Neometals

ASX Announcement

08 November 2023

Outstanding Nickel Sulphate Purity for Primobius

Highlights

- Primobius' German lithium-ion battery ("**LIB**") recycling demonstration trial generates battery-grade nickel sulphate exceeding Chinese cathode producer specifications from recyclingEV batteries;
- Nickel sulphate is the largest volume material produced from recycling NMC LIB's (the predominant EV chemistry in Europe) and the largest co-product revenue stream; and
- The nickel sulphate results support the marketability of the scaleable Primobius plant packages to be built by partner and leading plant builder, SMS group GmbH and supplied under technology licencing agreements.

Innovative battery materials recycler, Neometals Ltd (ASX: NMT & AIM: NMT) ("**Neometals**" or "**the Company**"), is pleased to announce the successful production of battery-grade nickel sulphate by its LIB recycling incorporated joint venture, Primobius GmbH ("**Primobius**"). Primobius is the 50:50 incorporated joint venture established by Neometals and SMS group to co-fund commercialisation of the patented LIB recycling technology ("**LIB Recycling Technology**"), originally developed by Neometals.

The LIB Recycling Technology is based on a two-stage process to recover lithium, nickel and cobalt (amongst others) before refining into battery materials that can be reused to produce new LIB's. Nickel is the largest volume battery material produced in the Primobius process, the second most valuable product and major contributor to ensuring the lithium co-product operating costs are in the lowest quartile.

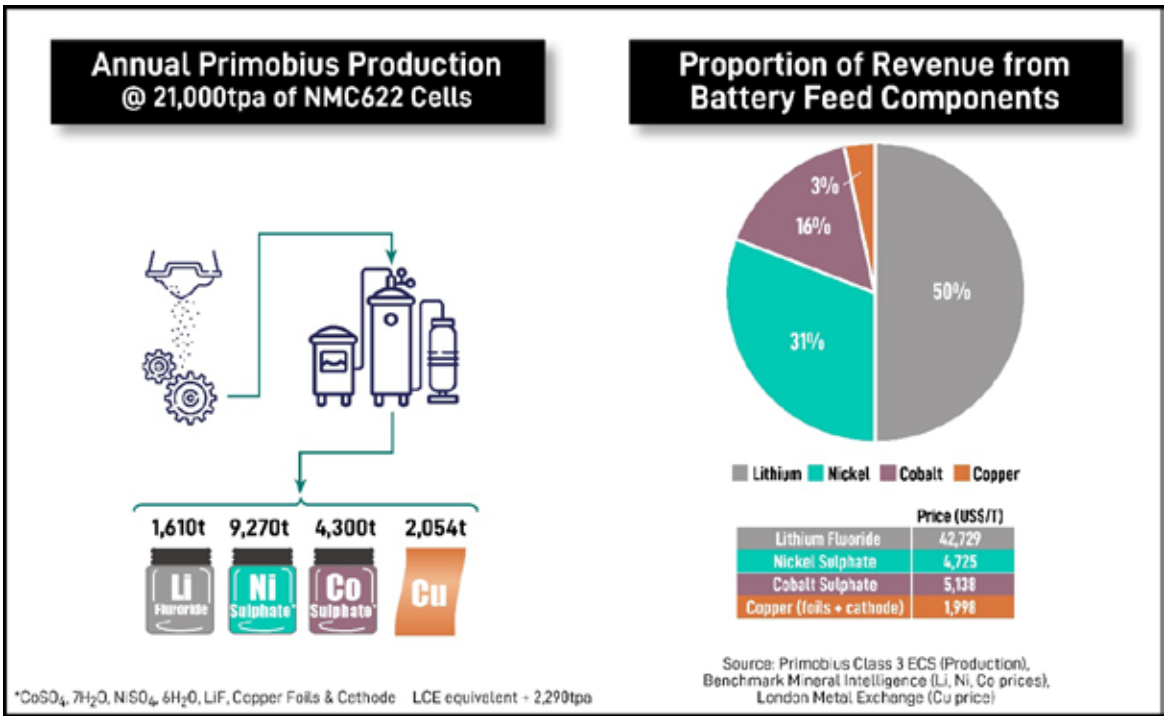

Fig 1 – Nominal Output and Relative Value from a Primobius' 21,000tpa plant

Product test-work

LIB's from the German EV auto industry were processed at Primobius' Hilchenbach recycling facility in Germany. Discharged and disassembled LIB modules were processed in the shredding 'Spoke' generating an intermediate product ("**Black Mass**") which was then refined in the demonstration-scale hydrometallurgical refining 'Hub' to recover the cathode materials into high-purity solutions via solvent extraction and precipitation (See Figure 2). The Black Mass is a mixture of the graphite anode and cathode active materials including lithium, nickel and cobalt.

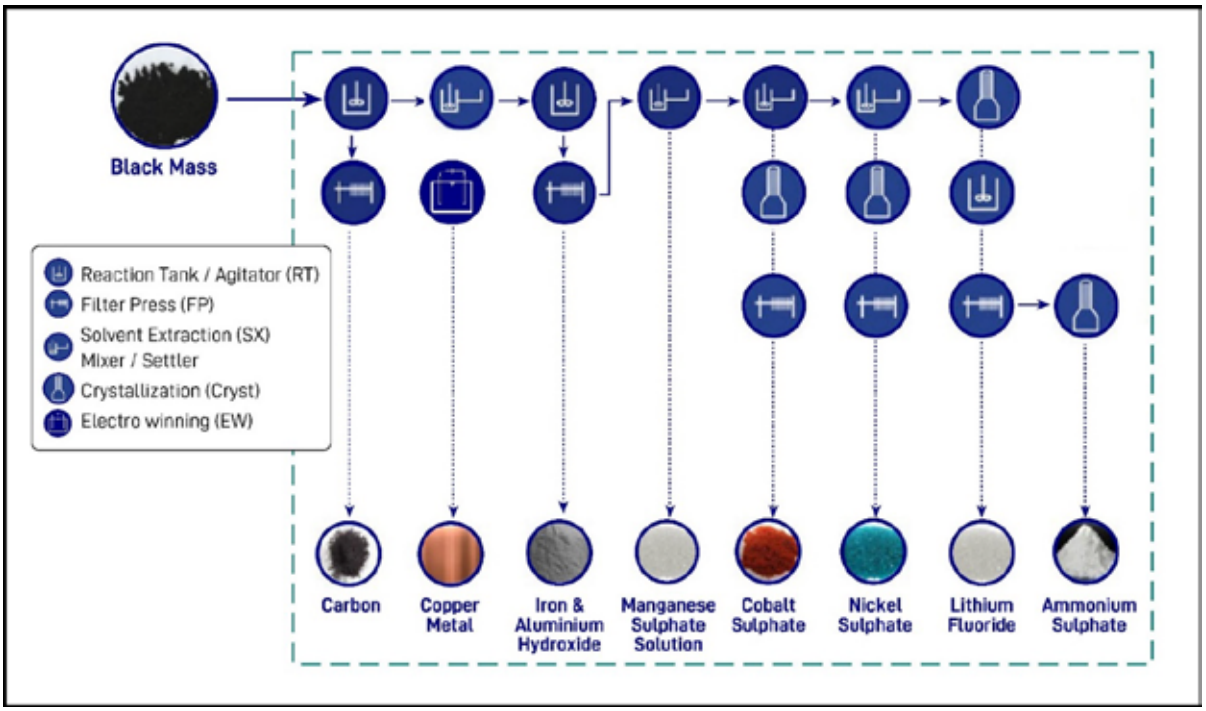

Fig 2 – LiB Recycling Process Flowsheet

The polished Hub nickel solution (feed) was evaporated (mother liquor) and crystallised off-site with a leading European equipment vendor. The nickel sulphate crystals were then washed and assayed by an independent third-party laboratory. The results confirmed the ability of the LIB Recycling Technology to produce battery-grade nickel sulphate (see Table 1**)** and validated the battery-grade product previously produced by Neometals in its 2019 pilot trials in Canada.

Next Steps

Primobius' production at scale of battery-grade nickel sulphate follows recent positive lithium recovery results[1] and leaves cobalt sulphate as the final key product to be tested. Cobalt solutions have been dispatched and the test work is expected to be completed in the current quarter.

The nickel sulphate results support the marketability of the scaleable Primobius plant packages to be built by our partner, and leading plant builder, SMS group GmbH and supplied under technology licencing agreements. Customers will be able to responsibly recycle their own LiB's, satisfying their regulatory and/or supply chain requirements, producing critical battery materials at potentially the lowest quartile operating cost and doing so with an industry leading carbon footprint.

[1] See Neometals' ASX release dated 4th October 2023 titled "Outstanding Lithium Recovery Results for Primobius"

Table 1 – Assay results for nickel solutions and crystals vs Primobius specifications

Nickel Sulphate Hexahydrate ($NiSO_4 \cdot 6H_2O$)

Component	Units	Feed to Evaporator	Mother Liquor to Crystalliser	Nickel Sulphate Washed	Primobius Specification Nickel Sulphate Battery Grade	Units
Ni	% w/w	8.9	12.3	22.1	22.0	% w/w min
SO4	% w/w	14.9	21	38.0		% w/w min
Cr	ppm	<0.2	<0.3	<0.8	5	ppm max
Mn	ppm	<0.1	<0.1	<0.4	10	ppm max
Fe	ppm	<0.2	<0.3	<0.8	5	ppm max
Co	ppm	18	26	46	50	ppm max
Cu	ppm	<0.2	<0.3	<0.8	5	ppm max
Zn	ppm	<0.2	<0.3	<0.8	5	ppm max
Cd	ppm	<0.1	<0.1	<0.4	2	ppm max
Hg	ppm	<0.2	<0.3	<0.8	3	ppm max
Mg	ppm	1	3	<0.8	50	ppm max
Ca	ppm	24	61	8	10	ppm max
Li	ppm	12	42	4		ppm max
Na	ppm	5	15	<0.8	50	ppm max
Al	ppm	<0.2	<0.3	<0.8		ppm max
Pb	ppm	<0.6	<0.8	<2.5	10	ppm max
As	ppm	<0.6	<0.8	<2.5		ppm max
Cl	ppm	<8	<10,8	<33,4		ppm max
P	ppm	83	114	209		ppm max
Total Organic Carbon	ppm	<20	20,14	10,8		ppm max
Water Insolubles	ppm				50	ppm max

Authorised on behalf of Neometals by Christopher Reed, Managing Director.

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For further information, visit www.neometals.com.au or contact:

Jeremy McManus
General Manage,
Investor Relations & Intellectual Property
T +61 8 9322 1182
E jmcmanus@neometals.com.au

About Neometals Ltd

Neometals has developed and is commercialising three environmentally-friendly processing technologies that produce critical and strategic battery materials at lowest quartile costs with minimal carbon footprint.

Through strong industry partnerships, Neometals is demonstrating the economic and environmental benefits of sustainably producing lithium, nickel, cobalt and vanadium from lithium-ion battery recycling and steel waste recovery. This reduces the reliance on traditional mine-based supply chains and creating more resilient, circular supply to support the energy transition.

The Company's three core business units are exploiting the technologies under principal, joint venture and licensing business models:

- **Lithium-ion Battery ("LiB") Recycling (50% technology) –** Commercialisation via Primobius GmbH JV (NMT 50% equity). All plants built by Primobius' co-owner (SMS group 50% equity), a 150-year-old German plant builder. Providing recycling service as principal in Germany and commenced plant supply and licensing activities as technology partner to Mercedes-Benz. Primobius targeting first commercial 21,000tpa plant offer to Canadian company Stelco in the DecQ 2023;
- **Lithium Chemicals (70% technology) –** Commercialising patented ELi™ electrolysis process, co-owned 30% by Mineral Resources Ltd, to produce battery quality lithium hydroxide from brine and/or hard-rock feedstocks at lowest quartile operating costs. Co-funding Pilot Plant trials in 2023 with planned Demonstration Plant trials and evaluation studies in 2024 for potential 25,000tpa LiOH operation in Portugal under a JV with related entity to Bondalti, Portugal's largest chemical company; and
- **Vanadium Recovery (100% technology)** – aiming to enable sustainable production of high-purity vanadium pentoxide from processing of steelmaking by-product ("Slag") at lowest-quartile operating cost. Targeting partnerships with steel makers and participants in the vanadium chemical value chain under a low risk / low capex technology licensing business model.