



# Australian manufacture of critical materials for advanced technologies

David Woodall – Managing Director

20 May 2020



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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. Mr Chalmers is a shareholder of Alkane Resources Limited and participates in the short and long term incentive plans.

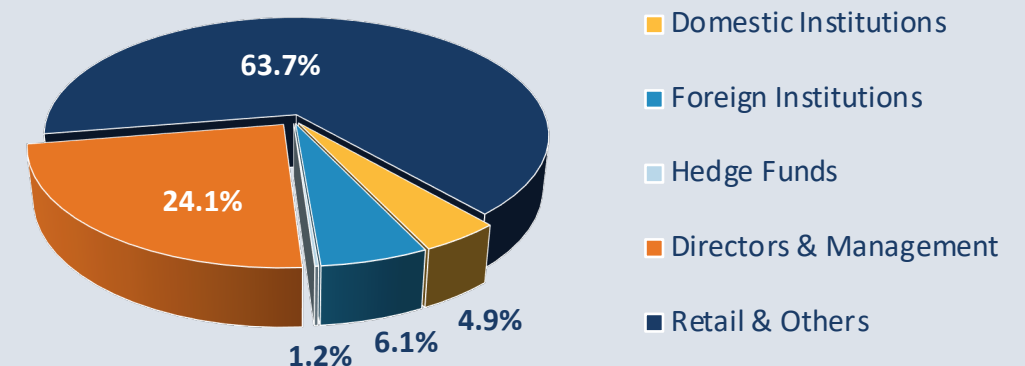
# Corporate Profile

- Australian Strategic Materials Ltd (ASM) is an emerging producer of value add metals and oxides products
- Established in 2000, historically a wholly-owned subsidiary of ASX-listed Alkane Resources Ltd and holding company for the Dubbo Project
- ASM to be standalone listed entity in early July 2020 (subject to shareholder resolution)
- Cash of A\$20 million (1 April 2020) and no debt
- Focused Board and Management Team to unlock shareholder value through construction, partnering and commercialisation
- Project located 400km northwest of Sydney  
Land and resource wholly owned



Directors	
Ian Gandel	Chairman
David Woodall	Managing Director
Nicholas Earner	Non-Executive Director
Ian Chalmers	Non Executive Director
Gavin Smith	Non-Executive Director
Dennis Wilkins	Company Secretary

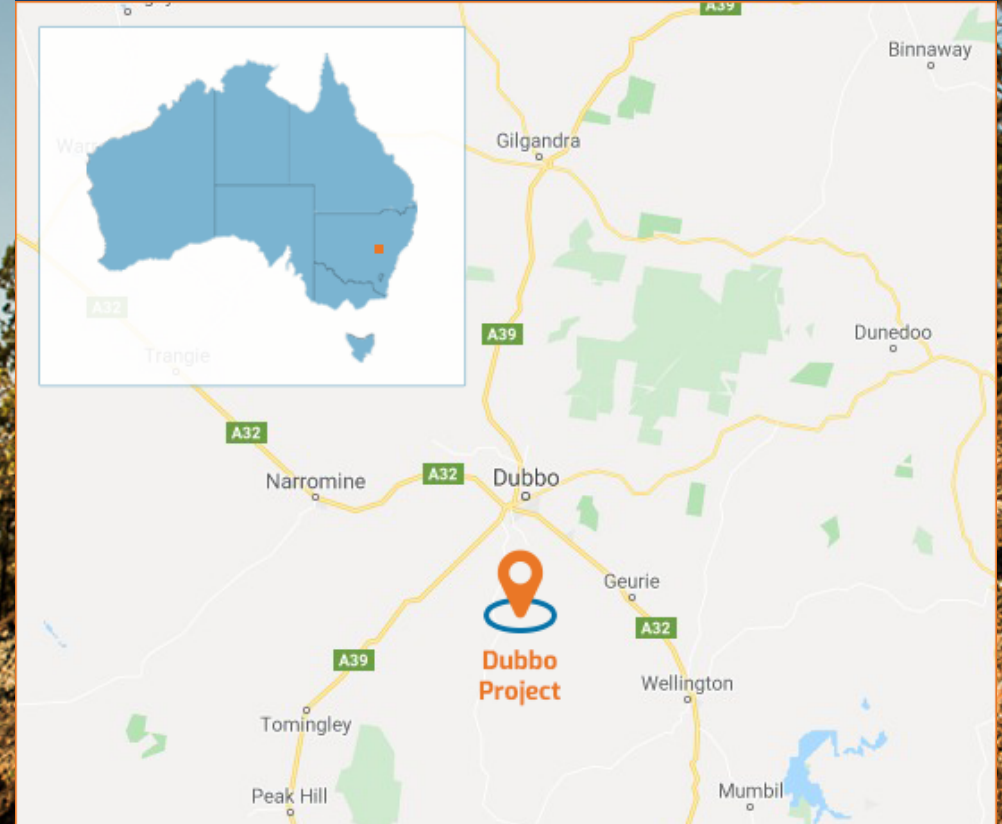
**Shareholder Ownership (Pro-forma Demerger)**  
~ 119m ASM shares out



# ASM Listing

- Shareholders to vote on ASM becoming separate company (de-merger from Alkane) in early July
- Eligible Shareholders will be entitled to receive one ASM Share for every five Alkane Shares
- Proposed ASX listing in mid July – no ongoing ownership by Alkane
- ASM Board and Management to bring focus and prioritise commercialisation of the Dubbo Project
- ASM to be demerged with a strong working capital position of A\$20 million and no debt
- Further detail on the demerger can be found on the recently launched website [asm-au.com](http://asm-au.com)

## Dubbo Project long life polymetallic project construction ready



**JORC (2012) Resource - 75.18 Mt @ 1.89%  
ZrO<sub>2</sub>, 0.04 % HfO<sub>2</sub>, 0.44% Nb<sub>2</sub>O<sub>5</sub>, 0.9% TREO**



# Critical minerals are:

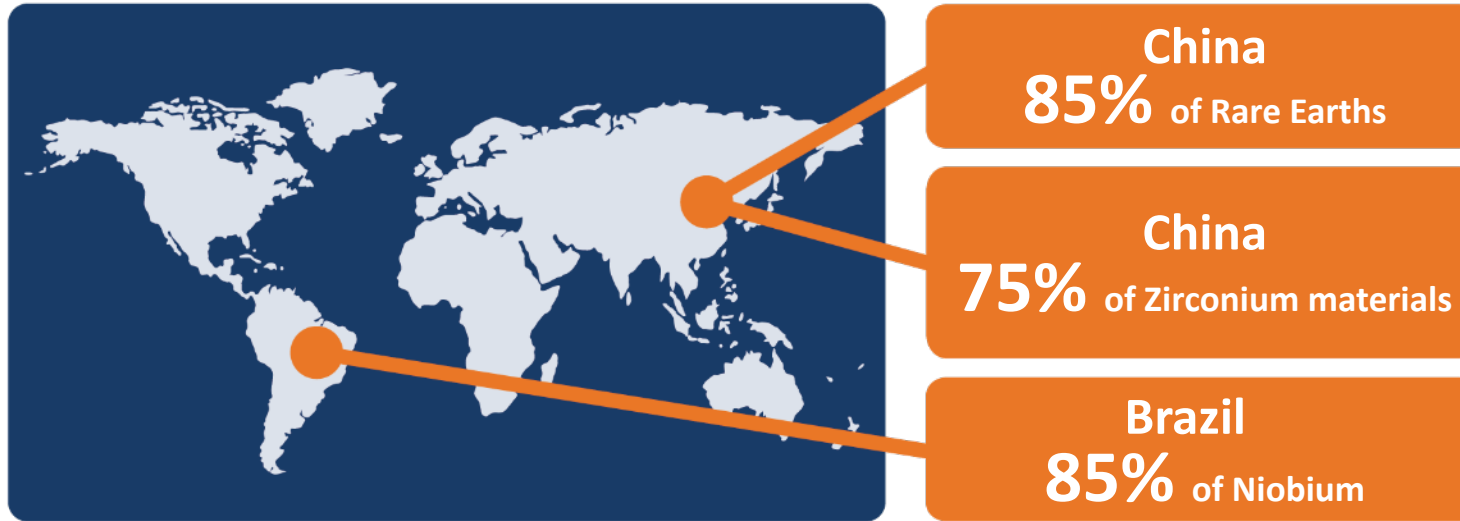
- Noted as critical by all major manufacturing nations
- Essential to national economy + security
- Vulnerable to supply disruptions, e.g. COVID19
- Essential to new and green technologies

Zirconium, Rare Earth Elements, Niobium and Hafnium are critical for:

1. Clean energy and reduced emissions (e.g. EV's, renewables)
2. High-Tech Products (e.g. phones, tablets)
3. Health & Well-being Products (e.g. MRI, replacement joints)
4. Aerospace & Manufacturing (e.g. jet engines)



# Lack of global supply diversity of critical minerals?



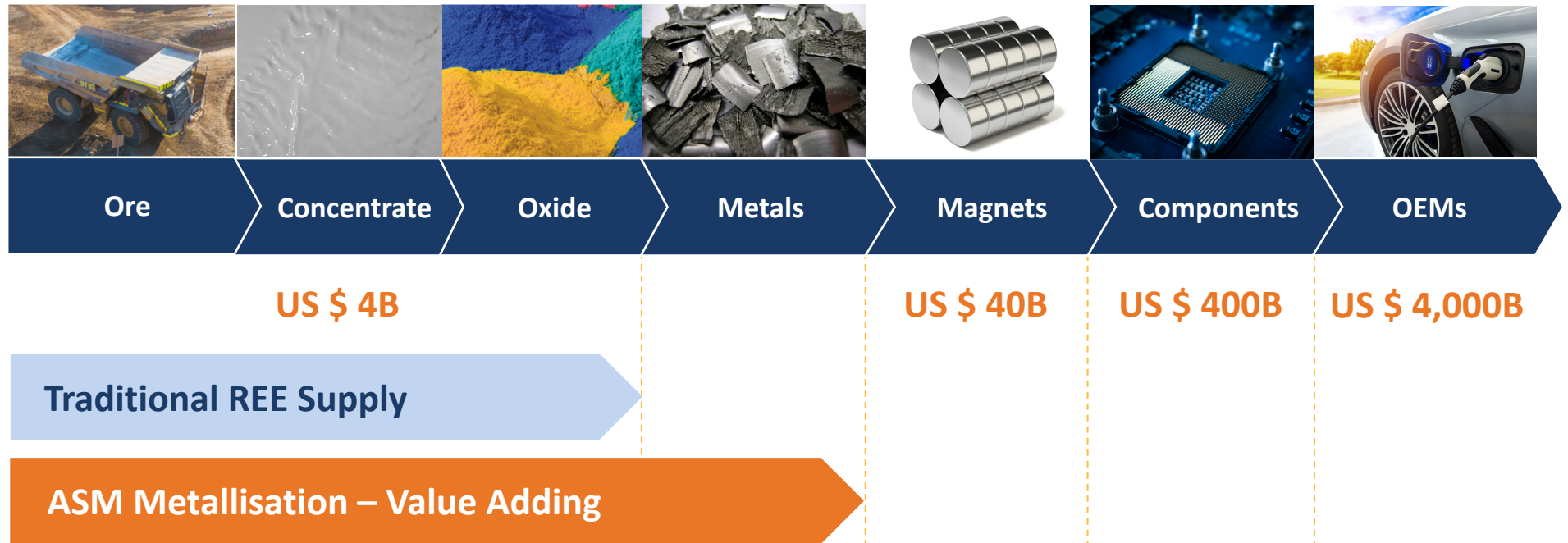
**Majority of REE and Zr are used in China** to manufacture high-tech products for domestic + global markets  
= 'Made in China 2025' policy

Limited supply reaching Australia + other nations  
Further choked by COVID-19

- ▶ increased threat to international economies and security
- ▶ **high demand for alternative sources**

# ASM in the REE Integrated Supply Chain

## REE Value Chain



- Mine to customer supply chain
- Delivery to customer specification
- Additional value added to all ASM products, inclusive of REE

*This figure is adapted from a presentation made by Professor K. G. van den Boogaart at the SME Critical Minerals Conference in Denver in August 2014.*

# Australia's in-ground resource

Ore to high purity metal oxides

## The Dubbo Project: 100% Australian



25km south of Dubbo, the Dubbo deposit is a **proven, large deposit** of Zr, REE, Nb and Hf minerals.



ASM spent **15 years in development with ANSTO** to optimise minerals recovery + processing.

## Clean Metal Project

### 2019

#### Joint Venture with ZironTech, South Korea

- Combine our proprietary oxide separation process and ZironTech's efficient metallisation technology
- ASM has exclusive global commercialisation rights on the metallisation process

### 2020

#### ASM's unique metals technology pilot plant to commence production

- Prove that we can manufacture pure metals at commercial scale
- Build strategic customer relationships for offtake agreements



# ASM – Dubbo Project 2020

## Detailed Feasibility Study announced in June 2018

- Robust project economics at forecast prices
- Diversified Products – Zirconium, REE, Niobium and Hafnium
- Project Approved – Construction Ready

## 2020 Optimisation Program

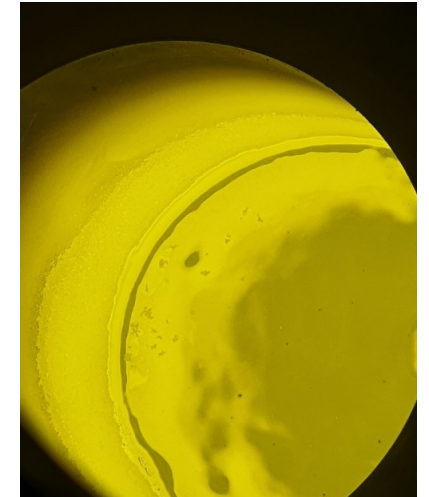
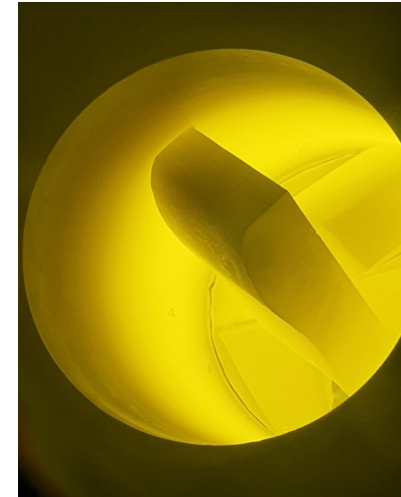
- Targeting step changes in financial returns by reducing capital requirements and increasing IRR and NPV
- Shift product revenue balance
- Process Optimisation:
  - Concentrate via flotation
  - Reduce leaching and solvent extraction capital
  - Maintain output for lower capex and opex
- Metallisation:
  - South Korean JV well established
  - Allows delivery to final customers
  - Offtake enabling

	2018 FEED Study *	2020 Study Goals
Capital Expenditure	AUD \$1,300 M	↓
NPV <sub>8</sub> (pre-tax)	AUD \$1,240 M	↑
EBITDA pa	AUD \$320 M	↑
IRR (pre-tax)	17.5 %	↑
<b>Products Produced:</b>		
Zirconium Products	~16,000 t	Slight reduction
TREO	~6,000 t	Increase
NdPr	~1200 t	Increase
Ferro - Niobium	~ 2,000 t	Slight reduction
Hafnium	50 t	Unchanged

*\* As per ASX announcement of 4 June 2018. The Company confirms that all the material assumptions and technical parameters underpinning the forecast financial information derived from a production target, in the initial public report continue to apply and have not materially changed.*

# ASM – 2020 Milestones

Value Adding Strategies	Project Implementation	Milestone
<b>Production of Critical Metals:</b> <ul style="list-style-type: none"> <li>• Joint Venture</li> <li>• Exclusive global licensing</li> <li>• All ASM products</li> </ul>	RMR Tech JV – with IP rights	✓
	Laboratory test program – Zr, Hf, and REE	✓
	Pilot Plant Construction	Q2 2020
	2t Zirconium Metal Production	Q3 2020
	REE Metallisation	Q3 2020
	Feasibility of Independent Metals Plant	Q3 2020
<b>Process Plant</b> <ul style="list-style-type: none"> <li>• Optimisation program</li> </ul>	Laboratory scale testwork	✓
	Flotation test program	Q2 2020
	Solvent extraction pilot program	Q3 2020
	Optimised FEED Study	Q4 2020
<b>Strategic Investor / Financing</b>	Export Finance Australia	✓
	Heads of Agreement Metalation	Q3 2020
	Strategic Partner	Q4 2020
	Offtake Agreement	Q4 2020





# Dave Woodall

ASM Managing Director

 [asm-au.com](https://asm-au.com)  [ASM\\_au](https://twitter.com/ASM_au)

# 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>5</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>5</sub>, Ta<sub>2</sub>O<sub>5</sub>, Y<sub>2</sub>O<sub>3</sub>,

*Note: Full details including Competent Person statements in ASX announcement 19 September 2017 - the Company confirms that all material assumptions and technical parameters underpinning the estimated Mineral Resources and Ore Reserves, and production targets and the forecast financial information as disclosed continue to apply and have not materially changed*

