Management Discussion and Analysis

The global trade growth is expected to rebound to 3.2%, in 2021. The projection assumes that trade uncertainties will persist but not escalate further.

Economy

After an estimated contraction of ~3.3% in 2020, the global economy is projected to grow in 2021 and beyond. This growth projection is attributable to the additional fiscal support in a few large economies, as well as the anticipated vaccine-powered recovery in the second half of 2021, according to the United Nations report on World Economic Situation and Prospects 2020. The recession caused by COVID-19 is likely to leave smaller scars than the 2008 global financial crisis. However, emerging market economies and low-income developing countries have been hit harder, and are expected to suffer more significant medium-term losses.

The global trade growth is also expected to rebound to 3.2%, in 2021. The projection assumes that trade uncertainties will persist but not escalate further.

The Indian GDP growth has contracted by 7.3% in FY 21, according to the National Statistics Office (NSO), an undertaking of the Ministry of Statistics and Programme Implementation. This has pulled the manufacturing sector growth down by 7.2% in FY 21.

Trends in Global Power Sector

The transformation in the Power Generation Industry over the last few years is expected to continue in the coming years as well. This transformation has resulted in a change in the energy generation mix, and also a shift from conventional energy sources to renewable energy sources. The industry has witnessed some key trends, such as sustainable power development and focus towards various concerns related to climate change, through eco-friendly policies. It is largely expected that the industry may witness greater acceleration towards eco-friendly “Green Power” solutions, going forward.

Indian Power Sector Outlook

The country’s need for energy is increasing rapidly, owing to economic growth and overall industrialisation and urbanisation over the past few years, taking the gross electricity consumption to 1,208 kWh per capita as on March 2020, from 1,181 kWh per capita as on March 2019, according to the Central Electricity Authority (CEA) – Ministry of Power.

India's total installed power generation capacity is 379 gigawatts (GW), as of March 2021, compared to 370 GW as of March 2020. This includes 94 GW of capacity from Renewable Energy Sources (RES), as against 91 GW as of March 2020. Of this, 10 GW capacity is from biomass power (Bagasse and Non-Bagasse), marginally up from 9.8 GW as of March 2020, followed by 168.6 MW from Waste-to-Energy, compared to 147.6 MW as of March 2020, as per the Ministry of New and Renewable Energy (MNRE), Government of India.

According to the 19th Electric Power Survey conducted by CEA, the all-India installed power generation capacity is projected to grow to 619 GW by the end of FY 27. The International Energy Agency (IEA) estimates also indicate that India will add between 600 GW to 1200 GW of power generation capacity before 2050.

Captive Power Generation

Globally, captive power generation is a key growth enabler for many manufacturing industries, where grid disturbances in the supply of power can affect operations. Owing to the increasing demand for power from emerging industrialised economies, such as China, India, Africa and the Middle East, investment in captive power plants is expected to remain strong.

In India, increasing focus on the industrial sector, driven by the 'Make in India' initiatives, rising input costs (energy) and electricity prices, coupled with stringent Government regulations, are expected to drive investment in the establishment of captive power plants for continued uninterrupted power supply, leading to sustainable industrial operations.

In India, the MNRE has set a target of 175 GW of renewable power capacity by FY 22. As per the CEA's strategy blueprint, the country is aiming for an even more ambitious target of 57% of the total electricity capacity from renewable sources by FY 27.

The power generation units run by both Captive Power Producers (CPPs) and Independent Power Producers (IPPs) can be fired by using both fossil fuel as well as renewables. The largest market for captive power generation in the country is the industrial sector, mainly on account of the increasing demand for electricity from energy-intensive industries, such as Cement, Iron & Steel, Petroleum Refineries and Chemicals etc.

Improvement in coal supply, growing awareness about renewable energy, besides eco-friendly power generation policies, will enhance the captive power additions in the country. According to the Ministry of Power, the installed captive power generation capacity (above 1 MW capacity) associated with industry-owned plants is estimated to be 80 GW as of March 2021, compared to 78 GW as of March 2020. The installed captive power generation capacity in India is estimated to grow at the rate of 5-6% annually over the next 2 years, till March 2023.

Renewable Energy Industry

Globally, there is an increasing focus on the replacement of existing coal-fired power plants with clean fuel generation in order to reduce carbon footprint. This will further augment the demand for renewable power generation in the future. The global renewable power capacity (excluding hydro) increased by 6.8% in 2020 to 1,438 GW, compared to 1,347 GW in 2019, according to the Renewables 2020 Global Status Report.

In India, the MNRE has set a target of 175 GW of renewable power capacity by FY 22. As per the CEA's strategy blueprint, the country is aiming for an even more ambitious target of 57% of the total electricity capacity from renewable sources by FY 27. According to the 2027 blueprint, India aims to have between 275 and 350 GW of electricity from renewable energy by FY 27. This will, in turn, increase the demand for thermal renewable energy (biomass-based power projects) in the country, and concurrently trigger greater opportunity for the installation of steam turbines in the future.

The Combined Heat and Power (CHP) system or Co-generation system generates electricity or mechanical power with lower carbon emissions compared to conventional power generation systems (fired using fossil fuels). Thus, CHP systems/technologies are widely preferred for captive power generation using thermal renewable energy sources, such as Bioenergy, Waste Heat, Residual Waste, Solar Thermal and Geothermal, for applications such as District Heating and Data Centres (for cooling purpose) etc. The bulk of the demand for CHP is expected to come from markets like Asia-Pacific, South and Central America, the Middle East and Africa.

Thermal Renewable Energy Industry

For thermal renewable energy, bio-energy will remain the prime source of fuel going forward. Its share is expected to decline due to the expansion of alternate renewable power generation technologies, namely Solar Photovoltaic and Wind. The bio-energy industry turns many potential feed stocks into solid fuels (biomass pellets, sugarcane bagasse), liquid biofuels (ethanol etc.) and gaseous fuels (biogas, landfill gas), which are then used to produce electricity, heat and transport fuels.

Global bio-energy capacity increased by 1.8% in 2020 to around 142 GW, up from 139 GW in 2019, according to the Renewables 2020 Global Status Report. China remains the largest capacity in operation as of 2020, followed by Brazil, the United States, India, Germany, the United Kingdom, Sweden and Japan. Higher acceptance of bio-energy will lead to increase of investment in biomass power plants globally.

According to an international report on Solid Biomass, in early 2020, there were nearly 4,200 active biomass based power plants worldwide, with an installed power generation capacity of around 72.5 GW. The installed power generation potential through biomass-based power plants is expected to reach 90.9 GW by the end of 2029, with the addition of around 1,250 plants. Strong potential exists for biomass in South East Asia, where the biomass-based power generation capacity is expected to increase from 90.9 to 109.9 GW by 2040.

The bio-energy potential in India has been estimated at 25 GW in FY 22, and the Government of India (GoI) has been consistently promoting the Biomass Power and Bagasse Co-generation programme. According to MNRE, a total capacity of 10 GW is installed in Biomass Power and Bagasse Co-generation Sector, as of March 2021.

India's current bagasse-based co-generation target from Sugar industry in FY 22 is estimated at 10 GW, and by FY 27, it is projected to reach 16 GW, according to MNRE estimates. This target is possible if there is a significant increase in sugarcane crushing capacity, coupled with favourable weather conditions and increased yields of sugarcane, leading to higher bagasse-based co-generation target in the future.

The CHP/Co-generation facilities produce both heat and power from the combustion of fossil and/or biomass fuels, as well as from geothermal and solar thermal energy sources. The term is also applied to plants that recover "waste heat" from thermal power generation processes.

Biomass (bagasse and non-bagasse) as fuel helps the CHP system generate power that is sustainable. Industrial use of bagasse-based co-generation, particularly from sugar and

palm oil mills, as well as wood waste from Pulp & Paper mills, is conducive to the production of power from biomass.

The waste heat that is recovered from other industrial sources/ processes is commonly found to generate steam and electricity in Cement processing, Iron and Steel processing, Petroleum Refining and Chemical processing etc. The total estimated energy generation potential from waste heat in India across various industrial sectors is around 5.0 to 7.5 GW, according to a report published by MNRE.

Waste heat recovery (WHR) power plant installed in cement plants uses the heat generated through rotary kiln preheater (PH), after quenching cooler (AQC) exhaust hot gases for power generation. According to industry sources, the waste heat recovery potential in the Indian cement industry alone is close to 0.75 to 1.0 GW, indicating huge opportunity for the adoption of WHR system. Despite its high initial cost of investment, the concept of WHR is slowly picking up across the country.

Residual waste is another source of input from the disposal of Municipal Solid Waste (MSW) and is treated with various Waste-to-Energy (WtE) technologies (such as incineration and gasification) for electricity generation.

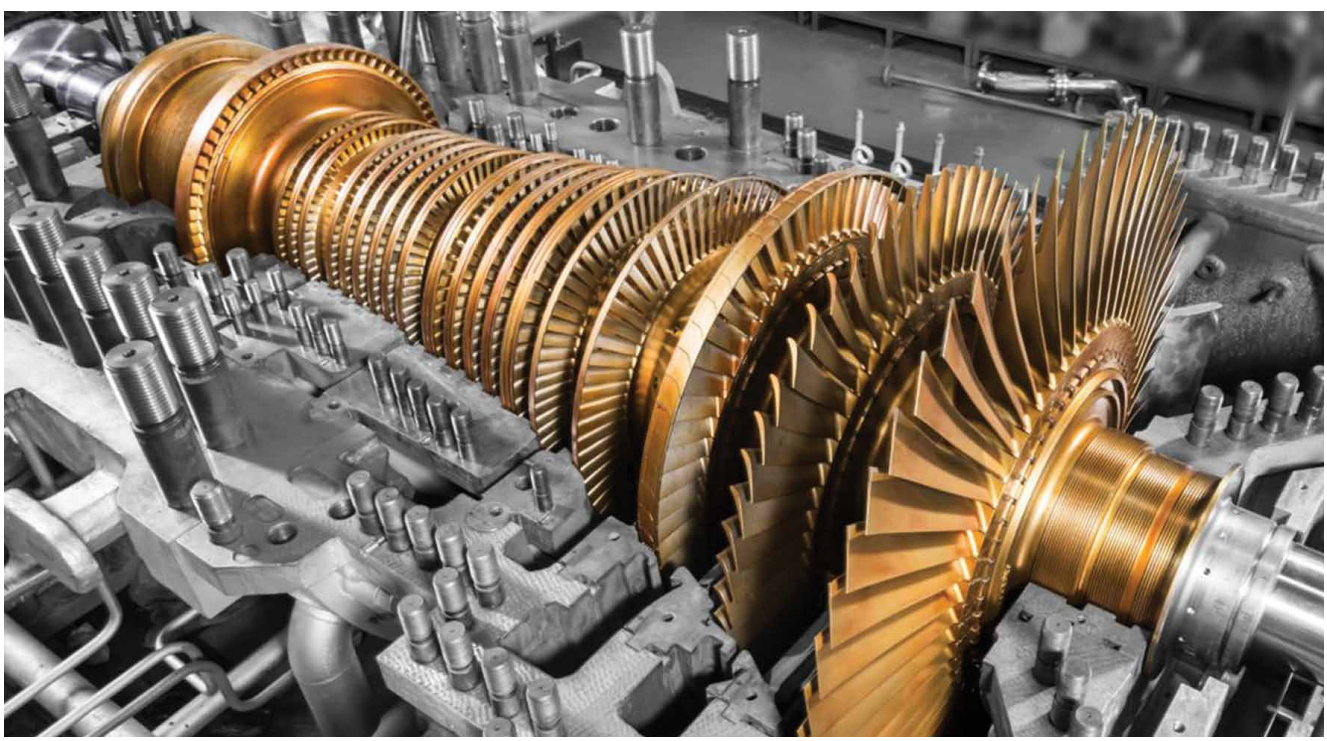
Rapidly increasing industrial waste, along with stringent EU-wide waste legislations, have been the key drivers for the growth of WtE technology in Europe – one of the largest markets for these technologies. Countries like Switzerland, Germany, Sweden, Austria and Netherlands lead installation capacity within Europe. The Asia-Pacific market is also expanding rapidly, owing to significant increase in waste generation by the two big developing nations, i.e. China and India, leading to higher investment thrust by Government organisations in India.

To conclude, rapid increase in electricity consumption, along with enhanced focus on electricity generation through thermal renewable energy sources, is expected to unleash sustainable power generation in the country.

Indian Manufacturing Sector

Manufacturing has emerged as one of the high growth sectors in India. The 'Make in India' programme is aimed at placing the country on the world map as a manufacturing hub, and bringing global recognition to the Indian manufacturing. Under the 'Make in India' initiative, the Government aims to increase the share of the manufacturing sector in the Gross Domestic Product (GDP) from 17-18% at present to 25% by FY 25. Improvements, such as ease of doing business, coupled with continuing augmentation in infrastructure and skilled workforce should support the spurt in manufacturing activities in the coming years.

Further, the Government focus on *Atmanirbhar Bharat*, i.e. a self-reliant India, envisions manufacturing to be a bigger



and more important part of the global economy; the policies are being directed towards making India more efficient, competitive, resilient, self-sustaining and self-generating.

India, with its large workforce, can utilise this opportunity to fill the gap created by the disruption in global supplies.

Industry Analysis – Manufacturing Sector Outlook

The largest market for captive power generation globally is the Industrial sector. The future growth of the global steam turbines market (5-100 MW power range) is mainly attributed to the increase in investment to promote energy efficiency in process industries, namely Sugar, Distilleries, Pulp & Paper, Cement, Steel, Chemical etc.

In the Sugar & Distillery industries, the Indian Government's focus on clean fuel has triggered significant potential for distilleries requiring captive power generation. With the launch of the National Biofuels Policy, as well as incentives offered by the Government (such as soft loans) for setting up of new distilleries and expansion of old/existing distilleries, huge investments are being made by the sugar companies in both Greenfield and Brownfield expansions. Investments are also being made for setting up grain-based distilleries to manufacture ethanol and supply the same to Oil Marketing Companies (OMCs).

The Central Government is focussed on reducing the country's dependence on imported crude oil while reducing the environmental impact of the pollution/emissions. In order to achieve this, the Government has been actively promoting the production and blending of fuel ethanol with petrol, and has targeted 20% blending (EBP20) by 2025. EBP20 which was earlier targeted by 2030, was advanced recently, which reaffirms the Government's focus and commitment. This augurs well for the steam turbine industry, as the demand for captive power generation in the country will also increase in the sector.

Globally, the demand for steam turbine from the process co-generation segment has grown, primarily due to increasing demand from Pulp and Paper, Cement, Steel and Chemicals industries, to name a few.

CHP Systems in Process Industries

The residues from Sugar and Palm oil mills in the form of Biomass (bagasse and non-bagasse) are used as fuel to generate power that is sustainable, with the help of Combined Heat and Power (CHP) system.

The Pulp and Paper industry constantly focusses on improving energy efficiency, which is attained through increased use of non-bagasse (e.g. wood waste biomass) based fuel for power generation, and by appropriate usage of steam. The inclusion of CHP/Co-generation in Paper industry contributes to the growth in demand for steam turbines.

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Despite the widespread use of CHP systems in the Indian Pulp and Paper industry (especially in large and medium plants), there continues to be significant potential for growth in CHP systems. According to ASSOCHAM and Indian Paper Manufacturers Association (IPMA), the Indian Paper Industry accounts for about 3% to 4% of the world's production of paper and paperboard, with approximately 600 paper mills, of which 12 are major players. The size of the Indian paper & paper products market is projected to reach USD 10 to USD 13 billion, and production to reach 22 million tonnes, by FY 25, from 15-17 million tonnes in FY 20.

The heat from the hot stream is recovered using Heat Recovery Steam Generator (HRSG) or Waste Heat Recovery Boiler (WHRB) for the generation of superheated steam, that can be used in process heating (co-generation) or to drive a steam turbine (combined cycle). The inclusion of CHP/cogeneration system in Cement, Steel and Chemical industries by the utilisation of hot exhaust gas from the production lines in order to reduce the operating cost.

India is the 2nd largest cement producer in the world. According to industry sources, cement production reached 329 million tonnes in FY 20 and is projected to reach 381 million tonnes by FY 22. The demand for cement in the construction industry drives production and is thus an important determinant of cement due to high energy consumption and CO_2 emissions. Of the more than 210 large cement plants in the country, only 70% of cement kilns have adopted WHR systems. Even though energy efficiency has become top priority for the Indian cement industry, the

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adoption of WHR systems in cement facilities still has a long way to go, which will in turn create opportunities for steam turbines in the future.

The global crude steel production reached 1,829 million tonnes for the year 2020, down by 0.9% compared to 2019, according to the World Steel Association. India is the 2nd largest steel producer in the world. According to the Ministry of Steel, crude steel production reached 108.5 million tonnes in FY 20, and is expected to reach 125 million tonnes by FY 22. India's overall steel production capacity stood at ~140 million tonnes in FY 20, and is anticipated to reach 300 million tonnes by FY 30.

Power has been one of the major cost components for the steel industry. The steel industry is characterised by high load variations, due to many on and off conditions of furnace and kiln, causing load fluctuations in furnaces and kilns to affect the stability of the grid and quality of power supply. Triveni Turbines provides its customers a complete power plant solution for sustainable power. The Company offers total solutions for the Turbo generator operation (i.e. Supply of Steam Turbine, Steam Piping, Fire Fighting System & Entire Cables), thereby providing an end-to-end solution.

The global chemical industry is driven by the demand from its own consumption (Basic, Specialty and Knowledge chemicals) and from various end-user industries (Industrial, Agricultural and Consumer markets). The Indian chemical industry contributes 3.0% to 3.5% to the global chemical industry and is highly diversified. The market size of the Chemicals & Petrochemicals sector in India is expected to reach USD 300 billion by 2025 from USD 178 billion in 2020, according to the National Investment Promotion & Facilitation Agency. This growth should lead to fresh capacity creation, both in terms of Greenfield and Brownfield expansions, creating demand for steam turbines.

Most licensors and designers of new Refineries, Chemical and Petrochemical plants have become extremely conscious of the need for energy efficiency. This has paved the way for steam balancing and extreme utilisation of steam as a key design factor in the Oil & Gas – Downstream sector. 1) This has, over the past few decades, pushed the steam turbine manufacturers to adapt to various levels of steam conditions, ranging from very low pressure steam inlets (4 Bar) to supercritical steam (140 Bar), and power ranging from 10 kW and up to 30 MW or above as per the plant size; 2) This also puts pressure on the existing plants to look at their steam headers closely for available steam, and increase the utilisation by pressure reducing stations and removing dump condensers.

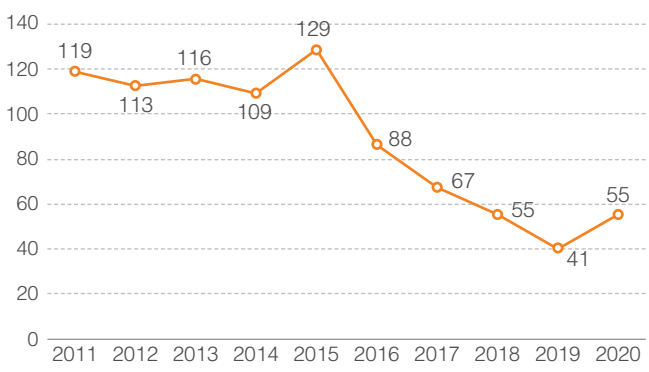
With this analysis in mind, and supported by their design capabilities, 1) The steam turbine manufacturers will be able to save on electrical power by using this technique in steam turbines; 2) The steam turbine manufacturers can increase the extent of variable adaptation. By doing so, all sizes of critical equipment, like process pumps, water pumps, small lube pumps, fans, blowers, air compressors and process compressors, can be driven by steam, thus boosting energy saving and utilisation.

Energy efficiency and CO_2 emission reduction plays a crucial role in driving the demand for thermal renewable based steam turbines in various process heating and power generation applications. With cheap coal prices and supportive policies for coal fired power plants in the country, the demand for fossil fuel steam turbines is also expected to grow.

Global Steam Turbine Market Analysis

The global steam turbine market declined from a level of 120 GW in 2011 to 55 GW in 2020 - a decline of 8% yearly over a period of 9 years.

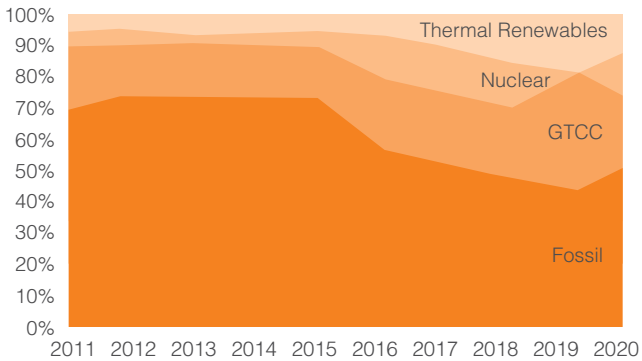
Global Steam Turbine Market (in GW)



Source: International Power Report, 2020

Fossil Fuel based power generation, which was earlier the main source of fuel, declined from 69% in 2011 to 52% in 2020, whereas Thermal Renewable based power generation increased from 6% in 2011 to 12% in 2020.

Global Steam Turbine Market, By Fuel



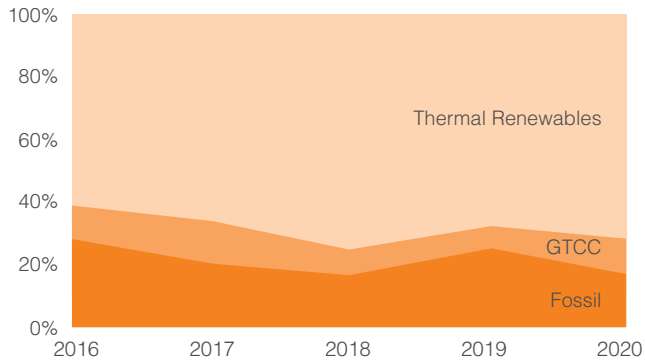
Source: International Power Report, 2020

The global steam turbine market is broadly classified into three power rating categories, namely <30 MW; 30.1 – 100 MW and >100.1 MW power range.

In terms of number of MWs sold during the last 5 years (2016 to 2020), the global steam turbine market has seen the sharpest decline in the > 100.1 MW range, at 13% CAGR. In the case of <30 MW range, the market has seen a decline of 0.66% CAGR. In the case of 30.1 to 100 MW range, the market has been steady and registered a CAGR of 4%.
Source: International Power Report, 2020

Unlike the global steam turbine market (full range), wherein Fossil Fuel dominates, in the <30 MW range, the growth of Thermal Renewables has been quite consistent and strong. Fossil Fuel's share has remained flat at 22%, while the dominance of Thermal Renewables is quite significant at 68%.

Global Steam Turbine Market, (<30 MW range), By Fuel



Source: International Power Report, 2020

In the five-year period (2016-2020), Triveni held a market leadership position in unit terms in the global market for <30 MW range. In 2020, Triveni held a market leadership position in both MW and unit terms in the global market for <30 MW range.

The global steam turbine market for <30 MW range in 2020, in terms of MW, de-grew by 14% compared to 2019. Increased economic and industrial activity in China, as well as positive market growth from Asia region, was seen as the most dominant geographic trend of 2020. The market was primarily driven by Thermal Renewable based power plants (including Biomass, Waste Heat and Waste-to-Energy), followed by Fossil Fuel fired power plants and Gas Turbine combined cycle (GT-CC) power plants.

Triveni continues to drive its market growth by establishing a strong global footprint and offering a wide range of state-of-the-art steam turbines, coupled with an excellent Aftermarket portfolio to meet the needs of its growing base of customers round the clock.

Steam Turbines Market in India

In 2020, the Indian steam turbine market for <30 MW range, in terms of MW, declined by 52% compared to 2019. The market was primarily driven by Thermal Renewable based power plants (including Biomass, Waste Heat and Waste-to-Energy), followed by Fossil Fuel fired power plants. Majority of the steam turbines' requirement in 2020 was from captive power generation, and from energy intensive segments like Steel, besides Process Co-generation segments like Cement, Pulp and Paper, Chemicals and Fertilisers, followed by Independent power generation.

With the Manufacturing sector on the growth trajectory, and industries like Sugar, Steel, Cement, Pulp and Paper and Chemicals expected to increase production, the demand for steam turbines should remain robust in the future.

Business Review

With sustained focus on adopting innovative technology, backed by seamless execution, Triveni has emerged as a trusted service provider for clients around the world. To ensure sustained growth in brand recall, the Company has consistently strengthened its position in the Industrial sector by meeting the captive power requirements of its customers in various Greenfield and Brownfield projects. Triveni continues to drive its market growth by establishing a strong global footprint and offering a wide range of state-of-the-art steam turbines, coupled with an excellent Aftermarket portfolio to meet the needs of its growing base of customers round the clock.

The overall order booking for FY 21 declined by 19% from the previous fiscal, on account of the COVID-19 pandemic, which led to lockdown in the country, forcing the closure of both our manufacturing units, as well as our sales & service offices, from March 2020. Logistic bottlenecks, closure of customers' sites, suspension of travel, and disruption in our supply chain network had an impact on despatches and order booking. However, the Company resumed operations in a phased manner from the third week of April 2020, and has been strictly following Government guidelines issued from time to time.

The Company witnessed a massive scaling up of its competitive strengths in Q1 FY 21, investing in more digitally advanced software and automation-led platforms. It was quick to devise plans of "Virtual Customer Connect", and is closely tracking and engaging with customers through webinars and techno-commercial meetings.

The performance of the Company from Q2 FY 21 onwards started showing signs of improvement, and turnover and profitability also increased, driven by its agility and adaptability to the new normal. This bodes well for the business, as the addressable markets have started showing positive momentum, although the pandemic is still impacting the overall global economy. However, despite the adverse impact of COVID-19 on the international order booking in FY 21, the Company's domestic order booking supported it in a big way amid the prevailing uncertainty, due to its strong presence and dominant market share in the Indian market.

In the domestic market, the Company witnessed postponement of order finalisation towards the latter part of Q4 FY 21, which resulted in higher order intake by 35% over the corresponding quarter of the previous year. However, overall for FY 21, domestic order booking declined by 5% as compared to FY 20. The key segments which created sufficient traction for order finalisation in FY 21