TSXV: FCLI fullcirclethium.com

MAY 2023



# A BATTERY MATERIAL PROCESSING COMPANY

Focused on Lithium & Battery Materials Reintegration

"The Home of Lithium Science"

## DISCLAIMER

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The Company believes that these risks and uncertainties include, but are not limited to, the following: inability to economically and efficiently source, recover and recycle lithium-ion batteries and lithium-ion battery manufacturing scrap, as well as third party lithium feedstock, and to meet the market demand for an environmentally sound, closed-loop solution for manufacturing waste and end-of-life lithium-ion batteries and other lithium feedstock; inability to successfully implement the growth strategy, on a timely basis or at all; inability to manage future growth effectively; inability to refurbish and scale up the Company's processing plant and other future projects in a timely manner or on budget or that those projects will not meet expectations with respect to their productivity or the specifications of their end products; failure to materially increase recycling capacity and efficiency; failure of thirdparty technology that is part of the Company's processing plant's workings; the Company may engage in strategic transactions, including acquisitions, that could disrupt its business, cause dilution to its shareholders, reduce its financial resources, result in incurrence of debt, or prove not to be successful; one or more of its current or future facilities becoming inoperative, capacity constrained or if its operations are disrupted; additional funds required to meet capital requirements in the future not being available to the Company on commercially reasonable terms or at all when it needs them; the Company expects to incur significant expenses and may not achieve or sustain profitability; problems with the handling of lithium-ion battery cells that result in less usage of lithium-ion batteries or affect operations; inability to maintain and increase feedstock supply commitments as well as securing new customers and offtake agreements; a decline in the adoption rate of electric batteries particularly in electric vehicles, or a decline in the support by governments for "green" energy technologies; decreases in benchmark prices for the metals contained in the Company's products; changes in the volume or composition of feedstock materials processed at the Company's processing plant or future plants (if any); the development of an alternative chemical make-up of lithium-ion batteries or battery alternatives; the Company requires customers and other sources of lithium feedstock; insurance may not cover all liabilities and damages; the Company is reliant on the experience and expertise of its management and technical team; reliance on third-party consultants for its regulatory compliance; inability to complete its recycling processes as quickly as future customers may require; inability to compete successfully against already established battery recycling companies; increases in income tax rates, changes in income tax laws or disagreements with tax authorities; significant variance in operating and financial results from period to period due to fluctuations in its operating costs and other factors; fluctuations in foreign currency exchange rates which could result in declines in future sales and net earnings (if any); unfavourable economic conditions, such as consequences of the global COVID-19 pandemic; natural disasters, unusually adverse weather, epidemic or pandemic outbreaks, boycotts and geo-political events; failure to protect its intellectual property and knowhow; the Company may be subject to intellectual property rights claims by third parties; failure to effectively remediate the material weaknesses in its internal control over financial reporting that it may identify or if it fails to develop and maintain a proper and effective internal control over financial reporting. 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## WHY FULL CIRCLE LITHIUM?



### US Based Operations and Fully Operational Plant

- Permitted downstream 2ktpa capacity lithium carbonate (LC) processing plant in Georgia, USA 20yr production track record
- Diversified upstream business with LIB recycling, midstream feedstock recycling and lithium refinery
- Produced battery grade LC from spent lithium-ion batteries (LIB) and other feedstock at pilot scale
- Plant has excellent infrastructure and room for expansion to 10ktpa LC

### Proven Processing and Green Footprint

- Conventional technologies being used throughout recycling/refinery process to recover lithium compounds and other battery materials for a complete recycling solution with carbon neutrality
- Proprietary modular front-end lithium extraction process (LEP) processing plant completed and shipped to client's plant for feedstock recycling
- Starting larger scale demonstration of process utilizing a range of spent LIB types (40k lbs) building our battery processing unit
- Lithium refinery business line complements the business model and provides significant diversification and growth potential
- Patent pending portfolio of lithium related technologies 1 already filed

### **Outstanding Market Dynamics**

- Significant interest from midstream feedstock providers and refinery business for recycling and processing solutions
- Massive battery build-out worldwide and in North America (LIBs & scrap) with Electric Vehicle (EV) LIBs at the forefront needing end-of-life solutions, >5EV and LIB giga-factories builds with >US\$70B in EV/LIB investment regionally
- Critical battery materials are in short supply and at high price due to high demand

### Proven Team & Support

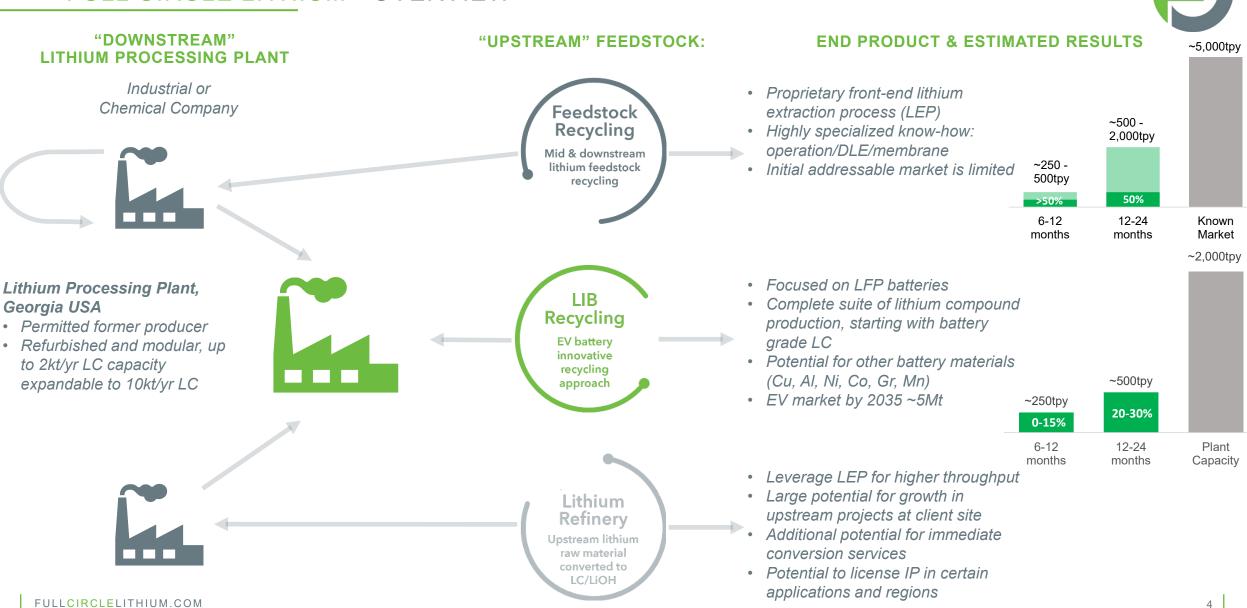
- Leading technical expertise with +70yrs of combined experience in lithium operation and processing
- Proven lithium industry and capital markets experience
- Strong government support in Georgia with >100GWh of gigafactory build-out in the region







## FULL CIRCLE LITHIUM - OVERVIEW





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industry.

5

companies.

director since 2010.

# GEORGIA, USA SCALABLE OPERATIONAL PLANT

## **Downstream Processing LC Plant**

- Plant has up to 2,000 t/yr LC capacity with ability to expand to up to 10,000 t/yr LC
  - Capacity to process lithium sulphate/lithium chloride streams and can also process multiple 3rd party industrial/mining streams
  - The plant is currently leased with an option to purchase 100% for US\$500k
  - Portfolio of patent pending lithium technology

### Feedstock Sourcing – Three Diversified Business Lines

### Midstream Feedstock Recycling – no longer a science experiment

- Potential to use Georgia plant or instal proprietary modular plant at client site
- Completed lab and pilot scale processing of multinational client's lithium feedstock and installing propriety modular demo processing plant at client's chemical plant
- Analyzing and pilot testing other lithium streams

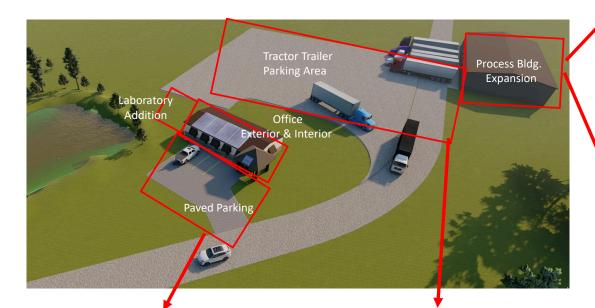
## LIB Recycling

- Team has disassembled spent LIBs and successfully produced LC at the plant
- Larger scale demonstration work ongoing to demonstrate large scale processing and economics, as well as optimize/automate disassembly methods for final LC extraction process

Lithium Refinery – numerous discussion on-going for processing



## PLANT REFURBISHMENT PHASE 1











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- Proven and tested and fully operational processing plant in Nahunta, Georgia
- Over a period of 18 years had >15 engineering contracts and produced more than 20t of battery grade LC
- Mothballed in 2012 due to deteriorating market conditions



- Proof of concept on battery recycling completed in 2019/20, ongoing process optimization on different types of LiBs (Sourced 40k lbs of LIBs)
- · Modified plant process flow sheet completed for quick restart
- Discussions with a number of companies with respect to midstream feedstock recycling business
- LiP technology in place IP development ongoing

COMMERCIALIZATION & REVENUE **GENERATION** +2023Future

- C\$10M funding concurrently with TSXV gopublic transaction
- No additional funds expected to be needed for initial revenue generation – for midstream feedstock recycling business and LIB recycling
- · Continued focus on spend LIB sourcing for recycling and lithium refinery business
- Additional growth not funded, expected to come from: (a) plant expansion: up to10kt LCE. (b) additional midstream feedstock recycling and lithium refinery deals, and (c) selective and strategic JV/M&A

## SUMMARY





Diversified business profile in a fast-growing global lithium recycling processing industry

Highly experienced

technical and

management

team

lithium industry

Operational plant with a 20 year track record of LC production

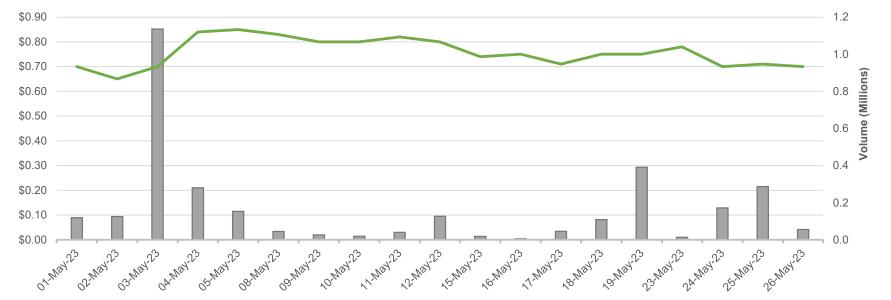
Proven processing from raw material (LIBs) and lithium by-product streams to battery grade LC or other lithium compounds





68.3	C\$0.70 (May 26, 2023)	~C\$50M			
Issued & Outstanding Shares	Share Price (TSXV:FCLI)	Market Capitalization			
81.4	~C\$9M (no debt)	~32%			
F.D. Outstanding Shares	Net Cash	Insider Ownership (Mgmt/BoD)			

\*Go-public date of May 1, 2023 at C\$0.70



# SELECTED MARKET COMPARABLES



Company	Market Cap. (US\$M)	<b>EV</b> (US\$M)	Locations	Business Segments					EV/EBITDA	
				Battery Recycling	Other Lithium Recycling	Lithium Refinery	Upstream/DLE	<b>2025E</b> (US\$M)	<b>2025E</b> (x)	Notes
Li-Cycle <sup>®</sup>	\$809	\$562		x				\$160	3.5x	Solely focuses on LIB recycling, typical shred/blackmass/hydro. Many partnerships. Large investments with large negative EBITDA.
	\$527	\$515		x			X (mining asset)	na	na	Selective dissassembly/hydro; also owns a clay mining assets Tonopah in Nevada.
Nm Neometals	\$184	\$143		X (JV wth Primobious)	X (Vanadium JV)	X (JV with MinRes)		-\$6	nmrf	Diversifed business through JV strategy.
battery metals	\$149	\$139					x	na	na	Solely focused on DLE extraction for upstream assets. Building demo plants in USA/Latam.
AQUA METALS	\$86	\$91		x				na	na	Solely focused on black mass proprietary modified hydro technology, business through equipment, royalty, and service agreements.
comstock	\$68	\$67		x				na	na	
	\$65	\$49		x				na	na	
<b>Electra</b> Battery Materials	\$36	\$81		x		X (cobalt)	X (cobalt)	\$44	1.8x	Mostly focused on the cobalt market, recently announced blackmass recycling business. In debt problems, strategic review on-going.
$\mathbf{\Theta}$	\$35	\$29		x	x	X	x	\$24	1.2x	Diversified business focused on lithium recycling in LIB and midstream operations, with a 2ktpa LC facility. Also working on lithium extraction from upstream assets and lithium refinery.

• Only a few comparables to FCL trade publicly or have estimated valuations

 There are many other companies in the recycling business (Redwood, Cirba Solutions, Neometals, Lithion, Ascend) and other lithium processing (GEO40, Lilac, Summit Nanotech), each with its own processing differentiator (mostly not proven at scale); some mining companies are also working on DLEs

• Most public comparables are focused on recycling of long lead time end of life LIBs, no other public or private company has the strategy of recycling both LIBs and midstream feedstock, as well as pursuing lithium refinery

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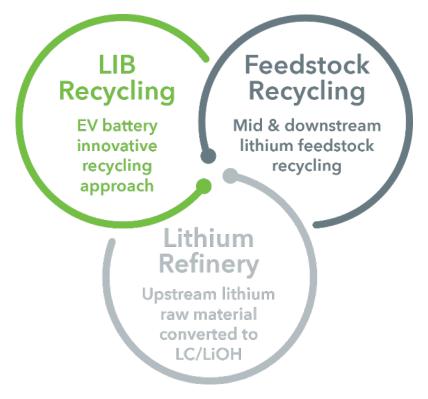


# **BUSINESS OVERVIEW**



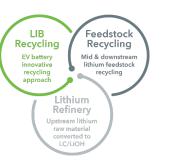
## BUSINESS MODEL OVERVIEW

- Full-service battery metals processing company with a fully refurbished downstream LC plant with a capacity of 2kt per annum based in Georgia USA
  - Primary focus is on recycling lithium and other high purity battery materials
  - Proprietary front-end lithium extraction process (LEP) and back-end processing technologies know-how enhances and unlocks lithium recovery
  - All processes are modular and designed to be integrated into existing operations
  - Engineering expertise is focused on minimizing raw materials and waste (high recovery) with the lowest carbon intensity level possible
  - The process has been demonstrated at pilot scale on numerous industrial lithium byproduct streams and is efficient, continuous and cost competitive
- Our upstream business segments (LIB recycling/midstream feedstock recycling/lithium refinery) can provide feedstock to our downstream LC plant or simply provide other lithium compounds directly to end-users
  - The plant can take different lithium feedstock (lithium chloride/sulphate) and produce battery grade LC
  - LIB recycling in advance stages of demonstration and focused on mitigating the three process safety risks: discharge of batteries, hydrogen/heat generation and fluoride process/recovery
  - Midstream feedstock recycling demo plant installation in Q2-Q3 2023
  - Lithium refinery in initial stages of development and end-user discussions



## MIDSTREAM FEEDSTOCK RECYCLING

- Business is focused on chemical and manufacturing companies that utilize lithium compounds in their primary processes (to make other valuable products) and have a residual lithium bearing streams or waste
- FCL deployed of a demo plant to ChemicalCo1 with a term sheet in place
  - Demo plant installation and 6-8 week demonstration phase to occur by end of Q2 early Q3 2023
  - Subject to final agreement, will lead to proprietary modular commercial production plant build-out by year end
- Currently in discussion with a number of other specialty chemical companies
- A typical process would entail:
  - Analyzing third-party lithium stream for lithium content and impurities at FCLs facilities
  - Using FCL's proprietary lithium extraction technologies (LEP) and know-how to demonstrate extraction and purification of lithium chemicals at the Georgia plant
  - Demonstrate win-win economics for both parties
  - Build processing capability to extract lithium into a range of desired lithium compounds (lithium extraction and processing can occur at FCL's plant or modular plant can be installed at client site)

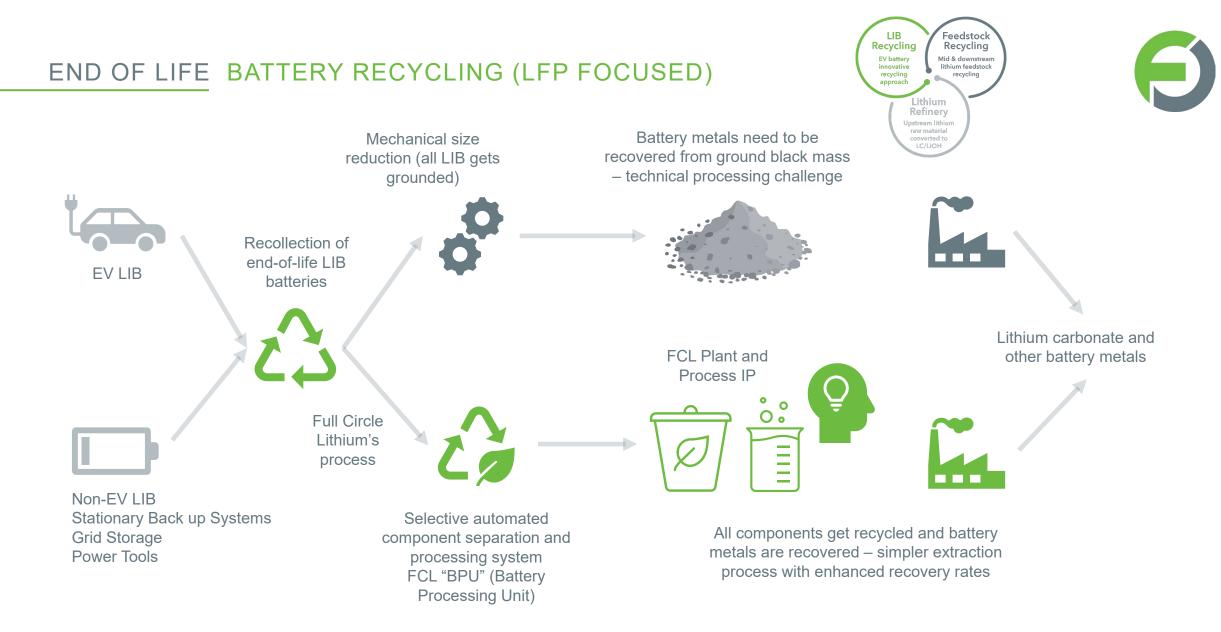




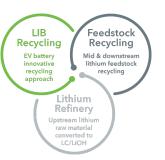
ChemicalCo1 – Example







Focused on mitigating the three process safety risks of LIB recycling: discharge of batteries, hydrogen/heat generation and fluoride process/recovery





- FCL can offer lithium extraction and lithium carbonate production expertise
  - The FCL team has produced lithium precursor from brines, clays, hard-rock and petro-brines and saleable lithium chemicals for over four decades
  - FCL's plant can act as a pilot and/or full commercial processing plant for US based projects that want to tap into FCL's expertise and save significant time and money in developing their own such plants and expertise
- Significant interest in lithium chemical extraction and processing expertise
  - Upstream development stage mining companies (brines, clays, hard-rock, geo-brines and petro-brines) and most lack LC expertise and/or do not have a pilot or plant
- Extraction and processing of the lithium is highly complex and very particular to the chemistry of each project, however once lithium sulfate or lithium chloride is produced the process is well understood
- Few lithium refineries in the USA and capacity is limited, prices of lithium products have generally increased over the past two years and are harder to secure from USA producers Albemarle and Livent
- There is a need for new, nimble and adaptive lithium chemical processing companies that can meet the growing need for processing various feedstock and/or precursor raw lithium concentrates and supply the market with battery grade lithium

# ADDITIONAL INFORMATION

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## **GEORGIA – PRIME LITHIUM PROCESSING REAL ESTATE**

- Electric Mobility Manufacturing
  - In Georgia alone EV-related projects have surpassed US\$20B with OEM's such as Hyundai Motor Group & Rivian, battery suppliers such as SK Battery and Freyr, as well as other supply chain enablers which include battery recyclers Ascend Elements and SungEel Recycling
  - Other include:, Aspen Aerogels, Aurubis, Caterpillar, Club Car, Cimbar Performance Minerals, Denkai, Dongwon Tech, Duckyang America, EnChem Ltd., EcoPro, Energy Assurance GEDIA, JCB, Kirchoff, Heliox, Plug Power, TEKLAS, Textron, Wonbang Tech, Yamaha Motor Manufacturing
- Strong Workforce
  - State-sponsored training facilities, high-end education programs, and nationally ranked colleges provide Georgia businesses with talent to achieve success
- Supportive consumer adoption of EVs and electrification
  - Public and private entities are offering incentives and suggesting policies to support continued growth of the electric mobility sector (Electric Vehicle Supply Equipment Tax Credit & \$250 Georgia Power rebate program)
  - Georgia is 6th in the nation for public EV charging stations, offering more than 1,500 individual outlets, equating to more outlets per capita than anywhere in the Southeast
  - The State of Georgia is focused on the future of electrification







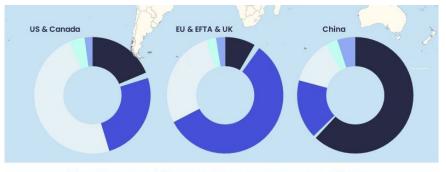
## THE MARKET – LFP BATTERIES

### LFP Expected to Dominate the Electric Battery Market

- LFP share continues to increase across all regions so far this year, reaching ~40% in the first quarter compared to 30% in Q1 2022, driven by an increasing number of vehicles being sold with LFP packs and the growing BESS market
- LFP market share is to be in the mid 50% through the end of the decade, but the market ex-China may rise to 20-30% by 2030
- The US LFP market is small but growing, and several announced large projects are underway in the EV (Ford/Tesla) and BESS market
- LFP batteries are expected to become a more viable option to power a greater portion of vehicle models, especially medium-sized vehicles
- LFP now is the dominant option for the BESS market

### Market Examples

- Dedicated BESS cells are increasingly larger format prismatic cells (LFP) with cycle life reported up to 12,000 cycles (~30 year life when cycled once per day)
- Lower energy density for LFP results in greater battery system weight and size, however Gotion has produced an LMFP batteries with an impressive energy density of 240 Wh/kg or 525 Wh/L



📕 LFP 📃 Low-Nickel 📃 Mid-Nickel 👘 High-Nickel 🛑 Other Li-ion 📃 Non Li-ion

Battery market by chemistry  I low-N NMC  LFP Na-lon				C iigh-N NMC			<ul> <li>high-N, cobalt free</li> <li>Solid-state</li> </ul>			Source: Rystad Energy NCA Novel chemistries				
2015	39				15			36				11		
2016	30			14		8	30			18				
2017	23	14			14			26			23			
2018 12	2	14 20						33			21			
2019 7	18	18 27						23			25			
2020	21	36						19		24				
2021	17	34					15			34				
2022	15	35				13					35			
2023 12		37				11				39				
2024 8		39				9 43								
2025 4		40				7								
2026 4		36			5				48					
2027 🖪		31		3 4				5	0			5		
2028 3	20	5	4					51			7	3		
2029	20	5					10	4						
2030	15	6			56						14	5		
%	10%	20%	30%	40	%	50%	)	60%	70%	80%	90%	6		

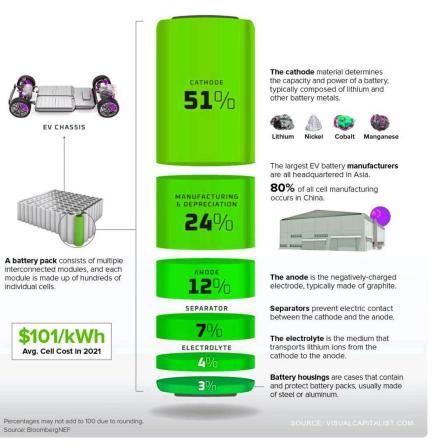
## LITHIUM-ION BATTERY (LIB)

- Almost two thirds of the cost of an average LIB is composed of the cathode/anode where most battery critical raw materials are located
- Cathode material is the most important segment of the LIB, while lithium is the key component for all LIBs
- Depending on the formulation and type of the LIB (LFP, NCA, NMC) lithium, nickel, cobalt, manganese and graphite are important valuable elements
- Average cost of a typical electric vehicle (EV) LIB is US\$6,000 to US\$7,000 based on 2021avg cost of \$101kWh
  - Continued price pressure on raw materials over the past months have increased the price of the battery to >\$200kWh
- In addition, Gigafactories produce large amounts of raw material scrap of Cathodes and Anodes

# Breaking Down the Cost of an **EV BATTERY CELL**

The average cost of lithium-ion batteries has declined by 89% since 2010.

#### What makes up the cost of lithium-ion cells?

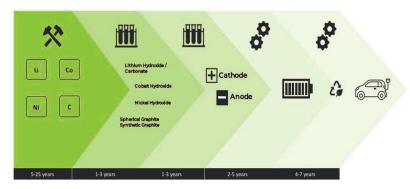


## THE MARKET THE CASE FOR RECYCLING

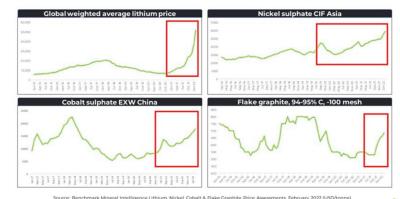


- Insufficient investment in raw materials to meet demand, expected to last for the foreseeable future
- Raw material prices are currently at all time highs due to supply/demand fundamentals
- The LIB supply chain is complicated and long
- Battery prices are starting to reflect higher raw material prices
- Additional supply, i.e. recycling, will not fix the problem but it can alleviate and be profitable

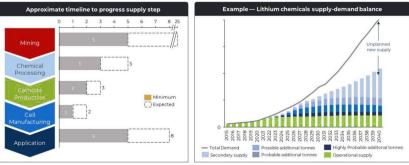
## THE LITHIUM ION BATTERY AND ELECTRIC VEHICLE SUPPLY CHAIN IS A **LONG ROAD**



### SUPPLY CHAIN IMPACT: RISING RAW MATERIAL PRICES...

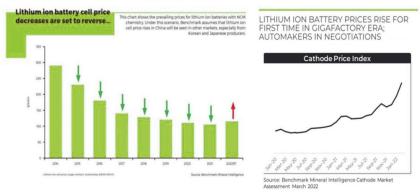


### THE GREAT RAW MATERIAL DISCONNECT: IT TAKES MUCH LONGER TO BUILD A RAW MATERIAL PROJECT THAN A BATTERY OR CAR PLANT



#### Source: Benchmark Mineral Intelligence Lithium Forecast Q4 202

### SUPPLY CHAIN IMPACT: ... MEAN RISING BATTERY COSTS



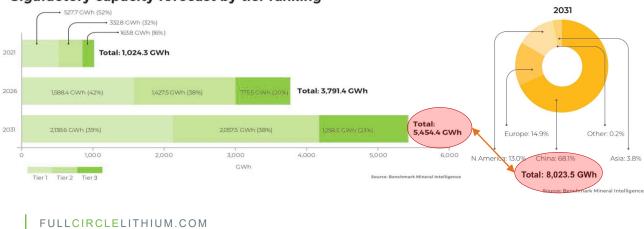
## THE MARKET – LITHIUM-ION BATTERY (LIB)



## **Enormous Battery Build Out Planned**

- LIB recycling will be key with over 5.4TWh of battery production planned worldwide by 2031 (source BMI)
  - +US\$430B to be invested in gigafactories (US 700GWh, Europe 850GWh and China 3.7TWh)
  - Typical size of LIB expected to be 60-70kWh
  - $\circ~$  1TWh could build +15M electric vehicles per year
  - $\circ~$  Over the next decade there will significant LIB rollout
- US based battery makers require a recycling solution
  - >100GWh of gigafactory build-out in FCL's region –
  - (Ford, Hyundai, Rivian, GM, Stellantis, Toyota, VW, SK Energy, LG Chem, Samsung)

### Gigafactory capacity forecast by tier ranking



## LIB Lifecycle & Others

- BloombergNEF predicts 5Mt of end-of-life batteries will be available for recycling in 2035, enough material to support 15%-30% of the key metals used for battery manufacturing in that year
- EV and stationary storage projects will reach the end of their initial life after operating for roughly 8-12 years.
- LIB manufacturing today has ~10-30% raw material scrap
  - Significant potential to reprocess battery materials
- Non EV batteries are another market potential (i.e. power storage and electronics)

