power generation refers to the production of electricity closer to the point of consumption, enanbling 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 CO_2-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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Industry is the most energy consuming sector

The World Energy Outlook 2024 also pointed out that the total final energy consumption (TFC) across end-use sectors increased by 1.7% to 445 exajoules (EJ) in 2023. This increase was split between industry (beyond 170 EJ or 38%), buildings (~125 EJ or 28%), transport (~120 EJ or 27%), and agriculture & other non-energy users (around 25 EJ or 7%). The TFC is expected to climb steadily by 1.3% per year till 2030, in line with the trend of the last 10 years.

As the most energy consuming and CO_2 emitting end-use sector, industry accounts for 38% of TFC and nearly 50% of CO_2 emissions globally. Energy-intensive sectors, such as chemicals, iron and steel, cement and aluminium, dominate this demand. Regionally, energy demand growth is concentrated in the emerging economies, while advanced economies are focussing concertedly on efficiency improvements and clean energy adoption.

Strong impetus towards promoting energy efficiency

Recent years have seen a decline in the energy intensity of the global economy on account of technological progress, efficiency improvements, and changes in the structure of the global economy. Growth in renewables and increasing electrification of end-uses play an important role in boosting the efficiency of energy systems. The annual investment in energy efficiency exceeded USD 390 billion in 2023, up from USD 300 billion in 2020. Many major economies have adopted legislative and policy measures to steer further efficiency gains in the coming years. These measures include the Inflation Reduction Act in the United States of America (USA); the Energy Efficiency Directive in the European Union; the revised Act on Rationalising Energy Use in Japan; and the most recent cycle of the Perform, Achieve and Trade scheme in India.

Global Power Sector

Though electricity demand in advanced economies remained subdued in 2024, robust growth in developing countries sustained global consumption. According to IEA's Electricity 2024 report, global electricity demand was projected to reach 29,000 TWh in 2024, driven by an improving global economic outlook and a resurgence in industrial activity across both advanced and emerging markets.

Renewable energy continued its strong momentum, generating an estimated 11,300 TWh, constituting approximately 40% of the global electricity in 2024. This is expected to rise to over 17,000 TWh by 2030, marking a significant milestone toward a cleaner energy future.

Propelled by the rapid expansion in renewable energy, the power generation sector is at the forefront of the global transition towards net-zero emissions. However, reduction of global CO_2 emissions remains a key challenge in this transition.

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