Fuji Xerox International Resource Recycling System in Asia-Pacific region

- Concept of Fuji Xerox Integrated Recycling System
- 3R System of Fuji Xerox
- Integrated Recycling System in Asia-Pacific region
- Establishment of International Resource Recycling System
  1) Key enablers
  2) Conclusion

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Manufacturing Group
Fuji Xerox
Fuji Xerox Overview

Name

Fuji Xerox Co., Ltd.

Principle

Office Equipment

- Copy Machines (PPC)/Digital Multifunction Machines/ Color Multifunction Machines/Laser Printers, etc

DocuCentre 707

DocuCentre Color 400

DocuPrint 205/255/305
Fuji Xerox Network in Asia-Pacific

Business in Asia-Pacific region

- Establishment: 1962.2.20
- Number of employees: 14,601
- Marketing base: Operating subsidiaries in 9 countries/region in Asia-Pacific

Fuji Xerox plays an important role in the Xerox Group, undertaking R&D, manufacturing, marketing and services businesses. We are simultaneously pursuing expansion to meet local and regional needs in the Asia-Pacific region as well as China (including Hong Kong).
Cooperation required to establish sustainable society

Environment Policy, regulation

Government

Sustainable Society

Customer

Company

Green Consumer

EPR (Extended Producer’s responsibility)
Fuji Xerox Corporate Recycling Policy

“Promote the reuse of resources for Infinite Zero Landfill”

Policy for the implementation

Fuji Xerox, as a member of society, will achieve corporate recycling policy in all of territories based on the concept of EPR

- Collection of used equipments by marketer/manufacturer
- Disassembly of used equipments by manufacturer
- Material recycling by collaboration between companies
- Zero landfill
- Prevent risks might be incurred by hazardous substances
- Prevent illegal disposal
3R System of Fuji Xerox

< Corporate recycling policy > Promote the reuse of resources for “infinite” zero-landfill (1995)

Closed Loop System
- Introduced copier machine w/reused parts to domestic market in 1995
  - Collection ratio >90%
  - Production volume of the copier machine with reused parts 30,000 units/year

Inverse Manufacturing
- Quality assurance technology of remaining life of the parts
- 3R design/multiple-generation design
- Design to reduce content of hazardous substances
  - Parts reuse ratio 50% (number of parts)

Zero emission
- Establishment of "zero-landfill" network throughout Japan
  - 2000.8 recycling ratio: 99.97%
<Base policy>

- Fuji Xerox, as manufacturer, directly manages and operates the plant and guarantees no risks to customer and import country
- Provide continuous and uniform quality by centralizing used equipments generated in 9 countries and region of Asia-Pacific
- Reduce environmental impacts in each country/region

<4 principles>

1. Prevent illegal disposal by collecting used equipments by manufacturer’s responsibility
2. Not to incur environmental impacts in importing country (ex. by hazardous substances)
3. Not to generate waste in the importing country
4. Provide benefits to the importing country

Started operation in Dec 2004
Fuji Xerox International Resource Recycling System

- Respective resource recycling system in 9 countries/region
- Wastes generated at 5–50%
Centralized Recycling Center Established in Thailand

Collect used Xerox office equipment/supplies from Operating Companies of 9 countries/region in Asia-Pacific
Ecoland in Thailand (FXEM)

• High material recovery ratio achieved by thorough manual disassembly
  : Separation category: 44 in Japan – 64 in Thailand
• Thorough separation of plastics by type and material recovery
  : 6 types in Japan – 14 types in Thailand
• Thorough control of parts contains hazardous substances
  : 4 parts contains hazardous substances are to be treated in Japan
• Consideration for working environment
• Tracking System
Stock area - Ecoland in Thailand
Disassembly and Separation of Used equipment—Ecoland in Thailand
Equipment to Separate Plastics and Metals Automatically – Ecoland in Thailand
Disassembly and Separation area - Ecoland in Thailand
Parts Reuse Area of Cartridge – Ecoland in Thailand
By the network with recycling processors (12 partners in Thailand/Asia and 4 partners in Japan) who have excellent skills and technologies, materials can be recovered at high ratio.

Separation Categories:

- **Material Recycle**: 88.8%
- **Thermal Recycle**: 10.8%
- **Land-filled Wastes or Incinerated Wastes with no recovery of thermal energy**: 0.4%

### Recovery Processes:

- **Electric furnace or Reflecting furnace**
  - Iron, Copper, Aluminum
- **Smelting & Refining process**
  - Collected metals (Au, Ag, Cu, Pb, Fe, Al)
- **Crush**
  - PWBA
- **Melt & Separation**
  - Copper
- **Crush**
  - Wash to be cullet
  - Brawn Tube
- **Treated to be collected as Hg metal**
  - Fluorescent Lamp, LCD Backlight Lamp, Ni-Cd Battery
- **Treated to be collected as Cd metal**
  - Selenium Drum
- **Treated to be collected as Se metal**
  - Selenium
- **Alternate fuel**
  - Incineration (No recovery of thermal energy)
  - Ash waste
  - Land-filled
- **Recycled Paper**
  - No Waste
- **Recycled Pellets**
  - No Waste
- **Culled (material for Brawn tube glass)**
  - No Waste
- **Plastics are thermal recycled.**
  - No Waste
- **Alternate raw material for cement.**
  - No Waste
Remanufacturing of Used supplies (cartridge) at FXEM

“Quality Assurance of Same as Brand New” based on Fuji Xerox Standard

Exported to Operating Companies (9 countries/region) of Asia-Pacific
1) Closed loop system by Fuji Xerox (manufacturer)
2) Tracking system by weight
3) Manifest management

Information disclosure

Database of FXEM Monitoring System
- weight of used equipment received
- weight of 64 categories of pre-materials
- weight of pre-material sent to recycling partner
- weight of recovered material by recycling partner
Establishment of integrated recycling system in Asia-Pacific region
- Used office equipments/cartridges generated in 9 countries/region are transported to the integrated recycling site in Thailand and materials are recovered for “infinite zero landfill”

Reduced environmental impacts/improved management
- Reduction of environmental impacts (landfill ratio)
  - Landfill ratio : 25% → 0.8% (2005)
  - Landfilled weight : 1,047 t → 104 t (2005) (weight calculated by assumed conventional treatment method)
- Proper treatment of parts containing hazardous substances
  - To be treated in Japan
- Tracking system established by manufacturer through product lifecycle enables to reduce risks such as illegal disposal

Achievements

<table>
<thead>
<tr>
<th>Received quantities of used office equipment</th>
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<tbody>
<tr>
<td>21,000 units</td>
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<tr>
<td>7,000 units</td>
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<table>
<thead>
<tr>
<th>Recycling ratio</th>
</tr>
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<tbody>
<tr>
<td>%</td>
</tr>
<tr>
<td>'04</td>
</tr>
<tr>
<td>'05</td>
</tr>
<tr>
<td>99.4%</td>
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<tr>
<td>99.2%</td>
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<table>
<thead>
<tr>
<th>Recycled weight</th>
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<tbody>
<tr>
<td>(t)</td>
</tr>
<tr>
<td>'04</td>
</tr>
<tr>
<td>'05</td>
</tr>
<tr>
<td>967 t</td>
</tr>
<tr>
<td>3,752 t</td>
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<table>
<thead>
<tr>
<th>Weight of resources escaped from landfill by integrated recycle system</th>
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<tbody>
<tr>
<td>'04</td>
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<tr>
<td>'05</td>
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<tr>
<td>Assumed weight of waste landfilled at conventional recycling</td>
</tr>
<tr>
<td>Weight of waste landfilled/incinerated with no energy recovery by integrated recycling</td>
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<tr>
<td>Weight of resources escaped from landfilled/incinerated with no energy recovery by integrated recycling</td>
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Establishment of International resource recycling system

1) Key enablers: support by governments / collaboration between companies

- Government of Thailand
  - Import permission
  - Plant establishment approval

- Marketing companies
  - Collection

- Logistics partner (Mitsui)
  - Transportation inside Thailand
  - External transportation

- Recycling partners
  - Thailand
    - Fuji Xerox International Resource Recycling system (Disassembly/separation Tracking)
  - Japan (treatment of hazardous parts)

- Government of export countries/region
  - Export permission
1. Establishment of International resource recycling system

1) Key enablers- 2: necessity of cross-regional partnership

Resource recycling may require cross-regional partnership in some cases; proper treatment of hazardous substances are not available (technologies/system, e.g.).

Fuji Xerox case

- 16 recycling partners support the system. Some of the parts contain hazardous substances are to be treated in Japan, therefore, Fuji Xerox case is the pattern (□) of the above.
  - Recycling partners in Thailand:
    - 12 partners (including 6 Japanese companies)
  - Recycling partners of Japan/Asia: 4 partners
International laws/regulations on resource utilization

Sustainable Society

Regulation for proper treatment of wastes

INTERNATIONAL

Basel Convention
(Regulation on transboundary movement of hazardous wastes)

LOCAL

Wastes treatment Law by country

INTERNATIONAL

Regulation to promote recourse utilization

LOCAL

NON

WEEE (EU)
Electric Appliance Recycling Law (JPN)

The Hazardous Substances Act (Thailand)

Establishment of International Resource Recycling Model is required
Establishment of International resource recycling system

2) Conclusion

Asia-pacific region / China where economy has grown rapidly, environmental issues have become serious accordingly. Companies should take part in the activities to reduce environmental impacts utilizing their know how/technologies.

Economic growth and environmental impacts

Environmental impacts are increased in accordance with rapid economic growth in Asia-pacific / China

On the assumption that increased environmental impact as waste (①), proper treatment of hazardous substances (③) and wastes contain hazardous substances (①) will be required.

Fuji Xerox case

- Established of international resource recycling system in Asia-pacific region
  - Established the system to collect used equipments in 9 countries / region
  - Achieved zero landfill in 9 countries / region in one time

- No increase on environmental impacts (①)
even though market continues its growth.

- Established integrated recycling center in Thailand where “recycling at same quality of Japan” is available.
  - Material recycling ratio 99.2%
  - Landfilled weight : about 1000t (assumption) at conventional recycling ② 104t
  - Recycling of the parts contains hazardous materials

- No increase of (①) ②
- Thank you for your kind attention -