

INDUSTRY OVERVIEW

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OVERVIEW OF THE ELECTROLYTIC COPPER FOIL MARKET AMID DUAL MACRO TRENDS, WITH DOWNSTREAM DEMAND ANALYSIS

Analysis of the Global and China Energy Transition Landscape

Against the backdrop of intensifying global climate change risks and rising geopolitical uncertainties, the energy system is facing dual challenges of decarbonization pressure and security constraints. Extreme weather events and greenhouse gas emission restrictions are driving countries to transition toward low-carbon and clean energy systems, while fluctuations in international energy prices and supply chain instability are prompting major economies to reduce their structural reliance on fossil fuels. In this context, building a secure and sustainable energy system centered on new energy has become a common direction for global energy development. From a policy perspective, major global economies continue to advance the energy transition by improving institutional frameworks and setting clear medium- to long-term targets. Under its “carbon peaking and carbon neutrality” goals, China is promoting adjustments to its energy structure, proposing the establishment of a new power system with new energy as the mainstay, and introducing supporting policies for new energy grid integration and new-type energy storage systems. From an industry perspective, the energy transition is gradually shifting toward a stage characterized by industrialization and large-scale application. Installed capacity of wind and solar power continues to grow, while new energy vehicles, energy storage systems and distributed energy are being rapidly adopted, driving the electrification of energy consumption.

Analysis of Key Downstream Demand in the Global and China’s New Energy Industry

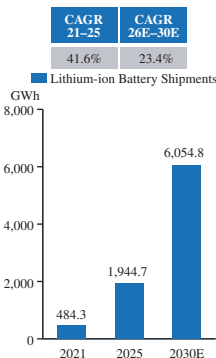
Against the backdrop of the continued advancement of the energy transition, the new energy industry is entering a phase of accelerated growth, driving increasing demand across key downstream application sectors, including new energy vehicles, consumer electronics and energy storage systems. In the automotive sector, driven by the trends of electrification, intelligence and connectivity, new energy vehicle shipments continue to expand, supporting growing demand for power batteries and related systems. In the consumer electronics sector, as terminal devices continue to upgrade and application scenarios become more diversified, shipments are increasing steadily, driving demand for high energy density, miniaturized and high-efficiency batteries. In addition, in the energy storage system sector, with the large-scale deployment of renewable energy and the growing need for grid stability, energy storage system installations are expanding rapidly, further driving demand for battery systems. As a core carrier across these applications, lithium-ion batteries enable energy storage systems, power supply and system operation, and are indispensable to the functionality of new energy systems. As demand from these application sectors continues to grow, demand for lithium-ion batteries is expected to increase in tandem. Global lithium-ion battery shipments increased from

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484.3 GWh in 2021 to 1,944.7 GWh in 2025, and are projected to further expand to 6,054.8 GWh by 2030, representing a CAGR of approximately 23.4% from 2026 to 2030. As a key material for lithium-ion batteries, electrolytic copper foil is expected to experience sustained demand growth alongside the expansion of lithium-ion battery applications.

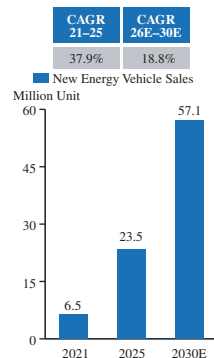
Global Lithium-ion Battery Shipments

2021&2025&2030E



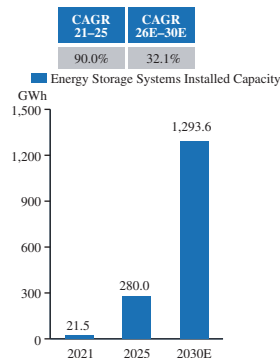
Global New Energy Vehicle Sales

2021&2025&2030E



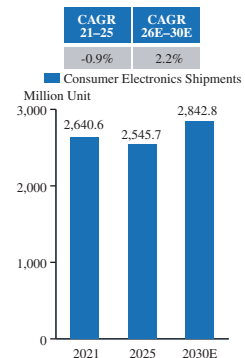
Global Energy Storage Systems Installed Capacity

2021&2025&2030E



Global Consumer Electronics Shipments

2021&2025&2030E



Source: Frost & Sullivan, International Energy Agency, Ministry of Industry and Information Technology

Analysis of the Global and China’s Development of Artificial Intelligence

As a key driver of a new round of information technology transformation, the development of artificial intelligence is closely tied to its computing power foundation and hardware carriers. In the early stages, artificial intelligence relied on algorithm optimization and improvements in computing capability, with model training and inference conducted through centralized computing. With the maturation of deep learning and the large-scale deployment of perception-based applications, demand for computing power increased significantly, accelerating the development of data centers and high-performance computing infrastructure. In recent years, with the evolution of large models, parameter scales and algorithm complexity have continued to increase, making computing power infrastructure a core foundation for artificial intelligence development.

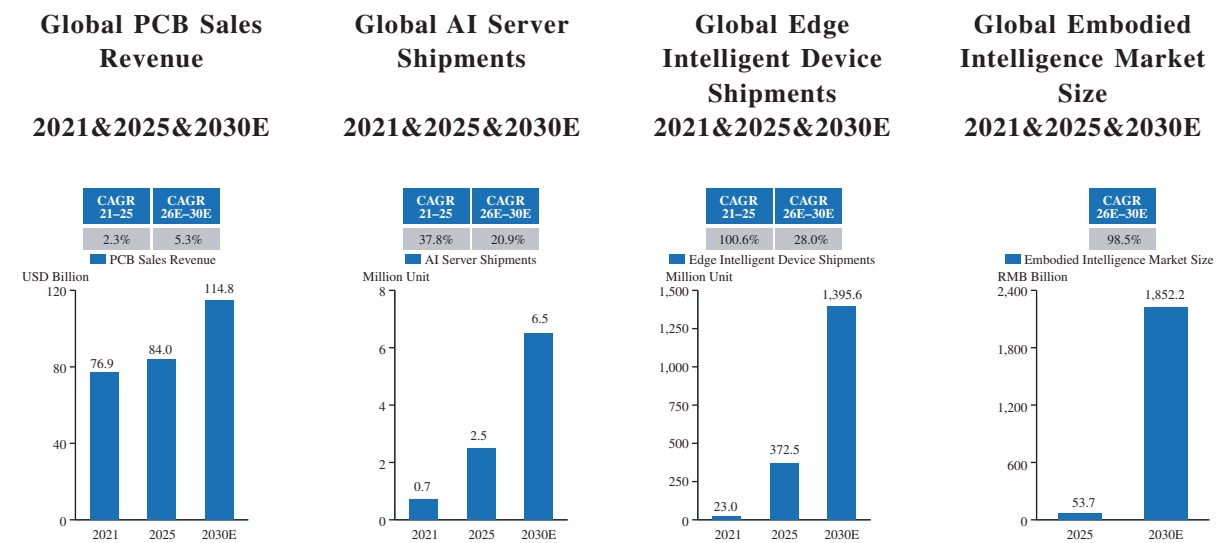
Against this backdrop, computing power carriers have evolved from a single cloud-based model to a coordinated architecture across cloud, edge and terminal. Model training and complex inference remain concentrated in data centers and AI servers, while advances in model compression, inference acceleration and energy efficiency optimization are enabling artificial intelligence capabilities to extend to the terminal side, driving growth in both the scale and functionality of intelligent devices. Overall, cloud-based infrastructure and terminal-side devices together constitute the core hardware carriers of artificial intelligence. While supporting the expansion of servers and data centers, they also increase system complexity and drive growing demand for related electronic manufacturing and fundamental materials.

Analysis of Key Downstream Demand in the Global and China’s Artificial Intelligence Industry

Against the backdrop of the rapid advancement and large-scale deployment of artificial intelligence technologies, the AI industry is entering a phase of accelerated growth, driving increasing demand across key downstream application sectors, including AI servers, edge-side intelligent devices and embodied intelligence. In the computing infrastructure segment, driven by the

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scaling of large models and rising computing power demand, AI server deployments continue to expand, supporting demand for high-performance computing hardware. In the edge-side application segment, as artificial intelligence extends to terminal devices and application scenarios diversify, shipments of edge intelligent devices are increasing, driving demand for local computing and data processing capabilities. In addition, in the embodied intelligence segment, with the integration of artificial intelligence and the physical world accelerating, embodied intelligence is developing rapidly, further driving demand for intelligent hardware systems. As a core component embedded across these applications, PCB serves as the fundamental carrier for electronic components, enabling signal transmission, power distribution and system integration, and is indispensable to AI-related hardware. As demand for such applications continues to expand, demand for PCB is expected to grow in tandem. The global PCB market size increased from USD 76.9 billion in 2021 to USD 84.0 billion in 2025, and is projected to further expand to USD 114.8 billion by 2030, representing a CAGR of approximately 5.3% from 2026 to 2030. As a core raw material of PCB, electrolytic copper foil is expected to experience sustained demand growth alongside the expansion of PCB applications.



Source: Frost & Sullivan, Global Electronics Association, International Energy Agency

Analysis of the Synergistic Growth Trend between Energy Transition and the Artificial Intelligence Industry

From the perspective of industrial development logic, the energy transition and the artificial intelligence industry are forming a synergistic growth pattern characterized by mutual reinforcement. The rapid evolution of artificial intelligence continues to amplify energy demand through multiple channels. As model scales expand and application complexity increases, demand for computing power rises significantly, driving the expansion of data centers and AI servers and increasing high-density, continuous electricity consumption. At the same time, the extension of artificial intelligence capabilities from cloud to terminal devices is driving upgrades in sensing, computing and interaction, further increasing overall power demand.

Against this backdrop, the coordinated development of computing infrastructure and intelligent devices has transformed energy demand from a centralized load into a multi-layer structure spanning data centers, edge nodes and terminals. This places higher requirements on power system stability, continuity and regulation capability, thereby accelerating the development of new energy generation, energy storage systems and related infrastructure. At the same time, the energy transition is providing

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increasing support for the large-scale development of artificial intelligence. As new energy capacity expands and energy storage systems and system dispatch capabilities improve, supply stability, scalability and long-term cost control are enhanced. This helps alleviate energy constraints associated with high computing loads and better matches the demand of data centers and intelligent devices for stable and efficient power supply, supporting the continued expansion of computing infrastructure and terminal devices.

Analysis of the Key Value of Electrolytic Copper Foil in This Context

Against the backdrop of the synergistic growth between the energy transition and the artificial intelligence industry, electrolytic copper foil, as a key fundamental material, plays an indispensable role in both the new energy industry chain and the electronic manufacturing system. In the new energy sector, it serves as the anode current collector of lithium-ion batteries, underpinning the large-scale application and performance improvement of power batteries and energy storage systems. In the electronic manufacturing system related to artificial intelligence, it acts as a high-end interconnection material and is widely used in high-performance PCBs, supporting signal transmission stability, system reliability and overall performance.

As applications in new energy and artificial intelligence evolve toward larger scale, higher performance and greater integration, demand expansion and technological upgrades jointly drive increases in both the usage scale and performance requirements of electrolytic copper foil. On the one hand, growing shipments of new energy vehicles, energy storage systems and artificial intelligence-related equipment increase the number of lithium-ion batteries and electronic systems, thereby expanding overall copper foil consumption. On the other hand, rising requirements for energy density, safety and consistency in new energy systems, together with higher demands for computing density, reliability and high-speed interconnection in artificial intelligence devices, further elevate both usage intensity and technical requirements at the single-cell and system levels.

GLOBAL ELECTROLYTIC COPPER FOIL INDUSTRY ANALYSIS

Definition and Classification of Electrolytic Copper Foil

Electrolytic copper foil is a thin metallic material produced using high-purity copper, in which copper ions are deposited onto the cathode through electrolysis of a copper sulfate solution. It features controllable thickness, high uniformity and excellent electrical conductivity. The as-deposited foil is further processed through surface treatment and performance optimization according to application requirements, and then slit into finished products. Benefiting from advantages in large-scale production, consistency control and cost efficiency, electrolytic copper foil is widely used in lithium-ion batteries, electronic information and manufacturing sectors. Based on downstream performance requirements, electrolytic copper foil can be broadly classified into lithium-ion battery copper foil and electronic circuit copper foil. Lithium-ion battery copper foil, used as the anode current collector, can be further categorized into ultra-thin ($<6\ \mu\text{m}$) and very thin ($6\text{--}12\ \mu\text{m}$) copper foil. Electronic circuit copper foil, used as a conductive and interconnection material in circuit boards, is typically classified into thin ($12\text{--}18\ \mu\text{m}$), standard ($18\text{--}70\ \mu\text{m}$) and thick ($>70\ \mu\text{m}$) copper foil.

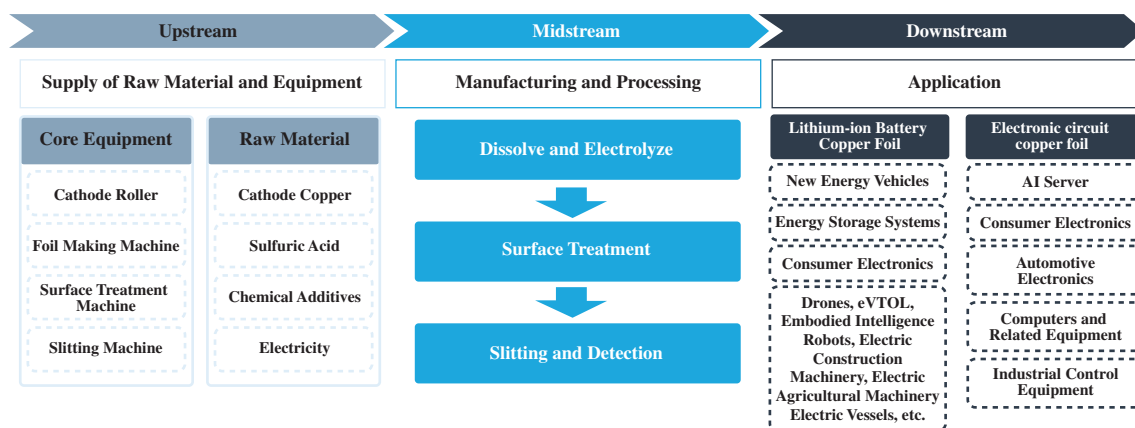
Industry Chain of the Electrolytic Copper Foil Industry

The electrolytic copper foil industry chain mainly comprises upstream raw materials and equipment, midstream manufacturing and processing, and downstream applications. The upstream segment includes core equipment and raw materials. Equipment mainly covers cathode rollers, foil-making machines, surface treatment and slitting equipment, while raw materials include cathode copper, sulfuric acid, chemical additives and electricity, which together determine product

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performance in thickness control, consistency and surface quality. The midstream segment involves the manufacturing and processing of electrolytic copper foil, including dissolving cathode copper to form a copper sulfate solution, electrolytic deposition, followed by surface treatments such as anti-oxidation and roughening, as well as slitting and quality inspection. This segment is critical to the formation of product performance. The downstream segment mainly includes lithium-ion battery copper foil and electronic circuit copper foil applications. Lithium-ion battery copper foil is used in new energy vehicles, energy storage systems and consumer electronics, while electronic circuit copper foil is widely applied in AI servers, consumer electronics, automotive electronics, computers and industrial control equipment.

Industrial Chain of the Electrolytic Copper Foil Industry



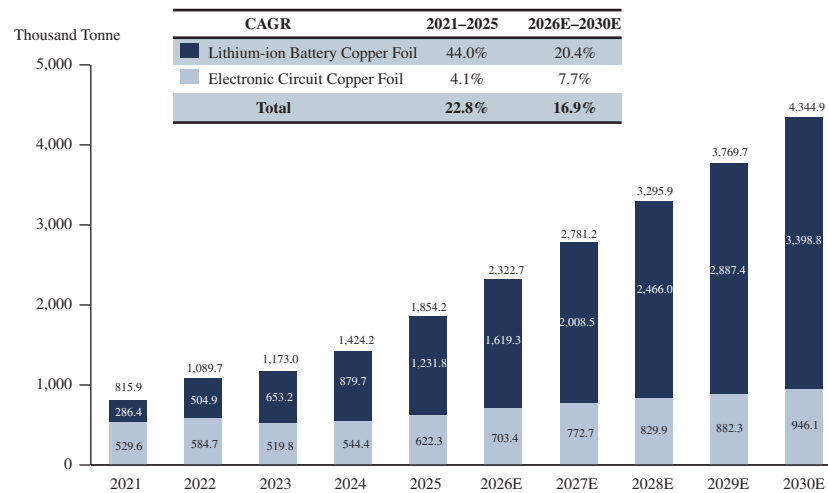
Source: Frost & Sullivan, Global Electronics Association

Electrolytic Copper Foil Market Analysis

With the continued development of the new energy industry and the electronic information industry, demand for key fundamental materials from lithium-ion batteries and high-end electronic manufacturing continues to increase, driving the continuous expansion of the electrolytic copper foil market. Global shipment volume of electrolytic copper foil increased from 815.9 thousand tonnes in 2021 to 1,854.2 thousand tonnes in 2025. Looking ahead, driven by the continued growth in demand for new energy vehicles, energy storage systems and high-performance electronic products, the importance of electrolytic copper foil as an anode current collector and a key electronic interconnection material will become more prominent. Global shipment volume of electrolytic copper foil is expected to reach 4,344.9 thousand tonnes by 2030. Lithium-ion battery copper foil is the core component of the electrolytic copper foil market, and its demand growth is mainly driven by the accelerated penetration of new energy vehicles, energy storage systems and electrified terminals. Global shipment volume of lithium-ion battery copper foil is expected to increase from 1,231.8 thousand tonnes in 2025 to 3,398.8 thousand tonnes in 2030. Electronic circuit copper foil is mainly used in the electronic circuit board sector, and its demand is highly correlated with the overall development level of the electronic information industry. Global shipment volume of electronic circuit copper foil is expected to increase from 622.3 thousand tonnes in 2025 to 946.1 thousand tonnes in 2030.

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Global Shipment Volume of Electrolytic Copper Foil by Application, 2021–2030E



Source: Frost & Sullivan, Global Electronics Association, International Energy Agency

Analysis of Key Drivers of the Electrolytic Copper Foil Industry

- AI-driven upgrades in new energy and electronic systems are increasing demand for high-performance electrolytic copper foil.** As artificial intelligence penetrates new energy systems, data centers and electronic devices, requirements for computing density, system complexity and reliability continue to rise, driving higher performance requirements for electronic interconnection materials and battery materials. As the anode current collector of lithium-ion batteries and a core material for high-performance PCBs, electrolytic copper foil benefits from its advantages in conductivity, consistency and reliability.
- Downstream products are evolving toward higher energy density and integration, raising performance requirements for electrolytic copper foil.** In the lithium-ion battery sector, increasing demands for energy density and safety are driving the development of thinner and higher-strength copper foil. In the electronic manufacturing sector, higher integration and signal transmission requirements are driving demand from high-performance PCBs for higher-quality copper foil.
- Policy support and regulatory improvements provide a solid foundation for long-term industry development.** As new energy and electronic information industries continue to grow, improving policy frameworks and technical standards support the R&D, application and industrialization of electrolytic copper foil. Policies promoting new energy development, advanced manufacturing and the self-sufficiency of critical materials further underpin the industry’s long-term growth.

Development Trends of the Electrolytic Copper Foil Industry

- The technological development path is shifting from single-point breakthroughs to systematic process optimization.** As downstream applications impose increasingly stringent requirements on performance consistency and reliability, the development of electrolytic copper foil technologies is gradually transitioning from improvements in single

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performance indicators to systematic optimization across electrolysis processes, surface treatment and quality control, placing higher demands on overall process capabilities and manufacturing systems.

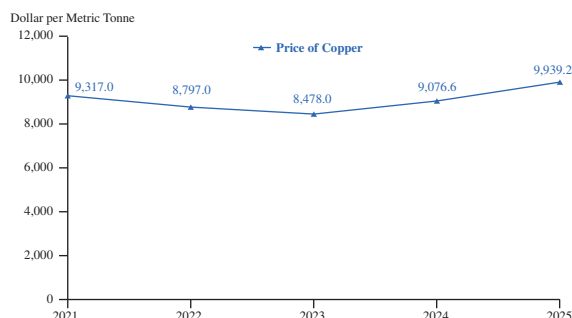
- **Rising localization levels across the new energy and electronic industry chains reinforce the trend of domestic supply of critical materials.** With the continued expansion of the new energy and electronic information industry chains, downstream customers are placing increasing emphasis on supply chain stability and localized supporting capabilities. As a key fundamental material, the advantages of localized supply of electrolytic copper foil in ensuring delivery stability, shortening response cycles and enabling collaborative R&D are becoming increasingly prominent.
- **Sustainability requirements are accelerating the adoption of green manufacturing processes.** Driven by the “carbon peaking and carbon neutrality” goals and sustainability principles, the industry is placing increasing emphasis on energy conservation, resource utilization efficiency and environmentally friendly processes. The application and optimization of green manufacturing processes are gradually becoming an important direction for industry development.
- **New current collector materials such as composite copper foil are in the industrialization exploration stage and are expected to gradually expand their application in high-safety battery systems.** As next-generation battery technologies such as solid-state and semi-solid-state batteries continue to advance, requirements for safety, energy density and lightweight profiles are increasing, driving continuous evolution in the structural design and functional properties of current collector materials. Composite copper foil, through its composite structure, offers potential advantages in reducing unit weight and enhancing safety redundancy, and its application potential in next-generation battery systems is expected to be gradually realized.

Analysis of Raw Material Prices of Electrolytic Copper Foil

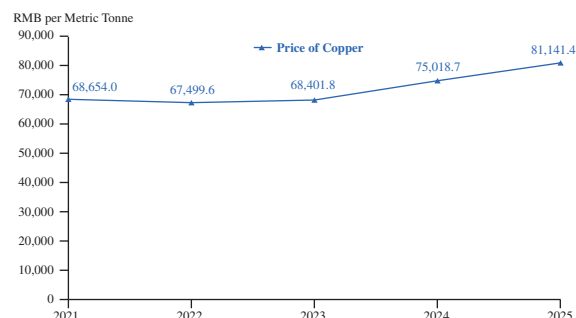
The primary raw material for electrolytic copper foil is copper. However, the profitability of copper foil enterprises is not significantly directly affected by fluctuations in copper prices, as their profit levels are mainly determined by processing fees, which reflect process and technological value-added. As an important bulk industrial metal, copper is widely used in areas such as new energy power generation and energy storage systems, electric drive and high-voltage systems of new energy vehicles, as well as data center servers and supporting infrastructure, due to its excellent electrical and thermal conductivity. Its price trend is highly correlated with the development of the new energy and high-end manufacturing industries. From 2021 to 2025, global copper prices generally exhibited a trend of first declining and then rebounding. From 2021 to 2023, affected by factors such as pandemic-related disruptions, tightening global monetary policies, a slowdown in macroeconomic growth and weaker-than-expected recovery in manufacturing demand, downstream copper demand experienced phased pressure, and prices declined. Thereafter, as the installed capacity of new energy accelerated, the penetration rate of intelligent vehicles continued to increase, and the construction of AI data centers entered an accelerated stage, copper demand grew significantly; meanwhile, on the supply side, constrained by the long development cycle of mines, the relatively slow release of new capacity and restrictions on the import of certain resources, supply growth remained relatively limited. The market supply-demand relationship became tighter, driving a notable rebound in copper prices after 2023.

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**Annual Average Copper Prices,
Global, 2021–2025**



**Annual Average Copper Prices,
China, 2021–2025**



Source: Frost & Sullivan, London Metal Exchange, Shanghai Metals Market

Mainstream New Energy Battery Technology Routes and Development Trends

At present, new energy batteries mainly include technological routes such as lithium-ion batteries and sodium-ion batteries. Lithium-ion batteries are an electrochemical energy storage system in which lithium ions are intercalated and deintercalated between the cathode and anode to achieve energy storage and release, with copper foil serving as the anode current collector. Benefiting from high energy density, strong rate performance and mature manufacturing processes, lithium-ion batteries have been widely applied in new energy vehicles, energy storage systems and consumer electronics. Sodium-ion batteries, by contrast, use sodium ions as charge carriers and offer certain advantages in terms of cost, safety and low-temperature performance; however, constrained by energy density levels and the maturity of the industry chain, their current applications are mainly concentrated in certain energy storage systems, low-speed new energy vehicles, two-wheelers and backup power supplies. From a medium- to long-term perspective, the core direction of technological evolution in new energy batteries lies in continuously improving energy density and safety performance to meet the needs of extended driving range in new energy vehicles and the large-scale deployment of energy storage systems. Under this development trajectory, supported by a well-established industry chain and continuous engineering iteration capabilities, lithium-ion batteries will remain the mainstream technological route in the field of electrochemical energy storage systems, while sodium-ion batteries will mainly serve as a complementary solution in cost-sensitive or specific application scenarios. As lithium-ion batteries evolve toward high-performance systems such as semi-solid-state and solid-state, both the capacity and structural complexity of individual battery cells are increasing, placing higher requirements on the stability, consistency and reliability of key materials. In this process, copper foil, as an essential material, is expected to see further increases in both usage per cell and performance requirements alongside rising battery capacity and ongoing design optimization.

Comparison between Mainstream New Energy Battery Technology Routes

Category	Lithium-ion Battery	Sodium-ion Battery
Main cathode material types	Ternary materials (NCM/NCA), lithium cobalt oxide (LCO), lithium iron phosphate (LFP)	Layered oxides, polyanionic compounds, Prussian blue analogs

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Category	Lithium-ion Battery	Sodium-ion Battery
Representative cathode material compositions	Li(Ni ₂ Co ₂ Mn)O ₂ , Li(Ni ₂ Co ₂ Al)O ₂ , LiCoO ₂ , LiFePO ₄	NaMO ₂ , Na ₃ V ₂ (PO ₄) ₅ , Na ₂ Fe[Fe(CN) ₆], etc.
Energy density (Wh/kg)	High	Relatively low
Cycle life	Medium to high	Medium
Safety	Medium to high	High
Cost	Medium to relatively high	Low
Main application scenarios	New energy vehicles, energy storage systems, consumer electronics, etc.	Energy storage systems, low-speed new energy vehicles, two-wheelers, etc.

Source: Frost & Sullivan, International Renewable Energy Agency, United States Department of Energy

Pricing Mechanism and Future Outlook of Electrolytic Copper Foil Enterprises

From the perspective of pricing mechanisms, the profitability of electrolytic copper foil is primarily determined by processing fees rather than raw material copper prices. As copper is a bulk commodity, price fluctuations can generally be passed through to downstream customers. Copper foil enterprises typically adopt a pricing model of “copper price pass-through + processing fee”, and therefore fluctuations in copper prices have a relatively limited direct impact on gross profit margins.

Processing fees are closely correlated with product performance and technological content. In lithium-ion battery and high-end electronic applications, downstream customers impose stringent requirements on thickness consistency, mechanical properties, surface treatment and reliability. High-performance copper foil requires stronger process control, higher equipment precision and better yield management, resulting in higher technical barriers and value-added. Accordingly, enterprises capable of stably supplying high-performance products are generally able to command higher processing fees and achieve stronger profitability.

At the industry level, under the combined effects of demand upgrading and improvements in the competitive landscape, the pricing system is expected to gradually stabilize and more fully reflect the processing value of high-performance products. On the demand side, continued growth in new energy and high-end electronics is driving increasing demand for high-performance copper foil, shifting competition from capacity expansion toward technology and quality. On the supply side, more rational capital expenditure, stricter environmental requirements and rising technological barriers are accelerating the exit of small and inefficient players and increasing industry concentration. As market structure continues to optimize and capacity expansion becomes more disciplined, competition is expected to become more orderly, with limited risk of destructive price competition, supporting the industry’s transition toward sustainable, technology-driven development.

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COMPETITION ANALYSIS OF THE COMPANY’S INDUSTRY

Competition Overview of the Global Electrolytic Copper Foil Industry

The global electrolytic copper foil market mainly comprises two major segments: lithium-ion battery copper foil and electronic circuit copper foil. The two types of products differ significantly in terms of technological pathways, downstream applications and competitive dynamics. The industry has gradually formed a relatively differentiated development landscape, with distinct and relatively independent competitive systems established around different application scenarios. Among them, Chinese enterprises, leveraging well-established industry chain support, large-scale manufacturing capabilities and sustained capital investment, have secured an important market position in the lithium-ion battery copper foil segment and are continuously advancing toward higher-end products in the electronic circuit copper foil segment, gradually increasing their participation and influence in the high-performance materials market. With the continued growth in demand for new energy power batteries and the increasing performance requirements of high-frequency and high-speed electronic products, the electrolytic copper foil industry is evolving toward thinner specifications, higher performance and greater consistency. The focus of competition is gradually shifting from pure capacity scale to technological iteration capabilities and comprehensive operational capabilities.

Competition Analysis of the Global Electrolytic Copper Foil Industry

In 2025, the global electrolytic copper foil market exhibited a relatively fragmented competitive landscape. In terms of shipment volume of electrolytic copper foil, the top five companies accounted for a combined market share of approximately 28.9%. Among them, the Company ranked third with a shipment volume of approximately 100.1 thousand tonnes of electrolytic copper foil, representing a market share of 5.4%.

Ranking and Market Share of Electrolytic Copper Foil Enterprises (by Shipment Volume), Global, 2025

Ranking	Company Name	Shipment Volume of Electrolytic Copper Foil (thousand tonne)	Market Share (%)
1.	Company A	141.3	7.6
2.	Company B	123.2	6.6
3.	The Company	100.1	5.4
4.	Company C	99.7	5.4
5.	Company D	72.6	3.9
	Others	1,317.3	71.1
Total		1,854.2	100.0

Source: Frost & Sullivan, the respective companies’ annual reports

Notes:

- (1) Company A is a listed company founded in 1985 and headquartered in Jiangxi, China. It focuses on the research, development, production and sales of electrolytic copper foil, with products mainly covering lithium-ion battery copper foil and electronic circuit copper foil.
- (2) Company B is a private company founded in 1996 and headquartered in Guangdong, China. It focuses on the research, development and production of electrolytic copper foil, primarily serving lithium-ion battery applications.

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- (3) Company C is a listed company founded in 2001 and headquartered in Guangdong, China. It focuses on the research, development, production and sales of high-performance electrolytic copper foil, with key applications in lithium-ion batteries and electronic circuits.
- (4) Company D is a listed company founded in 1989 and headquartered in Guangdong, China. It focuses on the research, development, production and sales of electrolytic copper foil, with products mainly used in lithium-ion batteries and PCB.

In 2025, the global lithium-ion battery copper foil market exhibited a competitive landscape characterized by leading players with a relatively fragmented overall structure. In terms of shipment volume of lithium-ion battery copper foil, the top five companies accounted for a combined market share of approximately 39.3%. Among them, the Company ranked third with a shipment volume of approximately 94.4 thousand tonnes of lithium-ion battery copper foil, representing a market share of 7.7%.

Ranking and Market Share of Lithium-ion Battery Copper Foil Enterprises (by Shipment Volume), Global, 2025

Ranking	Company Name	Shipment Volume of Lithium-ion Battery Copper Foil (thousand tonne)	Market Share (%)
1.	Company A	117.7	9.6
2.	Company B	113.0	9.2
3.	The Company	94.4	7.7
4.	Company C	93.9	7.6
5.	Company D	65.4	5.3
	Others	747.4	60.7
Total		1,231.8	100.0

Source: Frost & Sullivan, the respective companies' annual reports

Analysis of Market Entry Barriers

- **Technical barriers.** The production of electrolytic copper foil involves multidisciplinary technologies such as electrochemistry, materials engineering and precision process control, requiring strong integrated technical capabilities. As downstream applications upgrade, enterprises must continuously develop high-performance and next-generation products to meet increasingly stringent requirements in thickness control, mechanical properties and consistency. The stable deposition of ultra-thin copper layers and repeatable control of surface morphology, mechanical properties and thermal stability rely on long-term process accumulation and optimization. Core capabilities in additive systems, current control strategies and process parameter combinations are highly specialized and difficult to replicate in the short term, forming significant technical barriers.

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- **Customer barriers.** Downstream applications impose high requirements on product stability and consistency, and new entrants must undergo rigorous and lengthy customer qualification processes. In sectors such as automotive, new energy and high-end electronics, supply chains are relatively stable, with customers preferring suppliers with proven track records. Enterprises are also required to build high-quality customer resources and maintain stable delivery and service capabilities, making it time- and resource-intensive for new entrants to achieve large-scale supply.
- **Talent barriers.** The industry relies on multidisciplinary technical teams with expertise in electrochemistry, materials engineering and process control. Such talent requires both strong theoretical foundations and extensive production experience, and is typically developed through long-term accumulation. The limited supply and concentration of high-end talent among established players make it difficult for new entrants to build mature teams in the short term.
- **Capital barriers.** Electrolytic copper foil production is capital-intensive, requiring significant upfront investment in customized equipment. Enterprises must also rely on large-scale production and refined management to improve yield and reduce costs. In addition, continuous raw material procurement and working capital requirements place sustained pressure on cash flow, particularly during initial production and expansion stages.

SOURCE OF INFORMATION

We engaged Frost & Sullivan, an independent market research consultant, to conduct an analysis of, and to prepare the F&S Report about, the electrolytic copper foil market. Frost & Sullivan is an independent global consulting firm founded in 1961 in New York and its services include, among others, industry consulting, market strategic consulting and corporate training. In connection with the market research services provided, we have paid a fee of RMB 750,000 to Frost & Sullivan, which we believe to be consistent with market rates. In compiling and preparing the F&S Report, Frost & Sullivan conducted (1) primary research includes interviewing industry participants, competitors, downstream customers and recognized third-party industry associations; and (2) secondary research includes reviewing corporate annual reports, databases of relevant official authorities, as well as the exclusive database established by Frost & Sullivan over the past decades. The market projections in the F&S Report are based on the following key assumptions during the forecast period: (i) the social, economic and political conditions in Chinese markets discussed will remain stable during the forecast period, (ii) government policies on the Global and China electrolytic copper foil markets will remain consistent during the forecast period, and (iii) the electrolytic copper foil market will be driven by the factors which are stated in the F&S Report. All the data and forecasts contained in this section are derived from the F&S Report. The commissioned report has been prepared by Frost & Sullivan independently without the influence from the Company or other interested parties. Our Directors confirm that, to the best of their knowledge, after making reasonable inquiries, there is no material and adverse change in the market information since the date of the F&S Report, which may qualify, contradict or have an impact on the information in this section.