Canaccord Genuity Capital Markets

Company Update

Cobalt Blue Holdings

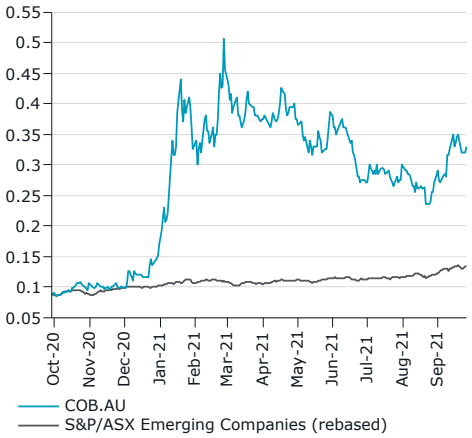
EV Materials

27 September 2021

Rating	Price Target
SPECULATIVE BUY *unchanged*	**A$0.65** *unchanged*
COB-ASX	Price **A$0.33**

Market Data

52-Week Range (A$) :	0.08 - 0.52
Market Cap (A$M) :	98.5
Shares Out. (M) :	298.5
Dividend /Shr (A$) :	0.00
Dividend Yield (%) :	0.0
Net Debt (Cash) (A$M) :	(9.9)
Enterprise Value (A$M) :	88.6
NAV /Shr (A$) :	0.65
Net Cash (A$M) :	9.9
P/NAV (x) (A$) :	0.51



Source: FactSet

Priced as of close of business 27 September 2021

Canaccord Genuity (Australia) Limited has received a fee as Joint Lead Manager to the Cobalt Blue Holdings Limited Capital Raising announced 10 June 2021.

Timothy Hoff | Analyst | Canaccord Genuity (Australia) Ltd. | THoff@cgf.com | +61.2.9263.2745
Tyson Kestel | Associate Analyst | Canaccord Genuity (Australia) Ltd. | TKestel@cgf.com | 08 9263 1156
Reg Spencer | Analyst | Canaccord Genuity (Australia) Ltd. | rspencer@cgf.com | +61.2.9263.2701

Capital efficient cobalt

The following is an excerpt from our Cobalt Market, Miner, Refiner report.

Cobalt Blue is developing the Broken Hill Cobalt Project (BHCP) in western NSW, Australia. The BHCP presents as a cobalt-focussed project with a low capital intensity versus industry comps, while at the same time delivering a meaningful volume of cobalt into the market (3.5ktpa) over a long project life (17 years). COB is currently piloting its process in Broken Hill, before running a demonstration plant in 2022 and expects to make an FID on the project in late 2022/early 2023. Its processing flowsheet is somewhat unique; however, we believe there is embedded value in the IP, which may present further commercial opportunities. **We value the stock at $0.65/share and rate it a SPECULATIVE BUY.**

Process delivers benefit of by-products

Cobalt mineralisation at the BHCP is associated with pyrite (FeS2) hosted within the deposit. As with refractory gold deposits, the pyrite needs to be oxidised to efficiently extract cobalt and COB's process aims to reduce complexity and capex, while lifting recoveries and capturing revenue streams from both cobalt and elemental sulphur. The process involves concentrating ore before calcining under inert conditions. This produces a readily leachable pyrrhotite (Fe7S8) from which cobalt can be leached and elemental sulphur produced as a by-product. While unique, the process builds upon sound metallurgical foundations of reducing material volume and upgrading cobalt grade prior to the higher cost processes of roasting and leaching. The process has been trialled on other pyrite concentrates, suggesting a robust process.

Long-life operations with leverage to cobalt pricing

We forecast COB producing an average 3.3ktpa Co over the LOM at an AISC of US$13.5/lb Co (including sulphur/nickel by-product credits). COB released a PFS in 2018, updated its estimates in 2020 and intends to release a Feasibility Study in 2022. With capex of A$560m (CGe A$620m), the BHCP screens as a low capital intensity project at US$120m/ktpa versus industry comps of US$437m/ktpa in a stable mining jurisdiction. The current resource underpins a +20-year mine life and with LG Energy Systems (LGES) as a key battery supply chain partner, we believe the project has the right team and backing to deliver the BHCP.

$0.65 price target heavily risked for a project leveraged to Co prices

Our SPECULATIVE BUY recommendation and A$0.65 price target is based on our one-year forward NAV risked at 35% (unrisked A$1.80/share). We use long-run cobalt pricing of US$40/lb, AUD/USD 0.75 and a discount rate of 10%, which is consistent amongst our cobalt coverage. COB has strong leverage to cobalt pricing with a 10% lift in our baseline pricing translating to a 30% lift in price target. We assume funding is met with a 60:40 debt:equity split with funding completed in mid-2023. Our SPECULATIVE BUY rating and risking takes into account project stage, execution risks and funding requirements.

Cobalt: driven by battery demand to the point of deficit

The cobalt market is relatively small (128kt in 2020) but highly topical when considering the lithium-ion battery supply chain. Supply is dominated by the Democratic Republic of Congo (~70% of global supply), with the metal largely mined as a by-product of copper. Demand has traditionally been driven by portable device batteries (LCO cathodes) and alloys. However, we expect this to rapidly shift to demand linked to EVs, consuming 32% of cobalt by 2025 and 50% by 2030, doubling demand to 272kt despite thrifting and a shift to low/no cobalt cathodes. We expect the market to be balanced on a knife's edge until 2024 when it enters a structural deficit.

Cobalt Blue is hosting an investor presentation on Wednesday 6 October at 10am AEST. Registration link

Cobalt supply and demand

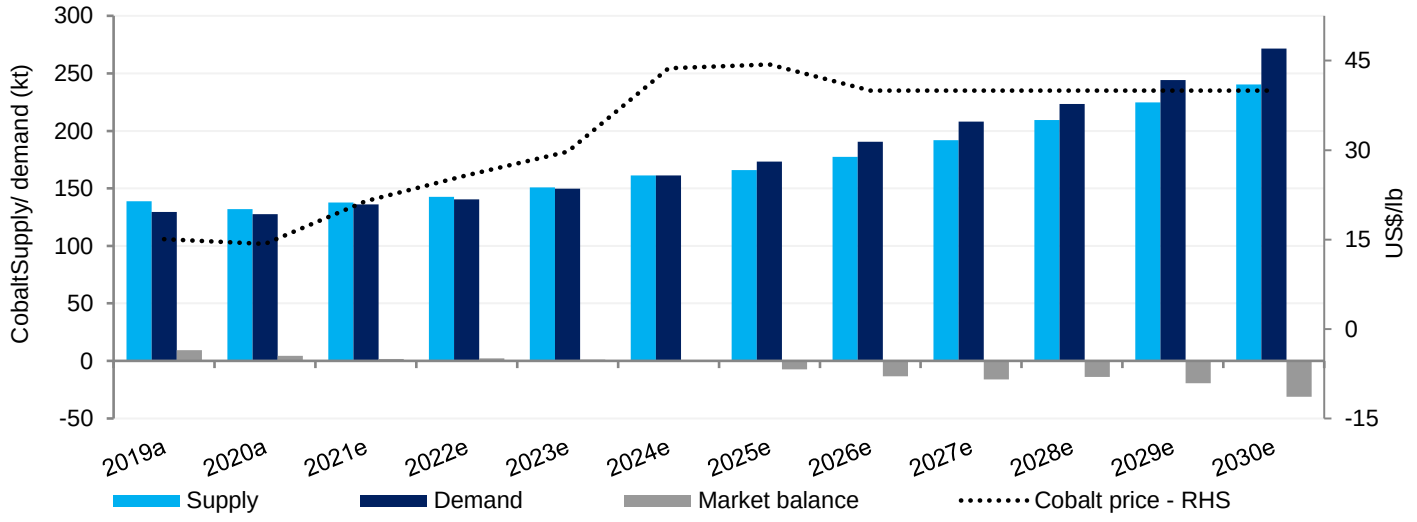
Despite substitution, EVs to become >50% of cobalt demand

The cobalt market is a relatively small market of 128ktpa and is dominated by supply from the DRC and demand from its use in batteries. Traditionally this has been in the form of lithium cobalt oxide (LCO) cathodes; however, the rapid adoption of EVs and the use of nickel manganese cobalt (NMC) cathodes is set to push the market into deficit, in our view. We anticipate the total market growing at 8% GAGR until 2030, more-than-doubling in size from 128kt in 2020 to 272k in 2030, with a 31kt deficit.

Cobalt demand from consumption in lithium-ion batteries (LIBs) (ex-traditional battery market) has grown 102% over the last three years (2017-20). Behind this is the use of NMC cathode chemistries in the EV supply chain. We anticipate cobalt consumption in LiBs to rise from 36kt in 2021 (26% of the 136kt cobalt market) to 59kt in 2025 (34% of total market) and 137kt in 2030 (50% of total market) despite thrifting and movement to high nickel, low cobalt cathode chemistries. Supply of cobalt is largely as a by-product of copper and nickel production, with few pure play cobalt sources. Supply is dominated by the DRC as a copper by-product, which supplies 70% of the global market and we expect the DRC to maintain its market position out to 2025. Refining is dominated by China with 70% of global capacity. Chinese dominance in refining will likely continue over the next 10 years as its investment in Indonesian HPAL and in the DRC provide feedstock for Chinese refiners.

We anticipate the market existing on a knife's edge over the next three years with minor surpluses to 2023 (1-2kt). From 2024 the market enters a deficit which we don't forecast closing without significant investment or demand destruction from high prices.

Figure 1: Summary of Canaccord supply and demand model



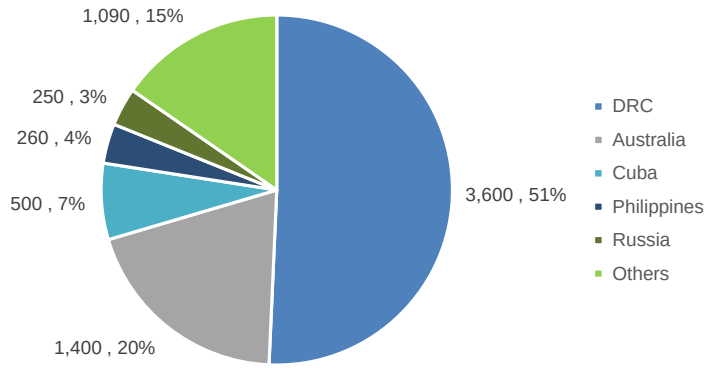
Source: Company reports, Canaccord Genuity estimates

Supply – no disconnect from DRC and China, not now, not in 2030

Cobalt supply is predominantly as a by-product of copper production (60%), with other sources being from nickel laterites (15%), nickel/copper sulphides (11%) and other cobalt ores (13%). Globally, 86% of reserves are concentrated in the DRC, Australia and Cuba. In general, most nickel laterites will host some level of cobalt (may or may not be economic); however, it does not follow that most copper or nickel sulphide deposits will host payable levels of cobalt.

The DRC is the world's largest producer of cobalt, supplying ~70% of raw cobalt units and hosts 51% of global reserves. The DRC's dominance of cobalt supply is likely to remain given the high-grade nature of its deposits (~0.5% Co) vs global deposits, a supportive copper price environment stimulating by-product production and having an established production base. However, there are limitations on supply out of the DRC, with social and governance risks crimping future investment and the lack of infrastructure investment handicapping supply expansion. The world's largest cobalt mines (Kamoto, Tenke, Mutanda) may also reach the limits of production capacity and all based in the DRC. Another source of cobalt from the DRC is via artisanal mining, some of which is reportedly extracted under child/slave labour conditions. While the percentage of this is likely to be relatively small, it can be an issue for ESG conscious consumers.

Figure 2: Reserves by country (kt)



Source: USGS, Company reports, Canaccord Genuity estimates

Key cobalt feedstocks for the refining supply chain includes concentrated ores, hydroxide (mixed and as cobalt hydroxide), cobalt briquettes, cobalt cathode and cobalt carbonate, to name a few. Refining capacity is dominated by China however due to it being a niche commodity and small-scale in nature there is a geographically diversified refining base.

Future supply

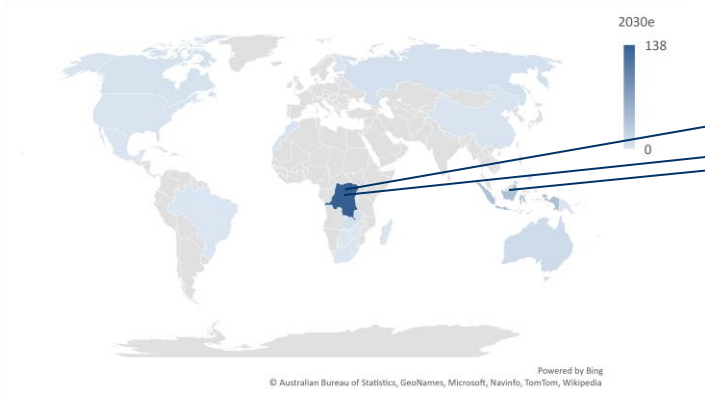
We forecast supply growth in cobalt to come from several sources over the near, medium and long term.

In the *near term* (2021-24), the DRC will likely grow its market share, increasing supply from 107kt in 2021 to 116kt in 2025, however post 2025 growth may only come with improved economics from higher pricing.

The next largest source of growth is likely to come from Indonesian HPAL projects. We expect these to ramp up from 1kt in 2021 to 12kt by 2025 and 36kt by 2030. There is significant risk to these projects, in our view, in terms of timing (delivery and ramp-up of these projects is a new skill for the Chinese operators), operations (these plants plan to utilise deep sea tailings which has been an issue of debate) and environmental footprint (most projects in Indonesia will be powered by coal fired generations, with large CO_2 footprints).

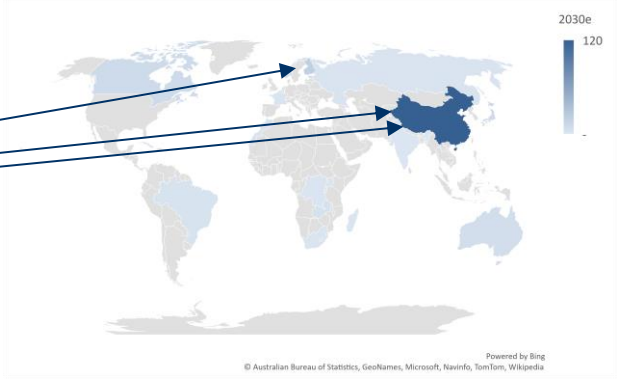
These HPAL operations are also targeting nickel units and come with a significant capital cost. On a cobalt capital intensity basis, we estimate these projects to cost US$651m/t cobalt per year. These units help the market balance but are unlikely to be a viable solution to sourcing large-scale cobalt. The other issue regarding Indonesian HPAL is that the investment is largely being made by Chinese companies and these cobalt units are likely to be utilised by the Chinese supply chain. We estimate ex-China demand for cobalt from EV's to be 90kt by 2030, which would consume 100% of ex-China refined material and almost all recycled material. In our view, it is unlikely the world can disconnect from a Chinese refining supply chain, which has been a consistent theme amongst OEMs over the last two years.

Figure 3: Cobalt mined supply (kt) by country (2030E)



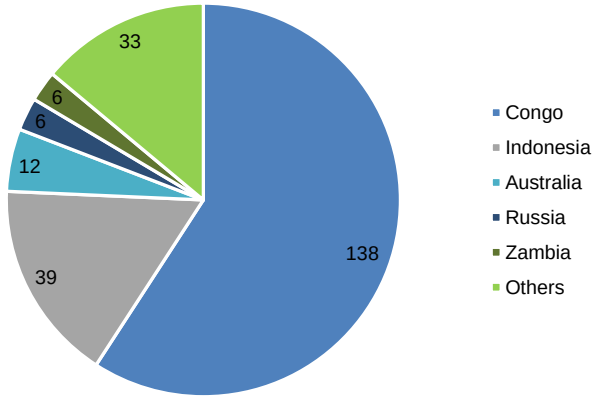
Source: Company reports, Canaccord Genuity estimates

Figure 4: Cobalt refined supply (kt) by country (2030E)



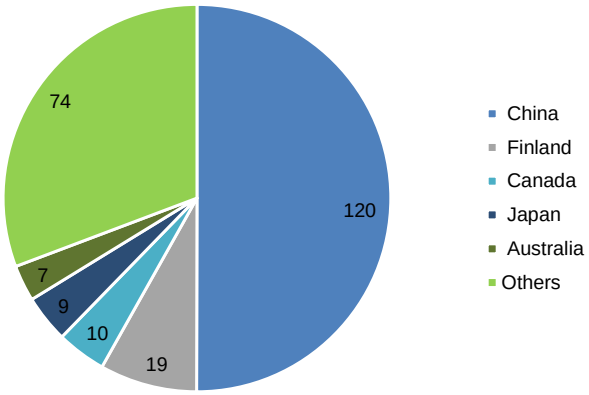
Source: Company reports, Canaccord Genuity estimates

Figure 5: Cobalt mined supply (kt) by country (2030E)



Source: Company reports, Canaccord Genuity estimates

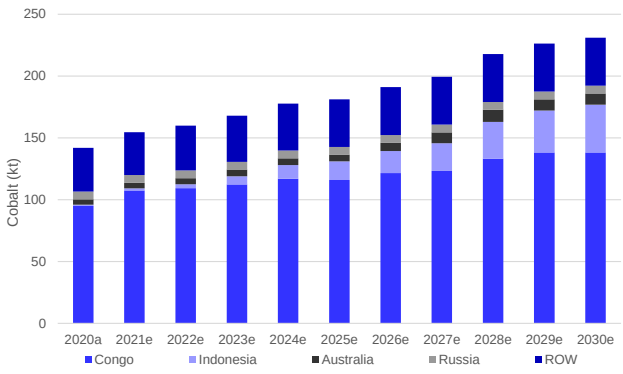
Figure 6: Cobalt refined supply (kt) by country (2030E)



Source: Company reports, Canaccord Genuity estimates

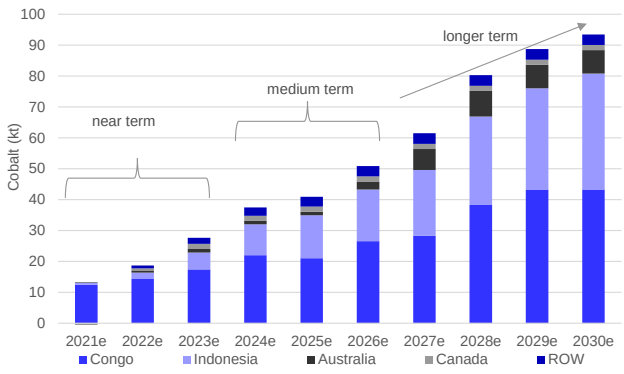
Over the *medium term* (2024-27), there are several projects that we believe will begin production. These projects are expected to produce smaller amounts of cobalt (1-5ktpa); however, they represent an ex-DRC/Indo/China supply source that can be audited and are accessible to consumers outside the current majors. This supply is required, as we believe the market moves into a structural deficit around 2024.

Figure 7: Top 5 cobalt-producing countries



Source: Company reports, SNL, Canaccord Genuity estimates

Figure 8: Growth in production from 2020



Source: Company reports, SNL, Canaccord Genuity estimates

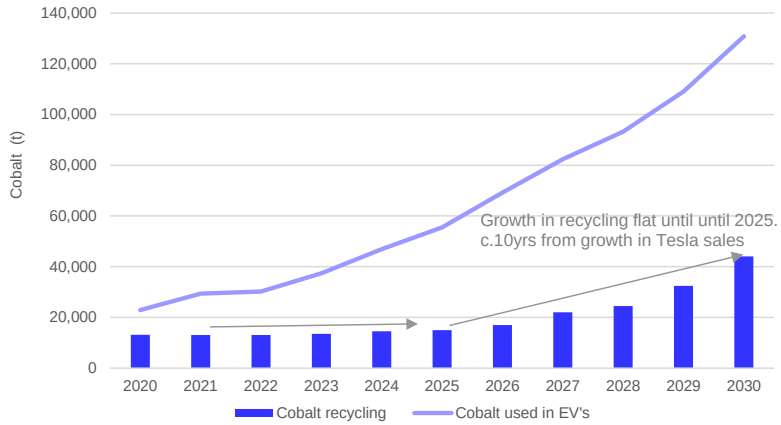
Longer term (+2027), we believe supply is likely to come from three sources: 1) improved recoveries from copper concentrates; 2) nickel laterite sources that are incentivised into the market to meet nickel demand; and 3) recycling.

Current cobalt production is largely as a by-product of copper mining and as prices rise additional efforts to improve flotation recoveries, capture cobalt from waste streams or through reprocessing of tailings are likely.

Nickel laterites should also be a focus for cobalt units based on a) the long-life nature of these deposits, and b) nickel will be the primary target, which is also required for batteries, making them an attractive battery material supplier. This comes at a cost though, with high capital intensity of US$551m/ktpa cobalt and, in general, large capex bills (usually >US$1bn).

Recycling is touted as an opportunity for cobalt units; however, we think about cobalt recycling in terms of the need to build up working capital before recycling can occur. Currently, recycling occurs on a small scale for batteries and through remelting alloys containing cobalt. EV batteries will be more amenable to recycling (larger format, scale and relative consistency in packaging). However, these auto batteries are likely to have at least a 10-year life (either in car or as battery storage as flagged by VW and Stellantis) and so even if 100% of 2020 batteries were recycled in 2030 (improbable in our view), there would still be a +10kt deficit. We assume recycling rates grow on a lagged basis and will be more significant in the 2030s.

Figure 9: Recycling lags consumption of cobalt, even towards the end of the decade with low-cobalt cathodes; recycling cannot match consumption

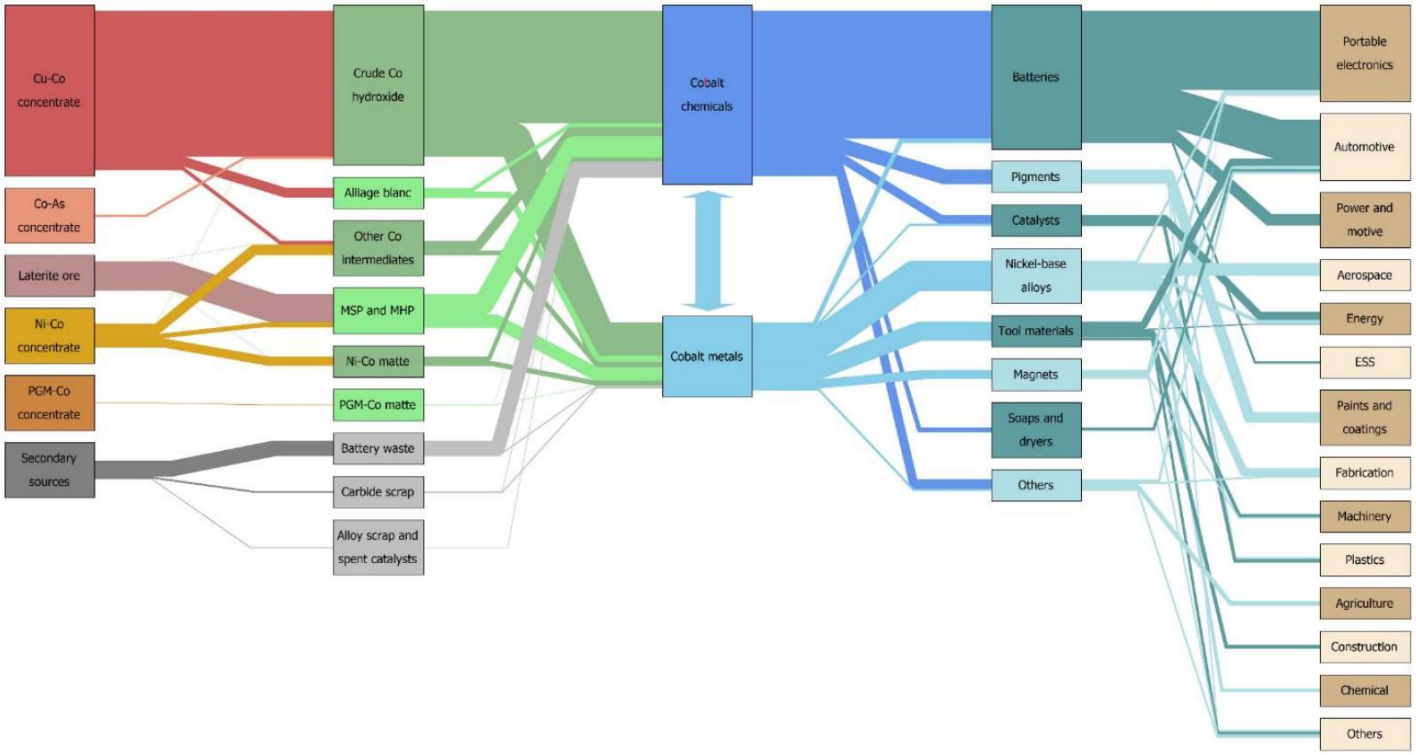


Source: Canaccord Genuity estimates

Refining

A large proportion of primary refining occurs in China (70%); however, there is a diversified refining base globally to produce cobalt products. As seen in Figure 10, the cobalt supply chain has several primary sources which are processed into an intermediate product before reaching final chemical or metal products. The key chemical path feedstock are cobalt concentrates which are then processed into cobalt hydroxide and then chemicals; or from nickel HPAL projects which produce a mixed hydroxide product (MHP) or mixed sulphate product (MSP).

Figure 10: Cobalt raw material flow sheet shows several processing steps required before end use



Source: Cobalt Institute

Once in the refining supply chain, various products are produced from cobalt powders, hydroxides, carbonates, sulphates, acetone and oxides. Each of these are used by different industries for different uses. Figure 11 below shows a map of uses and where the battery supply chain uses these products.

Figure 11: Cobalt products and end-use markets are diverse with various feedstocks able to be produced into refined products

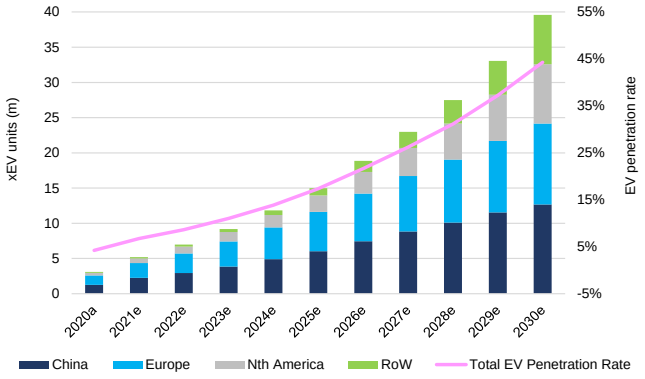
Product family		End-use market applications						
		Hard metal	Diamond tools	Catalyst	Electronics	Animal feed	Carboxylates	Pigments, glass and ceramics	Battery
Fine powders	Co fine powders	✓	✓						✓
Cobalt Chemicals	Co hydroxide			✓			✓	✓	✓
	Co carbonate			✓		✓			
	Co sulfate					✓			✓
	Co acetate			✓		✓			
	Co oxide				✓				✓

Source: Jervois Global presentation

Demand

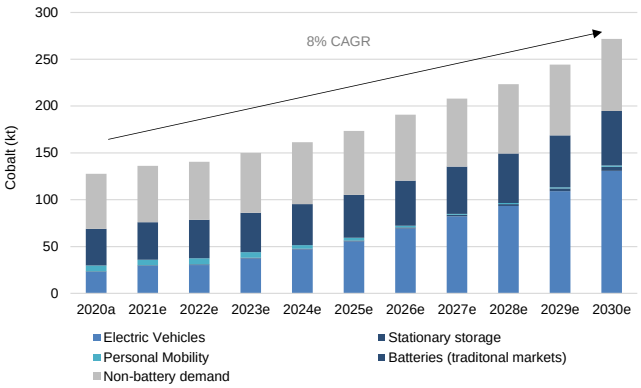
Demand for cobalt has been driven by batteries for some time; however, these have been for portable devices such as mobile phones, which make up c.40% of cobalt consumption. With the advent of EVs this has been shifting rapidly, with new growth now largely driven by batteries used in EVs. Traditional markets fall into a number of categories including superalloys (high temperature applications), hard facing (tool bits), ceramics & pigments (colour), catalysts (assist with oxidation) and permanent magnets. We expect demand in 2021 to be 136kt, rising 100% by 2030 to 272kt.

Figure 12: We anticipate EV sales lifting to c.40m units by 2030. This drives consumption of LiB raw materials



Source: Company reports, Canaccord Genuity estimates

Figure 13: Cobalt demand growing by 8% CAGR out to 2030 but we expect to see an acceleration from 2025

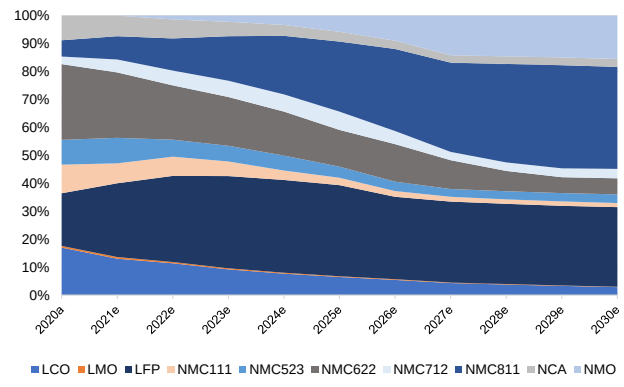


Source: Company reports, Canaccord Genuity estimates

Battery consumption

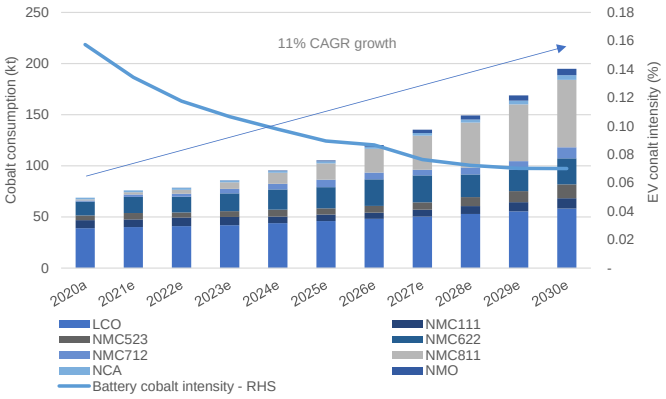
Traditionally batteries which used cobalt had LCO cathodes – these batteries have a high energy density and so helped give rise to portable devices such as mobile phones, laptop computers and tablets. These markets are now largely considered to be saturated; however, we still anticipate 3% p.a. growth in demand from mobile phones and 5% p.a. growth in other applications, largely driven by the Internet Of Things and increased use of wearable technology. The key driver of cobalt consumption over the next decade is through its use in electric vehicles via the use of NMC and nickel cobalt aluminium (NCA) cathode chemistries.

Figure 14: We believe NCM 811, LFP and high NiMn batteries will dominate the chemistry split by the end of 2030



Source: RhoMotion, Canaccord Genuity estimates

Figure 15: We estimate cobalt consumed in batteries to increase at 11% CAGR despite -8% p.a. reduction in cobalt intensity over the next decade



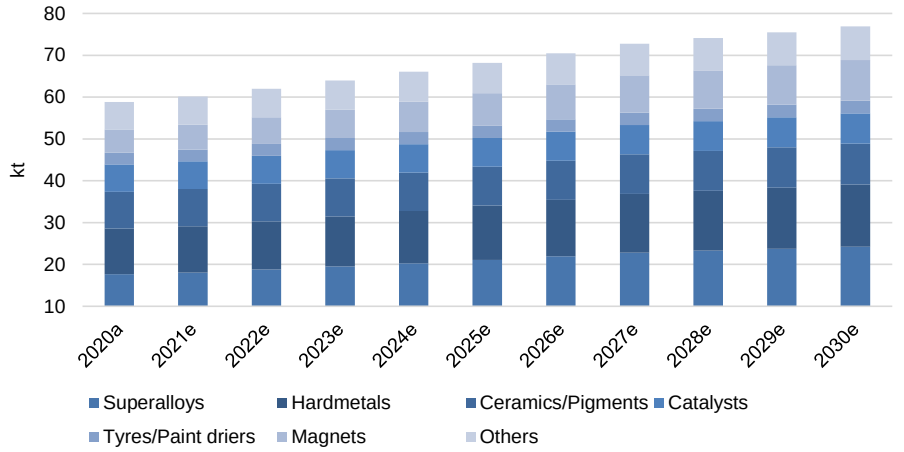
Source: RhoMotion, Canaccord Genuity estimates

Cobalt is used in these chemistries to stabilise the structure of the cathode during discharge and recharge cycles. Reducing cobalt content shortens the functional capacity and life of the battery. However, this is being addressed by the industry through manufacturing techniques, alternative chemistries (high nickel/manganese cathodes) and advanced separators and electrolytes. The migration towards lower intensity cobalt cathodes is also occurring within NMC formulations, which have migrated from 111 (equal nickel, manganese and cobalt) to 523, 622, 811 and even discussions on 9,0.5,0.5. We forecast batteries becoming less cobalt dense in the future; however, this ultimately is offset by overall demand from battery growth. We expect cobalt intensity to fall from c.0.15kg/kwh in 2020 towards 0.06kg/kwh by 2030. This is driven by our assumed adoption of NMC 811, Ni-Mn and LFP cathodes as the primary beneficiaries from the shift in chemistries (Figure 16).

Non-battery consumption

Non-battery consumption is dominated by superalloys and hard metal coatings. Aerospace applications tends to be the largest consumer of metal and much of it is recycled at the end of the functional life. In some circumstances agreements are in place for those parts to be returned to the OEM for recycling. Ceramics and pigments (used for blue tint), catalysts and paint dryer are some of the largest chemical uses of cobalt (ex-battery).

Figure 16: We expect non-battery demand for cobalt to grow at a CAGR of 3% over 10 years

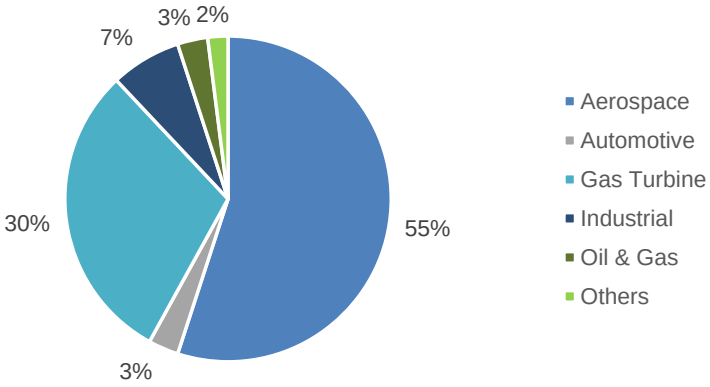


Source: Company reports, Canaccord Genuity estimates based on multiple sources

Superalloys

Superalloys are designed to withstand high temperatures, usually >540°c and are highly resistant to corrosion or oxidation. The three common forms of superalloys are cobalt based, nickel based, and iron based. Cobalt alloy has a higher meting point compared to nickel and iron alloys. It also has superior corrosion resistance and thermal fatigue resistance. Superalloys are mainly used in aerospace, power and gas turbines, oil and gas and automotive industries.

Figure 17: Cobalt based superalloy applications



Source: Cobalt Institute, Canaccord estimates

Demand from the aerospace industry (Commercial, Business, Military and Rotary Wing) accounts for 55% of total demand of cobalt based superalloys. Applications in aerospace industry includes gas turbine engine components such as disks, bolts, blades, shafts, combustors and afterburners.

We expect the cobalt demand for superalloys to record ~3% CAGR between 2021-30E. This is mainly supported by the growth in military spending and recovery of commercial aerospace post pandemic. Despite the COVID-19 pandemic, the global military expenditure rose to $1.98 trillion in 2020, an increase of 2.6% YoY. Cobalt's use in defence demonstrates why it is usually considered a critical mineral and the need for secure supply lines.

Hard metals

Cemented carbides, also known as hard metals, are alloys that consist of hard carbide materials bonded together by a metallic binder such as cobalt. Cobalt is used as the binder due to its high meting point (1493°C) and high temperature strength. Hard metals are used in cutting tools, dies, jigs and other applications in a wide range of industries such as automotive, engineering, aerospace, mining and energy. We expect cobalt demand for hard metals to remain stable and record ~3% CAGR between 2021-30.

Figure 18: Magnetic resonance imaging

Source: Cobalt institute

Figure 19: Tungsten Carbide tools

Source: Cobalt institute

Magnets

Cobalt is present in various types of magnets, which are used in applications such as wind turbines, hard disk drives, motors, sensors, actuators, magnetic resonance imaging etc. Cobalt is known for its high curie point (the temp at which a material loses its permanent magnetism). The cobalt content in Sm-Co and Al-Ni-Co permanent magnets is ~30%. In addition to its use in Sm-Co and Al-Ni-Co magnets, cobalt is also used in Nd-Fe-B magnets to improve stability and corrosion resistance, however the cobalt content is much lower ~1-5%. We expect cobalt demand for magnets to record ~5.1% CAGR between 2021-30.

Catalysts

Cobalt is used as a catalyst in desulphurisation, synthesis of polyester precursors and hydroformylation. In desulphurisation, cobalt is used to remove sulphur from natural gas and other refined petroleum products. It is also used in the synthesis of terepthalic acid and di-methylterephthalate, which are mainly used as precursors in the production of polyester. Hydroformylation produces aldehydes from alkenes using a cobalt catalyst. We expect cobalt demand for catalysts to record ~1% CAGR between 2021-30.

Tyres/Paint driers

Cobalt is the most widely used surface drier. It is used in paint driers to speed up oil oxidation and make the paint film more stable and resistant. We expect cobalt demand from this sector to record ~1% CAGR between 2021-30.

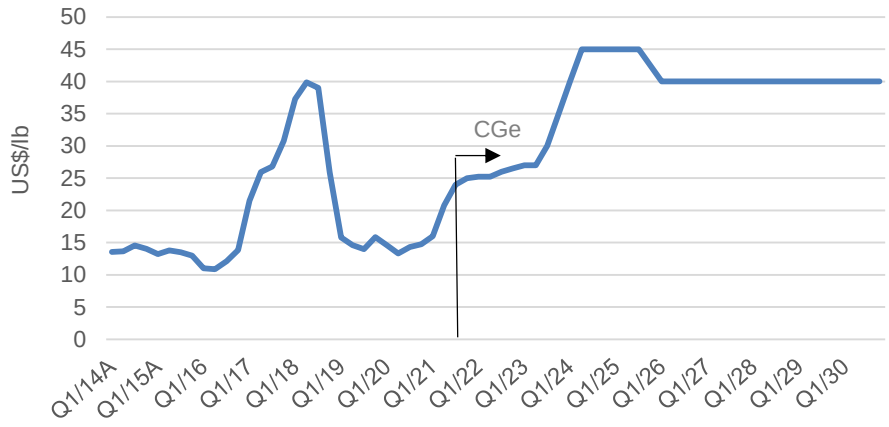
Ceramics and pigments

Cobalt is used in making the pigments for colourants. The cobalt pigments are used in the decoration of ceramics. It also can be added to glass as a colour or as a decolouriser. We expect cobalt demand from this sector to record ~1% CAGR between 2021-30.

Pricing

We set pricing broadly in line with how we see the market responding to a deficit that emerges from 2024. We forecast prices rising beyond the previous peak of US$42.52/lb. and set long term pricing at US$40/lb. As there are few cobalt specific deposits, we believe this price will elicit some level of supply response either through artisanal sources, recycling of hard metals, or improved economics for nickel/cobalt or copper/cobalt projects. It will also likely result in demand destruction in the alloy and chemical markets. As we have seen in lithium markets (and other small-scale markets) as the supply demand balance tightens pricing can react quickly and the supply response can take years. With our expected 31kt deficit in 2030, we estimate US$4-14bn of investment is needed to deliver additional tonnes and balance the market.

Figure 20: Cobalt pricing spiking from 2024 as the market enters a deficit



Source: FactSet, Canaccord Genuity estimates

Figure 21: Summary of Canaccord supply and demand model

Canaccord Global Lithium Supply/Demand Model

Global Mined Supply by Country

Country	2019a	2020a	2021e	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	2030e
Congo	96.6	94.9	107.4	109.3	112.4	117.0	116.0	121.5	123.2	133.2	138.2	138.2
% growth	*8%*	*-2%*	*13%*	*2%*	*3%*	*4%*	*-1%*	*5%*	*1%*	*8%*	*4%*	*0%*
Indonesia	1.1	1.1	1.7	3.2	6.6	11.1	15.0	17.8	22.4	29.7	33.9	38.6
% growth	*3%*	*4%*	*55%*	*82%*	*108%*	*68%*	*36%*	*19%*	*26%*	*32%*	*14%*	*14%*
Australia	4.5	4.3	4.5	5.0	5.4	5.4	5.4	6.9	11.1	12.6	11.9	11.9
% growth	*19%*	*-5%*	*5%*	*10%*	*9%*	*0%*	*0%*	*27%*	*61%*	*14%*	*-6%*	*0%*
Russia	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
% growth	*3%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
China	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
% growth	*-9%*	*-14%*	*0%*	*0%*	*-42%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
New Caledonia	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
% growth	*-14%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Cuba	5.4	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
% growth	*-5%*	*0%*	*-1%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Canada	2.3	2.9	2.2	3.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
% growth	*-54%*	*26%*	*-22%*	*61%*	*26%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Philippines	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
% growth	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Zambia	4.9	5.4	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
% growth	*0%*	*10%*	*9%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Madagascar	3.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
% growth	*0%*	*-73%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Papua New Guinea	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
% growth	*-35%*	*25%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Others	8.6	8.0	7.5	7.8	7.9	8.6	9.1	9.3	9.3	9.3	9.3	9.3
% growth	*-1%*	*-7%*	*-6%*	*3%*	*2%*	*9%*	*6%*	*2%*	*1%*	*0%*	*0%*	*0%*
Total (kt)	**145**	**142**	**155**	**160**	**168**	**178**	**181**	**191**	**202**	**221**	**229**	**234**
% growth	*2%*	*-2%*	*9%*	*3%*	*5%*	*6%*	*2%*	*6%*	*6%*	*9%*	*4%*	*2%*

Global Refined Supply by Country

Country	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
China	55.0	56.4	66.2	73.0	79.8	87.5	91.4	96.9	100.5	110.4	115.7	119.8
% growth	*12%*	*3%*	*18%*	*10%*	*9%*	*10%*	*4%*	*6%*	*4%*	*10%*	*5%*	*4%*
Finland	19.1	18.5	17.4	16.5	16.5	16.5	14.9	15.5	16.0	17.6	19.2	19.4
% growth	*-9%*	*-3%*	*-6%*	*-5%*	*0%*	*0%*	*-9%*	*4%*	*3%*	*10%*	*9%*	*1%*
Norway	6.3	6.6	6.0	6.0	6.2	6.1	6.2	6.2	6.2	6.2	6.2	6.2
% growth	*-21%*	*5%*	*-9%*	*0%*	*3%*	*-1%*	*1%*	*0%*	*0%*	*0%*	*0%*	*0%*
Russia	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
% growth	*0%*	*6%*	*-6%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Japan	5.1	5.1	5.1	5.1	5.1	5.1	5.6	6.5	7.8	9.5	9.5	9.5
% growth	*1%*	*1%*	*0%*	*0%*	*0%*	*0%*	*9%*	*16%*	*21%*	*21%*	*0%*	*0%*
Canada	4.5	5.3	4.7	5.2	6.8	7.9	8.9	9.9	9.9	9.9	9.9	9.9
% growth	*-14%*	*19%*	*-12%*	*12%*	*31%*	*15%*	*13%*	*11%*	*0%*	*0%*	*0%*	*0%*
Belgium	5.0	5.3	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
% growth	*0%*	*6%*	*-6%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Australia	3.4	2.9	2.9	2.9	2.9	2.9	2.9	3.3	5.3	7.0	7.2	7.2
% growth	*18%*	*-15%*	*0%*	*0%*	*0%*	*0%*	*0%*	*14%*	*61%*	*31%*	*4%*	*0%*
India	4.1	3.8	3.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% growth	*7%*	*-6%*	*-16%*	*-73%*	*-100%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Zambia	2.6	4.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
% growth	*0%*	*69%*	*-23%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Others	32.3	21.8	22.2	22.9	23.5	25.1	26.0	29.1	36.1	39.0	47.0	58.5
% growth	*-14%*	*19%*	*-12%*	*12%*	*31%*	*15%*	*13%*	*11%*	*0%*	*0%*	*0%*	*0%*
Total (kt)	**139**	**132**	**138**	**143**	**151**	**161**	**166**	**177**	**192**	**210**	**225**	**241**
% growth	*7%*	*-5%*	*4%*	*4%*	*6%*	*7%*	*3%*	*7%*	*8%*	*9%*	*7%*	*7%*

Global Cobalt Demand by Market

Market	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Electric Vehicles	16.3	22.9	29.4	30.2	37.4	46.9	55.5	69.2	82.4	93.2	109.1	130.9
% growth	*-8%*	*40%*	*29%*	*3%*	*24%*	*25%*	*18%*	*25%*	*19%*	*13%*	*17%*	*20%*
Personal Mobility (m)	7.0	6.3	5.9	6.5	5.9	3.7	2.9	1.8	1.0	1.1	1.2	1.4
% growth	*11%*	*-10%*	*-7%*	*11%*	*-9%*	*-38%*	*-20%*	*-38%*	*-44%*	*11%*	*11%*	*11%*
Stationary Storage Demand by Application	0.0	0.6	0.6	0.7	0.7	0.9	0.9	1.2	1.5	2.1	3.0	4.4
% growth	*37%*	*1848%*	*-12%*	*25%*	*-8%*	*31%*	*4%*	*31%*	*31%*	*36%*	*42%*	*47%*
Batteries (traditonal markets)	40.6	39.0	40.1	41.0	42.0	43.9	45.9	48.1	50.4	52.8	55.4	58.2
% growth	*5%*	*-4%*	*3%*	*2%*	*2%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
Superalloys	20.1	17.7	18.0	18.8	19.5	20.3	21.1	21.9	22.8	23.3	23.7	24.2
% growth	*4%*	*-12%*	*2%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*2%*	*2%*	*2%*
Hardmetals	12.4	10.9	11.1	11.5	12.0	12.5	13.0	13.5	14.0	14.3	14.6	14.9
% growth	*-1%*	*-12%*	*2%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*2%*	*2%*	*2%*
Ceramics and pigments	9.1	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.6	9.7
% growth	*7%*	*-3%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Catalysts	6.8	6.6	6.6	6.7	6.8	6.8	6.9	7.0	7.0	7.1	7.2	7.2
% growth	*3%*	*-4%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Tyres/Paint driers	2.7	2.8	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.1
% growth	*0%*	*5%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Magnets	5.6	5.5	5.9	6.3	6.8	7.3	7.8	8.3	8.9	9.2	9.4	9.7
% growth	*4%*	*0%*	*7%*	*7%*	*7%*	*7%*	*7%*	*7%*	*7%*	*3%*	*3%*	*3%*
Other applications	8.9	6.6	6.7	6.9	7.0	7.1	7.3	7.4	7.6	7.7	7.9	8.0
% growth	*33%*	*-26%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*
Total (kt)	**130**	**128**	**136**	**140**	**150**	**161**	**173**	**191**	**208**	**223**	**244**	**272**
% growth	*4%*	*-1%*	*7%*	*3%*	*7%*	*8%*	*7%*	*10%*	*9%*	*7%*	*9%*	*11%*

Market Balance

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Market surplus (deficit)	9.4	4.4	1.7	2.1	1.0	-0.1	-7.5	-13.3	-16.1	-13.8	-19.5	-31.2
% demand	*7%*	*3%*	*1%*	*2%*	*1%*	*0%*	*-4%*	*-7%*	*-8%*	*-6%*	*-8%*	*-11%*
% supply	*7%*	*3%*	*1%*	*2%*	*1%*	*0%*	*-5%*	*-8%*	*-8%*	*-7%*	*-9%*	*-13%*

Source: Company reports, Canaccord Genuity estimates

Cobalt Blue – capital efficient cobalt
SPEC BUY, A$0.65 price target

Cobalt Blue is developing the Broken Hill Cobalt Project (BHCP) in western NSW, Australia. The project differs in that cobalt is the primary revenue stream. The BHCP presents as a cobalt-focussed project with a low capital intensity versus industry comps, while at the same time delivering a meaningful volume of cobalt into the market (3.5ktpa) over a long project life (17 years). COB is currently piloting its process in Broken Hill, before running a demonstration plant in 2022 and expects to make an FID on the project in late 2022/early 2023. Its processing flowsheet is somewhat unique; however, we believe there is embedded value in the IP, which may present further commercial opportunities.

Process delivers benefit of by-products

Cobalt mineralisation at the BHCP is associated with pyrite (FeS_2) hosted within the deposit. As with refractory gold deposits, the pyrite needs to be oxidised to efficiently extract cobalt and COB's process aims to reduce complexity and capex, while lifting recoveries and capturing revenue streams from both cobalt and elemental sulphur. The process involves concentrating ore before calcining under inert conditions. This produces a readily leachable pyrrhotite (Fe_7S_8) from which cobalt can be leached and elemental sulphur produced as a by-product. While unique, the process builds upon sound metallurgical foundations of reducing material volume and upgrading cobalt grade prior to the higher cost processes of roasting and leaching. The process has been trialled on other pyrite concentrates, suggesting a robust process.

Long life operations with leverage to cobalt pricing

We forecast COB producing an average 3.3ktpa Co over the LOM at an AISC of US$13.5/lb Co (including sulphur/nickel by-product credits). COB released a PFS in 2018, updated its estimates in 2020 and intends to release a Feasibility Study in 2022. With capex of A$560m (CGe A$620m), the BHCP screens as a low capital intensity project at US$120m/ktpa versus industry comps of US$437m/ktpa in a stable mining jurisdiction. The current resource underpins a +20-year mine life and with LG Energy Systems (LGES) as a key battery supply chain partner, we believe the project has the right team and backing to deliver the BHCP.

A$0.65 price target heavily risked for a project leveraged to Co prices

Our SPECULATIVE BUY recommendation and A$0.65 price target is based on our one-year forward NAV risked at 35% (unrisked A$1.80/share). We use long-run cobalt pricing of US$40/lb, AUD/USD 0.75 and a discount rate of 10%, which is consistent amongst our cobalt coverage. COB has strong leverage to cobalt pricing with a 10% lift in our base line pricing translating to a 30% lift in price target. We assume funding is met with a 60:40 debt:equity split with funding completed in mid-2023. Our SPECULATIVE BUY rating and risking takes into account project stage, execution risks and funding requirements.

Figure 22: NAV sensitivity to cobalt prices and payabilities

		Cobalt (US$/lb)						
		15	20	25	30	35	40	45
AUD/USD	0.80	$0.44	$0.20	$0.01	$0.20	$0.35	$0.55	$0.75
	0.75	$0.37	$0.13	$0.05	$0.25	$0.45	$0.65	$0.85
	0.70	$0.29	$0.06	$0.15	$0.35	$0.55	$0.80	$1.00
	0.65	$0.21	$0.00	$0.25	$0.50	$0.70	$0.95	$1.15
	0.60	$0.13	$0.10	$0.35	$0.60	$0.85	$1.10	$1.35
	0.55	$0.04	$0.25	$0.50	$0.75	$1.05	$1.30	$1.55

Source: Canaccord Genuity estimates

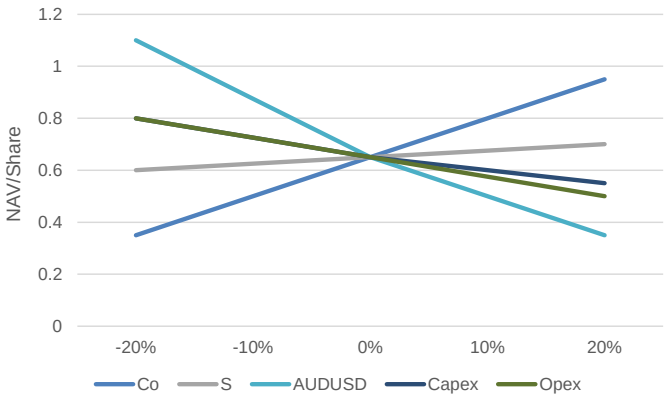
Company in a page

Figure 23: SOTP valuation for COB show strong upside based on the project as well as monetisation of its technology

JunQ '22	A$m	RISK ADJ.	EQUITY	A$M	PER SHARE
BHCP	525	35%	100%	184	$0.62
Exploration	0			0	$0.00
Corporate	-17			-17	$0.06
Technology	20			20	$0.07
Net Cash	10			10	$0.03
TOTAL				**196**	$0.65
Price target					**$0.65**

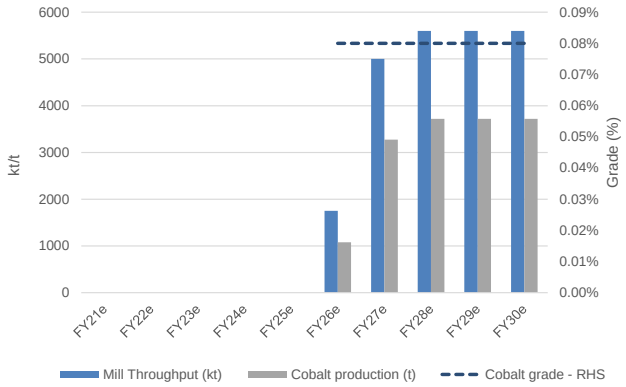
Source: Canaccord Genuity estimates

Figure 24: COB is leveraged to currency and cobalt pricing. Sulphur by-product credits are also important for the project's economics



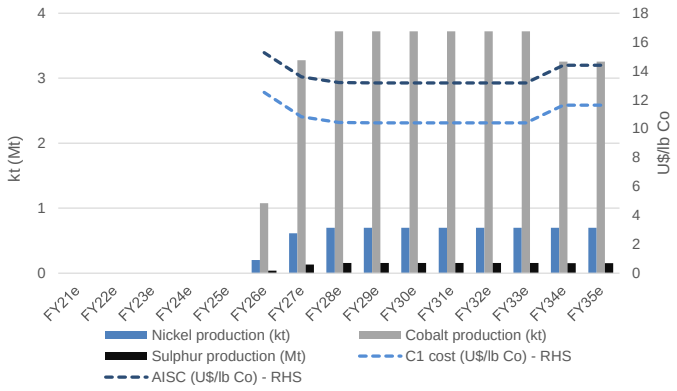
Source: Canaccord Genuity estimates

Figure 25: The BHCP deposit is relatively consistent in grade and hence earnings will be correlated cobalt prices rather than grade variance; we assume an 18 month ramp-up



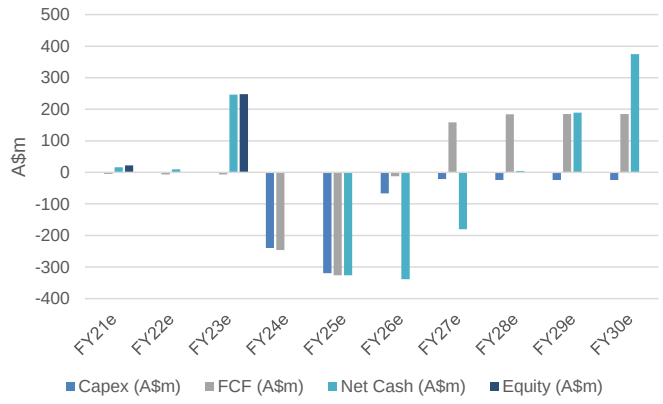
Source: Canaccord Genuity estimates

Figure 26: Once operational production is steady across cobalt, sulphur and nickel and costs stabilise



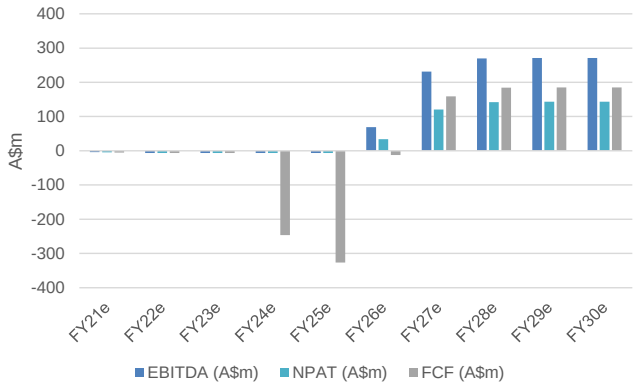
Source: Canaccord Genuity estimates

Figure 27: Capex, FCF and net cash profile



Source: Canaccord Genuity estimates

Figure 28: EBITDA, NPAT and FCF



Source: Canaccord Genuity estimates

Broken Hill Cobalt Project

Cobalt Blue is developing the BHCP in western NSW, using an in-house developed process to product cobalt and elemental sulphur from pyrite concentrate. The project differs from other cobalt projects in that cobalt is the dominant revenue source (84%). This results in the BHCP having the highest leverage to cobalt pricing, with every 10% move translating to an 30% move in NAV. COB has released a PFS and is currently running a pilot plant in Broken Hill which will generate samples for offtake partners and inputs for a demonstration plant and Feasibility Study.

A 2020 update to the 2018 PFS highlighted a 3.5ktpa cobalt, 300ktpa sulphur operation over a 17-year mine life, with AISC of US$13.1/lb to produce a cobalt sulphate and capital cost of A$560m including A$70m in contingencies. COB also highlighted the potential of producing a Mixed Hydroxide Product (MHP) which would reduce costs by c.US$3/lb.

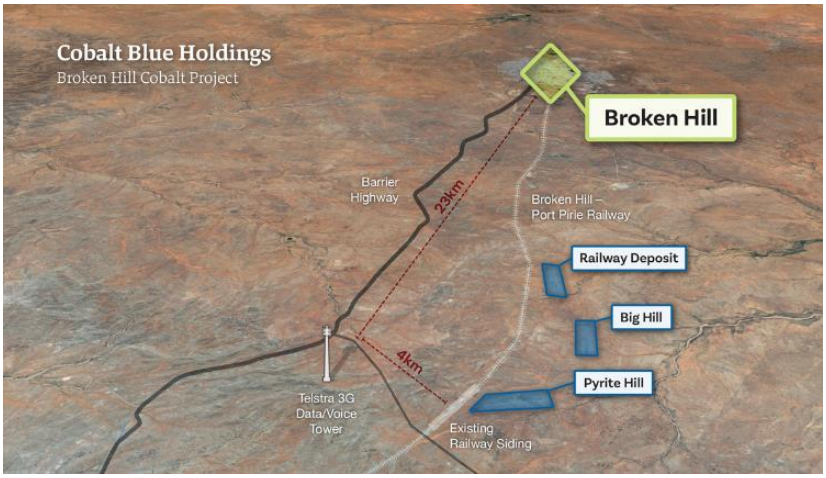
Location and history

The 100%-owned BHCP is in western New South Wales, approximately 1,200km from Sydney and 550km from Adelaide. The project covers an area of 63km^2 and is situated 23km west of Broken Hill. The deposits are close to an existing rail siding on the Broken Hill to Port Pirie rail line which connects the site to Spencer Gulf (Port Pirie). Broken Hill is connected to the National Electricity Market electrical power grid and there are renewables projects planned for the area which may allow COB to access lower carbon sources of power. Water is planned to be accessed through the Wentworth to Broken Hill pipeline. This has 10GL of capacity of which one-third is reserved for the town and two-thirds for industrial use. COB has an allocation of 1.5GL p.a. with room to go higher if required. In addition to this, water can be accessed from artisanal bores however a reverse osmosis plant would be required.

Figure 29: Favourable trucking and rail options are available to the BHCP

Source: Company reports

Figure 30: BHCP is located within driving distance of Broken Hill



Source: Company reports

The Thackaringa area (renamed Broken Hill Cobalt Project) has a history of mining since early 1880s. The area was initially mined for rich silver, lead and zinc ores.

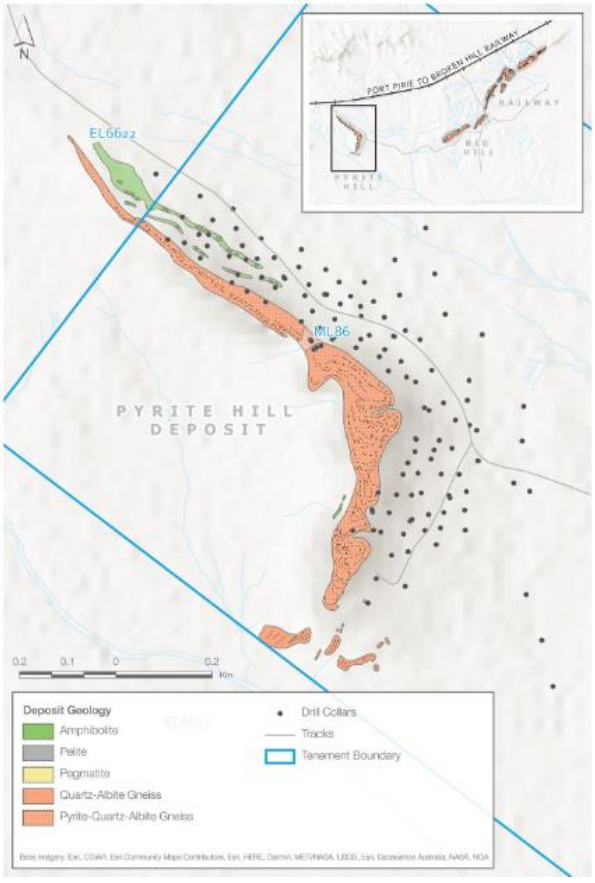
- 2012 – Broken Hill Prospecting Ltd. (BPL) undertakes the resource evaluation of Thackaringa area and concluded 35.7Mt of resources (Co 841 ppm) in Pyrite Hill, Big Hill and Railway deposits.
- 2016 – BPL decides to unlock the value of its 100% owned Thackaringa project through spin-off to Cobalt Blue Holdings Ltd (COB) over four stages. BPL and COB enter into a royalty agreement where COB agrees to pay a net smelter royalty of 2% to BPL.

- 2017 – COB reports the updated resource estimate of 54.9Mt (Co 910 ppm) after drilling 7,957m of diamond (22 holes) and reverse circulation (38 holes) holes over 2016 and 2017.
- 2018 – COB delivers the pre-feasibility study (PFS). The ore reserves were estimated to be 46.3Mt (Co 819 ppm and S 8.83%).
- 2018 – COB and BPL disagree on ownership earn-in status.
- 2020 – COB and BPL enter into an agreement for COB to acquire the remaining 30% from BPL for c.A$6m (over stages).
- 2020 - COB completes a project study update and updates the probable ore reserves to 71.8 Mt at 710 ppm cobalt (from 46.3 Mt at 819 ppm cobalt).
- 2021 – COB begins pilot plant operations and begins planning for a demonstration plant for 2022.

Geology

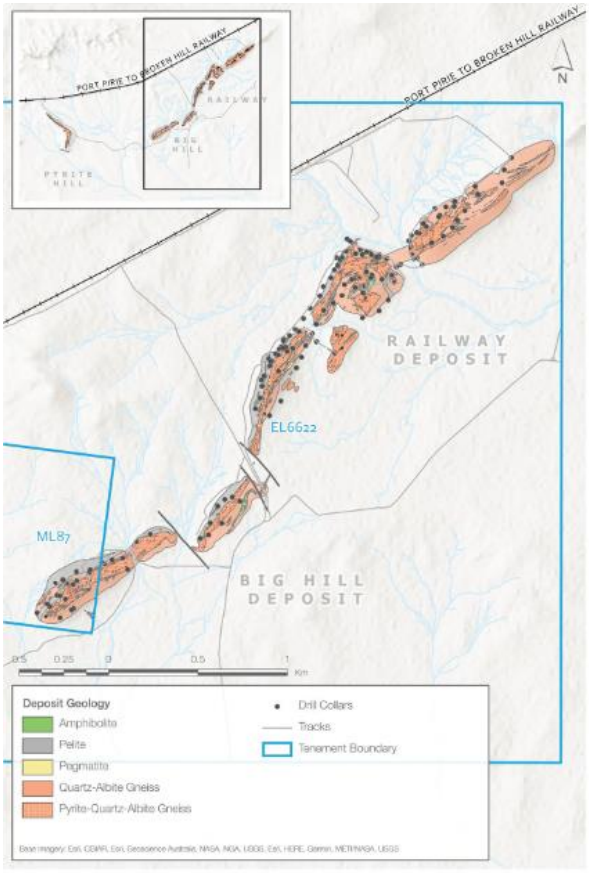
Mineralisation at the PHCP consists of strata bound units of pyritic quartz-albite gneiss with a moderate to steep dip. There are three deposits which make up the project being Pyrite Hill which is geographically separate from the Big Hill and Railway deposits.

Figure 31: Pyrite Hill deposit



Source: Company reports

Figure 32: Big Hill – Railway deposits



Source: Company reports

The Pyrite Hill deposit has a strike of some 1.2km and extends down dip 300m. Thickness varies from 10-100m with thicker sections in the middle of the deposit where folding has occurred and a change of strike to the south is evident. As the current mine plan is to extract sulphides, the mineral resource is measured from the base of partial oxidation 20-25m below surface.

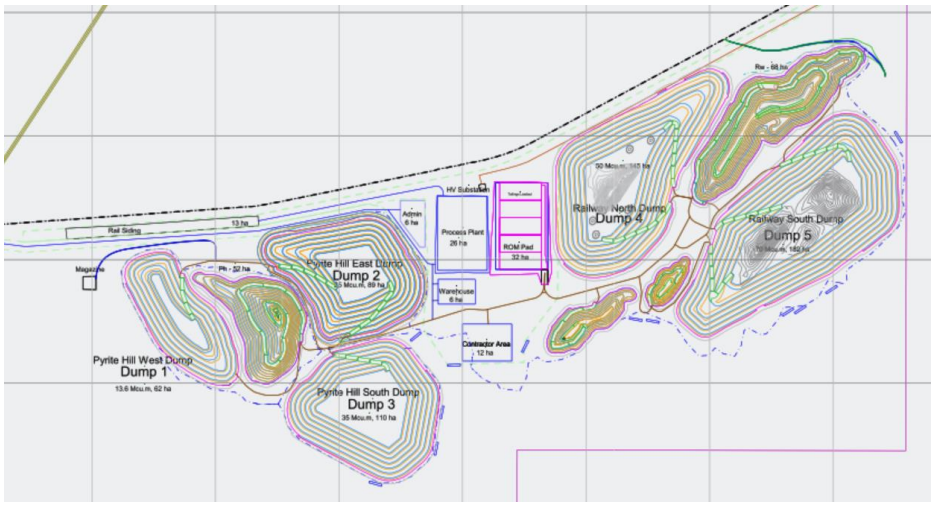
The Big Hill deposit also has a strike of 1.2km and comprises two mineralised zones separated by a fault, displacing the orebodies by some 150m. While the southwestern portion of the deposit has significant folding and is 30-100m below surface. The northeastern zone, while steeply dipping, is relatively linear. COB has shown mineralisation continues to a depth of 400m, with an average thickness of 35-40m. Oxidation occurs at the top of the deposit and this oxidised material will not be processed, no is included in the Resource.

The Railway deposit is found to the northeast of the Big Hill deposit and considered an extensional orebody. The southern end of the deposit is generally linear with a thickness of 30m; however, to the northeast the deposit thickens as folding occurs. In the centre of the deposit, deformation has occurred and mineralised widths of up to 300m occurs. Again, oxidation is observed in the top 15-20m of the deposits and is not included in Resource estimate.

Mining and processing

The BHCP will utilise open pit mining with conventional drill and blast, and load and haul mining (excavators and ridged body trucks). Mining will be relatively bulk in style with c.20Mtpa of material movement, not including process waste being transported to the integrated waste landform storage areas c.4-6mtpa.

Figure 33: Layout of BHCP mining and waste landform areas



Source: Company reports

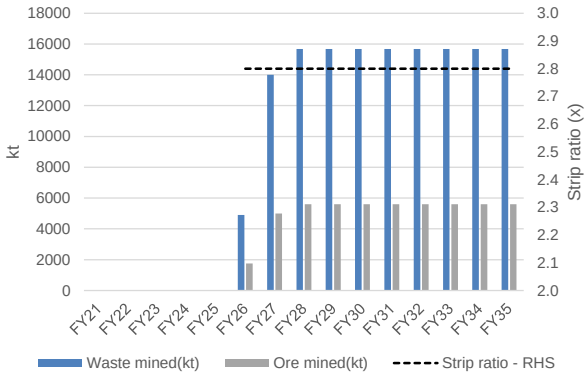
Ore movement ranges from 4-6.3mtpa and will be hauled to a ROM near the process plant. COB expects the plant to be located between mining areas to minimise LOM material movement. Waste rock is to be hauled to the waste dumps near to the pits. These waste landforms are also planned to be used as integrated waste landform (IWL) areas which will be used to store process waste. As BHCP does not grind ore to fine size fractions, COB anticipates that it can utilise dry stack tailings after being dewatered from the concentrate stage.

Figure 34: Integrated waste landform tonnage capacities; production target scenario

in MT	Dump 1 Pyrite Hill West	Dump 2 Pyrite Hill East	Dump 3 Pyrite Hill South	Dump 4 Railway North	Dump 5 Railway South	Total
NAF for ROM PAD						6
NAF for IWL base	3	5	4	11	14	37
NAF for IWL capping	3	5	4	11	14	37
Encapsulated Waste	22	42	34	86	114	298
Total material	28	52	43	107	142	372

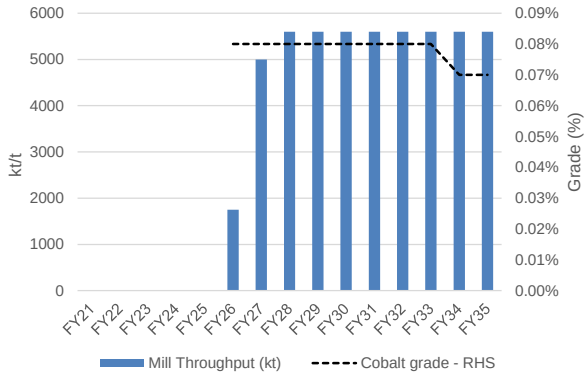
Source: Company reports

Figure 35: CGe mining assumptions for the BHCP



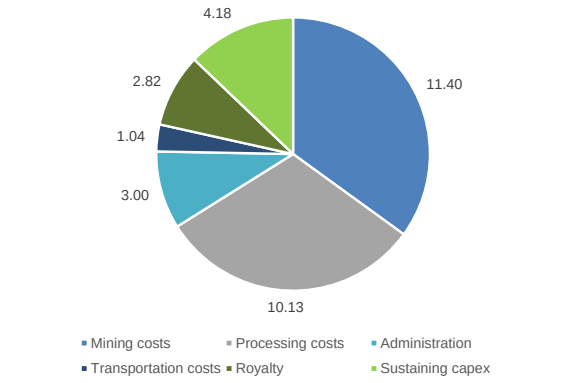
Source: Company reports, Canaccord Genuity estimates

Figure 36: CGe processing assumptions for the BHCP



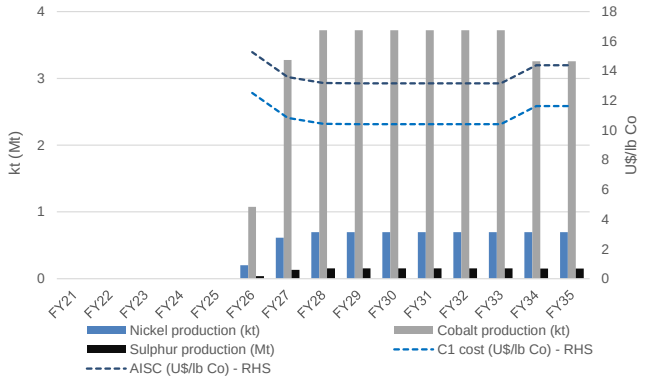
Source: Company reports, Canaccord Genuity estimates

Figure 37: CGe cost breakdown(A$/t) estimates



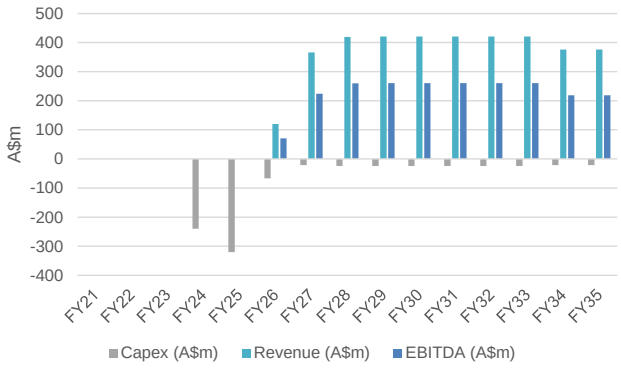
Source: Company reports, Canaccord Genuity estimates

Figure 38: CGe production estimates for the BHCP



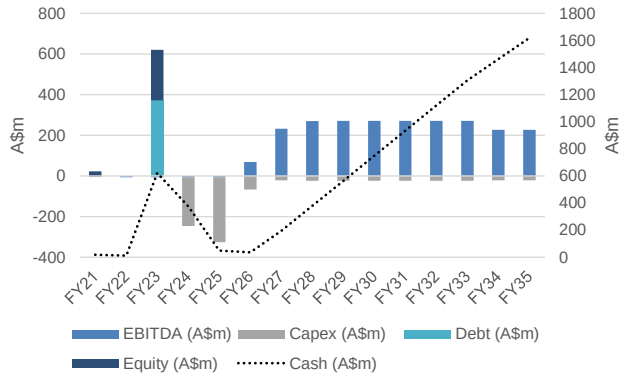
Source: Company reports, Canaccord Genuity estimates

Figure 39: CGe revenue, capex and EBITDA estimates



Source: Company reports, Canaccord Genuity estimates

Figure 40: Cash flow estimates for COB



Source: Company reports, Canaccord Genuity estimates

Process flowsheet

COB has developed its process flowsheet in-house for treating cobalt hosted in pyrite to produce either mixed hydroxide product (MHP) or cobalt sulphate. As outlined in Figure 41 below COB has developed this process to address a number of constraints which find a balance between capital costs, operational costs, waste products and revenue generating products.

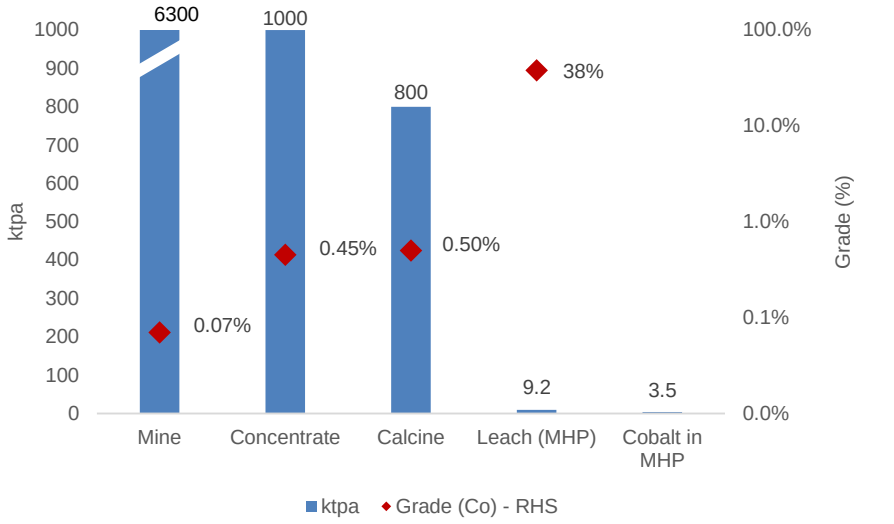
Figure 41: COB has a unique process designed to improve recoveries, reduce capital costs and recover revenue from sulphur credits

Method	Cobalt leach extraction	Comments
COB Process: Pyrite pyrolysis followed by leaching of calcine (chloride)	96-97% cobalt extraction at 130 °C	• 1/4 oxygen consumption compared to pressure oxidation leaching of pyrite • Formation of hematite in leach step due to chloride media • No SO_2 emissions from kiln operations • No requirement for neutralisation of acid generated in the leach reactions
Pressure Oxidation Leaching (sulphate)	>99% cobalt extraction at 180 °C	• High oxygen consumption of 1t O_2 per 1 t pyrite • Requirement for neutralisation of acid in leach liquor ahead of cobalt recovery • Formation of ferric basic sulphate at 180 °C, (temperatures of 210-220 °C required to produce hematite)
Atmospheric leaching (chloride)	5% cobalt extraction at 100 °C	• Formation of elemental sulphur coating on the feed particles prevented leach reaction progressing to completion
Roasting to make H_2SO_4, followed by atmospheric leaching of calcine (sulphate)	~15-20% cobalt extraction.	• Additional capex of ~A$400m for ~1mtpa acid plant • Higher roasting temperature removed more sulphur, but the calcine was more refractory, with low cobalt extraction similar to literature(1)

Source: Company reports

While novel, the process builds upon established technologies and metallurgical principles. Volumes of material processed are reduced through concentration which results in a corresponding uplift in grades. By the time the concentrate is presented the leach circuit 6.3mt of material has been reduced to 800kt. Ultimately the volume of material that is shipped is relatively small at c.10kt per year, containing 3.5kt of cobalt.

Figure 42: Volume of material is reduced through processing stages and grade uplift occurs before final calcining and leaching

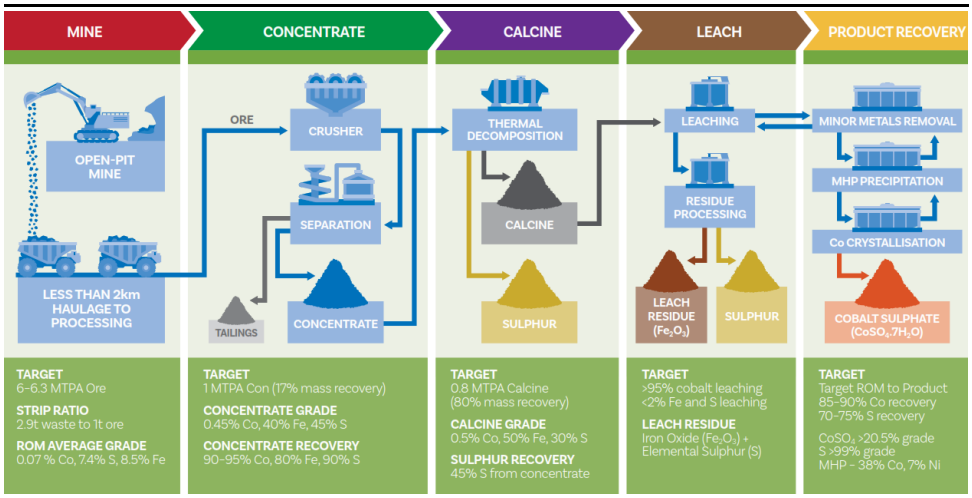


Source: Canaccord Genuity estimates

A brief outline of the process is described below:

- Ore is crushed to 1mm and processed through gravity and flotation circuits. This results in a c.6.4x uplift in cobalt grade and mass recovery of 15%.

Figure 43: Process flowsheet



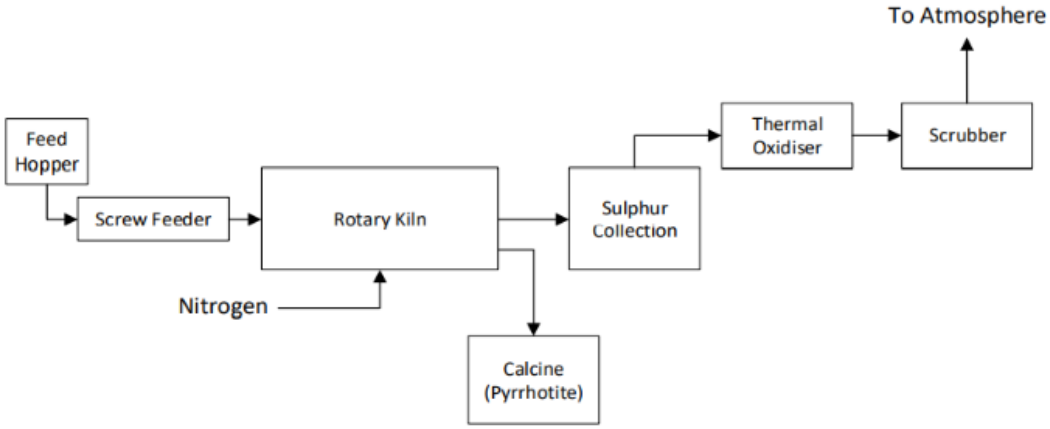
Source: Company reports

- The pyrite concentrate is calcined at 700-750˚C under inert conditions (nitrogen gas) for 30-45 minutes to produce pyrrhotite and elemental sulphur. As sulphur gas is cooled it condenses and turned into solid prill (circular nodules). This first pass recovers 45% of the sulphur into a saleable product.
  - $7FeS_{2(s)} + 7(122.5\ kJ/mole) = Fe_7S_{8(s)} + 3S_{2(g)}$

Figure 44: Pyrite feed and calcined pyrrhotite

Source: Cobalt Blue presentation

Figure 45: Calcining process flow sheet



Source: Company reports

Figure 46: Sulphur prill

Source: Cobalt Blue presentation

- The pyrrhotite is leached at low-temperature (120-140˚C) and low-pressure (2-15 bar) in an autoclave. Cobalt extraction into solution generally shows recovery >95% with oxygen consumption of 250kg/t. Iron rich leach residue is recovered via filtration and additional sulphur is recovered at this stage.
  - $Fe_7S_{8(s)} + 5.25O_{2(g)} = 3.5Fe_2O_{3(s)} + 8S_{(s)}$
- The final step is MHP recovery from leach solution. Minor metals are recovered prior to MHP precipitation via precipitation, ion-exchange, and solvent extraction. Unlike most MHP's on the market cobalt is the dominant mineral with >30% cobalt and 7% nickel (most MHP is ~30% nickel 3% cobalt) Both metals would be payable and we believe refiners would value the material given it would allow flexibility in creating product blends. The leach residue is removed by filtration, and further processed for sulphur recovery by remelting.

Figure 47: cobalt sulphate made from BHCP returned better than most industry specs. Upscaling pilot work may prove repeatability of results

Metal	Units	COB	AVG 9 producers
Co	%	>20.8%	>20.5
Al	ppm	2	<10
As	ppm	<1	<5
Ca	ppm	<0.01	<10 (can be up to 100)
Cd	ppm	<0.001	<10
Cr	ppm	<0.01	<5
Cu	ppm	1	<10
Fe	ppm	<1	<10
K	ppm	0.6	<5 (can be up to 100)
Mg	ppm	27	<20 (can be up to 100)
Mn	ppm	5	<10 (can be up to 100)
Na	ppm	128	<20 (can be up to 100)
Ni	ppm	<10	<10 (can be up to 100)
Pb	ppm	<0.05	<10
Si	ppm	<0.5	<20
Zn	ppm	<2	<10

Source: Cobalt Blue presentation

COB has highlighted the optionality at this stage of producing a cobalt sulphate through acid digestion and crystalisation. We believe that, given the additional expertise, capital requirement and cost versus the high payability of cobalt MHP, producing MHP will allow for a better economic outcome. Ultimately, if there is an advantage to going further downstream COB could elect to do this at a later stage. If this were the case it may choose to do this in a favourable jurisdiction where energy, labour and expertise is readily available.

COB has undertaken several stages of process testing since 2017, building on scale in each step. The next stage (demonstration plant) will run on a continuous basis and process 4,000t of material. This will generate samples for offtake partners and allow for processes to be developed and training of operators for the final plant. For a modest capital requirement COB may continue to run the plant, either for product pre-qualification or to test additional feedstock from third parties.

Sulphur production will likely be sold within Australia, as the country currently imports 1Mtpa (COB – 300ktpa production target). This is used in fertiliser (55%) and metallurgical consumption (43%).

COB will also produce a high Fe hematite however current test work indicates it is too high in sulphur to be saleable to most steel mills.

Figure 48: Process testing stages completed by COB

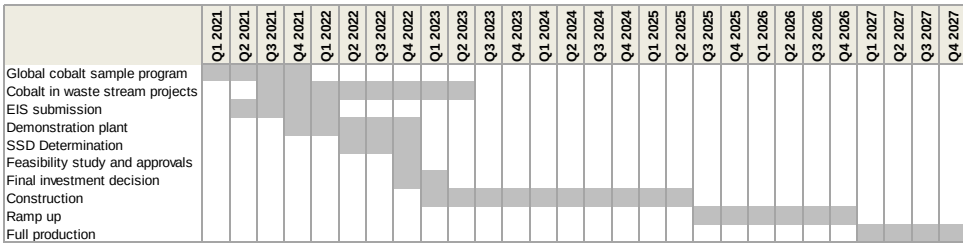
Study Level	Period	Concentrate Circuit		Pyrolysis Circuit		Leaching/Purification	
Scoping Study	FY2017	20-30 kg	Lab scale	1 kg	Lab scale	1 kg	Lab scale
Pre-Feasibility Study	FY2018	820 kg	Bulk trial in batch mode	100 kg	2-3 kg batches	30 kg	0.2-1 kg batches
Project Update	FY2020	45 tonne	Continuous pilot circuit 2-3 t/hr	150 kg	Continuous pilot circuit 4-8 kg/hr	20 kg	1-3 kg batches
Current Pilot	FY2021	45-50 t	Continuous pilot circuit 2-3 t/hr	Up to 15 t	Commercial sized furnace 100-150 kg/hr	Up to 15 t	Pilot equipment 1t batches
Future (Feasibility Study)	*FY2022*	*4000 t*	Mobile plant 10-15 t/hr	*Up to 500 t*	Commercial sized furnace 100-150 kg/hr	Up to 500 t	Demonstration plant 50-100 kg/hr

Source: Cobalt Blue presentation

Timeline

Cobalt Blue is currently running its pilot plant program which will process c.90t of ore into MHP. This will lead to further refinement and product samples prior to trialling a demonstration plant which would utilise much of the current equipment but process up to 4,000t of ore. COB has indicated that it intends to complete a Feasibility Study and FID in late 2022. We assume a slightly delayed schedule (COVID-19 impacts still unknown) with a two- and half-year construction period and first production in mid-2025. Once in production we have an 18-month ramp-up period before full nameplate production is met.

Figure 49: COB and CGe timeline for the delivery of the BHCP



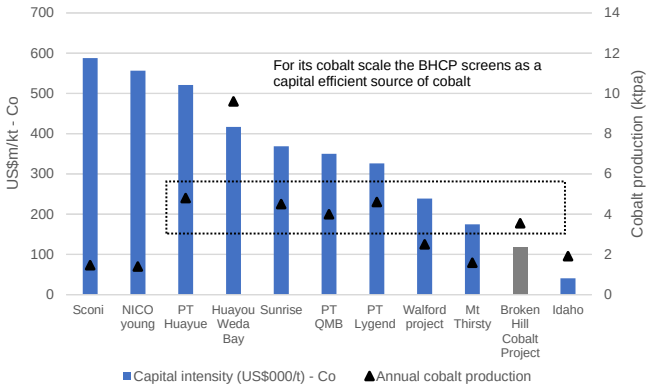
Source: Company reports, Canaccord Genuity estimates

Finance

COB completed a A$15m capital raising in mid-2021 to finance the pilot plant and Feasibility Study. Results from the pilot plant will be adopted to improve FS estimates. The PFS outlined capex of A$560m (A$620m CGe). To finance the Broken Hill cobalt Project we assume a 50:50 mix of debt and equity. Alternative options such as asset sell downs may be considered by the Company.

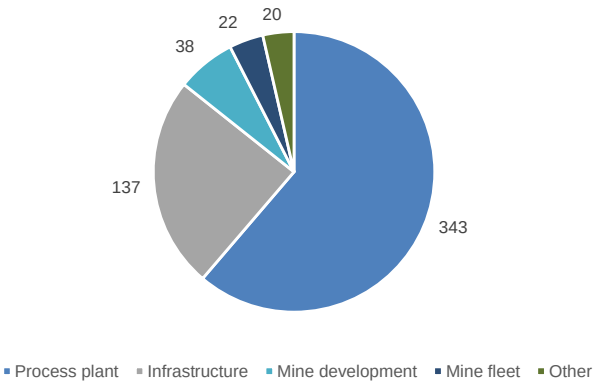
Given cobalt's concentration in supply it is usually considered a critical mineral, which may allow for COB to access financing through the Export Finance Australia or through the Clean Energy Finance Corporation.

Figure 50: Capital intensity of projects per tonne of cobalt



Source: Company reports, Canaccord Genuity estimates

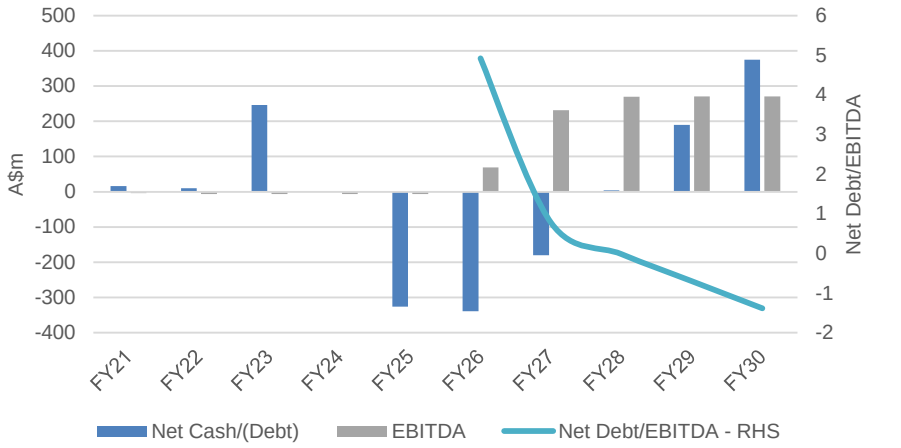
Figure 51: Breakdown of capex A$560m



Source: Company reports, Canaccord Genuity estimates

When comparing global cobalt projects, the Broken Hill Cobalt Project screens as one of the most capital efficient projects to produce cobalt tonnes. Figure 50 shows that there are few projects where cobalt production is elevated and capital costs are low. Higher pricing may incentivise production however we only expect it to be delivered in 2-3ktpa increments.

Figure 52: Net debt and EBITDA



Source: Canaccord Genuity estimates

R&R

The BHCP is underpinned by an 81kt cobalt Resource and a 51kt cobalt Reserve. There remains potential for exploration upside, in our view, given local mineralisation and a 13-year Reserve life (26-year Resource life) to discover additional material.

Figure 53: Resources for the Broken Hill Cobalt Project

Classification	Tonnes (Mt)	Co (%)	CoEq (%)	Ni (%)	S (%)	Contained Co (kt)	Contained Ni (kt)	Contained S (kt)
Measured	18	0.10%	0.13%	0.02%	10.9%	18.3	3.4	1,935
Indicated	59	0.06%	0.08%	0.01%	6.9%	37.1	7.2	4,062
Inferred	41	0.06%	0.08%	0.01%	7.2%	25.6	5.1	2,979
Total	**118**	**0.07%**	**0.09%**	**0.01%**	**7.6%**	**81.1**	**15.7**	**8,968**

Source: Company reports

Figure 54: Reserves for the Broken Hill Cobalt Project

Classification	Tonnes (Mt)	Co (%)	S (%)	Contained Co (kt)
Probable	71.8	0.07%	7.6%	51.0
Total	**71.8**	**0.07%**	**7.6%**	**51.0**

Source: Company reports

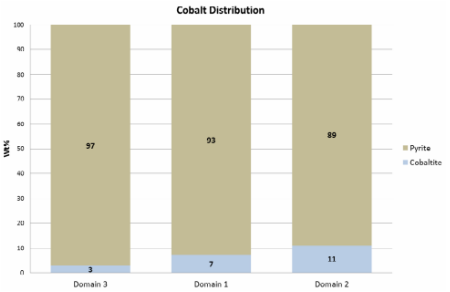
Cobalt in Waste Streams Project

COB has developed a novel technique for recovery of metals from pyrite. Currently in the global mining environment pyrite is usually selectively removed from concentrates due to the low metal content (vs other metal species chalcopyrite, bornite, etc.) which usually ends up in tailings storage facilities. COB will explore the potential to buy, licence or co-invest with third parties to implement its process at other deposits. Currently COB has conducted test work from three such potential partners: 1) the Mutooroo deposit located in the Broken Hill region; 2) Oz Minerals' (OZL-ASX) Carrapateena mine located in South Australia and the Millennium Project, located in Queensland. We find the OZL test work to be interesting since Carrapateena ore feed is likely to become more pyrite rich as the mine moves into the block cave (2025 CGe).

In addition to this COB will investigate the potential to reprocess historic tailings which may contain cobalt. An area of focus for the Company will be Queensland where there is a long history of copper mining. The Geological Survey of Queensland has, separately to COB, been working on cobalt in historic tailings and notes the North West Minerals Province (Mt Isa) as a particular interest. It has identified eight tailings or waste deposits which may be prospective for cobalt reprocessing.

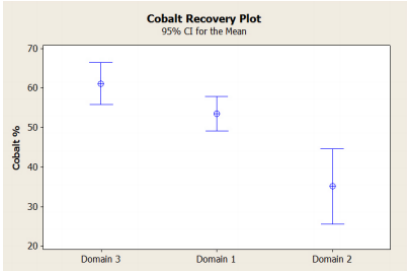
Ernest Henry tailings were noted in a University of Queensland PhD thesis as containing 500ppm Co and with mineralisation being related to pyrite, nickel and arsenic. The thesis demonstrated that pyrite is the predominant sulphide mineral within Ernest Henry tailings and cobalt recoveries were highly dependent on sulphur content, % pyrite and if cobalite was present. The study estimated the recovery of cobalt to be 54% from tailings and produced a 0.4% Co concentrate (similar to pre-calcine COB material). While no estimate was made for the total contained cobalt resource, the study implies there may be >50kt of recoverable cobalt in tailings.

Figure 55: Cobalt distribution within minerals found at EH



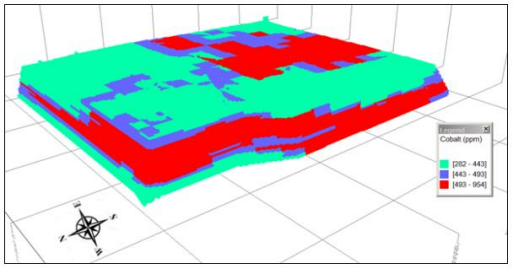
Source: A Novel Geometallurgical Approach to Tailings Storage Facility Characterisation and Evaluation, E Louwrens, 2016

Figure 56: Cobalt recovery from tailings samples



Source: A Novel Geometallurgical Approach to Tailings Storage Facility Characterisation and Evaluation, E Louwrens, 2016

Figure 57: distribution of cobalt within the EH tailings dam



Source: A Novel Geometallurgical Approach to Tailings Storage Facility Characterisation and Evaluation, E Louwrens, 2016

This highlights the potential for COB to utilise its process on existing tailings either through licence, partnership or acquisition of mineral rights.

We apply a nominal A$20m valuation to the patented IP which underlies the Waste Stream Project.

Board and management

Joe Kaderavek – Chief Executive Officer

Joe has been the CEO of COB since October 2016. Previously he held an international consulting role with a focus on renewable energy and battery storage technologies. He has around 15 years of experience in investment research (including senior roles in Deutsche Bank) focussed on mining, mineral processing and energy storage technologies. He has a bachelor's degree in Aeronautical Engineering from University of Sydney and an MBA from Deakin University.

Robert Biancardi – Independent Chairman

Robert has around 35 years of commercial experience across the finance, IT, healthcare and services sectors. Previously, he was the director of Evolution Healthcare, a leading private hospital operator. He also held senior roles in IBM, Citibank and Westpac. He has been a board member of the Heart Foundation of Australia (FIPOC) for over seven years.

Hugh Keller – Independent Director

Hugh is a graduate in law with 35 years of legal experience. He was a managing partner at Blake Dawson (now Ashurst) and its predecessor firms. He has also served as a chairman of a large private investment company with over $150m of net assets.

Rob McDonald - Independent Director

Rob has more than 10 years of experience in business development and strategic planning roles within the RioTinto Group at Hamersley Iron, RTZ Services and Rio Tinto Minera SA. He also has more than 20 years of experience in investment banking as director and principal of Resource Finance Corporation and as a Managing Director of N M Rothschild and Sons.

Dr Andrew Tong – Executive Manager

Andrew is a metallurgist. He has around 15 years of experience in project development, mining and processing activities. Previously he was the CEO of Compass Resources/Northern Territories Resources. Prior to that, he was the CEO of Goldsmith Resources and director of Australia Gold.

Danny Morgan – Chief Financial Officer

Danny is a Chartered Accountant. He has around 25 years of financial and commercial experience with a focus in the resources industry. Previously, he worked with a range of resource companies including Donaldson Coal, Hydra Energy, Oil Search and Roc Oil.

Adam Randall – Demonstration Plant manager

Adam has 30 years of experience in the mining industry and associated mineral processing technology development. Previously he worked in roles ranging from mining and processing operations through to cutting edge research and development for hydrometallurgical mineral processing.

Joe Lam - Chief Representative, China

Joe is a chemical engineer. He has more than 25 years of experience in minerals processing project development in Australia and China.

Major shareholders

Figure 58: Major shareholders

Name	Holding (%)	Name	Holding (%)
Citicorp Nominees Pty Limited	6.46	Hsbc Custody Nominees (Australia) Limited	1.82
BNP Paribas Nominees Pty Ltd	2.89	Pearce Financial Services Pty Ltd	1.68
CS Third Nominees Pty Limited	2.68	Mrs Katie Elizabeth Reece	1.3
American Rare Earths Ltd	2.01	Kaderavek Family	1.3
Hill Family Group Pty Ltd	1.98	CS Fourth Nominees Pty Limited	1.22

Source: Company reports, Canaccord Genuity estimates

Risks

Financing risks

As a pre-production company with no material income, COB is reliant on equity and debt markets to fund development of its assets and the continuing business development activities. Total development and working capital requirements are subject to completion of final studies. There are no guarantees that studies will result in a positive investment decision for the Broken Hill Cobalt Project. Further, we can make no assurances that accessing these markets will be done without further dilution to shareholders.

Exploration risks

Exploration is subject to a number of risks and can require a high rate of capital expenditure. Risks can also be associated with conversion of inferred resources and lack of accuracy in the interpretation of geochemical, geophysical, drilling and other data. No assurances can be given that exploration will delineate further mineral resources or that the company will be able to convert the current mineral resource into minable reserves.

Development risks

Developing mining operations comes with a set of risks associated with the timing and cost of a project. Delays due to equipment, labour, weather or pandemics occur and can draw down on contingency allowances provisioned by the company. Commissioning also presents as a period of elevated risk as equipment is turned on and ramped up. Failure of critical equipment can occur and further delay projects.

Operating risks

If and when in production, the company will be subject to risks such as plant/equipment breakdowns, metallurgical (meeting design recoveries within a complex flowsheet), materials handling and other technical issues. An increase in operating costs could reduce the profitability and free cash generation from the operating assets considerably, and negatively impact valuation. Further, the actual characteristics of an ore deposit may differ significantly from initial interpretations, which can also materially impact forecast production from original expectations.

Commodity price and currency fluctuations

As with any mining company, COB is directly exposed to commodity price and currency fluctuations. Commodity price fluctuations are driven by many macroeconomic forces including inflationary pressures, interest rates and supply and demand factors. These factors could reduce the profitability, costing and prospective outlook for the business.

Figure 59: Financial summary for Cobalt Blue (COB-ASX)

Cobalt Blue		**ASX:COB**
Analyst :	Tim Hoff	
Date:	27/09/2021	
Year End:	June	

		Rating:	**SPEC BUY**
		Target Price:	**A$0.65**

Market Information		
Share Price	A$	0.33
Market Capitalisation	A$m	98.5
12 Month Hi	A$	0.52
12 Month Lo	A$	0.08
Issued Capital	m	298.5
Options	m	0.0
Fully Diluted	m	298.5

Valuation		**A$m**	**A$/share**
BHCP	NPV @ 10%	184	0.62
Exploration		-	-
Corporate		(17)	(0.06)
Technology		20	0.07
Net Cash		10	0.03
TOTAL		**196**	**0.65**
Price target			**0.65**

Assumptions	**2020a**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
AUD/USD	0.67	0.75	0.75	0.75	0.75	0.75
Sulphur Price US$/t		122.50	145.00	145.00	145.00	145.00
Cobalt US$/lb	14.44	16.48	24.88	26.63	37.50	45.00
Iron ore US$/t		125.00	100.00	100.00	100.00	100.00

Production Metrics	**2020a**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
BHCP (100%)						
Cobalt (kt)	0.00	0.00	0.00	0.00	0.00	0.00
Elemental sulphur (kt)	0.00	0.00	0.00	0.00	0.00	0.00
Iron orer (kt)	0.00	0.00	0.00	0.00	0.00	0.00
Cash cost (US$/lb)	0.00	0.00	0.00	0.00	0.00	0.00
AISC (US$/lb)	0.00	0.00	0.00	0.00	0.00	0.00

Reserves & Resources		**Mt**	**Co %**	**Contained Co (kt)**
BHCP (100%)				
Resources		123	0.07%	81.40
Reserves		71.8	0.07%	51.00

Company Description

Cobalt blue holdings ltd (ASX:COV) is developing the 100% owned Broken hill cobalt project located in New South Wales. The company aims to mine and refine cobalt into a battery ready (cobalt suflate) product to supply precursor material to the Li-ion battery markets

Profit & Loss (A$m)	**2020a**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
Revenue	0.1	0.1	0.0	0.0	0.0	0.0
Other Income	0.0	0.0	0.0	0.0	0.0	0.0
Operating Costs	0.0	0.0	0.0	0.0	0.0	0.0
Exploration expensed/written off	0.0	2.2	4.4	4.4	4.4	4.4
Corporate/Other expenses	2.1	2.0	2.0	2.0	2.0	2.0
EBITDA	**-1.9**	**-4.2**	**-6.4**	**-6.4**	**-6.4**	**-6.4**
Dep'n	0.3	0.2	0.0	0.0	0.0	0.0
Net Interest	0.2	0.2	0.0	0.0	0.0	0.0
Tax	0.0	0.0	0.0	0.0	0.0	0.0
NPAT	**-2.4**	**-4.6**	**-6.4**	**-6.4**	**-6.4**	**-6.4**
EBITDA Margin	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*
EV/EBITDA	***nm***	***nm***	***nm***	***nm***	***nm***	***nm***
EPS	*-$0.02*	*-$0.02*	*-$0.02*	*-$0.02*	*-$0.01*	*-$0.01*
EPS Growth		*-41%*	*-2%*	*0%*	*-57%*	*0%*
PER	*-21.3x*	*-15.0x*	*-15.3x*	*-15.3x*	*-35.5x*	*-35.5x*
Dividend Per Share	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Dividend Yield	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***	***0.0%***

Cash Flow (A$m)	**2020a**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
Cash Receipts	0.0	0.0	0.0	0.0	0.0	0.0
Cash paid to suppliers & employees	-1.9	-1.9	-2.0	-2.0	-2.0	-2.0
Tax Paid	0.0	0.0	0.0	0.0	0.0	0.0
Exploration and growth	0.0	-3.3	-4.4	-4.4	-4.4	-4.4
+/- Working cap change	0.0	0.1	0.0	0.0	0.0	0.0
Operating Cash Flow	**-1.9**	**-1.8**	**-2.0**	**-2.0**	**-2.0**	**-2.0**
Capex	-0.3	-0.6	0.0	0.0	-240.0	-320.0
Other	-0.3	-2.8	-4.4	-4.4	-4.4	-4.4
Investing Cash Flow	**-0.6**	**-3.3**	**-4.4**	**-4.4**	**-244.4**	**-324.4**
Debt Drawdown (repayment)	0.0	0.0	0.0	372.0	0.0	0.0
Share capital	-0.2	22.1	0.0	243.0	0.0	0.0
Dividends	0.0	0.0	0.0	0.0	0.0	0.0
Net interest	0.0	0.0	0.0	0.0	0.0	0.0
Financing Cash Flow	**-0.2**	**21.9**	**0.0**	**615.0**	**0.0**	**0.0**
Opening Cash	4.7	2.1	18.8	12.4	621.0	374.5
Increase / (Decrease) in cash	-2.7	16.8	-6.4	608.6	-246.4	-326.4
FX Impact	0.0	0.0	0.0	0.0	0.0	0.0
Closing Cash	**2.1**	**18.8**	**12.4**	**621.0**	**374.5**	**48.1**
Op. Cashflow/Share	*-$0.01*	*-$0.01*	*-$0.01*	*-$0.01*	*-$0.01*	*-$0.01*
P/CF	*-53.2x*	*-54.4x*	*-49.3x*	*-49.3x*	*-49.3x*	*-49.3x*
FCF	***($2)***	***($5)***	***($6)***	***($6)***	***($246)***	***($326)***
EV/FCF	***nm***	***nm***	***nm***	***nm***	***nm***	***nm***
FCF Yield	***-2%***	***-5%***	***-7%***	***-7%***	***-250%***	***-331%***

Balance Sheet (A$m)	**2020a**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
Cash + S/Term Deposits	2.1	18.8	12.4	621.0	374.5	48.1
Other current assets	0.3	0.3	0.3	0.3	0.3	0.3
Current Assets	**2.3**	**19.2**	**12.7**	**621.3**	**374.9**	**48.4**
Property, Plant & Equip.	1.0	0.8	0.8	0.8	240.8	560.8
Exploration & Develop.	20.2	21.3	21.3	21.3	21.3	21.3
Other Non-current Assets	0.3	0.3	0.3	0.3	0.3	0.3
Payables	0.9	1.1	1.1	1.1	1.1	1.1
Short Term Debt	0.8	0.7	0.7	372.7	372.7	372.7
Long Term Debt	1.8	1.8	1.8	1.8	1.8	1.8
Other Liabilities	1.0	1.0	1.0	1.0	1.0	1.0
Net Assets	**19.3**	**36.9**	**30.4**	**267.0**	**260.6**	**254.1**
Shareholders Funds	26.6	48.7	48.7	291.7	291.7	291.7
Reserves	0.9	0.9	0.9	0.9	0.9	0.9
Retained Earnings	-8.2	-12.7	-19.2	-25.6	-32.0	-38.5
Total Equity	**19.3**	**36.9**	**30.4**	**267.0**	**260.6**	**254.1**
Debt/Equity	*9%*	*5%*	*6%*	*1%*	*1%*	*1%*
Net Debt/EBITDA	*-0.3x*	*3.9x*	*1.5x*	*38.3x*	*0.0x*	*-50.6x*
ROE	*-12%*	*-12%*	*-21%*	*-2%*	*-2%*	*-3%*
ROIC	*-11%*	*-19%*	*-27%*	*-27%*	*-2%*	*-1%*
Book Value/share	0.06	0.12	0.10	0.89	0.87	0.85

Source: Company reports, Canaccord Genuity estimates

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Investment Recommendation

Date and time of first dissemination: September 27, 2021, 03:54 ET

Date and time of production: September 27, 2021, 03:54 ET

Target Price / Valuation Methodology:

Cobalt Blue Holdings - COB

Our price target is set in line with our risked (35%) NAV.

Risks to achieving Target Price / Valuation:

Cobalt Blue Holdings - COB

Financing risks

As a pre-production company with no material income, COB is reliant on equity and debt markets to fund development of its assets and the continuing business development activities. Total development and working capital requirements are subject to completion of final studies. There are no guarantees that studies will result in a positive investment decision for the Broken Hill Cobalt Project. Further, we can make no assurances that accessing these markets will be done without further dilution to shareholders.

Exploration risks

Exploration is subject to a number of risks and can require a high rate of capital expenditure. Risks can also be associated with conversion of inferred resources and lack of accuracy in the interpretation of geochemical, geophysical, drilling and other data. No assurances can be given that exploration will delineate further mineral resources or that the company will be able to convert the current mineral resource into minable reserves.

Development risks

Developing mining operations comes with a set of risks associated with the timing and cost of a project. Delays due to equipment, labour, weather or pandemics occur and can draw down on contingency allowances provisioned by the company. Commissioning also presents as a period of elevated risk as equipment is turned on and ramped up. Failure of critical equipment can occur and further delay projects.

Operating risks

If and when in production, the company will be subject to risks such as plant/equipment breakdowns, metallurgical (meeting design recoveries within a complex flowsheet), materials handling and other technical issues. An increase in operating costs could reduce the profitability and free cash generation from the operating assets considerably, and negatively impact valuation. Further, the actual characteristics of an ore deposit may differ significantly from initial interpretations, which can also materially impact forecast production from original expectations.

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As with any mining company, COB is directly exposed to commodity price and currency fluctuations. Commodity price fluctuations are driven by many macroeconomic forces including inflationary pressures, interest rates and supply and demand factors. These factors could reduce the profitability, costing and prospective outlook for the business.

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Global Stock Ratings (as of 09/27/21)

Rating	Coverage Universe		IB Clients
	#	%	%
Buy	638	66.53%	44.20%
Hold	159	16.58%	25.79%
Sell	7	0.73%	42.86%
Speculative Buy	149	15.54%	59.06%
	959*	100.0%	

*Total includes stocks that are Under Review

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NOT RATED: Canaccord Genuity does not provide research coverage of the relevant issuer.

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12-Month Recommendation History (as of date same as the **Global Stock Ratings** table)

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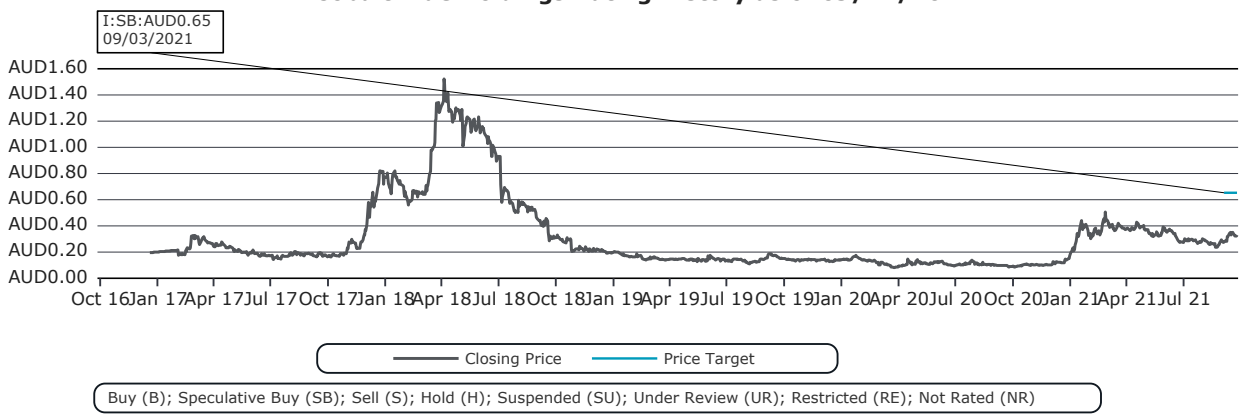
Cobalt Blue Holdings Rating History as of 09/24/2021



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