

ASX RELEASE

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20 February 2017

NEOMETALS COMPLETES LITHIUM BATTERY RECYCLING STUDY

HIGHLIGHTS

- **Neometals completes ‘proof of scale’ test work at its facilities in Montreal, Canada on co-developed, proprietary process to recover Cobalt from Lithium Ion Batteries from consumer electronic devices.**
- **Preliminary Engineering Cost Study supports business case to accelerate commercialisation of the technology**
- **Projected operating cost of US\$4.45/lb contained Cobalt.**

Neometals Ltd (**ASX: NMT**) (“**Neometals**”) is pleased to announce that, in line with its strategy to diversify into the downstream lithium/battery material supply chain, it will continue to advance its opportunity to focus on processing used lithium ion batteries to recover high value materials.

With rapid increases in global production of lithium-ion batteries, of which more than 50% contain lithium-cobalt chemistry, Neometals has co-developed a technology to economically recover high-value cobalt (99.2% recovery) as a material that can be re-cycled within the battery manufacturing chain. The cobalt supply chain is under some stress due to the rapid increase in demand from battery manufacturing and a supply chain that is dominated by co-production and high sovereign risk resource locations. Currently less than 5% of used lithium-ion batteries are recycled as disposal is typically either paid-for recycling or landfill.

Neometals completed laboratory scale test work on 100kg of spent lithium-ion laptop and phone batteries (containing an average of 19.8% Co) and engaged Sedgman to complete an Engineering Cost Study on a small scale plant using the technology. Results from the study, outlined in Appendix 1, have indicated strong potential for a viable processing operation via a modular plant to initially recover saleable Cobalt product from used lithium-ion batteries.

Neometals has a dedicated subsidiary, Urban Mining Pty Ltd, to hold its interest in the intellectual property and manage the commercialisation of the technology.



Immediate plans involve investing in a continuous operation, pilot-scale hydrometallurgical plant at NMT's Montreal laboratory to accelerate the evaluation of the recovery of high-purity Cobalt and future recovery of lithium, nickel, copper and aluminium.

Subject to the success of the mini-pilot/pilot scale testwork, it is Neometals' intention to proceed with a feasibility study as recommended by Sedgman in the Engineering Cost Study. The proposed work plan will be funded internally, with an expected date of completion in December 2017.

The currently preferred project development strategy is to advance the technical and economic evaluation in parallel with ongoing discussions with potential partners to fast track the development of a commercial scale plant. Neometals has internal financial resources with which to fund evaluation, construction and commissioning of the commercial-scale plant and will seek partners with complementary skill sets.

The Scoping Study has identified many opportunities to further improve the economics by optimising factors such as recovery of other battery materials beyond cobalt such as lithium, nickel, copper and aluminium oxide products.

Neometals Managing Director, Chris Reed, commented: *"With the Mt Marion Lithium Project successfully in production, Neometals' can extend its strategic focus to opportunities in the higher margin, downstream opportunities in the lithium value chain where we can apply our knowledge and technology portfolio. Here the opportunity is to provide an environmentally and ethically responsible, end-of-life solution - by recycling the lithium units we produce – urban mining.*

ENDS

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APPENDIX 1: SCOPING STUDY HIGHLIGHTS

The highlights for an initial 10t per day (3,424tpa) throughput module, the subject of the study, are summarised below. Operating and Capital Costs are both valid as at January 2017 with an indicative accuracy in the range of $\pm 30\%$. All analysis is in US\$ dollars and assumes a selling price of US\$35,000/t for Cobalt.

Scoping Study Highlights	
Annual Production	666 t contained Co or 1,467,280 lb
Life of Plant (LOP)	10 years
Life of Plant (LOM) Revenue	US\$ 233 million
Pre-tax Cashflow	US\$ 144 million
Pre-tax NPV (10% discount rate)	US\$ 84 million
Average Net Operating Cost of recovered Co	US\$ 4.45/lb (US\$9,852/t)
Total initial capital costs	US\$ 4.5 million
Payback of capital costs	<1 year

CAUTIONARY STATEMENT

The Scoping 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 Scoping Study will be realised.

DEVELOPMENT SCENARIO

The development scenario for this study, with the aim of refining the concept into a production unit that can be scaled up to full commercial operations, is characterised by:

- Relocatable, modular plant with a throughput capacity of 3,424 tpa located in Montreal, Canada
- Lithium-Ion battery feedstock provided by OEM's and battery collectors.
- A new technology based on limited testwork will be used for high, low cost recovery of Cobalt with Lithium by-product.

Processing

The proposed process is based on the development test work that was conducted for the Company in Montreal, Canada.

The process comprises the following steps:

- Feed preparation - Pulverising and segregation of the used batteries
- Extraction - Acid leach of used battery feed to selectively dissolve up to 99% of the cobalt values. Purification - to remove other metal values from the cobalt solution
- Recovery - of pure cobalt carbonate (>99.9% pure) by hydrometallurgical methods.

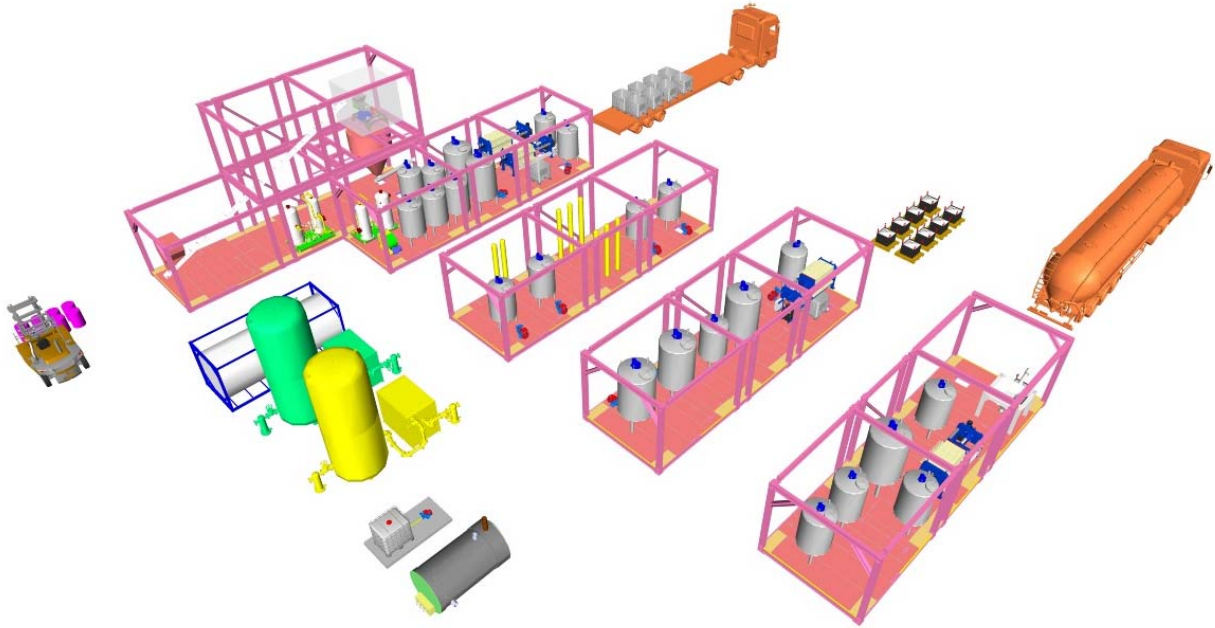


Figure 1. 3D Rendering of proposed Modular, Containerised Lithium Battery Processing Facility

Feed to the initial plant will be used rechargeable lithium ion batteries that predominantly arise from consumer electronics equipment such as smart phone, laptops and other portable electronic devices. These rechargeable batteries typically use battery chemistry that is generally known as lithium cobaltate (LCO) and have been in commercial use for at least 20 years. This cathode chemistry typically contains approximately 60% Co (eg 600kg contained cobalt per tonne of cathode feed into the plant) and has the best commercial potential for the operation. Several other rechargeable lithium ion battery cathode types also contain significant proportions of cobalt, although less than 60%, and will be tested in the future for viability as a source for the process.

Rechargeable lithium ion batteries are typically disposed of either through paid for waste disposal (including by voluntary battery collection points that aggregate batteries for disposal) or through uncontrolled landfill (eg batteries thrown into domestic garbage). The intended feed material to this plant will arise from the former source (legislated/mandatory recycling by battery makers and organised battery aggregators) and has had no revenue associated with it in the project model (eg the sources are assumed to be not paying Urban Mining for disposal). Urban Mining is in discussions with potential feed sources for both the pilot plant and initial proposed commercial operation.

Global used rechargeable lithium ion battery arisings from consumer electronics have been estimated to contain more than 30,000t of contained cobalt, based on being 60,000t of cathode materials available for recycling in 2016 (Argonne National Laboratory 2016).

Project Infrastructure

Sedgman proposed that the trial processing will take place at a site in Montreal, Canada where the Company already maintains pilot testing facilities. The footprint of the plant is 25m x 35m. A suitable commercial-scale processing site will have access to local infrastructure such as:

- power generation and reticulation
- water
- buildings
- supply of used batteries

CAPITAL COST ESTIMATE

Processing

Sedgman developed the process design criteria for the facility and based the +/-30% capital estimate for the process plant on budget price estimates from equipment suppliers using those criteria after internal and external review.

Project infrastructure

Infrastructure costs such as buildings, hardstand foundations, waste disposal, dismantling and erection were not allowed for by Sedgman but have been estimated in the economic analysis.

OPERATING COST ESTIMATE

Processing

The processing facility operating cost was estimated by major cost type and is considered a concept level estimate with a nominal accuracy of $\pm 30\%$. The estimated cash cost for processing is US\$4.45/lb Co.

MARKET AND MARKETING

Cobalt is traded on the London Metal Exchange (LME), a terminal market that publishes daily prices for cobalt. The price for cobalt at the time of writing is >US\$43,000 per tonne and cobalt compounds used in battery materials typically attract a price premium.

Assessment of the market by Neometals using third party commodity research and current spot prices, led to the US\$35,000/t Co price assumptions.

The plant scope is to recover and produce high purity cobalt carbonate and/or cobalt sulphate at a specification that is used in the manufacture of rechargeable lithium ion battery cathode materials. The tests to date have demonstrated the process is capable of producing the required purity of product for this market.

ECONOMIC ANALYSIS

Neometals prepared a simplified discounted cash flow analysis to provide an early 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 credit or any other type of funding of the project.

The important economic and technical assumption inputs are summarised as:

- 99.2% recovery of Cobalt contained in the used battery feed material achieved in testing of the process (19.8% Cobalt by weight).
- Price US\$35,000/t contained Cobalt.
- 10% gross sales royalty to cover processing technology license
- US\$4.5 M capital cost for processing plant (installed) excluding infrastructure (+/- 30% estimate from Scoping Study).

Initial economic assessment indicates potential for a viable operation. The project highlights are:

- Pre-tax NPV_{10%} of US\$87 M
- Life of Plant Revenue of US\$233 M
- conservative Plant life 10 years
- payback period of less than one year
- average net operating cost of US\$4.45/lb (US\$9,852/t) of recovered Co
- annual production of 666t Co as cobalt carbonate.



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The Evolution of Lithium™

20 February 2017

Lithium Battery Recycling Opportunity

<5% Lithium-Ion Batteries Recycled Globally



Source: Christian Hanisch, Recycling of Lithium-Ion Batteries (April, 2016)

Neometals Strategy

Combining innovative cost advantages and strong partners



to develop a portfolio of globally significant mineral resources



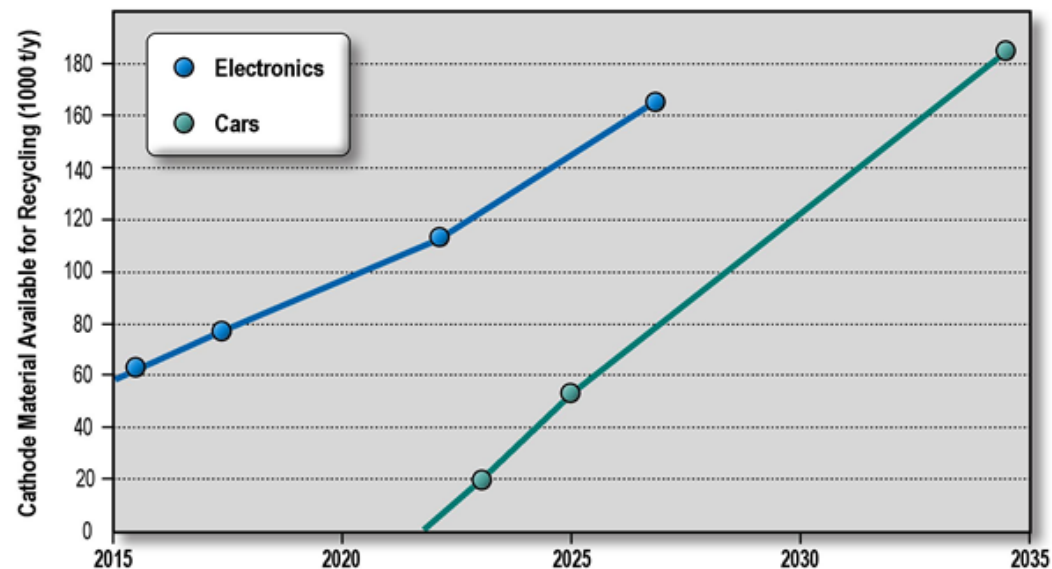
into lower-risk, long-life, high-margin operations to optimise stakeholder returns



Lithium-Ion Battery Recycling Strategy

Exploiting cost advantage in recovery of Cobalt from Lithium Cobalt Batteries in Consumer Electronics to develop a low-risk, long-life, high-margin operation with strong partners.

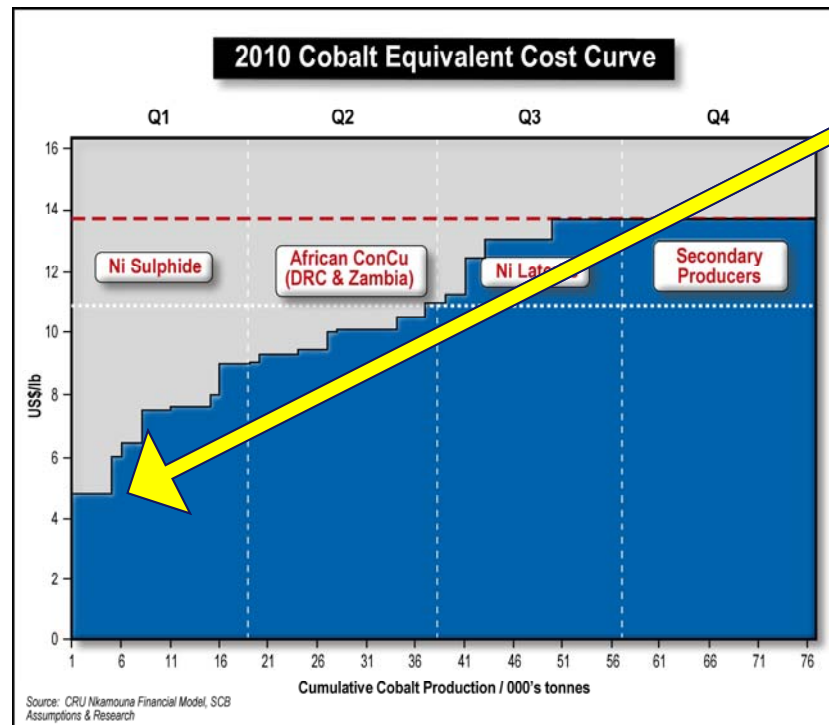
Electronic Batteries Will Come Back Much Sooner



Source: Argonne National Laboratory - 2016

Lithium Battery Processing Facility

Sedgman Scoping Study Results ($\pm 30\%$ accuracy)



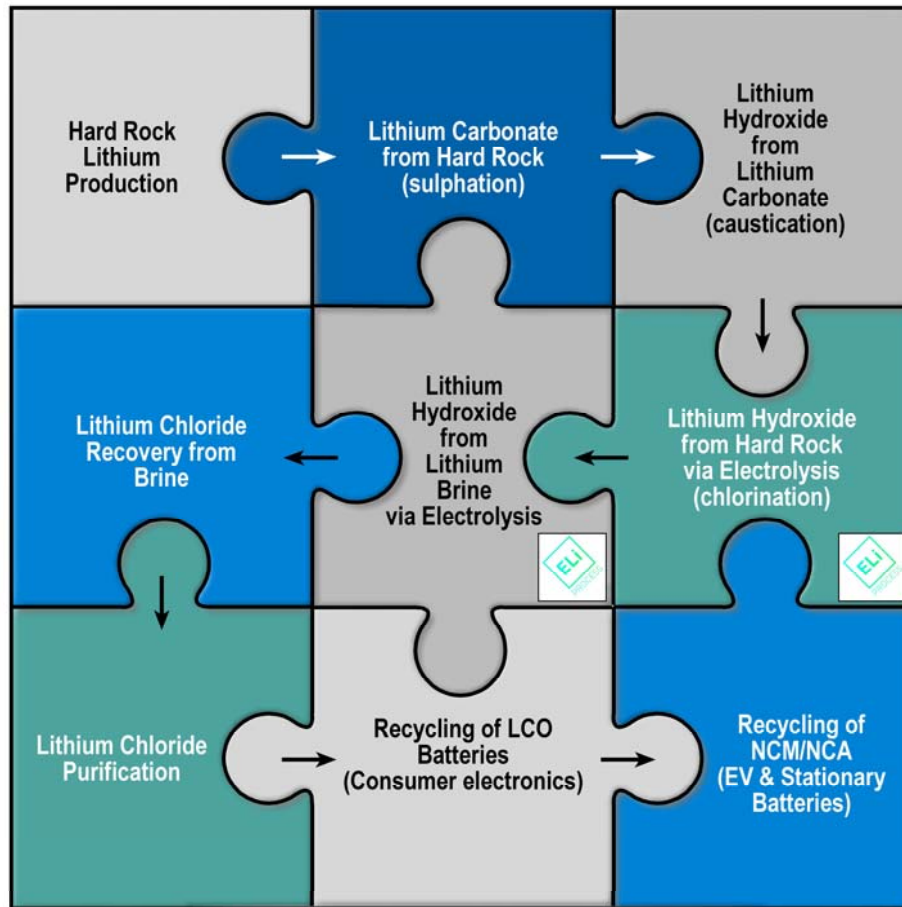
Operating Costs
US\$4.45/lb Co (US\$10k/t)

Spot price
US\$17.80/lb Co (US\$39.5k/t)

Capex
US\$4.5M

Recommendation to proceed to
semi-pilot plant

Genesis of our Lithium Downstreaming Activities



Commercialise Mt Marion ✓

Evaluated Conventional Downstream Processing ✓

Co-developed, Evaluated, Patented New ELi® Process ✓

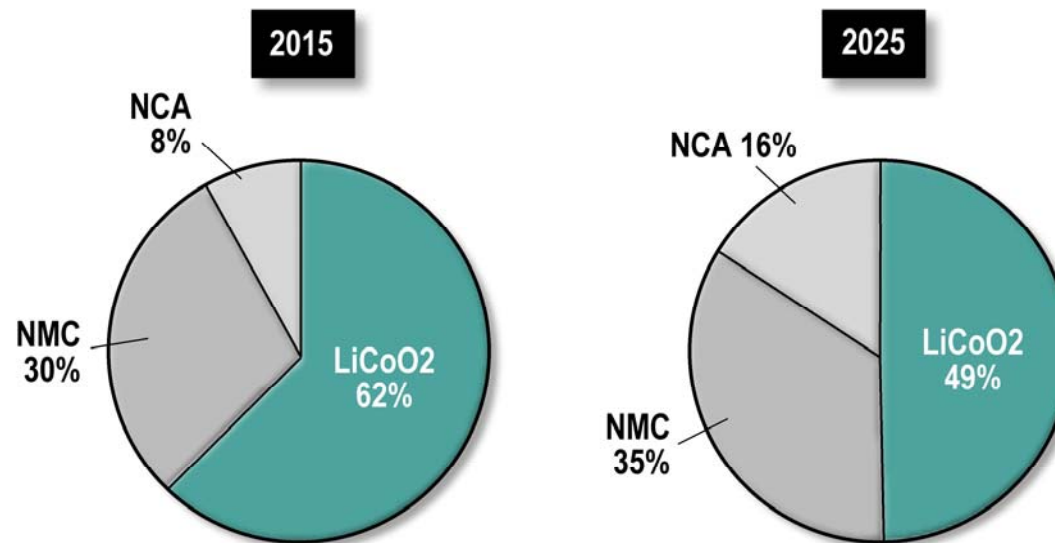
Co-developed, Evaluated, Patent Pending ELi® for brines ✓

Testing and Evaluating Lithium-Ion Battery Recycling ✓

Primary Target – Cobalt then Lithium

Secondary Target – Lithium, Nickel, Copper, Aluminium from EV/Stationary NCM/NCA Batteries

NMC and NCA batteries will overtake LCO batteries as the leading consumer of cobalt in the next ten years

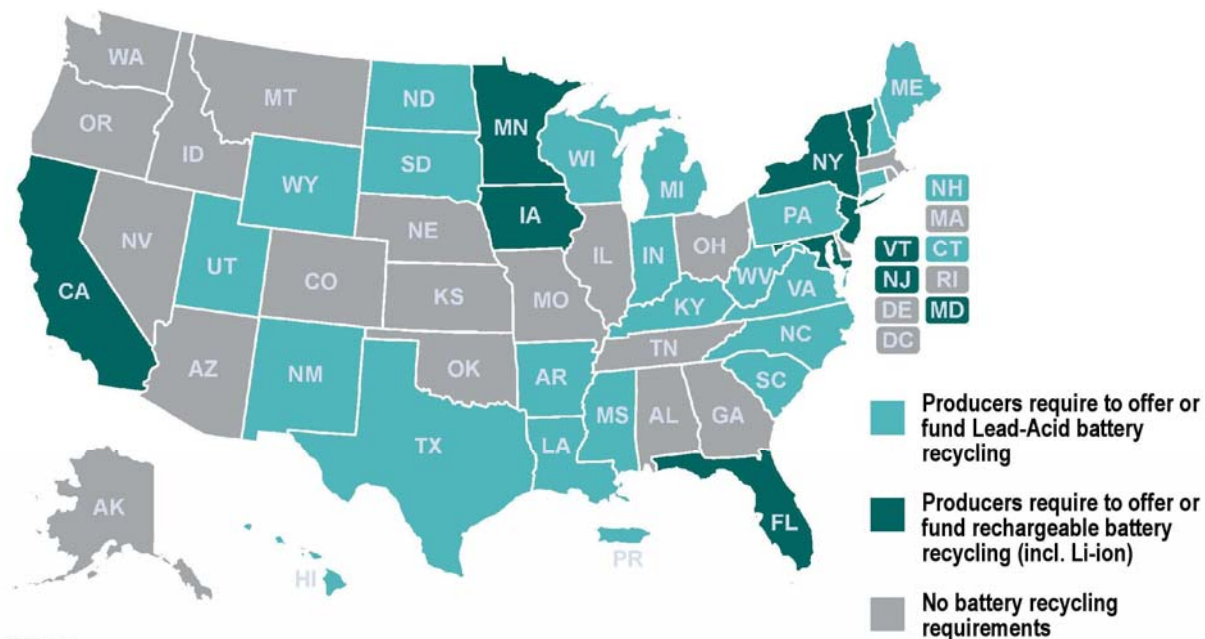


Source: CRU International Limited (2016)

Sustainability

Recycling is becoming mandatory in the developed world

USA Battery Recycling Laws State by State



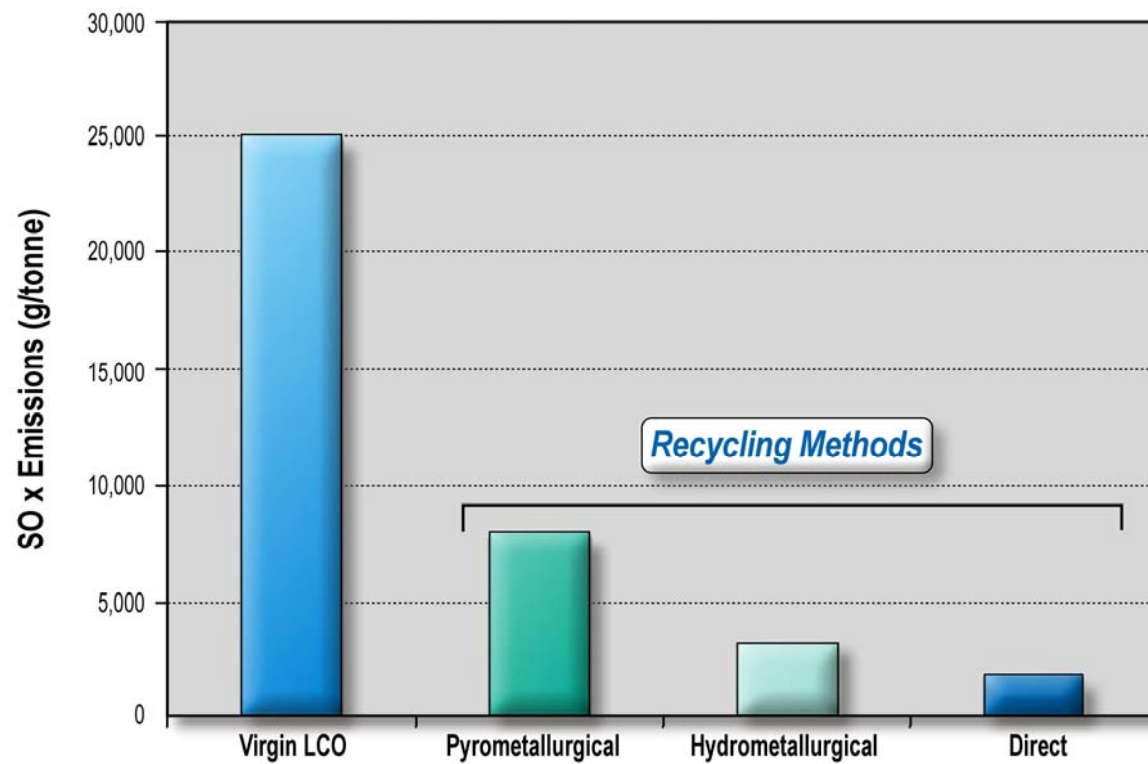
Source: Call2Recycle

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Sustainability

Recycling Metals Made From Sulphide Ores Reduces Cathode Environment Burden



Source: Linda Gaines. Transport Systems Analyst. Argonne National Laboratory. May 2016

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Ethical Supply

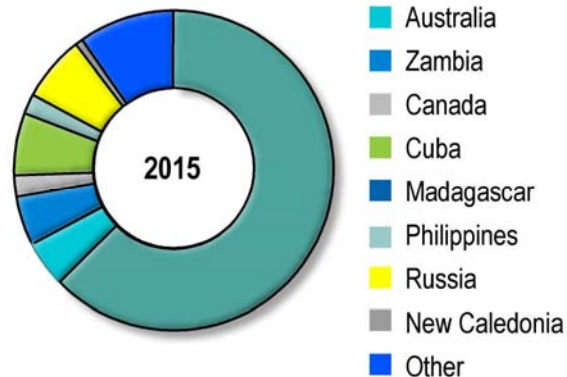
The Washington Post

The Switch

Tech giants pledge to keep children out of cobalt mines that supply smartphone and electric-car batteries

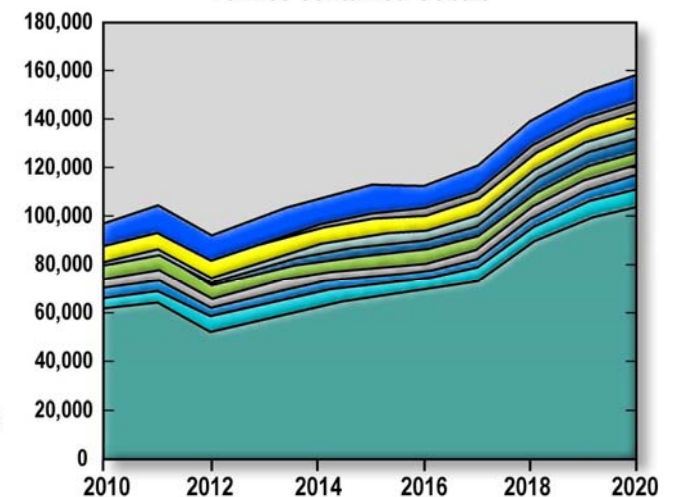
The DRC is the dominant force and will grow increasingly important throughout the forecast period

Global mine production
- 113,017
tonnes contained cobalt



Source: CRU International Limited (2016)

Tonnes contained Cobalt

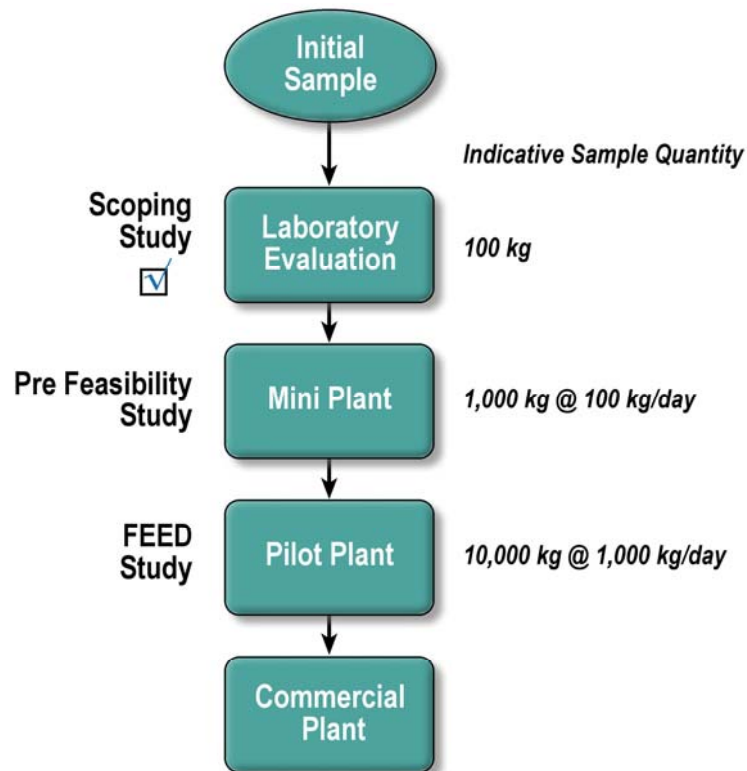


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Commercialisation Plan

Project Development Phasing



Accelerate test work and engineering studies

Obtain feed/offtake partners in parallel with above.

Obtain site/approvals in parallel with

- Design/procurement 16 weeks
- Fabrication/construction 26 weeks
- Commissioning 6 weeks