



## GALAXY RESOURCES LIMITED

**DB Lithium-Ion Battery Supply Chain Conference**

November 2017

ASX: GXY

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## **CONTACT INFORMATION**

Level 4 / 21 Kintail Road,  
Applecross, Western Australia 6153  
PO Box 1337, Canning Bridge LPO  
Applecross Western Australia 6953  
T: +61 8 9215 1700  
F: +61 8 9215 1799  
E: [info@galaxylithium.com](mailto:info@galaxylithium.com)

# Galaxy Overview

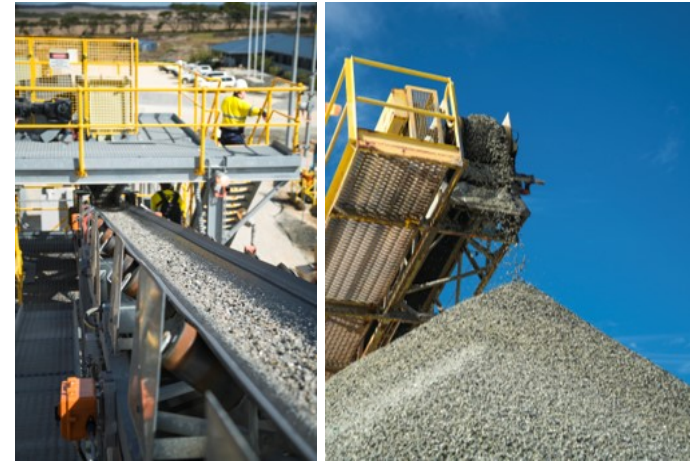
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# Company Highlights



- One of the premier **global lithium opportunities** with existing production and a world class asset development pipeline
- **Operations restarted at Mt Cattlin with expanded capacity** to generate substantial, 100%-owned cash flows in 2017, positioning Galaxy as a **major global supplier of high quality lithium**
- Diversified project portfolio with **hard rock and brine based lithium assets** across Australia, Argentina and Canada
- **Revised DFS at flagship Sal de Vida Project in Argentina** supports low cost, long life project with robust economics; Development Team confirmed
- **James Bay in Canada, is a high quality development asset**, providing a valuable option for Galaxy to supply North American and European markets
- Highly credentialed Management and Board with a **strong network of downstream and end-user customers in the global lithium markets**
- Robust lithium macro trends with **surging demand from lithium ion battery applications** and a lagged supply-side response

*Mt Cattlin Operations – Australia*



*En route to Sal de Vida lithium project – Argentina*



## The leading global pure play lithium company, listed on the ASX, with significant institutional interest and outstanding liquidity

### Financial Information (2017.11.14)

<b>Share price</b>	<b>A\$4.02</b>
Number of shares (undiluted) <sup>1,2</sup>	403.3m
<b>Market Capitalisation</b>	<b>A\$1,621.4m</b>
Cash (30-Sep-17)	A\$57.4m
Debt (30-Sep-17)	A\$8.5m
Net cash (30-Sep-17)	A\$48.9m
<b>Enterprise Value</b>	<b>A\$1,572.5m</b>

Source: IRESS

Notes:

1 Excludes 19.6M unlisted options on issue at various vesting and expiry dates with exercise prices between A\$0.365 and A\$2.78

2 Excludes 5.0M share appreciation rights

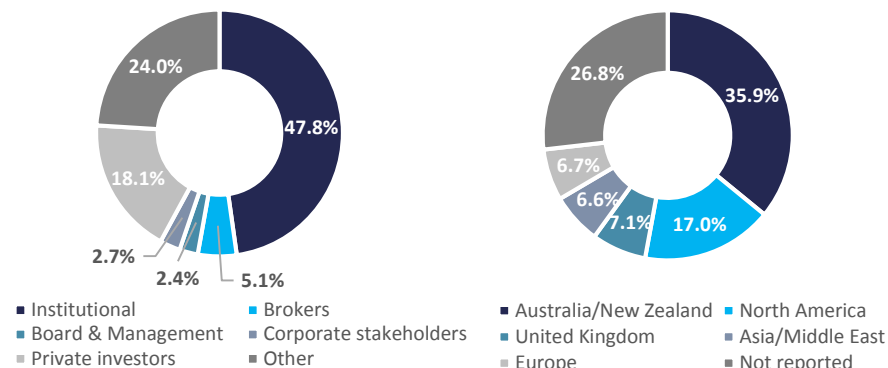
### Top Shareholders (30 Oct 2017)

Investor	%
Blackrock Group	6.3%
Ausbil IM	5.3%
Board and Management	2.4%
Top 20 shareholders	39.4%

### Share Price Performance (1 year)

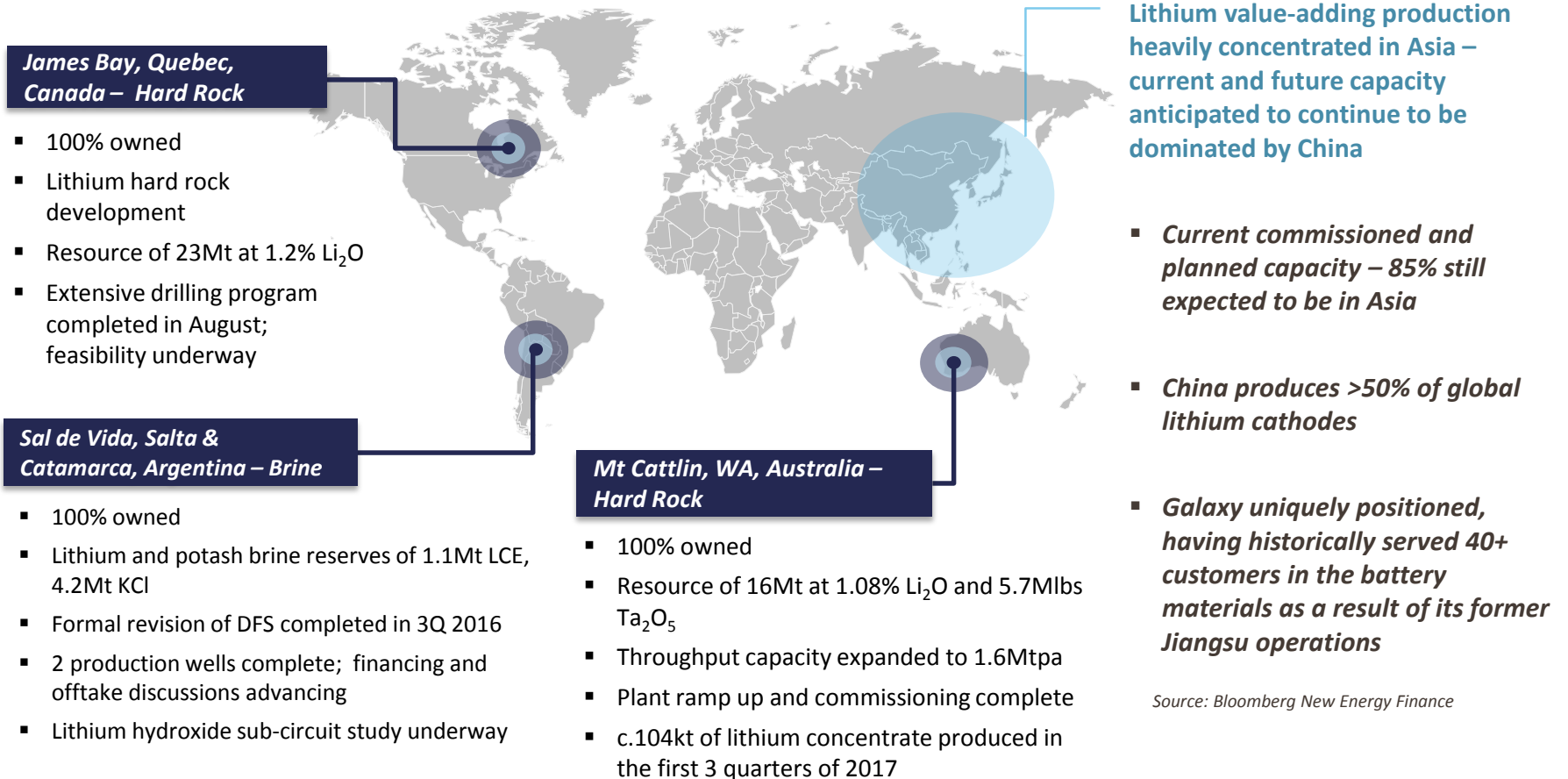


### Shareholder Type and Geographical Breakdown (30 Oct 2017)





## With a portfolio of both hard rock and brine based lithium assets, Galaxy is well networked with key customers in the Asian lithium market



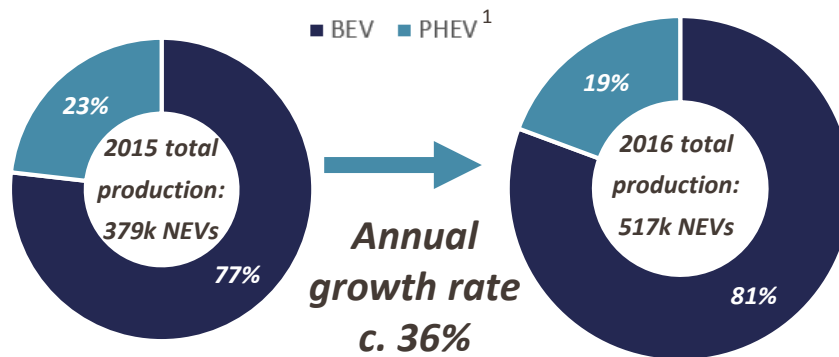
## Market Review

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## China is the largest consumer of lithium chemicals (c.87kt LCE vs Japan c.25kt / South Korea c.20kt LCE 2016), driven by growth in New Energy Vehicles (“NEV”)

- **“Medium to long term plan for the auto industry” (2025 plan):** details how China plans to strengthen its domestic auto industry and expand global exports of NEVs
  - Forecast production of 2 million NEVs p.a. and targeted NEV stock of 5 million vehicles in 2020
  - Targeted 20% NEV penetration in 2025 (c. 7 million NEVs p.a. out of total projected production of 35 million vehicles)
  - At 7 million vehicles pa, implies **additional demand 280kt<sup>2</sup> LCE by 2025**
- **Supportive policy:** A NEV quota scheme for all auto manufacturers in China, economic incentives for the consumer and changes in consumer preferences countering subsidy reduction effect, support for growth and investment in lithium battery sector

### Breakdown of New Energy Vehicle Production in China



### 2017 YTD NEV Unit Production<sup>1</sup>

NEV model	H1 2017	Q3 2017
BEVs	176.1k	171.9k
PHEVs	36.1k	39.9k
<b>Total</b>	<b>212.2k</b>	<b>211.8k</b>

**2017 YTD NEV Production @ 424k**

**YTD YoY growth of 40.2%**

Source: CAAM, CJ Securities

Notes:

1. BEVs = Battery Electric Vehicles, PHEV = Plug-In Hybrid Electric Vehicles
2. Assumed average size of lithium ion battery of 50kWh and LCE demand per EV pf 0.8kg/kWh

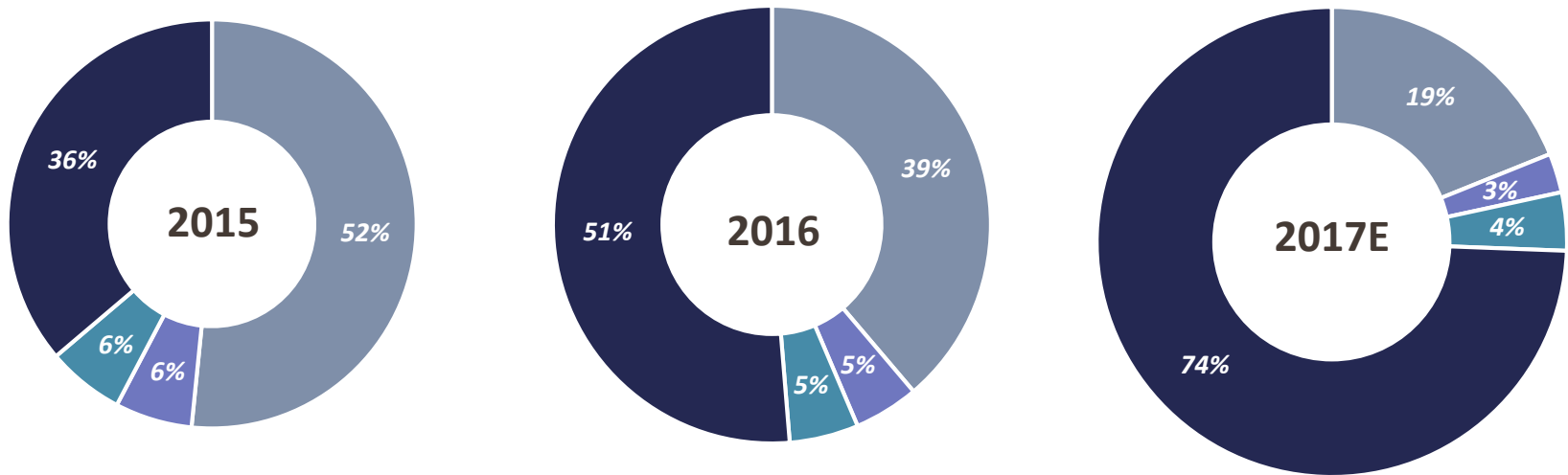


# China Lithium-Ion Battery (“LiB”) Consumption



**Lithium-ion battery applications transitioning from being predominantly dominated by consumer electronics (“3C”) to new energy vehicles (“NEV”)**

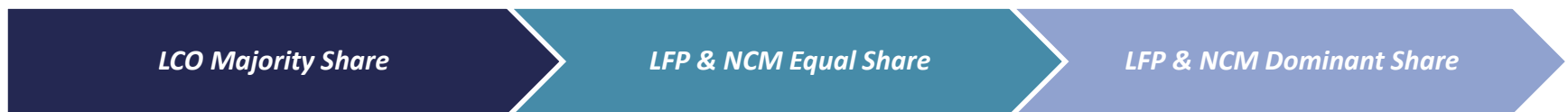
Lithium-Ion Battery Consumption Mix



Source: CJ Securities

■ 3C ■ Other Portables ■ Storage ■ NEV

## Cathode Chemistry Transition



## China continues its leading investment into NEVs and has introduced a number of policy measures aimed at continuing to encourage uptake

### Government Policy & Investment

- **Committed domestic investment** – Committed build out of a nationwide charging infrastructure to support 5 million NEVs by 2020
- **Mandatory NEV targets** – Government initiating credit system encouraging auto manufacturers to target NEV production percentages of 8%, 10% and 12% over the next 3 years
- **Plans to completely phase out ICE production** – Penalties for manufacturers exceeding certain production thresholds

### China Licensing Restrictions

- Certificate of entitlement (COE) required for car purchase
  - Cost of a COE in Shanghai for an internal combustion engine (ICE) vehicle: US\$15k for an individual; US\$30k for a company
- **In Beijing (BJ) and Shanghai (SH):**
  - The right to purchase an ICE vehicle is subject to a lottery
  - Success rates: 4% (SH); 0.2-0.3% (BJ)
- Driving restrictions for ICE vehicles
- ***NONE OF THE ABOVE RESTRICTIONS FOR PROSPECTIVE NEV OWNERS***

Shanghai license plates used to distinguish between car types



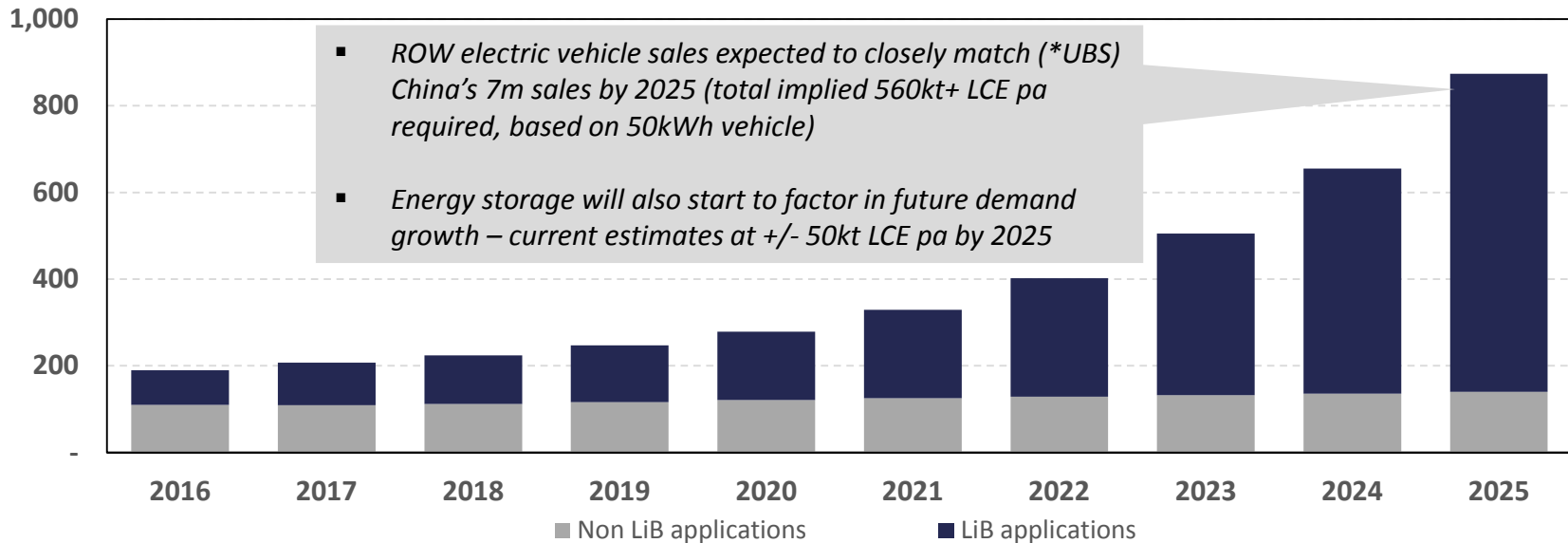
Blue plates: ICE vehicles



Green plates: NEV vehicles

## Lithium demand expected to grow 4x from historical c. 200kt LCE in 2016 to over 800kt LCE by 2025

### Lithium Carbonate Demand (kt LCE)



**Lithium industry needs to bring online 600kt+ of incremental supply (equiv. circa +70kt growth p.a.) to meet demand balance – major challenges include number of “shovel-ready” projects to fund into production and capital available to finance those projects**

## Both Automakers and Governments are setting aggressive strategies and targets which will continue to support increase in adoption of EVs

### Automaker Targets

	Plans to launch <b>30 new EV models by 2025</b> and to be <b>25% of total sales in 2025</b>
	Intention to release dedicated EVs in China in 2018
	All new models will have <b>full or partial electric engines by 2019</b>
	Plans to offer <b>25 electrified models, with 12 fully BEVs, by 2025</b>
	Stated that their <b>new models from 2020 will be electric</b>
	Plans to introduce 2 new EVs in the next 18 months, and the <b>at least 20 new "all electric vehicles" by 2023</b>
	Model 3 launched in July 2017, the company is <b>targeting 20k/month production in December</b>
	Introduction of Leaf full model change in <b>Sep 2017</b> aimed at millennial market
	Electrified fleet to include <b>8 pure electric vehicles and 12 electrified models</b>

Source: Company data, Goldman Sachs Global Investment Research

### Government Policies

	European Commission proposes to reduce vehicles' CO <sub>2</sub> emissions by 30% by 2030
	No more sales of internal combustion engines (ICE) from 2040 (France/UK) or 2025 (Netherlands)
	Introducing a significant cap and trade mechanism that forces local car manufacturers to meet quotas of EVs
	EV penetration target of 40% in 2032
	Ban sales of gas and diesel cars by 2025
	US\$7,500 federal subsidy + ZEV regulation
	US\$100 subsidy per kWh battery

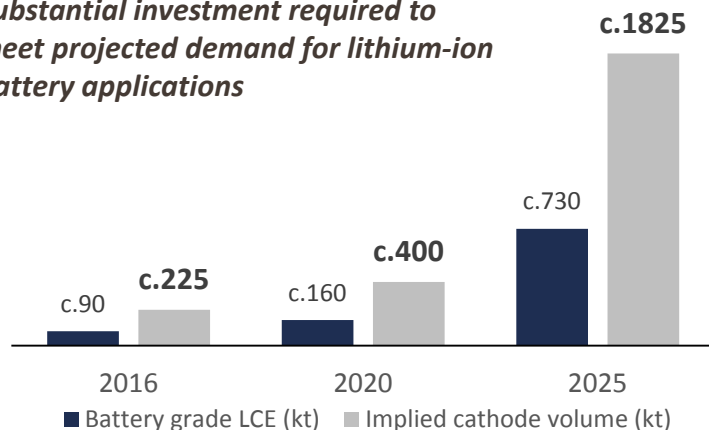
Source: Government websites, Goldman Sachs Global Investment Research

## Continued investment in cathode production capacity expansion required to facilitate growth alongside the expected demand growth for LiB applications

- Demand growth in lithium ion battery applications to place strong pressure on supply of cathode materials
  - Majority of new expansions are focused on high-end cathodes for automotive batteries
- Due to enhanced energy density demands, growth in automotive battery demand is driving ternary (NCM) and NCA cathodes to become the increasingly dominant chemistries
- Consumer electronics to uphold demand for LCO, potential switch to ternary chemistries if cobalt supply becomes problematic

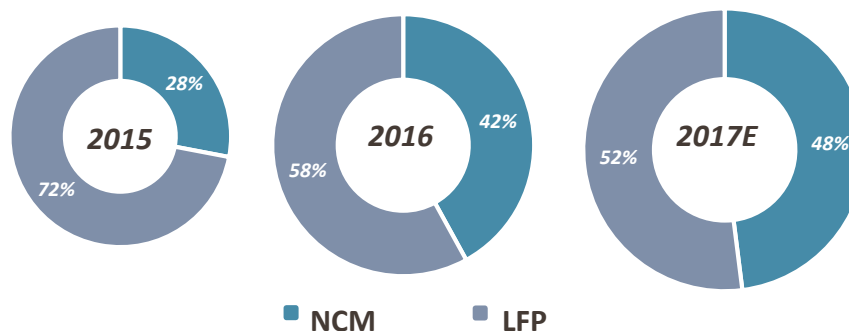
### Implied Cathode Demand (Based On Battery Grade LCE)<sup>1</sup>

*Substantial investment required to meet projected demand for lithium-ion battery applications*



### China NEV Cathode Mix Transitioning From LFP to Ternary

*By 2020, projected NEV cathode mix to reach an estimated 85%/15% mix between ternary and LFP*



Source: UBS, Benchmark Minerals, Company Disclosure, Bloomberg, CJ Securities

Notes:

1. Battery grade LCE demand based on UBS estimates; Implied cathode volume assumes that the average LCE intensity per tonne of cathode is 0.4
2. LFP = Lithium Iron Phosphate, NCM = Nickel Cobalt Manganese

# Growth Initiatives Throughout The Value Chain



## Structural changes in electrification of transportation and continued policy support globally is accelerating investment along the lithium value chain

### Announced Expansions of Cathode Producers



€300m investment committed to cathode capacity



Plans to expand capacity from 8ktpa in 2016 to 31ktpa in 2020, mainly for NCM



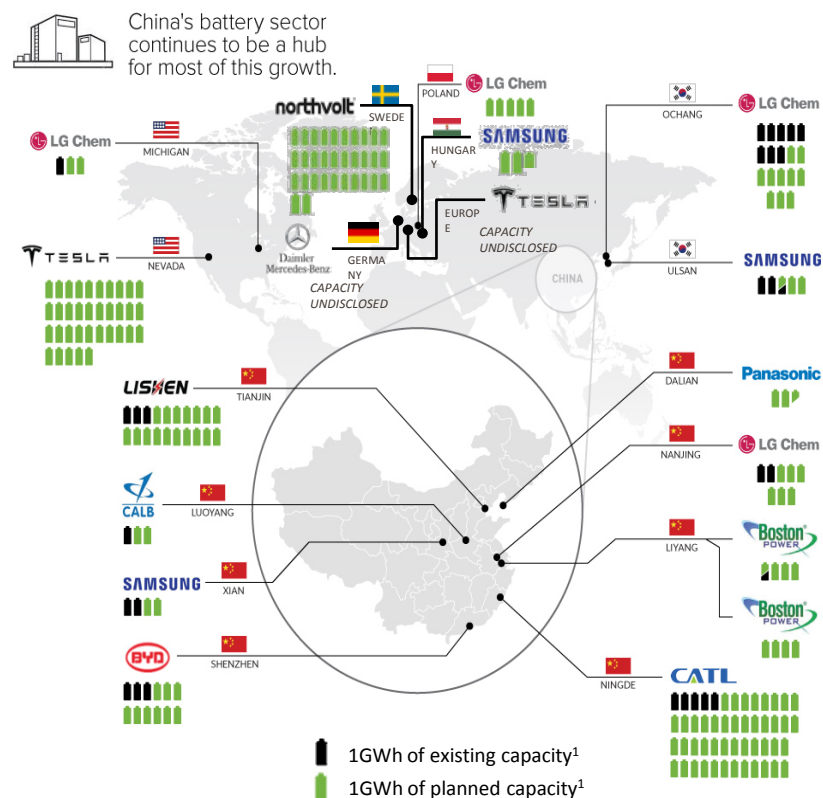
We create chemistry

€400m commitment to build cathode production facilities in Europe



¥4bn investment to increase cathode capacity by c.12ktpa

### Planned Construction/Expansion Of Selected Gigafactories



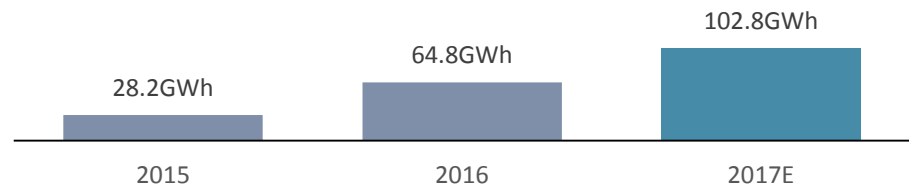
Source: Benchmark Minerals, Company Disclosure, Bloomberg, CJ Securities



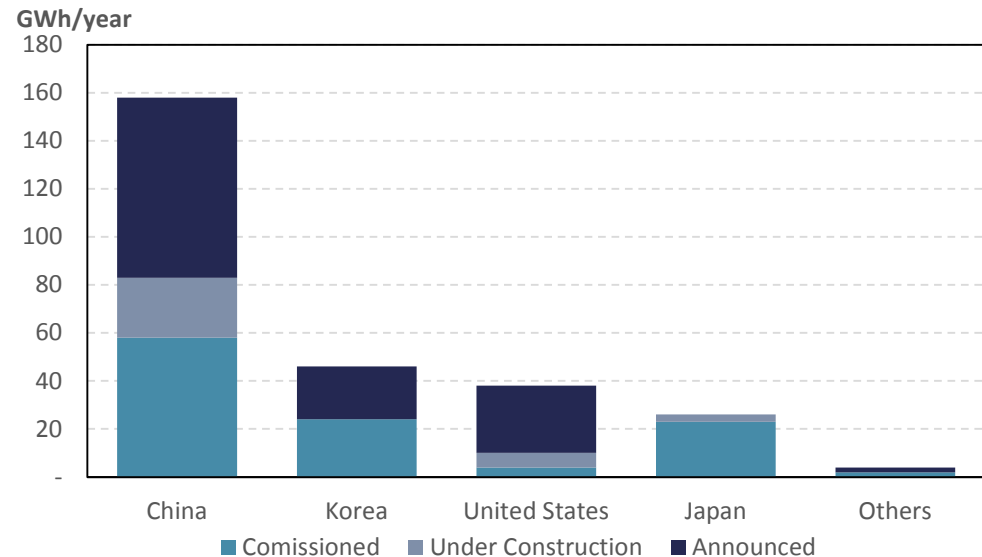
## Significant investment is being made into increasing global battery manufacturing capacity, driven primarily by China

- China vs ROW:** China has a total c.160GWh of capacity vs ROW aggregate capacity of c. 120GWh
  - **Represents 57% of global capacity** announced to date
- LCE Required:** If fully utilised today, a total of 280GWh capacity will use **224kt LCE of battery grade material vs only c.90kt LCE** of material that was used in batteries in 2016
- Capital Investment:** Using the Tesla Gigafactory **capital intensity of c.US\$150m/GWh**, this equates to an estimated **US\$40B+ of investment capital** to build out global lithium battery manufacturing capacity

 **Lithium-Ion Battery Manufacturing Capacity**  
Capacity expected to grow 2x from 2017E levels to 2020



**Global Breakdown of Lithium-Ion Battery Project Capacity**

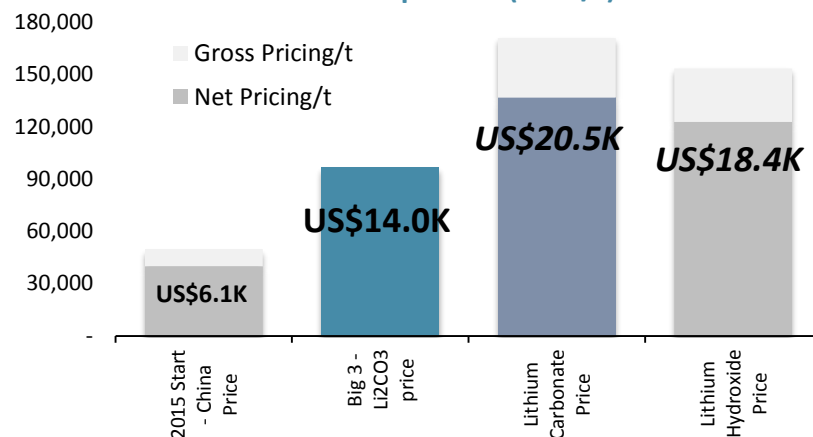


Source: Benchmark Minerals, Bloomberg New Energy Finance

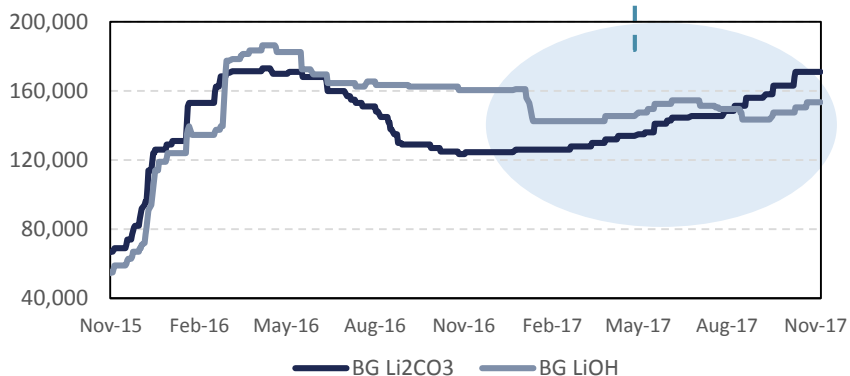
## Continued strength in lithium prices is a clear indication that demand growth is likely to be outpacing supply side growth

- Substantial **growth in demand** for lithium chemicals underpinned by a significant **expansion in NEV uptake in China** - **Li<sub>2</sub>CO<sub>3</sub> prices are up 36%** versus 2016 year-end
- China domestic lithium production in 2016 was 87kt LCE vs 70kt LCE in 2015 – **Jan to July 2017 already recorded 101% increase to 73kt LCE** of lithium material imports (lithium concentrate, carbonate, and chloride; excluding DSO) vs same period in 2016
- 5% retraction in LiOH prices since 2016-end** – most growth dependent on ex-China demand from Japan (NCM-811/NCA)

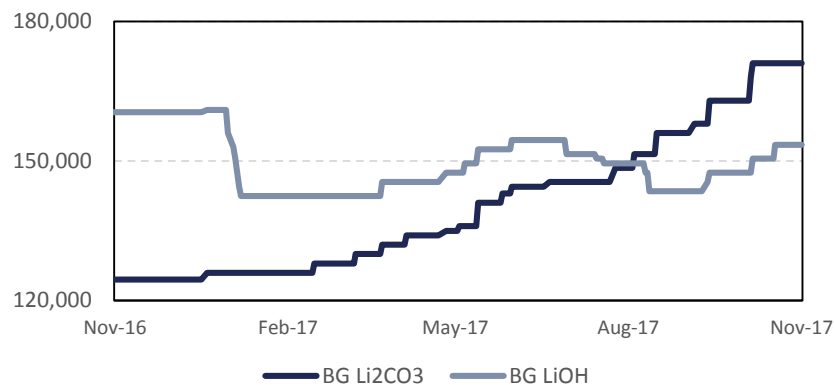
Lithium Carbonate Price Comparison (RMB/t) – November 2017



Historical Lithium Prices (RMB/t)



Historical Lithium Prices LTM (RMB/t)

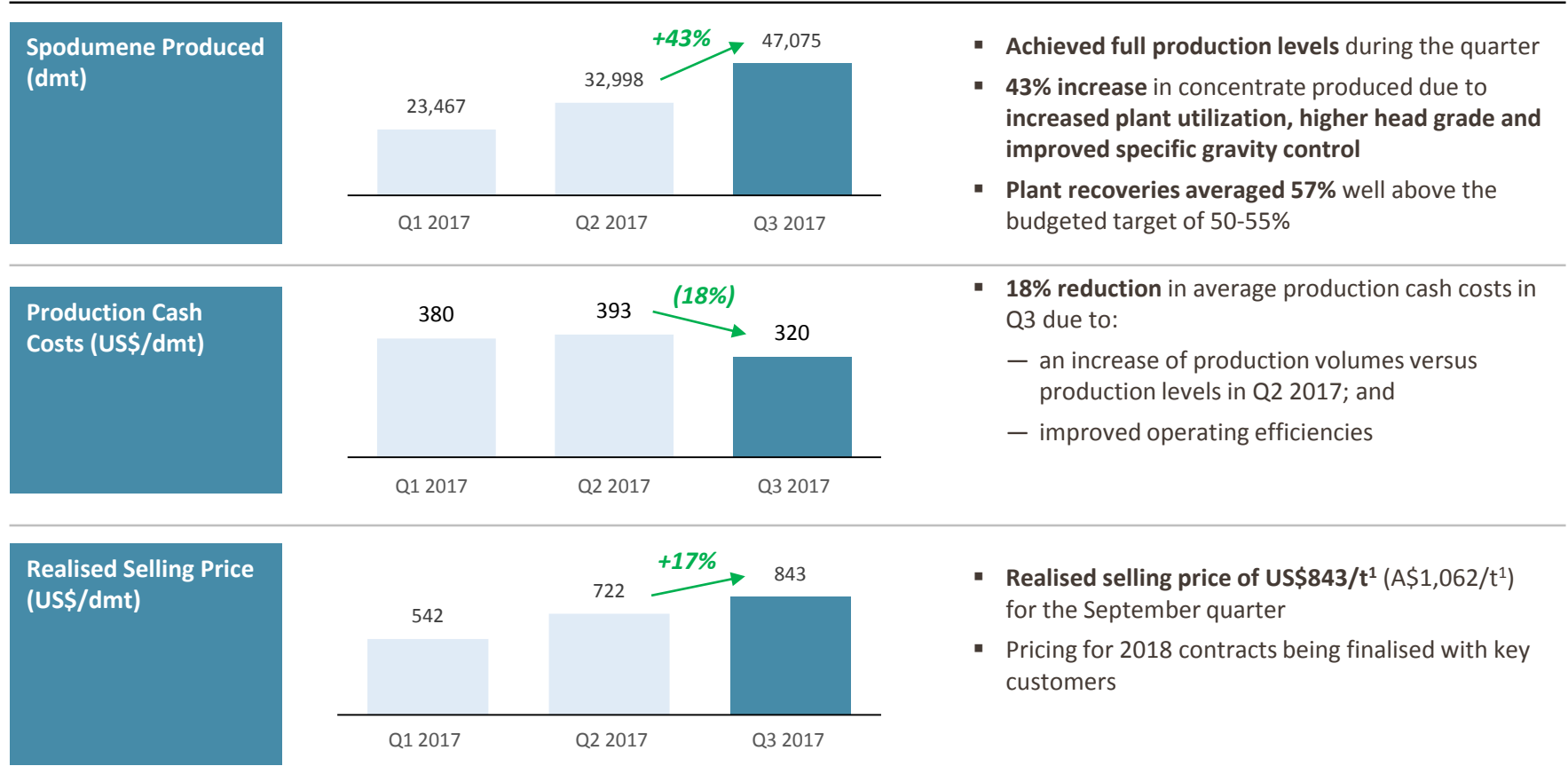


Source: CLA, Company Estimates, CJ Securities

# Galaxy Projects Update

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## Galaxy successfully achieved improvement across key metrics for the September quarter



- Achieved full production levels during the quarter
- 43% increase in concentrate produced due to increased plant utilization, higher head grade and improved specific gravity control
- Plant recoveries averaged 57% well above the budgeted target of 50-55%

- 18% reduction in average production cash costs in Q3 due to:
  - an increase of production volumes versus production levels in Q2 2017; and
  - improved operating efficiencies

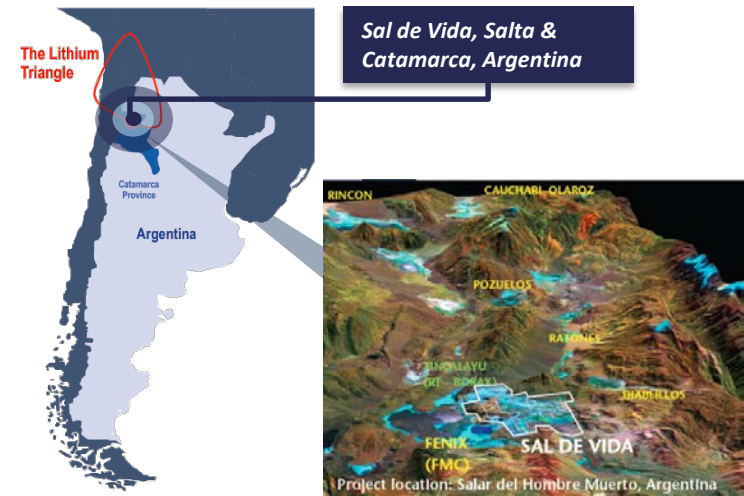
- Realised selling price of US\$843/t<sup>1</sup> (A\$1,062/t<sup>1</sup>) for the September quarter
- Pricing for 2018 contracts being finalised with key customers

<sup>1</sup> Cash costs and realised prices before royalties and marketing fees

## One of the world’s largest and highest quality undeveloped brine deposits with significant expansion potential

- A premier lithium and potash brine development project
  - 100% owned by Galaxy and fully permitted
  - Located between Salta and Catamarca Province in Argentina, in an area that is known as the ‘Lithium Triangle’
- Lithium triangle home to >60% of global annual lithium production
  - Sal de Vida located on the same salar as FMC’s Fenix operations
- Revised DFS reaffirms the technical superiority of Sal de Vida and potential for a highly profitable operation
  - Estimated **post-tax NPV<sub>8% real</sub> of US\$1.4bn**
  - Potential to generate **average annual revenues of US\$354M**
  - Potential to generate **average annual operating cash flow of US\$273M pre-tax (US\$182M post-tax)**
- Large mineral reserves to support long life annual production of **25ktpa of battery grade lithium carbonate and 95ktpa of potash**
- Brine projects have the advantages of **lower operational costs and greater ability to expand production facilities**
- Discussions advancing with offtakers and potential strategic partners

Location



### Sal de Vida Reserve Estimates

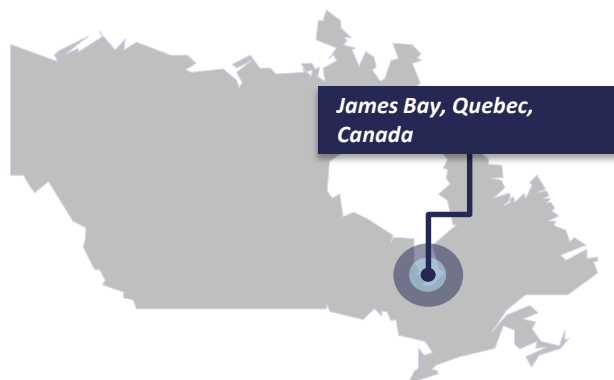
Reserve category	Time period	Tonnes Li total mass	Tonnes equivalent Li <sub>2</sub> CO <sub>3</sub>	Tonnes K total mass	Tonnes equivalent KCl
Proven	1-6	34,000	181,000	332,000	633,000
Probable	7-40	180,000	958,000	1,869,000	3,564,000
<b>Total</b>	<b>40 years</b>	<b>214,000</b>	<b>1,139,000</b>	<b>2,201,000</b>	<b>4,197,000</b>

Source: Revised Sal de Vida DFS – August 2016. Assumes 500mg/L Li cut off

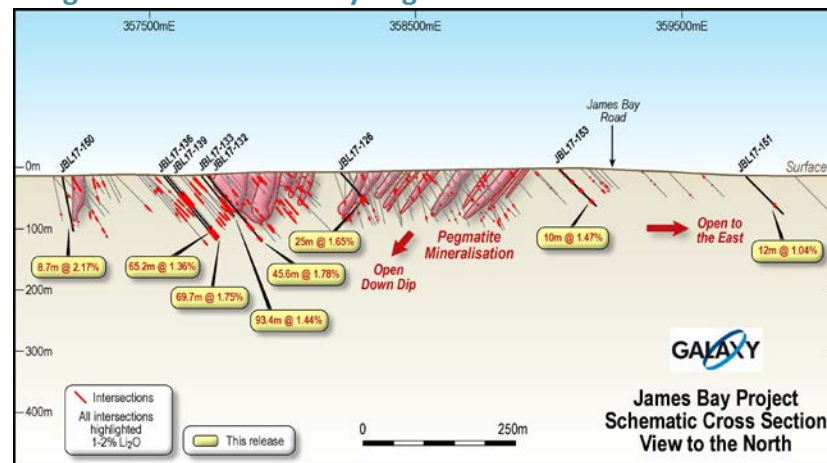
## The project provides a **valuable option for capitalising on long term lithium demand growth**, and the potential to supply the North American market

- Lithium pegmatite project located in James Bay, Québec, Canada, **100% owned by Galaxy**
  - Strategically located in a mining friendly jurisdiction with a low cost of energy and good infrastructure nearby
- US\$3.3m exploration and development program completed Q3 2017, which included a 33,000m diamond drilling program aiming to **extend existing resources, upgrade mineral resources to reserves** and explore pegmatites not previously drilled
- **Feasibility Study work has commenced**; expected completion Q1 2018
  - Study will take advantage of Mt Cattlin experience to draw synergies for engineering and process flow sheet design
- Scope of study will include metallurgical testing and **evaluation for potential downstream conversion facility** in Québec
  - Metallurgical test work conducted in 2012 produced **spodumene grades of 6.53% Li<sub>2</sub>O** at a **75% lithium recovery rate**

### James Bay Location



### Long Section of James Bay Pegmatite Swarm





## Optimisation of Mt Cattlin operations and accelerating the development of Sal de Vida and James Bay **allows Galaxy to capitalise on the lithium market growth**

### **MT CATTLIN**

*Production & ramp up*

- Focus on processing plant optimisation to maximise 2018 lithium concentrate production volumes
- Extensive brownfield and greenfield drilling targeting mine life extension
- Offtake discussion well advanced for long term supply contracts from 2018 onwards

### **SAL DE VIDA**

*Field work, offtake & project financing*

- Site works commenced, first production wells completed, pilot testing underway
- Discussions advancing with offtakers and potential strategic partners, evaluating project financing options in parallel

### **JAMES BAY**

*Project development*

- Upgrade of existing resource and definition of ore reserves following extension and infill drilling program
- Feasibility study work has commenced, drawing on Mt Cattlin experience to support upstream component, evaluation downstream lithium conversion facility

### **MACRO**

*Robust lithium demand*

- Continued strong growth in demand for lithium, led by increase in NEV sales and adoption rates in China, as well as robust growth other markets
- Lagged response from supply side of both lithium compounds and concentrate feedstock, increased pricing levels being sustained

## Competent Person Statement

### Sal de Vida

Any information in this report that relates to the estimation and reporting of the Sal de Vida Project Mineral Resources and Mineral Reserves is extracted from the report entitled "*Sal De Vida: Revised Definitive Feasibility Study Confirms Low Cost, Long Life and Economically Robust Operation*" created on 22 August 2016 which is available to view on [www.galaxylithium.com](http://www.galaxylithium.com) and [www.asx.com.au](http://www.asx.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resources and Mineral Reserves estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

### James Bay

The information in this report that relates to the estimation and reporting of the James Bay exploration results is extracted from the ASX announcement's dated 27 June 2017, 2 August 2017, 10 August 2017 and 14 September 2017 which are available to view on [www.galaxylithium.com](http://www.galaxylithium.com) and [www.asx.com.au](http://www.asx.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the exploration results in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in this report that relates to Mineral Resources at the James Bay Project is based on work completed by Mr James McCann, who is a Member of the Ordre des Geologues du Quebec, a Recognised Overseas Professional Organisation. Mr McCann is a full time employee of Galaxy, and 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 a Competent Person as defined in the 2004 edition of the "*Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves*". Mr McCann consents to the inclusion in the report of the matters based on his information in the form and context it appears. This information was prepared and first disclosed under the JORC Code 2004 and it has not been updated since to comply with JORC code 2012 on the basis that the information has not materially changed since it was last reported.

### Mt Cattlin

The information in this report that relates to the estimation and reporting of the Mt Cattlin Project Mineral Resources and Mineral Reserves is extracted from the report entitled "*Mt Cattlin Update: Revised Resource & Reserve Statement*" created on 4 August 2015 published by General Mining Limited (ASX: GMM) which is available to view on [www.asx.com.au](http://www.asx.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement made by GMM. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.