



International Recycling Network of Mobile Phone in Asia Region

Metal Recovery from E-Waste, Poly- Metallic Material

October 31, 2006

Masayuki Naka

DOWA ECO-SYSTEM CO., LTD.

Constituents in E-Waste

- Cadmium
- Lead
- Antimony
- Arsenic
- Mercury
- Selenium
- Fluorocarbons (CFCs, HCFCs & HFCs)
- Brominated Flame Retardants

- Gold
- Silver
- Copper
- Platinum

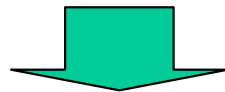
.....Etc.

Metal Contents in Electronic Equipments

Item	Au ppm	Ag ppm	Cu %	Pd ppm	Pb %	Bi %	Se %	Zn %	Cd %	Hg %	As %
MD Player	230	1,400	8.7	10	0.003	0.001	<0.00 1	0.022	0.002		<0.00 1
CD Player	130	1,210	5.5	6	0.180	0.002	0.001	0.003	0.002		0.010
Tape Recorder	40	850	8.2	6	0.140	0.004	0.004	0.008	<0.00 1		0.006
Digital Camera	170	500	5.6	4	0.020	0.040	<0.00 1	0.005	0.001		<0.00 1
Video Cam.	100	630	6.9	30	0.190	0.013	0.001	0.011	0.001	Tr.	0.014
Silicon Audio	500	2,400	11.3	50	0.400	0.003	0.001	0.011	0.002		0.023
Mobile Phone	400	2,300	17.2	100	0.37	0.02	<0.01	1.4	<0.01		0.003

Potentiality of Nonferrous Metal Industry

- Complex contents in raw materials
 - Various elements (valuable metals and impurities) in crude ore
- Handling toxic substances in safety
 - Valuable but toxic metals (ex. Pb, Cd)
 - Contents as impurities (ex. As)



Unique role in environmental management & recycling
“The Anchor of Recycling”, “The Joint of Recycling Loop”

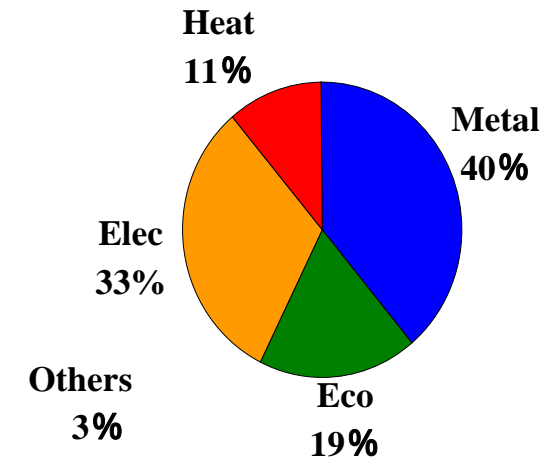
**Dowa’s Business Model: Integration between
Metals Sector and Environmental Business Sector**

DOWA's Corporate Data

Founded	: September 18, 1884
Incorporated	: March 11, 1937
Net sales:	: JPY 316,388 million (as of FY2005)
Net income	: JPY 14,532 million (as of FY2005)
Total assets	: JPY 309,315 million (as of end of FY2005)

Main Businesses

- Nonferrous Metals
- Environmental Management and Recycling
- Electronic Materials
- Metal Processing
- Heat Treatment



Sales by Segment(Consolidated) FY 2005

Overall Business Activities

DOWA ECO-SYSTEM CO., LTD.

Environmental Management & Recycling



DOWA METALS & MINING CO., LTD.

Nonferrous Metals
Gold, Silver, Copper,
Zinc, Platinum group
metals, Gallium,
Indium, etc.



*Support of Sustainable Development
through our Operations*

Included in final Products

Personal Computers
Plasma Televisions
Mobile Phones
Batteries,
Magnetic Recording Tapes,
Automobiles, etc



DOWA METALTECH CO., LTD.

Metal Processing
Connector
Materials,



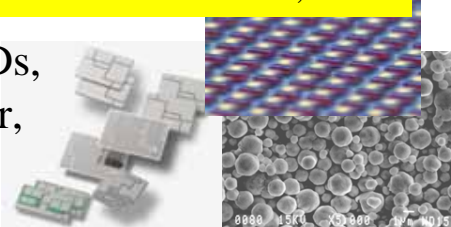
DOWA THERMOTECH CO., LTD

Heat treatment for
automobile parts,
Industrial furnace

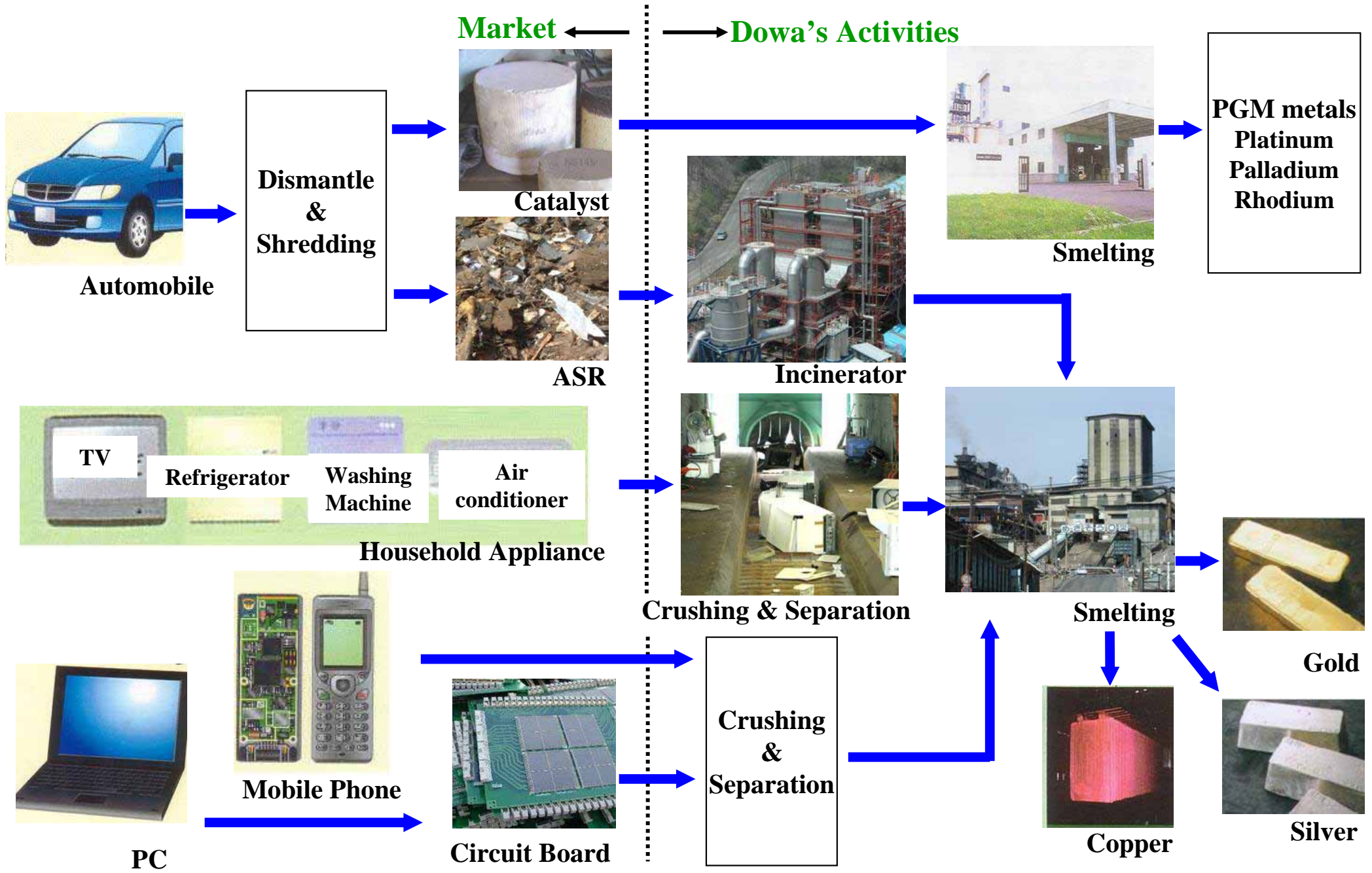


DOWA ELECTRONICS MATERIALS CO., LTD.

Gallium LEDs,
Silver Powder,
Zinc Powder,



Metal Recycling



E-waste Recycling

Crashed OA



PCB



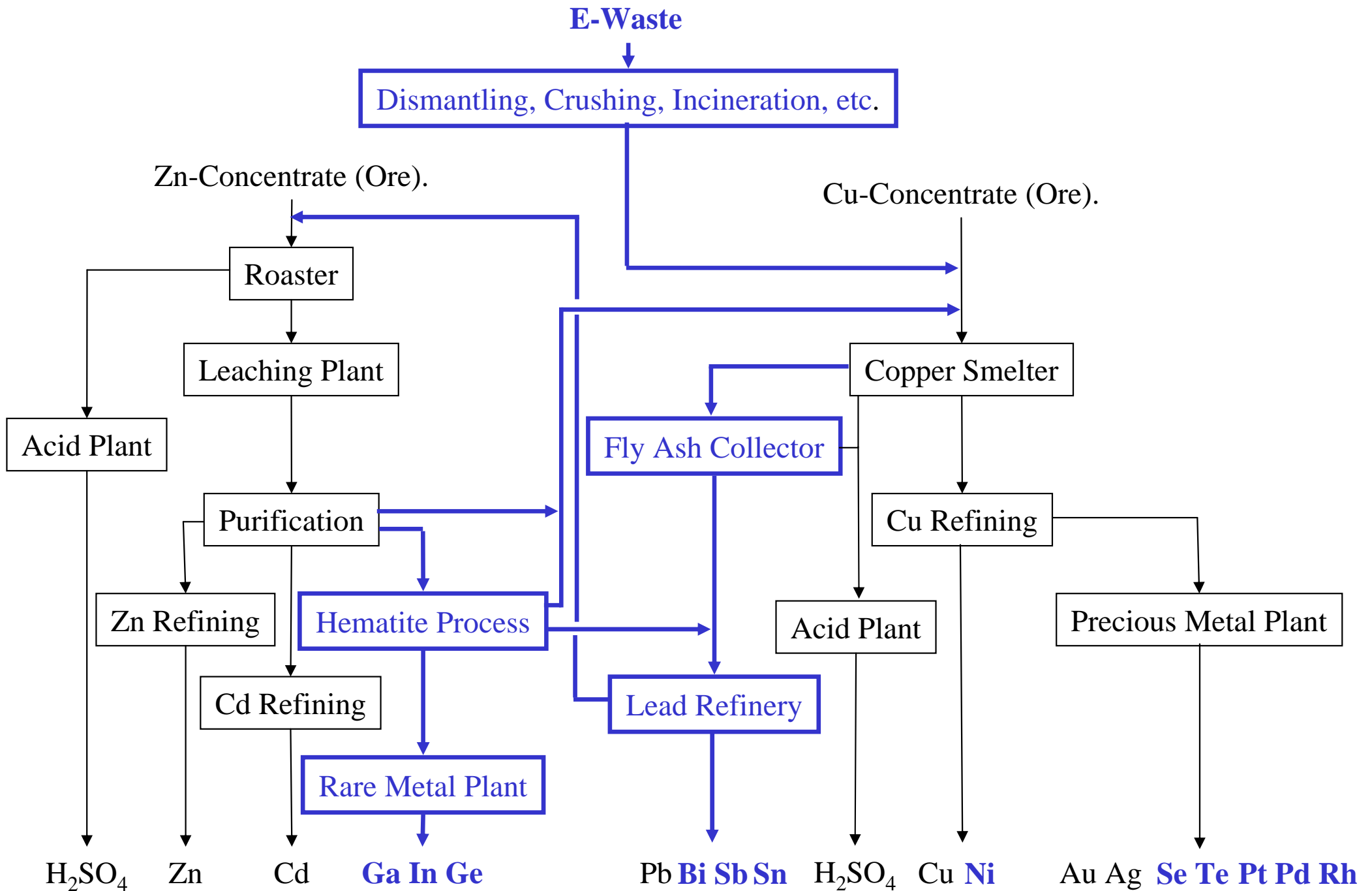
Button shaped batteries



Mobile Phone



Process Flow of Dowa's Smelter/Refineries Complex



Difference between Hydro-Metallurgy and Dowa's Technology

	Hydro-Metallurgy	Dowa's Technology
Key Process	Cyanidation, Amalgamation or Acid Leaching	Integrated Smelter/Refineries
Recoveries	Precious Metals only	Base Metals, Precious Metals & Rare Metals

Dowa's Overseas Activities in Metal Recycling

- **China:** Dowa Environmental Management Co., Ltd.
 - Recovering Precious Metals from E-Wastes
- **USA:** Nippon PGM America Inc.
 - Pre-treatment & Shipping Centre for Catalysts of ELV
- **Singapore:** Eco-system Japan Co., Ltd. Singapore
 - Collecting and Shipping Centre for E-Wastes

Pilot Project to Establish Scheme for Collection and Movement of E-Waste from SE Asia to Japan

- Stage1 (FY2006)
 - Study on the pilot scheme with a fund of JPY10M contributed by DOWA
- Stage2 (FY2007)
 - Implementation of the pilot scheme utilizing outcome of stage1
- Objective:
 - To establish collecting scheme of end of life mobile phones generated in Malaysia, Singapore and Thailand through a collaboration of relevant authorities
 - To establish transboundary movement scheme of the mobile phones from those countries to Japan
 - To investigate the possible application of those schemes to e-wastes other than mobile phones

International Recycling Network of Mobile Phone in Asia Region



Collection in Thailand, Malaysia, Singapore



transport

Performing by DOWA



Recycling in JAPAN

