

INDUSTRY OVERVIEW

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OVERVIEW OF THE NEW INFRASTRUCTURE INDUSTRY

New infrastructure refers to an infrastructure system that is underpinned by information networks, driven by technological innovation, and provides services including digital transformation, intelligent upgrading and integrated innovation. New infrastructure primarily comprises information infrastructure, converged infrastructure and innovation infrastructure.

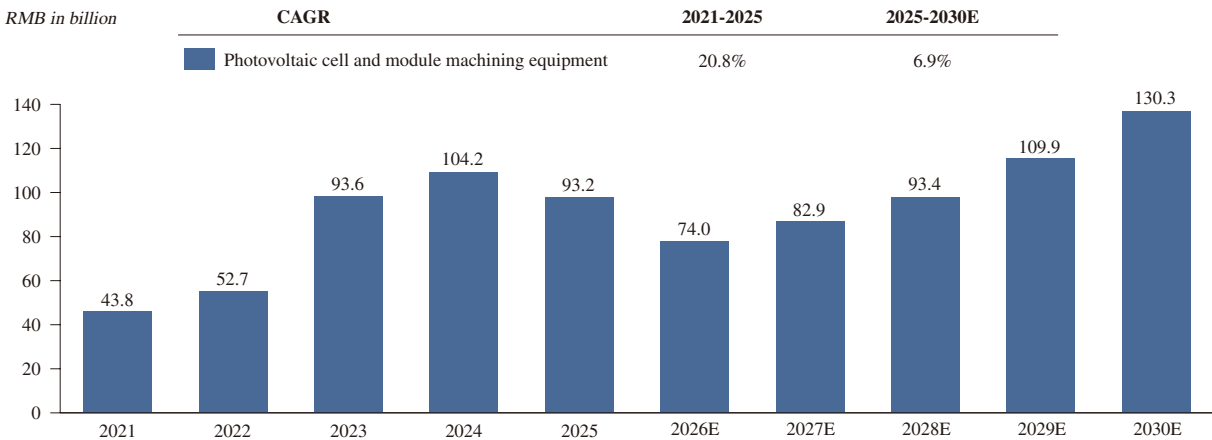
Information infrastructure refers to infrastructure developed through the evolution of next-generation information technologies and primarily includes, among others, artificial intelligence and data centres. In recent years, artificial intelligence and data centres have experienced rapid growth. The global investment in artificial intelligence increased to RMB12.6 trillion in 2025 and is expected to reach RMB51.1 trillion by 2030. The continued deepening of artificial intelligence applications has driven sustained growth in demand for computing power, with the global compute capacity being expected to reach over 50.0 ZFlops by 2030, according to CAICT. The supply of computing power is primarily enabled by data centre infrastructure, and its performance is highly dependent on high-performance chips. As the physical carrier of computing power, a chip’s transistor scale and architectural design directly determine data processing efficiency. Laser machining equipment is increasingly incorporated into chip manufacturing processes, particularly laser precision micro- and nano-machining equipment, which features its broad range of applications, precise energy control, micron-level processing capability and extremely low heat-affected zone and is well suited to thermally sensitive and structurally precise steps in chip manufacturing. Accordingly, laser precision micro- and nano-machining equipment has become increasingly important in the build-out of information infrastructure.

Converged infrastructure refers to infrastructure formed through the deep application of technologies such as the internet, big data and artificial intelligence to support the transformation and upgrading of traditional infrastructure, thereby creating converged forms of infrastructure. It includes, among others, smart energy infrastructure such as photovoltaic power stations. Photovoltaic power stations have developed rapidly in recent years, as the global end-use energy consumption has been gradually shifting from fossil fuels towards electricity, with the proportion of global fossil fuel consumption decreasing from 80.7% in 2021 to 78.6% in 2025, and being further expected to decrease to 69.8% by 2050, according to EIA. In 2025, global power generation increased to approximately over 30 PWh. In 2025, power generation in China amounted to 10.6 PWh, representing a year on year increase of 4.8%, while power generation in the United States reached 4.3 PWh, representing a year on year increase of 2.5%. To address rising electricity demand, and driven by both energy security considerations and the transition to a low-carbon economy, governments worldwide have placed increasing emphasis on power infrastructure development. Against this backdrop, photovoltaic power generation, benefiting from broad resource availability, relatively short construction cycles and a continued decline in LCOE, has become

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one of the key directions of global energy transition. In 2025, photovoltaic power generation accounted for approximately 8.0% of the global power generation, while the proportion was 11.1% in China and 6.8% in the United States, and according to EIA, the share of photovoltaic power generation in global renewable electricity generation is expected to increase to 27.3% by 2030 and further to 39.1% by 2050. Meanwhile, continuous improvement in photovoltaic cell conversion efficiency has become a core driver of photovoltaic power generation development. In order to reduce shading losses, enhance conductivity performance and improve overall conversion efficiency, different technology routes impose stringent requirements on photovoltaic cell processing precision, thereby driving continued expansion in demand for photovoltaic equipment. By 2030, in terms of revenue, the market size of the global photovoltaic cell and module machining equipment industry is expected to reach RMB130.3 billion, representing a CAGR of 6.9% from 2025 to 2030. In photovoltaic cell manufacturing, laser precision micro- and nano-machining equipment plays an important role in key processes such as cell doping, ablation and repair. It can achieve high-precision, with minimal thermal impact at micro- and nano-scales, aligning with the stringent requirements of high-efficiency photovoltaic cells for both processing precision and temperature control.

**Market size of the global photovoltaic cell and module machining equipment industry,
in terms of revenue, 2021-2030E**



Source: CPIA, IEA, CIC Report

Note: The figures of the chart have been rounded up to one decimal place.

ANALYSIS OF THE GLOBAL LASER MACHINING EQUIPMENT INDUSTRY

Definition and categorisation of laser machining equipment

Laser machining equipment refers to advanced manufacturing equipment that uses a high-energy-density laser beam as a tool to perform processes such as laser doping, ablation, annealing, etching, debonding on materials. By processing precision, laser machining equipment can be categorised into laser precision micro- and nano-machining equipment and conventional laser machining equipment. Laser precision micro- and nano-machining equipment represents a core enabling technology for high-end manufacturing and refers to laser machining equipment capable of achieving processing accuracy within 100 microns in three dimensions, with processing-induced damage controllable to the micron-level, and can be widely applied in photovoltaics, semiconductors and next-generation display/light source manufacturing. Most CO₂ laser machining equipment used in sheet material cutting has a processing accuracy exceeding 100 microns and is therefore generally not regarded as laser precision micro- and nano-machining equipment.

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By pulse duration, laser machining equipment can be categorised into continuous-wave laser machining equipment, nanosecond laser machining equipment, picosecond laser machining equipment and femtosecond laser machining equipment. Continuous-wave laser machining equipment refers to machining systems in which the output power of the laser remains constant over time and is emitted in a continuous-wave state, and energy output is continuous and there is no pulse interval. Nanosecond laser machining equipment refers to machining systems with laser pulse durations in the nanosecond range; picosecond laser machining equipment refers to machining systems with pulse durations in the picosecond range; and femtosecond laser machining equipment refers to machining systems with pulse durations in the femtosecond range. Ultrafast laser machining equipment include picosecond laser machining equipment and femtosecond laser machining equipment.

By application, laser machining equipment can be categorised into photovoltaic laser machining equipment, semiconductor laser machining equipment, next-generation display/light source laser machining equipment and others. Photovoltaic laser machining equipment can be further segmented, by target object, into photovoltaic cell laser machining equipment and photovoltaic module laser machining equipment. Photovoltaic cell laser machining equipment can be further segmented, by the applicable photovoltaic cell technology, into, among others, PERC cell laser machining equipment, TOPCon cell laser machining equipment, HJT cell laser machining equipment, BC cell laser machining equipment and perovskite cell laser machining equipment. Semiconductor laser machining equipment refers to advanced equipment that applies laser technologies in semiconductor manufacturing. Next-generation display/light source laser machining equipment refers to specialised equipment used for laser machining of next-generation display technologies such as Mini LED and Micro LED, as well as other light source applications. By processed material, representative sub-categories of laser machining equipment also include PCB laser machining equipment and TGV laser machining equipment. The trend towards higher-density PCBs places more stringent requirements on processing precision, and laser drilling technologies can meet the demand for microvia processing of high-layer-count PCBs. PCB laser machining equipment refers to equipment that uses laser technologies to perform cutting, drilling, grooving and other processes on PCBs. TGV laser machining equipment refers to equipment that uses laser technologies to achieve micron-level processing and form TGV structures on glass substrates.

The value chain of the global laser machining equipment industry

The upstream segment comprises optical components suppliers providing materials such as lasers, galvo scanners and beam shaping optics, mechanical components suppliers offering aluminium and stainless-steel machined parts, electrical components suppliers and other suppliers, including numerical control systems and motion control systems suppliers.

The midstream segment comprises laser machining equipment manufacturers. Taking the photovoltaic laser machining equipment subcategory as an example, leading companies typically place emphasis on upstream and downstream coordination. On the upstream side, they establish relationships with leading suppliers of key components such as lasers, thereby enhancing supply chain reliability. On the downstream side, they maintain close cooperation with key customers through, among other things, process validation and joint R&D mechanisms. Based on a deep understanding of downstream application requirements, leading participants are able to capture first-mover advantages during new technology introduction and commercialisation, thereby further consolidating their core competitive position within the value chain.

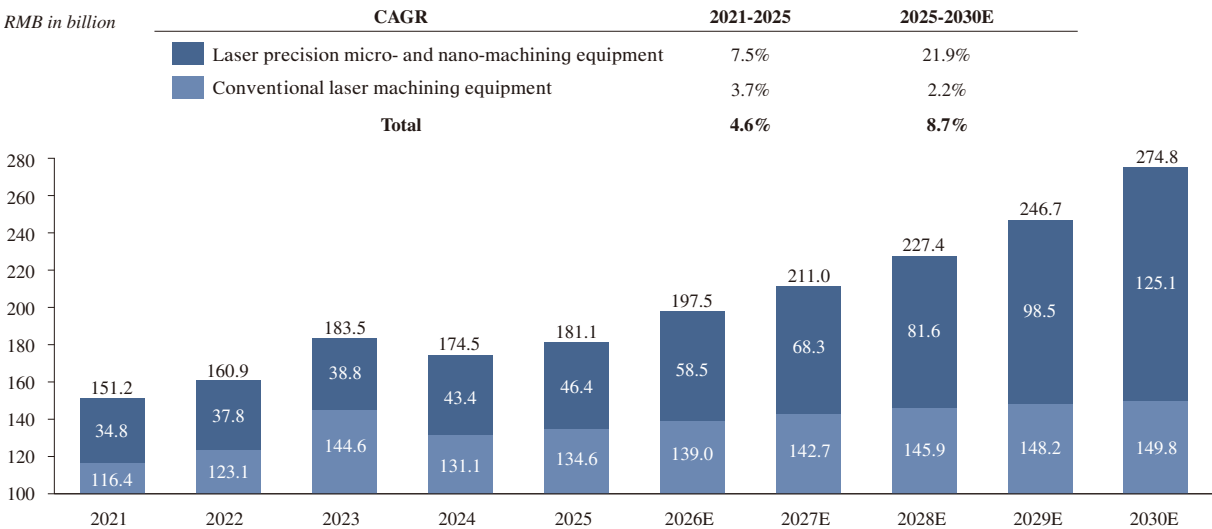
The downstream segment comprises application scenarios. Laser machining equipment is widely applied across advanced manufacturing fields, including photovoltaics, semiconductors, next-generation display/light sources, automotive and medical equipment industries. For example, in the photovoltaic sector, laser machining equipment can be used across processes such as ablation and doping for photovoltaic cells, as well as scribing and welding in module production. Laser precision micro- and nano-machining equipment is increasingly adopted in photovoltaic cell production and can be used in the patterning processes for BC cells, thereby supporting the industrialisation of lower-cost back-contact cell technologies.

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The market size of the global laser machining equipment industry

Driven by expansion across multiple downstream industries, the global laser machining equipment market has continued to exhibit overall growth. From 2021 to 2025, in terms of revenue, the market size of the global laser machining equipment industry increased from RMB151.2 billion to RMB181.1 billion, representing a CAGR of 4.6% during the period. Notwithstanding a temporary contraction in 2024, the laser precision micro- and nano-machining equipment market continued to grow, while the overall market’s decline was primarily due to reduced demand for laser welding from downstream industries such as the automotive. The market recovery in 2025 was mainly driven by the continued growth of laser precision micro- and nano-machining equipment and the growing demand for additive manufacturing equipment within the conventional laser machining equipment segment. Looking ahead, the industry is expected to undergo a structural transition, with laser precision micro- and nano-processing technologies continuing to penetrate application scenarios such as photovoltaics, semiconductors and next-generation display/light sources. As a result, laser precision micro- and nano-machining equipment is expected to become an increasingly important engine for the market growth. By 2030, in terms of revenue, the market size of the global laser machining equipment industry is expected to reach RMB274.8 billion.

Market size of the global laser machining equipment industry, in terms of revenue, 2021-2030E



Source: CPIA, WSTS, CIC Report

Note: The figures of the chart have been rounded up to one decimal place.

Photovoltaic cell laser machining equipment constitutes a vital segment of the global laser precision micro- and nano-machining equipment market, primarily driven by the continued upgrading of photovoltaic cell technologies and the further adoption of laser processing in photovoltaic cell manufacturing. In the next five years, BC cells are expected to become the mainstream in the photovoltaic cell industry, supported by advantages such as higher power generation efficiency. Accordingly, BC cell laser machining equipment is expected to represent the largest segment of the photovoltaic cell laser machining equipment market going forward. In terms of revenue, the market size of the global BC cell laser machining equipment industry is expected to record a CAGR of 66.9% from 2025 to 2030.

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Laser precision micro- and nano-machining equipment for semiconductor manufacturing is also a significant sub-category within the laser precision micro- and nano-machining equipment market. In 2025, in terms of revenue, its market size reached RMB10.5 billion. Looking ahead, continued breakthroughs in advanced semiconductor packaging technologies are expected to further stimulate demand for semiconductor laser precision micro- and nano-machining equipment. By 2030, in terms of revenue, the market size of the global laser precision micro- and nano-machining equipment applied in semiconductor manufacturing is expected to reach RMB42.0 billion, representing an expected CAGR of 31.8% from 2025 to 2030. PCBs can be used to connect chips and other electronic components into a complete electronic system and represent a principal carrier enabling semiconductor devices to be applied in downstream electronic products. As semiconductor demand continues to increase, demand for PCBs has also risen, thereby driving growth of the global PCB laser machining equipment market. By 2030, in terms of revenue, the market size of the global PCB laser machining equipment industry is expected to increase to RMB30.0 billion, representing an expected CAGR of 10.9% from 2025 to 2030.

TGV laser machining equipment has been increasingly adopted in the semiconductor and next-generation display/light source sectors. By 2030, in terms of revenue, the market size of the global TGV laser machining equipment industry is expected to reach RMB14.5 billion, with an expected CAGR of 88.2% from 2025 to 2030.

Drivers of the global laser precision micro- and nano-machining equipment industry

Increasing adoption of laser processing in the photovoltaic industry. With the expansion of mass production capacity for N-type cells, demand from the photovoltaic industry for laser machining equipment has continued to increase. Compared with P-type cells, N-type cells offer a higher theoretical conversion efficiency ceiling, lower light-induced degradation and stronger low-light response, and have progressively become a mainstream technology route. N-type cells are highly sensitive to surface passivation quality and contact resistance during processing. Compared with conventional processing methods, laser precision micro- and nano-machining equipment can perform fine processes without damaging micro-level passivation layers, thereby supporting the realisation of the performance advantages of N-type cells. For example, in the doping process, laser-selective doping equipment can achieve high-concentration doping in the contact area between metal gridlines and silicon wafers, effectively reducing resistive losses during current transmission. In photovoltaic module processing, equipment such as full-panel laser welding equipment is progressively replacing traditional equipment, primarily due to its higher efficiency and stability, and its application continues to deepen.

Rapid growth in demand for BC cells. BC cells can improve photoelectric conversion efficiency by placing electrodes entirely on the rear side of the cell, thereby reducing front-side shading losses. The theoretical photoelectric conversion efficiency of BC cells had exceeded 29.0% by 2025, which made it one of the photovoltaic cell technologies with the highest conversion efficiency. As a result, market attention has increased, and leading photovoltaic enterprises have stepped up investment in improving BC cell capacity, and BC cell demand is expected to enter a growth phase. BC cells, benefiting from their front-side gridline-free electrode structure, offer an advantage in reducing silver usage, thereby mitigating cost pressures arising from higher silver prices, and have become a major technology pathway for the industry to hedge raw material cost risks. The average closing price of spot silver increased from approximately RMB7.7 thousand per kilogram in December 2024 to approximately RMB16.0 thousand per kilogram in December 2025, representing a year-on-year increase of 107.4%. Given the higher structural complexity of BC cells, requirements for processing precision, patterning capability and process consistency are significantly more stringent. Laser processing plays a critical role in key processes such as patterned etching and is a critical process approach for enabling high-efficiency BC cell production. As the industrial scale of BC cells expands and technology maturity improves, demand for laser precision micro- and nano-machining equipment is expected to increase.

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TOPCon cell technology advancements. Benefiting from high conversion efficiency, low degradation and strong scalability for mass production, TOPCon has emerged as one of the dominant photovoltaic technology routes, with its production capacity expanding in recent years. In this context, laser precision micro- and nano-machining equipment has become a critical enabler, supporting the fine machining of complex passivated contact architectures and thereby enhancing cell efficiency, reducing recombination losses and improving manufacturing stability. Meanwhile, TOPCon cell technology continues to advance, approaching the theoretical limit of single-junction crystalline silicon cells. Ongoing process optimisation is expected to further improve its economic viability, thereby driving incremental demand for production line upgrading and supporting continued growth in the laser precision micro- and nano-machining equipment market.

Progress in the industrialisation of other new cell technologies. The development of perovskite cells is expected to further raise the upper limit of photovoltaic conversion efficiency, thereby creating additional growth potential for the industry. A typical perovskite cell structure comprises three functional layers (P1, P2 and P3) and requires laser scribing to achieve electrical isolation and series interconnection. Scribing accuracy is typically required at the micron-level. This precision threshold imposes stringent requirements on thermal impact control and line-width consistency for laser machining equipment. Accordingly, the industry is accelerating the transition towards ultrafast laser scribing technologies to meet the demanding process standards of perovskite cells. The industrialisation of perovskite cells is advancing, and certain enterprises have entered pilot-scale stages. HJT cells, supported by their distinctive technical architecture, demonstrate long-term potential in improving manufacturing efficiency and expanding application scenarios. In addition, HJT cells are relatively lightweight, enabling adaptation to non-conventional configurations and aligning with emerging requirements for lightweight applications.

Deepening applications in semiconductors and next-generation display/light sources. With the continued development of the global semiconductor industry, alongside rising demand from application areas such as artificial intelligence and data centres, the complexity of semiconductor manufacturing processes has continued to increase, resulting in more stringent requirements for processing precision, yield control and production efficiency. Against this backdrop, laser processing technologies, benefiting from non-contact processing, high precision, a small heat-affected zone and strong flexibility, have been increasingly adopted in semiconductor manufacturing and are widely used across multiple critical steps, including wafer annealing and debonding. Laser precision micro- and nano-machining equipment can be applied to processes such as laser annealing for materials including silicon carbide, and TFLN. In parallel, TGV technology, benefiting from higher space utilisation efficiency, lower interconnection latency and lower power consumption, has continued to broaden its application prospects in advanced semiconductor packaging. Laser machining equipment can achieve high-precision TGV micro-via formation on glass substrates, thereby supporting the evolution of packaging technologies towards higher integration density. Laser precision micro- and nano-machining, leveraging machining precision, selectable process adaptability and high-throughput, has also become a key process tool enabling the scaled mass production of next-generation display/light source products, with applications including Micro LED mass transfer, laser mass welding, laser repair, TGV laser micro-via forming.

Trends of the global laser precision micro- and nano-machining equipment industry

Increasing investment in R&D. Leading manufacturers have continued to increase R&D investment in laser precision micro- and nano-machining equipment. These technologies, including high-precision etching of TGV glass substrates and Micro LED mass transfer applications, present relatively high technical barriers, and participants are typically required to undertake substantial investments across multiple dimensions, including equipment expenditure and the establishment and management of specialist technical teams. Such R&D investment is, in turn, increasing the industry entry barriers. Leading participants with accumulated core technologies and sustained R&D investment are expected to further consolidate their competitive advantages.

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Rising industry concentration in photovoltaic cell laser machining equipment industry. As photovoltaic cell technologies continue to evolve towards higher efficiency, photovoltaic manufacturers have imposed more stringent requirements on processing precision, production yield, equipment stability and long-term operational reliability. In addition, photovoltaic cell manufacturing is characterised by high production cadence, long continuous operating hours and a high degree of production line coordination, thereby placing increasingly stringent requirements on equipment-to-line compatibility, process support capability and after-sales service capability. Accordingly, customers in the photovoltaic cell laser machining equipment market increasingly prefer leading equipment manufacturers with mature technology, stable product performance, robust service systems and scalable delivery capability. As a result, orders have increasingly concentrated among leading participants.

Strategic positioning into emerging application areas. With continuous iteration in laser processing technologies and the expansion of downstream demand in advanced manufacturing, certain manufacturers are making forward-looking technology deployments to extend application scenarios into emerging fields. In the photovoltaic sector, laser precision micro- and nano-machining equipment is gradually expanding into frontier applications such as high-efficiency photovoltaic modules and novel cell structures, as well as broader photovoltaic applications across a full range of scenarios, thereby providing technical reserves to support future photovoltaic technology upgrades. In the semiconductor sector, as advanced semiconductor packaging technologies continue to develop, laser precision micro- and nano-machining equipment is accelerating its penetration into key advanced semiconductor packaging process steps, including RDL processing, with application depth continuing to increase. By establishing technical capabilities and customer cooperation foundations in advance, manufacturers are better positioned to secure favourable competitive positions as emerging industries progress through commercialisation.

Intelligent upgrading. With the continued development of artificial intelligence, its integrated application within advanced manufacturing has deepened, driving intelligent upgrades for laser precision micro- and nano-machining equipment across multiple stages, including equipment design, operation and maintenance. In the design stage, AI-assisted design tools can improve structural design efficiency and simulation and verification capability, enabling faster product iteration. During operation, AI enables real-time sensing and closed-loop control, allowing systems to monitor whether products meet specifications, automatically adjust parameters and calibrate performance, and continuously evaluate operating conditions. In maintenance management, AI predictive maintenance based on big data analytics can materially reduce unplanned downtime. Overall, the increasing adoption of artificial intelligence is driving systematic improvements in efficiency, precision and reliability and is accelerating the industry’s evolution towards intelligentisation.

Maintenance services are becoming increasingly critical. Maintenance services form a key component of after-sales support, and maintenance procedures for laser precision micro- and nano-machining equipment are typically complex. In particular, inspection and maintenance of critical components such as lasers, galvo scanners and optical paths generally require specialist technicians and dedicated diagnostic tools. Professional maintenance services can help maximise the overall economic performance of equipment by preventing failures in advance and assisting customers in reducing operating costs. Given customers’ high requirements for stable operation and product yield, they increasingly require manufacturers of laser precision micro- and nano-machining equipment to provide professional and necessary maintenance services to ensure equipment remains in a satisfactory operating condition. Accordingly, maintenance services are progressively becoming one of the key factors considered by customers when selecting laser precision micro- and nano-machining equipment suppliers.

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Cost analysis in the global laser precision micro- and nano-machining equipment industry

Lasers, as the core component responsible for energy conversion and output, constitute a principal raw material in the manufacturing of laser precision micro- and nano-machining equipment. For manufacturers of laser precision micro- and nano-machining equipment, ultrafast lasers represent one of the key laser categories. From 2021 to 2025, the average price of ultrafast lasers from global leading brands decreased from RMB1,116.9 thousand per unit to RMB975.0 thousand per unit and remained relatively stable.

ANALYSIS OF THE GLOBAL LASER PRECISION MICRO- AND NANO-MACHINING EQUIPMENT APPLICATIONS

The photovoltaic industry refers to the industrial system engaged in the conversion of solar energy into electricity, covering photovoltaic cells and modules, as well as related manufacturing and operation and maintenance service segments. The global photovoltaic market has continued to expand, with favourable industry prospects. In 2025, the global cumulative installed photovoltaic capacity reached over 2,800 GW. The sustained expansion of the photovoltaic market has driven growth in demand for laser precision micro- and nano-machining equipment. In photovoltaic cell and module manufacturing, laser precision micro- and nano-machining equipment performs processes such as etching and doping on photovoltaic materials by controlling parameters including the laser beam’s energy, wavelength, pulse duration and focal position, thereby improving photovoltaic cell conversion efficiency, reducing production costs and enhancing product quality. The expansion of photovoltaic applications across a full range of scenarios impose more stringent requirements on the processing precision and equipment reliability of laser precision micro- and nano-machining equipment.

The semiconductor industry generally refers to the industrial system that, based on silicon, compound semiconductors and other semiconductor materials, provides computing, storage, communications and control capabilities, covering the full value chain including chip design, manufacturing and packaging. The global semiconductor industry has continued to grow. In terms of revenue, market size increased from RMB3.6 trillion in 2021 to RMB5.7 trillion in 2025, representing a CAGR of 12.2% from 2021 to 2025, and is expected to increase further to RMB16.9 trillion by 2030, representing an expected CAGR of 24.3% from 2025 to 2030. Driven by applications such as artificial intelligence and data centres, demand for advanced process nodes and high-end packaging has increased rapidly, resulting in more stringent requirements for processing precision, production consistency and equipment reliability, thereby providing sustained opportunities for the laser precision micro- and nano-machining equipment market. In semiconductor manufacturing and packaging, laser precision micro- and nano-machining equipment can support advanced laser annealing processes for materials such as silicon carbide and TFLN, as well as key processes including TGV laser micro-via forming, RDL laser drilling and CPO laser machining. In addition, demand for other components used in semiconductor-related machining, including PCBs, has continued to increase. In 2030, the market size of the global PCB industry, in terms of revenue, is expected to reach RMB751.4 billion. Laser precision micro- and nano-machining equipment can also be applied in key PCB processes, including high-precision drilling and microvia processing.

The next-generation display/light source industry refers to an industrial system that, based on micro light-emitting devices, thin-film devices and other advanced display/light source technologies, provides high-brightness, high-resolution, low-power-consumption and flexible display solutions. It includes frontier display technologies such as Micro LED. The global next-generation display/light source market is in a phase of rapid growth. Driven by emerging application demand such as smart wearable devices, including smartwatches, and in-vehicle displays, the industry’s growth potential continues to expand. In next-generation display/light source manufacturing, laser micro- and nano-machining equipment can materially enhance processing precision, yield and production efficiency, thereby meeting the requirements for precision manufacturing of high-density, micron-level display devices.

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COMPETITIVE LANDSCAPE OF THE GLOBAL LASER MACHINING EQUIPMENT INDUSTRY

Overview of the competitive landscape

The global laser machining equipment market is characterised by relatively low market concentration. As downstream applications continue to impose more stringent requirements on laser processing precision, the laser precision micro- and nano-machining segment has demonstrated stronger growth. Globally, there are over 100 manufacturers of laser precision micro- and nano-machining equipment. In addition, photovoltaic cell laser machining equipment represents an important category of the laser precision micro- and nano-machining equipment industry. This market exhibits a relatively high degree of concentration, primarily due to higher entry barriers. Global enterprises, represented by the Company, have established first-mover advantages in this market and continue to strengthen their competitive position through sustained R&D investment and innovation.

Ranking of the global laser precision micro- and nano-machining equipment industry

In 2025, the Company generated revenue of approximately RMB2.0 billion from its laser precision micro- and nano-machining equipment, ranking fourth in the global laser precision micro- and nano-machining equipment market with a market share of 4.3%.

Top 5 laser precision micro- and nano-machining equipment companies, by laser precision micro- and nano-machining equipment revenue, global, 2025

Ranking	Company	Laser precision micro- and nano-machining equipment revenue (RMB in billion)	Market share (%)
1	Company A	5.1	10.9%
2	Company B	3.9	8.4%
3	Company C	2.6	5.7%
4	The Company	2.0	4.3%
5	Company D	1.2	2.6%

Source: CIC Report

Note:

Company A	Established in 1996 and headquartered in Guangdong. It is principally engaged in the research and development, design, manufacturing and sale of laser machining equipment and automation solutions, and was listed on the Shenzhen Stock Exchange in 2004.
Company B	Established in 1937 and headquartered in Japan. It focuses on precision processing solutions centred on dicing, grinding, polishing and certain laser processing applications, and also provides related machines, tools and processing services. It was listed on the Tokyo Stock Exchange in 1999.
Company C	Established in 1923 and headquartered in Germany. It provides manufacturing solutions across machine tools, laser technology and electronics for industrial applications.
Company D	Established in 1999 and headquartered in Hubei. It operates across intelligent manufacturing, optical connectivity and sensing-related businesses. It was listed on the Shenzhen Stock Exchange in 2000.

The figures of the table have been rounded up to one decimal place.

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Ranking of the global photovoltaic cell laser machining equipment industry

As an important segment within laser precision micro- and nano-machining equipment, photovoltaic laser machining equipment demonstrates broad growth potential, in which photovoltaic cell laser machining equipment occupies a dominant position. The global market size of photovoltaic cell laser machining equipment reached RMB2.5 billion in 2025 in terms of revenue. In the global photovoltaic cell laser machining equipment market, as of December 31, 2025, the Company is one of the few suppliers that has achieved comprehensive mass-production and delivery coverage across multiple photovoltaic cell technologies, including BC, TOPCon, HJT, perovskite and PERC.

In 2025, the Company generated revenue of approximately RMB2.0 billion from photovoltaic cell laser machining equipment and ranked first among global suppliers of photovoltaic cell laser machining equipment, with a market share of 80.4%.

Top 3 photovoltaic cell laser machining equipment companies, by photovoltaic cell laser machining equipment revenue, global, 2025

Ranking	Company	Photovoltaic cell laser machining equipment revenue (RMB in million)	Market share (%)
1	The Company	1,981.0	80.4%
2	Company E	227.7	9.2%
3	Company F	40.1	1.6%

Source: CIC Report

Note:

Company E: Established in 2008 and headquartered in Guangdong. It is principally engaged in the research and development, design, production and sales of high-end non-standard intelligent laser machining equipment, and was listed on the STAR Market of the Shanghai Stock Exchange in 2020.

Company F: Established in 2007 and headquartered in Guangdong. It is primarily engaged in the research and development, production and sales of photovoltaic manufacturing equipment. It was listed on the ChiNext Market of the Shenzhen Stock Exchange in 2018.

The figures of the table have been rounded up to one decimal place.

Key success factors of the global laser precision micro- and nano-machining equipment industry

Sustained R&D capability and adequate R&D investment. In the case of photovoltaic cell laser machining equipment, photovoltaic cell technologies have experienced rapid evolution to N-type structures and are further expanding towards perovskite, tandem and other next-generation architectures. Each technology iteration tends to drive market demand for a new generation of laser precision micro- and nano-machining equipment. This development dynamic requires industry participants to maintain sustained and forward-looking R&D capabilities, supported by long-term and stable capital investment. In an industry characterised by rapid technology iteration, companies with strong R&D capabilities, deep technology accumulation and forward-looking process roadmaps are better positioned to maintain their competitiveness. In particular, during key periods of technological transition, timely R&D progress is essential for sustaining customer recognition and securing participation in the supplier ecosystems of major customers.

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Forward-looking business positioning. As applications of laser precision micro- and nano-machining equipment continue to extend into emerging high-growth fields, long-term competitiveness increasingly depends on strategic, forward-looking deployment. In frontier directions where technologies in photovoltaics, semiconductors and next-generation display/light sources remain in evolution, industry participants need to leverage industry insight to assess development trends and develop laser machining equipment compatible with next-generation processes in advance. Such deployment can support the establishment of first-mover advantages and enable participants to capture structural opportunities in rapidly expanding markets.

Continuous accumulation of know-how databases. The manufacturing and application of laser precision micro- and nano-machining equipment is highly dependent on know-how accumulated over time. Established participants, through sustained services to downstream customers, continuously accumulate production data relating to, among others, laser parameter matching, optical component selection, optical path control and positioning calibration. Such data forms systematic and reusable know-how databases that are difficult for other participants to replicate. Know-how databases not only reflect an enterprise’s technical capabilities but also serve as effective tools for addressing diverse customer requirements.

Transferable technology reserves. Leading participants typically develop, through long-term accumulation, a portfolio of transferable process technologies, such as laser doping, ablation, annealing, etching, debonding and microvia processing, which can be migrated across application fields and can materially shorten new product development cycles. Such transferable technology reserves not only shorten the time to enter new application areas, but also lower customer switching costs and enhance customer stickiness. In addition, the capability to reuse and redeploy technologies enables enterprises to realise technology transfer across different photovoltaic cell technologies and other application fields, including semiconductors, PCB, displays and other emerging fields, thereby enabling them to respond more rapidly to market changes, enhance the scalability of products and services, and establish strong competitive advantages amid intensifying industry competition.

Global production base and global delivery capability. With customers increasingly deploying their production capacity on a global basis, leading laser precision micro- and nano-machining equipment industry participants are required to establish cross-regional production and delivery capabilities. By setting up manufacturing bases in multiple locations globally, and by deploying comprehensive technical support systems, on-site engineering teams and remote diagnostic capabilities, participants can address cross-regional customer needs efficiently during equipment commissioning, mass-production ramp-up and technology upgrades. In addition, leveraging artificial intelligence to optimise workflows can further enhance commissioning efficiency and customers’ production line stability. Such global footprint and delivery capabilities also provide a solid foundation for participants to secure repeat orders and consolidate market share.

SOURCES OF INFORMATION

We have engaged China Insights Consultancy, an independent market research consulting firm, to conduct a detailed analysis and prepare an industry report on the markets in which we operate. China Insights Consultancy is an independent global consulting firm founded in China. It is principally engaged in the provision of market research consultancy services, conducting industry research, and providing market and enterprise strategies and consultancy services across various industries. We incurred a total of RMB530,000 in fees and expenses in connection with the preparation and use of the CIC Report.

INDUSTRY OVERVIEW

China Insights Consultancy conducted both primary and secondary research using a variety of resources in the completion of this report. Primary research involved interviewing key industry experts and leading industry participants. Secondary research involved analysing data from various publicly available data sources, such as EIA, IEA, IRENA, WSTS, CPIA, CAICT, Chinese Optical Society, company reports and the internal database of China Insights Consultancy.

The market projections in the commissioned report are based on the following key assumptions: (i) the overall social, economic, and political environment is expected to maintain a stable trend during the forecast period; (ii) the key industry drivers are likely to continue to drive the growth in each market during the forecast period; and (iii) there is no extreme force majeure or unforeseen industry regulations in which the market may be affected either dramatically or fundamentally during the forecast period. All statistics are reliable and based on information available as at the date of this report. Other sources of information, including those from the government, industry associations, or market participants, may have provided some of the information on which the analysis or its data is based. All the information regarding the Company has been sourced from the Company’s audited report or management interviews.