



FASTMARKETS' BATTERY MATERIALS REVIEW

BATTERY MATERIALS CONFERENCE 2019

SHANGHAI, CHINA





Battery Materials Conference 2019

Shanghai

Contents

3. Eight things we learned in Shanghai

Fastmarkets' battery raw materials team summarizes key takeaways from its Battery Materials Conference 2019.

4. Hydroxide price benchmarks cobalt market

Cobalt hydroxide prices reflect true fundamentals of the cobalt market.

5. Cobalt stocks need drawdowns to support prices

Producer stocks of cobalt sulfate, chloride and tetroxide need buying up if prices are to recover.

6. Seven things we learned about the lithium market

Main points on lithium to take away from Fastmarkets' Battery Materials Conference 2019.

7. EVs could have solid-state batteries in 10-15 years

Electric vehicles will shift to using solid-state batteries containing lithium metal in the long term, but liquid electrodes will remain in use until at least the late 2020s.

8. Strong demand and low exchange stocks boost nickel outlook

Healthy nickel demand in the stainless steel and battery sectors and shrinking inventories on the Shanghai Futures Exchange and London Metals Exchange bode well for nickel prices.

9. China's EV policy will support nickel-rich battery demand

The halving of Chinese NEV subsidies will have a long-term positive impact on nickel-cobalt-manganese lithium-ion battery development.

10. Natural graphite becoming new trend in EVs

Increasing demand for graphite cathode in new energy vehicles is turning the market's attention toward flake graphite.

11. About Fastmarkets Battery Materials

Understand the pricing outlook for nickel, lithium, cobalt and graphite with dedicated pricing updates from Fastmarkets' price reporting team.

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for growing markets





Eight things we learned in Shanghai

Fastmarkets' battery raw materials team summarizes key takeaways from its Battery Materials Conference 2019.

Charlotte Radford, Violet Li, Carrie Shi, Huaqing Fu

1. Cobalt upside limited without China

While market participants at the Minor Metals Trade Association's (MMTA) 2019 conference in Edinburgh (9-11 April) were enjoying cobalt prices bottoming and resultant restocking, delegates at Fastmarkets' Battery Materials Conference 2019 (10-12 April) in Shanghai questioned whether Chinese demand would support higher prices.

Cobalt metal and sulfate prices tracked higher in China in the first half of April as rising international prices strengthened local sentiment. But Chinese consumers' reluctance to start buying on a larger scale is expected to cap future gains.

Delegates said that while buyers have started to lock in hydroxide, the recent increase in prices – standard-grade cobalt rose 15.4% between the end of March and the middle of April – remains fragile into the typically weaker summer season...

2. ...as oversupply continues to weigh on market

Bullish supply-side announcements (the suspension of sales and exports of hydroxide from Katanga in the Democratic Republic of Congo (DRC), halt to production at Chambishi and closure of Boss Mining), came before aggressive

buying and lower producer stocks forced cobalt prices to bottom out in late March.

One difference compared to 12 months ago is producers' availability of metal. They are believed to be sitting on comfortable stocks, but could start to build up inventories again.

Delegates did not rule out the threat of Chinese metal production and artisanal output from DRC if prices continue to climb, with no signs that demand has improved to absorb a supply increase.

3. Nickel to continue to rely on laterite

Laterite ore will continue to be the leading contributor to nickel supply as sulfide ore faces further depletion in traditional producing regions, like Canada and Australia.

Laterite ore accounts for 70% of total nickel ore supply and sulfide ore makes up the remaining 30%. Indonesia and the Philippines will continue to provide most nickel supply globally.

4. Integration in nickel battery industry to intensify

Nickel miners and battery makers partnering in battery projects is likely to become a trend, driven by higher margins.

Integration will guarantee sufficient, stable supply and better risk management, but mean less material is freely available in the open market.

5. Production of lithium from brine increasing

Due to cheaper production costs, lithium produced from brine has a price advantage over that produced from spodumene.

Lithium prices have been under pressure due to rising supply from new brine projects in China. Supply is expected to exceed demand and materials produced from spodumene will face price pressure in the near future.

6. More lithium hydroxide demand expected

China's 2019 new energy vehicle (NEV) subsidies only support vehicles with higher driving range and high energy

density batteries, meaning most battery producers have shifted to higher nickel-content NMC (nickel, manganese, cobalt) cathodes.

Demand for lithium hydroxide is expected to increase, exceeding lithium carbonate, supported by the development of high-nickel content batteries.

7. Demand for natural graphite could outstrip supply

Synthetic graphite anode is still preferred in batteries, but use of natural graphite is rising.

Natural graphite supply is expected to be short by 34,000 tonnes in 2020. By 2025, the market for battery cathode materials may require an extra 1.2 million tonnes of natural graphite, causing a shortage of 385,000 tonnes.

8. Flake graphite gaining more attention

Market participants are monitoring flake graphite prices, due to increasing demand for graphite cathode from the NEV sector.

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Hydroxide price benchmarks cobalt market

Cobalt hydroxide prices reflect true fundamentals of the cobalt market.

Susan Zou

"We are happy to see Fastmarkets launch cobalt hydroxide assessments, which is more representative of the [...] cobalt market as a whole," Forrest Deng, general manager of research at China Molybdenum said at Fastmarkets' Battery Materials Conference 2019 in Shanghai.

"In the past, we recognized the cobalt metal price assessed by Fastmarkets and priced other cobalt products [...] against this assessment," Deng said.

"[But due to its small size], the metal market [...] can't represent the whole cobalt market anymore," he

added. Traditional pricing mechanisms mean volatility can filter through from metal to other products in the cobalt chain, Deng said.

Separate markets

Cobalt metal and cobalt hydroxide have their own fundamentals, Tony Southgate from Stratton Metals told delegates.

Cobalt metal is typically consumed by the aerospace and catalyst industries, while the battery sector is the main consumer of cobalt hydroxide. "[The cobalt hydroxide market] approaches about 100,000 tonnes per year, while cobalt

metal is about 35,000 tonnes per year. In the next few years, the cobalt hydroxide price could be one of the most important prices for the cobalt market," he added.

Spot liquidity for cobalt hydroxide picked up amid a market downturn since mid-2018, after consumers became reluctant to commit to long-term contracts.

Fastmarkets assessed the standard-grade cobalt price at a two-and-half-year low of \$13.30-14.20 per lb on March 22, down 68.8% from a nearly ten-year high of \$43.70-44.45 per lb on April 23, 2018. The

price was assessed at \$15.35-16.75 per lb on April 12, 2019.

Fastmarkets launched two cobalt hydroxide assessments in February this year, including a monthly hydroxide index and a twice-monthly hydroxide payable indicator against the low end of Fastmarkets' standard-grade cobalt benchmark price.

Fastmarkets' monthly cobalt hydroxide index, min 30% Co, was at \$9.81 per lb, cif China, on March 29, while the payable indicator was at 66-68% against Fastmarkets' standard-grade cobalt price (low end).

Cobalt stockpiling drives spring spot buying

The uptick in metal purchases in late March and the first half of April was attributed to stockpiling rather than consumption.

Susan Zou

Cobalt stockpiling in late March and early April was prompted by expectations that prices will rebound in two to three years, Tony Southgate from Stratton Metals said.

The international cobalt benchmark price rebounded for the first time in five months at the end of March and momentum continued into April. The standard-grade cobalt price had been under pressure since late November 2018. The price started to trend lower to \$33.25-33.95 per lb on November 21, according to Fastmarkets data.

"Some traders [felt] that if

they can buy below \$15 per lb, in two to three years, they are pretty much guaranteed to make some money," Southgate said.

Traditional and western producers had been building inventories ahead of the price rebound, and some lowered offer prices to lock in sales before the end of the financial year.

Cobalt metal price likely to test new low

This stockpiling is temporary and prices are vulnerable to a backswing because metal producers are building inventories, Southgate

warned.

Although demand from the electric vehicle sector has strengthened, demand from the mobile phone sector is falling. While recent restocking may

reduce some inventories, stocks are likely to continue growing in the near future and demand is set to weaken further in the traditionally soft summer season.





Cobalt stocks need drawdowns to support prices

Producer stocks of cobalt sulfate, chloride and tetroxide need buying up if prices are to recover.

Charlotte Radford

“You’re really going to have to see stocks come down 20-50%, [if cobalt prices are to recover],” Lara Smith, managing director of Core Consultants, told delegates at Fastmarkets’ Battery Materials Conference 2019 in Shanghai.

Cobalt sulfate supplies are up 38% year on year at around 7,000 tonnes, according to the Core’s estimates, while prices are down 63% from a year ago, Fastmarkets’ data show.

Fastmarkets’ sulfate price assessment was at 51,000-55,000 yuan (\$7,600-8,200) per tonne, ex-works China, on April

12, down from 140,000-144,000 yuan per tonne a year earlier.

Cobalt metal prices – the benchmark used across the supply chain – rallied from \$14.70-15 per lb at the beginning of 2017, to highs of \$43.70-44.45 per lb at the end of April last year – a near 10-year high, according to Fastmarkets’ standard-grade assessment.

Prices have fallen heavily since then on tight availability of credit in China and oversupply of cobalt hydroxide, although a recent rally has been sparked by battery market

expectations. While prices were falling, consumers were working through high-priced stock, reluctant to start buying in case of further drops in price.

Producers started reducing output from the third quarter of 2018, leading to a steady drawdown of inventory, Smith told delegates.

As of mid-April, traders and consumers have started replenishing metal stocks as the market turned. That needs to continue across the supply chain for cobalt prices to recover meaningfully.

“For some products [such as cobalt chloride], output started increasing from late February, which negated any price recovery,” Smith said.



Key questions for the cobalt market

Charlotte Radford, Susan Zou, Martim Facada, Carrie Shi, Huaqing Fu

Will China’s cobalt metal imports pick up in 2019?

China imported only 6 tonnes of cobalt metal in October 2018, an all-time low.

When global cobalt metal prices bottomed out in late March 2019 and made a quick turnaround at the beginning of April, some Chinese traders and consumers resumed imports amid a positive import arbitrage.

Chinese import arbitrage has traditionally been in mild negative territory, but due to the bearish outlook shared by Chinese market participants towards the ramp-up of cobalt hydroxide production,

China’s theoretical import loss widened to over \$11 per lb last November.

However, after international benchmark cobalt prices fell heavily between December and February, China’s import loss turned to profit, at \$1.55 per lb in late March.

Is there appetite for cobalt hedging?

The shift in cobalt prices compared with a year ago attests to the market’s potential volatility.

The London Metal Exchange launched a new cobalt contract, cash-settled against Fastmarkets’

benchmark price assessment, in March.

A pronounced decline in prices, especially since the beginning of the year, has piqued buyer interest but slowed uptake of the new hedging mechanism.

A recent rebound in prices, combined with the expectation that electric vehicle (EV) manufacturers will consider it essential to hedge cobalt exposure, means interest in the new contract is growing.

What do lower cobalt prices mean for the shift to nickel-rich cathodes?

Multi-year price highs and

changes to China’s EV subsidy policy prompted discussions about an expedited shift to 811 battery cathodes last year. In April 2019, cobalt prices were about 66% lower than a year ago.

While China’s latest subsidy policies give preference to higher energy-density vehicles (with higher-nickel, lower-cobalt cathodes), weaker cobalt prices, development costs and safety concerns mean that rapid transition is unlikely.

The subsidy program will be scrapped from 2020, so NCM622 lithium-ion batteries could prove the mainstream option.



Seven things we learned about the lithium market

Main points to take away from Fastmarkets' Battery Materials Conference 2019.

Martim Facada, Carrie Shi

1. Lithium prices to remain under pressure in 2019

Lithium prices will remain under pressure this year, due to increasing supply.

New projects able to produce battery-grade lithium carbonate and hydroxide in China will contribute to supply and likely exceed demand throughout 2019.

2. Chinese lithium spot price is the global benchmark

Lithium spot prices in China, the world's largest consumer and producer of lithium compounds, influence the rest of the world's contract prices.

"The influence of the Chinese spot lithium prices across the world has been evident due to the rapid increase in supply from China to the rest of world in recent years," Zhou Jianqi, general manager of Yahua Lithium, said.

The vast majority of global lithium spodumene production is sold to China and processed into lithium carbonate and hydroxide. In 2018, global spodumene production totaled 191,050 tonnes of lithium carbonate equivalent (LCE), compared with 148,400 tonnes of LCE produced from brine,

according to Fastmarkets research.

China is also an important producer of lithium compounds from brine.

3. Chinese lithium compounds becoming more significant

Not all lithium producers in China are able to produce battery-grade material, but many can.

Most new and current lithium producers in China have added, or plan to add, lithium production capacity to supply the battery industry in 2019 – a shift that is likely to increase China's importance in the battery supply chain.

4. More lithium produced from brine

There is a trend toward producing battery-grade lithium compounds from brine in China, with material sold at a discount to compounds produced from spodumene.

Higher production costs for spodumene compounds remain the principal factor behind this trend.

"The quality of material produced from brine is also very good, and it can be used in our production of

cathode material. However, if the lithium market keeps falling, material produced from spodumene will face price pressures due to [...] higher production costs," one delegate said.

5. Lithium compounds from brine vs hard rock

Despite higher production costs, lithium compounds produced from hard rock are preferred in China.

The consistent quality of carbonate and hydroxide produced from hard rock, as well as lower proportions of impurities such as boron and magnesium, are the two main advantages.

Additional benefits include faster ramping-up of production from mines compared with brine operations and that they are less affected by adverse weather conditions. Brine and hard rock are likely to continue to coexist as raw materials for lithium compounds.

6. Lithium hydroxide demand to grow

China's 2019 new energy vehicle (NEV) subsidies prioritize longer driving range and higher energy density.

This is encouraging most battery producers to adopt

higher nickel-content NMC (nickel, manganese, cobalt) cathode batteries. Higher nickel-content NMC cathode batteries, such as NMC 622 and 811, typically consume more lithium hydroxide.

"Demand for lithium hydroxide is expected to exceed lithium carbonate demand, supported by the development of high-nickel content batteries," a lithium producer told Fastmarkets.

However, lithium carbonate is set to remain the most widely used lithium compound in batteries over the next few years.

7. Micronized lithium hydroxide gains favor

Lithium hydroxide producers in China are focused on increasing output of micronized lithium hydroxide.

This type of material is favored by producers of higher nickel-content batteries, because it is easier to use and gives higher performance.

Not all lithium producers in China are currently able to produce micronized material. The higher costs of micronization, as well as its toxicity, are barriers for some.



EVs could have solid-state batteries in 10-15 years

Electric vehicles will shift to using solid-state batteries containing lithium metal in the long term, but liquid electrodes will remain in use until at least the late 2020s.

Charlotte Radford

“The practical reality of how [solid-state battery technology] goes from laboratory to supply isn’t so much to do with the raw materials, as much as ‘how’ [this is achieved],” Emily Hersch, managing partner of DCDB Group, told delegates at Fastmarkets’ Battery Materials Conference 2019.

The long-term outlook for solid-state battery adoption by electric vehicles (EVs) means the benefit of such technology does not fundamentally change trajectories for demand growth for other battery raw materials for now.

Solid-state batteries bring a number of benefits over packs using liquid electrolytes, making development of the technology to a mass scale appealing.

In particular, they eliminate the need for cobalt, the price of which has fluctuated over the past two years.

Fastmarkets’ benchmark standard-grade cobalt price stood at \$15.30-16.75 per lb, in-warehouse as of Wednesday April 10.

It reached a near 10-year high of \$43.70-44.45 per lb in April 2018 and hit a more than two-year low of \$13.30-14.20 per lb in late March this year.

High prices and volatility, alongside limited opportunities to hedge cobalt exposure, have increased the appeal of lower-cobalt battery chemistries or cobalt-free battery technology, especially for automakers seeking to lock in raw material costs.

On paper, solid-state batteries can cost less, have higher energy density (meaning they can travel longer distances between charging) and are safer.

“All major battery and auto manufacturers have at least a foot in the door when it comes to solid-state batteries,” Hersch said.

But new manufacturing techniques and processes required for solid-state batteries limit the practicality to produce on a mass scale for the time being.

“You’re going to lose out when it comes to cost and temperature range. [The limitations] can take that battery outside the performance range that makes it practical for the application you’re looking at,” Hersch said.

According to Hersch, solid-state batteries will first be seen in cost-insensitive niche

applications, such as drones and military equipment.

That will be followed by consumer electronics before being used in EVs in the late 2020s or early 2030s.

“The scale is the major challenge, [but] the future is lithium metal because [of its] energy density,” Hersch said.

Lithium prices facing supply pressure

China’s spot battery-grade lithium carbonate and hydroxide markets have seen a very slow price decrease since the beginning of the year, due to slower spot consumption.

The expected reduced value of the 2019 NEV subsidy paid to manufacturers and tighter qualifications kept consumers from purchasing additional material in the

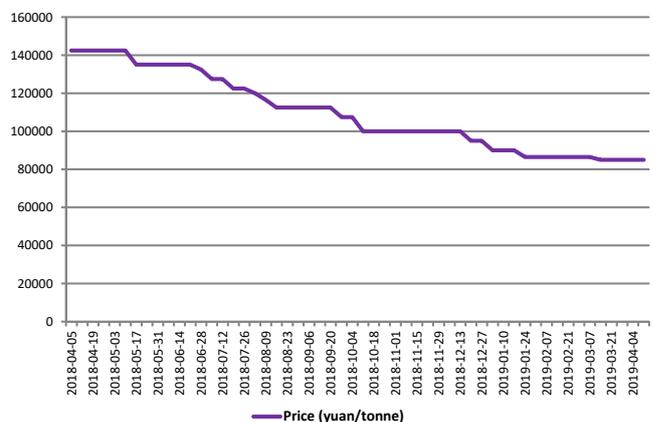
spot market for most of the first quarter of 2019.

Market participants are mulling the impact of additional units of lithium compounds added to the Chinese market year on year, as well as the recent VAT cut that could push prices down.

The Chinese domestic spot battery-grade lithium carbonate price (min 99.5% Li₂CO₃) fell to 70,000-78,000 yuan per tonne on Thursday April 4, from 75,000-85,000 yuan per tonne on January 3, on a China ex-works basis.

Battery-grade lithium hydroxide monohydrate (min 56.5% LiOH.H₂O) fell to 93,000-98,000 yuan per tonne on Thursday April 4, from 99,000-109,000 yuan per tonne on January 3, on a China ex-works basis.

Lithium hydroxide monohydrate min 56.5% LiOH.H₂O technical and industrial grade, spot price, ex-works domestic China





Strong demand and low exchange stocks boost nickel outlook

Healthy nickel demand in the stainless steel and battery sectors and shrinking inventories on the Shanghai Futures Exchange and London Metals Exchange bodes well for nickel prices.

Violet Li

“We have two drivers in [nickel] demand: stainless steel and batteries, and nickel inventories have been falling over the last few years,” Macquarie Capital senior commodities consultant Jim Lennon told delegates at Fastmarkets’ Battery Materials Conference 2019 in Shanghai.

“I think it will [continue to] fall over the next few years; the nickel market will remain in deficit [...] which should push prices higher,” Lennon said, without giving a breakdown of forecast prices.

Nickel inventories at both LME and SHFE warehouses have been on a downward trajectory since 2018.

LME nickel stocks totaled 182,446 tonnes as of April 1, 2019, down by 50% from 368,430 tonnes on January 1, 2018. Nickel stocks in SHFE-approved warehouses have fallen by 80% over the same period to 9,749 tonnes on April 4 from 48,920 tonnes on January 1, 2018.

Lennon concluded the falls reflect deficits and some financial buying of stocks.

“Last year there’s probably about 50,000 tonnes of inventories transferred from the LME warehouses in Asia into non-reported inventories



in Europe, held by banks and traders, partly for reasons of a positive outlook for the market, or better premiums in the European area,” Lennon said.

Stainless steel demand still dominates, but EV sector growing faster

Stainless steel takes up 70% of global nickel usage, compared with 6% used by the electric vehicle (EV) sector, according to Lennon.

But EV demand growth is speeding up, he said. “World production of stainless steel in 2016 grew by 8.5%, 2017 by 6% and last year by 5%. This year, our projection is 3.5-4%, so we do see some slowdown, but still a steady growth rate. Nickel usage in batteries will grow by 30-40% [in 2019],

so the underlying growth in nickel [consumption] continues to be quite impressive,” Lennon said.

More nickel briquette was used in the EV sector following rising demand for batteries, raising the nickel briquette premium over the past year.

Fastmarkets MB’s monthly duty-free nickel briquette premium cif Shanghai stood at \$240-270 per tonne at the end of March 2019, up from \$220-260 per tonne at the launch of the assessment in August last year.

Nickel briquette is the one of the main raw materials of nickel sulfate, a key material used in the production of nickel-cobalt-manganese (NCM) and nickel-cobalt-aluminium (NCA) batteries used in EVs.

How to avoid a class one nickel deficit?

Concerns around a shortage of nickel suitable for batteries are growing, with the market lacking the supply response seen in cobalt and lithium markets.

Investment in class one nickel projects has largely been on the back burner as LME nickel prices languish below levels necessary to incentivize investment.

There are concerns an increase in nickel prices – fueled by battery demand – would trigger an increase in NPI production, which cannot be used to produce sulfate.

The nickel market could split in two – the traditional reference to the steel market, and a new reference to reflect the battery sector.



China's EV policy will support nickel-rich battery demand

The halving of Chinese NEV subsidies will have a long-term positive impact on nickel-cobalt-manganese lithium-ion battery development.

Susan Zou

China's EV policy will support nickel-rich Li-ion battery demand in the medium-to-long term, delegates at Fastmarkets' Battery Materials Conference 2019 in Shanghai were told.

"The values of subsidies have been cut significantly," Junquan Chen, section chief of Minmetals Economic Research Institute, said. "Therefore, under the pressure of high production costs, lithium iron phosphate (LFP) batteries would be the choice for some medium-to-low end EVs," he added.

For the latest Chinese new energy vehicle (NEV) subsidy policy announced in late March, the value of the subsidies has been halved to 18,000 yuan (\$2,680) for EVs with a driving range of 250-400km and 25,000 yuan for those at or over 400km.

This is compared with 34,000 yuan for EVs with a driving range of 250-300km and 50,000 yuan for those at or over 400km in last year's subsidy policy.

"However, the subsidy policy and dual credit policy only provides incentives to those who produce EVs with higher driving range and energy density which LFP batteries cannot satisfy. In other words, current Chinese policies favor nickel-cobalt-

manganese (NCM) lithium-ion battery in the medium-to-long term," Chen said.

The dual credits policy, formally introduced in April 2018, is made up of a corporate average fuel consumption (CAFC) credit and NEV credit that set standards for both fuel consumption and production and sales of EVs respectively.

The higher the driving range of the EVs, the more NEV credits car makers will get.

Impact on battery chemicals

Current Chinese policies encourage the production of EVs with higher energy density, which is boosting demand for nickel-rich NCM lithium-ion batteries, according to Chen.

"The demand for nickel and lithium per EV will continuously rise, while that for cobalt will gradually decline," Chen said.

The resulting pressure on the price of cobalt sulfate, a key

Battery demand (GWh)



battery raw material, became apparent in the second quarter of last year, when the 2018 subsidy policy already prioritized the production of nickel-rich batteries.

Fastmarkets assessed the cobalt sulfate, Co 20.5% min, China price at 65,000-68,000 yuan per tonne ex-works on December 28, 2018, down over 50% from the historical high of 145,000-150,000 yuan per tonne on April 11, 2018.

However, the consensus ahead of the conference was that the immediate negative impact on the cobalt sulfate price as a result of 2019 NEV subsidy policy will be limited, thanks to upticks in the international cobalt benchmark price,

which is used by cobalt sulfate refineries to calculate cobalt raw material import costs.

Fastmarkets' Chinese cobalt sulfate price jumped to 50,000-53,000 yuan per tonne on April 10, up from a nearly two-and-half-year low of 45,000-47,000 yuan per tonne on March 27.

Fastmarkets' standard-grade cobalt price rose to \$15.30-16.75 per lb on April 10, from \$13.30-14.20 per lb on March 22, the lowest level in two and half years.

Standard-grade cobalt prices rose in early April on continued restocking by buyers who encountered market tightness into the second quarter of this year.

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Natural graphite becoming new trend in EVs

Increasing demand for graphite cathode in new energy vehicles is turning the market's attention toward flake graphite.

Huaqing Fu

Natural graphite is set to become a new trend in the electric vehicle (EV) sector in the future, delegates at Fastmarkets' Battery Materials Conference in Shanghai heard.

Demand for flake graphite from its traditional downstream industries, such as refractories, foundry and lubricants, has been stable over the past few years.

In high-tech fields, such as the EV sector, consumption of flake graphite has emerged as a growth point of demand.

Although the consistency and consequent performance characteristics of synthetic graphite is better than natural graphite for battery applications, the lower price

of the latter can reduce production costs and leaves scope for further processing to improve performance, Jonghui Wang from China Minmetals told delegates.

In an optimistic scenario, it is estimated that consumption of natural flake graphite in batteries will reach 434,000 tonnes in 2025, of which lithium battery cathode will account for 310,000 tonnes.

Consumption of natural graphite in batteries will increase from 9.7% of total consumption in China in 2015, to 40-50% by 2030, Wang said. This will mostly be driven by increasing uptake of new energy vehicles (NEVs).

China is the world's largest NEV market and it is

estimated that the size of China's power batteries sector will exceed 100GWh in 2020 and the natural graphite market is expected to be short by 34,000 tonnes in 2020, according to forecasts by UBS.

It is expected that the market for battery cathode materials will require an additional 1.2 million tonnes of natural graphite by 2025 which may lead to a shortage of 385,000 tonnes, as per UBS data.

Prices for spherical graphite – the engineered form of graphite used in batteries – will be underpinned by development in the NEV/EV sectors.

Fastmarkets assessed Chinese export price for spherical

graphite 99.95% C, 15 microns, at \$2,800-2,900 per tonne fob China on Thursday April 11, unchanged since May 24, 2018.

Increasing demand for spherical graphite in NEV batteries has led to a surge in Chinese imports of upstream materials, such as flake graphite, which China had previously sourced domestically.

"End users thought [domestic] supply of flake graphite was enough, but now we have to rely on a lot of imports," one delegate said on the sidelines of the conference. "With increasing import volumes and downstream demand for natural flake graphite [...] this is making the market pay more attention to the price of flake graphite," they added.

Key questions for the graphite industry in 2019

What factors might dominate the spherical graphite market in 2019?

The relative lack of volatility in spherical graphite prices in 2018 helped underpin healthy development of the EV industry.

But environmental inspections ahead of the Shanghai Cooperation Organization summit in

May 2018 led spherical graphite producers in Shandong province to suspend operations. Similar inspections ahead of the National People's Congress and Chinese People's Political Consultative Conference in March 2019 further tightened supply.

Market participants expect inspections to continue to dominate the market this

year, given there are still some producers who are not meeting environmental standards.

Will China turn into a major importer of upstream flake graphite?

Although China imported negligible volumes of natural flake graphite up until a few years ago, that has changed dramatically.

In some Chinese production hubs such as Shandong, the volume and grade of flake graphite mined has declined. Growing demand for flake graphite from the EV and other industries has left China needing foreign products to fill its domestic supply gap.

In 2018, China imported 60,254 tonnes of flake graphite, up from 5,482 tonnes in 2017.



About Fastmarkets Battery Materials

Understand the pricing outlook for nickel, lithium, cobalt and graphite with dedicated pricing updates from Fastmarkets' price reporting team.

Fastmarkets has over 130 years of commodity expertise and aims to be the world's leading and most trusted price reporting and intelligence service.

Using transparent and auditable methodologies to report data and insights in a variety of industries, we provide interested parties with a clear picture on the markets and their effects on business and the supply chain.

Market dynamics for battery raw materials, such as lithium, will cause great uncertainty and volatility in prices.

This will drive the need for use of an independent price benchmark to be used by buyers and sellers in the market to enter into long-term supply contracts and manage price risk and

volatility through a futures market that will develop over time.

Price reporting agencies (PRAs) such as Fastmarkets specialize in developing such prices.

Over the last 100-plus years, we have worked closely with markets to develop pricing that most closely reflects the commodities they trade.

Today, we have a global team of more than 400 people, including 50 employees in China.

Our expert teams assess prices with the aid of state-of-the-art data collection software and a process that stands up to an annual independent external audit.

Our process is aligned to core IOSCO principles, enabling us to provide assurance to the market that we comply with the highest standards expected from global PRAs.

This is how we have developed a suite of pricing benchmarks for the key

battery-making commodities including lithium, graphite, cobalt and nickel products.

Our Battery Materials Conference 2019 in Shanghai in April was one of the many industry-leading events we curate, organize and run, bringing together the biggest OEMs, battery manufacturers, cathode makers and chemical companies to better understand end-user needs and expand your business in the world's biggest battery market.

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