

# Today and Tomorrow of Secondary Lead Manufacturing in Japan

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Chairperson of the Board  
Japan Secondary Lead Association

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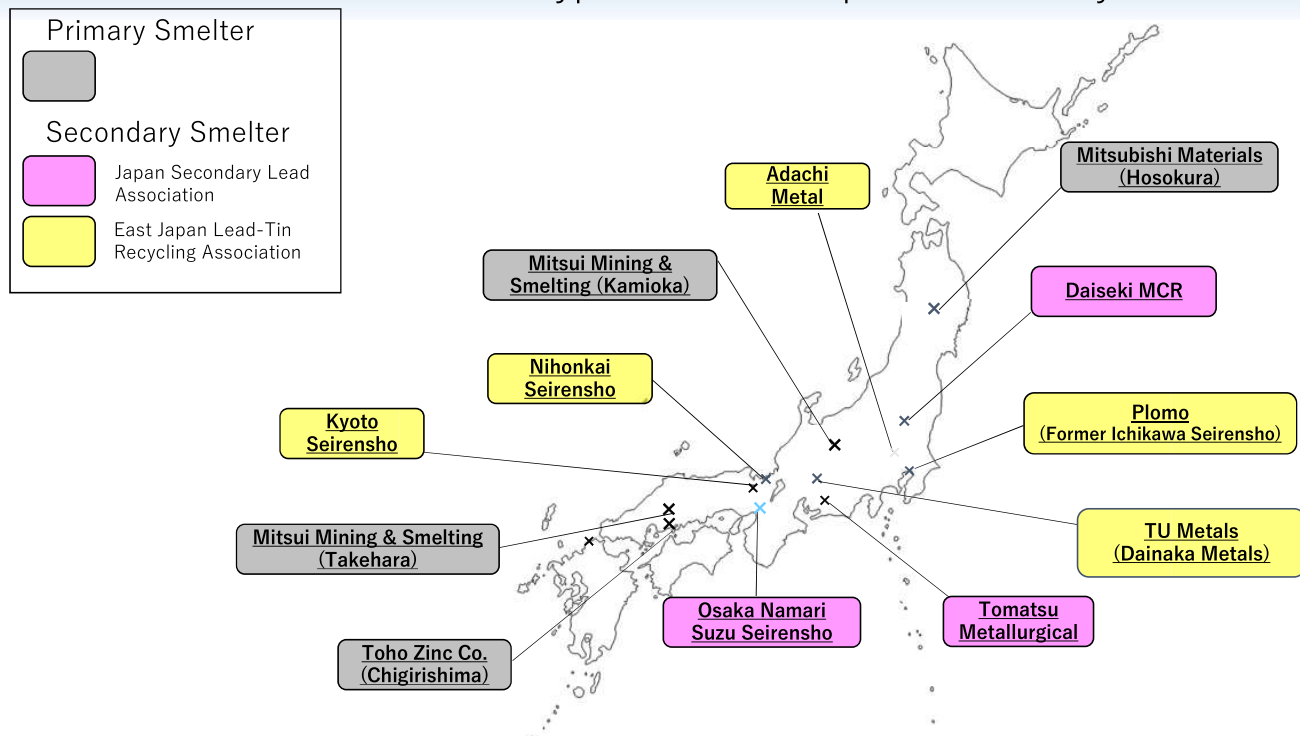
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President & Chief Executive Officer  
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2023 ILZSG Lisbon

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## Lead Smelting in Japan in 2023 Furnace types: Blast & Cupola >> Rotary



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## Historically, number of secondary smelters have decreased due to environmental requirements / decrease in domestic Pb demand

Association Name	Established (Year)	Number of Corporation in	
		Year 1992	Year 2023
Japan Secondary Lead Association	1951	8	3
East Japan Lead-Tin Recycling Association	1971	16	5
West Japan Lead-Tin Recycling Association	1971	13	0
<b>TOTAL</b>		37	8

- In addition to these 3 associations, there are 2 other lead-related associations in Japan
  - Lead Solder Association
  - Lead Pipes and Sheets Association

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## Environmental regulations as compared to EU

Environmental Regulation Exhaust Gas		
Material	Japan (Osaka)	Europe (BAT)
SO <sub>2</sub>	≤ 65 ppm	50~350 mg/Nm <sup>3</sup> (18~126 ppm)
NO <sub>2</sub>	≤ 180 ppm	NA
Pb	≤ 3 mg/Nm <sup>3</sup> (K-value equiv)	≤ 1 mg/Nm <sup>3</sup>
Dust	≤ 0.1 g/Nm <sup>3</sup>	≤ 0.005 g/Nm <sup>3</sup>
Hg	400 μg/Nm <sup>3</sup>	NA

BAT: Best Available Technique

Ref: Official Journal of the Europe Union L 174/32 2016  
 "COMMISSION IMPLEMENTING DECISION (EU) 2016/1032 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the non-ferrous metals industries"

Environmental Regulation Wastewater to city sewage		
Material	Japan (Osaka)	Europe (BAT)
Pb	≤ 0.1 mg/L	≤ 0.5 mg/L
As	≤ 0.1 mg/L	≤ 0.1 mg/L

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## Ties to Battery Companies demonstrate the Fire Refining Quality of Japanese Secondary Lead Smelters

**Energy With Co.**  
(Former Hitachi)

**GS Yuasa Co.**

(Former GS, Yuasa)

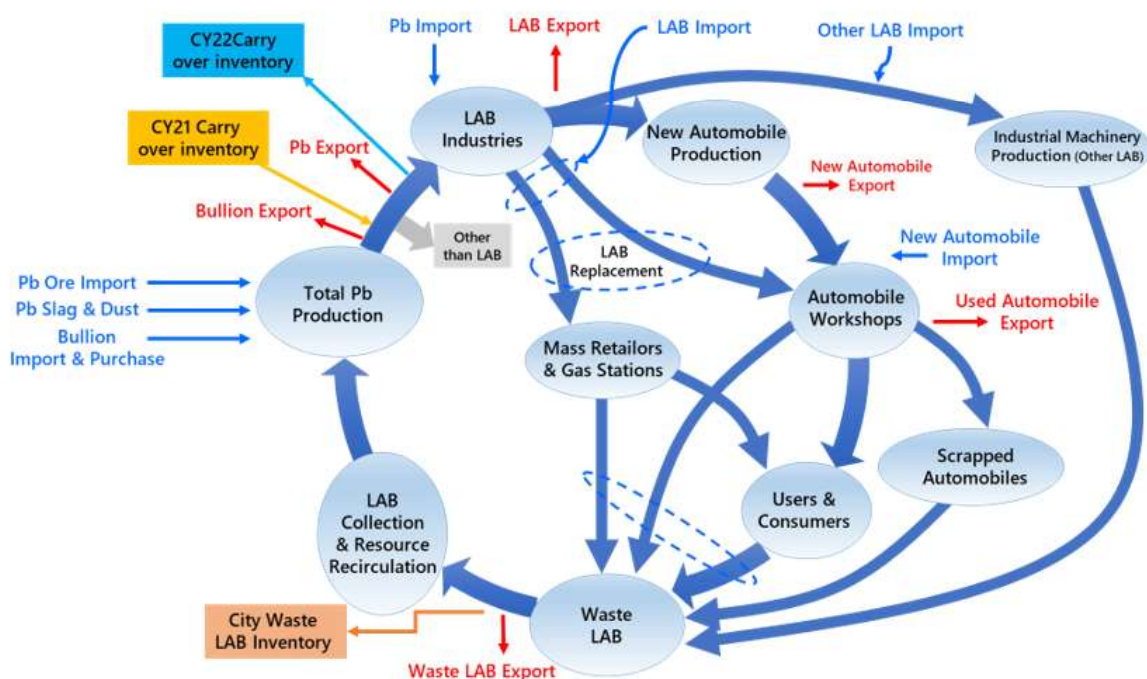
**GY Energy Co.**

(Former Panasonic)

**Furukawa  
BT Co.**

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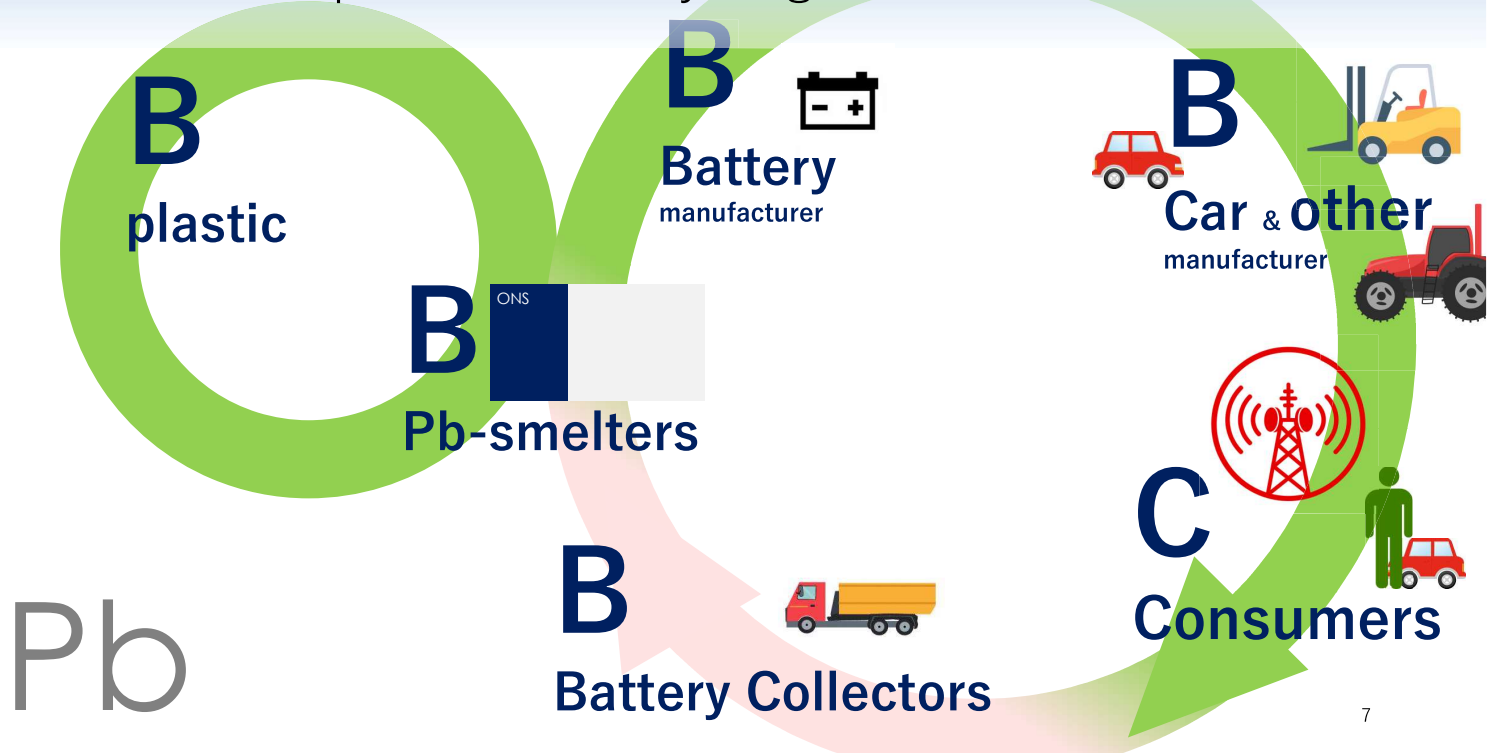
## Japan Domestic Pb Circulation is well-balanced



CY2022

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The weak-point of Pb-recycling is in the uLAB collection

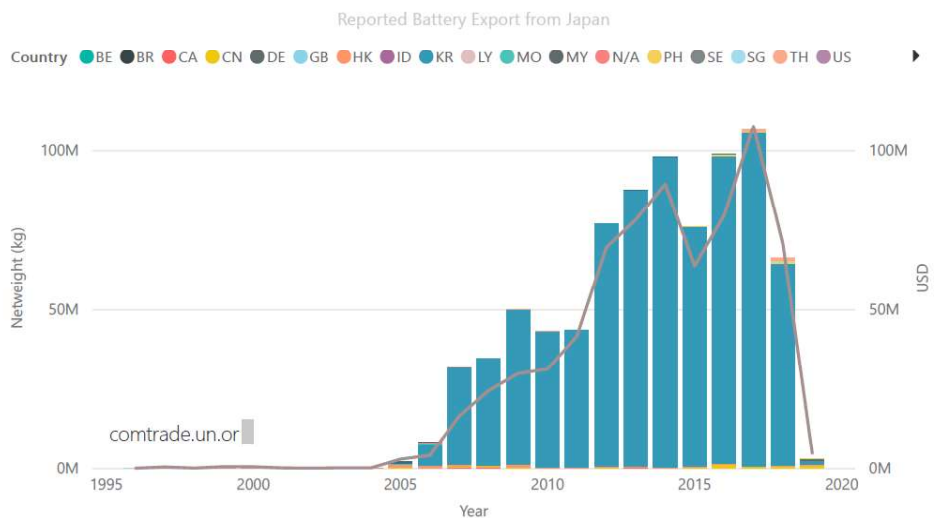


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## Threats to Domestic Lead Material Balance in recent years

Major lead manufacturing countries seek lead scrap sources in Japan

- Waste lead-acid battery export stopped since 2019
- Application for export of lead-acid battery scrap to Ministry of Environment continues
- Increase in application for secondary lead smelting factories (4 new cases in 2023) intended for export



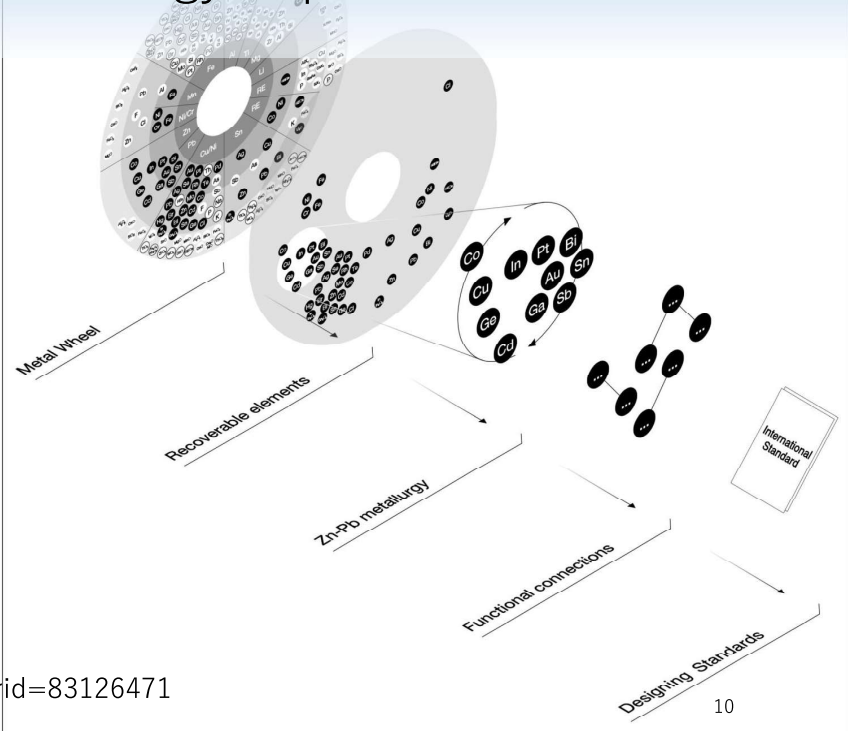
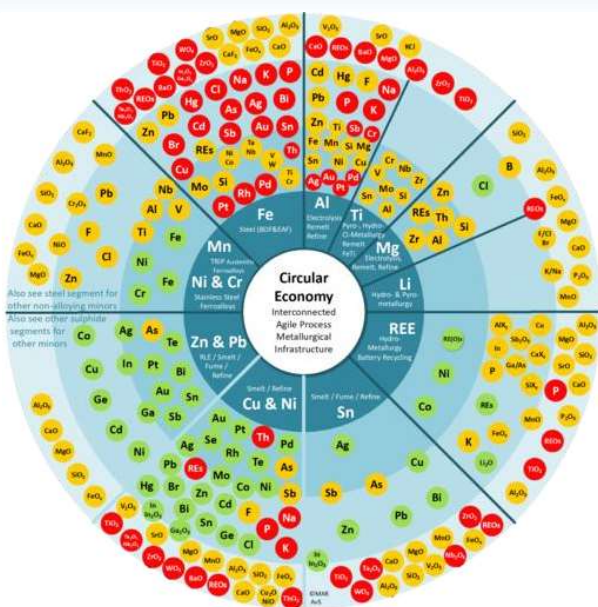
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# Characteristics of Secondary Lead Smelting in JP

- Pb Production follows environmental regulations comparable to global standards
- 99.995% Pb can be produced by pyrometallurgical refining by secondary lead smelters
- Nation-wide Pb recycling is well-developed
- Domestic Pb Material Balance is well-balanced
  - 93% of domestic lead is consumed by lead-acid battery manufacturing
  - Secondary lead manufacturers depend > 90% on used lead-acid battery (uLAB) scrap

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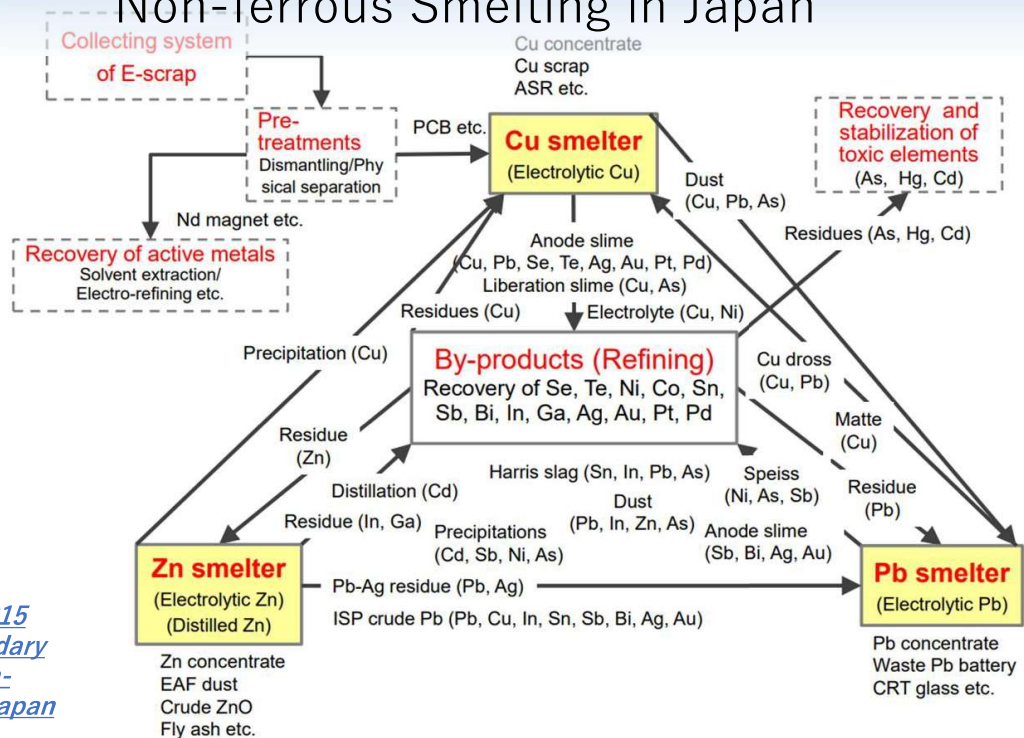
## Sustainable Metallurgy requires Pb



<https://commons.wikimedia.org/w/index.php?curid=83126471>  
<https://www.mdpi.com/2079-9276/10/1/5>

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# Domestic Material Balance in Pb is necessary to operate Non-ferrous Smelting in Japan



*Ref. Shibata et. al 2015  
Treatments of Secondary  
Raw Materials in Non-  
Ferrous Smelters in Japan*

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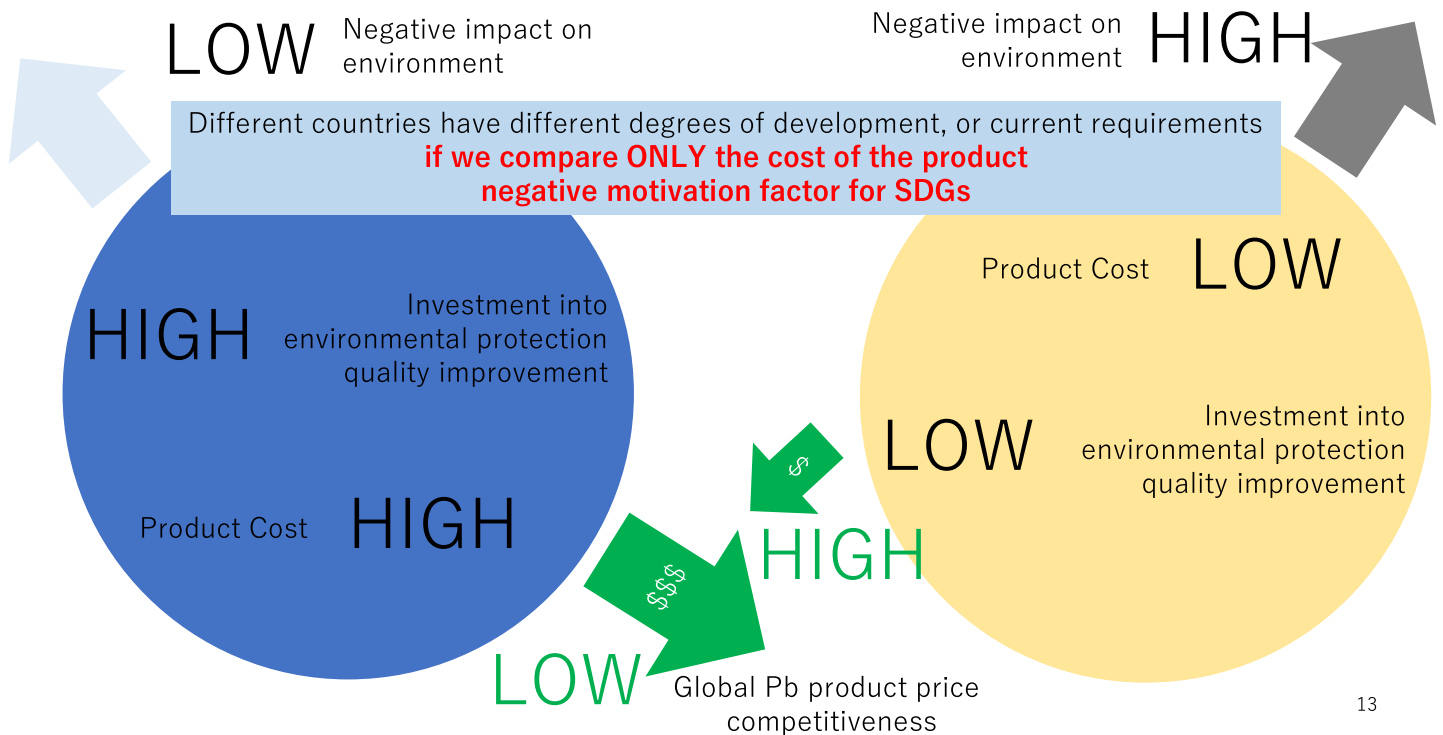
## Future Challenges in Domestic Lead Smelting

- Systematize waste lead-acid battery and lead scrap collection towards a better circular economy
- Develop the most effective smelting and refining process to meet SDGs requirements
  - Develop alternate or intermediate business value measurements other than monetary measurements like cost/profit for SDGs, for example
    - Water usage: supplied water / sewage ratio
    - Heat recycling
    - Fossil resources usage: energy interpretation of fuel per metric ton of product.
    - Climate Change Greenhouse gases not limited to Carbon Neutrality, per metric ton of product
- Entire life cycle of Pb manufacturing should be assessed
  - Supply Chain Scope 1~3
  - Various smelting and refining methods

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## Lead Smelting viewed from an international perspective



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AS THE EARTH IS CONNECTED, we share the same waters and the same atmosphere –



if we compete ONLY by price, this is  
**BAD FOR OUR EARTH**

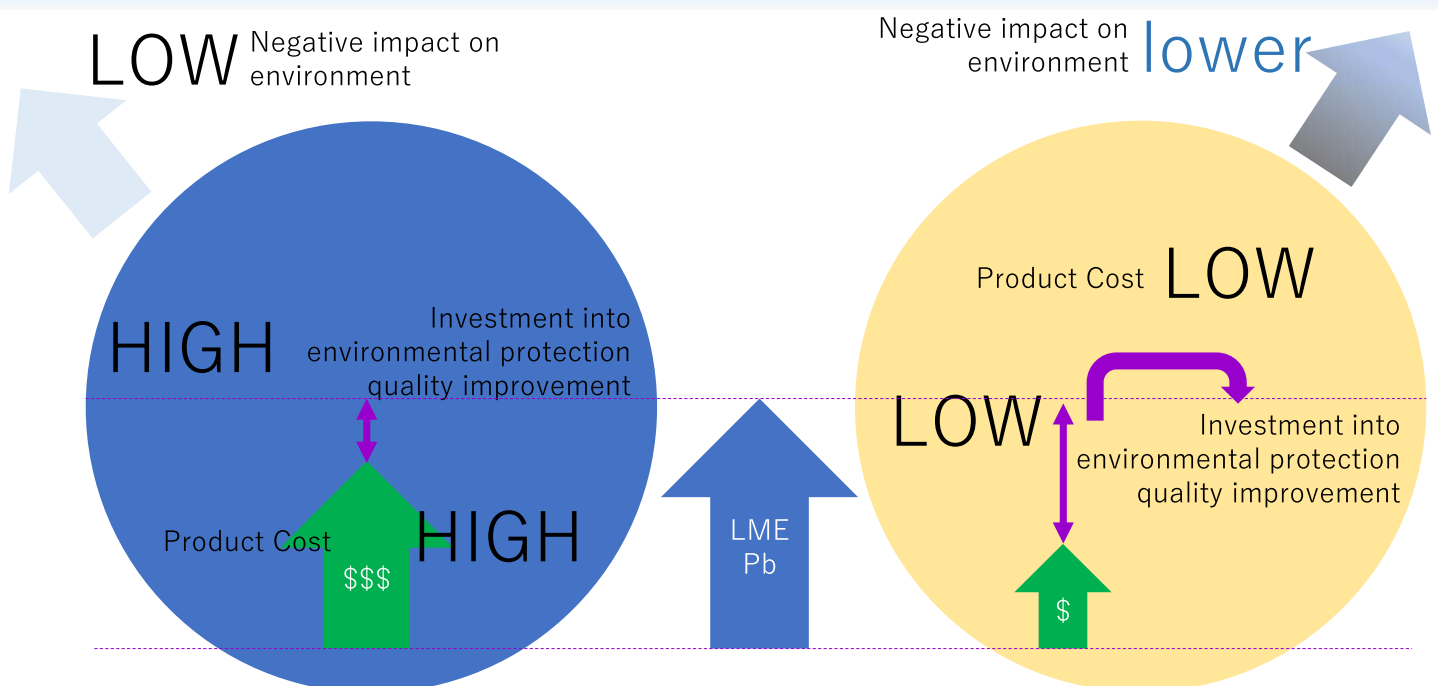
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# Future Challenges in ~~Domestic~~ Global Lead Smelting

- Systematize waste lead-acid battery and lead scrap collection towards a better circular economy
- Develop the most effective smelting and refining process to meet **LOCAL** SDGs requirements
  - Develop alternate or intermediate **GLOBAL** business value measurements other than monetary measurements like cost/profit for SDGs, for example
    - Water usage: supplied water / sewage ratio
    - Heat recycling
    - Fossil resources usage: energy interpretation of fuel per metric ton of product.
    - Climate Change Greenhouse gases not limited to Carbon Neutrality, evaluated by CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub> etc. per metric ton of product
- Entire **GLOBAL** life cycle of Pb manufacturing should be assessed
  - Supply Chain Scope 1~3
  - Various smelting and refining methods

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## SDGs optimization START LOCAL! → gLOCAL



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let us leave a healthier earth for our children and our grandchildren



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## Personal Dream Goals

- Model Clean Lead Manufacturing Factory
  - Automated
  - Gender free
- Japan as a center of competence :
  - Industrial complex for all non-ferrous metal recycling by optimizing primary and secondary Pb and other nonferrous metal manufacturers

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*Thank you*