Ivent Solutions Market Trend Update
September 2021

Chinese Lithium Prices Surge on Optimism for LFP Demand

Lithium prices in China rallied further in the week up to Thursday August 19, with optimism over demand for lithium iron phosphate (LFP or LiFePO4) batteries continuing to boost sentiment. Domestic prices for battery-grade lithium in China rose on strong momentum in technical-grade carbonate market and tight supply in spot market.

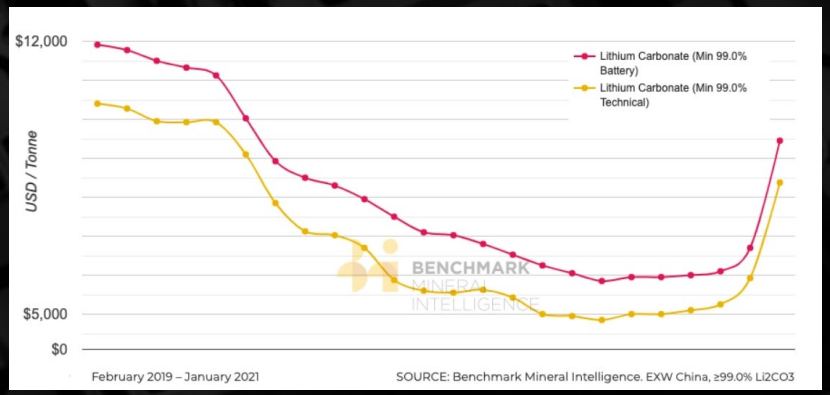
Seaborne prices for battery-grade lithium hydroxide strengthened on emergence of more inquiries after week-long summer holidays in Japan. Battery-grade lithium prices in Europe and the United States rose on tight availability despite the normal summer lull. Battery-grade lithium carbonate prices in China rose rapidly despite thin trades during the week, with producers who had been keeping a close eye on the rally for technical-grade material either making aggressive offers or refraining from issuing them in anticipation of higher prices.

The supply of lithium carbonate is even tighter than that for lithium hydroxide. Such tightness is driven by the strong demand from producers of LFP batteries. It is not difficult and does not take a long time to build up an LFP battery pack operation line, which results in a quick ramp-up of LFP production capacity, which in turn boosts demand for technical-grade lithium carbonate. In addition to this some market participants have pointed out that lithium producers in China who feed on brine, thought the spodumene rally was the common driver for the entire lithium complex. As such, these producers are looking to raise prices for lithium salts produced from brine. Spodumene and brine are the two major feedstock for producing lithium salts.

BATTERY-GRADE LITHIUM SPOT PRICES

	New price	Previous price	% Change
Lithium carbonate 99.5% Li2CO3 min, battery grade, spot price range exw domestic China, yuan/tonne	105,000 -110,000	95,000 -100,000	▲ 10.3
Lithium hydroxide monohydrate 56.5% LiOH.H2O min, battery grade, spot price range exw domestic China, yuan/tonne	120,000 -123,000	110,000 -120,000	▲ 5.7
Lithium carbonate 99.5% Li2CO3 min, battery grade, spot prices cif China, Japan & Korea, $/kg	14.00 -15.00	14.00 -15.00	0
Lithium hydroxide monohydrate 56.5% LiOH.H2O min, battery grade, spot price cif China, Japan & Korea, $/kg	15.50 -17.00	15.00 -16.50	▲ 3.2
Lithium carbonate 99.5% Li2CO3 min, battery grade, spot price ddp Europe and US, $/kg	15.00 -16.00	14.50 -15.50	▲ 3.3
Lithium hydroxide monohydrate 56.5% LiOH.H2O min, battery grade, spot price ddp Europe and US, $/kg	16.50 -17.50	16.00 -17.00	▲ 3.0
Spodumene min 6% Li2O min, cif China, $/tonne	880-950	690-750	▲ 27.1

Source: Fastmarkets



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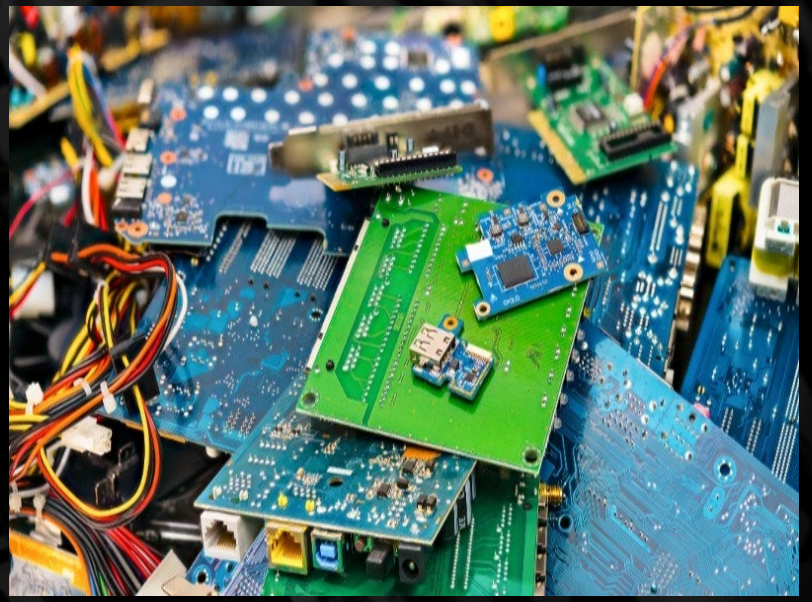

Electronic Component Shortages Update - 2022 and Beyond:

Electronic component shortages have been a hindrance on the booming electronics marketplaces since 2018. While new orders roll in and production remains steady, there simply have not been enough components and raw materials to go around.

After US tariffs were imposed on imported Chinese goods and factories were shut down due to the Coronavirus, OEM's raced to understand what was ahead for their already constrained inventory. But, COVID-19 was not the only culprit, it has actually exposed pre-existing cracks in the supply chain. Here is why 2022 is shaping up to be another difficult year…

The COVID-19 pandemic certainly threw everyone a curveball with a level of market uncertainty not seen in modern times. Electronics manufacturers in particular are suffering mainly thanks to supply chain disruptions and ongoing component shortages. The pandemic shut down a lot of avenues for raw materials and bulk electronic components, leaving manufacturers with half-finished products and idle capacity. Many components come from supply chains in Asia, and since China was ground zero for the Coronavirus, the shortages started affecting global manufacturers. In an April 2021 report, JJS Manufacturing detailed how the chip shortage is affecting more than just the automobile industry. Shortages are now reaching across all manufacturers, industries, and products. Shortages aren't the only problem of course, so are rising prices. As demand for electronic components rise, the supplies dwindle and we see costs increase. Thanks to the US stimulus package, many electronics manufacturers were able to stay on their feet and even begin re-tooling for production of much-needed electronics like ventilators and medical monitoring equipment, but are now returning to traditional products.

From the outset of 2021, the outlook for the electronics manufacturing industry has steadily grown murkier. Many PCB's, semiconductors and electromechanical items such as solar panels and batteries are still produced in Asia, and with the ongoing supply chain disruptions, some electronics manufacturers are looking at moving their operations back to familiar soil (which can also result in increased costs for the consumer).

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Component shortages will continue to persist in 2021 as many valuable raw materials were in low supply or completely unavailable. Unfortunately 2022 is shaping up to be another long wait… In Q1 2021, the semiconductor supply chain joined the long list of those facing shortages. A report from ElectronicsB2B indicated that the semiconductor industry value is set to increase by 11% from 2020 to 2027. Plagued with increasing demand, semiconductor chip manufacturers are bottlenecked to a point going back many months, or even a year… this in a time when orders have not slowed down. It's becoming evident that the semiconductor shortage is less about the COVID-19 pandemic and more about critical issues in the supply chain infrastructure. The semiconductor industry will face further uncertainty into 2022 due to:

- Adoption of 5G-based automation
- High demand
- Lack of producers
- Geopolitical factors (such as the US' current sanctions on China)
- COVID-19 Lockdowns
- Unreliable leadtimes

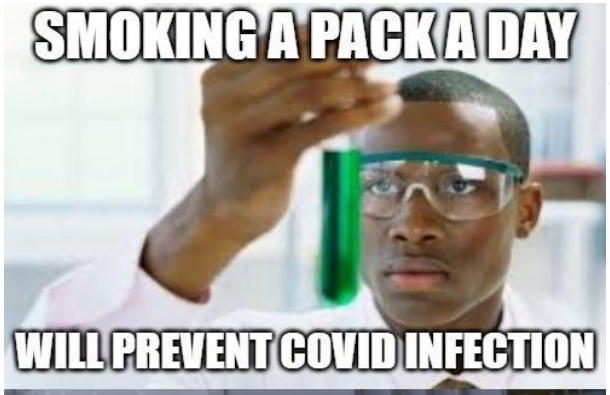
The end game is to simply produce more semiconductors worldwide. For American OEM's, producing more chips domestically reduces lead-times and other risks associated with importing… however this also correlates in increased chip costs.

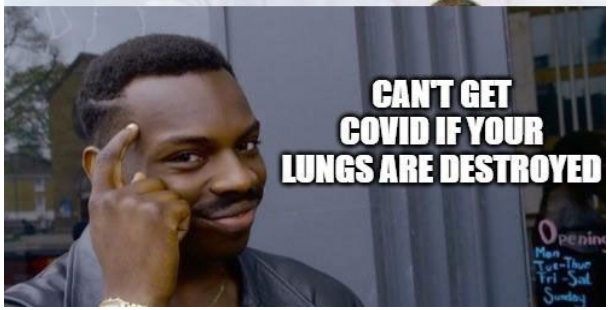
If COVID-19 has shown us anything, it is that supply chains are surprisingly volatile and in general quite fragile. The longer a supply chain is, the more susceptible it is to disruptions, so US electronics manufacturers in particular are finding suppliers closer to home. This will minimize the risk of expensive delays in production lines and reduce lead-times, but will take time to implement.

Additionally, supply chains that are closer to home are less likely to be affected by global disruptions. If there is a natural disaster in India, chances are it won't affect your supply chain in Canada for example. This makes the prospect of manufacturing in New Zealand still very attractive, it is not always the last cent of cost saved that represents the true cost of ownership…

THEY SAID A MASK AND GLOVES WERE ENOUGH TO GO TO THE GROCERY STORE

THEY LIED, EVERYBODY ELSE HAD CLOTHES ON





The good thing about having a social life like mine is that you don't even notice that you are in quarantine

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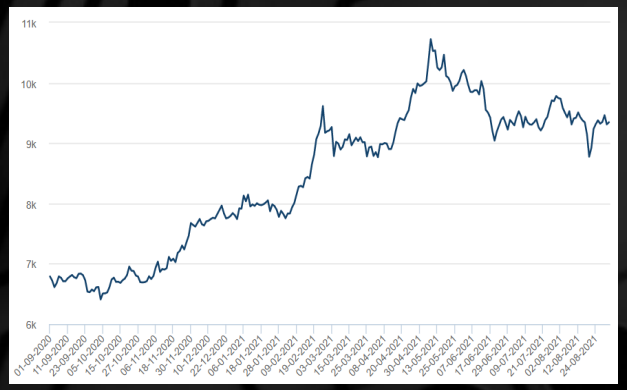
NZD versus AUD - AU$0.960 vs NZ$1.00

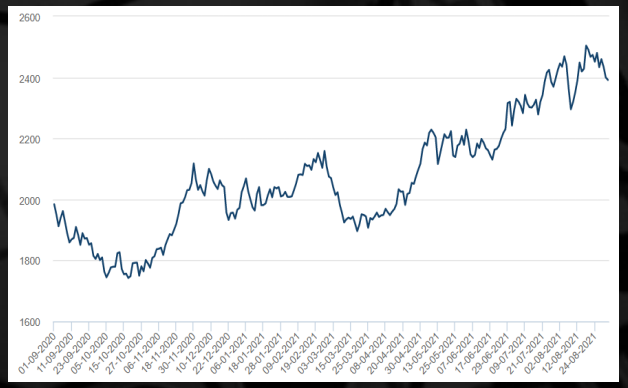
NZD versus USD - US$0.705 vs NZ$1.00

NZD versus EUR - EU$0.595 vs. NZ$1.00

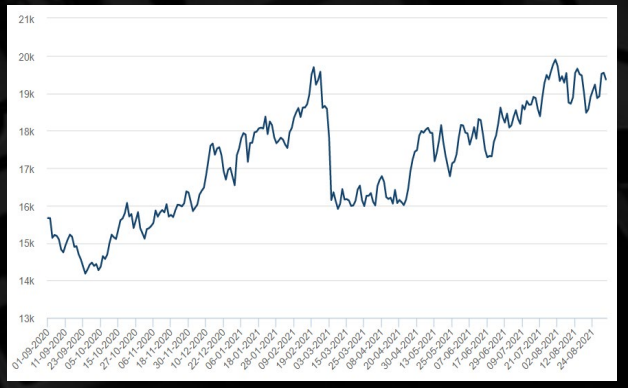
Copper - USD9300 / tonne



Lead - USD2400 / tonne



Nickel - USD19400 / tonne



This Month in Tech History...

September 26, 1924 – Jean Hoerni, a pioneer of the transistor, is born in Switzerland. A physicist, Hoerni in 1959 invented the planar process, which, combined with Robert Noyce's technique for placing a layer of silicon dioxide on a transistor, led to the creation of the modern integrated circuit. Hoerni's planar process allowed the placement of complex electronic circuits on a single chip.

September 4, 1956 – The IBM 350 Disk Storage Unit Model 1 was announced, which was the first commercial storage unit to use magnetic disk storage, the technology behind hard disk drives. About the size of two refrigerators and weighing in at one ton, the 350 could store about 4 – 5 megabytes, depending on how it was calculated.

September 12, 1958 – Jack Kilby successfully tests the first integrated circuit at Texas Instruments to prove that resistors and capacitors could exist on the same piece of semiconductor material. His circuit consisted of a sliver of germanium with five components linked by wires. Along with Bob Noyce, he is considered the inventor of the integrated circuit (IC).

September 14, 1959 – The Soviet space probe Luna 2 crashes onto the surface of the Moon, becoming the first man-made object to reach the Moon, as well as the first man-made object to reach any celestial body.

September 17, 1976 – NASA rolls out the first Space Shuttle, Enterprise, from its assembly facility to a waiting crowd. Included in the crowd was a delegation of actors from the Star Trek TV series. Originally to be named Constitution, a write-in campaign by Star Trek fans convinced President Gerald Ford and NASA to rename the Space Shuttle.

September 30, 1980 – Digital, Intel, and Xerox release version 1.0 of the Ethernet specification, known as the Blue Book. Since that time, Ethernet has evolved into the de facto networking standard for local area networks (LAN) in businesses and in the home.

September 21, 1996 – A New York Times article warned against the dangers of trusting computers too completely after an investigation revealed that a programming error may have contributed to the crash of American Airlines Flight 965 in Colombia in December 1995. The pilots apparently selected the first choice of a beacon to guide the plane's autopilot to a landing without checking that it was what they actually wanted. As a result, the plane was directed 100 miles off course, with the devastating result of 159 deaths.

September 10, 1990 – The first Internet search engine, Archie, is launched. It was used to index FTP archives to make finding files easier. However, as the technology for the World Wide Web was not invented until later in the year, it was not the first web search engine.

PRC HOLIDAYS

Events	Dates Observed
New Year's Day	January 1-3
Chinese New Year	February 11-17
Tomb Sweeping Day	April 3-5
Labour Day/May Day	May 1-5
Dragon Boat Festival	June 12-14
Mid-Autumn Day	September 19-21
National Day	October 1-7

- Minimal production impact.
- High production impact and requires planning accordingly.
- Note that factories typically take two weeks for Chinese New Year but may vary.

JANUARY

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31						

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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