ASX ANNOUNCEMENT

4 June 2019

Neometals
All the right elements

NEOMETALS COMPLETES LITHIUM BATTERY RECYCLING SCOPING STUDY

HIGHLIGHTS

- **Scoping Study supports robust economic outcomes for Neometals' battery recycling process**
- **Process recovers cobalt, nickel, copper and lithium as high-purity sulphate products, with estimated operating cost of less than US$7/lb (US$15/kg) of contained cobalt as cobalt sulphate, before by-product credits**
- **Provisional patents pending in Australia and Europe**
- **Pilot test work in Canada on schedule and will be followed by planned Class 3 Engineering and Feasibility Studies**

Neometals Ltd (**ASX: NMT**) (**"Neometals"** or **"the Company"**) is pleased to announce completion of an Association for the Advancement of Cost Engineering ("**AACE**") Class 5 scoping study ("**Study**") on its lithium-ion battery ("**LIB**") recycling technology that is presently being demonstrated by the Company in its Canadian pilot plant ("**Pilot**"). Primero Group Ltd ("**Primero**") was engaged to complete the Study which determined operating and capital costs based on Neometals bench-scale test work and on the associated mass/energy balance prepared by Strategic Metallurgy Pty Ltd ("**Strategic Metallurgy**"). Financial modelling was undertaken by Azure Capital.

Neometals is extremely encouraged by the outcomes of the Study which indicate potentially robust economic margins. The Study supports Neometals' strategy to target the growing need for sustainable recycling solutions as the worldwide adoption of LIBs continues to grow.

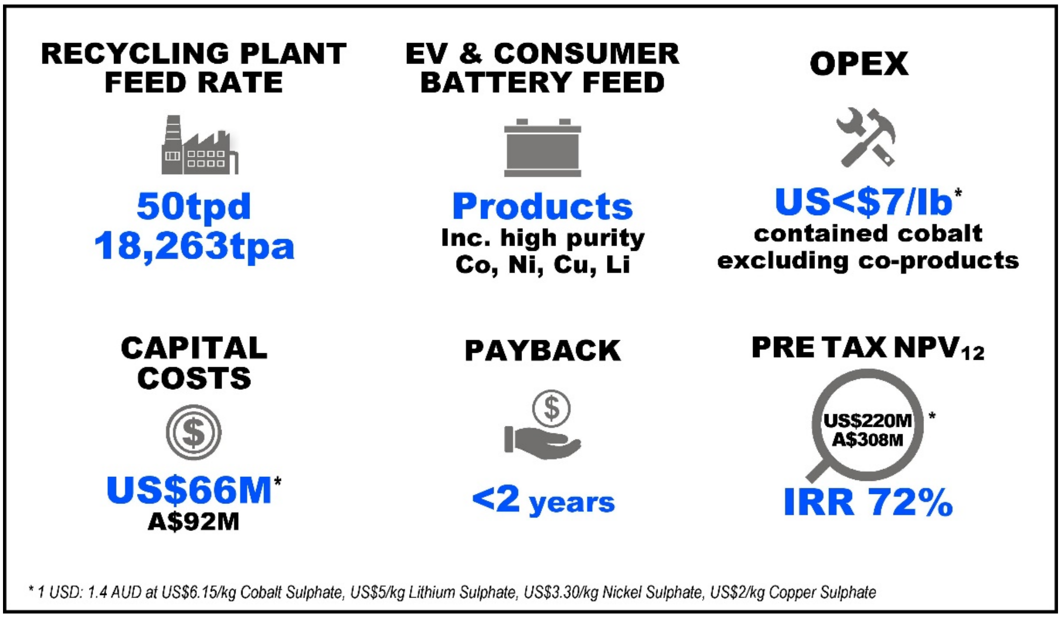

Figure 1: *Key highlights of the Study*

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The Study follows a separate historical evaluation of cobalt recovery from consumer electronics batteries which are typically based on lithium cobalt oxide ("**LCO**") cathode chemistries (*see Neometals ASX release dated 20th February 2017*). Since 2017, forecast consensus on LIB production growth trends towards nickel-manganese-cobalt ("**NMC**") cathode chemistries for electric vehicles ("**EV's**") and stationary storage ("**ESS"**) applications. Accordingly, Neometals adjusted its approach and designed a completely new recycling process with flexibility to process both LCO and NMC battery types and to recover embedded high-purity chemicals with minimal impact on the local ecosystem.

The results from this Study are significant and allows Neometals to confidently advance commercial dialogues in parallel with preparations for detailed engineering and cost studies.

Strong progress is also being made with Neometals' LIB Pilot. The Company will use data and learnings from the Pilot to estimate the cost to build and operate a commercial-scale recycling plant to a higher level of accuracy in an AACE Class 3 Feasibility Study. The Feasibility Study is planned to commence early in the 2019/2020 financial year.

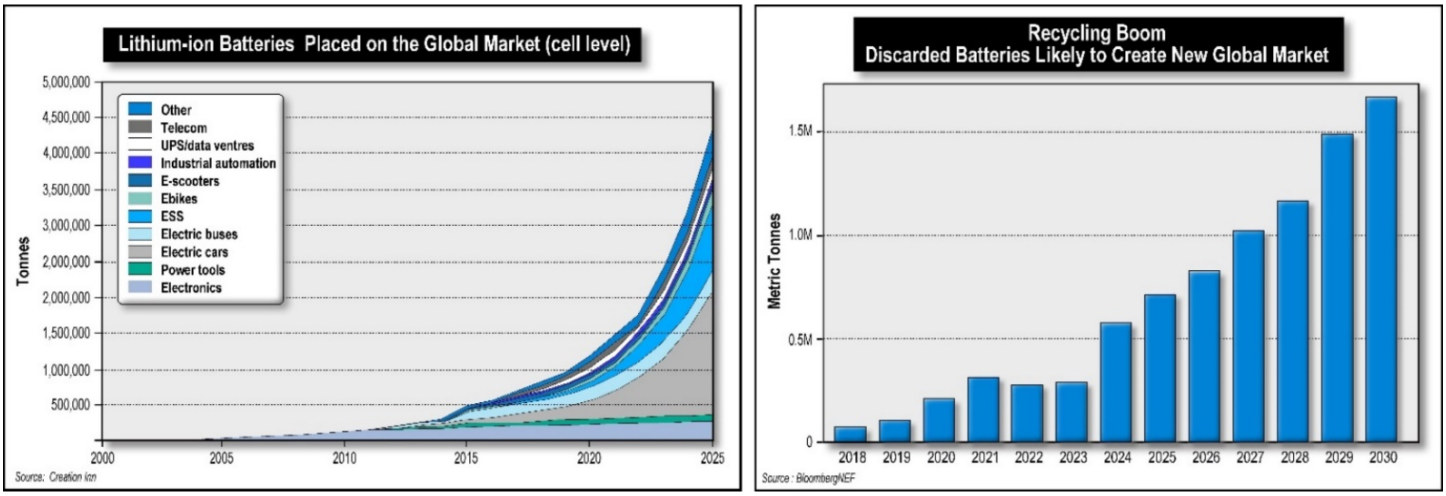

Figure 2 and 3: *Moving left to right, graphs showing a greater than 4-fold forecast increase in LIBs placed on the market by 2025 and an approximate 15-fold forecast increase in discarded batteries available for recycling by 2030*

Neometals Managing Director Chris Reed said:

"We are pleased with the economic outcomes of the Scoping Study on our new flowsheet, it is a credit to our project team and our consulting engineers. We have proved the efficacy of our process at the bench scale and continue to de-risk and optimise in the current pilot plant in Canada.

The global adoption of electric vehicles and battery storage of renewable energy continues at a rapid pace and the direct result will be a massive volume increase in production scrap and end-of-life lithium batteries from consumer electronics and electric vehicles. Governments world-wide are legislating and planning to legislate compulsory lithium battery recycling to remove them from landfills and responsibly recover the majority of their constituents, creating an ethical and sustainable supply chain.

We have invested in a true 'recycling' solution rather than base metal recovery process. It has been engineered for real world conditions and recovers multiple high-purity chemical products from an array of battery chemistries. We look forward to successfully completing the pilot plant test work in Canada so as to prove the technical feasibility and economic viability in a comprehensive feasibility study. In parallel we will accelerate our commercialisation discussions with relevant major players in the global lithium battery supply chain."

Study Outcomes

Neometals has been developing and evaluating its proprietary processing method to recycle scrap and spent LIBs to recover cobalt, nickel, lithium, copper, iron, aluminium, manganese into saleable products. Primero has been assisting Neometals with metallurgical design, flowsheet development and pilot plant supervision and management.

Primero has completed the Study considering both a 10tpd and a 50tpd battery shredding and hydrometallurgical processing circuit ("**Recycling Plant**"), with AACE Class 5 order of magnitude (±35%) capital cost and (±35%) operating cost estimates. The Study is based on process design criteria and mass-energy balance model provided by Strategic Metallurgy.

The Recycling Plant flowsheet, which is being optimised at pilot scale, comprises two sections:

1. Shredding, removal of metal casings and plastics in the feed preparation facility ("**Feed Preparation Facility**"); and
2. Leaching, recovery and refining to deliver chemical products via the hydrometallurgical processing facility ("**Hydrometallurgical Processing Facility**").

The Study estimate was based on establishing a green-fields operation for an integrated shredding and processing plant located in Kwinana (chosen for accuracy of estimating purposes) and identifies a number of opportunities to optimise plant configuration and cost.

Financial Summary

The Study concluded that 50tpd battery feed was a more efficient scale for initial commercial operation. Highlights for 50tpd (~18,250tpa) are summarised below. All estimates are in Australian dollars and the financial analysis in US$ dollars using an exchange rate of US$0.714. The Study assumes a selling price of US$6,151/t for cobalt sulphate, US$2,030/t for copper sulphate, US$5,000/t for lithium sulphate and US$3,298 for nickel sulphate.

Table 1: *Scoping Study Highlights*

Scoping Study Highlights	
Annual Production	9,623 t Cobalt Sulphate 5,635 t Copper Sulphate 1,544 t Lithium Sulphate 2,020 t Nickel Sulphate
Life of Plant (LOP)	10 years
Life of Plant (LOM) Revenue	US$ 850 million
Pre-tax Cashflow	US$ 502 million
Pre-tax NPV (12% discount rate)	US$ 220 million
Average Net Operating Cost of recovered cobalt as cobalt sulphate excluding by-product credits	US$6.65/lb (US$14.65/kg)
Total initial capital costs	US$66 million
Payback of capital costs	<2 years

CAUTIONARY STATEMENT
The Study referred to in this report is based on low-level technical and economic assessments and is insufficient to provide definitive assurance of an economic development case, or to provide certainty that the conclusions of the Study will be realised. Further detailed studies will be required to determine the feasibility and viability of a commercial-scale project

Development Scenario

The development scenario for this study is characterised by:

- Greenfields development starting with cleared industrial site in Kwinana, Australia
- Modular plant with a throughput capacity of 18,250tpa
- Lithium-Ion battery feedstock comprising 50:50 LCO and NMC batteries.

<u>Processing Flowsheet</u>

The process flowsheet was developed with the assistance of Primero for the Feed Preparation stage and Strategic Metallurgy for the Hydrometallurgical Processing stage.

Feed Preparation

Cylindrical 18650 battery cells were assumed as the battery feedstock used for the Study. A two-stage shredding process is followed by drying and beneficiation to separate coarse metal and plastic materials from feed for processing in the hydrometallurgical section of the plant. The metal materials are drummed for sale as scrap metal for recycling.

Hydrometallurgical Processing

The feed, referred to as Black Powder in Figure 4 below, is processed in the leach circuit to facilitate the dissolution of cobalt, nickel, manganese copper and lithium. The pregnant leach solution ("**PLS**") is separated from the solid leach residue. Further extraction and purification of PLS results in the recovery of cobalt, nickel as high purity sulphates suitable for potential sale directly back into the LIB supply chain. Other products, including lithium and copper sulphates, could supply standard existing refineries for these metals. The solid leach residue contains the graphite anode material which will be dried and drummed for sale.

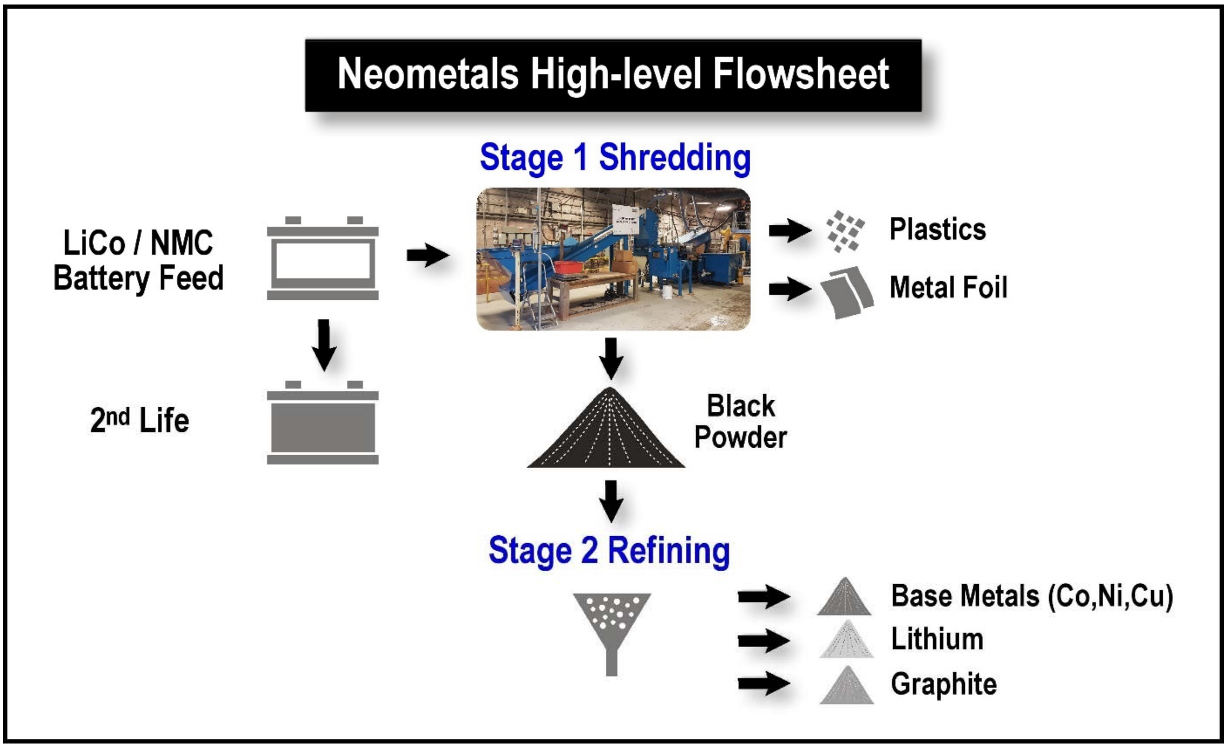

Figure 4: *High level flowsheet showing the materials generated from Feed Preparation and Hydrometallurgical Processing facilities*

Project Infrastructure

For the purpose of cost assumptions, the design assumes that the entire plant will be based inside a constructed industrial building in a major western industrial region/area. Kwinana, Western Australia was used as a reference location with plant offices, administration, ablutions facilities and a laboratory. The assumption for this study is that water, natural gas and electricity are all available at the site boundary. The plant layout incorporates appropriate fire protection and safety equipment.

The geographical location for the ultimate commercial-scale plant will be finalised during commercial negotiations. Future studies will evaluate the benefit of separating the locations of the Feed Preparation Facility from the Hydrometallurgical Processing Facility in a "hub and spoke" configuration to minimize logistic and safety risks, optimise capital efficiency and maximise value. Buildings for battery feed storage and for product storage have been included in the design.

Capital Cost Estimate

Processing

Primero developed the process design criteria for the facility and based the +/-35% capital estimate for the process plant on budget price estimates from equipment suppliers.

Table 2: *Capital Costs Estimate*

Capital	A$M
Direct – Buildings and Plant	62
Indirect – EPCM etc	11.2
Contingency (25%)	18.3
Total	91.5

Operating Cost Estimate

The processing facility operating cost was estimated by major cost type and is considered an AACE Class 5 - level estimate with a nominal accuracy of ±35%. The estimated operating cost is less than US$6.65/lb (US$14.65/kg) cobalt recovered as cobalt sulphate heptahydrate ($CoSO_4.7H_2O$), excluding by-products.

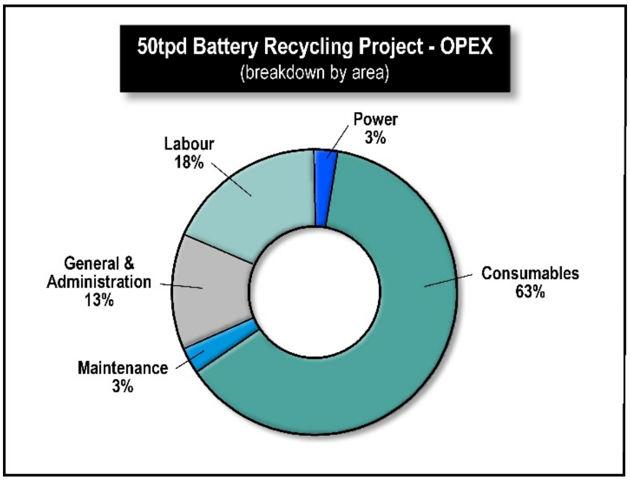

Figure 5: *Operational cost breakdown by key areas*

Economic Analysis

Neometals engaged Azure Capital to prepare a comprehensive discounted cash flow analysis to provide an indication of the potential of the project. The analysis makes the following assumptions:

- no allowance was made for tax
- no allowance was made for inflation
- NPV is calculated against the full capital cost of process plant and does not include for debt or any other type of funding of the project

The important economic and technical assumption inputs not aforementioned are summarised below:

- 88% recovery of Cobalt, Nickel and Copper contained in the battery feed material, 70% for Lithium
- A$91.5 M capital cost for processing plant (installed) including infrastructure (+/- 35% estimate from Scoping Study)

Pricing of cobalt and nickel sulphate products are based on Argus Metals International estimates from 22 May 2019.

Neometals has shown operating costs on a per pound (kilogram) of contained cobalt (as cobalt sulphate excluding by-products) basis to give a conservative single product point of reference for assessing relative operating cost competitiveness of the process. Cobalt contributes approximately 70% of the revenue. Costs split by each specific chemical product produced remain commercial in confidence.

Project Sensitivities

A sensitivity analysis on the pre-tax NPV is provided below in Figure 6:

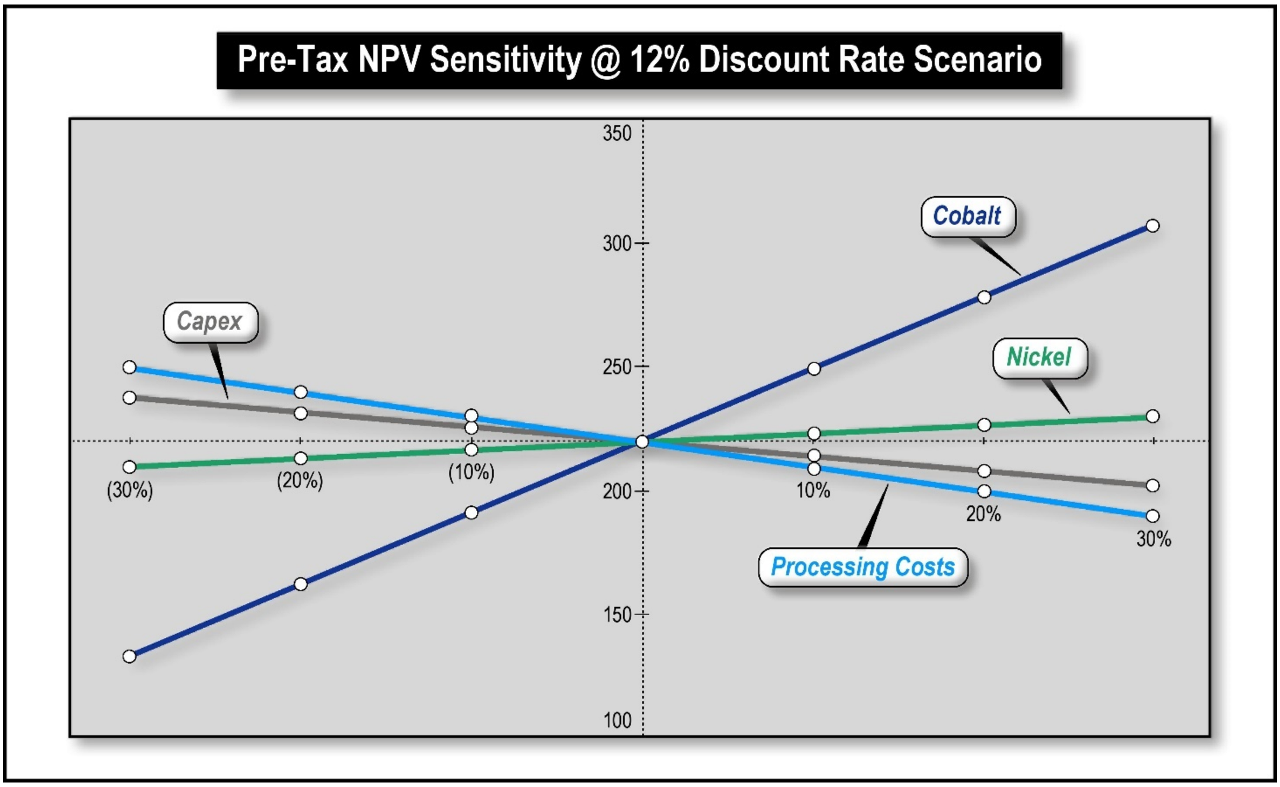

Figure 6: *Pre-Tax NPV Sensitivity*

Market and Marketing

The growing need for a universal LIB recycling solution allows Neometals to consider participation at several levels in the market. The Company's flowsheet differs from pyrometallurgy-only routes and offers a true modular closed-loop recycling solution that is designed for variable real-world conditions to generate high value chemicals rather than 'intermediates'.

Neometals is considering a range of business models to suit the varying requirements of participants in the LIB supply chain. These are outlined below in Figure 7:

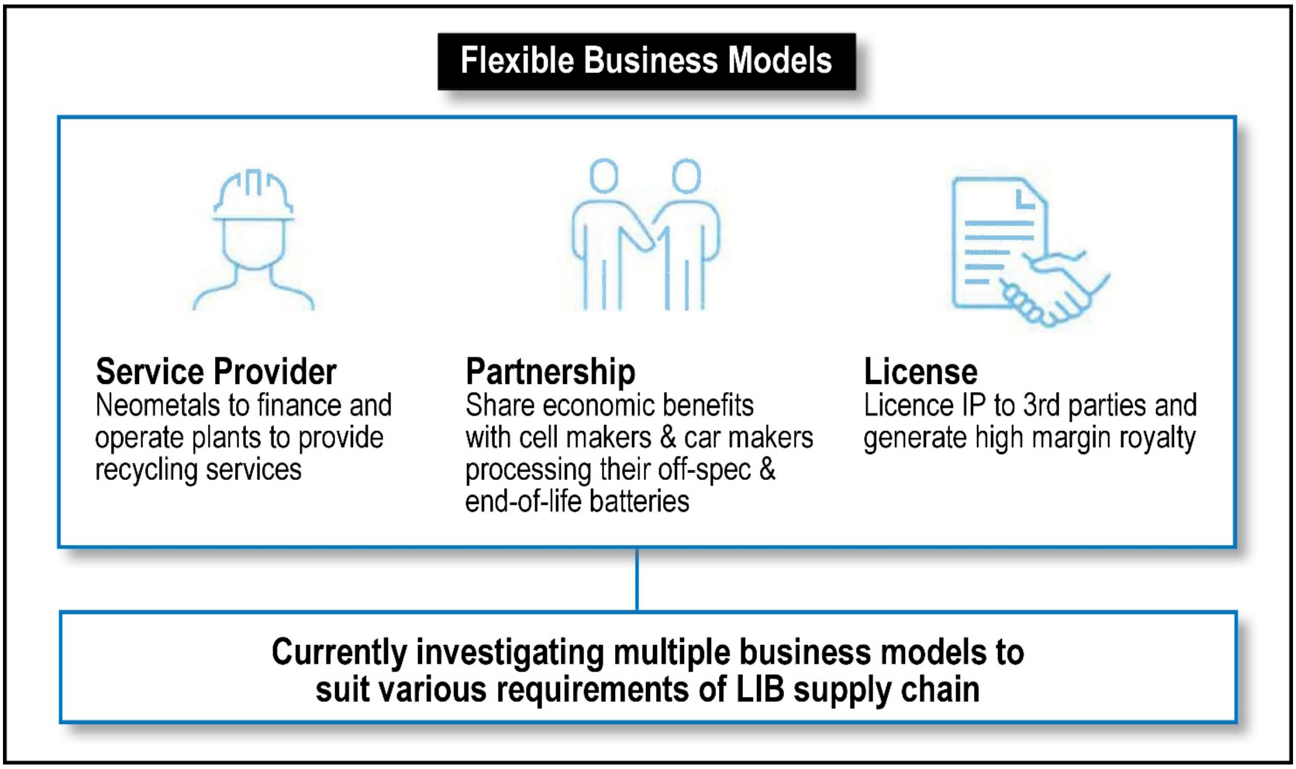

Figure 7: *Flexible Business Models*

At completion of the current pilot test work program, Neometals will commence product evaluation and market qualification testing of the various chemicals produced. This work will support the internal product characterisation work completed to date.

Market

See Appendix 1

Next Steps

- Feed Preparation Facility design being improved based on lessons learned during the pilot
- Pilot hydrometallurgical test work is in progress and on track
- Evaluation and market qualification as part of ongoing discussions with potential partners and end users of products
- Demonstration scale operation prior to commercial deployment will be considered either in Montreal at the Neometals industrial facility or at the site of a commercial partner
- Class 3 Feasibility Study to follow Pilot

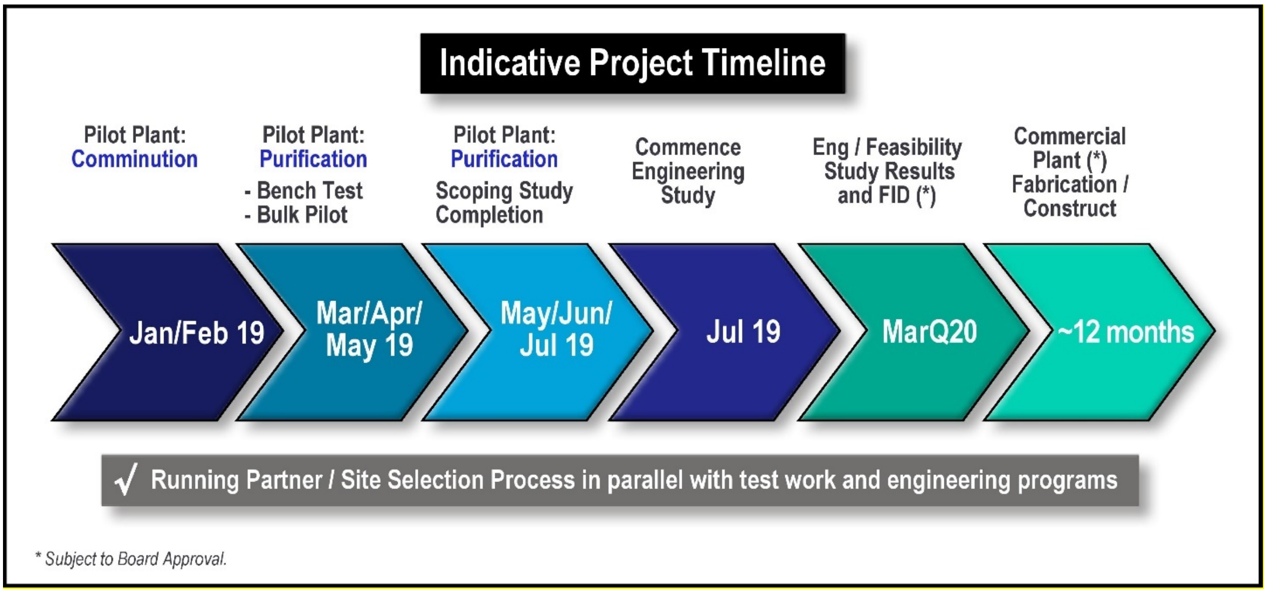

Figure 8: *Indicative Project Timeline*

Cautionary Statement

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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 mining 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.

Advice

Nothing in this document constitutes investment, legal or other advice. Investors should make their own independent investigation and assessment of the Company and obtain any professional advice required before making any investment decision based on your investment objectives and financial circumstances.

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About Neometals Ltd

Neometals innovatively develops opportunities in minerals and advanced materials essential for a sustainable future. The strategy focuses on de-risking and developing long life projects with strong partners and integrating down the value chain to increase margins and return value to shareholders.

Neometals has three core projects:

- Barrambie Titanium and Vanadium Project - one of the world's highest-grade hard-rock titanium-vanadium deposits, working towards a development decision in mid-2019;
- Lithium-ion Battery Recycling – a proprietary process for recovering cobalt and other valuable materials from spent lithium batteries. Pilot plant testing currently underway with commercial development decision expected by December 2019; and
- Lithium Refinery Project – Progressing plans for a lithium refinery development to supply lithium hydroxide to the battery cathode industry, underpinned by a binding life-of-mine annual offtake option for 57,000 tonnes per annum of Mt Marion 6% spodumene concentrate.

APPENDIX 1

Market for End of Life LIB

Analyst consensus shows clear trends highlighting material expansion to LIB demand and production due to growing electric vehicle and home energy storage sales penetration together with greater consumption of consumer electronics.

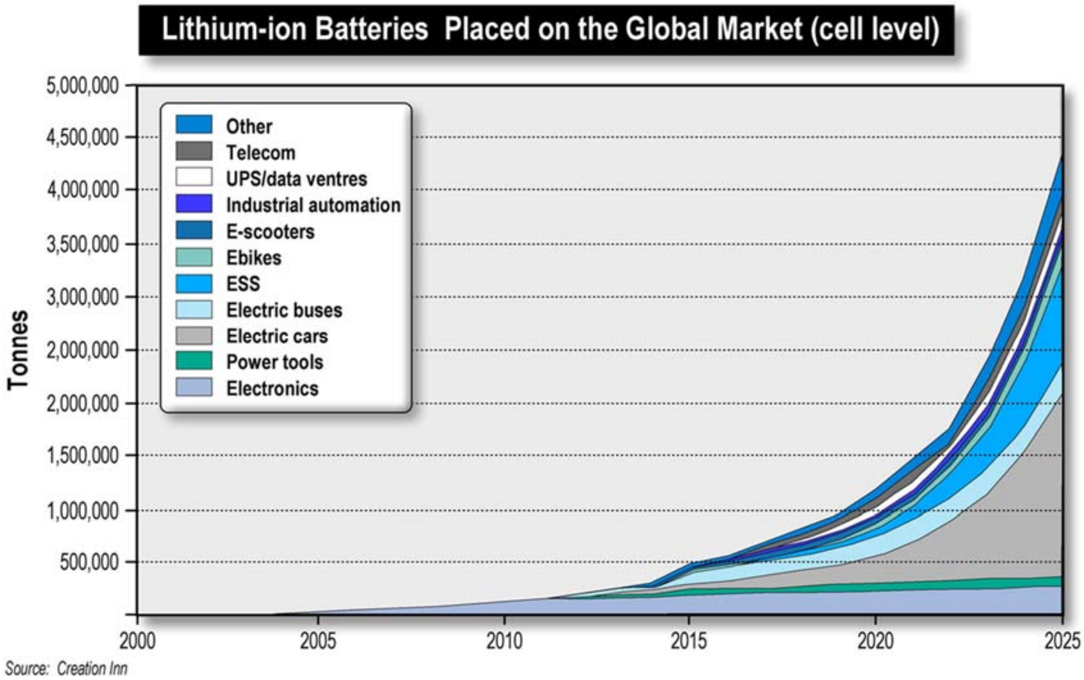

Figure 1: *Graph showing an approximate four-fold increase in LIBs placed on the market between now and 2025*

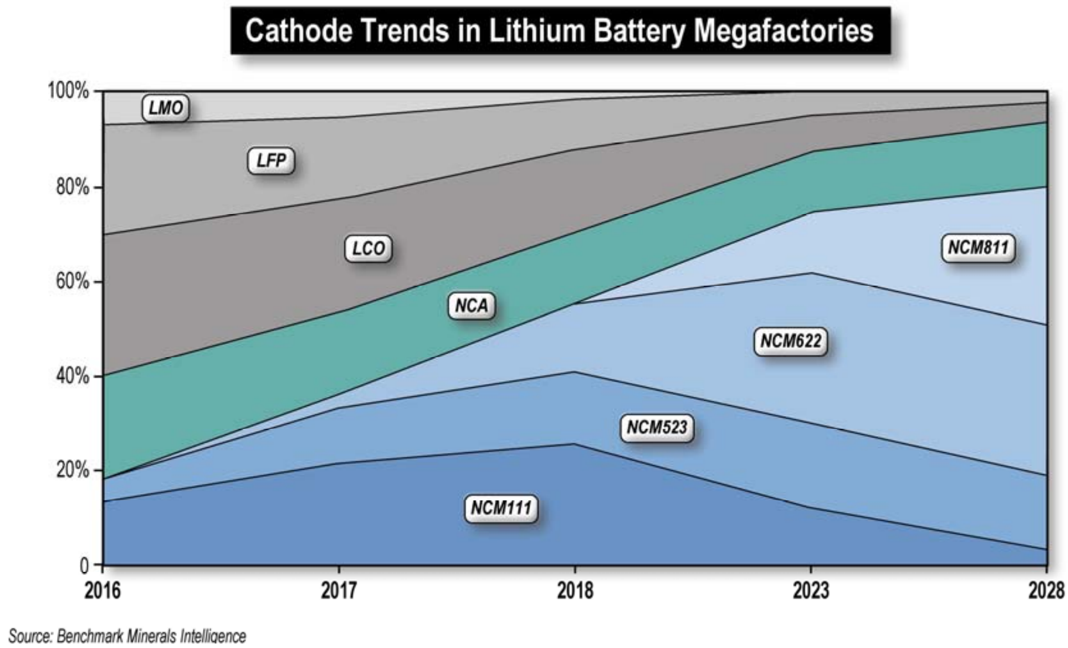

Figure 2: *Graph showing the forecast LIB cathode production trend towards nickel rich cathode chemistry (NMC) in its varying formats, associated with the predominance of the EV sector and its use of the nickel-rich battery chemistries.*

LIBs are forecast to have a duty life spanning approximately 8 years in a consumer EV. Consequently, the volume/quantity curve for forecast battery arisings is assumed to have a similar shape and magnitude to that of the forecast battery production curve, only shifted by 8 years.

According to Circular Energy Storage (2018), the value of the end-of-life market for LIBs is expected to exceed USD$1.3 billion in 2018, of which USD$1.1 billion will come from recovery of materials and around USD$0.2 billion from repair, refurbishment and preparations for reuse of industrial batteries (as distinct from portable batteries). In 2025 the market for LIB recycling is expected to grow to USD$3.5 billion and the market for second life batteries to USD$4.2 billion.

The LIB end of life market, currently dominated by China (70%) and South Korea (16%), is driven by the following key players in the value chain:

- Electric vehicle manufacturers with regulatory and/or corporate commitments to recycle spent LIBs in vehicles they sold (locally and internationally). These companies have a focus on ethical sourcing and disposing of materials as well as demand for the materials recovered from recycling processes;
- Companies that refine mined and recycled materials to chemical products, prepare anodes, cathodes and electrolytes for batteries and battery companies that do some or all of this in house; and
  The energy storage market which uses industrial batteries to provide different services to secure the quality of the grid or provide backup power and energy efficiency to households, industrial or commercial buildings and operations.

The current Chinese and Taiwanese dominance in battery recycling relates partly to the volume of LIBs exported to China as part of electronic device refurbishment (where batteries are embedded) and the sheer volume of electrode material being manufactured in Asia (and hence recycled in the same market). Going forward, it is expected that volumes of industrial LIBs (vehicles and stationary storage) will dwarf that from portable electronics and the locations where LIBs reach end of life will reduce Asia's market share given regulations making waste transport, particularly hazardous waste, increasingly difficult and expensive.

Although LIBs contain toxic substances they are not considered hazardous when declared as waste, but rather, they fall into that category by piggybacking legislation for other hazardous batteries such as nickel cadmium and lead-acid. As a result, LIBs are banned from both landfilling and incineration in Europe, Canada, Japan, and in a few states in the US.

For industrial batteries in the EU, recycling responsibility stays with the producer (i.e. vehicle manufacturers) to arrange for take-back of spent batteries at no cost for the end-user (i.e. vehicle owner). As such, the collection target is 100% given prohibition on landfilling and incineration of industrial batteries. All industrial batteries must be taken back and recycled. In the US, the recycling responsibility stays with the owner of the battery (who may have to pay a waste sorting company to take the battery when its spent), but in states where landfill and incineration are prohibited, the effect on recycling is similar to the EU. Like the EU, Chinese producers that placed the batteries on the market face the bill for recycling.