

# TRIVENI TURBINES

ENHANCING THE WELL-BEING OF ALL STAKEHOLDERS BY LEVERAGING CUTTING-EDGE TECHNOLOGIES & INDUSTRY-BEST PRACTICES



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The Indian government's recently launched Make in India and PLI schemes have positioned the country as a major manufacturing hub lately. Since the manufacturing units demand a stable and sufficient power supply, the industry is now seeking various ways to reduce energy costs, as these expenses directly influence product pricing in the market. Dependence on traditional energy sources is no longer feasible, and the manufacturers must seek ways to meet its energy needs through sustainable alternatives. The manufacturing sector must align with India's global commitment to achieving a net-zero economy by 2070, which requires a shift to environmentally sustainable manufacturing practices.

Technological advancement in the manufacturing sector is crucial for several reasons. Firstly, innovations such as renewable energy sources, energy-efficient machinery, and smart grid systems allow manufacturers to adopt greener, more sustainable power

solutions. This not only lowers their environmental impact but also ensures a stable and reliable energy supply, reducing vulnerability to energy shortages and price fluctuations. Secondly, advanced technologies help manufacturers optimize processes, minimize waste, and use resources more efficiently. Most importantly, energy-efficient technologies can result in significant long-term cost savings, making manufacturing more competitive on a global scale. Steam turbines, for example, offer a highly efficient means of meeting the sector's energy demands.



**Triveni Turbines' commitment towards setting benchmarks for the robustness and reliability of steam turbines enable it to supply world-class solutions and services to customers worldwide**

Unlike some other power generation methods, steam turbines can operate continuously with minimal wear and tear, making them ideal for

applications such as power plants. Steam turbines also require lower mass flow rates compared to gas turbines, meaning they can produce the same power with fewer input resources. Additionally, steam turbines have a very high power-to-weight ratio when compared to reciprocating engines, making them more compact and space-efficient while delivering significant power outputs. Another significant advantage of steam turbines is their high thermal efficiency, particularly when compared to reciprocating engines. This efficiency not only lowers operational costs but also helps to reduce greenhouse gas emissions. Lastly, the rotary design of steam turbines makes them especially well-suited for driving electricity generators.

### Where Technology Drives Business & People Drive Technology

Triveni Turbines is a leader in the sub-100MW steam turbine market, catering to Sugar, Distillery, Cement, Steel, Food Processing, Pulp & Paper, Pharmaceuticals, Petroleum Refineries, Chemicals, Petrochemicals and Fertilizer industries. Over the past 60 years, the company has installed 6000+ turbines in 80 countries, with over 16GW capacity. Triveni Turbine's in-house R&D unit is approved by Department of Scientific & Industrial Research, India (DSIR) and associates with several leading universities & domain experts in turbo-machinery. By adopting innovative R&D strategies tailored to market demands such as efficiency, cost-effectiveness, and serviceability, Triveni Turbines has earned the reputation of being the

largest and most preferred steam turbines manufacturers of up to 100 MW power ratings in the world.

With distinctive combination of the OEM expertise and a highly skilled team, Triveni Turbines delivers a comprehensive range of customized products that have established it as one of the most trusted names in the industry. It also offers a comprehensive range of spare parts and services to ensure its customers experience no downtime in their manufacturing plants. Additionally, the company has a dedicated division called Triveni REFURB, which specializes in the restoration and repair of rotating equipment, regardless of the brand or age. Some of the key features that distinguish the company's turbines on a global scale include their compact design, superior rotor dynamics, optimized casing, advanced blading, integration of cutting-edge technology, and more. Further, the company features in-house installation and commissioning (I&C) teams dedicated to providing a seamless plug-and-play experience for our customers' plant operators. This capability is further strengthened by a dedicated after-market team that operates round-the-clock to deliver continuous customer support.

### Tech-driven approach to Quality Enhancement

Triveni Turbines has built its operations on three foundational principles – Reliability, Sustained Efficiency, and Lower Lifecycle Costs. The company maintains an unwavering commitment to quality and adheres to major international standards including API, ASME, AGMA, NEMA, and IEC, among others. The company has partnered with several prominent design firms worldwide such as IISc (India), University of Cambridge (UK), Polimi (Italy), Sikorsky (Lockheed Martin, US), Concepts NREC (US), and ITSM Stuttgart (Germany) to create concepts aimed at maximizing productivity for its customers. Additionally, Triveni operates an advanced in-house testing facility equipped with state-of-the-art technologies to conduct comprehensive 15-point quality assessments on every product before market release.

“Equipped with the latest precision equipment, tools and software, Triveni Turbines' manufacturing facility has a production capacity of over 350 turbines annually. This setup enables it to conduct production, assembly, testing, and refurbishing services seamlessly under a single roof. Also, the company's commitment towards setting benchmarks for the robustness and reliability of steam turbines enables it to supply world-class solutions and services to customers



worldwide. Further, Triveni Turbines continually strives to develop technologically advanced designs using cutting-edge tools and software such as Turbo-machinery Computational Fluid Dynamics (CFD) tools, Finite Element Analysis (FEA) tools, CAD Modeling, and lateral & torsional rotor dynamics software. This has helped the company greatly to introduce a range of innovative products that align with evolving market and customer requirements.

### Conclusion

As India advances towards sustainability and clean energy, it becomes clear that manufacturing firms must embrace technological advancements to ensure energy-efficient and environmentally friendly production processes and power generation techniques. This shift is crucial not only for reducing carbon emissions but also for driving India's manufacturing sector towards a cleaner and more sustainable future. In this technological era, it is essential to integrate technology, sustainability, and human resources to maintain the relevance and prosperity of the manufacturing sector. 