



# A Fully Integrated and Independent Supplier of Critical Metals

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## **Competent Person**

Unless otherwise stated, the information in this presentation that relates to mineral exploration, mineral resources and ore reserves is based on information compiled by Mr D I Chalmers, FAusIMM, FAIG, (director of the Company) who has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Ian Chalmers consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.

# Contents

- What Differentiates ASM
- Critical Materials - Essential For New Technology
- Critical Material Supply
- Critical Materials Demand
- An Emerging Integrated Metals Supplier
- Dubbo Project Optimisation
- Evolution of ASM's Metals Business
- Potential Timetable to a Sustainable, Secure & Stable Supply
- ASM's Focus – Next 6 Months



# ASM – Emerging Metal Producer



**ASM (Mine to Manufacturer) Metallisation in Korea**

**Opportunity to produce products direct to end users**

**Non-Chinese producers**

**Oxides mostly sent to China and Japan**

**Non-Chinese producers**

**Concentrates & Carbonates mostly sent to China**

**ASM provides:**

- **Full value captured along supply chain** (no discounting)
- **Total Supply Chain Solution** – geopolitical and process risk mitigation.
- **Flexibility** – Grow oxide production (Dubbo expansion) and metal processing (metallisation plants across the world)

# ASM – Mine to Manufacturing

## Dubbo Project



- Key products defined
- Flowsheet optimised to deliver key products, with potential at a lower capital and operating costs with increased revenue
- Envisioned to be “net zero carbon”

## Ziron Tech



- Ownership of a novel patented metallisation process
- World class Ziron Tech R&D team focused on new materials for emerging technologies
- Developer/preferred partner of innovative materials processing

## Metal



- Enables preferred partnerships of metal production
- Delivered a new business unit on Titanium metal / metal powder business
- Enables the integration into global markets through specialty metal plants strategically located

# Critical Materials – Essential for New Technology

**Electric Vehicles - ~5kg**  
Rare Earth Permanent Magnets



**Growth - 3.4M to 25.3M EV cars by 2030**

*Source: Deloitte Insight – Electric Vehicle: Setting a course for 2030*

**Wind turbines – ~ 195kg of Nd/MW**



**Forecast 7.9% annual growth - 2020 to 2024**

*Source: EU's Joint Research Centre*

**Defence / Aerospace**

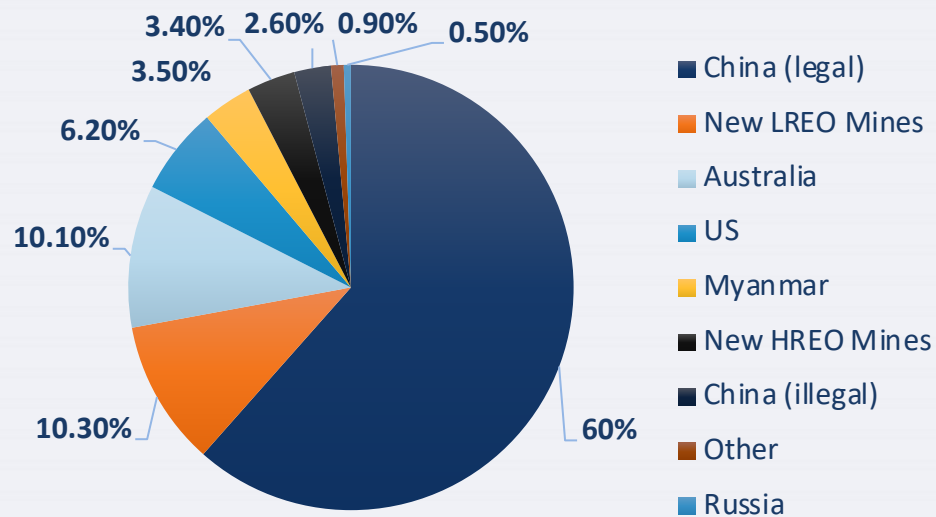


**Jet turbines, GPS, defence systems**

# Critical Materials Supply – Snap Shot

1. Production of oxides, metals and metal powders highly concentrated
2. Suppliers of concentrates and oxides receive discounted Realised Pricing
3. Metals and Powders integrated within manufacturing sectors where additional value is gained.

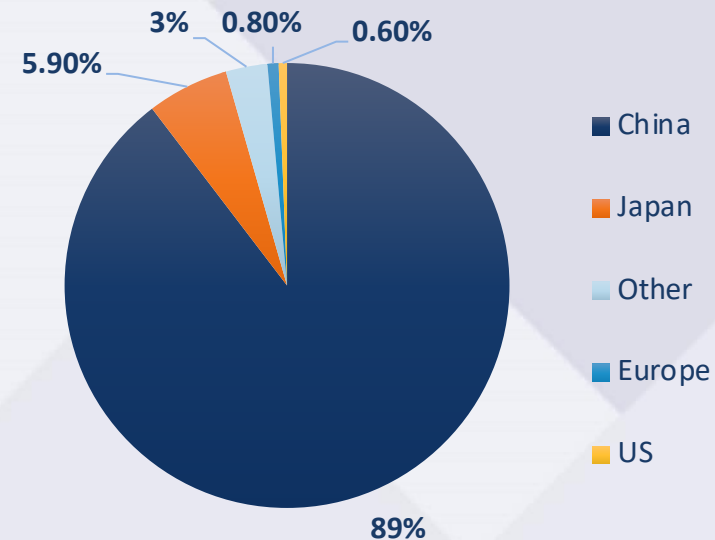
Projected Regional Production of Rare Earth Oxides - 2030



Forecast Production 2030 - ~90 ktpa

Source: Adamas Intelligence

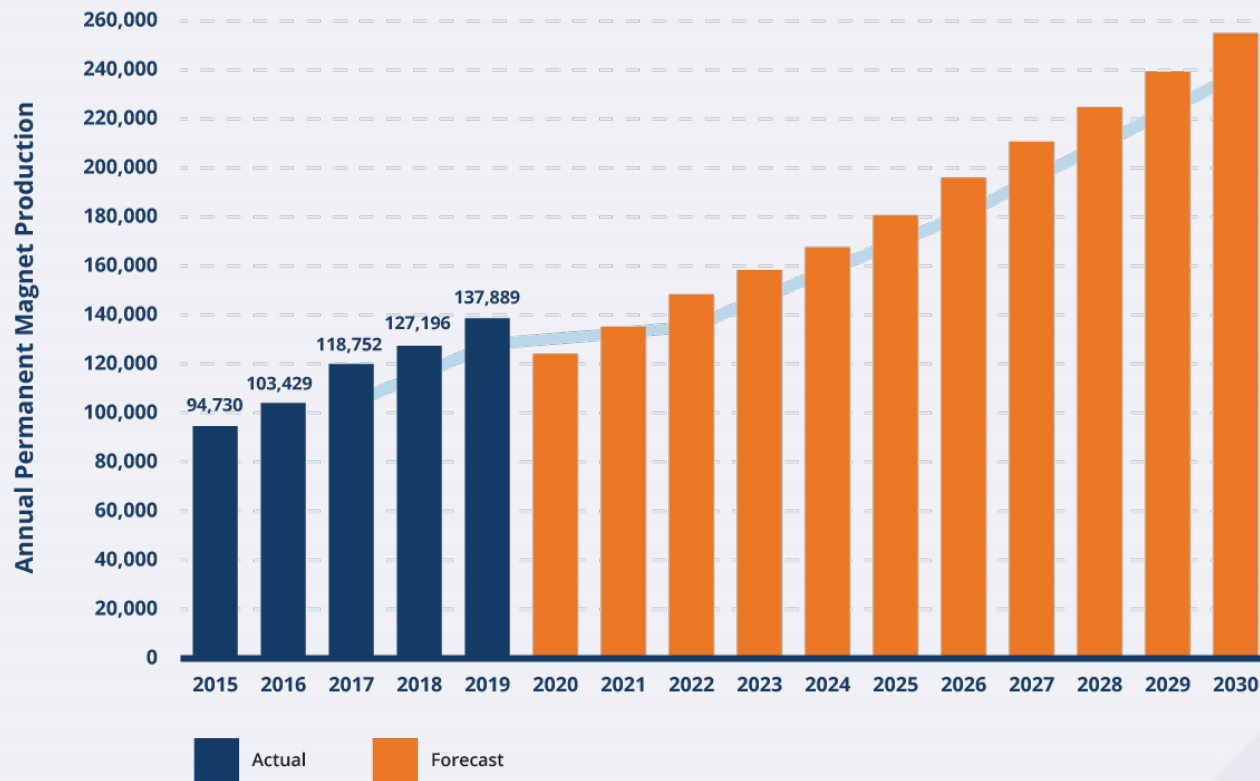
Projected Regional Manufacturing of Permanent Magnets - 2030



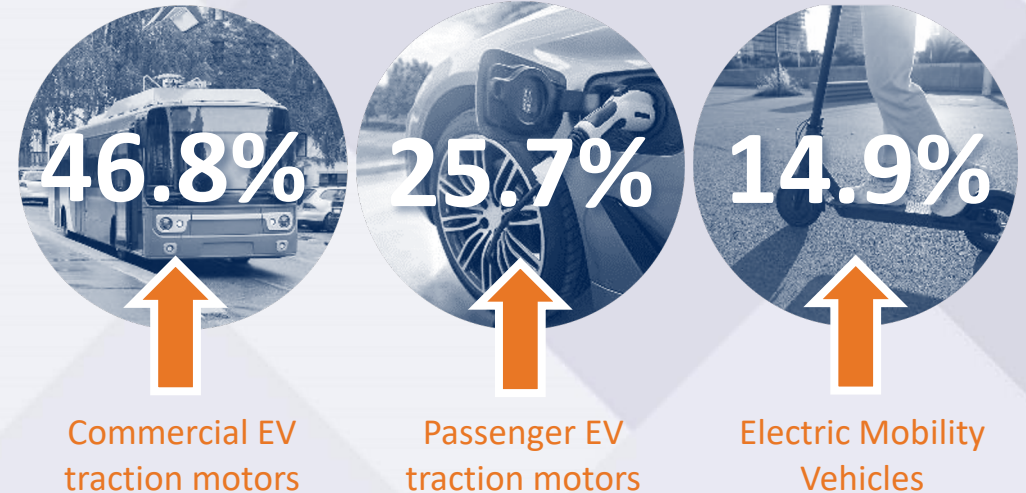
Source: Adamas Intelligence

# Critical Materials Demand - Rare Earth Magnets

Electric vehicles will consume 25% of permanent magnets globally by 2030



## Growth Rare Earth Permanent Magnets to 2030





# ASM – Fully Integrated Producer of Critical Metals



Present Producers and Developers	ASM Delivers
<ul style="list-style-type: none"> <li>▪ ROW Producers deliver lower value carbonates and separated oxides into market</li> <li>▪ 90% of the conversion to metal achieved by Chinese rare earth refiners</li> <li>▪ Value realised by end users and not the producers of carbonates and separated oxides</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fully integrated - All Dubbo products converted to metal.</li> <li>✓ Only fully integrated commercial producer of metals, alloys and powders direct to <b>End Users</b></li> <li>✓ ASM value realised by the <b>Environment, Communities, and Shareholders</b></li> </ul>

# Dubbo Plant Optimisation

On Time and Budget for completion in Q1 2021

Flowsheet simplified and optimised

Potential improved project financial returns

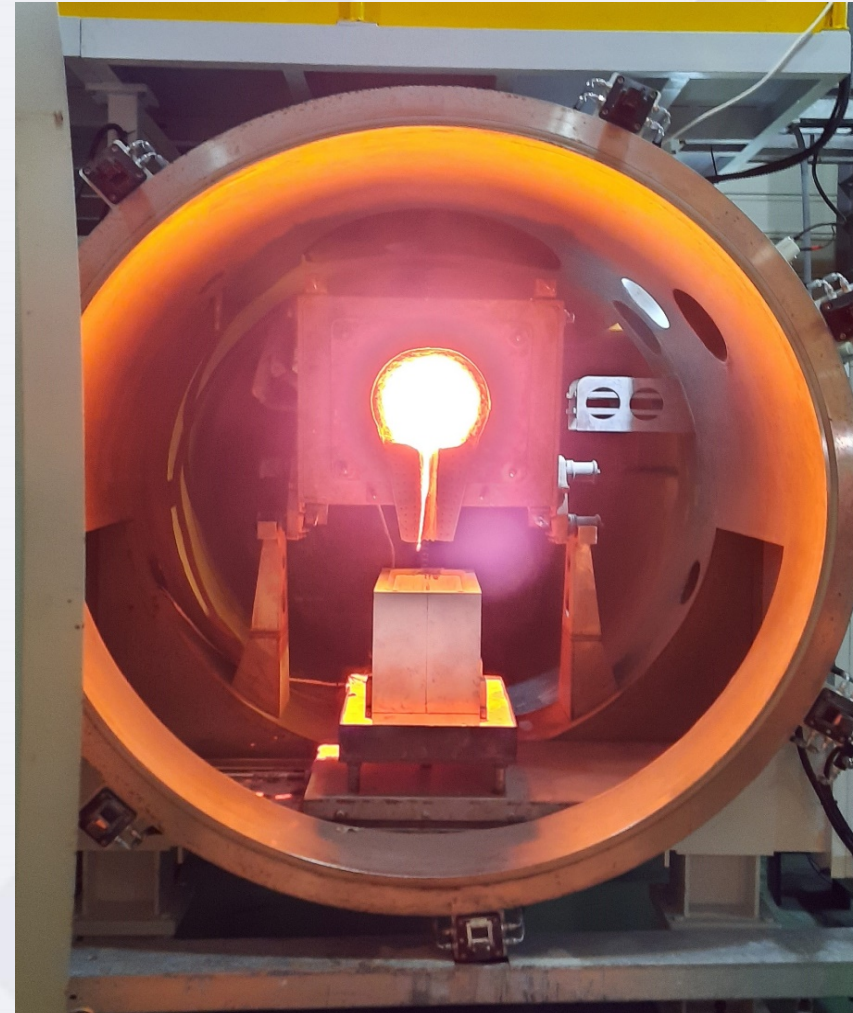


# Ziron Tech - Innovation – Technology - Value

ASM has 95% interest in Ziron  
Technology Corporation (Ziron Tech)

ASM to expand pilot plant  
All Metallisation IP owned by ASM

Proven Commercial Metal Production  
Ti, CuTi, Ti powder, Nd, Pr, NdPr, NdFeB, Dy



# ASM Integrated Metals Business

## Rare Earths

- Long term stable, secure, and sustainable supply
- Deliver strip metal alloy for permanent magnets direct to end user
- Opportunity to be part of a permanent magnet solution

## Titanium

- Independent, lower cost, environmentally responsible supply
- Independent business that provides titanium metal, metal alloys and powders
- Potential to integrate into 3D manufacturing

## Critical Metals

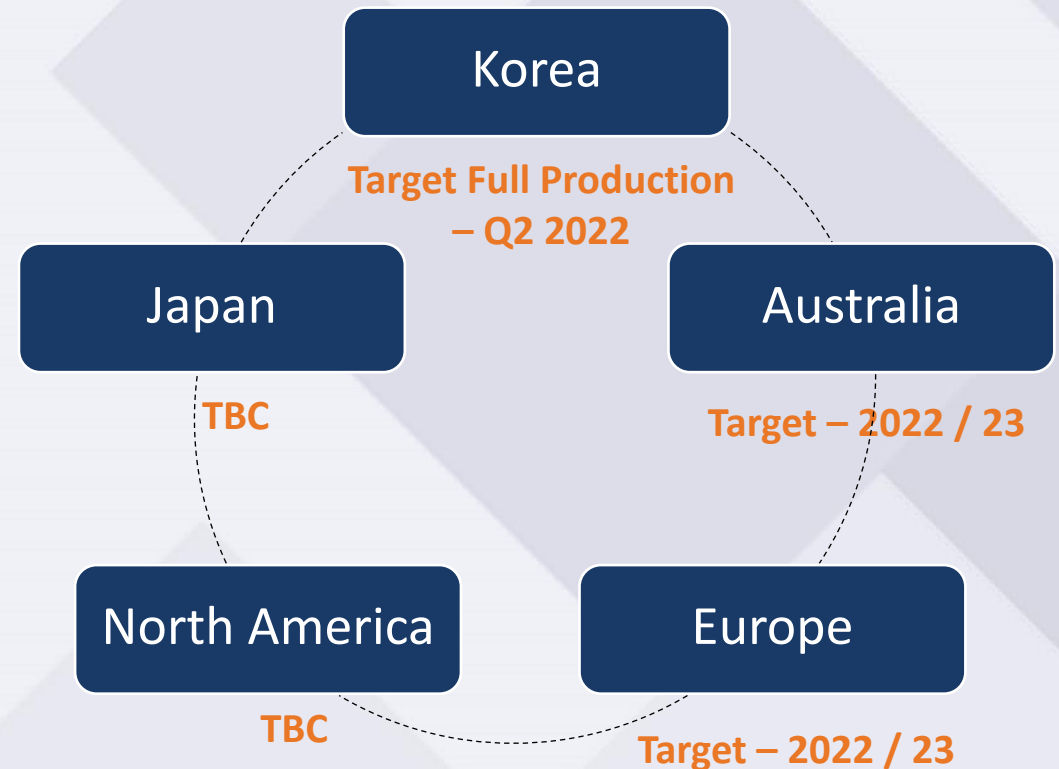
- Supply zirconium and hafnium metal for present and future demand
- Supplier of niobium metal
- Independent supply of critical metals

# A Global Independent Integrated Metals Producer

Complete Korean Metal Plant  
Scoping Study

Complete Detailed Engineering  
Commence 1,000kg NdFeB alloy sample

Develop a Korean 5,200t metals facility  
(Ti metal, NiTi, Cuti, Ti Powder, NdFeB alloy, and Dy)



# ASM Focused on Delivery

## Delivered

- **Acquired 95% of Ziron Technology Corporation (Ziron Tech)**
- **Produced high-purity zirconium metal powder, titanium copper alloy, ferro-neodymium, neodymium iron boron (NdFeB) magnet alloy**
- **Korean Atomic Energy Research Institute (KAERI) confirmed de-hafniated zirconium metal meets Korean market requirements**
- **Agreement with Dongkuk Refractories & Steel signed to design, develop, assemble, install and verify a 250kg/day commercial plant**

# Potential Timetable – Sustainable, Secure & Stable Supply



# ASM Focused on Delivery – Next 6 Months

## Planned

- **Optimisation of the Dubbo Project on target - end of Q1 2021**
- **Scoping study complete on Korean Metal Plant**
- **Detailed Engineering of Korean Metal Plant commenced**
- **Continued progress on discussions;**
  - **With metal offtake and strategic partners**
  - **With Key Korean Government departments**
  - **With large Korean EPC / EPCM companies on development and financing of Dubbo**
  - **On financing of the Dubbo Project**





# Dave Woodall

ASM Managing Director

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# Dubbo Project Resources & Reserves

## Dubbo Project – Mineral Resources

Resource Category	Tonnes (Mt)	ZrO <sub>2</sub> (%)	HfO <sub>2</sub> (%)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (%)	Y <sub>2</sub> O <sub>3</sub> (%)	TREO* (%)
Measured	42.81	1.89	0.04	0.45	0.03	0.14	0.74
Inferred	32.37	1.90	0.04	0.44	0.03	0.14	0.74
<b>Total</b>	<b>75.18</b>	<b>1.89</b>	<b>0.04</b>	<b>0.44</b>	<b>0.03</b>	<b>0.14</b>	<b>0.74</b>

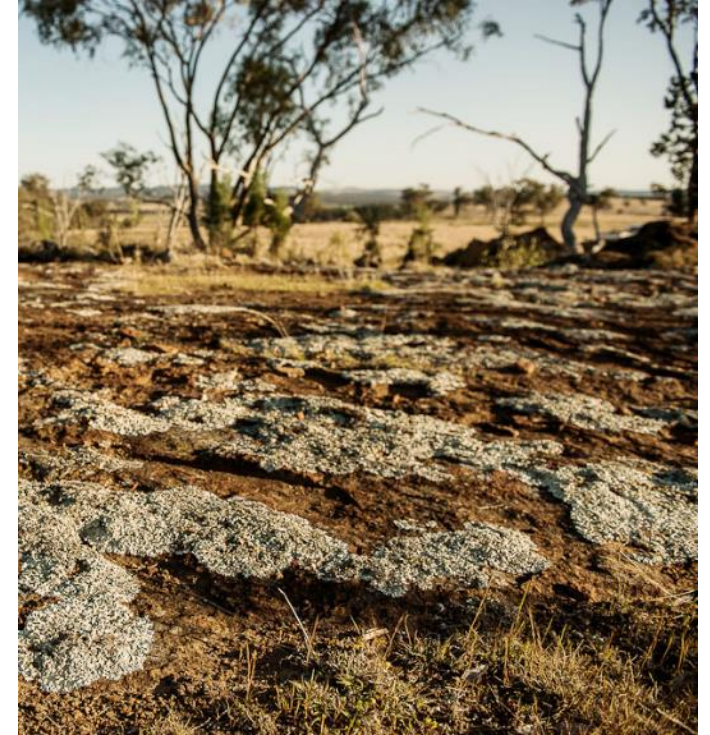
\*TREO% is the sum of all rare earth oxides excluding ZrO<sub>2</sub>, HfO<sub>2</sub>, Nb<sub>2</sub>O<sub>3</sub>, Ta<sub>2</sub>O<sub>5</sub>, Y<sub>2</sub>O<sub>3</sub>,

## Dubbo Project – Ore Reserves

Reserve Category	Tonnes (Mt)	ZrO <sub>2</sub> (%)	HfO <sub>2</sub> (%)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (%)	Y <sub>2</sub> O <sub>3</sub> (%)	TREO* (%)
Proved	18.90	1.85	0.04	0.440	0.029	0.136	0.735
<b>Total</b>	<b>18.90</b>	<b>1.85</b>	<b>0.04</b>	<b>0.440</b>	<b>0.029</b>	<b>0.136</b>	<b>0.735</b>

\*TREO% is the sum of all rare earth oxides excluding ZrO<sub>2</sub>, HfO<sub>2</sub>, Nb<sub>2</sub>O<sub>3</sub>, Ta<sub>2</sub>O<sub>5</sub>, Y<sub>2</sub>O<sub>3</sub>,

*Note: Full details including Competent Person statements are included in the Company's annual governance statement in the Annual Report released to the ASX on 7 October 2020 - the Company confirms that all material assumptions and technical parameters underpinning the estimated Mineral Resources and Ore Reserves, as disclosed continue to apply and have not materially changed*



# Corporate Profile

## Capital Structure

Ordinary Shares	119.05 million
Share Price (27 January 2021)	A\$5.08
Market Capitalisation	A\$604.8M
52 week low/high	A\$0.84/\$6.84
Cash (31 December 2020)	A\$12.4M
Enterprise Value	A\$592.4M
Average Daily Turnover (3 Months)	A\$2.45 million

**Experienced Board and Management Team focused on delivering:**

- Development of the Dubbo Project
- Production of high purity metals direct to customers
- Integrate further in the critical metals value chain



## Share Price and Volume (3 Months)



## Shareholders 31 December 2020

