

INDUSTRY OVERVIEW

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OVERVIEW OF GLOBAL AND CHINA NEW ENERGY BATTERY INDUSTRY

Overview of the Development of Global New Energy Battery Industry

As one of the key technological pathways supporting the global energy transition and electrification, new energy batteries mainly include lithium-ion batteries, sodium batteries, and other types. Among them, lithium-ion batteries, benefiting from high energy density, long cycle life, and well-established industrialisation system, have become the dominant technology route in the new energy battery sector. Lithium-ion batteries are widely used in electric vehicles, energy storage systems (ESS), and consumer electronics, serving as a critical energy carrier for the electrification of the global energy system. In particular, driven by emerging applications such as energy storage and data centers, the industry is expected to maintain strong growth momentum. By 2030, global lithium-ion battery shipments in the data center sector are expected to reach approximately 300 GWh, while energy storage battery shipments are projected to exceed 2,500 GWh, becoming key drivers of the industry. Since 2025, the lithium-ion battery industry has gradually transitioned from an extensive development stage characterised by rapid capacity expansion to a high-quality development stage driven by technological upgrades and industrial chain optimisation.

From the perspective of downstream applications, in the power battery segment, the global new energy vehicle market continues to expand, while automakers are accelerating their integration into the value chain of battery, with an increasing number of companies establishing in-house battery production capacity. These trends are driving the development of high-performance battery technologies such as ultra-fast charging and long-range capabilities. In the energy storage battery segment, the rapid growth of global renewable energy installations, coupled with increasing electricity demand from data centers, is significantly boosting demand for large-capacity and high-safety energy storage batteries. At the same time, the rapid development of emerging industries such as robotics and low-altitude aircraft is driving increasing demand for battery products with high energy density, miniaturisation, and enhanced safety, further expanding application scenarios and supporting continuous market growth.

Overview of the Development of China New Energy Battery Industry

Increasing technical requirements in material systems, manufacturing processes, safety standards, and system integration capabilities have significantly reduced the number of new entrants. Industry competition has gradually shifted from capacity-driven model to comprehensive competition centered on technological accumulation, product safety, performance, and manufacturing efficiency. Meanwhile, Chinese lithium-ion battery companies are transitioning from an export-oriented model to a globally coordinated value chain layout, by establishing overseas production bases and strengthening localised supply chain collaboration. Against this backdrop, lithium-ion battery intelligent equipment enterprises are also enhancing their global delivery capabilities by localising both equipment technologies and service systems, thereby providing strong support for the globalisation of lithium-ion battery manufacturers.

At the same time, domestic policy support continues to strengthen for both lithium-ion batteries and upstream intelligent equipment sectors. Under the “15th Five-Year Plan”, new energy and high-end equipment manufacturing have been identified as key development priorities. On the one hand, policies are guiding power battery and energy storage battery technologies toward higher safety, higher energy density, and longer cycle life, accelerating the release of demand for advanced equipment corresponding to key lithium-ion battery processes such as stacking and filling. On the other hand, policies promoting intelligent manufacturing, digital factories, and green manufacturing are driving lithium-ion battery production lines to upgrade from standalone automation to integrated intelligent, flexible, and data-driven systems.

INDUSTRY OVERVIEW

Analysis of New Energy Battery Technology Pathways

Lithium-ion battery technology is undergoing iterative upgrades driven by both structural design and material system innovation. In recent years, the industry has gradually phased out low-efficiency small-cell designs in favor of large cylindrical or elongated, thinner large-format cell solutions. In terms of battery material systems, continuous improvements in cathode and anode materials, as well as electrolyte formulations, are driving lithium-ion batteries toward higher energy density, enhanced safety, and longer lifespan, forming a technology trend centered on high integration and efficient energy utilisation.

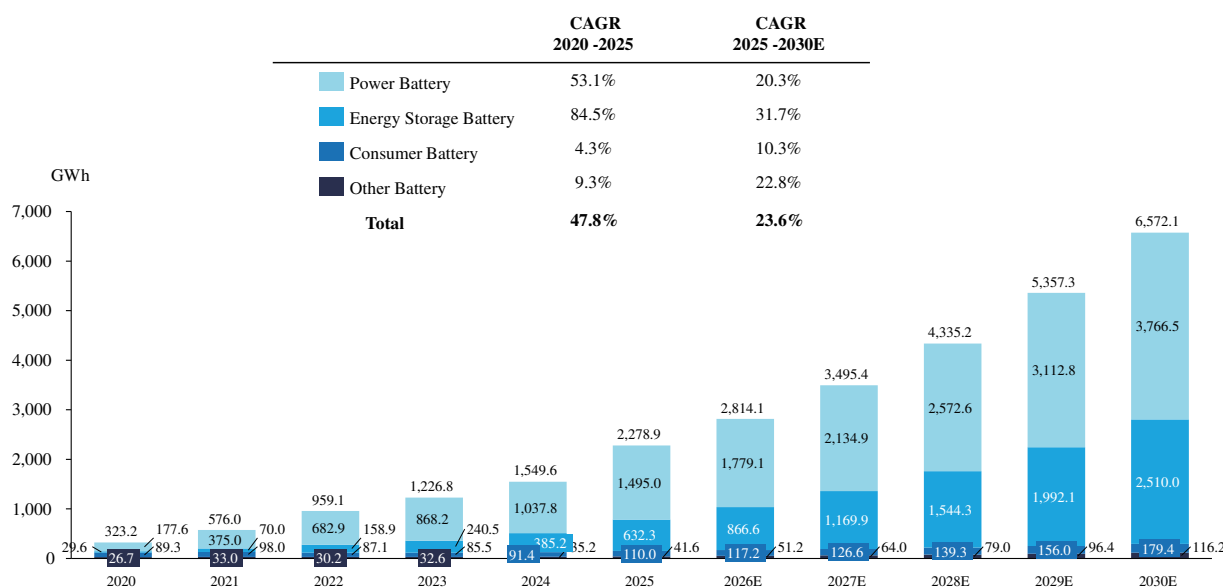
Specifically for energy storage batteries, ultra-large-capacity cells of 600Ah and above have become the mainstream technical direction. Constrained by core factors such as electrode sheet size, internal stress distribution, space utilisation rate and safety, cells above 600Ah almost universally adopt stacking process during production. Thus, stacking process has become the standard and optimal solution for the mass production of ultra-large-capacity energy storage cells.

In addition, solid-state battery and semi-solid-state battery technologies are regarded as key pathways to break through the energy density limits of traditional liquid lithium-ion batteries while reducing thermal runaway risks. As electrolyte systems evolve from liquid to semi-solid and eventually to fully solid states, new requirements are imposed on cell structures and manufacturing processes. Under this trend, the penetration rate of stacking processes continues to increase. Compared with traditional winding processes, stacking technology reduces stress concentration and lithium plating risks caused by electrode bending, making it more suitable for meeting the uniformity and stability requirements of solid-state electrolyte interfaces. By 2030, global shipments of solid-state battery and semi-solid-state battery are expected to exceed 500 GWh, demonstrating strong commercialisation potential and further accelerating the adoption of stacking processes in lithium-ion battery manufacturing. Therefore, the development of solid-state and semi-solid-state batteries will simultaneously drive the evolution of manufacturing processes toward stacking-based production, jointly shaping the next generation of high-performance battery technologies.

Market Size Analysis of Global New Energy Battery Industry

The global new energy battery industry is maintaining rapid growth and has become a key pillar of the global energy transition and modern industrial system, with lithium-ion batteries accounting for over 90% of total shipments. Global lithium-ion battery shipments increased from 323.2 GWh in 2020 to 2,278.9 GWh in 2025, representing a CAGR of 47.8%. By 2030, global shipments are expected to reach 6,572.1 GWh, with a CAGR of 23.6% from 2025. By application segment, power battery, energy storage battery, and consumer battery shipments are projected to reach 3,766.5 GWh, 2,510.0 GWh, and 179.4 GWh, respectively, by 2030, with corresponding CAGRs of 20.3%, 31.7%, and 10.3% from 2025.

Global Lithium-ion Battery Shipments by Application Scenarios, 2020-2030E



Sources: IEA, Frost & Sullivan

INDUSTRY OVERVIEW

From the perspective of global lithium-ion battery effective production capacity and regional distribution, China has long maintained a dominant position in the global manufacturing system, while overseas markets are accelerating production capacity expansion. In 2025, global lithium-ion battery effective production capacity reached approximately 3.0 TWh, with China accounting for a dominant share of 73.9%. The shares of effective production capacity in Europe and the United States increased to 8.4% and 11.0% in 2025, respectively. Looking ahead to 2030, global lithium-ion battery effective production capacity is expected to expand to approximately 8.0 TWh. The shares of effective production capacity in Europe and the United States are projected to increase to 11.0% and 13.3%, respectively, thereby driving a gradual diversification of the global production capacity structure.

OVERVIEW OF GLOBAL AND CHINA LITHIUM-ION BATTERY INTELLIGENT EQUIPMENT INDUSTRY

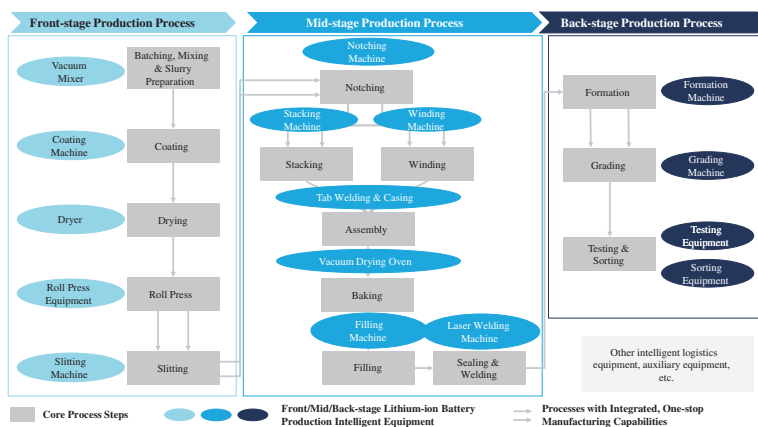
Analysis of Lithium-ion Battery Production Processes and Core Workflow

The lithium-ion battery production process is typically divided into three stages: front-stage electrode manufacturing stage, mid-stage cell assembly stage, and back-stage formation, capacity grading, and module assembly stage. Among these, mid-stage cell assembly stage is the core segment that determines cell structure and performance, mainly involving key processes such as stacking or winding, notching, and filling. The stacking process directly affects battery consistency, yield rate, safety, and electrochemical performance, making it one of the segments with the highest technological barriers in lithium-ion battery manufacturing equipment.

In terms of cell forming methods, there are two main approaches: stacking and winding. The winding process is currently more mature and is primarily applied in cylindrical batteries and some prismatic batteries. It continues to dominate the power battery segment, especially in large cylindrical batteries. The stacking process, on the other hand, is mainly used for pouch batteries and elongated, thinner prismatic batteries. By stacking multiple layers of electrodes alternately, stacking technology significantly improves space utilisation and reduces stress concentration caused by electrode bending, thereby lowering internal resistance and enhancing cycle life. It also demonstrates clear advantages in charge/discharge efficiency and thermal management. At present, stacking cells account for a relatively high proportion in energy storage batteries.

With the continuous expansion of the lithium-ion battery industry, the growth rate of stacking processes is expected to exceed that of winding processes. On the one hand, increasing demand for high safety, long cycle life, and large-capacity structures in energy storage batteries supports the sustained high penetration of stacking cells. On the other hand, in future technology pathways of power battery, the penetration of blade battery and prismatic batteries is expected to further increase, thereby driving greater adoption of stacking processes in the power battery segment. Overall, in 2025, the penetration rates of winding and stacking batteries are approximately 65% and 35%, respectively. By 2030, these are expected to shift to approximately 45% and 55%. With the continuous adoption of prismatic and elongated, thinner cell formats in the power battery sector, the application scope of stacking processes in lithium-ion battery manufacturing will further expand, making it a key development direction for mid-stage lithium-ion battery intelligent equipment.

Lithium-ion Battery Production Process Flow



Sources: China Industrial Association of Power Sources, Frost & Sullivan

Note: Integrated machines covering multiple process steps are commonly applied in the production process.

INDUSTRY OVERVIEW

Analysis of Key Process Pain Points in Lithium-ion Battery Production

In the production of power battery and energy storage battery, stacking and filling are among the most critical processes and represent key bottlenecks affecting yield rate and efficiency. The stacking process requires high precision in electrode notching, accurate alignment during stacking, and fast production cycle time. Traditional step-by-step processes often suffer from high misalignment rates and extensive manual intervention. Leading companies have adopted laser notching and stacking integrated machine solutions to integrate notching and stacking into a single process, which not only significantly improves alignment accuracy but also shortens the production cycle. The filling process requires uniform electrolyte penetration, precise filling volume, and controlled temperature and humidity conditions. Filling machines achieve high consistency and low defect rates through precise flow control, pressure monitoring, and temperature and humidity management. The precision of notching and stacking, filling control capability, equipment stability, and adjustability of mid-stage lithium-ion battery intelligent equipment directly determine product yield, performance consistency, and production efficiency. Therefore, mid-stage lithium-ion battery intelligent equipment serves as a key enabler for enhancing the overall value of the production line and achieving customisation for different application scenarios.

Analysis of the Lithium-ion Battery Intelligent Equipment Value Chain

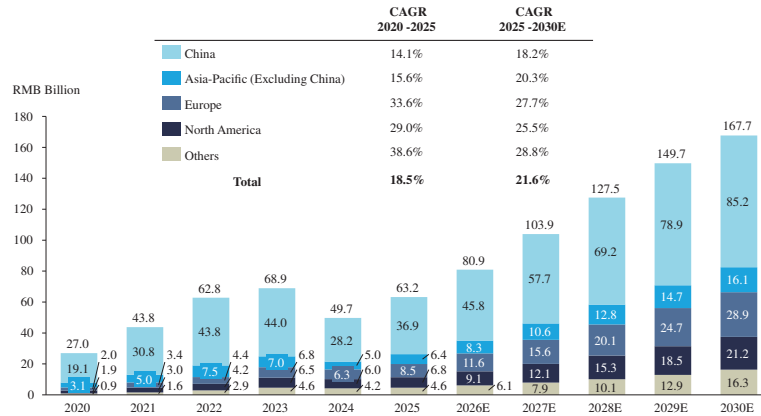
The lithium-ion battery intelligent equipment value chain exhibits strong characteristics of technology integration. The upstream segment mainly includes core components and systems such as precision transmission systems, motion control systems, pneumatic components, machine vision, and industrial software, which provide the foundational support for equipment precision, stability, and automation levels. The midstream consists of lithium-ion battery intelligent equipment manufacturers. Their core competitive barriers lie in a deep understanding of battery manufacturing processes, capabilities in precision equipment R&D and manufacturing, and software system development. By deeply integrating mechanical equipment, control systems, and industrial software, such equipment can not only perform automated production tasks but also enable real-time data acquisition, production parameter adjustment, and equipment status monitoring, thereby improving production efficiency and yield rate. The downstream segment comprises lithium-ion battery manufacturers. Leading battery manufacturers are placing higher demands on production line efficiency, yield rate, and extreme manufacturing capabilities. Meanwhile, continuous iteration of battery technologies is driving midstream lithium-ion battery intelligent equipment enterprises to carry out ongoing technological upgrades and customised R&D, thereby forming long-term and stable cooperative relationships.

Market Size Analysis of Lithium-ion Battery Intelligent Equipment Industry

From 2020 to 2025, the market size of global lithium-ion battery intelligent equipment industry increased from RMB27.0 billion in 2020 to RMB63.2 billion in 2025, representing a CAGR of 18.5%. In 2024, the market experienced short-term fluctuations due to a cyclical inventory destocking across the battery industry and a slowdown in capacity expansion investments. In 2025, industry capacity utilisation rebounded significantly, with the global top three lithium-ion battery manufacturers achieving utilisation rates exceeding 90%, driving a rapid recovery in equipment investment demand. China remains the largest market globally, with its market size expected to grow from RMB36.9 billion in 2025 to RMB85.2 billion in 2030. Meanwhile, Europe and North America are expected to record strong growth, with CAGRs of approximately 27.7% and 25.5% from 2025 to 2030 respectively. This growth in overseas markets is primarily driven by the localisation of battery supply chains and expanding downstream demand, creating significant opportunities for Chinese lithium-ion battery intelligent equipment manufacturers in overseas production line deployment and project execution.

INDUSTRY OVERVIEW

Market Size of Global Lithium-ion Battery Intelligent Equipment Industry by Regions, by Revenue, 2020-2030E

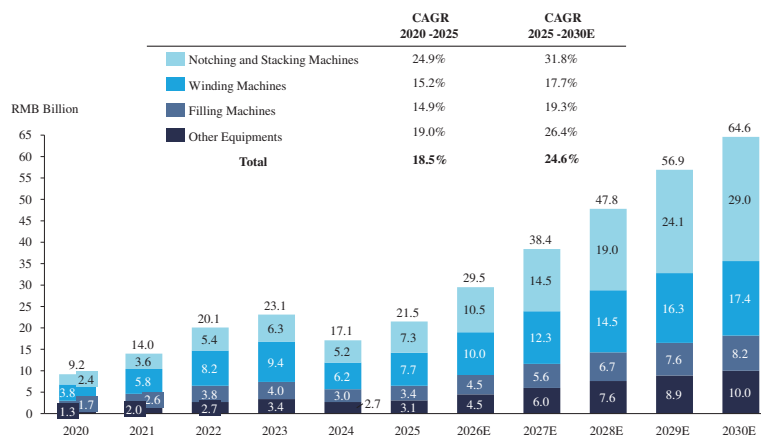


Sources: McKinsey & Company, Frost & Sullivan

The mid-stage lithium-ion battery intelligent equipment directly affects battery structural stability, energy density, and yield rate, making it a critical segment in battery manufacturing with high technical barriers and concentrated value. In 2025, mid-stage intelligent equipment accounted for approximately 34.0% of the global lithium-ion battery intelligent equipment market. With the advancement of high energy density battery technologies, the expansion of power battery and energy storage production capacity, and increasingly stringent requirements for production efficiency and yield, demand for mid-stage intelligent equipment is expected to continue growing. The global mid-stage lithium-ion battery intelligent equipment market is projected to increase from RMB21.5 billion in 2025 to RMB64.6 billion in 2030, representing a CAGR of 24.6%.

For equipment types, notching and stacking machines, winding machines, and filling machines constitute the core mid-stage equipment system. Currently, winding processes remain dominant in power battery production. However, as batteries evolve toward larger formats and elongated, thinner designs, notching and stacking machines are expected to grow faster. The global lithium-ion battery notching and stacking machines market is projected to increase from RMB7.3 billion in 2025 to RMB29.0 billion in 2030, representing a CAGR of approximately 31.8%, outpacing winding machines. By 2030, the market sizes of winding machines and filling machines are expected to reach RMB17.4 billion and RMB8.2 billion respectively.

Market Size of Global Mid-stage Lithium-ion Battery Intelligent Equipment Industry by Equipment Types, by Revenue, 2020-2030E



Sources: Frost & Sullivan

Notes: Notching and stacking machines include notching machines, stacking machines, notching and stacking integrated machines and pouched stacking machines.

INDUSTRY OVERVIEW

Market Driver Analysis of Lithium-ion Battery Intelligent Equipment Industry

Rapid Expansion of Battery Capacity and Overseas Deployment

Driven by strong growth in power battery and energy storage demand, the lithium-ion battery industry is entering a TWh-scale capacity expansion cycle, which is continuously boosting demand for lithium-ion battery intelligent equipment. Global lithium-ion battery effective production capacity reached 3.0 TWh in 2025, with a CAGR of 38.0% from 2020 to 2025. At the same time, supply chain localisation policies in Europe and the United States, such as the “EU Battery Action Plan”, “Green Deal Industrial Plan”, and “Critical Raw Materials Act”, are accelerating the localisation of raw material sourcing, processing, and recycling to establish regional battery ecosystems. Against this backdrop, Chinese battery companies are accelerating overseas capacity deployment. Overseas battery plant construction not only generates incremental equipment demand but also raises requirements for equipment suppliers in terms of international certification, project delivery capabilities, and localised operation and maintenance services, driving the establishment of global delivery and service systems.

Battery Scaling and Elongated, Thinner Cell Design Driving Equipment Upgrade

Power battery and energy storage battery are evolving toward higher energy density and greater system integration. Trends toward larger capacity and elongated, thinner cell designs are accelerating equipment upgrades. In power battery field, elongated, thinner cell designs enhance volumetric utilisation and system energy density while improving safety and cycle life. In energy storage field, 314Ah LFP batteries have achieved large-scale deployment, while 600Ah and above cells are gradually entering mass production. These developments significantly increase the complexity of mid-stage processes, particularly in stacking, where higher precision in electrode alignment and stacking stability is required. They also drive coordinated upgrades in downstream processes such as filling. The laser notching and stacking integrated machine, which integrates notching and stacking processes, significantly improves alignment precision, reduces material damage, and shortens production cycles. As requirements for efficiency, consistency, and automation continue to rise, such integrated solutions are emerging as a key direction for mid-stage process upgrades.

Scale Manufacturing and High Yield Requirements Enabling High-end Equipment

Leading battery manufacturers are increasingly focused on achieving both large-scale production and high yield rates. Under mass production conditions, battery cells must maintain parts-per-billion (PPB) level consistency and safety, imposing stringent requirements on equipment precision, process control, and system stability. For example, stacking machines must operate at approximately 0.1 second per piece, while enabling millisecond-level dynamic correction to minimise alignment deviations and contamination risks. At the same time, earlier-generation production lines are gradually becoming inadequate in terms of precision, automation, and efficiency, driving demand for equipment upgrades and retrofits, and thereby releasing replacement demand.

Market Trend Analysis of Lithium-ion Battery Intelligent Equipment Industry

Accelerated Penetration of Equipment Integration and Production Line Automation

Lithium-ion battery intelligent equipment is evolving from standalone automation toward process integration and fully automated production lines. Integrated solutions, such as the laser notching and stacking integrated machine, reduce process interruptions, minimise material handling risks, and optimise plant footprint and capital expenditure. Automation is also extending from individual workstations to full-line coordination. Intelligent conveyor equipment connects front-stage, mid-stage, and back-stage processes, enabling automated transport, buffering, and flexible scheduling. These advancements enhance traceability, operational stability, and yield, while reducing manufacturing costs per GWh.

Localised Operation and Maintenance System Promoting Upgrade of Equipment Service Capabilities

As Chinese battery manufacturers accelerate global expansion, overseas gigafactories are placing increasing demands on localised service capabilities. In regions such as Europe, stringent carbon footprint regulations, data compliance requirements, and high downtime costs necessitate comprehensive local service systems covering installation, commissioning, maintenance, and upgrades. Leading equipment manufacturers are establishing regional technical centers, supported by local engineering teams to facilitate production ramp-up and process optimisation. In addition, replacement cycles for earlier-generation equipment are expected to further drive demand for upgrades and retrofits.

INDUSTRY OVERVIEW

Evolution of Solid-state Battery Technology Boosting Equipment Value

As battery technologies evolve toward semi-solid-state battery and solid-state battery systems, manufacturing processes are undergoing fundamental changes. Due to the lack of fluidity and the brittle nature of solid electrolytes, stacking becomes the dominant process, accompanied by new requirements such as thermal lamination and ultra-high-pressure densification. This drives the development of advanced equipment integrating thermal, mechanical, optical, and electrical technologies. Meanwhile, solid-state battery production requires ultra-low humidity environments and highly automated material handling systems. These changes significantly increase capital intensity per GWh and create greater value opportunities for technologically advanced equipment manufacturers.

Entry Barrier Analysis of Lithium-ion Battery Intelligent Equipment Industry

As the global power battery and energy storage battery industry accelerates its international expansion, the lithium-ion battery intelligent equipment industry has developed barriers across localisation, technology, customer resources, and capital. In terms of localisation, overseas battery plant construction relies on suppliers for installation, commissioning, maintenance, and system upgrades. Strong modular design and standardised delivery enable rapid deployment and continuous optimisation, enhancing customer stickiness. Technologically, mid-stage intelligent equipment needs deliver high precision and consistency under high-speed operations, requiring advanced design, process integration, and system stability. These capabilities depend on long-term R&D, experienced teams, and validation with leading customers. From customer perspective, the industry is characterised by high customer concentration and switching costs. Equipment typically undergoes lengthy validation, and once adopted into production lines, stable supplier relationships are formed, especially for leading manufacturers favoring long-term partners for joint R&D. The industry is also capital-intensive, requiring sustained investment in both advanced equipment R&D and precision manufacturing capabilities.

Competitive Landscape Analysis of Global Lithium-ion Battery Intelligent Equipment Industry

Lithium-ion battery intelligent equipment manufacturers can be broadly classified into specialised lithium-ion battery intelligent equipment providers and integrated solution providers offering complete production lines. Compared with integrated solution providers, specialised providers concentrate their R&D resources on core process segments, enabling more targeted upgrades and cost-efficient retrofit solutions.

As the global lithium-ion battery industry chain accelerates its international expansion, leading Chinese lithium-ion battery intelligent equipment providers are accelerating their expansion into overseas markets, establishing localised delivery and operation systems through collaboration with local technical service partners. In terms of customer validation, overseas clients generally have longer validation cycles compared to the domestic market, typically extending to nearly one year. This is primarily attributable to longer cross-border transportation and logistics cycles, greater complexity in coordinating localised commissioning resources, and differences in acceptance standards, certification processes, and quality requirements across markets, which collectively prolong project implementation and acceptance timelines.

In 2025, the global mid-stage lithium-ion battery intelligent equipment market reached RMB21.50 billion. The top five mid-stage lithium-ion battery intelligent equipment providers collectively accounted for approximately 48.1% of the market, indicating a relatively concentrated competitive landscape. Among them, the Company recorded revenue of RMB1.22 billion from mid-stage lithium-ion battery intelligent equipment, representing a market share of 5.7%, ranking fourth globally.

INDUSTRY OVERVIEW

Global Top Five Mid-stage Lithium-ion Battery Intelligent Equipment Providers by Revenue, 2025

Ranking	Company	Headquarters	Revenue (RMB Billion)	Market Share (%)
1	Company A	Jiangsu Province, China	4.40	20.5%
2	Company B	Guangdong Province, China	2.00	9.3%
3	Company C	Guangdong Province, China	1.80	8.4%
4	The Company	Guangdong Province, China	1.22	5.7%
5	Company D	Guangdong Province, China	0.90	4.2%
Top Five			10.32	48.1%
Total			21.50	100.0%

Source: Annual report from listed companies, Frost & Sullivan

In 2025, the global lithium-ion battery notching and stacking machine market reached RMB7.30 billion. The top five lithium-ion battery notching and stacking machine providers collectively accounted for approximately 59.1% of the market, indicating a concentrated competitive landscape. Among them, the Company generated revenue of RMB0.72 billion from lithium-ion battery notching and stacking machines, corresponding to a market share of 9.8%, ranking second globally. Only the top three lithium-ion battery notching and stacking machine providers, including the Company, have the capability to mass-produce stacking machines with stacking efficiency of 0.1 second per piece as of the end of 2025.

Global Top Five Lithium-ion Battery Notching and Stacking Machine Providers by Revenue, 2025

Ranking	Company	Headquarters	Revenue (RMB Billion)	Market Share (%)
1	Company A	Jiangsu Province, China	1.80	24.7%
2	The Company	Guangdong Province, China	0.72	9.8%
3	Company B	Guangdong Province, China	0.70	9.6%
4	Company E	Guangdong Province, China	0.60	8.2%
5	Company F	Guangdong Province, China	0.50	6.8%
Top Five			4.32	59.1%
Total			7.30	

Source: Annual report from listed companies, Frost & Sullivan

In 2025, the global lithium-ion battery filling machine market reached RMB3.40 billion. The top five lithium-ion battery filling machine providers collectively held approximately 51.4% of the market, indicating a relatively concentrated competitive landscape. Among them, the Company generated revenue of RMB0.19 billion from lithium-ion battery filling machines, representing a market share of 5.7% and ranking fifth globally.

Global Top Five Lithium-ion Battery Filling Machine Providers by Revenue, 2025

Ranking	Company	Headquarters	Revenue (RMB Billion)	Market Share (%)
1	Company A	Jiangsu Province, China	0.70	20.6%
2	Company G	Jiangsu Province, China	0.40	11.8%
3	Company H	Guangdong Province, China	0.25	7.4%
4	Company F	Guangdong Province, China	0.20	5.9%
5	The Company	Guangdong Province, China	0.19	5.7%
Top Five			1.74	51.4%
Total			3.40	

Source: Annual report from listed companies, Frost & Sullivan

In 2025, the global lithium-ion battery winding machine market reached RMB7.70 billion. The top five lithium-ion battery winding machine providers collectively accounted for approximately 69.4% of the market, indicating a concentrated competitive landscape. Among them, the Company recorded revenue of RMB0.24 billion from lithium-ion battery winding machines, representing a market share of 3.1% and ranking fifth globally.

INDUSTRY OVERVIEW

Global Top Five Lithium-ion Battery Winding Machine Providers by Revenue, 2025

Ranking	Company	Headquarters	Revenue (RMB Billion)	Market Share (%)
1	Company A	Jiangsu Province, China	1.80	23.4%
2	Company C	Guangdong Province, China	1.50	19.5%
3	Company B	Guangdong Province, China	1.20	15.6%
4	Company D	Guangdong Province, China	0.60	7.8%
5	The Company	Guangdong Province, China	0.24	3.1%
Top Five			5.34	69.4%
Total			7.70	

Source: Annual report from listed companies, Frost & Sullivan

Notes:

1. Company A, established in 2002 and listed on both Shenzhen Stock Exchange and Hong Kong Stock Exchange, is primarily engaged in the R&D, manufacturing and sales of lithium-ion battery, solid-state battery and photovoltaic intelligent equipment, and provides integrated lithium-ion battery intelligent equipment solutions.
2. Company B, established in 2006 and listed on Shenzhen Stock Exchange, is primarily engaged in the R&D, manufacturing and sales of lithium-ion battery intelligent equipment, and provides integrated lithium-ion battery intelligent equipment solutions.
3. Company C, established in 2006, is primarily engaged in the R&D, manufacturing and sales of lithium-ion battery intelligent equipment, with major products including laser notching machines, winding machines, integrated stacking machines and formation and capacity grading machines.
4. Company D, established in 2003, is primarily engaged in the R&D and manufacturing of mid-stage lithium-ion battery intelligent equipment, with products including winding machines, notching and stacking machines.
5. Company E, established in 2001 and listed on Shenzhen Stock Exchange, is primarily engaged in the R&D, manufacturing and sales of mid-stage and back-stage lithium-ion battery intelligent equipment, with products including notching and stacking machines, formation and grading machines, etc.
6. Company F, established in 2014 and listed on Shanghai Stock Exchange, is primarily engaged in the R&D, manufacturing and sales of lithium-ion battery intelligent equipment, and provides integrated lithium-ion battery intelligent equipment solutions.
7. Company G, established in 2017 and belong to a subsidiary of a company listed on the Shanghai Stock Exchange, is primarily engaged in the R&D, manufacturing and sales of front-stage and mid-stage lithium-ion battery intelligent equipment, with major products including coating machines, slitting machines and winding machines.
8. Company H, established in 2012 and belong to a subsidiary of a company listed on the Shanghai Stock Exchange, is primarily engaged in the R&D, manufacturing, sales and services of front-stage and mid-stage lithium-ion battery intelligent equipment, with major products including stacking machines, welding machines and filling machines.

Raw Material Price Analysis of Global Lithium-ion Battery Intelligent Equipment Industry

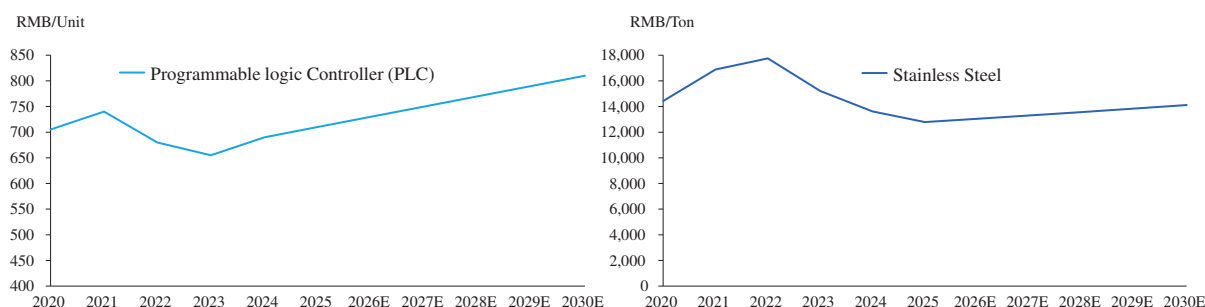
PLC (programmable logic controller) is one of the core components of lithium-ion battery intelligent equipment and is primarily used for real-time control of production processes. From 2021 to 2023, the average price of PLCs in China declined, mainly due to the gradual recovery of supply chains and the temporary slowdown in downstream demand from industries such as consumer electronics and automobiles. Starting from 2024, driven by the increasing level of industrial automation and the wider adoption of Internet of Things (IoT) applications, the average price of PLCs in China rebounded to approximately RMB720.0 per unit in 2025. During the forecast period, as demand for industrial automation continues to grow and products undergo ongoing upgrades and iteration, PLC prices in China are expected to reach approximately RMB800.0 per unit by 2030.

Stainless steel is widely used in structural components, conveying parts and key components in direct contact with batteries in lithium-ion battery intelligent equipment, and plays an important role in corrosion resistance, operational stability and service life of equipment. Since 2022, as raw material prices declined and downstream demand softened, the average price has generally trended downward, reaching approximately RMB13.0 thousand per ton in 2025. Looking ahead, stainless steel prices are expected to reach approximately RMB14.0 thousand per ton by 2030.

At the same time, in the lithium-ion battery intelligent equipment industry, equipment manufacturers typically adjust equipment pricing dynamically in response to changes in key raw material prices. In addition, by establishing long-term cooperation with core suppliers, optimising procurement strategies and improving production efficiency, companies are able to partially mitigate the impact of raw material price fluctuations on operating costs.

INDUSTRY OVERVIEW

Prices of PLCs and Stainless Steel in China, 2020-2030E



Source: Shanghai Futures Exchange, Frost & Sullivan

SOURCE OF INFORMATION

We commissioned Frost & Sullivan to conduct market research on the global lithium-ion battery intelligent equipment industry to prepare the F&S Report. Frost & Sullivan is an independent global consulting firm founded in New York in 1961, providing industry research and market strategies. We have entered into an agreement to pay Frost & Sullivan RMB400,000 for the preparation of the F&S Report.

In preparing the F&S Report, Frost & Sullivan conducted detailed research, including discussions with several leading industry participants regarding industry conditions and interviews with relevant individuals. Frost & Sullivan also conducted secondary research, including reviewing company reports, independent research reports, and data from its own research database. Frost & Sullivan derived the estimated statistics of total market size based on historical data analysis incorporating macroeconomic data, taking into account the aforementioned main industry drivers. Its market engineering forecast methodology combines multiple forecasting techniques with a system based on market engineering measurements and relies on the expertise of the analyst team to integrate the key market elements investigated during the project research phase. Such elements primarily include expert opinion forecasting methods, integration of market drivers and constraints, integration of market challenges, integration of market engineering measurement trends, and integration of econometric variables.

The F&S Report was prepared based on the following assumptions: (i) the social, economic, and political environments globally and in Chinese Mainland are likely to remain stable during the forecast period; and (ii) the key relevant industry drivers may drive the market during the forecast period.

This section and other chapters of the document excerpt portions of information from the F&S Report, aiming to provide [REDACTED] with a more comprehensive introduction to the industry in which we operate. The Directors confirm that, to the best of their knowledge and after making reasonable enquiries, there have been no material adverse changes in overall market information since the date of the release of the F&S Report which are sufficient to make material corrections, contradict or have an impact on such information.