



(ASX:ABX)

# Producing aluminium fluoride from recycled aluminium smelter bath

Bell Bay Major Projects Conference  
Hotel Grand Chancellor, Launceston

**Mark Cooksey**  
Managing Director and CEO

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11:40am AEDT



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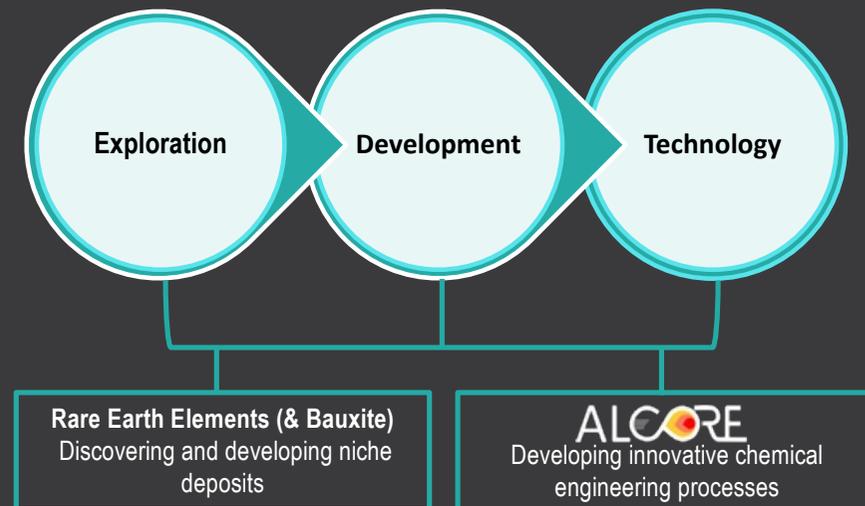
Prices for aluminium fluoride (AlF<sub>3</sub>) were sourced from Asian Metals, China Customs and verified by comparison with prices from Bloomberg. The price actually achieved will depend upon market conditions at the time of sale.

## Delivering materials for a cleaner future

- Discovering and developing an ionic adsorption clay rare earth project in northern Tasmania
- Establishing a plant to produce hydrogen fluoride and aluminium fluoride from recycled industrial waste, to replace imports (ALCORE)

## Legacy business

- Mining and enhancing bauxite resources for the cement, aluminium and fertiliser industries



# Board of Directors - Alcore

Hon Paul Lennon AO (Chair)



- Premier of Tasmania 2004-2008
- Deputy Premier and Minister for Infrastructure, Energy & Resources 1998-2004
- Principal Paramul Pty Ltd 2009-

Ian Levy (Director)



- 30 years of senior management and geological experience with multiple commodities, including at WMC and Pancontinental Mining
- Previously CEO of Allegiance Mining and Director of Gloucester Coal
- Member of JORC for 11 years (4 years as Vice Chairman) and Federal President, Australian Institute of Geoscientists

Dr Mark Cooksey (Managing Director and CEO)



- More than 20 years with Rio Tinto and CSIRO
- Worked closely with aluminium and other metal industries
- Significant experience in commercialising new technologies and processes
- PhD in Chemical & Materials Engineering

Rex Adams (Non-Executive Director)



- Founding director of Blue Ocean Equities
- Executive Director of Southern Cross Equities
- Over 17 years in the mining industry & 26 years in finance in Senior Resources Analyst & Research Manager roles

Derek Firth (Non-Executive Director)



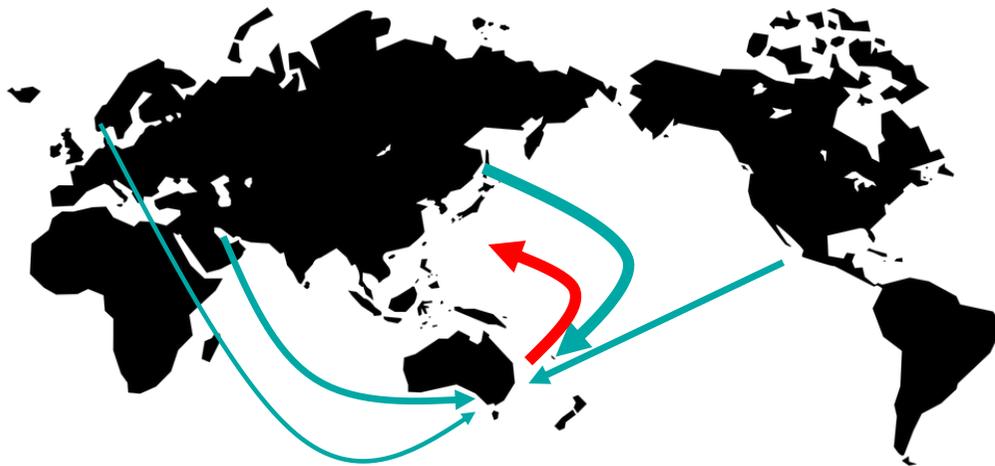
- Chairman, CORE Refining Limited (CRL)
- Former Senior Partner Simpson Grierson (NZ Lawyers)
- Specialist construction and energy lawyer

# Aluminium fluoride from aluminium smelter waste

Aluminium fluoride ( $\text{AlF}_3$ ): essential for aluminium smelting

- 1.2 million tonnes produced globally per year worth US\$1.5 billion (US\$1,000-1,800 per tonne)
- 50% produced in China, mainly for Chinese smelters
- Australia imports 100% of requirements, mostly from China

- Traditionally produced from high-cost fluorspar and alumina trihydrate
- Achievable specification – product purity risk is low
- Mature market – dozens of customers globally



→ Aluminium fluoride      → Tapped bath

Current imports/exports

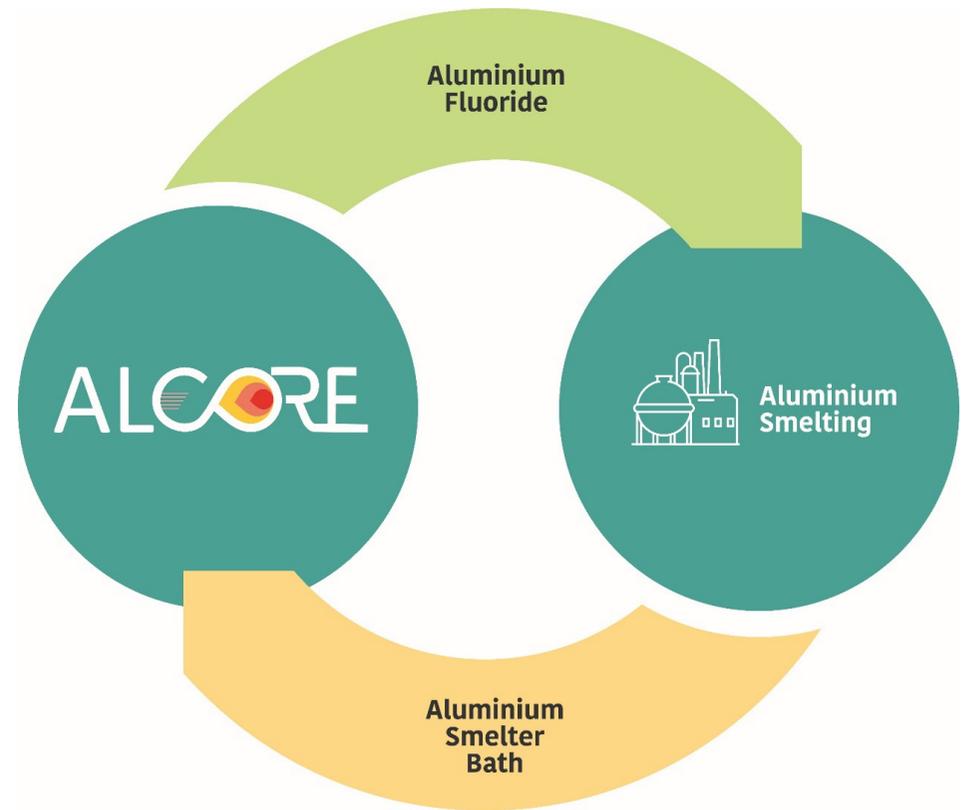
‘Tapped bath’: an aluminium smelter waste

- Fluorine is lost from smelter in ‘tapped bath’
- Only attractive market is new smelter construction; none in Australia
- Global market for tapped bath has moved into oversupply
- Tapped bath is a low-cost source of fluorine

# ALCORE Process to produce aluminium fluoride

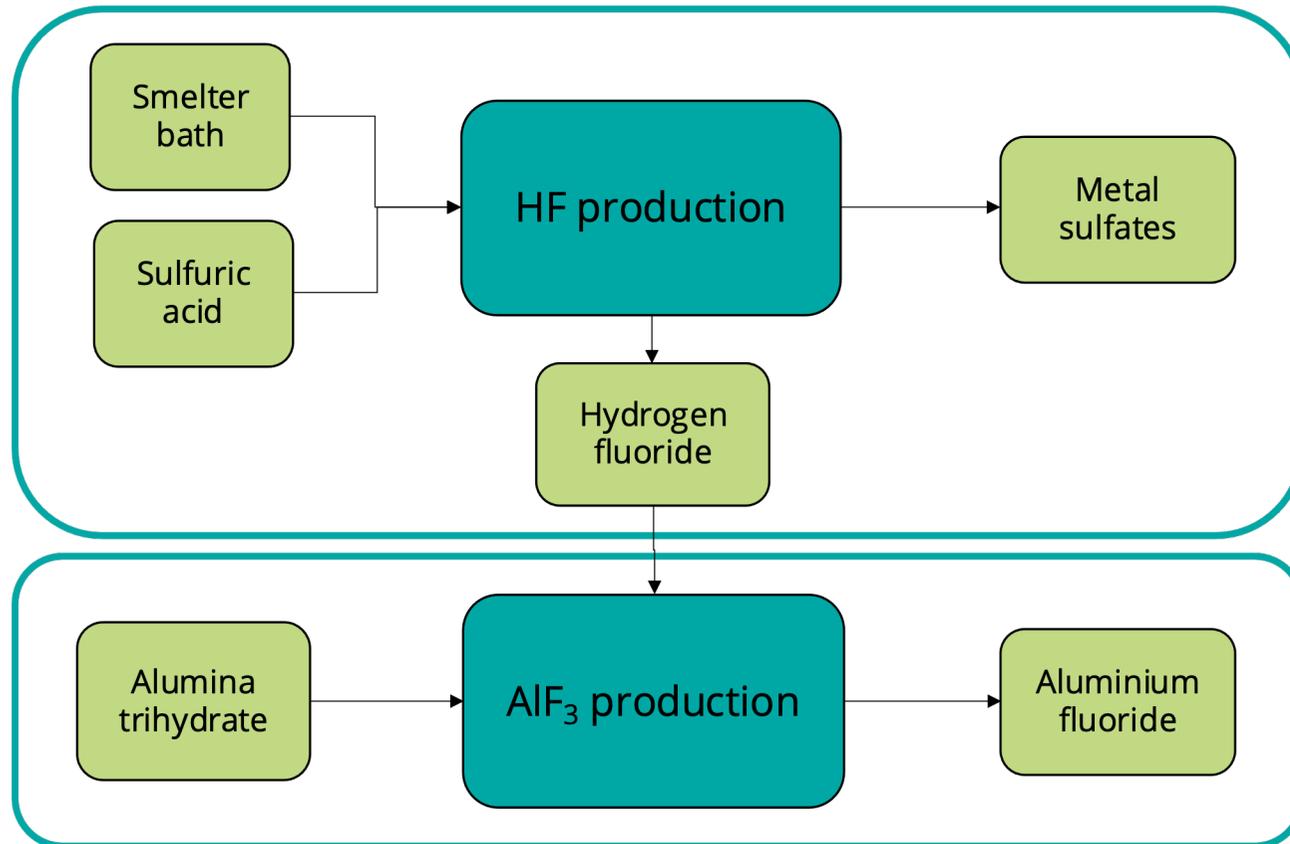
- Exemplary illustration of circular economy

- ABx's 83%-owned refining technology subsidiary
- Developing processes to produce aluminium fluoride using<sup>1</sup>:
  - Fluorine from tapped bath (an aluminium smelter waste)
  - Aluminium from dross (an aluminium smelter waste) or bauxite



<sup>1</sup>ABX ASX Release, 7 June 2022

# ALCORE Process flowsheet



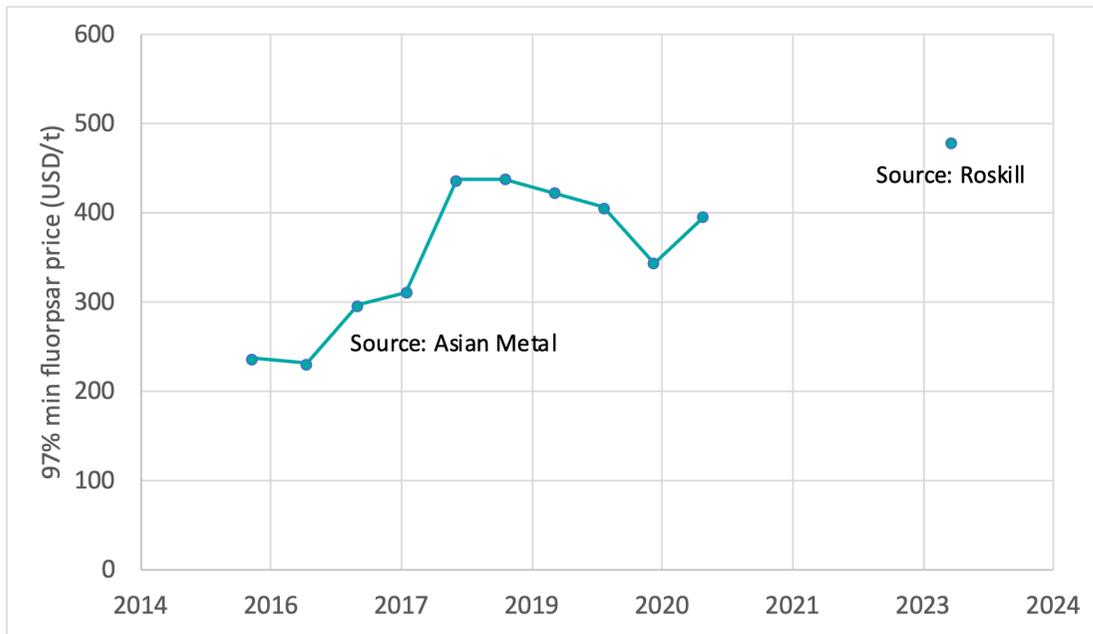
Developed by Alcore

Existing commercial process

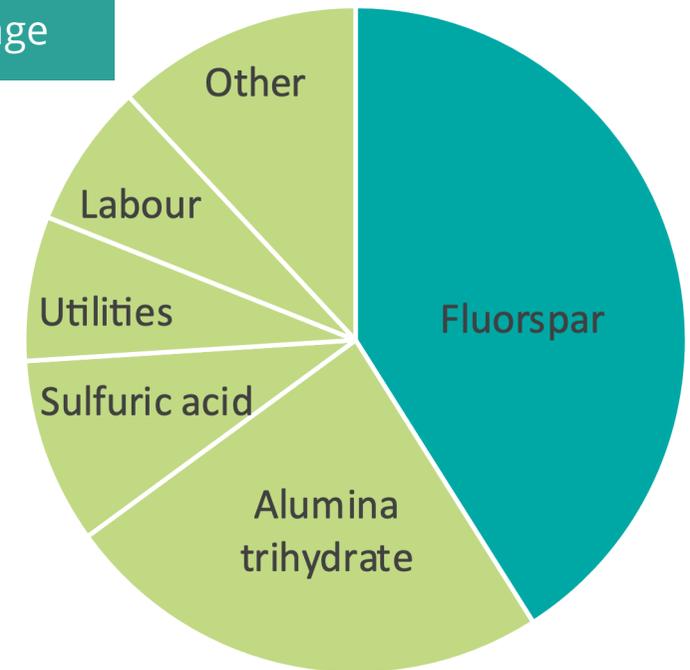
# ALCORE Process economics

- Fluorspar typically represents 40% of the cost of producing aluminium fluoride

• Use of smelter bath instead of fluorspar provides significant cost advantage



Based on average aluminium fluoride production costs (2019)



Source: K. Satterthwaite (Roskill), Aluminium fluoride and aluminium: 2019 trends and outlook to 2029, Fluorspar 2019, London, United Kingdom, 25-27 September 2019

# ALCORE Technical progress

- Critical processing steps have been demonstrated in laboratory
- Initial operating conditions for the pilot plant reactor have been selected<sup>1</sup>
- Bath pilot batch reactor fully installed, and commissioning is in progress<sup>2</sup>
- For continuous pilot plant, technical requirements for oleum production module and bath reactor module finalised with two international suppliers

<sup>1</sup>ABX ASX Release, 24 October 2022

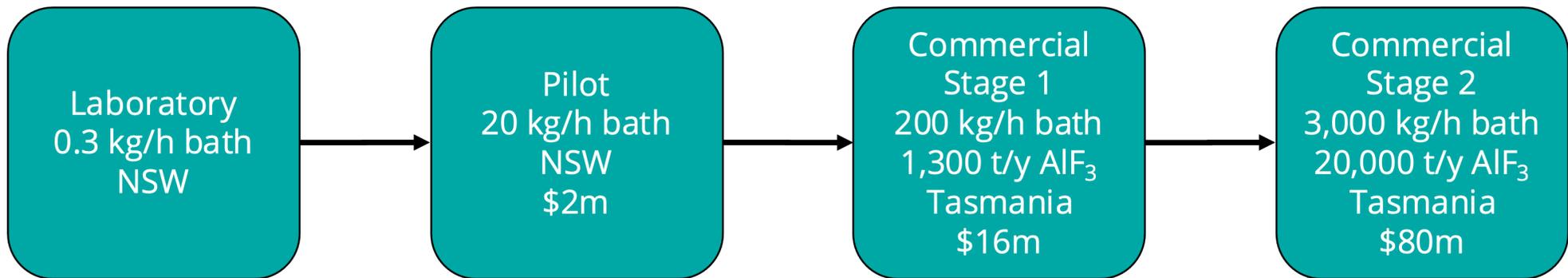
<sup>2</sup>ABX ASX Release, 13 September 2023



Bath pilot batch reactor (centre)

# ALCORE Process scale-up

- Rigorous scale-up to reduce technical risk
- First aluminium fluoride plant planned for Bell Bay, Tasmania, near existing hydro-powered aluminium smelter. Planned production 20,000 t/y
- High potential for plants in other major aluminium smelting regions
- Potential expansion into other markets, including fluorine chemicals



\$7.5m grant awarded<sup>1</sup> and \$5.7m instalments received<sup>2</sup>

<sup>1</sup>ABX ASX Release, 29 April 2022

<sup>2</sup>ABX ASX Release, 28 June 2023

# ALCORE Technical plan

Reactor	Purpose	Commissioning
Bath pilot batch reactor	<ul style="list-style-type: none"> <li>• Confirm preferred reactor design</li> <li>• Demonstrate that can achieve high fluorine yield from bath</li> <li>• Produce metal sulfate residue suitable for further process development</li> </ul>	August 2023
Bath continuous pilot plant	<ul style="list-style-type: none"> <li>• Demonstrate quality of hydrogen fluoride produced at pilot scale</li> <li>• Determine design and operating parameters for commercial plant</li> </ul>	Q2 2024



Illustrative images



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