Tariffs, technology, regulation and subsidies

How they influence lead –acid battery scrap generation

Agenda

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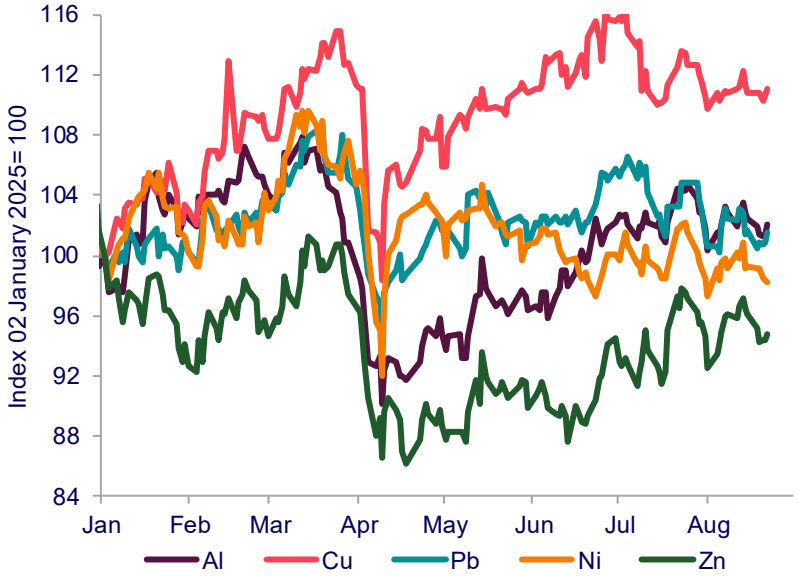
2025- so far

Cash price very close to year opening levels

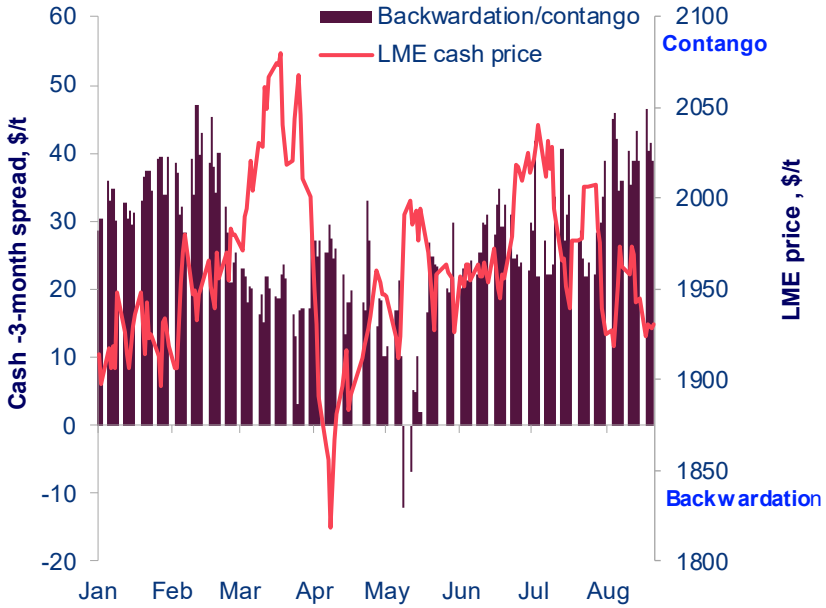
Lead - in the middle of the pack

LME metals price performance 2025



Source: LME, Wood Mackenzie

Lead has remained in contango for almost all of 2025



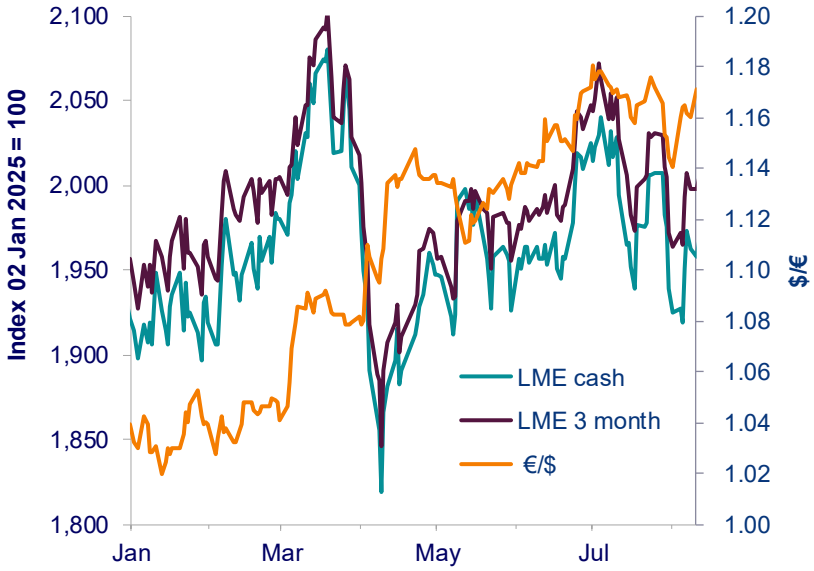
Source: LME, Wood Mackenzie

Price follows macro economic events above metal balance

LME stock build financed by contango during 2025

Source: LME, Wood Mackenzie

USD – lead price correlation resets after liberation day

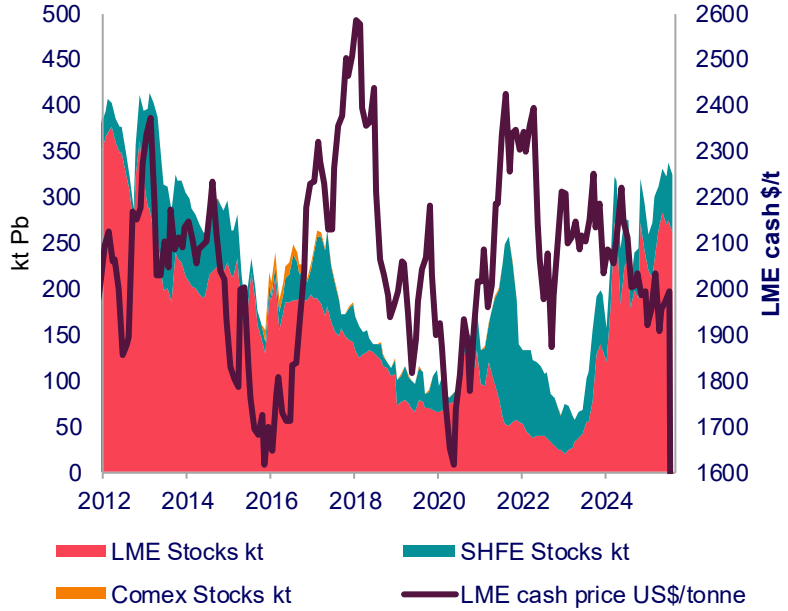


Source: LME, Wood Mackenzie

Exchange stocks build during 2025

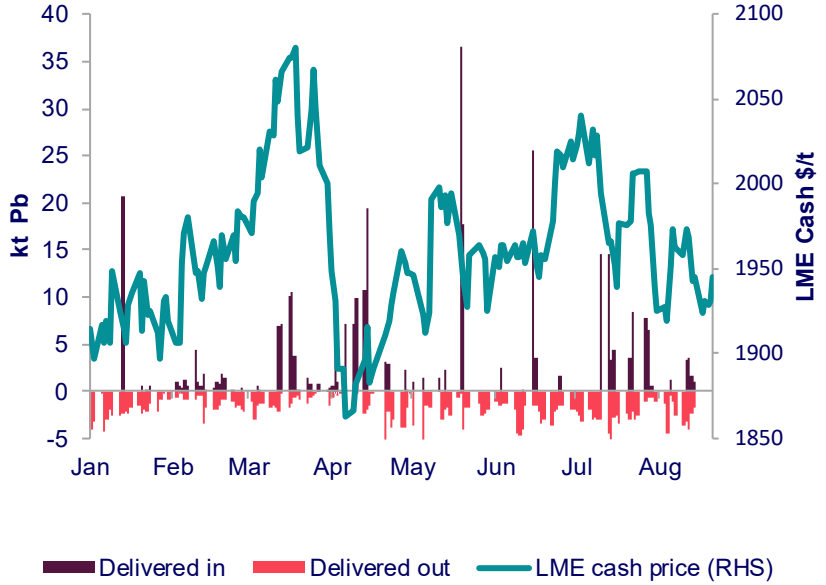
SHFE and LME stock Moving together

LME and SHFE stock movements similar in 2025



Source: LME, Wood Mackenzie

Many small withdrawals but few large deliveries to LME



Source: LME, Wood Mackenzie

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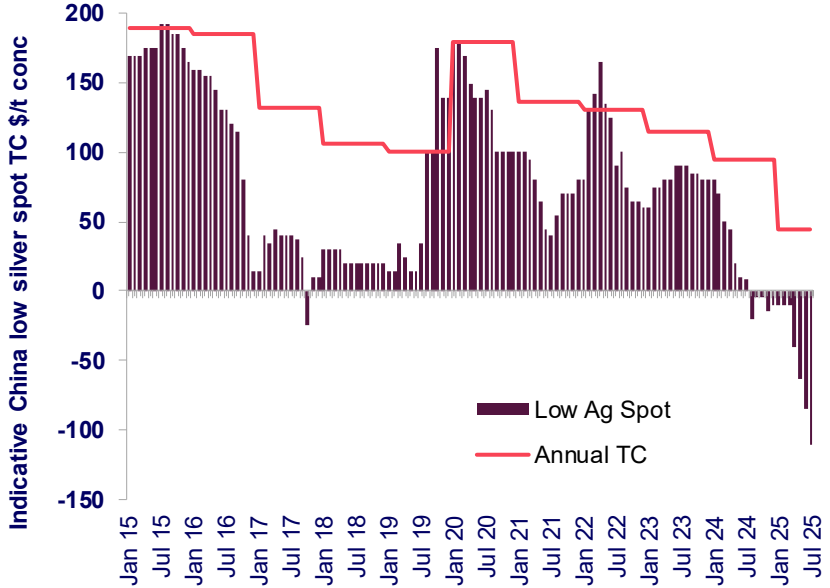
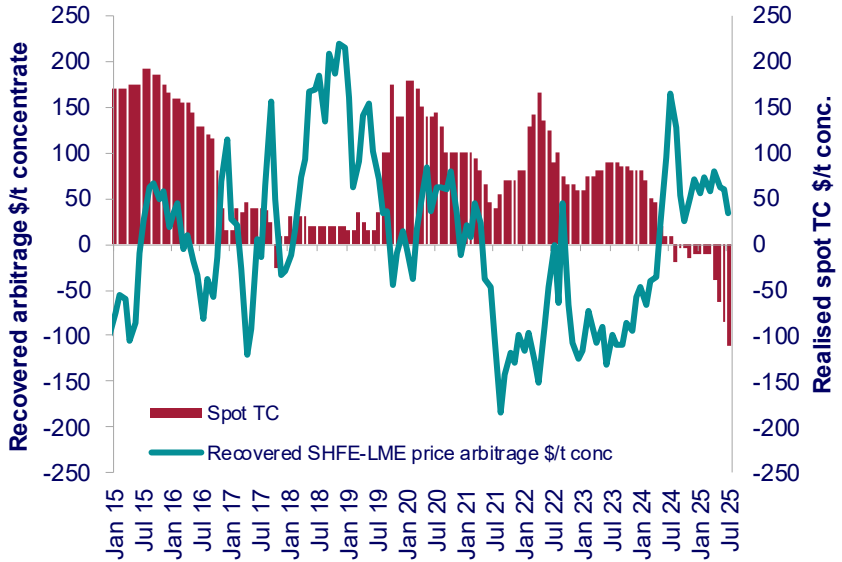
Concentrate Treatment Charge

Low silver spot and benchmark TCs



Source: Wood Mackenzie

Lead arbitrage and spot TC



Source: LME, SHFE, Wood Mackenzie

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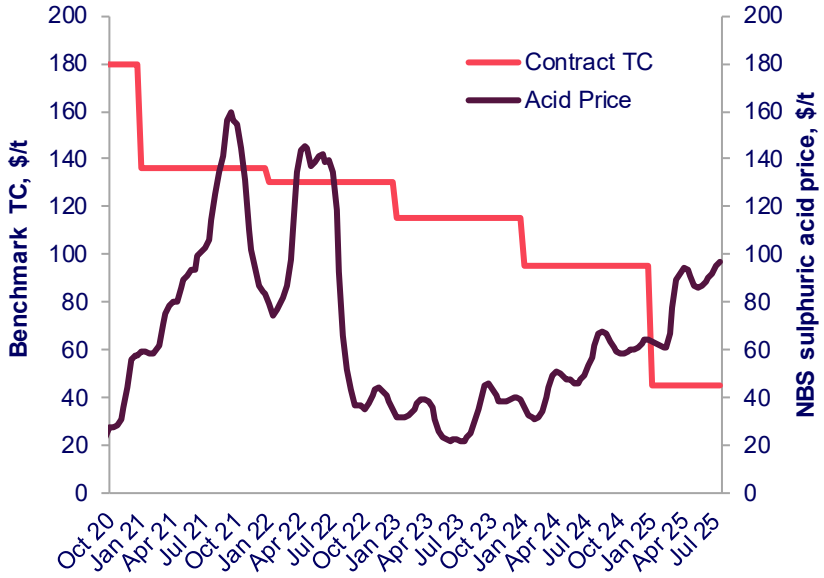
Influences on China spot TCs

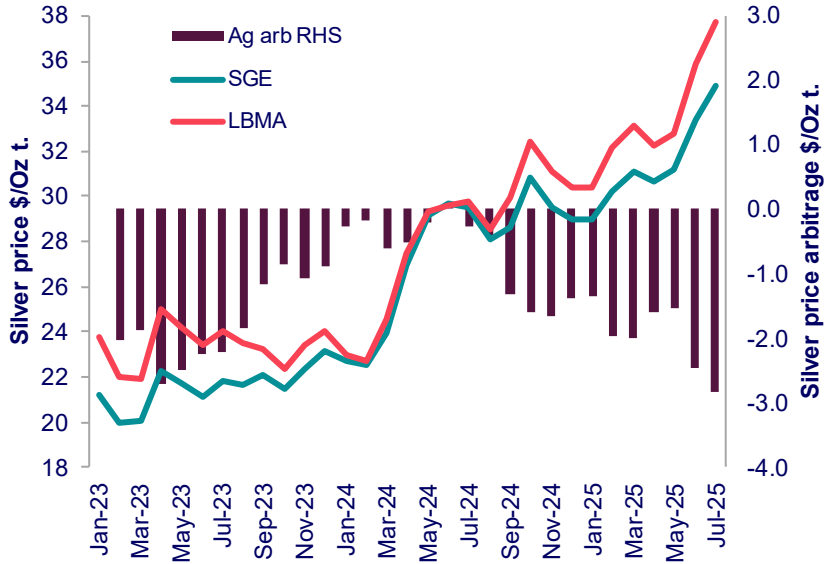
Byproduct revenues rising

Sulphuric acid price - China



Source: Wood Mackenzie, NBS China

Silver price arbitrage

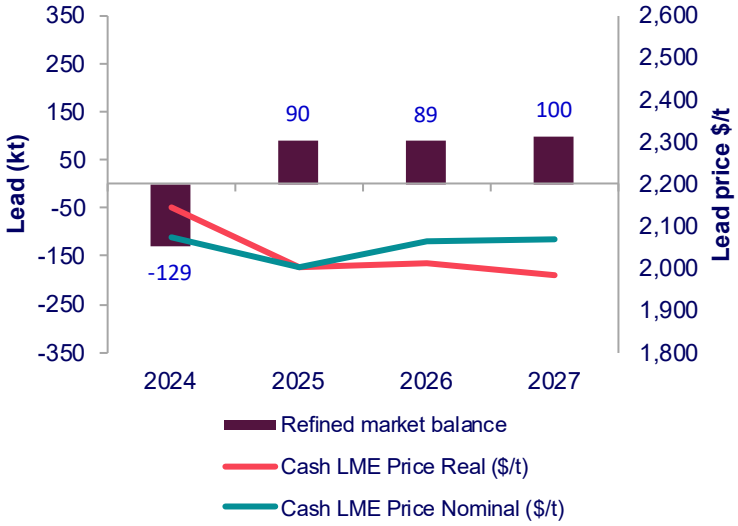


Source: SGE , LBMA, Wood Mackenzie

Short–term forecast

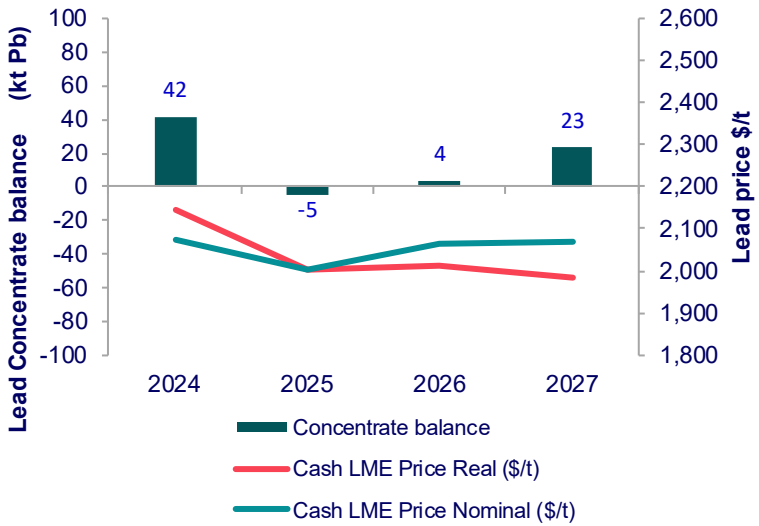
Short-term forecast

Refined Balance



Source: Wood Mackenzie, LME

Concentrate balance



Source: Wood Mackenzie LME

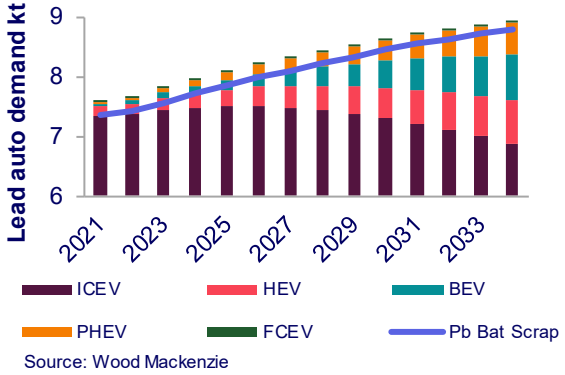
Global Auto demand powertrain scenarios

Lead battery demand and lead battery scrap generation vary with pace of EV transition

Base case

(2034 total 8.9 million tonnes)

This scenario assumes that on switch to BEV, 12v SLI batteries are replaced by smaller lead-acid auxiliary batteries (LAAB

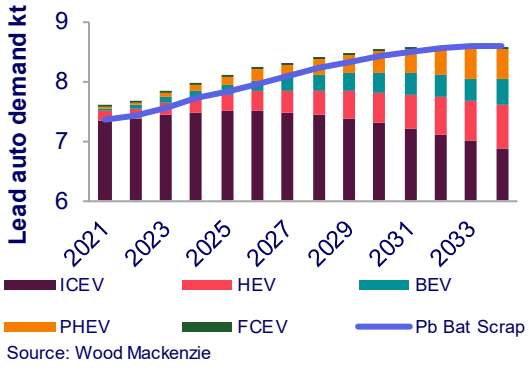


Source: Wood Mackenzie

Auxiliary battery substitution

(2034 total 8.5 million tonnes)

As scenario one but 80% of lead acid auxiliary batteries (LAAB) in non-ICE vehicles are gradually replaced with lithium-ion batteries (LIB) by 2034.

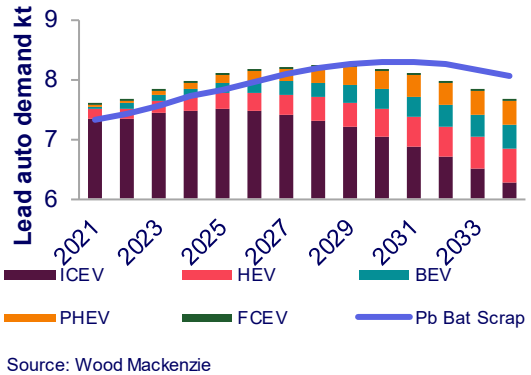


Source: Wood Mackenzie

SLI Li ion substitution

(2034 total 7.7 million tonnes)

As scenario two and 55% of SLI batteries in ICE, HEV and PHEV powertrain have switched to a lithium-ion battery by 2034.



Source: Wood Mackenzie

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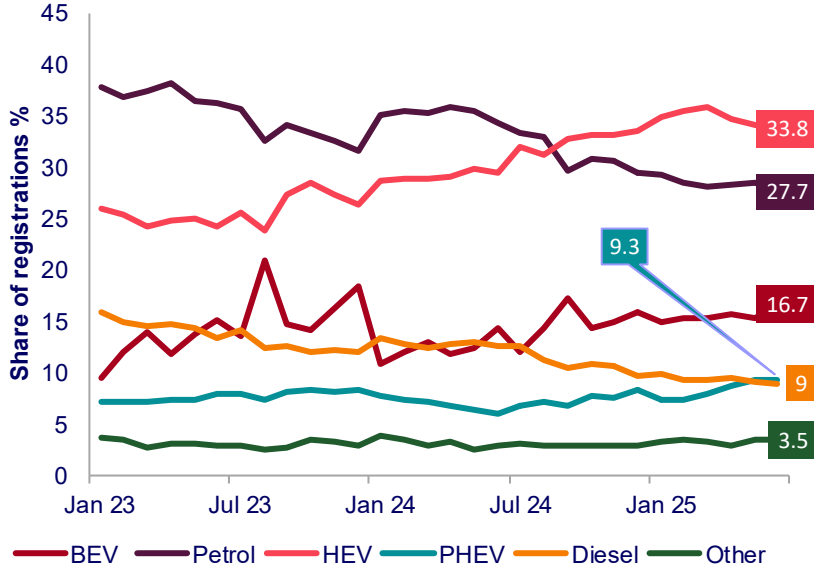
EV Transition assisted by production subsidies and purchase credits

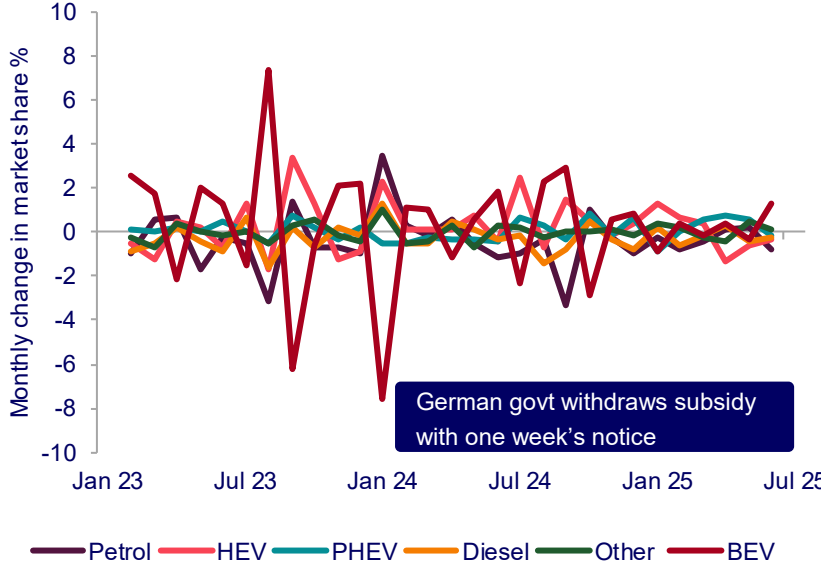
European Union members withdrew sales subsidies on an uncoordinated national basis

European passenger vehicle registrations by powertrain



Source: ACEA, Wood Mackenzie

Subsidy generated market share volatility



Source: ACEA,Wood Mackenzie

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OBBBA – The big beautiful bill

Ending the EV mandate

EV purchase tax credits

Removes 30D, 25E, and 45W credits in September 2025, 7 years ahead of schedule

- BEV sales share to drop from 21% in Q1 to 18% in H2

Charging infrastructure credits

Eliminates 30C tax credit in June 2026 - 6 years ahead of schedule

- Will concentrate BEV adoption in urban areas

Battery manufacturing credits

45X credit incorporates stricter rules of origin

- A headwind for lithium-ion battery production
- Antimony production and recovery could be funded

Corporate Average fuel economy

Completely removed corporate average fuel economy (CAFÉ) penalties

- Future of hybrid power trains uncertain
- No government incentives for range extenders and strong hybrids

Heavy duty EV program

Environmental protection agencies US$ 1 billion heavy–duty EV program rescinded.

Clean hydrogen production credit

Fundable projects should begin before December 2027 - 5 years earlier than previous target start.

- 75% of US green hydrogen pipeline at risk
- Blue hydrogen qualifies for carbon capture and storage credit

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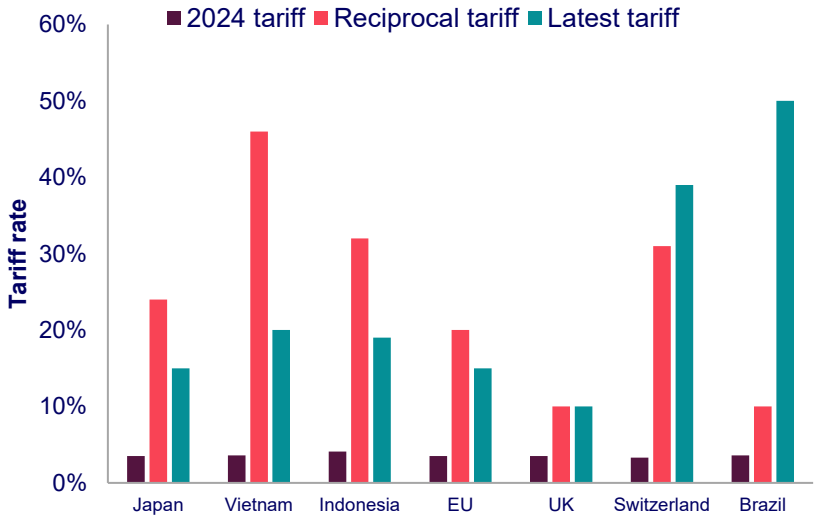
Tariff Development

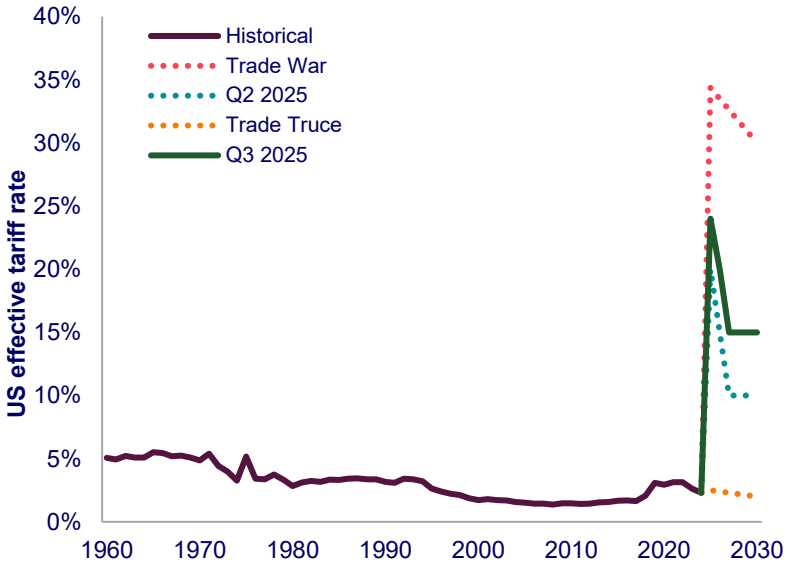
Tariff deals may avoid the high reciprocal tariffs, but the US average tariff is still set to soar

US wields higher tariffs with and without agreement



Source: Wood Mackenzie, Trade Data Monitor, WTO IDB, WTO RTA, World Tariff Profiles

Our US tariff assumptions increase



Source: Wood Mackenzie, US Customs

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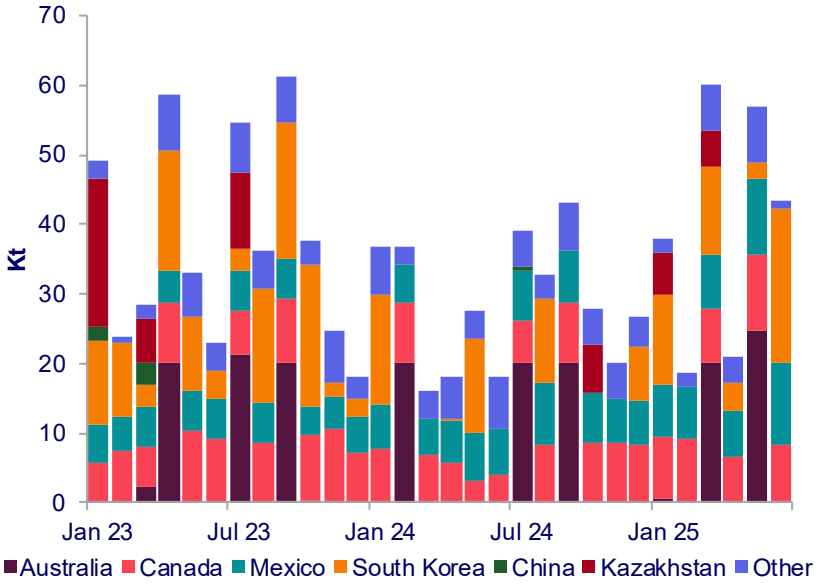
US lead imports in H1 2025

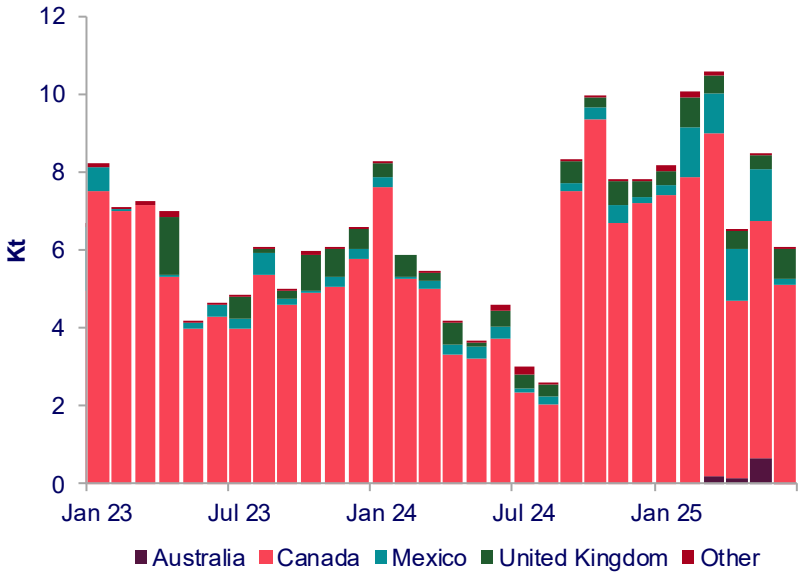
Refined Lead imports up 55% year-on-year, other alloy and bullion up 56% year-on-year

Refined lead imports



Source: Global Trade tracker, Wood Mackenzie

Other unwrought lead imports

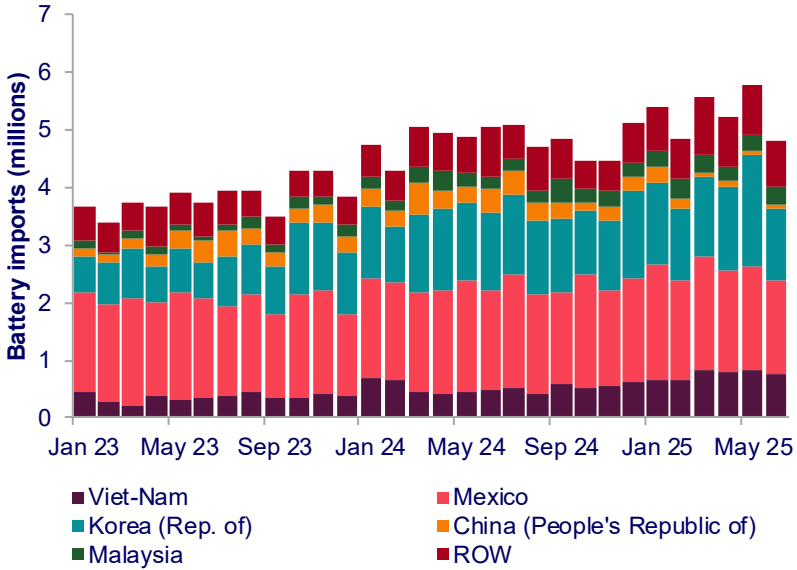


Source: Global trade tracker, Wood Mackenzie

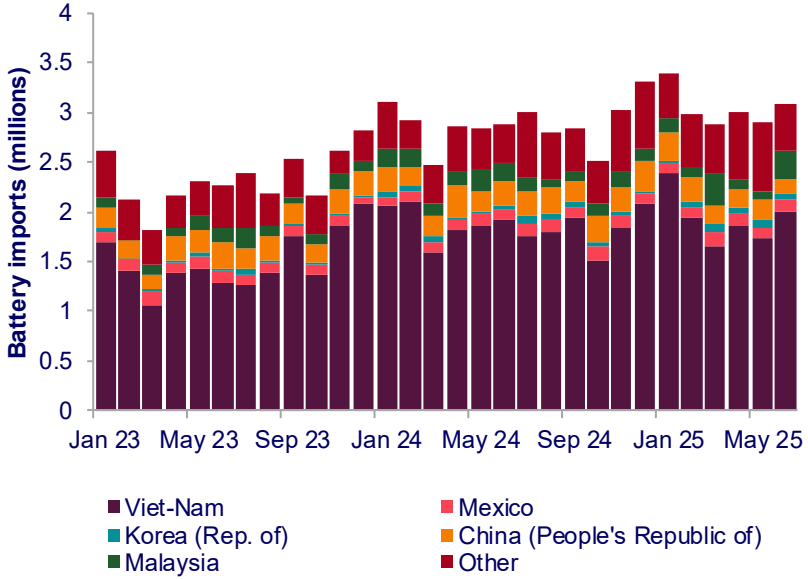
US Battery imports elevated in advance of tariffs

Vietnam dominated auto import growth while increased industrial battery imports were more widely shared

US SLI battery imports up 9% YTD



US Non SLI Battery imports up 7% YTD

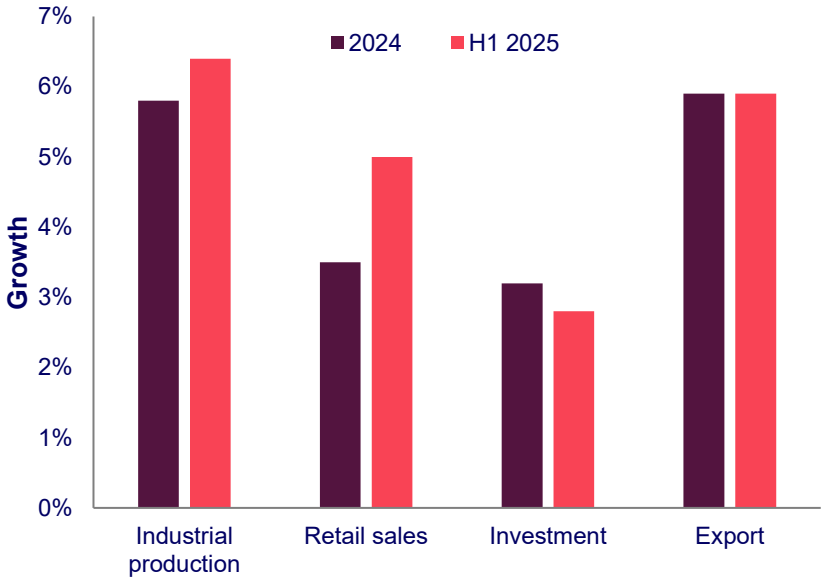


Source: Global Trade Tracker, Wood Mackenzie

China on target for 4.9% GDP growth for the year

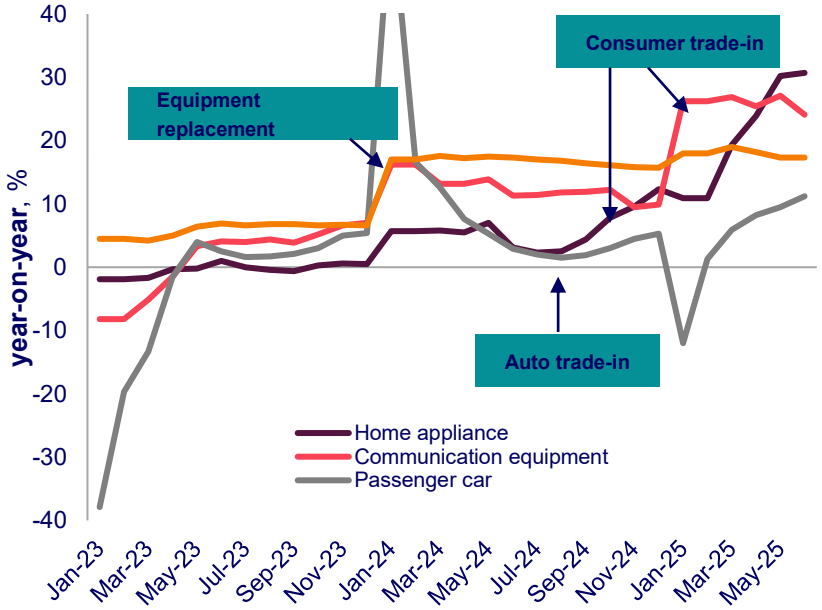
Stronger-than-expected exports and domestic demand were the main reasons for the outperformance

China's economic indicators, 2024 vs H1 2025



Source: CEIC data, Wood Mackenzie

Fiscal stimulus drove up domestic demand

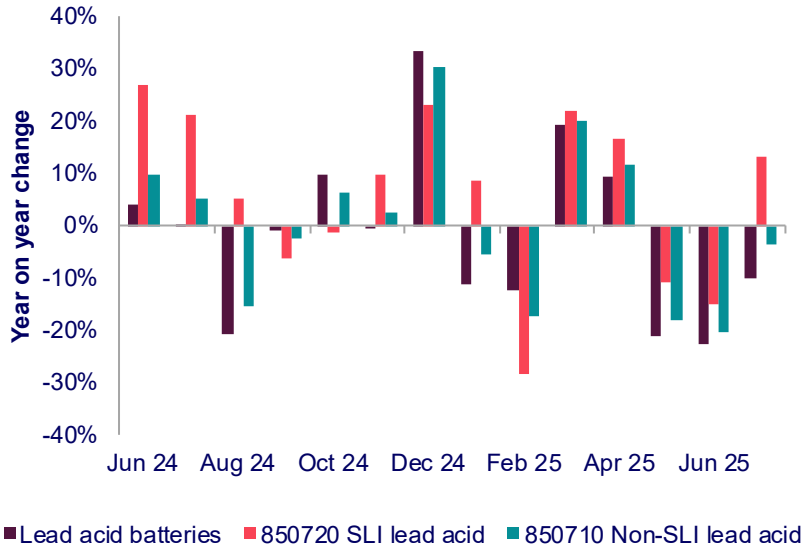


Source: CEIC data, Wood Mackenzie

Chinese Lead-acid battery exports- effect of tariffs

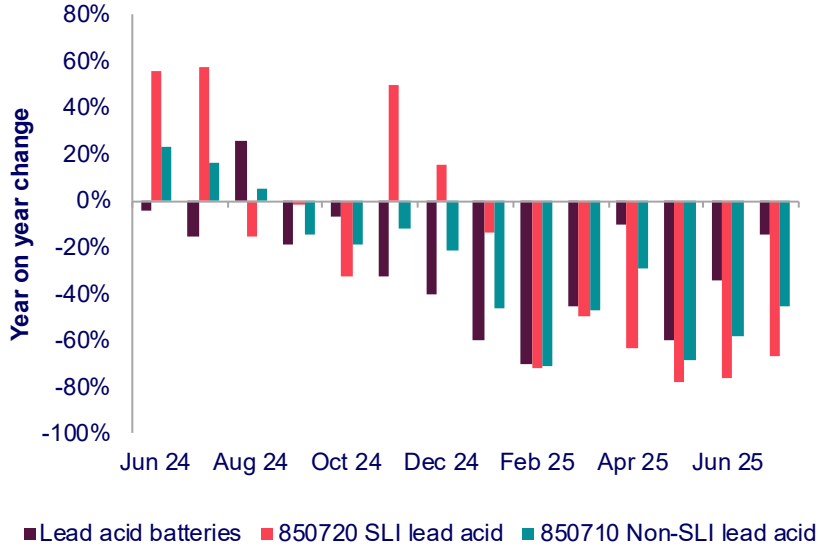
Year to date exports are down 3.2% but exports to the US are down 53% and to Vietnam up by 108%

Chinese lead–acid battery (LAB) exports



Source: Global trade tracker, Wood Mackenzie

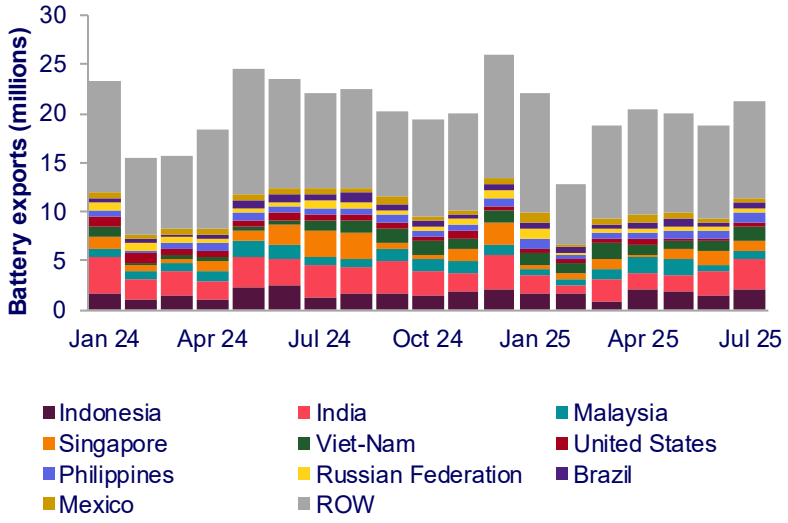
Chinese LAB exports to US



Source: Global Trade tracker, Wood Mackenzie

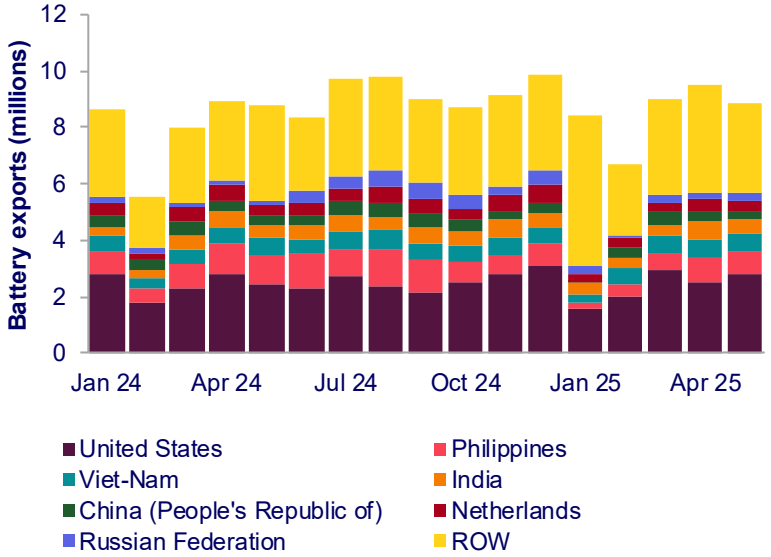
China and Vietnam Lead-acid battery exports - effect of tariffs

Chinese lead–acid battery (LAB) exports



Source: Global trade tracker, Wood Mackenzie

Vietnamese lead-acid battery (LAB) exports



Source: Global Trade tracker, Wood Mackenzie

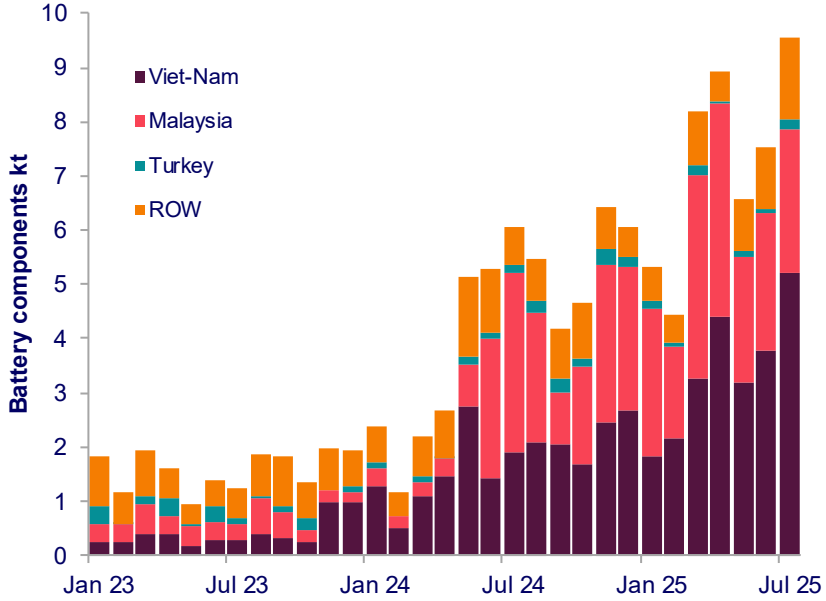
US puts 40% tariffs on transshipment, pending new definition for such goods

Most of the trade through ASEAN can continue before the announcement of the new definition

Vietnam trade data shows evidence of transshipment

Source: Global Trade tracker, Wood Mackenzie

Chinese battery parts exports surge



Source: CEIC data, Wood Mackenzie

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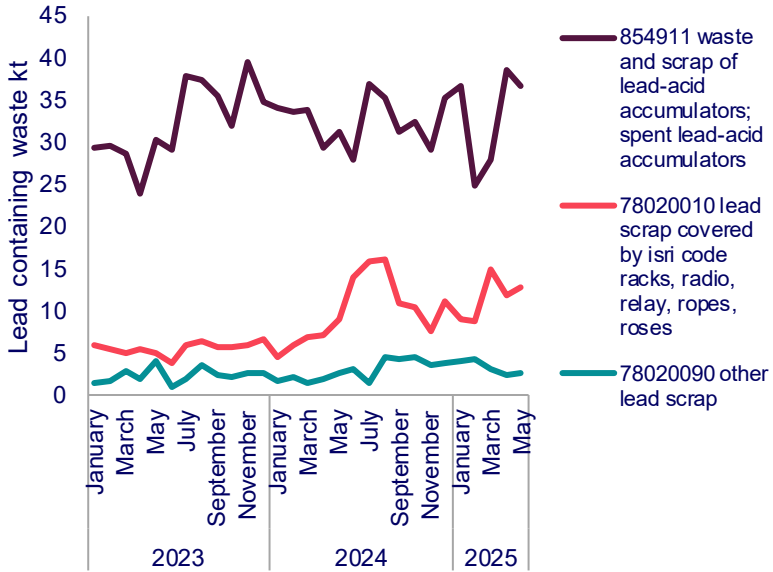
Not all tariffs have immediate effect

India removed import duties on lead waste in the last union budget in April

Selected Indian lead waste imports



Source: Global trade tracker, Wood Mackenzie

Regulation

Controlling its impact on demand by preparing a fair and level playing field

Governments have a responsibility to ensure responsible production, sourcing, use recycling and disposal of all chemicals including lead and its compounds. But the efficient regulation requires:

- Proportionate risk-based approach to chemicals management and a coherent regulatory landscape
- Simplification of the regulatory landscape for lead producers, industries using lead for critical and strategic applications, and recyclers
- Revision of rules preventing investment in sustainable strategic industries using hazardous substances in which risks are properly managed
- Trade policies that protect critical and other essential raw materials necessary for the energy transition
- Removal of burdensome waste shipment notification procedures
- Enforcement of rules that require equivalent conditions regarding health & environmental protection for non-domestic recycling facilities receiving exports of waste batteries and lead containing waste products
- A technology-neutral position to innovation funding available for Net-Zero technologies that acknowledges the potential of lead-based batteries

REACH listing

Registration Evaluation Authorisation and Restriction of Chemicals - EU regulation in force since 2007

Current status of lead

- **Metallic lead** is on the Candidate List of Substances of Very High Concern (SVHCs) due to its classification as a reproductive toxicant
- **European Chemicals Agency (**ECHA) has recommended lead for inclusion in Annex XIV, the REACH Authorisation list, which would require companies to apply for authorisation to continue using it.
- **Lead compounds** A number Pb compounds have been recommended by the ECHA for Authorisation but have not been included in REACH Annex XIV.
- As of the latest update, the European Commission has not added metallic lead to the Authorisation List, and in 2024, it stated that it does not intend to ban or include lead metal in Annex XIV at this time. There is no current indication that the Commission will include Pb compounds in the REACH Authorisation List.

Implication if lead is eventually added to the list

- Authorisation seeks to ensure that SVHCs are progressively replaced with safer alternatives **where feasible**. Once a substance is added to Annex XIV a sunset date will apply, after which it cannot be used or placed on the EU market without Authorisation unless an exemption applies.
- Companies would need to apply for authorisation to continue using it but there would be an **extensive transition period before restrictions take effect .**
- Industries such as battery manufacturing, electronics, ammunition, and construction would be significantly impacted due to lead's widespread use. **Risks from lead are already addressed by over 30 pieces of lead-specific EU legislation.**
- The Commission may amend or withdraw any authorisation on review **if suitable substitutes become available**.

Conclusion

Tariffs and subsidy policy control the speed of lead's EV journey

Technology and regulation determine the route and final destination

Q&A

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