Lithium Universe LIMITED

PRECIOUS METALS EXTRACTION RECYCLING DIVISION

Extraction of Silver from PV Waste

LITHIUM REFINERY DIVISION

Closing the Lithium Conversion Gap in Nth America

Lithium Universe LIMITED

THE LITHIUM CONVERSION GAP

MINE SUPPLY

+40 companies Quebec

>500Mt +1% Li_2O resource

Canada, Brazil, Africa

No current lithium converters

Only 100 Ktpa planned

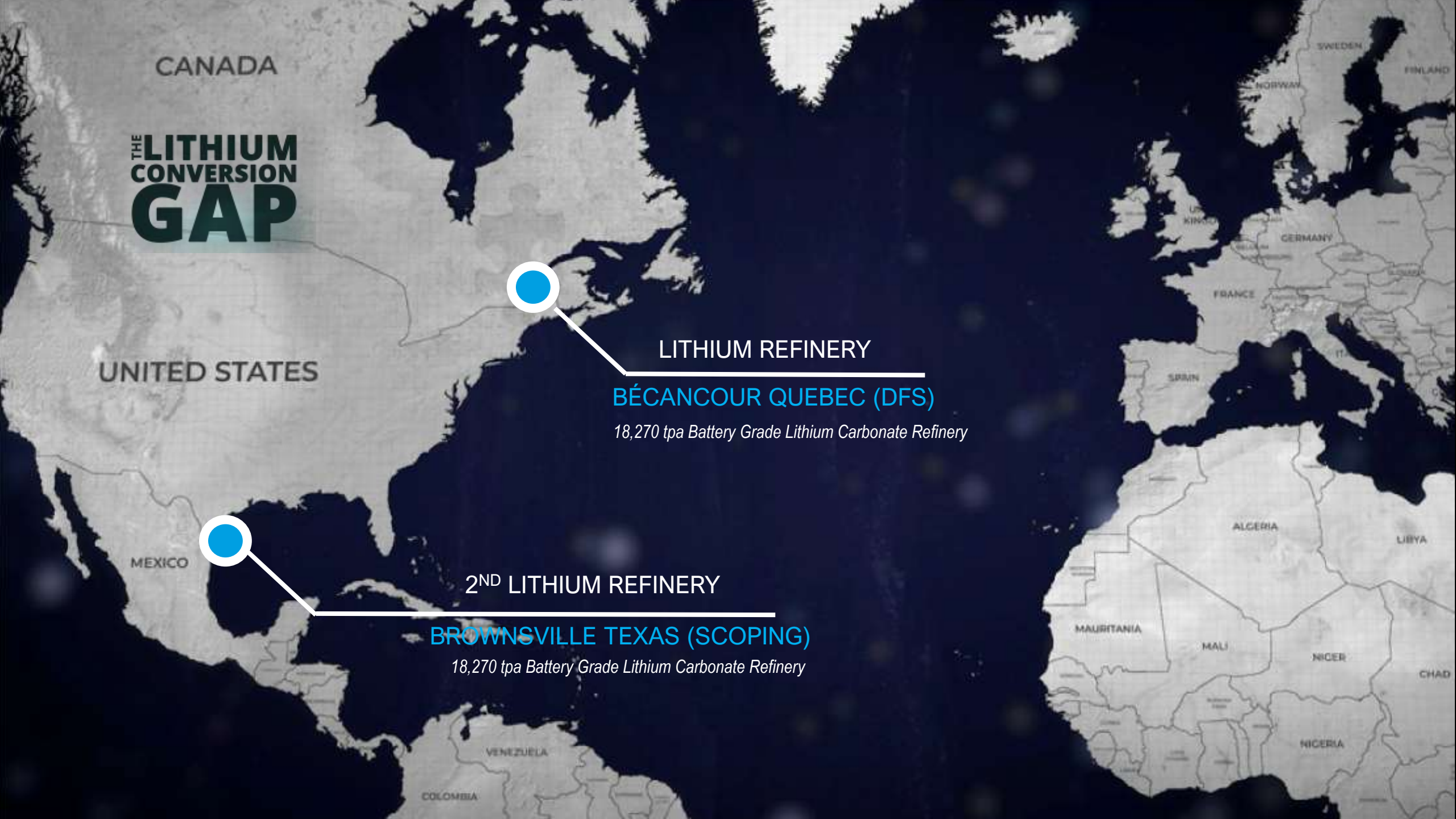
No lithium refining experience

DEMAND

+20 battery manufacturers

1,000GW by 2028

850,000t LCE per year


CANADA
THE LITHIUM CONVERSION GAP
UNITED STATES
MEXICO
LITHIUM REFINERY
BÉCANCOUR QUEBEC (DFS)
18,270 tpa Battery Grade Lithium Carbonate Refinery
2ND LITHIUM REFINERY
BROWNSVILLE TEXAS (SCOPING)
18,270 tpa Battery Grade Lithium Carbonate Refinery
SWEDEN
FINLAND
NORWAY
GERMANY
FRANCE
SPAIN
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
CHAD
NIGERIA
VENEZUELA
COLOMBIA


UM SUPPLY
CANADA
UNITED STATES
MEXICO
BRAZIL
GREENLAND
RUSSIA
KAZAKHSTAN
PROCESSING
CHINA
INDIA
AUSTRALIA
CHINA 96% WORLD CONVERSION
THE LITHIUM GAP

PROBLEMS FILLING THE GAP

- Many failures, technical difficulties
- Existing Lithium producers
- Relatively young industry
- Complex chemical business

Experienced Operators

Proven Technology

CHINA LITHIUM CONVERSION

Where did the technology come from?

- China dominates lithium spod conversion (>96% globally)
- Replication outside China has failed (Tianqi & Albermarle)
- China banned its export of conversion technology
- Original technology brought to China by Australian Company
- Galaxy built the Jiangsu 17 ktpa Li C plant in 2011
- Largest plant at the time was 5 ktpa
- Became the benchmark and revolutionized China's Li industry
- LU7 (ex Galaxy) can bring this technology to Canada/USA

PATENT I/P RIGHTS

- Chemistry comes from 1950's
- Process is now essentially OPEN Technology
- Most plants use the basic process
- Difference is the intimate operating knowledge
- Steers the design phase – mistakes at design - disaster
- LU7 & Hatch have collective know how
- Replicate exactly the final Jiangsu Plant
- 3 LU7 Patents pending – process improvements

DESIGN MISTAKES - MASSIVE SCALING ISSUES

CANADIAN ATTEMPTS

North American Lithium

- Shutdown 2015
- Spent circa CAD 250m
- Produced 109 t LC

Nemaska Lithium

- DFS completed 2018
- Spent CAD 411 m
- Failed to start up 2019

Rio Nemaska 2

- In construction
- 32,000 tpa LiOH
- Start Prod 2028

AUSTRALIAN ATTEMPTS

X

Tianqi Kwinana LiOH

- 8 Years so far
- Capital Cost Blowout
- > A$1 billion
- Care and Maintenence

X

Albemarle Kemerton LiOH

- 5 years so far
- Still <20% of design rate
- Shut trains 2,3,4
- Write down US$1.5 billion

Covalent Kwinana LiOH

- 50,000 tpa LiOH
- Wesframers:SQM
- Estimate US$1.2b
- Ramping Up

?

Alkaline Pressure Leach

- Unproven Technology
- 1995 Greenbushes 5Ktpa
- Failed due to scaling
- Tesla and Keliber

THE COMPETITION

Lithium refinery shuts in another blow to ‘Made in Australia’

Companies Mining Lithium

Australia’s li dream is fading. Can tax breaks revive it?

HOME / NEWS / UNCATEGORISED

Tianqi, IGO suspend Australia Li project in face of weak market

Break it Down: IGO puts kibosh on Kwinana

Fraser Palamara investigates the IGO decision to put the brakes on its Kwinana refinery in a blow for Australia’s downstream industry.

Albemarle to idle Kemerton lithium hydroxide plant, flagging hard-rock cost pressures

CHINA TECHNOLOGY EXPORT BANS

China revises catalog of technologies subject to export controls

Xinhua | Updated: 2025-07-16 09:24

The update also modified existing restrictions on non-ferrous metallurgy technology by imposing control on techniques including spodumene-based lithium carbonate production, while adjusting requirements for gallium metal extraction.

DREAM TEAM TO BRING TECHNOLOGY

Terry Stark
Head of Mining
Ex Galaxy GM Operations

Roger Pover
Head of Processing
Ex Galaxy Plant Manager

John Loxton
Head of Li Refinery
Ex Hatch Li Carb Plant

John Sobolewski
Chief Financial Officer
Ex Galaxy CFO & Co Sec

HATCH

DREAM TEAM TRACK RECORD

Jiangsu Li Carbonate Plant

2 Years to Commercial Production

Ground Breaking	Start of Construction	Project Completion	
21 Feb 2010	1 May 2010	6 Dec 2011 (19 months)	6 May 2012 (6 months Commissioning)

- Capital Cost – US$120 m
- At design rate 20,000 tpa
- Highest quality LC worldwide


Jiangsu Lithium Carbonate Plant
GALAXY
GALAXY
GALAXY
Galaxy Lithium (Jiangsu)
Company Limited
银河锂业(江苏)有限公司

CLOSING THE LITHIUM CONVERSION GAP

”Copy and Paste Modular Lithium Refineries that Work”

CLOSING THE LITHIUM GAP

BÉCANCOUR LITHIUM REFINERY

- Replicate the success at Jiangsu
- 18,270 tpa green BG lithium carbonate plant
- Bécancour, Quebec's Battery Hub
- Same flow sheet, same equipment, same suppliers

HATCH

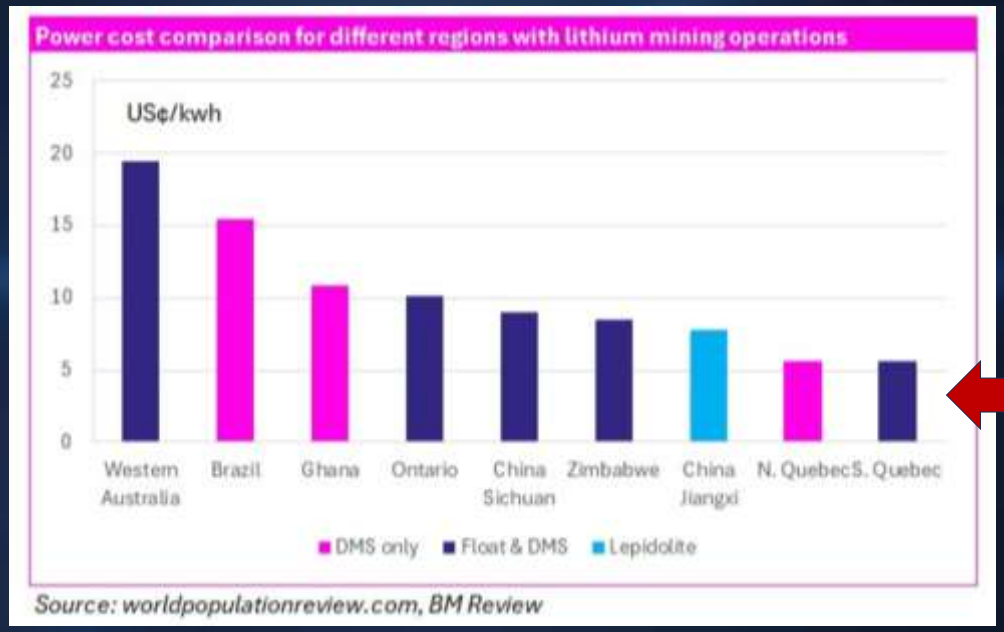
WHY BECANCOUR, QUEBEC?

- Proximity to Nth American EV battery supply chain
- Access to low-cost hydroelectric power
- Abundant local spodumene resources
- Established industrial park/chemical infrastructure
- Strong government incentives from Quebec
- Deep water port and shipping routes

QUEBEC LITHIUM CONVERSION

Why can you compete with China?

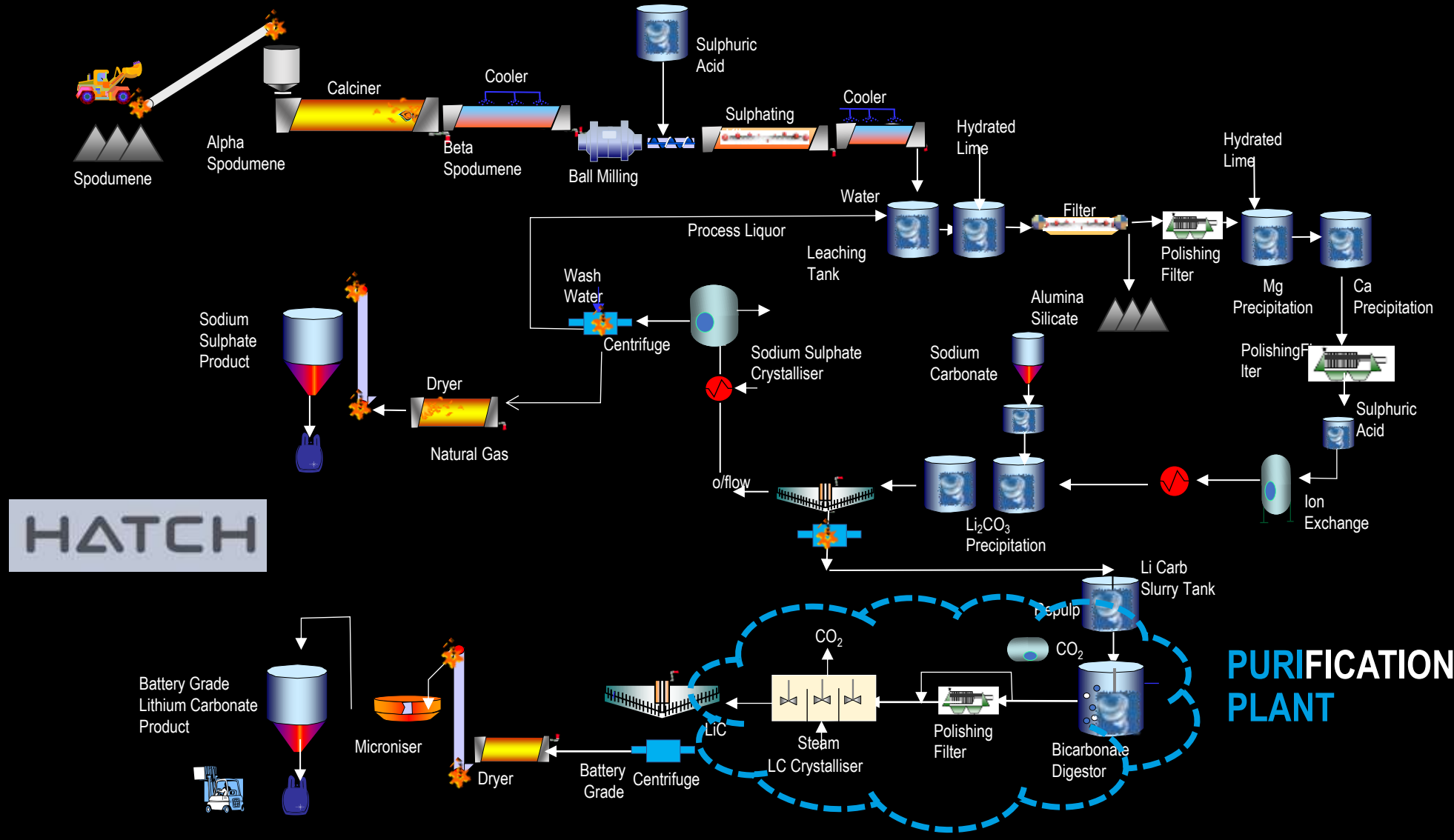
- Access to Cheap Green Power
- Nearby feedstock - Canada, Brazil and Africa
- Decrease in transport costs of spodumene
- End market North America
- US$3,900/t vs China of US$3,500/t LC



Source: worldpopulationreview.com, BM Review


GOOD LOCATION
Sept-Iles
Havre-Saint-Pierre
Natashquan
Baie-Comeau
Saguenay
Rimouski
Carleton-sur-mer
Rivière-du-Loup
Bathurst
Edmundston
Québec City
30,000 Spodumene Shipments
Bécancour
Lithium
Refinery
Montreal
Summerside
Moncton
Fredericton
PRINCE EDWARD ISLAND
Cape Breton Island
Truro
Antigonish
Saint John
MAINE
Bangor
NOVA SCOTIA
THE LITHIUM REFINERY

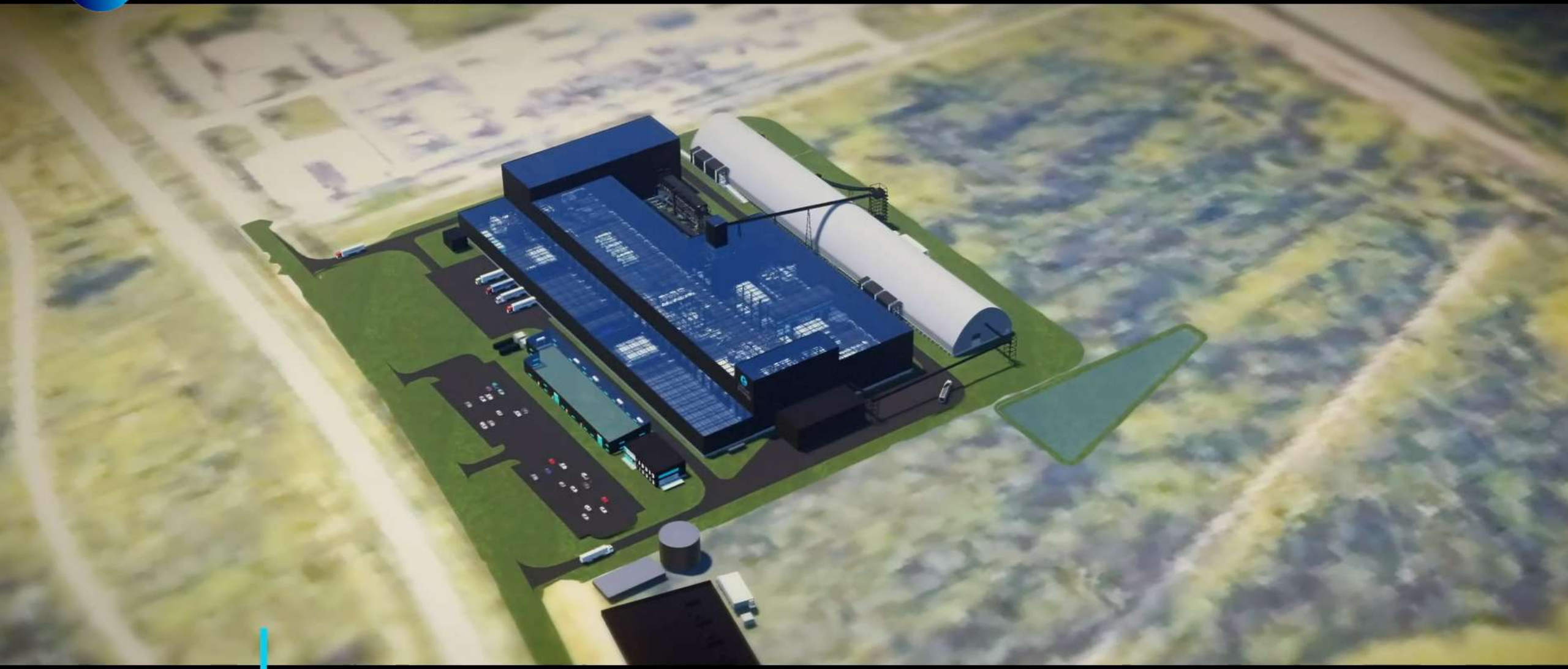
LITHIUM REFINERY FLOW SHEET



HATCH

PURIFICATION PLANT

Lithium Universe
LIMITED



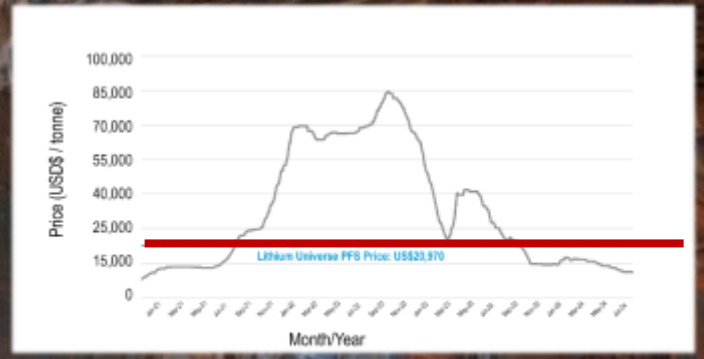
3D Model

Becancour Lithium
Carbonate Refinery

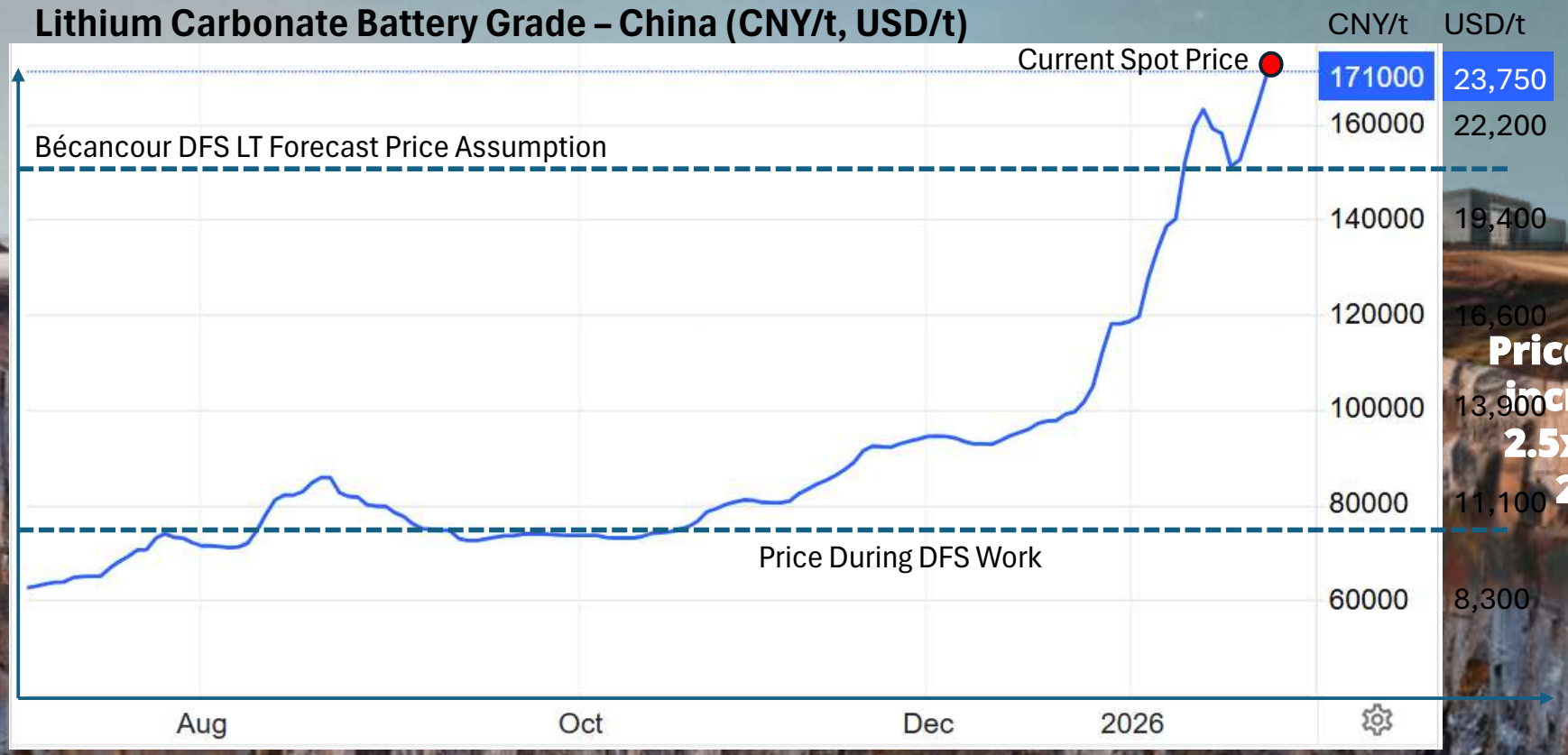
CLOSING THE LITHIUM GAP

BÉCANCOUR LITHIUM DFS

- SC6 US$1,170/t LC $20,970/t
- Capex US$549 million
- NPV8 US$718 million
- IRR 21% Payback 3.9 years
- EBITDA US$148 million



CURRENT LITHIUM PRICE RECOVERY



Prices have increased 2.5x since 2025

PROJECT ADVANCEMENTS

- Application 22.5 MW electricity, Hydro Quebec
- Environmental survey – no showstoppers
- Co-operation with W8banaki First Nation
- Previous farm land
- Permitting should be straight forward

PROJECT MOU'S

- Exclusive supply alumina silicate to Lafarge
- Canada's largest cement producer
- Supply of sodium sulphate to Africa
- MOU with Polytechnique for training

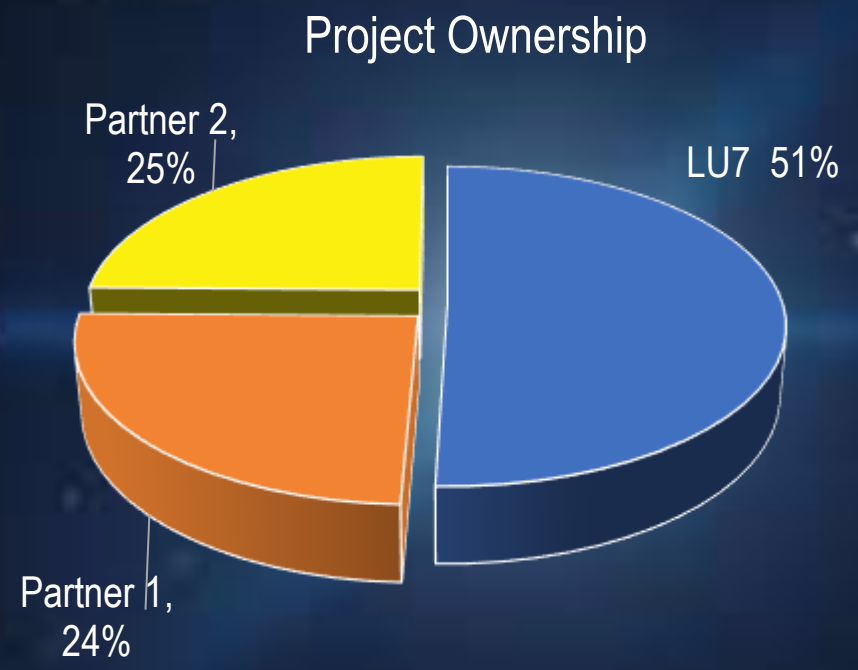
POLYTECHNIQUE MONTRÉAL
TECHNOLOGICAL UNIVERSITY

STRATEGIC BINDING FEEDSTOCK SUPPLY FROM NIGERIA

- Strategic 10-year (rolling 5) spodumene supply
- Binding Offtake Agreement - Norah Mining Ltd
- Supply of 80,000 tpa spod con 6.0% Li_2O equivalent
- Norah concentrator is in construction
- LU7 will trade to third parties
- LU7 to benefit from an 7.5% partner price discount

FUNDING STRATEGY

- Strategic partners to own 49%
- Target OEM with final LC offtake
- Equity from sale injected to project
- Debt and Equity of 50/50
- LU7 remains as operator




CANADA
UNITED STATES
MEXICO
TESLA LITHIUM HYDROXIDE REFINERY
CORPUS CHRISTI
LU7 PROPOSED LITHIUM REFINERY
PORT OF BROWNSVILLE TEXAS
VENEZUELA
COLOMBIA
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
CHAD
NIGERIA
GERMANY
FRANCE
SPAIN
SWEDEN
FINLAND


CANADA
UNITED STATES
MEXICO
VENEZUELA
COLOMBIA
SWEDEN
FINLAND
NORWAY
GERMANY
FRANCE
SPAIN
ALGERIA
LIBYA
MAURITANIA
MALI
NIGER
CHAD
NIGERIA
Conventional Sulfuric Acid
Proven Process
LU7 PROPOSED LITHIUM REFINERY
PORT OF BROWNSVILLE TEXAS

WHY PORT OF BROWNSVILLE?

- Established Chemicals & Energy Infrastructure
- Lower-Cost Workforce -25%
- Pro-Business Environment
- Binational logistics hub (US–Mexico)
- Cheaper Supplies and Consumables from Mexico
- Foreign Trade Zone & Tax advantages
- Deep Water Port for Spodumene Imports
- IRA Incentives & Policy Support

PORT OF BROWNSVILLE, TEXAS

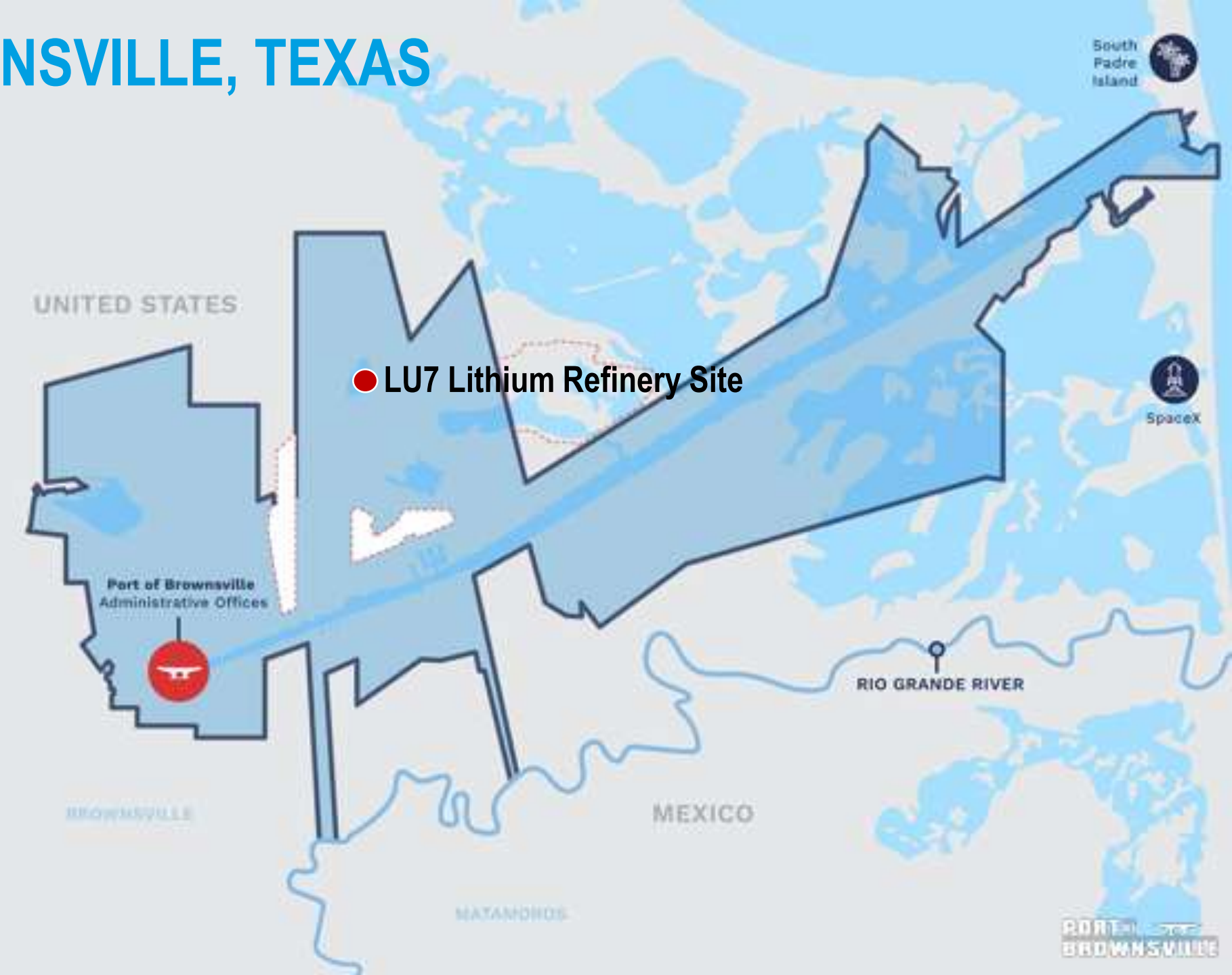
40,000 ACRES
Largest land-owning public port authority in the U.S.

Only deepwater seaport directly on the U.S. and Mexico border.

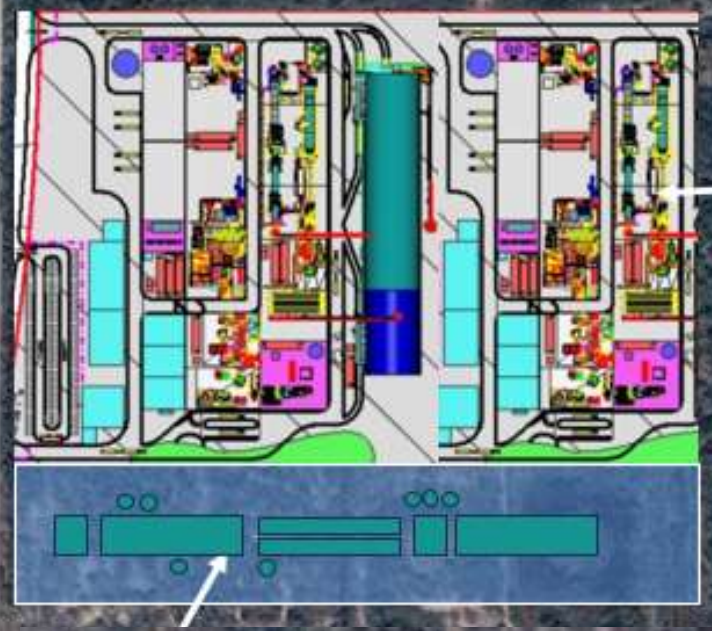
Large and growing **petroleum and break bulk** trades.

10,000+ local employees.

Homeport of **SpaceX**.



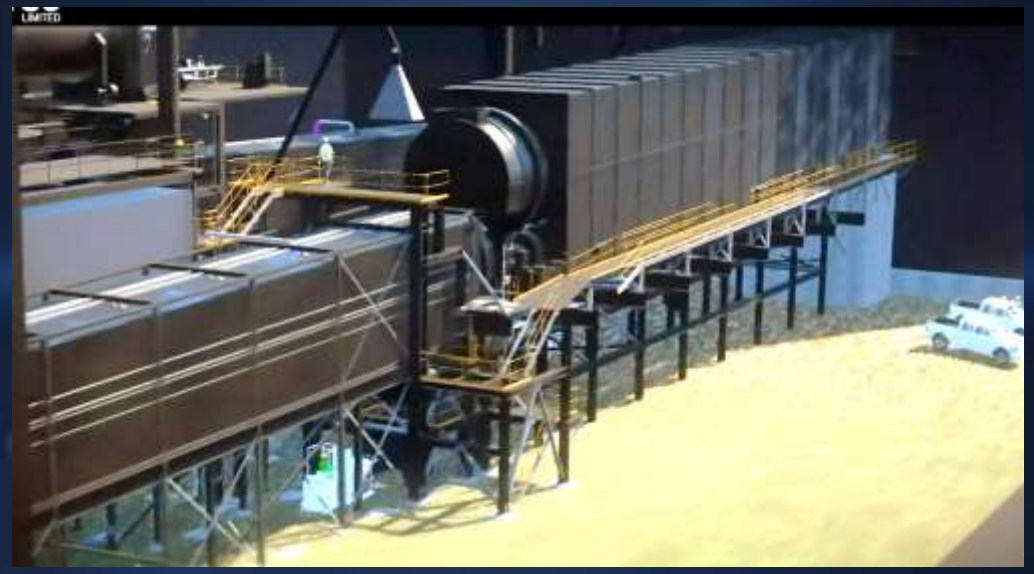
LU7 PROPOSED SITE



- 35 Acres
- Power lines to Site
- Gas supply to site
- Established roadways
- Close to Port Berth
- 30,000 t Spodumene Shipments

BROWNSVILLE STRATEGY

- Finalize site selection
- Option to lease application for site
- Preliminary environmental assessment
- Suppliers, Utilities and Local Government
- Complete Scoping Feasibility Study



Lithium Universe LIMITED

SILVER EXTRACTION PV SOLAR CELL RECYCLING TECHNOLOGY

THE PROBLEM TODAY

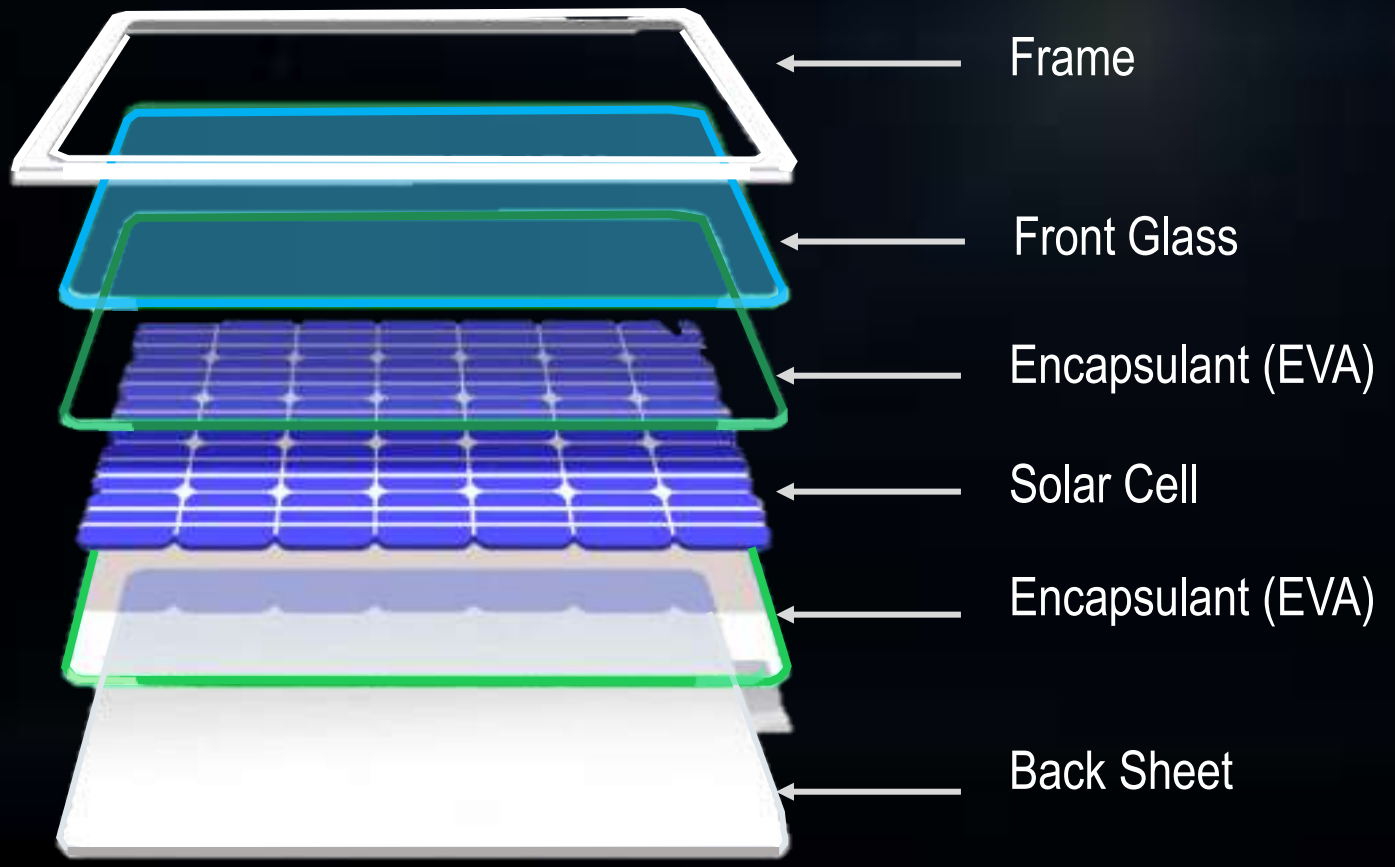
- Globally 60-78mt accumulated waste PV by 2050
- Australia 1 Mt end-of-life PV worth $1B by 2045
- Only 15% of PV cells today are recycled
- Rest ends up in LAND FILL
- Valuable silicon, silver, gallium & indium

15%

SCRAPING VALUABLE SILVER

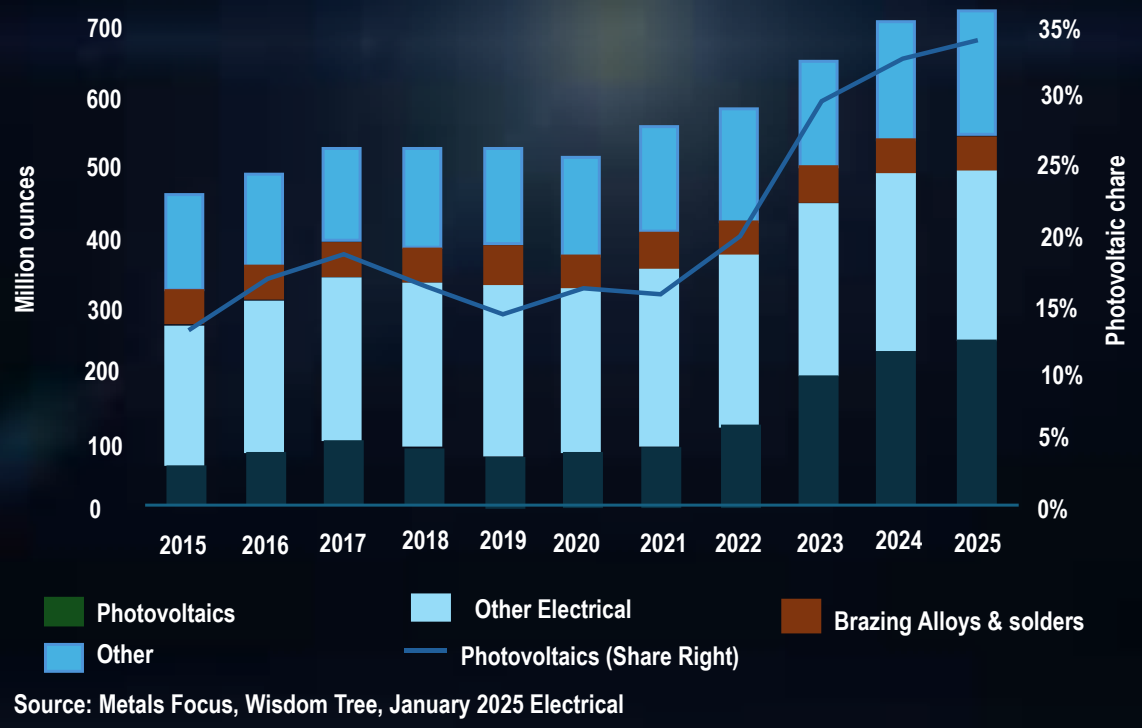
- About 20 grams of Silver – each PV panel
- Electrical contacts – flow of electricity
- “Fingers" (thin lines) and "busbars" (thicker lines)
- >A$67 of Silver in every panel

PV SOLAR CELL



SILVER MARKET

- Record demand 680 million ounces in 2024
- Industrial demand surged by 7%
- Growth is expected to carry beyond 2025
- Photovoltaics and AI as the fastest-growing drivers



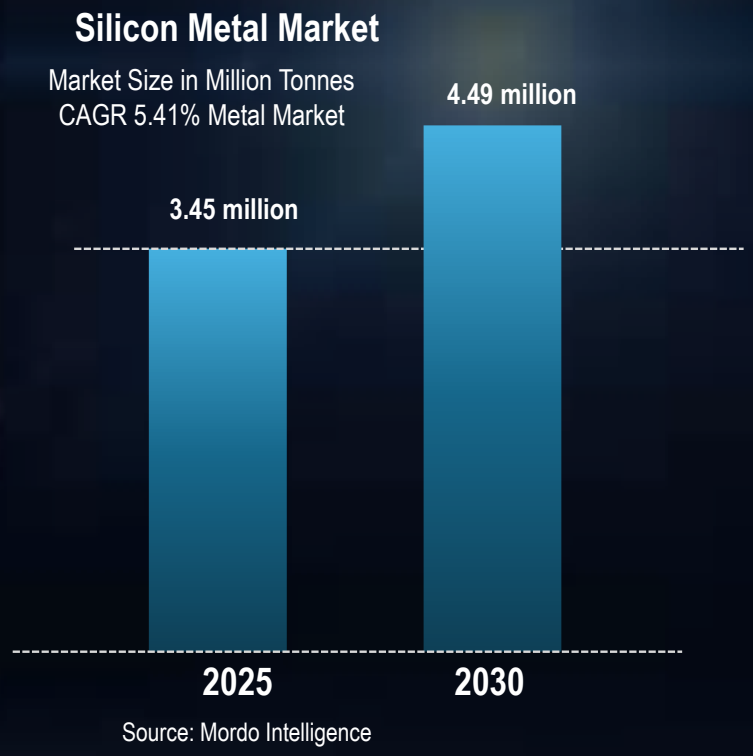
Source: Metals Focus, Wisdom Tree, January 2025 Electrical

SILVER PRICE RESPONSES

- Demand has started to outstrip supply
- Market deficit 118 mil oz
- Significant silver price increase
- US$15/oz in 2018 to US$73/oz 2025
- 380% increase since 2018
- Silver recovery from recycling will become increasing important

SILICON MARKET

- 3.45 million tonnes in 2025
- 4.49 million tonnes by 2030 growing at CAGR 5.41% pa
- Solar panels projected highest growth rate of 7% til 2029
- Silicon dominance in semi-conductor material in solar cells



TRADITIONAL PV RECYCLING

- Shredding and grinding PV cells
- EVA (binder) is removed by high temperatures
- EVA removed by toxic acid chemicals
- Low value glass applications – insulation, buildings
- Low silicon and silver recovery
- Due to complexity, high cost, poor yields

Initial Dismantling

Mechanical Breakdown

Material Extraction

LU7 PV RECYCLING TECHNOLOGY

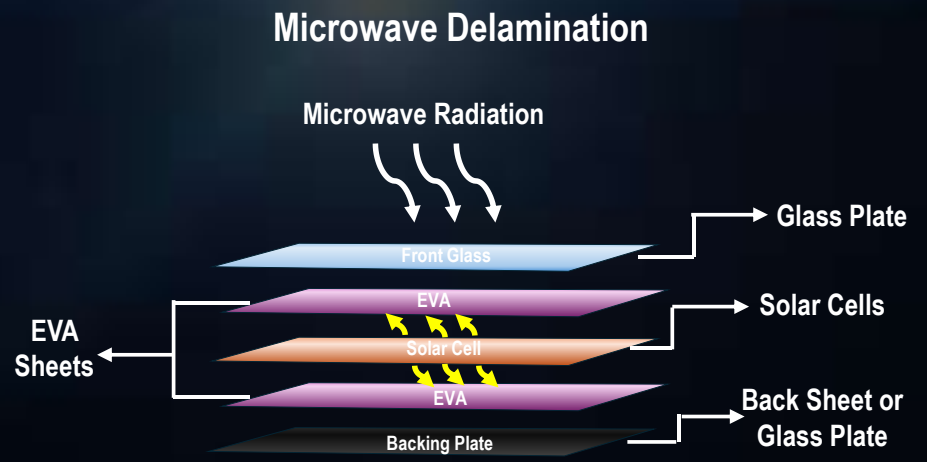
- Microwave Joule Heating Technology (MJHT)
- Jet Electrochemical Silver Extraction (JESE)
- Layer by layer separation
- Preserves materials in cleaner separable form
- High value products instead of waste

MACQUARIE University
SYDNEY·AUSTRALIA

Lithium Universe LIMITED

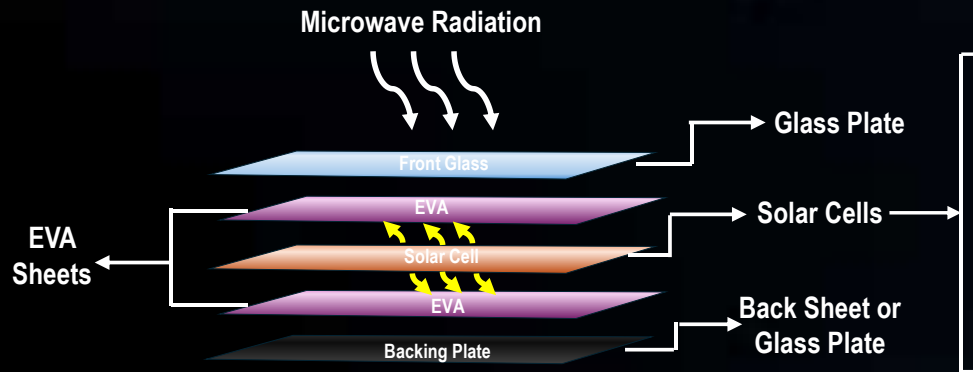
MICROWAVE DELAMINATION

- Microwave Joule Heating Technology (MJHT)
- Utilizes Microwave Technology
- Selectively heat and delaminates PV cells
- Glass panel instead of crushed glass
- Silicon sheet instead of crushed powder
- High value products instead of waste

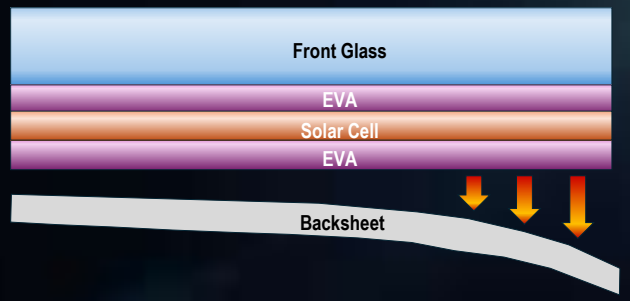


MJHT SELECTIVE DELAMINATION

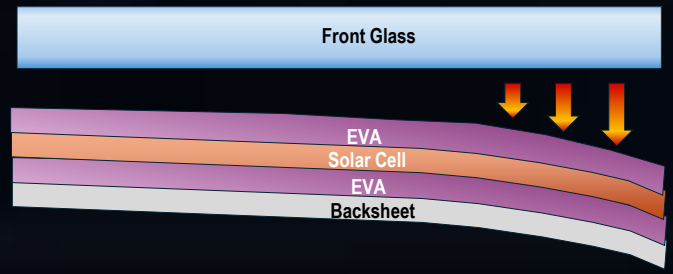
Microwave Delamination



Back Sheet Delamination

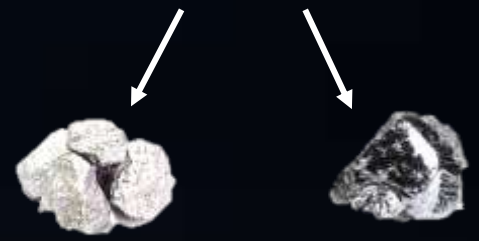


Front Glass Delamination



Clean Glass Sheet to be Reused

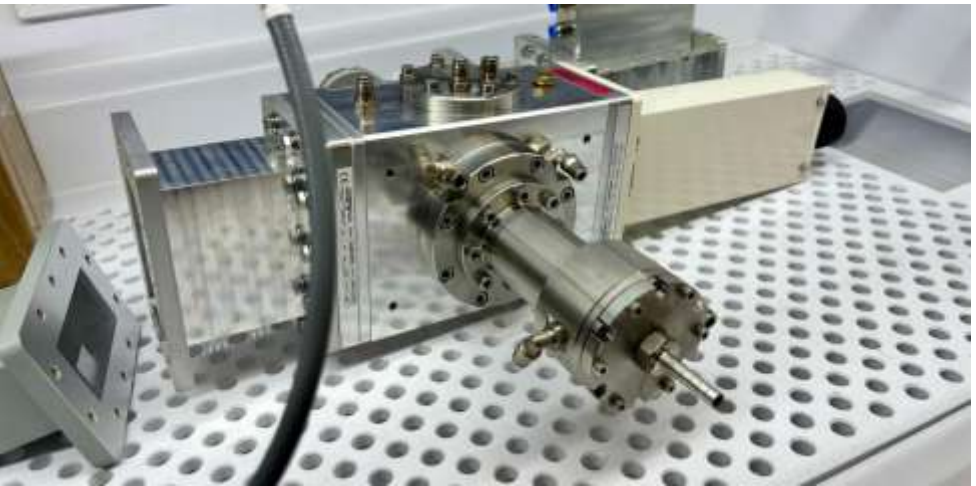
Silicon Wafer for Silver Extraction & Silicon Recycling

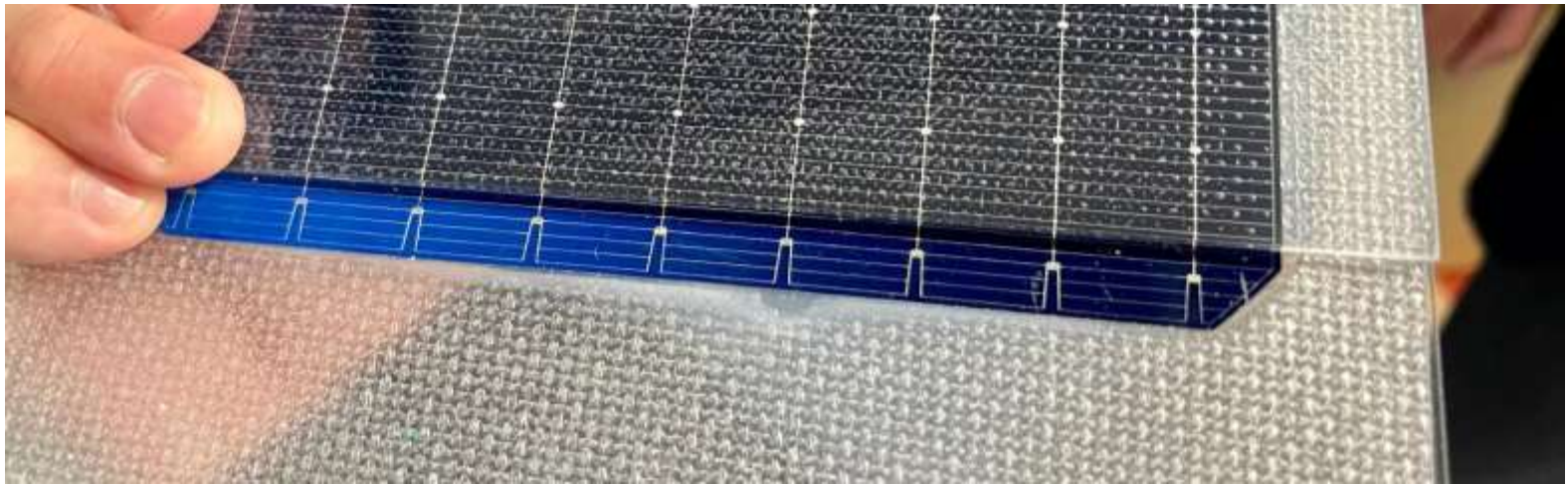


Silver (High Purity)

Silicon (High Purity)


Dinesh

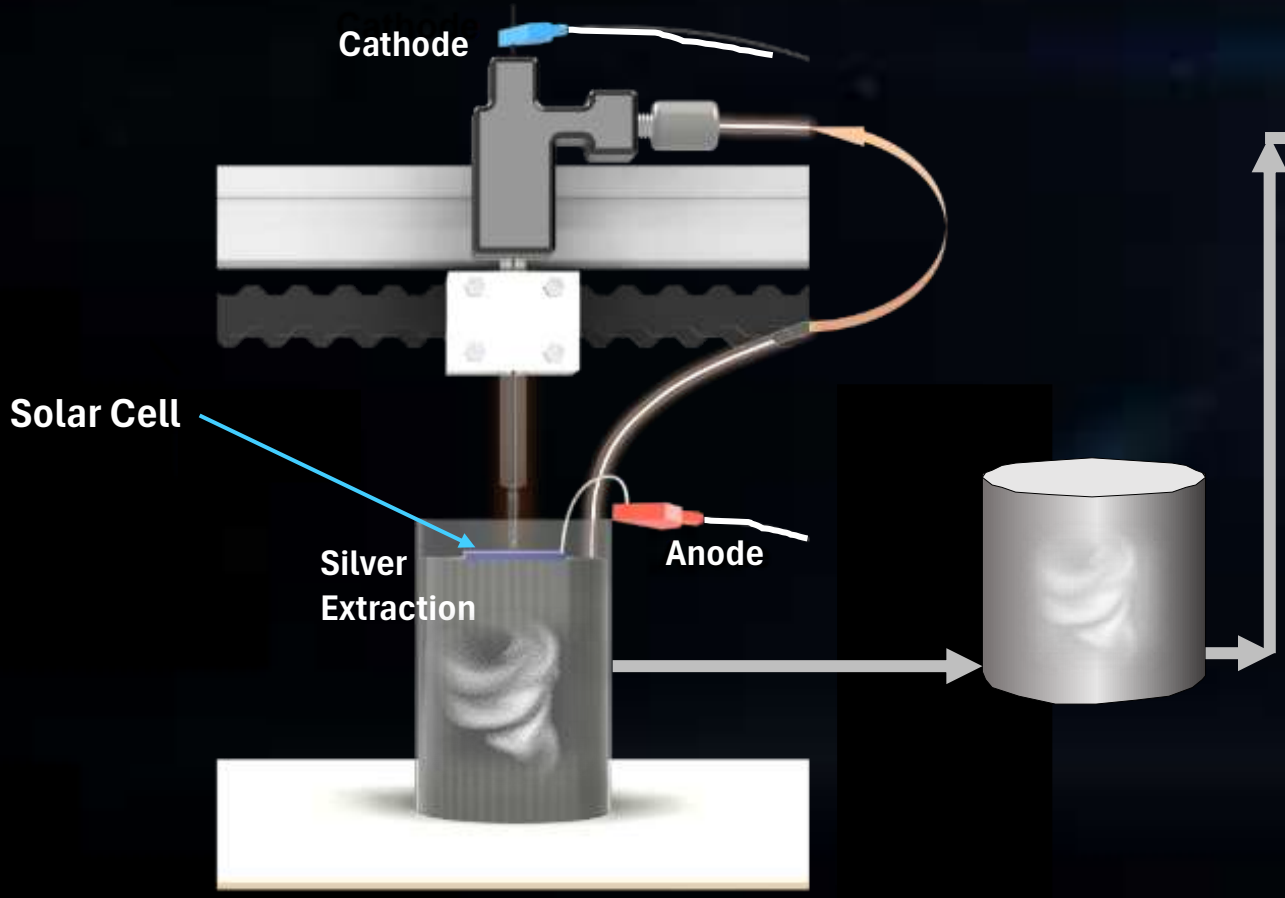




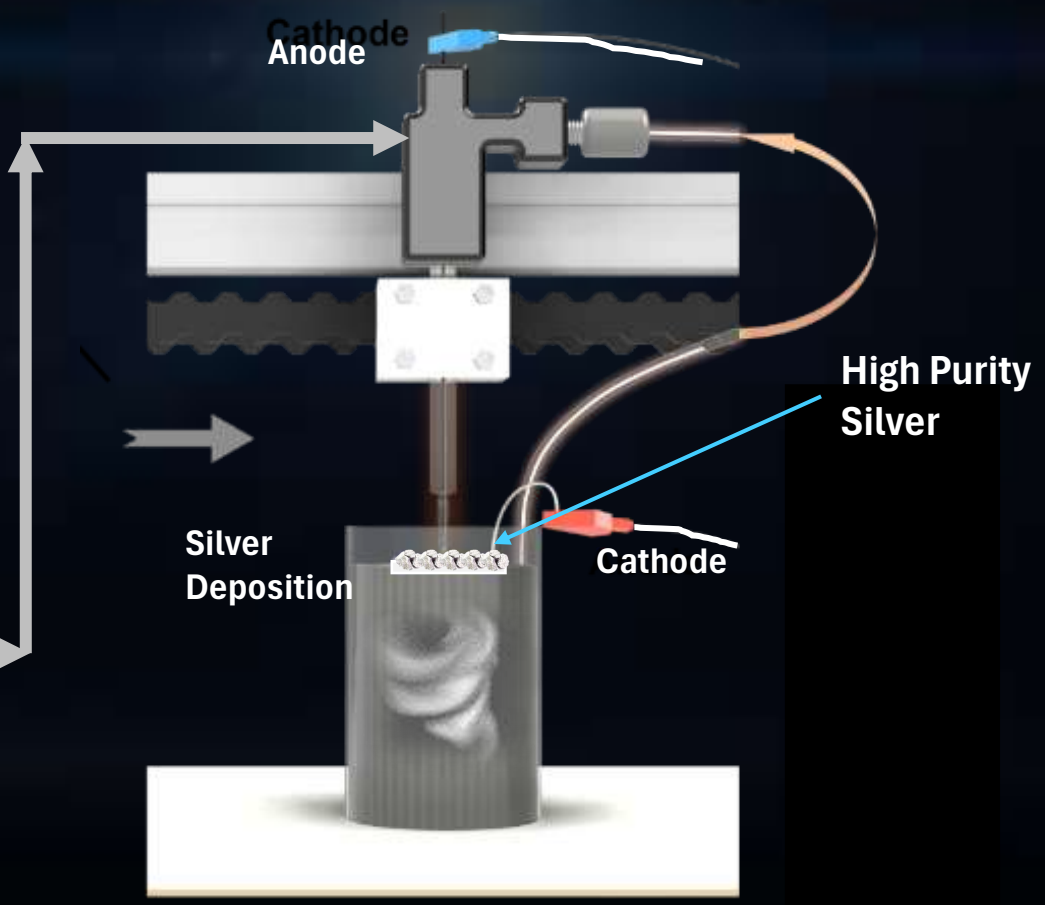
SILVER EXTRACTION

- Jet Electrochemical Silver Extraction (JESE)
- Uses electrochemical low-voltage jet to selectively extract silver
- Silver dissolves into dilute nitric acid electrolyte
- Leaves aluminum and other impurities behind
- High purity silver metal recovered from electrolyte via electrochemical deposition

SILVER EXTRACTION



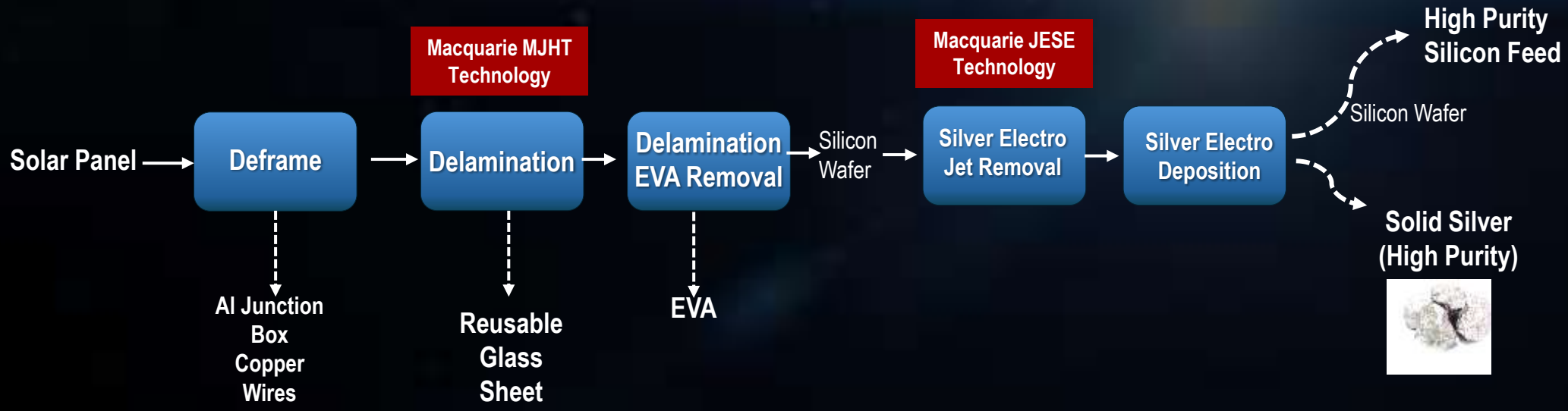
SILVER DEPOSITION



ACHIEVEMENTS

- Silver removal leaves impurities – adjust voltage
- Silver deposited at the same process
- Recoveries better than 95%
- 96% purity of silver deposited
- Dopants can be cleaned off silicon wafer
- Silicon wafer high purity for direct reuse
- All high value separate products

RECYCLING TECHNOLOGY



ADVANTAGES OF TECHNOLOGY

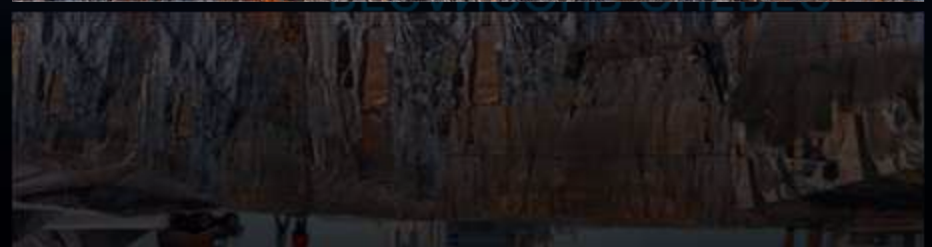
- Negates the fine unusable powder – conventional recycling
- Layer by layer separation
- Preserves material in cleaner separable form
- Low energy heating – Microwave Technology
- Glass sheet can be reused to make PV cells again
- Glass, Silver, Silicon – all at high purity
- Higher recoveries, less waste
- 3-4 times Value Recovery

PRECIOUS METALS EXTRACTION RECYCLING DIVISION

Extraction of Silver from PV Waste

LITHIUM REFINERY DIVISION

Closing the Lithium Conversion Gap in Nth America



CAUTIONARY STATEMENTS

Information Required by Listing Rules

The Becancour Lithium Refinery Definitive Feasibility Study (PFS) does not rely upon estimated ore reserves / and or mineral resources. The spodumene concentrate feedstock for the proposed refinery has been assumed to have been purchased directly from spodumene miners currently producing spodumene concentrates or marketing agents or traders currently purchasing spodumene concentrate and selling to the downstream processors. Accordingly, the JORC Code is not relevant to this study nor are Listing Rules 5.16 and 5.17 to the extent to which they relate to matters concerning JORC.

Forward Looking Statements

This release contains "forward-looking information" that is based on the Company's expectations, estimates and projections as of the date on which the statements were made. This forward-looking information includes, among other things, statements with respect to studies, the Company's business strategy, plan, development, objectives, performance, outlook, growth, cash flow, projections, targets and expectations. Generally, this forward looking information can be identified by the use of forward-looking terminology such as 'outlook', 'anticipate', 'project', 'target', 'likely',' believe', 'estimate', 'expect', 'intend', 'may', 'would', 'could', 'should', 'scheduled', 'will', 'plan', 'forecast', 'evolve' and similar expressions. Persons reading this news release are cautioned that such statements are only predictions, and that the Company's actual future results or performance may be materially different. Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the Company's actual results, level of activity, performance or achievements to be materially different from those expressed or implied by such forward-looking information. Forward-looking information is developed based on assumptions about such risks, uncertainties and other factors set out herein, including but not limited to general business, economic, competitive, political and social uncertainties; the actual results of current development activities; conclusions of economic evaluations; changes in project parameters as plans continue to be refined; future prices of metals; failure of plant, equipment or processes to operate as anticipated; accident, labour disputes and other risks of the chemical industry; and delays in obtaining governmental approvals or financing or in the completion of development or construction activities. This list is not exhaustive of the factors that may affect our forward-looking information. These and other factors should be considered carefully, and readers should not place undue reliance on such forward-looking information. Neither the Company, nor any other person, gives any representation, warranty, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statement will actually occur. Except as required by law, and only to the extent so required, none of the Company, its subsidiaries or its or their directors, officers, employees, advisors or agents or any other person shall in any way be liable to any person or body for any loss, claim, demand, damages, costs or expenses of whatever nature arising in any way out of, or in connection with, the information contained in this document. The Company disclaims any intent or obligations to or revise any forward-looking statements whether as a result of new information, estimates, or options, future events or results or otherwise, unless required to do so by law.

Cautionary Statement

The DFS is based on the material assumptions outlined including that it has been completed in accordance with AACE Principles to a Class 5 level with a nominal level of accuracy of ± 35%, that the financial forecasts rely upon the purchase of third party spodumene concentrate as the feedstock for the plant. The DFS referred to in this announcement has been undertaken to assess the potential technical feasibility and economic viability of constructing and operating facilities capable of producing battery grade lithium carbonate for use in lithium-ion batteries from those units of operations and provide baseline financial metrics to consider future investment decisions.

The Definitive Feasibility Study (PFS) is based on the material assumptions. These include assumptions about the availability of funding. While Lithium Universe considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the DFS will be achieved. To achieve the range of outcomes indicated in the DFS, funding of in the order of US$600 million will likely be required. Investors should note that there is no certainty that Lithium Universe will be able to raise that amount of funding when needed. It is also likely that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Lithium Universe's existing shares. It is also possible that Lithium Universe could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the project. If it does, this could materially reduce the Company's proportionate ownership of the project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the DFS