



China New Energy Monthly Report

May 2022

LIB

Overview of new energy prices and supply/demand

Battery cell cost and procurement by battery makers

Cobalt industry

Lithium industry

Nickel industry

Precursor and cathode material

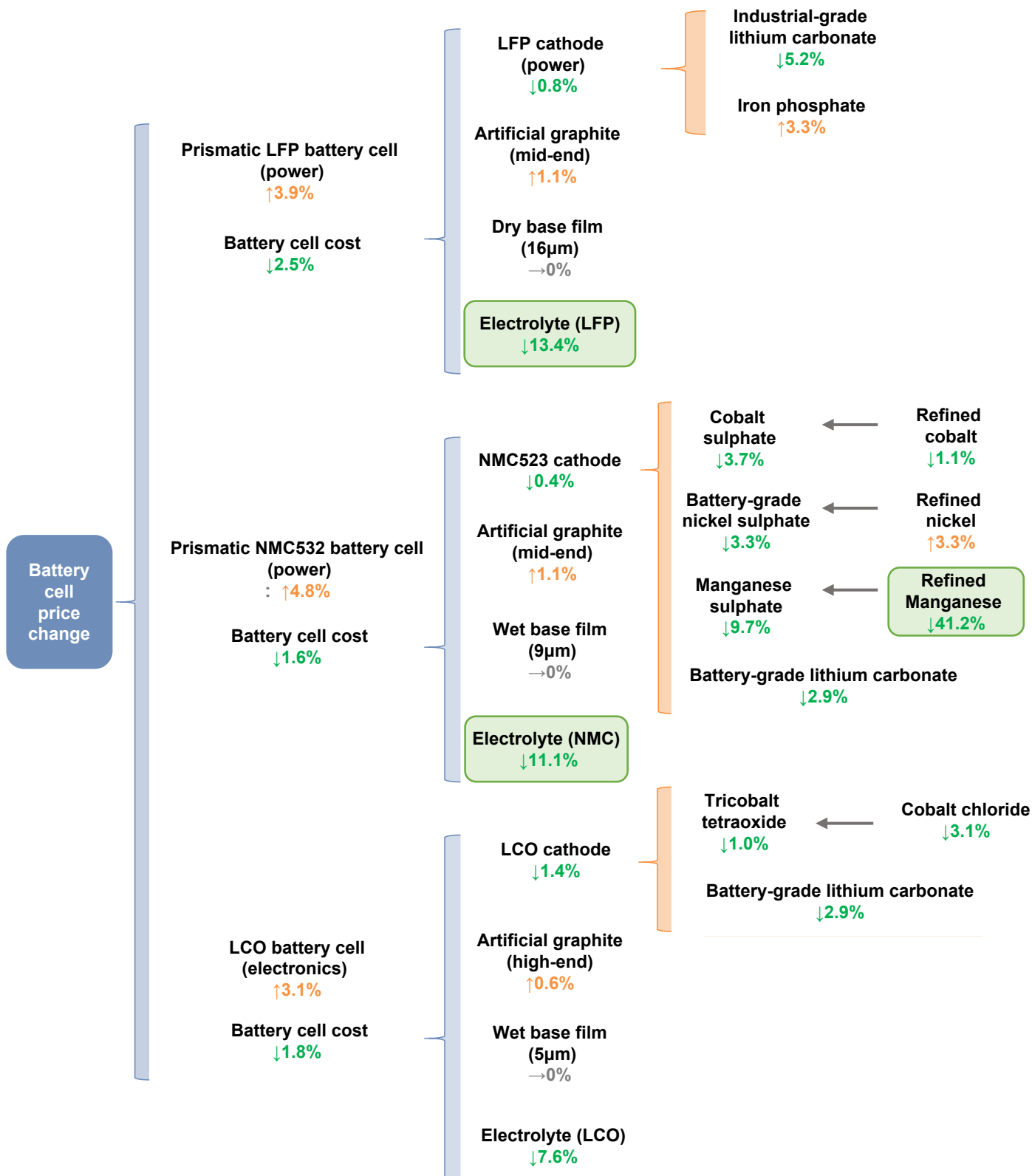
Motive power battery and end-user market

Comments on monthly hot topics in the new energy industry



1. Overview of new energy prices and supply/demand

1.1 Battery cell slowed down its price hike amid falling material prices in April





1. Overview of new energy prices and supply/demand

1.2 Slightly falling lithium and cobalt salt prices pulled down the cost of precursor, cathode material as well as battery cell in April

Price Index	Unit	Average price in January	Average price in February	Average price in March	Average price in April	MoM in January	MoM in February	MoM in March	MoM in April
Refined cobalt	10,000 yuan/mt	49.7	52.9	56.5	55.9	5.1%	6.4%	6.9%	-1.1%
Cobalt intermediate product	\$/pound	27.9	29.4	31.9	33.9	3.7%	5.5%	8.5%	6.3%
Cobalt sulphate (Co 20.5%)	10,000 yuan/mt	10.5	11.2	11.9	11.5	7.1%	7.3%	6.4%	-3.7%
Cobalt chloride	10,000 yuan/mt	12.4	13.1	14.1	13.7	4.8%	6.3%	7.5%	-3.1%
Tricobalt tetraoxide	10,000 yuan/mt	40.4	41.3	43.5	43.1	8.9%	2.3%	5.4%	-1.0%
Spodumene concentrate	\$/mt	2,379.5	2,628.8	2,825.9	3,301.8	17.7%	10.5%	7.5%	16.8%
Industrial-grade lithium carbonate	10,000 yuan/mt	30.8	40.8	48.3	45.8	39.1%	32.4%	18.5%	-5.2%
Battery-grade lithium carbonate	10,000 yuan/mt	32.6	42.2	49.9	48.5	37.9%	29.5%	18.2%	-2.9%
Micro-grade battery-grade lithium hydroxide	10,000 yuan/mt	27.4	36.7	48.5	49.1	33.2%	34.0%	32.1%	1.3%
Battery-grade lithium hydroxide (coarse particles)	10,000 yuan/mt	26.7	36.0	47.7	48.3	34.6%	34.9%	32.5%	1.3%
NMC532 cathode material precursor (motive power)	10,000 yuan/mt	13.0	14.2	15.4	15.4	3.0%	9.4%	8.1%	0.1%
NMC532 cathode material (motive power)	10,000 yuan/mt	26.5	31.7	36.7	36.6	13.8%	19.6%	15.9%	-0.4%
NCM811 cathode material (motive power)	10,000 yuan/mt	29.4	34.7	41.6	41.9	10.3%	18.2%	19.8%	0.8%
LFP (motive power)	10,000 yuan/mt	11.9	14.5	16.2	16.1	23.2%	22.1%	11.4%	-0.8%
LCO	10,000 yuan/mt	47.3	52.8	58.0	57.2	14.8%	11.6%	9.8%	-1.4%
LMO (motive power)	10,000 yuan/mt	9.7	12.2	14.3	13.8	24.6%	26.0%	17.6%	-4.0%
SMM #1 refined nickel	10,000 yuan/mt	16.5	17.7	22.2	23.0	10.5%	7.7%	25.3%	3.3%
Battery-grade nickel sulphate	10,000 yuan/mt	3.7	4.1	4.9	4.7	6.3%	9.0%	20.2%	-3.3%
Prismatic NMC532 cathode material battery cell (motive power)	10,000 yuan/mt	0.9	0.9	1.0	1.1	5.3%	7.6%	11.9%	3.9%
Prismatic LFP battery cell (motive power)	10,000 yuan/mt	0.8	0.8	0.9	1.0	9.4%	9.1%	13.7%	4.8%
Scrap prismatic NMC532 cathode material battery (motive power)	10,000 yuan/mt	3.4	3.8	5.4	5.2	20.9%	41.0%	40.9%	-3.2%
LCO pole piece & battery black powder	10,000 yuan/mt	23.8	26.1	30.4	29.6	16.5%	16.5%	16.5%	-2.5%
Battery-grade manganese sulphate ex-factory price	10,000 yuan/mt	1.0	1.0	1.1	1.0	-0.4%	-0.4%	5.3%	-9.7%



1. Overview of new energy prices and supply/demand

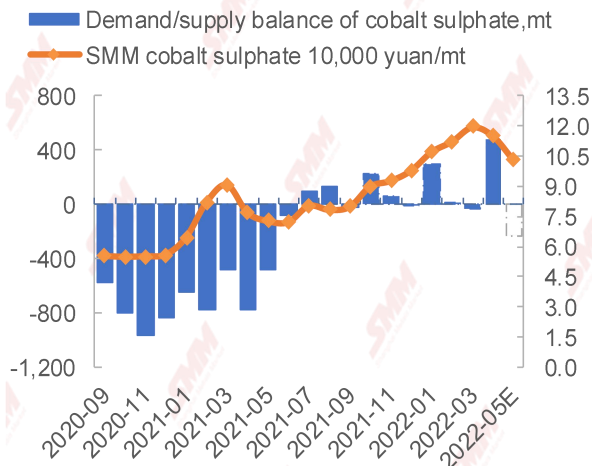
- **The prices of cobalt products fell in an all-round way in April 2022, with cobalt sulphate and cobalt chloride prices down by 3.7% and 3.1% month-on-month respectively.** In the past month, cobalt salt transactions were quite thin, and the cobalt salt factories accumulated large amount of finished products stocks. In addition, the coefficient of recycled materials decreased in April, therefore, such cobalt salt factories tended to be cautious in purchasing raw materials, while they focused on digesting the inventory of finished products and actively sold off. On the demand side, the pandemic continued to spread across the country, and the production of precursors has been significantly reduced. These factors have all contributed to the decline in the prices of cobalt salts. **The transaction prices of Co₃O₄ and LCO fell 1% and 1.4% month-on-month respectively.**
- **The prices of industrial-grade and battery-grade lithium carbonate dropped slightly by 5.2% and 2.9% MoM respectively in April 2022.** The persistent COVID has forced the terminal to suspend or reduce their production, hence the orders for cathode active materials (CAMs) decreased, subsequently resulting in sluggish demand for lithium salt. In addition, a large number of raw materials arrived at ports in April, and the prices dropped in light of excess supply in the market. The prices of nickel sulphate contracted 3.3% in April, easing the cost pressure of battery enterprises. Meanwhile, the production of new energy vehicle companies has been affected by the pandemic, resulting in a quiet raw material market. Nonetheless, with the addition of extensive vehicle price hikes in March, the cost pressure on terminal battery enterprises has been eased to some extent. **(NMC 532 prismatic battery cell (power battery) prices rose 4.8% in April)**



1. Overview of new energy prices and supply/demand

1.3 Supply/demand review and forecast

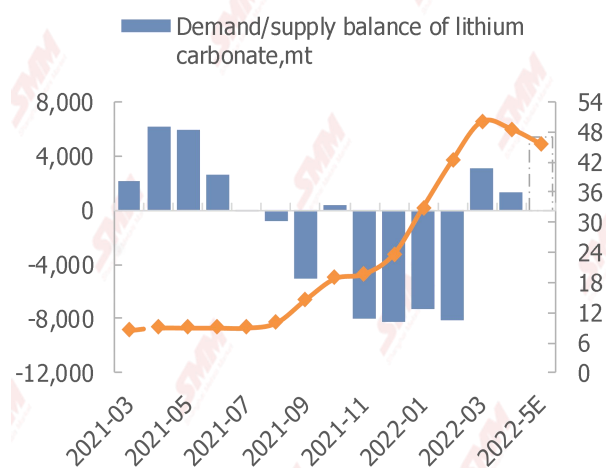
➤ **Downstream demand for cobalt salts is relatively weak in May, and prices may fall**



Domestic cobalt sulphate is expected to be in small supply deficit of 237 mt in metal content in May. China's cobalt sulphate output rose 10% month-on-month in April. And in May, the arrival of cobalt-based raw materials at ports may continue to improve. However, affected by the pandemic, precursor manufacturers have reduced their production. Downstream purchases were not active in April, and the inventory of finished products continued to accumulate. Due to inventory pressure, the cobalt salt factories' production schedule in May will be reduced, and the supply is expected to fall by 2.5%.

On the demand side, spreading COVID in China has restricted the downstream procurement of precursors, resulting in a decline in precursor output in April. The impact of the pandemic continues in May, and some leading manufacturers have begun to ramp up the production approaching half-year reporting period. It is expected that downstream power and electronics battery output will increase in May. SMM believes that China's total demand for cobalt sulphate in May will increase by 9.7% month-on-month. But considering that the production in May is mainly based on old raw material inventories, the purchasing demand will be low and it is expected that **the prices of cobalt salt may continue to decline in May.**

➤ **Imports and supply likely to increase significantly in May, hence prices may fall further**

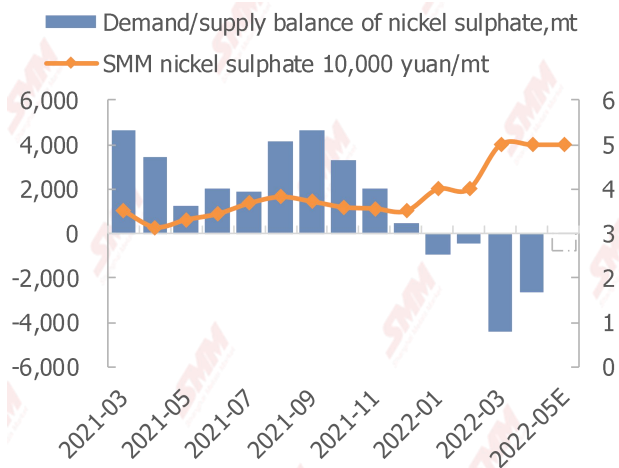


Lithium carbonate supply recorded a surplus of 1,318 mt in April, which narrowed from that in March. China lithium carbonate output was 26,678 mt in April, a month-on-month increase of 2% and a year-on-year increase of 30%. Although new production capacity was being put into production in April, some manufacturers carried out short-term maintenance or suspended the production due to the epidemic. Hence the supply rose slightly as a whole. The demand side continued to weaken. But due to restrictions on imports and exports under spreading pandemic, supply surplus in the market narrowed. In May, due to the recovery of production from scenarios like maintenance and added output from brine lakes, the supply will still rise and the demand will remain weak. In addition, the centralised release of imported lithium carbonate will have an impact on the supply-demand balance, the supply surplus may aggravate, hence there is still possibility that prices will fall.



1. Overview of new energy prices and supply/demand

1.3 Supply/demand review and forecast



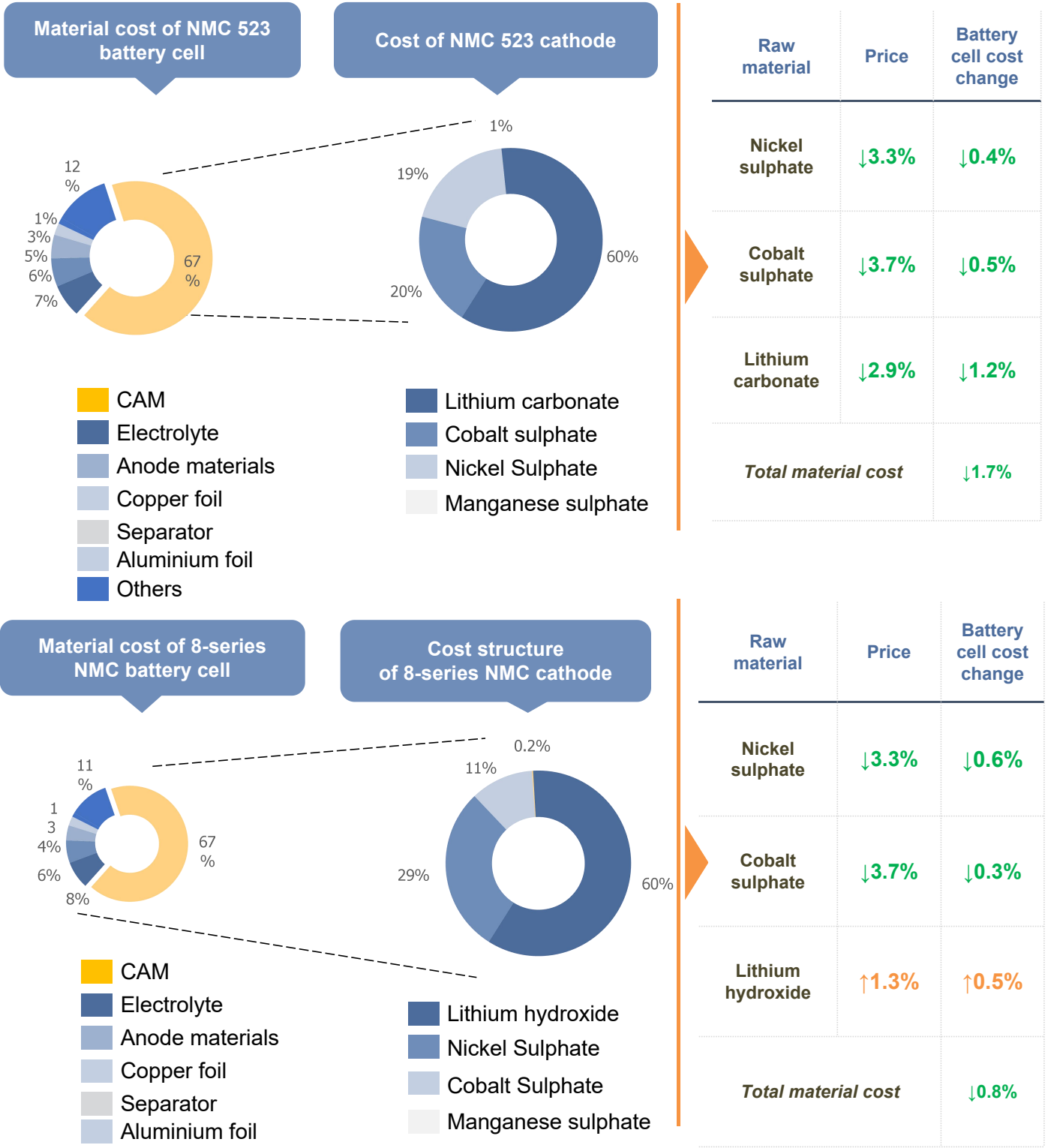
- **Nickel sulphate supply remained in deficit in April, and precursor manufacturers purchased on rigid demand due to weak supply and demand**

Nickel sulphate supply deficit stood at 2,628 mt in nickel content in April. The output of nickel sulphate slumped amid operation losses of nickel salt factories in light of weakness in both supply and demand. According to SMM research, the supply of nickel salt is likely to rise month-on-month in May, but the demand could hardly recover in the month due to the impact of the pandemic. Hence the supply and demand will remain weak. Nickel salt factories may make some concessions in terms of prices when the cost is falling. The price range of nickel salt is expected to be 45,000-48,000 yuan/mt in May.



2. Battery cell cost and procurement by battery makers

2.2 Battery cell cost dropped in April amid falling lithium salt prices



Material cost of 8-series NMC battery cell

Material	Percentage
CAM	67%
Electrolyte	11%
Anode materials	8%
Copper foil	6%
Separator	4%
Aluminium foil	3%
Others	1%

Cost structure of 8-series NMC cathode

Material	Percentage
Lithium hydroxide	60%
Nickel Sulphate	29%
Cobalt Sulphate	11%
Manganese sulphate	0.2%

Nickel sulphate	↓3.3%	↓0.6%
Cobalt sulphate	↓3.7%	↓0.3%
Lithium hydroxide	↑1.3%	↑0.5%
Total material cost		↓0.8%



2. Battery cell cost and procurement by battery makers

2.2 The proportion of LFP battery among leading battery companies increased steadily in the first quarter of 2022, and the proportion of high nickel batteries also increased

Battery enterprise		CATL	BYD	LG Chem	CALB	Guo-xuan Hi-Tech	EVE Energy	Farasis Energy	SVOLT Energy	Sun-woda	Ruipu Energy
Product structure changes	High-nickel ternary	↑		↑			→	↑	↓	→	
	Low-medium nickel Ternary	↓	↓	↓	↓	↓	→	↓	↑	↓	
	Lithium iron phosphate	→	↑		↑	↑	→		↑	↑	
Cathode materials supply	Rongbai Technology										
	Bamo Technology										
	Xiamen Tungsten										
	Hunan Changyuan LICO										
	Beijing Easpring Material Technology										
	Zhenhua Electronics										
	Shanshan Energy										
	Reshine New Material										
	Defang Nano										
	Yuneng										
	Self-supplied										



Supply relationship



Proportion of products increased this quarter



Proportion of products unchanged this quarter



Proportion of products decreased this quarter



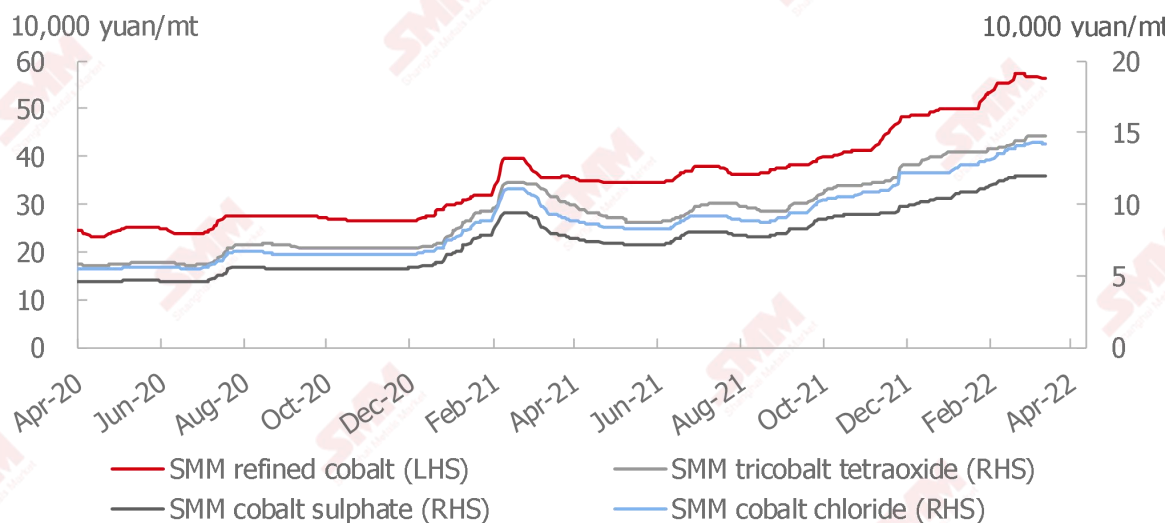
2. Battery cell cost and procurement by battery makers

- The proportion of LFP battery among leading battery companies increased steadily in the first quarter of 2022, and the proportion of high nickel NMC batteries also increased. Lithium prices rose sharply in the first quarter, which led to an increase in the procurement cost and unstable procurement volume of LFP material enterprises, and a slowdown in the growth of materials purchased by battery enterprises. In addition, in the first quarter, leading battery companies advanced their orders for high-nickel materials, resulting in an increase in the proportion of high-nickel NMC materials. At present, the proportion of LFP batteries among domestic leading battery companies is basically 60% or above, and it is expected that the output of LFP batteries will grow steadily in the future.
- The demand in the downstream power market in the first quarter rose slightly compared with the fourth quarter last year, and the supply chain of leading battery companies was stable. This year, the changes in suppliers were minimal, with existing changes mainly due to the influence of customer orders and products.



3. Monthly analysis of cobalt industry

3.1 Price review and forecast in cobalt industry



3.1.1 Prices of refined cobalt dropped 1% MoM in April, likely to fall in May

The monthly average price of refined cobalt was 559,000 yuan/mt in April 2022, down 1% month-on-month and up 57% year-on-year, and is expected to extend the decline into May.

- The prices of refined cobalt dropped slightly in early April. **Domestic inventories continued to decrease, while logistics was blocked by spreading pandemic. The downstream demand weakened.**
- Prices of refined cobalt fell again in the middle of the month. The procurement demand did not improve, and the **raw materials arrived at ports in large quantities. Coupled with falling prices of various cobalt-based products**, refined cobalt prices fell owing to the market sentiment.
- At the end of the month, the prices dropped sharply. At the **end of the month, top-tier refined cobalt manufacturers lowered their ex-factory prices in addition to fluctuating futures prices.** As such, refined cobalt prices dropped significantly.

3.1.2 Cobalt sulphate prices fell 3% MoM in April, and are expected to fall further in May

The average monthly price of cobalt sulphate was 115,000 yuan/mt in April, a decrease of 3% month-on-month and up 49% year-on-year. The prices are likely to fall again in May.

- Cobalt sulphate prices dropped slightly in early April. Since late March, multiple factors such as the pandemic have **forced precursor manufacturers to reduce their production, and the purchase activities also stagnated with manufacturing mainly consuming raw material stocks. The upstream and downstream was in intensive tug-of-war. In this case, some cobalt salt manufacturers lowered the prices moderately.**
- In the middle of the month, the prices of cobalt sulphate continued to **decline. A large number of cobalt-based raw materials arrived at ports during this period. And the inventory of finished products held by cobalt salt factories also accumulated palpably owing to poor sales. The downstream, on the other hand, purchased only on rigid demand. The prices dropped on serious imbalance between supply and demand.**
- At the end of the month, the prices of cobalt sulphate dropped sharply, and **some cobalt salt factories that used recycled materials as raw materials had less finished product inventory. Due to the bearishness and working capital pressure, they actively sold off by fiercely lowering the prices, pulling down market prices as a whole.**



3. Monthly analysis of cobalt industry

3.1.3 Prices of Co₃O₄ fell 1% MoM in April, likely to fall further in May

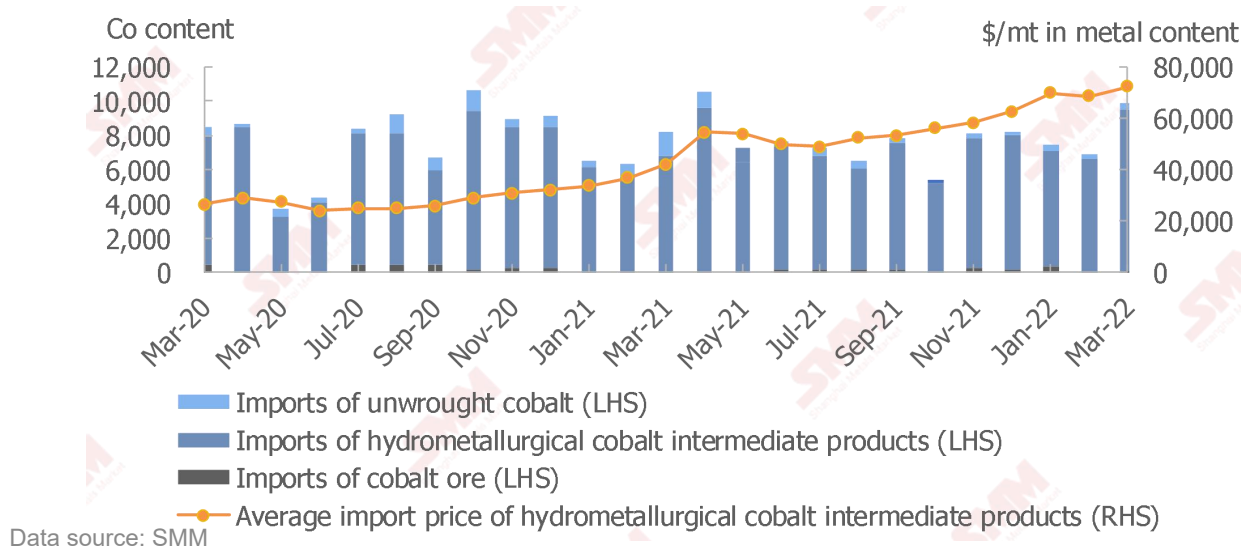
The monthly average price of Co₃O₄ stood at 431,000 yuan/mt in April, down 1% month on month but up 44% year on year, and is expected to fall further in May.

- At the beginning of the month, the prices of cobalt chloride showed signs of falling, and the prices of Co₃O₄ gradually declined due to the dual influence of falling cost and weakening demand.
- In the middle of the month, the demand for LCO batteries weakened owing to the seasonal off in the electronics market in the second quarter, and the overall transactions in the Co₃O₄ market was muted. The prices of Co₃O₄ dropped on oversupply.
- At the end of the month, due to the continued impact of the pandemic, the overall demand for domestic cobalt products was weak, and the transaction of Co₃O₄ thinned again. Hence the prices moved all the way down with few market inquiries.



3. Monthly analysis of cobalt industry

3.2 A large number of cobalt-based raw materials arrived at ports in March, resulting in excess cobalt salt stocks

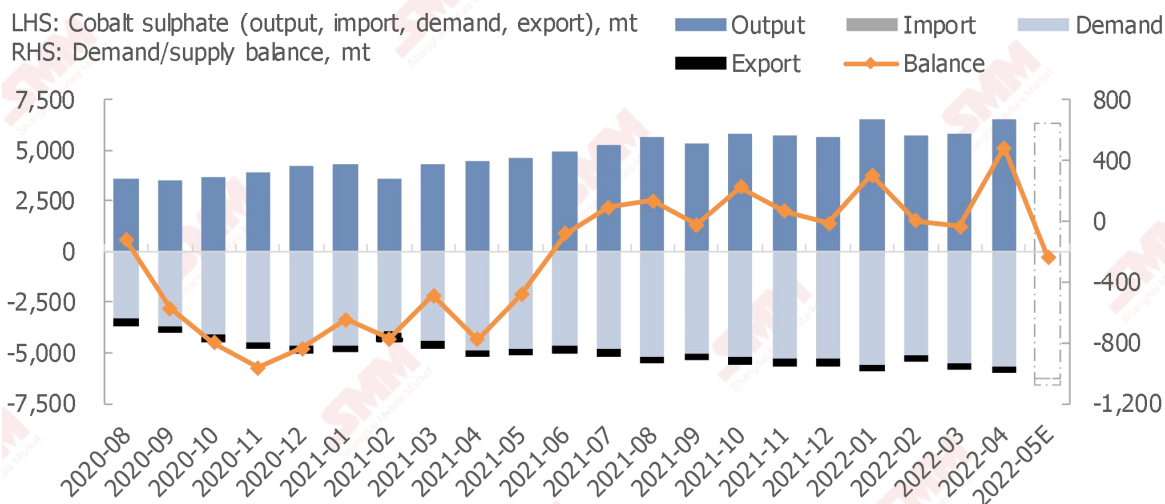


- According to latest data from the General Administration of Customs, China imported 10,000 mt of cobalt-based raw material in metal content in March, a month-on-month increase of 44% and year-on-year increase of 21%. The imports totalled 24,400 mt in metal content in the first quarter of 2022.
- China imported 122 mt in metal content (Co content at 8%) of cobalt ore in March, down 7% MoM and up 263% YoY. Imports of cobalt ore were 595 mt in metal content in the first three months of 2022, up 278% year-on-year. Imports of cobalt hydrometallurgy intermediate products were 9,400 mt in metal content in March(calculated at 27% grade), up 45% month-on-month and 38% year-on-year. Imports of cobalt hydrometallurgy intermediate products totalled 22,700 mt in metal content in the first quarter, up 23% year-on-year. Imports of unwrought cobalt were 391 mt in metal content in March (calculated at 99.8% grade), up 24% month-on-month and down 71% year-on-year. Imports of unwrought cobalt totalled 1,060 mt in metal content in Q1, down 58% year-on-year.
- The average import price of cobalt hydrometallurgy intermediate product was \$72,352/mt (Co content) in March 2022, an increase of 3% month-on-month and 71% year-on-year. **The average import price stood at \$69,876/mt in metal content in the first three months of 2022.**
- In January to March, the increase in domestic cobalt-based raw material imports was mainly contributed by cobalt intermediate products and unwrought cobalt. The imports of cobalt pre still trended lower. **The import volume of cobalt intermediate products increased significantly in March according to the Customs. Thanks to the gradual ease of land transportation from the Congo to Durban, South Africa, intermediate products that were backlogged at Durban Port last year were finally able to be shipped, and the shipping situation improved compared with the previous month. SMM expects that imports of intermediate products will continue to increase in April.** Recently, South Africa has suffered from severe floods, and the city of Durban has been greatly impacted. Infrastructure such as bridges, port roads, telecommunications and electricity have been severely damaged, and the port has ceased operations. Durban is the largest port for cobalt-based raw material delivery in Africa. This round of floods is expected to once again lead to problems of tight transportation capacity. **A number of cobalt ore warehouses have been damaged by the flood. Even after the resumption of shipping, the amount of arrivals at ports will be reduced. According to estimates based on the time required by land transportation, space booking, loading, and shipping, it is expected that the flood will affect the arrival of intermediate products in May-June.** These shipments are expected to be delayed by 2-3 weeks from the original schedule.



3. Monthly analysis of cobalt industry

3.3 Cobalt sulphate supply in a surplus in April, but this may reverse into a slight deficit in May with improvement of downstream demand



- The Chinese cobalt sulphate market saw a supply surplus of 480 mt in metal content in April, which is estimated to reverse into a supply deficit of 237 mt in metal content in May.
- On the supply side, China's cobalt sulphate output stood at 6,510 mt in metal content in April, up 10% MoM and 28% YoY. A large number of imported cobalt intermediate products arrived at ports in April. Considering the inventory of raw materials and labour costs, most producers maintained stable output. **The domestic cobalt sulphate output is estimated at 6,345 mt in metal content in May, down 3% month-on-month. SMM has adjusted the sample coverage rate of each category of products in new energy industry chain from March 2022, with details shown on slide 38.**
- Export orders for cobalt sulphate remained stable, all of which were long-term orders, and the monthly supply was relatively stable. SMM expects the export volume of cobalt sulphate to be 350 mt in metal content in April.



3. Monthly analysis of cobalt industry

3.3 Cobalt sulphate supply in a surplus in April, but this may reverse into a slight deficit in May with improvement of downstream demand

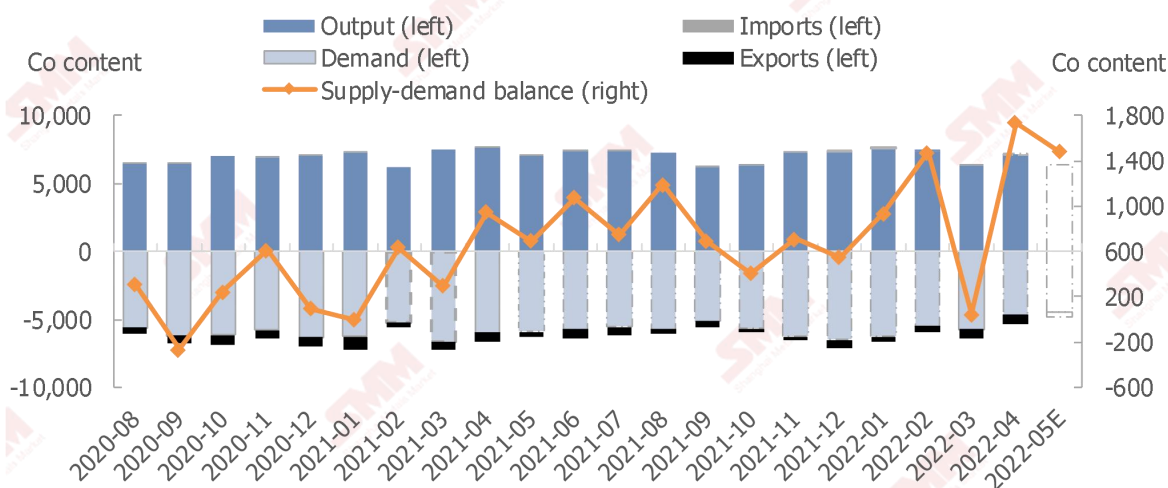
April	Volume (mt)	MoM (%)	YoY (%)
Output	6,510	10	28
Demand	5,680	3	22
Imports	0	0	0
Exports	350	0	0

- On the demand side, China's demand for cobalt sulphate stood at 5,680 mt in metal content in April, up 3% MoM and 22% YoY. **The overall transaction in April was sluggish, and the inventory of finished products of cobalt salt plants accumulated significantly.** The production of precursor plants was severely affected by the pandemic, prompting them to clear their raw material inventories instead of making purchases. **It is expected that the arrivals of imported intermediate products at ports will continue to improve in May. Given the backlog of finished product inventory caused by poor demand, cobalt salt plants will turn more cautious about producing in May.** SMM estimates that China's total demand for cobalt sulphate will be 6,232 mt in metal content in May, including 5,111 mt in metal content from PCAM. *With the transformation of downstream NCM cathode material precursor to high nickel and low cobalt, SMM has updated the monthly changes in the demand coefficient of cobalt sulphate of different models.*



3. Monthly analysis of cobalt industry

3.4 Tricobalt tetroxide demand from LCO declined in April due to off-season for digital market



- The supply surplus in the Chinese tricobalt tetroxide market expanded sharply to 1,738 mt in April.
- Imports and exports of tricobalt tetroxide were 13 mt and 709 mt respectively in April. Imports and exports are estimated at 10 mt and 439 mt respectively in May.
- On the supply side, China's tricobalt tetroxide output stood at 7,097 mt in April, a month-on-month increase of 11% and year-on-year decrease of 7%. **In April, affected by the pandemic and off-season in the digital market, downstream demand for LCO weakened, which had a knock-on effect on the demand for tricobalt tetroxide.** China's tricobalt tetroxide output is estimated to drop 11% MoM to 6,332 mt in May. *SMM has adjusted the sample coverage rate of each category of products in new energy industry chain from August 2021, with details shown on slide 38.*
- On the demand side, China's LCO output stood at 5,673 mt in April, which required 4,663 mt of tricobalt tetroxide, down 18.5% MoM and 28% YoY. Digital batteries entered the off-season in the second quarter, causing the orders for digital LCO to decline. People began to take classes online and work from home when the COVID-19 broke out two years ago, which created a surge in the demand for mobiles and tablet computers. However, the demand for digital products weakened this year after being released over the past two years, resulting in sluggish trades in LCO battery market. **China's tricobalt tetroxide demand is estimated to drop 5% MoM and 27% YoY to 4,420 mt in May.**

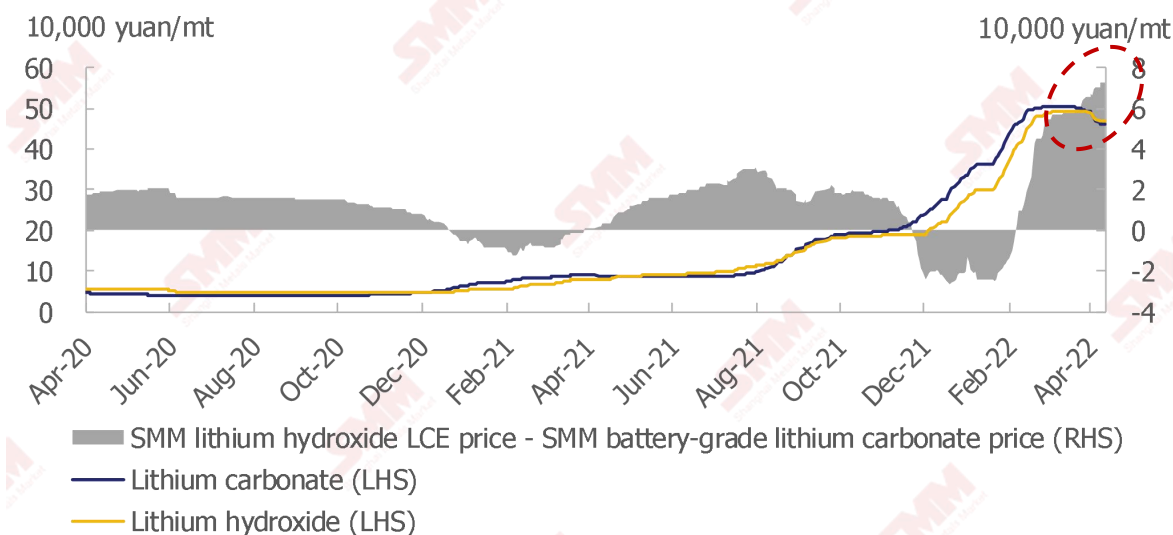
April	Volume (mt)	MoM (%)	YoY (%)
Output	7,097	11	-7
Demand	4,663	-18.5	-28
Imports	13	116%	0
Exports	709	64.1%	0

Data source: SMM, China customs



4. Monthly analysis of lithium industry

4.1 Decline in lithium salt prices accelerated in the second half of April as the pandemic hurt demand



4.1.1 The prices of lithium carbonate fell 3% month-on-month in April

The monthly average price of battery-grade lithium carbonate was 484,842 yuan/mt in April, down 3% MoM. The prices are expected to fall further in May as demand growth will not catch up with supply.

- At the beginning of the month, the supply continued the upward trend, but the demand weakened. Small and medium-sized smelters and traders followed suit after a few major smelters lowered their offers, while buyers took a wait-and-see stance, weighing on prices slightly.
- In the middle of the month, supply continued to grow, while demand was hurt by the pandemic. Small and medium-sized smelters and traders cut their offers further.
- At the end of the month, major smelters hardly made any quotation and focused on delivery of long-term orders. Some smelters sold at lower prices due to financial pressure. The price negotiations between sellers and buyers were in a deadlock again after lithium concentrate auction in Australia ended, and the prices fell slightly.



4. Monthly analysis of lithium industry

4.1.2 The prices of lithium hydroxide rose 1% month-on-month in April, but dropped in the second half of the month

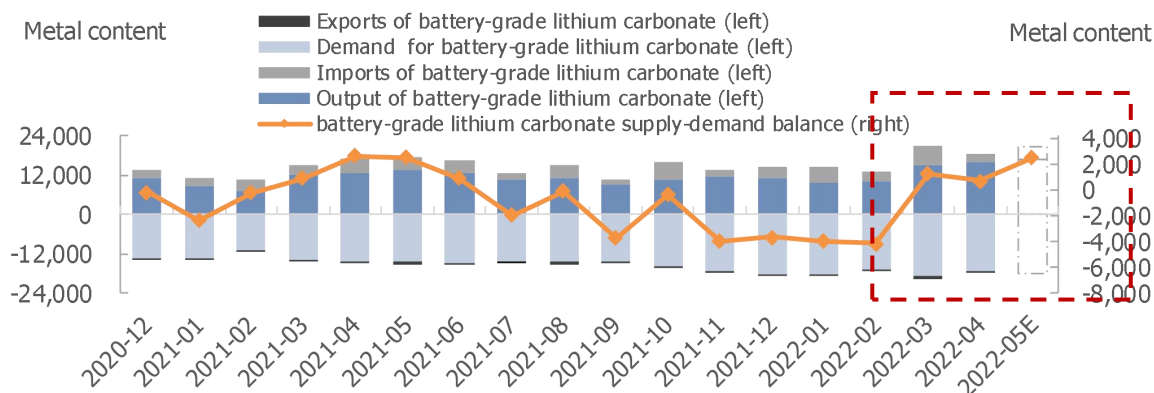
The monthly average price of battery-grade lithium hydroxide was 483,210 yuan/mt in April, up 1% month on month. The prices are expected to fall in May due to poor demand.

- At the beginning of the month, there was a small increase in the supply due to the release of new capacity, while demand declined amid high nickel prices and the pandemic. Mainstream smelters held their offers firmly due to tight supply, while downstream buyers reduced their purchases amid pessimistic demand outlook, thus the prices remained stable.
- In the middle of the month, affected by the downward trend of lithium carbonate prices, most smelters refrained from making quotations. Bullish overseas market encouraged some major smelters to demand high prices. Some high-nickel battery material plants reduced purchases due to falling orders, bearish sentiment and supply from battery makers. Instead of purchasing lithium hydroxide, some buyers chose to purchase lithium carbonate for causticising. Falling lithium carbonate prices and demand dragged down lithium hydroxide prices.
- At the end of the month, most smelters suspended making quotations, but were bearish on future prices due to falling lithium carbonate prices. In light of bullish overseas market, major smelters did not expect a significant price reduction. Affected by falling lithium carbonate prices and presence of lithium hydroxide made through causticisation process, lithium hydroxide prices declined.



4. Monthly analysis of lithium industry

4.2 Battery-grade lithium carbonate market saw greater supply and weaker demand in April, but oversupply eased as imports were hindered by the pandemic



April	Volume (mt)	MoM	YoY
Output	15,782	4	25
Demand	17,365	-8	22
Imports	2,500	-55	-44
Exports	210	-64	-40

➤China's battery-grade lithium carbonate output stood at 15,782 mt in April, up 4% MoM and 25% YoY. In April, most of the producers who use spodumene as raw materials maintained normal operations, except for a few who were shut down due to spodumene shortages, maintenance and the pandemic. Some producers who use lepidolite as raw materials saw a gradual release of new capacity. The production of lithium carbonate from salt lakes gradually reached the peak. Entering May, some smelters were still short of raw materials, but the new capacity of some smelters continued to ramp up. Some smelters recovered from maintenance and the pandemic. Widening price difference between industrial and battery-grade lithium carbonate will encourage some producers to purify the former into the latter. **The domestic battery-grade lithium carbonate output is estimated at 16,890 mt in May, up 7% MoM. SMM has adjusted the sample coverage rate of each category of products in new energy industry chain from March 2022, with details shown on slide 38.**

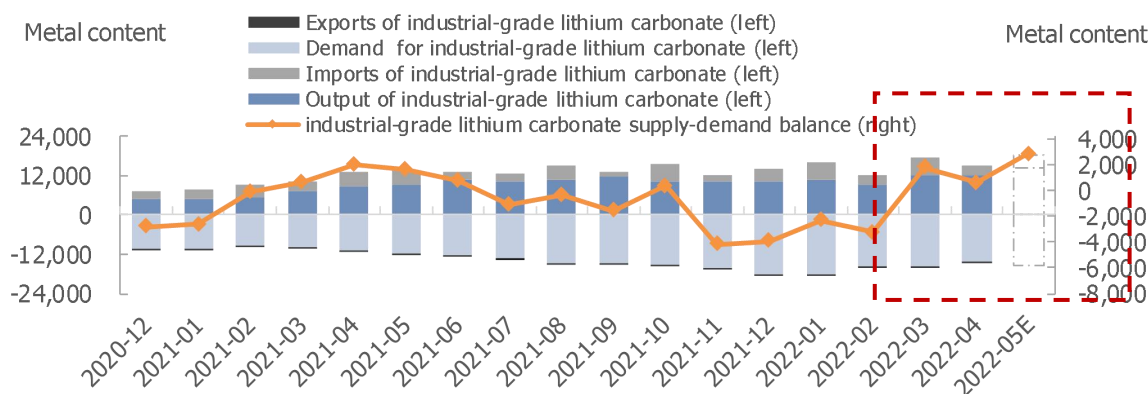
➤China's demand for battery-grade lithium carbonate fell 8% MoM in April, but rose 22% YoY. The orders of NMC cathode material producers declined due to high nickel prices and the pandemic. This, coupled with adequate inventory on hand, prompted them to reduce purchases. The demand from LCO declined significantly as the digital market entered the off-season. The pandemic hit the production and orders of LFP plants, forcing them to reduce purchases. Looking into May, with auto makers gradually resuming production after the pandemic has improved, LFP plants are expected to raise their operating rates and purchases. However, demand from the three other types of cathode materials may fall further due to destocking by battery makers and poor end demand. **It is expected that the overall demand for battery-grade lithium carbonate will rise merely 2% MoM in May.**

➤Affected by the pandemic, lithium carbonate imports were severely hit in April. Entering May, more imported lithium carbonate will enter the domestic market after the pandemic is brought under control, which will exacerbate the oversupply.



4. Monthly analysis of lithium industry

4.3 In April, the demand for industrial-grade lithium carbonate decreased, but oversupply eased slightly thanks to hindered imports



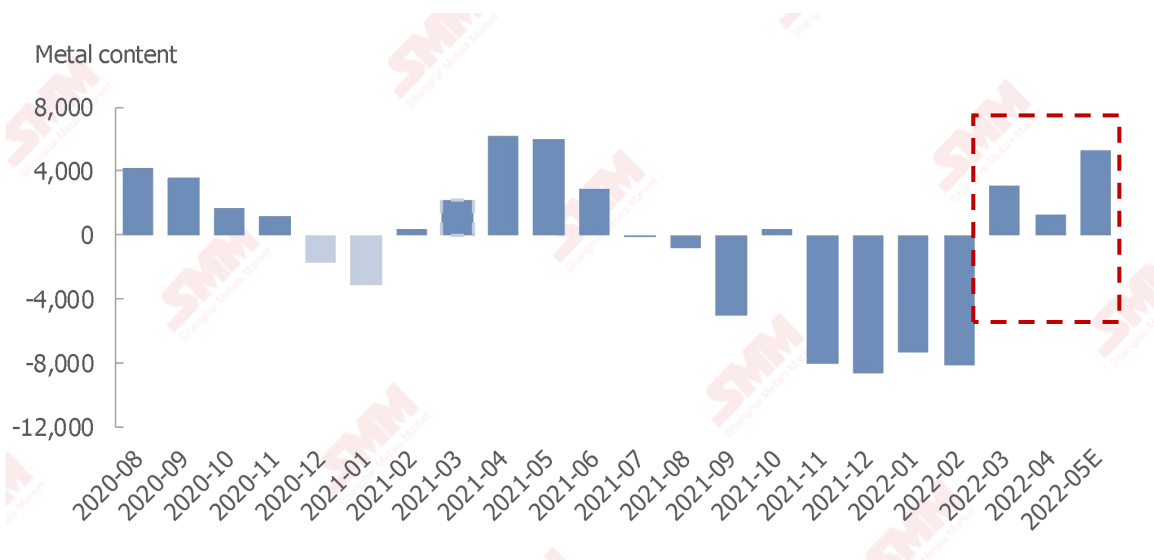
April	Volume (mt)	MoM	YoY
Output	12,449	2	43
Demand	14,249	-9	29
Imports	2500	-55	-44
Exports	90	-64	-40

- China's industrial-grade lithium carbonate output stood at 12,449 mt in April, up 2% MoM and 43% YoY. Production in Qinghai gradually peaked. Some producers who use lepidolite as raw materials undertook brief maintenance, but producers who use scrap saw a significant increase in their output. Entering May, the overall supply will increase further thanks to the ramp-up of new capacity, completion of maintenance and technical upgrading, as well as further recovery of production in Qinghai. **The domestic industrial-grade lithium carbonate output is estimated at 14,472 mt in May, up 16% MoM. SMM has adjusted the sample coverage rate of each category of products in new energy industry chain from March 2022, with details shown on slide 38.**
- On the **demand side**, the demand for industrial-grade lithium carbonate dropped by 9% MoM in **April**. The decline in orders prompted major LFP enterprises to reduce their purchases. In the face of high lithium prices and the off-season, LCO plants turned more cautious about restocking and slashed their planned production by half. **Entering May, thanks to the recovery of LFP production, it is expected that the total demand for industrial-grade lithium carbonate will rise by 8% MoM this month.**



4. Monthly analysis of lithium industry

4.4 Lithium carbonate supply surplus eased in April thanks to hindered imports

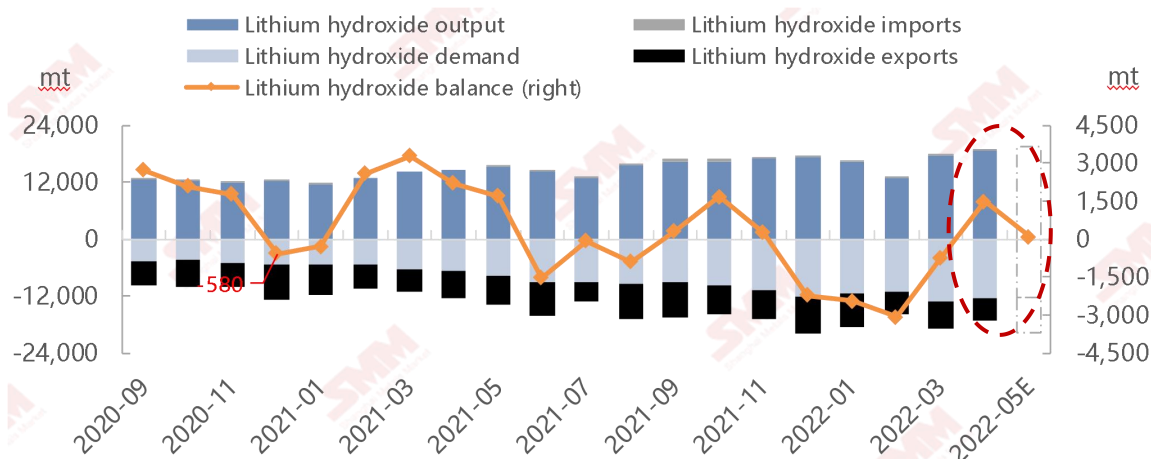


- The lithium carbonate market saw a supply surplus of 1,318 mt in April. **Domestic lithium salt plants held 5,200 mt of lithium carbonate inventory in April, while downstream material plants held 24,922 mt of lithium carbonate inventory, up 5% on the month.**



4. Monthly analysis of lithium industry

4.5 In April, lithium hydroxide market shifted to oversupply amid growing supply, falling demand and lower exports



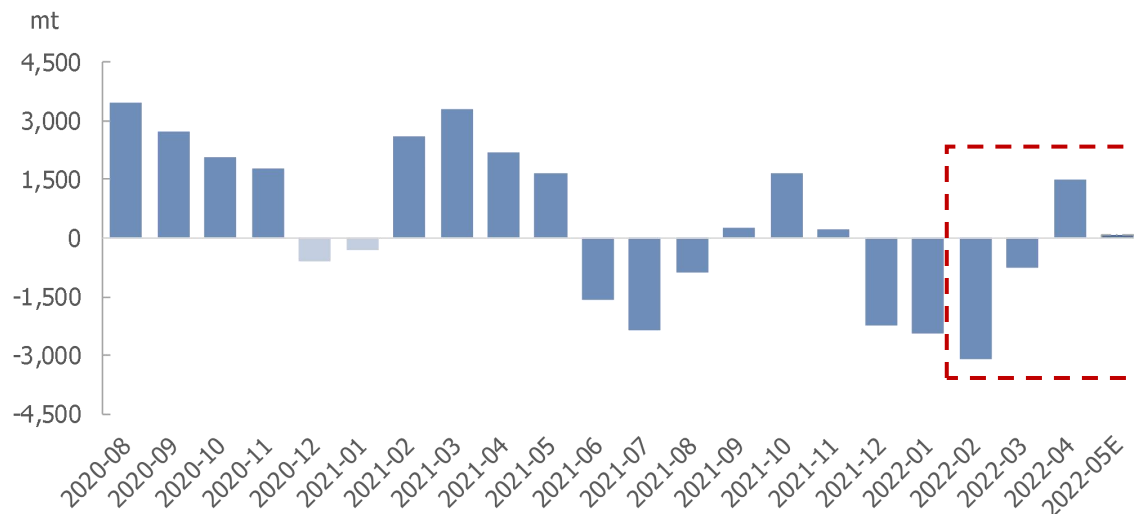
April	Volume (mt)	MoM (%)	YoY (%)
Output	18,520	5	31
Demand	12,313	-6	56
Imports	285	-39	0
Exports	5,000	-14	-12

- China's lithium hydroxide output stood at 18,520 mt in April, up 5% MoM. New capacity ramped up, but some smelters undertook maintenance in the middle of this month. Falling prices of lithium carbonate encouraged some producers to increase their output through causticising process. Entering May, the overall supply will increase slightly, driven by trial operations of new production lines, recovery from maintenance, as well as increased output through causticising process. **The domestic lithium hydroxide output is estimated at 19,388 mt in May, up 5% MoM. SMM has adjusted the sample coverage rate of each category of products in new energy industry chain from March 2022, with details shown on slide 38.**
- **Auto makers reduced or halted their production under the impact of the pandemic, which hurt the orders of battery makers and reduced lithium hydroxide demand by 6% MoM in April.** Entering May, some battery factories maintained destocking strategy, and the orders for high-nickel NMC materials did not improve. **As a result, lithium hydroxide demand is estimated to drop 1% MoM.**



4. Monthly analysis of lithium industry

4.6 In April, lithium hydroxide market shifted to oversupply amid poor demand



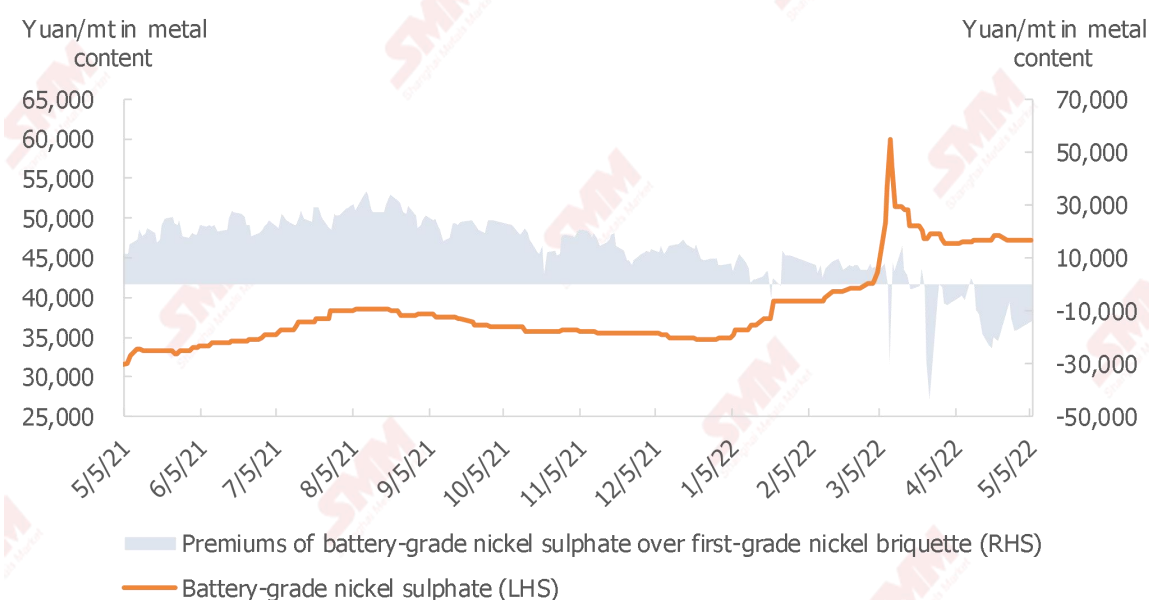
- **The lithium hydroxide market shifted to a supply surplus of 1,492 mt** in April. Under the impact of the pandemic, domestic demand was sluggish and exports declined. This, coupled with falling prices of lithium carbonate, sent lithium hydroxide prices lower in late April. Entering May, the overall supply increased slightly, while demand remained stable. However, given the recovery of exports, the market is likely to **shift to a tight balance**.



5. Monthly analysis of nickel industry

5.1 Price review and forecast of nickel industry

5.1.1 Nickel salt prices continued to fluctuate at a high level in April under the support of elevated LME nickel prices



- The performance of the nickel salt market was poor throughout April. Transactions were primarily driven by long-term orders, except for limited rigid demand from some precursor plants. Nickel salt enterprises were plagued by high raw material costs, especially those who use nickel briquette and imported MHP as raw materials. However, weak demand prevented higher costs from passing onto the prices of finished products, resulting in losses on nickel salt enterprises, and their **output fell 12% month-on-month**. With **supply and demand both falling, the prices of nickel salt fluctuated at a high level in April under the support of high nickel prices**.
- Entering May, bearish macro sentiment and weaker demand caused by the pandemic weighed on commodity prices. Nickel prices fell significantly. The retreat of raw material prices helped ease the cost pressure of nickel salt producers. However, poor profits discouraged nickel salt producers from resuming production on a large scale. Limited supply allowed nickel salt prices to fall more slowly than nickel prices. Although the supply of nickel salt increased month-on-month in May, demand is unlikely to recover due to the impact of the pandemic. **In light of lower costs, nickel salt prices are expected to drop to 45,000-48,000 yuan/mt in May.**



5. Monthly analysis of nickel industry

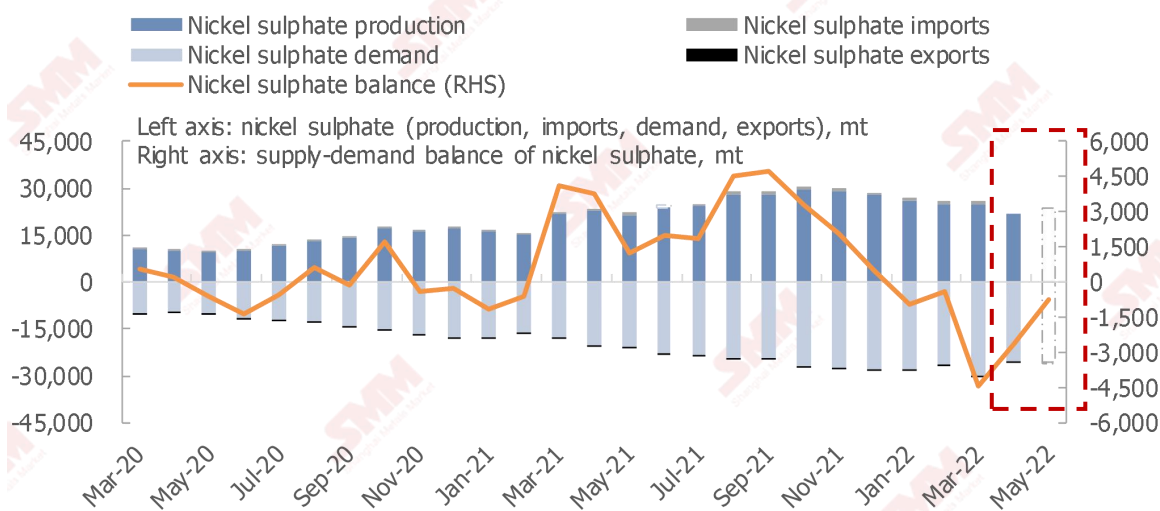
5.1.2 Discounts of nickel salt against nickel briquette narrowed in May as prices of the former were more resilient to decline than the latter

➤ Premiums of battery-grade nickel sulphate over refined nickel (nickel briquette) averaged -12,000 yuan/mt in April, versus -2,000 yuan/mt in March. Nickel prices remained high in April, but nickel salt prices failed to rise due to poor demand. Many nickel salt factories reduced their use of nickel briquette due to poor profits. Entering May, relatively tight supply allowed nickel salt prices to fall less sharply than nickel prices, thus the discounts of battery-grade nickel sulphate against nickel briquette shrank. With nickel prices gradually returning to rational levels, discounts of nickel salt against nickel briquette are expected to narrow further and may even turn into premiums this month.



5. Monthly analysis of nickel industry

5.2 China's output of nickel sulphate continued to decline to 21,600 mt in Ni content, down 12.5% MoM



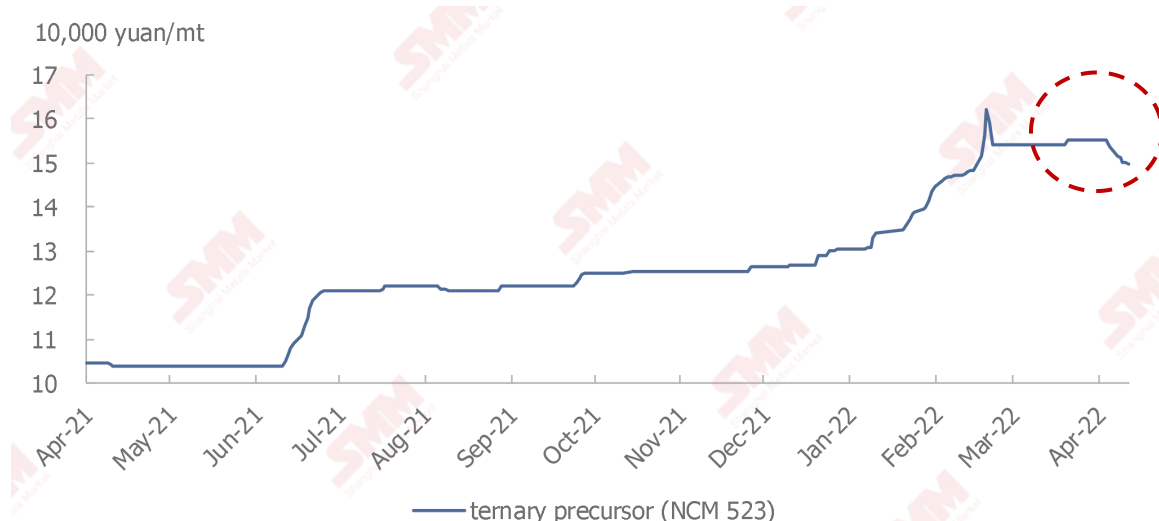
- **China's output of nickel sulphate stood at 21,600 mt in metal content, and 97,500 mt in physical content in April 2022, down 12.46% from the previous month and down 5.22% year-on-year.** In April, poor profits, higher costs and the weak demand forced the salt plants to cut their production. Accordingly, the nickel salt output of integrated producers also fell with the declining precursor output. In addition, in terms of raw material supply structure in April, nickel sulphate produced by in-house dissolution of nickel briquette dropped to 20%, and the proportion of high-grade nickel matte increased to 12%, and the proportion of intermediate products was about 46%. **In May, with the drop of raw material prices and the improvement in profits, some salt plants have begun to resume work. The output is expected to increase by 9.01% from April and 9.71% year-on-year.** However, poor downstream demand, such as precursors and batteries will probably drag down the increase in the profits of nickel salt in May, and the overall output is relatively low compared with the previous high.
- **According to customs data, in March 2022, China imported 1,041 mt of nickel sulphate in Ni content, down 53% MoM and down 19% YoY.** From January to March, the imports totalled 2,540 mt in Ni content, up 33% YoY. **The exports stood at 229 mt in Ni content, up 21,853% MoM and up 2,166% YoY.** The export volume stood at 239 mt in Ni content from January to March. In March, the exports increased significantly from the previous month, mainly because the salt plants actively sought opportunities in overseas markets to gain profits in light of poor demand in China. **It is expected that the export volume of nickel salt will still be high in May.**
- **In April, the nickel sulphate supply deficit stood at 2,628 mt in Ni content, which is caused by the decreased output aroused by higher costs of nickel salt.** According to SMM survey, in May, the nickel salt supply will increase from the previous month, but the demand could hardly recover from the pandemic, hence the supply and demand will continue to be weak. The prices of nickel salt may fall when the costs move down. In May, nickel salt prices are expected to move between 45,000-48,000 yuan/mt.

April	Volume (mt)	MoM (%)	YoY (%)
Output	21,638	-13	-5
Demand	25,125	-16	20
Imports	1,034	-1	37
Exports	176	-23	896



6. Monthly analysis of precursors and cathode materials

6.1 Precursor prices dropped slightly amid falling costs and the weak downstream demand



Prices of PCAM (for NMC 532) averaged 154,000 yuan/mt in April, flat from the previous month. In April, the weak terminal demand caused by the pandemic and the falling costs of raw materials dragged down the precursor prices in the second half of the month. In May, with the falling costs, the prices are going to decline slightly.

At the beginning of the month, the prices of nickel salt went up, while the cobalt salt prices dropped slightly, so the manufacturing cost rose as a whole. The purchasing in the market was weakened by various factors, such as the diverged acceptable prices between upstream and downstream, the high downstream inventory and the poor demand. Driven by the costs, the prices **rose slightly**.

In mid-April, the manufacturing cost dropped slightly as the prices of cobalt and manganese continued to decline though nickel salt prices were slightly raised. The high nickel prices, and the high inventory and low operating rates of downstream suppressed the downstream purchasing, hence the market transaction was still slack. Accordingly, the precursor prices **dropped slightly** along with the falling costs.

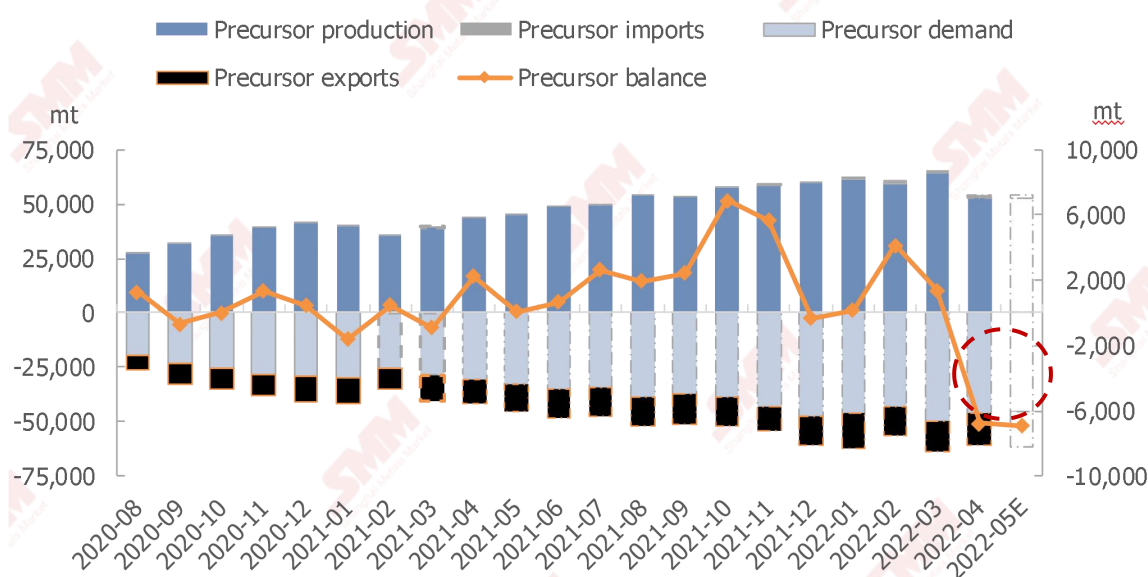
In late April, the costs dropped significantly as the prices of nickel, cobalt and manganese fell. The pandemic still suppressed the terminal demand. Besides, the producers generally reduced their inventory and purchased little as the prices of raw materials fluctuated wildly, hence the market transaction was sluggish. The **prices were dragged down** by the falling manufacturing costs.

April	Volume (mt)	MoM (%)	YoY (%)
Output	52,842	-18	22
Demand	45,784	-8	51
Imports	1,200	16	195
Exports	15,000	9	32



6. Monthly analysis of precursors and cathode materials

6.2 The precursor output dropped sharply due to the weak demand in April, and the situation will remain until May

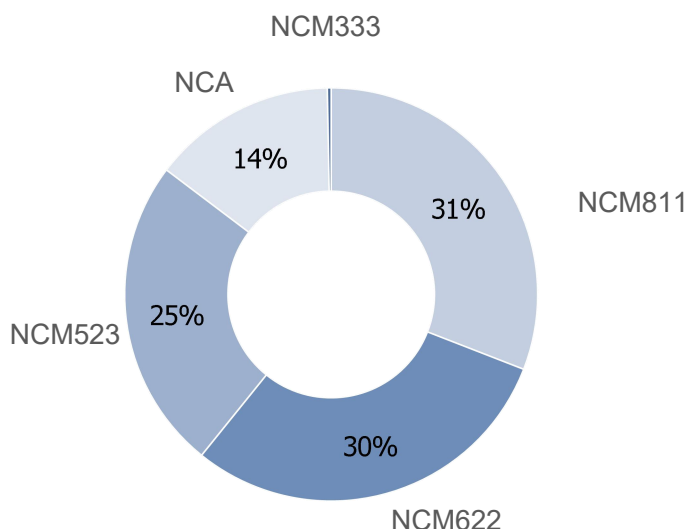


- The output of precursor stood at 53,000 mt in April, a month-on-month decrease of 18%. On the supply side, leading precursor plants in Zhejiang resumed the production at the beginning of April. However, the weak demand and the unstable prices of nickel and cobalt-based raw materials significantly decreased the output of precursors in April.
- On the demand side, affected by the pandemic outbreak in China, the output of cars dropped sharply as the car companies were short of supply across the supply chain. Besides, the leading battery factories decreased their inventory of NMC materials. Therefore, the demand for precursors in the domestic power market dropped sharply in April. In the electronics market, due to the fluctuation of lithium prices, the number of orders failed to increase, and the demand from the electronics market dropped. In the overseas market, better demand in the power market raised the number of orders received by overseas leading battery companies, and the export volume of precursors rose. In general, the demand for precursors fell in April.
- It is expected that downstream demand from sectors such as power and electronics will not rise in May, while overseas orders will increase steadily, and precursor output will be flat from the previous month. The sample has been adjusted by SMM, please refer to page 38 for details. Since January 2022, SMM PCAM supply-demand balance has added the export volume of NC.



6. Monthly analysis of precursors and cathode materials

Overseas demand for high-nickel material continued to increase, and the ratio of 5 series products decreased by the production reduction of leading battery companies in China

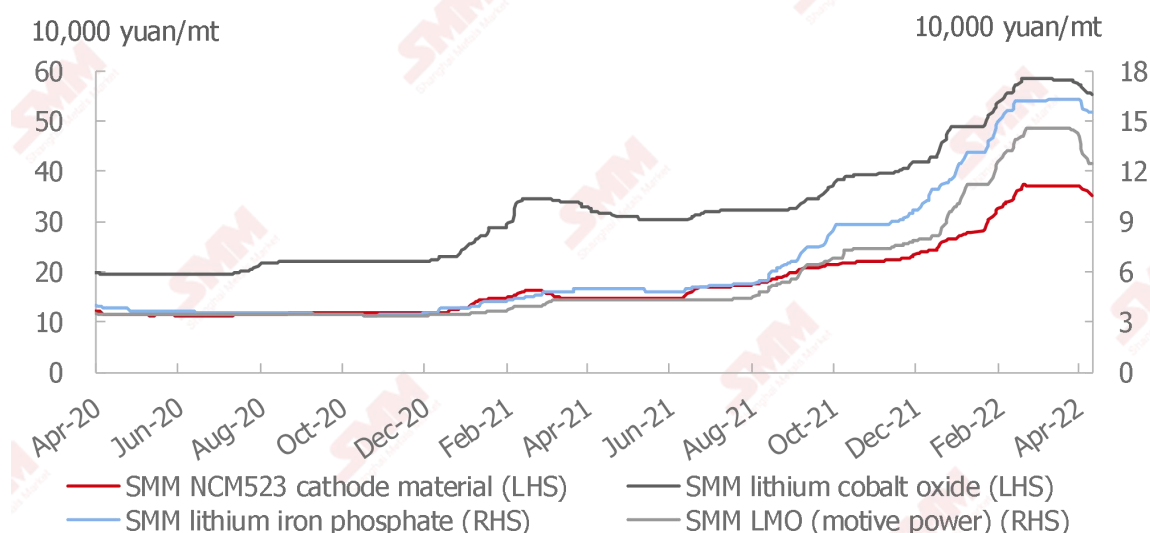


- In April, the number of orders of high-nickel material received by overseas leading battery enterprises returned to the normal level, and the demand for high-nickel material increased, among which the increase of NC series was still sharp, thus the **ratio of high-nickel products continued to increase**. **The ratio of 5-series products decreased** owing to the sluggish electronics market and the **production reduction of leading battery enterprises in China**.



6. Monthly analysis of precursors and cathode materials

6.3 Driven by the cost and demand, the prices of cathode active materials will continue to fall in May



NMC: The average monthly price was 366,000 yuan/mt in April, down 0.4% month-on-month, but up 148% year-on-year. The prices are expected to decline in May.

- At the beginning of April, manufacturing costs were dragged down slightly by the decline in the prices of lithium salt. Besides, the consumption in in-plant inventory of leading battery factories aroused by high lithium prices and the influence of the pandemic further suppressed the demand and the operating rates. However, the decline in costs had not been fully reflected, **so the prices were stable**. In mid-April, the prices of lithium salt dropped significantly and the precursor prices also dropped slightly, hence the cost was lowered. Due to the weak demand and the fluctuation of raw material prices, the inquiries in the market increased slightly after the lithium salt prices went down, but most of the traders held a wait-and-see attitude and the transactions were rare. In general, the **prices of lithium salt were dragged down** by the falling costs. In late April, the prices of precursor and lithium salt dropped, and the cost was lowered. Transactions in the spot market were sluggish because the demand was weak, and the high raw materials could not be reflected in downstream. Besides, due to the downward trend of the average purchase price, the prices of NMC materials were slightly lowered.

LFP: The average monthly price was 161,000 yuan/mt in April, a decrease of 1% month-on-month but an increase of 244% year-on-year. The prices are expected to be stable in May.

- At the beginning of April, the prices of lithium salt and LFP were stable. Some enterprises started to use the lithium salt stocks stored in early March, and the manufacturing cost and quotation rose slightly. Due to the pandemic, the shortage of anode and parts in the terminal and the high inventory of materials, the purchase of upstream LFP was reduced. In mid-April, the pandemic suppressed the downstream demand, and the overall trading in the LFP spot market was slack. In late April, the prices of upstream lithium salt dropped sharply, and some LFP enterprises seized the chance to purchase low-priced lithium salts from upstream traders and small and medium-sized lithium salt factories. Accordingly, quotes for LFP dropped along with the costs.



6. Monthly analysis of precursors and cathode materials

LCO: The average monthly price was 572,000 yuan/mt in April, up 8% month-on-month and up 43% year-on-year. The prices are expected to rise in May.

- At the beginning of April, the demand for LCO weakened and the transaction decreased, but LCO prices tended to be stable as the price change of tricobalt tetraoxide was not reflected in LCO yet.
- In the second half of April, LCO prices dropped continuously as the demand for LCO was weak in the off-season, and the raw material costs, such as LFP and tricobalt tetraoxide, dropped.

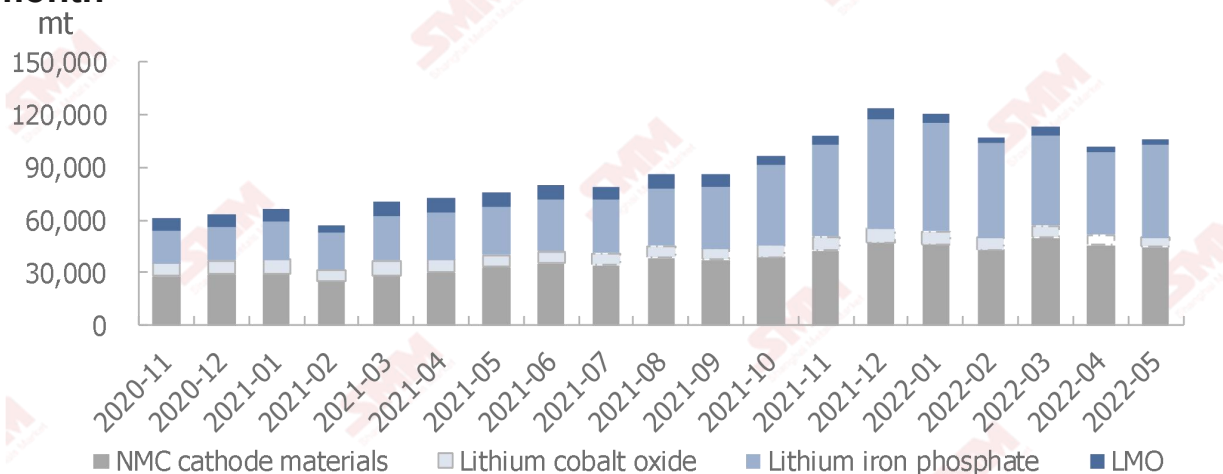
LMO: The average monthly price stood at 137,700 yuan/mt in April, up 4% month-on-month and up 235% year-on-year. The prices will probably drop in May.

- In the first half of April, LMO prices dropped sharply. On one hand, when the lithium salt prices fell, most terminal traders and battery companies that stored finished products of LMO previously sold off the stocks at a substantially low price. On the other hand, downstream demand dropped significantly in the off-season. In the second half of April, the downstream demand was still poor, especially in markets like electronics and e-bike. Most LMO materials enterprises stopped or halved their production, so the operating rates continued to fall. However, LMO prices ran steadily thanks to the slowing dumping of goods in light of the gradual stabilisation of lithium salt prices.



6. Monthly analysis of precursors and cathode materials

6.4 In April, the demand in power and electronics markets was sluggish, and the total output of cathode active materials declined month-on-month



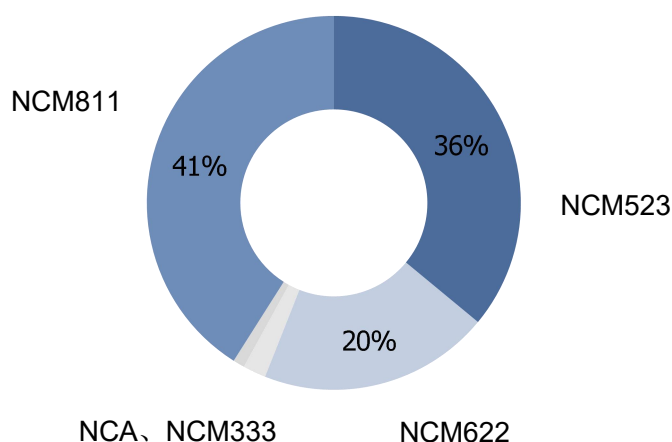
- **On the supply side, the total output of cathode active materials (CAMs) fell in April.** Due to the impact of the pandemic on the demand and the off-season, prices of CAMs could hardly rise, and the operating rates dropped. In May, LFP companies will resume the production one after another. The future demand is expected to be more positive, and the production will pick up slightly. Production of other varieties of CAMs will remain low or drop slightly because of the poor orders.
- **The demand for CAM dropped.** In terms of power market, the pandemic hindered the production of some car companies and battery factories, which further weakened the demand. Besides, the off-season was approaching, hence the terminal demand was extremely weak. In addition, stocks stored in the early stage and the high prices of materials suppressed the purchase of CAMs by some battery factories. **In May, the terminal demand in the power market will pick up slightly when the car companies resume the production after the pandemic.** While the electronics and e-bike markets are still in the off-season, so the demand for CAMs will rise slightly. *The sample has been adjusted by SMM, please refer to page 38 for details.*

April	Volume (mt)	MoM (%)	YoY (%)
Ternary cathode materials	45,784	-8	51
Lithium iron phosphate	46,837	-8	77
Lithium cobalt oxide	5,673	-18	-23
Lithium manganese oxide	3,268	-43	-61



6. Monthly analysis of precursors and cathode materials

The ratio of 6-series NMC materials in China increased slightly, while that of 5-series and 8-series declined slightly

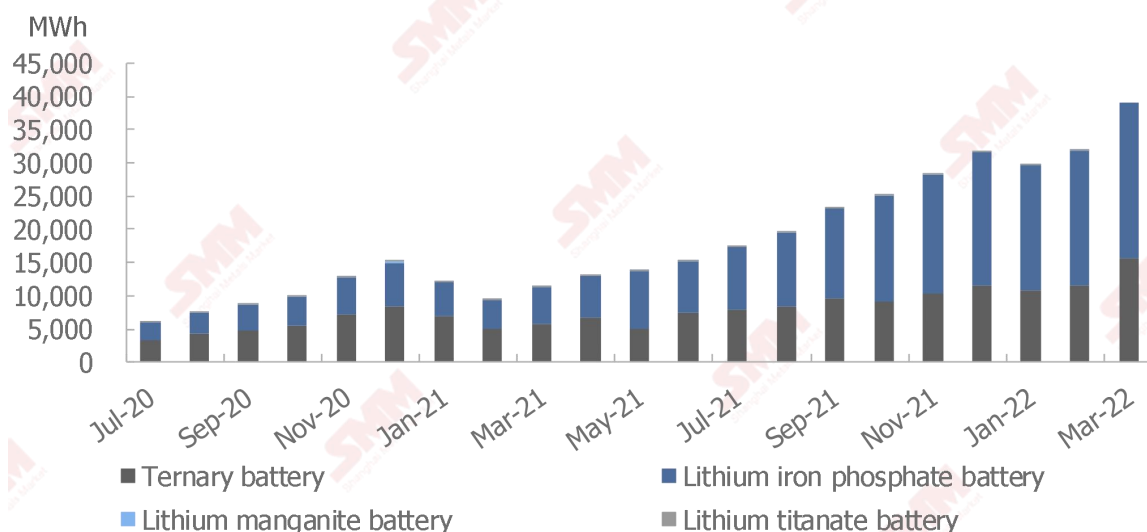


- In April, because some material manufacturers saw changes in the structure of orders and the battery factories deliberately lowered the inventory of 5-series and 8-series NMC materials, the output and ratio of 6-series both increased. Orders are expected to be stable in May, and the ratio of materials will be the same as that in April.



7. Analysis of motive power battery and end-user market

7.1 In March, the output of power batteries rose sharply, and it may decline in April amid weak terminal demand



- **Power battery output totalled 39.1GWh in March 2022, up 247% on the year and up 23% on the month.** In March, the output of power batteries in China rose sharply. The output of NMC battery stood at 15.5Gwh, up 34% on the month and 167% on the year. The output of the LFP battery stood at 23.6G Gwh, up 18% MoM and up 333% YoY. The growth rate of NMC battery was faster than that of LFP, and its market shares slightly increased by 3 percentage points to 39.7%, while that of the LFP battery dropped to 60.2%.
- The total **installed capacity** recorded 21.4GWh in March, down 56% MoM but up 138% YoY. In March, the installed capacity of power batteries in China picked up, mainly due to the consumption of previous inventory and the prolonged production and sales cycle. In March, the installed capacity of NMC batteries was 8.2 Gwh, an increase of 40% MoM and an increase of 61% YoY. The installed capacity of the LFP battery recorded 13.2Gwh, up 69% MoM and up 238% YoY.

In March, the installed capacity of power batteries rose by 57%, while in April, the installed capacity will be dragged down by the pandemic

Unit: MWh	Volume in Mar	Proportion (%)	MoM (%)	YoY (%)	YTD (%)	YTD YoY (%)
Ternary materials	8,210	38.3	40	61	21,355	55
Lithium iron phosphate	13,181	61.5	69	239	29,835	218
Lithium manganese oxide	13.6	0.1	-71	40	60.6	154
Total	21,415	100	57	138	51,276	121



7. Analysis of motive power battery and end-user market

7.2 NEV market picked up in March, but the influence of production suspension and price increase aroused by the pandemic will gradually be reflected

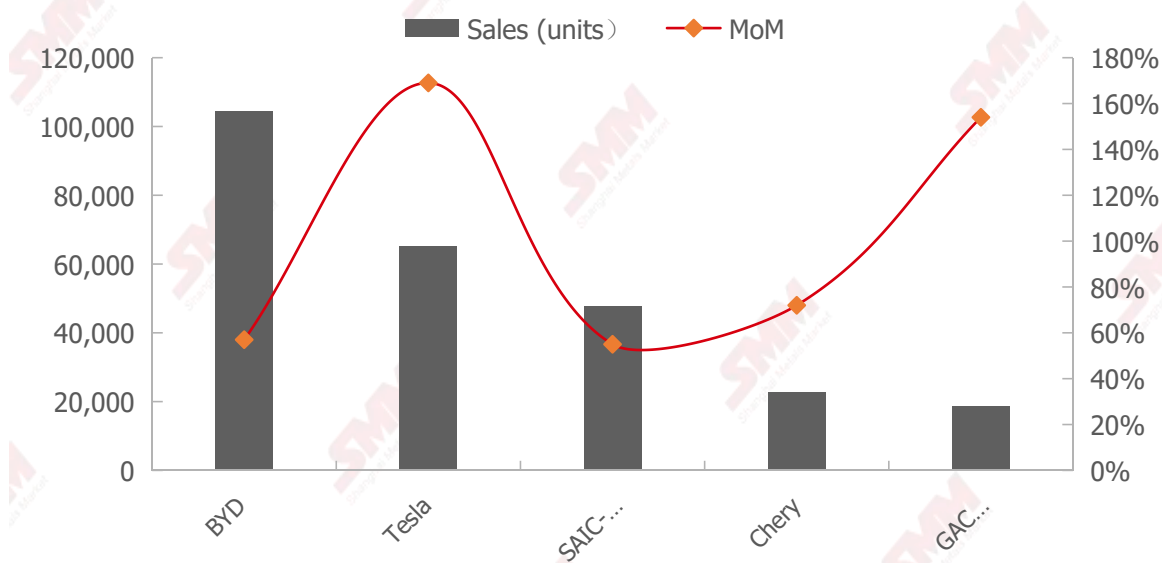
#	Model	Battery type	Battery enterprise	Battery capacity (kwh)	Range (KM)	March sales (vehicle)
1	Wuling Hongguang MINI	LFP	Hefei Gotion High-Tech/CATL/Great Power	13/13.8/13.9	170/170/170	39,768
		Ternary	Hefei Gotion High-Tech/Xingheng Power Source	9/14	120/170	2,768
2	Tesla Model Y	LFP	CATL	60	525	30,894
		Ternary	LG	78	566	8,445
3	Tesla Model 3	LFP	CATL	60	556	23,087
		Ternary	LG	78	675	2,649
4	BYD Song PLUS	LFP	BYD	18	100	21,934
5	BYD Qin PLUS	LFP	BYD	18	120	13,827
6	BYD Han	LFP	BYD	65	506	11,133
		Ternary		15	81	1,320
		LFP		31	301	4,258
7	Chery QQ1	Ternary	DFDchem	31	301	7,400
8	BYD Dolphin	LFP	BYD	45	401	10,178
9	Chery QQ Ice Cream	LFP	Hefei Gotion High-Tech	14	170	10,098
10	BYD Qin Pro	LFP	BYD	48	400	9,419

- According to statistics, **428,000 new energy passenger vehicles were insured in March**, a sharp increase of 128% from 188,000 units in the same period last year, but a 79% decline from February 2022. In March, the NEV market was picking up. Influenced by the price increase of raw materials and the supply of batteries, new energy vehicle companies began to increase their prices one after another in 2022. However, according to the data of March, the amount of insured new energy vehicles was still skyrocketing because the orders delivered by NEV companies in March were generally orders that were placed previously.
- Judging from the top ten best-selling models, Wuling Hongguang MINI achieved a sales of **42,000 units in March**, up 53% from the previous month, still ranking the first. Tesla Model Y and Model 3 ranked second and third respectively, with a sales of 39,000 units and 26,000 units respectively, up by 107% and 400% from the previous month. **In terms of battery types**, the installed capacity of LFP batteries across the top ten models continued to rise and still surpassed that of NMC batteries, totalling **6.1GWH and accounting for 80% of the total**. The proportion of NMC batteries dropped to 20%, and the installed capacity was only 1.5GWH.



7. Analysis of motive power battery and end-user market

Top five sellers of new energy passenger vehicles in Mar



- In terms of the performance of car companies, the top ten car companies accounted for **85%** of the total sales, and **BYD still ranked first, with 104,000 units insured in March.**
- The market shares of **BYD** reached **24% in March**, down 11 percentage points from the previous month.
- Affected by the pandemic situation and the battery supply, the growth of SAIC Roewe and Shanghai Volkswagen was slightly slower, **increasing by 38% and 26% MoM in March**, respectively. However, SAIC Roewe delayed the price increase for one month when prices of raw materials and other NEV brands were raised one after another, which stimulated the consumption.



7. Analysis of motive power battery and end-user market

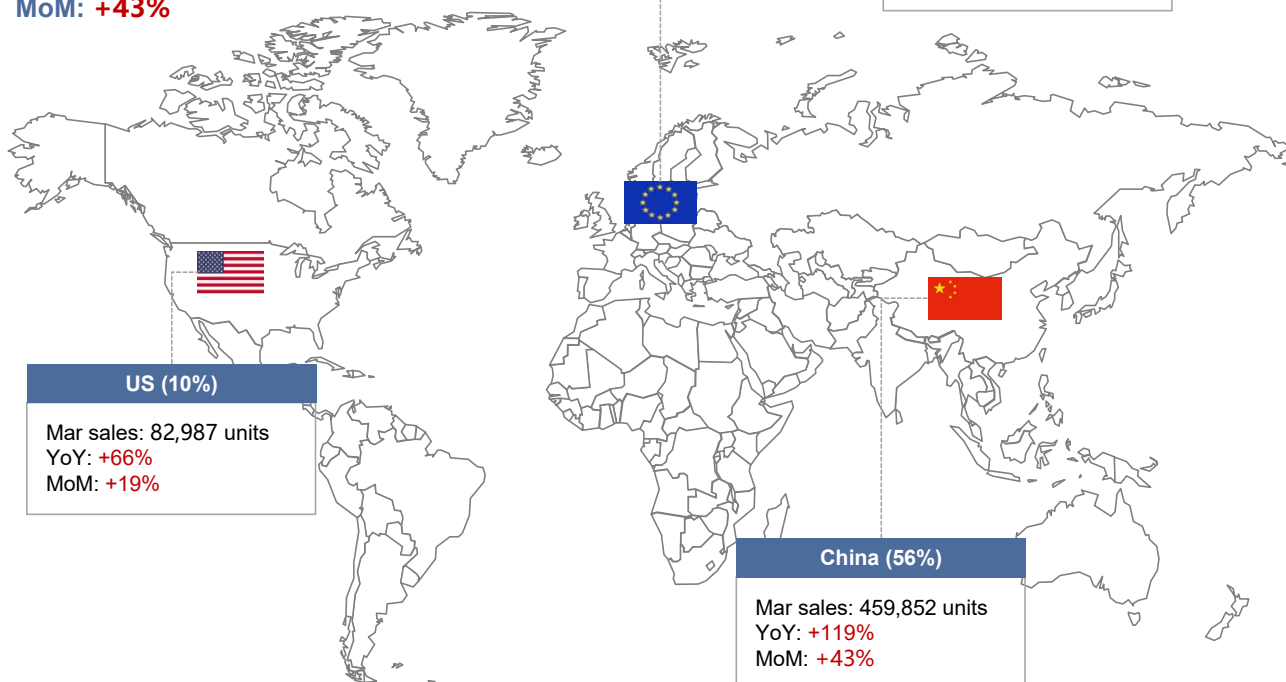
7.3 The pandemic slowed down the growth rate of NEV sales, and 820,000 units were sold around the world in March

Global NEVs sales
in Mar (unit):

820,155

YoY: **+66%**

MoM: **+43%**



#	Model	Company	Mar sales (units)	YoY (%)	MoM (%)
1	Model Y	Tesla	60,748	238%	39%
2	Model 3	Tesla	51,351	26%	44%
3	Wuling Hongguang MINIEV	SAIC-GM-Wuling Automobile	22,110	20%	115%
4	Song DM	BYD	19,057	2991%	17%
5	Qin PLUS DM-I	BYD	14,243	468%	-
6	Chery QQ Ice Cream	Chery	10,588	-	81%
7	Li One	Lixiang Automobile	10,026	125%	31%
8	Benni	China Chang'an Automobile Group	8,942	162%	91%
9	Dolphin	BYD	8,565	-	23%
10	Qin PLUS	BYD	8,264	28%	14%

Data source: SMM



8. SMM comments of monthly hot topics in the new energy industry

[Cobalt and Lithium Raw Materials]



CATL Won the Largest Lithium Mine in Yichun and the Lithium Salt Production Capacity may Reach 200,000 mt

A subsidiary of CATL spent 865 million yuan to purchase the exploration right of ceramic soil (containing lithium) in Yifeng County, Jiangxi, China.

➤ SMM comment

According to the SMM survey, the mineral deposit is located in Yifeng County, Yichun City. According to the data, the mineral resources of porcelain stone are estimated to be 960 million mt, and the associated lithium metal oxides are about 2,656,780 mt. Yichun, where the mineral deposit is located, has the richest lithium resources in Asia. The overall lepidolite resources in this area are equivalent to 6.29 million mt of lithium carbonate.

[Power battery]



CATL Launched the Third Generation CTP Technology

At the recent ChinaEV 100 forum, CATL presented two major innovations, including the third generation CTP technology through continuous technical iteration, which is internally called the "Qilin Battery". Its system weight, and energy density and volume energy density continue to lead the industry.

➤ SMM comment

The Qilin battery released by CATL this time, with the same chemical system and the same battery pack size, can increase its power by 13% compared with the 4680 system. This battery will be officially released in April 2022. The non-thermal diffusion battery technology of CATL with a life span of 1000 km and higher specific energy will be mass-produced in 2023.

BYD to Stop Producing Fuel Vehicles

On April 3, BYD officially announced that according to its strategic development, it would stop producing fuel vehicles from March 2022. In the future, in the automotive sector, the company will focus on pure electric and plug-in hybrid vehicles.



➤ SMM comment

According to the data, in the first two months of 2022, BYD's sales of new energy vehicles have accounted for more than 97% of the total sales of all its models, and its fuel vehicle business accounts for an extremely small proportion of its overall business. The production and sales report released by BYD on April 3 shows that BYD has produced and sold 0 fuel vehicles in March 2022, which also means that it has officially become the world's first traditional car company with complete electric transformation.



8. Sample coverage of new energy items

➤ The sample has been adjusted by SMM, please refer to the following table for details.

Type	Product	Estimated number of samples	Estimated coverage
Cobalt salt	Cobalt sulphate	36	97%
	Cobalt chloride	20	97%
Precursor	Tricobalt tetraoxide	20	98%
	Ternary cathode precursor	30	98%
Lithium salt	Lithium carbonate	58	97%
	Lithium hydroxide	31	98%
Cathode materials	Ternary cathode	37	97%
	LCO	20	98%
	LFP	25	98%
	LMO	29	97%
Total		306	-



SMM New Energy Team



Yettie Yi

Master of International Business,
Macquarie University

- Research & Consulting Director- New Energy, joined SMM in 2013
- Corporate consulting services, Providing corporate strategic services for more than 100 well-known companies globally
- Focus on new energy industry chains, corporate strategy, operation optimization as well as investment and acquisitions.
- Worked as a consulting project manager in a German strategic consulting company



Miranda Mei

Master of Finance,
Purdue University

Focus on researching the new energy industry chain, unique ideas on motive batteries and cathode materials



Serafina Huo

Master of Finance and
Business Analysis,
University of Sydney

Focus on the cobalt industry chain, research involving supply and demand, costs, policies, futures



Sherie Liu

Master of Finance,
University of Glasgow

Tracking lithium battery industry chain dynamics for a long time with deepening industry analysis and research



Emma Fang

Master of Economics,
Xiamen University

Responsible for new energy battery material research and consulting, with in-depth knowledge on nickel, cobalt, lithium and manganese



Antares Yuan

Master of Financial
Analysis, University of
New South Wales

Responsible for research of power batteries and new energy vehicles sectors, and tracking the downstream demand of NMC batteries



Vincent Yan

Bachelor of Economics,
University of Nottingham

5 years of manufacturing management consulting experience, with focus in market research and strategic consulting



Jared Zhu

University of Shanghai for
Science and Technology

Responsible for new energy strategic consulting and has deep understanding of the NE industry chain

SMM also provides

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