MANAGEMENT DISCUSSION AND ANALYSIS

ECONOMIC REVIEW

Global Economy

The financial year 2019-20 began with apprehensions of a slowdown, mainly over the US-China trade war and concerns over Brexit, and ended with an almost catastrophic blow to the world economy because of the novel coronavirus pandemic. The combination of these factors made 2019 the year of slowest growth since the financial crisis of 2008. In its April 2020 outlook, the International Monetary Fund (IMF) calculated a global economic growth of 2.9% in 2019, down from 3.6% in 2018, and negative growth of 3% in 2020. The slower growth was attributed to a lag in global manufacturing and trade, muted economic activity in a few emerging markets and international trade disruptions.

The ongoing efforts of mitigating the slowdown were derailed by the COVID-19 virus which first came to light in China in December 2019 and has now spread to more than 190 countries. To save human lives through self-isolation, all activities barring the most essential were shut down in many countries, causing a massive erosion of employment and income, and hitting most business sectors. A long-term impact on consumer demand and investor confidence as well as the global supply chain is unavoidable. According to an analysis from the United Nations Conference on Trade and Development (UNCTAD), commodity-rich exporting countries will face a USD 2-3 trillion drop in investments in the next two years. IMF has projected that the global economy will grow by 5.8% in 2021 supported by fiscal and monetary measures, provided the contagion recedes in the second half of 2020.

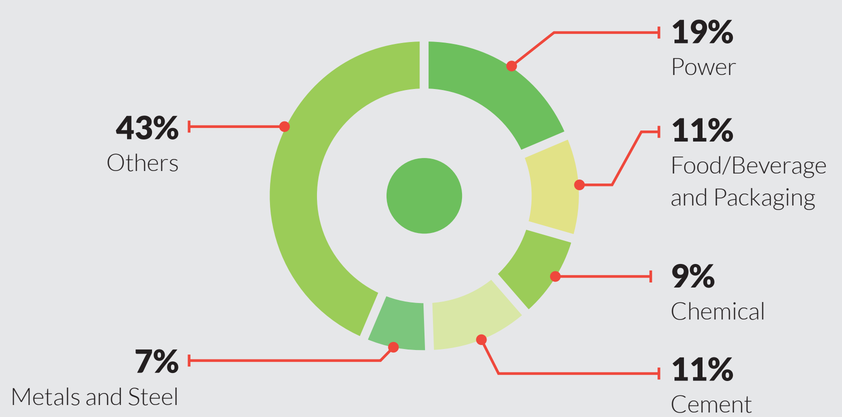
For the first three quarters of FY2019-20, the sharp decline in global growth impacted investment for capacity building in core sectors such as cement, metals, and power. Lower crude oil prices called for no major expansions or greenfield projects in the refinery sector, except for a couple of government approved tenders in line with the fuel shift drive in India. Moving into Q4, investments were expected to pick up in South East Asian and SAARC economies both for products and projects, including expansions in the refinery sector. Isolated enquiries were witnessed for larger projects in Africa and South America but have been delayed. However, the onset of the global pandemic deranged the company's order booking in this quarter, especially in March. Consequently, the international order booking for the company remained subdued during the year.

Indian Economy

On the domestic front, the macro conditions remained weak due to factors such as non-banking financial sector crisis, liquidity crunch, lower GST collections and strain on fiscal deficit. Key economic parameters like consumption, investment and export plunged significantly over the year, bringing down the total growth. The already stressed economy was battered by the coronavirus pandemic in Q4, as India enforced a nationwide lockdown, one of the strictest in the world. The economy expanded by 3.1% in Q4 and dragged the full year FY2019-20 GDP growth to 4.2%, weakest since the financial crisis hit more than a decade back. India's industrial output in FY2019-20 contracted 0.7% over FY2018-19, which was primarily driven by a severe fall of 16.7% in March, because of the closure of a large number of factories during the lockdown. All major sectors registered a considerable degrowth year-on-year.

Capital goods being a derived demand sector, Thermax's growth depends on the investments in core sectors of the economy. As shown below, the following sectors contributed to the order booking of the company during the year under review.

Sector Wise % Order Booking



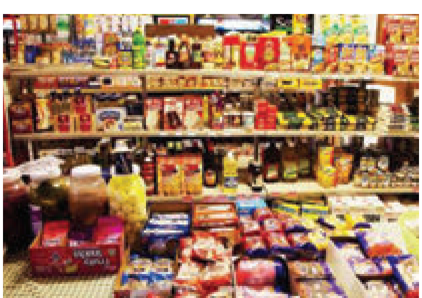
POWER

Based on data from the Central Electricity Authority (CEA), India targets a power generation capacity of around 480 GW by the end of FY2021-22 from 370 GW as of March 31, 2020, and of this, renewables will contribute about 175 GW. As a signatory to the COP 21 agreement on climate change, India has pledged that by 2030, the greenhouse gas emission intensity of its GDP will be reduced by 33-35% below 2005 levels and 40% of its power capacity would be based on non-fossil fuel sources. The Union Budget 2020-21 allotted Rs. 2,516 crore for solar power - a 10.35% increase over the last Budget, apart from Central Financial Assistance for a capacity addition of 7,500 MW of solar power in FY2020-21. This strong government focus on renewables is expected to offer new opportunities for Thermax.

Compliance with new emission norms requires that existing thermal power plants be retrofitted with auxiliaries such as Flue Gas Desulphurisation (FGD) systems. To ensure uninterrupted power supply, the implementation is slated to be carried out in phases, covering around 160 GW of power plant capacity. The market size of FGDs is expected to be Rs. 650-800 bn over the next four years. This opportunity augurs well for the company, with the possibility to translate it into orders for FGD from customers operating thermal power plants and from select cement customers.

However, it is likely that in FY2020-21, private power distribution companies will revisit their capex plans. According to an estimate by Confederation of Indian Industry (CII), the nationwide lockdown could result in total demand compression of up to 36 billion units of electricity, implying a net revenue loss of around Rs. 30,000 crore at the discom level. The commercial and industrial sector in India consumes around 52% of electricity, followed by 24% by domestic households and 18% by the agriculture sector. The higher tariffs are borne by the commercial sector, thereby significantly denting the collections of discoms. Push towards energy efficiency is likely to spawn opportunities for cogeneration solutions, where power and steam are generated simultaneously.

Notwithstanding the medium and long-term prospects, renewable energy capacity addition is likely to be impeded by the COVID-19 crisis. Solar projects, largely dependent on imported modules from China and Malaysia, will be impacted due to raw material shortage, production delays, supply chain disruption and the recent stand-off with China. As per industry reports, India is expected to add only 5,000 MW of solar capacity in the year 2020, nearly 32% lower than 2019, due to extended project timelines. Additionally, inconsistencies in net metering policy across different states pose significant challenges for rooftop solar.

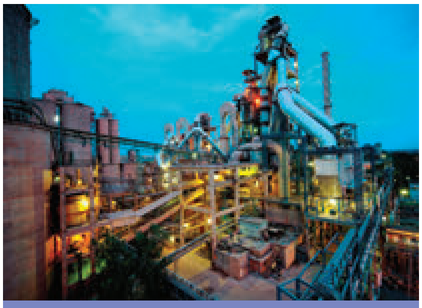


FOOD, BEVERAGE AND PACKAGING

The fast moving consumer goods (FMCG) sector is also currently facing challenges. High unemployment, rising inflation rates and a minimal uptick in income levels are taking a toll on urban demand. With domestic consumption contributing to almost 60% of India's GDP, steps are being taken by the government to revive consumption. The Union Budget 2020-21 announced reforms such as a change in the income tax slab to ensure more free income in the hands of the new earners. This, along with an emphasis on targeted measures for boosting the rural economy, is expected to have a twin positive impact on consumption. Budgetary incentives to boost investments in the dairy industry are also expected to support revival of the rural economy and domestic consumption. Till the onset of COVID-19, expected consumption growth was likely to stimulate investments in capital goods by FMCG, food processing and dairy sectors. However, limited mobility to prevent the COVID-19 spread and rising unemployment may derail sales, leading to the postponement of capex plans by consumer-facing companies.

CHEMICALS

The chemical industry has witnessed a positive momentum, maintaining a CAGR of 17% between 2016 and 2019, even when India's economy faced headwinds. Thermax's chemical business was a beneficiary of this growth with opportunities predominantly for its performance chemicals in the developed markets. The growth is likely to continue despite the economic challenges that caused India's GDP growth rate to drop substantially. Chemical companies can also benefit from rising domestic demand in chemical end-use sectors, many of which fall under the 'essential goods' category which is expected to be less impacted by the economic slowdown and COVID-19 crisis. India's attractiveness as a manufacturing destination, given the trade conflicts, especially among China, the United States, and Western Europe and its improved ease of doing business, are some of the other positive factors.



CEMENT, METAL AND STEEL

The infrastructure sector has been the biggest focus area for the government. The National Infrastructure Pipeline has lined up 6,500 projects across key sectors while the Union Budget 2020-21 has proposed the development of 2,500 km access control highways, 9,000 km of economic corridors, 2,000 km of coastal and land port roads and 2,000 km of strategic highways. The thrust on road construction has fuelled demand for the company's waste heat recovery based captive power plants from the cement industry. Infrastructure development also generated enquiries for capital goods from the sponge iron industry. While the demand from the steel industry remained muted due to stressed balance sheets of several steel companies, supply constraints from China could result in an uptick of domestic demand. However, the lockdown has resulted in various infrastructure project sites staring at closure owing to labour shortage and supply chain disruptions. The existing grave fiscal situation in the construction sector for both the Centre and states further implies that continued funding of infrastructure capital expenditure will be a challenge in the near future. Additionally, as focus shifts towards rolling out of relief packages to help overcome the loss of income due to the crisis, it may undermine the government's ability to spend on infrastructure projects over the next one or two years.

Thermax's CFBC boiler clocks 674 days of uninterrupted operation at a large petrochemical complex in Gujarat

Outlook

Against a backdrop of muted growth in global and domestic economies further disrupted by the onset of the global pandemic, the company foresees a couple of challenging years ahead. Low growth in core sector industries has curtailed fresh investments in capacity building. Additionally, substantial Non Performing Assets (NPAs) in the banking and Non-Banking Financial Company (NBFC) sectors are affecting liquidity in the market. Stretched balance sheets of several conglomerates are further dampening private capacity enhancement. Moreover, the outbreak of the pandemic has resulted in industries shifting from expansion to survival mode; thus, fresh capex investments are unlikely in the short term. As and when business expansion takes place, it is likely to happen in a staggered manner, with FMCG and consumption related sectors expected to be the first off the blocks followed by white goods, automobile and construction sectors. Only when consumption gains momentum will investments be made in capacity building. However, as capex gets deferred, Operation and Maintenance (O&M), replacement demand and shift to renewables in line with government regulations may offer new opportunities for Thermax. Amidst all the disruption and economic fallout, there is also the prospect for India to emerge as the new investment destination as companies globally look to relocate their manufacturing hubs. The *Atmanirbhar Bharat* initiative, a massive government stimulus package as well as a move towards making India more self-reliant in the post-COVID world, may also encourage domestic investments.

Focus on capitalising opportunities from reviving sectors – dairy, food processing, chemical & fertilisers and pharmaceuticals; improving order booking from the international market; revenue recognition from the existing order book; sustaining margins through robust execution capabilities; and improving O&M footprint backed by strong internal cost control measures should support Thermax in navigating this unprecedented crisis.

The Power business bagged its largest O&M contract for a 90 MW captive cogeneration power plant

COMPANY OVERVIEW

Thermax Group is an engineering and capital goods major headquartered in Pune, India. The group operates with 7 wholly owned subsidiaries in India and 23 wholly owned overseas subsidiaries.

The company operates through three business segments: Energy, Environment, and Chemical. The wide range of products and services can be grouped as follows:

- Standard and custom-built products
- Projects and Engineering, Procurement and Construction (EPC) solutions for larger non-standard products
- Lifecycle and Operations and Maintenance (O&M) services

OPERATIONAL PERFORMANCE

In FY2019-20, Thermax Group's total income stood at Rs. 5,831 crore, compared to Rs. 6,123 crore in FY2018-19. The decline of revenue was due to slowdown in the global and Indian economy, further impacted by the COVID-19 outbreak.

The international business for the group decreased 25% to Rs. 1,969 crore from Rs. 2,636 crore in the previous financial year due to limited capacity expansion, especially large projects in the target markets.

The group reported a consolidated order booking of Rs. 5,498 crore in FY2019-20, compared with Rs. 5,633 crore in the previous year. International order booking stood at Rs. 1,470 crore in comparison with Rs. 1,984 crore, contributing about 26.7% of the consolidated order booking in FY2019-20 as compared to 35.4% in FY2018-19. The company has been focussing on expanding its footprint in the international market, while restructuring its international business.

The Boiler and Heater business has been transferred to Thermax Babcock & Wilcox Energy Solutions (TBWES) through a slump sale, post acquisition of shares in TBWES, effective October 1, 2019.

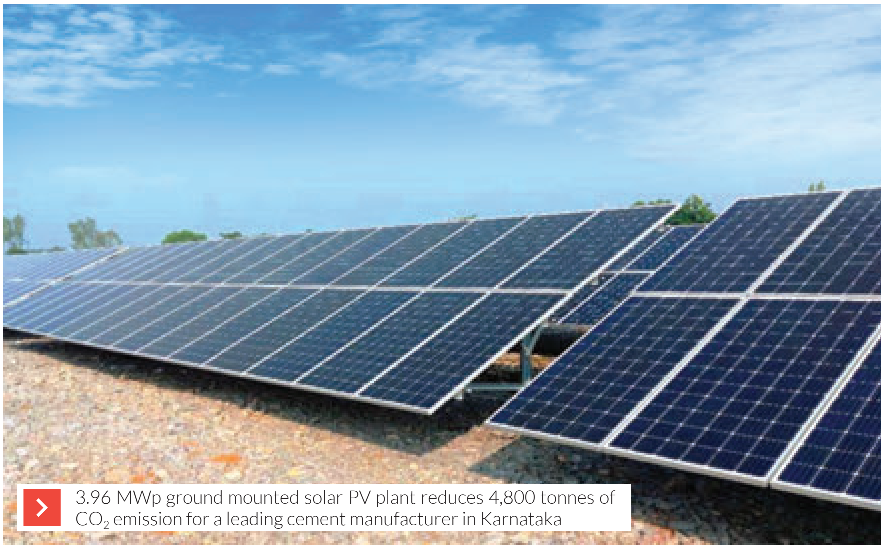
BUSINESS SEGMENTS OF THE COMPANY

This section comprises the segment wise performance of the group, along with that of the related subsidiaries.

Energy Segment

Energy needs are growing around the world, and increasing levels of energy efficiency and sustainability are expected from core and allied businesses in this sector. With its range of energy efficient and environment friendly solutions, Thermax is well equipped to support these objectives.

The Thermax Energy segment comprises Process Heating, Absorption Cooling and Heating, Boiler and Heater and Power (EPC and Solar) businesses and related services. Under the Process Heating business, the company offers packaged boilers, thermal oil heaters, heat recovery boilers and hot water generators. Thermax is among the leaders in vapour absorption cooling and heating systems, with its chillers used worldwide for industrial refrigeration, air conditioning, process cooling and heating. Thermax Cooling Solutions Limited (TCSL), a wholly owned subsidiary, offers a range of wet and dry cooling solutions for energy efficient heat removal from process and manufacturing industries. TBWES, a 100% subsidiary of Thermax, provides steam generation solutions for process and power needs, and offers renovation and modernisation services for old boilers and process furnaces. The company has domain experience in setting up captive power, cogeneration and trigeneration plants on an EPC basis, with an installed base of more than 3,300 MW. The company is leveraging this capability for solar installations across various industries. Investments in digital capabilities and R&D have been increased for driving sustainable solutions across its growing portfolio of products and services. Thermax and its group companies have supplied global markets with heating and cooling systems and power plants generating energy from renewable sources such as biomass, waste heat from industrial plants and solar energy.

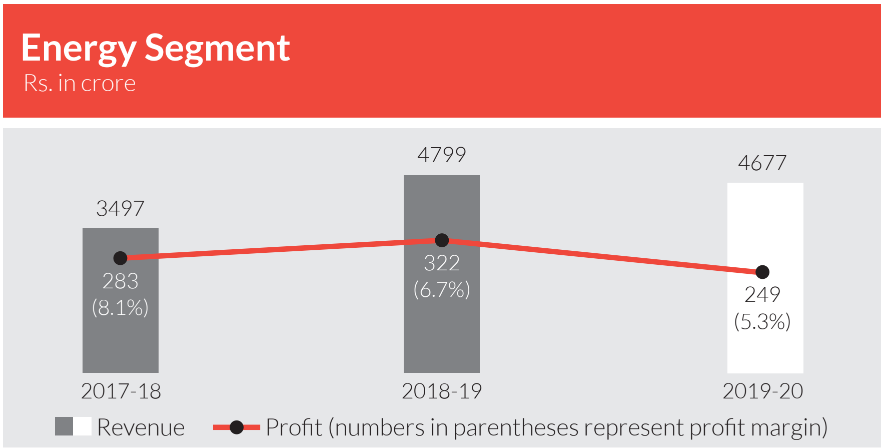


3.96 MWp ground mounted solar PV plant reduces 4,800 tonnes of CO_2 emission for a leading cement manufacturer in Karnataka

Drivers
• Expected FDI inflow post COVID-19 pandemic can result in new business opportunities in the domestic market
• Increased focus on waste heat recovery projects due to improved payback with lower interest rates
• Conducive policies surrounding climate change and renewable energy
• Sustainability and water consumption regulations will increase demand for dry cooling solutions
• Demand for cooling arising from global warming and urbanisation
• Increased demand in food processing, pharmaceutical and chemical industries in developing countries will drive the growth of product business
• Energy efficiency measures present retrofit opportunities
• Demand for EPC, solar and waste heat recovery plants due to increased focus on energy efficient solutions
• EPC for captive power and cogeneration in the international markets

Focus Areas
• Leveraging sale of products, or steam on hire, Industrial Internet of Things (IIoT) for remote services and O&M
• Modularisation in international markets for reduction in onsite construction work
• Products and niche applications of vapour absorption machines globally with special focus on food and beverage, pharmaceuticals, chemicals and fertilisers
• Visibility for non-standard products such as heat pumps, heat transformers and hybrid chillers
• Improve on-time performance and productivity while reducing costs
• Increase domestic market reach for solar and battery storage
• Provide efficiency improvement solutions for large boilers and heaters
• Work with OEMs, process licensors, distributors, packagers, industrial associations and HVAC and other consultants in target markets to gain market share for both absorption cooling and process cooling products
• Enter refrigeration market by proliferation of hybrid chillers (negative temperature) and process cooling products
• Provide industrial process integrated absorption machines for heating and cooling applications

Performance FY2019-20



The Energy segment contributed 80.4% (79.4%) of the group's gross operating revenue in FY2019-20. Operating revenue (net) at the group level stood at Rs. 4,677 crore (Rs. 4,799 crore) for the year, while segment profits for the same period stood at Rs. 249 crore (Rs. 322 crore). The order booking for FY2019-20 stood at Rs. 3,280 crore, lower than the previous year's figures of Rs. 4,476 crore. Despite opening the year on a promising order book, the revenue recognition was impacted severely due to the onset of the pandemic in the crucial last month of the financial year. Muted enquiries from the core sectors during the year resulted in no major project orders being concluded. The FY2020-21 outlook for the segment continues to be challenging.

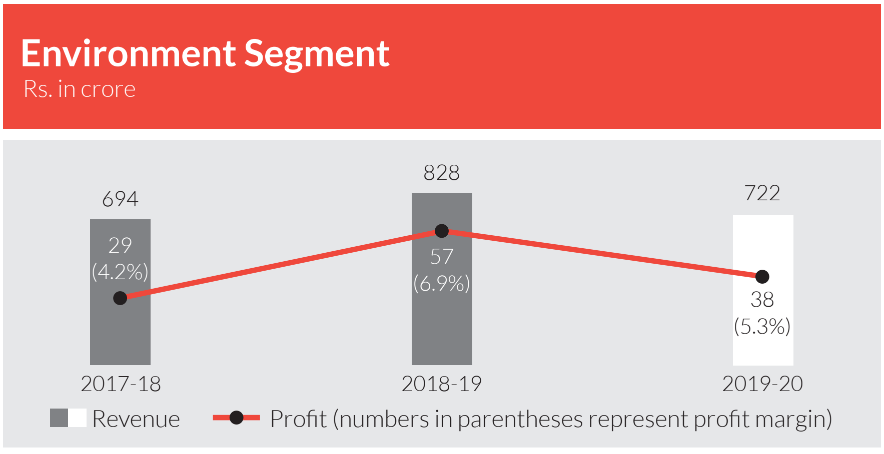
Environment Segment

Drivers
• Enforcement of emission norms globally
• Fuel shift from coal to biomass or agro-based fuels
• Stringent regulatory discharge norms
• Market demand for prefabricated/plug-and-play water and waste treatment products

Focus Areas
• Effective lifecycle management of products and solutions with emphasis on predictive maintenance
• Develop air pollution control solutions to handle gaseous pollutants
• Continued focus on digitalisation and remote monitoring of products and systems
• Focus on plant modernisation projects for improvement and upgrades
• Positioning as an end-to-end water management services provider

Environmental norms for process-driven industrial sectors are getting stricter and more closely regulated, with serious concerns over air pollution and effluent management. Thermax's solutions for controlling emission and for minimising waste discharge and maximising recycling are a strategic fit in helping customers reduce their impact on the environment. Thermax offers air pollution control systems for both particulate and gaseous emissions to a wide range of industries – cement, steel and ferrous metals, power generation, chemical, fertilisers, etc. The Water and Waste Solutions (WWS) business supports industrial and commercial establishments to treat water for their process requirements and to clean sewage and effluent; often recycling the water, especially where there is a shortage of water. Led by its expertise in handling various pollutants and fuel firing conditions, the company's Enviro business has garnered sizeable market share in India and completed marquee projects in South East Asia which it plans to develop as a second domestic home market. The WWS business includes water treatment, wastewater treatment/recycling, zero liquid discharge solutions, sewage treatment/recycling and desalination plants. The business has to date completed over 20,000 installations. The growth of the Environment segment has been underpinned by the company's technological knowhow and customised solutions.

Performance FY2019-20



The segment accounted for 12.4% (13.7%) of the group's gross operating revenues in FY2019-20. Operating revenue (net) at the group level stood at Rs. 722 crore (Rs. 828 crore) for the year, while segment profits for the same period stood at Rs. 38 crore (Rs. 57 crore). As in case of the Energy segment, the Environment segment faced a similar challenge of revenue recognition in the last month. The order booking for FY2019-20 stood at Rs. 1,777 crore, higher than the previous year's figures of Rs. 741 crore. The order booking for the segment surpassed the Rs. 1,500 crore mark for the first time on the back of the two major FGD orders bagged during the year. Opening the year with a promising order carry forward, complemented with increased enforcement of emission norms and regulatory discharge norms are likely to augur the growth of the segment in the coming year.

Chemical Segment

The Chemical segment manufactures and markets a wide range of specialty chemicals to help improve processes across a spectrum of industries. It comprises the following: microporous resins, performance chemicals, paper chemicals, construction chemicals and oil field chemicals.

Thermax is recognised as Asia's leading manufacturer and exporter of ion exchange resins and is a pioneer in water and wastewater treatment chemicals.

The company's specialty chemicals serve a number of industrial sectors, with clients spread across the world.

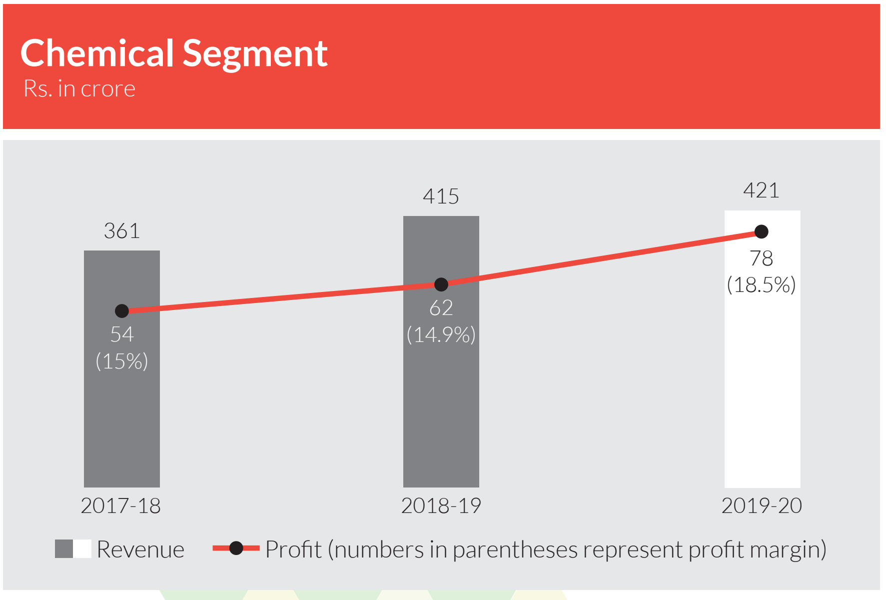
The chemical manufacturing facilities are located at Paudh (Maharashtra), Jhagadia and Dahej (Gujarat). The facilities at Gujarat are established at par with global standards, which will help the company expand its business in promising international markets, supported by its well-earned reputation for customised and cost-effective solutions.

Drivers
• Significant headroom for growth owing to limited organised players and comparatively lower market share of the company
• Increase in demand for cartridge applications for specific contaminant removal
• Increase in demand for solvent-free and low Total Organic Carbon (TOC) resins for applications such as ultrapure water
• Investments in petrochemical sector is leading to opportunities for MEG (Monoethylene Glycol) and catalyst resins
• Accent towards recycling of water in the wake of global water crisis

Focus Areas
• Expand dealer network into industrial areas and cluster in order to enhance reach
• Enhance customer contact to understand their processes and create specialty chemicals
• Nurture key accounts for long-term business association and partnerships
• Addition of premium specialty chemicals to the portfolio through merger & acquisition
• Drive technology tie-ups for bringing cutting edge construction practices to India

In the second phase expansion, Thermax ramps up the capacity at its chemical facility at Dahej to 22,000 m^3

Performance FY2019-20



In FY2019-20, the Chemical segment accounted for 7.2% (6.9%) of the group's gross operating revenue. The Chemical business segment posted operating revenue of Rs. 421 crore (Rs. 415 crore). The profit for the segment was Rs. 78 crore as compared to Rs. 62 crore in the previous fiscal. The profitability of the Chemical segment has improved due to the increase in capacity utilisation, efficient sourcing and lower cost of key raw materials. Order booking for the segment in FY2019-20 stood at Rs. 441 crore. The Chemical business achieved growth in revenue, attributed to a healthy order booking from domestic and international customers in FY2019-20. The business is expected to continue its growth momentum in the coming year on account of demand from the US and European markets providing essential goods and services and growth in the pharmaceutical and food & beverage sectors in the domestic market.

SUBSIDIARIES

The MDA captures the growth trends and outlook of only those subsidiaries that have a reasonable impact on the segmental performance. The comprehensive details on each subsidiary are available in AOC-1, on page 298.

Energy Segment

Thermax Babcock and Wilcox Energy Solutions Pvt. Ltd.

The project business of Heating viz. large Boiler & Heater subset (B&H) was transferred to the Thermax Group's wholly owned subsidiary Thermax Babcock & Wilcox Energy Solutions Pvt. Ltd. (TBWES) effective October 1, 2019. With this transfer, TBWES becomes a fully integrated boiler company offering boilers suitable from 6 MWe to 800 MWe power generation and heaters up to 100 Mn Kcal/Hr size, firing variety of solid fuel (biomass, crop residue, coal, lignite, pet coke, waste fuels, etc.), oil/gas, as well as waste heat solutions. TBWES will offer a wide range of technologies such as stoker firing, Atmospheric Fluidised Bed Combustion (AFBC), Circulating Fluidised Bed Combustion (CFBC), pulverised coal burner firing with an access to a state-of-the-art manufacturing facility. During the year, TBWES completed supply of the large modularised auxiliary boilers as a part of its largest export order from the biggest refinery in Africa, reducing construction time at site from 6 months to 21 days. TBWES also offers a wide range of services to support the life cycle operation of its entire range of boilers and heaters. As a part of services, TBWES is using IIoT, to enable commissioning of boilers remotely as also enhancing its value add to customers by providing remote assistance to improve performance and reliability. The outlook for the next year appears challenging due to a tepid order book at the start of the year and limited project announcements on the anvil.

Danstoker A/S (Denmark)

Danstoker A/S, a step-down subsidiary is engaged in the business of design, production and sale of predominantly biomass boilers and related equipment to the European market, including rebuilding and servicing of boilers. Danstoker Denmark incurred losses due to cost overruns during the year. Concerted efforts are being made to improve operations and reduce cost, which will help in improving profitability.

Boilerworks A/S (Denmark)

Boilerworks A/S, a part of Danstoker Group and a step down subsidiary of the company, specialises in the manufacture and supply of high pressure boilers and components for power plants, waste and biomass fired plants, industrial and petrochemical plants. The subsidiary continued to incur a loss in FY2019-20 but relatively lower than that in the previous fiscal owing to the decision of discontinuing large project execution with the possibility of cost overruns. With such projects nearing conclusion and focus on service jobs, accompanied with fixed cost reduction, Boilerworks A/S is expected to improve its financial performance in the current fiscal. The lower impact of COVID-19 on the Scandinavian economy as compared to the rest of the world will sustain the momentum of business opportunities for Boilerworks A/S.

Danstoker Poland Społka Z Ograniczona Odpowiedzialnoscia (DSPL)

DSPL is a step-down subsidiary of Danstoker A/S and is engaged in the design, manufacturing and supply of boilers, hot oil heaters and other related equipment to the Eastern European region, including for Danstoker A/S Denmark. Danstoker Poland has acquired a good learning in manufacturing high quality products. With significant improvement in 'Right First Time' manufacturing, it is expected to provide low cost manufacturing muscle to the company's European business. Additionally, DSPL has been focussing on getting direct orders from the local and neighbouring markets, which will improve its financial performance in the current year.

PT Thermax International, Indonesia (PT TII)

PT TII is a subsidiary of Thermax Engineering Singapore Pte Limited and is engaged in the design, manufacturing, supply, installation, commissioning and servicing of boilers, heaters and other related equipment with a focus on serving the South East Asian region. PT TII had an improved revenue and lowered its losses as compared to the previous fiscal. The entity has gained experience in the execution of large projects in the current year, which has been institutionalised and will enable it to garner better returns from future projects. However, due to the subdued economy in Indonesia and major markets of PT TII, the order booking was not close to desired levels in FY2019-20 and the outlook appears challenging.

Thermax (Zhejiang) Cooling & Heating Engineering Co. Limited, China (TZL)

TZL closed its manufacturing facility in China during the year, disposing of its land and building, however, continued to maintain its service office to support existing customers.

Other Subsidiaries

Thermax Onsite Energy Solutions Limited (TOESL)

TOESL, a wholly owned subsidiary, is engaged in the build-own-operate (BOO) business of providing green, sustainable solutions by supplying utilities such as steam to its customers.

Apart from several contracts for steam and heat supply, the subsidiary commissioned its first plant for supplying treated water to a polyester company in Maharashtra during the year. The company also won its maiden order for providing solar power to a pharmaceutical packaging company in Maharashtra. The company partnered an FMCG major in its decarbonisation strategy and is currently installing two large biomass waste boilers under the BOO model at the customer's Gujarat manufacturing facility.

Continued focus on agro-waste steam and heat solutions coupled with expansion in the renewables space, further buoyed by the slowdown in capex plans of customers would provide growth opportunities for TOESL in the current fiscal.

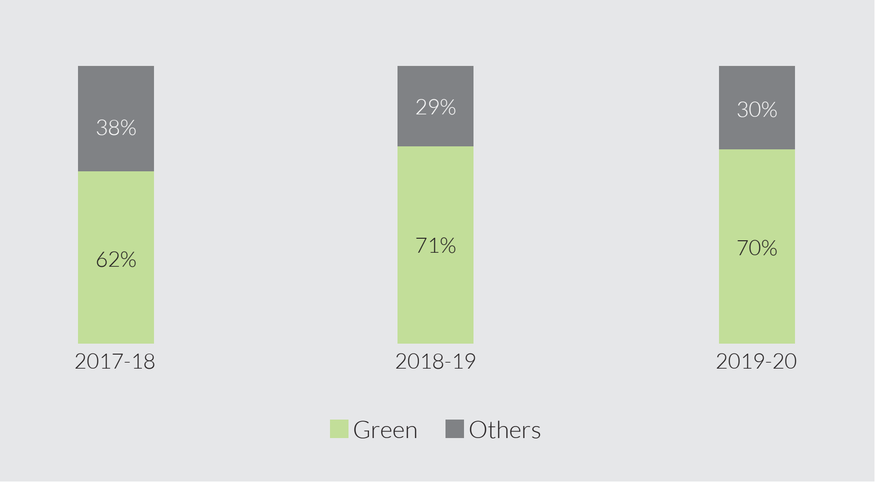
Thermax Inc. (USA)

Thermax Inc., a step-down subsidiary in the USA is the sales and service arm of the company and operates in two segments - Energy (sales of absorption chillers) and Chemical (sale of ion exchange resins). The subsidiary registered a flat revenue in FY2019-20 on account of the slowdown in the chillers business. With encouraging prospects for both Energy business in new markets and the Chemical businesses, the outlook for the subsidiary looks promising.

PERFORMANCE ON STRATEGY

1. Increase the Share of Green Offering in Line with the Company's Vision of Providing Sustainable Solutions

% Green Order Booking



The graph above represent the share of green offerings in the overall order booking of the Thermax Group. 'Green' is defined as orders which comprise utilisation of non-fossil fuels from the Energy segment, all orders booked by the Environment segment and non-fossil application based orders from the Chemical segment.

During the year, the share of green offering was 70% of the total order booked by Thermax as compared to 71% in the previous year. The share can be mainly attributed to the significantly high order booking of the Environment segment. Stricter emission norms announced to regulate SOx emissions from thermal power plants helped the business achieve a breakthrough of two Flue Gas Desulphurisation (FGD) system orders for power plants in India. With the capacity totalling 2,000 MW, the highest gas volume handled by the segment to date. The company is hopeful of pursuing more FGD orders in private and public sectors in future. The business also benefitted from opportunities arising out of strict implementation of emission norms in South East Asia particularly for palm oil producers, the segment that witnessed a surge in production. The EPC business received an order for the supply of a waste heat recovery power plant.

Unique applications based on heat recovery from industrial plants and processes developed by the Absorption Cooling and Heating business such as air cooled compressors, glass manufacturing and potato frying saw an upbeat, catering to customers' need of optimised energy costs.

Highlights of FY2019-20

Recovering Energy to Fuel Savings

To optimise its energy usage and reduce costs, a leading Indian tyre manufacturer opted for Thermax's hot water driven vapour absorption chiller. The replacement of electric chillers by our vapour absorption technology yielded waste heat recovery up to 76% of the total input energy and 92% reduction in energy requirement for cooling. The customer also achieved a significant carbon emission reduction of 646 tonnes/

annum, equivalent to taking 129 cars off the road or planting 64,593 trees.

More Power Through Solar

Thermax's largest solar installation during the year was the commissioning of a 3.96 MWp captive ground mounted solar PV plant for a leading cement manufacturer at Karnataka. The installation was done on an undulating terrain and the plant grid was successfully synchronised with an 11 kW power evacuation system. This project is slated to help the customer achieve its sustainability goals by offsetting 4,800 tonnes of CO_2 emission, besides meeting its renewable power obligation.

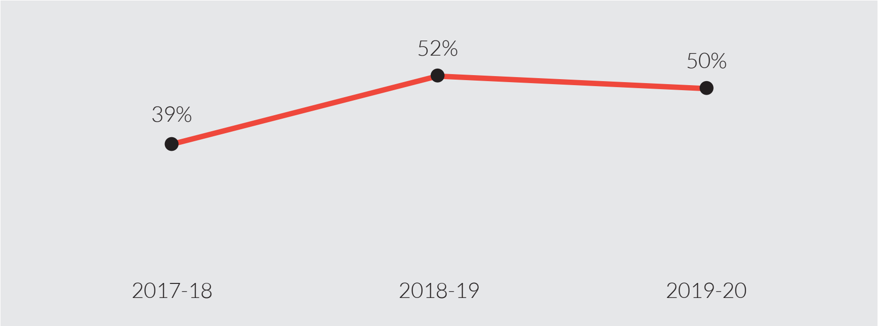
Advanced Technology for Efficient Effluent Treatment Process

Thermax helped one of the major automotive engine manufacturers to achieve zero liquid discharge for the wastewater generated in their factory by deploying an advanced technology to remove contained oil, solids and other organic compounds. This was earlier being done through a combination of chemical and biological treatment, consuming significant energy and space. A system with a special arrangement for controlling noise levels was also incorporated in this project.

Thermax's 58 TR hot water driven vapour absorption chiller at an Indian tyre manufacturing plant recovers heat from the air-cooled compressor and utilises it for cooling application in the plant

2. Mitigate the Cyclicality in Projects Business by Increasing Share of Business from Products and Services

% Order Booking from Products and Services



During the year, 50% of the company's order booking came from products and services, consistent with last year's mix. The order booking from products and services was Rs. 2,746 crore as compared to Rs. 2,998 crore in the previous fiscal.

The standard products of the Heating business - small packaged boilers - continued to witness opportunities from the consumption oriented sectors. The service business continued to grow on the back of growth of product business. The mix of spares and services proved to be a favourable model for the business.

The TBWES services business intensified its focus on the spare parts business. It is widening its offerings to include boiler re-deployment, repowering, rejuvenation and refuelling projects.

The ion exchange resin business registered a marginal increase in top line over last year, while the performance chemicals business registered a substantial growth over the previous year with 100% retention of annual contracts of major customers. Breakthrough orders came from steel and refinery segments. Construction chemicals also witnessed a commendable increase in revenue over the last financial year and this momentum is expected to continue in this year.

Innovation and new applications in sectors such as food & beverages, chemical and fertilisers were the main drivers for the growth of the Absorption Cooling and Heating product business. Its Remote Online System Support (ROSS) is now connected to around 547 chillers across the globe. The technology is being highly appreciated by customers for its remote diagnosis capability. Proactive maintenance followed by issue identification has ensured continued productivity in many customer plants till date. Businesses leveraged digitalisation to monitor customer complaints through the Salesforce.com Service Cloud leading to improved responsiveness and efficiency in managing complaints, while effectively tracking and eliminating recurring complaints.

During the year, the Water and Waste Solutions business developed several new products such as in-house multi-effect evaporators (for zero liquid discharge systems), prefabricated systems and portable water testing kits. As a value-add, plant audit service was extended to customers and spares business was enhanced with focus on on-time delivery.

The Power O&M services acquired new customers including one of its largest orders in the domestic segment during the year. The business is focussing on growing its portfolio of value-added services to customers and expanding its presence in the international market.

Highlights of FY2019-20

600+ Days of Continuous Operation

Since 2016, TBWES O&M team has been providing boiler upkeep services to a large petrochemical complex in Gujarat. One of the Thermax CFBC boilers and associated ESP at the complex recorded 674 days of continuous operation till it had to be stopped due to the nationwide lockdown. To ease the operational challenges of such a large steam generation complex, all the units were put on automatic control. With close to two years of uninterrupted operation, this performance is a benchmark for any CFBC boiler globally.

Largest O&M Order of 90 MW

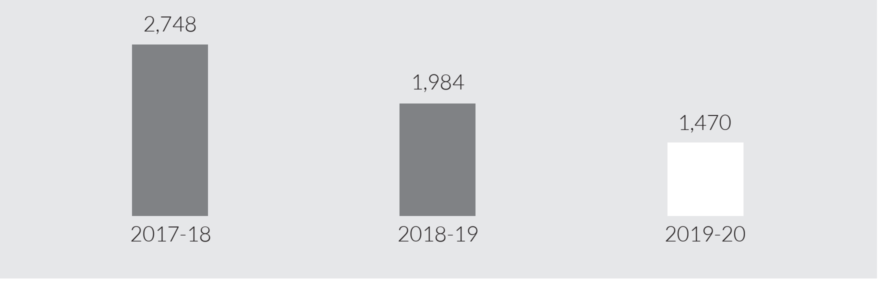
The Power O&M business bagged its largest contract encompassing operation and maintenance of a 90 MW captive cogeneration power plant, including non-Thermax make equipment. The company created a benchmark by taking over the plant within a short time of 15 days, which included deploying and onboarding almost 350 personnel and staff, ensuring continuity and smooth operation of the plant.

Thermax Electrostatic Precipitator (ESP) at a power producing major in the Philippines

3. **Reduce Dependence on Domestic Market Through Selective Internationalisation**

International Order Booking

Rs. in crore



The international order booking was Rs. 1,470 crore in FY2019-20 as compared to Rs. 1,984 crore in FY2018-19, mainly due to slowdown in investments witnessed globally and no large project orders received during the year.

The international business of Absorption Cooling and Heating witnessed a good track of orders from the US, Nigeria, Saudi Arabia, and Bangladesh this year. The division has closely collaborated with HVAC and CPHC consultants and several OEMs in various markets. While the international projects business continues to be challenging in Europe, the business has entered new geographies such as Bolivia, Columbia, Puerto Rico and Egypt with a few good orders. The Chemical business bagged significant orders from large OEMs in the U.S. and Europe for water treatment and process applications.

Thermax bagged an international project in the Middle East for setting up a power plant on an EPC basis, besides commissioning yet another EPC project for a leading biomass based independent power producer in South East Asia.

Highlights of FY2019-20

Largest Overseas Order for Electrostatic Precipitator

The Enviro business commissioned an Electrostatic Precipitator (ESP) for a leading power producer in the Philippines as well as in South East Asia. This ESP is the largest overseas installation by Thermax, done on a 410 TPH CFBC boiler. The high point of the project was supplying the precisely engineered ESP structure along with a 75 meter tall stack by way of sub-assemblies and commissioning the entire edifice at the customer's end and complying with all safety norms.

FINANCIAL PERFORMANCE

In FY2019-20, Thermax Limited, on a standalone basis, registered a total income from continuing operations of Rs. 3, 319 crore as compared to Rs. 3,664 crore in the previous year. The total income of Thermax Group was Rs. 5,831 crore (Rs. 6,123 crore). The group's profit before tax and exceptional items for FY2019-20 stood at Rs. 375 crore as compared to Rs. 501 crore in the previous year. The net cash inflow from operations is Rs. 326 crore (Rs. 115 crore outflow).

The company and its Indian subsidiaries have computed the tax expense of the current financial period as per the tax regime announced under section 115BAA of the Income-tax Act, 1961. Accordingly, (a) the current and deferred tax expense for the year ended March 31, 2020, has been determined at the rate of 25.17% and (b) the deferred tax assets as at April 1, 2019, (on brought forward losses and other items) have been written down considering the enacted rate of 25.17%.

During the year, the company has declared interim dividend of Rs. 7/- per equity share on March 13, 2020 and same was paid on March 18, 2020.

KEY FINANCIAL RATIOS

In accordance with the SEBI (Listing Obligations and Disclosure Requirements 2018)(Amendment) Regulations, 2018, the company is required to give details of significant changes (change of 25% or more as compared to the immediately previous financial year) in key sector specific financial ratios.

Particulars	Thermax Limited (Continuing Operations)		Thermax Group	
	FY2019-20	FY2018-19	FY2019-20	FY2018-19
Debtors Turnover ratio	3.67	3.33	3.88	4.30
Inventory Turnover ratio	7.61	8.34	6.41	7.62
Interest coverage ratio	48.81	61.48	25.94	35.98
Net Profit Margin	4.9%	4.4%	3.6%	5.3%
Current Ratio	1.45	1.48	1.43	1.30
Return on Capital Employed	9.3%	11.8%	13%	14%
Return on Net worth(RONW)	5.9%	5.9%	7%	11%

Lower revenue and profit in Energy and Environment segments have resulted in lower Net Profit Margin, Return on Capital Employed and Return on Net Worth.

OPPORTUNITIES AND THREATS

Opportunities

1. The growing global energy demand, especially with a focus on increasing the share of renewables in the energy mix, and continuous research and development for creating alternative fuel sources constitute the biggest growth impetus for the company.

2. Industrial production contributes just over half of all global energy consumption and this is expected to grow by 1.5% worldwide each year till 2035. This indicates the potential demand for solutions that reduce the carbon footprint and the cost of industrial energy consumption. The trend is expected to catapult the demand for the company's Energy segment where energy efficiency and waste to energy will be huge drivers for business growth going forward.

3. Environment, sustainability, and circular economy are becoming mandatory focus areas for all nations after the signing of COP21 and COP24 agreements on mitigating climate change. Stringent environmental norms implemented across the world will significantly aid the Environment segment of the company.

4. The global requirement for new air pollution control systems owing to the revision of emission norms will be a major opportunity. Air quality control equipment has been made mandatory for SOx emitting industries in many countries. This has increased the demand for FGD system, which reduces SOx in flue gas through chemical treatment. The company sees a high demand potential for its environment solutions due to this policy change.

5. Growth in the global food processing industry because of growing urbanisation and consumerism will be a growth driver for Thermax solutions.

6. With the ZLD norms getting stricter, there are opportunities for effluent treatment and multiple effect evaporator chemicals. Water recycling will be another key focus area for all industries, and the company considers it to be a significant driver for its Water and Waste Solutions.

Threats

1. In the current scenario, the COVID-19 pandemic and the lockdown are the biggest threats to the company. The pandemic has not only hampered the supply chain but has also created a serious scarcity of manpower because of the migration of labour and physical distancing norms. The virus will affect consumer and investor sentiments for a year or two, and is likely to have a negative impact on the company's performance in the next fiscal, since larger project order booking will be hampered.

2. Geopolitical tensions and trade war between major economies pose some threats to the company's international operations and supply chain.

3. In India, liquidity crunch for banks and non-banking financial companies, loan defaults, and negative consumer and investor sentiment are possible hurdles.

4. Highly leveraged balance sheets of several organisations further impacted by the COVID-19 pandemic has tightened the cashflow situation, which will impact capex investments significantly.

RISK MANAGEMENT

The company has an Enterprise Risk Management (ERM) framework in place for identification, assessment, mitigation and reporting of risks. The Risk Management Council and Committee of the company carry out a detailed review of key risks facing the company, its impact on strategic decisions and mitigation measures. The review of these risks is done based on the important changes in the external environment, which have a significant bearing on the risks. The company actively keeps track of changes in the domestic economic environment, geopolitical developments, key commodity prices such as oil, coal and steel, currency and interest movement. Apart from mitigation, these risks are also monitored for any emerging business. The details of the company's ERM framework are available on Page 52.

INTERNAL CONTROL

The company has an internal audit function which continuously evaluates the quality of its controls and the extent of compliance with them. The company has also introduced a process of control self-assessment by its operating managers. In addition, internal financial controls were specifically audited by an external audit firm. The company uses various enterprise resource planning packages in its operations that contain a variety of in-built controls. Careful analysis is done for variations between performance and plan. The company has a strong culture and processes that reduce the risk of unethical conduct. These include a clear code of conduct and whistle-blowing processes. Based on all of the above, the Board believes that the internal controls are adequate and that they operated effectively during the year. Similarly, the company has a process by which operating managers are kept up to date with legal amendments affecting their areas of operation. Operating managers confirm compliance with various provisions every month. Additionally, the internal auditors, the statutory auditors and the secretarial auditors check compliance with certain laws related to their areas of work. The company has a culture that reduces the risk of non-compliance with the laws. Based on the foregoing, the Board believes that the systems to ensure compliance with applicable laws are proper and that they operated effectively.

ENVIRONMENT, HEALTH AND SAFETY (EHS)

Safety is of utmost importance to Thermax. The safety performance of the company is reviewed by the MD and CEO every quarter while Divisional Safety Councils regularly review the divisional performance. Necessary corrective and preventive actions are taken at the organisational level and by respective businesses to ensure high levels of safety performance.

During the year, TOESL received the ISO 14001:2015 certification for the first time by DNV GL while the Power EPC business was ISO 45001:2018 certified by Bureau Veritas. Transition audits from OHSAS 18001:2007 to ISO 45001:2018 were conducted by DNV GL for TOESL and the project arm of Heating business. Recertification audits of the Chemical plants at Paudh and Jhagadia as well as certification audit of the Chemical plant at Dahej for ISO 45001:2018 and ISO 14001:2015 were done by Bureau Veritas during the financial year.

Surveillance audits for OHSAS 18001:2007 certification was conducted by Bureau Veritas for WWS business and Thermax Engineering Construction Company Ltd. (TECC), a subisidary of Thermax. Thermax's manufacturing facilities at Chinchwad and Savli and assembly centre at Mundra were audited for OHSAS 18000:2007 and ISO 14001:2015 certification by DNV GL. The Enviro plant at Solapur and TBWES plant at Shirwal were audited by TUV:SUD and LRQA respectively for ISO 45001:2018 and ISO 14001:2015 certifications during the year.

1,691 internal audits and 31 external safety audits and inspections were carried out in FY2019-20. Special safety audits for fire prevention were conducted at office locations and manufacturing plants in Pune. All manufacturing and project locations have developed an emergency preparedness plan. They have also imparted training on fire prevention and control and conducted mock drills on emergency evacuation at plants and office locations.

Regular safety trainings are conducted for employees, contractors, vendors and suppliers. To transition from OSHAS 18001 to ISO 45001:2018, the first 'international standard' in occupational health and safety (OH&S) management, 20 safety officers and divisional coordinators were trained by TUV:SUD and Bureau Veritas during the year to become certified auditors.

The National Safety Council (NSC) conducted an internal auditor course on SHE (Safety Health and Environment) statutory compliance. Through this specialised programme recognised by NABET (National Accreditation Board for Education and Training), 24 safety officers and divisional safety coordinators from Thermax were trained as internal auditors.

The continued use of a mobile app on incident reporting has improved the reporting of leading indicators, which is helping in minimising the hazards and risks at plants and sites.

At manufacturing plants which are under the Environment Management System, a number of programmes on waste/ resource reduction were successfully implemented during the year.

HUMAN RESOURCE

During the year, the company focussed on learning, skill upgrading, leadership development, digitalisation of processes and capacity building. The details are available in the Human Capital section on page 42. The company also ensured the occupation health and safety of its employees in the wake of the COVID-19 pandemic. For more details, refer the COVID-19 chapter on page 5.

CAUTIONARY STATEMENT

The Management Discussion and Analysis contains statements about future events, financial and operating results of Thermax Group, which are forward-looking. By their nature, forward-looking statements require the company to make assumptions and are subject to change based on risks and uncertainties. A number of factors could cause assumptions and actual future results and events to differ materially from those expressed in the forward-looking statements. Readers are cautioned not to place undue reliance on forward-looking statements.