Agenda

1. Global exploration activity and outlook
2. Battery materials - Lithium
3. Battery materials - Cobalt
4. Battery materials - Nickel
Global Exploration Activity and Outlook

1,651 companies with budgets budgeted for 2018, growth of 19%

-53% decline in budgets from 2012 to 2018

Source: S&P Global Market Intelligence; as of February 27, 2019.
In 2018 gold accounted for US$5 billion of budgets whilst copper accounted for US$2 billion.
Global Exploration Activity and Outlook

4 year high for juniors’ share of exploration in 2018

35% increase in junior budgets in 2018

>50% majors accounted for more than half of spending last three years

Source: S&P Global Market Intelligence; as of February 27 2019.
Global Exploration Activity and Outlook

Mining sector financings turned a corner in early 2016…

But currently very challenging

Source: S&P Global Market Intelligence; as of February 27 2019.
Global Exploration Activity and Outlook

Active projects remained strong through January

Number of drill holes also high

Source: S&P Global Market Intelligence; as of February 27 2019

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Global Exploration Activity and Outlook

US$1.39 trillion mining industry market cap

-16% drop in value since January 2018

75-100 Activity levels since early 2017

Source: S&P Global Market Intelligence; as of February 27 2019.
Global Exploration Activity and Outlook

9 new copper deposits in 2018

94% of new copper hosted in Timok Lower zone and Alpala

25% of new deposits in Australia host only 5% of total copper since 2008

Global Exploration Activity and Outlook

Major copper discoveries lacking since 2008

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Copper in major discoveries (Mt)

<table>
<thead>
<tr>
<th>Year</th>
<th>Major discoveries</th>
<th>Projected major discoveries</th>
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<tbody>
<tr>
<td>1990</td>
<td>120</td>
<td>80</td>
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<td>1992</td>
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<tr>
<td>2016</td>
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Past Production

Projects

Operating/planned mines

...and many older discoveries already producing

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Copper in major discoveries (Mt)

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<th>Projects</th>
<th>Operating/planned mines</th>
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Source: S&P Global Market Intelligence; as of February 27 2019
Global Exploration Activity and Outlook

Equity market support needed to sustain high drilling levels

Producers key to 2019 exploration budgets

5-10% increase in 2019 budgets

Source: S&P Global Market Intelligence; as of February 27 2019.
Lithium ion battery technology currently dominated by cathode chemistries which use nickel and cobalt.

<table>
<thead>
<tr>
<th>Cathode</th>
<th>Current</th>
<th>Being deployed</th>
<th>Next generation</th>
<th>Advanced</th>
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<td>NMC111</td>
<td>N0.8C0.15A0.05</td>
<td>NMC622 N0.9C0.05A0.05</td>
<td>NMC811</td>
<td>Li metal HVS</td>
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<tr>
<td>Graphite</td>
<td>Carbon alloys</td>
<td>Graphite + 5-10% silicon</td>
<td>Graphite/Silicon composite</td>
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<tr>
<td>Organic solvent + LiPF6 salts</td>
<td>Gel Polymer</td>
<td>5V electrolyte</td>
<td>Polymer</td>
<td></td>
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</tbody>
</table>

Source: IEA, Meeus (2018); Nationale Plattform Elektromobilität (2016); NEDO (2018); Howell (2016); Pillot (2017), S&P Global Market Intelligence; as of March 11 2019.
Lithium demand from battery manufacturing has increased by almost 500% since 2007.

In 2017 global new EV sales were over 1 million, up from less than 1,000 in 2007.

Battery materials - Lithium

**Long term contracts**

Most lithium products are brought on long term contracts and prices are specific to individual products.

**US$21,500/tonne**

CIF Asia price hit peak in October 2017 and has since dropped back towards US$13,000/tonne.

**25%**

YOY increase in 2018 carbonate price from Atacama operations despite 4% drop in CIF Asia price.

Battery materials - Lithium

- 68% of global lithium resource base found in brine deposits
- 58% of 2018 lithium production from pegmatite deposits in Australia
- Bolivia has the biggest resource base globally but no commercial production

Lithium projects produce a number of different end products:

- Brine
- Pegmatite
- Concentrate
  - Lithium Carbonate
  - Lithium Chloride
  - Lithium Hydroxide

Lithium Hydroxide premium averaged US$2,500 in 2018 similar to levels seen in 2011-2014.

Increasing lithium prices have led to global lithium exploration budgets increasing by 58%.

In 2018 exploration budgets increased most in Argentina while Chile and Australia saw drops.

Battery materials - Lithium

US$2,415/LCE
average cost of pegmatite operations in 2019, 56% lower than average brine cost

30%
of total cash costs for brine producers is reagents

US$230M
increase in royalties at Atacama operations from 2017

Battery materials - Lithium

**US$9,135/LCE**
average margin of brine operations in 2019, double that of pegmatite operations

**44%**
average price received for LCE in concentrate compared to carbonate

**197%**
higher margins for lithium hydroxide produced from Greenbushes concentrate

Battery materials - Lithium

Chemistry of brines is the most important factor influencing costs

0.007% maximum Mg content in high purity lithium carbonate

0.05% maximum SO$_4^-$ content in high purity lithium carbonate

Mined lithium supply to reach over 1.2MT by 2022

By 2023 spodumene will account for 63% of production down from 67% in 2018

Battery materials - Cobalt

Price peaked at over US$90,000/tonne in 2018 but has now dropped back towards US$30,000/tonne

...price increases have led to a three fold increase in exploration budgets for cobalt

Battery materials - Cobalt

54% forecast 2019 net revenue generated from cobalt at DRC operations

US$8.5/lb
DRC operations are on average lower cost than those in other countries

High margins, long life
DRC operations likely to continue to dominate cobalt supply in future

Battery materials - Cobalt

2.17MT contained cobalt in reserves in DRC

63% of 2018 global cobalt production from DRC

0.8% average grade of reserves in DRC vs 0.08% from other major producers

Batteries only currently account for 3% of Nickel use, this is forecast to increase to 8% by 2021.

Price of nickel still driven by stainless steel, less dramatic changes compared with lithium and cobalt.

Battery materials - Nickel

Nickel reserves in laterite deposits over double that found in sulfide deposits

Nickel exploration budgets up over 20% in 2018 but still well down from 2008 peak

Battery materials - Nickel

Class 1 Nickel is the only form that is suitable for battery manufacturing – this is primarily sourced from sulfide and limonite deposits.

Battery materials - Nickel

US$3.1/lb average cash cost of sulfide operations, lowest cost type of nickel operation

47% forecast 2019 net revenue generated from nickel at sulfide operations

Hydrometallurgy capital intensive and have proved difficult to operate efficiently

Battery materials - Nickel

Nickel production expected to increase 1.3% by 2021

....biggest increase is expected from hydrometallurgical laterite projects

1. Exploration budgets are increasing but copper discovery rates remain low

2. Lithium brine operations are higher cost than hard rock mines but have higher margins

3. Cobalt production will continue to be dominated by mines in the DRC

4. Nickel demand from batteries will increase but remain relatively small compared to global supply