SMM 上海有色网

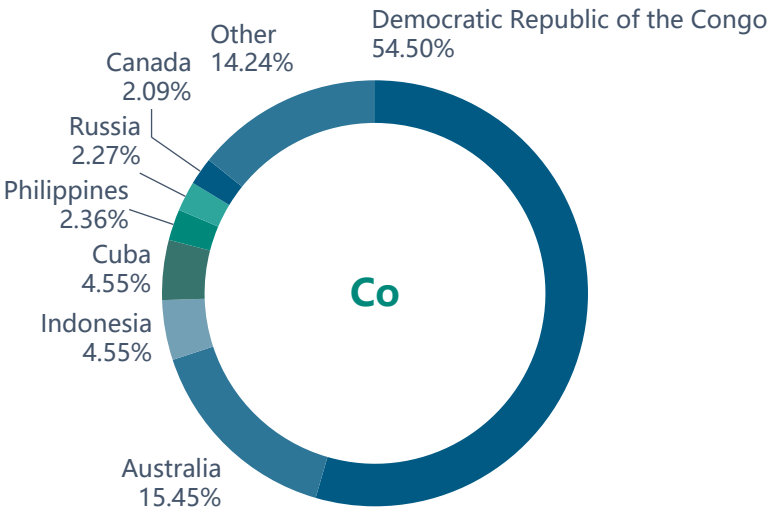
China Cobalt Market Report 2024

2024/04

1 Global Cobalt Raw Material Analysis

1.1 Global Cobalt Reserves Types and Distribution Characteristics (2023)

Figure: Global Cobalt Reserves Distribution in 2023



Source: SMM

Table: Global Cobalt Reserves Distribution in 2023

Country	Total Reserves (10,000 mt)
Democratic Republic of the Congo	600
Australia	170
Indonesia	50
Cuba	50
Philippines	26
Russia	25
Canada	23
Others	108.9
Total	*1100*

The global distribution of cobalt reserves is highly concentrated. According to statistics from the United States Geological Survey (USGS), the global proven cobalt reserves amount to 11 million mt. The distribution of cobalt reserves is extremely uneven, with countries such as the Democratic Republic of Congo (DRC) and Australia being the most enriched. The DRC's share of cobalt reserves is 54.5%, followed by Australia with 15.45% and Indonesia with 4.55%. The reserves are distributed in small amounts in other countries.

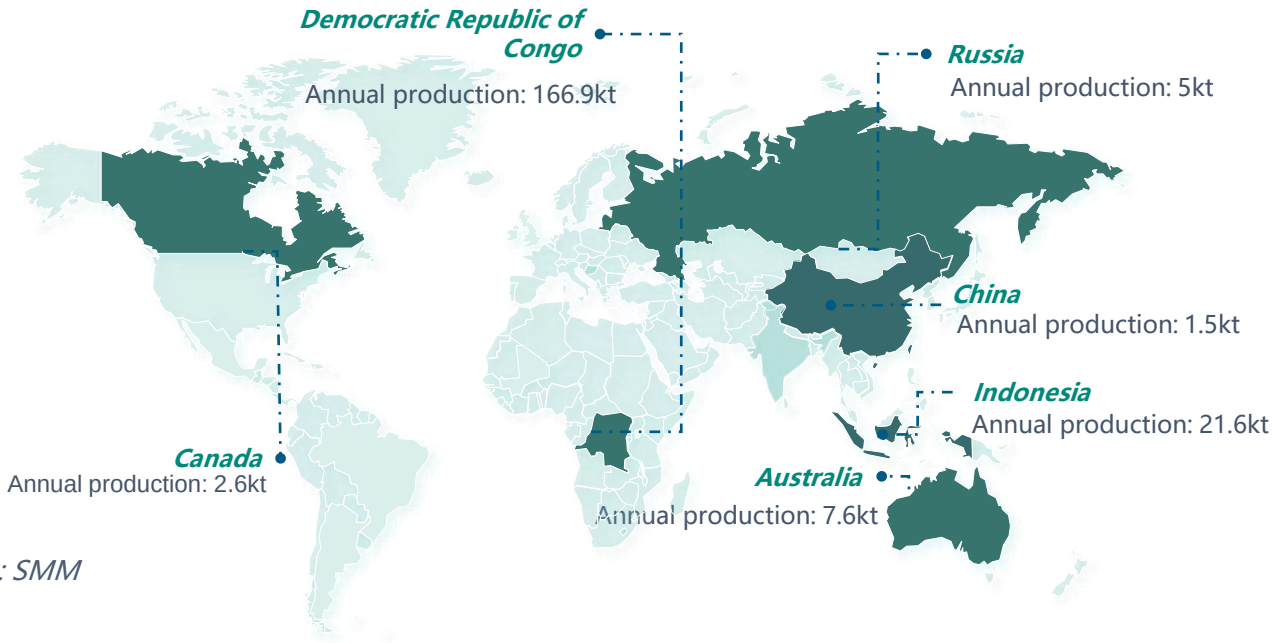
- **Congo (DRC):** In 2023, the DRC has about 6 million tonnes of existing cobalt reserves, accounting for the largest share globally and making it the largest cobalt-producing country, accounting for over 75% of global cobalt production. The grade is mostly between 0.3%-0.5%, and the quality is comprehensively superior to other sources.
- **Australia:** In 2023, Australia has 1.7 million mt of existing cobalt resource reserves, ranking second in the world, accounting for 15.45% of the global total. However, it falls far behind the DRC 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 reserves come from associated ores, which are importantly coexistent in copper, nickel, and iron ores. There are now 150 known cobalt reserve sites, distributed across 24 provinces (regions), with Gansu Province having the most reserves, accounting for approximately 30% of the national total. However, 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. There are very few mines that can be mined economically, so China deeply relies on the imports.

1) Resource distribution is based on the statistics of globally identified reserves in 2023.

1 Global Cobalt Raw Material Analysis

1.2 Global Cobalt Raw Material Supply Analysis (2018-2024F)

Figure: Global Cobalt Raw Material Supply by country in 2023

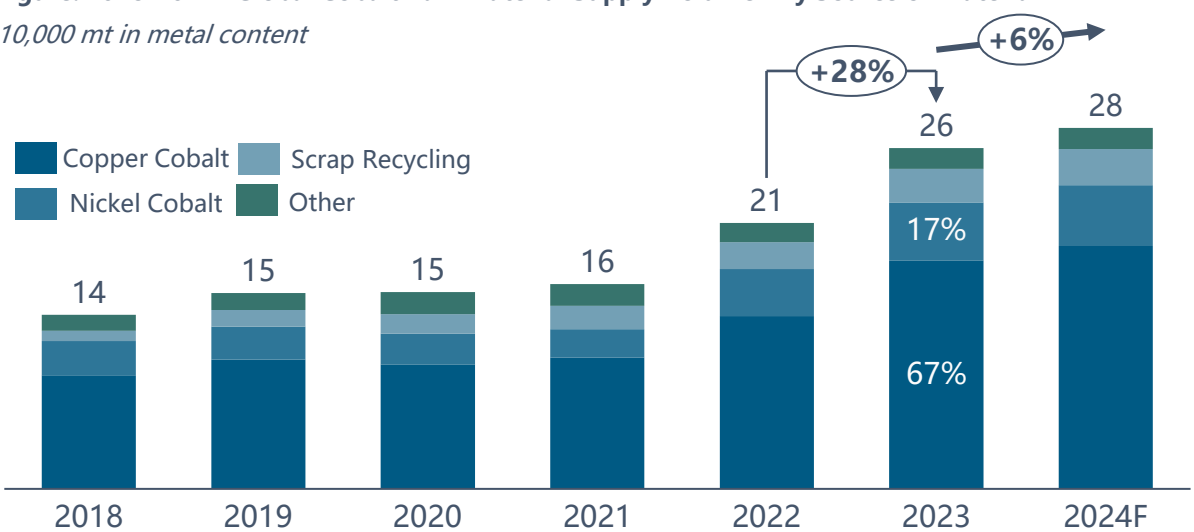


Source: SMM

➢ The production of operating mines: According to SMM statistics, the total global supply of cobalt raw materials in 2023 is 264,000 mt in metal content, of which the total supply of primary materials is 238,300 mt in metal content, mainly concentrated in the Democratic Republic of Congo (DRC), Australia, Indonesia, Canada, and other regions. SMM predicts that the cobalt supply will remain relatively stable in the next five years. The DRC's copper-cobalt mine projects will gradually expand their production capacities in the coming years. The volume of cobalt raw material suppliers from foreign and Chinese capitals will continuously increase, leading to supply growth. China maintains a relatively stable import volume of cobalt resources. The domestic supply remains very small volume due to the shortage of cobalt resource in China. China will continue relying on the imported cobalt raw materials, especially from the DRC to meet the domestic demand. Additionally, the supply of cobalt from nickel-cobalt mines in Indonesia and other places, as well as from lithium battery recycling, will gradually increase over the next few years. Therefore, this also provides a part of the increment for the domestic supply of cobalt resources.

Figure: 2018-2024F Global Cobalt Raw Material Supply Volume - By Source of Material

10,000 mt in metal content



1 Global Cobalt Raw Material Analysis

1.3 Analysis of Future New Projects (2023-2024F)

Table: 2023-2024F Overview and Analysis of Newly Commissioned Projects

10,000 mt in metal content

Resource Type	Region	Mine/Project Name	Expected Production Year Output	Notes
Copper-Cobalt	Democratic Republic of the Congo (DRC)	Kisanfu	3	Maintaining Growth in 2024
Copper-Cobalt	Democratic Republic of the Congo (DRC)	Kinsevere	0.5	First Cobalt Production in 2023
Copper-Cobalt	Democratic Republic of the Congo (DRC)	Musonoi	0.78	Infrastructure Construction Completed in 2024
Copper-Cobalt	Democratic Republic of the Congo (DRC)	Mutoshi Mine	1.6	Originally scheduled for Q4 2023, but delayed due to financial issues
Nickel-Cobalt	Indonesia	Huayue Phase I and II	0.6	Commenced Production in H2 2023
Nickel-Cobalt	Indonesia	Tsingshan-GEM-Brunp	0.75	Gradual increase in production in 2024
Nickel-Cobalt	Indonesia	PT Huayu Nickel Cobalt	1.2	Projected Full Production Capacity by 2024
Pyrite	Australia	Broken Hill	0.4	Site Construction Completed in 2022

Source: SMM

Analysis of Factors Affecting Resource Extraction Volume:

- **Factors affecting copper-cobalt mine projects**

Copper-cobalt mines are primarily located in the Democratic Republic of the Congo, and the main content is copper. Due to the considerable profit from copper in 2023 and Q1 2014, it is encouraging the ramping-ups of the greenfield and brownfield projects. High copper prices and low cobalt prices could further drive producers to adjust their product mix to achieve better profit margins. However, the logistical issues and stability in the DRC always affect the existing mines and projects, which are worthy being considered.

- **Factors affecting nickel-cobalt mine projects**

Primarily in Indonesia, due to the successful construction and expansion of the MHP projects, Indonesian capacity has rapidly risen. Indonesian low-grade laterite nickel ore can be processed using high-pressure leaching technology to recover cobalt elements, which also has a cost advantage. However, cobalt is also a by-product, so it is easily affected by the fluctuations in the price of nickel, which affects the progress of the MHP project, and in turn affects the output of cobalt. And also the other factor that could have a great impact on these HPAL projects is the attitude from the new Indonesian government.

2 Global Cobalt Demand Analysis

Analysis and Forecast of Downstream Demand for Cobalt Products

➢ Global demand for cobalt mainly comes from digital products, EVs, 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 batteries of digital products and magnetic materials is accelerating. The proportion of cobalt demand in traditional industries is also synchronously declining. The recent implementation of subsidies from many countries/regions for new energy vehicles has markedly enhanced their development prospects. Consequently, cobalt demand, essential for electric vehicle batteries, has experienced a surge.

2.1 Analysis of the Electric Vehicle Market Trends

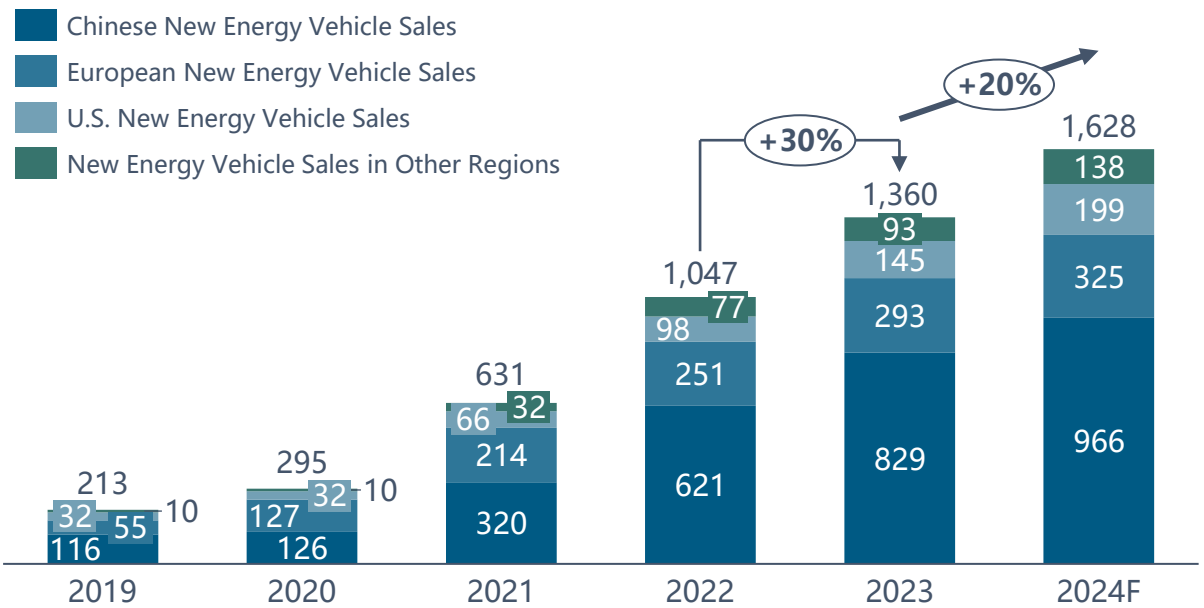
➢ Between 2019 and 2022, global sales of electric vehicles soared, achieving a compound annual growth rate (CAGR) of 69% and exceeding 11 million units by 2022. Despite the economic downturn and the elimination of subsidies in China in 2023, sales still grew by 31% YoY, reaching more than 13 million units. Looking forward, while the market growth rate for EVs is expected to decelerate from its initial surge, it is still projected to expand at a strong rate of 10-20%.

➢ In 2023, China dominated the electric vehicle market with 61% of global sales and a penetration rate of 32%. In non-Chinese regions, the penetration rate was considerably lower at 9%. Europe saw new energy vehicles make up 21% of its total vehicle sales, achieving a penetration rate of about 17%. In the United States, these vehicles represented 11% of total sales with a penetration rate just under 10%. Overall, adoption in other global regions has been relatively slower. This suggests significant potential for future demand growth in overseas markets.

➢ SMM expects Chinese EVs market will remain strong growth in 2024. However, in the rest world, the electric vehicle sector is facing headwinds now. SMM still believes the EVs will gain more market shares from the ICE vehicle.

Figure: 2019-2024F Global new energy vehicle sales

10,000 units



Source: SMM

➢ In Chinese EVs market, cobalt demand has been affected by the increasing market shares of LFP battery and high-nickel content ternary lithium battery. In 2023, due to the collapse of lithium prices, battery producers preferred reducing their stock of raw materials. Those factors resulted in 17% decrease in domestic cobalt demand from the EVs battery sector in 2023. SMM expects the domestic market share of ternary lithium battery will drop to 24% in 2024 from 27% in 2023. However, the cobalt consumption from EVs battery sector is expected to rise by 8.3% in 2024, thanks to new models with NCM batteries and low inventories of battery raw materials.

Figure: 2018-2024F EVs lithium battery demand in China by type

unit: GWH (left) ; % (right)

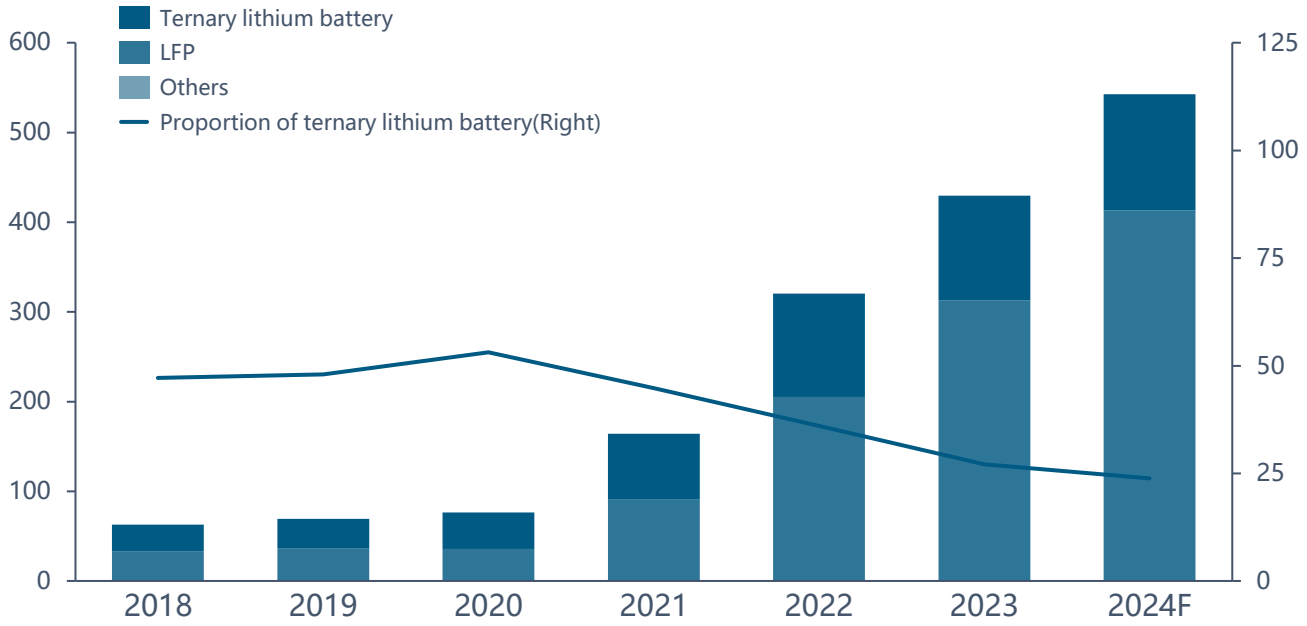
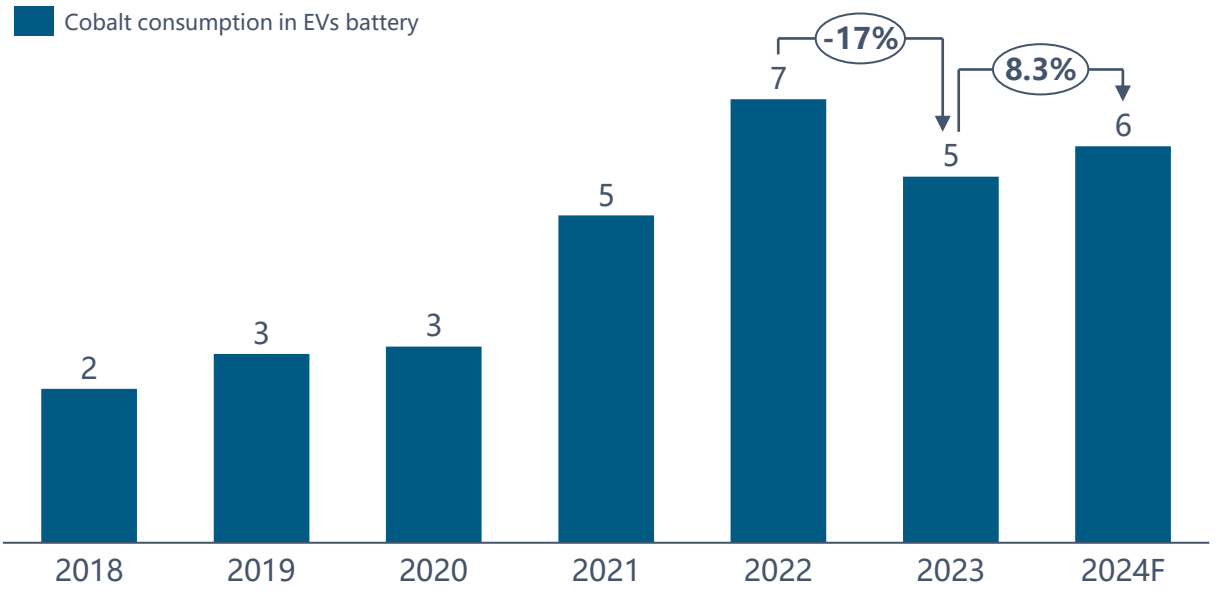


Figure: 2018-2024F Cobalt consumption from EVs battery sector in China

unit: 10,000 tons metal content



Source: SMM

2. Global Cobalt Demand Analysis

2.1 Analysis of the Electric Vehicle Market Trends

➢ In the electric vehicle market, battery electric vehicles(BEVs) constitute roughly 70% of sales, with plug-in hybrid electric vehicles(PHEVs) making up about 30%. In 2023, the growth rates for battery electric vehicles in China experienced an initial rise, followed by a decline, and then stabilized. Plug-in hybrids showed a similar pattern, with their growth rates picking up towards the end of the year. The increase in sales of plug-in hybrid models in 2023 can be attributed to the significant rise in lithium-ion battery materials costs over previous year, which pushed up battery prices. Chinese OEMs made efforts to release more plug-in hybrid models to meet demand. Plug-in hybrid models, which feature dual power systems and smaller batteries, are less affected by price fluctuations of key materials. They also offer advantages such as reduced dependence on charging infrastructure and fewer range limitations in various scenarios. As a result, many automakers have ramped up their investment in the development of hybrid platforms. This year, the launch of numerous high-quality plug-in hybrid models has enriched market segmentation and boosted their sales volumes. As automakers continue to expand their range of plug-in hybrid offerings, the market share of these vehicles is expected to steadily rise.

Figure: Sales volume and market share of BEVs and PHEVs from 2020 to 2023 in China

10,000 units

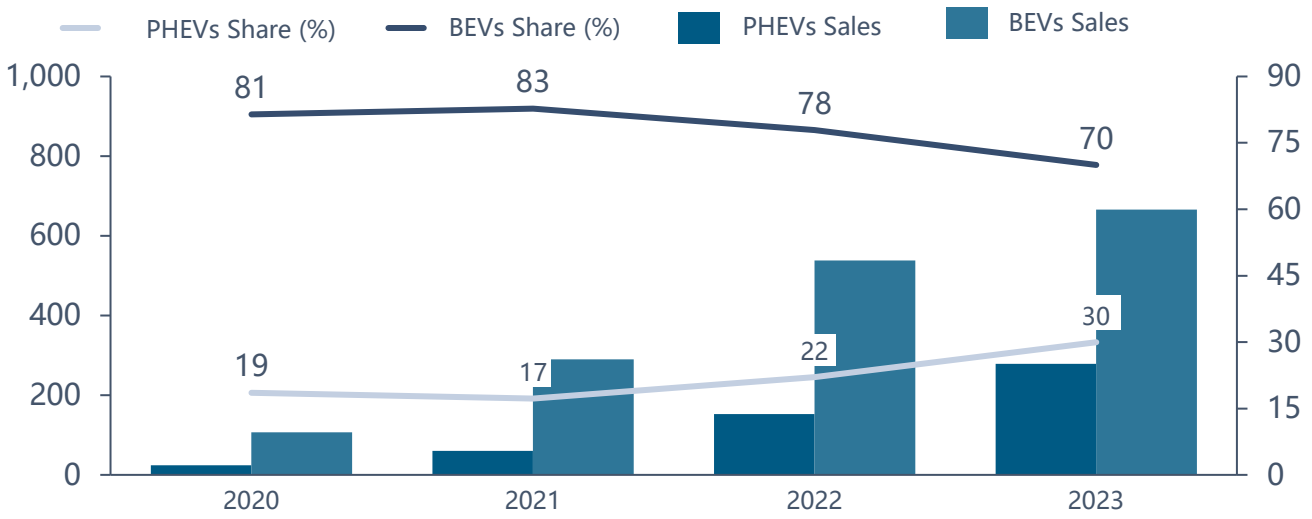
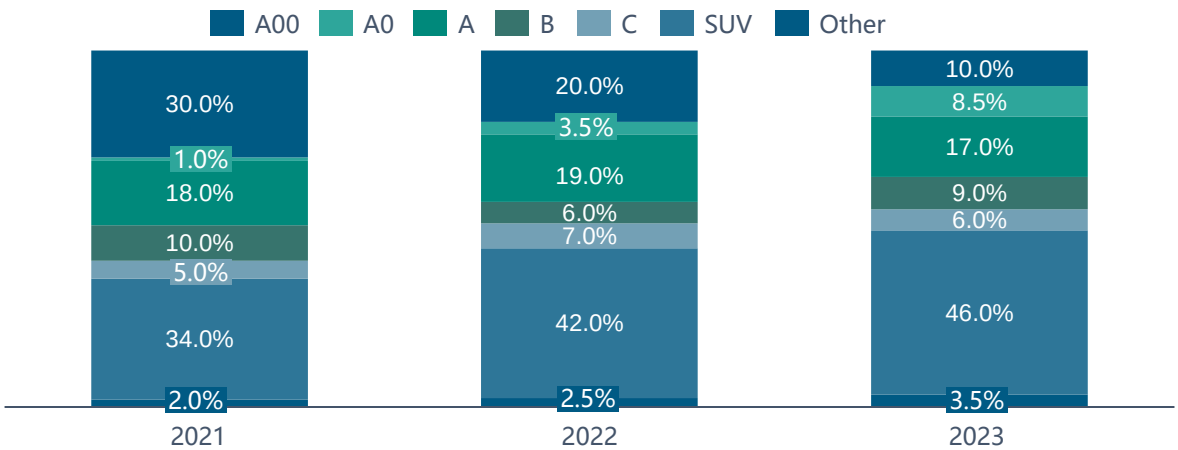


Figure: Market share of electric vehicle sales by class in China

Unit %



Source: SMM

2. Global Cobalt Demand Analysis

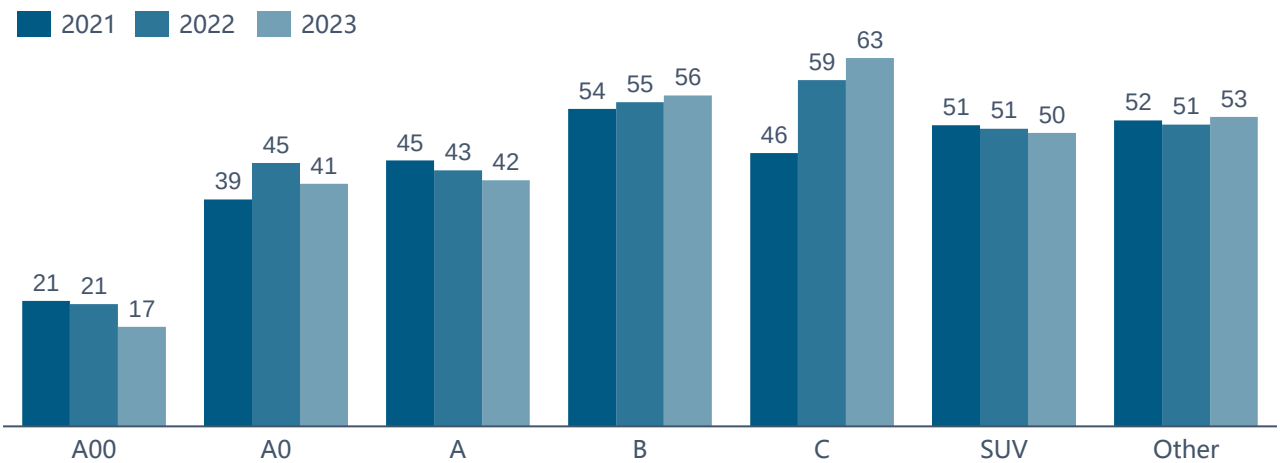
2.1 Analysis of the Electric Vehicle Market Trends

➢ Chinese domestic self-owned brand automakers have shown strong performance in 2023, with BYD leading with over 3.0m units sales, achieving YoY growth of 62%. BYD ‘s success can be attributed to its diverse portfolio of five major brands, which cater to different market segments and price ranges, contributing to its ongoing market share expansion. Additionally, GAC Aion has exhibited impressive performance, with a growth rate exceeding 77%, compared to 2022. The brand continues to hold a strong position in the online ride-hailing market. Among newer brands, Tesla remains the sales leader, although its growth has slowed due to less frequent product updates. Li Auto, a prominent domestic brand, has successfully targeted specific customer demographics by offering exceptional value within its price segment, resulting in significant sales growth. The launch of the AITO by Huawei's automotive sector in the fourth quarter of 2023 has sparked significant enthusiasm in the Chinese market, leading to continued sales growth. This momentum is expected to carry into 2024. After a strong performance in 2023, Li Auto plans to launch new models in 2024, potentially sustaining its robust growth trajectory.

➢ The average battery capacity for BEVs has consistently increased, with a yearly rise of 3.8 kWh in both 2022 and 2023. For PHEVs, the average battery capacity per vehicle also grew yearly, with increases of approximately 3.1 kWh in 2022 and 3.2 kWh in 2023. There is a clear differentiation in battery capacity trends across various vehicle model levels. Notably, smaller micro models, particularly in the A00 category and Class A, have seen a decline in average battery capacity. This trend reflects a slowdown in sales growth for small micro vehicles, with demand concentrating on top models like the Wuling Hongguang Mini, which has decreased the market's battery capacity. Conversely, Class B and Class C vehicles have experienced increases in individual vehicle battery capacity. Despite a decrease in the market share of pure electric models in 2023, there was notable structural improvement and increased demand for intelligent features in plug-in hybrid models within these classes. This, coupled with the launch of several mid-to-high-end new energy models, has driven an upward trend in battery capacity per vehicle. Looking into 2024, the average battery capacity per vehicle in the new energy sector is expected to continue rising, driven by two main factors. First, the ongoing advancement in vehicle intelligence, which increases battery consumption. Second, changes to national policies that exempt electric vehicles from acquisition tax only if they have a range below 200 kilometers, likely promoting structural optimization and boosting average battery capacity per vehicle.

Figure: Average battery capacity by category for electric passenger vehicles in China

Unit: kWh



Source: SMM

2. Global Cobalt Demand Analysis

2.2 Consumer electronics market

➢ The traditional digital market mainly covers consumer goods such as laptops, tablets, and smartphones. The demand has passed the explosive growth phase, and the future will primarily involve replacement of existing stocks and increased battery demand brought about by high-end intelligence. Due to the implementation of new national standards and the prominent economic performance of declining lithium prices, demand for electric bicycles is steadily increasing. Furthermore, with the advancement of technology and the increase in people's consumption levels and changes in lifestyle, emerging electronic products such as wearable devices, electronic cigarettes, drones, and bluetooth speakers continue to emerge. With the diversification of application scenarios, it is expected that the consumer lithium battery market will maintain a steady growth trend.

➢ In the first half of 2023, the demand in the traditional digital consumption field was weak, and the industry chain continued to reduce inventory, leading to lower demand for consumer lithium batteries. However, in the second half of the year, the demand for mobile phones rebounded due to regional recovery and new products upgrades. The decrease in laptop shipments narrowed in the context of channel inventory digestion, which also led to a recovery in lithium battery demand.

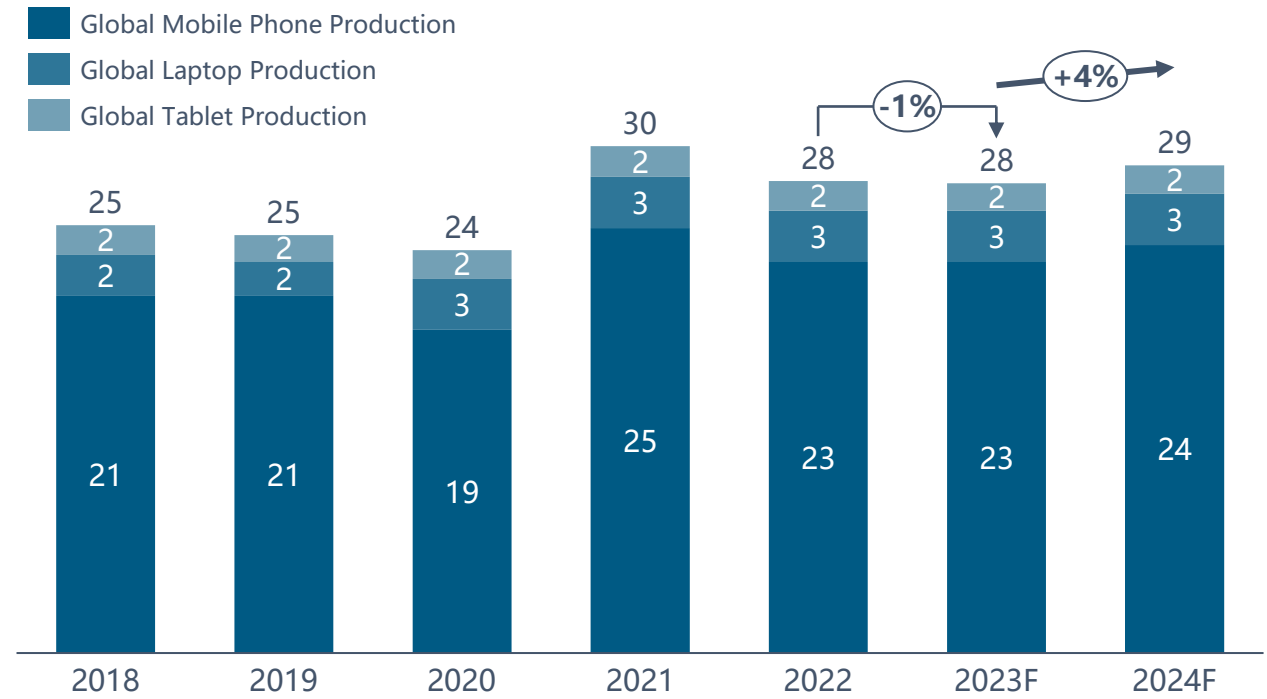
➢ In the two-wheel vehicle market, the trend of lithium batteries further replacing lead-acid batteries continues. The main reason is the significant decrease in the cost of lithium carbonate, the core metal material of lithium batteries, in 2023, which highlighted the cost-effectiveness of lithium batteries and increased the penetration rate of lithium-powered two-wheelers.

➢ Furthermore, although the e-cigarette market has been temporarily disrupted due to stricter overseas policies, China, as the main producer of e-cigarettes globally, has seen a significant year-on-year increase in exports since 2023. In the long term, as the global e-cigarette policy outlook gradually becomes clear, it will be beneficial to further promote the compliant expansion and development of the global e-cigarette market and achieve the substitution of traditional tobacco.

➢ Overall, the global consumer electronics market has undergone three major cycles to date, driven respectively by PCs, mobile phones and tablets, and emerging consumer devices such as wearable devices and drones.

Figure: 2018-2024F Global production of traditional consumer electronics market

Unit: 100 Million Units



Source: SMM

2. Global Cobalt Demand Analysis

2.2 Consumer electronics market

➢ From the perspective of traditional consumption: In 2024, the smartphone and laptop sectors are expected to continue their strong recovery. The emergence of new technologies such as 5G and foldable screens will accelerate the upgrade of smartphone products. The application of new technologies, such as AI, will further increase the power consumption of smartphones over time, demanding higher battery capacities. There is still room for further growth in the global smartphone output and its demand for lithium batteries. In 2024, Chinese smartphone brands like Huawei and Xiaomi are expected to introduce significant new features to the market, demonstrating their substantial market influence. In the laptop segment, two key developments are anticipated for 2024. First, following inventory reductions, a resurgence in demand for laptop upgrades is expected. Second, the emergence of generative AI at the PC interface is set to introduce new applications, attract more chip suppliers, potentially shorten the replacement cycle, and enhance the gross margins of end products.

Figure: Global smartphone shipments

Unit: 100 million Units

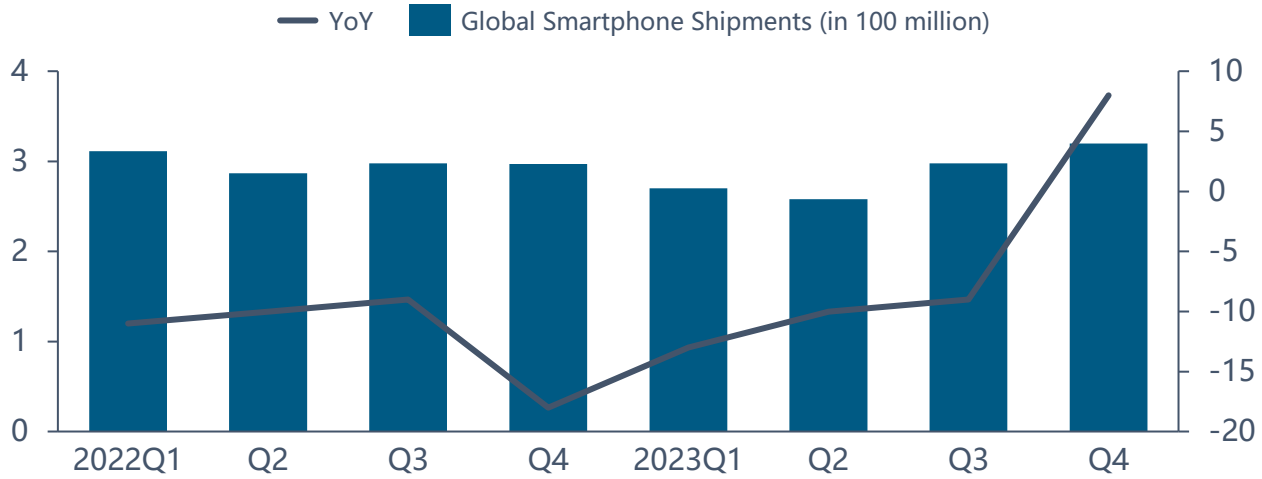
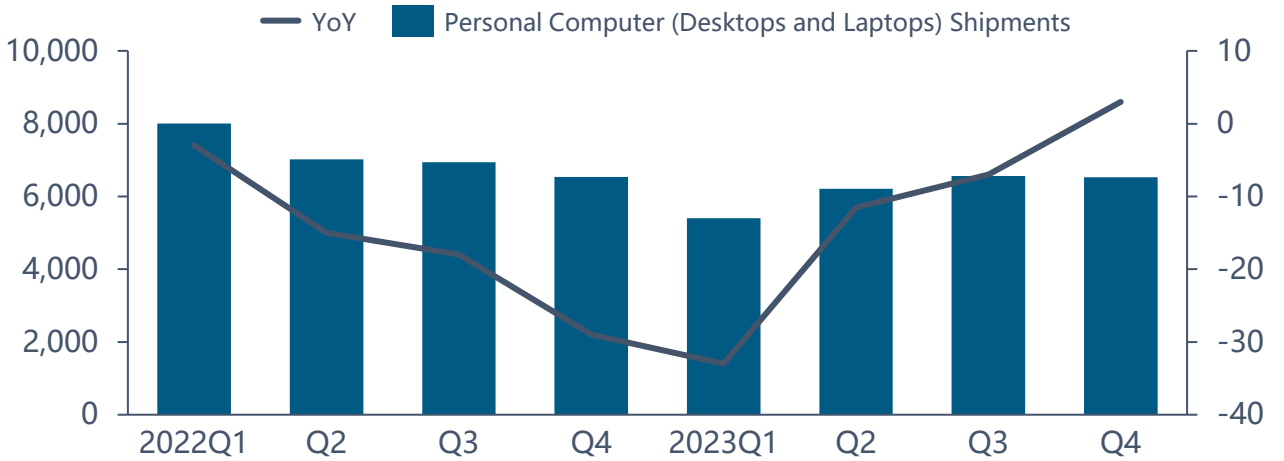


Figure: Global personal computer (desktops and laptops) shipments

Unit: 10,000 Units



Source: SMM

2. Global Cobalt Demand Analysis

2.2 Consumer electronics market

➢ Looking at the emerging consumption fields, the global market is currently in a phase where emerging consumption is driving the growth of consumer electronics. Emerging consumption includes wearable devices, wireless headphones, electronic cigarettes, drones, etc. In the wearable device sector, with market competition and technological advancement, manufacturers constantly enrich product features to satisfy consumers. In 2023, the growth rate has slowed down due to economic conditions but it still has long-term development potential. It is expected to maintain moderate growth in the medium and long term. In the drone sector, drones are categorized into two major markets: military and civilian. Civilian uses can be further divided into industrial and consumer levels, with broad terminal application scenarios. In the past, consumer-grade drones were the main growth drivers in the civilian sector. In recent years, with the application of 5G technology, drone application scenarios in the industrial sector have expanded, and the market share of industrial drones has gradually surpassed half of the total civilian drone market, becoming the main growth engine for the future. In light of the development of information warfare, security issues related to territorial disputes have become increasingly frequent in recent years, expanding the demand for consumer batteries in the military drone sector.

Figure: Global shipments of wearable wristband devices

Unit: 10,000 Units

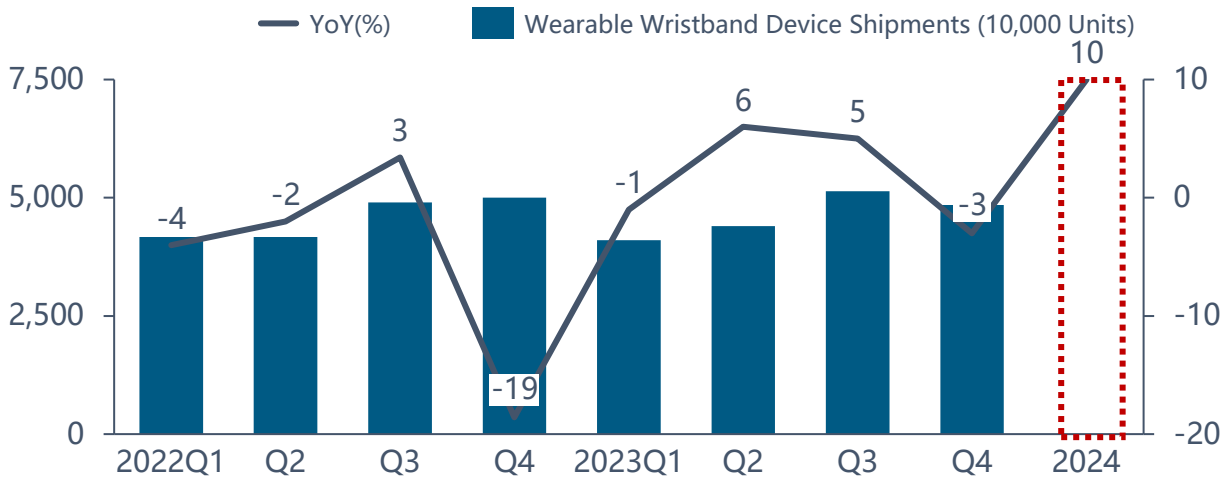
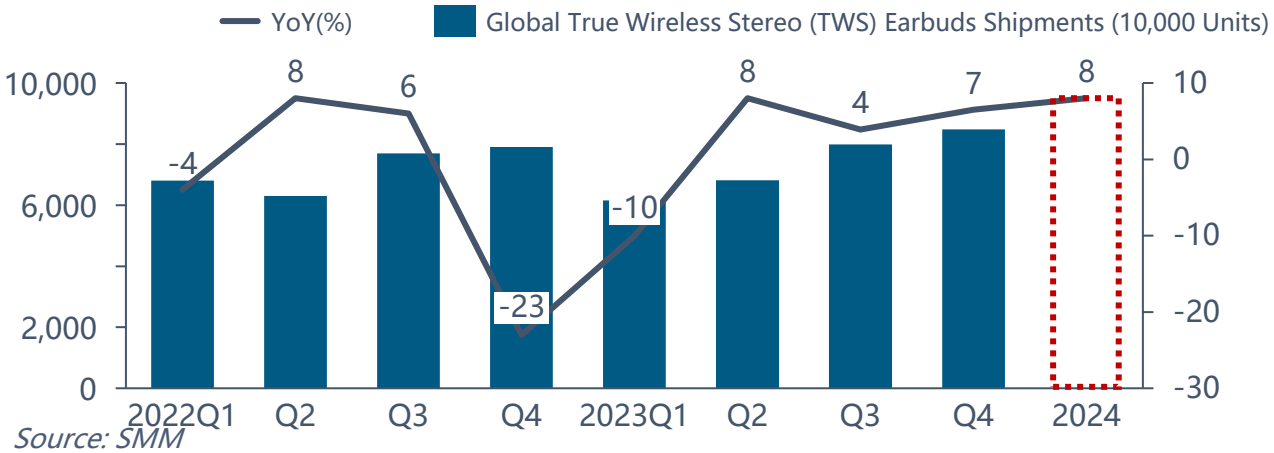


Figure: Global shipments of true wireless stereo (tws) earbuds

Unit: 10,000 Units



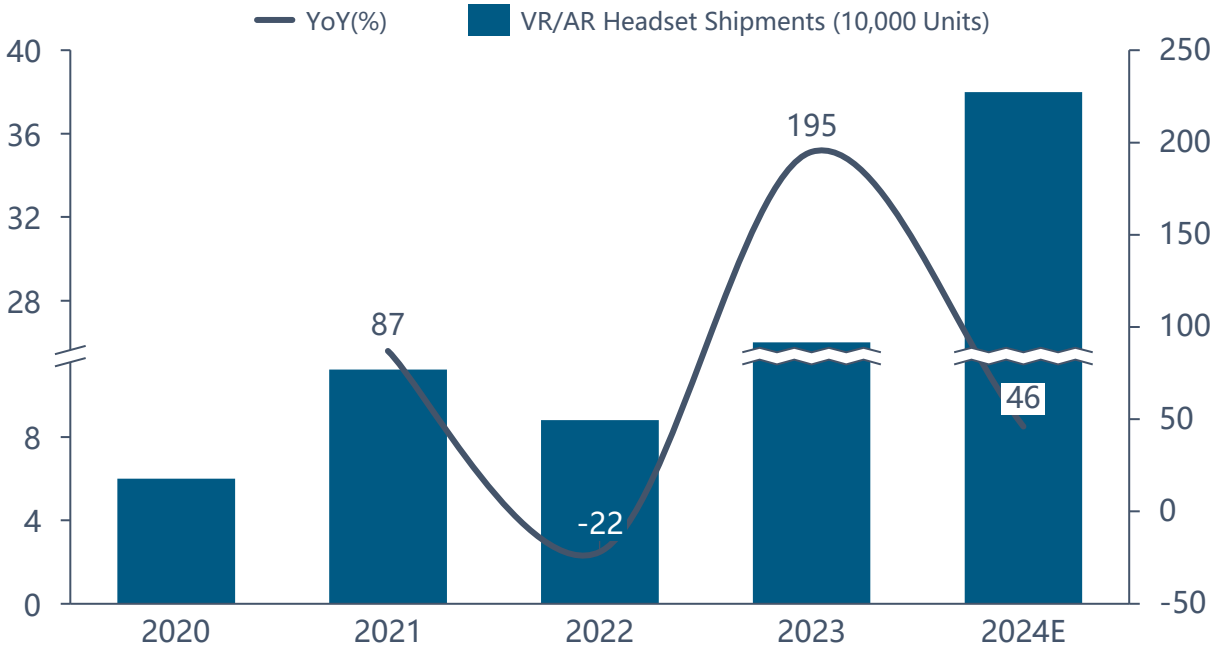
Source: SMM

2. Global Cobalt Demand Analysis

2.2 Consumer electronics market

Figure: Global shipments of VR/AR headsets

Unit: 10,000 Units



2.3 Traditional market

➢ In traditional markets, cobalt demand is relatively modest, primarily catering to sectors like high-temperature alloys, hard metals, catalysts, ceramic pigments, magnetic materials, and organic materials. High-temperature alloys are crucial in aerospace and energy for their superior strength at high temperatures, oxidation resistance, and thermal corrosion resistance. Hard metals are preferred in tool materials for their high hardness, wear resistance, strength, toughness, heat resistance, and corrosion resistance. The production of high-temperature alloys has increased notably, driven by advancements in the military and aerospace sectors, thereby securing cobalt demand. Additionally, as a key magnetic material, cobalt is used in manufacturing various magnetic components like magnets and cores and is utilized in communications and electronics through its inclusion in steel-vanadium alloys. Cobalt alloys, valued for their excellent biocompatibility and corrosion resistance, are extensively used in manufacturing medical devices like artificial joints and dental implants. With ongoing advancements in science and technology, the future applications of cobalt look promising.

➢ In 2023, the alloy segment, crucial in traditional industries, saw growth driven by military and aerospace needs. Future demand for alloys is expect to remain stable. Meanwhile, demand for magnetic materials is largely focused on samarium-cobalt permanent magnets, used extensively in microwave devices, high-speed motors, sensors, and magnetic components. Supported by Chinese government policies, market demand growth, and technological innovation, this sector is expected to continue its growth trend. However, since samarium-cobalt permanent magnets require relatively less cobalt, the incremental demand for cobalt may be limited.

Source: SMM

2. Global Cobalt Demand Analysis

2.3 Traditional market

Figure: Global production of high-temperature alloys

Unit: 10,000 mt

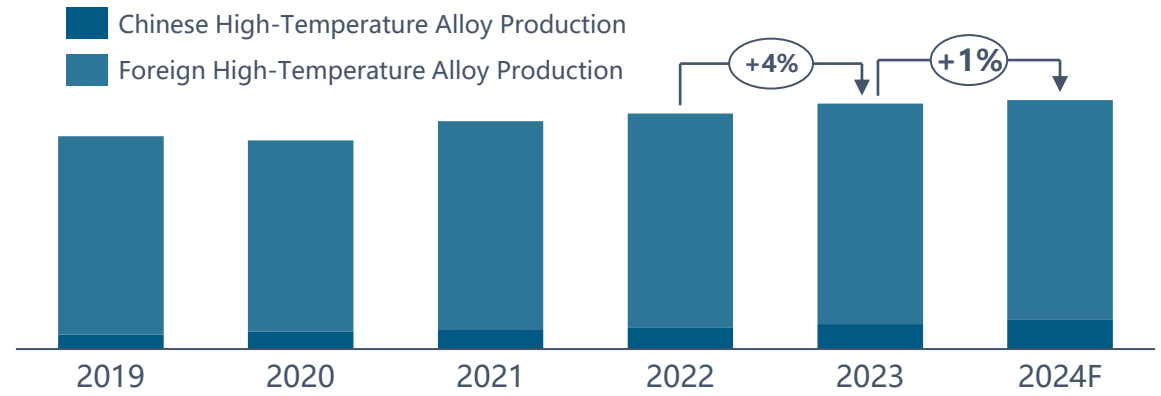


Figure: Global production of hard metals

Unit: 10,000 mt

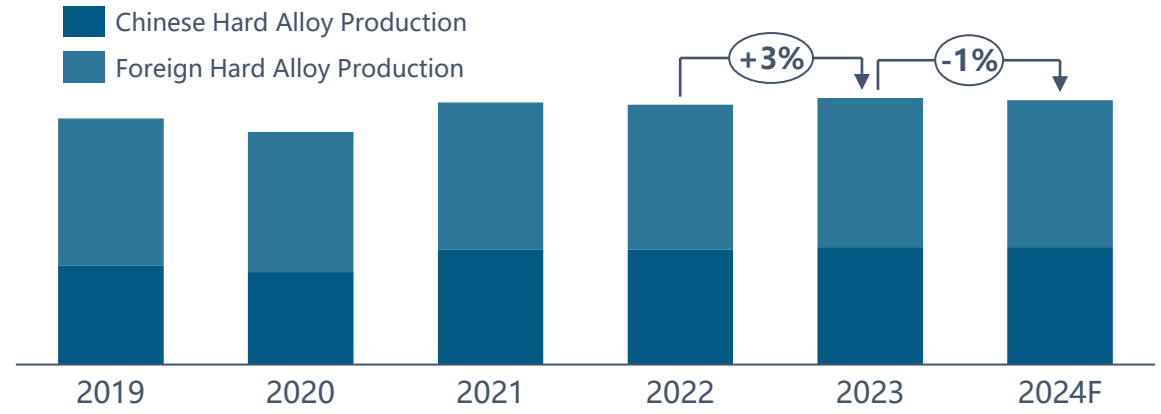
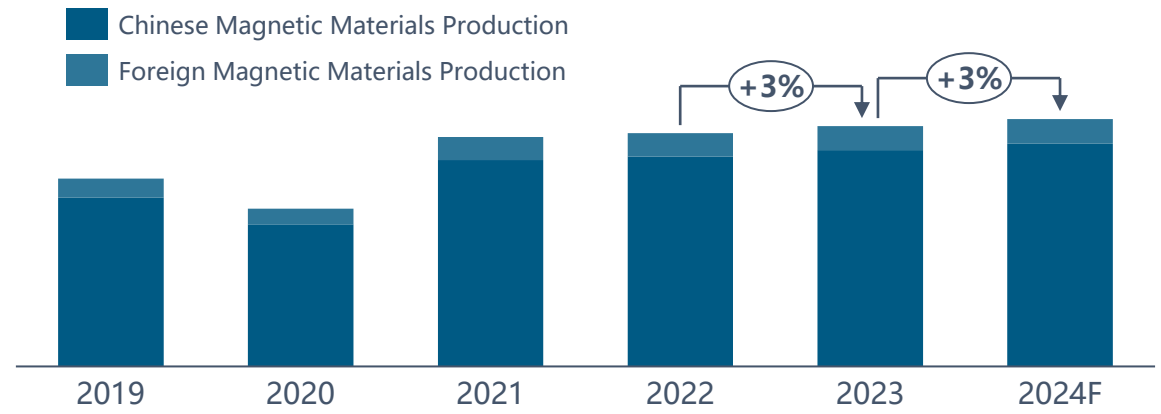


Figure: Global production of magnetic materials

Unit: 10,000 mt



Source: SMM

2. Global Cobalt Demand Analysis

2.4 Overall Assessment of Cobalt Demand:

➢ Global demand for cobalt mainly comes from digital, EVs, 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 was accelerating. The proportion of cobalt demand in traditional industries was also synchronously declining. The recent implementation of subsidies for new energy vehicles has markedly enhanced their development prospects. Consequently, cobalt demand, essential for electric vehicle batteries, has experienced a surge.

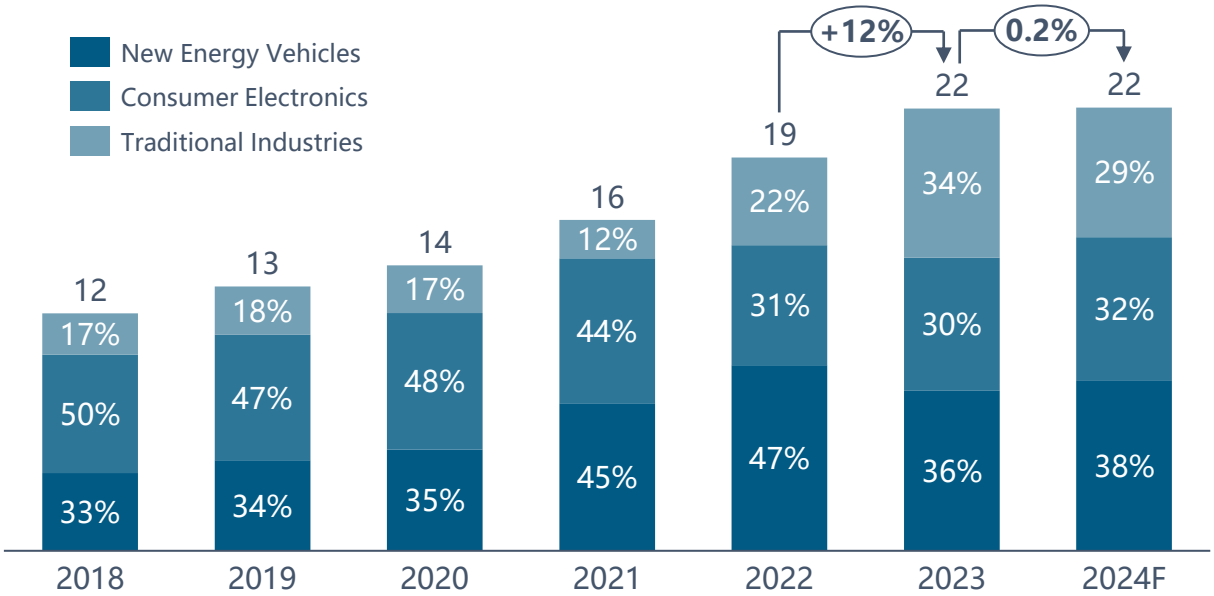
➢ In 2023, the total global demand for cobalt raw materials was 216,200 mt in metal content. Looking at the specific downstream application proportions, the global lithium battery industry accounted for 66% of the cobalt demand. Looking downstream, the EV battery industry accounted for 36% of the demand for cobalt. In China, mainly affected by the decline in subsidies for new energy vehicles, EV battery demand was digested ahead of schedule at the end of 2022, causing the demand for NEV sectors to recover less than expected in 2023, and the proportion has declined YoY. Digital batteries, driven by Q3 releases from Huawei and Apple, made up 30% of cobalt demand. Q3 saw an optimistic recovery in the digital market and a notable H2 rise in consumer electronics demand. In addition to this, the global traditional industry accounted for 34% of the cobalt demand. Stimulated by military and aerospace demand, the demand in traditional industries has significantly increased YoY.

➢ In 2024, global demand for cobalt raw materials is expected to modestly increase to about 216,700 mt, driven by rising consumer and EV demands. The lithium battery industry's share of this demand is projected to rise to 70%. Looking downstream, due to the drive of new energy vehicles, the EV battery still has a certain increase in the demand for cobalt.

➢ Aside from other traditional industries, the demand in 2023 was ahead of schedule, so it is projected that operations will return to normalcy in 2024 and then continue to run steadily.

Figure: 2018-2024F Global Cobalt Demand by Downstream

10,000 mt in metal content

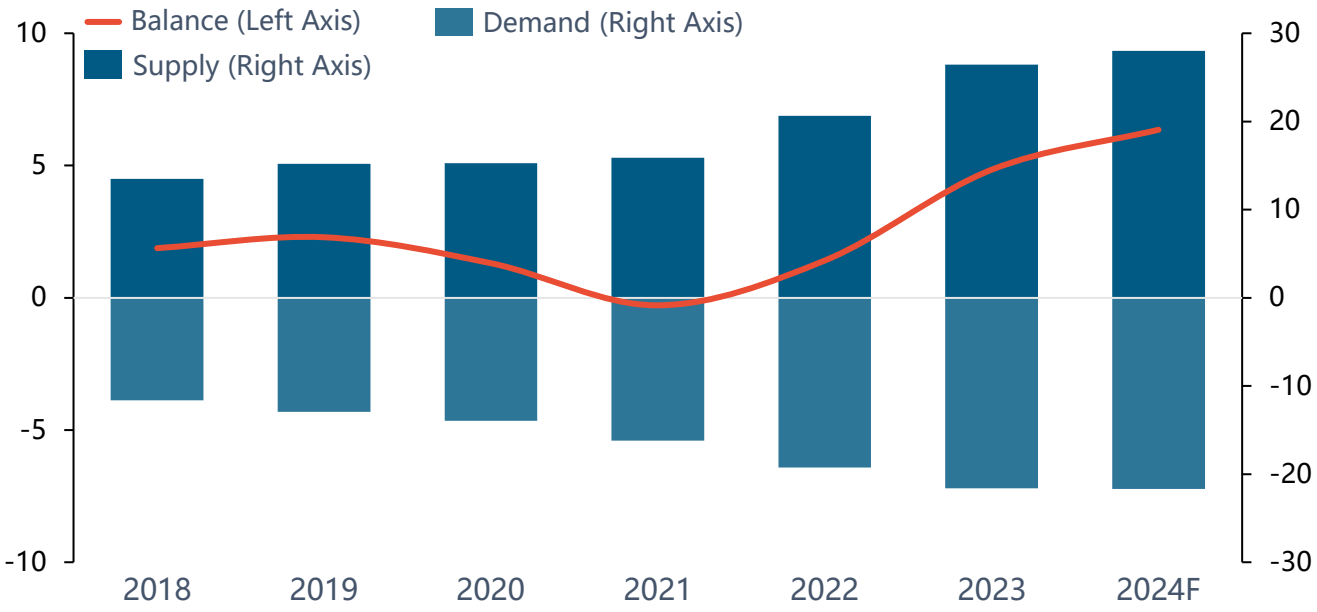


Source: SMM

3. Global cobalt supply and demand analysis (2018-2024F)

Figure: Global cobalt raw material supply and demand balance (2018-2024F)

10,000 mt in metal content



Source: SMM

➢ From 2018 to H1 2020, the supply side continued to grow while the demand side was rapidly weakened due to a significant decline in China's new energy subsidies and the sudden outbreak of the COVID-19 pandemic, resulting in an oversupply in the market balance. From H2 2020 to Q1 2022, with countries, especially those in Europe, increasing subsidies for new energy vehicles, the global production and sales volume of new energy vehicles in 2021 is to reach 6.31 million vehicles, up 114% YoY. However, the supply side was hindered by geographical differences in Africa and the impact of shipping logistics in South Africa and other places, leading to a shortage of global cobalt resources and becoming the main bottleneck in cobalt supply. From Q2 2022 to the end of 2022, due to the ongoing impacts of the COVID-19 pandemic and sluggish economic growth, consumer demand in the digital segment decreased. Ternary power gradually shifted towards high-nickel, high-energy density, and the growth rate of cobalt demand in traditional industries slowed.

➢ In 2023, the global cobalt market trended towards accumulation, with supply growth outpacing demand growth. On the supply side, new production capacities such as Glencore, CMOC Group Limited, and the Indonesian nickel-cobalt project were launched in 2023, increasing supply. The global cobalt supply is expected to be 264,000 mt in metal content, with a growth rate of 28%. On the demand side, the early demand in the digital consumer market weakened, but there was a certain recovery towards the end of the year driven by new Huawei devices. However, the EV market was hit by LFP products, the economy of ternary materials declined, the production of ternary products fell, and the corresponding cobalt demand growth slowed. The total global cobalt demand in 2023 is estimated to be 216,000 mt in metal content.

➢ In 2024, the growth rates of global cobalt supply and demand were relatively stable, but the supply growth rate was higher than the demand growth rate, thus maintaining an overall surplus in the supply-demand relationship. On the supply side, the expansion of raw ore capacity continues, notably with a significant increase in MHP production in Indonesia. Additionally, the recycling market is maintaining its growth momentum, contributing to an overall rise in supply. The global cobalt supply is estimated to reach approximately 280,200 mt in metal content. On the demand side, the demand growth rate in the EV market slightly increased, the consumer market steadily grew, and the growth rate in traditional industries remained stable. In 2024, the total global demand for cobalt is anticipated to be approximately 216,700 mt in metal content.

4. Appendix: Main drivers for Chinese companies to invest in the global cobalt industry

➢ As shown in this report, China does not have enough cobalt reserve to meet the demand，which is one of main drivers for Chinese cobalt producers to find investment opportunities in the other countries. At the same time, strong copper demand and less copper reserve in China make these projects more valuable for investment.

➢ In 1999, the Chinese government initiated the Going Out Strategy, which encouraged Chinese companies to expand overseas foreign direct investments. As strong domestic demand growth in many different minerals and less reserve in China, many Chinese companies would like to directly invest in overseas mining assets under the Going Out Strategy in order to secure their supply chain.

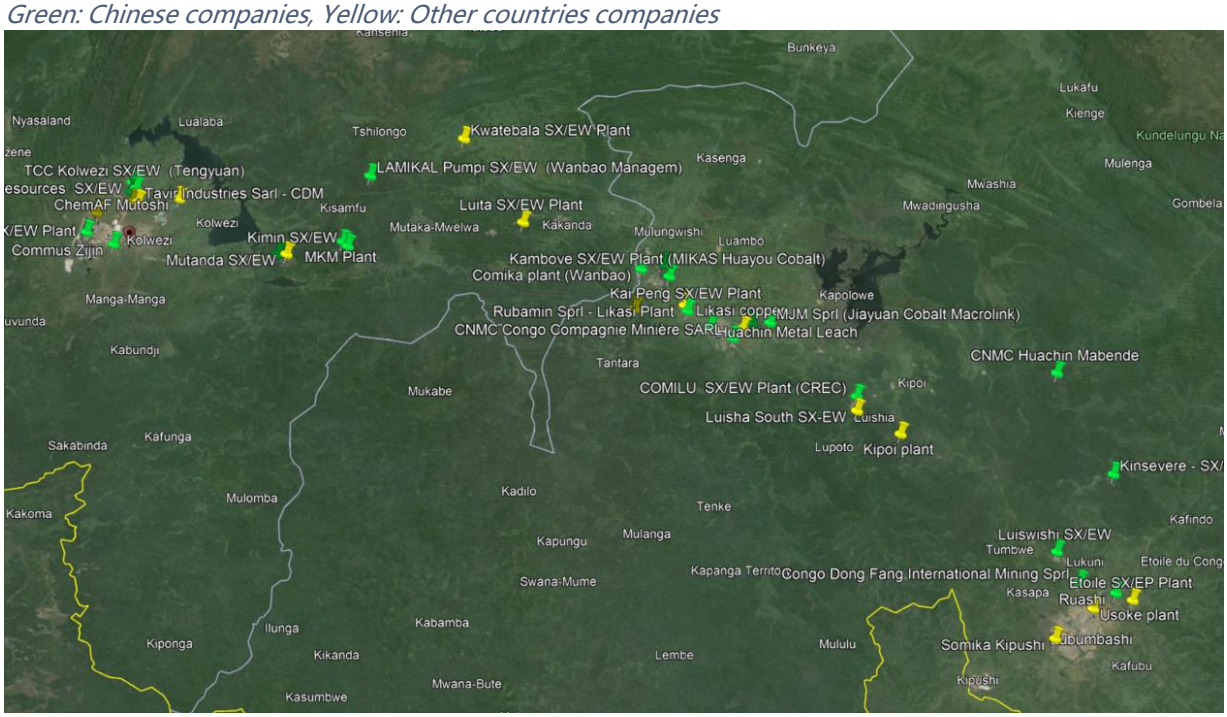
➢ Supported by a new mining code in 2022 which was issued under pressure from the World Bank, the liberalization of mining sector in DRC resulted in an influx of foreign companies, including Chinese investors. From 2003, Chinese companies started to invest in some small-scale pyrometallurgical smelting projects, which includes Wanbao, Huayou and others. During the copper bull market of 2004-2007, companies at that time made huge profits. However, the global financial crisis eliminated many small and medium-sized companies. After the global financial crisis, the hydrometallurgical process has become more popular in DRC as high-grade copper/cobalt ore was depleting. DRC need more investment to further develop the mining and refining industry. At the same time, EVs industry started booming in China. Chinese companies realised cobalt is the critical mineral for the lithium-ion battery industry and started to invest in cobalt mines rather than only refining facility in DRC.

➢ Since the European debt crisis, Chinese companies accelerated the M&A of mining assets in DRC from many western mining companies. For example, MMG purchased Anvil Mining Limited in 2012. Jinchuan Group fully incorporated Metorex as a subsidiary with a $1.28 billion buyout in 2012. In 2014, Zijin Mining merged COMMUS at 112 million USD from Huayou Cobalt. In 2016, CMOC acquired 56% shares of TFM with 2.65 billion USD from Freeport-McMoRan. The commodity super-cycle in China and the financial situation of some western mining companies gave more opportunities to Chinese mining companies to access some minerals resources that they always desire to obtain before. In order to access more copper/cobalt reserves in DRC, Chinese companies adopted more flexible investment strategies, for example Sicomines project and Deziwa project, which supplied more options for DRC authorities.

➢ Similar as DRC, the strong demand in battery metals, the Indonesian nickel export ban policy, and HPAL technology development encouraged more Chinese investment in the nickel/cobalt industry in Indonesia, which secures nickel supply for China and further enhance China's position in the global cobalt industry.

Figure: Copper/cobalt processing plants in DRC

Green: Chinese companies, Yellow: Other countries companies



Source: SMM, Google maps

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