
INDUSTRY OVERVIEW

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OVERVIEW OF TIC INTEGRATED SOLUTION MARKET

Definition of TIC Integrated Solutions

TIC (Testing, Inspection, and Certification) refers to professional services provided by specialized institutions. The primary goal of TIC is to verify the quality of products and equipment, ensuring strict adherence to fundamental compliance requirements. Compared to traditional standalone services, TIC integrated solutions offer a comprehensive and integrated approach. Such an approach matches the specific technical standards and regulatory rules of different industries. TIC integrated solutions provide full-lifecycle technical services centered around the core business assets of enterprises. The integrated services include testing, inspection, certification, auditing, and advisory. Delivering such services systematically helps enterprises achieve compliant operations, reduce operational risks, improve service quality, and boost business value. Currently, TIC integrated solutions are widely applied across multiple sectors, including power and new energy, oil and gas, marine engineering, construction and engineering, food and beverage, electronics manufacturing, healthcare, etc.

Value Contribution of TIC Integrated Solutions

Compliant operations and market access

In accordance with the *Work Safety Law of the People’s Republic of China* (《中華人民共和國安全生產法》), as well as the statutory requirements for mandatory periodic testing of critical facilities stipulated under the *Regulations on Safety Management and Supervision of Pressure Pipelines* (《壓力管道安全管理與監察規定》) and the *Rules for Periodic Inspection of Pressure Vessels* (《壓力容器定期檢驗規則》), enterprises are legally required to conduct mandatory periodic testing and inspection of their key equipment assets to ensure operational compliance. By leveraging industry-specific regulations and technical standards, TIC integrated solutions assist enterprises in securing product approvals, obtaining manufacturing licenses, passing system audits, facilitating customs clearance, and maintaining ongoing compliance. Securing these essential qualifications effectively mitigates the business risks associated with non-compliance, lack of proper certifications, or potential government penalties.

Quality assurance and risk mitigation

Through laboratory testing, on-site inspections, process audits, failure analysis, and risk assessments, TIC integrated solutions independently verify product quality, equipment conditions, manufacturing workflows, and service delivery. Identifying quality defects and safety hazards at an early stage significantly enhances overall product reliability and operational safety.

Operational efficiency and value chain coordination

Integrating separate testing, inspection, certification, and advisory services creates a unified technical system with fully traceable data. Covering key business stages like R&D testing, production monitoring, supplier management, and post-sale tracking, the integrated system connects all daily

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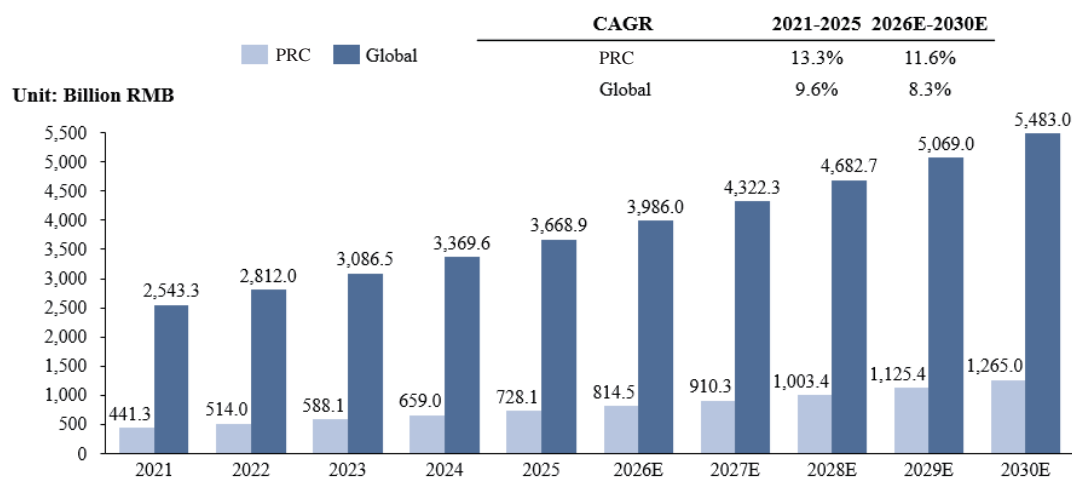
operations smoothly. Standardizing test criteria and gathering quality records ultimately reduces repeated tests, minimizes resource waste, and boosts coordination efficiency across different regions and business units.

Market Size of Global and PRC TIC Integrated Solution Market

Driven by the surging demand for end-to-end supply chain assessments, rigorous ESG regulatory requirements, and the accelerated adoption of digital quality management, the market is expected to expand steadily in the future. According to Frost & Sullivan, the global TIC integrated solution market size reached RMB3,668.9 billion in 2025, which increased from RMB2,543.3 billion in 2021, representing a CAGR of 9.6% from 2021 to 2025, and is expected to further increase to RMB5,483.0 billion by 2030, representing a CAGR of 8.3% from 2026 to 2030.

Propelled by the ongoing transition toward advanced manufacturing, increasingly rigorous quality control standards, and a surging demand for cross-border compliance as PRC’s enterprises accelerate their global expansion, the market is expected to expand steadily in the future. According to Frost & Sullivan, the PRC TIC integrated solution market size reached RMB728.1 billion in 2025, which increased from RMB441.3 billion in 2021, representing a CAGR of 13.3% from 2021 to 2025, and is expected to further increase to RMB1,265.0 billion by 2030, representing a CAGR of 11.6% from 2026 to 2030.

Global and PRC TIC Integrated Solution Market Size, By Revenue, 2021-2030E



Source: TIC Council China, China Inspection and Testing Society (CITS), Frost & Sullivan

Market Drivers and Future Trends of TIC Integrated Solution Market

Upgrade towards more intelligent and integrated services

Driven by growing client demands for higher efficiency, reliable traceability, and cross-regional consistency, TIC service providers are transitioning from standalone testing institutions into integrated solution providers. Spanning the entire value chain, comprehensive services cover R&D, manufacturing, logistics, and post-sale support. Meanwhile, the fast adoption of intelligent and digital tools, including IoT and big data, drives the industry toward intelligent and data-driven operations.

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Extending technical expertise to broader industrial applications

TIC integrated solutions deliver strict technical supervision and risk management across a diverse range of heavy and light industrial sectors.

Heavy Industrial Sectors:

- Power and new energy sector: TIC integrated solutions verify the safety and performance of wind, solar, and grid-storage systems;
- Oil and gas sector: TIC integrated solutions combine advanced non-destructive testing, asset integrity management, and regulatory compliance assessment throughout the entire lifecycle of oil and gas assets to ensure operational safety, prevent equipment failure, and optimize asset performance;
- Marine engineering sector: Comprehensive technical services offer full-lifecycle supervision, from equipment certification to structural safety assessments, to ensure compliance and reliability in complex offshore working conditions;
- Construction and engineering sector: Technical supervision guarantees structural safety and strict adherence to design and quality standards from project commencement to final delivery.

Light Industrial Sectors:

- Food and beverage sector: Comprehensive testing integrates multi-parameter safety assessment, real-time technical support, regulatory alignment, and end-to-end traceability to ensure strict adherence to the highest food safety and hygiene standards;
- Electronics manufacturing sector: Rigorous certification verifies the reliability and performance of electronic components, helping relevant industries meet international standards and access global markets.

Industrial upgrading and supply chain quality governance

Global industries are shifting from scale expansion to quality improvement and resilience enhancement. Manufacturing upgrading, service quality improvement, supply chain transparency and mutual recognition in cross-border trade all require stronger quality verification capabilities. By providing technical support covering R&D verification, raw material approvals, production control and final product release, TIC integrated solutions help enterprises improve product reliability, brand credibility and supply chain management capabilities.

Continuous enhancement of compliance and regulatory requirements

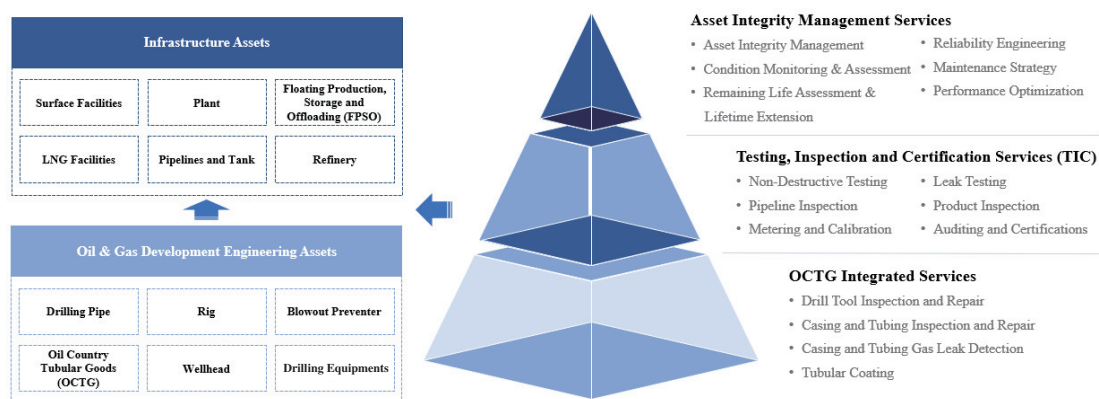
Global economies continuously update regulations covering product safety, environmental protection, engineering construction, and data security. Policies such as PRC’s *Outline for Building a Quality Nation* (《質量強國建設綱要》) and the *14th Five-Year Plan for a Modern Energy System* (《「十四五」現代能源體系規劃》), strongly support the growth of testing and certification services. Operating under the strict oversight of the NQI (National Quality Infrastructure) framework, the TIC integrated solution service delivers highly standardized services. Companies increasingly rely on professional TIC integrated solutions to verify market entry standards, establish management systems, and monitor ongoing compliance.

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OVERVIEW OF THE TIC INTEGRATED SOLUTION MARKET FOR THE OIL AND GAS SECTOR

Development Status of the TIC Integrated Solution Market for the Oil and Gas Sector

TIC (Testing, Inspection, and Certification) integrated solutions for the oil and gas sector refer to comprehensive testing and inspection services provided for the entire industry chain of the oil and gas sector. The associated service portfolio encompasses general testing, asset integrity management, metering and calibration, and other related services. The service scope directly encompasses oilfield operators, oilfield service providers, EPC contractors, and equipment manufacturers. Furthermore, the integrated service system provides bottom-up, full-lifecycle asset integrity solutions for oil and gas development engineering assets, and infrastructure assets. Ultimately, such specialized service constitutes a vital safeguard for regulatory compliance, operational safety, and efficiency optimization within the industry.



Source: China Petroleum and Chemical Industry Federation (CPCIF), official websites of relevant companies, Frost & Sullivan

Currently, service providers in the oil and gas testing and inspection industry are mainly divided into two categories. The first includes self-operated testing institutions of major oil and gas groups. Such internal departments mainly serve the core needs of their parent companies while also taking on some outside commercial projects. The second category consists of independent third-party institutions providing specialized testing services. The lack of effective data integration among different service providers leads to systematic pain points, such as weak cross-professional synergy, inability to reuse data and information, and scattered division of responsibilities, which reduce the efficiency and service quality of oil and gas testing and inspection services.

To resolve the industry bottlenecks, TIC integrated solutions for the oil and gas sector deeply integrate testing, metering, and asset integrity management. Relying on a unified data platform, the new model creates a complete service system for the entire lifespan of an asset. The integrated approach breaks down communication barriers between different teams and helps prevent operational risks in advance. Furthermore, by optimizing resource allocation, the comprehensive service model significantly reduces maintenance costs and shortens project duration. Ultimately, the unified system provides clients with clear and systematic value, such as regulatory compliance, lower costs, higher efficiency, and extended asset lifespans.

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Value Contribution of TIC Integrated Solution Market for the Oil and Gas Sector

Support for Intelligent and Digital Transformation

Testing and inspection services heavily rely on manual experience and offline data collection. Consequently, scattered regional data and delayed decision-making fail to provide accurate data support for corporate ESG compliance. TIC integrated solutions for the oil and gas sector solve these bottlenecks by combining IoT and big data technologies to build digital asset management platforms. By integrating full-process testing data, the digital platform eliminates data barriers and drives the intelligent upgrade of all business processes. Moreover, real-time monitoring capabilities facilitate precise environmental testing and leak management, which makes environmental protection much more efficient and fully meets global ESG compliance requirements. Therefore, TIC integrated solutions for the oil and gas sector serve as a crucial cornerstone for driving the intelligent and digital transformation of the industry.

Defense Line for Production Safety

Oil and gas materials carry inherent safety risks due to their high flammability, explosiveness, corrosiveness, and susceptibility to leakage. Additionally, the entire supply chain operates under extreme conditions involving high pressure, high temperatures, and complex geological environments. Such harsh working conditions can easily cause uncertain accidents and severe financial losses. To address these risks, regular inspections on core equipment and professional assessments effectively identify safety hazards in advance to prevent accidents. Furthermore, data-driven predictive maintenance helps companies significantly improve their overall operational efficiency. Therefore, TIC integrated solutions for the oil and gas sector act as a vital guarantee for maintaining a strong defense line for production safety.

Guarantee of Compliant Operations

TIC integrated solutions for the oil and gas sector take general technical standards such as API (American Petroleum Institute), ISO (International Organization for Standardization), and ASME (American Society of Mechanical Engineers) as core guidelines. Furthermore, the comprehensive inspection services strictly adhere to global environmental agreements, such as *the Paris Agreement*, as well as PRC's regulations including *the Atmospheric Pollution Prevention and Control Law of the People's Republic of China* (《中華人民共和國大氣污染防治法》) and *the Administrative Measures for Industrial Energy Conservation* (《工業節能管理辦法》). The rigorous compliance requirements are applied consistently across the entire lifecycle of oil and gas exploration, storage and transportation. The testing and inspection results are the statutory core basis for enterprises to obtain production licenses and market access qualifications. Consequently, such official qualifications help enterprises avoid major compliance risks such as administrative penalties and qualification revocations, building a rigid guarantee for the stable operation of enterprises. Therefore, TIC integrated solutions for the oil and gas sector are the key support to ensure the compliant operation across the entire industry value chain.

Market Opportunities for TIC Integrated Solution Market for the Oil and Gas Sector

Oil and gas serve as a critical global strategic resource, offering substantial market potential for TIC integrated solution services. Global energy production is increasingly concentrated in key operational areas across the Middle East, North America, and the Asia-Pacific region, where vast reserves and high production capacities provide the foundation for the global energy supply chain. The Middle East in particular acts as the most critical energy supplier to the world, as massive export capabilities and a strategic location secure the stability of international energy markets, thereby creating an urgent and constant demand for TIC integrated solutions to ensure the safety and reliability of large-scale energy infrastructure.

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Driven by rising energy security demands across countries, the ongoing global energy transition, and the increasing prominence of natural gas which accelerates the development of liquefied natural gas (LNG) infrastructure, the global oil and gas market is expected to expand steadily in the future. According to Frost & Sullivan, the global oil market size reached 98,077.1 thousand barrels per day in 2025, which increased from 90,253.0 thousand barrels per day in 2021, representing a CAGR of 2.1% from 2021 to 2025, and is expected to further increase to 104,094.3 thousand barrels per day by 2030, representing a CAGR of 1.1% from 2026 to 2030. In the natural gas market, the global natural gas market size reached 4,193.9 billion cubic meters in 2025, which increased from 4,046.3 billion cubic meters in 2021, representing a CAGR of 0.9% from 2021 to 2025, and is expected to further increase to 4,595.7 billion cubic meters by 2030, representing a CAGR of 1.7% from 2026 to 2030.

PRC’s oil and gas market has maintained overall growth. Driven by energy security safeguards, expanded oil and gas reserves and production, and a higher share of natural gas consumption fueled by energy mix optimization, the market is projected to maintain its continuous expansion, with natural gas growing faster than oil. According to Frost & Sullivan, PRC’s oil market size increased from 3,994.0 thousand barrels per day in 2021 to 4,367.3 thousand barrels per day in 2025, representing a CAGR of 2.3% from 2021 to 2025, and is expected to further increase to 4,720.7 thousand barrels per day by 2030, representing a CAGR of 1.4% from 2026 to 2030. In the natural gas market, PRC’s natural gas market size increased from 209.2 billion cubic meters in 2021 to 260.8 billion cubic meters in 2025, representing a CAGR of 5.7% from 2021 to 2025, and is expected to further increase to 318.8 billion cubic meters by 2030, representing a CAGR of 3.9% from 2026 to 2030.

In response to the increasingly strict standards for high-efficiency, low-carbon, and secure development, the oil and gas market is accelerating its transformation and upgrading, gradually shifting from scale expansion to quality enhancement. Enterprises have intensified efforts in energy conservation and consumption reduction, equipment upgrades, green maintenance and risk control, raising the market’s overall operational efficiency. Meanwhile, the continuous improvement of regulator rules, technical standards and service protocols has optimized market dynamics and resource allocation efficiency. As the industry places greater emphasis on production safety, compliant operations and low-carbon development, the importance of testing, inspection and asset integrity management services is becoming more prominent. The value of such services is shifting from a traditional supporting function to a key capability for ensuring safe operations, improving asset utilization efficiency and supporting high-quality industry development.

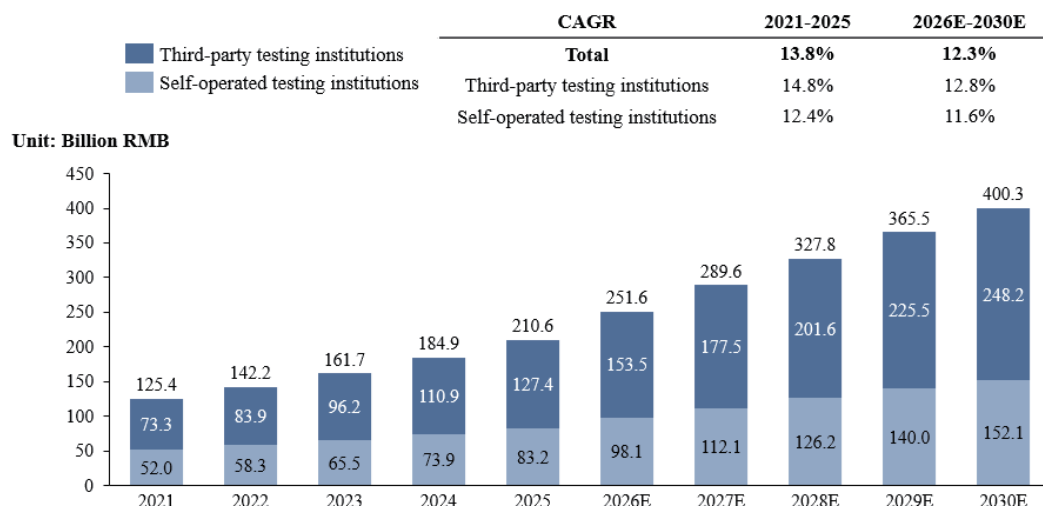
Market Size of Global and PRC TIC Integrated Solution Market for the Oil and Gas Sector

Driven by the accelerated aging of global oil and gas infrastructure and the successful implementation of digital testing technologies, the demand for relevant testing and inspection services continues to experience robust growth. According to Frost & Sullivan, the global TIC integrated solution market for the oil and gas sector reached RMB210.6 billion in 2025, with a CAGR of 13.8% from 2021 to 2025. As global in-service oil and gas pipelines, refining facilities and offshore platforms enter the mid-to-late service stages, risk-based maintenance and asset integrity management will be fully popularized, driving the industry into a period of steady expansion. According to Frost & Sullivan, the global TIC integrated solution market for the oil and gas sector will reach RMB400.3 billion in 2030, with a CAGR of 12.3% from 2026 to 2030.

Divided by service type, the market size of global third-party testing institutions reached RMB127.4 billion in 2025, which is expected to reach RMB248.2 billion in 2030, with a CAGR of 12.8% from 2026 to 2030. The market size of self-operated testing institutions of global oil and gas enterprises reached RMB83.2 billion in 2025, which is expected to reach RMB152.1 billion in 2030, with a CAGR of 11.6% from 2026 to 2030.

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Global TIC Integrated Solution Market for the Oil and Gas Sector, By Revenue, 2021-2030E



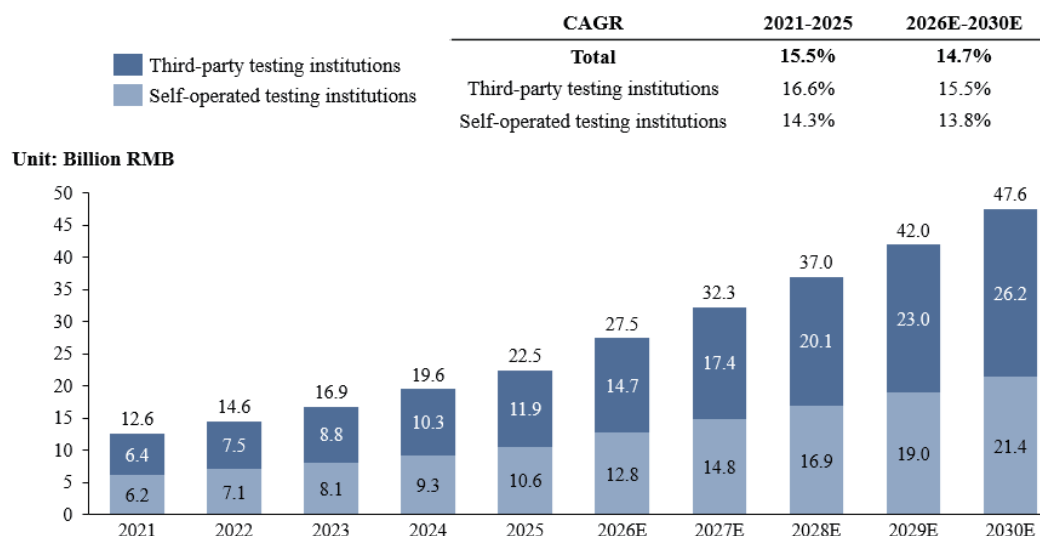
Source: Global Energy Monitor, Energy Institute, Frost & Sullivan

Driven by the rising production volume of oil and gas resources in PRC, the critical need for the operation and maintenance of mature oilfields and shut-in wells has become increasingly prominent. Consequently, such operational requirements continue to fuel the demand for oil and gas testing and inspection services. According to Frost & Sullivan, the market size of PRC TIC integrated solution market for the oil and gas sector reached RMB22.5 billion in 2025, with a CAGR of 15.5% from 2021 to 2025. As PRC’s exclusive compliance requirements for oil and gas asset emission and environmental protection become increasingly strict, the demand for relevant testing and inspection services continues to expand. Ultimately, the regulatory pressure drives the steady growth of the industry. According to Frost & Sullivan, the market size of PRC TIC integrated solution market for the oil and gas sector will reach RMB47.6 billion in 2030, with a CAGR of 14.7% from 2026 to 2030.

Divided by service type, the market size of PRC’s third-party testing institutions reached RMB11.9 billion in 2025, which is expected to reach RMB26.2 billion in 2030, with a CAGR of 15.5% from 2026 to 2030. The market size of self-operated testing institutions of PRC’s oil and gas enterprises reached RMB10.6 billion in 2025, which is expected to reach RMB21.4 billion in 2030, with a CAGR of 13.8% from 2026 to 2030.

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PRC TIC Integrated Solution Market for the Oil and Gas Sector, By Revenue, 2021-2030E



Source: CPCIF, Global Energy Monitor, Energy Institute, Frost & Sullivan

Competitive Landscape of the Global and PRC TIC Integrated Solution Market for the Oil and Gas Sector

The global TIC integrated solution market for the oil and gas sector is dominated by international giants, which have formed a widespread layout in core oil and gas producing regions globally. International enterprises represented by SGS, Bureau Veritas, DNV, Intertek, and TÜV Rheinland have long established deep cooperative relationships with core oil and gas groups (such as Saudi Aramco, ExxonMobil, Chevron, etc.). Leveraging accumulated technological expertise, comprehensive certification frameworks, and extensive global service networks, the industry leading companies firmly hold the top market positions. In 2025, measured by revenue, the market concentration of the top five players in the global TIC integrated solution market for the oil and gas sector reached 44.1%.

The PRC TIC integrated solution market for the oil and gas sector is relatively fragmented, presenting a competitive landscape where comprehensive testing institutions and professional testing institutions compete directly. In 2025, the market concentration of the top five players in PRC TIC integrated solution market for the oil and gas sector is 19.2%. Among the top five players, professional testing institutions continuously enhance their strengths through technological innovation, service network expansion, and qualification accumulation. In 2025, in terms of revenue within PRC TIC integrated solution market for the oil and gas sector, the company ranked 5th in the overall market and 2nd among professional testing institutions, with a corresponding market share of 1.8%.

Ranking ⁽¹⁾⁽²⁾	Company	Country	Market Share	Company Type ⁽³⁾
1.	Company A ⁽⁴⁾	PRC	7.1%	Professional testing institutions
2.	Company B ⁽⁵⁾	PRC	3.8%	Comprehensive testing institutions
3.	Company C ⁽⁶⁾	Switzerland	3.5%	Comprehensive testing institutions
4.	Company D ⁽⁷⁾	France	3.0%	Comprehensive testing institutions
5.	The Company	PRC	1.8%	Professional testing institutions

Source: Financial reports of relevant companies, interviews with industry experts, Frost & Sullivan

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Notes:

- (1) The revenue data of Company A to Company D is based on estimation calculated by unit sales and other available public information, cross-checked with industry participants and experts on best effort, thus may be different from the auditing data from the above players.
- (2) Available public information includes financial reports of listed companies and publicly available industry reports, etc.
- (3) Professional testing institutions deliver testing, inspection, and certification services for specific industrial segments, focusing deeply on particular testing verticals. Comprehensive testing institutions possess cross-industry service capabilities, enabling the delivery of testing, inspection, and certification services tailored to the distinct standards of various industries.
- (4) Company A was established in 1979 with its headquarters located in Beijing, PRC, where its main businesses cover special equipment testing and inspection, safety risk assessment, failure analysis, and the formulation of industry regulations and standards.
- (5) Company B was established in 2003 with its headquarters located in Guangdong, PRC, and is listed on the Shenzhen Stock Exchange, where its main businesses cover life science testing, industrial and engineering testing, consumer goods testing, and trade assurance services.
- (6) Company C was established in 1878 with its headquarters located in Geneva, Switzerland, and is listed on the Swiss Exchange, where its main businesses cover natural resources inspection, industrial and environmental testing, consumer goods and retail testing, and global management system certification.
- (7) Company D was established in 1828 with its headquarters located in Paris, France, and is listed on the Euronext, where its main businesses cover marine and offshore facilities inspection, building and infrastructure testing, industrial equipment asset integrity assessment, and agri-food and consumer products certification.

Entry Barriers of the TIC Integrated Solution Market for the Oil and Gas Sector

Qualification Barriers

The TIC integrated solution market for the oil and gas sector operates under stringent dual regulatory oversight from both PRC’s and international authorities. New market entrants are required to obtain core PRC’s qualifications, including the work safety testing and inspection qualification issued by the Ministry of Emergency Management and the CMA metrology certification. Furthermore, prospective players need to successfully acquire two major authoritative international qualifications, which are the ISO 17025 laboratory accreditation and the API certification. The relevant qualifications establish strict requirements regarding fixed asset scale, technical personnel allocation, and standardized facility construction. The associated approval processes involve complex procedures and lengthy review cycles. Consequently, companies are obliged to invest substantial capital, human resources, and time to meet the stringent prerequisites and complete the entire qualification process. Ultimately, the high difficulty and significant costs associated with obtaining such qualifications create substantial barriers to entry.

Market Entry Barriers

Major oil and gas enterprises enforce strict supplier qualification and evaluation systems. Such evaluation procedures entail complex admission protocols and rigorous review standards, requiring solution providers to demonstrate proven comprehensive capabilities, extensive project experience, and exceptional service quality. Building a robust customer base requires long-term project validation and sustained reputation enhancement. Lacking an established track record with industry-leading oil and gas conglomerates, new entrants face immense challenges in penetrating the core market quickly.

Technical Barriers

The TIC integrated solutions for the oil and gas sector imposes extremely high testing data accuracy and exceptional equipment durability under complex working conditions. Service providers are expected to master advanced core technologies, such as non-destructive testing and asset integrity assessment. Additionally, market participants need to conduct targeted research and development (R&D) to create specialized testing equipment suitable for diverse operational scenarios, including oil and gas exploration, storage, transportation, and refining. R&D initiatives in the sector entail substantial upfront capital investments and lengthy development cycles. Furthermore, driven by the accelerating pace of technological iteration, new entrants struggle to overcome core technical bottlenecks in the short term, thereby forming formidable technical barriers.

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Talent Barriers

The sustainable development of the industry relies heavily on multidisciplinary professionals possessing both theoretical expertise and on-site practical experience. Practitioners are expected to thoroughly understand oil and gas engineering principles and testing technologies, while remaining fully conversant with PRC’s and international industry standards. Simultaneously, technical talents need to demonstrate robust on-site execution capabilities under harsh working conditions and the ability to manage unforeseen risks. Given the lengthy training cycles and market scarcity of such highly skilled professionals, new entrants struggle to quickly recruit, train, and assemble qualified service teams, thus creating a substantial talent barrier.

Service Capability Barriers

TIC integrated solutions for the oil and gas sector span the entire industry value chain, encompassing oil and gas exploration, development, storage, transportation, and refining. Consequently, the operational environments across such service scenarios remain highly complex and demanding. As a result, downstream customers exhibit a strong need for integrated testing, hazard mitigation, full-lifecycle operation and maintenance services. Such comprehensive demands drive testing providers to establish localized operational bases and high-standard laboratories to ensure agile responses and stable service delivery. Lacking large-scale project experience and facing prohibitive offline infrastructure costs, new entrants find it exceptionally difficult to build and sustain comprehensive service capabilities, establishing a definitive barrier to entry.

Drivers of the TIC Integrated Solution Market for the Oil and Gas Sector

Growing TIC Integrated Solutions Requirements Across the Entire Value Chain

Increased investment in upstream gas exploration and the continuous expansion of midstream infrastructure, such as high-pressure gas pipelines, storage terminals, and natural gas processing plants, necessitate constant technical assessment to ensure asset integrity. Complex logistics and high-pressure transport systems create a clear need for professional safety inspections and performance testing tailored to gas-specific equipment. Furthermore, the downstream segment, encompassing city gas distribution networks and industrial end-user applications, drives demand for rigorous verification of downstream pressure regulation and flow control equipment. Industry participants rely more heavily on TIC integrated solutions to manage operational risks across the entire natural gas value chain, prevent equipment failure, and ensure the long-term safety and reliability of critical energy assets.

Energy Transition in Emerging Markets

Rapid industrial growth and urbanization across emerging markets in the Middle East and Africa are accelerating the regional transition toward natural gas and renewable energy. Major energy infrastructure projects in these regions necessitate strict technical compliance, international safety certification, and consistent quality assessments throughout the entire lifecycle from initial construction to final operation. The resulting expansion of regional infrastructure directly increases the demand for TIC integrated solutions, as global energy companies increasingly rely on specialized technical support to meet international safety criteria and ensure the successful delivery of complex projects.

Enhancement of Asset Operation and Management Requirements

As the industry comprehensively enters the stage of refined operations, the operational focus of downstream enterprises gradually shifts from capacity expansion to the maximization of asset efficiency. Consequently, demands for full-lifecycle operational management of core production equipment continue to rise. Extending equipment service life, reducing comprehensive maintenance costs, and minimizing

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unplanned downtime have emerged as critical operational priorities. By delivering full-lifecycle condition monitoring and data-driven maintenance guidance, TIC integrated solutions for the oil and gas sector precisely address such refined management needs, playing a pivotal role in enhancing equipment stability and operational efficiency.

Upgrade of Compliance and Regulatory Requirements

The compliance supervision of the global TIC integrated solution market for the oil and gas sector has been comprehensively upgraded. PRC’s *Work Safety Law of the People’s Republic of China* (《中華人民共和國安全生產法》) and *Special Equipment Safety Law of the People’s Republic of China* (《中華人民共和國特種設備安全法》), as well as the United States’ *Process Safety Management of Highly Hazardous Chemicals regulations*, all impose mandatory requirements for the normalized testing and inspection of facilities. Oil and gas enterprises need to rely on specialized testing solutions to complete full-process compliance verifications and proactive risk assessments. Such measures can effectively avoid uncertain incidents and mitigate substantial non-compliance penalties, thereby driving sustained demand for high-quality testing and inspection services.

Future Trends of the TIC Integrated Solution Market for the Oil and Gas Sector

Digital Transformation

TIC integrated solution market for the oil and gas sector is moving rapidly toward digital and intelligent operations. By applying artificial intelligence and big data to core work processes, TIC integrated solutions use automated tools to replace manual testing, which significantly improves work efficiency. A unified data system allows for the integration of Internet of Things (IoT) and big data analytics, effectively removing data barriers across the entire industry chain. Furthermore, automated inspection data from various operational scenarios continuously refines and trains AI algorithms. Continuous feedback from this data flow drives ongoing improvements in testing precision, comprehensively elevating the core competitive advantages of digitalization and intelligence.

Green and Low-Carbon Development

Global net-zero emission targets are steadily advancing. Simultaneously, regulatory authorities are implementing key environmental regulations, including the *Atmospheric Pollution Prevention and Control Law of the People’s Republic of China* (《中華人民共和國大氣污染防治法》) and the *European Climate Law*. Consequently, green and low-carbon transformation has become a development trend for the industry. TIC integrated solutions for the oil and gas sector can provide diversified professional services such as leak detection and repair, as well as green compliance certification, which can fulfill mandatory environmental requirements for enterprises. Furthermore, specialized testing delivers essential technical support for the sustainable transition of the entire value chain, thus creating broad market growth potential for the industry.

Continuous Expansion of Service Boundaries

Developed in high-risk and heavily regulated environments, TIC integrated solution services for the oil and gas sector require exceptional technical capabilities. Proven strengths in analyzing complex operating conditions, assessing asset health, ensuring compliance accomplishment, and executing digital delivery allow service providers to easily adapt to other industries. Rising demands for work safety, asset efficiency, and lifecycle management are actively reshaping to other industries like chemicals, new energy, mining, advanced manufacturing, and construction engineering. Applying proven oil and gas TIC methodologies to these broader fields empowers service providers to capture growing opportunities.

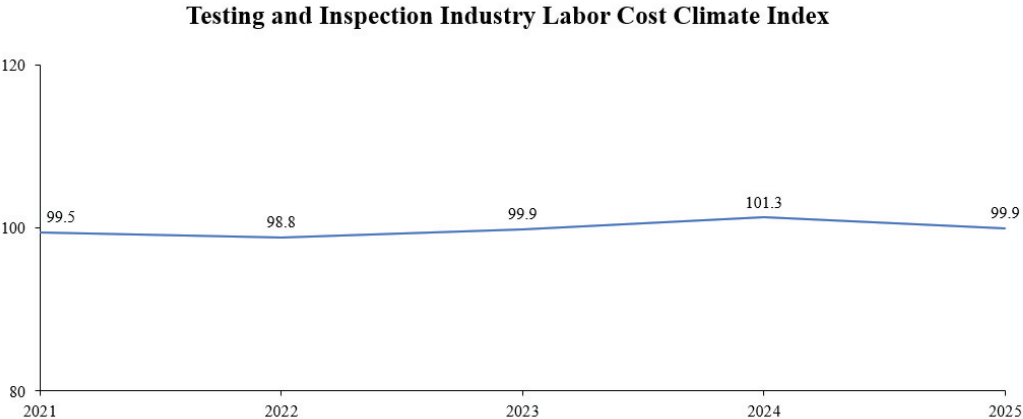
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Upgrading the global service capabilities of PRC’s enterprises

The accelerated globalization of energy infrastructure is creating more opportunities for PRC’s TIC integrated solution providers in overseas markets. PRC’s providers have developed clear competitive strengths in the delivery of large-scale overseas infrastructure projects, EPC project, and oil and gas asset-related services. Through full-lifecycle technical support for major international energy projects, such service providers have gained extensive experience in cross-border technical standards and complex engineering execution. A strong track record in supporting PRC’s energy companies overseas also places PRC’s TIC integrated solution providers in a favorable position to build global recognition and capture long-term market growth.

COST ANALYSIS OF TIC INTEGRATED SOLUTION MARKET FOR THE OIL AND GAS SECTOR

The TIC integrated solution market for the oil and gas sector is a technology-intensive industry, where the remuneration expenses of professional personnel constitute the core costs for enterprises to provide services. The industry generally adopts the Testing and Inspection Industry Labor Cost Climate Index to measure the fluctuations of this cost. The index was 99.5, 98.8, and 99.9 from 2021 to 2023 respectively, which reflects that the industry faced upward pressure on labor costs. Such rising costs were driven mostly by public health events that reduced the available workforce and pushed up overall employment costs. Since 2024, with the larger talent supply, more standardized testing procedures, and the wider use of automated equipment, the index rose to 101.3, indicating a drop in labor costs. In 2025, the index dropped back to 99.9, showing a moderate increase in labor costs compared to 2024. Recent cost growth mainly comes from a rising demand for specialized talent in high-end testing services. To meet advanced testing needs, enterprises should pay higher salaries for rare experts with cross-industry experience. Looking forward, driven by technological substitution and management optimization, the labor cost will be maintained within a stable, controllable, and reasonable range in the long term.



Source: State Administration for Market Regulation, Frost & Sullivan

Note:

- (1) The Testing and Inspection Industry Labor Cost Climate Index utilizes 100 as its baseline value, where an index higher than 100 represents a decrease in labor costs, and an index lower than 100 represents an increase in labor costs.
- (2) The Labor Cost Climate Index serves as a sub-index of the Testing and Inspection Industry Climate Index and is periodically issued by the State Administration for Market Regulation.

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SOURCE OF INFORMATION

In connection with the [REDACTED], we have engaged Frost & Sullivan to conduct a detailed analysis and prepare an industry report on our market. Frost & Sullivan is an independent global market research and consulting company founded in 1961 and based in the United States. Services provided by Frost & Sullivan include market assessments, competitive benchmarking, and strategic and market planning for a variety of industries. We have agreed to pay Frost & Sullivan a fee of RMB[550,000] for the preparation of the Frost & Sullivan Report. The payment of such amount was not contingent upon our successful [REDACTED] or on the content of the Frost & Sullivan Report. Except for the Frost & Sullivan Report, we did not commission any other industry report in connection with the [REDACTED].

We have included certain information from the Frost & Sullivan Report in this document because we believe such information facilitates an understanding of our markets for potential investors. Frost & Sullivan prepared its report based on its in-house database, independent third-party reports, and publicly available data from reputable industry organizations. Where necessary, Frost & Sullivan contacts companies operating in the industry to gather and synthesize information in relation to the market, prices and other relevant information. Frost & Sullivan believes that the basic assumptions used in preparing the Frost & Sullivan Report, including those used to make future projections, are factual, correct and not misleading. Frost & Sullivan has independently analyzed the information, but the accuracy of the conclusions of its review largely relies on the accuracy of the information collected. Frost & Sullivan research may be affected by the accuracy of these assumptions and the choice of these primary and secondary sources.

Our Directors confirm that, after making reasonable enquiries, there has been no material adverse change in the market information since the date of the Frost & Sullivan Report which may qualify, contradict or have an impact on the information in this section.