

# India Marine Engines Market Segmented By Stroke (Four Stroke, Two Stroke and Others), By Capacity (Up to 1,000 HP, 1,001-5,000 HP, 5,001-10,000 HP, 10,001-20,000 HP and Above 20,000 HP), By Fuel Type (Heavy Fuel Oil, Intermediate Fuel Oil and Others), By Ship Type (Bulk Carriers, General Cargo Ships, Container Ships, Ferries & Passenger Ships, Oil Tankers and Others), By Region, and By Competition, 2019-2029F

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# **Report description:**

India Marine Engines Market has valued at USD 1.68 billion in 2023 and is anticipated to project robust growth in the forecast period with a CAGR of 3.01% through 2029. The tourism sector, encompassing leisure boating and cruise tourism, has the potential to stimulate the demand for marine engines. As an increasing number of individuals pursue recreational activities on water, there arises a necessity for boats and vessels equipped with reliable engines.

Key Market Drivers

Growing Demand for Commercial Shipping Services

The Indian marine engines market is witnessing a substantial boost due to the growing demand for commercial shipping services. This surge is driven by various factors that have collectively contributed to the expansion of the maritime industry in India. First and foremost, India's strategic geographical location has positioned it as a crucial hub for international trade and shipping. With an extensive coastline along the Arabian Sea and the Bay of Bengal, India enjoys close proximity to major global trade routes. Consequently, the country serves as a pivotal transit point for goods moving between Europe, Asia, and Africa. The upsurge in international trade has necessitated a corresponding increase in shipping activities, leading to a surge in the demand for marine engines.

Moreover, the Indian government's initiatives, such as "Sagarmala" and "Make in India," have further bolstered the maritime sector. Particularly, the Sagarmala initiative aims to modernize port infrastructure, enhance logistics efficiency, and promote coastal shipping. This has incentivized businesses to invest in expanding their fleets, thereby necessitating new marine engines to power vessels efficiently.

Furthermore, the steady growth of the Indian economy has resulted in increased consumption, manufacturing, and infrastructure development. These sectors heavily rely on maritime transportation for the import and export of raw materials and finished products. The need for reliable and efficient marine engines is paramount to ensure the smooth functioning of the supply chain, and this demand remains a significant driver of the marine engines market.

Stringent Environmental Regulations Promoting Cleaner Technologies

Environmental concerns and the need to adhere to stringent regulations are emerging as a critical driver for the Indian marine engines market. With a globa focus on reducing emissions and minimizing the environmental impact of maritime transportation, the demand for cleaner and more sustainable marine engine technologies has grown significantly.

International conventions such as the International Maritime Organization's (IMO) MARPOL Annex VI have mandated strict limits on sulfur emissions from vessels. To ensure compliance with these regulations, shipowners are increasingly adopting engines that utilize cleaner fuels like liquefied natural gas (LNG) and implementing exhaust gas cleaning systems (scrubbers). These changes have triggered a wave of retrofitting and replacement in the marine engines market.

Additionally, the Indian government has introduced measures to address environmental concerns in the maritime sector. Initiatives such as "Green Port" and the promotion of eco-friendly shipping practices have spurred greater demand for environmentally friendly marine engines. This includes the adoption of technologies such as selective catalytic reduction (SCR) systems and energy-efficient engines, which effectively reduce nitrogen oxide (NOx) and carbon dioxide (CO2) emissions. The growing awareness among consumers regarding the environmental impact of shipping, coupled with the increasing pressure on companies to adopt sustainable practices, is driving the adoption of cleaner marine engines. Consequently, manufacturers are investing in research and development to produce engines that not only comply with regulations but also contribute to reducing the industry's carbon footprint.

### Expansion of the Offshore Oil and Gas Industry

The expansion of the offshore oil and gas industry serves as a significant catalyst for the Indian marine engines market. India possesses considerable offshore oil and gas reserves within its waters, necessitating a robust fleet of vessels powered by advanced marine engines to facilitate exploration and extraction activities in these areas.

India's energy requirements represent one of the primary factors contributing to this growth driver. With the country's population and economy continuing to flourish, there is a parallel increase in energy demand. Offshore oil and gas reserves offer a valuable domestic source of energy production, thereby reducing India's reliance on oil imports. To tap into these reserves, oil and gas companies are making substantial investments in offshore exploration and drilling operations.

These offshore operations entail a diverse range of vessels, including drilling rigs, offshore support vessels, and floating production storage and offloading (FPSO) units. These vessels are equipped with specialized marine engines engineered to withstand the demanding offshore environments. Consequently, there has been a surge in demand for such engines as the offshore industry expands.

Moreover, the Indian government has implemented policies to promote the development of the offshore oil and gas sector, encouraging investment and streamlining regulatory processes. This favorable environment has attracted both domestic and international players to invest in offshore exploration and production, thereby further bolstering the marine engines market. In conclusion, the Indian marine engines market is driven by the rising demand for commercial shipping services, stringent environmental regulations promoting cleaner technologies, and the expanding offshore oil and gas industry. These drivers are shaping the market's dynamics and are expected to continue exerting their influence on its growth in the foreseeable future. Key Market Challenges

# Regulatory Compliance and Environmental Concerns

One of the primary challenges encountered by the Indian marine engines market is the imperative of meeting increasingly stringent regulatory requirements and addressing environmental concerns. Internationally, the maritime industry faces mounting pressure to reduce its environmental footprint, particularly in terms of sulfur dioxide (SO2), nitrogen oxides (NOx), and carbon

### dioxide (CO2) emissions.

The International Maritime Organization (IMO) has implemented regulations such as MARPOL Annex VI, which mandates lower sulfur content in marine fuels and imposes limits on NOx emissions. Compliance with these regulations necessitates significant investments in technology and infrastructure. Shipowners and operators must either transition to low-sulfur fuels like marine gas oil (MGO) or invest in exhaust gas cleaning systems (scrubbers) to mitigate emissions.

This challenge is particularly pronounced in India, where the majority of vessels still rely on high-sulfur fuels. Retrofitting existing engines or transitioning to cleaner alternatives can pose a considerable financial burden. Additionally, ensuring consistent enforcement of these regulations and establishing a level playing field for all operators remains a challenge, with concerns regarding non-compliance.

Moreover, India's coastline and ports often confront environmental issues such as oil spills and marine pollution, warranting stricter enforcement of environmental regulations. This further amplifies the compliance burden on marine engine manufacturers and operators.

Effectively addressing these regulatory and environmental concerns will require substantial investments in research and development, technological advancements, and the adoption of cleaner fuels. The marine engines market in India must identify sustainable solutions to ensure compliance while minimizing its environmental impact.

Technological Advancements and Innovation

The rapid pace of technological advancements in marine engine design and propulsion systems presents a significant challenge to the Indian marine engines market. While innovation is crucial for efficiency, environmental sustainability, and competitiveness, it can be a double-edged sword, particularly for established manufacturers who must consistently invest in research and development to maintain competitiveness.

As global demand for more fuel-efficient and environmentally friendly marine engines increases, manufacturers face pressure to invest in cutting-edge technologies. New engine designs incorporate features such as advanced fuel injection systems, electronic control systems, and hybrid or electric propulsion systems. These innovations not only enhance engine performance but also reduce emissions and operational costs.

However, keeping up with the latest technologies can be expensive and time-consuming for both manufacturers and vessel operators. It requires significant capital investments in research, development, and testing. Smaller players in the Indian marine engines market may encounter challenges in competing with larger, well-funded companies in this regard.

Furthermore, the rapid pace of technological change can lead to obsolescence. Vessels with older engines may struggle to upgrade or retrofit their propulsion systems to meet evolving regulatory and environmental standards. This technological challenge emphasizes the importance of staying ahead of the innovation curve while considering the practicality of implementation for the existing fleet.

# Key Market Trends

Transition to Cleaner and Sustainable Propulsion Technologies

A prominent trend observed in the India Marine Engines Market is the ongoing transition towards cleaner and more sustainable propulsion technologies. This shift is primarily driven by a combination of domestic and international factors, including stringent environmental regulations, global sustainability goals, and the maritime industry's commitment to reducing its carbon footprint. To comply with international regulations such as the International Maritime Organization's (IMO) MARPOL Annex VI, which mandates lower sulfur emissions and stricter controls on nitrogen oxides (NOx), shipowners and operators in India are increasingly adopting cleaner marine engines. This transition involves a shift away from conventional high-sulfur fuels towards cleaner alternatives like liquefied natural gas (LNG), as well as the installation of exhaust gas cleaning systems (scrubbers) to effectively reduce emissions.

Furthermore, there is a growing interest in exploring alternative propulsion methods, such as battery-electric and hybrid propulsion systems. These innovative technologies offer potential solutions for achieving zero-emission shipping, particularly for smaller vessels operating in coastal areas. The Indian government's emphasis on promoting electric mobility and renewable energy sources is expected to further accelerate the adoption of these sustainable propulsion technologies in the marine engines market.

Manufacturers are actively investing in research and development to create more fuel-efficient and environmentally friendly

marine engines. These advanced engines not only assist vessels in meeting regulatory requirements but also contribute to reducing operational costs, ultimately enhancing competitiveness in the global market. As the world progresses towards a greener and more sustainable future, this trend will continue to significantly influence and shape the Indian marine engines market. Digitalization and IoT Integration

Another significant trend observed in the India Marine Engines Market is the growing integration of digitalization and Internet of Things (IoT) into engine monitoring and maintenance processes. This trend is primarily driven by the imperative to enhance operational efficiency, minimize downtime, and optimize predictive maintenance practices.

Modern marine engines are now equipped with sophisticated sensors and data collection systems that enable real-time monitoring of various parameters, including engine performance, fuel consumption, and emissions. This valuable data is transmitted to onshore control centers, facilitating remote monitoring and comprehensive analysis. IoT technologies play a pivotal role in providing engine manufacturers and ship operators with crucial insights into engine health, fuel efficiency, and potential issues. Predictive maintenance emerges as a key application of IoT in the marine engines market. By leveraging data collected from sensors, advanced machine learning algorithms can accurately predict maintenance requirements, thereby preventing costly breakdowns and optimizing overall engine performance. This proactive approach effectively minimizes unplanned downtime and significantly reduces operational costs for vessel operators.

Furthermore, the rising prevalence of digital twins for marine engines is worth mentioning. These digital replicas efficiently simulate the behavior of physical engines, empowering engineers and operators to conduct comprehensive testing of various scenarios, optimize performance, and plan maintenance activities with precision.

The adoption of digitalization and IoT integration is expected to witness substantial growth in the forthcoming years as the industry increasingly recognizes the profound value of data-driven decision-making and the significant potential for cost savings. Moreover, this transformative shift aligns seamlessly with India's broader initiatives encompassing Industry 4.0 and the digitization of diverse sectors.

Segmental Insights

Stroke Insights

The Two Stroke emerged as the dominant segment in the global market in 2023. The Two-Stroke Segment of the India Marine Engines Market is primarily driven by the shipping industry, encompassing both domestic coastal shipping and international maritime trade. These engines are renowned for their impressive power-to-weight ratio, rendering them ideal for larger vessels that demand substantial propulsion force.

Two-stroke engines are the preferred choice for commercial shipping owing to their efficiency and robust power output. They find extensive application in cargo vessels, oil tankers, and container ships, which form crucial components of India's trade and transportation infrastructure. Fuel efficiency plays a pivotal role in the selection of two-stroke engines as it directly impacts operational expenses. Engine manufacturers continually strive to enhance the efficiency of these engines through design advancements and the utilization of alternative fuels, such as LNG.

The Two-Stroke Segment is currently witnessing a gradual shift towards cleaner fuels like liquefied natural gas (LNG) to mitigate emissions and comply with environmental regulations. This transition presents lucrative opportunities for engine manufacturers to develop and supply dual-fuel or LNG-powered two-stroke engines. Moreover, there is an increasing trend of retrofitting older vessels with conventional two-stroke engines with emission-reduction technologies, including exhaust gas cleaning systems (scrubbers) and NOx reduction systems. This retrofitting trend opens avenues for manufacturers and service providers. Capacity Insights

The Above 20,000 HP segment is projected to experience rapid growth during the forecast period. These engines play a pivotal role in powering large container ships, bulk carriers, oil tankers, cruise liners, and offshore drilling rigs. They are designed to deliver the high thrust and torque necessary for efficient propulsion and operation of these substantial vessels.

Engines in this segment are primarily utilized in large vessels that significantly contribute to India's maritime trade, energy sector, and naval operations. These vessels are instrumental in transporting goods, energy resources, and passengers both domestically and internationally.

Meeting stringent emissions regulations, including IMO Tier III and MARPOL Annex VI, is a notable trend. Manufacturers are developing engines with advanced emission-control technologies, such as selective catalytic reduction (SCR) systems and exhaust

gas cleaning systems (scrubbers), to minimize nitrogen oxide (NOx) and sulfur emissions. Fuel efficiency is a critical consideration for engines in this segment due to the substantial fuel consumption of large vessels. Manufacturers continuously strive for design improvements and explore alternative fuels, such as liquefied natural gas (LNG), to enhance fuel efficiency and reduce operational costs.

In conclusion, the "Above 20,000 HP" segment of the India Marine Engines Market plays a crucial role in bolstering the country's maritime trade, offshore energy sector, and defense capabilities.

## **Regional Insights**

South India emerged as the dominant region in the India Marine Engines market in 2023. South India is home to several prominent ports and shipyards, such as Chennai, Kochi, Visakhapatnam, and Ennore. These ports serve as key drivers of the marine engines market in the region. The shipbuilding and repair industry in South India has attracted both domestic and international players, contributing to a diverse ecosystem of marine engine manufacturers, distributors, and service providers. The shipbuilding and repair industry in South India presents significant opportunities for marine engine manufacturers. As shipyards undertake new vessel construction and refurbishment projects, there is a continuous demand for modern and efficient marine engines. The region's strategic proximity to the Bay of Bengal and the potential for offshore oil and gas exploration offer growth prospects for marine engine suppliers. Engines for offshore drilling rigs, support vessels, and platforms are essential for the expanding offshore energy sector.

South India is increasingly investing in renewable energy, including offshore wind farms. Marine engines play a crucial role in the installation, maintenance, and operation of wind turbines and other offshore renewable energy infrastructure. Ongoing and planned port modernization projects in Chennai, Visakhapatnam, and other ports create opportunities for marine engines used in port equipment, tugboats, and dredging vessels.

In conclusion, the marine engines market in South India is characterized by a robust presence of shipbuilding and repair activities, significant offshore energy potential, and a growing focus on renewable energy projects.

**Key Market Players** Yanmar Holdings Co., Ltd. John Deere India Private Limited Mahindra & Mahindra Ltd Simpson & Co. Ltd. Wartsila India Private Limited Scania CV India Pvt Ltd Volvo Group Cummins India Ltd Hyundai Heavy Industries Mitsubishi Heavy Industries Report Scope: In this report, the India Marine Engines Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below: □□India Marine Engines Market, By Stroke: o∏Four Stroke o
Two Stroke o∏Others India Marine Engines Market, By Product: o Up to 1,000 HP o∏1,001∏5,000 HP o∏5,001∏10,000 HP o∏10,001∏20,000 HP o
Above 20,000 HP □India Marine Engines Market, By Fuel Type:

o Heavy Fuel Oil o
Intermediate Fuel Oil o Others India Marine Engines Market, By Ship Type: o
Bulk Carriers o
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Oil Tankers o∏Others India Marine Engines Market, By Region: o∏North India o
South India o∏East India Competitive Landscape Company Profiles: Detailed analysis of the major companies present in the India Marine Engines Market. Available Customizations: India Marine Engines Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report: **Company Information** Detailed analysis and profiling of additional market players (up to five).

# **Table of Contents:**

1. Product Overview 1.1. Market Definition 1.2. Scope of the Market 1.2.1. Markets Covered 1.2.2. Years Considered for Study 1.2.3. Key Market Segmentations 2. ⊓Research Methodology 2.1. Objective of the Study 2.2. □Baseline Methodology 2.3. ∏Formulation of the Scope 2.4. Assumptions and Limitations 2.5. Sources of Research 2.5.1. Secondary Research 2.5.2. Primary Research 2.6. Approach for the Market Study 2.6.1. The Bottom-Up Approach 2.6.2. The Top-Down Approach 2.7. Methodology Followed for Calculation of Market Size & Market Shares 2.8. Forecasting Methodology 2.8.1. Data Triangulation & Validation 3. Executive Summary 4. Impact of COVID-19 on India Marine Engines Market 5. Voice of Customer

6. India Marine Engines Market Overview 7. India Marine Engines Market Outlook 7.1. Market Size & Forecast 7.1.1. By Value 7.2. Market Share & Forecast 7.2.1. By Stroke (Four Stroke, Two Stroke and Others) 7.2.2. [By Capacity (Up to 1,000 HP, 1,001-5,000 HP, 5,001-10,000 HP, 10,001-20,000 HP and Above 20,000 HP) 7.2.3. By Fuel Type (Heavy Fuel Oil, Intermediate Fuel Oil and Others) 7.2.4. [By Ship Type (Bulk Carriers, General Cargo Ships, Container Ships, Ferries & Passenger Ships, Oil Tankers and Others) 7.2.5. □By Region (North India, South India, East India, West India) 7.3. □By Company (2023) 7.4. Market Map 8. North India Marine Engines Market Outlook 8.1. Market Size & Forecast 8.1.1. By Value 8.2. Market Share & Forecast 8.2.1. By Stroke 8.2.2. By Product 8.2.3. By Fuel Type 8.2.4. By Ship Type 9. South India Marine Engines Market Outlook 9.1. Market Size & Forecast 9.1.1.∏By Value 9.2. Market Share & Forecast 9.2.1. By Stroke 9.2.2. By Product 9.2.3. By Fuel Type 9.2.4. By Ship Type 10. East India Marine Engines Market Outlook 10.1. Market Size & Forecast 10.1.1.∏By Value 10.2. Market Share & Forecast 10.2.1. □By Stroke 10.2.2. □By Product 10.2.3. By Fuel Type 10.2.4. By Ship Type 11. West India Marine Engines Market Outlook 11.1. Market Size & Forecast 11.1.1. By Value 11.2. Market Share & Forecast 11.2.1. By Stroke 11.2.2. By Product 11.2.3. □By Fuel Type 11.2.4. By Ship Type 12. Market Dynamics 12.1. Drivers 12.2. Challenges

13. Market Trends and Developments 14. Company Profiles 14.1. Tanmar Holdings Co., Ltd. 14.1.1. Business Overview 14.1.2. Key Revenue and Financials 14.1.3. Recent Developments 14.1.4. Key Personnel/Key Contact Person 14.1.5. Key Product/Services Offered 14.2. John Deere India Private Limited 14.2.1. ||Business Overview 14.2.2. Key Revenue and Financials 14.2.3. 
□Recent Developments 14.2.5. Key Product/Services Offered 14.3. Mahindra & Mahindra Ltd 14.3.1. ⊓Business Overview 14.3.2. Key Revenue and Financials 14.3.3. Recent Developments 14.3.4. Key Personnel/Key Contact Person 14.3.5. ||Key Product/Services Offered 14.4. Simpson & Co. Ltd. 14.4.1. Business Overview 14.4.2. Key Revenue and Financials 14.4.3. Recent Developments 14.4.4. Key Personnel/Key Contact Person 14.4.5. Key Product/Services Offered 14.5. Wartsila India Private Limited 14.5.1. Business Overview 14.5.2. Key Revenue and Financials 14.5.3. 
¬Recent Developments 14.5.4. 
¬Key Personnel/Key Contact Person 14.5.5. ||Key Product/Services Offered 14.6. Scania CV India Pvt Ltd 14.6.1. □Business Overview 14.6.2. Key Revenue and Financials 14.6.3. Recent Developments 14.6.4. Key Personnel/Key Contact Person 14.6.5. Key Product/Services Offered 14.7. Volvo Group 14.7.1. Business Overview 14.7.2. Key Revenue and Financials 14.7.3. Recent Developments 14.8. Cummins India Ltd 14.8.1. Business Overview 14.8.2. Key Revenue and Financials

14.8.3. Recent Developments

- 14.8.4. Key Personnel/Key Contact Person
- 14.8.5. Key Product/Services Offered
- 14.9. Hyundai Heavy Industries
- 14.9.1. Business Overview
- 14.9.2. Key Revenue and Financials
- 14.9.3. Recent Developments
- 14.9.4. Key Personnel/Key Contact Person
- 14.9.5. Key Product/Services Offered
- 14.10. Mitsubishi Heavy Industries
- 14.10.1. Business Overview
- 14.10.2. Key Revenue and Financials
- 14.10.3. Recent Developments
- 14.10.4. Key Personnel/Key Contact Person
- 14.10.5. Key Product/Services Offered
- 15. Strategic Recommendations
- 16. About Us & Disclaimer



# India Marine Engines Market Segmented By Stroke (Four Stroke, Two Stroke and Others), By Capacity (Up to 1,000 HP, 1,001-5,000 HP, 5,001-10,000 HP, 10,001-20,000 HP and Above 20,000 HP), By Fuel Type (Heavy Fuel Oil, Intermediate Fuel Oil and Others), By Ship Type (Bulk Carriers, General Cargo Ships, Container Ships, Ferries & Passenger Ships, Oil Tankers and Others), By Region, and By Competition, 2019-2029F

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