

ASX Release

28 November 2025

## 2025 AGM Presentation

**Metallium Limited** (“Metallium” or the “Company”) (ASX: **MTM**; OTCQX: **MTMCF**) is pleased to provide a copy of the Managing Director’s presentation for the Company’s 2025 Annual General Meeting being held today, Friday 28 November 2025.

This announcement has been authorised for release by the Company Secretary.

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### ABOUT METALLIUM LIMITED



**Metallium Ltd** (ABN 27 645 885 463), is pioneering a low-carbon, high-efficiency approach to recovering critical and precious metals from mineral concentrates and high-grade waste streams. The company’s patented **Flash Joule Heating (FJH)** technology enables the extraction of high-value materials—including **gallium, germanium, antimony, rare earth elements, and gold**—from feedstocks such as refinery scrap, e-waste, and monazite.

Aligned with U.S. strategic supply chain objectives, Metallium has recently secured its first commercial site in Texas via its wholly owned subsidiary, **Flash Metals USA Inc.**, marking a major step toward near-term production and revenue generation.

To learn more, visit:

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# METALLIUM

REVOLUTIONARY METAL RECOVERY TECHNOLOGY

Transforming waste streams and mineral ores into high-value products via breakthrough technology

AGM PRESENTATION

28 November 2025

Metallium Ltd  
ASX: MTM / OTCQX: MTMCF

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# METALLIUM: A GLOBAL METALS EXTRACTION TECHNOLOGY COMPANY

✓ **Metallium has undergone a major transformation over the past 12 months.**

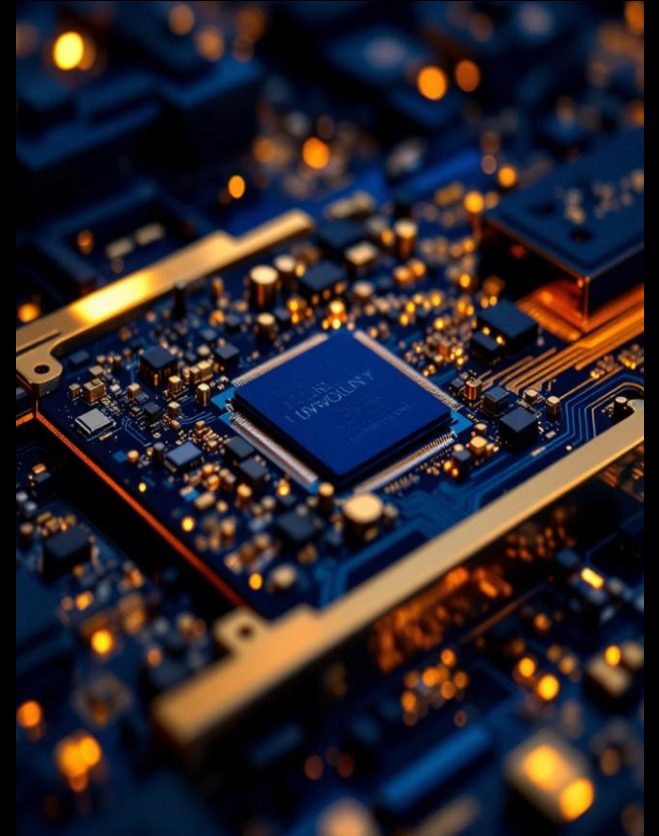
The company is now a global industrial technology platform with a first operating hub in the United States and a clear pathway to replicate nationally, and internationally.

✓ **FY2025 delivered breakthrough achievements across all fronts:**

Technology validation, commercial agreements, a permanent U.S. footprint, and strategic partnerships spanning recycling, electronics and mining sectors.

✓ **FJH has been de-risked at pilot scale:** Identical reactor modules are being deployed at the full-scale plant in Texas.

✓ **VISION 2030: BECOME THE GO-TO TECHNOLOGY SOLUTION FOR E-WASTE & CHALLENGING MINERAL PROCESSING OPPORTUNITIES, GLOBALLY**



# FY2025 – A BREAKTHROUGH YEAR FOR TECHNOLOGY AND COMMERCIALISATION

## Strategic Commercial Agreements

1

Feedstock agreement with Glencore Recycling (N. America)

Additional partnerships with Indium Corporation, Ucore and multiple U.S. recyclers

2

## Technology Validation Milestones

~20x upgrade of raw Harts Range REE ore and ~53x Dy enrichment

Successfully extracted tin and palladium from e-waste PCBs achieving 86% tin and 82% palladium recovery rates

## U.S. Footprint Established

3

Long-term Texas Technology Campus lease with scalable capacity

Additional site options across the U.S..

OTCQX Uplisting & pathway to NASDAQ

4

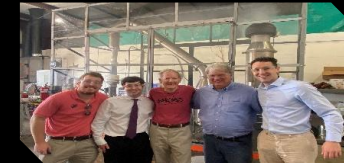
## FJH Module Design Finalised

First commercial-scale FJH module ready for fabrication

## Government Recognition

5

SBIR Phase-I contract with the U.S. DoW for gallium recovery



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# METALLIUM AT A GLANCE

*"Best-in-Class" Metal Recovery, Low Impact, Globally Deployable, Commercially Disruptive Business Models*



## Build-Own-Operate (BOO)

### Urban Mining / Recycling

Build-Own-Operate model for e-waste and e-scrap processing. High-margin metal recovery including Au, Ag, Cu, Pd, Ga, Ge.

E-waste provides an accelerated path to FJH commercialisation owing to high-value PCB feedstock, abundant supply, and superior recoveries

### Technology Advantages

- Metal / mineral / feedstock agnostic
- FJH: ultra-fast, modular, chemical-lean metal liberation
- First hub operational in Texas with global roll-out planned
- Targeting **Europe, Middle East, Asia and Elsewhere**



## Processing-as-a-Service (PaaS)

### Mineral Processing (MP)

Licensing & joint ventures for critical-mineral ore treatment. Asset-light deployment for rare earths and strategic minerals.

FJH offers transformational performance in MP, delivering rapid concentration / impurity removal, and significant reductions in acid, water, and energy consumption

### Market Exposure

- E-waste surge and circular economy transition
- Semiconductor and critical technology metals
- National security supply chain initiatives

# THE GLOBAL CRITICAL METALS PROBLEM

The Western World Is Entering a Critical-Metals Crunch

## Major Metal Repositories Far Higher in Grade vs. Typical Mineral Orebody

E-waste is the world's fastest-growing waste stream, rising at double-digit rates and containing vast quantities of precious & strategic metals. Current recovery methods are slow, costly and dominated by a handful of non-U.S. firms

## Inaccessible Mineral Resources

Large volumes of REE ores and other mineral tailings are stranded because incumbent processing is chemically intensive, slow to deploy and difficult to scale.

## Modern Supply Chains Depend on China's Processing Monopoly

China dominates processing for REEs, battery materials and semiconductor metals. Non-Chinese refining capacity remains minimal, leaving global supply chains exposed to significant geopolitical and export-control risk.

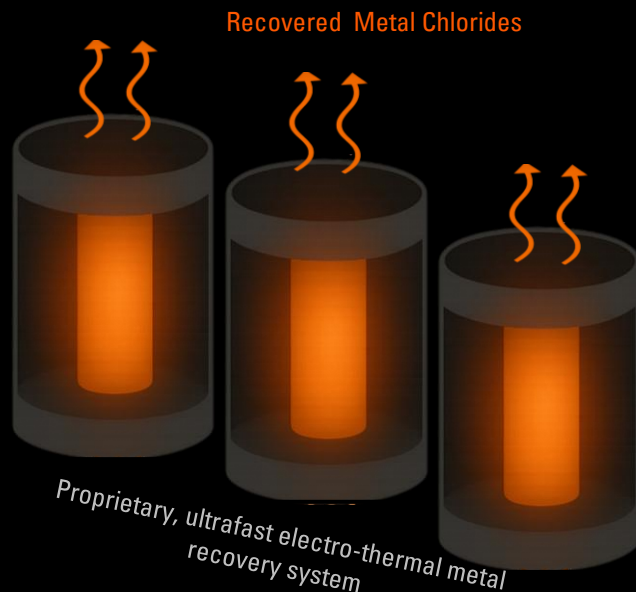


# INTRODUCTION TO FLASH JOULE HEATING

Metallium's Core Technology – Rapid Thermal Liberation for Metal Recovery



Metal-rich Feedstock  
+ Proprietary Catalyst  
+ Reactant



**Ultrafast Heating:** We apply a short burst of electric energy to crushed ore or waste. The feed heats in very short timeframes.

**Proprietary Chemistry:** Target metals form chloride vapours which are condensed into high-purity metal chloride products  
→ **No acid leaching** → **No multi-stage smelting** → **No harmful tailings.**

**What It Enables:** FJH can unlock value from difficult materials like lithium concentrates, rare earth concentrates and intermediates, red mud tailings, and e-waste - faster and more economically than traditional methods.

**Designed for rapid deployment and modular scalability** - enabling fast setup across distributed sites, with minimal permitting and infrastructure requirements.

**Single-step, low-carbon process to extract metals faster, with higher efficiency and lower reagent use than incumbent technologies.**

A disruptive new pathway for critical and precious metals recovery

# WHY FJH IS BREAKTHROUGH

Technology Built for 21st-Century Metal Supply Chains

## Feed Versatility

- PCBs, server boards, telecom equipment
- Semiconductor manufacturing waste and Ga/Ge scrap
- REE ionic clays and heavy-REE ores
- Monazite concentrates and red-mud derivatives
- Industrial catalysts and specialty-metal residues

## Minimal Environmental Impact

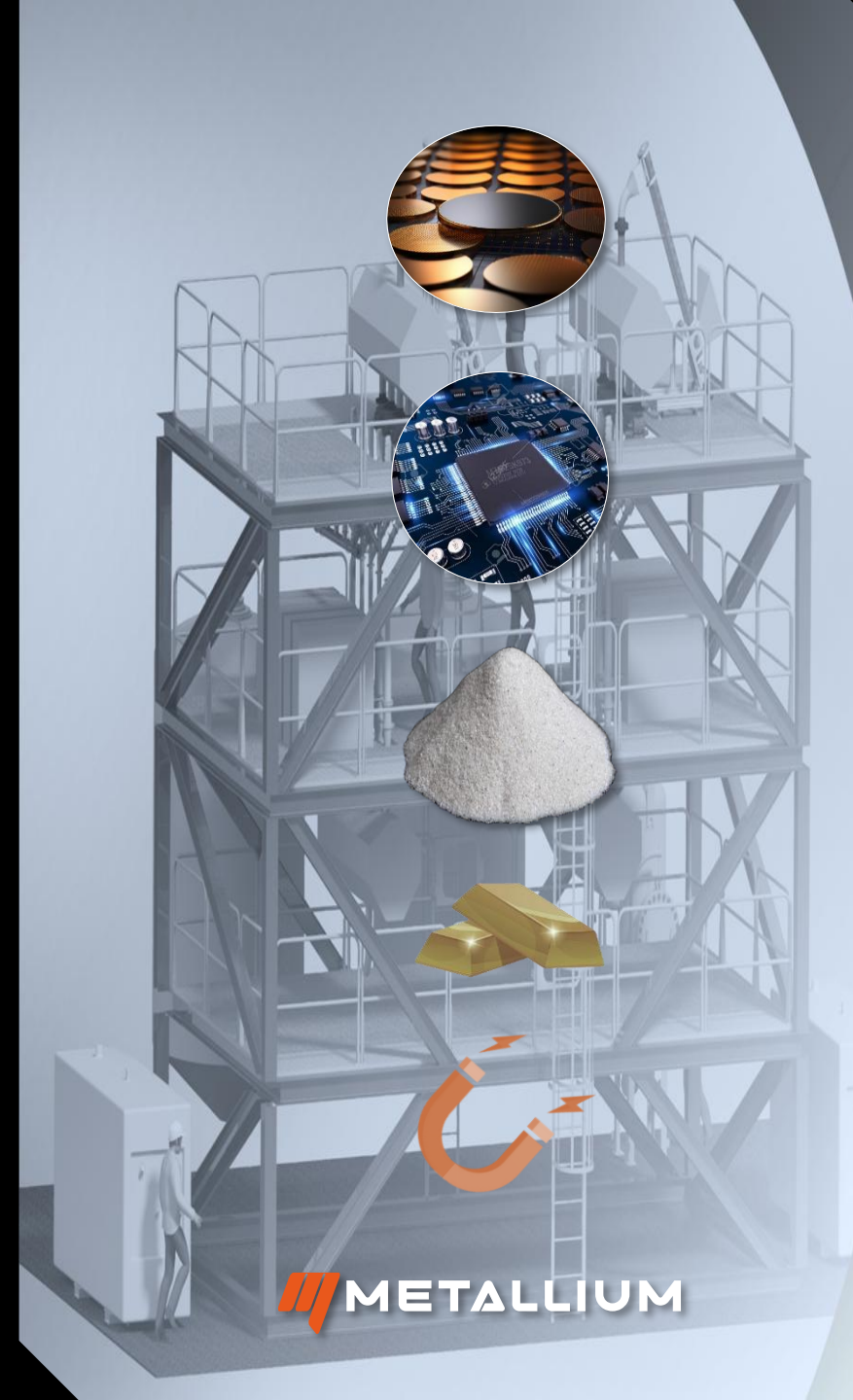
- Negligible water consumption vs hydrometallurgy
- No acid circuits or cyanide leaching
- Minimal tailings generation
- Lower emissions profile

## Low Capital Intensity

- Modular units with <<< lower upfront investment vs alternatives
- Standardised design enables replication across regions
- Rapid deployment timeline vs traditional infrastructure

## Flexible Siting

- Can operate near urban centres or mine sites
- Small physical footprint suited to existing industrial zones
- Favourable regulatory profile in OECD and allied nations



**METALLIUM**

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# OUR BUSINESS MODEL: TWO ENGINES OF VALUE

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	URBAN MINING (WASTE RECYCLING)		MINERAL PROCESSING (MINING PROJECTS)	
	<p><b>Technology Metals:</b></p> <p>Gallium, Germanium, Indium, Tin, Antimony</p> 	<p><b>Electronic Waste:</b></p> <p>Gold, Copper, PGE -rich Printed Circuit Boards</p> 	<p><b>Rare Earth Elements (REEs)</b></p> <p>Nd, Pr, Dy, Tb</p> 	<p><b>Red Mud (Bauxite Residue)</b></p> <p>Alumina, Ga, REEs, Titanium</p> 
	<p><b>Build-Own-Operate (BOO)</b></p>		<p><b>Processing-as-a-Service (PaaS)</b></p>	
<b>BUSINESS MODEL</b>	<p><b>End-to-end ownership of feedstock, processing, and metal sales:</b> Metallium will source feedstock, operate its own facilities, &amp; capture full value from recovered metals</p>		<p><b>Licencing:</b> Provide equipment &amp; services to miners / processors. Monetise via <b>Licensing &amp; Production Royalties</b></p>	
<b>PRODUCTS</b>	<p>Metal chlorides or derivatives – Essential for semiconductors, photovoltaics etc.</p>	<p>Metal chlorides or derivatives incl. Gold Chloride – Highly saleable</p>	<p>Various optionality for metal chlorides or more refined intermediates</p>	
<b>INDUSTRIAL PARTNER(S)</b>				

# DUAL BUSINESS MODEL: MAXIMUM MARKET CAPTURE

## Urban Mining / Recycling

Build–Own–Operate Model for High-Value Scrap



## Mineral Processing

Licensing & Joint Ventures for Critical Metals



### Advantages

- Exposure to premium metal prices across multiple commodities
- Rapid revenue cycles with short processing times
- No dependency on exploration or mining cycles
- BOO model is replicable in all major e-waste generating geographies

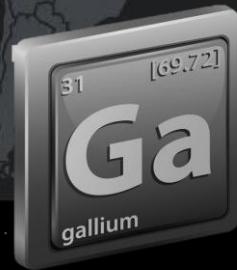
### Advantages

- This asset-light approach enables Metallium to scale globally with minimal capital intensity, leveraging partners' existing infrastructure whilst maintaining high-margin technology exposure
- Multiple potential revenue streams: Technology fees, royalties, toll treatment margins

# STRATEGIC PARTNERSHIP WITH INDIUM CORPORATION - UPDATE

Indium Corporation – a private New York-based company – is a global leader in specialty metal refining, particularly for gallium, germanium, and indium used in semiconductors.

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- ✓ Established 1934 in New York, USA, **Indium Corp** operates 16 facilities across 8 countries with 1000+ employees, serving high-tech industries (semiconductors, defence, etc.).
- ✓ Considered a global authority in Gallium, Germanium, and Indium supply amongst other specialty technology (electronics / semiconductors) metals.

- ✓ **Technical program progressing well:** processing Ga/Ge scrap continues to deliver high-purity recovered products, consistent with the aims of the collaboration.
- ✓ **QA/QC verification in progress:** Recovered materials have been provided to Indium for independent analysis. Early feedback remains positive and aligned with expectations.
- ✓ **Collaboration framework extended:** The existing collaboration framework has been mutually extended to accommodate the completion of QA/QC and associated technical work.
- ✓ **Pathway to binding agreements:** Following QA/QC validation, both parties expect to advance discussions toward binding agreements.

# STRATEGIC PARTNERSHIPS WITH E-WASTE FEEDSTOCK SUPPLIERS - UPDATE

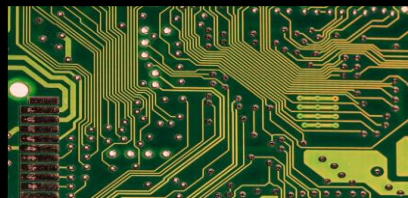
Metallium is building a multi-supplier network for high-value PCB e-waste, partnering with major recyclers

**GLENCORE**

**DYNAMIC**  
LIFECYCLE INNOVATIONS

 **Plastic Recycling Inc.**

- ✓ **GLENCORE RECYCLING:** Global leader in metals recycling with extensive U.S. operations and globally
  - ✓ **DYNAMIC LIFECYCLE INNOVATIONS:** Major U.S. recycler & supplier of PCB material, with national intake across diverse e-scrap streams
  - ✓ **PLASTIC RECYCLING INC. (PRI):** U.S. recycler and supplier of PCB-rich material, across multiple high-value e-waste sources
  - ✓ **OTHER POTENTIAL SUPPLIERS:** Advanced discussions underway with additional U.S. and global recyclers to diversify supply
- 
- ✓ **PATHWAY TO BINDING AGREEMENTS:** Active negotiations with Glencore, Dynamic, PRI and others toward multi-year supply contracts
  - ✓ **SCALABLE NATIONAL NETWORKS:** Partners operate large U.S. recycling hubs supporting multi-site expansion
  - ✓ **COMMISSIONING FEEDSTOCK SECURED:** Approximately 60t of mixed PCB already been secured to support commissioning



# THREE GLOBAL ASPIRATIONS FOR MARKET LEADERSHIP

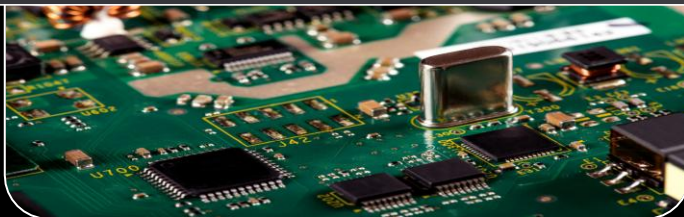
## – PILLAR I –

### E-WASTE

#### Benchmark for E-Waste & Tech-Metal Recycling

Become the globally recognised benchmark technology for PCBs, telecom scrap, server boards and semiconductor waste.

Focus metals: Au, Ag, Cu, Pd, Sn, Sb etc



## – PILLAR II –

### RARE EARTHS / CRITICAL MINERALS

#### Go-To Tech for REE and other Critical Metal Ores & Tailings

Establish FJH as the preferred front-end upgrading step for REE miners and magnet-metal producers.

Capable of treating ionic clays, hard-rock ore, monazite, MREC and red-mud derivatives.



## – PILLAR III –

### GALLIUM / GERMANIUM

#### Global Platform for Strategic Semiconductor Metal Recovery

Become the leading recovery route for Ga, Ge, In and related strategic metals used in defence, AI, photonics and advanced semiconductors.



# VISION 2030: A GLOBAL NETWORK OF FJH UNITS

Metallium's ambition is to expand toward a **global network of recovery plants** targeting precious, strategic and rare-earth metals from the world's fastest-growing waste streams and most challenging mineral feedstocks.

## The Platform Is Designed to Be Deployed Across:



### E-Waste Recycling Hubs

Major urban centers with established collection infrastructure



### Semiconductor Corridors

Electronics manufacturing zones generating high-value scrap



### Mineral Provinces

REE mining regions and industrial processing centers



### Allied Geographies

Nations seeking to secure critical-metal supply chains



FJH's ultra-fast, chemical-lean, low-impact design allows Metallium to scale quickly, avoid the permitting and capital barriers of legacy processing, and operate close to feedstock sources — reducing transportation costs and carbon footprint.

One modular technology — globally deployable. Modular. Scalable. Low impact.



# GLOBAL ASPIRATIONS AND SCALING ROADMAP - EWASTE

2027

**16k**

*Tonnes Per Year*

Stage-2 inbound PCB processing capacity at Gator Point, TX

2030

**50k+**

*Tonnes Per Year*

Target annual production globally by 2030 across e-Waste

2030

**<1%**

*Market Penetration*

Of global PCB waste market needed to achieve 2030 targets\*

## GEOGRAPHIC EXPANSION AMBITIONS

### United States

First hub operational in Texas, with additional modules planned for West Coast and Northeast recycling centers

### Asia-Pacific

Largest e-waste generation globally, major semiconductor manufacturing clusters, and critical-mineral processing hubs

### Europe

High e-waste volumes, strong circular-economy policy support, and favorable regulatory environment for clean-tech deployment

### Middle East

Growing electronics consumption, strategic geographic location, and government investment in industrial diversification

# THE NEXT 12 MONTHS – COMMERCIALISATION & EXPANSION PLANS

01

## U.S. Stage-1 Commissioning & Nameplate Operation

Commissioning and ramp-up of U.S. commercial facility in Texas to nameplate capacity, with ramp-up to nameplate and scale-up thereafter

03

## Global Project Scoping

First scoping work for global hub locations, including site selection and partnership discussions

05

## Potential Non-Dilutive Funding

U.S. government funding applications through Department of Energy, Department of War, EXIM Bank and DFC programs

07

## Expanded Test Results

Additional metallurgical test results across e-waste, REE and semiconductor-metal feedstocks to support customer engagement

02

## Feedstock Contracts

Execution of additional North American feedstock contracts with recyclers and electronic manufacturers

04

## REE & Other Mineral Processing Technology Agreements

New REE technology licensing agreements and potential royalty-bearing partnerships with mineral developers

06

## Module Standardization & New FJH Module for Significantly Larger Capacity

Standardization of FJH module designs for global deployment, incorporating lessons learned from Texas operations

Prototyping of "Revision-2" FJH design for higher capacity processing

# LOW EMISSIONS & ENVIRONMENTAL IMPACT

## ESG and Permitting Advantages

## SmCo Magnets Case Study: Comparison of FJH & Hydrometallurgy

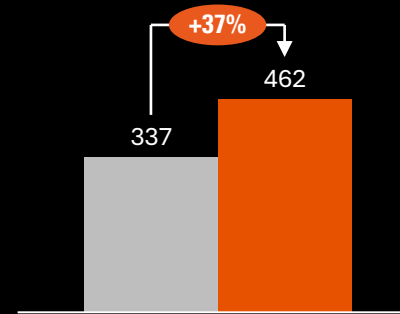
FJH avoids large waste ponds, avoids acid or cyanide circuits, and reduces carbon and water intensity

Small physical footprint and modularity allow operation near existing recycling centres and industrial precincts

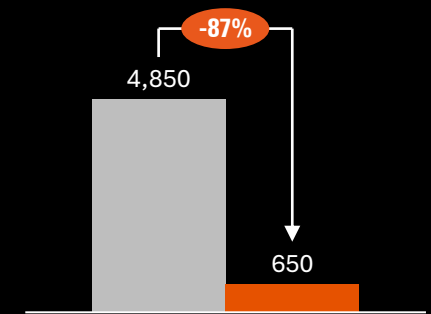
Minimal air emissions support easier permitting across OECD and non-OECD jurisdictions

Hydromet plus remote mining   Hydromet   FJH

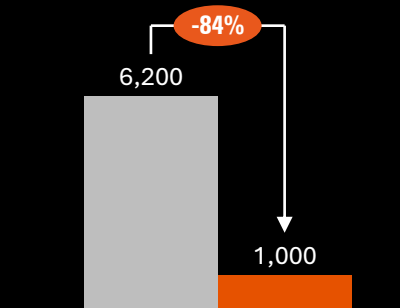
Sm yield per tonne of Co tonnes



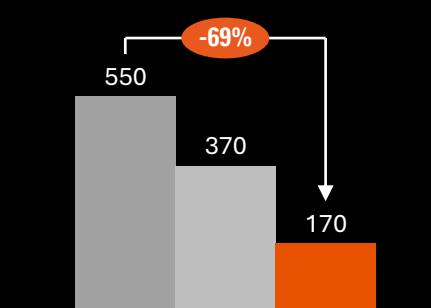
Energy consumption per tonne of Sm recovery MJ



GHG emissions per tonne of Sm recovery Kg CO2 equivalent



Processing inputs cost per tonne of Sm recovery \$/t



# The Future of Metals Recovery – Contact us to learn more or for partnership discussions

**Michael Walshe**

Managing Director & Chief Executive Officer  
Metallium Ltd

Stock Exchange



ASX: MTM



OTCQX: MTMCF

Investor and Announcement Engagement



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