

Collection and Recycling of Portable Rechargeable Batteries handled by JBRC

Japan Portable Rechargeable Battery Recycling Center (JBRC)

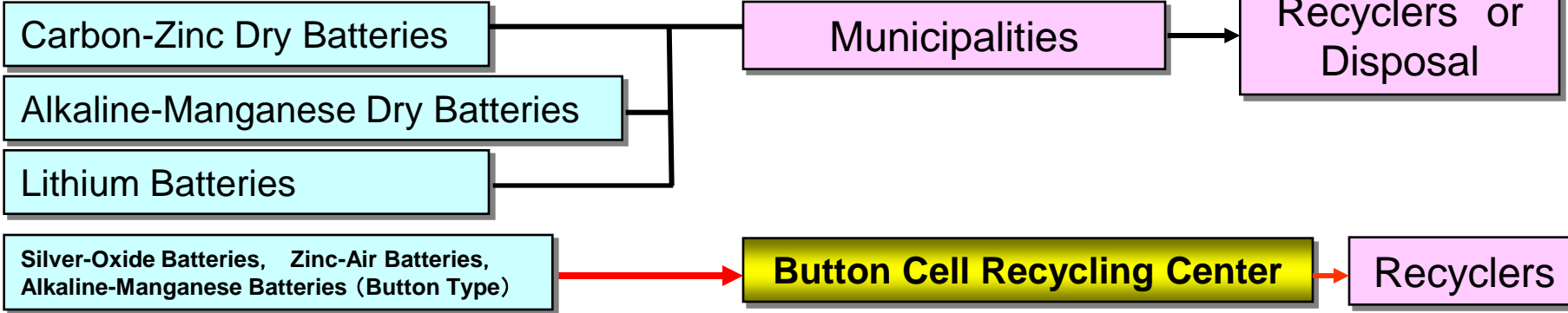
Battery Association of Japan

Sept 1, 2010

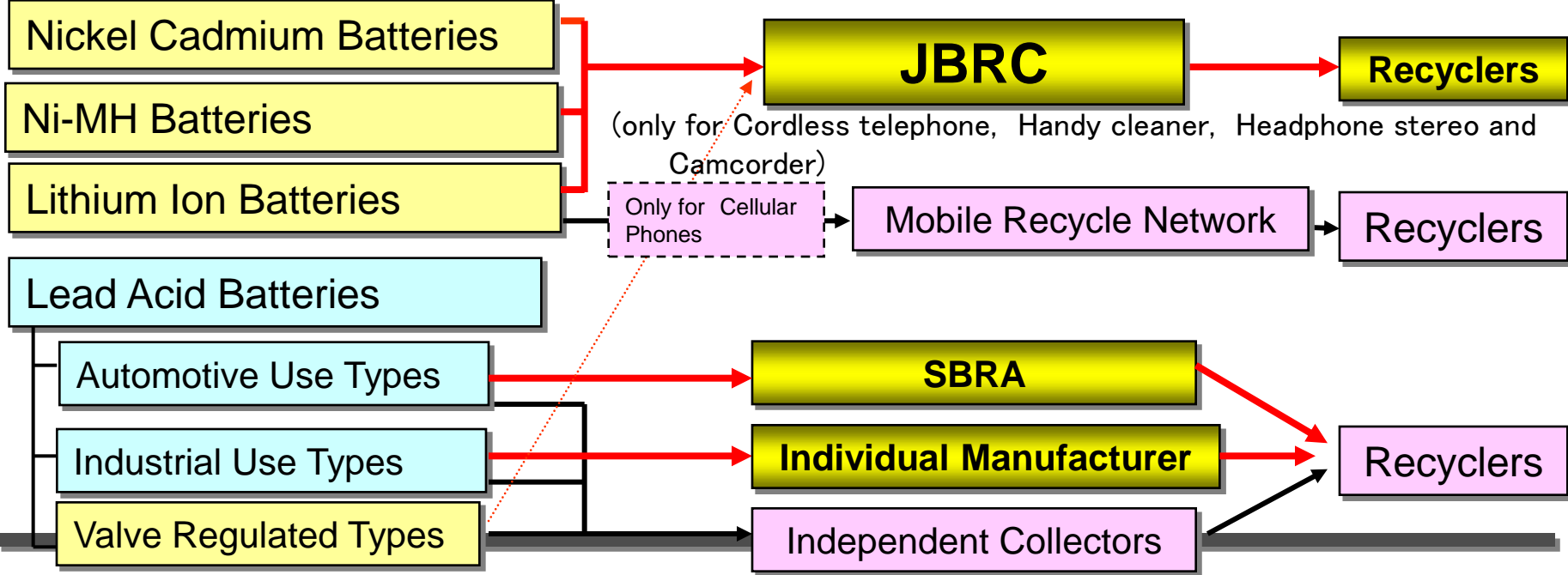
Battery Classifications & Recycling Roots

Primary Batteries

Collection and Recycling obligated by the Law



Secondary Batteries



- * **Recycling Law Started in 1991**
- * **Regulation of Ni-Cd batteries started in 1993**
 - **Indication of recycling mark**
 - **Easy Removability of Ni-Cd batteries from appliances**
- * **Reformed Recycling Law started in April, 2001**
 - **Regulation of 4 portable rechargeable batteries —**
 1. **Sealed Ni-Cd batteries**
 2. **Sealed Ni-MH batteries**
 3. **Lithium secondary batteries (Li-ion batteries)**
 4. **Sealed lead acid batteries (not more than 234kC)**
 - **Requirements to 4 batteries —**
 - **Markings**
 - **Easy Removability of Batteries from Appliances**
 - **Collection and recycling/Information supply**

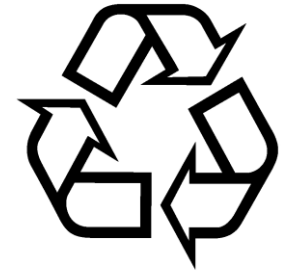
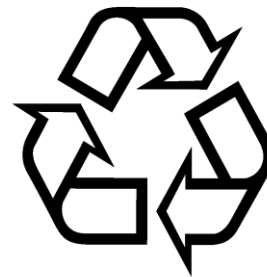
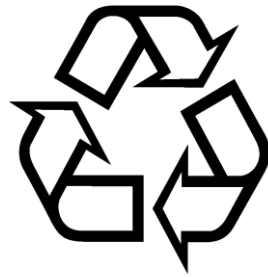
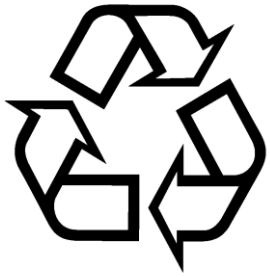
Recycling Marks of Portable Rechargeable Batteries

Ni-Cd

Ni-MH

Li-ion

Sealed Pb



Ni-Cd

Ni-MH

Li-ion

Pb

1. Idea for Battery Package Design

- Apply no soldering when equipped to appliances
- Apply easy removability from appliances

2. Markings

- Battery package design for appliance should be marked to appliance itself, instruction manual and others as much as possible.

3. Information

- The battery package design for appliance and easy removable method for battery should be informed.

4. Others

- Safety, technical update, evaluation, etc.

- **MANUFACTURES** of portable rechargeable batteries & specific portable rechargeable battery appliances
- **IMPORTERS** of portable rechargeable batteries & specific portable rechargeable battery appliances

Batteries	Legal benchmark (Minimum)
Sealed Ni-Cd battery	60%
Sealed Ni-MH battery	55%
Lithium secondary battery	30%
Sealed lead acid battery	50%

(Definition of recycle rate)

$$\frac{\text{Total weight of reusable elements (Fe, Pb, Ni, Co, Cd, etc)}}{\text{Weight of used rechargeable batteries}} \times 100$$

Corporate Name

JBRC

Full name

**Japan Portable Rechargeable Battery
Recycling Center**

Address

3-5-8, shibakoen, minatoku, Tokyo, Japan

Foundation

April 1, 2004 (April 2001 Non-corporate in BAJ)

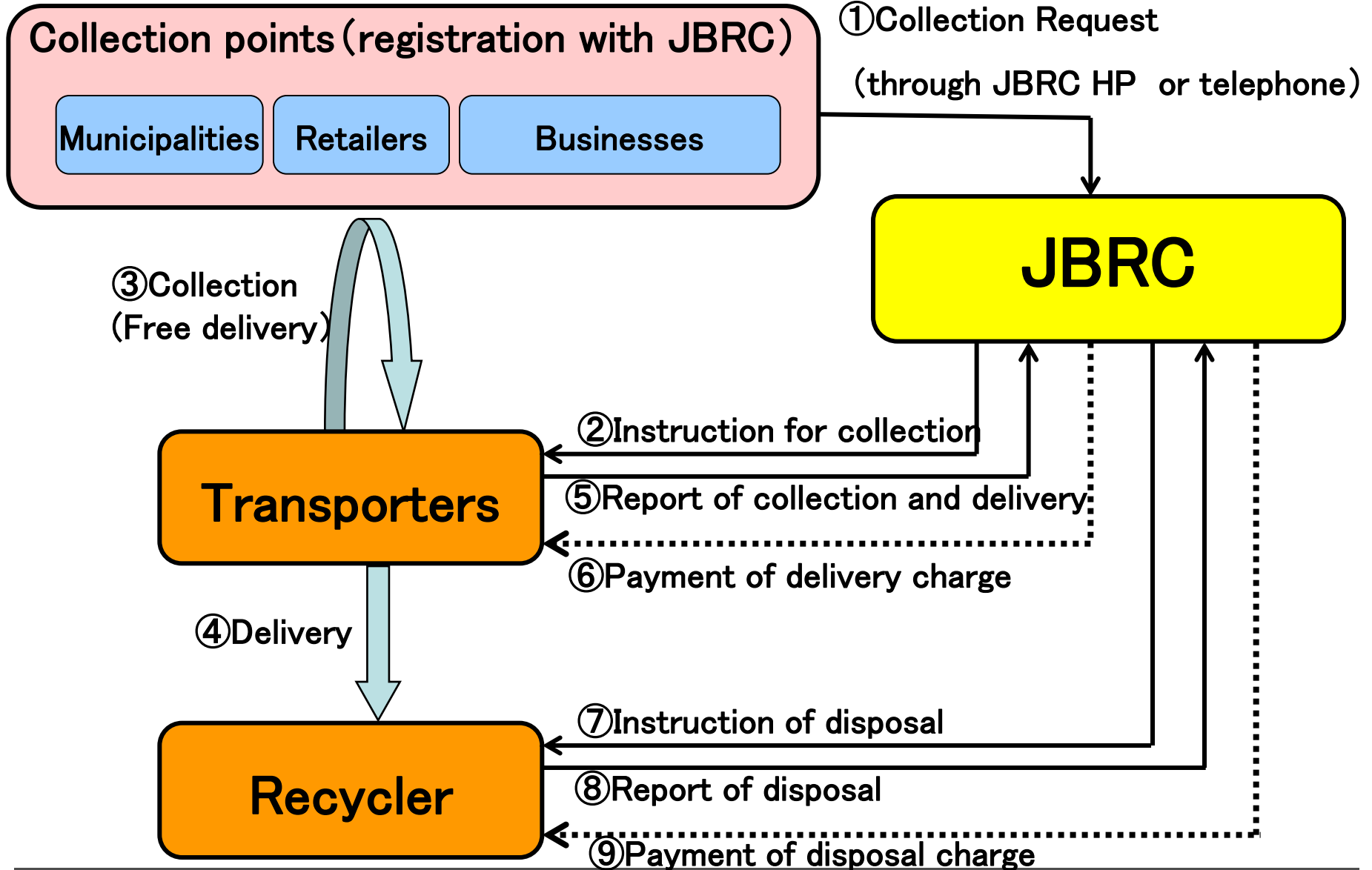
Work

**Collection and recycling of portable
rechargeable batteries**

Membership

286 companies (June 30, 2010)

Collection System of JBRC

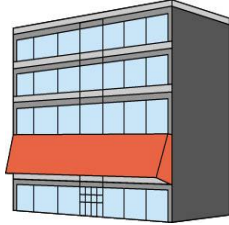


Collection Points

Electric
appliance
stores



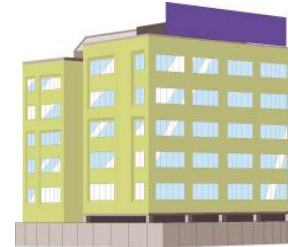
Large electric
appliance
stores



Camera Stores



Super Markets



DIY stores



Cellular phone
stores



Power tool
stores



Bicycle stores

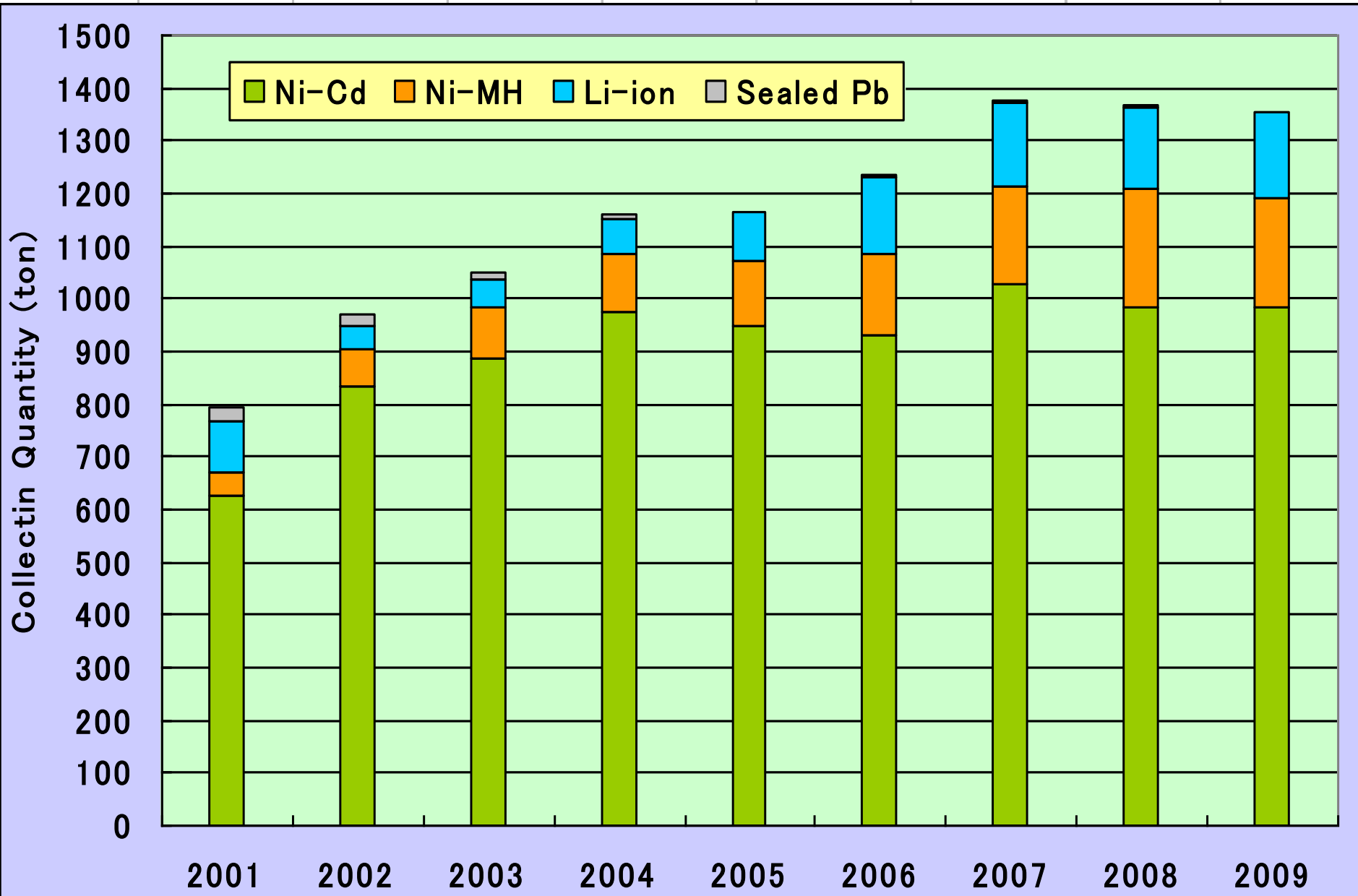


- Businesses
- Municipalities
- Others

**Collection
points**

**30,000
Points!!**

Battery Quantities Collected by JBRC



Furnaces for Treatment of Portable Rechargeable Batteries



Vacuum Furnace

(Nippon Recycle Center, Corp)



Rotary Kiln

(Toho Zinc, Co. Ltd)

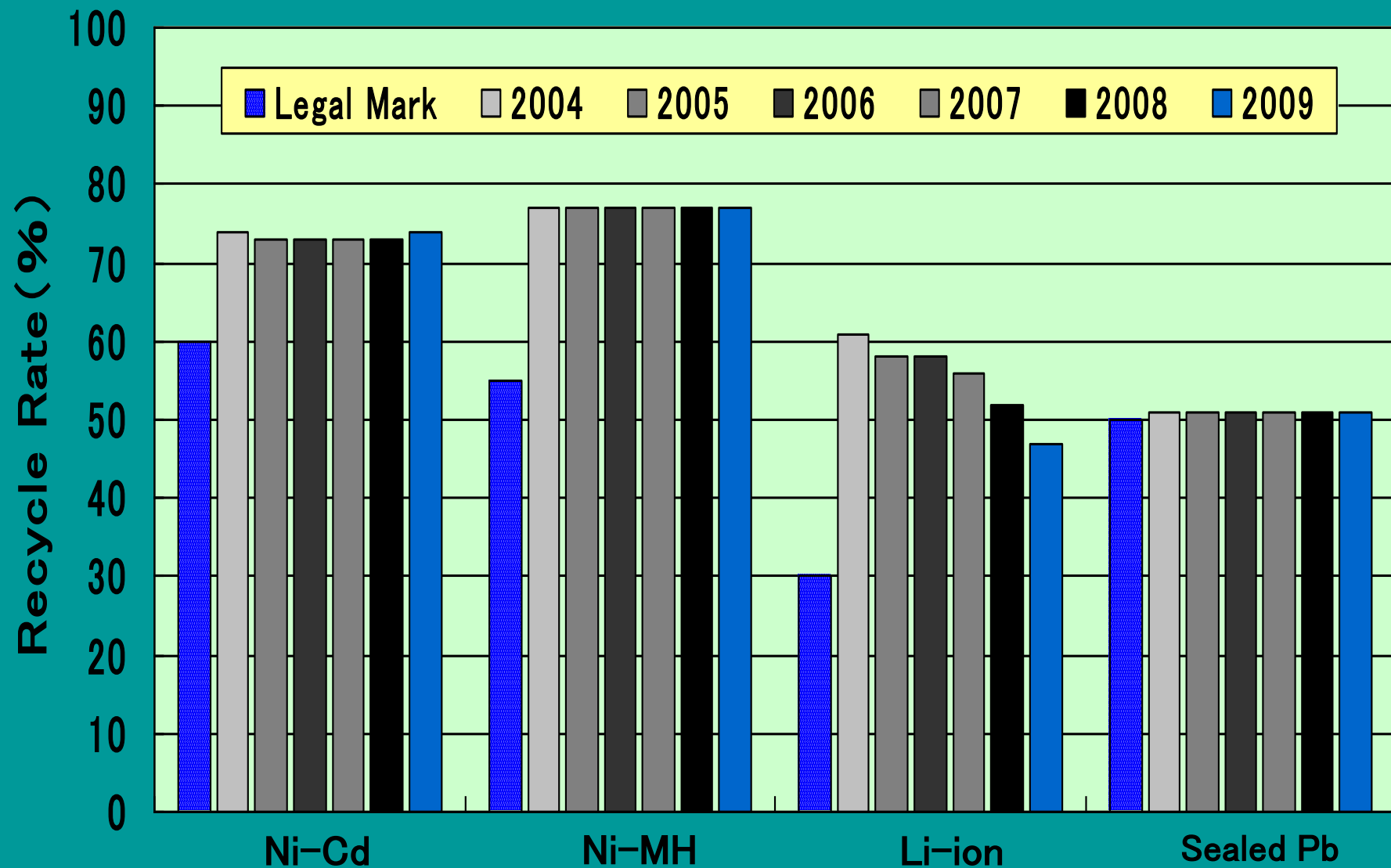


Cadmium Metal Ingot



**Residue including Ni, Fe,
etc.**

Recycle Rate



Safety aspects for collection of spent batteries by JBRC

■ Request from JBRC to keep safety

- *Insulation of lead wire / terminal*
- *Not to disassemble the battery pack*
- *Packing method ~ Limitation of weight per carton (20-25kg, Battery must be fixed in carton) etc.*

■ The way of promotion

- *Send “ Handbook for collection” to all of the collection points (total 30000 points)*
- *Send “Warning statement” to the collection points who release the batteries without any safety treatments*
- *Send the information magazine which explain the safety treatment issues to the collection points twice a year.*

How batteries arrived ?



Investigation of product code (Further Research)



**OUTCOME OF JBRC'S SCHEME FOR
USED LITHIUM-ION BATTERIES
TRANSPORTATION
IN JAPAN**

**NO INCIDENTS
DURING
TRANSPORTATION !!**

Thank you for listening !!

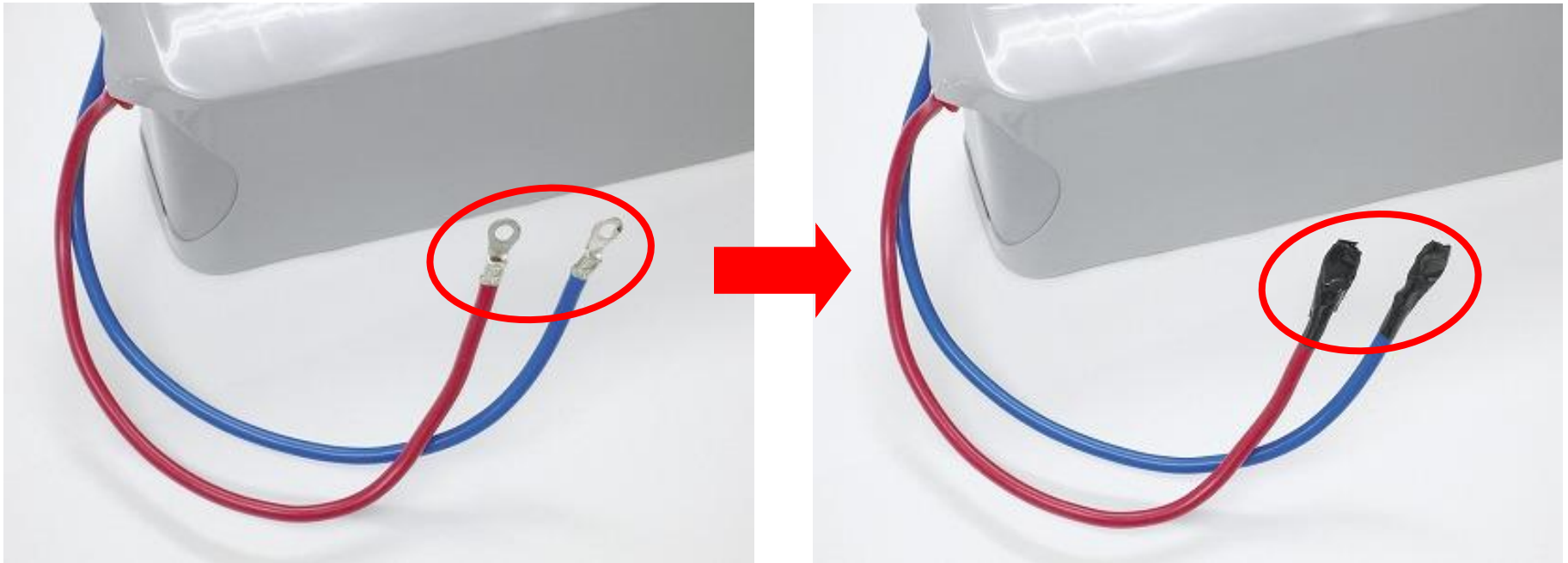
Appendix

How to keep the safety in collection?

Other than Lithium Ion batteries

<Safety treatment>

Insulating coating of positive/negative terminal of lead wire by adhesive tape



Example of safety treatment ~ case 2

<Safety treatment>

1st step

Separate the
Non-fixed
connected cell



Before treatment



2nd step

Insulating coating of
positive/negative
terminal of each cell



After treatment

Example of safety treatment ~ case 3

<Safety treatment >

Pack the connected cells all in one with adhesive tape



<Safety treatment>

Insulating coating of positive/negative terminal of each cell (both top and bottom) of battery pack by adhesive tape



Appendix 2

Markings	Indication of recycling marks to batteries
Removability	Easy removability of batteries from appliances
Collection and Recycling	Collection
	Recycling
	Enlightenment / Information supply
	Corporation with municipalities

- 1. Sealed Ni-Cd batteries**
- 2. Sealed Ni-MH batteries**
- 3. Lithium secondary batteries (Li-ion batteries)**
- 4. Sealed lead acid batteries (not more than 234kC)**
 - only for**
 - Cordless telephone**
 - Handy cleaner**
 - Headphone stereo**
 - Camcorder**

Requirements

- **Manufacturers of portable rechargeable batteries & portable rechargeable battery appliances in Japan**
- **Importers of portable rechargeable batteries & portable rechargeable battery appliances in Japan**
- **Corporate companies and corporate bodies understanding JBRC activities in Japan**

Procedure

- **Application for admission and approval of JBRC board of Directors**

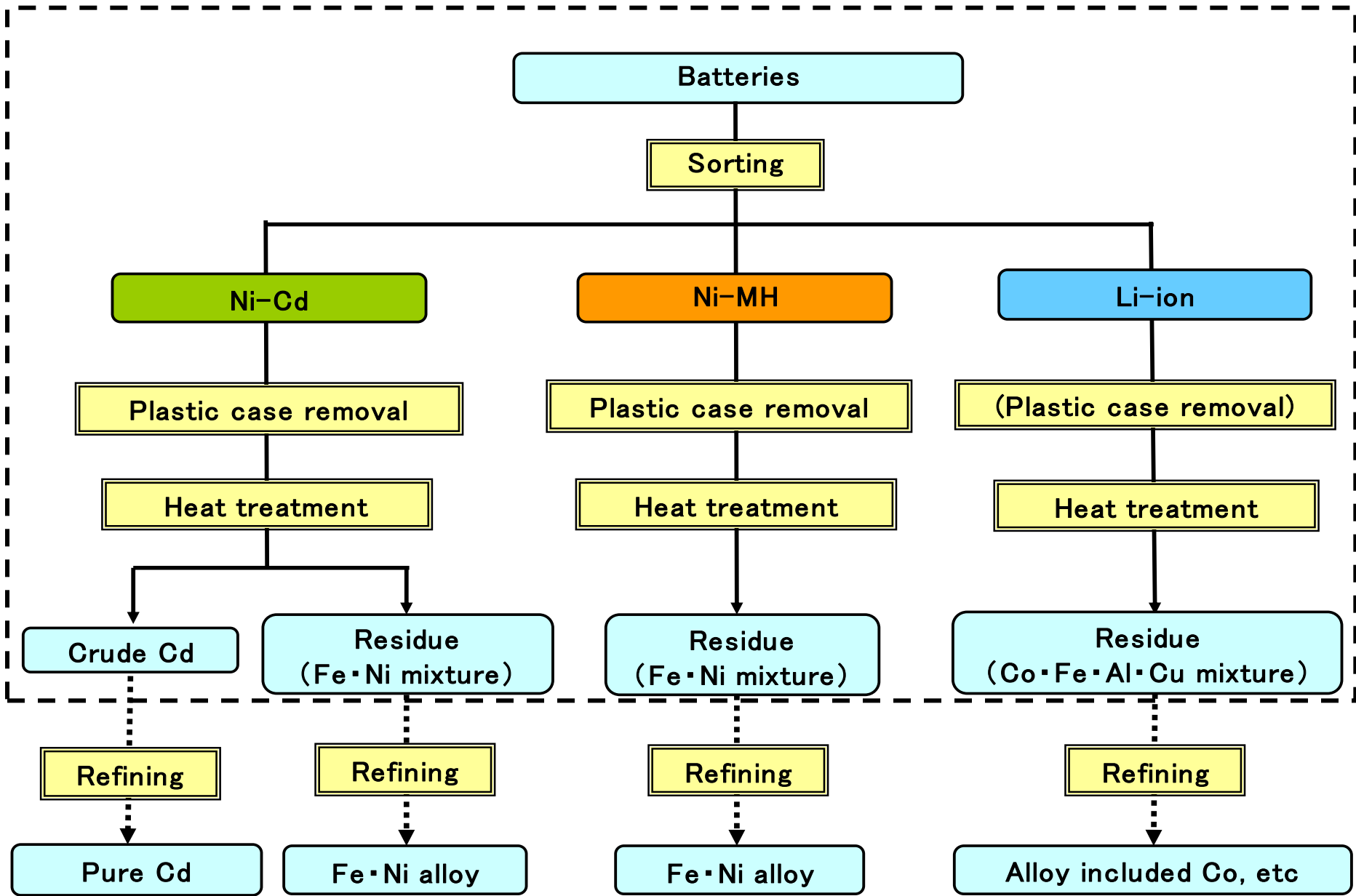
Requirements for Collection

- Method (Collection points, Collection box, etc)
- Disclosure of information for collection promoting
- Official announcement of collection results every year

Requirements for Recycling

- Recycling of rechargeable batteries
- Establishment of target of recycle rate
- Official announcement of recycling results every year

Recycling Treatment Process



$$\frac{\text{Metal contents of recycle substances}}{\text{Battery quantity}} \times 100$$

Main metal components of rechargeable batteries

	Metal component
Ni-Cd	<u>Ni</u> , <u>Fe</u> , <u>Cd</u> , Co
Ni-MH	<u>Ni</u> , <u>Fe</u> , Co, Others
Li-ion	<u>Co</u> , Al, Fe, Cu, Others
Sealed Pb	<u>Pb</u>