



23rd International Lead Conference

**Developments in Chinese Environmental
Legislation Impacting Lead Value Chains**

Jianbin Meng

Director of Economics and Environment

International Lead and Zinc Study Group (ILZSG)

ILZSG Overview

- Intergovernmental organization set up within the UN system
- Significant level of industry representation
- Established by UN in 1959 in New York
- Moved to London in 1977
- From start of 2006 ILZSG, ICSG & INSG co-located in Lisbon, Portugal



www.icsg.org



ILZSG



www.insg.org

ILZSG Overview – ILZSG Membership

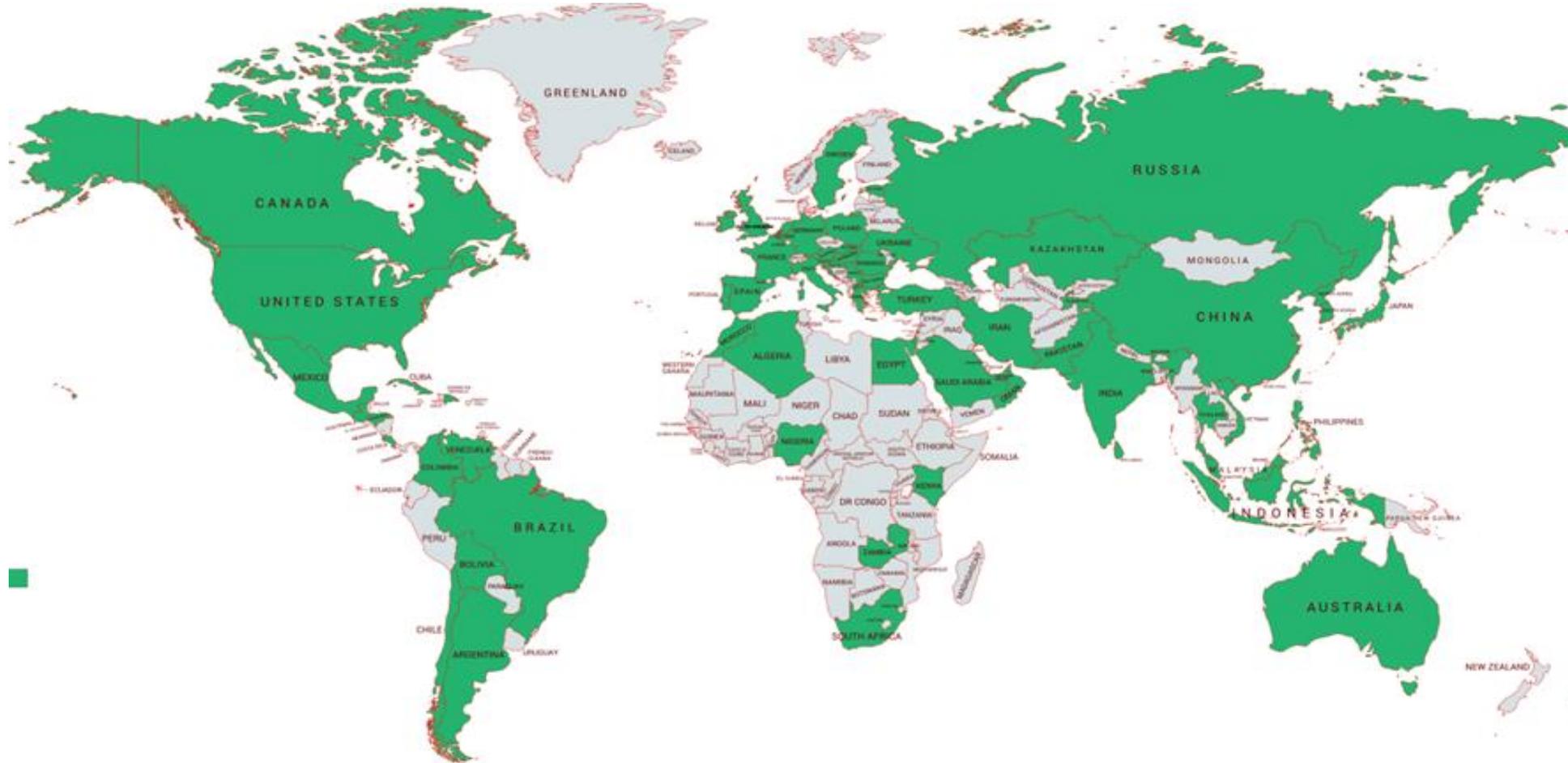
- Membership open to any country involved in lead and/or zinc production, usage, or trade.
- 27 members (>85% of global lead/zinc industry):



ILZSG Overview – Work of the Group

- 
- **Promote Market Transparency**
 - Closely monitor production, consumption, prices, stocks, trade flows and market balances
 - Reports and directories
 - **Facilitate Co-operation between Government and Industry**
 - Twice yearly meetings
 - Special conferences/seminars
 - **In-depth Research into Issues of Interest/Concern to Members**
 - Environmental legislation
 - Economic developments
 - **Assisting member governments in policy formulating**

Geographical Distribution of Lead Metal Producers

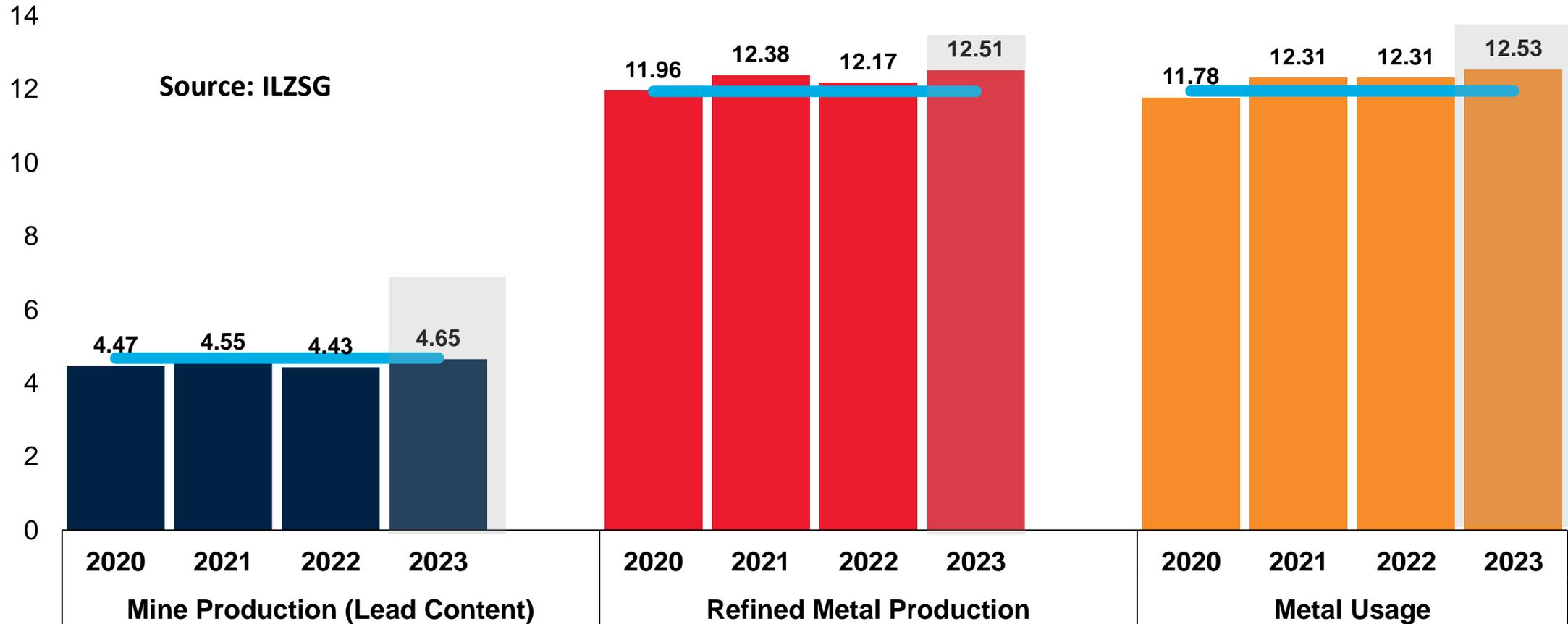


80 countries and regions were involved in lead metal production in 2022: 24 in Europe, 22 in Asia, 16 in the Americas, 17 in Africa, and Australia

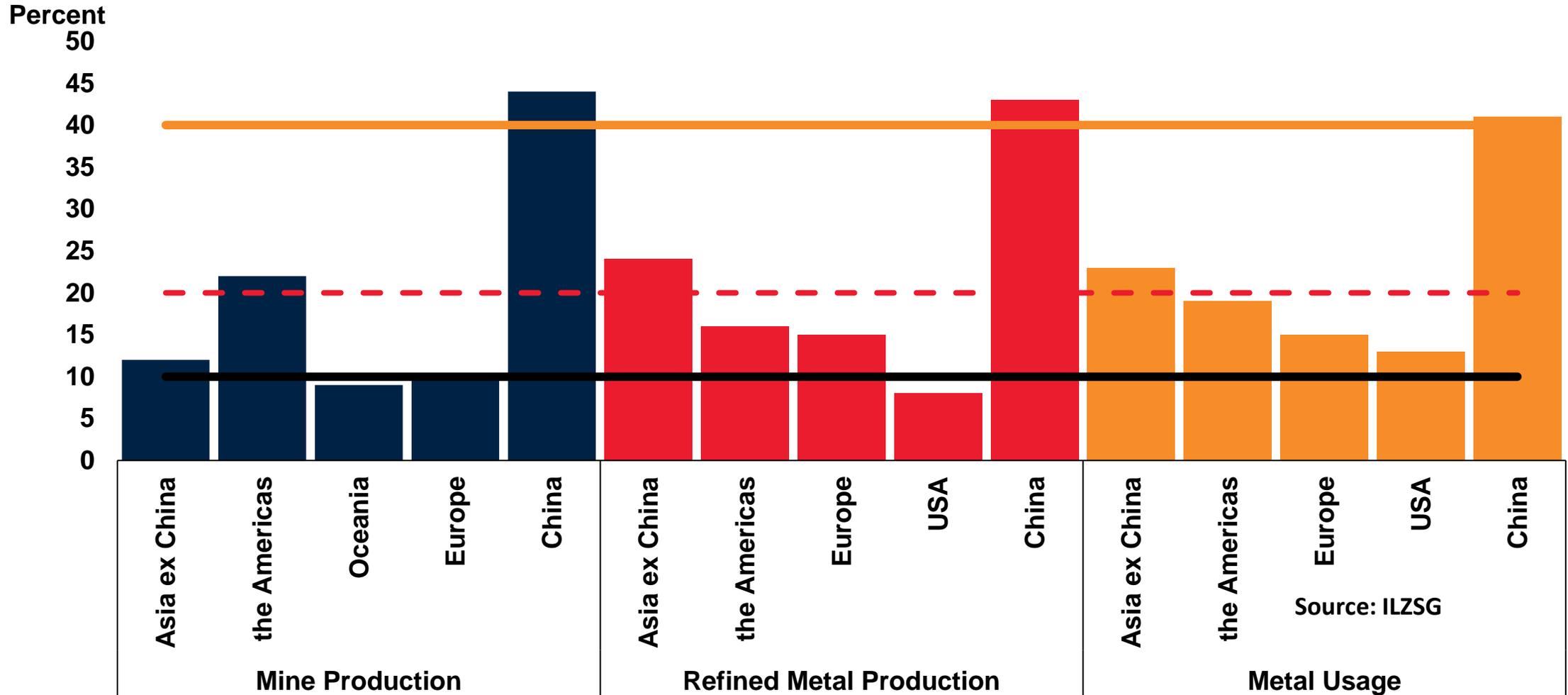
Production and Usage Trend (Lead)

Million Tonnes

— 2015-2019 average



Share of Regions in Percentage 2022 (Lead)

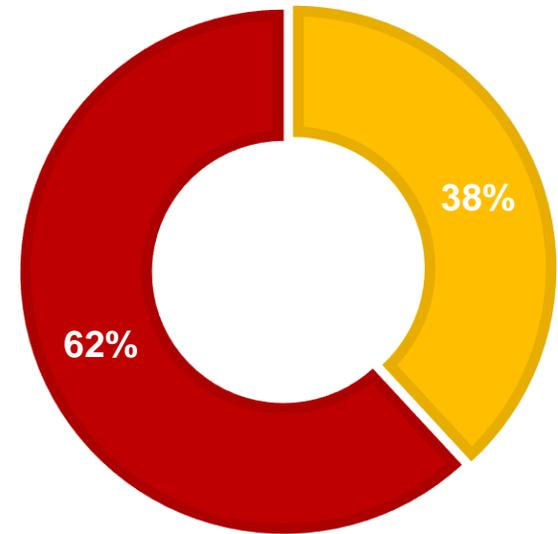
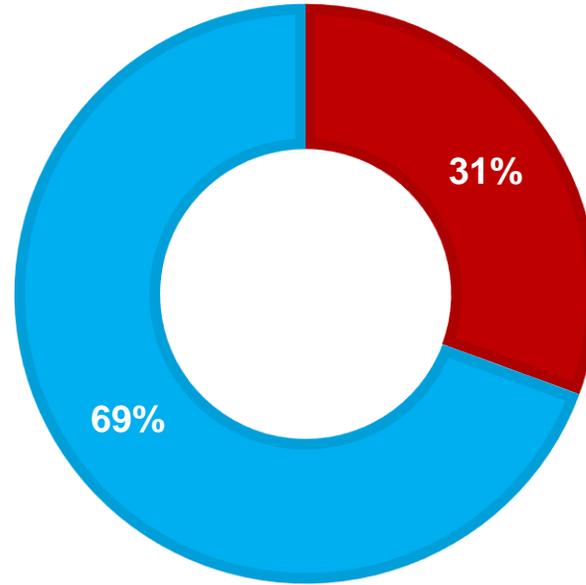
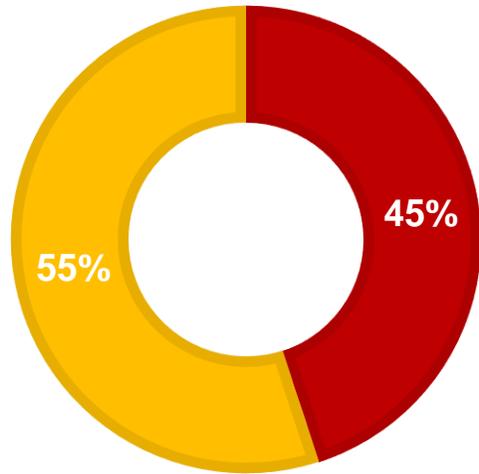


Mine Production & Concentrate Imports 2013-2022

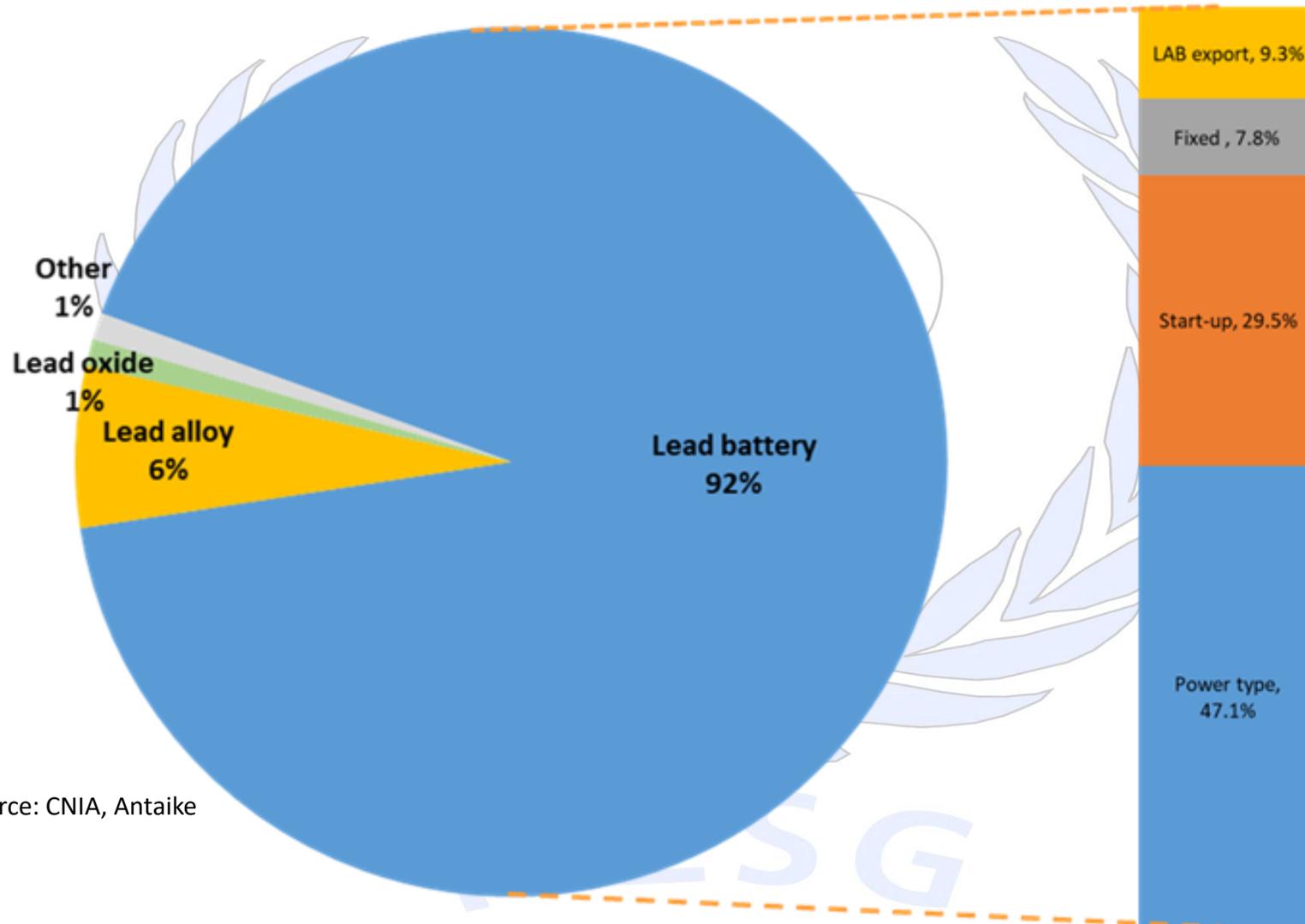
- China Mine Production
- World Mine Production ex China

- Concentrate imports China (net)
- Concentrate Production ex China production & ex China Imports

- Concentrate Production ex China production & ex China Imports
- China Mine Production + Concentrate Imports China (net)



Usage Structure of Refined Lead Metal in China



Source: CNIA, Antaika

Environmental Policies Related to Lead and Lead-Acid Battery Industry in China

1. 《Environmental Protection Law》 / 《Product Quality Law》 / 《Standardization Law》 /
2. 《Circular Economy Promotion Law》
3. 《Regulation on the Production License of Industrial Products》
4. 《Lead-acid battery product production license implementation rules》
5. 《Industrial structure adjustment guidance catalogue (2013 edition)》
6. 《Lead-acid battery industry entry conditions》
7. 《Lead-acid battery industry standard conditions》
8. 《Clean production standard for lead battery industry》
9. 《Clean production standard for waste lead-acid battery recycling industry》
10. 《Promoting the development norms for lead-acid batteries and recycled lead industry》
11. 《Product catalogue for export tax rebate 》
12. 《Notice on levying tax on batteries and paint》
13. 《Technical norms for application and issuance of pollutant discharge permit》
14. 《Directory of green industry guidance (2019 edition)》
15. 《Producers' responsibility extension scheme》
16. 《Action plan on pollution control of waste lead batteries》
17. 《Pilot work plan on centralized collection and trans-regional transfer system for lead battery manufacturers》
18. 《Mandatory national standard for "Electric Bicycle Safety Technical Specifications》
19. 《Utilization of Used Motive Battery for backup power by China Tower》
20. 《Law of Prevention and Control of Environmental Pollution by Solid-Waste (2020 edition)》
21. 《National Hazardous Waste List (2021)》
22. 《Technical Specification for Pollution Control of Waste Lead Battery Treatment》
23. 《Guidelines for Examination and Licensing of Hazardous Waste Management of Waste Lead Batteries》
24. 《Catalogue for the Guidance of Industrial Structure Adjustment》
25. 《Standard Conditions of Lead and Zinc Industry》
26. 《Pollutant Emission Standards for Lead and Zinc Industry》

《Producers' Responsibility Extension Scheme 2016》

《Action Plan for Prevention and Control of Waste Lead Battery Pollution 2019》

《Pilot work plan for centralized collection and cross-region transfer system for lead battery manufacturers》

Policy Targets

1. LAB producers are obliged to establish a standardized collection system
2. LAB producers are required to collect 70% of their sold products by 2025
3. All the collected waste LABs must be recycled in a safe manner
4. “Sale-Collection Equivalent” Model should be democratized nationwide

《Producers' Responsibility Extension Scheme 2016》
《Action Plan for Prevention and Control of Waste Lead Battery Pollution 2019》
《Pilot work plan for centralized collection and cross-region transfer system for lead battery manufacturers》

Enforcement Body

1. Ministry of Ecology and Environment
2. National Development and Reform Commission
3. Ministry of Industry and Information Technology
4. Ministry of Public Security
5. Ministry of Justice
6. Ministry of Finance
7. Ministry of Transport
8. State Taxation Administration
9. State Administration for Market Regulation

《Producers' Responsibility Extension Scheme 2016》

《Action Plan for Prevention and Control of Waste Lead Battery Pollution 2019》

《Pilot work plan for centralized collection and cross-region transfer system for lead battery manufacturers》

Market Implication

1. LAB producers will extend to the lead recycling sector by developing new smelting capacity or collaborating with existing smelters.
2. Excessive capacity of ULAB dismantling, since the first introduction of the Responsibility Extension Scheme in 2017, the capacity had increased from around 5 million tonnes to nearly 12 million tonnes at the end of 2021. License holders grew to about 80 from 40 for the same period.
3. The planned secondary lead capacity during the 14th Five-Year Plan Period (2021-2025) reached 4 million tonnes. Weeding out the uncertainties, it is estimated that by the end of 2025, there will be at least an addition of 1 million tonnes of secondary lead capacity

《Catalogue for the Guidance of Industrial Structure Adjustment 2019》

National Development and Reform Commission

Restricted category (technology is backward, new expansion is prohibited and needs to be transformed)

- Lead smelting projects below 50,000 tonnes/year (except for technical and environmental protection renovation projects without new capacity increment).
- New projects with a capacity of 50,000 tonnes/year or less.
- Reconstruction and expansion projects with capacity of 20,000 tonnes/year or less.
- Secondary lead projects with indicators such as resource utilization, energy consumption, and environmental protection that fail to meet industry access requirements.

Elimination category (outdated technology can't meet relevant regulations)

- Lead smelting using outdated methods and equipment like sintering pot, sintering pan, simple blast furnace, etc.
- Secondary aluminum and lead projects with annual capacity of less than 10,000 tonnes
- Sintering lead smelting process without supporting acid production and tail gas absorption system
- Sintering-blast furnace lead smelting process

《Standard Conditions of Lead and Zinc Industry》 Ministry of Industry and Information Technology

Quality, technology, and equipment

- Lead smelters should adopt advanced oxygen-enriched smelting-direct reduction of liquid high-lead slag or oxygen-enriched flash smelting and other lead smelting processes, with supporting comprehensive flue gas treatment facility. It encourages primary lead smelters to use these technologies to process secondary lead resources like lead paste and smelting slag.
- Lead and zinc smelters should have supporting comprehensive utilization systems for valuable metals.

Energy consumption

- For lead smelting enterprises, the comprehensive energy consumption of crude lead processing must be less than 250 kg standard coal/tonne.

Resource consumption and comprehensive utilization

- For lead smelting enterprises, total recovery rate should reach 97% or more
- Crude lead smelting recovery rate should reach 97.5% or more
- Tailings containing lead should be less than 2%
- Lead refining recovery rate should reach 99% or more
- Total sulfur utilization rate should reach 96% or more
- Sulfur capture rate must reach above 99.5%
- Water recycling rate must reach above 98%.

《Catalogue for the Guidance of Industrial Structure Adjustment 2019》
《Standard Conditions of Lead and Zinc Industry》

Impact

During 2015-2020, a total of 1.755 million tonnes of lead smelting capacity were eliminated or replaced including 1.015 million tonnes of primary lead smelting capacity.

《Implementation Guidance on Energy Reduction and Emission Cutting in the Energy Intensive Industries 2022》

《Elimination List of Backward Processes Inducing Heavy Pollution 2023》

By 2025, 50% of the lead smelting and refining capacity should meet the benchmark comprehensive energy consumption level: 230t standard coal for lead bullion, 100t standard coal for lead electrorefining, 330t standard coal for lead smelting/refining

By 2025, all lead smelting and refining capacities that fall short of baseline comprehensive energy consumption level shall be shut down: 300t standard coal for lead bullion, 120t standard coal for lead electrorefining, 420t standard coal for lead smelting/refining

By the end of 2023, all secondary lead capacities using crucible/pot furnaces must be eliminated as well as all the sintering-blast furnace lead smelting processes.

《Mandatory National Standard for "Electric Bicycle Safety Technical Specifications》

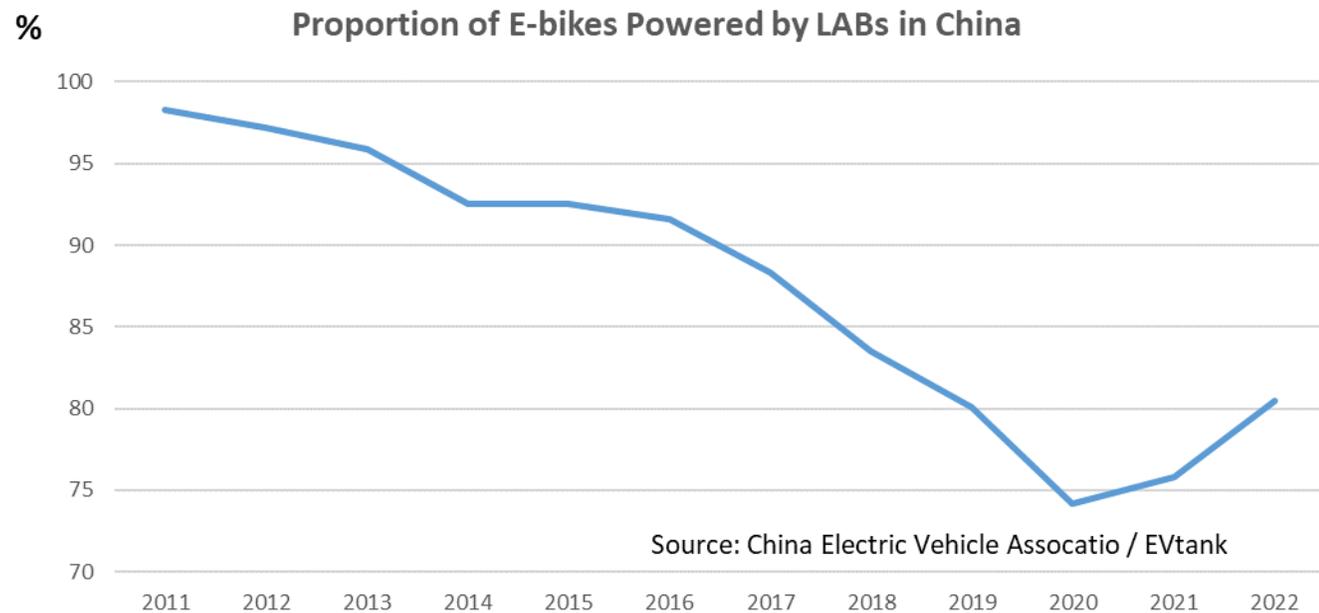
Key Points

1. Speed Limit \leq 25KMs/H or 15.5Miles/H
2. **Weight Limit including Battery \leq 55Kg/unit**
3. Motor Power Limit \leq 400W
4. Nominal Voltage of Battery \leq 48V
5. Mandatory Implementation Date: 15 April 2019
6. Grace period 2021-2023
7. Compulsory helmet requirement for E-bike riders (1 July 2023)

《Mandatory National Standard for "Electric Bicycle Safety Technical Specifications》

China's E-Bike Market

1. Cumulative E-bike Fleet > 350 Million Units
2. Around 90% of the Total Fleet Are Powered by Lead-Acid Batteries
3. Annual Production Volume ≈ 50 Million Units (2022)
4. LIB-powered E-bike will increase further to 40% of the total e-bike production by 2025
5. The penetration rate of LIB-powered E-bike retreated in 2022 due to the high price of lithium



《Utilization of Used Motive LIBs for Power Backup by China Tower》

Key Points

Replace LABs with used motive LIBs as backup power for base stations



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《Utilization of Used Motive LIBs for Backup Power by China Tower》

Achievement and Prospect

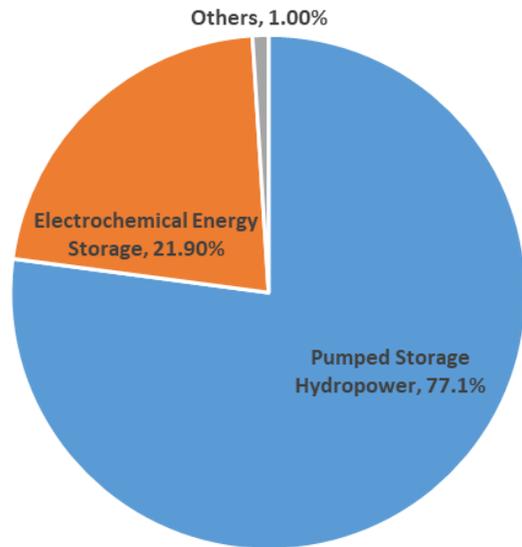
1. By the end of 2021, 3GWh of used motive LIBs were installed at its 500,000 base stations across 31 provinces, replacing a gross weight of LABs at 90,000 tons, or equivalent to used LIBs from 50 thousand EVs.
2. Its current energy storage capacity is 146GWh per year, the annual demand for energy storage batteries for replacing the obsolete battery and installing new base stations is 25GWh.
3. China Tower has stopped purchasing LABs.

《Action Plan for the Development of New Type of Energy Storage Projects》

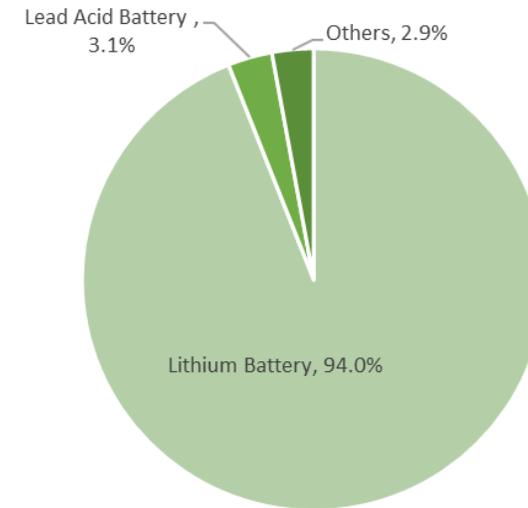
1. China National Development and Reform Commission and China National Energy Administration promulgated the Action Plan in March 2022
2. Various technological routes are mentioned in the Action Plan except LABs
3. It could be anticipated that no policy support for LABs in the energy storage sector in the future
4. As a result, LABs market in the energy storage sector will further shrivel in terms of either installed capacity or proportion

《Action Plan for the Development of New Type of Energy Storage Projects》

Installed Energy Storage Capacity at the end of 2022 China



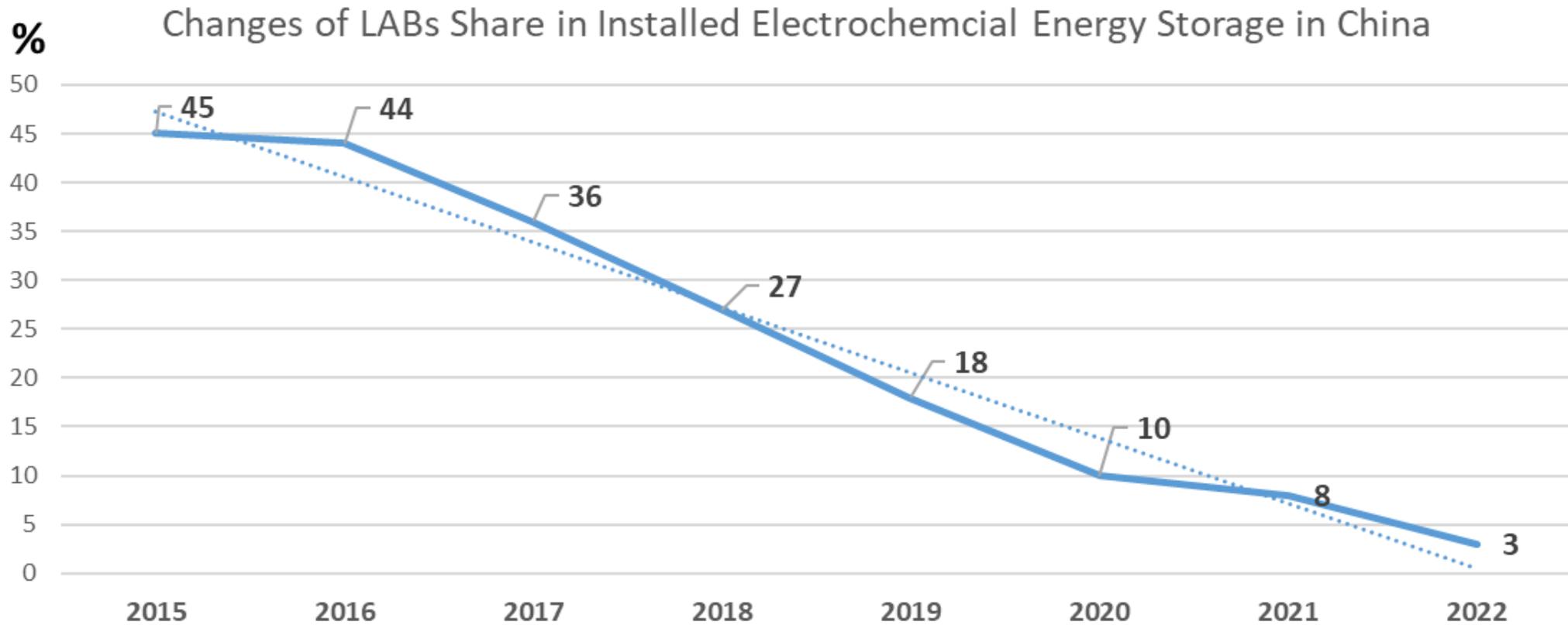
Composition of Installed Electrochemical Energy Storage Capacity at the end of 2022 China



Source: CNESA

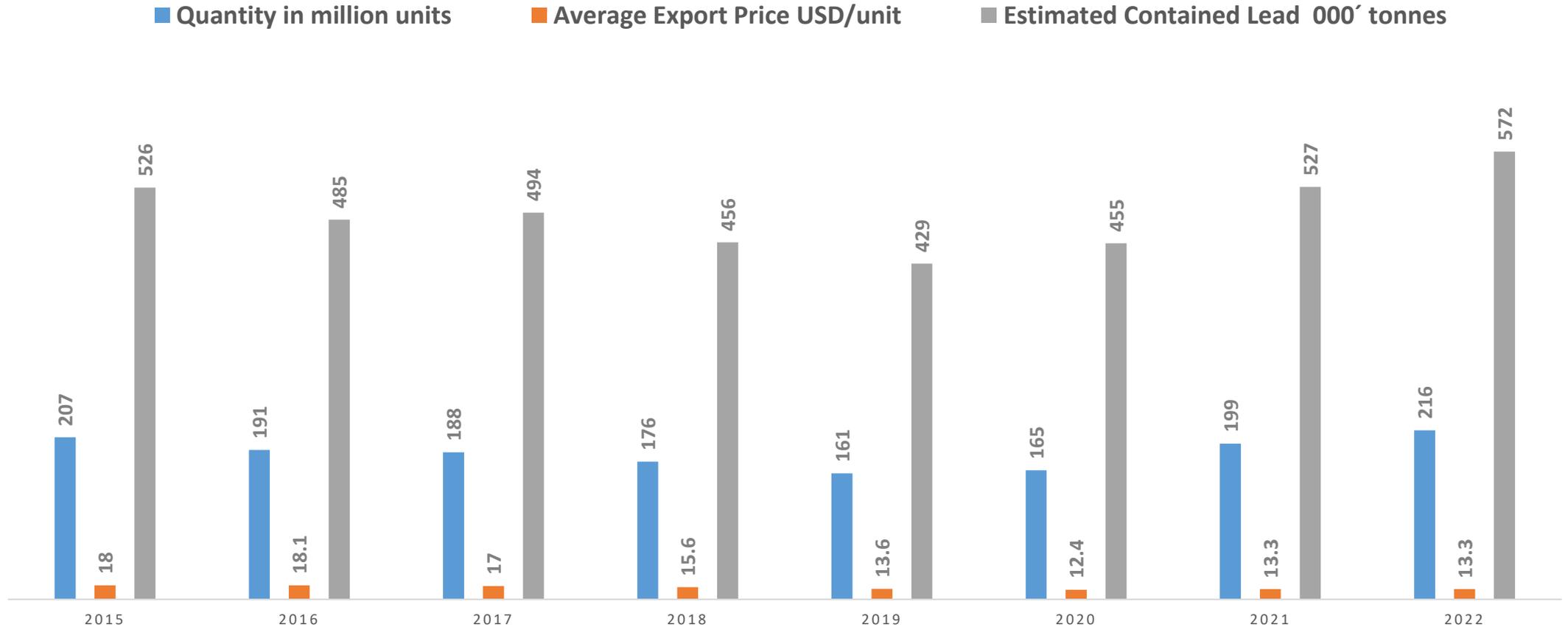


《Action Plan for the Development of New Type of Energy Storage Projects》



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《Export of LABs》



China levies VAT on LAB producers without tax rebates for export, in addition, a 4% export tax is imposed on LABs export.

《Minutes of the Meeting on Technical Criteria of Low-speed EVs》
《Technical Standards of Low Speed EVs》 (Draft)

Ministry of Industry and Information Technology

1. The disclosed Meeting Minutes indicated an explicit ban on LABs in Low-speed EVs
2. The draft Technical Standards requires that batteries installed in Low-speed EVs shall conform to various battery regulations and standards for EVs
3. The official promulgation of the Technical Standards has been delayed thanks to the strong industrial lobbying.

《Minutes of the Meeting on Technical Criteria of Low-speed EVs》
《Technical Standards of Low Speed EVs》 (Draft)
Implications on LABs

1. The size and weight requirement on Low-speed EVs will naturally strip LABs out of the market: Length $\leq 3500\text{mm}$, width $\leq 1500\text{mm}$, height $\leq 1700\text{mm}$, and total weight $\leq 750\text{kg}$.

2. The energy density requirement on motive batteries installed in Low-speed EVs should be $\geq 70\text{wh/kg}$, while the prevailing energy density of motive LABs is 40-60wh/kg.

3. LABs could only be used as auxiliary batteries in Low-speed EVs as in other vehicles, but the size of the auxiliary LABs in the Low-speed EVs will be reduced substantially.

Summary and Recommendation

1. Both lead metal production and LABs production are facing more stringent regulation and legislation environments
2. As the predominant lead-using industry, the LABs market confronts multifaceted threats both in the traditional SLI sector and the emerging energy storage and EV sectors
3. Thanks to the high demand for the replacement market and due to the constraints in the supply of alternative materials such as lithium, nickel and cobalt, a strong and high-level lead and LABs market is still foreseeable into the near future, but competition in the replacement market is going to get severe. As a result, more mergers and acquisitions (both vertical and horizontal) in the industry could be anticipated
4. Technological innovation or breakthrough focused on battery life, safety and energy density is in urgent need
5. Compared to other battery technologies, LABs competitive edge needs to be further sharpened in terms of cost and reliability
6. Effective communications regarding LABs advantages, benefits and mitigable environment and health risks to the communities, general public, downstream industries and regulators need to be tuned up and toned up.

THANK YOU!

Mr. Jianbin Meng

Director of Economics and Environment

International Lead And Zinc Study Group

International Nickel Study Group

Jianbin_meng@ILZSG.org

