Ban, Ban</td>
<td>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</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Permit, Permit</td>
<td>The Guidelines for the Classification of Used Electrical and Electronic Equipment</td>
</tr>
<tr>
<td>Philippines</td>
<td>Permit, Permit</td>
<td>DENR (Department of Environment and Natural Resources) Administrative Order (DAO) 94-28 “Interim guidelines for the importation of recyclable materials containing hazardous substances</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Permit, Permit</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: compiled by Author based on several sources
## Examples:
Incorporating reuse market into policies

<table>
<thead>
<tr>
<th>Country</th>
<th>E-waste recycling / EPR policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China</strong></td>
<td><strong>Quality assurance and labeling on Second hand EEE</strong></td>
</tr>
<tr>
<td></td>
<td>Article 12: Recovered electrical and electronic products which are repaired to be sold again shall meet the compulsory requirements of relevant national technical specifications to guarantee personal health and ensure safety of person and property, and they shall be marked at appropriate place with a secondhand sign.</td>
</tr>
<tr>
<td></td>
<td>Regulations on the Management of the Recovery and Treatment of Waste Electric and Electrical Products</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td><strong>Defining Responsibilities of refurbisher on their residues, waste transportation</strong></td>
</tr>
</tbody>
</table>
| | • Responsibility of Waste collecting, transporting  
| | • Ensuring they transported waste to authorised recyclers  
| | • Obligation of registering, filing sales and recording the amount of e-waste they generated |
| | the draft e-waste (Management and Handling) Rules, 2010 |
| **Thailand** | **Defining importer’s qualification for repairing ability** (in case of import for repair and refurbish purpose) |
| | Article 6.2.2 Importer shall operate a licensed factory with efficiency and capacity corresponding with ability to repair or refurbish such imported parts. |
| | 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.) |
### On-going Efforts at National level (case of Japan)

<table>
<thead>
<tr>
<th>Types</th>
<th>On-going Efforts</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type 1:</strong> Unusable / non-repairable end of life EEE</td>
<td>- Strengthen the controlling informal collector/traders</td>
<td>- Still struggling with catching the whole picture of informal actors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Difficulties to figure out licensed or not</td>
</tr>
<tr>
<td><strong>Type 2:</strong> Second hand EEE which are almost Unusable / non-repairable end of life EEE</td>
<td>- Strengthen Border control</td>
<td>- Impossibilities of perfect inspection</td>
</tr>
<tr>
<td><strong>Type 3:</strong> “Real” end of life of usable / repairable second hand EEE</td>
<td>- Developing guideline to distinguish reusable and non-reusable</td>
<td>- Increased burden and less priority in Customs?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Not cover all traded secondhand electronics.</td>
</tr>
<tr>
<td><strong>Type 4:</strong> Usable / repairable but energy inefficient used EEE</td>
<td></td>
<td>- Audio, Sewing Machine, Fixed phones, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- For trader: CRT TV only (CRT monitor is under consideration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For consumer, retailer: TV, AC, Washing machine, refrigerator)</td>
</tr>
</tbody>
</table>
### On-going Efforts at Basel Convention

<table>
<thead>
<tr>
<th>types</th>
<th>On-going Efforts</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1: Unusable / non-repairable end of life EEE (e-waste problem)</td>
<td>Developing Technical Guidelines on Transboundary Movements of E-waste and the Distinction Between Waste and Non-Waste</td>
<td>• Problems on waste/recyclables originated from SH-EEEs which were properly traded</td>
</tr>
<tr>
<td>Type 2: Second hand EEE which are almost Unusable / non-repairable end of life EEE</td>
<td></td>
<td>• Complexity in trade procedures – relationships with import regulations (explained next slide)</td>
</tr>
<tr>
<td>Type 3: “Real” end of life of usable / repairable second hand EEE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 4: Usable / repairable but energy inefficient used EEE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Examples of responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reparer</strong></td>
</tr>
<tr>
<td>• Appropriate treatment of residues (ensuring proper transportation to formal recycler)</td>
</tr>
<tr>
<td>• Quality assurance</td>
</tr>
<tr>
<td>• Monetary Contribution to promoting formal recycler depends on the size of repairing market</td>
</tr>
<tr>
<td><strong>#Low capacity to implement: household size business → needs an association?</strong></td>
</tr>
<tr>
<td><strong>Importer</strong></td>
</tr>
<tr>
<td>• Monetary Contribution to promoting formal recycler</td>
</tr>
<tr>
<td>• Reporting about business partner</td>
</tr>
</tbody>
</table>
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

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

- 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.

Chika Aoki

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