ILZSG

WORLD LEAD FACTBOOK 2026

International Lead and Zinc Study Group

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The **ILZSG** was set up by the United Nations in 1959 as an intergovernmental organization with 26 members, and is one of the longest-established International Commodity Organizations.

The main role of the **ILZSG** is to ensure transparency in the markets for lead and zinc worldwide. This is achieved by producing a continuous flow of information to the marketplace on supply and demand developments in lead and zinc through the monthly publication of high-quality statistics, in-depth market research and specifically targeted economic studies. The Group also organizes international sessions and special conferences bringing together industry and governments to discuss matters of concern in the lead and zinc sectors.

The **ILZSG** provides opportunities for regular intergovernmental consultations on international trade in lead and zinc, and considers possible solutions to any problems or difficulties which are unlikely to be resolved in the ordinary development of world trade. The Group also publishes continuous information on the supply and demand position of lead and zinc and its probable development and prepares special studies on a range of subjects related to the world lead and zinc market.

The work of the Group is largely carried out by four committees: Standing, Statistical and Forecasting, Mine and Smelter Projects, Economic and Environment. Each committee is chaired by a representative from one of the ILZSG's national delegations, who directs the programme of work. The committee chairpersons report back to the whole Study Group during formal sessions which are held at its headquarters in Lisbon, Portugal, or by government invitation in a member country.

International Lead and Zinc Study Group

MEMBER GOVERNMENTS

International Lead and Zinc Study Group

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International Lead and Zinc Study Group

SELECTED CURRENT PUBLICATIONS

1. Lead and Zinc Statistics - Monthly Bulletin + Interactive Database (data 1960 – current year)
2. Lead and Zinc Mine and Smelter Database
3. Lead and Zinc New Mine and Smelter Projects 2026
4. Study on Taxation and Fiscal Policies Impacting the Mining and Metals Sector 2026
5. Lead and Zinc: National Trade Tariffs and Measures 2026
6. The World Lead Factbook 2026
7. World Directory: Lead and Zinc Mines 2026
8. World Directory: Primary and Secondary Lead Plants 2026
9. World Directory: Primary & Secondary Zinc Plants 2026
10. Study on Development of the Global E-Bike Industry and Implications for Lead Demand 2025
11. Report on South East/South Asian Secondary Lead Metal Sector 2024
12. Lead and Zinc End Use Industry Statistical Supplement 2023
13. Environment and Health Controls on Lead 2023
14. Environment and Health Controls on Zinc 2023

For further details please refer to www.ilzsg.org

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DATA SOURCES AND METHODOLOGY

Scope and data. Unless otherwise stated, this edition presents calendar-year data through 2025. The 2025 figures are the latest available at the editorial cut-off and may include provisional or estimated values where final returns were unavailable. Such figures may be revised in subsequent ILZSG statistical releases.

ILZSG statistical series. Mine production, refined metal production, refined metal usage, capacity, project and market series are compiled from government returns, national statistics, industry information and ILZSG research. A source shown as 'ILZSG est.' identifies an ILZSG estimate.

Other sources. Where a figure identifies USGS, the United Nations, LME, SHFE or another organisation, that source governs the figure. Source dates and qualifications shown with individual figures should be read together with this note.

Units and conventions. A tonne is a metric tonne; '000 tonnes' and kt denote thousand tonnes, and Mt denotes million tonnes. Mine production is expressed as contained lead unless stated otherwise. Concentrate trade is presented as contained lead. Capacity and projects refer to annual capacity where available; production refers to actual output. Primary and secondary production follow the Official Definitions.

Trade data. The Harmonised System codes used are 2607.00 for lead ores and concentrates, 7801.10 for refined unwrought lead and 7801.91 for antimonial lead alloys. Import and export totals may differ because of reporting timing, partner attribution, valuation, transshipment, re-exports, coverage and revision practices. Flow maps show selected leading partners; arrows indicate reported direction and relative volume.

Geography, rounding and interpretation. Regional groupings follow ILZSG practice; EU27 is identified separately where used. Totals may not equal the sum of components because of rounding, and a missing value should not be interpreted as zero. For the latest revisions, readers should consult the ILZSG statistical database.

Definitions of mine production, metal production, primary and secondary production, metal usage and the applicable HS codes are provided on the Official Definitions page.

CHAPTER ONE: LEAD BASICS

Symbol: Pb

Electrons per Atom: 82

Atomic Weight: 207.2

Melting Point: 327.4°C

Boiling Point: 1749°C

Stable Isotopes: 204, 206, 207, 208

Crystal Structure: FCC

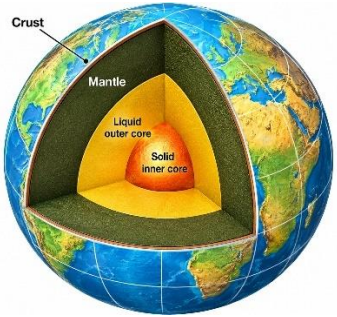
Density: 11.34 g/cm³

Colour: Light to Bluish Grey

- Soft, highly malleable
- Relatively poor conductor of electricity
- Resistant to corrosion but tarnishes upon exposure to air
- Attenuation of X-rays, gamma rays and sound waves

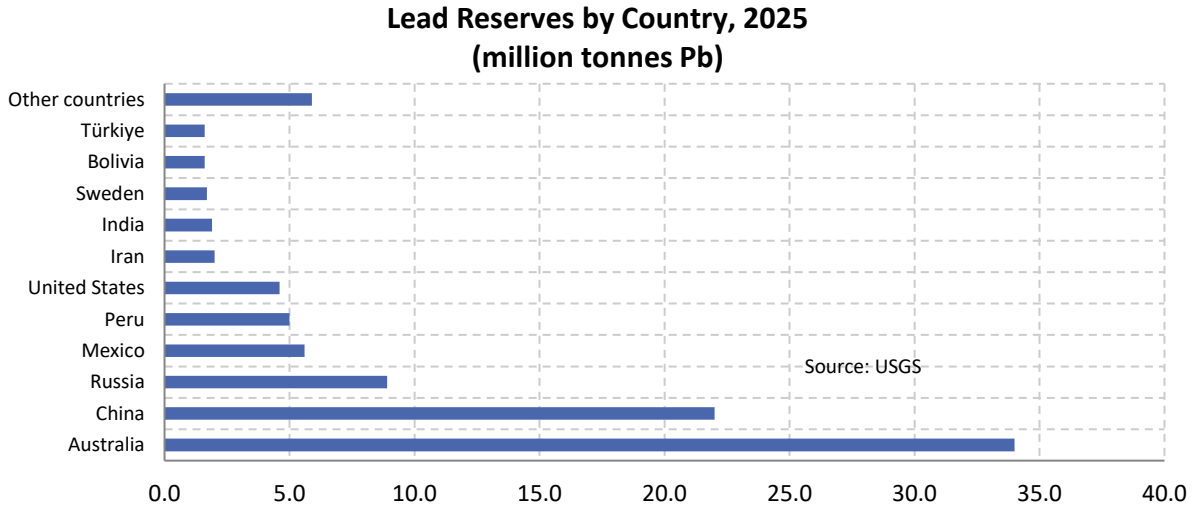
CHAPTER TWO: LEAD RESOURCES

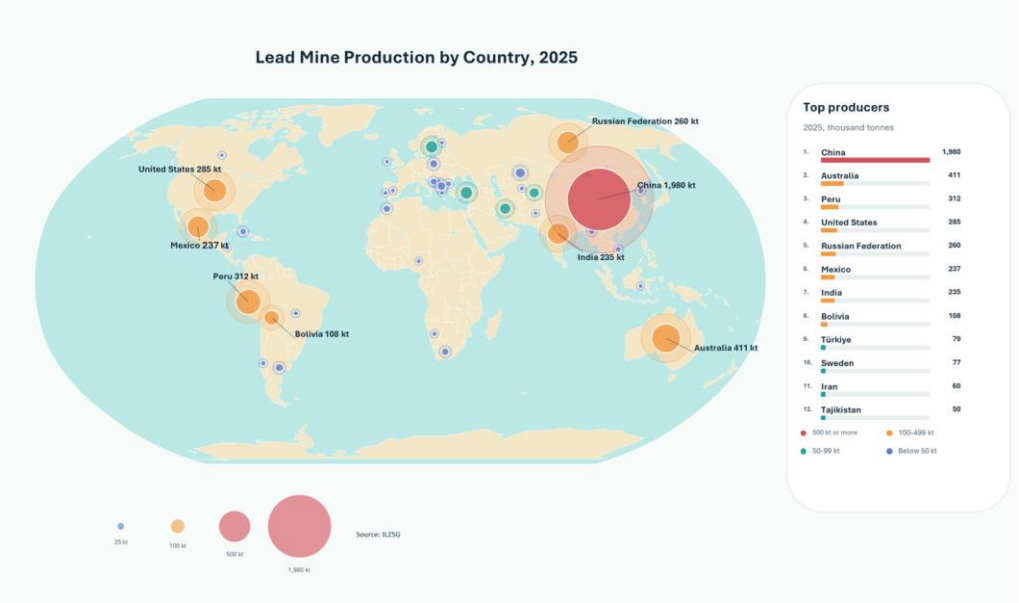
Galena (PbS) is the principal ore mineral of lead; cerussite (PbCO3) and anglesite (PbSO4) are also important. Small quantities of radiogenic lead occur in uranium- and thorium-bearing minerals. In 2025, 43 countries across Europe, Africa, the Americas, Asia and Oceania mined lead. World mine output was about 4.5 million tonnes of contained lead. Lead is commonly recovered as a co-product or by-product of zinc and silver mining.



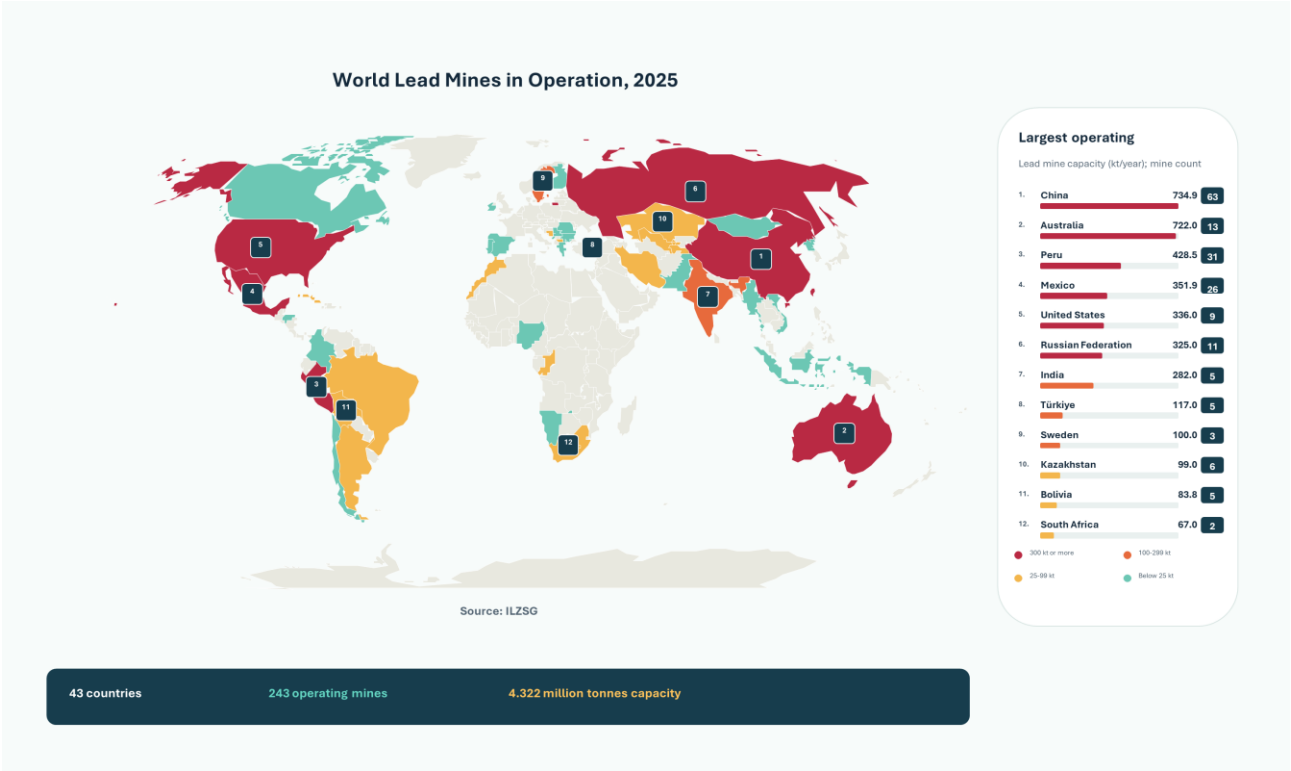
Lead Reserves

Identified world lead resources contain more than 2 billion metric tonnes of lead, while global lead reserves were estimated at approximately 95 million metric tonnes at year-end 2025. Major lead resources occur principally in Australia, China, Russia, Mexico, Peru and the United States, with additional significant resources in countries including Ireland and Portugal. Important lead and lead-zinc districts include Queensland, the Northern Territory and New South Wales in Australia; several regions of China; Siberia and other parts of Russia; southeastern Missouri, the Mississippi Valley and Alaska in the United States; Zacatecas and San Luis Potosí in Mexico; and the central Peruvian mining districts, including Cerro de Pasco and Morococha.





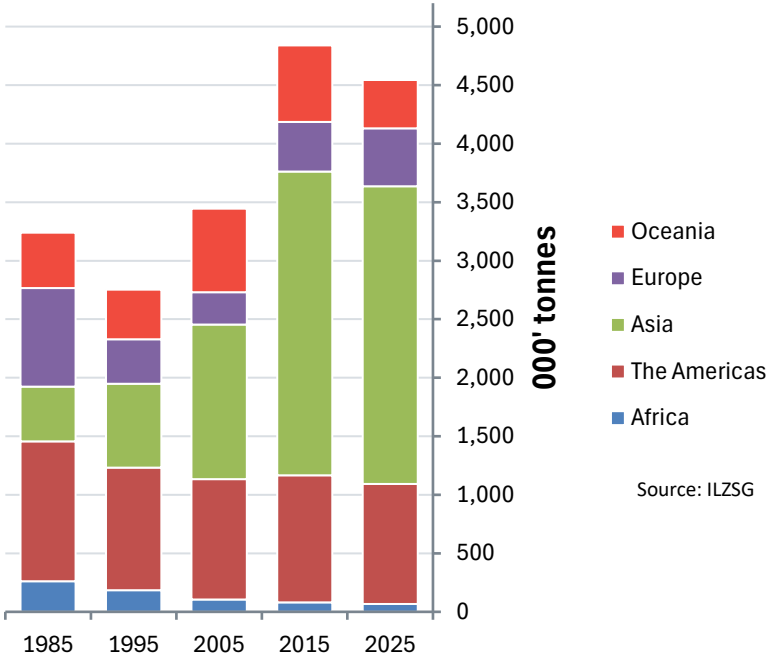
- More than 40 countries have mined lead ore since the 1990s across five continents.
- In 2025, 43 countries mined lead ore. China was the leading producer, followed by Australia, Peru, the United States, Russia, Mexico and India.
- Proportional circles show output volumes, while the ranking panel compares the leading producers and illustrates the geographic concentration of global lead mine supply.


World Lead Mines in Operation, 2025
Largest operating
Lead mine capacity (kt/year); mine count
1. China 734.9 63
2. Australia 722.0 13
3. Peru 428.5 31
4. Mexico 351.9 26
5. United States 336.0 9
6. Russian Federation 325.0 11
7. India 282.0 5
8. Türkiye 117.0 5
9. Sweden 100.0 3
10. Kazakhstan 99.0 6
11. Bolivia 83.8 5
12. South Africa 67.0 2
300 kt or more
100-299 kt
25-99 kt
Below 25 kt
Source: ILZSG
43 countries
243 operating mines
4.322 million tonnes capacity

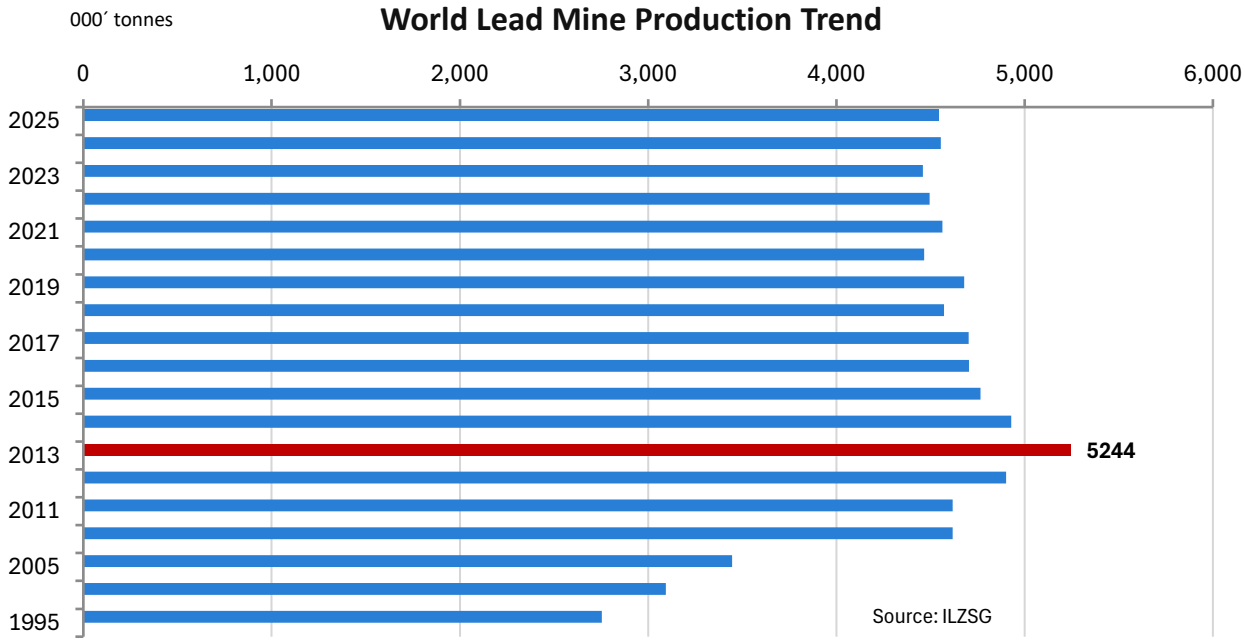
ILZSG data show:

- A clear long-term shift in world lead mine production towards Asia
- In the Americas, output remained broadly stable at around 1.0–1.2 million tonnes.
- In Asia, production expanded strongly, reaching 2.54 million tonnes in 2025.
- In Europe, output fell sharply from the 1985 level of 0.84 million tonnes to around 0.50 million tonnes in 2025.
- In Africa, output declined to about 0.07 million tonnes in 2025.
- In Oceania, production stayed within a broad 0.41–0.71 million-tonne range.

Lead Mine Production by Continent in the Past 40 Years



Source: ILZSG

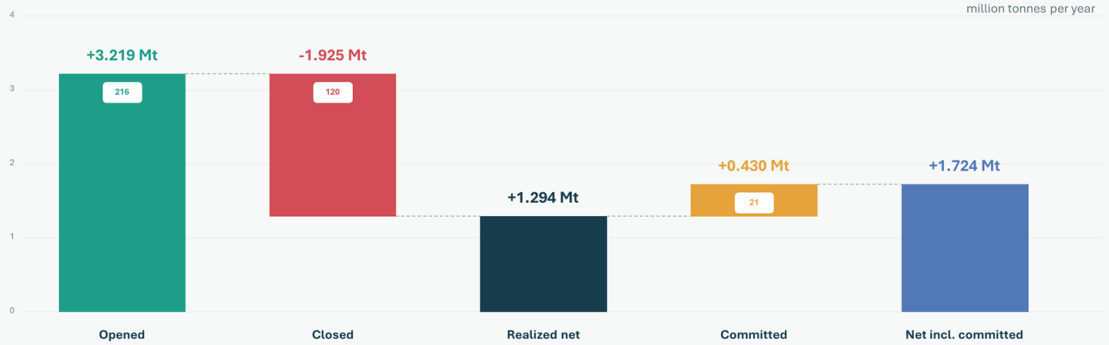


ILZSG data show world lead mine production surpassed 4 million tonnes in 2010 for the first time, and peaked at 5.244 million tonnes in 2013, then eased but remained around 4.5 million tonnes in recent years.

Lead Mine Capacity Change Since 2000

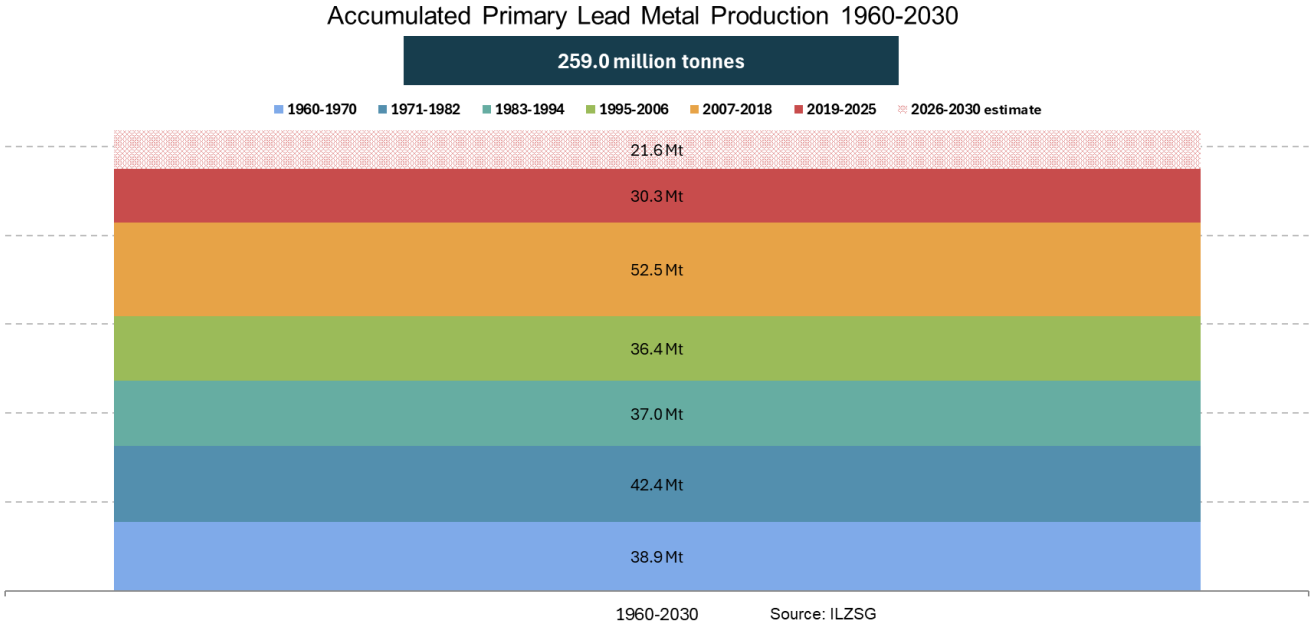
OPENINGS	CLOSURES	COMMITTED	UNDER CONSIDERATION (lead and zinc)
216 — 3.219 Mt added	120 — 1.925 Mt lost	21 — 0.430 Mt planned	193 — Capacity not supplied

Lead capacity bridge



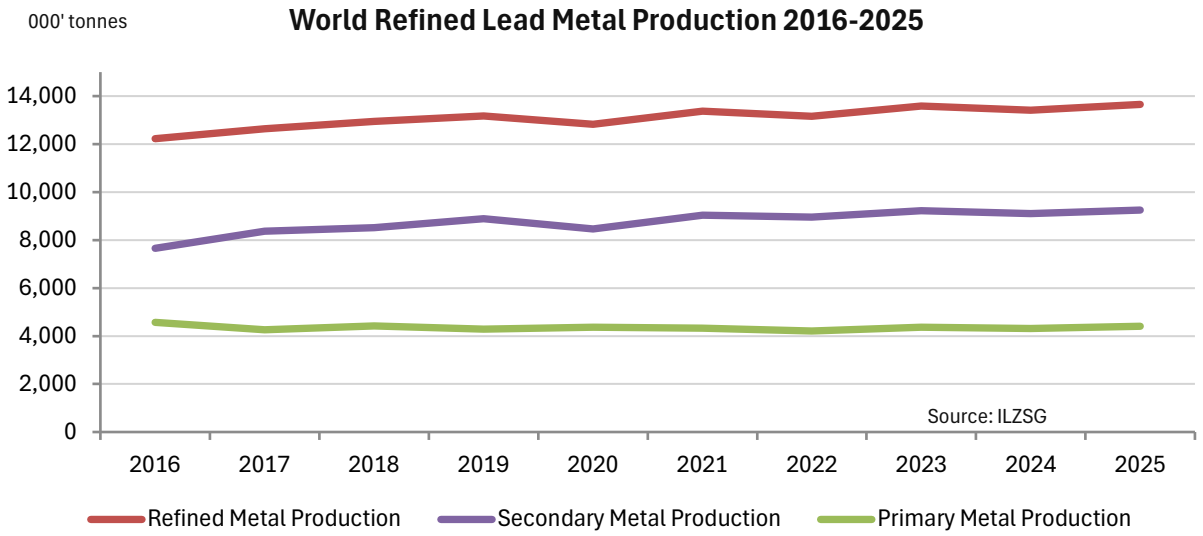
Source: ILZSG

Realized openings exceeded closures by 1.294 Mt. Including committed projects raises the indicated net gain to 1.724 Mt; under-consideration capacity might add furher capacities.

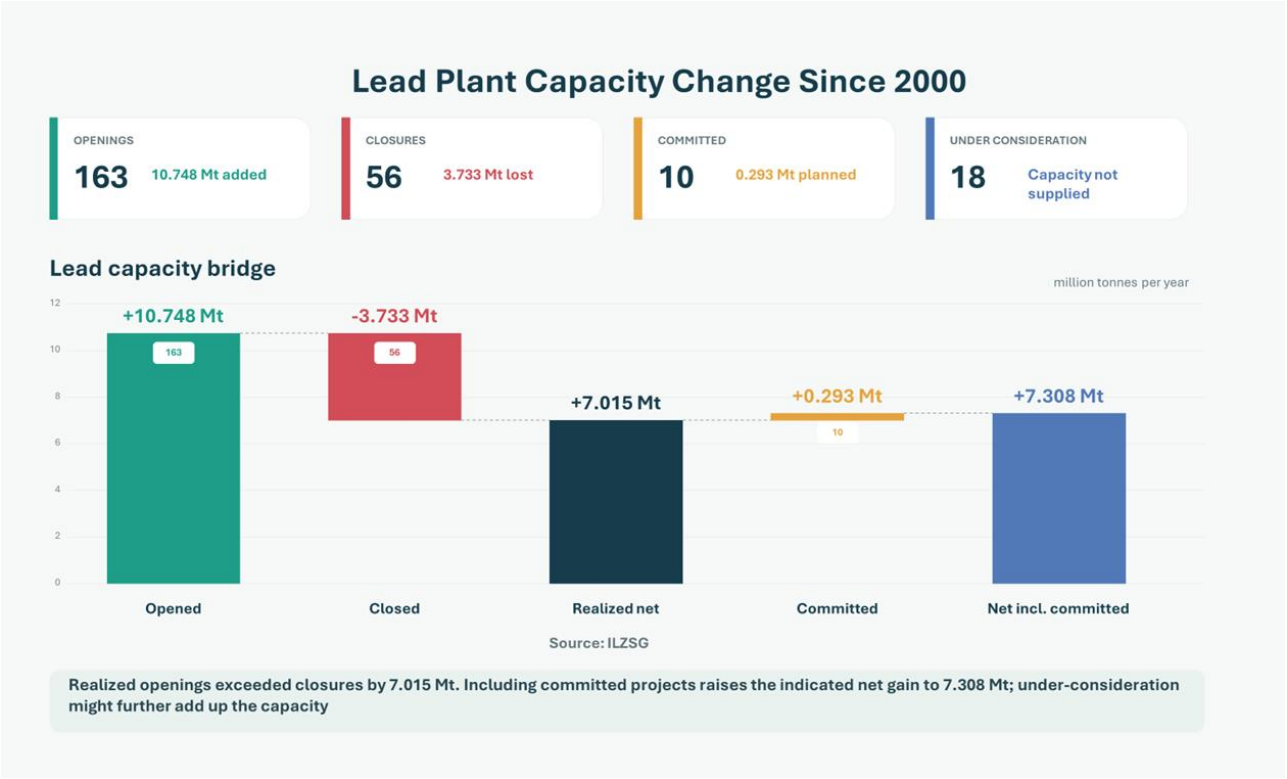


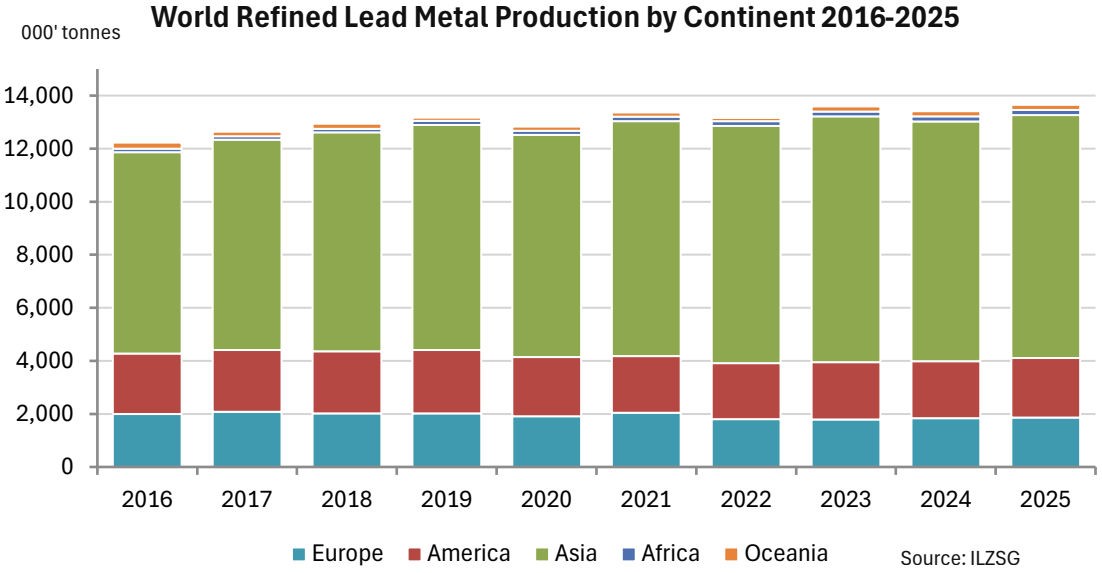
By the end of 2025, cumulative primary refined lead production had reached 237.4 million tonnes, illustrating the scale of long-term primary lead supply. If the 2019-2025 trajectory continues, the cumulative world primary lead metal production will reach 259 million tonnes by 2030.

CHAPTER THREE: REFINED LEAD METAL PRODUCTION

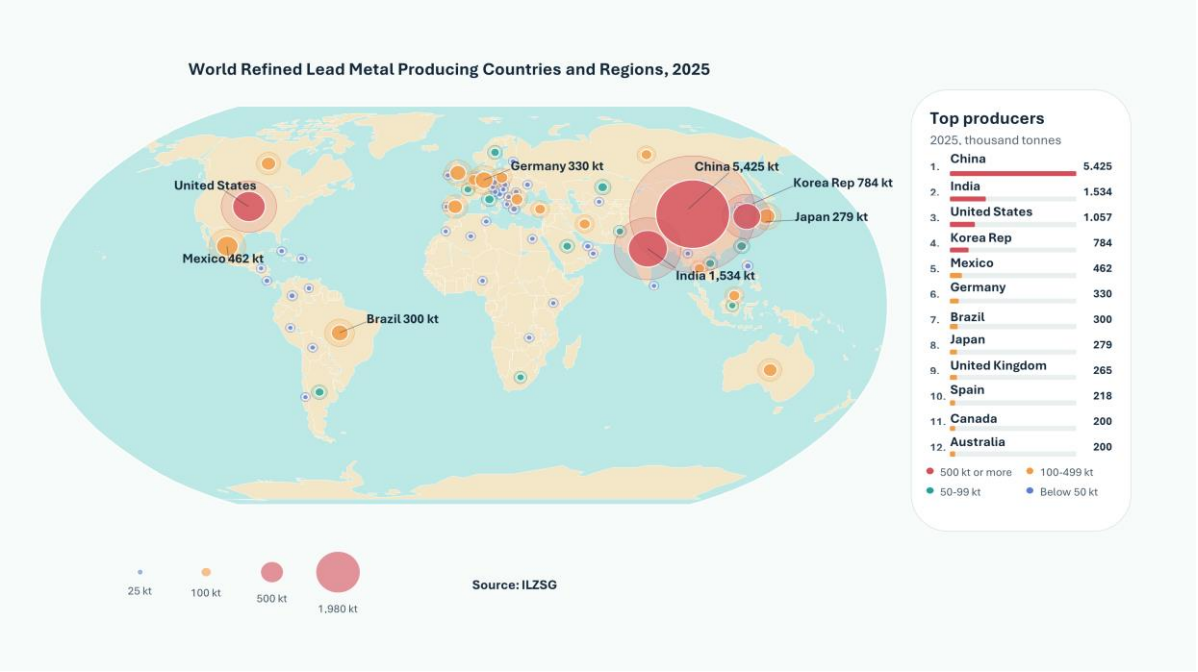


Global refined lead production increased overall from 2016 to 2025, despite declines in 2020, 2022 and 2024. Primary output remained broadly stable, while secondary output increased and was the larger component. Total production reached a new high in 2025.

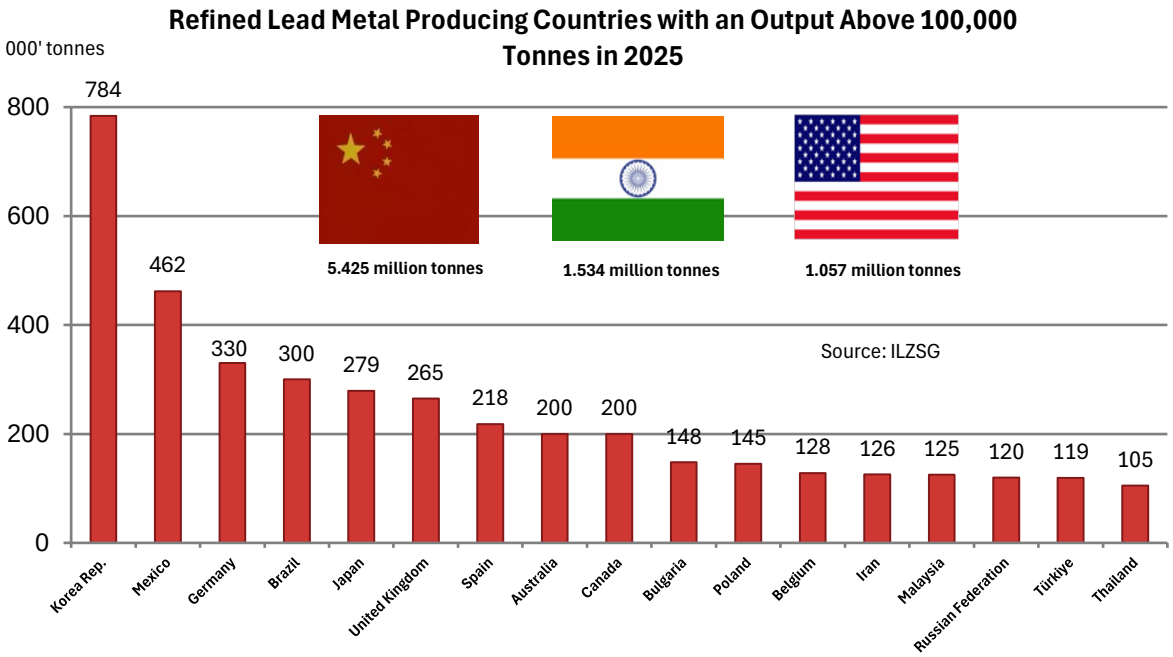

Lead Plant Capacity Change Since 2000
OPENINGS
163
10.748 Mt added
CLOSURES
56
3.733 Mt lost
COMMITTED
10
0.293 Mt planned
UNDER CONSIDERATION
18
Capacity not supplied
Lead capacity bridge
million tonnes per year
12
10
8
6
4
2
0
+10.748 Mt
163
-3.733 Mt
56
+7.015 Mt
+0.293 Mt
10
+7.308 Mt
Opened
Closed
Realized net
Committed
Net incl. committed
Source: ILZSG
Realized openings exceeded closures by 7.015 Mt. Including committed projects raises the indicated net gain to 7.308 Mt; under-consideration might further add up the capacity



World refined lead production increased overall between 2016 and 2025, led by growth in Asia. Europe and the Americas recorded relatively stable volumes, while Africa and Oceania remained smaller producers. Output declined in 2020 and 2022 before recovering to a new high in 2025.

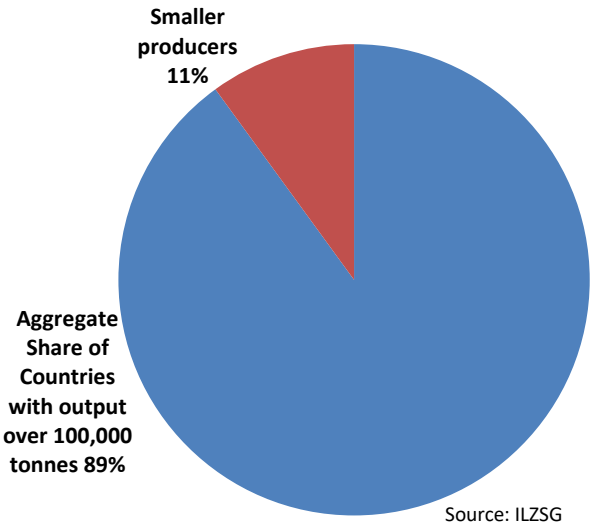


More than 80 countries and regions had lead smelting and/or refining capacity in 2025. China was the leading producer, followed by India, the United States, Korea Rep., Mexico and Germany. The map and ranking panel show the geographic concentration of global refined lead production.

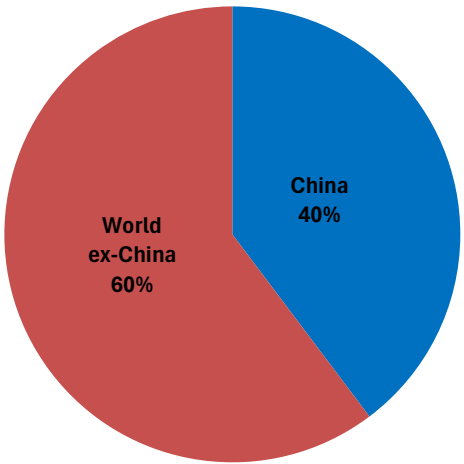


China was the largest refined lead producer in 2025, with output of 5.425 million tonnes. India ranked second, followed by the United States and Korea Rep. Most other major producers recorded output below 500,000 tonnes, underscoring the concentration of global supply.

World Refined Lead Metal Production Concentration Rate 2025

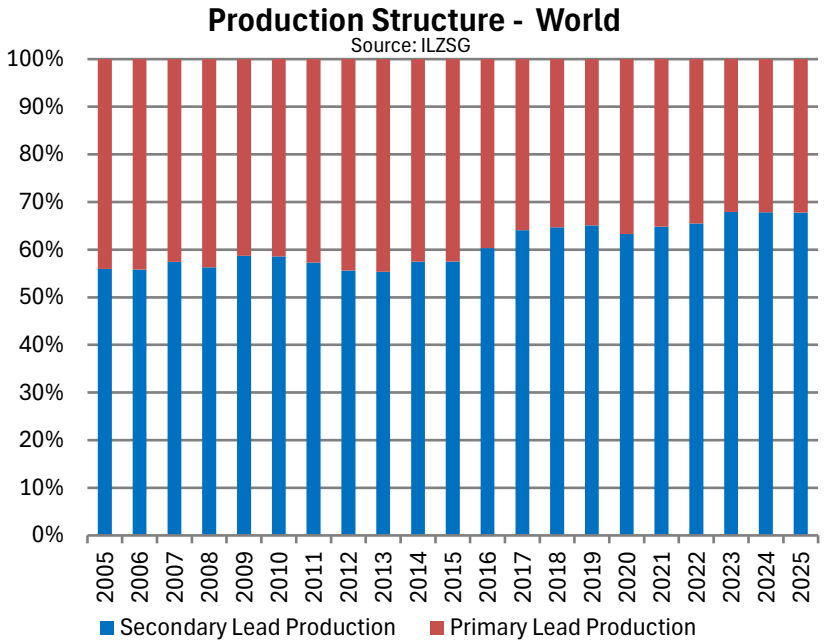


Source: ILZSG



Refined lead production is highly concentrated: countries producing more than 100,000 tonnes accounted for 89% of world output in 2025. China alone contributed 40% of the total.

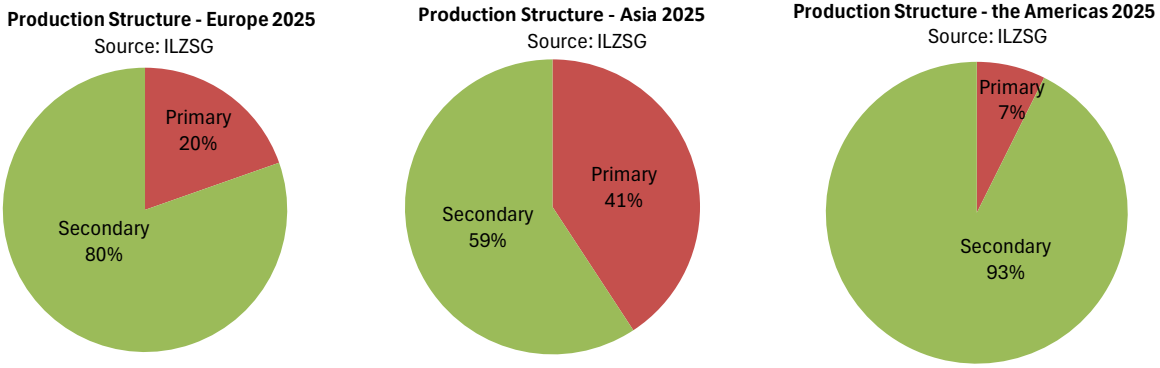
Refined Lead Metal Production Breakdown 2005-2025



ILZSG data show:

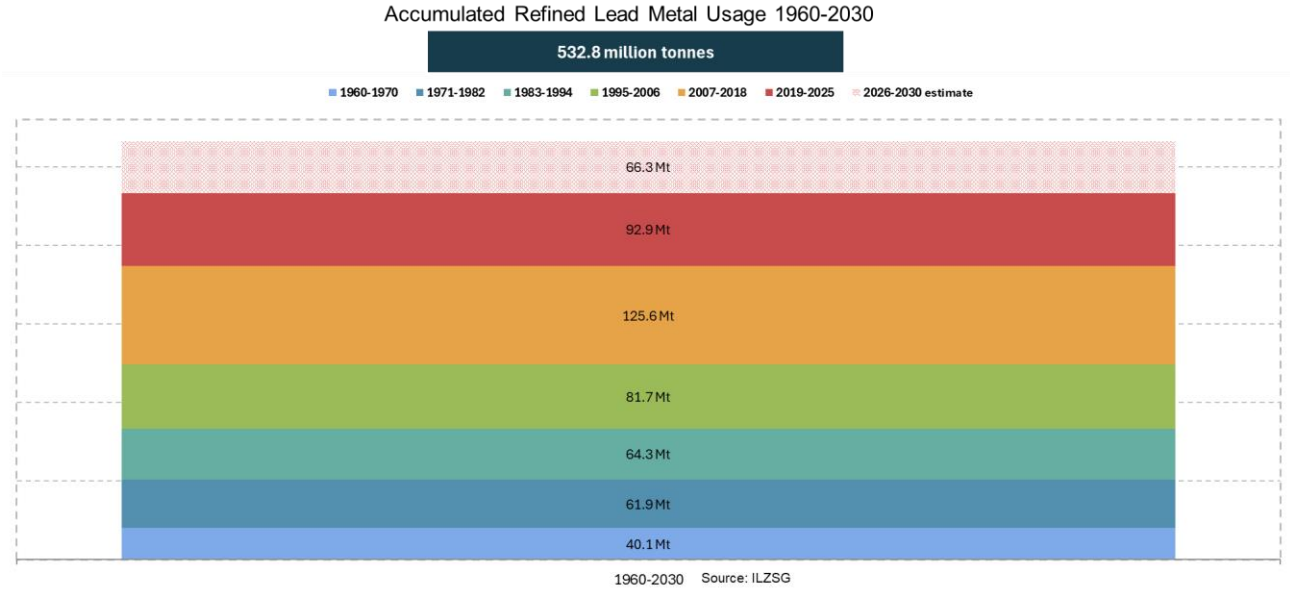
- Secondary production accounted for between 55% and 70% of total refined lead production during the period shown.
- The secondary share exceeded 60% for the first time in 2016.

World Refined Lead Metal Production Breakdown

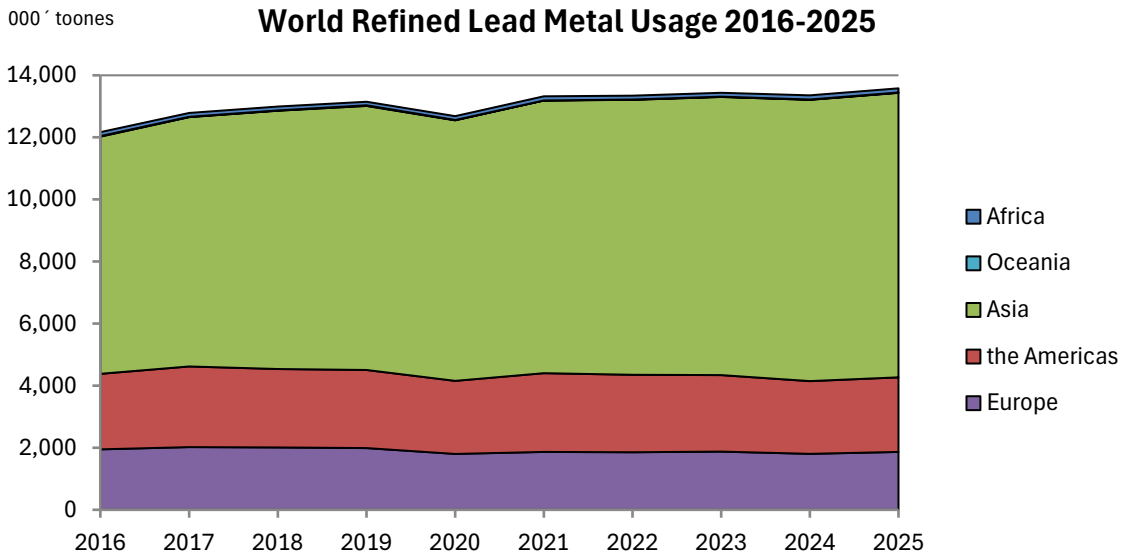


- In 2025, secondary refined lead production accounted for 93% of total refined lead production in the Americas.
- Secondary refined lead production accounted for 80% of European output.
- Secondary refined lead production accounted for 59% of Asian output.
- Asia's lower secondary share suggests scope for further growth, subject to scrap availability, collection rates and investment.

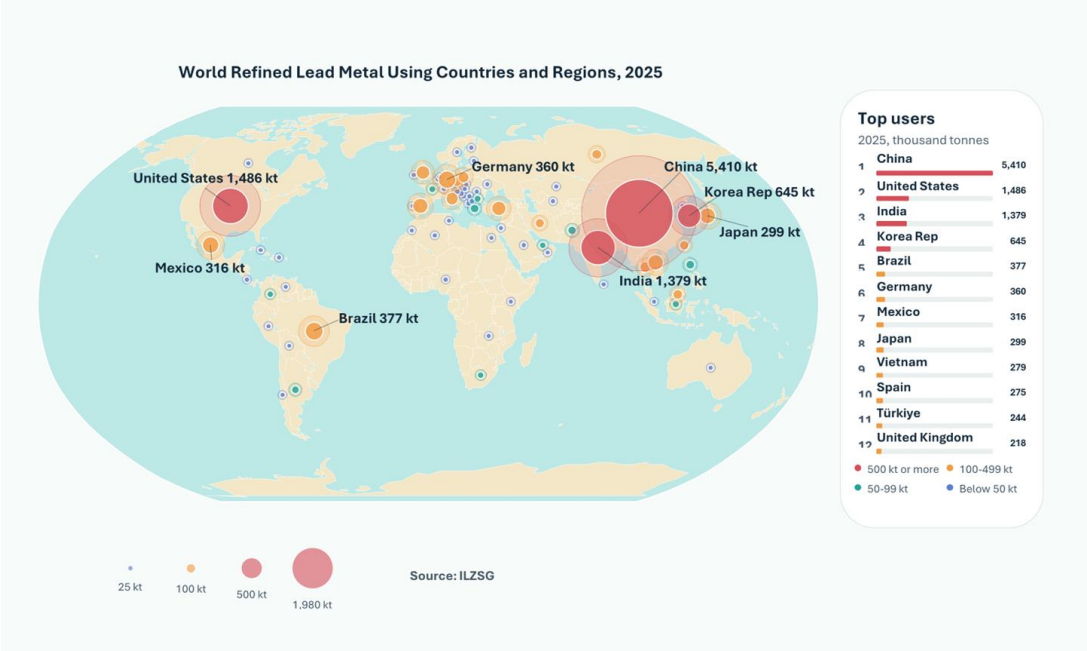
CHAPTER FOUR: LEAD USAGE



Accumulated refined lead metal usage reached 466.5 million tonnes through 2025. With the 2019-2025 trajectory continuing, the cumulative refined lead metal usage will top 532.8 million tonnes by 2030.

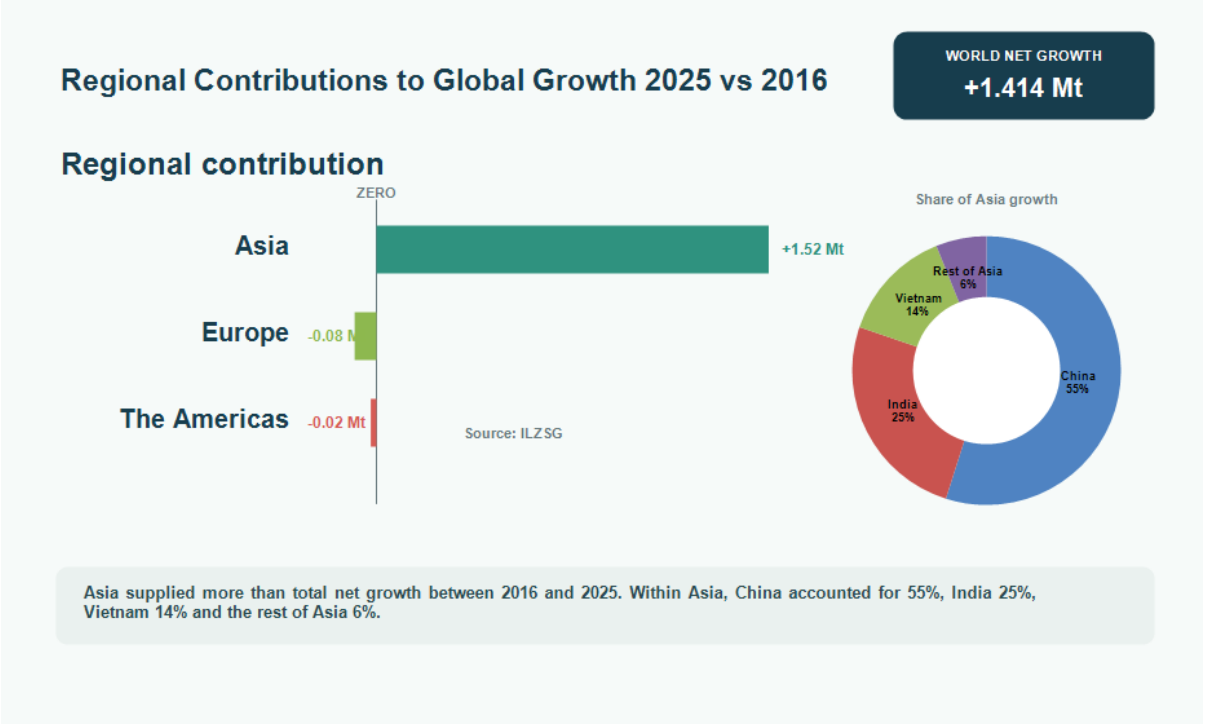


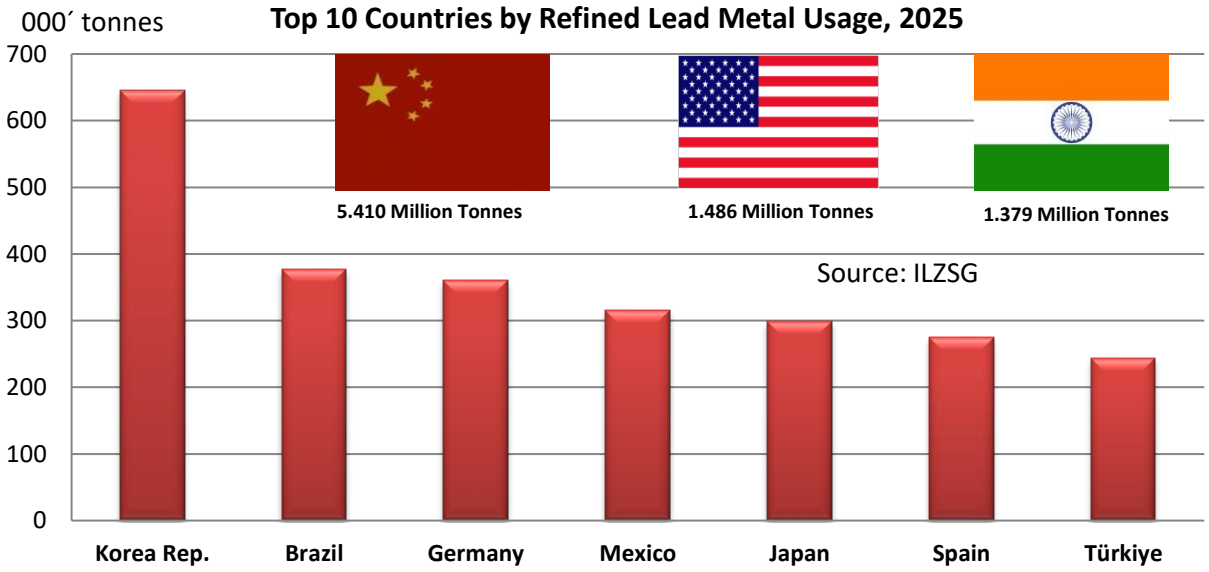
- Usage in Europe and the Americas remained broadly stable over 2016–2025.
- Growth was concentrated mainly in Asia, lifting world refined lead usage by around 1.6 million tonnes over the observed period.
- Global usage remained within a range of about 13.0–13.6 million tonnes in recent years, following the COVID-19-related decline in 2020 and recovery in 2021.



- More than 80 countries and regions use refined lead as an input to downstream products.
- Lead-containing products are used worldwide, with lead-acid batteries accounting for the largest share of demand.

World Refined Lead Metal Usage Growth 2025 vs 2016

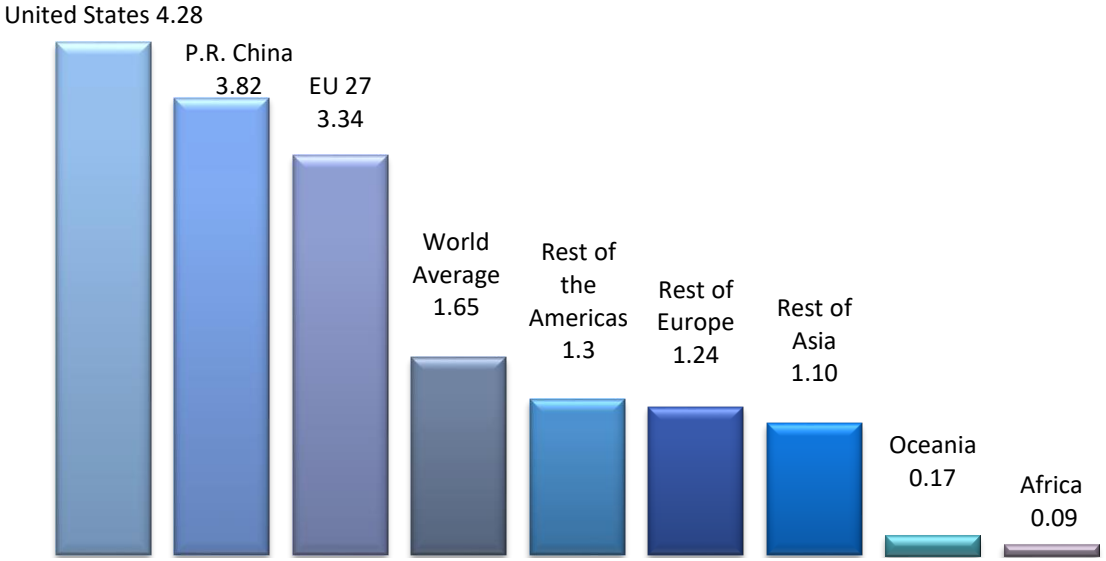




- China used more than 5.4 million tonnes of refined lead in 2025, accounting for 40% of global demand. The United States used about 1.5 million tonnes, equivalent to 11%. India came to the third with close to 1.4 million tonnes.

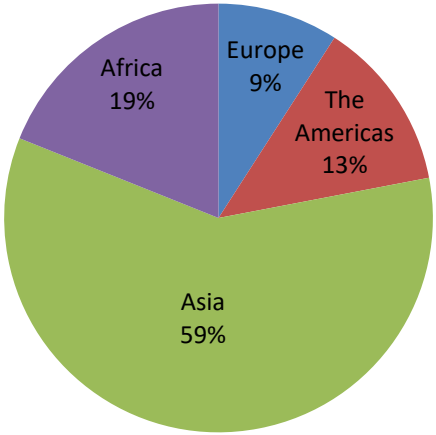
kg/per capita

World Refined Lead Metal Usage per Capita 2025



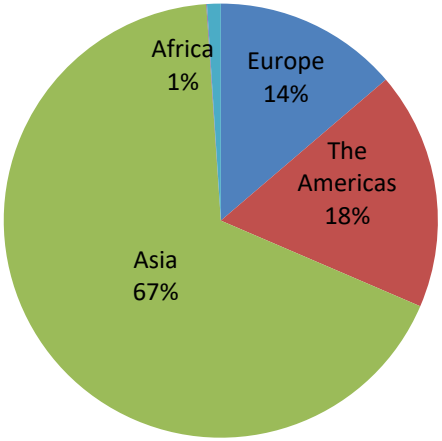
Source: ILZSG

World Demographic Breakdown 2025



Source: UN

World Refined Lead Metal Usage Geographic Allocation 2025



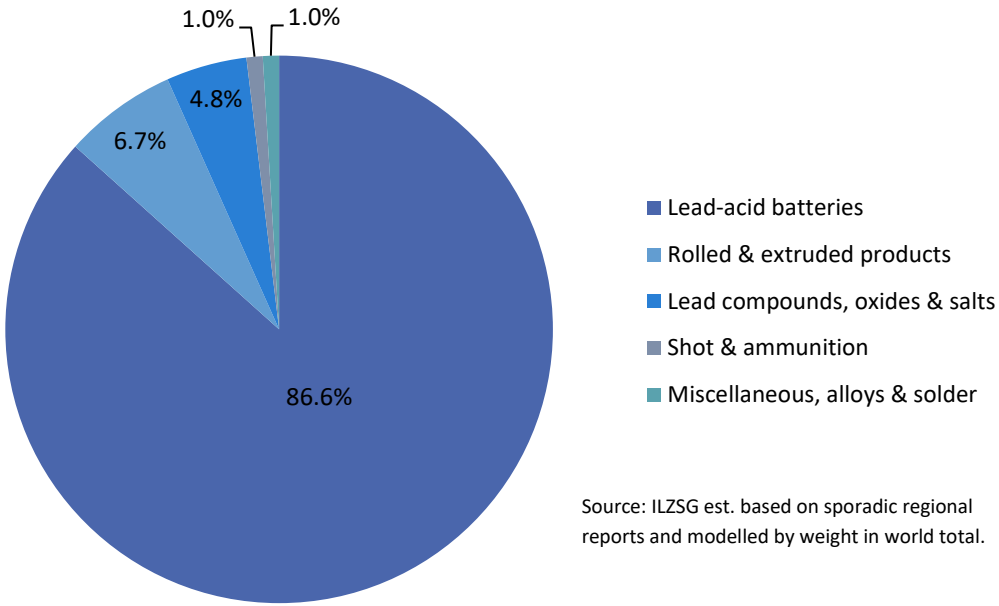
Source: ILZSG

Oceania including Australia and New Zealand with a population of 46.6 million used mere 8,000 tonnes of refined lead metal in 2025, accounted for less than 0.6% of the world total usage.

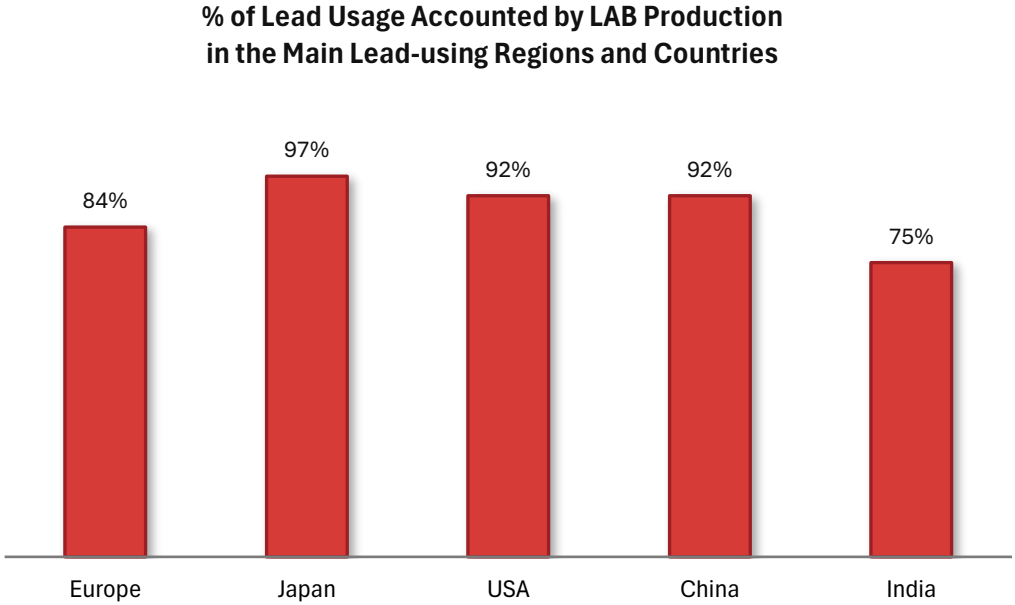
World Refined Lead Metal Usage

- Lead is among the earliest metals that have been extracted and used by humans, with a history extending back more than 6,000 years.
- Owing to its malleability, low melting point, high density and resistance to corrosion, lead has been used historically in water pipes, roofing, pigments, vessels, weights, coinage and alloys. Its principal modern applications include lead-acid batteries, rolled and extruded products, radiation shielding, cable sheathing, ammunition, lead compounds and specialised alloys.
- Today, lead-acid battery manufacturing is by far the largest end-use sector for refined lead. Demand is led by automotive starting-lighting-ignition and start-stop batteries, together with industrial batteries used for motive power, telecommunications, uninterruptible power supplies, data centres and other standby-power applications.
- Industry estimates indicate that automotive and industrial batteries account for more than 85% of global lead use. Lead batteries are also expected to retain an important role in transport, critical infrastructure and selected stationary and renewable-energy storage applications.
- Lead use in many traditional non-battery applications has declined as a result of health and environmental regulation, technological change and substitution by alternative materials. Nevertheless, lead continues to be used where its density, durability, corrosion resistance, shielding performance or recyclability provides a technical advantage.

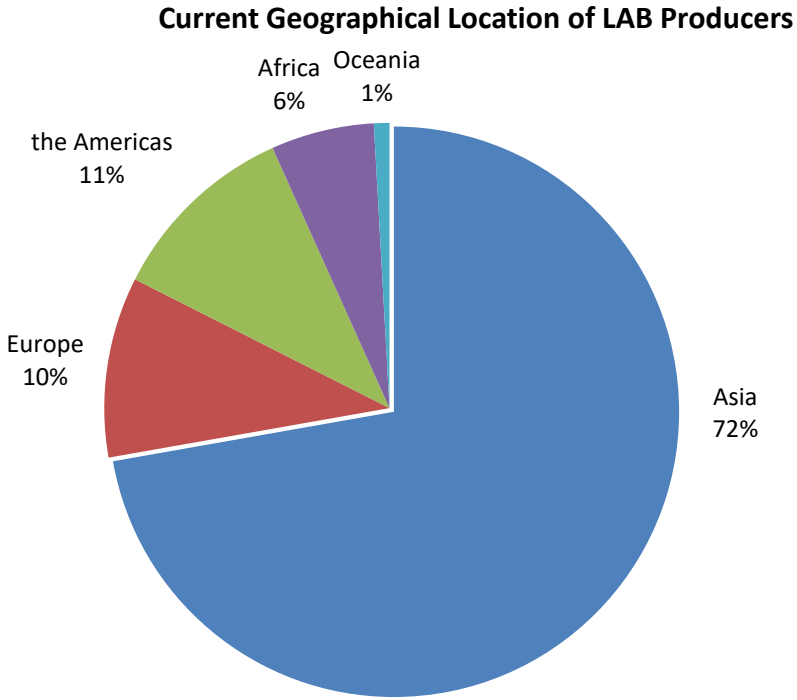
Current World Refined Lead Metal Usage by Sector



Source: ILZSG est. based on sporadic regional reports and modelled by weight in world total.



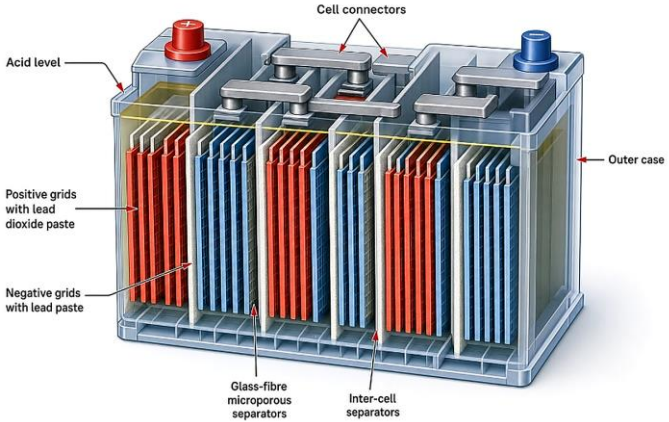
Source: ILZSG Est. synthesizing various sources including, but not limited to, JOGMEC, USGS, India's Ministry of Mines, EUROBAT, and SMM



Source: ILZSG est. through independent public-source review and indicative producer footprint

SLI Lead-Acid Batteries

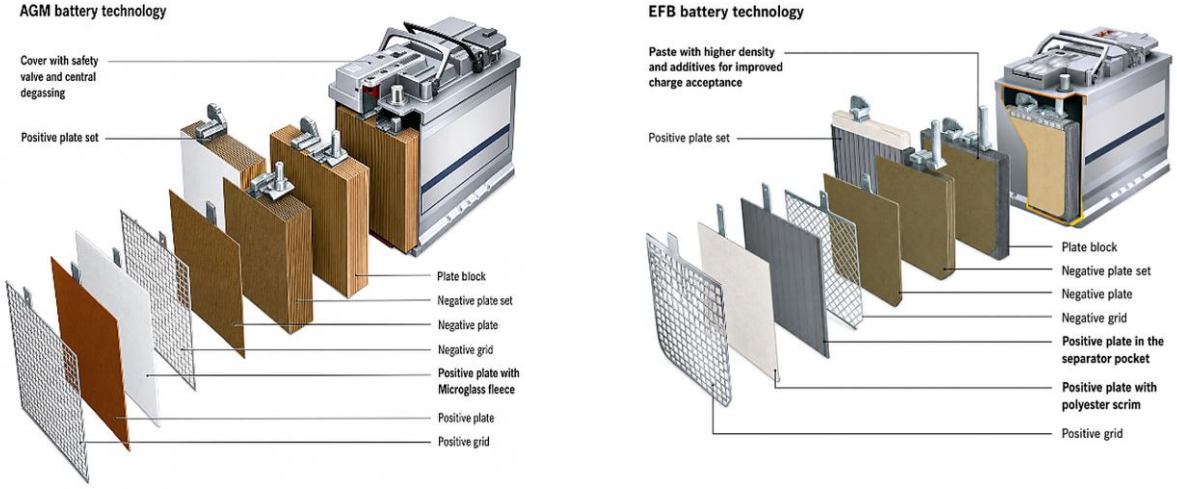
Standard SLI batteries are widely used in vehicles with internal combustion engines. On average, LABs for automobiles contain 9–14 kg of lead per unit. With the ongoing development of alternative battery chemistries and the accelerating adoption of EVs, it is possible that the traditional SLI LAB market will be affected, although any transition is likely to be gradual.



Note: the picture is created for illustration purpose only.

Start-Stop Lead-Acid Batteries

Advanced absorbent glass mat (AGM) and enhanced flooded batteries (EFBs) provide improved cycling performance and charge recovery for start-stop operation and fuel savings. These battery types may contain around 20% more lead than traditional SLI batteries.



Note: the pictures are created for illustration purpose only.

Industrial Lead-Acid Batteries

Lead content varies with battery design and storage capacity. Refined lead can account for nearly 60% of a lead-acid battery's weight. Industrial LABs are used in applications such as uninterruptible power supplies, telecommunications and renewable-energy storage.

Motive Lead-Acid Batteries

Motive lead-acid batteries are used in forklift trucks, airport ground-support equipment, golf carts and other traction applications.

Lead Wire, Lead Sheet, Lead Pipe and Cable Sheathing

Lead wire is used for a variety of applications such as lead anodes, lead weights, tying fishing flies, small castings for bullet and model-racing-car manufacture. Lead wire provides excellent resistance against heat, cold and chemicals.

Lead sheet is mainly used in the construction sector as a roofing material. According to the European Lead Sheet Association, over 100,000 tonnes of lead sheet are used globally each year. Other uses of lead sheet include radiation and X-ray shielding (lead sheet is an ideal quality product applicable to radiology for equipment such as linear accelerators, Gamma Knife systems, post-loading equipment, PET-CT rooms, CT rooms, DR rooms, DSA rooms, and X-ray machines in hospitals).

Lead Wire, Lead Sheet, Lead Pipe and Cable Sheathing

Lead pipe is now used mainly in specialized industrial applications involving acids and corrosive chemicals.

Lead Sheathed Cables

Lead has been used to sheathe cables for more than 130 years, but it was substituted substantially by other materials due to technological advancement in the cable industry. It is estimated that less than 10% of land and underwater cables are currently sheathed with metal. Lead accounts for a small portion of this market.

Lead Shot and Ammunition

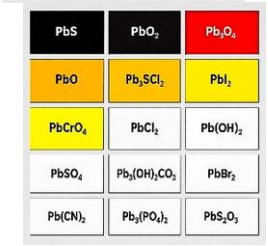
Lead remains widely used in ammunition, but environmental and wildlife concerns have led to tighter restrictions, particularly in wetlands.

Under the EU REACH Regulation, the use of lead shot in or within 100 metres of wetlands has been restricted since 15 February 2023. Broader restrictions remain subject to the applicable legislative process.

International initiatives, including work under AEWA and the Convention on Migratory Species, encourage the phase-out of lead ammunition where it poses risks to migratory species and their habitats.

Rules differ by jurisdiction; readers should consult current national and regional requirements.

Lead Compounds, Alloys and Solder

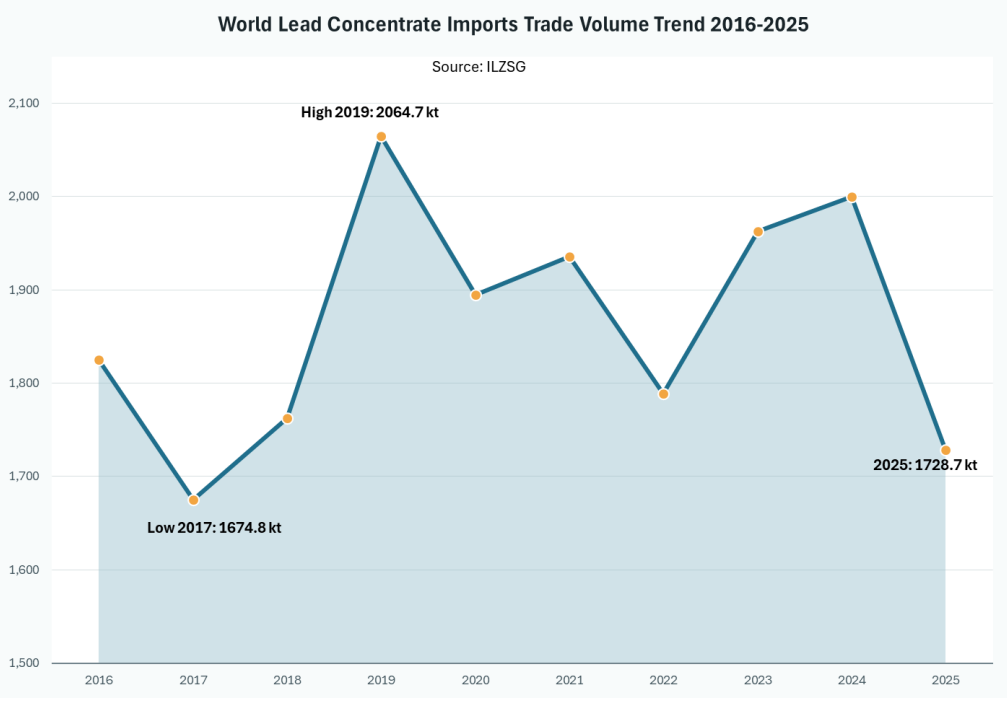


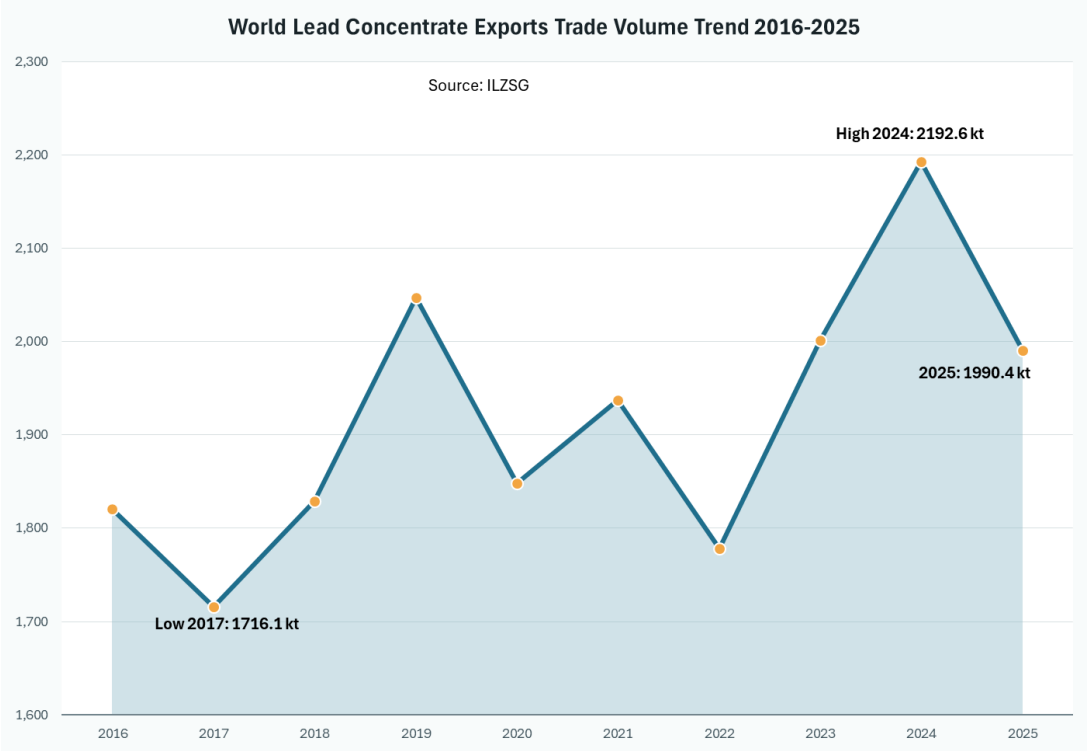
Lead compounds include lead monoxide (PbO), lead tetroxide known as red or orange lead (Pb3O4), tribasic lead sulphate, lead dichloride, dibasic lead phthalate, dibasic lead sulphate, neutral lead stearate, dibasic lead stearate, dibasic lead sulphite etc.

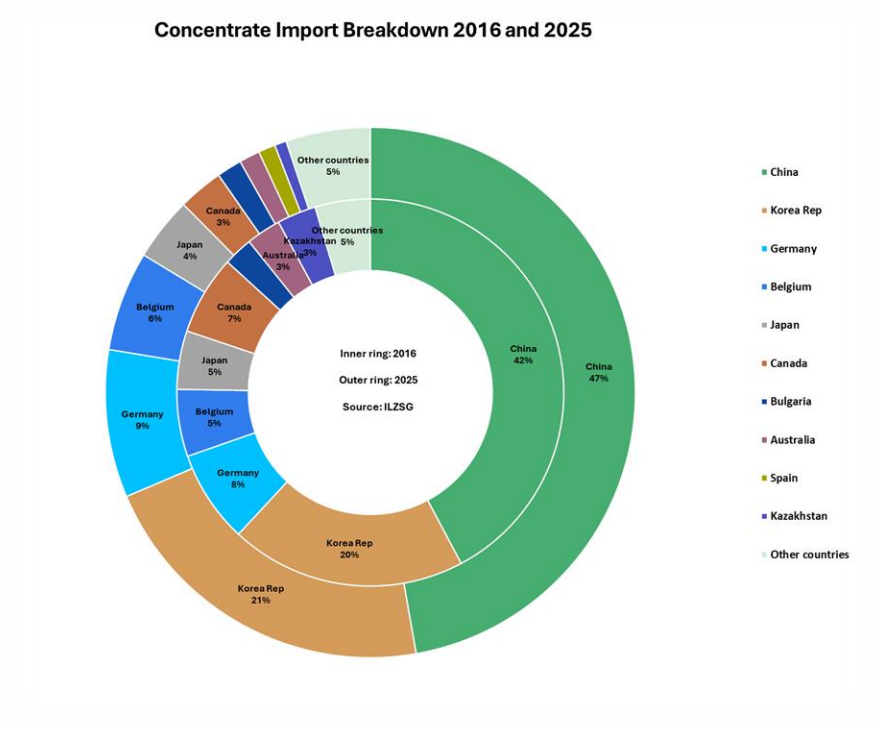
Lead-acid batteries are the main end-use sector for lead compounds. Other applications include plastic stabilizers, pigments and frits, crystal glass, and historical antiknock additives in petrol. Apart from batteries, usage in these sectors has decreased due to environmental legislation and subsequent substitution.

Lead alloys are used as type metal, window and fishing weights, etc. Lead solder was widely used in the electronics sector. However, its use in consumer products such as electronic devices has been banned in many jurisdictions; lead-free alternatives based on metals such as tin, silver and copper are now widely used.

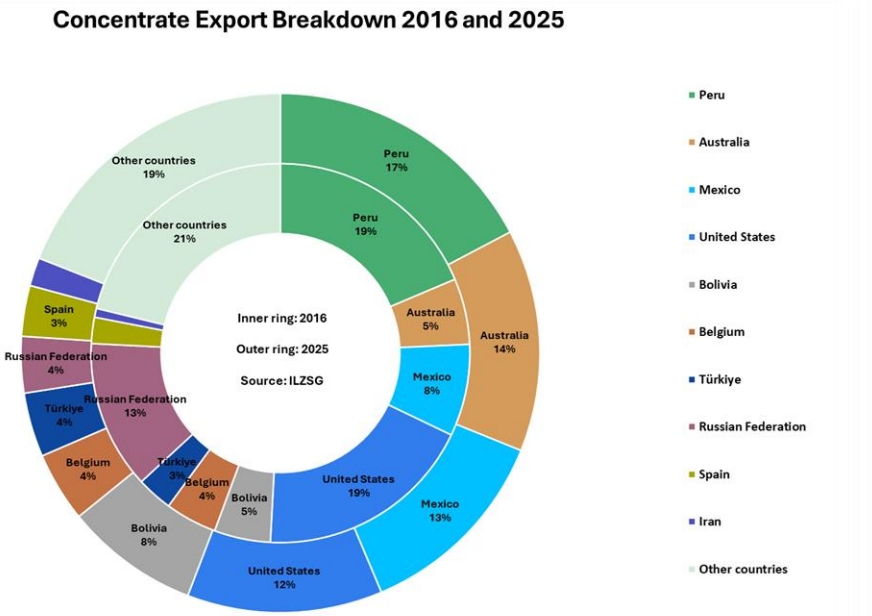
CHAPTER FIVE: LEAD MARKET AND TRADE



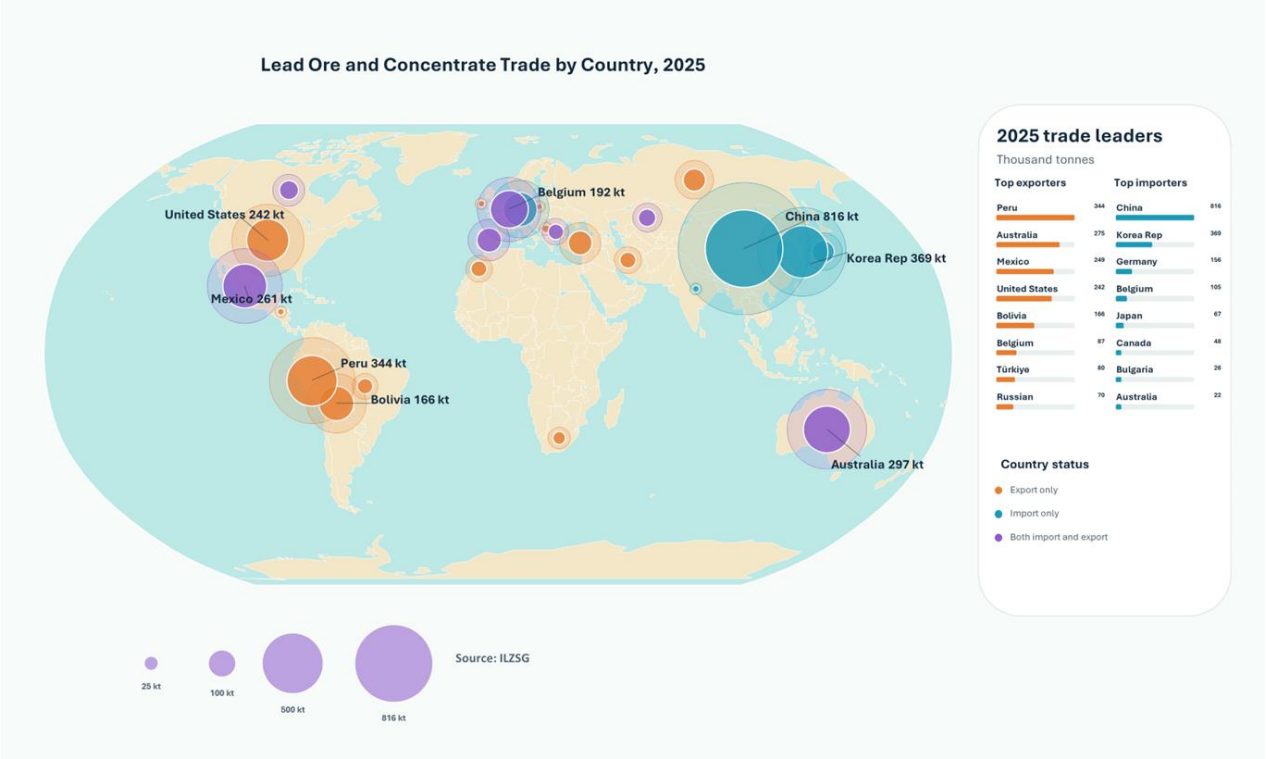

World Lead Concentrate Exports Trade Volume Trend 2016-2025
Source: ILZSG
High 2024: 2192.6 kt
2025: 1990.4 kt
Low 2017: 1716.1 kt
2,300
2,200
2,100
2,000
1,900
1,800
1,700
1,600
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025



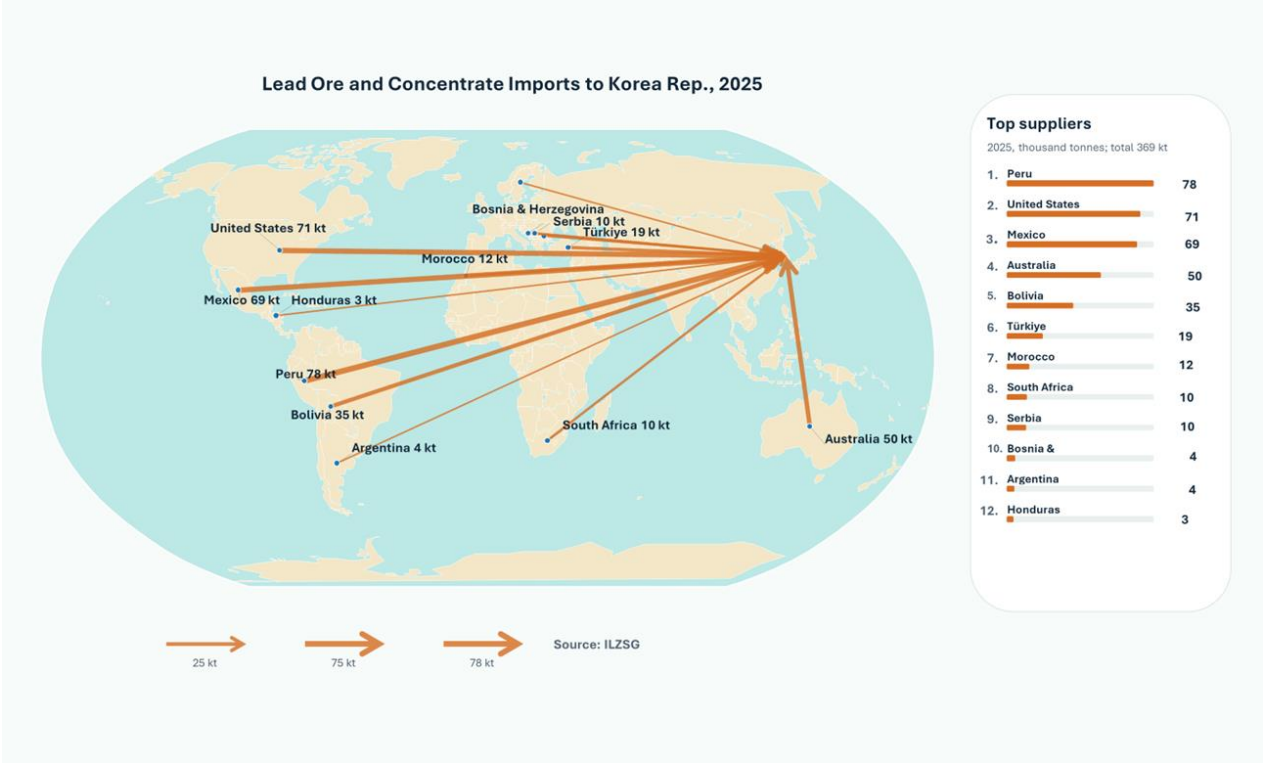
China remained the largest concentrate importer, but its share further increased from 42% in 2014 to 47% in 2025. Korea Rep increased from 20% to 21%, while Germany and Belgium retained stable shares. The distribution among the remaining importers indicates a modest diversification of trade.

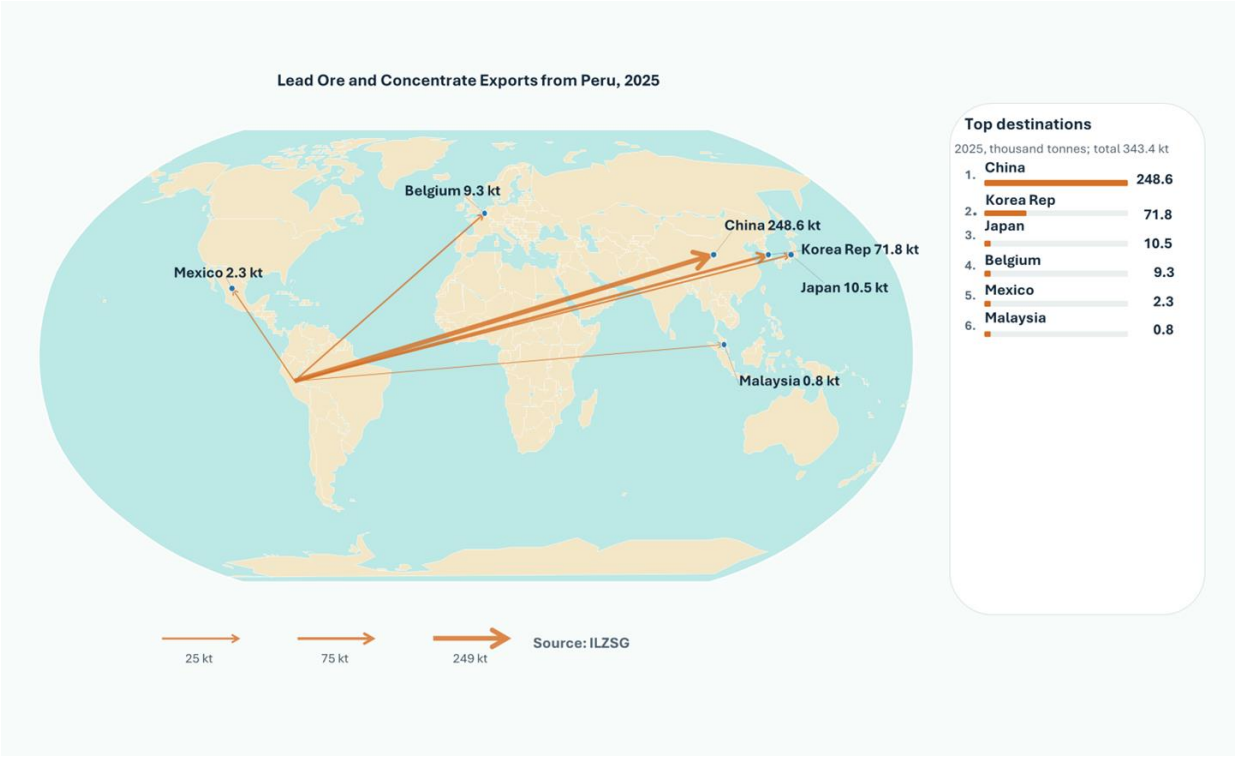


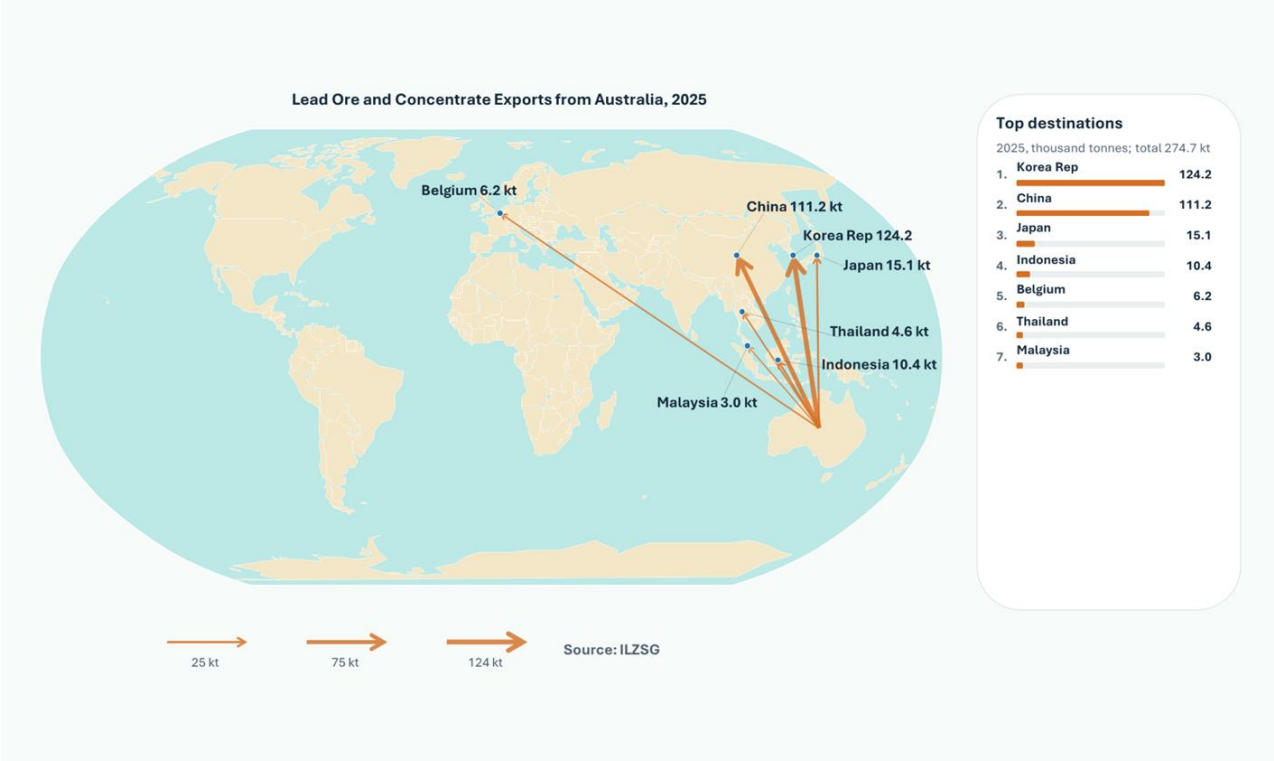
Peru became the largest concentrate exporter in 2025, rising from 17% of world exports in 2016 to 19%. Australia and Mexico also gained share, while the United States and Russian Federation declined. The leading exporters remain concentrated in the Americas and Oceania, while other countries account for a smaller combined share.

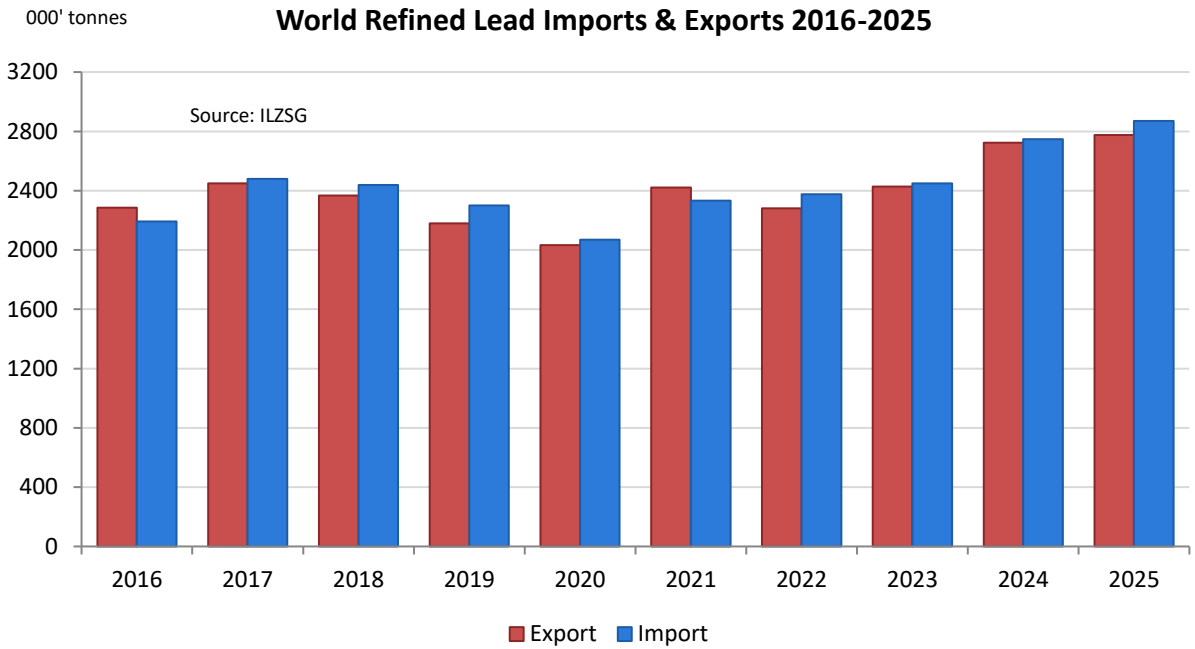

Lead Ore and Concentrate Trade by Country, 2025
United States 242 kt
Mexico 261 kt
Belgium 192 kt
China 816 kt
Korea Rep 369 kt
Peru 344 kt
Bolivia 166 kt
Australia 297 kt
25 kt
100 kt
500 kt
816 kt
Source: ILZSG
2025 trade leaders
Thousand tonnes
Top exporters
Peru 344
Australia 275
Mexico 249
United States 242
Bolivia 166
Belgium 87
Türkiye 80
Russian 70
Top importers
China 816
Korea Rep 369
Germany 156
Belgium 105
Japan 67
Canada 48
Bulgaria 26
Australia 22
Country status
Export only
Import only
Both import and export

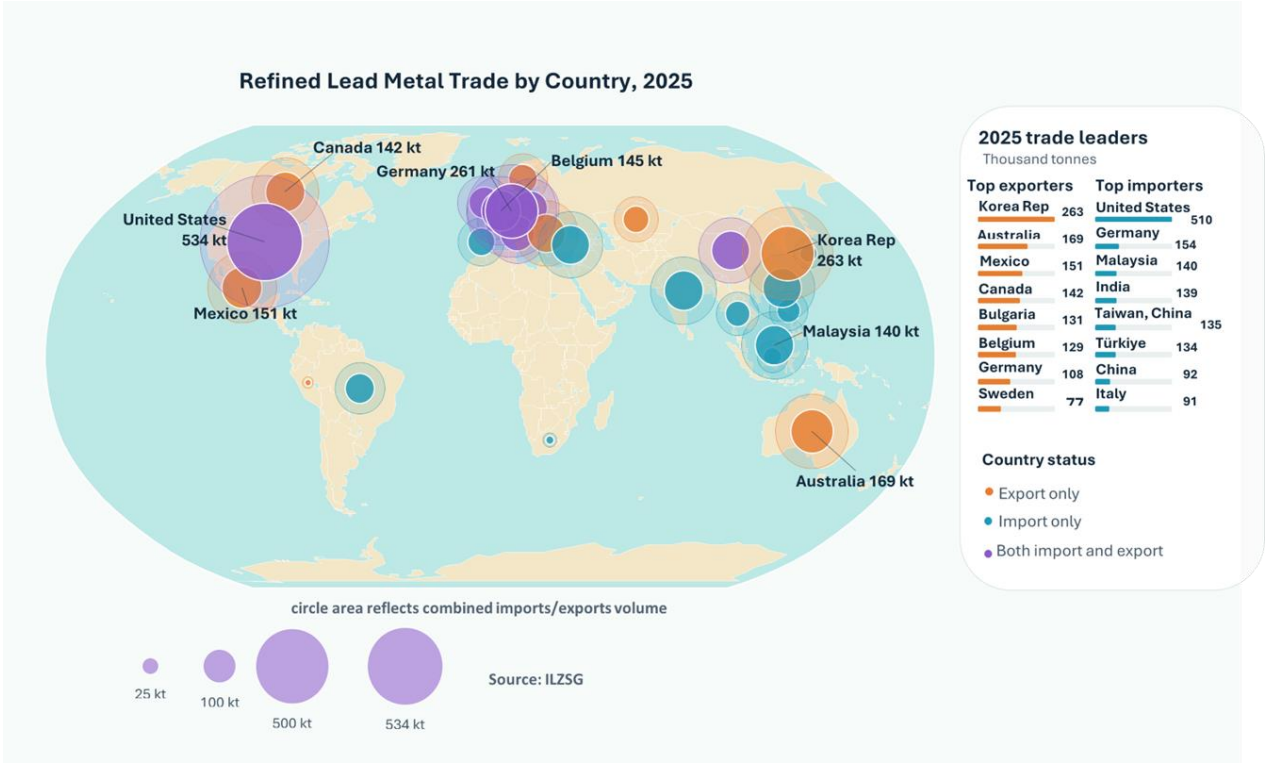
Lead Ore and Concentrate Imports to China, 2025
Russian Federation 243 kt
Kazakhstan 14 kt
Tajikistan 62 kt
Türkiye 35 kt
United States 63 kt
Morocco 18 kt
Myanmar 21 kt
Vietnam 14 kt
Oman 55 kt
Peru 74 kt
Brazil 17 kt
Australia 89 kt
25 kt
75 kt
243 kt
Source: ILZSG
Top suppliers
2025, thousand tonnes; total 816 kt
1. Russian Federation 243
2. Australia 89
3. Peru 74
4. United States 63
5. Tajikistan 62
6. Oman 55
7. Türkiye 35
8. Myanmar 21
9. Morocco 18
10 Brazil 17
11 Kazakhstan 14
12 Vietnam 14

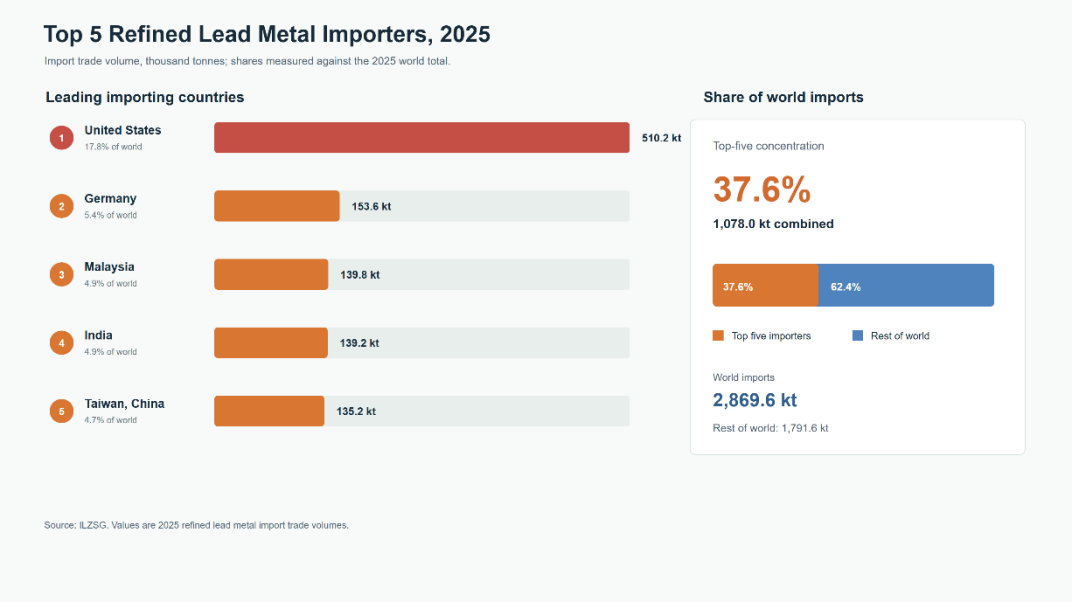

Lead Ore and Concentrate Imports to Korea Rep., 2025
United States 71 kt
Bosnia & Herzegovina
Serbia 10 kt
Türkiye 19 kt
Morocco 12 kt
Mexico 69 kt
Honduras 3 kt
Peru 78 kt
Bolivia 35 kt
Argentina 4 kt
South Africa 10 kt
Australia 50 kt
25 kt
75 kt
78 kt
Source: ILZSG
Top suppliers
2025, thousand tonnes; total 369 kt
1. Peru 78
2. United States 71
3. Mexico 69
4. Australia 50
5. Bolivia 35
6. Türkiye 19
7. Morocco 12
8. South Africa 10
9. Serbia 10
10. Bosnia & 4
11. Argentina 4
12. Honduras 3


Lead Ore and Concentrate Exports from Peru, 2025
Belgium 9.3 kt
China 248.6 kt
Korea Rep 71.8 kt
Mexico 2.3 kt
Japan 10.5 kt
Malaysia 0.8 kt
25 kt
75 kt
249 kt
Source: ILZSG
Top destinations
2025, thousand tonnes; total 343.4 kt
1. China 248.6
2. Korea Rep 71.8
3. Japan 10.5
4. Belgium 9.3
5. Mexico 2.3
6. Malaysia 0.8

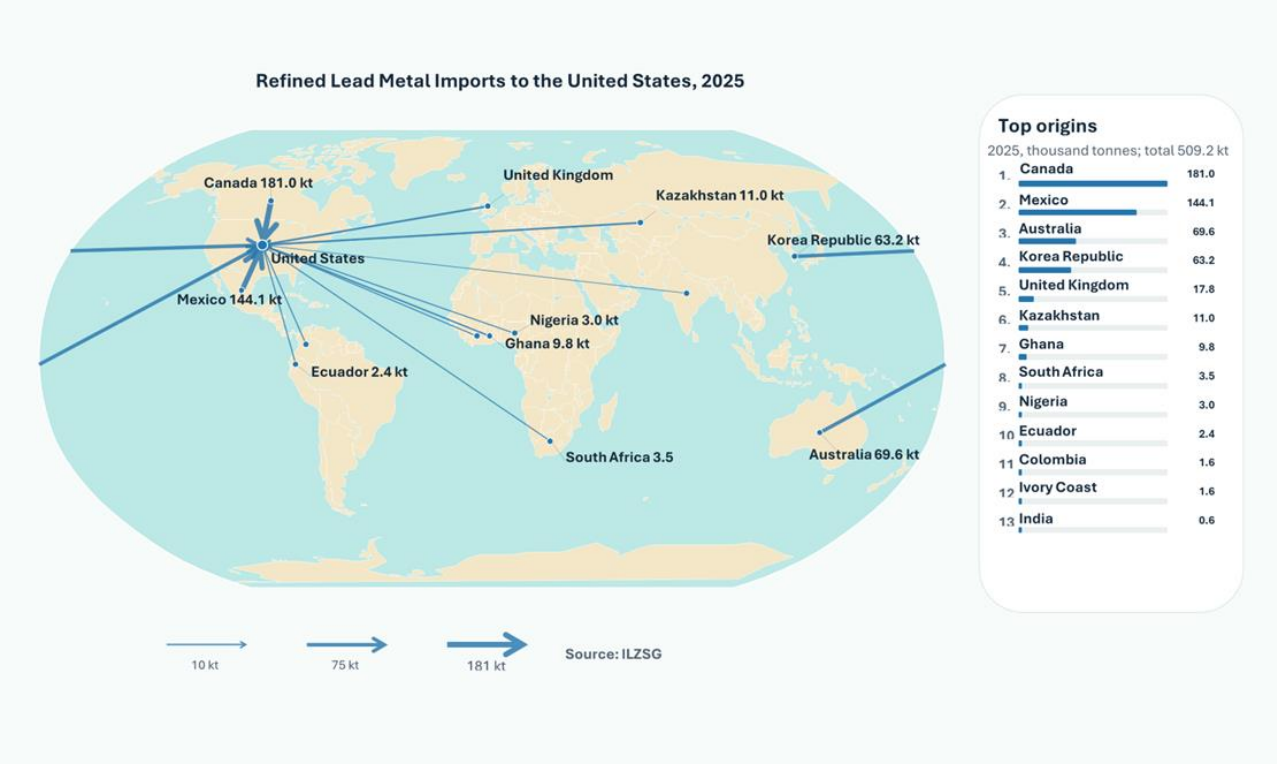

Lead Ore and Concentrate Exports from Australia, 2025
Belgium 6.2 kt
China 111.2 kt
Korea Rep 124.2
Japan 15.1 kt
Thailand 4.6 kt
Indonesia 10.4 kt
Malaysia 3.0 kt
25 kt
75 kt
124 kt
Source: ILZSG
Top destinations
2025, thousand tonnes; total 274.7 kt
1. Korea Rep 124.2
2. China 111.2
3. Japan 15.1
4. Indonesia 10.4
5. Belgium 6.2
6. Thailand 4.6
7. Malaysia 3.0

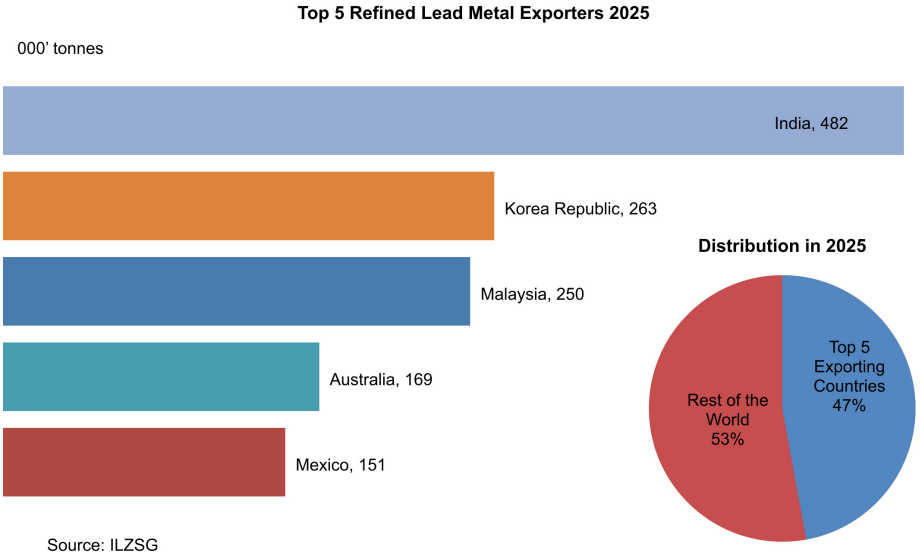

000' tonnes
World Refined Lead Imports & Exports 2016-2025
Source: ILZSG
3200
2800
2400
2000
1600
1200
800
400
0
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Export
Import


Refined Lead Metal Trade by Country, 2025
Canada 142 kt
Germany 261 kt
Belgium 145 kt
United States
534 kt
Mexico 151 kt
Korea Rep
263 kt
Malaysia 140 kt
Australia 169 kt
2025 trade leaders
Thousand tonnes
Top exporters
Korea Rep 263
Australia 169
Mexico 151
Canada 142
Bulgaria 131
Belgium 129
Germany 108
Sweden 77
Top importers
United States 510
Germany 154
Malaysia 140
India 139
Taiwan, China 135
Türkiye 134
China 92
Italy 91
Country status
Export only
Import only
Both import and export
circle area reflects combined imports/exports volume
25 kt
100 kt
500 kt
534 kt
Source: ILZSG

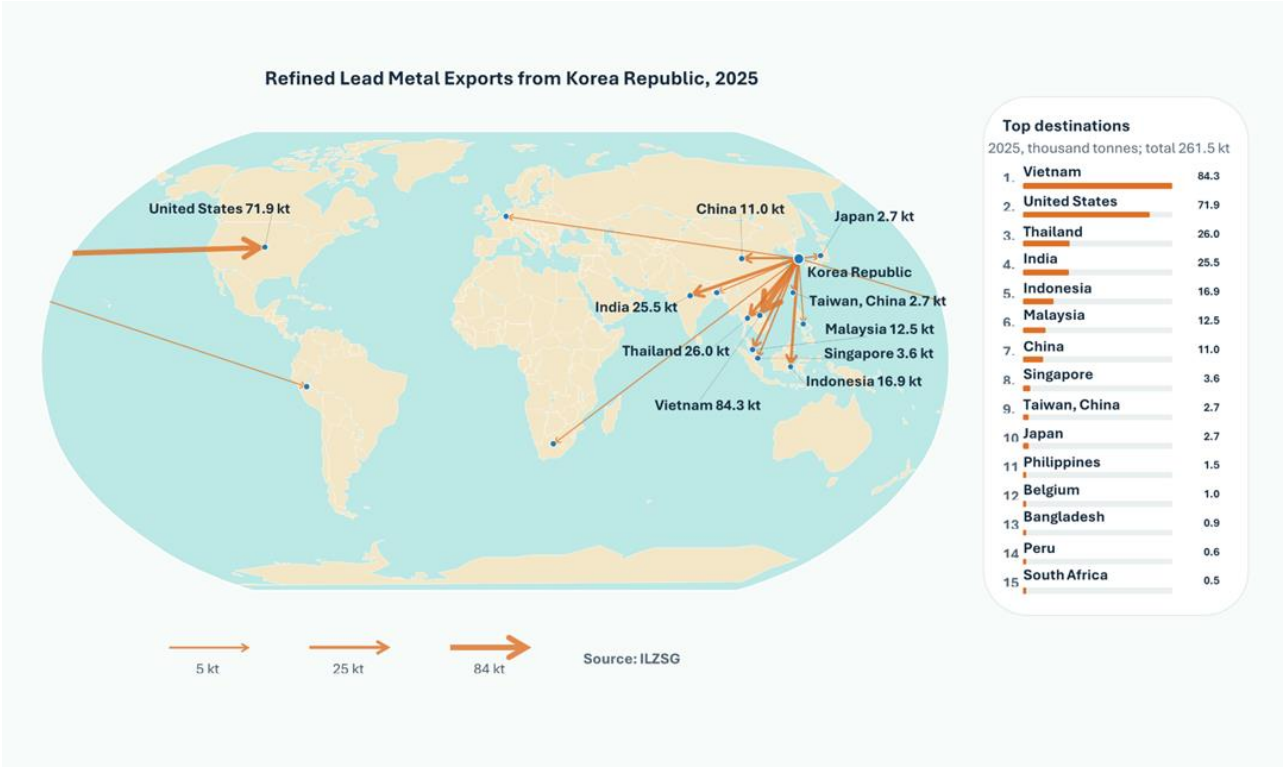


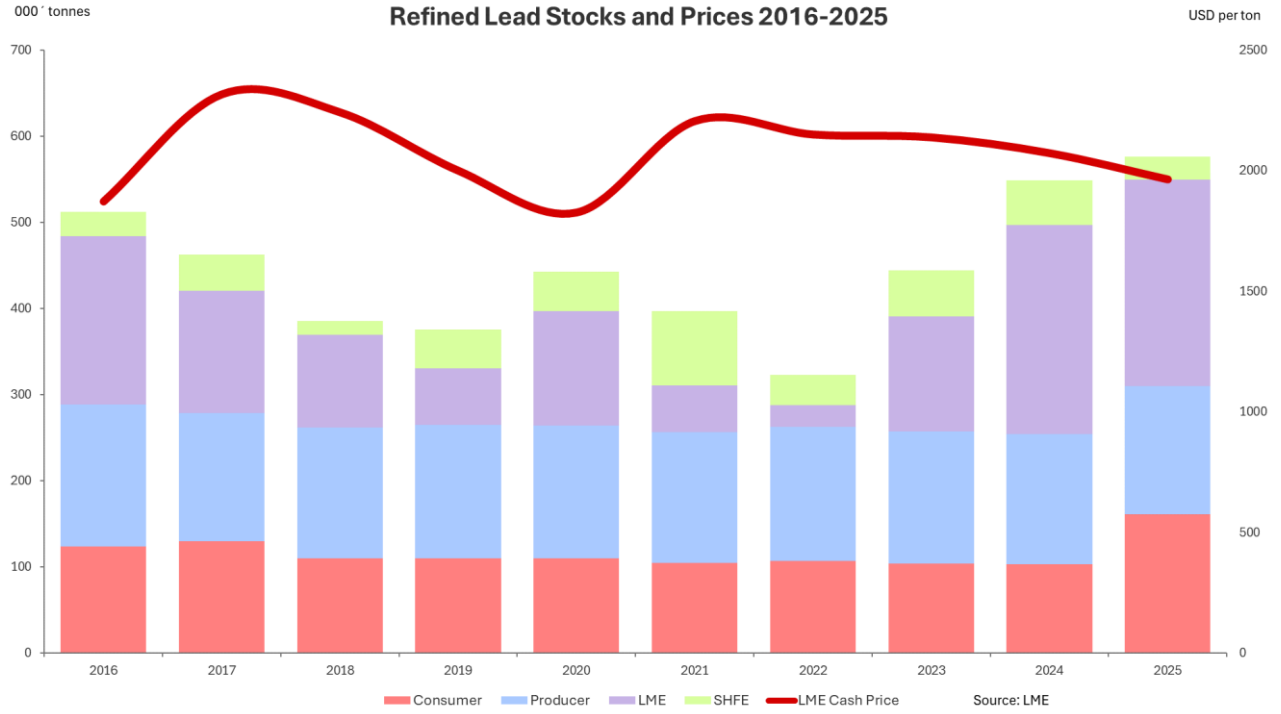
The United States was the world's largest refined lead importer in 2025, accounting for 17.8% of global refined lead imports. The five leading importers together accounted for 37.6%.


Refined Lead Metal Imports to the United States, 2025
Canada 181.0 kt
United Kingdom
Kazakhstan 11.0 kt
Korea Republic 63.2 kt
United States
Mexico 144.1 kt
Nigeria 3.0 kt
Ghana 9.8 kt
Ecuador 2.4 kt
South Africa 3.5
Australia 69.6 kt
10 kt
75 kt
181 kt
Source: ILZSG
Top origins
2025, thousand tonnes; total 509.2 kt
1. Canada 181.0
2. Mexico 144.1
3. Australia 69.6
4. Korea Republic 63.2
5. United Kingdom 17.8
6. Kazakhstan 11.0
7. Ghana 9.8
8. South Africa 3.5
9. Nigeria 3.0
10 Ecuador 2.4
11 Colombia 1.6
12 Ivory Coast 1.6
13 India 0.6



- India was the largest refined lead exporter in 2025, followed by Korea Rep.
- The five leading exporting countries accounted for 47% of global refined lead exports.


Refined Lead Metal Exports from Korea Republic, 2025
United States 71.9 kt
China 11.0 kt
Japan 2.7 kt
Korea Republic
India 25.5 kt
Taiwan, China 2.7 kt
Malaysia 12.5 kt
Thailand 26.0 kt
Singapore 3.6 kt
Indonesia 16.9 kt
Vietnam 84.3 kt
5 kt
25 kt
84 kt
Source: ILZSG
Top destinations
2025, thousand tonnes; total 261.5 kt
1. Vietnam 84.3
2. United States 71.9
3. Thailand 26.0
4. India 25.5
5. Indonesia 16.9
6. Malaysia 12.5
7. China 11.0
8. Singapore 3.6
9. Taiwan, China 2.7
10 Japan 2.7
11 Philippines 1.5
12 Belgium 1.0
13 Bangladesh 0.9
14 Peru 0.6
15 South Africa 0.5


000´ tonnes
Refined Lead Stocks and Prices 2016-2025
USD per ton
700
600
500
400
300
200
100
0
2500
2000
1500
1000
500
0
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Consumer
Producer
LME
SHFE
LME Cash Price
Source: LME

CHAPTER SIX: HEALTH, ENVIRONMENT AND SAFETY

Native lead is rare. Lead is usually found in ores associated with zinc, silver and copper and is often recovered together with these metals.

Over the past 50 years, the use of lead in road-vehicle petrol, many paints and some water-distribution applications has fallen substantially. Stronger workplace, emission and exposure controls have also reduced releases and exposures in many jurisdictions, although risks remain and vary by location.

The global phase-out of leaded petrol for road vehicles was completed in 2021, marking a major public-health achievement. Lead can nevertheless enter air, soil and water from natural processes and human activities, including mining and smelting, battery manufacture and recycling, legacy paint and contaminated dust, certain aviation fuels, and corrosion of lead-containing plumbing. Effective controls, monitoring and responsible recycling remain essential throughout the lead value chain.

In 2023, ILZSG published Environment and Health Controls on Lead, which summarises relevant legislation, initiatives and regulatory developments.

SWOT Summary of Lead Industry

The lead industry continues to play an important role in the global economy, mainly because of its use in lead-acid batteries. These batteries are still widely used in cars, backup power systems, telecommunications, and even some renewable energy storage applications. One of the industry's biggest strengths is its high recyclability. In many countries, more than 95% of lead-acid batteries are recycled, which is remarkable compared with many other materials. That not only cuts production costs but also helps conserve natural resources and supports a more circular approach to manufacturing. The industry also benefits from decades of established infrastructure, reliable production methods, and steady demand from both the transport and industrial sectors.

That said, the industry has some clear drawbacks. Depending on the exposure level, lead can pose health and environmental risks, so handling it safely is always a major concern. If mining, smelting, or waste disposal are not managed properly, they can contaminate the air, soil, and water. As a result, companies often face strict regulations and significant compliance costs. On top of that, the industry depends heavily on battery production, which means changes in the automotive or energy markets can have a noticeable impact.

Even with these challenges, there are still promising opportunities. Demand for dependable energy storage is growing, especially for data centres, hospitals, telecommunications networks, and renewable energy systems, where lead-acid batteries continue to have a place. The replacement market from the current ICE fleet still provide a mid to long term support to LABs. Improvements in recycling technologies and cleaner production processes could also make the industry more efficient while reducing its environmental footprint. In addition, developing economies may provide room for growth as vehicle ownership rises and industrial infrastructure expands.

The biggest threats, however, come from changing technology and tighter regulation. Lithium-ion batteries are increasingly present on the EV market and consumer electronics because they are lighter and store more energy. At the same time, governments are introducing stricter environmental and workplace safety standards, making operations more expensive and new mining projects harder to develop. Growing environmental, social, and governance expectations may also discourage investment. Looking ahead, the industry's long-term success will likely depend on balancing sustainable recycling, innovation, operational efficiency, and responsible production practices.

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Official Definitions

Lead Mine Production: Lead content by analysis of lead ores and concentrates plus the lead content of other ores and concentrates known to be intended for lead recovery.

Lead Metal Production: Total production by smelters and refineries of refined pig lead, including the lead content of antimonial lead and other fully refined lead alloys, regardless of the type of source material, i.e. whether ores, concentrates, lead bullion, mattes, residues, slag or scrap. Production on toll carried out in the reporting country should be included. Remelted lead and lead alloys recovered from secondary materials without undergoing a full refining process should be excluded.

Primary: Production of refined lead and refined lead alloys from concentrates, bullion and other primary materials (mine tailings and slags, residues, drosses, etc. from primary smelting and refining).

Secondary: Production of refined lead and refined lead alloys from scrap materials (lead-acid batteries, lead sheet, strip, pipes, cable sheathing, etc.) together with residues, drosses, wastes, etc. from fabricating/processing operations. Remelted lead and lead alloys recovered from secondary materials without undergoing a full refining process should be excluded.

Lead Metal Usage: Usage of the types of metal reported under Total Metal Production.

Harmonised System Trade Codes used by ILZSG as follows: Lead concentrates 2607.00; refined lead 7801.10; antimonial lead alloys 7801.91.

International Lead and Zinc Study Group

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