

# ACE Green technology: Sustainable lead recycling into the future

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Pb2025 | Amsterdam | June 2025



**Pb**  
**2025** JUNE  
25-27



Global electrification is impossible without sustainable battery materials



**Advancing  
Sustainable Global  
Electrification**



# Lead battery recycling

An established market still offering growth

Huge and increasing  
lead battery market

**USD 75 bn**

Lead battery market size

Growing  
end-market demand



Telecom towers



Uninterruptible  
Power Supply (UPS)

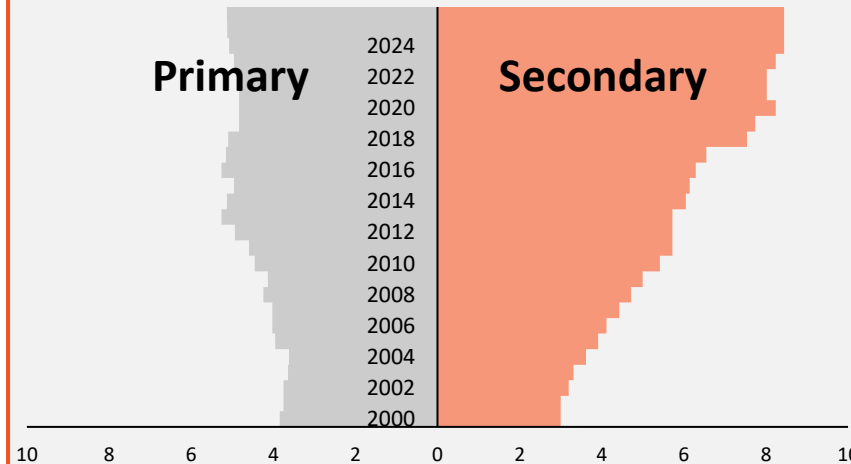


Transport & automotive

Recycling supplies 65% of  
the global lead

- ✓ Established collection infrastructures and supply chain
- ✓ Negligible growth in primary mine output

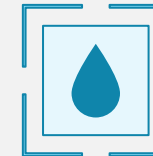
Global lead production (million tonnes)



Traditional smelters:  
how sustainable in the long term?



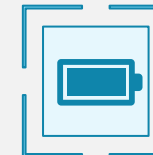
Emissions to air



Pollutants to water



Solid waste



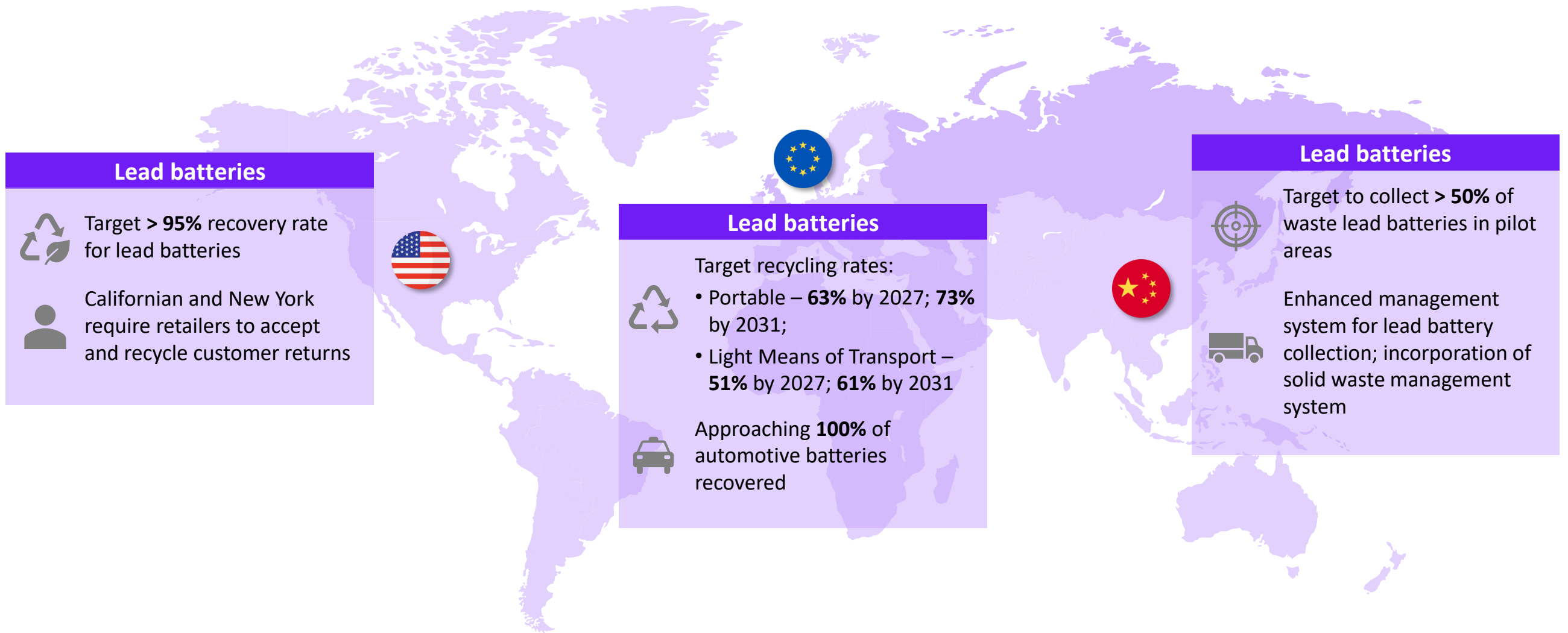
Higher energy demands



Less safe working  
environment

# Significant headwinds from tightening regulations

Changes will drive increasingly localised battery processing



**LEAD CONTAMINATION**

**Glencore closes Belledune  
smelter permanently**

**Community  
groups force  
Exide plant  
closure in Frisco**

**End of a lead-laced era: polluting  
Doe Run smelter to close after 120 years**

**Moves To Shut Down Lead Smelter**

**Missouri DNR fines Doe Run  
for emissions**

**RESIDENTS CALL FOR SHUT  
DOWN OF EXIDE SMELTER**

**Pollution, operator hazards and stricter permitting have forced many lead smelters to shutdown**

at its peak

**CONTAMINATION BY LEAD SMELTERS**





Supporting environmentally and economically sustainable  
domestic supply chains for recycled battery materials



# GREENLEAD® technology revitalising lead recycling











Efficient, safer, greener – and with better costs



## GREENLEAD® recycling technology



## Traditional smelting

		 ACE Green Recycling	
Energy source	 Energy requirement	Low	High
	 Renewable power	Yes	No
Operation	 Operating environment	Room temperature	> 1000 °C
	 Modular	Yes	No
	 Health & safety risks	Close to nil	Elevated
Environmental impact	 GHG Emission	Zero	500-1000 kg per tonne of batteries
	 Oxygen release	45 kg per tonne of batteries	None
	 Toxic waste creation	Very low volume	Higher volume
%	 Lead metal recovery %	> 99%	95-98%



# ACE Green – a global leader in sustainable battery recycling



## Compelling environmental & economic advantages

- Strong environmental credentials support future regulations
- Zero Scope 1 carbon emissions, zero toxic waste



## Proven commercial technology

- Enables domestic supply chain and retention of critical metals
- Superior recovery rates – over 99% lead recovery
- IP portfolio with over 100 patent filings



## Supportive political & economic tailwinds

- National security, economics and sustainability are driving onshoring of battery production
- Aligns with focus on prioritising domestic supply chains and manufacturing

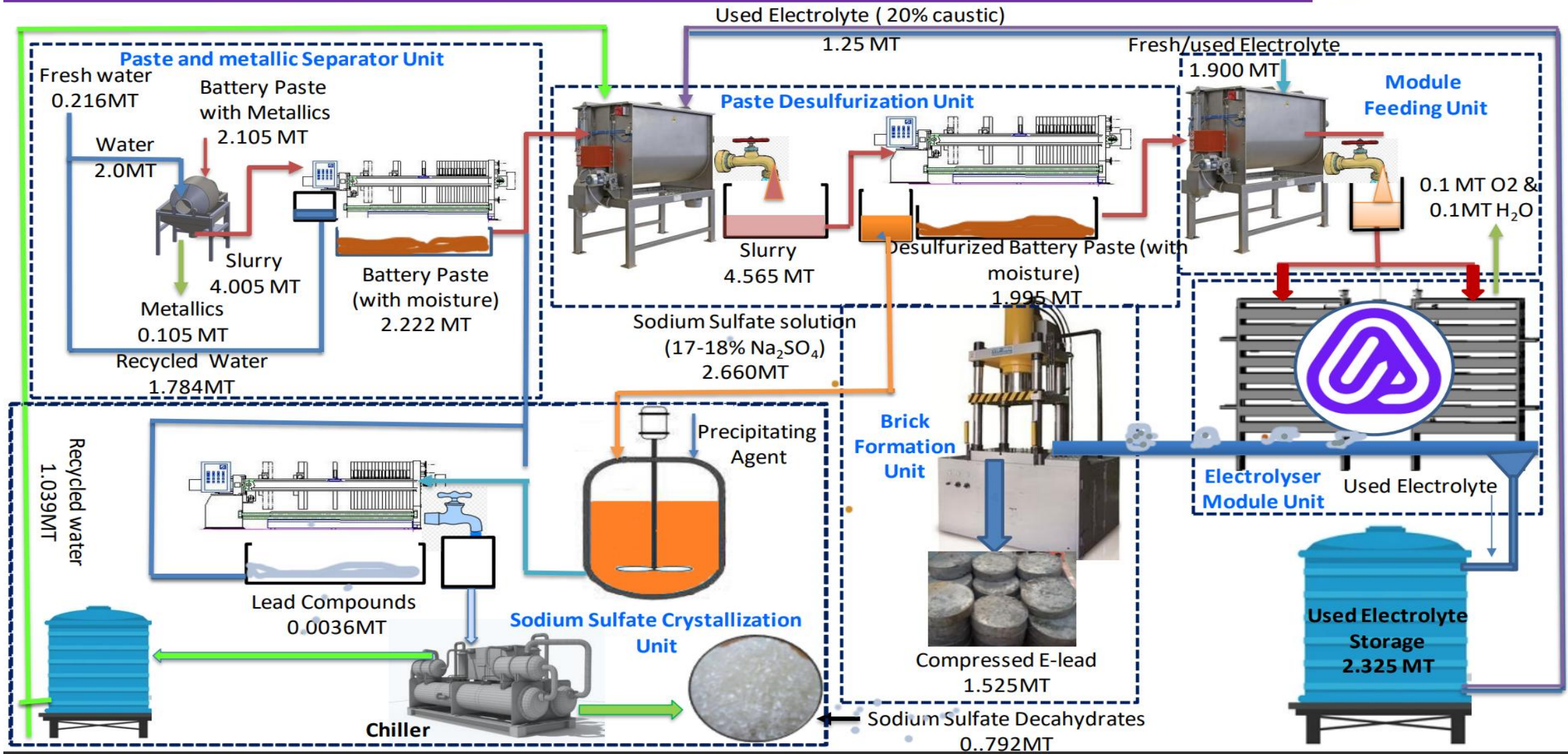




# The ACE technology

## Successfully commercialised sustainable lead recycling

### Lead-Acid Battery Recycling – Flow Diagram (Battery Paste Treatment; Part 1)





# ACE is quietly transforming how lead is recycled



**ACE electrolyser modules**



**ACE technology deployment**



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# Q&A



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