

SMM Global Cobalt Industry Chain Report

2018-2025

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Report Contents

Chapter 1: Global Cobalt Raw Material Market Analysis

- 1.1 Global Cobalt Resource Types and Distribution Characteristics (2024)
- 1.2 Global Cobalt Raw Material Supply Analysis
- 1.3 Global Cobalt Products Downstream Demand Analysis
 - 1.3.1 Global and Chinese NEV Market Status
 - 1.3.1.1 Current Status of China's NEV Market
 - 1.3.2 3C Digital and Power Tool Market
 - 1.3.3 Traditional Market
- 1.4 Global Cobalt Demand Analysis (2018-2025E)

Chapter 2: Analysis of China's Cobalt Metal Market

- 2.1 China's Cobalt Metal Market Analysis
 - 2.1.1 China's Cobalt Metal Supply Analysis (2022-2025E)
 - 2.1.2 Analysis of China's Cobalt Metal Imports and Exports (2024-2025E)
 - 2.1.3 China's Cobalt Metal Demand Analysis
 - 2.1.4 Cost and Price Analysis of Cobalt Metal in China (2024)

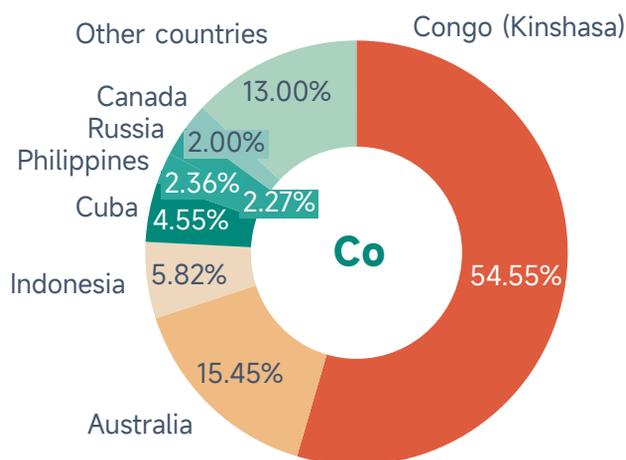
Chapter 3: Analysis of China's Cobalt Compound Market

- 3.1 Analysis of China's Cobalt Sulphate Market (2018-2025E)
 - 3.1.1 Analysis of China's Cobalt Sulphate Supply (2018-2025E)
 - 3.1.2 Analysis of Cobalt Sulphate Demand in China (2018-2025E)
 - 3.1.3 2024 China Cobalt Sulphate Cost and Price Analysis
 - 3.1.4 Analysis of China's Cobalt Sulphate Supply-Demand Balance (2018-2025E)
- 3.2 Analysis of China's Co₃O₄ Market (2018-2025E)
 - 3.2.1 Analysis of China's Co₃O₄ Supply (2018-2025E)
 - 3.2.2 Import and Export Analysis of Co₃O₄ in China (2018-2025E)
 - 3.2.3 Demand Analysis of Co₃O₄ in China (2018-2025E)
 - 3.2.4 Cost and Supply-Demand Balance Analysis of Co₃O₄ in China (2024)

Chapter 1: Global Cobalt Raw Material Market Analysis

1.1 Global Cobalt Resource Types and Distribution Characteristics (2024)

Chart: Global Cobalt Resource Distribution by Region in 2024



Source: USGS

Table: Global Cobalt Resource Distribution by Region in 2024

Country	Total Reserves (1,000 mt)
Congo (Kinshasa)	6,000
Australia	1,700
Indonesia	640
Cuba	500
Philippines	260
Russia	250
Canada	220
Others	1430
Total	11,000

The global distribution of cobalt resources is highly concentrated. According to statistics from the United States Geological Survey (USGS), the global proven cobalt ore reserves amount to 11 million mt. The distribution of cobalt resources is extremely uneven, with countries such as the Democratic Republic of Congo (Kinshasa) and Australia being the most enriched. The DRC's share of cobalt resources is 55%, followed by Australia with 15% and Indonesia with 6%. The resources are distributed in small amounts in other countries.

Congo (Kinshasa): In 2024, the DRC has about 6 million mt of existing cobalt resource reserves, accounting for the largest share globally and making it the largest cobalt-producing country, accounting for over 75% of global cobalt production. The grade is mostly between 0.2%-0.5%, and the quality is comprehensively superior to other sources.

Australia: In 2024, Australia has 1.7 million mt of existing cobalt resource reserves, ranking second in the world, accounting for 15% of the global total. However, it falls far behind the Congo (Kinshasa) in terms of cobalt development and supply. Australia is stepping up the development of cobalt mineral resources. Broken Hill, one of the oldest mining towns in the western part of New South Wales, is about to become one of the important cobalt production areas.

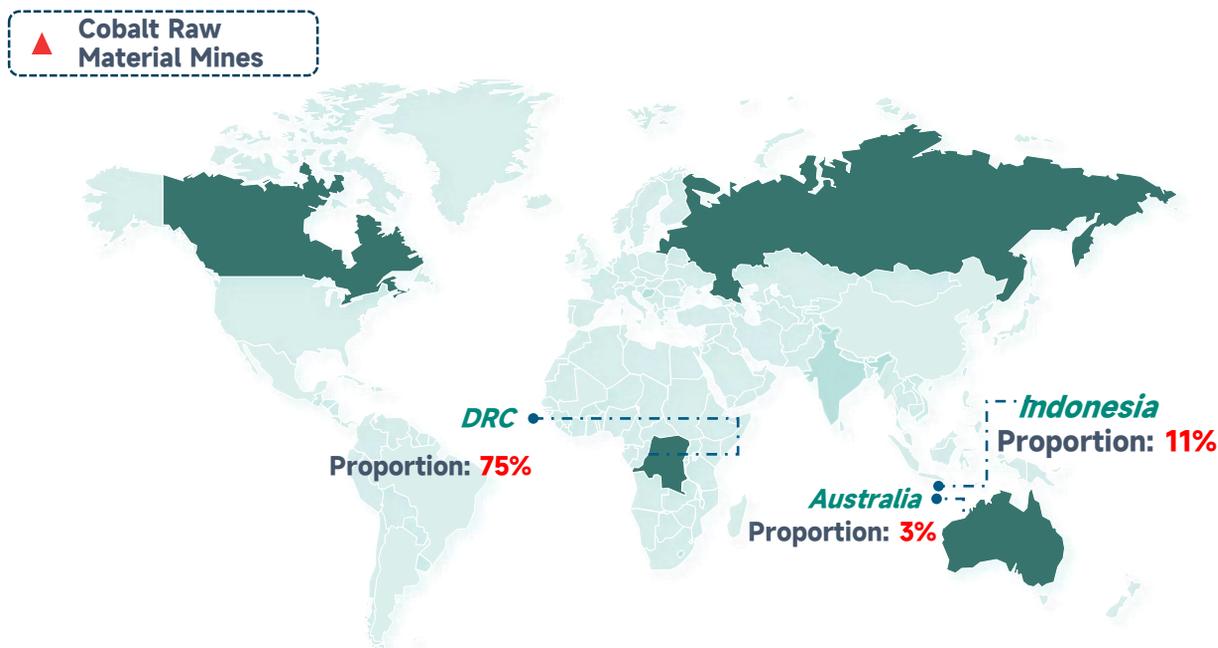
China: The vast majority of China's cobalt resources come from associated ores, which are importantly coexistent in copper, nickel, and iron ores. There are now 150 known cobalt ore production sites, distributed across 24 provinces (regions). The quality of China's cobalt ore is relatively low, and cobalt is primarily recovered as a by-product. The recovery rate is low, the process is complex, the production cost is high, so there is still rely on imports.

1) Resource distribution is based on the 2024 global identified reserves statistics

Chapter 1: Global Cobalt Raw Material Market Analysis

1.2 Global Cobalt Raw Material Supply Analysis

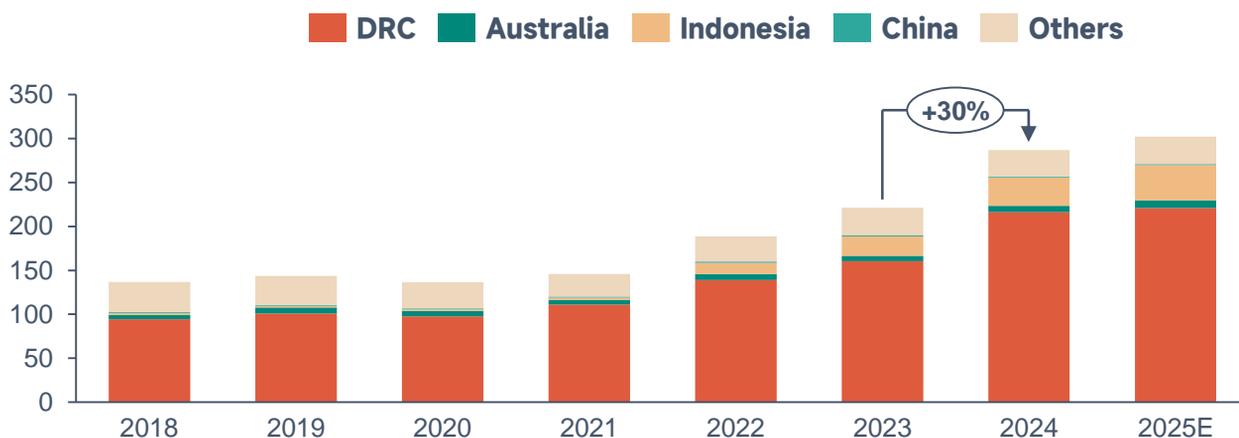
Chart: Proportion of Global Cobalt Raw Material Supply in 2024



Source: Corporate Financial Reports, SMM Processed Data Based on Model

Capacity and Production of Operating Mines: According to corporate financial reports compiled by SMM, the total global cobalt raw material supply in 2024 is estimated to be approximately 287,000 mt in metal content, mainly concentrated in regions such as the DRC, Australia, Indonesia. SMM estimates that cobalt supply will remain relatively stable, with copper-cobalt mine projects in the DRC gradually expanding capacity in the coming years. The output from foreign and Chinese cobalt raw material suppliers will continue to increase, driving supply growth. China's cobalt resource imports are expected to remain relatively stable, with no domestic supply shortages anticipated, as the country adheres to a dual approach of imports and domestic production. Additionally, nickel-cobalt mines like Indonesia will gradually contribute to cobalt supply in the coming years.

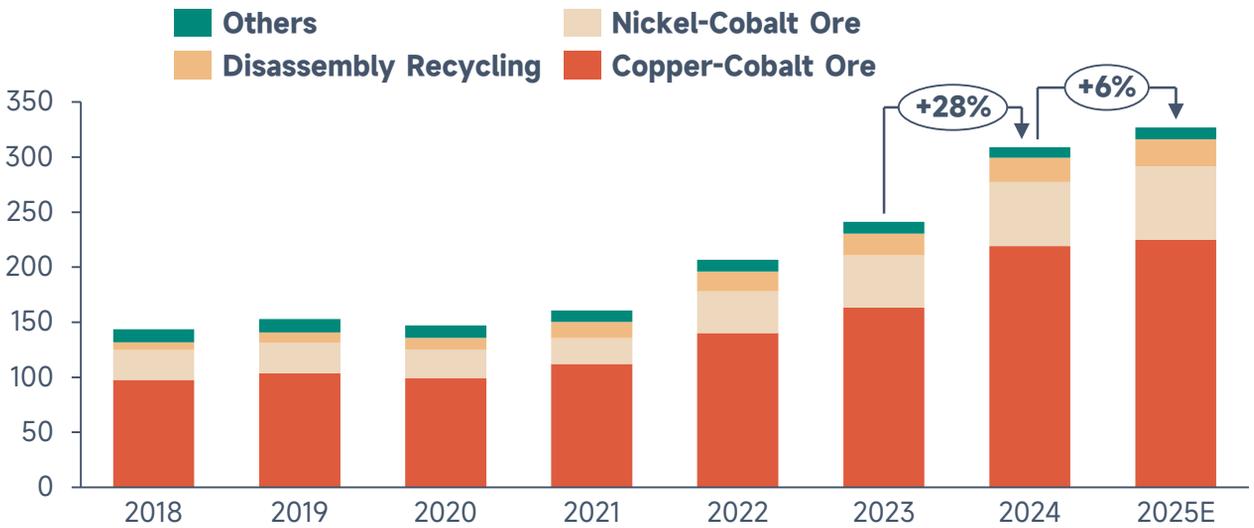
Chart: 2018-2025E Global Primary Cobalt Raw Material Supply by Country (Unit: 1,000 mt in metal content)



Source: SMM Processed Data Based on Model

Chapter 1: Global Cobalt Raw Material Market Analysis

Chart: 2018-2025E Global Cobalt Raw Material Supply by Raw Material Source
(Unit: 1,000 mt in metal content)



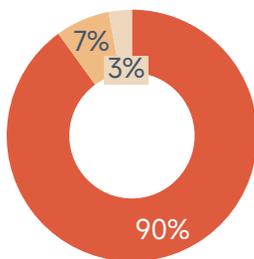
Source: Corporate Financial Reports, SMM Processed Data Based on Model

According to SMM's assessment based on corporate financial reports, 71% of global cobalt raw materials in 2024 came from copper-cobalt ore.

Currently, there are three sources of cobalt: cobalt ore, recycling, and other channels. Among them, 90% comes from primary cobalt ore, while recycling and other channels account for 7% and 3%, respectively. Cobalt ore is mainly concentrated in regions such as the DRC, Australia, and Indonesia. The total supply of cobalt raw materials from scrap reached 22,055 mt (metal content), up approximately 12% YoY.

Chart: Cobalt Raw Material Supply by Source in 2024

■ Cobalt Ore
■ Recycling
■ Other Channels



2024E Raw Material YoY Growth

Copper-Cobalt	34%
Nickel-Cobalt	22%
Recycling	12%
Total	28%

Source: Corporate Financial Reports, SMM Processed Data Based on Model

Chapter 1: Global Cobalt Raw Material Market Analysis

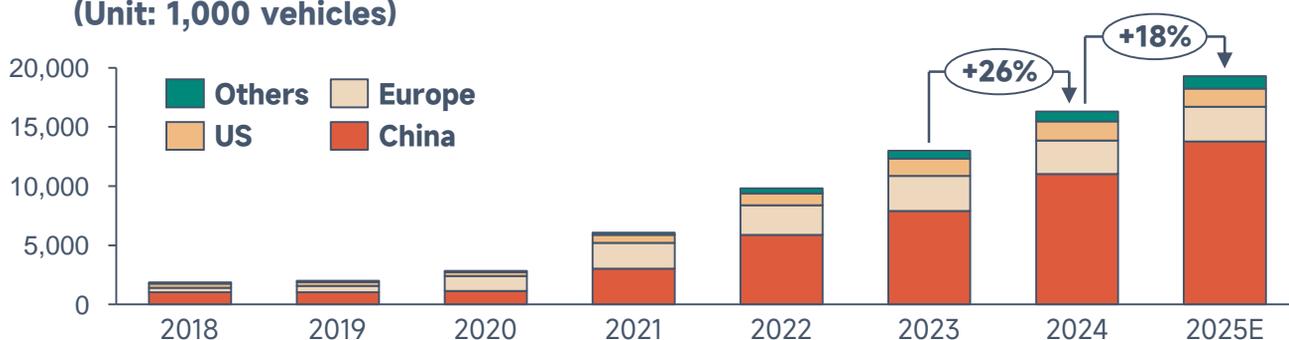
1.3 Global Cobalt Products Downstream Demand Analysis

1.3.1 Global and Chinese NEV Market Status

Global NEV Sales Analysis: Global passenger NEV sales in 2024 are expected to reach 16.30 million units, up 26% YoY. By market, the Chinese market in H1 was sluggish due to the continued impact of subsidy reductions and significant consumer hesitation amid price war among automakers. However, starting in H2, enhanced subsidies strongly stimulated NEV sales, showing robust growth far exceeding expectations. The European market underperformed, with electrification nearly stagnating, mainly due to the cancellation and reduction of subsidies in multiple countries. Additionally, the anti-subsidy policies and the early stage of localized industry chain construction led to almost no sales growth in Europe. The US market saw a slowdown in electrification trends, with some car models losing subsidy eligibility in 2024 due to the FEOC Act, coupled with supply constraints of affordable new car models, resulting in market performance below expectations.

Chart: 2018-2025E Global Passenger NEV Sales by Country

(Unit: 1,000 vehicles)

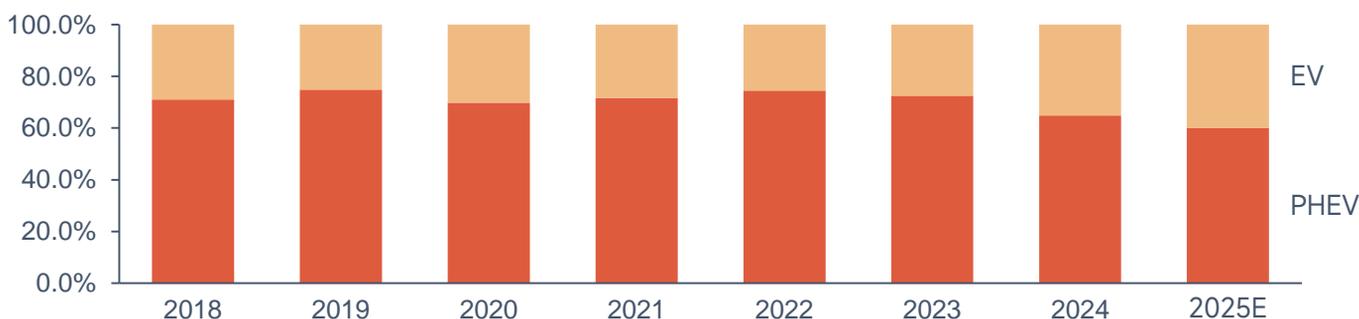


Source: SMM Processed Data Based on Model, MarkLines

Significant Growth in Plug-in Hybrid Car Models: In 2024, the market share of plug-in car models in global passenger NEV sales rose significantly. It is projected that 5.72 million plug-in hybrid passenger vehicles will be sold in 2024, accounting for 35% of global passenger NEV sales, a notable increase from 28% in 2023. The gradual increase in plug-in car sales is primarily due to the dual power systems of plug-in vehicles, which offer a clear advantage of being unrestricted by downstream charging pile construction and other usage scenarios, addressing consumers' concerns and anxieties about driving range.

Enhanced Product Strength and Cost Advantages Stimulate Plug-in Hybrid Sales: Numerous high-quality hybrid car models were intensively developed and launched into the market, with the segmentation of market product categories gradually improving. Enhanced product strength expanded consumer choices, coupled with the generally lower selling prices of hybrid car models, jointly driving the continuous growth in hybrid car sales. With mainstream automakers' ongoing R&D and investment in plug-in hybrid models, the market share of plug-in vehicles is expected to continue rising steadily, serving as a perfect short-term transition from fuel vehicles to pure electric vehicle models.

Chart: Market Share of Global Plug-in Hybrid and Pure Electric Passenger Car Sales (2018-2025E)



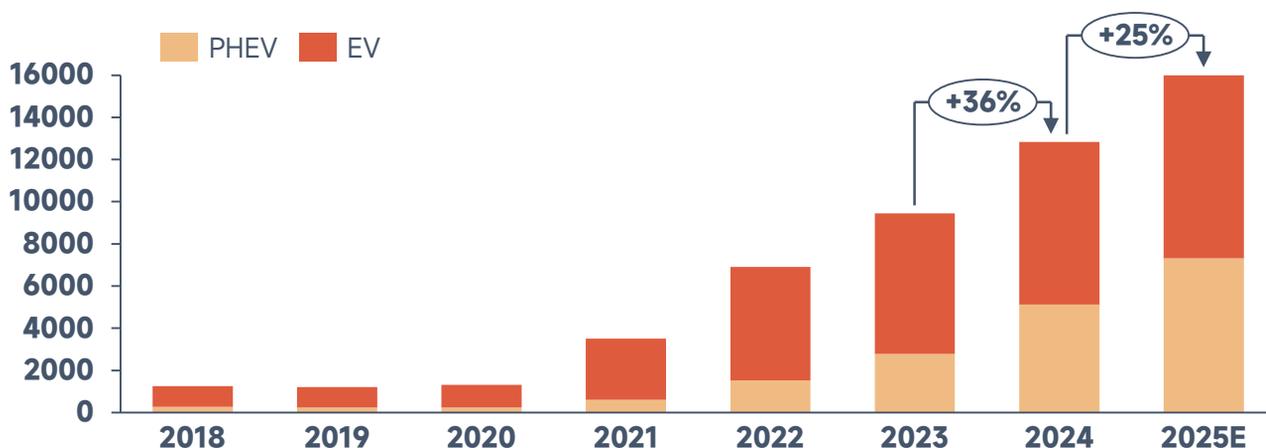
Source: SMM Processed Data Based on Model, MarkLines

Chapter 1: Global Cobalt Raw Material Market Analysis

1.3.1.1 Current Status of China's NEV Market

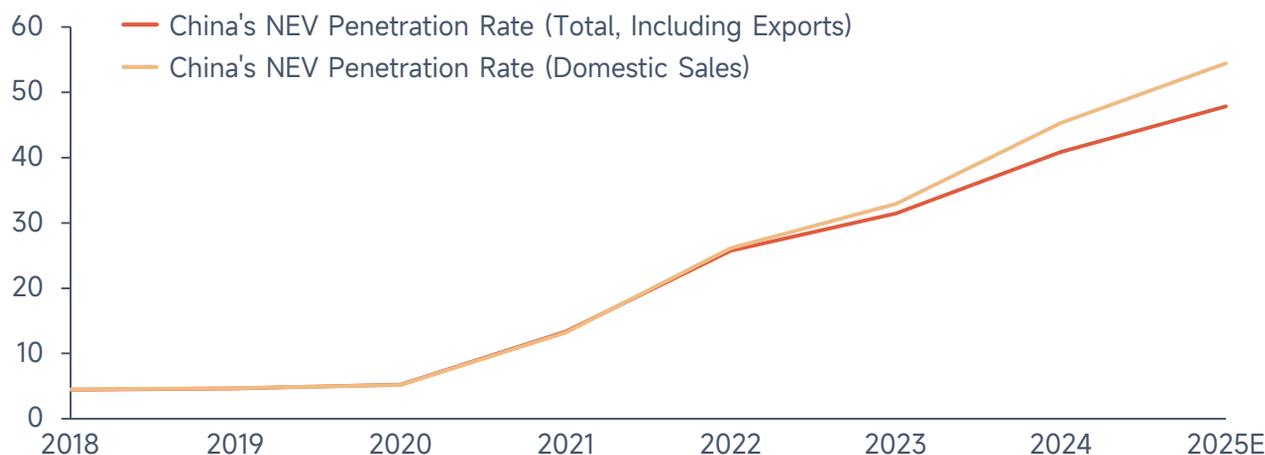
Analysis of China's NEV Sales: In 2024, the sales of NEVs in China are expected to reach 12.8 million units (including exports), up 36% YoY. Among these, the sales of pure electric vehicle models will be 7.71 million units, accounting for 60%, while plug-in hybrid models will reach 5.13 million units, accounting for 40%, setting a new historical high. Reviewing the car sales in the Chinese market, it is evident that in Q1, the continued impact of subsidy phase-out, coupled with strong destocking demand from automakers, constrained demand. However, starting from Q2, with the stimulus of trade-in subsidies and the subsequent release of scrappage and renewal subsidy policies, the subsidy-driven NEV market in China experienced an unexpected surge, achieving robust production and sales. It is clear that subsidy policies have a strong driving effect on the NEV market in China. Looking ahead, SMM remains optimistic about the growth rate of the Chinese market, expecting sales to reach 16 million units in 2025.

Chart: 2018-2025E China's NEV Sales (Including Exports) by Fuel Type (Units: 1,000 vehicles)



Source: SMM Processed Data Based on Model, CAAM

Chart: 2018-2025E China's NEV Penetration Rate (Units: %)



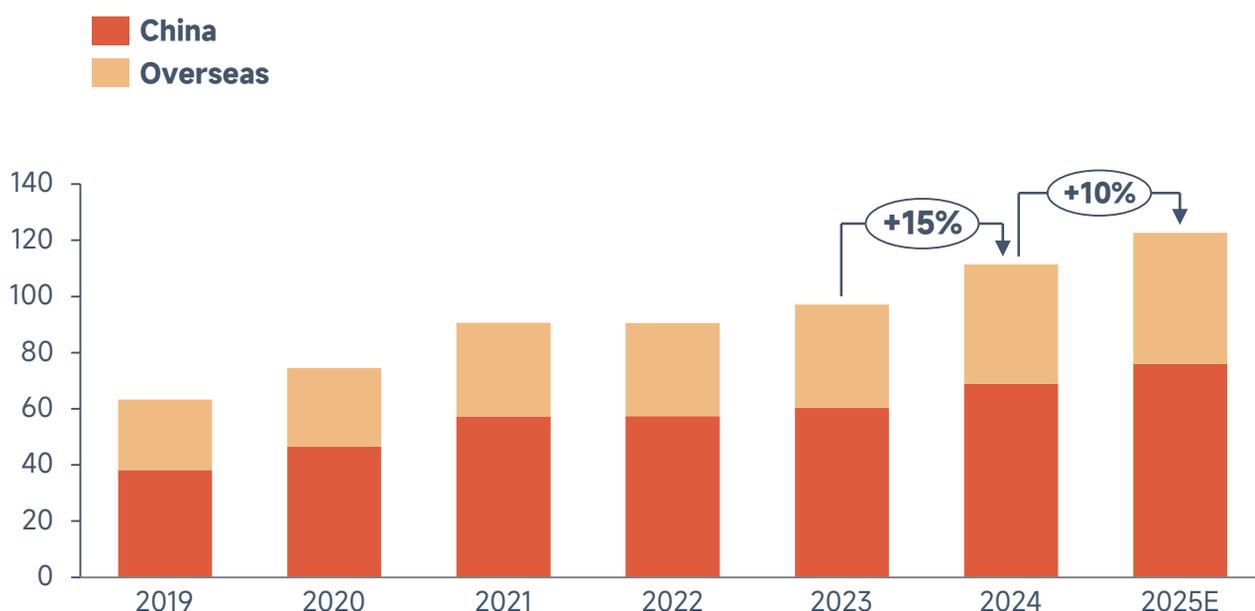
Source: SMM Processed Data Based on Model, CAAM

Chapter 1: Global Cobalt Raw Material Market Analysis

1.3.2 3C Digital and Power Tool Market

In 2023, demand in the traditional digital consumer sector was relatively sluggish, especially in H1, with market demand for traditional digital products such as smartphones and tablets being weak. The industry chain actively destocked, and inventory levels drop to historical lows. As destocking neared its end, a new restocking cycle began in H1 2024. The power tool industry, after a period of inventory buildup, also completed destocking by year-end 2023 and began to restock in 2024. Driven by restocking in both the traditional digital consumer sector and the power tool industry, consumer lithium battery demand in 2024 will rise to 111GWh, up 15% YoY.

Chart: 2019-2025E China and Overseas Consumer Electronics Battery Demand (Unit: GWh)



Source: SMM Processed Data Based on Model

3C digital products such as smartphones, laptops, and tablets have high requirements for lithium-ion batteries, especially in terms of battery life, charging speed, and safety. Additionally, pouch batteries, due to their lightweight, high discharge rate, and long cycle life, have broad prospects in high-end digital products. With the popularization of 5G technology, the 3C digital lithium battery market will further expand. Global 3C digital lithium-ion battery demand is expected to reach 47GWh by 2025.

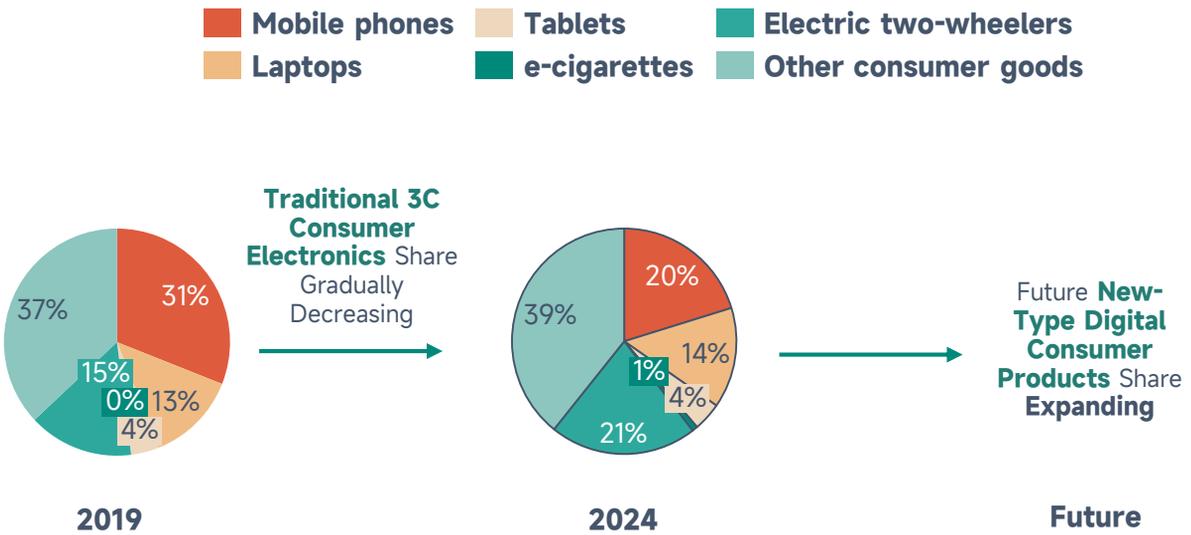
In recent years, the power tool market has been continuously expanding, especially with the increasing demand for cordless and portable tools, driving the widespread application of lithium-ion batteries in power tools. Compared to nickel-cadmium and nickel-metal hydride batteries, lithium-ion batteries have higher energy density, longer cycle life, and better environmental protection performance. Additionally, during 2023-2024, lithium battery raw material prices dropped to low levels, optimizing lithium battery manufacturing costs, further promoting their application in power tools. Currently, the power tool market mainly uses cylindrical lithium-ion batteries models 18650 or 21700, which are favored for their high discharge rate and long cycle life. With the increasing lithium electrification rate of power tools, global power tool production is expected to reach 401 million units by 2025, generating a demand for 27GWh of lithium-ion batteries.

Chapter 1: Global Cobalt Raw Material Market Analysis

In addition to traditional 3C digital products (such as mobile phones, laptops and Tablets), the rapid development of emerging fields has also brought new growth points to the lithium battery market. For example, the rapid development of power tools, electric two-wheelers, drones, and the continuous emergence of new consumer electronics products such as wearable devices, smart speakers, and portable medical devices have further expanded end-use applications, thereby increasing the demand for lithium-ion batteries. According to the forecast for 2024, global demand for lithium batteries from new-type consumer products is 44GWh, up 21% YoY.

Future global demand for consumer lithium batteries will be dominated by new-type electronic consumer products, while the proportion of traditional digital consumer fields will gradually decrease. In 2019, the traditional 3C consumer electronics accounted for 48% of demand for lithium batteries, but by 2024, this proportion is expected to decrease to 39%, and it is forecasted to continue declining in the future. New-type electronic products, due to their rapid technological iteration and wide application scenarios, will become the main driving force for the growth of the consumer lithium battery market. In 2024, the demand for lithium batteries in the new-type digital consumer field is expected to account for 39%, and this proportion will continue to increase. Among them, the drone industry is currently in a stage of rapid development and is an important part of the new consumer electronics market. With technological advancements and the expansion of application scenarios, the drone market is expected to continue its rapid growth.

Chart: Global Consumer Electronics Battery Downstream Demand Structure (2019-2024E)

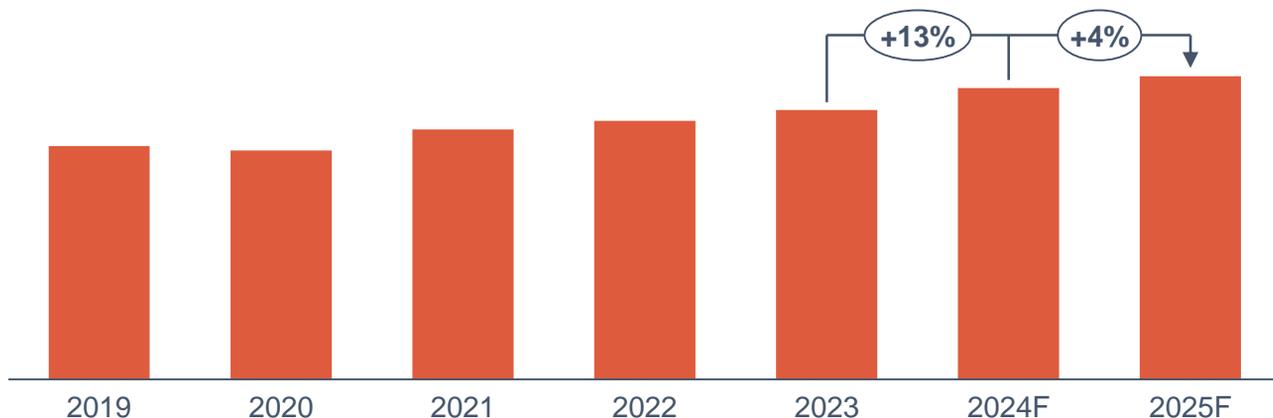


Source: SMM Processed Data Based on Public Information and Model

Chapter 1: Global Cobalt Raw Material Market Analysis

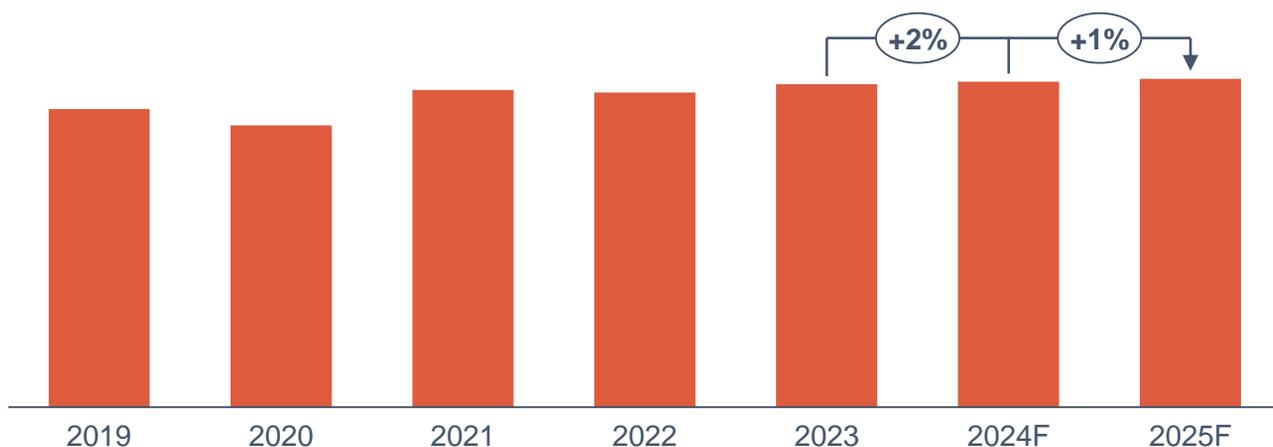
1.3.3 Traditional Market

Chart: 2019-2025E Global High-Temperature Alloy Production (Unit: 10,000 mt)



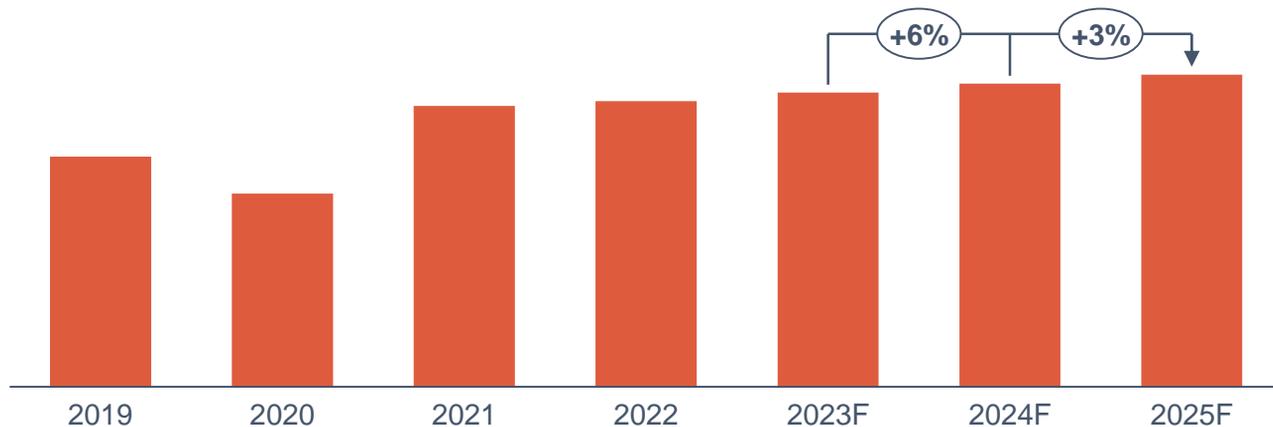
Source: SMM Processed Data Based on Model

Chart: 2019-2025E Global Cemented Carbide Production (Unit: 10,000 mt)



Source: SMM Processed Data Based on Model

Chart: 2019-2025E Global Magnetic Material Production (Unit: 10,000 mt)



Source: SMM Processed Data Based on Model

Chapter 1: Global Cobalt Raw Material Market Analysis

1.4 Global Cobalt Demand Analysis (2018-2025E)

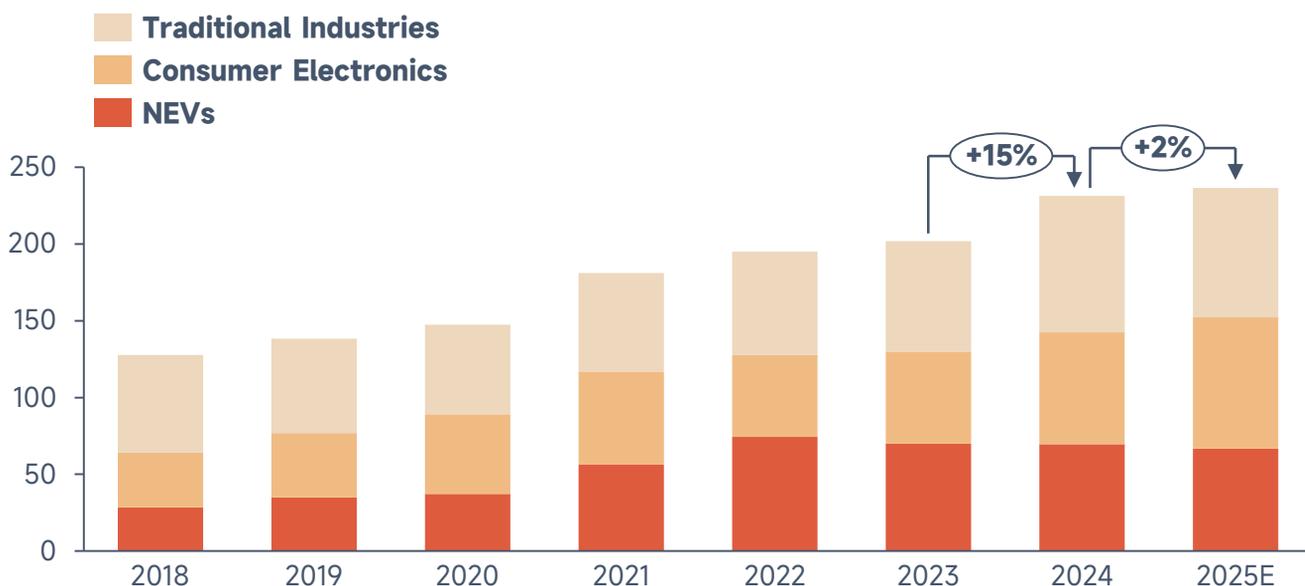
Global demand for cobalt mainly comes from digital, NEV, and energy storage applications in the lithium battery field, and traditional industries such as high-temperature alloys, hard alloys, catalysts, ceramic pigments, magnetic materials, organic materials, and other industries. With the popularization of smartphones, the demand for cobalt in digital batteries and magnetic materials is accelerating. The proportion of cobalt demand in traditional industries is also synchronously stable. With the explosive growth of the new energy vehicle market, the demand proportion of the EV sector has increased. However, in recent years, due to the continuous impact of the LFP system and the obvious trend of low cobalt within the NCM system, the proportion of EV demand has shown a gradually weakening trend.

In 2024, the total global demand for cobalt was 231,000 mt in metal content. Looking at the specific downstream application proportions, the global lithium battery industry accounted for 62% of the demand for cobalt raw materials. Looking downstream, the EV battery industry accounted for 30% of the demand for cobalt.

In the EV market, due to the stimulus of the trade-in policy, China's EV sales has maintained high growth. However, the continuous decline in the proportion of NCM installations, along with the continuous increase in the proportion of 6-series high-voltage and 8-series high-nickel products within the NCM system, and the continuous decline in weighted average cobalt consumption, have led to a lackluster performance of the EV sector demand this year. In addition, although a large proportion of NCM batteries are used in overseas markets, the sales performance of vehicles this year has also fallen short of expectations, resulting in no increase in cobalt demand in the global EV sector in 2024.

In 2025, global demand for cobalt is expected to modestly increase to about 236,569 mt, driven by rising consumer and traditional demands. The demand for cobalt in the EV battery industry accounted for 28%. Among them, the demand for cobalt in the consumer electronics industry will be stimulated by the China national subsidy and popularity of AI and iteration of electronic devices, whose proportion might increase to 36%.

Chart: 2018-2025E Global Cobalt Demand by Downstream Sector (Unit: 1,000 mt in metal content)

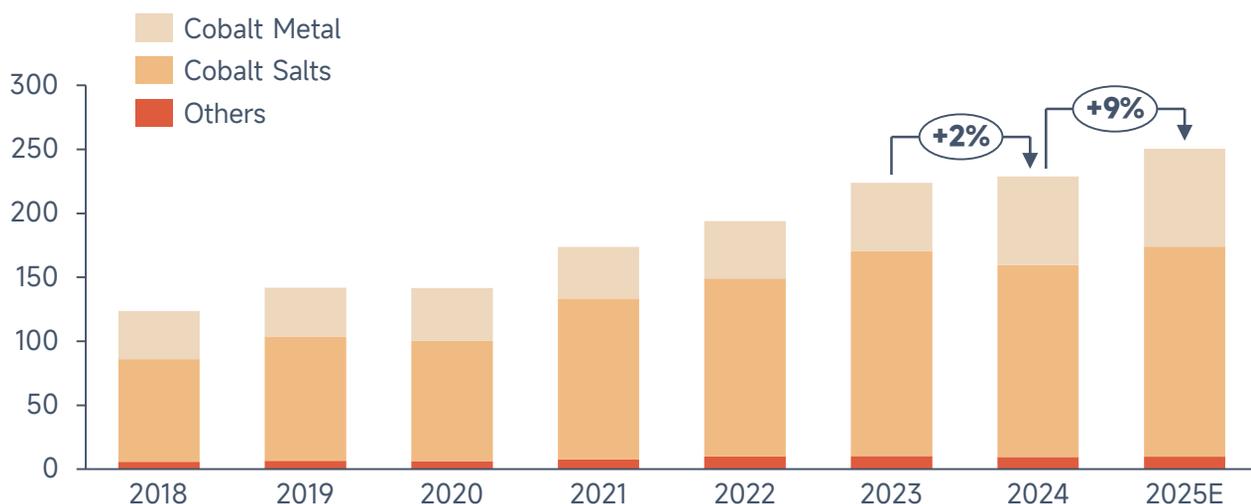


Source: SMM Processed Data Based on Model

Chapter 1: Global Cobalt Raw Material Market Analysis

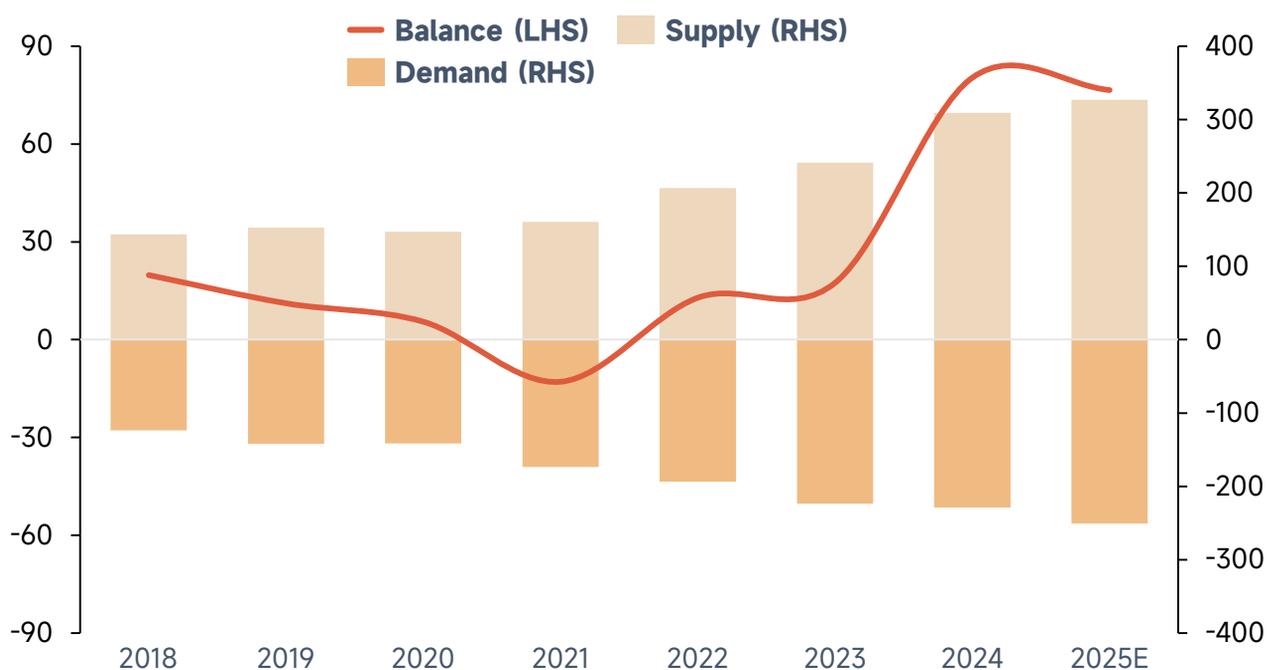
1.4 Global Cobalt Demand Analysis (2018-2025E)

Chart: 2018-2025E Global Cobalt Raw Material Demand by Products
(Unit: 1,000 mt in metal content)



Source: SMM Processed Data Based on Model

Chart: 2018-2025E Global Cobalt Raw Material Supply-Demand Balance
(Unit: 1,000 mt in metal content)



Note: Cobalt raw material demand is calculated from the production of cobalt products

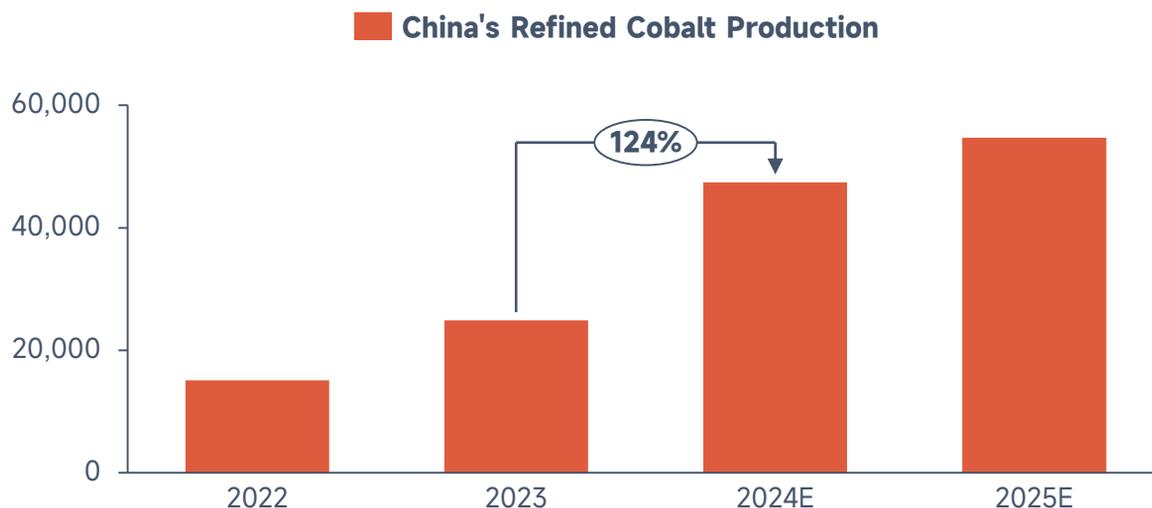
Source: SMM Processed Data Based on Model

Chapter 2: Analysis of China's Cobalt Metal Market

2.1 China's Cobalt Metal Market Analysis

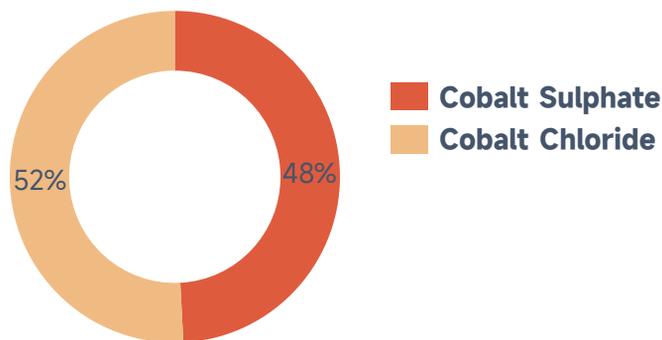
2.1.1 China's Cobalt Metal Supply Analysis (2022-2025E)

Chart: 2022-2025E China's Cobalt Metal Production (Unit: mt in metal content)



Source: SMM Processed Data Based on Market Communication and Model

Chart: Raw Material Proportion for China's Cobalt Metal in 2024



Source: SMM Processed Data Based on Market Communication and Model

In recent years, driven by the development of military and aerospace industries, China's refined cobalt capacity has been gradually released. In the end of 2024, domestic refined cobalt capacity reached 76,000 mt, with a YoY increase of 149% compared to 2023. For the full year of 2024, due to domestic demand for cobalt salt being concentrated among a few producers and thin profits, some cobalt salt companies shifted to refined cobalt production, which caused the huge increase for the cobalt metal capacity and production volume.

Chapter 2: Analysis of China's Cobalt Metal Market

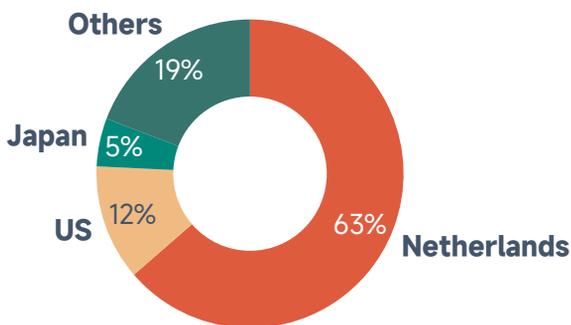
2.1.2 Analysis of China's Cobalt Metal Imports and Exports (2024)

Chart: China's Cobalt Metal Imports and Exports in 2024
(unit: mt in metal content)



Source: SMM compilation based on data from the General Administration of Customs of China

Chart: China's Cobalt Metal Export Destination Distribution in 2024



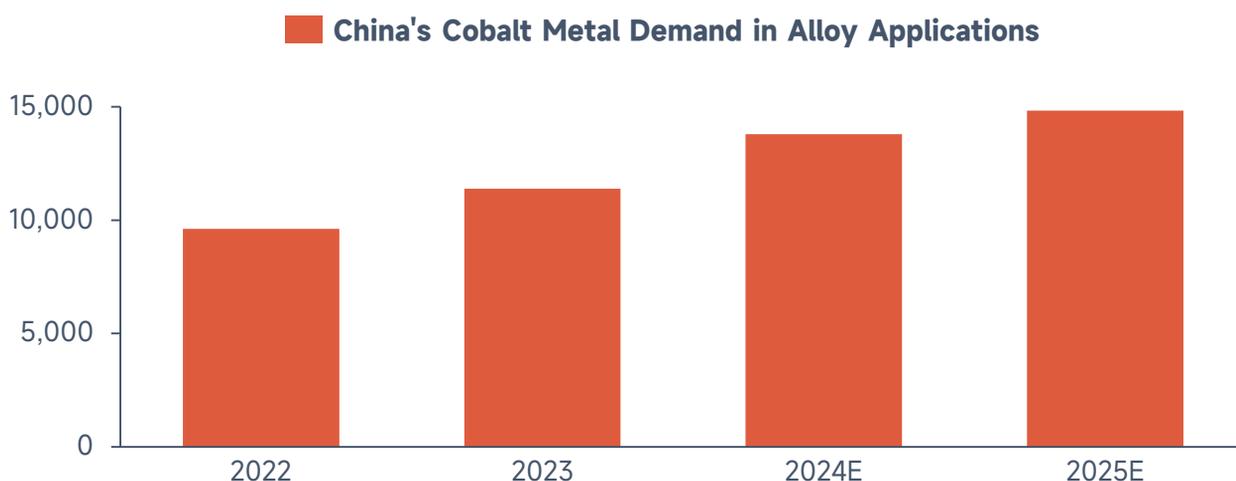
Source: SMM compilation based on data from the General Administration of Customs of China

With the continuous release of domestic refined cobalt capacity, domestic supply remained sufficient but difficult to absorb. Consequently, under a significant price spread between domestic and overseas markets, export sentiment for refined cobalt was relatively strong. According to data from the General Administration of Customs, China's total imports of refined cobalt amounted to 3,368 mt (metal content) in 2024, a YoY decrease of 10%, while total exports of refined cobalt reached 8,123 mt (metal content), a YoY increase of 116%.

Chapter 2: Analysis of China's Cobalt Metal Market

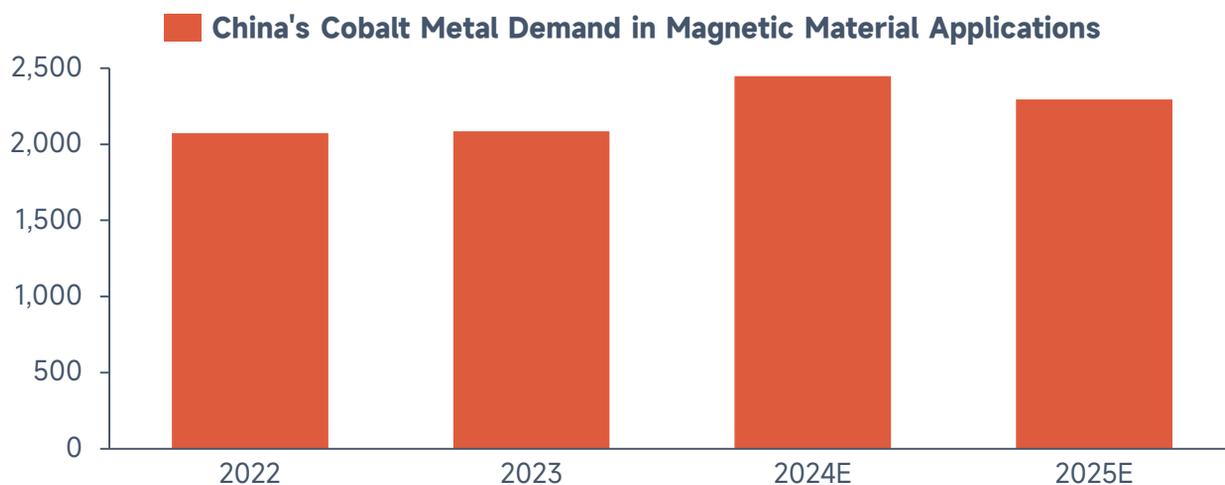
2.1.3 China's Cobalt Metal Demand Analysis

Chart: 2022-2025E Forecast of China's Cobalt Metal Demand in Alloy Applications (unit: mt in metal content)



Source: SMM Processed Data Based on Market Communication and Model

Chart: 2022-2025E Forecast of China's Cobalt Metal Demand in Magnetic Material Applications (unit: mt in metal content)



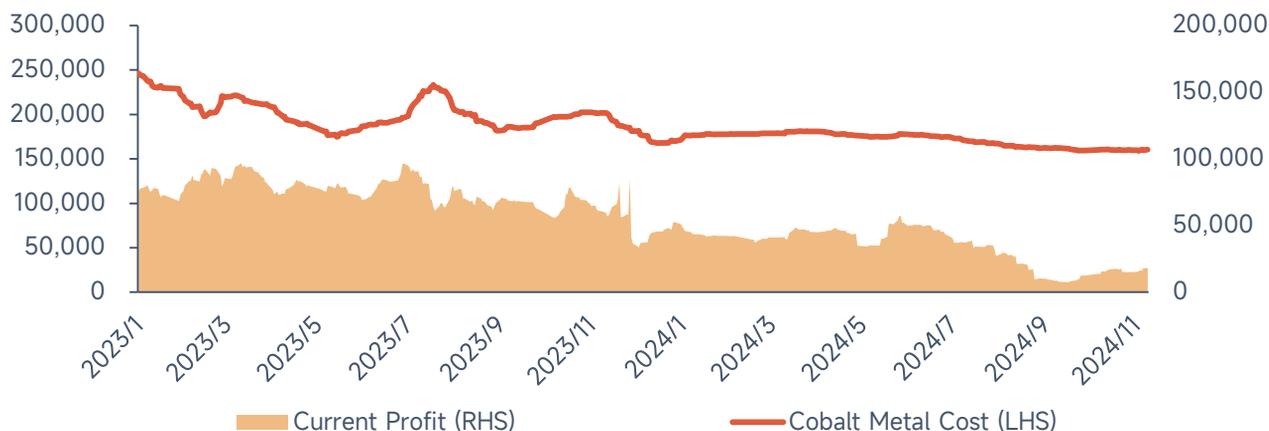
Source: SMM Processed Data Based on Market Communication and Model

Refined cobalt is primarily used in high-temperature alloys. Benefiting from the rapid development of China's aviation sector and the boost in demand from the military industry, the cobalt-based high-temperature alloy market is expected to see certain growth, with demand for the whole year of 2024 projected to increase significantly. Additionally, refined cobalt can also be applied in the magnetic materials, mainly driven by the demand for samarium-cobalt magnetic materials. In 2024, as samarium-cobalt permanent magnets were primarily used in communication base stations, high-temperature motors, and other special motors, the market still holds certain growth potential. In the future, as the high-temperature alloy and magnetic materials markets continue to grow, cobalt consumption is expected to increase further.

Chapter 2: Analysis of China's Cobalt Metal Market

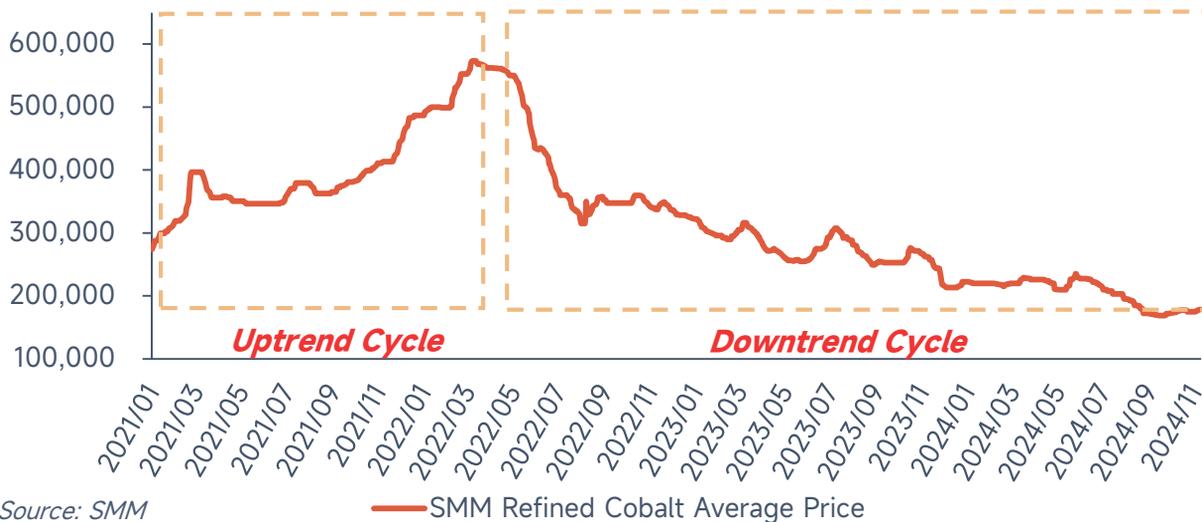
2.1.4 Cost and Price Analysis of Cobalt Metal in China (2024)

Chart: 2023-2024 Spot Cost and Profit of Cobalt Metal in China (Using Cobalt Intermediate Products as Raw Material) (Unit: yuan/mt)



Source: SMM based on processing data from Model

Chart: 2021-2024 China Cobalt Metal Price Review (Unit: yuan/mt)



Source: SMM

Chart: 2024 Cobalt Metal FOB Price Review (Unit: \$/lb)



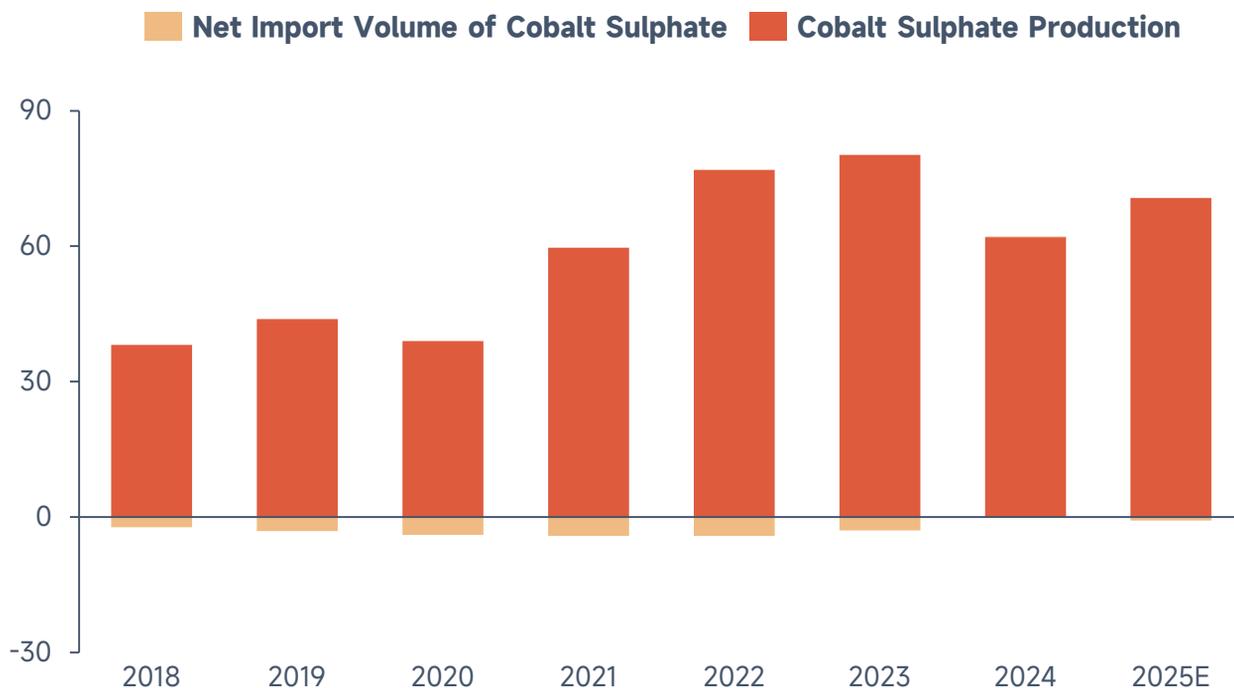
Source: SMM

Chapter 3: Analysis of China's Cobalt Compound Market

3.1 Analysis of China's Cobalt Sulphate Market (2018-2025E)

3.1.1 Analysis of China's Cobalt Sulphate Supply (2018-2025E)

Chart: 2018-2025E Forecast of China's Cobalt Sulphate Supply
(Unit: 1,000 mt in metal content)



Source: SMM Processed Data Based on Market Communication and Model

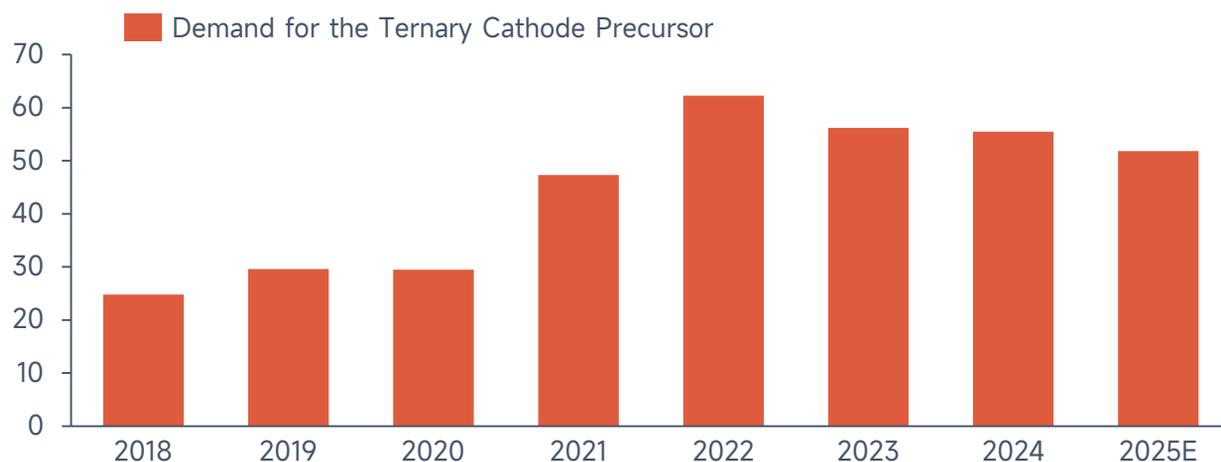
From the perspective of production: Due to excessive supply in 2023, there was a significant inventory buildup throughout the year. Entering 2024, the NEV market performed poorly. As annual demand was primarily driven by integrated enterprises, companies solely engaged in cobalt sulphate production faced significant pressure to sell. Coupled with declining raw material prices, the costs of spot cobalt sulphate continued to decrease. Since cobalt sulphate smelters prepared raw material inventory in advance, mismatches in raw materials led to persistently low operating rates at some cobalt sulphate smelters, with some even cutting production or shifting to refined cobalt production. Consequently, the total production in 2024 declined significantly.

From the perspective of imports and exports: The import and export volumes of cobalt sulphate are relatively small. Overseas demand is primarily driven by integrated enterprises, and the overall import and export pattern is expected to remain largely unchanged.

Chapter 3: Analysis of China's Cobalt Compound Market

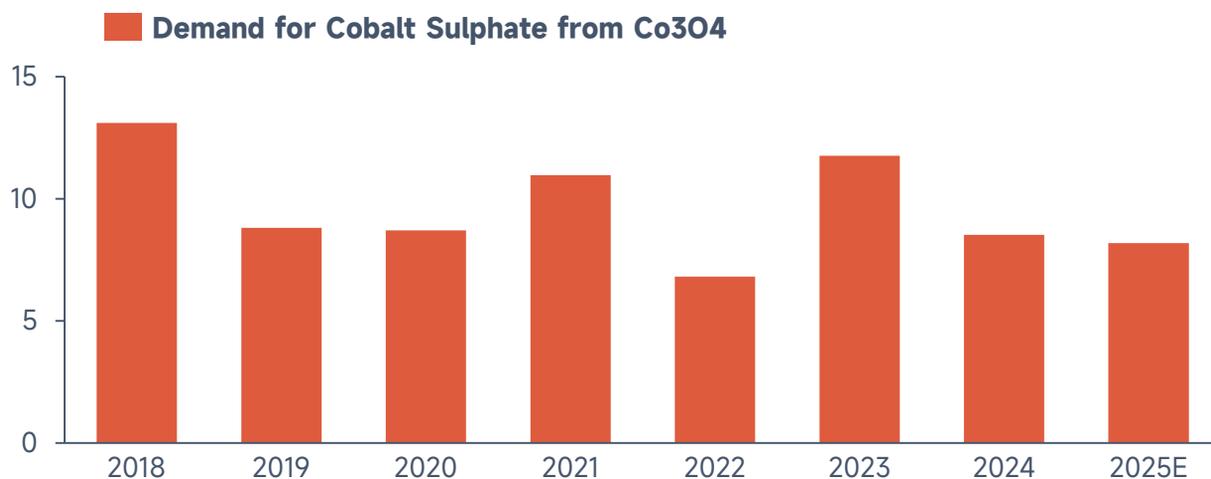
3.1.2 Analysis of Cobalt Sulphate Demand in China (2018-2025E)

Chart: 2018-2025E Analysis of Cobalt Sulphate Demand from Ternary Cathode Precursor in China (Unit: 1,000 mt in metal content)



Source: SMM Processed Data Based on Market Communication and Model

Chart: 2018-2025E Analysis of Cobalt Sulphate Demand from Co3O4 in China (Unit: 1,000 mt in metal content)



Source: SMM Processed Data Based on Market Communication and Model

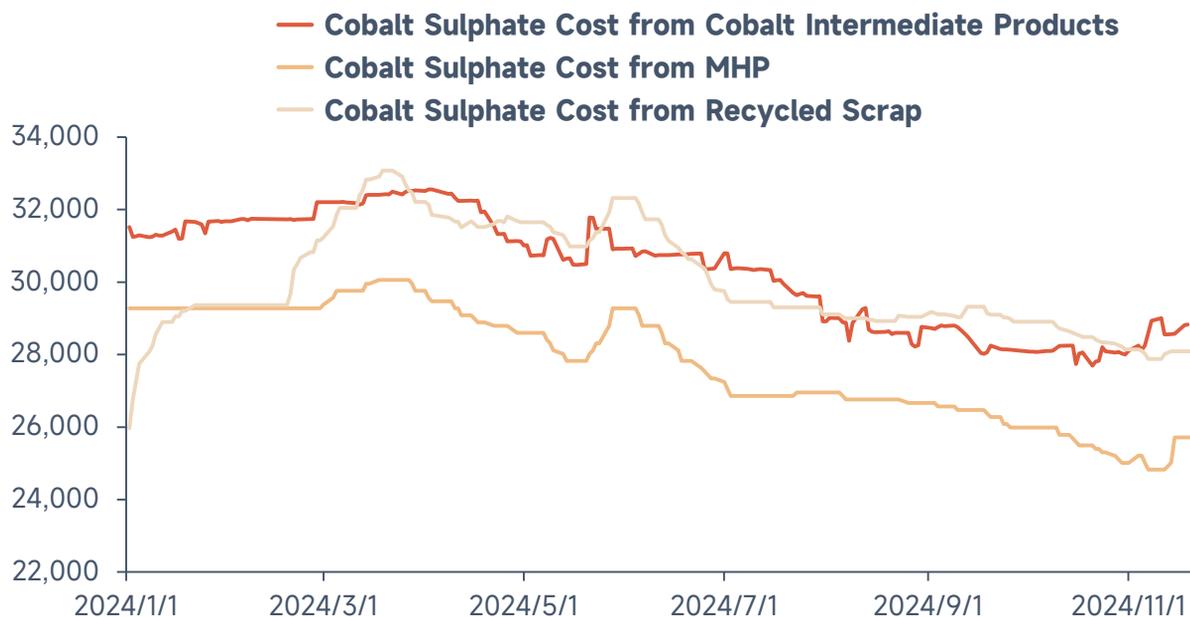
Cobalt sulphate is mainly applied in ternary cathode precursor. In 2024, due to the continuous market share squeeze of ternary battery cells by LFP battery cells, the consumption of cobalt sulphate in ternary cathode precursor sector declined. Although the consumer market grew rapidly in 2024, the overall consumption of cobalt sulphate was limited as only small proportion of cobalt sulphate was used in Co3O4 production and most of the new Co3O4 capacity used cobalt chloride as raw material.

In the future, with the decline in lithium prices, the cost advantages of LFP battery cells in the NEV sector may be difficult to sustain, and the NEV sector still holds certain development prospects. The consumer market may also benefit from the expansion of high-end electronic devices, such as wearable devices and smart home equipment, ensuring a stable demand for cobalt sulphate used in Co3O4.

Chapter 3: Analysis of China's Cobalt Compound Market

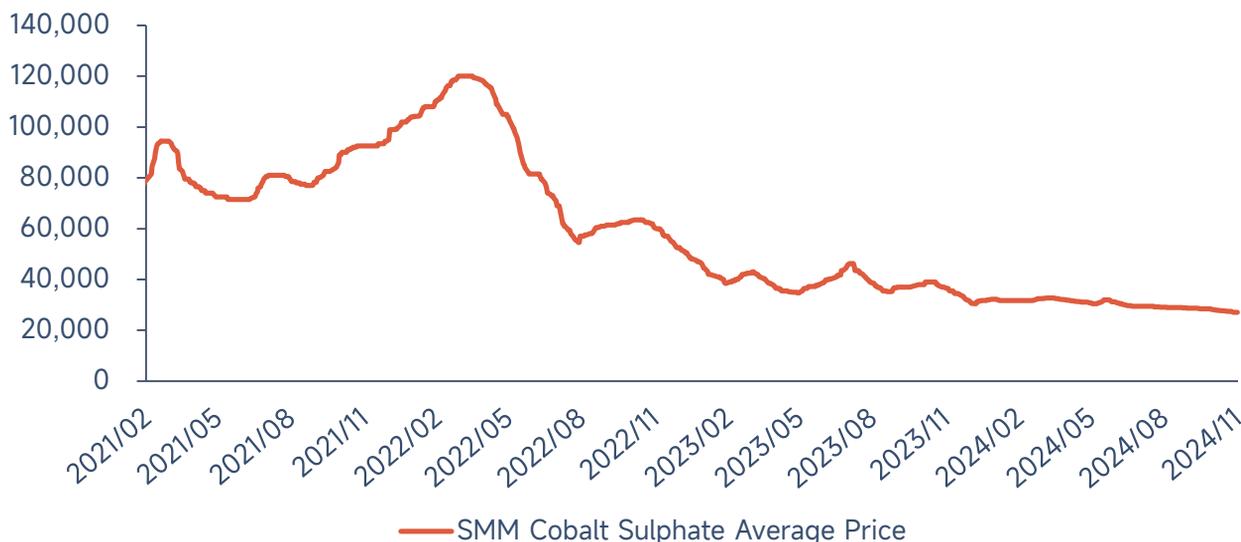
3.1.3 2024 China Cobalt Sulphate Cost and Price Analysis

Chart: 2024 China Cobalt Sulphate Cost by Raw Material (Unit: yuan/mt)



Source: SMM Processed Data Based on Market Communication and Model

Chart: 2021-2024 China Cobalt Sulphate Price Review (Unit: yuan/mt)



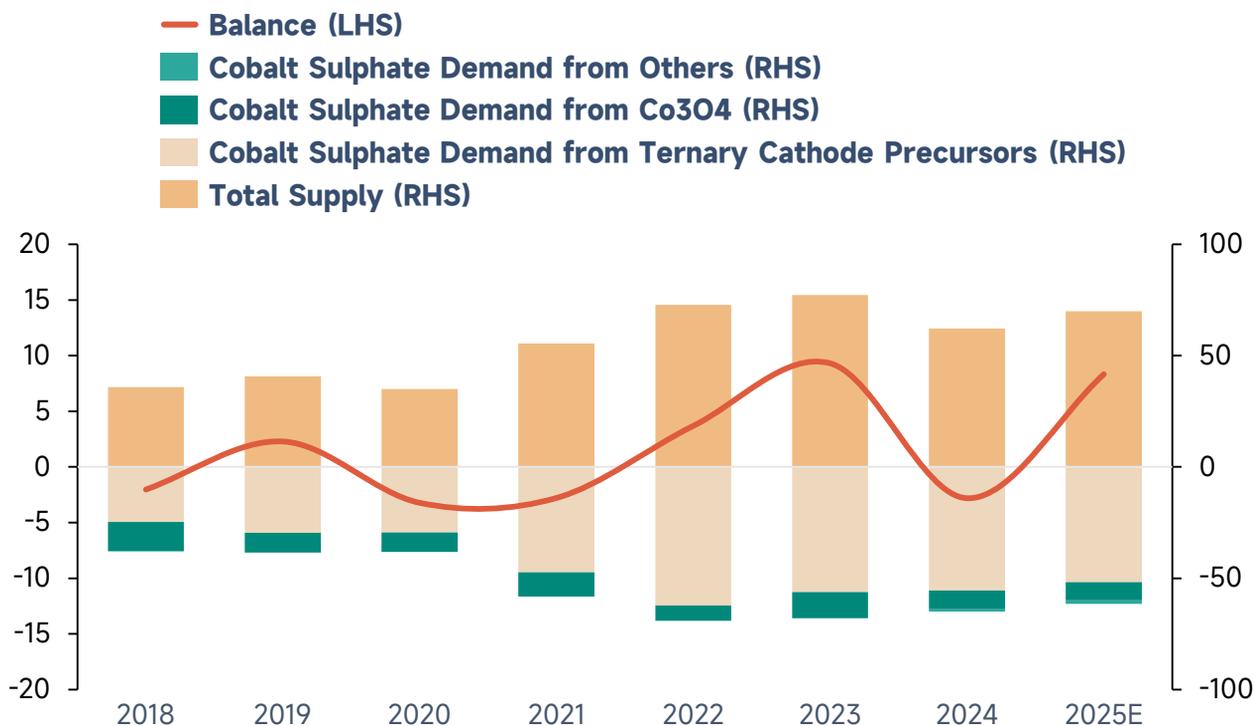
Source: SMM

Since cobalt contained in MHP may not be priced when its content is less than 2%, and cobalt sulphate is a by-product of producing nickel sulphate from MHP, the actual cost of using MHP as a raw material to produce cobalt sulphate is relatively low. In 2024, due to the shortage of scrap, the cost of cobalt sulphate produced from scrap was relatively close to that produced from cobalt intermediate products.

Chapter 3: Analysis of China's Cobalt Compound Market

3.1.4 Analysis of China's Cobalt Sulphate Supply-Demand Balance (2018-2025E)

Chart: 2018-2025E China's Cobalt Sulphate Supply and Demand Forecast (Unit: 1,000 mt in metal content)



Source: SMM Processed Data Based on Market Communication and Model

In 2024, due to downstream ternary cathode precursor demand focusing on medium- and high-nickel precursor, cobalt sulphate demand declined. Additionally, as demand in 2024 was concentrated among top-tier enterprises, the integrated structure deepened. On the supply side, due to significant stockpiling by traders in 2023, these inventories were carried over into 2024. Although cobalt sulphate production declined in 2024, the overall market supply remained relatively sufficient due to high social inventory levels, with destocking being the main trend throughout the year.

Chapter 3: Analysis of China's Cobalt Compound Market

3.2 Analysis of China's Co3O4 Market (2018-2025E)

3.2.1 Analysis of China's Co3O4 Supply (2018-2025E)

Chart: 2018-2025E Forecast of China's Co3O4 Supply (Unit: 1,000 mt)



Source: SMM processed data based on market communication and Model

In 2024, the supply growth rate of China's Co3O4 market was significant.

In the first quarter, due to the low price of cobalt and the impetus of stockpiling demand, market purchasing enthusiasm rose, orders for Co3O4 increased, and the output of smelters rose significantly. Although some small and medium-sized enterprises carried out maintenance during the Spring Festival, the demand of large enterprises remained stable and the overall output remained at a relatively high level.

In the second quarter, the operating rates of major smelters were good, the market concentration was relatively high, and they mainly delivered early orders. Although the competition in the conventional product market is fierce, the demand for high-voltage products is stable and the supply is sufficient.

In the third quarter, the willingness of LCO manufacturers to stock up strengthened. Coupled with the market recovery stimulated by Huawei's new models, the demand for Co3O4 increased. The major smelters maintained a high operating rate. After maintenance, manufacturers resumed production, and the overall supply increased.

In the fourth quarter, it is expected that the demand for LCO will tend to be flat, the purchasing intention will weaken, and the production plans of enterprises may be reduced. Throughout the year, the growth of the LCO market has driven up the production of Co3O4.

Chart: 2024-2025E New Co3O4 Capacity in China (Excerpt) (Unit: mt/year)

Company Name	Expansion Plan	Expansion Timeline
Company A	10,000	New Capacity in 2024
Company B	10,000	New Capacity in 2024
Company C	6,000	New Capacity in 2024
Company D	10,000	Expected in 2025

Source: SMM processed data based on market communication and public information

Chapter 3: Analysis of China's Cobalt Compound Market

3.2.2 Import and Export Analysis of Co3O4 in China (2018-2025E)

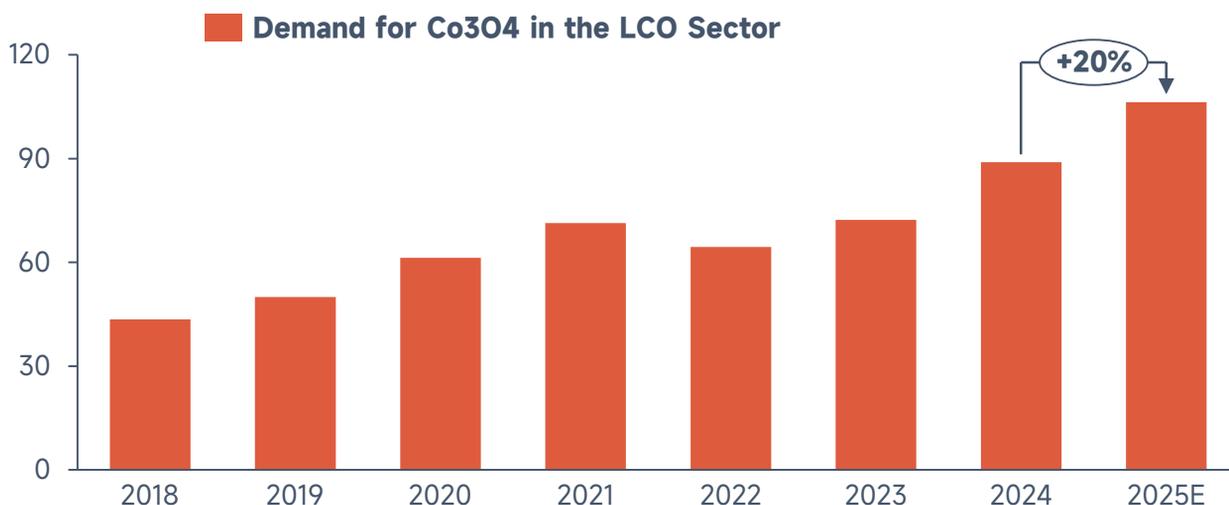
Chart: 2024 Import and Export Data of Co3O4 in China and Distribution of Export Destinations (Unit: mt)



Source: SMM based on data from the General Administration of Customs of China

3.2.3 Demand Analysis of Co3O4 in China (2018-2025E)

Chart: 2018-2025E Analysis of Co3O4 Demand from LCO in China (Unit: 1,000 mt)



Source: SMM based on processing data from market exchanges and model

In 2024, due to the high market enthusiasm for Huawei's new smartphone models in H2 2023, the market held similar expectations for new smartphone models in 2024. Coupled with the upgrade cycles of smartphones, tablets, and computers, the annual consumer market growth is projected to 20% in 2024, driving YoY growth in Co3O4 demand.

Chapter 3: Analysis of China's Cobalt Compound Market

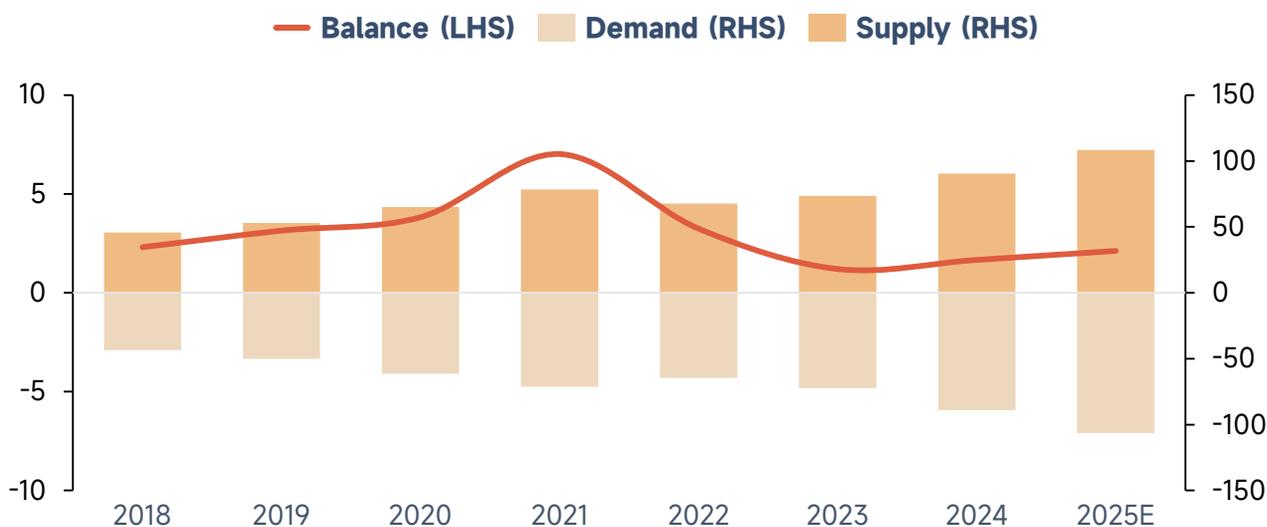
3.2.4 Cost and Supply-Demand Balance Analysis of Co₃O₄ in China (2024)

Chart: 2023-2024 Spot Cost of Co₃O₄ in China (Cobalt Chloride as Raw Material) (Unit: yuan/mt)



Source: SMM Processed Data Based on Market Communication and Model

Chart: China's Co₃O₄ Supply and Demand Forecast (2018-2025E) (Unit: 1,000 mt)



Source: SMM Processed Data Based on Market Communication and Model

In 2024, the supply side saw rapid commissioning of new capacity. Although the demand side also performed strongly, its growth rate lagged behind that of the supply side, leading to an increase in inventory buildup in 2024. Additionally, in terms of prices, due to the continuous decline in cobalt salt prices on the raw material side since 2024, the cost of Co₃O₄ decreased accordingly, resulting in lower spot prices.

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