CURRENT STATUS OF LEAD-ACID AND LITHIUM BATTERY RECYCLING IN JAPAN

9th International Secondary Lead & Battery Recycling Conference

Kota Kinabalu, Malaysia

IRuniverse

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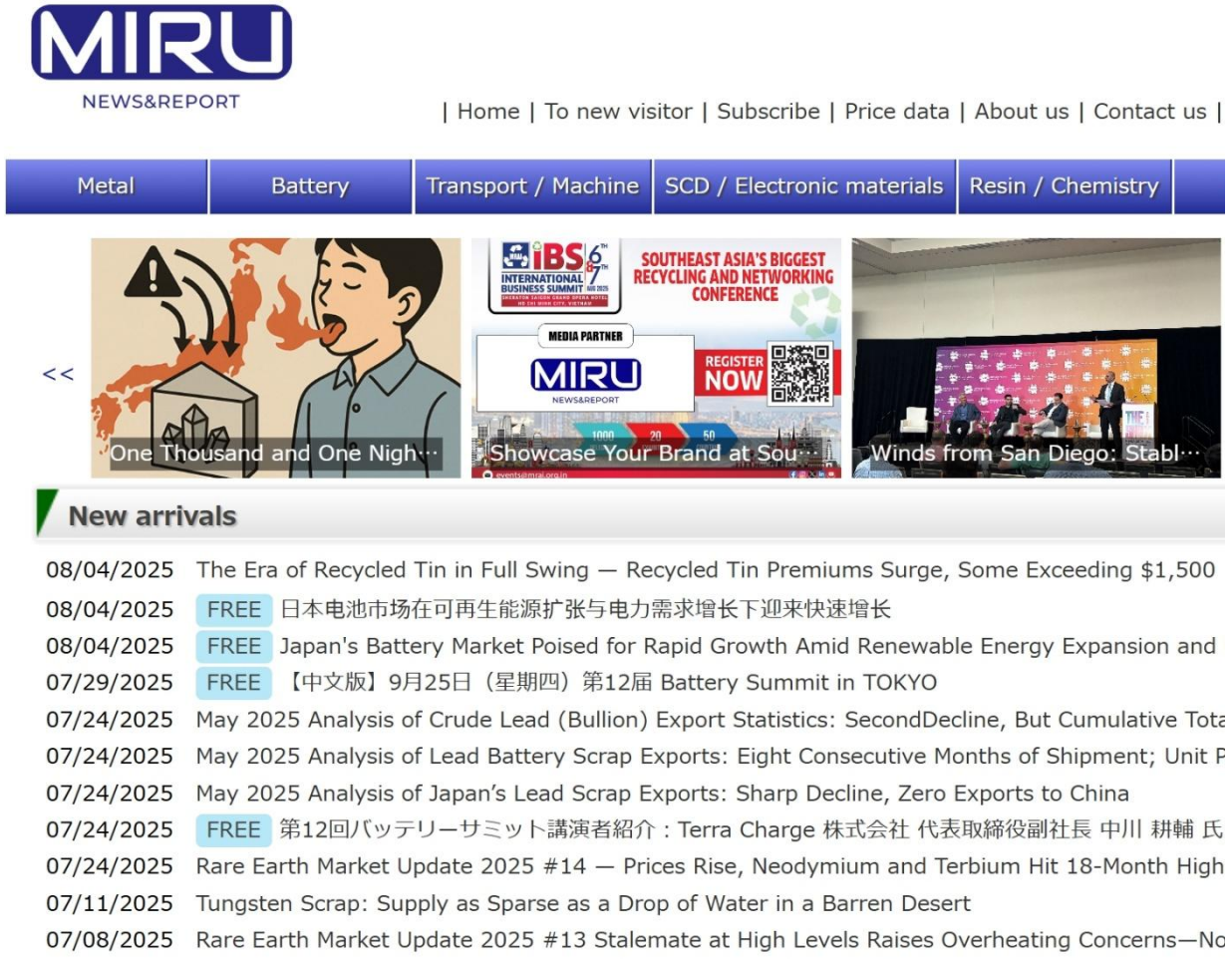
INFORMATION PLATFORM – MIRU.COM

MIRU.com delivers comprehensive coverage across the materials value chain — from upstream metals such as steel, non-ferrous, and rare metals, to downstream sectors including batteries, resins, electronic materials, and secondary raw materials

- Data resources: 300+ price indices, 76,000+ articles
- User base: approx. 10,000 members
- MIRU.com also operates an English edition



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Events

We organize workshops and conferences where industry experts share insights on real-world challenges and opportunities

- Each event attracts 100–150 companies, including government representatives, manufacturers, recyclers, and traders
- Annually hosting 5–7 regular conferences and networking events
- Coverage: steel, non-ferrous, rare metals, EVs, circular economy, and automotive industry

7th Battery Summit

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- Business matching with potential partners
- Market entry and business development support
- Assistance with sales promotion and industry networking

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Market Research

- Market-driven surveys using MIRU’s information network
- Direct interviews with frontline companies
- Journalists collecting multi-dimensional insights
- Local correspondents conducting on-site research
- Cross-industry analysis & joint research with international partners

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LEAD-ACID BATTERY RECYCLING SITUATION

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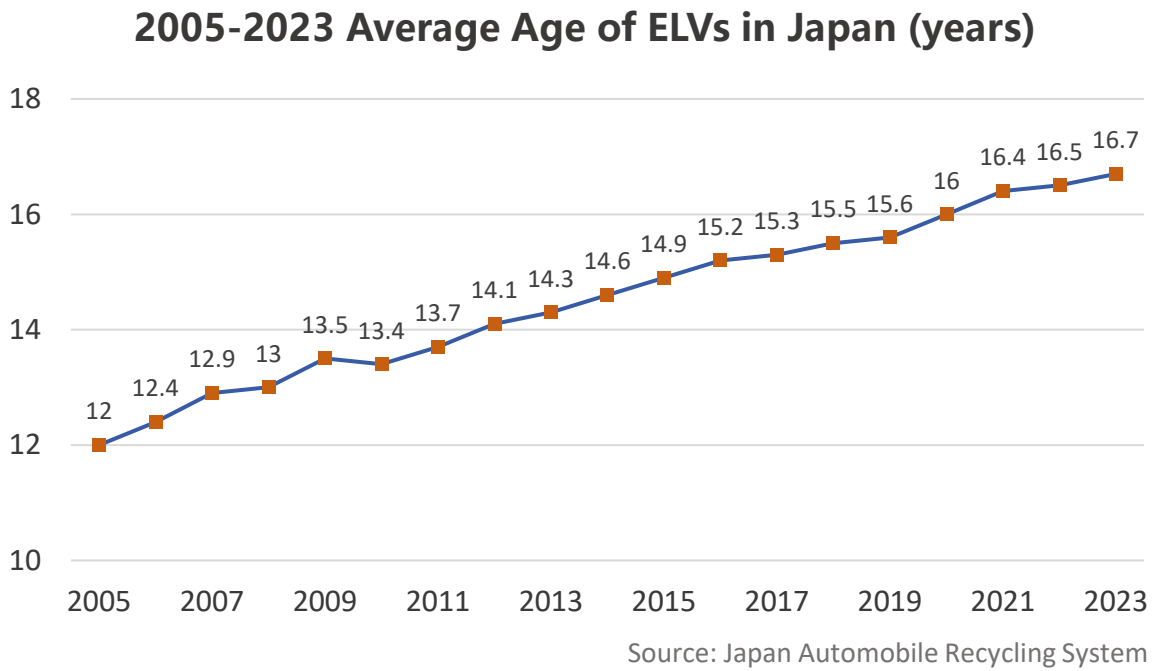
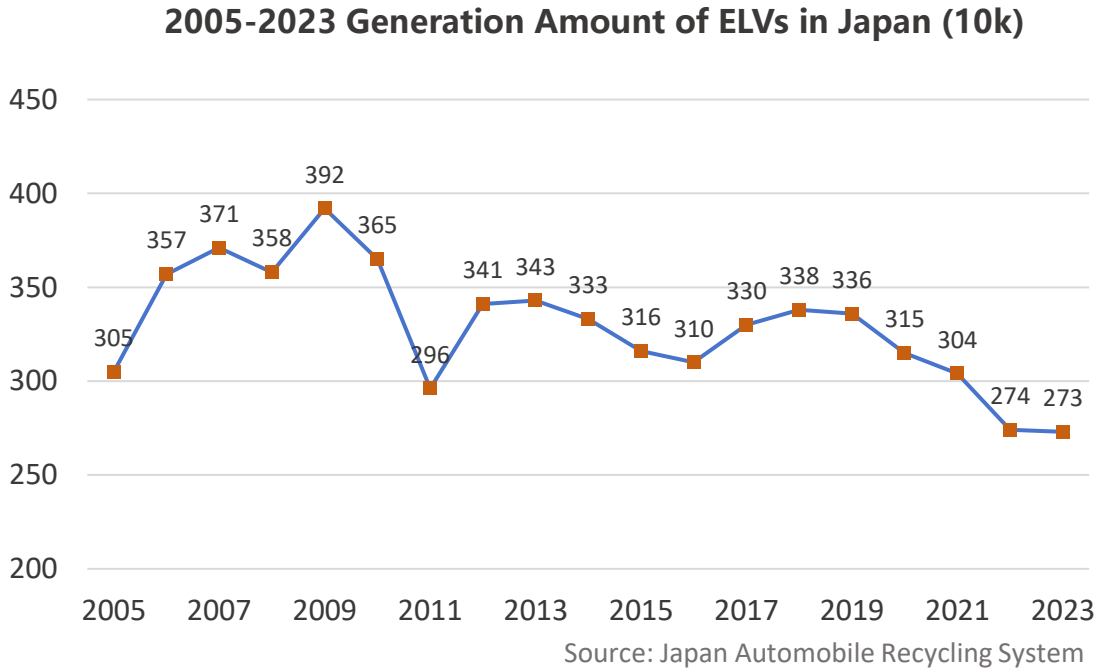
Severe Shortage of Raw Materials

- Decline in ELVs (end-of-life vehicles)
- Rising exports of used cars



Source: Japan Automobile Recycling System



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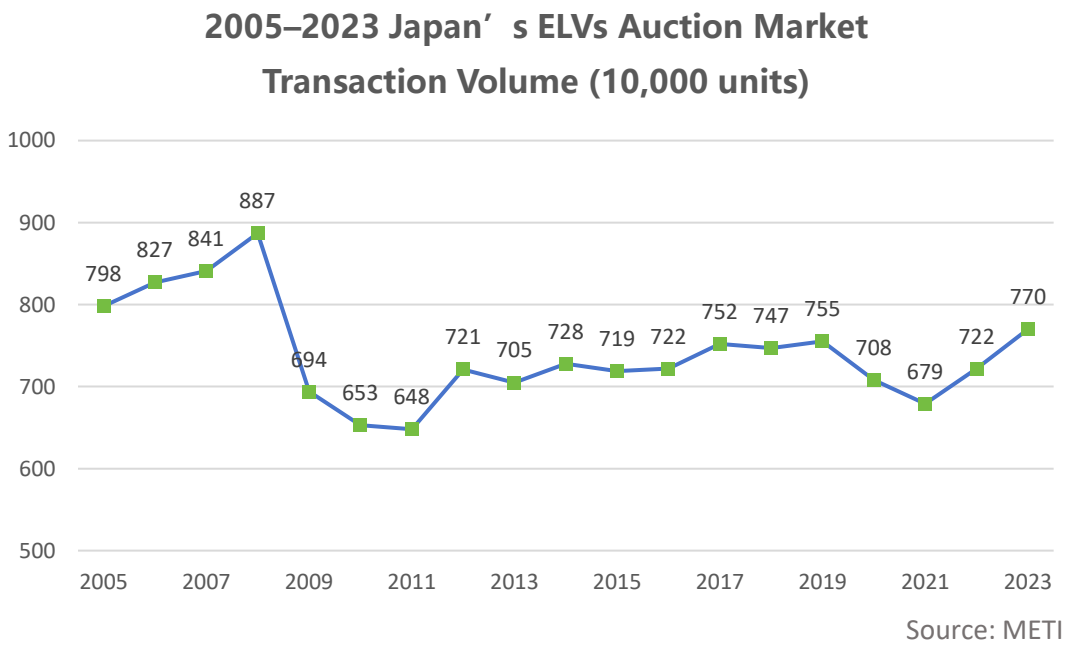
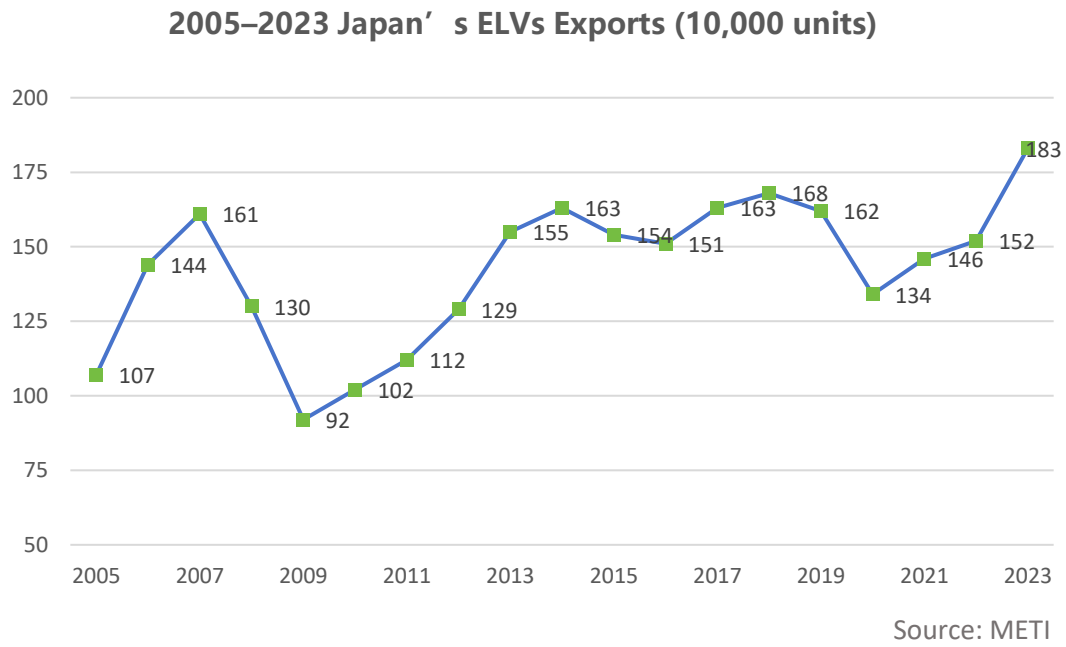


Source: METI



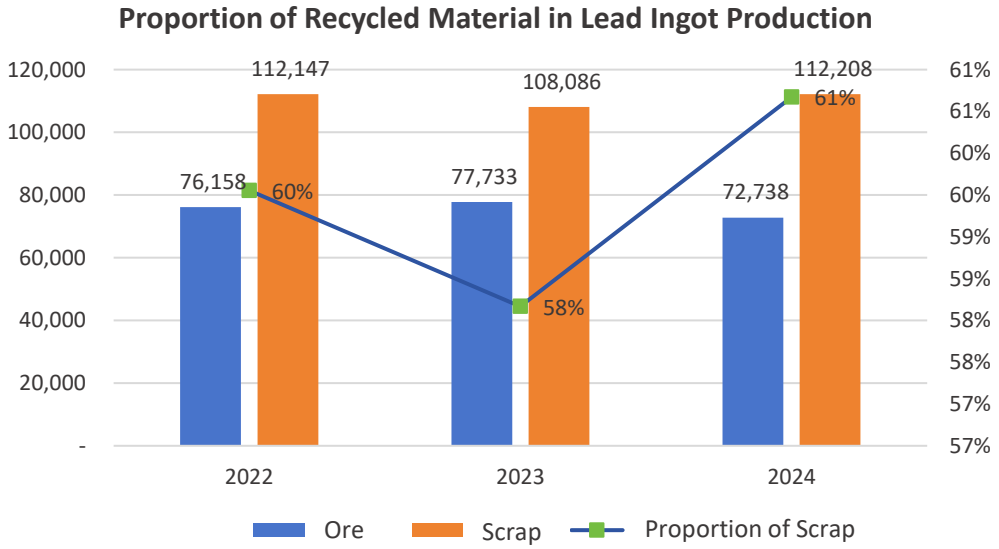
Source: METI

LEAD-ACID BATTERY RECYCLING SITUATION

Growing Dependence on Recycled Materials by Primary Smelters

- Worsening ore conditions
- Higher environmental requirements from automakers
- Domestic refined lead demand in 2024: approx.

  210,000 tons



Based on the data of "Mines" compiled by the Japan Mining Association

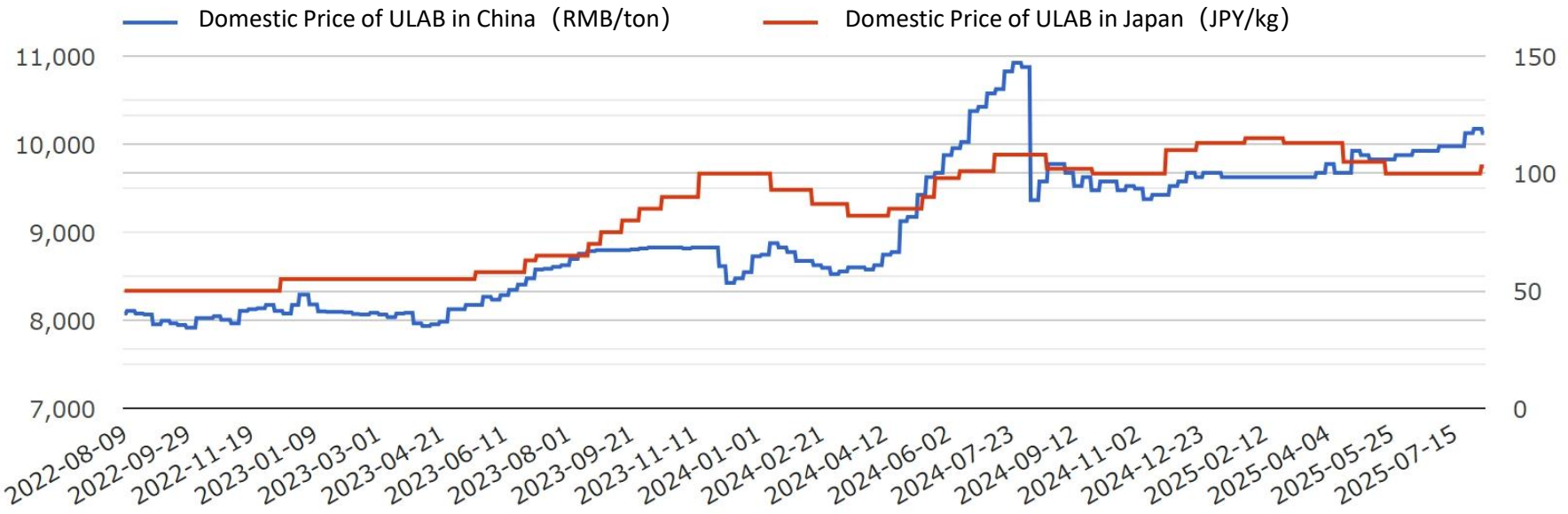
Primary lead smelters	Recycled lead production (ton)
Hosokura Metal Mining (Mitsubishi Materials Group)	25,000
Kamioka Mining & Smelting, Mitsui Kinzoku Takehara Smelter & Refinery (Mitsui Mining &Smelting)	40,000
Toho Zinc	40,000
DOWA and others	10,000
Subtotal	115,000
Secondary lead smelters	**Recycled lead production (ton)**
Daiseki MCR	12,000
PLOMO (Former Ichikawa Refining)	3,000
Kawasho (Accquired by PLOMO in 2017 and went to BRIA.)	1,800
Adachi Metal	3,600
Tomatsu metallurical	9,600
Sum-R-Company (meitoku)	4,200
T・U・Metal	3,600
Nihonkai Seiren	18,000
Kyoto Seirensyo	12,000
Osaka Namari-Suzu Seirensho	18,000
F&A Metals Industry	12,000
Reiwa Kinzoku Kuogyo	12,000
Subtotal	109,800
Total	224,800

Source: IRuniverse

LEAD-ACID BATTERY RECYCLING SITUATION

New Market Entrants

- In the past 3 years, multiple Chinese-owned lead recycling companies entered Japan
  - Lower waste battery prices in Japan compared to China
  - Intense competition and low profit margins in China



Source: MIRU

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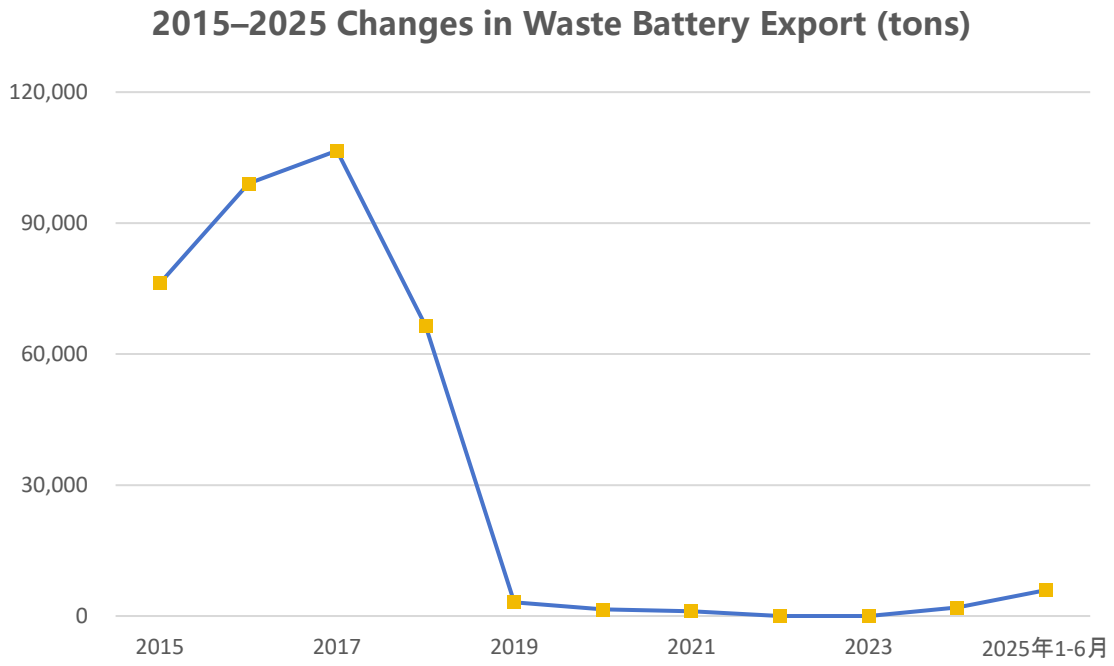
Exports & Policy Changes

October 2024: permits granted for exports of some waste batteries to Korea



Source: Ministry of Finance, Japan

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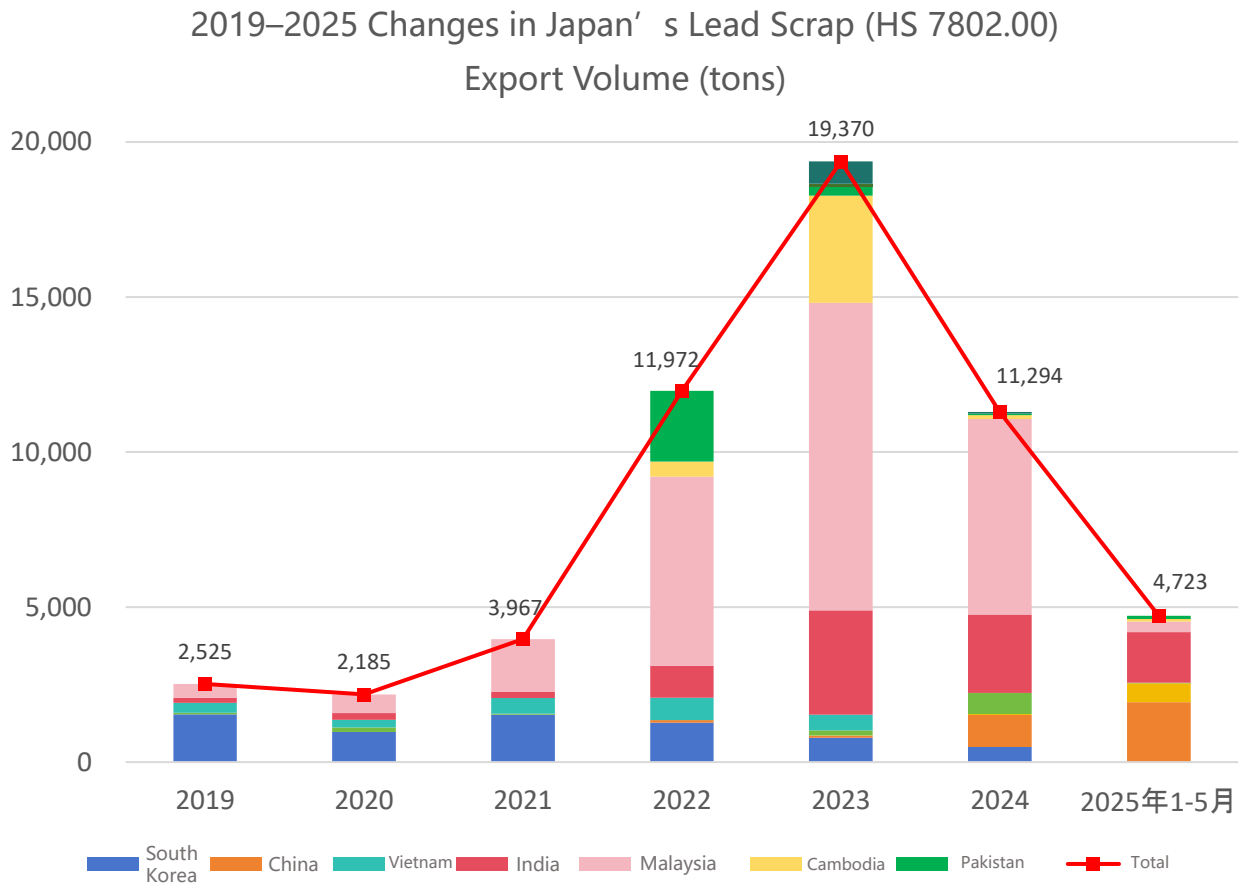
LEAD-ACID BATTERY RECYCLING SITUATION

Exports & Policy Changes

Illegal exports of lead waste reduced (Malaysia tightened controls)

Lead Scrap



Source: Ministry of Finance, Japan

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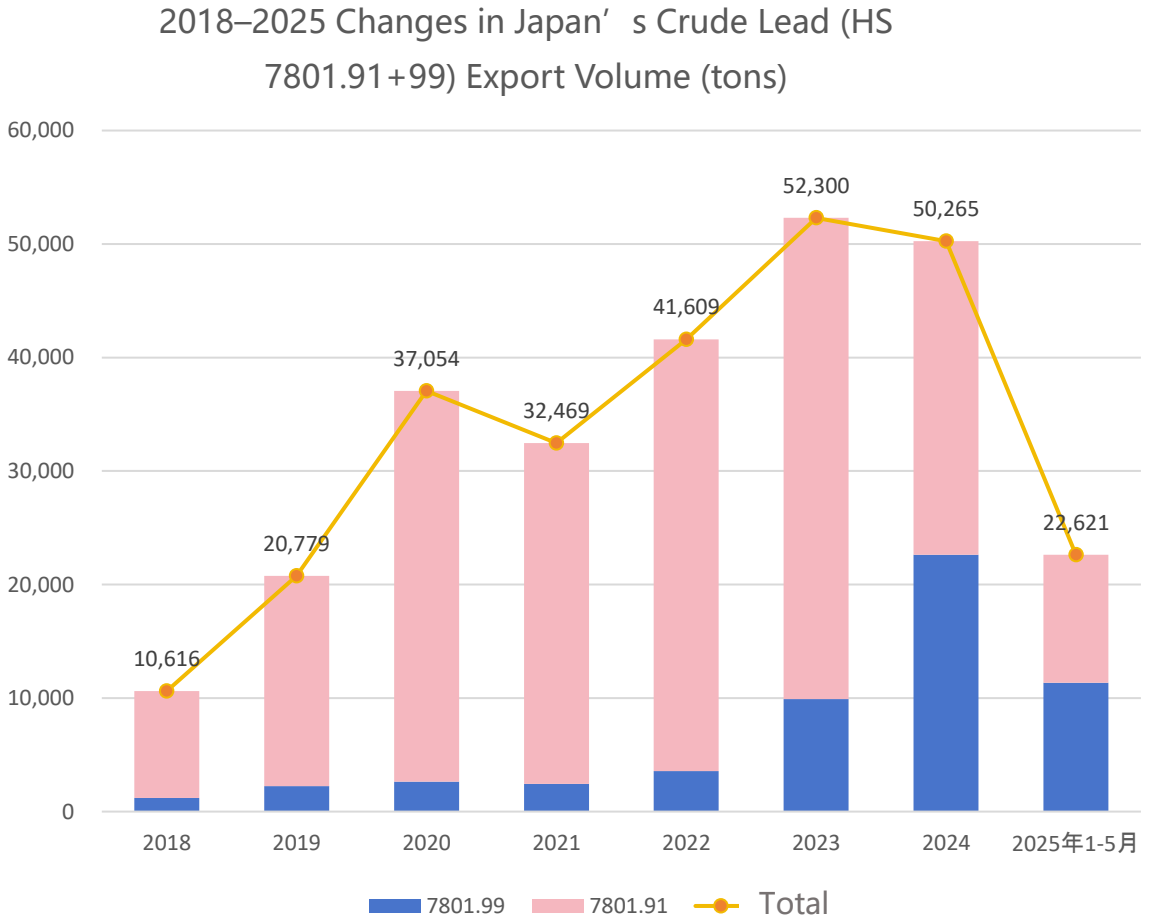
Exports & Policy Changes

- Crude lead exports steadily increasing
- 2024 exports exceeded 50,000 tons

Lead Ingot



Source: Ministry of Finance, Japan

LEAD-ACID BATTERY RECYCLING SITUATION

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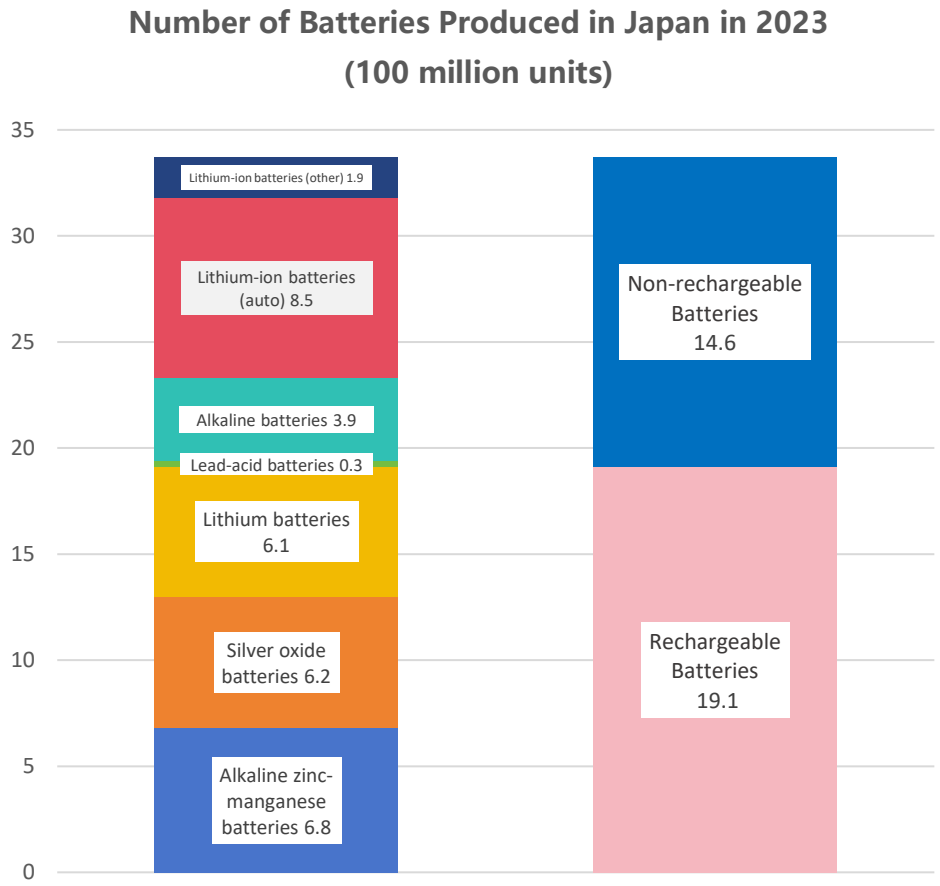
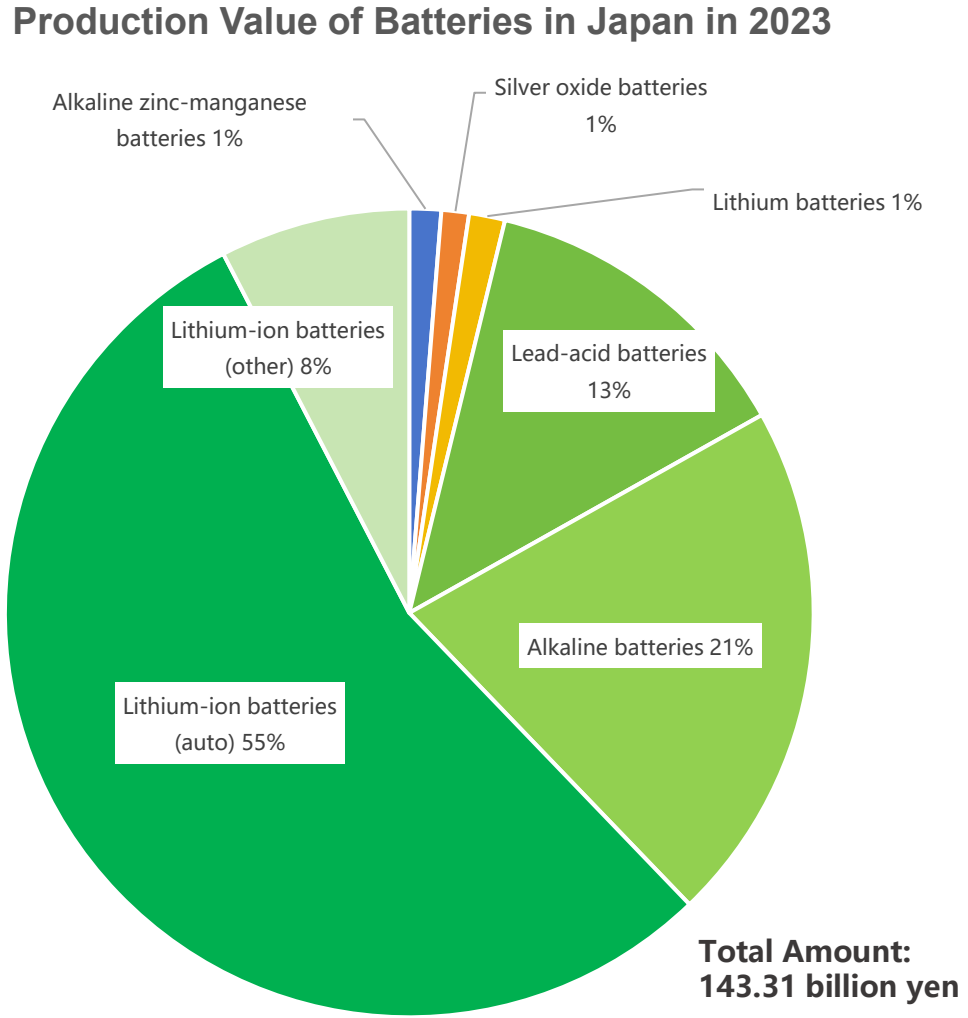
Summary – Lead-Acid Battery Recycling

- Market outlook: Japanese LAB recycling market will **remain tight**
- Domestic waste battery supply continues to decline
- Both primary smelters (Toho Zinc, Mitsui Mining & Smelting, Mitsubishi Materials) and secondary smelters increasingly depend on scrap → intensifying shortages
- Nearly 100% of waste LABs generated in Japan are processed domestically
- Export trend:
  - Korea exports resumed in Oct 2024 after suspension under Basel Convention in 2018
  - Chinese-owned secondary smelters have been active in Japan since 2021, boosting crude lead exports

Lithium-ion battery Recycling Situation

Japanese Battery Market Overview





Source: Battery Industry Association in Japan

Lithium-ion battery Recycling Situation

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Japanese Battery Market Overview

		Export Amount (100 million yen)					
		2020	2021	2022	2023	2024	2020
Non-rechargeable Batteries	Manganese	1	1	0	0	0	0.0
	Alkaline	18	25	32	24	30	1.1
	Silver Oxide	57	94	129	137	167	3.8
	Lithium	169	211	215	212	232	5.1
	Other	33	63	17	3	4	0.0
	Total	278	394	394	377	434	10.0
Rechargeable Batteries	Lead-Acid	110	132	133	128	149	0.0
	Ni-Cd	14	12	9	9	9	0.1
	Ni-Fe	0	0	0	0	0	0.0
	Li-ion	2,647	3,699	4,129	4,311	5,037	7.4
	Ni-MH	944	1,097	1,291	1,463	1,762	1.5
	Other	1,118	1,203	1,526	969	657	1.2
	Total	4,834	6,143	7,088	6,879	7,614	10.2
Total		5,112	6,537	7,482	7,256	8,048	20.2

	Import Amount (100 million yen)				
	2020	2021	2022	2023	2024
Manganese	17	15	16	19	16
Alkaline	140	137	188	171	178
Silver Oxide	1	1	1	1	1
Lithium	61	55	71	72	80
Other	20	14	17	18	32
Total	239	222	293	280	308
Lead-Acid	395	460	524	555	598
Ni-Cd	14	21	21	25	25
Ni-Fe	0	0	0	0	0
Li-ion	1,427	1,860	3,009	4,104	4,020
Ni-MH	46	50	62	52	49
Other	104	151	292	691	686
Total	1,985	2,543	3,907	5,426	5,378
Total	2,224	2,766	4,200	5,706	5,686

Based on Japan Battery Association trade data (imports/exports 2020–2024)

Lithium-ion battery Recycling Situation

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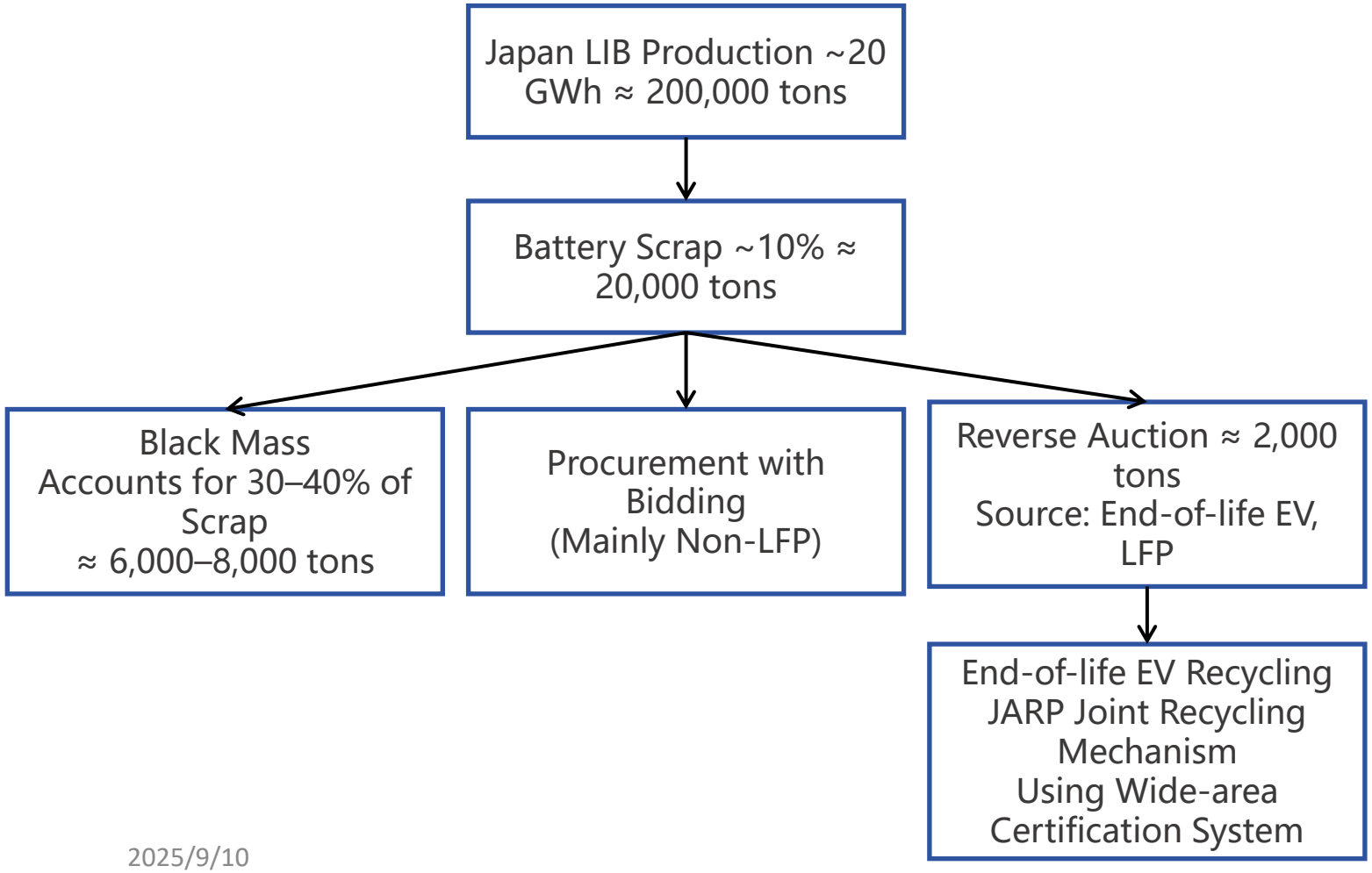
Japan’s LIB Recycling Market Overview



- JX Metals
- DOWA Holdings
- Taiheiyo Cement
- Sumitomo Metal Mining
- Mitsubishi Materials
- Emulsion Flow Technologies
- Envipro Holdings
- VOLTA
- Metal Do
- Fuji Material
- Dainen Materials
- Toyota Tsusho
- Asaka Riken
- Toho Zinc
- TMC
- Honda Motor Co., Ltd.
- Japan Heavy Chemical Industry
- Toyota Chemical Engineering
- Japan Recycling Center
- Advanced Material Japan
- COSMO
- Carbon Fiber Recycling Industry
- Queens Metal

Lithium-ion battery Recycling Situation

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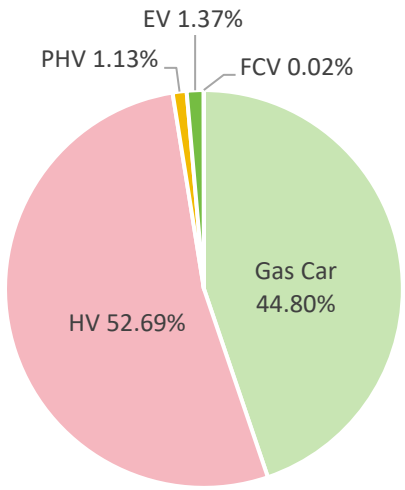
LIB Recycling Still in Early Stage

Progress remains slow due to:

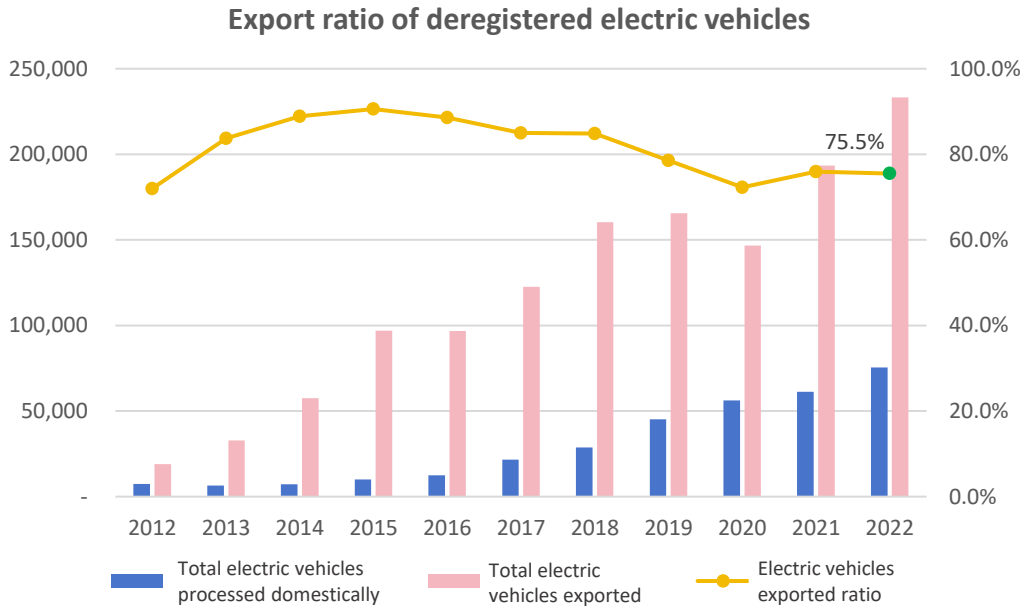
- Low amount of LIB scrap generated
- Japan’ s market dominated by HEVs, while BEV penetration remains low

LIB recycling rate from ELVs in FY2022: approx. **17.4%** (based on Japan Automobile Manufacturers Association data).
Assuming the ratio of lithium-ion batteries (LiB) to nickel-metal hydride batteries (NiMH) is 50%, the calculation is as follows:

- 6,575 ÷ (75,552 × 0.5) = 17.4%



Number and proportion of electric vehicles in Japan’ s passenger car sales from January to June 2025



Japan Automobile Manufacturers Association data

Lithium-ion battery Recycling Situation

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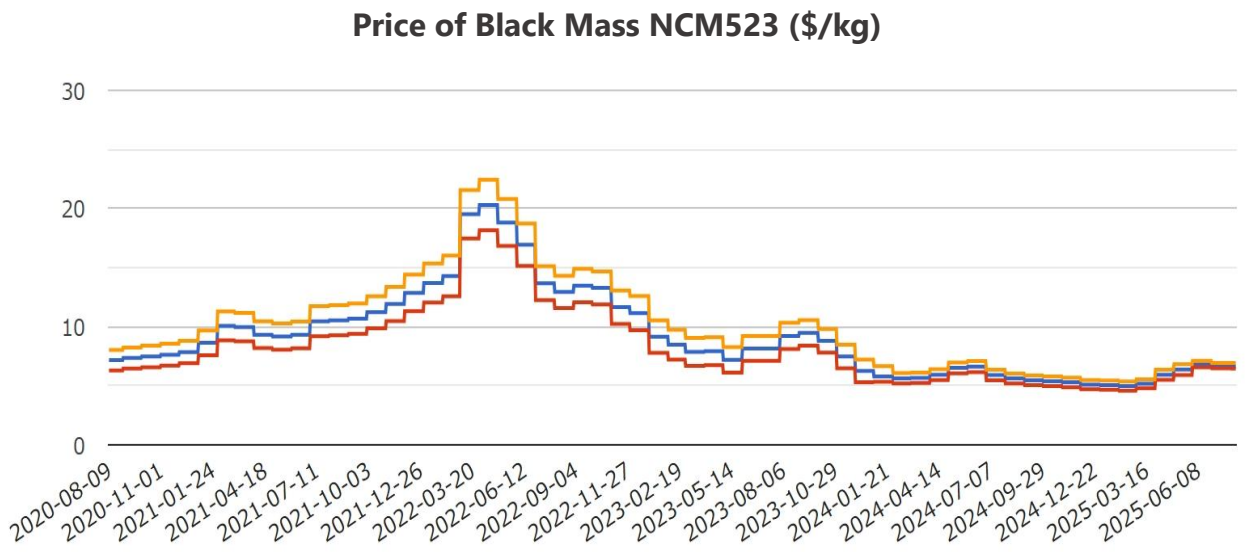
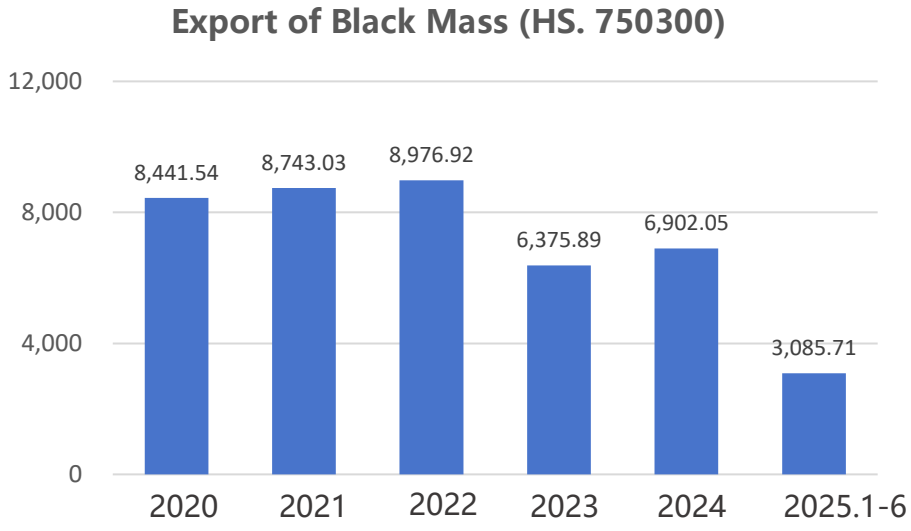
Black Mass Exports

- Most black mass produced by Japanese recyclers is exported (Malaysia, Philippines, Indonesia, Korea)
  - Domestic demand is limited due to lack of local LIB producers using black mass
  - Prices remain low



Source: MIRU



Source: Ministry of Finance of Japan

Lithium-ion battery Recycling Situation

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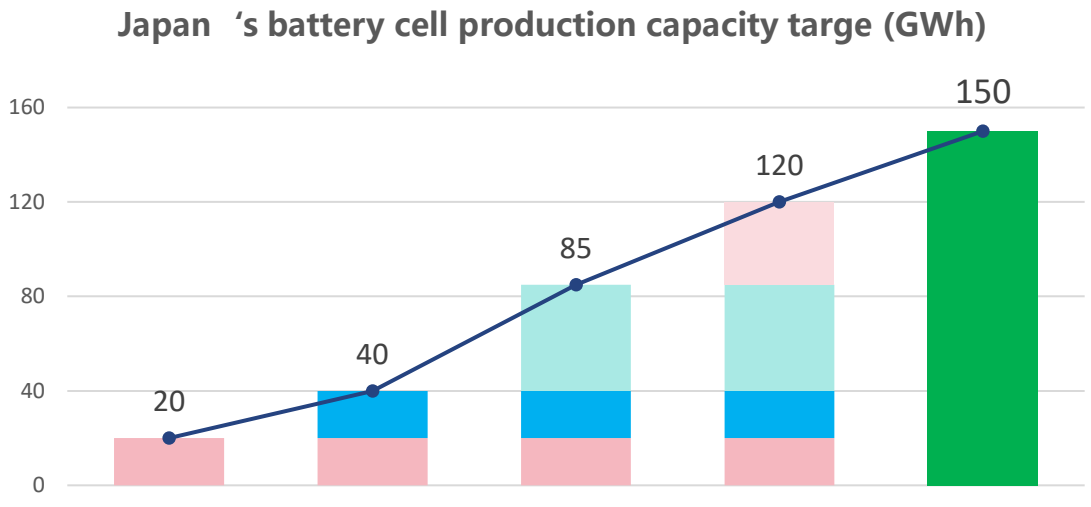
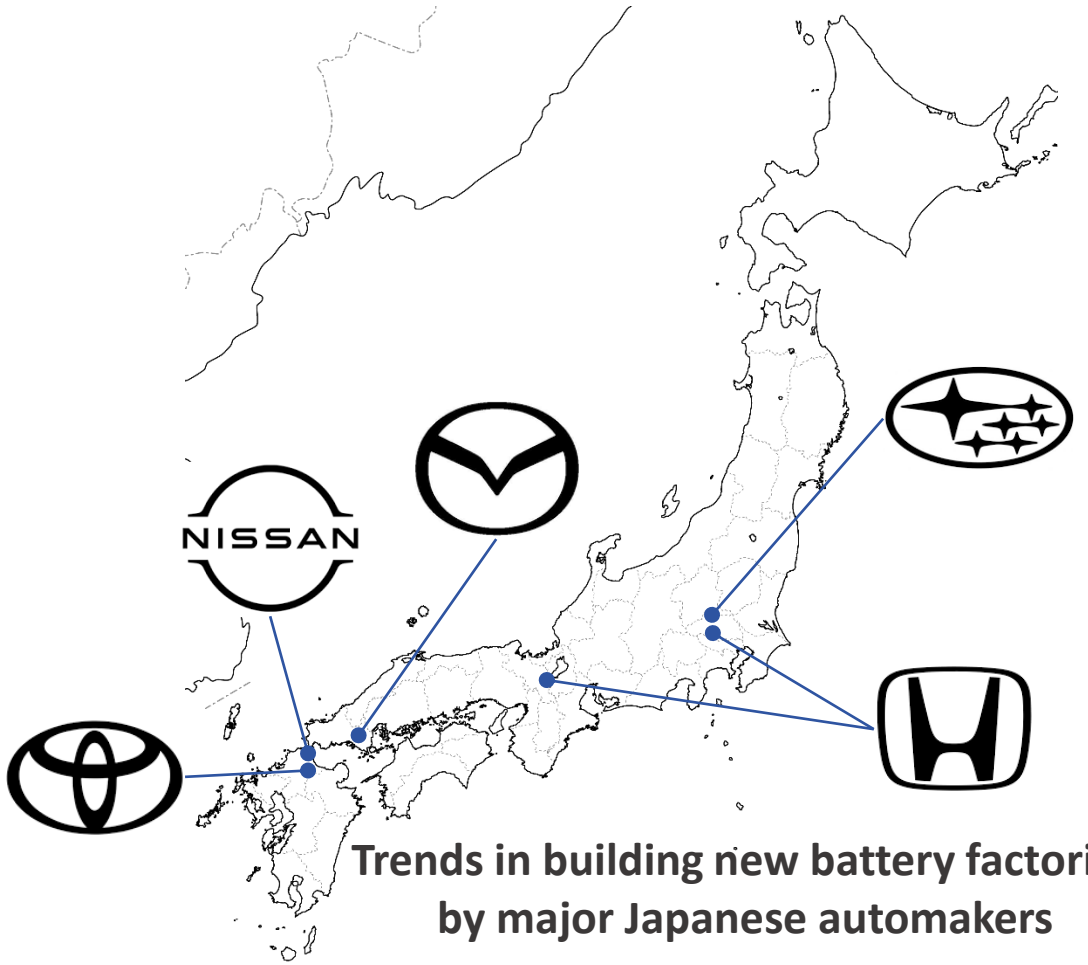
LIB Capacity Targets vs. Delays

Government target: 150 GWh/year capacity by 2030

- Reality: many projects delayed (e.g., Honda & GS Yuasa Shiga plant delayed by 3 years)
- Japan remains focused on NCM cathodes, while global trend shifts rapidly toward LFP (Korean firms also shifting)



Source: METI of Japan



Trends in building new battery factories by major Japanese automakers

Source: Nikkan Shimbun

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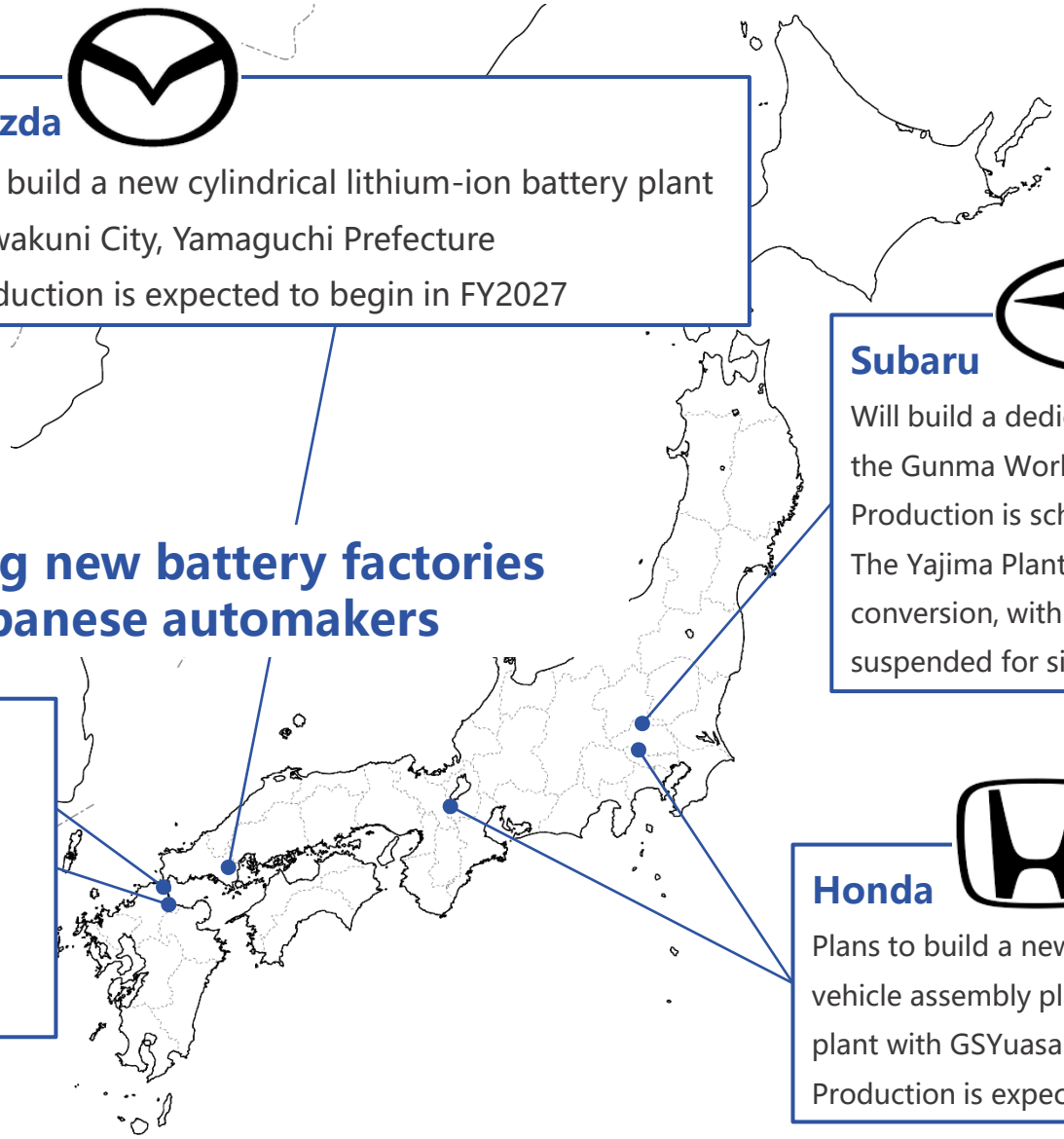
Source: Nikkan Shimbun

Trends in building new battery factories by major Japanese automakers



Nissan

Will build a new battery plant in Kitakyushu City, Fukuoka Prefecture
Construction will begin in FY2025, with production expected to begin in FY2028

Mazda

Will build a new cylindrical lithium-ion battery plant in Iwakuni City, Yamaguchi Prefecture
Production is expected to begin in FY2027

Subaru

Will build a dedicated EV plant within the Oizumi Plant at the Gunma Works
Production is scheduled to begin after 2027
The Yajima Plant will undergo a mixed-line EV production conversion, with one production line expected to be suspended for six months starting in August 2025

Toyota

Toyota Battery, will build a new next-generation battery plant for EVs in Fukuoka Prefecture
Production is scheduled to begin in 2028
The "Settlement Agreement Signing Ceremony" originally scheduled for April has been postponed

Honda

Plans to build a new battery plant at the former Sayama vehicle assembly plant and will jointly build a battery plant with GSYuasa in Moriyama City, Shiga Prefecture
Production is expected to begin in 2027

Lithium-ion battery Recycling Situation

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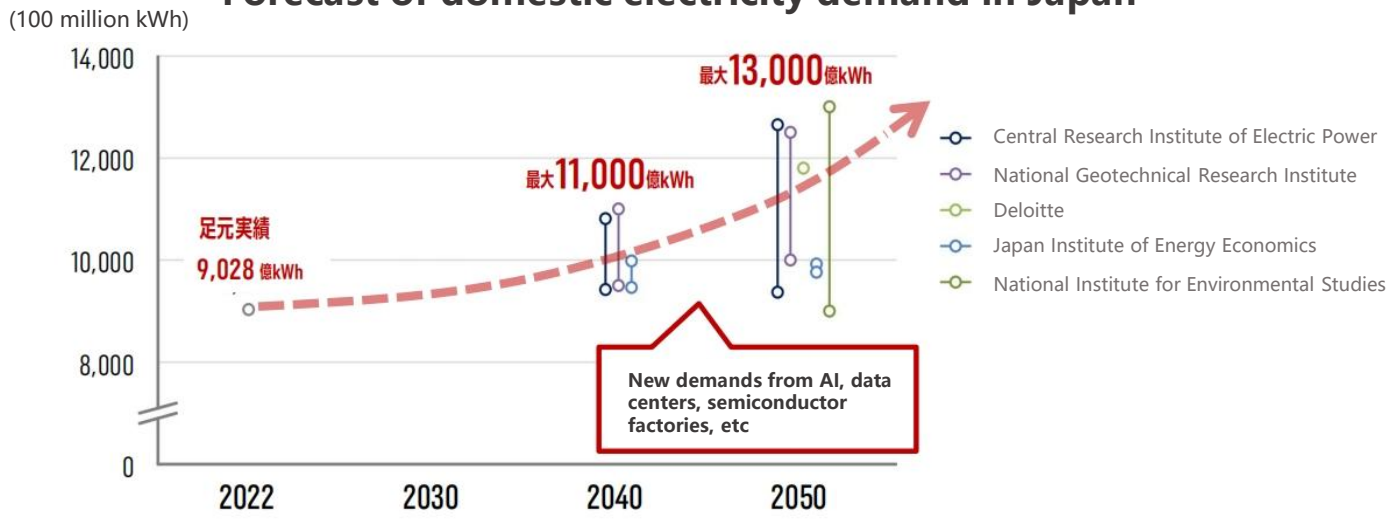
BESS (Battery Energy Storage System) Market

- Japan’ s renewable energy BESS market is expanding rapidly
  - Dominated by LFP batteries
  - Japan has little LFP domestic production; almost entirely reliant on imports (mainly from China)
  - Strengthening domestic control over BESS is vital for national security

Forecast of domestic electricity demand in Japan



Source：Power X

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Conclusion – Lithium Battery Recycling

- Japan’ s LIB recycling industry is still in its infancy
- LFP batteries will be the key determinant for the future
- Without a fast build-up of LFP recycling and processing systems, Japan’ s battery industry risks structural challenges

Thank you!

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2025 12TH

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Battery Summit

September 25-26
Tokyo, Japan

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