## LOWER-COST, LOWER-CARBON, SUSTAINABLE NICKEL SULFATE

**Euroz Nickel Day Presentation** 

September 16, 2021

ASX Code: NMT

OTC/Nasdag Intl: RDRUY

Frankfurt: R9R

Authorised for release by Christopher Reed,
Managing Director of Neometals Ltd



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#### **EXECUTIVE SUMMARY**

Neometals innovatively develops opportunities in minerals and advanced materials essential for a sustainable future 55

- Innovative ASX-listed project developer
- Focus integrated minerals/materials for EV and ESS sectors
- 3 core projects co-funded with partners all reaching FID's in 2022
- Pivoting from hard-rock mining to circular, sustainable materials recovery
- Team with growing track record in delivering project outcomes – Mt Marion
- Strong balance sheet to fund all projects through to FID's ~ A\$111M\* in cash and investments – no debt
- A\$87M in dividends/buyback/return of capital\*\* in last 5 years



# OPERATIONAL FOCUS ON ADVANCED PROJECTS

- Vanadium Recovery
- LiB Recycling

Titanium & Vanadium





(Feasibility / Demo Plant Stage, 50:50 Incorporated JV)



Vanadium Recovery Project

(Pre-Feasibility Stage, Co-operation Agreement for a 50:50 Incorporated JV)



Barrambie Titanium and Vanadium Project

(Pilot-stage, 100% NMT, MOU for 50:50 Operating JV);





# NEED TO DECARBONISE BATTERY (MATERIALS)

# NEED TO ADDRESS THE EMERGING 'CARBON SHOCK' OF EV'S

#### **Total CO<sub>2</sub> Emissions to Manufacture the Car**

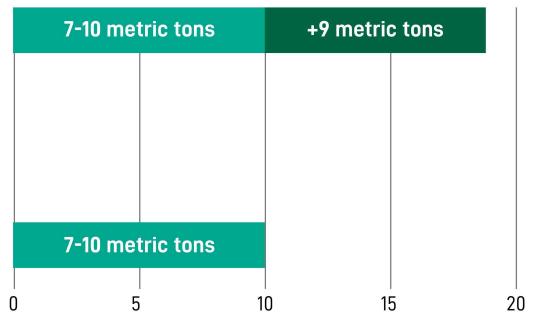
#### **Battery Production**



**≠** Electric Car



▲ Petrol Car

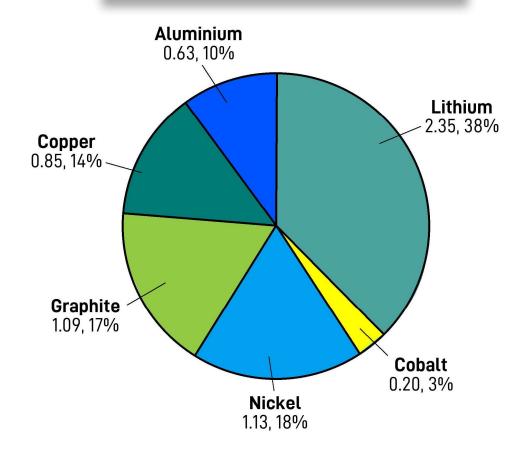


Source: The Correspondent



#### **NICKEL AND LITHIUM ARE THE LARGEST CONTRIBUTORS TO CO2 FOOTPRINT**

#### **CO<sub>2</sub> Footprint of Battery Components** (kg CO<sub>2</sub>e/kg of NMC811 Batteries)



Source:

Carbon footprint - SOM Benchmark World TourWest Jume 2020 Battery composition - Neometals Managment

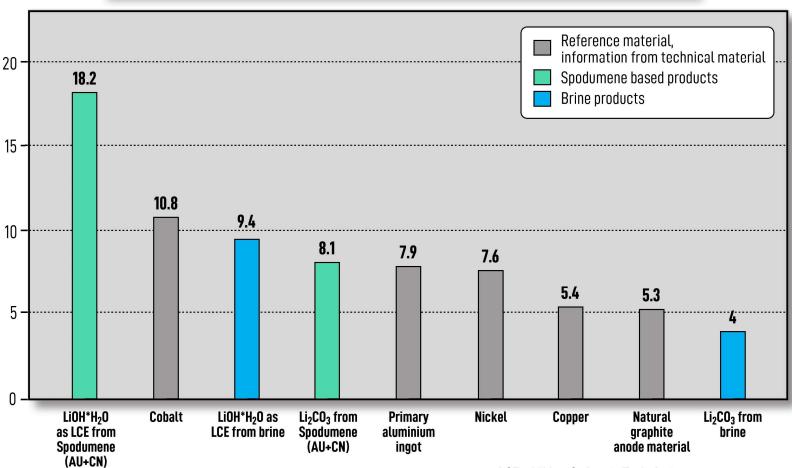
Graph excludes plastics, electrolyte and binder CO2 footprints are for metals, not salt equivalents





#### **LITHIUM BRINE IS THE SOLUTION – WHAT IS NICKEL'S?**

#### Comparison of CO<sub>2</sub>e Emissions, kg CO<sub>2</sub>e/kg Product



Source: SQM Benchmark World TourWest June 2020

LCE = Lithium Carbonate Equivalent Li<sub>2</sub>CO<sub>3</sub> Corresponds to 1 LCE 0.88 / LiOH\*H<sub>2</sub>O corresponds to 1 LCE \* Cradle-to-Gate

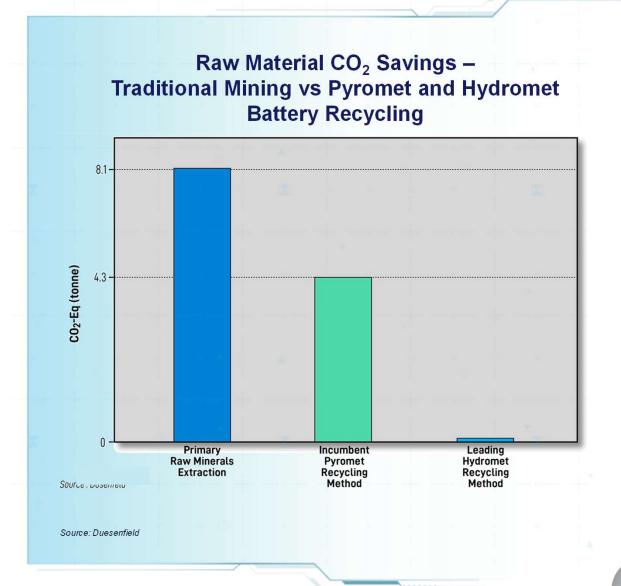
AU / CN: Australia / China





# ECO-FRIENDLY LIB RECYCLING IS A KEY SUSTAINABLE SOLUTION

HYDROMETALLURGICAL
RECYCLING
HAS THE LOWEST (BLUEST)
CARBON FOOTPRINT

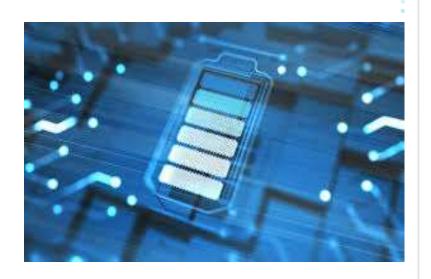




#### **NEW EU BATTERY REGULATIONS**

- Legislation update to ensure more sustainable batteries
- Regulations focus on:
  - Transparency;
  - Ethical raw materials;
  - CO<sub>2</sub> cell footprint; and
  - Recycling
- Staggered implementation:
  - 100% collection target industrial and EV
  - CO<sub>2</sub> footprint declaration from 2024
  - Recycling efficiency to 65% from 2025 then 70% by 2030
  - Carbon intensity labelling by 2026
  - CO<sub>2</sub> footprint threshold by 2027
  - Recycled content declarations 2027
  - Minimum recycled content from 2030









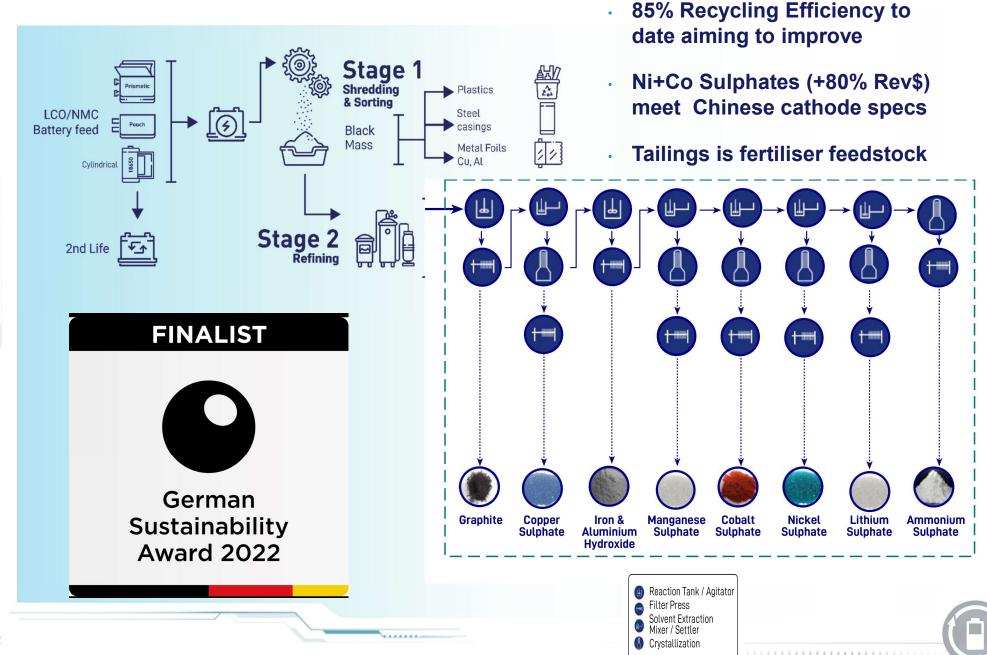


# MORE ENVIRONMENTALLY SUSTAINABLE NICKEL PROCESS



#### **OUR PROPRIETARY RECYCLING PROCESS**

Successfully Piloted at SGS Canada in 2019/20





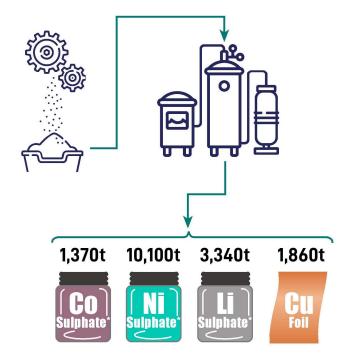


# POTENTIALLY LOWEST COST NICKEL SULFATE PRODUCER

# DEVELOPING EU'S LARGEST HYDROMET REFINERY FOR LIB CATHODE PRECURSORS

**Typical BEV Battery Composition Using NCM 811 Chemistry** 60kWh Contained / t battery As Components of 18650 cells grade / feed 34kg Cu 15.7% Cu 32kg 14.9% Ni 2.4% Li 5kg 1.9% Co 4kg

Annual Primobius Production @ 50 Tonnes per Day of Battery Cells



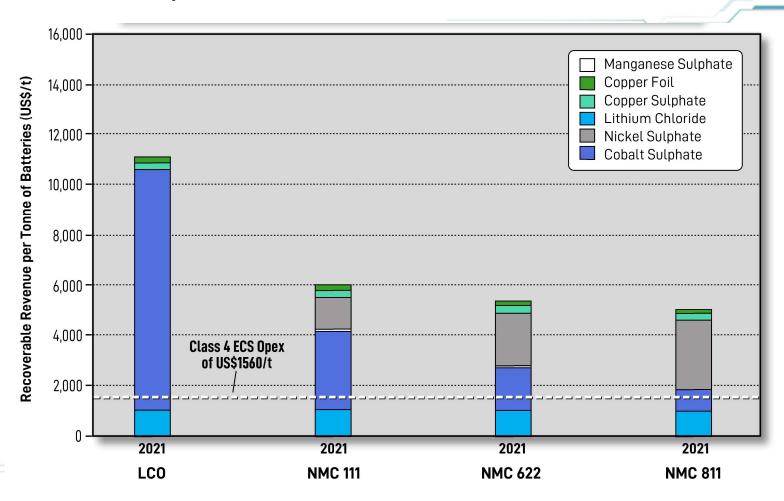
\*CoSO<sub>4</sub>, 7H<sub>2</sub>O, NiSO<sub>4</sub>, 6H<sub>2</sub>O, LiSO<sub>4</sub>. H<sub>2</sub>O

Source: Benchmark Minerals Intelligence



# ROBUST ECONOMICS ON MAJOR EV BATTERY CHEMISTRIES

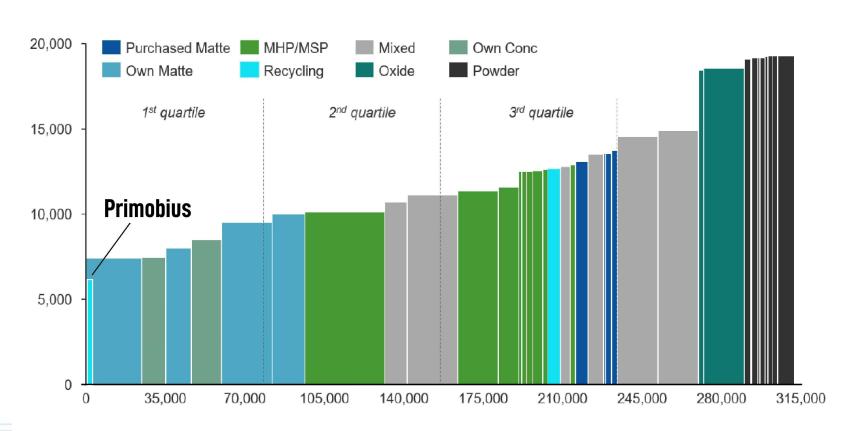
#### Recovered value of products of various cathode chemistries based on Pilot Plant Results



Source: Pricing - Fastmarkets (Cobalt, Nickel, Manganese - Spot), HIS Markit Trade Data (Lithium - Spot), Neometals Management (Copper Products - Forecast) Battery Cell Composition and Product Recoveries: Cobalt-82%, Nickel-83%, Lithium-82%, Copper-88% combined, Manganese-78% (Neometals Management)

#### POTENTIAL LOWEST COST NICKEL SULFATE PRODUCER

#### **Nickel Sulfate Cost Curve 2025**



Nickel sulphate production, tonnes Ni contained

Source: Cost Curve – Australian Mines/CRU (2019), Primobius Cost/Production – Neometals Management (2021) based on ASX Announcement:- Lithium Battery Recycling – Outstanding Cost Estimates (7 May 2021)





# Primobius

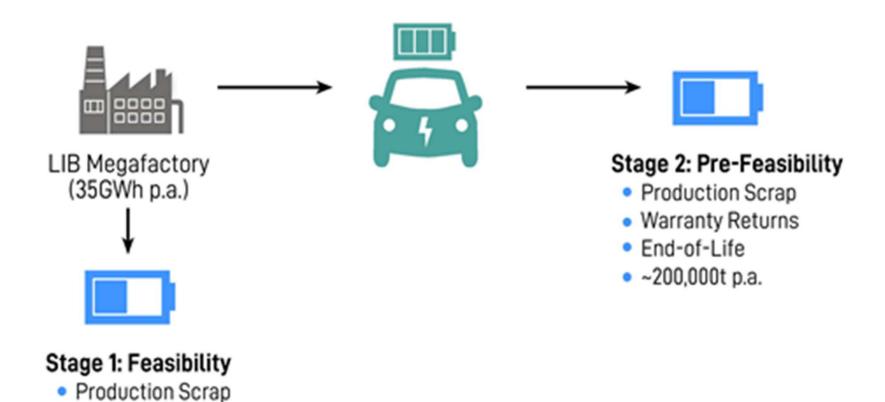
**Battery recycling without limits** 

## LI ION BATTERY RECYCLING PROJECT

50:50 JV with SMS group – 'Primobius GmbH'

# AIMING TO BE RECYCLER OF CHOICE FOR CELLMAKERS AND CARMAKERS

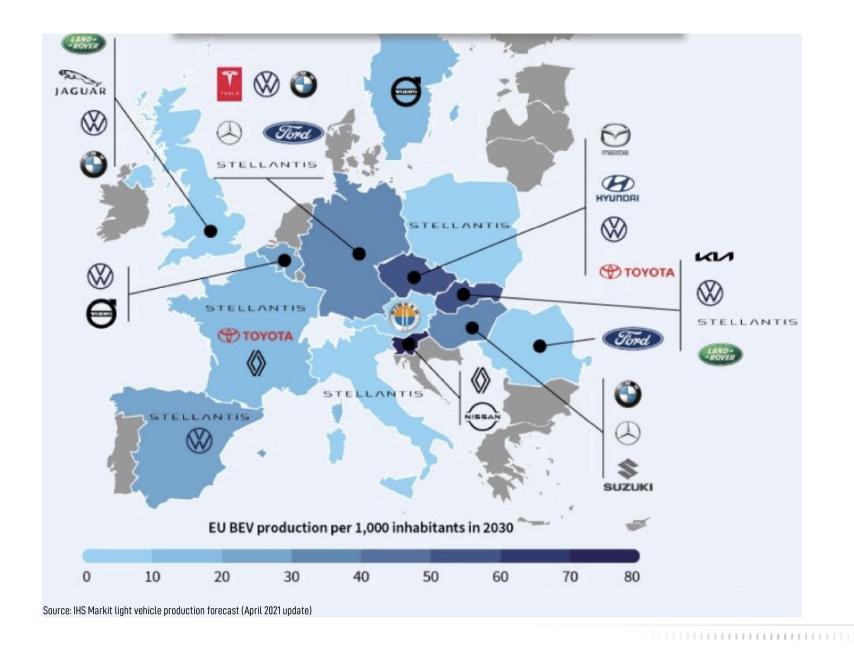
- Commercial operations starting in Europe, ROW to follow.





~20,000t p.a.

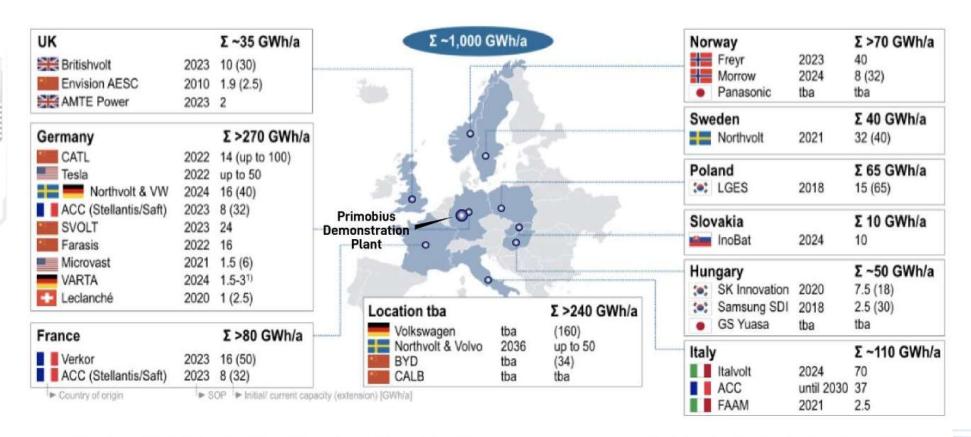
# EU FORECAST TO BE 2<sup>ND</sup> LARGEST EV PRODUCTION HUB GLOBALLY IN 2030





# **EU FORECAST TO BE 2<sup>ND</sup> LARGEST LIB PRODUCTION HUB GLOBALLY IN 2030**

Announced annual LiB cell production capacity until 2030 (GWh/a) - By country, by companies



Source: Roland Berger, July 2021, from Press Releases, Company Announcements & Expert Interviews

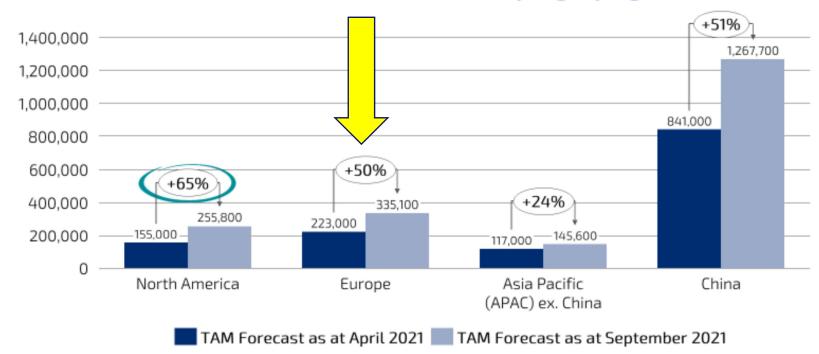
1) Roland Berger estimate based on 100-200 in units of 21700 cells



# AND GENERATE 2<sup>ND</sup> LARGEST VOLUME OF SCRAP AND END-OF-LIFE BATTERIES

#### **New Battery Mega-factory Deployment Far Exceeding Expectations**

Tonnes of Lithium-ion Batteries Available for Recycling – by Region in 2025(1,2)



#### Notes

April 2xx 1 vs. sept. axx 1 oral nearessate manks ( invar) recess. Units are cornes or utrium- on outcomes available for recycling/year
 Sources Benchmark Mineral Intelligence (\*BMT), U-Cyclie market intelligence and forecasting.

Source: Li-Cycle





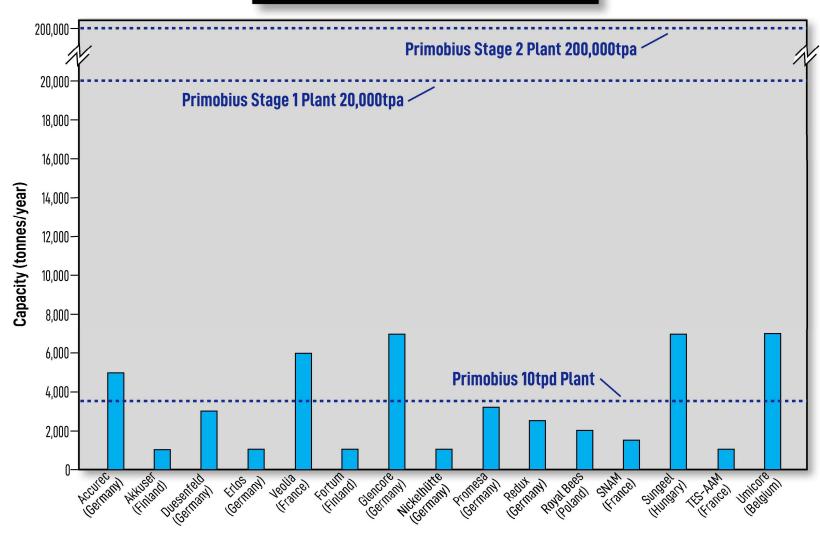
# GERMANY FORECAST TO BE LARGEST LIB PRODUCTION HUB GLOBALLY IN EU





# EU NEEDS A LARGE, SCALABLE SOLUTION FROM A RELIABLE LOCAL

Major European EV Battery Recycling Facility Capacities





#### **OUR COMMERCIALISATION PARTNER**



#### 50:50 JV WITH SMS group GmbH

- Incorporation of Primobius GmbH to evaluate and commercialise recycling technology
- Constructing a showcase demonstration plant in Germany, complete feasibility study and FID consideration MarQ22
- Evaluating both 20ktpa and 200ktpa plants
- SMS will build, operate and procure debt financing\* on behalf of JV
- Global commercial roll out capitalising on the SMS global footprint / reputation (140 years old, 14,500 employees at 95 sites)
- \*for 50:50 debt:equity on a best endeavours basis



#### Nm

#### **DEMONSTRATION PLANT**







Dedicated facility at SMS Manufacturing Headquarters Hilchenbach, Germany



#### **INDICATIVE TIMELINE FOR 50TPD PLANT**

Stage 1 **Shredding** Beneficiation Commissioned

Stage 2 **Hydromet** Refinery Commissioning

Complete Demonstration **Plant Trials** 

Complete Class 3 ECS Capex & Opex **Complete** and FID\*

Commence Feasibility Study Commercial Scale **Operations** 



Running Feedstock, Offtake, Product Evaluation in parallel



<sup>\*</sup> Subject to NMT and JV Board Approval.

#### **FLEXIBLE BUSINESS MODELS**



#### **Principal**

 Primobius to responsibly process production scrap or EOL batteries for a <u>fee</u>. Customer option to purchase all products under offtake agreement



#### Partnership

 Primobius to build and operate recycling plant(s) both <u>share</u> economic returns – JV etc. Partner option to purchase all products under offtake agreement



#### License

 License IP directly for royalty and potentially EPC recycling plant(s)

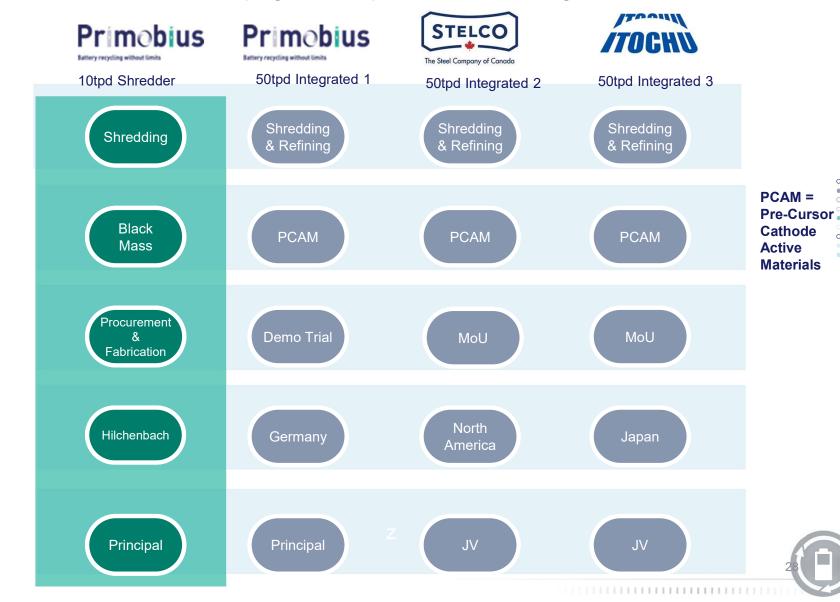






#### **DEMONSTRATING SPEED TO MARKET**

- Primobius decision to fast-track commercial operations in Germany (Q12022)
- Demo plant ("DP") upgrade for commercial 10tpd 'black mass' commercial operation
- Procurement and fabrication activities in progress and operating permit pending



**Plant Type** 

**Status** 

Location/s

**Business Model** 

#### Nm

#### PRIMOBIUS COMPETITIVE ADVANTAGE



USP = Unique selling proposition JV = Joint Venture

- Safe process according to regulations

  High share of recycled materials to high purity chemicals within regulatory requirements
- Plexible and robust technology
  Multiple battery chemistries, formats and types can be processed without cell discharging
- Better recovery, emissions and less transport than incumbents
- Continuous improvement

  Continuous optimization of existing processes with regards to product yield, quality and efficiency
- Ethical sourced high purity products

  High purity chemicals not intermediates for ethical re-supply to the cathode producer supply chains
- 6 Flexible business model
  Service provision, shared economics in JV's, licensing
- 7 Industrial scale
  Scalable plant from trusted brand with performance backstop



# CORPOR

#### Nm

#### **CORPORATE DASHBOARD**

ASX:	NMT	OTC:RDRUY
AOA.	I IVI	OIG.RDRUI

Shares on Issue <sup>1</sup>	m	548.4
Share Price (15-Sep-21)	A\$	0.865
Market capitalisation (15-Sep-21)	A\$m	474
Cash (30-Jun-21) <sup>2</sup>	A\$m	98.2
Debt	A\$m	-
Investments (30-Jun-21) <sup>3</sup>	A\$m	12.4

#### **Major Shareholders (7-Sep-21)**

-	
David Reed (Founder/Non-Executive Director)	6.9%
Clearstream/Deutsche Börse	2.9%
Top 20	35.4%
No of Shareholders	~9,900



Note 1: Excludes 12.99M performance rights. Note 2: incl A\$4.2M restricted term deposits Note 3: Loan receivables and investments

#### Nm

#### **OUR PEOPLE**

#### **NE Board Members**



Steve Cole Chair



David Reed



Dr Natalia Streltsova



Doug Ritchie



Dr Jennifer Purdie



Les Guthrie

#### **Management Team**



Chris Reed
Managing Director /
CEO



Jason Carone Company Secretary / CFO



Michael Tamlin COO



Darren Townsend CDO



**Irena Ivanova**GM - Engineering



Paul Wallwork
GM – Marketing
and Product
Development



Jeremy Mcmanus
GM – Commercial
and Investor
Relations



**Gavin Beer** GM – Lithium Processing



Matthew Read GM – Lithium Projects



David Robinson GM – Metallurgy and R&D

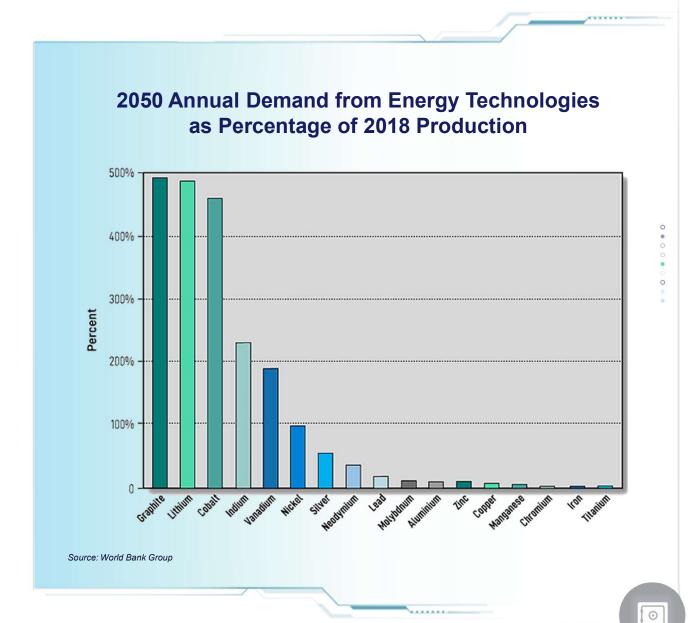


**Greg Hudson** GM – Geology



# UNPARALLELED EXPOSURE TO THE NEW ENERGY (STORAGE) MEGATREND

- Exposure to key commodities as the World transitions to low carbon:
  - Li, Co, Ni, V, Cg
- All the right elements<sup>®</sup>



#### **COMPANY HIGHLIGHTS**

#### **SECURITY**



Strong balance sheet, no debt - can fund developments to nearterm FIDs



Consistent strategy partnering to reduce risks and realise returns



Strong Board and management – project execution experience



History of cash and scrip returns to shareholders



Pivot to recycling and recovery removes mining risk conglomerate complexity disappearing



#### **OPPORTUNITY**

Green critical materials for Europe – big exposure to new energy megatrend



Resource efficiency for circular economy



Secure, ethical supply chain certainty



Multiple catalysts across portfolio

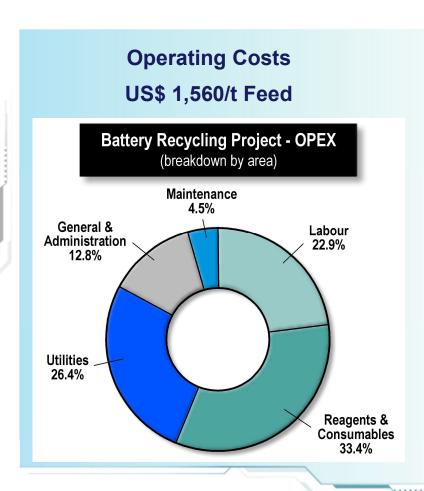


Transitioning to best practice ESG - 'sustainable investment'

# SUPPORTING INFORMATION

# ENGINEERING COST STUDY ESTIMATES MAY 2021 - AACE CLASS 4 (±25%)

Based on Pilot Plant at SGS Canada in 2019/20

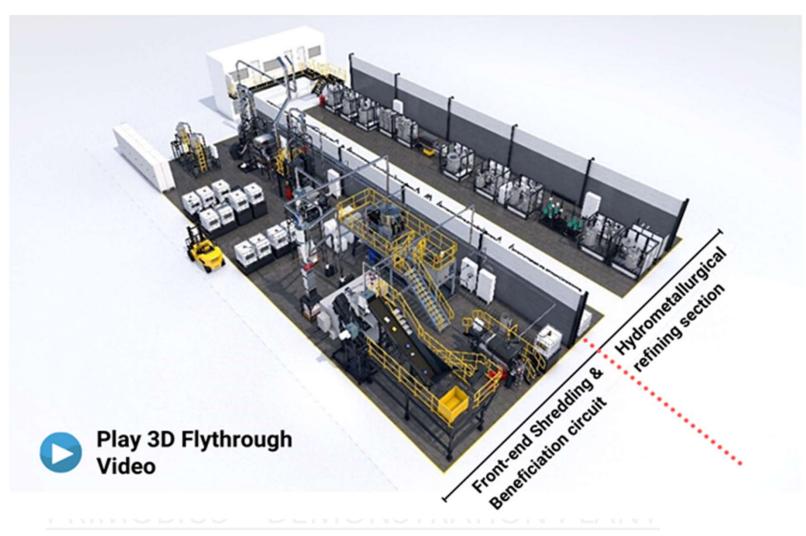


CAPITAL	US\$M
DIRECTS	
Infrastructure Civil	9
Land and Buildings	34
Front End	6
Hydromet	24
Utilities	12
Installation	11
Sub-Total Directs	96
INDIRECTS	
Engineering, Project Management and Owner's Costs	45
Insurance, Freight, Taxes and Interest	9
Sub-Total Indirects	54
CONTINGENCY (10%)	15
TOTAL	165

Source: Neometals ASX Announcement:- Lithium Battery Recycling – Outstanding Cost Estimates (7 May 2021)

Note: total numbers may not sum due to rounding

#### **PRIMOBIUS 3D FLYTHROUGH**



JULY 5, 2021

https://www.neometals.com.au/news-and-media/videos/

THE HEALTH THE

# MOU WITH STELCO INC (TSX: SLTC) FOR NORTH AMERICA

### Primobius

Battery recycling without limits



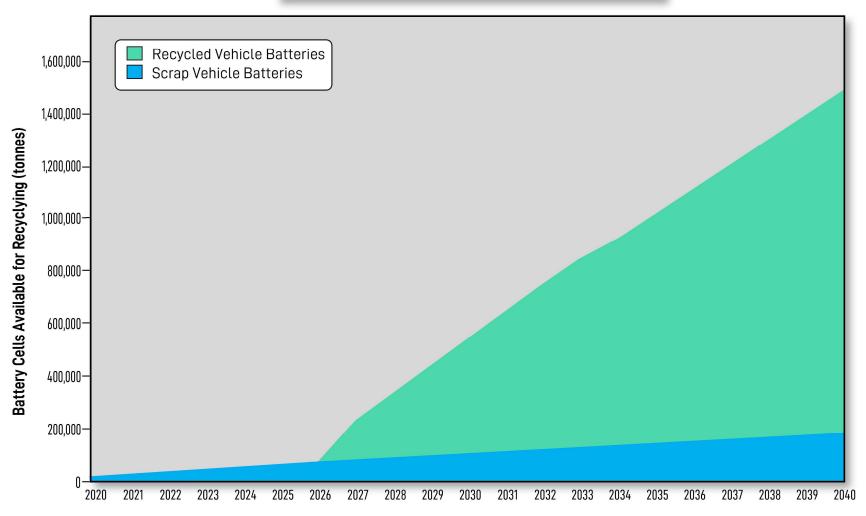
- Stelco is a leading North American steel producer (market cap +C\$3B)
- Stelco plans to introduce scrap steel from end-of-life vehicles into feed stocks for steelmaking
- Proposed 50:50 incorporated JV contemplates processing lithium batteries arising from the vehicle/scrap steel operations
- Primobius will supply and construct a plant for the JV with an initial capacity of 20ktpa
- Stelco will arrange sufficient supply of battery packs to the JV at no cost
- Evaluating a potential hub and spoke model, centralised hydromet circuit fed by multiple shredding/beneficiation plants in North America

Full details refer to Neometals ASX Announcement entitled: "LI Battery Recycling – MoU Stelco for North America" released on 27 May 2021.



# FORECAST BATTERY FEED VOLUMES, NTH AMERICA

#### **North American Battery Availability**



Source: Benchmark Mineral Intelligence (Battery Cell Capacity) and Neometals Management (Utilisation rate 75%, Scrap Rate 10% and Cell Weight 4.5a/Wh)



# MOU WITH ITOCHU CORPORATION OF JAPAN

## Primobius

**Battery recycling without limits** 





Itochu's stationary energy storage brand

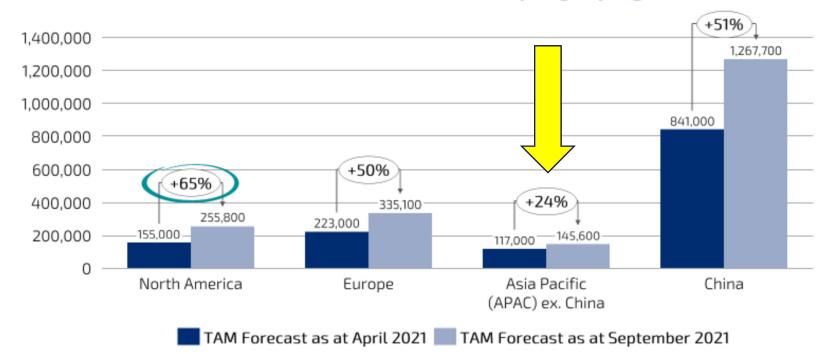
- Itochu is one of Japan's largest trading houses (market cap +US\$50B
- Itochu strong footprint in the lithium-ion battery supply chain
- Itochu produces cathode and anode materials, also its own stationary storage battery systems (ESS)
- Itochu will supply second demonstration trial which will process solely ESS batteries
- Evaluating hub and spoke model, centralised hydromet circuit fed by multiple shredding/beneficiation plants not only in Japan but throughout Asia.

Full details refer to Neometals ASX Announcement entitled: "Lithium Battery Recycling – MoU with Itochu Corporation" released on 5 March 2021.

# JAPAN HAS LARGEST VOLUME OF SCRAP AND EOL BATTERIES IN APAC

#### **New Battery Mega-factory Deployment Far Exceeding Expectations**

Tonnes of Lithium-ion Batteries Available for Recycling – by Region in 2025<sup>(1,2)</sup>



#### Notes

April 243 vs. Sept. 2421 (data nacressage mannet) invariance connect or stream-on datories available for recycling/year
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## THANK YOU

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