

Management Discussion and Analysis

Introduction to Triveni Turbines

Triveni Turbines is a market-leading corporation, with core competencies in the areas of industrial heat & power solutions, along with decentralised steam-based renewable turbines up to 100 MW size.

Pioneering industrial steam turbine solutions

Triveni Turbines has 50+ years of experience and expertise in manufacturing and assembly of engineered steam turbine solutions, designed to meet the growing heat and power requirements of industrial customers across the globe. As one of the market leaders focussed on delivering industrial heat & power solutions, and decentralised steam-based renewable turbines up to 100 MW size, the Company plays a pivotal role in the industrial energy sector.

The Company provides its solutions and services to a marquee clientele, spanning major end-user industries like

Sugar, Distillery, Cement, Steel, Food Processing, Pulp & Paper, Pharmaceuticals, Petroleum Refineries, Chemicals, Petrochemicals and Fertilisers, etc.

Promoting sustainable energy through decentralised generation

Playing a critical role in meeting the global energy requirements, steam turbines find extensive use in the generation of heat and power from steam. They have emerged as one of the most efficient ways to convert heat energy into mechanical energy, which can be further converted into electrical energy. In the context of Triveni Turbines, whose customers also include decentralised renewable energy providers, particularly in areas where there is a lack of access to the main power grid or unreliable power supply, steam turbines are also used in conjunction with renewable energy sources. Along with solar or geothermal energy sources, they provide reliable and clean energy to users. Decentralised

power generation refers to the production of electricity closer to the point of consumption, enabling enhanced energy efficiency and reliability, reduced transmission losses & costs, and promotion of energy security. By using steam turbines in combination with solar, geothermal or waste-to-energy sources, communities can generate clean and reliable energy, while reducing their dependence on fossil fuels and augmenting their energy security and resilience.

Expanding global presence

Triveni Turbines has a large global footprint, which it continues to expand through its strategic investments. The Company manufactures steam turbines at its world-class manufacturing facilities in Peenya and Sompura at Bengaluru, India, and assists its customers with their aftermarket requirements through its global servicing presence. It is continually scaling its customer-centric approach through a robust service network spread across India, and having international offices in Europe, Middle East and Africa.

The Company has also established a dedicated office and repair facility in the USA to support its comprehensive product and service offerings in the region. By delivering responsive support across time zones, Triveni Turbines is reinforcing customer trust across global markets, and ensuring top-of-the-mind brand recall for its growing client base.

Expanding portfolio through new technology development

New technology development is the key engine of the Company's portfolio expansion strategy. Triveni Turbines collaborates actively with stakeholders to pioneer new manufacturing and service solutions for a wide range of industries. It is also advancing its energy transition efforts through the development of CO₂-based technologies for energy storage, heating and cooling applications using heat pumps and chillers.

Global Energy Demand

Steady growth in global energy demand, with rising share of renewables

The World Energy Outlook 2024 report by the International Energy Agency (IEA) has reported a 15% increase in the global demand for energy over the last decade. Rising population, increase in economic activity, and industrial output in emerging market and developing economies are the key factors driving the demand. Of the total demand increase, 40% has been met by clean energy (renewables), nuclear and low-emission fuels, including Carbon Capture, Utilisation and Storage (CCUS). This has led to a decline in the share of fossil fuels in the global energy mix - from 82% in 2013 to 80% in 2023. As the world moves towards a more renewables-rich energy system, the fossil fuels usage is further expected to decline to 75% by 2030, and below 60% by 2050.



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In response to growing energy demand and the imperative to cut emissions, the power sector is undergoing a profound transformation towards cleaner, more sustainable energy sources. This marked shift is expected to accelerate going forward, as countries and corporations intensify their climate commitments.

Indian Energy Demand and Indian Power Sector

The significant demand in energy in recent years is attributable to the country's rapid economic growth, industrial expansion and urbanisation. This has catalysed a stronger emphasis on sustainable development and climate-focussed policies.

According to MOSPI's Energy Statistics for India 2024, the country experienced a healthy growth of 6.5% in consumption of energy from 33,018 Petajoule (PJ) in 2021-22 to 35,159 PJ in 2022-23(P). India's power sector has also undergone significant transformation, aligning with the global energy trends. As of March 31, 2025, of the country's total installed electricity generation capacity of 475.21 GW, renewable energy accounted for 43%, according to the Central Electricity Authority (CEA). This milestone achievement reflects India's growing commitment to clean energy and steady progress towards a sustainable future.

Biopower, comprising biomass and biogas, has further emerged as a strong driver of the clean energy transition, contributing an additional 11.58 GW, and playing a crucial role in converting agricultural and organic waste into energy and further diversifying the renewable mix.

These developments are reducing India's reliance on fossil fuels, and advancing its shift to a more resilient, low-carbon energy system. They are aiding the nation in its journey towards achieving 500 GW of renewable energy capacity by 2030, with expectations of a continually accelerating transition toward environmentally sustainable "Green Power" solutions.

Indian Manufacturing Sector – Significance of Captive Power Generation

A major energy consumer, the industrial sector requires power for machinery, heating, cooling and various operational processes. Triveni Turbines offers efficient solutions tailored to various industrial heating and cooling needs. The current limited adoption of renewable energy in this sector highlights a significant opportunity to develop robust steam turbine generator systems.

Driven by the Government's 'Make in India' initiative, the industrial sector is emerging as a high-growth area. Rising

input costs, particularly energy expenses and stricter regulations, are prompting investments in captive power plants to ensure reliable, cost-effective and sustainable energy supply. Captive power generation has assumed a major significance for manufacturers, especially those vulnerable to grid disruptions. The high cost of industrial electricity, improved coal availability, growing awareness of renewable alternatives, and supportive green energy policies are expected to accelerate captive power capacity expansion in the country.

Industries such as cement, steel, petroleum refining and chemicals, are key drivers of this demand. Captive power units provide operational flexibility, utilising both fossil fuels and renewable sources – including hydro, solar PV, wind, bio-power, waste-to-energy, waste heat recovery, concentrated solar power and geothermal energy.

Advantages of Steam Turbines for Combined Heat and Power Applications (CHP) Efficient cogeneration solutions

As a key player steering energy transition, Triveni Turbines offers steam turbine solutions that utilise low-pressure steam from extraction turbines for heating applications, enabling simultaneous production of heat and electricity. This cogeneration approach reduces power generation costs by 14–15% compared to Independent Power Producers (IPPs). Unlike solar power, which operates only during daylight hours, cogeneration provides continuous energy, effectively meeting a plant's combined heat and power needs, thus lending a distinct advantage to manufacturers.

The rising demand for electricity, along with a growing emphasis on biomass energy, waste-to-energy solutions and waste heat recovery, is propelling sustainable and cost-efficient power generation through cogeneration technologies. This remains a major area of investment and focus for the turbines industry in general, and Triveni Turbines in particular.

Global Steam Turbine Market Overview

According to industry reports, the global steam turbine market declined at a CAGR of 0.7%, from 108 GW in 2014 to 101 GW in 2024. In 2024, the global steam turbine market, grew by 13% year-on-year, at the back of increased electricity demand and growth in utility turbines. Excluding China and Japan, the market grew by 68% year-on-year, supported by rising demand in industrial heat and power solutions.