



## Rhyolite Ridge

American Source of Lithium & Boron  
for a Sustainable Future

Diggers & Dealers Mining Forum  
Kalgoorlie, Western Australia  
6 August 2019

## Providing the materials for a sustainable & thriving planet:

- Lithium and boron products integral to many emerging green technologies
- USA location close to major markets and provides strong ESG framework
- Long-life, scalable project to provide strong profits with small environmental footprint

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The information in this presentation that relates to Exploration Results is based on information compiled by Bernard Rowe, a Competent Person who is a Member of the Australian Institute of Geoscientists. Bernard Rowe is a shareholder, employee and Managing Director of Ioneer Ltd. Mr Rowe has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Bernard Rowe consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

In respect of Mineral Resources referred to in this presentation and previously reported by the Company in accordance with JORC Code 2012, the Company confirms that it is not aware of any new information or data that materially affects the information included in the public report titled "Rhyolite Ridge Mineral Resource Upgrade" dated 26 June 2019. Further information regarding the Mineral Resource estimate can be found in that report. All material assumptions and technical parameters underpinning the estimates in the report continue to apply and have not materially changed. The Company intends to report updated Mineral Resource and Ore Reserve estimates as part of the Definitive Feasibility Study currently in progress and due for completion in Q3 2019.

In respect of production targets referred to in this presentation and previously disclosed, the Company confirms that it is not aware of any new information or data that materially affects the information included in the public report titled "Outstanding Results from Rhyolite Ridge Pre-Feasibility" dated 23 October 2018. Further information regarding the production estimates can be found in that report. All material assumptions and technical parameters underpinning the estimates in the report continue to apply and have not materially changed.

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# Overview

## Ioneer is set to deliver a major lithium-boron mine in the USA

### 100%-owned Rhyolite Ridge:

- +30 year mine life, capable of producing at site:
  - +20,000 tonnes p.a. lithium carbonate
  - +170,000 tonnes p.a. boric acid
- Uniquely positioned to be a major supplier of both products
- Forecast to be bottom of the lithium cost curve due to revenue from boron co-product

#### Shares

1.47B

#### Options (Unlisted)

47.4M

#### Performance Rights

1.5M

#### Ownership

##### Top 20

60%

##### Directors / Management

8%

#### Share Price (30 July 2019)

A\$0.19

#### Market Cap

A\$280M

#### Cash (30 June 2019)

A\$49M

#### Debt

Zero

#### Enterprise Value

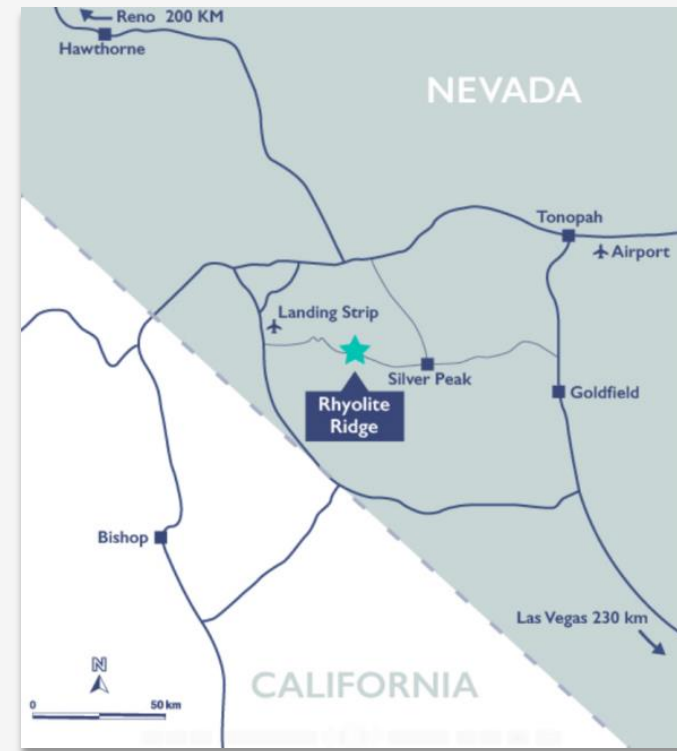
A\$231M



# Rhyolite Ridge Lithium-Boron Project

## Multi-generational source of lithium and boron

- ✓ Strategically located in a tier one mining jurisdiction - Nevada
- ✓ Definitive Feasibility Study to be completed in late Q3 2019
- ✓ Production targeted for late 2021
- ✓ Lithium-boron Measured & Indicated Resource increased 27% to 130M tonnes
- ✓ Excellent potential to increase production scale and mine life



Unique deposit as lithium and boron can be extracted using proven commercial processes to produce lithium and boron end-products on site



# Boron differentiates Rhyolite Ridge

Boron makes Rhyolite Ridge different to other sedimentary lithium deposits

- Two types of sedimentary lithium deposits: Lithium-Boron type and Clay type
- Lithium-Boron deposits are mineralogically different to clay deposits - this has major implications for ease and cost of processing
- Rhyolite Ridge is one of only two known large Lithium-Boron deposits globally
- Rhyolite Ridge ore is dominated (40-50%) by searlesite, a sodium boro-silicate mineral which is readily acid soluble
- Boron is a co-product providing 30-50% of revenue

**Unique lithium-boron deposit where metals can be extracted using proven commercial processes to produce lithium and boron end-products on site**

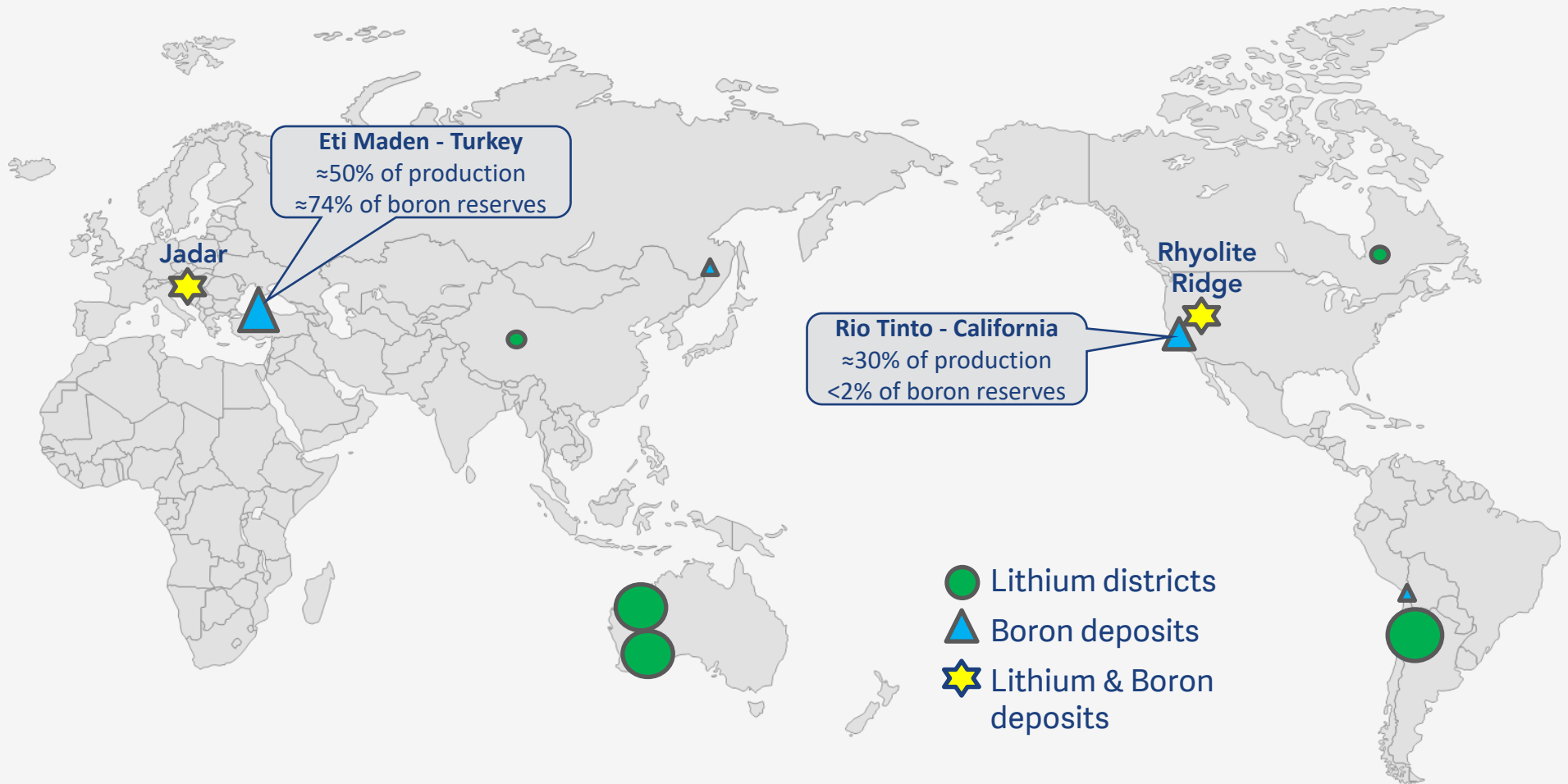


High-grade searlesite Li-B ore in outcrop



Rhyolite Ridge is located on US Gov't (BLM) land

# Major deposits/districts

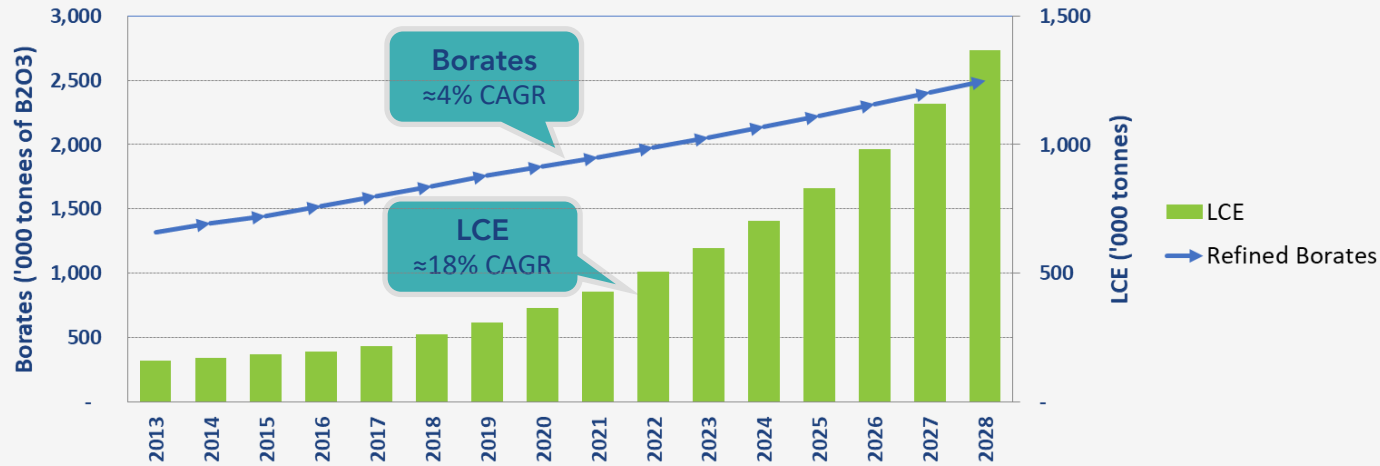


Lithium-Boron deposits are rare – only Rhyolite Ridge and Rio Tinto's Jadar



# Lithium & boron – essential for a modern world

Demand for Refined Borates & Lithium Carbonate Equivalent (LCE)



## Lithium

- EVs soon to be preferred vehicle
- Lithium essential to all types of EV batteries
- Demand consistently underestimated
- Rapid Li demand growth => circa 18% CAGR
- ≈5x tonnage increase from 2018 to 2028
- Automakers moving to ensure supply

## Boron

- Steady borates demand growth driven by:
  - Urbanisation
  - Energy efficiency
  - Agriculture
- Major boron users also use lithium
- Duopoly provides steady prices

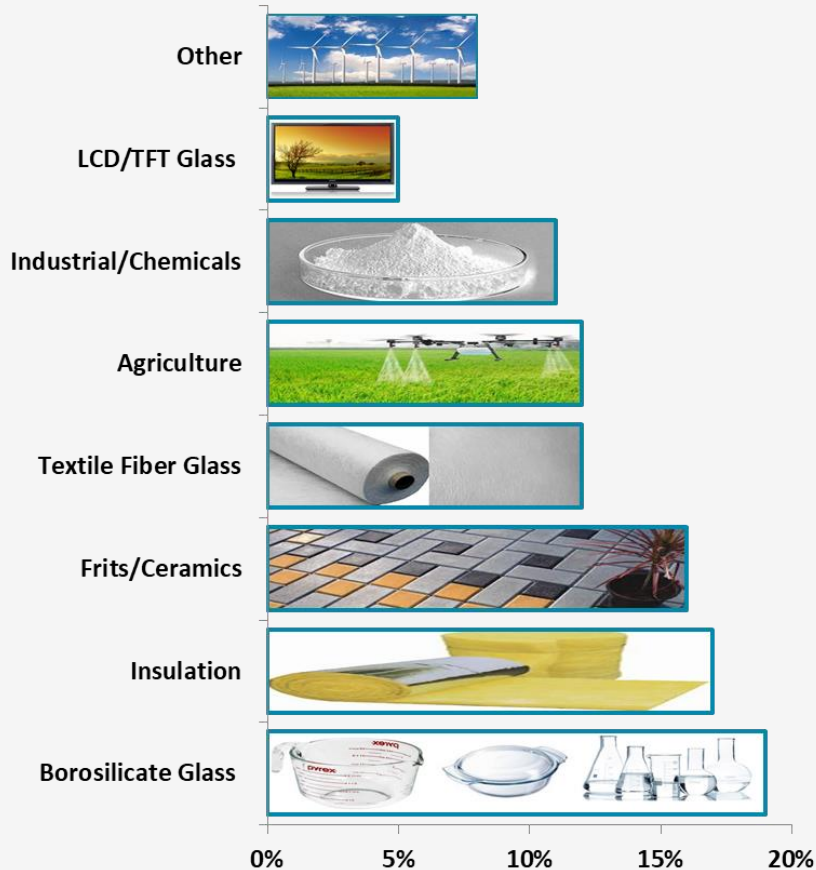
Note: Chart inputs are ioneer estimates derived from industry research.





# Boron is essential for a modern world

## Global Borates Demand by End Use

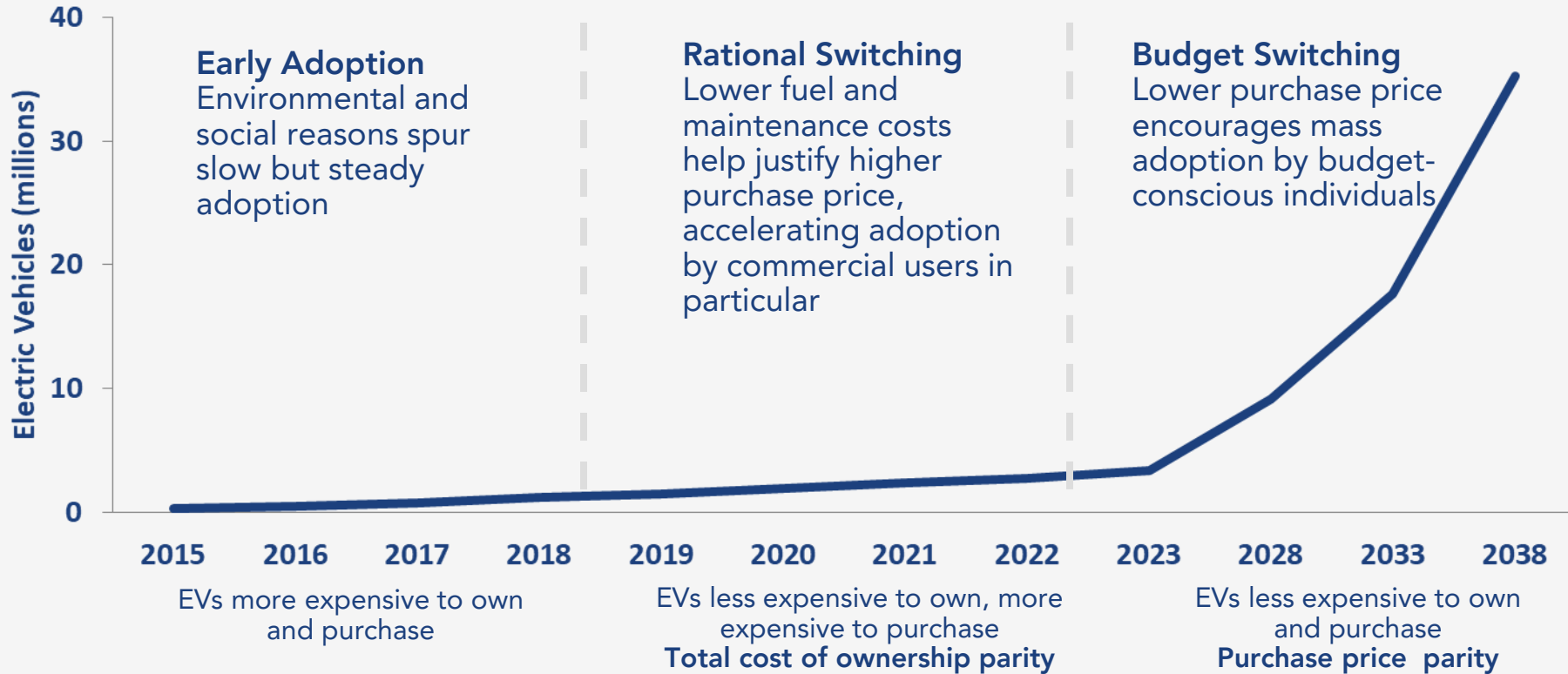


- Broad range of essential uses mitigates reliance on single sector
- USA and China housing markets important drivers of demand
- Increasing demand from agriculture, solar, specialty glass
- Demand currently  $\approx 2.1$  Mtpa of contained boric oxide ( $B_2O_3$ ) equivalent
- Market worth  $\approx$ US\$3.2 billion p.a., similar value to current lithium market
- Duopoly:
  - Eti (Turkey)  $\approx 50\%$  of refined market
  - Rio (California)  $\approx 30\%$  of refined market
- Customers value consistent quality and reliable supply
- Major boron users also use lithium

Notes: Borates demand includes refined chemicals ( $\approx 80\%$  of demand) such as boric acid and raw mineral products ( $\approx 20\%$  of demand). Chart inputs are ioneer estimates derived from industry research.



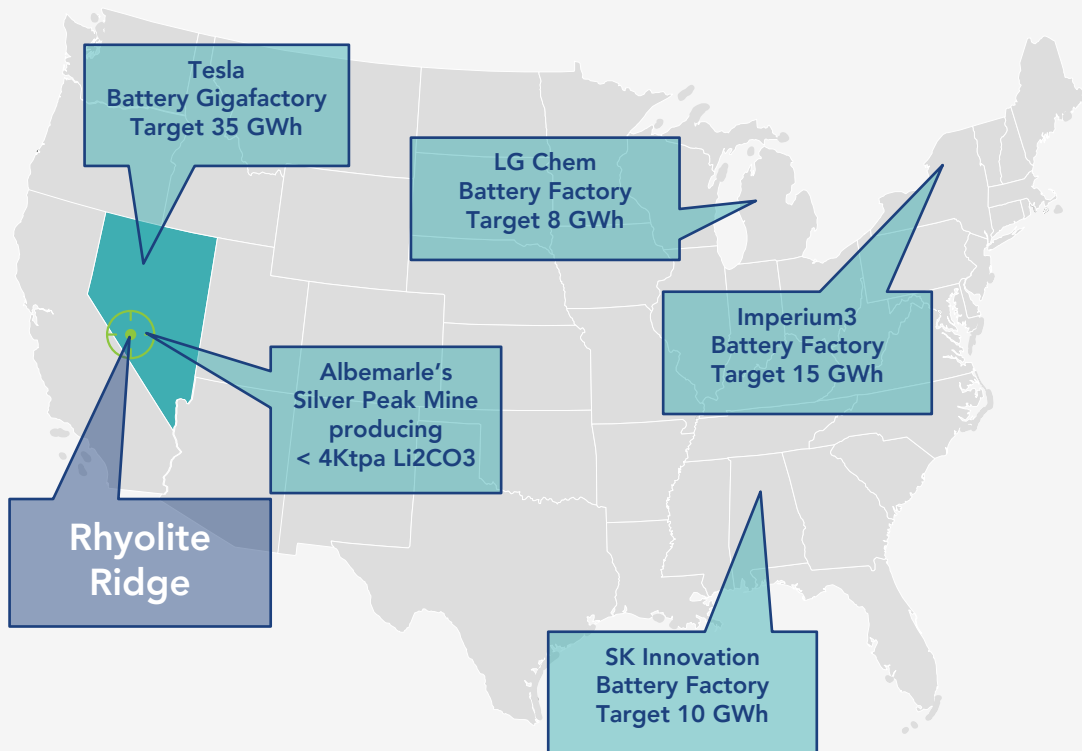
# Automakers moving to ensure lithium supply



- Lithium-ion battery cost reduction to soon create the tipping point for mass adoption of EVs
- Consistent lithium specifications increasingly important for battery cathodes
- Financing of new lithium projects needs to happen now due long lead times
- Lithium pricing required at levels to incentivise rapid growth of lithium supply from 2023



# Lithium – a critical mineral



## Limited USA lithium supply

- USA increasingly reliant on China for lithium-ion battery supply
- Bipartisan American Mineral Security Act introduced to complement Executive Order on critical minerals
- 1 GWh of lithium-ion battery capacity requires circa 800 tonnes of lithium carbonate equivalent
- Planned battery factories in USA already require circa 55,000 tonnes of LCE

**Rhyolite Ridge to supply secure domestic lithium in a sustainable manner**



# PFS demonstrated robust project economics

Lithium carbonate = 20kt p.a. Boric acid = 173kt p.a.

Annual Revenue  
**\$450M**

Total Capex  
**\$599M**

Annual EBITDA  
**\$297M**

After-tax  
Cashflow  
**\$6.6B**

After-tax NPV  
(7% real):  
**\$1.8B**

IRR  
**28%**

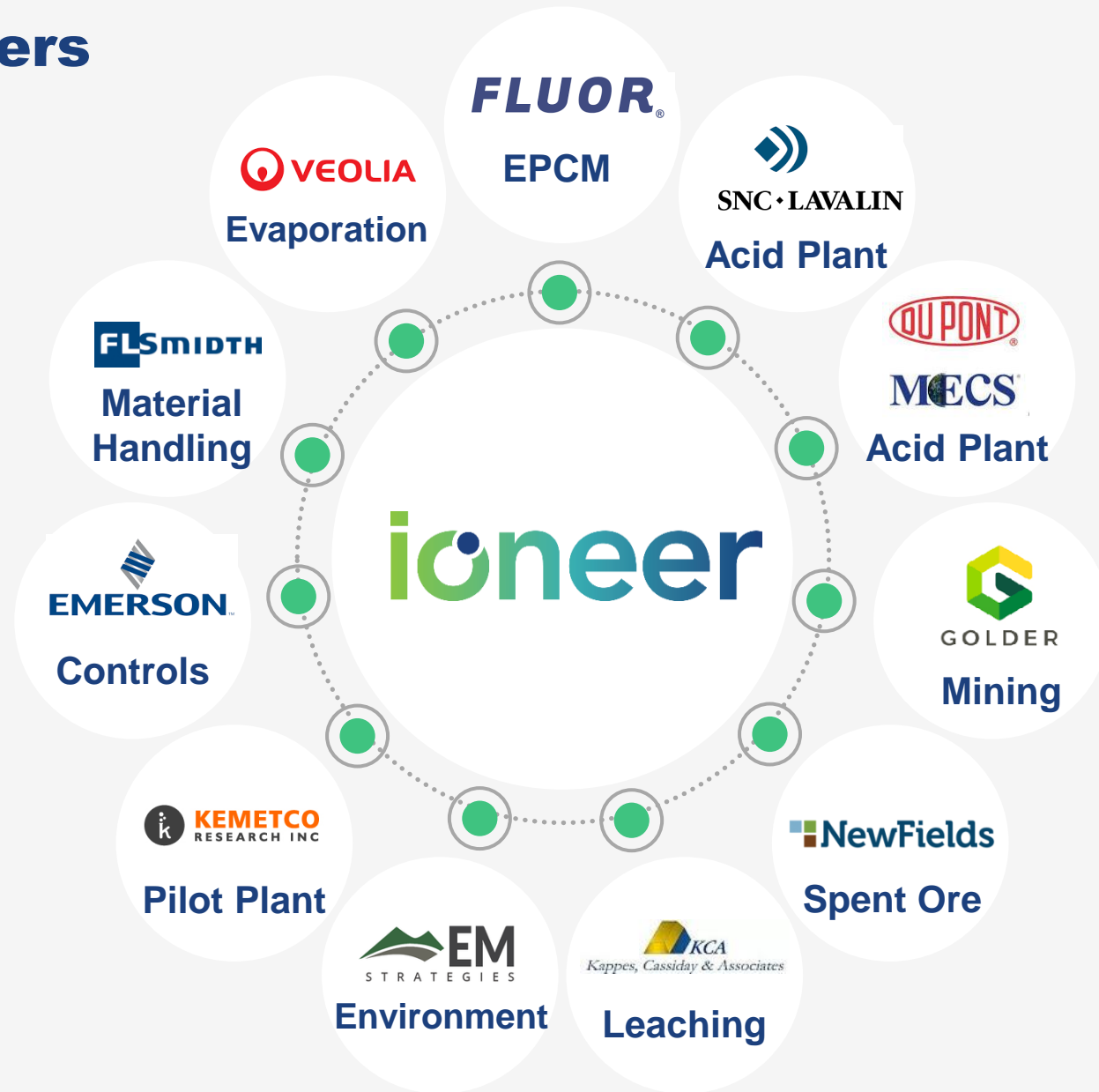
## Revenue and Operating Cost Comparison



- Operating costs < \$2,000/t LCE with boric acid credit places Rhyolite Ridge at bottom of the lithium cost curve
- Boric acid at \$700/t pays for most of site operating costs
- Capital intensity of \$18k/t LCE compares favourably with industry range of \$15-25k/t

Note: PFS outcomes detailed in announcement titled "Outstanding Results from Rhyolite Ridge Pre-Feasibility" dated 23 October 2018. The PFS base case used lithium carbonate sale prices ranging from US\$12,693/tonne to US\$16,862/tonne (CIF China) and a constant boric acid sale price of US\$700/tonne (CIF Asia).

# Key partners



# Milestones ahead



## Delivering a major lithium-boron mine in the USA

- ✓ Updated Ore Reserves and mine plan
- ✓ Complete pilot operation and provide samples to customers
- ✓ Fluor to complete DFS in late Q3 2019
- ✓ Strategic partnerships – global investment bank running formal process
- ✓ Targeting construction in 2020 and first production in late 2021

# Board of Directors



## Experienced Board with lithium-boron development expertise

- James D. Calaway, Chairman  
Former Chairman of Orocobre
- Bernard Rowe, Managing Director  
Founder of Ioneer
- Alan Davies, Non-Executive Director  
Former CEO of Energy & Industrial Minerals, Rio Tinto
- Pat Elliot, Non-Executive Director  
Former Head of Corporate Finance, Morgan Grenfell Australia
- John Hofmeister, Non-Executive Director  
Former President, Shell Oil USA

# Summary

## ioneer is set to deliver a major lithium-boron mine in the USA

### 100%-owned Rhyolite Ridge:

- +30 year mine life, capable of producing:
  - +20,000 tonnes p.a. lithium carbonate
  - +170,000 tonnes p.a. boric acid
- Uniquely positioned to be a major supplier of both products
- Forecast to be bottom of the lithium cost curve due to revenue from boron co-product



One of only two known Lithium-Boron deposits globally



Nevada location: major supplier of critical material to North America



Dual revenue stream (circa 60/40)



Kemetco operating pilot plant



Fluor on-track complete DFS in late Q3 2019



Multiple strategic partner options to take project forward



Production targeted for late 2021

The logo for ioneer, featuring the word "ioneer" in a white, lowercase, sans-serif font. The letter "i" has a small white circle above it, resembling a dot or a stylized eye. The background is a gradient from light green on the left to dark blue on the right, with several overlapping, semi-transparent circles in various shades of green and blue.

*Providing the materials  
for a sustainable &  
thriving planet.*





# Lithium and boron conversion factors

- Lithium and boron grades are fundamentally presented in parts per million (“ppm”) or percentages of each element in a given sample or estimate.
- Lithium and boron grades are also expressed as various compounds in percentages in order to facilitate comparisons between different types of deposits and/or various products.
- The lithium carbonate grades reported in the Company’s Mineral Resource estimates are calculated using the conversion factors in the table to the right and assume 100% of the contained lithium is converted to lithium carbonate
- The use of Lithium Carbonate Equivalent (“LCE”) is to provide data comparable with various lithium industry reports. LCE is often used to present the amount of contained lithium in a standard manner, i.e. – to convert lithium oxide into lithium carbonate. LCE is also used to convert revenue from other products (e.g. boric acid) produced at lithium operations into the amount of lithium carbonate that would provide revenue equivalent to a tonne of lithium carbonate.
- The formula used for the LCE values quoted in this report is:

$$\text{LCE} = (\text{lithium carbonate tonnes produced} + [(\text{boric acid tonnes produced} * \text{US\$700/tonne})/\text{US\$10,000/tonne}])$$

The conversion factors presented below are calculated on the atomic weights and number of atoms of each element in the various compounds.

Convert from		Convert to Li	Convert to Li <sub>2</sub> O	Convert to Li <sub>2</sub> CO <sub>3</sub>
Lithium	Li	1.000	2.152	5.322
Lithium Oxide	Li <sub>2</sub> O	0.465	1.000	
Lithium Carbonate	Li <sub>2</sub> O <sub>3</sub>	0.188	0.404	

Convert from		Convert to B	Convert to B <sub>2</sub> O <sub>3</sub>	Convert to H <sub>3</sub> BO <sub>3</sub>
Boron	B	1.000	3.219	5.718
Boric Oxide	B <sub>2</sub> O <sub>3</sub>	0.311	1.000	1.776
Boric Acid	H <sub>3</sub> BO <sub>3</sub>	0.175	0.563	1.000

## June 2019 Mineral Resource Estimate (5,000ppm Boron Cut-off)

### Lithium-Boron (Searlesite) Mineralisation

Group	Classification	Tonnage mt	Li ppm	B ppm	Li <sub>2</sub> CO <sub>3</sub> %	H <sub>3</sub> BO <sub>3</sub> %	Contained Tonnes	
							Li <sub>2</sub> CO <sub>3</sub> kt	Boric Acid kt
Upper Zone B5 Unit	Measured	27.0	1,900	18,000	1.0	10.3	270	2,770
	Indicated	42.0	1,750	17,150	0.9	9.8	400	4,140
	Inferred	<u>13.0</u>	<u>1,950</u>	<u>14,800</u>	<u>1.0</u>	<u>8.5</u>	<u>140</u>	<u>1,110</u>
	<b>Total</b>	<b>82.0</b>	<b>1,850</b>	<b>17,050</b>	<b>1.0</b>	<b>9.8</b>	<b>800</b>	<b>8,020</b>
Upper Zone M5 Unit	Measured	0.5	2,450	5,450	1.3	3.1	10	20
	Indicated	1.5	1,600	6,600	0.9	3.8	10	70
	Inferred	<u>0.0</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0.0</u>	<u>0</u>	<u>0</u>
	<b>Total</b>	<b>2.0</b>	<b>1,800</b>	<b>6,350</b>	<b>1.0</b>	<b>3.6</b>	<b>20</b>	<b>80</b>
<b>Upper Zone Total</b>	Measured	27.5	1,900	17,800	1.0	10.2	280	2,790
	Indicated	44.0	1,750	16,750	0.9	9.6	410	4,210
	Inferred	<u>13.0</u>	<u>1,950</u>	<u>14,800</u>	<u>1.0</u>	<u>8.5</u>	<u>140</u>	<u>1,110</u>
	<b>Total</b>	<b>84.5</b>	<b>1,850</b>	<b>16,800</b>	<b>1.0</b>	<b>9.6</b>	<b>820</b>	<b>8,110</b>
Lower Zone L6 Unit	Measured	13.5	1,350	7,600	0.7	4.4	100	590
	Indicated	45.5	1,400	11,300	0.7	6.5	330	2,930
	Inferred	<u>11.0</u>	<u>1,400</u>	<u>12,850</u>	<u>0.7</u>	<u>7.3</u>	<u>80</u>	<u>800</u>
	<b>Total</b>	<b>69.5</b>	<b>1,400</b>	<b>10,800</b>	<b>0.7</b>	<b>6.2</b>	<b>510</b>	<b>4,310</b>
<b>Total (all zones)</b>	Measured	41.0	1,700	14,400	0.9	8.2	370	3,380
	Indicated	89.5	1,550	13,950	0.8	8.0	740	7,130
	Inferred	<u>24.0</u>	<u>1,700</u>	<u>13,900</u>	<u>0.9</u>	<u>8.0</u>	<u>220</u>	<u>1,900</u>
	<b>Grand Total</b>	<b>154.0</b>	<b>1,650</b>	<b>14,100</b>	<b>0.9</b>	<b>8.0</b>	<b>1,330</b>	<b>12,420</b>

For further information on this Mineral Resource estimate, see Company announcement titled "Rhyolite Ridge Mineral Resource Upgrade" dated 26 June 2019.