CENTAURUS METALS LIMITED (ASX: CTM)

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Centaurus Metals ("CTM") is an Australia-listed mining exploration company focused on developing a nickel sulfide project in Brazil. The Jaguar Project ("Jaguar") was purchased from Vale S.A. in April 2020, giving CTM exploration, growth, and development opportunities in the international nickel sulfide market. The deposit is located in the Carajas Mineral Province of northern Brazil. Jaguar will produce more than 20,000 tons per year of Class 1 nickel. Initial geological results and mine construction plans suggest that the project is one of the world's most significant high-grade, undeveloped nickel sulfide mines. We are not aware of any resource globally that is projected to have higher operating margins. Today, you can purchase CTM for 25% of the project's estimated net asset value, assuming spot prices are 30% below the current price. Our risk-adjusted price target suggests a 200% upside in the share price, with catalysts inside the year for partial realization of that return.

Nickel Market: Some important context

Stainless steel is the primary demand driver for nickel, accounting for approximately 70% of global production. Batteries are the next most significant demand driver, accounting for over 10%, while other metal alloys and specialty steel products round out the difference. Batteries are not a new market for nickel,[1] but their share of market demand is expected to increase significantly. By 2025, batteries may grow to 20% of global nickel demand and scale to 35% by 2030.

Nickel production needs to scale to meet new demand (batteries are not stealing market share from the steel market). However, production cannot be scaled indiscriminately. It needs to ramp production that is economically viable to service the battery cathode industry.

Nickel deposits are not homogenous. Perhaps obvious, but this bifurcation forms the bases by which we may see the nickel market split into two markets this decade, providing different price signals for different types of nickel deposits and one of the reasons the Jaguar project is a valuable resource. The difference in deposits is worth a brief explanation.

Like other base metals, Nickel deposits come in two forms: sulfides and oxides. Nickel production can thus be sorted into two major groups:

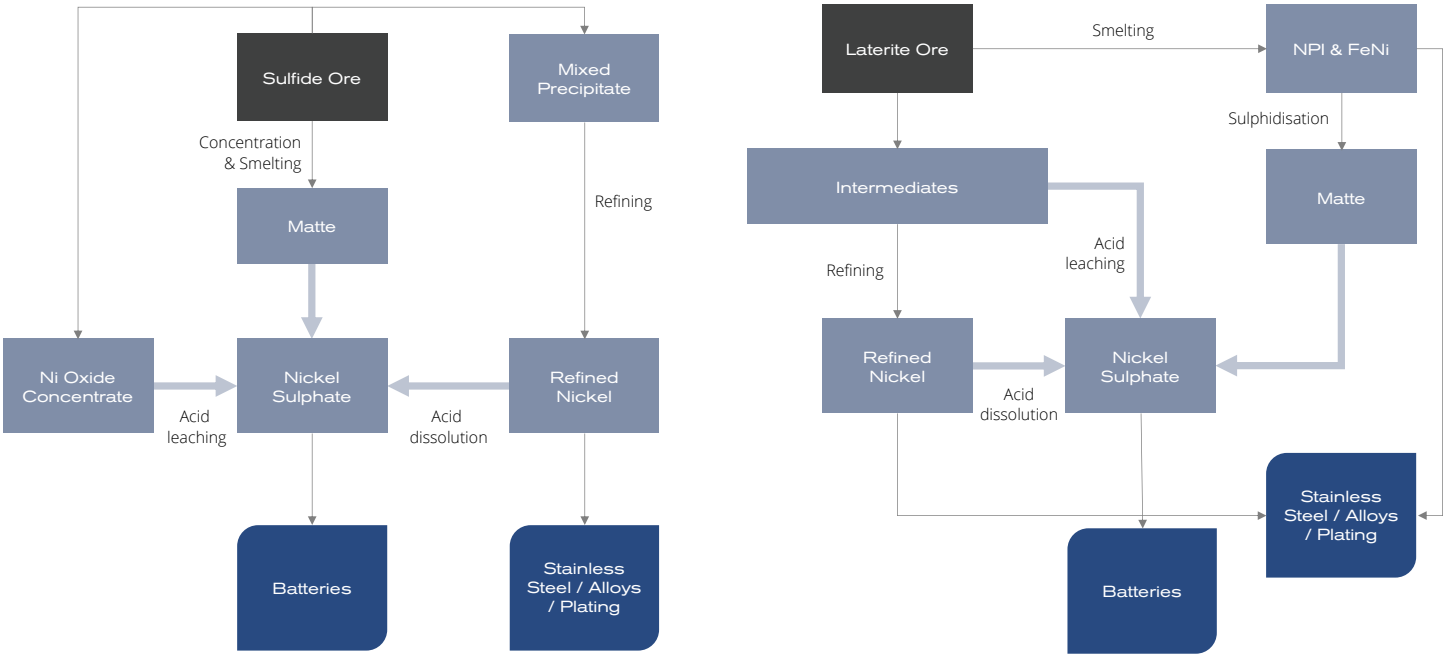
- ***Battery Grade Production:*** High-grade nickel for battery cathodes can be produced from sulfide and laterite oxide ore. BHP, Vale, Nornickel, and Glencore are the primary producers of high-grade nickel. Sulfide concentrates can be leached or smelted, producing nickel "matte" which is processed further to make nickel cathodes. Nickel sulfide mines tend to be large, capital-intensive projects. Operating cash costs range from $10,000–$15,000 per ton for the middle two quartiles of production cost curves. Norlisk (the state-sponsored Russian producer) is near the bottom tier of operating costs at around $8,000 per ton due to copper and palladium credits in their ore deposits.

- ***Ferronickel Production:*** Low-grade nickel deposits produce a concentrate

typically used in the production of ferronickel, which is primarily used by the steel industry. Low-grade nickel of this sort is only produced from laterite feeds. Key producers of low-grade nickel include Chinese and Indonesian NPI (Nickel Pig Iron) smelters and ferronickel producers like Anglo American, South32, POSCO, among others. Some limonite-hosted nickel laterites contain high grades of iron. Direct smelting of these ores produces nickel-pig iron, which is how low-cost stainless steel is made today.

High-grade nickel is sometimes referred to as Class 1 and low-grade nickel as Class 2. With the marginal demand for nickel being driven by battery applications, there is an emerging and potentially protracted scarcity of nickel sulphate, and our ability to bring new sulfide capacity into production is limited.

Figure 1: Nickel Production From Sulfide and Laterite Ore



Source: Massif Capital, Woodmac, Nickel Institute, Goldman Sachs Investment Research

The materials used in a cathode determine the conductivity profile of a battery. For applications like an electric vehicle (EV), nickel's relatively high energy density translates to less weight and more extended range, making it an obvious contender among competing chemistries. Nickel's adoption rate will ultimately be determined by the share of chemistries using nickel and global EV adoption rates.

EV penetration inflected over the last two years, growing from 2.1 million units sold in 2019 to 6.2 million in 2021. A fraction of global auto sales, but nonetheless a ~300% increase. Acceleration is expected to continue, with auto analysts forecasting a tripling by 2025 (20.2 million units), representing 1,263 GWh of battery energy capacity. From 2025 to 2030, we may see another ~250% increase to 3,300 GWh of

capacity. These projections lie at the core of the demand boom for nickel.

We want to emphasize that the range of adoption rates for EVs and nickel-based cathode technologies is vast, with very high levels of uncertainty. We are sympathetic towards the projections many analysts produce. The forecast we have seen are often built on individual assumptions that are perfectly reasonable. Nevertheless, the automotive industry/consumers may undershoot or overshoot these values by a wide margin. We believe material shortages will likely slow the roll out.

Nickel battery demand is expected to grow from just under 200k tons per year to over 1,400k tons per year under many EV growth scenarios. Class 1 nickel is in a deficit today. The EV market does not need to scale close to projected rates for a Class 1 deficit to persist for several years.

Using different materials in EV batteries is a search for an optimal balance between cost, range, and safety. Higher energy density batteries are typically lighter and can go further but generally are more expensive. Nickel-based cathodes fit in this category. Remove the nickel from the cathode; you will lower the cathode material costs — and thus battery costs — but lose out on some performance characteristics.

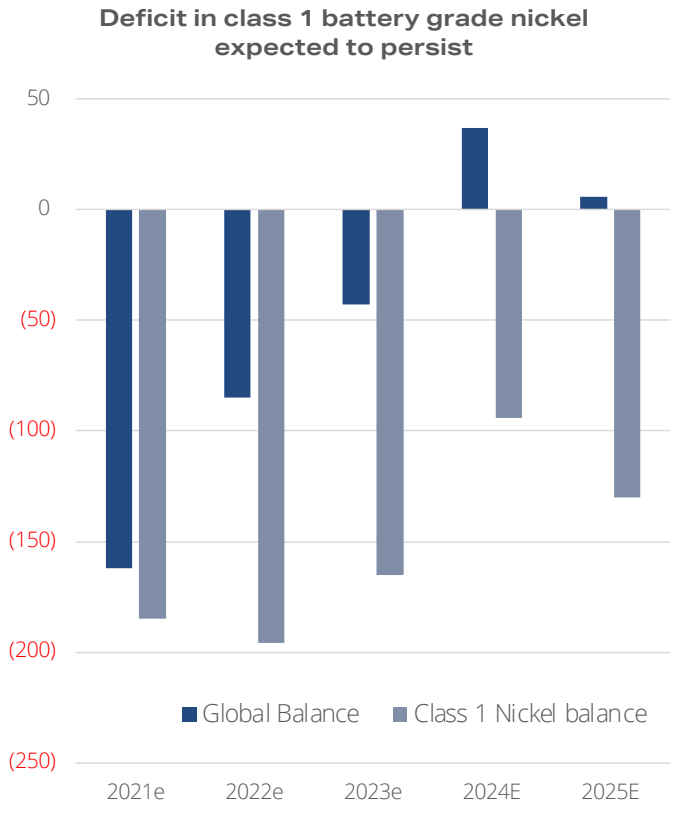
There are also growing geographical variations in battery chemistry preference. Today, iron-based chemistries (LFP batteries) are favored in China, whereas nickel chemistries (NMC batteries) are more prevalent in Western markets. LFP batteries are generally cheaper and more stable at higher temperatures but have lower energy density. Chinese battery manufacturers also hold essential LFP patents, which restrict the production of LFP almost exclusively to China. Western demand has favored higher energy density (translating to a longer range, all else equal) and appear, thus far, willing to pay for it.

There is a prevailing hypothesis that LFP batteries will gain market share in Western markets faster than expected. This may be reasonable: they are cheaper and likely less prone to future material shortages. We don't have any unique perspective on this matter, nor is our investment thesis predicated on precise LFP vs. NMC adoption curves. We would struggle to develop high conviction in such a thesis. Under a hyper LFP adoption scenario, forecasts suggest a relative Nickle drag of 300k tons per year by the end of the decade vs. various NMC adoption curves. A 300k drag reduces nickel battery demand from a potential 1,400k tons per year to 1,100k tons per year. Class 1 nickel would still need to scale by 5x in this environment.

Unlike copper and aluminum, which have the potential to become extremely tight markets mid-decade depending on adoption rates for electrification targets, nickel is already in a deficit. The nickel market experienced a record 162k ton deficit in 2021. A recent Goldman Sachs report highlights the severity of the deficit noting, "absent significant fundamental adjustment, the nickel market will not be able to supply the units required for the electrification of the global road transport sector...the market is woefully unprepared."[2] Nickel has a supply problem. But more specifically, it has a sulfide ore supply problem.

Figure 2: Nickel Supply | Demand Balance

all in '000 tones	2021e	2022e	2023e	2024E	2025E
Demand					
Class 1 Nickel Demand	1,158	1,293	1,413	1,500	1,630
Green	234	359	449	522	632
Stainless Steel	257	245	244	241	234
Other	668	690	721	737	764
Class 2 Nickel demand	1,712	1,734	1,881	2,007	2,061
Stainless Steel	1,712	1,734	1,881	2,007	2,061
Supply [Production]					
Class 1 Nickel	791	838	847	857	860
Class 2 Nickel	1,735	1,901	2,047	2,176	2,222
Chemicals	183	276	416	563	623
Others	0	0	0	0	0
Probable projects	0	1	20	32	49
-Class 1	0	0	3	5	7
-Class 2	0	1	18	28	42
World output	2,709	3,017	3,331	3,628	3,754
World output (adj. for disruption)	2,709	2,926	3,231	3,519	3,642
Battery Scrap Supply		16	20	24	55
Global Balance	(162)	(85)	(43)	37	6
Class 1 Nickel balance	(185)	(196)	(165)	(94)	(130)
Class 2 Nickel balance	23	112	122	131	135



Source: Massif Capital, Goldman Sachs Investment Research

Raw supply is not the only issue. Neither inventory nor conversion capacity appears sufficient. In 2021, supply disruptions in sulphate and NPI production — coupled with strong demand in both batteries and stainless steel, led to a significant draw of Class 1 inventories. Visible Class 1 stocks sit at just 93k tons today. These stocks are not sufficient to tackle demand and the Class 1 deficit in 2022. Potential losses from Russia only accelerate this depletion path. Russia is estimated to produce 133k tons of Class 1 supply this year, representing about 16% of global Class 1 supply. It also supplies intermediate nickel products to refineries in Europe. We do not see any evidence yet that sanctions or consumer self-sanctions have impacted Russia's exports of nickel to developed markets, but the situation is still clearly volatile. The longer the conflict, the more risk there is when consumers come to market to negotiate new contracts for 2023.

New mines bringing fresh production online do not appear sufficient either. Supply growth over the next 2–3 years looks to be concentrated in NPI production, shifting the Class II market into a surplus of ~100,000 tons. While more significant surpluses in Class II nickel in 2023–24 have the potential to offset continued shortfalls in Class I (through NPI to sulphate conversation[3]), we do not anticipate sufficient production to balance the market. If conversion capacity, likely coming from Indonesia, cannot facilitate market balancing in the Class 1 market, the incentive price to support non-Indonesian projects is roughly $34,000 per ton.

We estimate that the Jaguar project can achieve 65% operating income margins at $20,000 per ton, a price 40% lower than the incentive price for new supply and 30% below today's spot price.

Jaguar: Project Economics

Jaguar will produce 20,000 tons of nickel sulfide ore per year. An annual volume represents about 12% of the current Class 1 deficit. A meaningful project for the global market but not large enough to require overwhelming capital expenditure and infrastructure build-out. Its operating cash costs are, conservatively, 60% lower than world-class sulfide mines owned by Norlisk, Vale, and BHP, among others. The quality of the estimated resource suggests this ore body will almost certainly be monetized this decade.

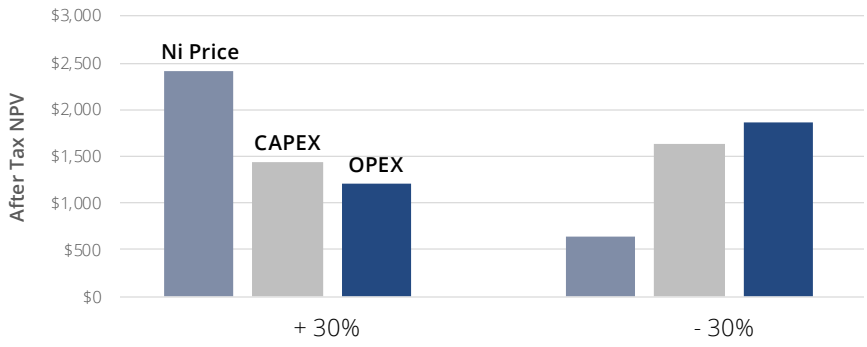
Over the life of the mine, we believe operating cash costs may average $3.3 per lb. with all-in sustaining costs (cash costs, plus royalties and sustaining capital expenditures) at just under $4 per lb. At current strip LME Ni metal prices of ~$13per lb., Jaguar would be producing CMT's market capitalization every year in free cash flow. Should prices moderate to $9 per lb., annual free cash flow production would pay back upfront capital expenditures in a year. The margin profile, under almost any price scenario, is extremely attractive.

Jaguar: Valuation

The first set of technical documents was released in the spring of 2021. Assuming a $20,000 per ton price, we think the project is worth about AUD 1.5 billion, implying CTM is trading at about 30% of its net asset value.[4] The attractive economics are robust to cost overruns of at least 30% for both capital and life of mine operating expenditures. We anticipate the first production in late 2024, with a full year of production in 2025. We believe CTM's value will approach that of its Jaguar project valuation, suggesting an AUD $3.6 per share, or 240% gain over a three-year holding period.

Figure 3: Valuation Sensitivities

Variable	Value Add Assumption	Sensitivity
Ni Price	US $20,000 / t	+/- 30%
Capital Costs (Development)	US $287.8M	+/- 30%
Operating Costs	Life of Mine OPEX US $2,088M	+/- 30%



Source: Massif Capital, CTM Scoping Study

Considering a volatile nickel market and waiting on cash flows for two and half years, relative pricing is a legitimate — and perhaps more appropriate — way to think about CTM's prospects. Here too we find a significant discount. Their enterprise value to inventory is about 1/10th of Australian listed one-asset producers. The quality of the mine (low taxes, accessible and shallow tones, production of 100% payable sulphate vs. 75% for peers proposing concentrate) suggests it should earn a premium perhaps, but not a 90% discount.

Jaguar: Important Characteristics Underwriting a Development Project

Jaguar is in an excellent location. Projects near the coast (and population centers in Brazil) often have better infrastructure but difficulty permitting based on the impacts on towns. Projects in the remote Amazon don't have population centers (and benefit from a 75% reduction in taxes in Northern Brazil) but have less than ideal infrastructure and, appropriately, complicated permitting given environmental implications. As described by Sprott Capital Partners, Jaguar has the best of both worlds as an “end of the road” project. It touches infrastructure but is close enough to the Amazon to get Amazonian tax breaks. It is a mine site without the need to relocate populations living on the mine site; it does not require any significant defor-estation, there are no indigenous population concerns, nor is it overly close to a large population center; all factors that can stop projects in their tracks.

The Carajas Province has a well-established mining regulation and tenement system, which gives management and capital providers a clear roadmap to turning the mine on. Royalties and taxes do not need to be conceived from scratch and deliberated in the legal system or the court of public opinion for years. There is precedent for royalty packages, and there is precedent for the favorable tax system. The levied tax is favorable on absolute terms, but equally important are the precedents such that operators and capital providers can gain conviction in development timelines.

Jaguar also inherits very low-cost hydropower and a state grid that is currently 80% renewable energy. Low variable operating costs mean higher margins and lower risk for any future cost profile that ascribes a monetary cost to atmospheric emissions tied to a company's production. An independent CO2 footprint study by UK consul-tants Skarn Associates showed Jaguar sitting in the top 3% of producing nickel assets when in production at ~4.7 tons per ton of nickel equivalent (“NiEq”), against an industry average of 33 tones per ton of NiEq.

Cheap power, coupled with a devalued Brazilian real, put CTM in a better position to execute than other western peers, who suffer from capital cost inflation which is destroying project economics and hiring challenges that are preventing even the best of management's team from executing within budget. Taping into a non-western, highly-skilled employee base is now a strategic advantage for CTM.

Jaguar: Upcoming Catalysts; Value Bump?

Here is what we are looking for over the next year.

1. An updated mineral resource estimate is due in the year's second half. We anticipate at the end of the third quarter.

2. A definitive feasibility study (DFS) is expected in the fourth quarter of this year. We expect a material improvement in the DFS compared to the original set of technical documents produced a year ago. The scoping study produced in 2021 and Massif's valuation model 364,000 tons of contained nickel, assuming 36.6 million tons at 0.76% of pittable resource. At the time of the scoping study, this estimate was a subset of the global resource of 59 million tons at 0.98% for roughly 576,000 nickel metals. Over the last year, the mineral resource estimate (MRE) has lifted to 81 million tons at 1.00% for 805,000 tons of contained nickel metal. While the 81 million tons MRE won't convert entirely to measured and indicated inventory that can be economically extracted, we believe it's likely that the contained nickel metal will be at least 20% higher than in our current estimates.

Figure 4: Resource Updates

	Q1 2021	Q4 2021	Delta (%)
Tonnes	58.6	80.6	38%
Grade (% NiEq)	0.98%	1.00%	2%
NiEq metal ('000 tons)	**576**	**805**	**40%**
Indicated (% total)	40%	55%	38%
Indicated grade (% NiEq)	1.15%	1.02%	-11%
Tonnes added ('000 tons)	10.6	22	108%
Grade of new tons (% NiEq)	0.41%	1.04%	154%
High Grade tonnes ('000 tons)	19.7	22.4	14%
High-grade (% NiEq)	1.60%	1.74%	9%
Ni metal ('000 tons)	**316**	**389**	**23%**

Source: Massif Capital, Sprott Equity Research

Investment Thesis

We believe that CTM will go ahead with a 3–4 million ton per year plant, with about $350M in CAPEX and about a 20% contingency on the CAPEX figure. The project is high grade; it has a low strip ratio starter (open) pit and quick payback, giving management ample reason to finance at least 75% from debt. The active permitting process is moving through milestones with essential operating license requirements, such as the environmental impact assessment, filed late last year.

CTM is in a narrow part of its development lifecycle that we have had success investing in. We believe the Jaguar project is closer to free cash flow than the market is pricing in. It's not a rare occurrence in mining firms, but it is not frequent either.

The market is somewhere between 6 months and two years behind where the mine is in development. We feel we have positive asymmetry here and believe we can measure it. We expect positive news from the company over the next year will re-rate the stock to reflect more than 50–60% of the project's net asset value. At that point, we will have an option to choose whether to hold the company through into production or sell. We have conviction in this project, but we recognize that the world, and our opinions and convictions, are malleable. We like the flexibility afforded by upside before any construction risk or requiring non-material changes in the nickel market for several years.

APPENDIX

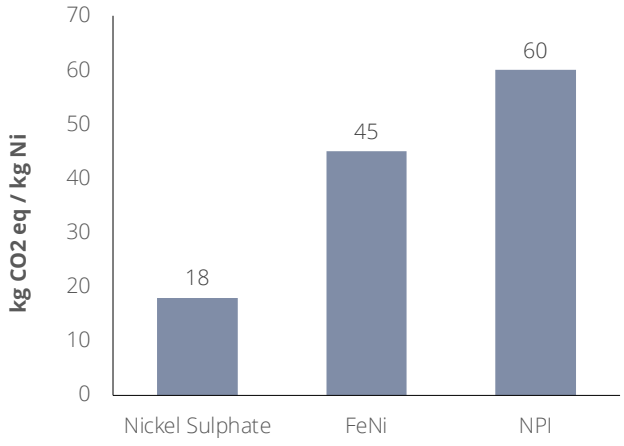
Technology Risk in Nickel Conversion Capacity

Processing laterites nickel ores requires an expensive hydrometallurgical process utilizing strong acid leaching at high temperature and pressure. Billions of dollars were invested and lost in developing "HPAL" — high pressure / acid leach tech in the last nickel bull market. As prices rose north of $50,000 per tone, major producers bought several junior producers and projects out of supply concerns. Billions were lost in this feeding frenzy (e.g., Norilsk's $7bn acquisition of Lionore, Vale's $19bn on Inco and Xstrata's $18bn on Falconbridge). Nickel peaked at $53,000 per ton in 2007 and bottomed at $8,000 in 2016. This tech has massively reduced the cost of producing stainless steel — the single most significant use for nickel globally. Some believe today that producing nickel matte from laterites can be done cost-effectively. If true (at any point), this will likely overturn the market conviction that sulfide production is cheaper than laterite production. This will probably lower nickel prices dramatically and render many undeveloped sulfide projects un-investable. We have seen announcements for a few years, specifically out of Tsingshan, that they are capable of such conversion. There is no evidence of any meaningful supply from this method.

Nickel's Carbon Footprint

To date, global electrification strategies — the principal force behind most decarbonization plans — rely on carbon-intensive commodities. Although nickel has a significantly smaller footprint than, for example, aluminum (accounting for 0.1% of global emissions vs. 2.0% for the latter), its decarbonization pathway may be an increasingly important factor for claiming a carbon-neutral EV

Figure 5



Source: Massif Capital, Nickel Institute, Goldman Sachs Investment Research

cradle to grave. About 50% of nickel is produced using coal-burning energy. Indonesia represents the bulk of this, representing about 39% of the total nickel supply.

If carbon intensity begins to matter for consumers (flowing through to auto OEMs), either spare capacity from Indonesia becomes a moot point, or Indonesia accelerates decarbonization at a cost, raising the price of the delivered product. Both paths raise prices.

Endnotes

[1]As far as we can tell, the first batteries using nickel were developed back in 1899, in the form of Nickel-cadmium batteries (Ni-Cd). This specific battery has limited use today as the EU has prohibited cadmium on the ground of toxicity. We see evidence of modern batteries using nickel in the cathode as early as the 1980's.

[2]"Nickel's class divide" Goldman Sachs Commodities Research, April 2022.

[3]Laterite ore deposits can be processed into battery-grade sulphate; however, the NPI to matte capacity, along with other routes such as high-pressure acid leaching to get to a sulphate are more costly and carbon intensive then direct from sulfide ore and, by volume, are likely still insufficient to address any Class 1 market deficit. See Appendix for further commentary.

[4]This excludes CTM's balance sheet and other assets they are developing or own. In our estimation, CTM's value is derived exclusively from the Jaguar Project today and thus is effectively a single asset company. While their balance sheet today reflects a cash balance, we do not consider this in the value of the business. Project NPV values are inclusive of capital expenditures and assumes Time (0) as 2023.

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In a Q&A, Massif Capital portfolio managers explain the benefits of real assets, the role real asset industries will play in the transition to a low-carbon economy, and the ways a long-short strategy can capitalize on the shakeout from this transition.

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