

# What is next for nickel in the era of Covid -19 and beyond?

## Update on “future facing” metals equities

Baker Steel Capital Managers LLP

Investment Manager of the BAKERSTEEL Electrum Fund

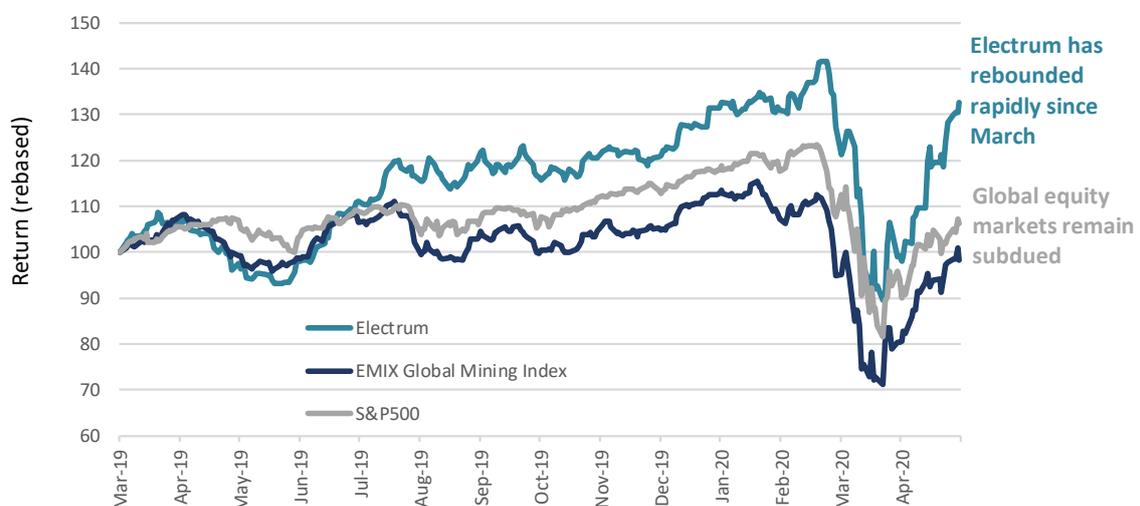
5 May 2020

BAKERSTEEL Electrum Fund (“Electrum”) has delivered strong performance over the past month in the wake of the COVID-19 driven sell-off across all asset classes, highlighting the benefits of the Fund’s strategic allocation to certain “future facing” metals. A key strength of Electrum’s investment strategy is its ability to balance exposure to different sub-sectors within the mining industry, informed by a top-down view of the markets. A good example of the Fund’s response to the shifting outlook for different metals has been its recent strategic weighting back towards gold, combined with a tactical allocation to nickel. Investments in nickel and gold producers have been a driver of recent Fund performance. While Baker Steel publishes commentary quite regularly on the gold sector, this article aims to give an insight into Baker Steel’s investment research process, with a focus on the nickel sector.

Earlier this month we published our first annual review for Electrum. As part of that review we stated our belief that the nickel market was especially vulnerable to COVID-19 supply disruptions and had significant potential for a short-term price response.

Since publication on 6 April, nickel has been one of the best performing metals on the London Metal Exchange and the Fund’s exposure to selected nickel equities has helped drive another month of outperformance, with the Fund having returned +33.7% during April, compared with the EMIX Global Mining Index (“the Index”) which has risen +25.5% (data in Euro terms, at 30/04/2020). Since Baker Steel was appointed as Investment Manager in March 2019 the Fund has outperformed the Index by +32.8% (in Euro terms). Our team sees a multitude of attractive investment opportunities at present and remains confident regarding the prospects of continued strong performance over the months and years ahead.

**BAKERSTEEL Electrum Fund - Performance since inception**



Source: Bloomberg. Data at 30 April 2020.

In this report we address the current state and outlook of the nickel market in more detail. In particular we examine the metal's unique supply structure and what this could mean for nickel in the short term with respect to COVID-19 supply interruptions and, in the longer-term, how supply chains might adapt to meet the demand for nickel from electric vehicles.

However, first it is important to address some of the more basic concepts of the nickel market and this strategic "future facing" metal.

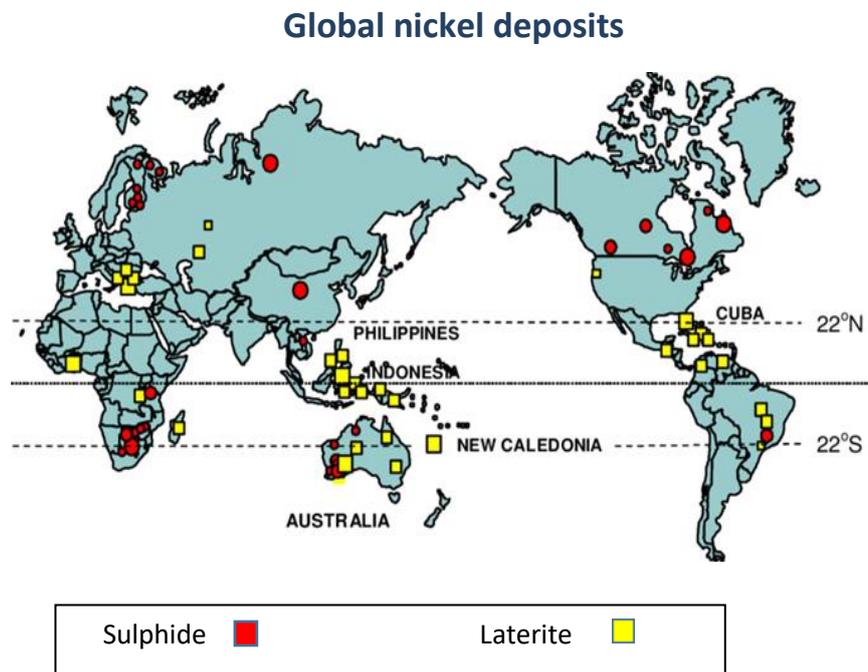
### What is nickel and what is it used for?

Nickel is used in a variety of applications, but its primary use is within steel making. In recent years however, nickel has become more widely known to investors owing to its use in lithium battery technology and therefore having exposure to rising electric vehicle ("EV") demand.

Importantly, different types of finished nickel are required for the different end markets and different types of deposits have differing cost structures for the production of each of the finished products.

### Where does nickel come from?

There are two main sources of primary nickel: sulphide ore and laterite ore. Sulphide ores are concentrated in Canada and Russia while laterite deposits are formed in hot and humid environments and therefore found in countries such as Indonesia, Brazil, Cuba and the Philippines.



Source: Mick Elias Associates, Nickel laterite deposits – geological overview, resources and exploitation, January 2002.

### How is nickel priced?

Prior to the late 1990's, most of the world's nickel came from sulphide ores. The Chinese-led commodity boom in the late 1990's and early 2000's saw the nickel price skyrocket. Higher prices incentivised new nickel deposits to be put into production and many laterite-based operations started to produce their own supply.

At this time it is estimated that USD 20bn dollars flowed into the sector, building laterite nickel projects with complicated processing flowsheets (High Pressure Acid Leaching or “HPAL”)\*. Most of these projects have never made an acceptable return on that capital outlay due to delays and high operating costs.

From the late 2000’s, increasingly cost competitive nickel operations have been developed by Chinese groups in Indonesia using simple (and largely decommissioned) processing technology that used upgraded iron rich nickel laterite ores for use directly in the steel furnaces. Known as nickel pig iron (NPI) these operations were built for a fraction of the capital outlay and had much lower operating costs than laterite operations using HPAL technology or sulphide operations which require smelting and refining capacity. Whilst it can be argued that the output from these NPI operations was (and is) subsidised by a lack of environmental oversight and cheap power, the operators of these integrated projects have been the winners in the nickel market over the last decade.

## **The outlook for the nickel market structure and implications of COVID-19**

Below we give an overview of the nickel supply chain covering its two main end uses; steel production and battery technology. We have included an appendix at the end of this report with a flowsheet explaining some of the terminology used below, which may be unfamiliar or confusing.

### **1. Steel Mills**

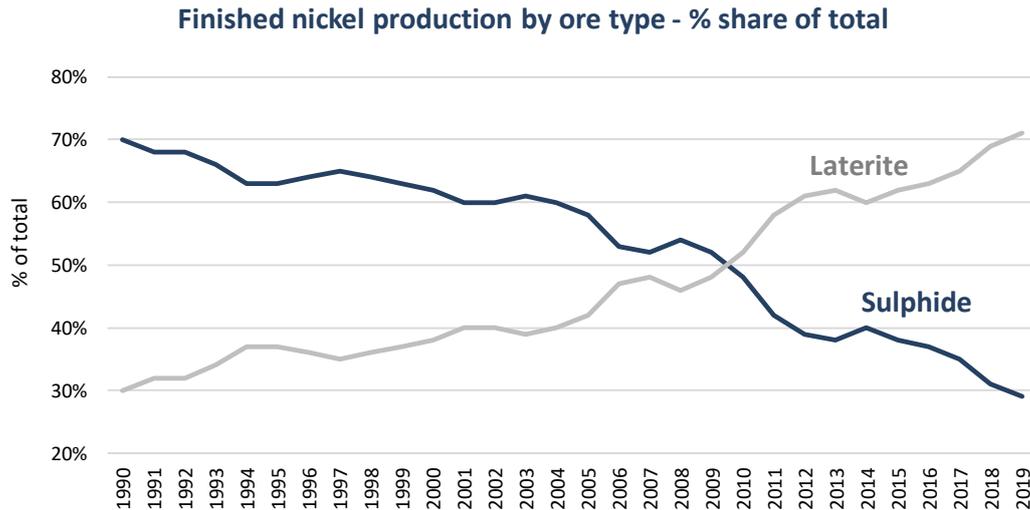
Steel mills can utilise a large proportion of low grade “Class 2” nickel units in their feed. Class 2 nickel units come with high levels of impurities, Ferronickel (FeNi) and nickel pig iron (NPI) are types of class 2 nickel. The Indonesian laterite operations have a material cost advantage in producing class 2 nickel units due to the superior infrastructure, proximity to the end user and iron by-product.

It is worth noting that the success of these Indonesian laterite operations has resulted in a substantial and permanent lowering of the cost curve for the nickel industry. Billions of dollars have been written down on HPAL operations and little investment has gone into sulphide operations.

### **2. Battery Industry**

Battery grade nickel units come in the form of nickel sulphate\* which is an extremely ‘clean’ form of nickel with low levels of impurities. Generally, nickel sulphate is produced directly from HPAL operations or converted from class 1\* (>99.8% ni) nickel products. Class 1 nickel products include nickel powders, cathodes and briquettes. Class 1 nickel units are produced from laterite ores using high pressure acid leach (HPAL) technology or from sulphide ore via a concentrator, smelter and refinery. We discuss later the conversion of class 2\*(<99.8% ni) nickel units to class 1 forms of nickel.

**Nickel supply chain** - Over the last ten years, the global steel industry’s supply chain has been altered substantially. Broadly the Chinese steel mills receive the majority of their class 2 nickel in the form of nickel pig iron from Indonesia or the Philippines. It should also be noted that the ban in Indonesian ore exports has led to an “on shoring” of some integrated Chinese steel mills into Indonesia. As a result, there are effectively two distinct steel supply chains: Indonesian and Philippines laterite ores supplying the Chinese via NPI; and the rest of the world buying from nickel units from sulphide or laterite HPAL producers.

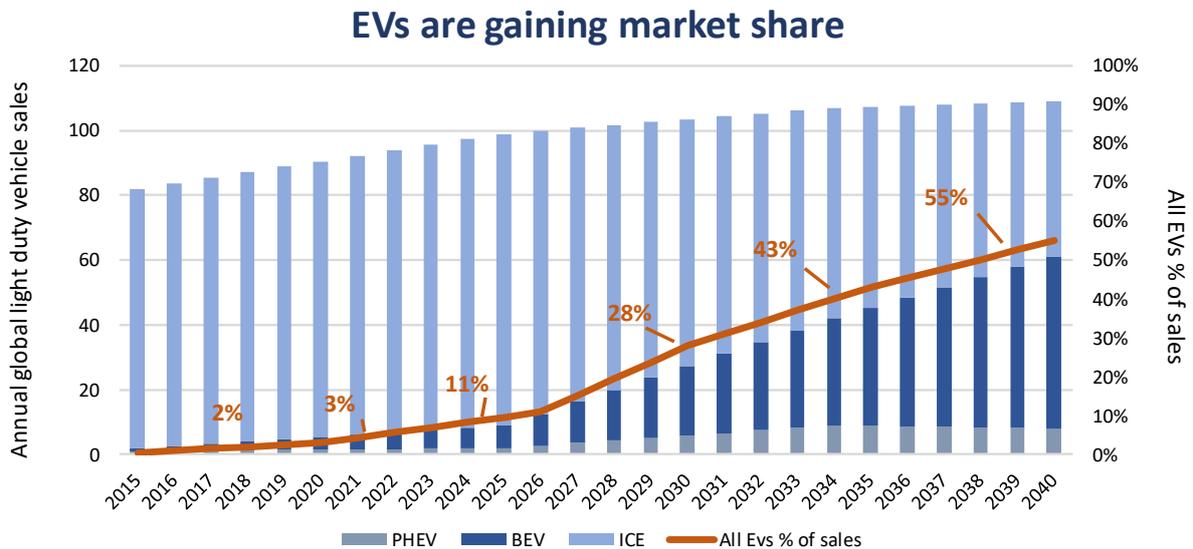


Source: Company data, INSG, Macquarie Strategy, July 2019

If there is widespread interruption to the supply of Indonesian ore, whilst at the same time Philippine ore export is also curtailed (due to COVID-19), then it is very difficult to see where the Chinese mills will get sufficient feed of class 2 nickel from. Therefore the nickel market is uniquely vulnerable to the impacts of COVID-19 supply interruptions. We have seen evidence of Chinese steel mills trying to increase stocks of NPI, as Chinese imports surged during March, according to the Shanghai Metals Market (SMM). Imports of both FeNi and NPI reached 3.8mtpa in March, up 243% year-on-year from 1.1mtpa in March 2019.

### The longer term outlook for nickel

The primary driver for nickel demand growth is the incremental demand from Electric Vehicle (EV) batteries which currently account for about 5% of the global automobile market but is set to increase around five-fold in a little over five years as the sales of EVs increase.



Source: Bloomberg New Energy Finance, Baker Steel Capital Managers LLP. Notes, plug-in hybrids: PHEV, battery electric vehicles: BEV

Over the next five years we anticipate that most of the incremental primary nickel will come from Indonesia, however the processing route and the final form of nickel produced could alter over time depending on technological advances. We do though expect the cost structure of the industry to increase regardless of the technology employed.

## Investment strategy

In the nickel sector, as with all commodities, Baker Steel focuses its investments on high quality producers with long-life mines, low costs of production and competent management. Our team prefers to invest where companies have an ability to capture the full value for their product which means having the necessary processing infrastructure in place. As always, we look to benefit from the upside of any price surge by investing in companies which have a clear and coherent shareholder returns strategy preferably tied to revenue.

*Following a successful first year of performance and growth, we would like to thank our investors and partners for their support as we look ahead to the multitude of opportunities in this exciting and fast-developing sector. A range of share classes remain open to new investment. Please do not hesitate to contact Baker Steel's team for more information.*

### **About Baker Steel Capital Managers LLP**

*Baker Steel Capital Managers LLP manages the **Baker Steel Gold Fund**, **BAKERSTEEL Precious Metals Fund**, **BAKERSTEEL Electrum Fund**, **Baker Steel Resources Trust** and **ES Gold & Precious Metals Fund**.*

*Baker Steel has a strong track record of outperformance relative to its peers and relative to a passive holding in gold or gold equities. Fund Managers Mark Burridge and David Baker have been awarded **two Sauren Gold Medals for 2019** and were awarded **Fund Manager of the Year** at the **2019 Mines & Money Awards**.*

*BAKERSTEEL Precious Metals Fund is the 2020 winner for the fifth year running of the **Lipper Fund Award** for Best Fund over 3 years and 5 years, Equity Sector Gold and Precious Metals while Baker Steel Resources Trust has been named **Investment Company of the Year 2019**, Natural Resources, by **Investment Week**.*

## Glossary

\*Laterite ores are formed by weathering of ultramafic rocks. Generally this weathering needs a hot and humid climate which explains why many such deposits are found near the equator.

\*Sulphide ores such as Norilsk and Voisey Bay deposits accounted for the majority of nickel production until the late 1990's.

\* HPAL (or High Pressure Acid Leach) - a processing technology for laterite ores which currently accounts for about 10% of the nickel produced globally. The HPAL process utilises elevated temperatures (roughly 255 degrees Celsius), elevated pressures (roughly 50 bar or 725 psi), and sulphuric acid to separate nickel and cobalt from the laterite ore.

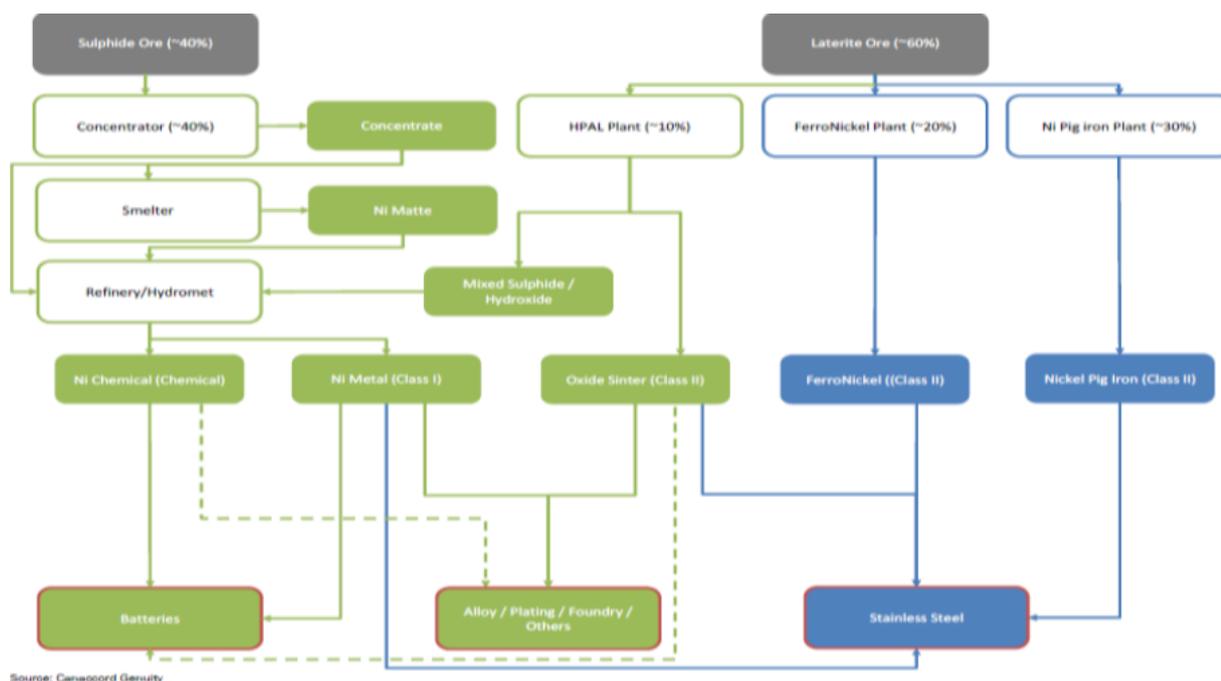
HPAL has been used since 1961 when it was first put into commercial production at Moa Bay, Cuba. It has subsequently increased in use since that time. Quote from <http://www.calderaengineering.com/industries-served/high-pressure-acid-leach-and-pressure-oxidation/high-pressure-acid-leach>

\*NPI (or Nickel Pig Iron) and FerroNickel - in 2005 with the world facing an impending shortage of nickel required to feed Chinese industrialization, the Chinese adapted old decommissioned technology (pig iron blast furnaces) to treat nickel bearing iron ore (laterite) to produce very low grade FeNi (2% Ni). The adaptation of

these decommissioned furnaces and subsequent construction of bigger and more efficient furnaces led to a massive increase in output of low grade FeNi that became known as NPI (nickel pig iron). This raw material was adopted in China for utilisation in the manufacture of stainless steel. <https://www.benchmarkminerals.com/membership/nickel-the-often-forgotten-battery-metal/>

\*Class 1 and class 2 nickel - Class 1 refers to higher purity nickel units typically found in powders, briquettes and chemicals. Class 2 refers to lower purity nickel units utilised in NPI or Ferronickel.

### Nickel market flowsheet



### Important

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