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enabling future energy



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# Corporate Overview

## Capital Structure

ASX code	MNS
ASX share price [28 August 2017]	A\$0.48
52 week Low - High	A\$0.475 - 0.985
Shares on issue	549.7 million
Market Capitalisation	A\$264 million
Unlisted Options [various strike]	19.75 million
Average daily volume [100 days]	1.02 million
Cash	A\$7.0M
Debt	A\$0.0M

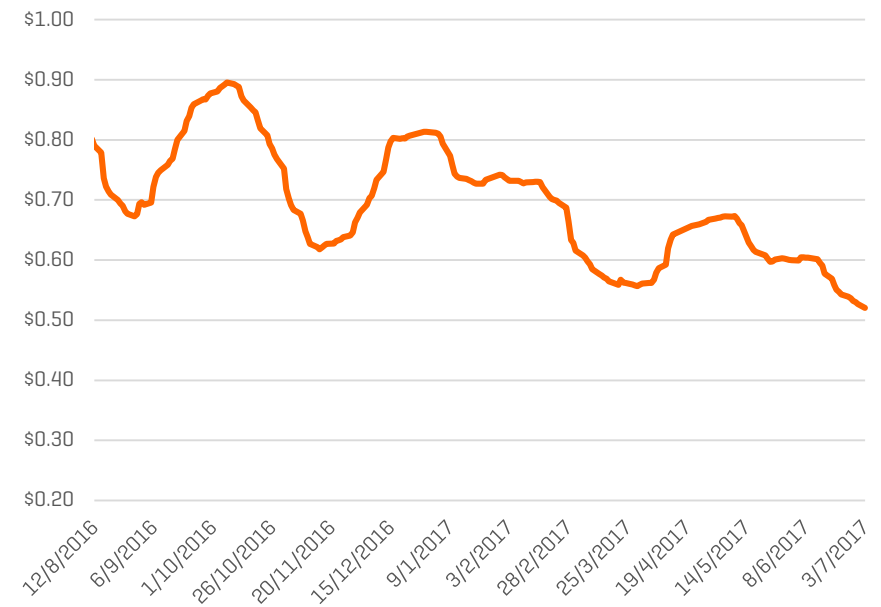
## Analyst Coverage

**BELL POTTER**

## Major Shareholders

Shareholder	Shares [M]	Ownership
Mazzdel Pty Ltd	50.5	9.2%
Pershing Aust. Noms	26.2	4.8%
Citicorp Noms	21.3	3.9%

## MNS Share Price



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# 4 Board and Management

<b>Frank Poullas</b> Non-Executive Chairman	<ul style="list-style-type: none"> <li>• Over 20 years in investment markets, technology and engineering sectors</li> <li>• Partner in a successful IT firm</li> <li>• Involved in successful ventures within the mining industry</li> </ul>
<b>Distinguished Professor M. Stanley Whittingham</b> Non-Executive Director	<ul style="list-style-type: none"> <li>• Key figure in the invention of the Lithium-ion battery technology and nominated for the Nobel Science Prize.</li> <li>• Has headed large projects for the US Department of Energy, Exxon and Schlumberger.</li> <li>• Distinguished Professor of Chemistry at Binghamton University, part of State University of New York</li> </ul>
<b>Dr Ulrich Helmut Bez</b> Non-Executive Director	<ul style="list-style-type: none"> <li>• Over 40 years experience in the automotive industry, with role of Chairman and CEO for Aston Martin between 2000-2014</li> <li>• Led the design and development of the Porsche 911 Turbo whilst at BMW created the Technik GmbH division</li> <li>• Held director roles with companies such as Daewoo</li> <li>• Lectured at leading institutions including Harvard, Columbia and Kings College</li> </ul>
<b>Marc Vogts</b> Non-Executive Director	<ul style="list-style-type: none"> <li>• Marc is a project executive with +40 years experience in major mining projects in South Africa, Madagascar, Australia, Canada, Chile, Indonesia, Papua New Guinea and USA. Previous roles include Project Director for the QMM Project in Madagascar for Rio Tinto, Vice President for Project Management for BHP Billiton and Vice President for all Uranium Projects including Olympic Dam for BHP Billiton</li> <li>• Chief Executive Officer at the John Grill Centre for Project Leadership at the University of Sydney</li> </ul>
<b>Peter Tsegas</b> Non-Executive Director	<ul style="list-style-type: none"> <li>• 15+ years experience in Tanzania engaging both private and public sectors on projects; Tanzanian resident</li> <li>• Previous consulting roles to the Tanzanian government and to a number of mining companies including Rio Tinto</li> </ul>



# Board and Management *continued*

**Peter Sarantzouklis**  
Non-Executive Director

- Peter has held executive roles within the banking industry with wide ranging experiences over the past 22 years. Peter worked as the Chief Financial Officer and Head of Strategy, for the St George Banking Group for 3 years and also worked as Chief Product Officer at Westpac Bank
- Strong skills around products, financing, project management and governance

**Johann Jacobs**  
Non-Executive Director

- 30+ years experience in the resources sector
- Managed established companies and acquisitions, including project expansions and start-up mining operations in Australia, South Africa and Indonesia

**Dr Frank Houllis**  
Chief Executive Officer

- 20 years practical experience in development and engineering of metallurgical process
- Deep process experience across a wide range of commodities; led process development teams at ANSTO (process manager, 2008-2014), BHP Billiton (principal engineer, 2005-2008) and Intec Ltd (1995-2005)

**Shailesh Upreti**  
Lead battery consultant

- 16+ years experience in lithium-ion battery technologies
- Strong track record in product development and commercialisation
- 5 year PostDoc completed under the supervision of Professor Stan Whittingham, one of the leading pioneers in development of Lithium-ion batteries with over 40 years experience in the field

**Rod Chittenden**  
Head of Operations

- 30 years experience, metallurgist with a strong track record in project development; has worked in Australia, Europe, Africa
- Detailed involvement in metallurgical testing, feasibility studies, process design and commissioning for projects with Newcrest Mining, Barrick Gold, Paladin Energy and Mantra Resources

# Investment Highlights

- Magnis has established itself as a pivotal Consortium Member and owner in developing Lithium-ion battery plants globally – three announced with others pending
- Consortium participation underpinned by anode materials and technologies
- Highly experienced and credible Board of Directors with unrivalled capabilities and expertise in the Lithium-ion battery sector
- Owner and operator of World Class Nachu Graphite Deposit in Tanzania with an initial 15 year ROM at 240kt graphite concentrate
- Magnis to unlock value through growth strategies – take Nachu into production and progressively develop Lithium-ion battery plants





An aerial photograph of a vast solar farm in a desert. The solar panels are arranged in neat, rectangular rows, covering a large area of the arid, brownish landscape. In the background, several wind turbines are visible on a distant ridge. The overall scene is bathed in a warm, orange-brown light, suggesting either sunrise or sunset. The text "Lithium-ion Battery Plants" is overlaid in white, centered over the solar panels.

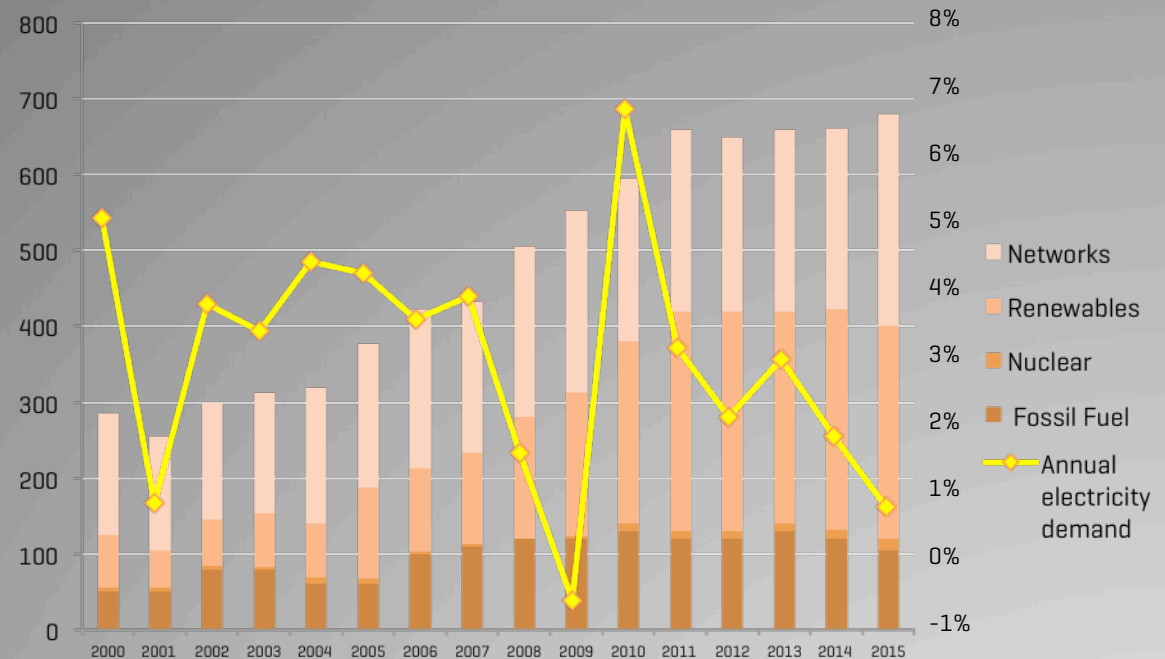
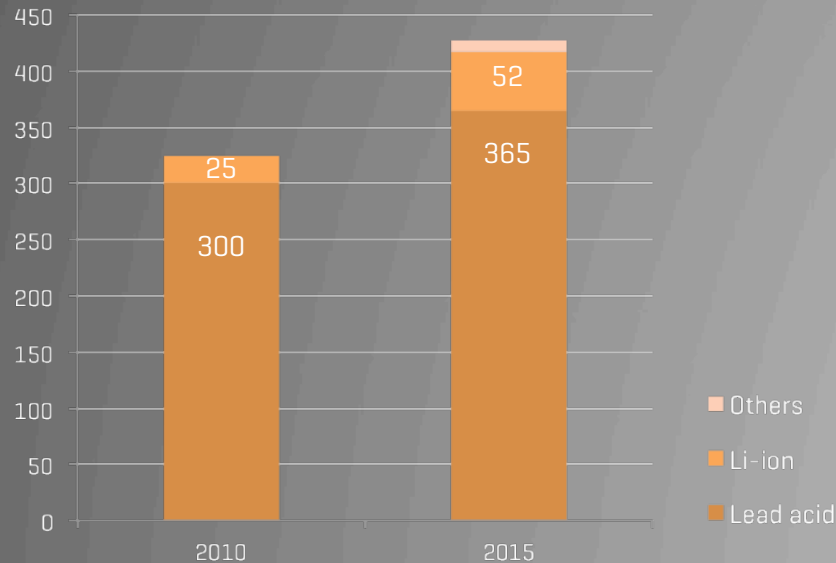
# Lithium-ion Battery Plants

# Lithium-ion Batteries – growing target markets

## • Lead Acid

- **Automotive Starter** >250 GWh market with significant growth potential due to adoption of start-stop technology
- **Forklift, Cart, Rickshaw** >75 GWh market using larger packs
- **UPS** ~40 GWh market for applications such as mobile towers and also using larger packs

Global Battery Market GWh



## • Energy Storage

- **Renewables** Annual new investment US\$260B exceeds that for fossil fuels
- **Remote and Standby** Standalone and hybrid systems competitive with diesel and gas
- **Networks** Load balancing and frequency modulation



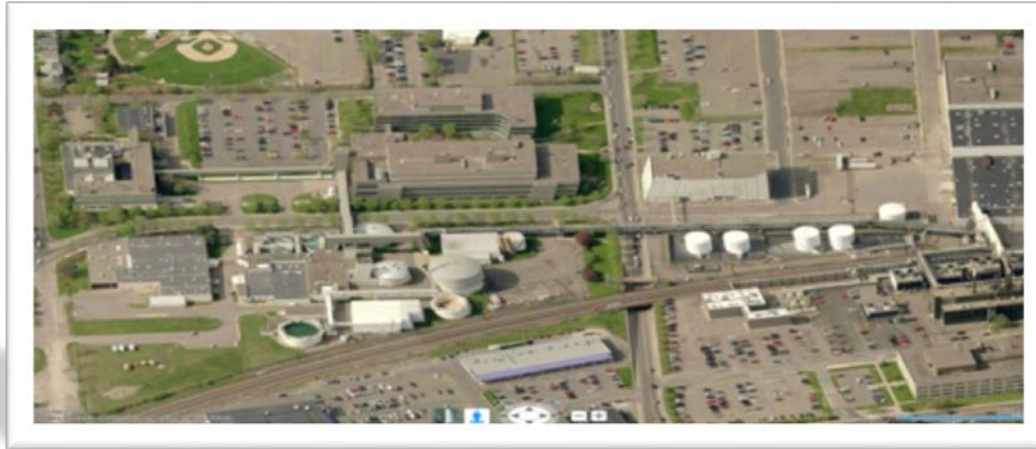
# Townsville Lithium-ion Battery Plant – further validation

- 15 GWh Lithium-ion Battery Plant to be located in Townsville, Australia
- Supported by Global LIB Consortium including participation from Eastman Kodak Company [NYSE:KODK]
- Strong state and local government support
- Scoping Study completed
- Woodstock site selection completed – 400 hectares offered for small equity stake in project
- Site contains all major infrastructure including rail, power and close access to Port of Townsville



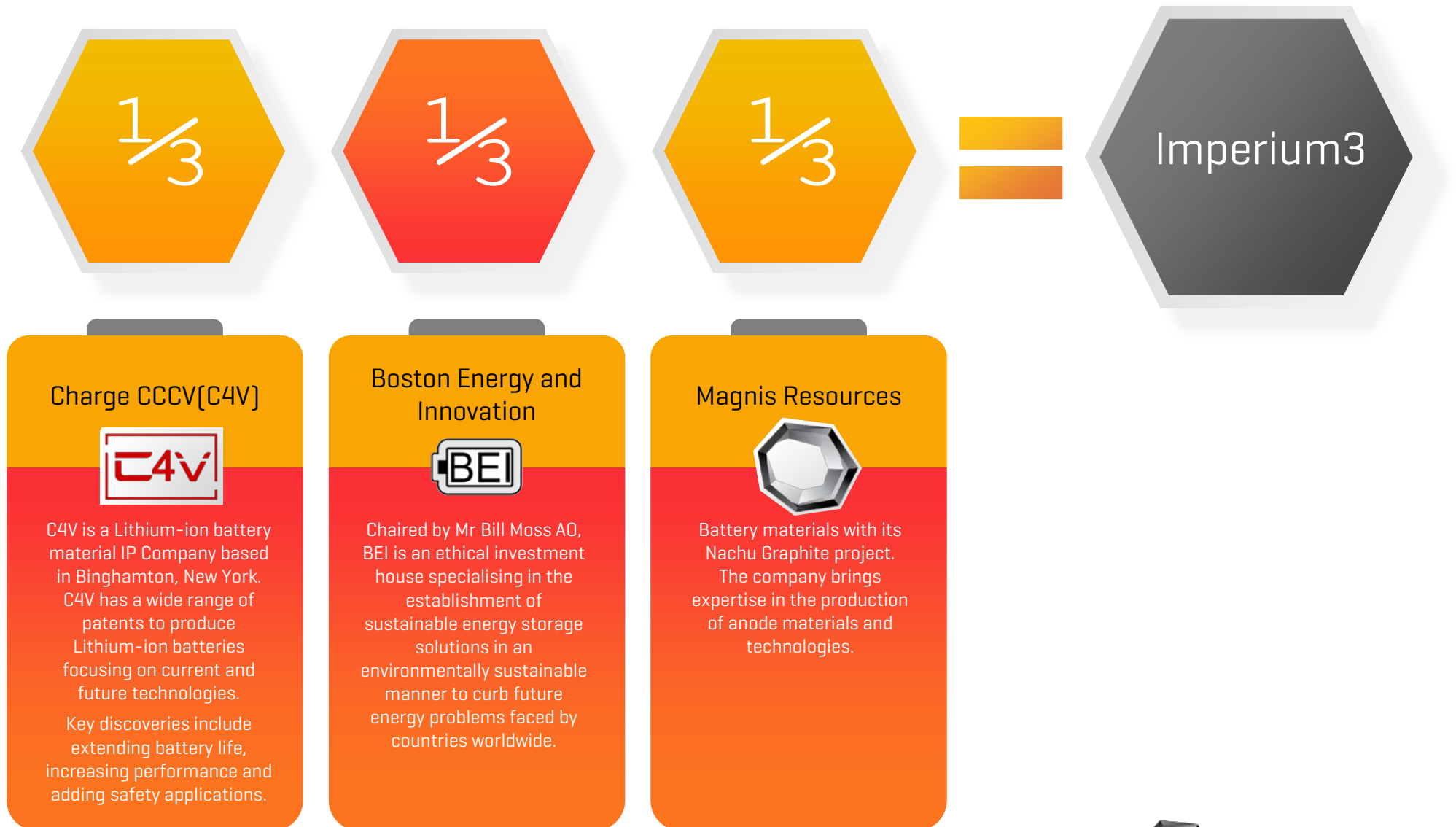
# New York Lithium-ion Battery Plant – underpinning off take

- 15 GWh Lithium-ion Battery Plant to be located in Huron Campus the birthplace of IBM in Upper State New York
- Supported by New York State Government and leading Global Consortium of Lithium-ion Battery specialists
- Facilities previously produced high technology equipment by IBM
- Speed to production key
- Advanced Offtake and Financing discussions
- Scoping Study completed





# Global Lithium-ion Battery Consortium





# Germany Battery Plant – Supply of raw materials

- Magnis has signed a MoU to supply raw materials for the planned gigafactories
- Initial Production by the end of 2019
- 34 GWh cell manufacturing lithium-ion battery plant
- 18 Major German Companies and institutes in the consortium
- Consortium includes companies throughout the Lithium-ion battery supply chain



# TERRA E

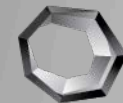


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# The Battery Plant opportunity is significant for Magnis –

## Case example: CATL Batteries

- CATL Batteries second major capital raising in October 2016 valued the company at US\$11.5b, with 7.5GWh of current production.
- Hon Hai Group purchases a 1.19% stake in CATL Batteries for US\$175m in March 2017 which values CATL at US\$14.7b.
- CATL has plans to increase to 50GWh of production in 2020, work and construction yet to begin.
- Most recent valuation for CATL at approx. US\$2b per GWh of current production.
- Magnis currently involved in plants with ownership for 30GWh of future production with plans to increase to over 100GWh in the near future.



# MNS has a differentiated graphite industry strategy



We are focused on providing an alternative to the spherical graphite supply chain through a greener, more cost effective and secure route to market.

- Not all graphite is created equal and the market for graphite is not homogenous
- Concentrate, purity and a 'sustainable' flowsheet to produce coated spherical graphite are key drivers in the lithium-ion battery market
- Thickness and ordered crystal structure of Nachu natural graphite flake supports sustainable production of high value products including spherical graphite to Lithium-ion battery specifications without any chemical or thermal purification
- Capitalise on the significant divergence in graphite end markets by focusing solely on growing and high value product markets:
  - Avoid exposure to traditional graphite markets with clear future oversupply risk in fine grain, lower purity products
  - Produce a high quality spherical graphite product for use in lithium-ion battery anodes
- Leverage unique qualities of Nachu graphite in a manner that will allow full value capture for the high purity Nachu ore body
- Board and management teams with leading high calibre technical experts in LIB manufacture and automotive

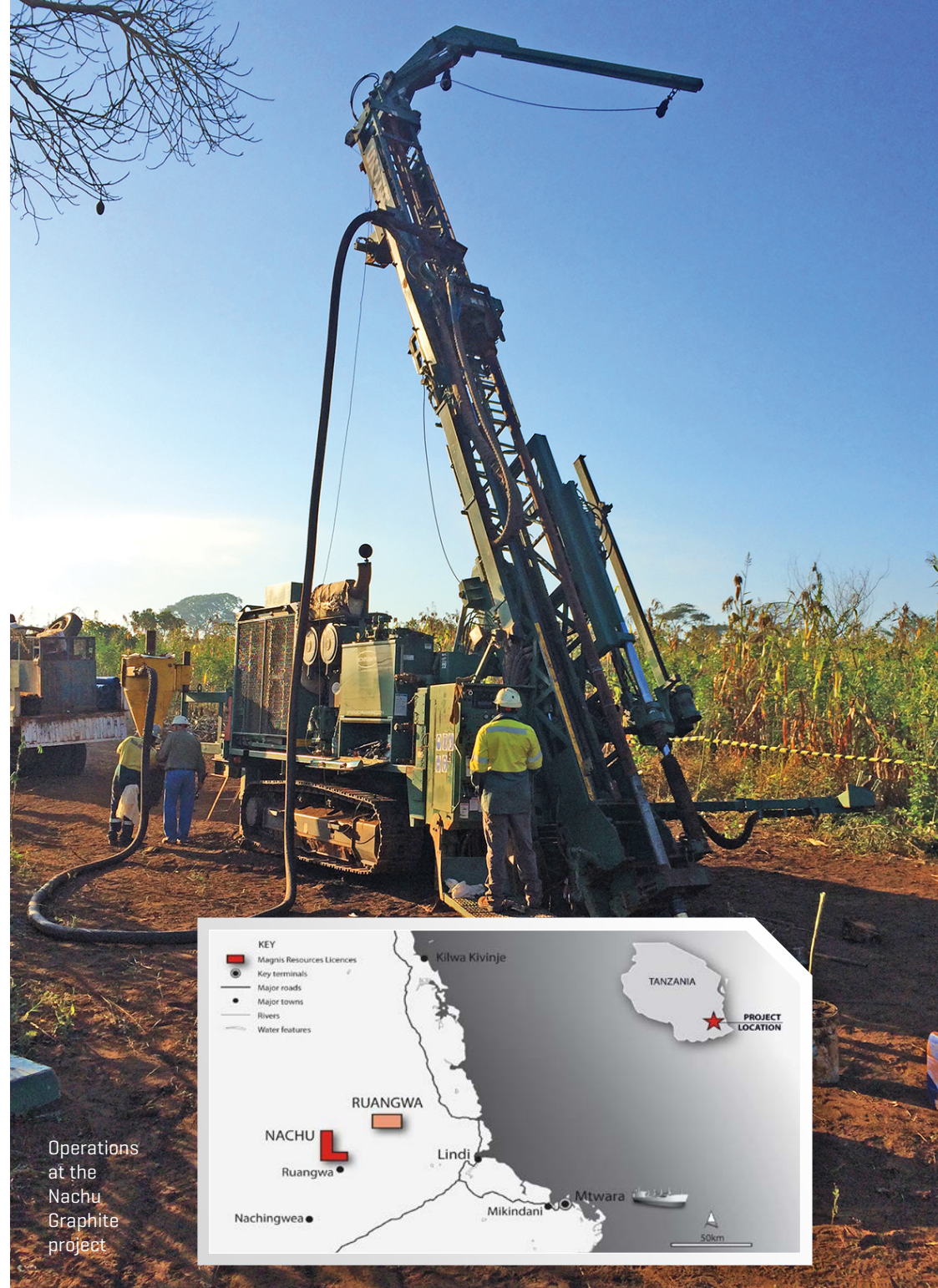


The background of the slide is a photograph of a sunset. The sky is a gradient of orange and red, with the sun visible as a bright orange circle. Several trees are silhouetted against the sky, including a large tree branch in the upper right foreground and several smaller trees in the middle ground. The overall mood is serene and natural.

# Nachu Graphite Project

# Nachu Graphite Project - shovel ready

- Located west of the coastal city of Lindi and ~220km by road from port city of Mtwara in south east Tanzania
- One of the most advanced graphite projects of scale globally
- Annual production of ~240kt graphite concentrate for an initial 15 year LOM
- BFS completed
- ESIA completed in accordance with Equator Principles guidelines
- Power solution, water and port access
- Land valuation complete and compensation for re-settlement of households nearing finalisation
- Special Economic Zone (SEZ) granted for production of value added graphite products
- Clear strategy and process route to produce a high quality spherical graphite product
- Project development integrated to downstream LIB manufacturing to leverage competitive advantage from quality of graphite and security of non-China supply chain



Operations at the Nachu Graphite project

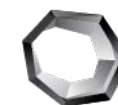


# Compelling BFS Results

- BFS confirms Nachu as a robust, high returning graphite project with premium product quality
- Average 220ktpa graphite concentrate produced over an initial reserve-backed 15 year mine life
  - 240ktpa over first 12 years
- Strong further high grade resource conversion potential
- Post-tax NPV<sub>10%</sub> of US\$1.69b and project IRR of 98%
- 12.5x mine life to payback ratio
- Outstanding forecast operating margin of US\$1,791/t
- Projected basket price of US\$2,350/t reflects high value products – exceptional purity and flake size
- Increased pre-production capex relative to PFS driven by larger plant capacity [3.6mtpa PFS]

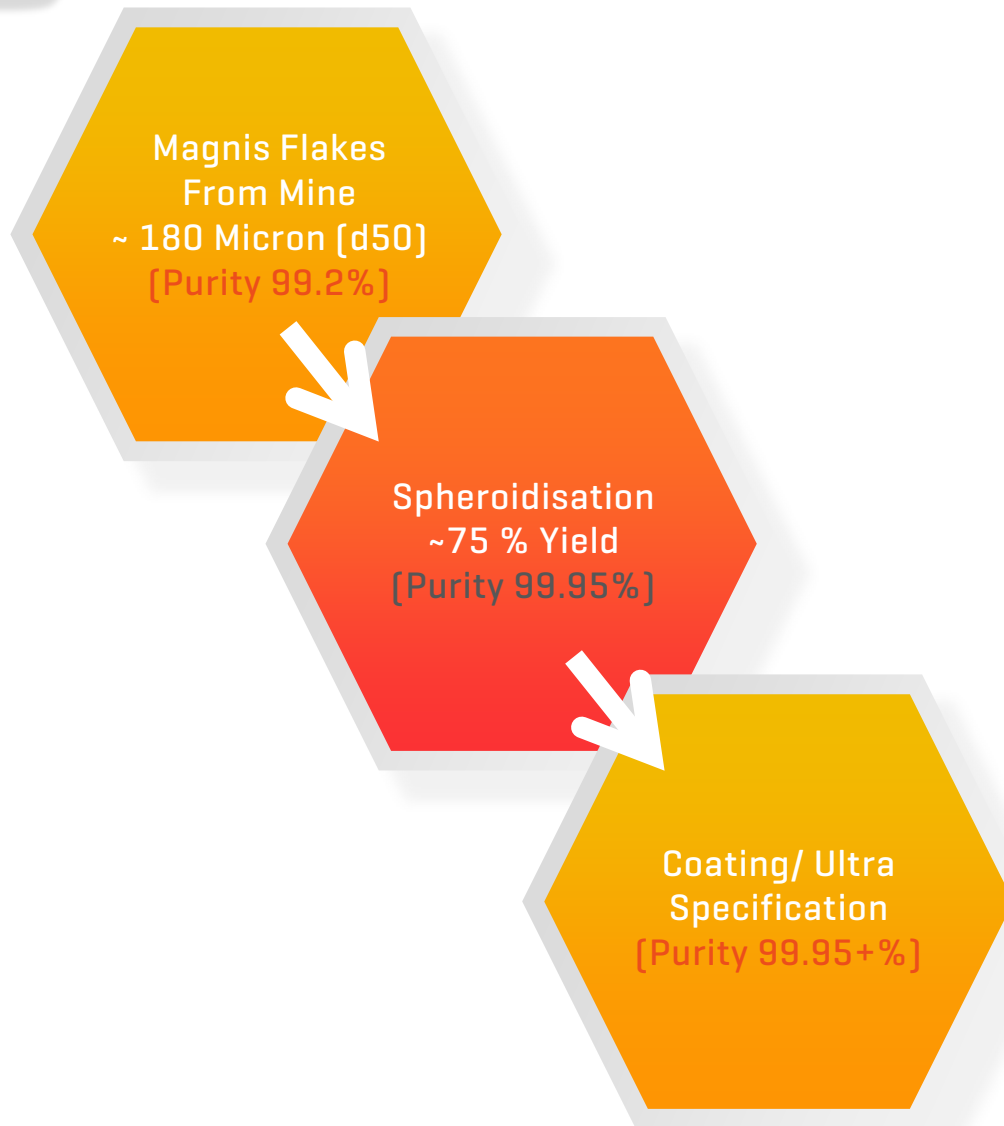
1. Refer Magnis ASX release on 31 March 2016 [Bankable feasibility study finalised].

Key Project Parameters	BFS [March 2016] <sup>1</sup>
Resources	174mt at 5.4% TGC
Reserves	76mt at 4.8% TGC
Initial life of mine [years]	15.2
Total mined ore [mt]	76.3
Strip ratio [LOM avg]	1.5
Plant throughput [mtpa]	5.0
Feed grade [% TGC, LOM avg]	4.8%
Recovery [LOM avg]	92%
Graphite concentrate production [ktpa, LOM avg]	220
Average concentrate purity [% TGC]	98%
Cash cost [US\$/t conc FOB Mtwara, LOM avg]*	559
Pre-production capital [US\$m]	269
Sustaining capital [US\$m]	71
Weighted average basket price [US\$/t conc FOB]	2,350
Free cash flow [US\$m pa, LOM avg]	255
NPV <sub>10%</sub> [US\$m, post-tax]	1,686
Project IRR [post-tax]	98%
Payback period [years]	1.2
* Excludes production royalty [3%]	





## Supply Chain and IP

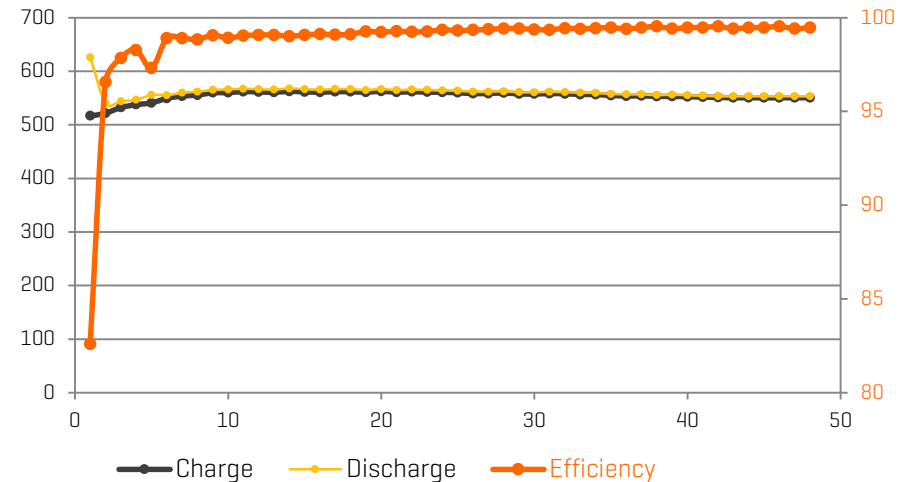


- Magnis Resources' supply chain has significant flexibility to meet customers indicated specifications
  - This starts and finishes with the quality of the in-situ graphite at Nachu
- Co-location potential of downstream facilities for efficiency, reduced cost and rapid scale up potential to meet end user demand
  - Establishment of a higher quality and consistent non Chinese supply source
- Magnis may supply both coated and uncoated spherical graphite subject to customer requirements
  - Coated and Uncoated Spherical Graphite @ >99.95% C
- Industry leading infrastructure and IP
  - Team with cumulative 50+ years of Li-ion industry experience
- Access to IP to continue product evolution

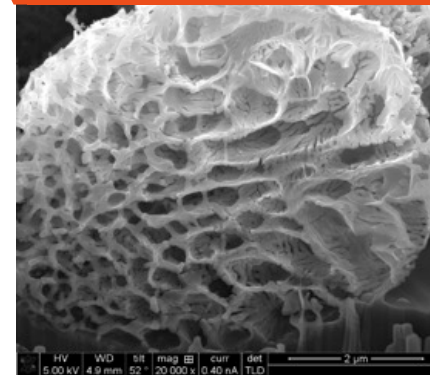
# Results validate R&D commitment

- Graphite and silicon anode blend is an area receiving significant attention from battery makers and car manufacturers for the next generation of high performance anode material
  - Magnis team experience allows for parallel development of the silicon blend with delivery of coated spherical graphite material from the Nachu project
- Testwork conducted for a 10% silicon additive blended with Nachu coated spherical graphite
- Initial results from coin cell testing include
  - First charge capacity of 587+ mAh/g, a 65% improvement over the energy density of ~355mAh/g for current industry standard graphite anode
  - First cycle efficiency >86%
  - More than 98% capacity retention after 38 cycles
- Potential to deliver significant increase in mileage and power
  - The 65% increase in anode capacity translates to 20-30% increase in mileage for current battery pack sizes

## Nachu graphite & silicon blend anode performance result



## Internal view of silicon composite particle



# Advantageous product streams and pricing

240ktpa Flake Graphite Concentrate [average 98.6% TGC]\*

## 22ktpa Super Jumbo Flake

**Size:** +500 microns, +35 mesh

**Purity:** 97% – 98.5% TGC

**Key markets:** Aerospace, composites and niche markets

**Current pricing:** US\$4,000–6,000/t CFR\*\*

## 77ktpa Jumbo Flake

**Size:** 300–500 microns, +50/–35 mesh

**Purity:** 97.5% – 99% TGC

**Key markets:** Expandable graphite, composites and electronics

**Current pricing:** US\$2,500–3,000/t CFR\*\*

## 141ktpa Battery Feedstock

**Size:** Sub 300 microns, –50 mesh

**Purity:** 99.5% TGC

**Key markets:** Spherical graphite for use in Li-ion battery anodes

**Current pricing:** +US\$2,100/t FOB\*\*

- Premium pricing due to purity, absence of halides and terminal product performance
  - Spherical graphite produced from Nachu Battery Feedstock delivers superior performance to leading synthetic graphite
- Downstream margin capture
  - Toll processing (spheronising and coating) to produce spherical graphite
- Strong market outlook for all Nachu product streams
  - In contrast, clear future oversupply risk in fine grain, lower purity products
  - Large flake sizes provide significant marketing flexibility

\* Concentrate production rate over first 12 years of initial mine plan

\*\* Current pricing based on industry sources and end user discussions



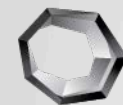
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# Potential Lithium-ion Battery Plant Offtake

Plant	Size	Spherical Graphite [tpa]	Magnis Graphite Concentrate [tpa]
New York	15GWh	15,000	20,000
Townsville	15GWh	15,000	20,000
Germany	34GWh	34,000	45,000
<b>TOTAL</b>	<b>64GWh</b>	<b>64,000</b>	<b>85,000</b>

- Offtake Agreements being negotiated with all consortiums
- Further plants to be announced during 2017
- Current pricing for high performing Spherical Coated graphite at \$8,000 - \$12,000t
- Magnis cost for high performing Spherical coated graphite at \$2,900t

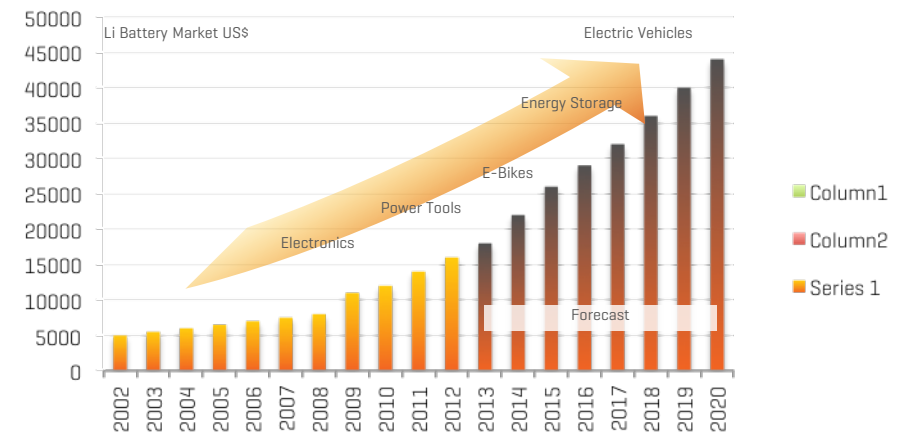


# Targeting an Exponential Market Growth

- Volkswagen strategy highlights the structural shift towards electric vehicles
- Target of 20-25% of group sales in 2025, implies annual sales of 2-3m “e-cars” v 2015 Volkswagen global total sales of 9.93m
  - Compares to broker/industry forecasts of EV sales representing ~2.5% of new cars sales by 2020
- To support strategy Volkswagen anticipates fleet requirement of ~150Gwh by 2025
  - Equates to ~150ktpa anode material or ~150ktpa spherical graphite
  - At current Chinese flake yields into spherical graphite estimated at 30-40%, equates to ~450ktpa of natural graphite
  - Nachu graphite test work has indicated spherical graphite yields of ~75%
- EV are no longer the domain of Silicon Valley companies
  - EVs represent ‘product innovation’ of a staple of civilisation not revolution which drive the potential for “hyper adoption” scenarios that significantly exceed market forecasts



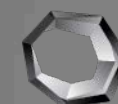
## A dynamic and potentially rapidly growing market



Source: Citi Research

# Timeframe on next steps

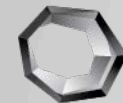
		Target Date					
		2017		2018		2019	
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Battery Plants	New locations to be announced	During 2017					
	Funding		2H 2017 onwards				
	Offtakes		2H 2017 onwards				
	Completion of Feasibility Studies		2H 2017				
	Production					1H 2019 onwards	
Nachu Graphite	Financing		2H 2017				
	Offtake		2H 2017				
	Production					1H 2019	





# Investment Summary

- Downstream Lithium-ion battery manufacture with existing manufacturing supply chain partners and government support
- Gigafactories using sustainable supply chains bypassing China route
- Ownership in highly lucrative Lithium-ion Battery Gigafactories
- High calibre board and management teams with expertise in all project facets from mine development to LIB manufacture to downstream industries including automotive business
- Nachu is a high quality, long life graphite resource which is development ready with outstanding returns
- Industry first with no downstream chemical or thermal purification required leading to strong green credentials and the lowest cost producer of spherical graphite above 99.95%TGC purity





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