



Beyond Lithium: Alkane's Essential Elements

Sydney Mining Club 2 August 2018

Nic Earner, MD Alkane Resources Ltd



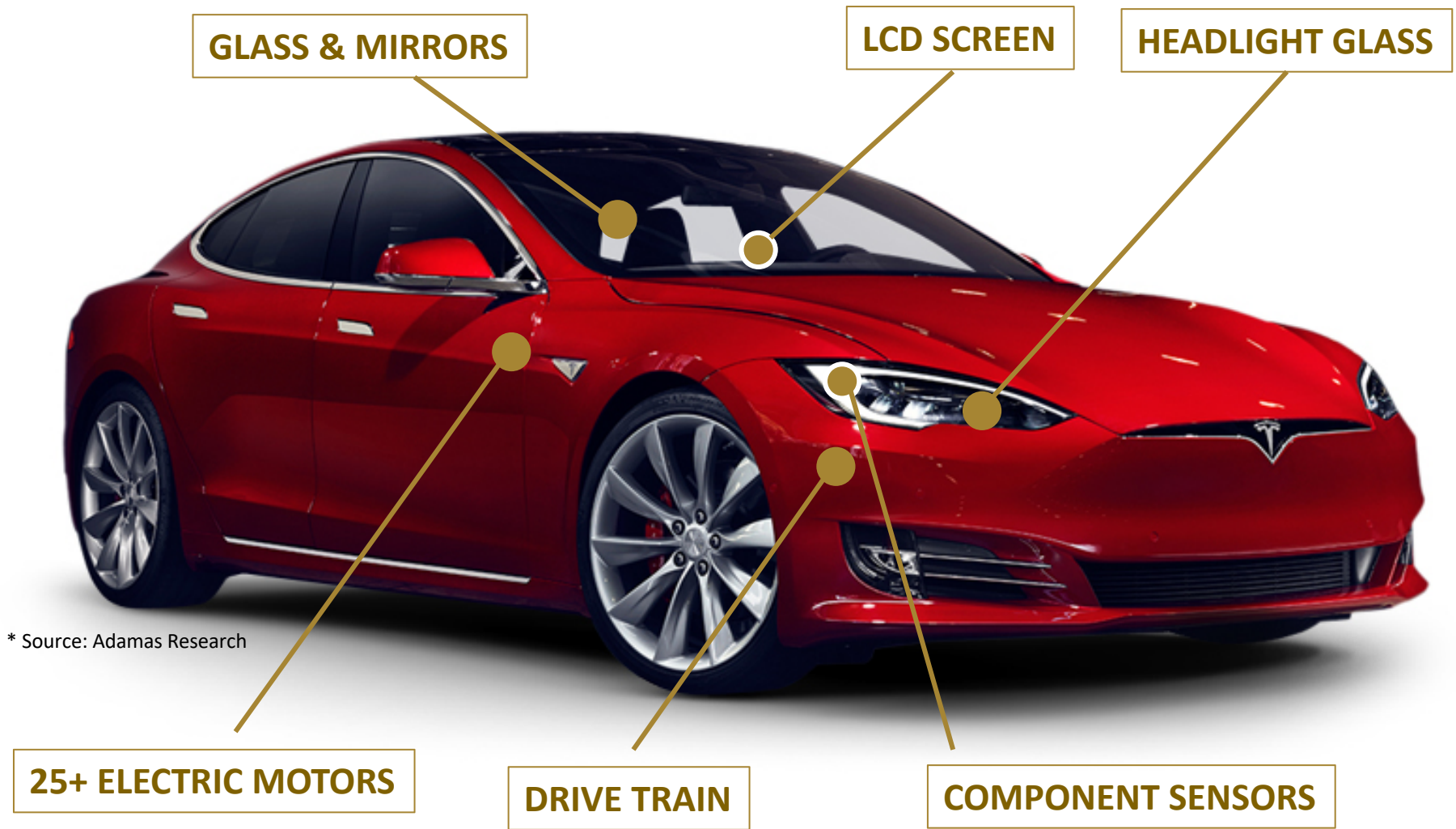
Electric Vehicles are Driving Minerals Demand

LITHIUM BATTERY

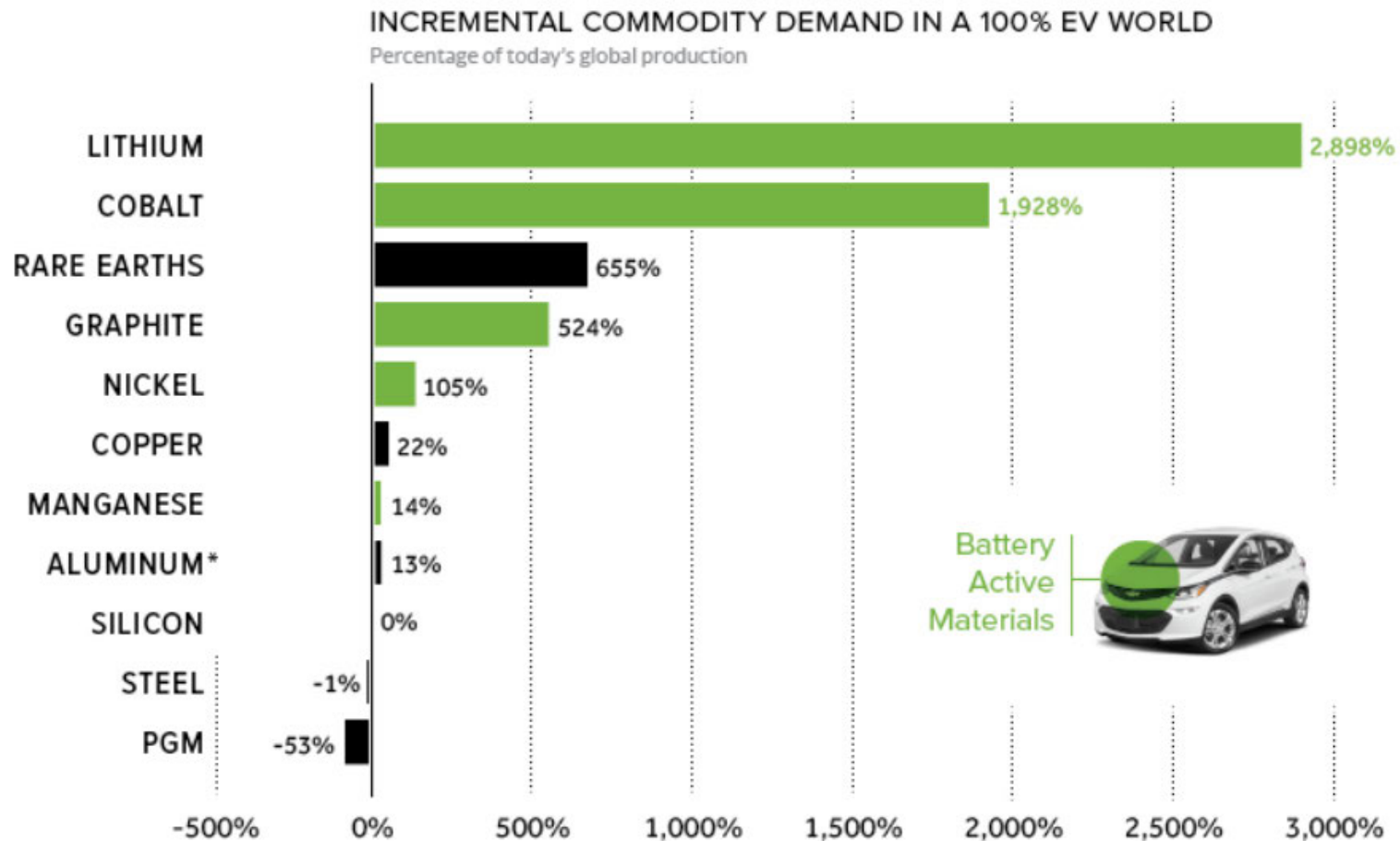


<https://seekingalpha.com/article/4027705-tesla-really-worthless-rangeley-capital-discussion>

Electric Vehicles are Driving Rare Earths Demand



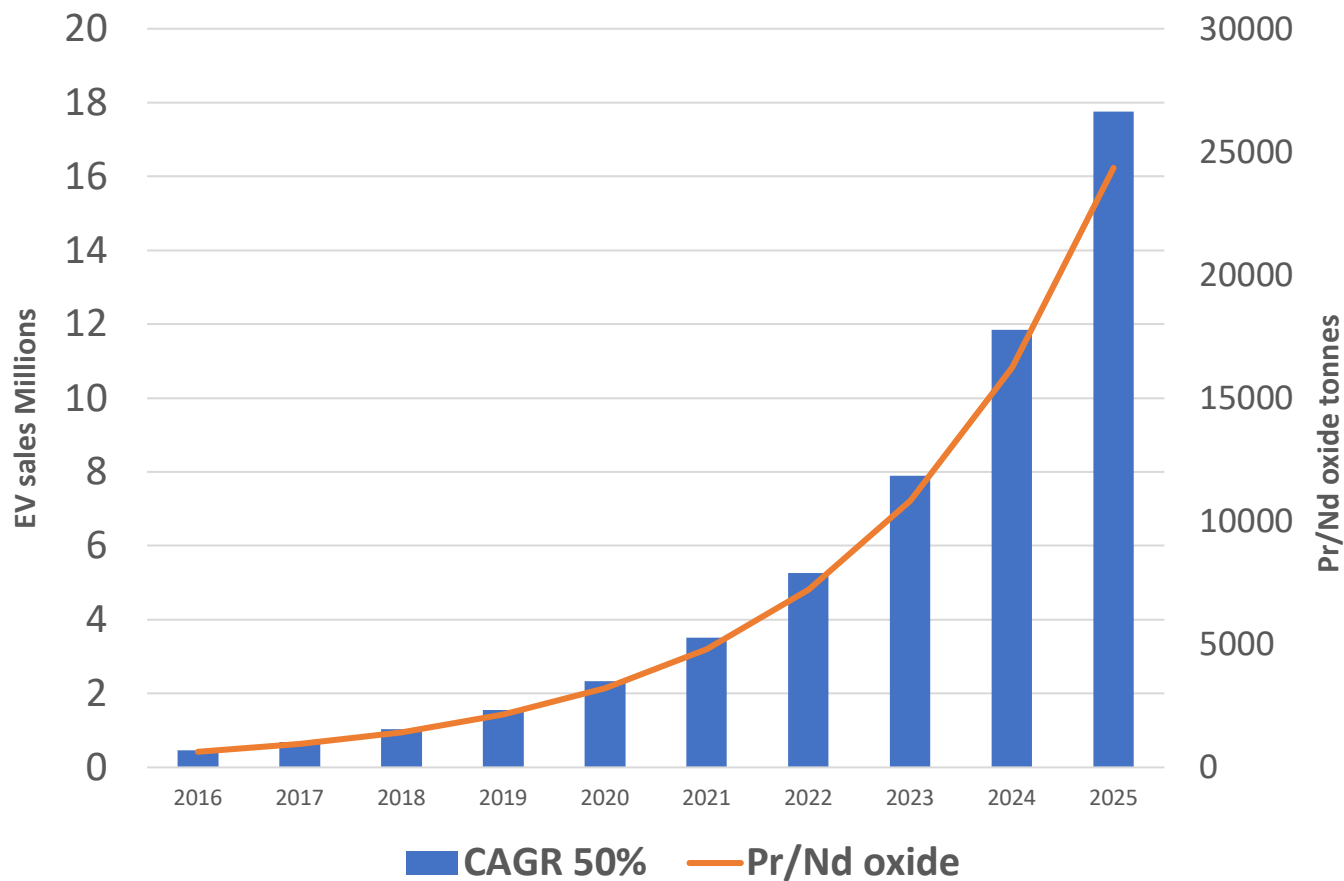
The Critical Link Between Lithium & Rare Earths



*Small amounts of aluminum are used in NCA batteries, but this change in demand stems mostly from replacing steel in the body.

Sources: UBS, Visual Capitalist

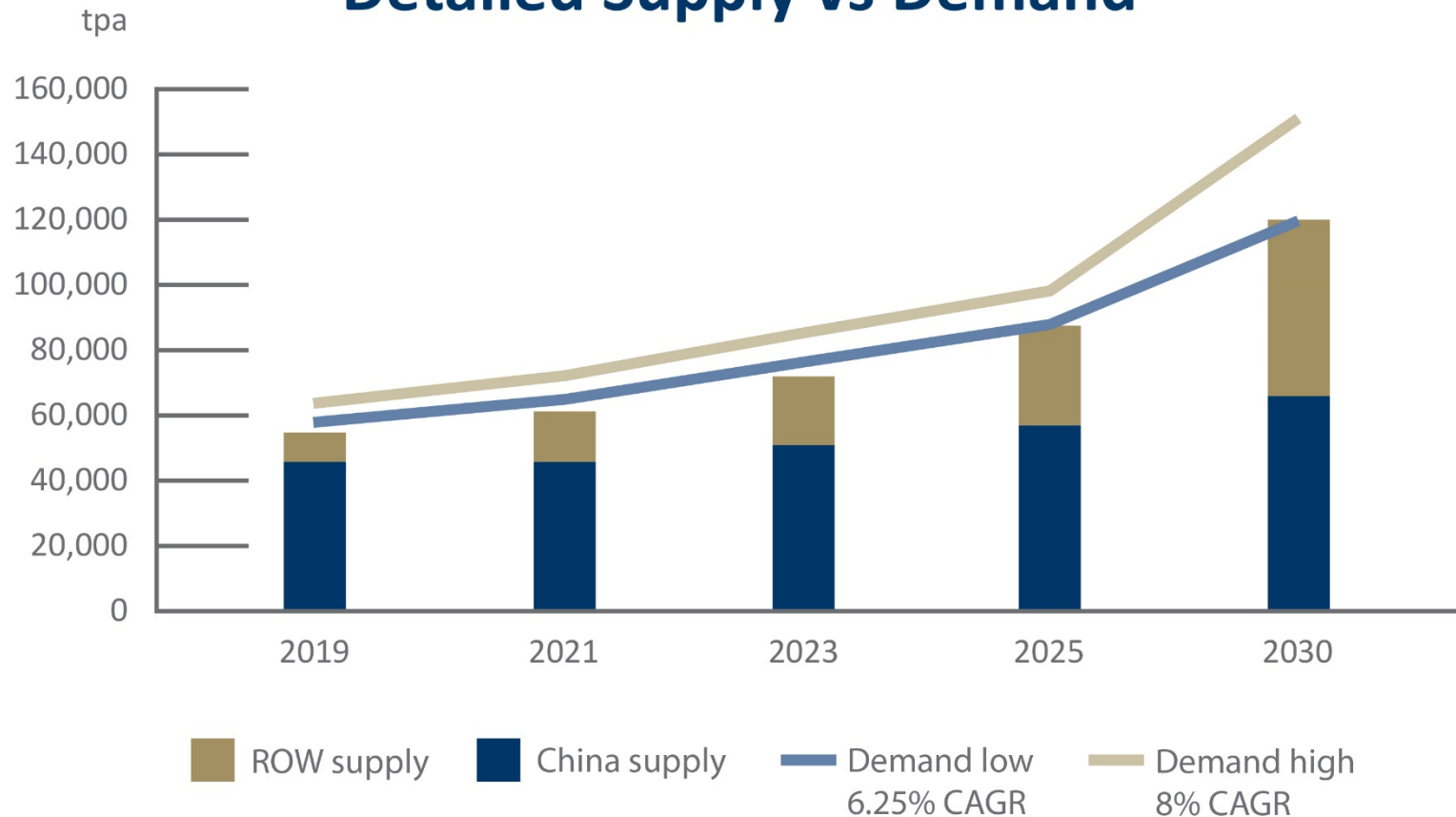
Exponential Growth in EV Sales



10 million EVs requires + 15,000 tpa rare earths (Pd/Nd)

Supply vs Demand (Rare Earths – Pr/Nd oxides)

Detailed Supply vs Demand



Source: IMCOA

A Lesson from China: The Rare Earth Value Chain

In 2016



Rare earths
Mineral concentrates



Rare earth oxides
US\$4-5b



Permanent (NdFeB)
Magnet market
US\$10.5b



\$83b in 2012



\$78b



\$5.6b



\$440b

US\$600b+

Since 1970s, China has successfully implemented each component of the rare earth value chain to create downstream domestic jobs

Rare Earths: China's Tactics 2017/18

- **Consolidate industry**
- **Shut down illegal production**
- **Fund production companies**
- **Eliminate export quotas and taxes**
- **Legislate for royalties**
- **Clean up environmental practices**
- **Integrate the entire value chain**



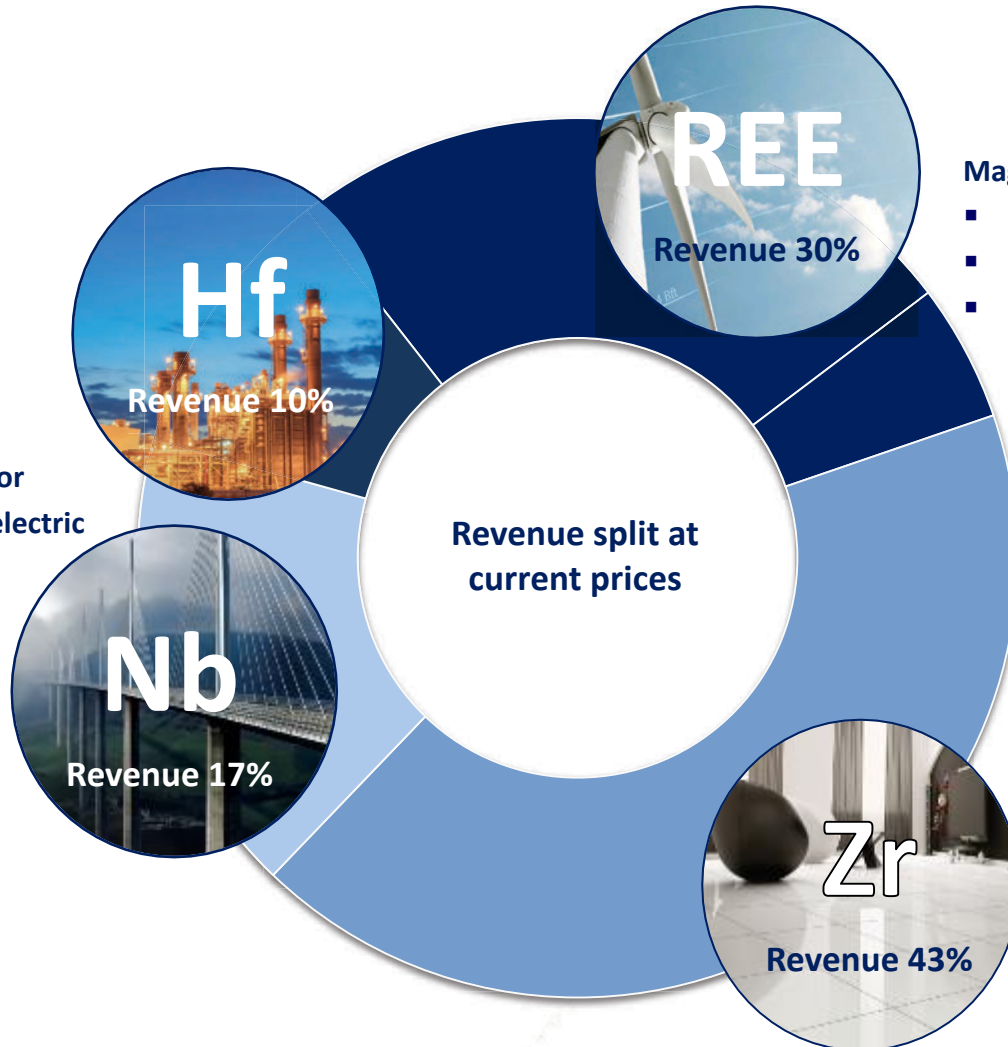
Not Just a Rare Earths Project

Hafnium

- Superalloys
- Plasma cutting tips
- Nuclear control rods
- Catalyst precursor
- Jet engines TBCs
- Developing applications for thermoelectric and ferroelectric

Niobium

- Superalloys
- Structural steel
- Auto steel
- Rocket nozzles



REE 30%

Magnets 25%

- EV's
- Wind power
- Robotics

Non-Magnets 5%

- Catalysts
- Glass
- Phosphors
- Metal alloys
- Polishing
- Ceramics

Zirconium

- Ceramics
- Catalysts
- Chemicals
- Refractory
- Foundry
- Jet engines TBCs

Steps to Market



Proven Resource



Flow Sheet



Engineering



Permits



Land Tenure



Stable Mining Jurisdiction



Team



External Markets & Pricing

The Future

- EV supply chain investment must include rare earths
- Rare earths production must increase worldwide
- New projects need to come online
- Alkane's Dubbo Project has completed all critical steps and is ready for funding
- Increasing rare earth prices
+ potential supply disruption = incentive to invest
- What else does Alkane have in its favour?

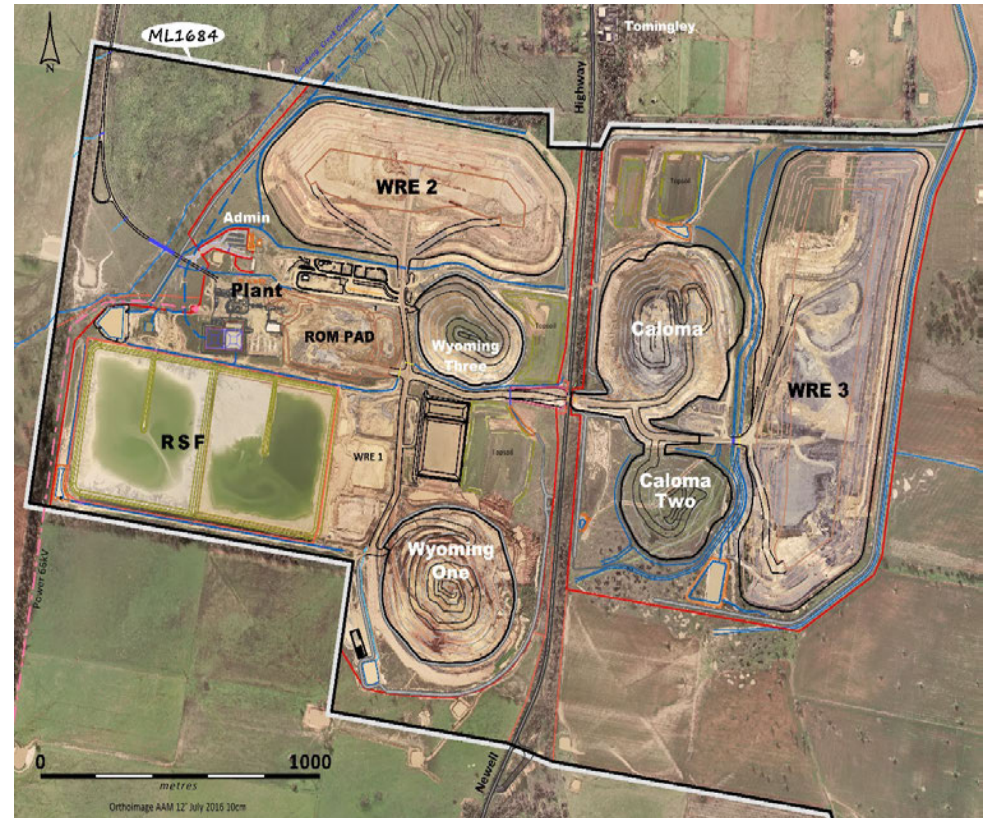
More than Rare Earths - Successful Gold History

- 1996-2005 – Peak Hill Gold Mine operated
- Discovered McPhillamy's - proved resource and sold - \$70m (2012)
- 2014 - Current – Tomingley Gold Operations (812,000 oz init. resource)
 - commissioned on-time/budget (\$116m) – No debt
- 2018 – TGO - NSW Mine Operator of the Year
- Successful ongoing exploration program provides pipeline of potential development projects
- Underground resources and reserves at TGO



Tomingley Gold Operations (TGO)

- 2018 'Mining Operation of the Year' (NSW Mining)
- Construction on-time and on budget. No debt.
- Excellent operational performance
- Full year cash flow \$60.1m FY18
- FY18 initial guidance exceeded
- 78,533 oz gold
- A\$1,002/oz – ASIC
- Total gold production to 30 June 2018: 305,506 oz
- Total cash flow to 30 June 2018: \$146m



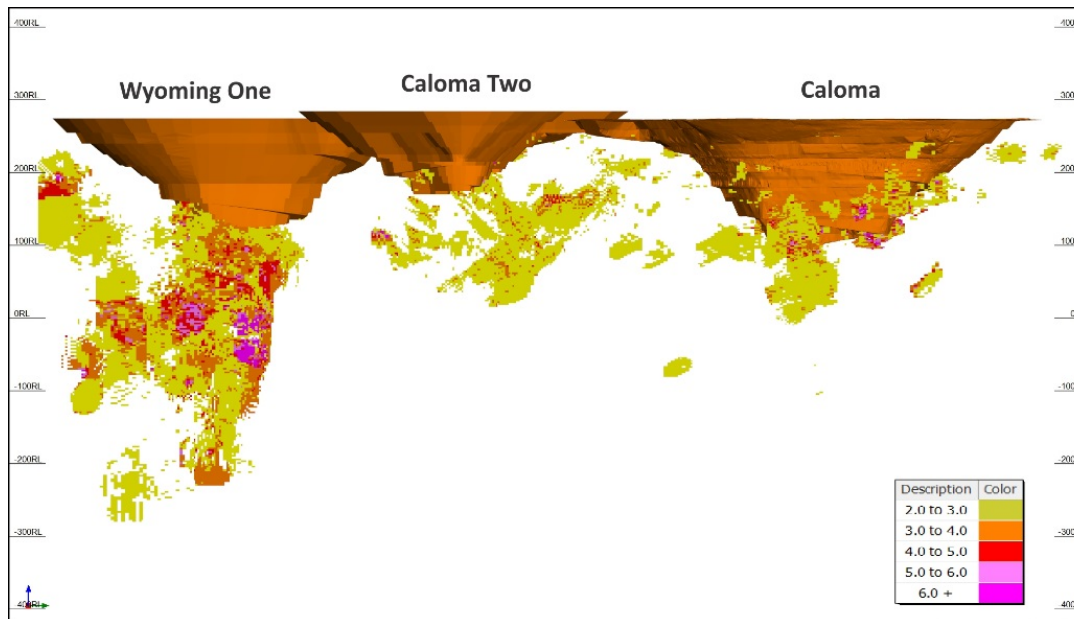
TGO Performance

Year	Gold poured	Gold sold	AISC*	Revenue	Operating Cash Flow
2014	20,713	16,374	\$1,604	\$23.3M	
2015	69,612	70,734	\$1,249	\$101.9M	\$28.6M
2016	67,812	67,893	\$1,256	\$109.1M	\$24.6M
2017	68,836	69,929	\$1,335	\$117.3M	\$32.7M
2018	78,533	75,507	\$1,002	\$128.8M	\$60.1M
2019 est	32,500		\$1,350	\$56.4M	

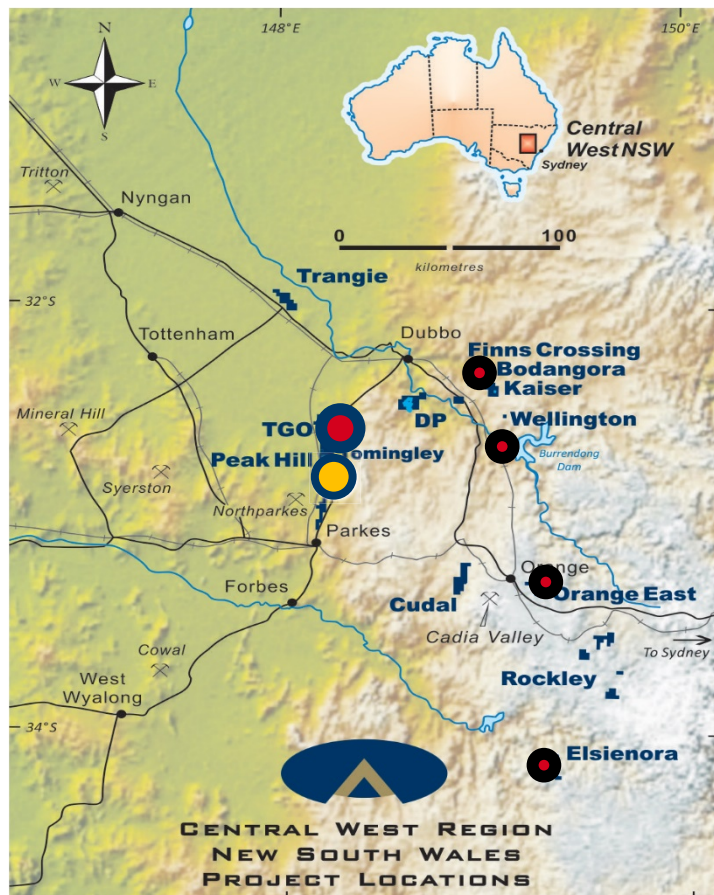
**AISC = All In Sustaining Cost comprises all site operating costs, royalties, mine exploration, sustaining capex and mine development and an allocation of corporate costs presented on the basis of ounces produced*

TGO Underground

- Planning for underground operations underway - investment decision expected December 2018.
- A project manager has been appointed
- Portal development anticipated in March 2019.



Exploration



- **Peak Hill Gold Mine 1996 – 2005 production**
 - Substantial gold-copper sulphide deposit
 - potential feed for TGO
- **TGO – Regional exploration**
 - A number of ore intercepts in drilling over a 5km strike length
- **Advanced exploration projects at**
 - **Bodangora – Kaiser (Au – Cu)**
large gold-copper porphyry system
 KSRC001 60m grading 0.81g/t gold and 0.91% copper
 KSRC018 311m grading 0.28g/t gold and 0.08% copper
 - **Wellington (Cu – Au)**
defined small VMS deposit (non JORC)
 - **Elsienora (Au – base metals, barite)**
McPhillamys style targets (2.5Moz)
 - **Orange East (Au)**
McPhillamys style targets

Gold Growth Strategy

- Leverage TGO infrastructure with underground and surrounding resources.
- Grow a portfolio of small promising gold projects for development through acquisition.



Conclusion

- Dubbo Project ready to develop
- Momentum for funding is increasing
- TGO running well
- TGO underground in final checks for financial decision
- TGO regional exploration has high potential
- Quality regional tenements
- Considering investments for development



Nic Earner
Managing Director
NEarner@alkane.com.au
@alkaneresources



www.alkane.com.au

Disclaimer

This presentation contains certain forward looking statements and forecasts, including possible or assumed reserves and resources, production levels and rates, costs, prices, future performance or potential growth of Alkane Resources Ltd, industry growth or other trend projections. Such statements are not a guarantee of future performance and involve unknown risks and uncertainties, as well as other factors which are beyond the control of Alkane Resources Ltd. Actual results and developments may differ materially from those expressed or implied by these forward looking statements depending on a variety of factors. Nothing in this presentation should be construed as either an offer to sell or a solicitation of an offer to buy or sell securities.

This document has been prepared in accordance with the requirements of Australian securities laws, which may differ from the requirements of United States and other country securities laws. Unless otherwise indicated, all ore reserve and mineral resource estimates included or incorporated by reference in this document have been, and will be, prepared in accordance with the JORC classification system of the Australasian Institute of Mining, and Metallurgy and Australian Institute of Geosciences.

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.

Dubbo Project Resources & Reserves

Dubbo Project – Mineral Resources

Resource Category	Tonnes (Mt)	ZrO ₂ (%)	HfO ₂ (%)	Nb ₂ O ₅ (%)	Ta ₂ O ₅ (%)	Y ₂ O ₃ (%)	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
Total	75.18	1.89	0.04	0.44	0.03	0.14	0.74

*TREO% is the sum of all rare earth oxides excluding ZrO₂, HfO₂, Nb₂O₃, Ta₂O₅, Y₂O₃,

Dubbo Project – Ore Reserves

Reserve Category	Tonnes (Mt)	ZrO ₂ (%)	HfO ₂ (%)	Nb ₂ O ₅ (%)	Ta ₂ O ₅ (%)	Y ₂ O ₃ (%)	TREO*
Proved	18.90	1.85	0.04	0.440	0.029	0.136	0.735
Probable	0						
Total	18.90	1.85	0.04	0.440	0.029	0.136	0.735

*TREO% is the sum of all rare earth oxides excluding ZrO₂, HfO₂, Nb₂O₃, Ta₂O₅, Y₂O₃,

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

TGO Open Pit Resources and Reserves (30 June 17)

TOMINGLEY GOLD OPERATIONS MINERAL RESOURCES (as at 30 June 2017)									
DEPOSIT	MEASURED		INDICATED		INFERRED		TOTAL		Total Gold (Koz)
	Tonnage	Grade	Tonnage	Grade	Tonnage	Grade	Tonnage	Grade	
	(Kt)	(g/t Au)	(Kt)	(g/t Au)	(Kt)	(g/t Au)	(Kt)	(g/t Au)	
Open Pittable Resources (cut off 0.50g/t Au)									
Wyoming One	1,716	1.7	400	1.6	625	1.1	2,741	1.6	137
Wyoming Three	86	2.0	16	1.3	33	1.4	135	1.7	8
Caloma One	954	1.6	1,016	1.2	824	1.2	2,794	1.3	120
Caloma Two	-	0.0	956	2.1	927	1.1	1,883	1.6	97
Stockpiles	762	1.0					762	1.0	23
TOTAL	3,518	1.6	2,358	1.7	2,409	1.3	8,315	1.4	385

TOMINGLEY GOLD OPERATIONS ORE RESERVES (as at 30 June 2017)							
DEPOSIT	PROVED		PROBABLE		TOTAL		Total Gold (Koz)
	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	
Open Pittable Reserves (cut off 0.50g/t Au)							
Wyoming One	1,033	1.7	134	1.5	1,167	1.6	63
Wyoming Three	0	0	0	0	0	0	0
Caloma One	58	2.2	0	0	58	2.2	4
Caloma Two	-	-	167	2.7	167	2.7	14
Stockpiles	762	1.0	-	-	762	1.0	22
TOTAL	1,853	1.4	301	2.2	2,154	1.5	104

Note: ASX announcements 3 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

TGO Underground Resources and Reserves (31 March 17)

TOMINGLEY GOLD PROJECT MINERAL UNDERGROUND RESOURCES (31st March 2018)									
DEPOSIT	MEASURED		INDICATED		INFERRED		TOTAL		Total Gold (Koz)
	Tonnage	Grade	Tonnage	Grade	Tonnage	Grade	Tonnage	Grade	
	(Kt)	(g/t Au)	(Kt)	(g/t Au)	(Kt)	(g/t Au)	(Kt)	(g/t Au)	
Underground Resources (cut off 2.50g/t Au)									
Wyoming One	0	0.0	866	4.0	110	3.2	976	3.9	122
Wyoming Three	10	3.6	6	3.1	4	3.1	20	3.4	2
Caloma	82	3.8	35	3.4	47	3.0	164	3.5	18
Caloma Two	-	0.0	218	3.6	76	3.2	294	3.5	33
Sub Total	92	3.6	1,125	3.9	237	3.2	1,454	3.7	175
TOTAL	92	3.6	1,125	3.9	237	3.2	1,454	3.7	175

UNDERGROUND ORE RESERVES (May 2017)			
SOURCE	Tonnage (Kt)	Grade (g/t Au)	Gold (koz)
Proven	45	2.7	4
Probable	688	3.2	70
TOTAL	732	3.1	74

Note: ASX announcements 4 and 11 June 2018 - 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