Industrial metals - at the beginning of a new super-cycle

Industrial metals are among the big winners of the COVID-19 crisis: in 2020 they gained an average of 20% and this year they have already achieved a double-digit performance (see Fig. 1). Not despite, but rather because of the virus, the fundamental outlook is very positive in the short to medium term. Although demand fell sharply in the course of the first lockdowns, many mine operators were also affected by COVID-related closures. Extreme inventory build-ups thus did not materialise. At the same time, political decision-makers around the globe launched fiscal stimuli of unprecedented magnitude. Thanks to the numerous economic stimulus and infrastructure programmes, industry is buzzing, which is also driving strong demand for raw materials. In addition to the economic upswing, industrial metals are also increasingly gaining longer-term tailwinds. This is because they are core raw materials for many key technologies to decarbonise our society and thus fight climate change. For industrial metals, a new structural boom, a super-cycle, may have just begun.

Within *Focus* we comment on extraordinary market events and analyse capital market related special topics.

Industrial metals benefit from cyclical and structural tailwinds

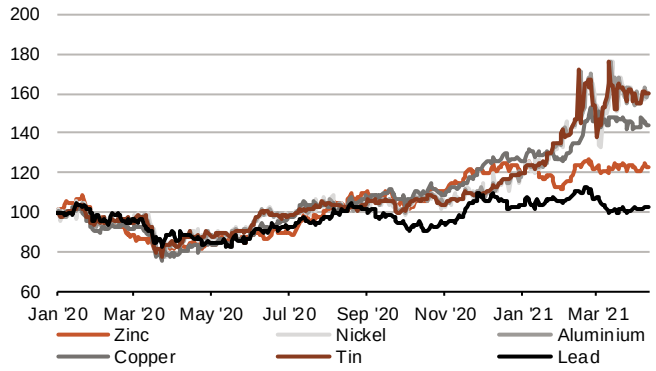
Industrialisation and the super-cycles of the past

A super-cycle describes a phase of above-average and long-term rising commodity prices followed by a phase of below-average and long-term falling commodity prices. At 20 to 70 years, the duration of such a super-cycle is significantly longer than that of a business cycle, which usually runs for seven to eleven years. Super-cycles are typically triggered by an unexpected, long-lasting and strong increase in demand. However, this sudden surge in demand is met by a relatively scarce and inelastic supply. This is because the extraction of many raw materials is associated with very high and risky initial investments and start-up phases lasting years. Since the sustainability of demand growth and the profitability of new investments are initially fraught with great uncertainty, producers initially postpone the latter and thus additionally delay the necessary production expansions. The results are supply deficits and steadily rising commodity prices over the years. Later, when demand growth subsides and supply finally increases, the cycle enters a phase of falling prices and supply surpluses. Finally, producers hold back on capital expenditures for years until the "hog cycle"[1] starts all over again.

A sudden and prolonged surge in demand, combined with inelastic supply, typically results in a new super-cycle

Fig. 1: Industrial metals - the winners of the COVID-19 crisis

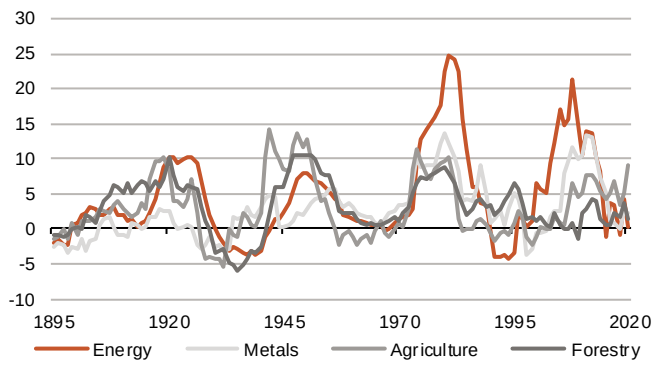
Price development indexed to 100 for the industrial metals zinc, nickel, aluminium, copper, tin and lead since January 2020.



Time period: 01/01/2020 - 09/04/2021.
Source: Bloomberg, own calculations.

Fig. 2: Industrialisation triggered past super-cycles

10-year rolling average of the annual price development of commodities from the energy, metals, agriculture and forestry sector in percent.



Time period: 01/01/1895 - 31/12/2020, annual data.
Source: Statistics Canada, own calculations.

[1] After Arthur Hanau

There have been four super-cycles over the past 150 years (see Fig. 2). All four coincided with periods of rapid industrialisation. They started with the industrialisation of the US in the late 19th century. The second commodity boom was triggered by the 1930s rearmament for the Second World War. This was followed from the late 1950s onwards by the reindustrialisation of Europe and Japan after the destruction caused by the war. And finally, around the turn of the millennium and with the rise of the emerging markets, the most recent super-cycle began. China in particular entered a phase of massive economic growth. The rapid construction of entire cities and their modern infrastructure was accompanied by a great hunger for raw materials.

Periods of rapid industrialisation were always the starting point for super-cycles in the past

Decarbonisation and the super-cycle of the future

Today, too, the recent rise in the prices of many commodities is demand-induced and coincides with a period of strong economic growth, relatively low inventories, years of investment restraint and tight production capacities. It thus fits well into the picture of past super-cycles and could represent the start of a new one. Nevertheless, the coming super-cycle is likely to be very different from its predecessors. While in the past periods of industrialisation always triggered a commodity boom, in the coming decades the cause is likely to be decarbonisation. The decisive difference between the past and the future lies in the beneficiaries of the underlying upswing in demand. In past super-cycles, energy commodities, industrial metals, agricultural products and livestock often benefited in unison. In contrast, decarbonisation is likely to benefit industrial metals, in particular, while energy commodities are likely to lose out. As an investor, differentiation is therefore necessary in order to profit from this megatrend.

Differentiation between different commodity segments is necessary to benefit from decarbonisation

Demand: the central role of metals in decarbonisation

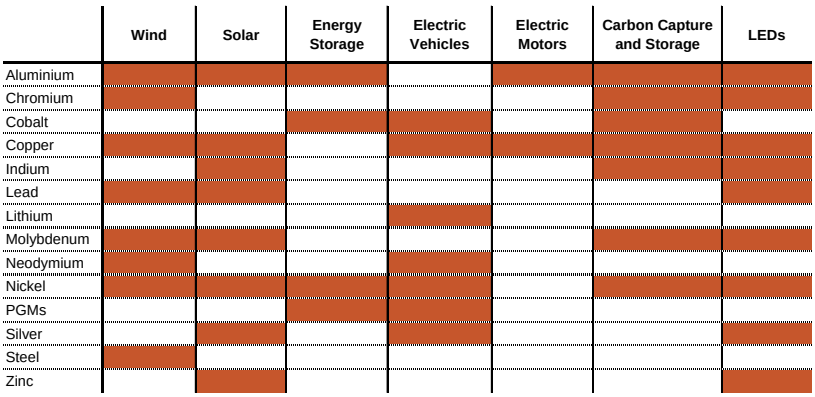
The industrial metals copper, aluminium and nickel play a key role across the entire spectrum of decarbonisation – from energy generation by solar or wind, to energy storage and use through batteries and electric motors, to CO2 sequestration (see Fig. 3).

Industrial metals are key raw materials in many green technologies to decarbonise our society

The example of copper shows the extent of the demand boom in various application areas. Copper is an important raw material in the electrification that accompanies decarbonisation because of its high conductivity. Wind power requires about four times and solar power up to twelve times more copper than power generation

Fig. 3: Use of (industrial) metals in the fight against climate change

Use of industrial metals, precious metals and rare earths in energy production, storage, mobility and other applications



Source: World Bank[2], BofA Global Research

from fossil fuels. An electric car contains about five times more copper than a car with a combustion engine. The decentralisation of electricity generation and the expansion of the necessary charging infrastructure also require large amounts of copper. Aluminium is the material of choice for lightweight construction. Nickel increases the energy density and storage capacity of batteries. Both metals enable significantly higher efficiency in electromobility, for example.

In addition to other industrial metals such as lead or zinc, precious metals such as silver or platinum are also used in certain green technologies. Silver is already an important raw material in the production of photovoltaic cells. Platinum is used in hydrogen fuel cells.

The achievement of ambitious climate targets is likely to be accompanied by a multiplication of metal demand

It is the physical and chemical properties that make many metals indispensable in the shift towards renewable energies. Studies by the World Bank and the International Renewable Energy Agency show what this could mean for demand for these metals in the coming decades. If we want to limit global warming to well below two degrees by 2100, demand for aluminium and silver could be more than four times higher by 2050 than if we were to continue the energy transition at the current, too slow pace. For copper, zinc and lead, the relative demand could more than triple.[2] The European Commission arrives at similar conclusions. Demand from the wind and solar energy sectors for aluminium, copper, nickel and zinc could roughly double by 2035 if the EU is to achieve climate neutrality by 2050 (see Fig. 4).[3] Therefore, on the demand side, the conditions for a super-cycle in the coming decades are given.

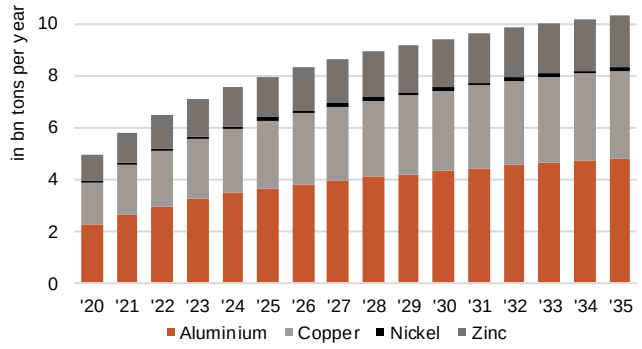
Supply: the delayed response of the producers

After years of depressed capital expenditure, supply is likely to struggle to meet the sudden surge in demand

As of today, the supply side is not yet prepared for such a surge in demand. Investments are necessary for an increase in supply. However, after the peak of the last super-cycle at the beginning of 2011, these investments were scaled back sharply with a typical delay. The investment activity of producers in response to the sudden demand from emerging markets reached its maximum in 2013, when their economic growth had already cooled down and metal prices had already fallen significantly

Fig. 4: Strongly increasing demand from green technologies

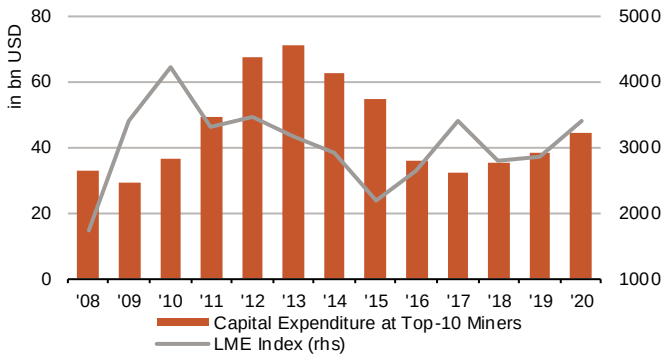
Forecast of the annual raw material demand of wind and solar energy of the EU until 2035 under the scenario of full decarbonisation by 2050



Time period: 01/01/2020-31/12/2035, annual data
Source: European Commission Joint Research Centre[3], own calculations

Fig. 5: Lack of capital expenditure likely to fuel supply deficits

Annual capital expenditure of Rio Tinto, BHP, Anglo American, Glencore, Vale, Antofagasta, Freeport-McMoRan, Teck Resources, Fortescue Metals Group and South32



Time period: 01/01/2008-31/12/2020, annual data
Source: Bloomberg, own calculations

[2] Hund, Kirsten et al. 2020. *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*. Washington: The World Bank Group.

[3] Carrara, Samuel et al. 2020. *Raw materials demand for wind and solar PV technologies in the transition towards a decarbonised energy system*. Petten: European Commission, Joint Research Centre (JRC)

(see Fig. 5). Over the following years, the investments of the mine operators halved, the overcapacities were reduced and the market finally rebalanced.

In order to satisfy the demand growth accelerated by decarbonisation in the future, more must now be invested in the exploitation of new mineral deposits. As in past super-cycles, however, the inelasticity of supply is proving problematic. Two difficulties in particular are likely to delay supply expansions: 1) bringing new mines on stream is an extremely time-consuming process; and 2) the capital intensity of new mines has steadily increased over the past decades.

Commissioning new mines is an extremely time-consuming process

Difficulty 1: The University of Arizona estimates a lead time of 6 to 20 years before first ores are extracted from a new mine. This is because two steps are necessary before the actual mining of raw materials can take place. First, a mineral deposit must be discovered. Samples must be taken from it and analysed. If they are promising, feasibility and profitability studies follow. The second step is the planning and finally the construction of the mine. In addition to complex approval procedures, ever stricter environmental regulations are likely to delay or even prevent construction of some projects in the future.

Capital intensity for new mines has steadily increased over the past decades

Difficulty 2: The low-hanging fruit has already been harvested. Naturally, when expanding production in the past, mine operators concentrated on mining sites with the highest possible mineral concentration and/or the lowest possible extraction costs. This means that new mines have increased in capital intensity and only become profitable when commodity prices are higher. A higher recycling rate could provide relief and additional supply, but again, higher prices are often the key to profitability.

Rising metal prices in the fight against climate change

The rapid rally on the metal markets in recent weeks and months was not only fundamentally driven by the economic recovery, but also increasingly by speculative investors. Industrial metals are therefore not necessarily cheap in the short term and are susceptible to setbacks. In the coming decade, however, demand for many industrial metals and individual precious metals is likely to rise almost inevitably. Many of the key technologies in the fight against climate change are based on their properties. On the other hand, supply is not yet prepared for this and is dependent on higher prices. In the long term, rising metal prices are likely to be the result. A new cycle of decarbonisation has begun.

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IMPORTANT NOTICES

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