# INDUSTRY OVERVIEW

*The information and statistics set out in this section and other sections of this document were extracted from the Frost & Sullivan Report, which was commissioned by us, and from various official government publications and other publicly available publications. We engaged Frost & Sullivan to prepare the Frost & Sullivan Report, an independent industry report, in connection with the* ***[REDACTED]****. We believe that the sources of this information are appropriate sources for such information and have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information is false or misleading or that any fact has been omitted that would render such information false or misleading. The information from official government sources has not been independently verified by us, the Joint Sponsors,* ***[REDACTED]****,* ***[REDACTED]****,* ***[REDACTED]****,* ***[REDACTED]****,* ***[REDACTED]****, any of their respective directors and advisors, or any other persons or parties involved in the* ***[REDACTED]****, and no representation is given as to its accuracy.*

## SOURCE OF INFORMATION

We commissioned Frost & Sullivan to conduct market research on global and China's power generator sets industry, power generator engines industry and medium- and high-speed marine engines industry and to prepare the Frost & Sullivan Report. Frost & Sullivan is an independent global consulting firm founded in 1961 in New York that offers industry research and market strategies. We have contracted to pay RMB0.6 million to Frost & Sullivan for compiling the Frost & Sullivan Report.

In preparing the Frost & Sullivan Report, Frost & Sullivan conducted detailed primary research which involved discussing the status of the industry with certain leading industry participants and conducting interviews with relevant parties. Frost & Sullivan also conducted secondary research which involved reviewing company reports, independent research reports and data based on its own research database. Frost & Sullivan obtained the figures for the estimated total market size from historical data analysis plotted against macroeconomic data as well as considered the above-mentioned industry key drivers. Its market engineering forecasting methodology integrates several forecasting techniques with the market engineering measurement-based system and relies on the expertise of the analyst team in integrating the critical market elements investigated during the research phase of the project. These elements primarily include expert-opinion forecasting methodology, integration of market drivers and restraints, integration with the market challenges, integration of the market engineering measurement trends and integration of econometric variables.

The Frost & Sullivan Report is compiled based on the following assumptions: (i) the social, economic and political environment of the globe and the PRC is likely to remain stable in the forecast period; and (ii) related industry key drivers are likely to drive the market in the forecast period.

## OVERVIEW OF POWER GENERATOR SETS INDUSTRY

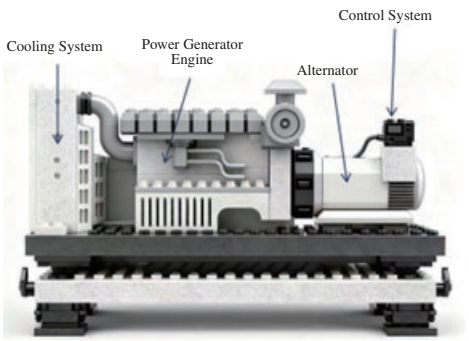
### Introduction of Power Generator Sets

Power generator sets are comprehensive power generation assembly consisting of a power generator engine, an alternator, a control system, and auxiliary products. These auxiliaries encompass essential components such as the cooling, fuel supply, and exhaust systems. The power generator engine functions as the prime mover, converting the chemical energy of fuel into mechanical energy, which is subsequently transformed into electrical energy by the alternator. The control system and auxiliary products ensure stable and efficient operation under varying load conditions. Power generator sets are primarily deployed for standby power, emergency power supply, and distributed generation systems. They are widely utilized in scenarios demanding uninterrupted and stable power supplies, such as data centers, distributed power stations, and infrastructure.

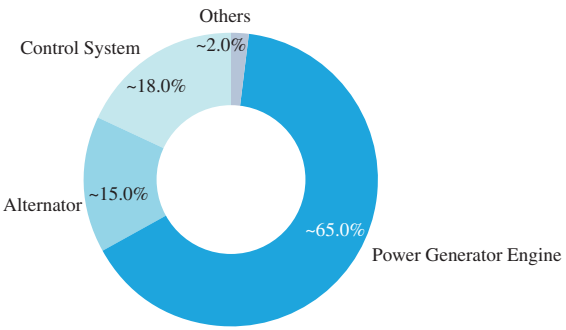
In the cost structure of power generator sets, the power generator engine serves as the core component and accounts for the highest component cost of BOM (bill of materials), typically representing approximately 65% of the total BOM. The power generator engines industry is technology intensive. The engine design and manufacturing require critical technologies, including structural design, combustion control, thermal efficiency optimization, precision machining, and material innovation. These technologies directly determine the operational reliability, energy efficiency, and environmental emission performance of the power generator sets, constituting the product's core competitive advantage.

**Key Components and Cost Structure of Power Generator Sets**

**Key Components of Power Generator Sets**




**Cost Structure of Power Generator Sets**




*Source: China Internal Combustion Engine Industry Association (CICEIA), Frost & Sullivan*

**Value Chain of Power Generator Sets**

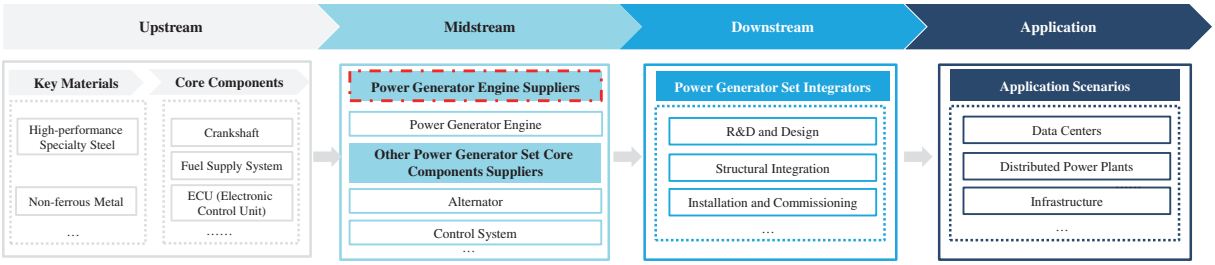
The upstream of the power generator set value chain primarily involves the supply of key materials and core components. Key materials include high-performance specialty steels and non-ferrous metals, the properties of which directly determine the structural integrity, thermal resistance, and corrosion resistance of the units. Core components encompass essential parts such as crankshafts, fuel supply systems, electronic control units (ECUs) and others, all of which are pivotal factors influencing the overall performance and reliability of the final product.

The midstream of the value chain is dominated by suppliers of power generator engine, alternator, control system, and other components. As the core power unit of the power generator set, the power generator engine directly determines the output power, fuel economy, and operational stability of the entire machine. This segment is characterized by high technical and capital barriers, resulting in significant market concentration.

The downstream of the industry primarily consists of OEMs, who are power generator set integrators responsible for R&D and design, structural integration, and installation and commissioning. Because these OEMs utilize power generator engines as core components, they represent the primary customer base for power generator engine manufacturers. The core expertise of this segment involves the seamless integration of key modules, such as the engine, alternator, and control system, into power generator sets through precise power matching, structural optimization, and electronic control system integration to satisfy diverse application requirements.

Power generator sets are widely used in various industries such as data centers, distributed power stations, and infrastructure. These fields have extremely high requirements for power continuity and reliability, driving continuous innovation in power generator sets redundancy design, remote monitoring, and intelligent operation and maintenance.

**Value Chain of Power Generator Sets Industry**




*Source: CICEIA, Frost & Sullivan*

## OVERVIEW OF POWER GENERATOR ENGINES INDUSTRY — DIESEL, GAS AND NEW FUEL ENGINES

### Introduction of Power Generator Engines Industry

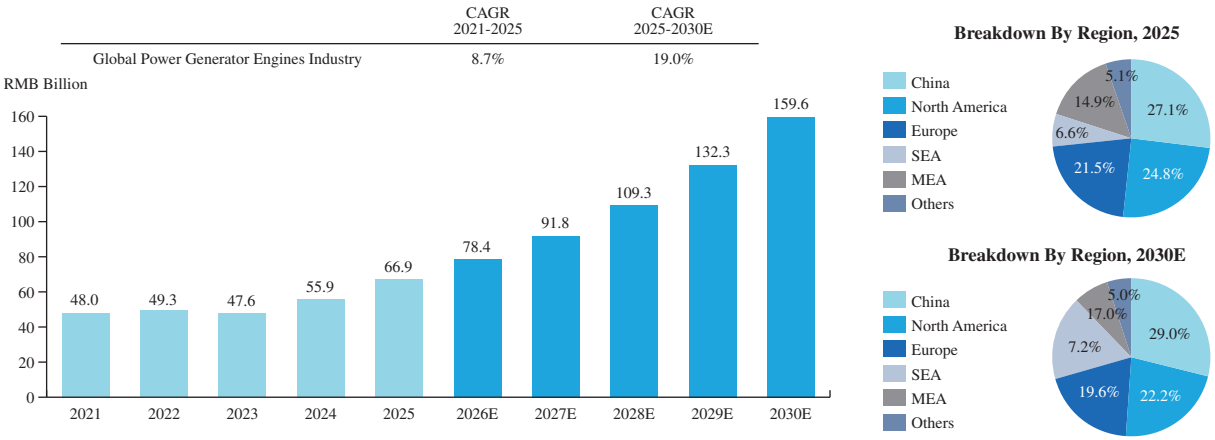
Power generator engines primarily include diesel engines, gas engines, and new fuel engines in terms of fuel type. Among these, diesel engines utilize compression ignition and are characterized by high reliability, thermal efficiency, and relatively low fuel consumption. They are widely used in industries demanding high power and durability, such as data centers, distributed power stations, and infrastructure. Diesel power generator engines accounted for over 80% of the total power generator engine market share in terms of sales revenue in 2025. Gas engines, fueled by natural gas, coalbed methane, or synthesis gas from oil fields, operate on spark ignition. They offer advantages in clean emissions and low operating costs, primarily serving distributed energy generation systems. New fuels represent the industry's green transition, mainly including low-carbon or potential zero-carbon fuel power systems like methanol, hydrogen and ammonia.

The key performance metrics of power generation engines primarily include power output, cylinder bore, and displacement. Based on power output and related metrics, these engines can be classified into medium- to light-duty engines which have power output below 500 kW, heavy-duty engines which have power output between 500 and 1,500 kW, and large engines which have power output above 1,500 kW. Medium- to light-duty engines are characterized by their compact design, rapid startup and load response capabilities, and lower overall maintenance and operational costs. These advantages make them suitable for telecom base stations, infrastructure, and public safety and emergency response scenarios such as firefighting, disaster relief, and water conservancy. Heavy-duty engines balance high output power with fuel economy and are extensively used in infrastructure, construction, real estate, and animal husbandry, as well as mainstream generator sets. Large engines provide high power output for use cases with extremely stringent requirements on stability, vibration control, and energy efficiency, such as data centers, distributed power stations, financial institutions, and high-end manufacturing, as well as mining and oil & gas exploration.

### Market Size of Power Generator Engines Industry

In terms of revenue, the global power generator engines market grew from RMB48.0 billion in 2021 to RMB66.9 billion in 2025, representing a CAGR of 8.7%. The global power generator engines market has experienced steady growth, driven by robust demand from downstream applications such as data centers, distributed power stations, and infrastructure. Supported by ongoing product technological upgrades and increasing demand growth from downstream applications, the global power generator engines market is expected to reach RMB159.6 billion by 2030, representing a CAGR of 19.0% from 2025 to 2030. Within this expanding market and the broader power generator engines industry, diesel remains the predominant fuel source. Despite the global energy transition, the clean-energy engines market is projected to grow modestly from RMB9.2 billion in 2025 to only RMB10.8 billion by 2030, with a CAGR of 3.2%. This stark contrast underscores the resilience and continued market dominance of diesel power solutions for the foreseeable future.

**Market Size of Global Power Generator Engines Industry, 2021–2030E**




*Source: CICEIA, Frost & Sullivan*

*Note:* This market size refers to the total revenue generated from the sale of standalone power generator engines (comprising diesel, gas, and new fuel types), excluding intra-group transfers and captive consumption for downstream power generator sets.

Benefiting from the rapid global development of artificial intelligence (AI) technology, the proliferation of distributed power stations applications, and the ongoing advancement of infrastructure, China's power generator engines industry has shown rapid growth. The market size increased from RMB10.8 billion in 2021 to RMB18.1 billion in 2025, with a CAGR of 13.8%. Driven by the surging demand for computing power in data centers, the market size for power generator engines in China is projected to grow at a CAGR of 20.7% from RMB18.1 billion in 2025 to RMB46.3 billion in 2030.

## Market Drivers and Developing Trends of Power Generator Engines Industry

### *Sustained Growth in Downstream Market Demand*

With the continuous growth of AI demand, computing power requirements have significantly increased. The power density per rack in AI data centers (AIDCs) has risen from less than 10kW to over 60kW, exceeding 120kW in some scenarios. This necessitates power generator engines that support higher power output and millisecond-level response capabilities. Concurrently, power generator engines provide crucial backup power for AIDCs, meeting the reliability, timeliness, and emergency response capabilities required by data centers. According to International Energy Agency (IEA), global electricity consumption by data centers was approximately 415TWh in 2024 and is expected to double to 945TWh by 2030, providing stable and sustained demand for power generator engines. In the global power generator engines market, the share attributable to data center applications rose significantly from 28.2% in 2021 to 57.2% in 2025, with corresponding revenues increasing rapidly from RMB13.5 billion to RMB38.2 billion over the same period, and it's expected to reach RMB107.3 billion in 2030, with a CAGR of 22.9% from 2025 to 2030. Meanwhile, IEA data also indicates that about 730 million people worldwide still lack access to reliable electricity. Traditional centralized power supply models struggle to address this need due to weak adaptability and high coverage costs. In contrast, distributed power stations, with their core advantages of flexible deployment, proximity to users, and controllable costs, can effectively fill the electricity supply gap, aligning with global energy accessibility needs and market growth opportunities. The continuous growth in global infrastructure demand and ongoing investment in infrastructure by countries worldwide provide a solid demand foundation for the power generator engines industry. Data from the Global Infrastructure Hub shows that infrastructure investment across 56 countries, including China and the US, increased from USD2.4 trillion in 2020 to USD2.6 trillion in 2024 and is expected to reach USD2.8 trillion by 2030. The expansion of infrastructure scale directly drives the demand for mobile and backup power for construction and facility operations.

***Rise of China's Brands***

At present, the global high-end data center power generator engines industry is dominated by leading overseas enterprises, presenting high technological and brand barriers. However, in an increasingly complex geopolitical environment, the stability of overseas supply chains has declined, leading to significantly extended delivery cycles for imported equipment. This has created an important development window for domestic manufacturers. With the accelerated growth of the AI industry, bottlenecks in overseas equipment supply have become more pronounced. Coupled with persistently rising supply chain uncertainties due to geopolitical factors, domestic large engine manufacturers are poised to seize opportunities arising from unmet market demand and accelerate import substitution. In addition, China's internal combustion engine export value achieved rapid expansion from 2021 to 2025, with export value increasing from USD5.2 billion in 2021 to USD6.8 billion in 2025, gradually increasing its global share. The localization of power generator engines presents vast market opportunities for domestic enterprises.

**Favorable Policies**

In recent years, the PRC government has promulgated a series of favorable policies, injecting strong momentum into the continuous high-quality development of the power generator engines and equipment industry while charting a clear path for its high-end and intelligent evolution, with a core focus on significantly improving energy efficiency and reducing carbon emissions. On the one hand, driven by the deepening implementation of the "Work Plan for Stable Growth of the Electric Equipment Industry (2025-2026)" (《電力裝備行業穩增長工作方案(2025–2026年)》) and policies promoting large-scale equipment upgrades, financial instruments such as ultra-long-term special treasury bonds have been directly deployed to support the upgrade and replacement of existing equipment in the energy and power sectors, thereby securing massive and steady replacement orders for the industry. On the other hand, the "Negative List for Market Access (2025 Edition)" (《市場准入負面清單(2025年版)》) and increasingly stringent energy consumption quota standards have accelerated the phase-out of outdated, high-energy-consuming generating units, compelling market demand to pivot towards high-efficiency, low-carbon, and compliant equipment. Concurrently, the "Guidance on Promoting the High-Quality Development of Energy Equipment" (《關於推進能源裝備高質量發展的指導意見》) and the pilot programs for the construction of new-type power systems are actively steering power generation equipment towards core technological breakthroughs in wide-load energy efficiency, high flexibility, and intelligent control, accelerating the large-scale commercialization of new-generation units. Coupled with the incremental demand for stable and reliable standby and distributed power generation units catalyzed by the construction of an energy-efficient and low-carbon computing power network under the "East Data, West Computing" (東數西算) project, the power generator engines industry is poised to embrace a historic development opportunity characterized by robust expansion on both the supply and demand sides, underpinned by the resonance of multi-dimensional policy dividends including financial support, standard-driven upgrades, technological advancement, and new infrastructure expansion.

**Entry Barriers of Power Generator Engines Industry**

The power generator engine industry is characterized by formidable technological and certification, brand and reputation, and capital barriers that favor established market leaders. Achieving the critical balance between high power density, thermal efficiency, and stringent global emission standards requires deep expertise in high-efficiency energy conversion and intelligent systems, alongside costly international certifications such as CE, UL, and CSA. Beyond technical mastery, the industry relies heavily on proven reliability and brand equity, as customers in mission-critical sectors like data centers prioritize verified operational track records over new market entrants. Furthermore, the capital-intensive nature of high-precision manufacturing and R&D necessitates massive initial investment and scale to optimize cost structures. These multifaceted entry requirements create a high-threshold environment where leading enterprises leverage their integrated technological advantages and deep-rooted customer trust to consolidate market dominance.

### Challenges of Power Generator Engines Industry

The global power generator engine industry is undergoing a profound transformation driven by technological convergence, shifting demand cycles, and a reshaped competitive landscape. As the industry pivots toward higher thermal efficiency, low-carbon fuel compatibility, and intelligent O&M, traditional players face dual pressures from rising R&D costs and the energy transition. While renewable energy and macroeconomic cycles squeeze traditional standby markets, the surge in AI-driven data centers and high-reliability industrial needs are fueling growth in high-density power solutions. This has triggered a shift from Western brand dominance to a fierce global competition featuring Chinese enterprises, where success now depends on system integration and life-cycle services rather than standalone product performance, ultimately leading to increased market consolidation and a "survival of the fittest" environment for smaller manufacturers.

### Competitive Landscape of China's Power Generator Engines Industry

Regarding the competitive landscape, there are currently fewer than 50 players in the PRC power generator engine industry, presenting a highly concentrated and oligopolistic market. In the PRC medium- and high-speed marine engine market, there are currently around 20 core players that have entered the mass production stage. The current China's power generator engines market is concentrated, with high-power and high-value products clustered among leading enterprises. In 2025, the top five providers of power generator engines in China accounted for a combined market share of approximately 62.4% of the total market. Among them, the Company ranked first in the industry, accounting for a 22.3% share of the Chinese power generator engines market.

**Top 5 Power Generator Engines Providers in China, 2025**

| Ranking | Company | Sales Revenue (RMB Billion) | Market Share (%) |
|---|---|---|---|
| **1** | **the Company** | **4.0** | **22.3%** |
| 2 | Company A | ~2.3 | 12.9% |
| 3 | Company B | ~2.2 | 12.4% |
| 4 | Company C | ~1.6 | 8.7% |
| 5 | Company D | ~1.1 | 6.2% |
| | **Top 5** | **~11.3** | **62.4%** |
| | **Total** | **18.1** | |

*Source: CICEIA, Frost & Sullivan*

*Notes:*

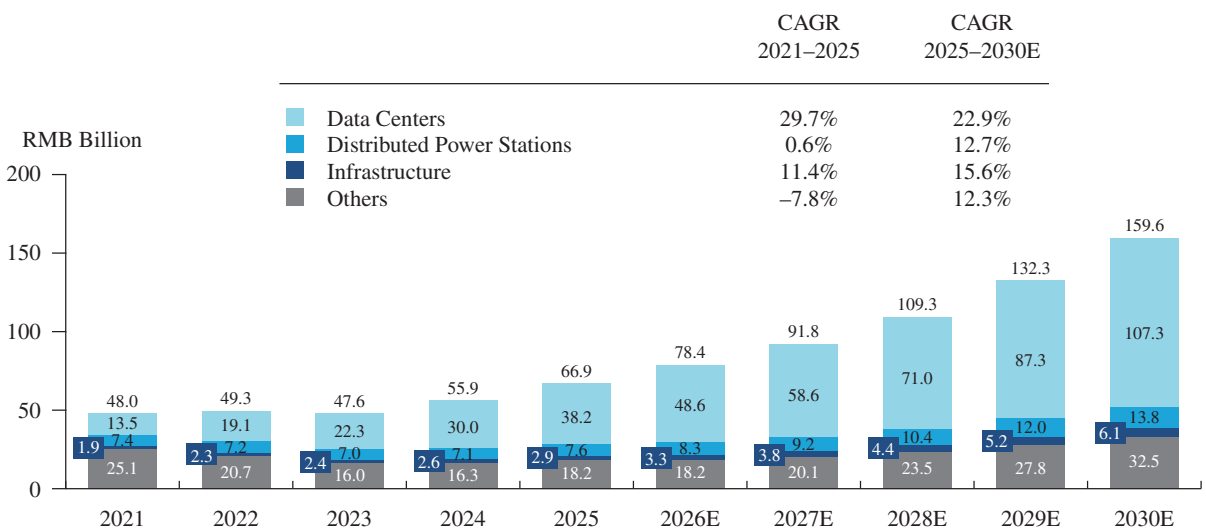
1. Sales revenue refers to the total revenue generated from the sale of a standalone power generator engine, excluding intra-group transfers and captive consumption for downstream power generator sets.
2. "China" refers to Chinese mainland only.
3. Company A, founded in 1946 and headquartered in China, is listed on the Shenzhen Stock Exchange and Hong Kong Stock Exchange. It is primarily engaged in the R&D, manufacturing, and sales of products across various sectors, including power systems, commercial vehicles, agricultural equipment, construction machinery, and smart logistics.
4. Company B, founded in 1919 and headquartered in the United States, is listed on the New York Stock Exchange (NYSE). It mainly specializes in the R&D, production, and service of power systems such as engines, powertrains, and hydrogen power.
5. Company C, founded in 1909 and headquartered in Germany, primarily focuses on the R&D, production, and sales of industrial power equipment, including high-power diesel engines, gas engines, and power generator sets.
6. Company D, founded in 1925 and headquartered in the United States, is listed on the NYSE. It is mainly engaged in the R&D and manufacturing of construction machinery, diesel and gas power systems, and energy equipment.

### Market Size of Global Power Generator Engines Market by Core Applications

The explosive growth in global computing demand, driven by advancements in artificial intelligence and big data, has positioned data centers as critical digital infrastructure. By 2030, global AI server shipments are projected to reach approximately 6.5 million units, representing a 3.3-fold

increase from 2024 levels and reflecting a robust CAGR of 21.7%. This unprecedented expansion has escalated demands for enhanced power load capacity and supply reliability, establishing power generator engines as essential backups to mitigate grid fluctuations, power rationing, or sudden outages. Renowned for their superior efficiency, reliability, rapid response, and durability, these engines deliver stable output under diverse conditions, making them ideal for emergency backups, remote power supply, and industrial applications. With strong fuel efficiency, low maintenance costs, and extended service life, they are indispensable in regions with energy constraints or unstable grids. As the data center industry shifts from basic hosting to AI computing hubs, the amplified requirements for AIDCs, including ultra-high power density, reliable supply, and advanced cooling systems, further underscore the vital role of power generator engines as a dependable backup energy source. This surge in data center expansion serves as the direct and primary driver behind the robust growth in the global power generator engines market, where the share attributable to data center applications rose from 28.2% in 2021 to 57.2% in 2025, with corresponding revenues increasing from RMB13.5 billion to RMB38.2 billion over the same period. Fueled by ongoing advancements in AI and big data, this market share is anticipated to reach approximately 67.2% by 2030, translating to revenues of approximately RMB107.3 billion. Simultaneously, as the global power shortage increase, distributed power stations are expanding steadily as a vital supplement to the power grid. The market size of power generator engines for distributed power stations grew from RMB7.4 billion in 2021 to RMB7.6 billion in 2025. By 2030, supported by energy security strategies, the market size is expected to reach RMB13.8 billion. Furthermore, sustained investment in global infrastructure provides a stable market for both installed and incremental demand. The market size of power generator engines for infrastructure grew from RMB1.9 billion in 2021 to RMB2.9 billion in 2025, with a CAGR of 11.4%. And it is projected to reach RMB6.1 billion by 2030.

**Market Size of Global Power Generator Engines Industry by Core Applications, 2021–2030E**




*Source: CICEIA, Frost & Sullivan*

*Note:* The market size refers to the total revenue generated by the sale of power generator engines in different applications.

## OVERVIEW OF MARINE ENGINES INDUSTRY — MEDIUM- AND HIGH-SPEED MARINE ENGINES

### Introduction and Classification of Marine Engines

Marine engines encompass specialized internal combustion systems purpose-built for vessel main propulsion and auxiliary power generation. The industry fundamentally categorizes into two primary segments: low-speed marine engines, and medium- and high-speed marine engines. Low-speed marine

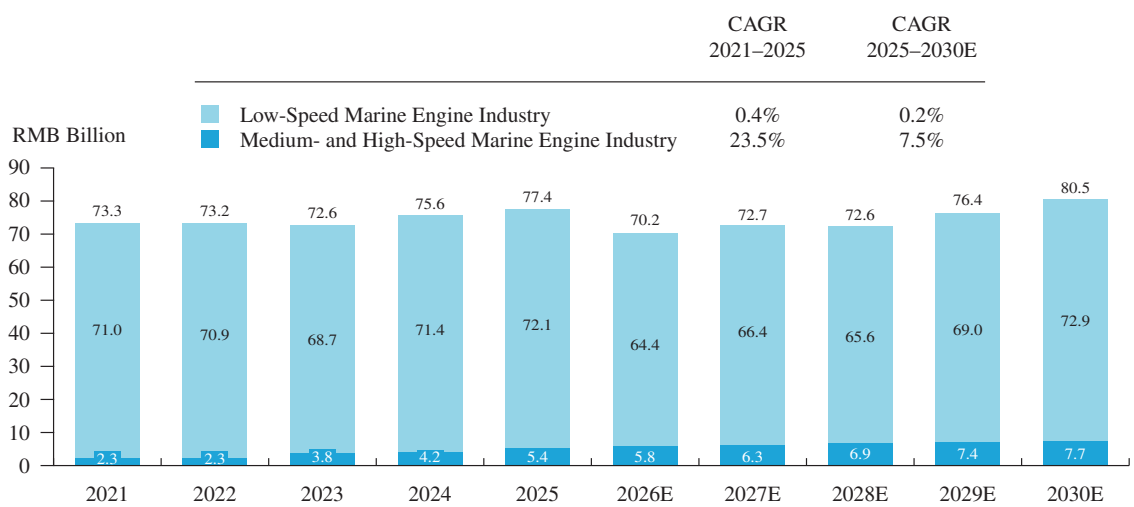
engines typically operate at crankshaft speeds below 300 rpm. Specifically engineered for high-power, long-endurance, and continuous steady-load conditions, these systems serve waves of international trade primarily as the main propulsion engines for large-scale ocean-going vessels, including bulk carriers, tankers, and container ships. Medium- and high-speed marine engines refer to integrated technical systems with a rated speed exceeding 300 r/min, specifically engineered for vessels operating in inland and coastal environments. Within this category, medium-speed engines with speeds ranging from 300 r/min to 1,000 r/min typically drive propellers through reduction gearboxes or serve as generator sets. Given their balanced technical performance and versatility, these engines are widely utilized as main engines for inland, coastal and engineering vessels. High-speed engines with speeds exceeding 1,000 r/min are distinguished by their compact size and lightweight design, and are primarily deployed for the propulsion or power supply of naval vessels, high-speed crafts, governmental vessels, and medium-sized engineering vessels. Medium-speed engines have become the preferred power solution for medium-to-large vessels, such as ocean-going transport ships and offshore engineering vessels.

Within the marine engine industry, low-speed and medium- to high-speed engines diverge fundamentally across technical, operational, and commercial dimensions. Technically, low-speed engines utilize direct-drive configurations optimized for the high thermal efficiency demanded by large ocean-going vessels, whereas medium- and high-speed engines employ reduction gearboxes to achieve compact, highly maneuverable designs suited for inland and coastal applications. Commercially, the massive scale of low-speed engines dictates higher technical thresholds, per-unit values, and market concentration. Consequently, given these profound differences in engineering, application scenarios, and market dynamics, these two engine types cater to separate customer bases and function as entirely distinct, non-interchangeable product segments.

**Market Size of Marine Engines Industry**

The market size of the global marine engines industry demonstrated stable resilience, recovering from RMB73.3 billion in 2021 to RMB77.4 billion in 2025. Within this landscape, low-speed marine engines consistently occupy the dominant market share, accounting for over 90% of the total market value, driven by sustained baseline demand for large commercial fleets. Looking ahead, driven by the dual forces of steady global trade growth and stringent low-carbon transition policies, the industry is poised for a new cycle of technological upgrades and fleet renewals. The global green shipping trend is accelerating the shift toward higher engine efficiency and cleaner alternative fuels, stimulating robust demand for both new installations and retrofits. Consequently, the overall market size is projected to expand steadily, reaching approximately RMB80.5 billion by 2030.

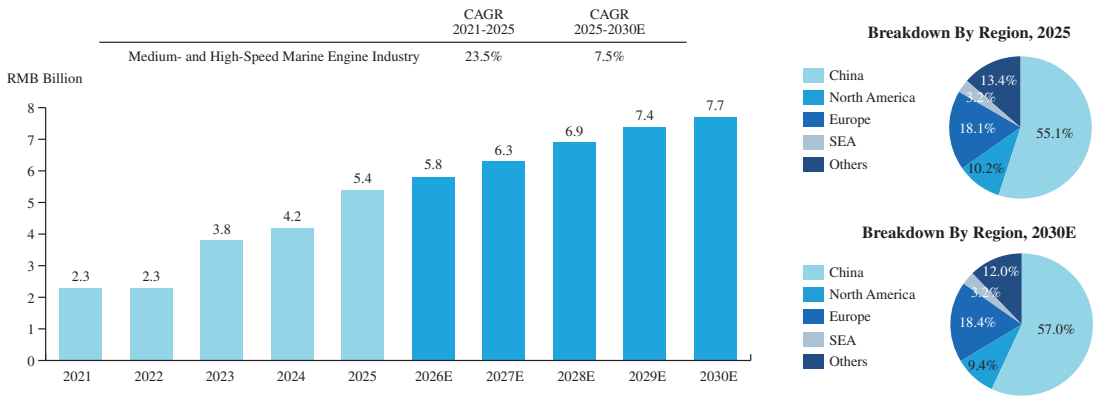
**Market Size of Global Marine Engines Industry, 2021–2030E**




*Source: Clarksons, CICEIA, Frost & Sullivan*

The market size of medium- and high-speed marine engines increased substantially from RMB2.3 billion in 2021 to RMB3.8 billion in 2023. This robust growth was primarily driven by the strong global macroeconomic recovery, the explosive rebound in tourism and coastal transportation demand, as well as the rapid development of coastal industries such as offshore wind power. These factors spurred a significant increase in orders for ferries, tourist vessels, workboats and offshore support vessels, thereby further expanding the market size to approximately RMB5.4 billion in 2025. Looking ahead, driven by the dual forces of steady global trade growth and additional low-carbon transition policies, the industry is poised for a new cycle of technological upgrades and product enhancements. The green shipping trend is pushing engine development toward higher efficiency and cleaner emissions, further stimulating demand for both new installations and retrofits. By 2030, the global market size is projected to reach RMB7.7 billion, with a forecasted CAGR of 7.5% from 2025 to 2030.

**Market Size of Medium- and High-Speed Marine Engines Industry, 2021–2030E**




*Source: Clarksons, CICEIA, Frost & Sullivan*

*Note:* The market size refers to the total revenue generated by the sale of medium- and high-speed marine engines.

Within the global growth landscape, China continues to act as a core growth engine. The Chinese market grew from approximately RMB1.4 billion in 2021 to RMB3.0 billion in 2025, achieving a CAGR of 20.5%. It is anticipated that the market size in China will further expand to RMB4.4 billion by 2030, representing an accelerated CAGR of 8.2% from 2025 to 2030. China's strong performance is anchored by its dominant position in the global shipbuilding industry and its proactive investment in the transition toward green propulsion technologies.

## Market Drivers and Developing Trends of Medium- and High-Speed Marine Engines Industry

### *Technological Innovation Leading to Product Upgrades*

The marine engine industry is undergoing sustained technological upgrading. Conventional fuel-based propulsion technologies continue to improve efficiency and reduce emissions via combustion optimization and reduced mechanical losses. Simultaneously, low- and zero-carbon technologies are accelerating, with dual-fuel engines, ammonia and hydrogen systems, and intelligent control becoming key R&D priorities. Medium-speed engines are emerging as a vital direction due to their strong fuel adaptability. In parallel, high-speed engines are evolving toward higher strength, lightweight designs, and intelligent operation to meet the rigorous reliability demands of large vessels and power generation.

***Dual Drivers of Policies and Environmental Regulations***

Driven by tightening global low-carbon regulations, the marine engines industry is accelerating its green transition. Participants are intensifying the deployment of low-carbon technologies, with alternative clean fuels such as hydrogen, ammonia, and methanol emerging as key strategic directions. Simultaneously, stricter standards are accelerating global fleet renewal. In August 2024, the "Implementation Rules for Subsidies for the Scrapping and Renewal of Old and Used Transport Vessels" (《交通運輸老舊營運船舶報廢更新補貼實施細則》) were released, which provided financial incentives for the retirement of obsolete vessels and encouraged the adoption of new-energy or clean-energy-powered vessels to meet environmental requirements. Additionally, the "Action Plan for Green Development of the Shipbuilding Industry (2024–2030)" (《船舶製造業綠色發展行動綱要(2024–2030年)》) sets clear targets, including achieving a market share exceeding 50% in the international market for LNG- and methanol-powered vessels by 2025, and establishing a comprehensive green development framework by 2030.

**Entry Barrier of Medium- and High-Speed Marine Engines Industry**

The medium- and high-speed marine engines industry has technical barrier that demands mastery of core technologies such as large-bore designs, high-speed operation, and high-efficiency combustion control, capabilities that incumbents have validated over the years. This is compounded by talent barrier, as the industry requires multidisciplinary expertise spanning marine propulsion, mechanical design, electronic control systems, and intelligent manufacturing, which newcomers struggle to assemble quickly compared to leaders with global R&D networks. Furthermore, cost advantage barrier exists where established players leverage integrated industrial eco-systems and modular manufacturing processes to achieve economies of scale, whereas entrants face high fixed investments and R&D expenditures without initial volume. Finally, certification barrier mandates complex approvals from classification societies like DNV, RS, VR, and CCS; this rigorous process favors established firms with robust quality systems over entrants lacking the necessary documentation and experience to gain market access.

**Challenges of Medium- and High-Speed Marine Engines Industry**

The industry faces multifaceted challenges, beginning with environmental regulatory challenges where tightening standards compel enterprises to address compliance costs and transition roadmaps toward LNG, green methanol, and green ammonia to meet the International Maritime Organization (IMO) 2050 Net-Zero Emission target and EU's FuelEU Maritime. This shift introduces significant cost challenges, as green vessels demand higher initial investments: construction costs for LNG-powered vessels are approximately 40% higher than diesel equivalents, while methanol dual-fuel Very Large Crude Carriers (VLCCs) have increased by about 20%. Furthermore, infrastructure challenges remain a critical bottleneck; as of 2025, only 35 methanol bunkering ports are planned globally compared to 276 established LNG bunkering ports, with facilities for hydrogen and ammonia being even more scarce. This insufficient infrastructure creates a deadlock, deterring shipowners from investing in new vessels while investors hesitate to build facilities without guaranteed demand.

**Competitive Landscape of China's Medium- and High-speed Marine Engines Industry**

The medium- and high-speed marine engine market in China is highly concentrated, characterized by fewer than 20 core industry participants. The top three providers of medium- and high-speed marine engines in China collectively accounted for approximately 57.0% of the total market share. Among them, the Company ranked second in the industry with sales revenue of RMB530.0 million, representing approximately 17.9% of the China's marine engines industry.

**Top 3 Medium- and High-speed Marine Engines Providers in China, 2025**

| Ranking | Company | Sales Revenue (RMB Million) | Market Share (%) |
|---|---|---|---|
| 1 | Company A | ~745 | 25.2% |
| **2** | **the Company** | **530** | **17.9%** |
| 3 | Company E | ~410 | 13.9% |
| | **Top 3** | **~1,685** | **57.0%** |
| | **Total** | **2,955** | |

*Source: International Council on Combustion Engines (CIMAC), CICEIA, Frost & Sullivan*

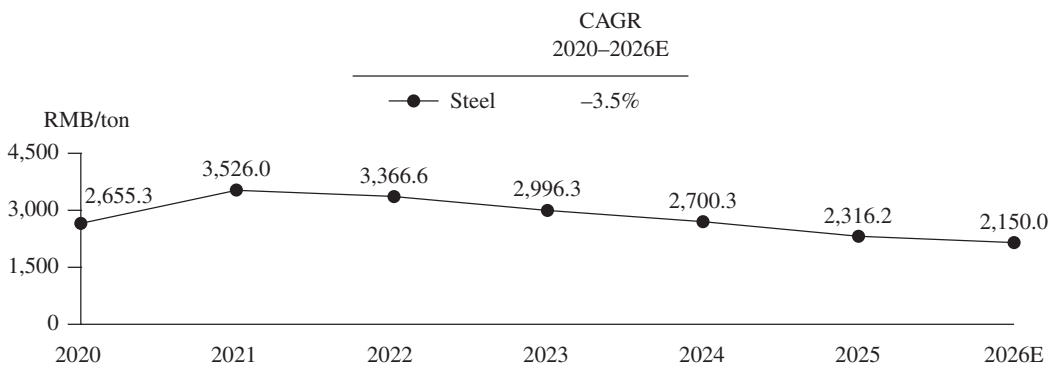
*Notes:*

1. Sales revenue refers to the total revenue generated by the sale of medium- and high-speed marine engines.
2. "China" refers to Chinese mainland only.
3. Company A was established in 1946 and headquartered in China, is listed on the Shenzhen Stock Exchange and Hong Kong Stock Exchange. It is primarily engaged in the R&D, manufacturing, and sales of products across various sectors, including power systems, commercial vehicles, agricultural equipment, construction machinery, and smart logistics.
4. Company E was established in 1970 and headquartered in China. The company is primarily engaged in the research, development, manufacturing, and servicing of power systems, including high-power medium-speed marine diesel engines, gas engines, dual-fuel engines, and generator sets.

## RAW MATERIAL PRICE ANALYSIS

Steel is a critical raw material in the manufacturing of power generator engines, widely used in the production and processing of core structural components such as crankshafts, connecting rods, and engine blocks. Historically, the average price of steel exhibited a downward trend, decreasing from RMB3,526.0 per ton in 2021 to RMB2,316.2 per ton in 2025. This decline was primarily driven by shifting supply-demand dynamics and fluctuations in underlying cost factors. On the demand side, a broader macroeconomic deceleration led to a softening of downstream market demand, thereby exerting downward pressure on overall steel consumption. Concurrently, on the supply side, the gradual normalization of global supply chains enhanced the stability of upstream raw material supplies. Consequently, prices for key raw materials, notably iron ore and coking coal, declined significantly. This reduction in production costs further suppressed overall steel prices. Looking forward, while steel prices are ultimately expected to stabilize as supply and demand rebalance and raw material volatility moderates, the prevailing downward trajectory is anticipated to persist in the near term, with average steel prices projected to reach approximately RMB2,150.0 per ton in 2026.

**Prices Analysis of Steel, 2020–2026E**




*SOURCE: Wind, Baiinfo, ifind, Frost & Sullivan*