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#### **Competent Persons**

The information in this report that relates to Mineral Resources is based on information compiled by Mr. Robert Spiers who is a full time employee of Hellman & Schofield Pty Ltd and who is a Member of the Australian Institute of Geoscientists. Mr. Spiers has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Spiers consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Ore Reserves is based on information compiled by Mr. Roselt Croeser who is a full time employee of Croeser Pty Ltd. Mr. Croeser has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Croeser consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Exploration Results, including exploration data and geological interpretations is based on information compiled by Mr Philip Tornatora who is a full time employee of the Company and who is a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr. Tornatora has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Tornatora consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

#### James Bay Competent Person

The mineral resources are reported in accordance with National Instrument 43-101 and have been estimated in conformity with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserves Best Practices" guidelines. Resource evaluation work was completed by Mr. Sébastien Bernier, P.Geo (OGQ#1034, APGO#1847) an independent Qualified Person as defined by NI 43-101.

#### **GALAXY OVERVIEW**





- Lithium Pure Play
- Downstream Integration Value Add
- Resource, Chemical, Battery
- Operating mine and ore resources Australia
- Resource in Canada
- Lithium Carbonate chemical facility in China
- Lithium battery project in China



# CHINESE LITHIUM INDUSTRY & MARKETS

### CHINA 12th FIVE YEAR PLAN



- US\$ 460 billion in green related projects
- Towards a low carbon economy
- 5m EVs by 2020 (13.6 mil vehicles pa)
- 50% ownership of EVs & Hybrids by 2030
- Beijing Initiatives will drive EV demand
- "Mass energy storage" key to China's strategy
- China targeting 20% from renewable source by 2020
- China 1.6 MW of wind power installed every hour

#### **TOTAL LITHIUM INDUSTRY - CHINA 2011**





#### **TOTAL LITHIUM INDUSTRY - CHINA**



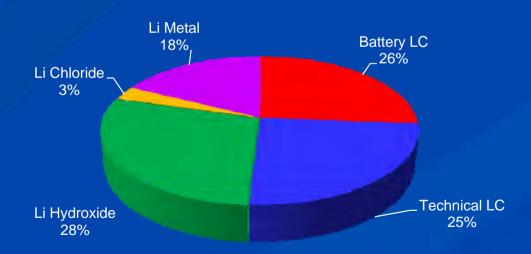
- Total Li production is estimated at 51 kt LCE
- → Imports of Li products incl brine is 15 kt LCE
- Exports of Li products incl metal is 17 kt LCE
- Estimated mineral consumption is 5 kt LCE
- All Li consumption in China estimated at 54 kt LCE



#### LITHIUM PRODUCTION IN CHINA



- ◆ Total battery grade production is estimated at 13 kt LCE
- Tech grade Li production is 13 kt LCE
- ◆ Li Hydroxide production is 14.5 kt LCE
- Li metal production around 7.5 kt LCE (1.4 kt metal)



## **BATTERY GRADE LC PRODUCTION**





## **CATHODE PRODUCTION 2011**



Format	tonnes
LCO	22,500
LNMC	8,600
LMO	2,500
LFP	1,000
Others	800
Total	35,400
LCE	13,800







- ◆ Total No of producers 600+
- Total Capacity 8 million KWH
- Break down by Battery type:
  - ◆ LCO 48% used in mobile, laptops, PDA's
  - → NCM 32% power tools, e-bikes
  - ◆ LFP 12% power tools, e-bikes, EV, HEV
  - ◆ LMO 8% power tools, e-bikes
- Expansion projects in pipeline 7 million KWH (almost double!)

### **TECH GRADE PRODUCTION**





### LI HYDROXIDE PRODUCTION





#### LITHIUM NEWS IN CHINA

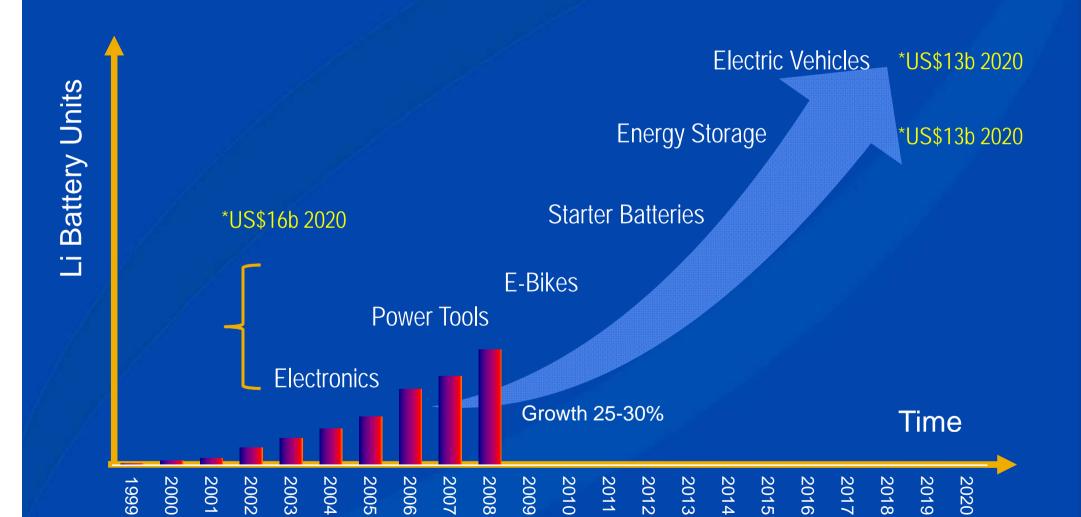


- 2011 e-Bike output was 29m units with 2.5% using Li batteries
- Forecast to increase to 20% by 2015 (source China Bicycle Association)
- New Cathode capacity coming on line is estimated to be approx 20,000 tpa
- Beijing Pulead announced expansion plans to install 50,000tpa of LFP capacity.
- 55 Auto makers in China with many potentially developing EV, HEV & PHEV



### **GROWTH IN OTHER AREAS BEFORE EVs**





#### PRESSURE ON LEAD BATTERIES





### FOCUS ON THE E-BIKE MARKET



- China produces 27 m E-Bikes pa
- 97% heavy lead acid batteries
- PRC weight restrictions
- > 1,000 lead plants shutdown
- Mass conversion to Li Batteries





# GALAXY'S BUSINESS RESOURCE, CHEMICAL, BATTERY



# **RESOURCE DIVISION**



#### MT CATTLIN MINE



- Mt Cattlin commenced late 2010
- Record construction of <11 months</p>
- Project on time and on budget (A\$80m)
- Ramp up continues
- Produced 63,853 t spodumene in 2011
- Three shipments during the year
- Sales of Ta concentrate







#### JAMES BAY SPODUMENE JV



- Building our lithium footprint
- ◆ 20% with earn in to 70% Lithium One
- ◆ 10 t bulk sample collected at James Bay
- ◆ 2<sup>nd</sup> round of metallurgical testing to commence
- 95 infill channel samples collected
- Mineral and Lithium Carbonate Plant engineering cost studies underway
- Discussions continue with indigenous Eastman Cree community



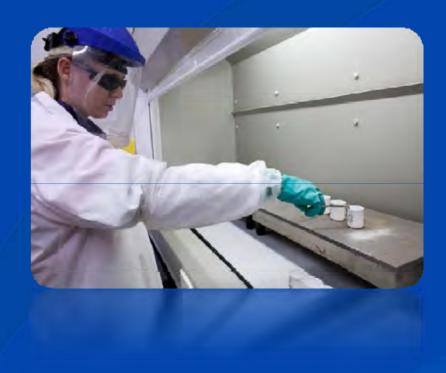












# CHEMICAL DIVISION

### JIANGSU PLANT IS STRATEGICALLY LOCATED





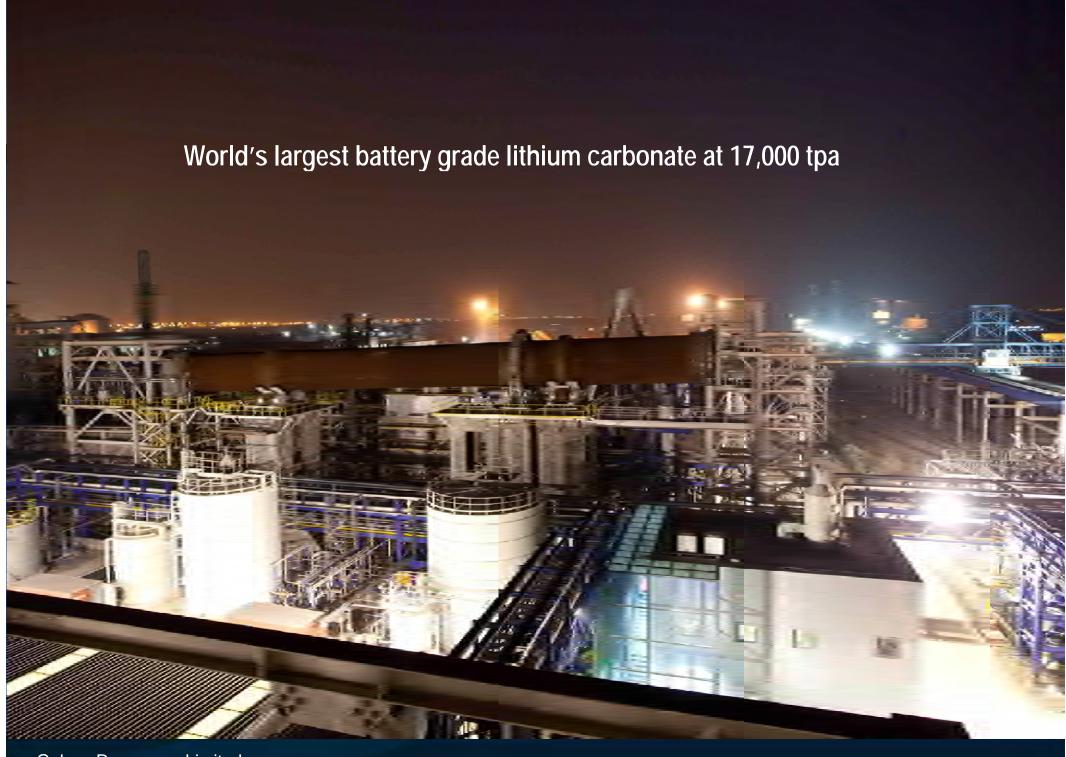
- Zhangjiagang Free Trade Zone
- Galaxy owns 100%
- 120 top foreign companies
- Chemical Industrial Park
- Adjacent to a wharf
- Supply of sulfuric acid and soda ash
- Close to markets

#### JIANGSU LITHIUM CARBONATE PLANT





- Focus lithium-ion battery industry
- Continuous production technology
- Highly process controlled
- Capital cost of US\$100 m
- Capability 99.9% purity and above
- Mechanical completion achieved in early Dec 2011
- Cold commissioning 2 months
- Hot commissioning
- Plant opening 7 March 2012
- First product in first quarter 2012





















































### **GALAXY IN CHINA**



- Build transparency in the market
- Priority customers have 5 year guaranteed supply
- Long term commitment to Chinese market
- Galaxy will publish it's quarterly prices
- Product quality tracking system
- Customers will benefit from analysis for each pallet
- Download from web analysis tracking system



#### **GALAXY ANNOUNCES EXPANSION STUDY**





- Feasibility study to investigate expansion into battery-grade lithium hydroxide at Jiangsu
- Proposed production of 5,000 tpa battery grade lithium hydroxide
- Potential to increase total Jiangsu lithium products output to 22,000 tpa
- Believe there is extra front end capacity
- Lithium hydroxide used in cathode and electrolyte production
- Battery-grade lithium hydroxide commands price premiums versus carbonate
- Strong growth with limited suppliers in the world

#### **GALAXY ANNOUNCES EXPANSION STUDY**



- Incremental expansion likely to result in lower operating costs at Jiangsu
- Land available next door
- Study will take 6 months
- Internal Galaxy team and Hatch Engineering
- ◆ If successful, plant could be operating 18-24 mths
- Additional spodumene from market or James Bay



### **GALAXY ANNOUNCES EXPANSION STUDY**









# **BATTERY DIVISION**

### CHINA'S LITHIUM BATTERY INDUSTRY





- Thousands of small medium factories
- High labour assembly lines
- Cheap low quality raw materials
- Prone to quality inconsistencies
- High defect rates affecting life of batteries
- All trying to do their own R&D
- Cannot compete with Japanese & Korean batteries

### GALAXY'S APPROACH





- Feasibility study completed
  - "Turn key" equipment supplied by KUBT (Korea)
  - Full automation extremely low reject rates
  - Suppliers of Samsung and LG Chem
  - K2 Energy US lithium battery partner
  - Leap frog R&D
  - 350,000 battery packs
- More stable Lithium Iron Phosphate batteries
- All 350k battery sales off-take achieved

#### **CURRENT STATUS**





- for the plant output to 620,000 battery packs
- Minimal capital cost increase
- Off-take of 450,000 achieved to date
- Term sheets received by 3 major PRC banks
- Environmental approval completed
- Safety approval in progress
- Land secured
- Board yet to make final decision
- May consider a strong JV partner

### INTERNATIONAL PARTNERS





Owner
Galaxy Resources
Australia





Technology Partner K2 Energy Solutions USA



Turn Key Partner KOBET Consortium Korea



EPCM Manager M+W Group Germany



Plant Location Zhangjiagang China



### **K2 ENERGY PARTNERSHIP**



- Established US lithium battery producer
- License to use all K2 Energy's technology
- K2 provides recipe, expertise, commissioning support
- Highest energy densities of any LFP products on the market
- Intellectual property

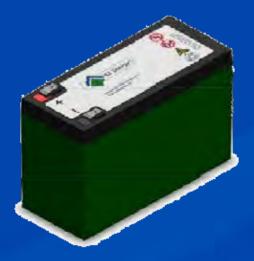
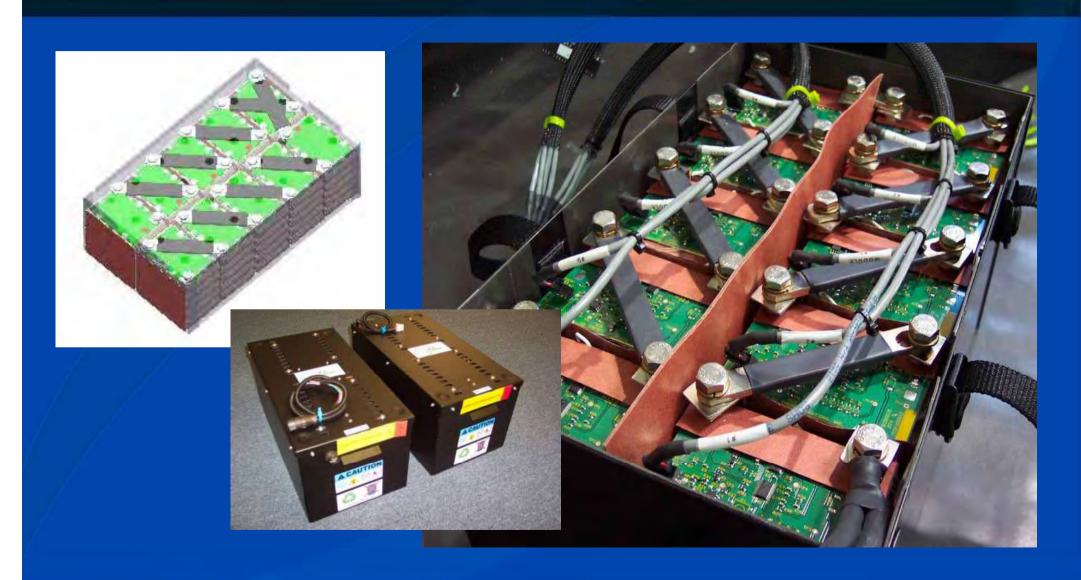


Table 1 - Energy Density (Wh/I)					
Battery type	K2	Comp 1	Comp 2	Comp 3	
18650 E	290		261	213	
18650 P	242	220			
26650 P	241	220	223		
26650 EV	297				

# EXPERIENCE IN LARGE FORMAT BATTERIES





## PROJECT STATISTICS



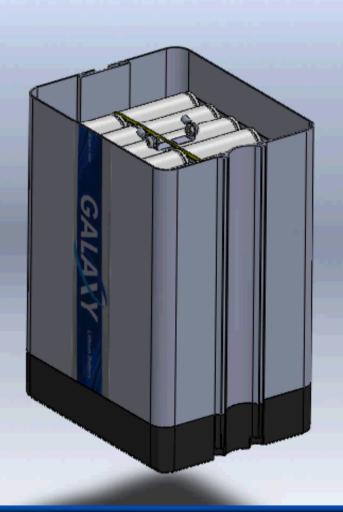
Statistic		
Number of Battery Packs pa	620, 000	
Battery Pack Capacity	36V, 10Ah	
Cathode Base Material	Li Iron Phos	
Anode Base Material	Graphite	



36 cylindrical cells

# **BATTERY PACK ASSEMBLY**











Typical KUBT mixer



KUBT coating and drying machinery



KUBT rolling and slitting machinery





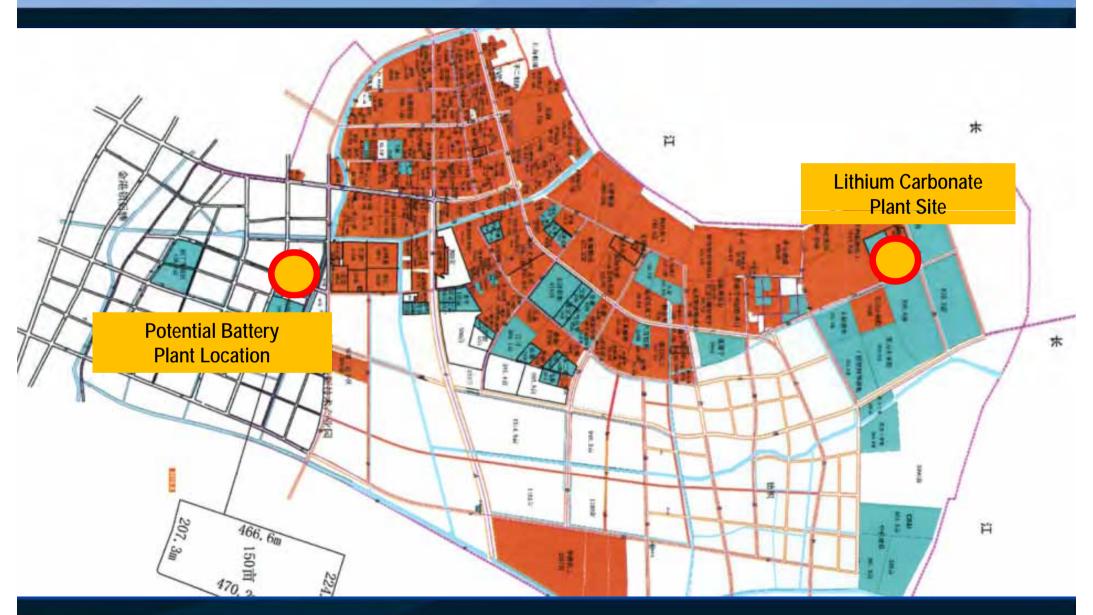
KUBT rolling and slitting machinery



KUBT separator formation machinery

### SITE SECURED





## **UPDATED FEASIBILITY STUDY**



Production Rate (packs pa)	620,00	
Capital Costs	A\$ 142 million	
Revenue pa	A\$142 million	
Ave Net Cash (pre tax) pa ^	A\$ 68 million	
Net Present Value NPV (non-geared, real @10%) ^	A\$ 365 million	
Internal rate of Return IRR%	43%	





### **MUCHAS GRACIAS**