



TATA CONSULTING ENGINEERS LIMITED

22ND ANNUAL REPORT 2020-21

REIMAGINE REINVENT GROW



ANNUAL REPORT

2020-2021

FORWARD-LOOKING STATEMENT

This Annual Report and other statements – written and oral – that we periodically make contain forward-looking statements that set out anticipated results based on the Management's plans and assumptions. We have tried wherever possible to identify such statements using suitable words in connection with any discussion on future performance. We cannot guarantee that these forward-looking statements will be realised, although we believe we have been prudent in our assumptions.

The achievement of results is subject to risks, uncertainties and even inaccurate assumptions. Should known or unknown risks or uncertainties materialise, or should underlying assumptions prove inaccurate, actual results could vary materially from those anticipated, estimated or projected. We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise.

APPROACH TO REPORTING

The Annual Report is aimed at meeting the information requirements of all our Stakeholders, including Investors, Customers, Suppliers, Employees, Contractors, Competitors, Press, Analysts, the Government and others.

MATERIALITY

The Report includes information that our Senior Management believes is material to our Stakeholders and it presents an overview of our businesses and associated activities that help in short, medium and long-term Value Creation. We have presented information around our strategic approach, and the Report also discusses what different capitals mean for the Company.

SCOPE OF THE REPORT

We have presented the information on all our business units in a fair, balanced and understandable manner. The performance disclosure is reported for the period FY 2020-21.

MANAGEMENT REVIEW

For optimal presentation of the information in the Report, the Strategic Framework, Governance Overview, Performance and Value Creation Model have all been perused by the Senior Management.

REPORTING PRINCIPLE

Through the Report, we are attempting to present our '*Integrated Thinking*' process by aligning our communication with the International Integrated Reporting (IR) Framework by the International Integrated Reporting Council (IIRC) and the Companies Act, 2013. The Report tries to communicate a clear, concise, integrated story that explains how all our resources create value for the business and its Stakeholders.

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Tata Consulting Engineers Limited (TCE) is an Integrated Engineering Consultant providing concept to commissioning services under three Strategic Business Clusters:

- 1. Infrastructure*
- 2. Plant Engineering*
- 3. Digital, Innovation & Technology.*

TCE is a 100% subsidiary of Tata Sons Private Limited. The Tata Group is one of India's most respected conglomerates.

ABOUT US

Reimagine, Reinvent, Grow

Established in 1962, Tata Consulting Engineers Limited (TCE) is India's Leading Integrated Engineering Consultant providing Concept to Commissioning services. With 10,000+ projects delivered in more than 55 countries, the company had a 20% growth in new business acquisition. TCE, amongst the top 2 consultants in its core sectors - Power, Infra and Resources is a well-diversified firm with equal distribution between domestic and international projects. TCE continues to be a part of the Nation's Strategic Projects across Infra, Transportation, Nuclear, Power, Defence, Space and Urbanisation.

TCE has a track record of delivering several one-of-a-kind projects with a strong knowledge base and technical expertise. The Company has multi-disciplinary engineering talent with capabilities to manage complex projects worldwide. TCE is among the few companies geared for the Industry 4.0 era, providing engineering solutions for Industrial Internet of Things (IIoT).

Currently, TCE is executing projects (design, engineering and/or site services) at 130 sites across India and overseas. TCE has a dedicated talent pool with core engineering skills, thus serving as an integrated service model for its clients.

The Company's ability to manage complex projects, and experience in building cost-effective and environment friendly solutions, makes it one of the most sought after engineering solutions partner across the globe. TCE's Digital Engineering and 3D - 5D delivery models enable the Company to provide niche services tailored to client needs. This is underscored by several success stories in delivering client aspirations.

Vision

To be an internationally respected engineering consultant offering comprehensive solutions

Mission

Provide technically excellent and innovative solutions for adding value to all stakeholders, and operate globally as professional consulting engineers

Values

- Customer Satisfaction and Loyalty
- Technical excellence with professional ethics
- Responsibility to society
- Employee dignity and self-respect
- Organisational and individual growth





59 Years
of Technical Excellence



10000+
Projects Delivered Globally



2419 Employees



\$35 bn
Worth projects under
Management

Our Cluster

SECTORS & SERVICES



29%
Share of Revenue



31%
Share of Revenue

PLANT ENGINEERING CLUSTER:

Power Sector

Thermal, Nuclear, Renewable, Captive, Energy Storage, Transmission & Distribution.

Resources Sector

1. HYDROCARBONS & CHEMICALS

Oil, Gas and Petroleum Refineries, Petrochemicals, Fertilisers, Chemicals & Specialty Chemicals, Food & Pharmaceuticals, Glass, Rubber, Cement and Allied Process Industries.

2. MINING & METALLURGY

Iron & Steel, Mining & Beneficiation of Ferrous & Non-ferrous, Smelting and Processing, Geology and Mine Planning, Mineral Processing and Beneficiation, Material Handling.



DIGITAL, INNOVATION & TECHNOLOGY CLUSTER:

Digital & Advanced Technology Service

3D Modelling & 4D Simulation, Asset Digitisation, Engineering IT Services, BIM & IIoT, New Machine Development, Machine Localisation, Machine Component Development, Design Validation, FE Analysis & Special Projects

Technology Group Service



Our Cluster

SECTORS & SERVICES



40%
Share of Revenue

INFRASTRUCTURE CLUSTER:

Infrastructure Sector

Urban Development, Water and Wastewater, Environment, Urban Transport, Ports & Harbours, Industrial Facilities & Buildings.

Project Management & Safety Service

Project Management, Engineering Review, Construction Management/ Supervision, Program Management, Interface Management, Specialised Services, Quality & Safety Audits, Outage Management, Procurement Assistance, Quality, Inspection & Equipment Management, Vendor Quality Assessment, Vendor Management, Inquiry/Tender Preparation and Award.

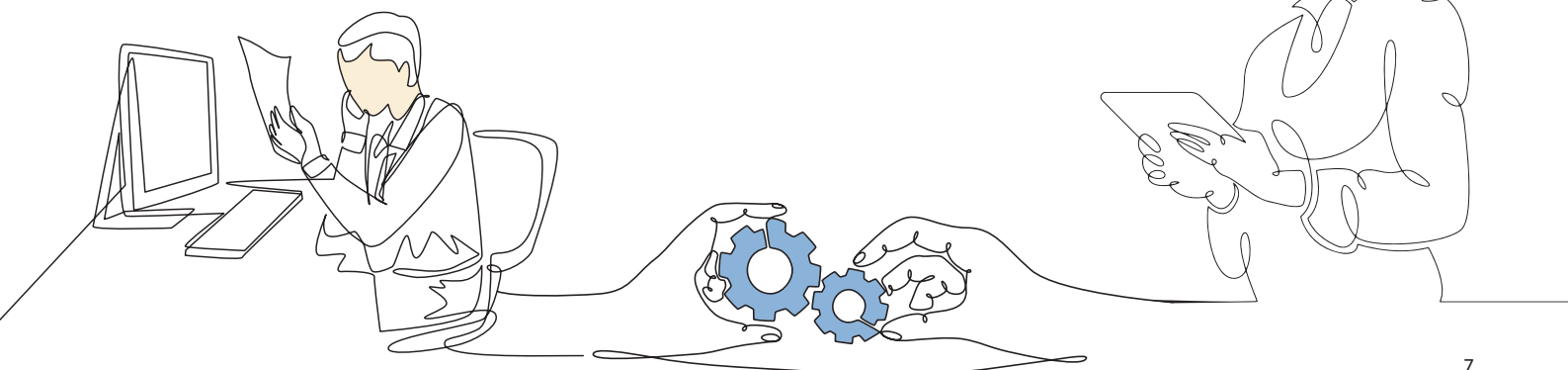
EcoFirst Subsidiary

Sustainable Integrated Design of Buildings, Urban Design, Sustainable Engineering Economics, Climate and Sustainability Services, Program Management, Digital & Modelling



Design & Engineering Services common to all Clustures

Project Concept Development, Pre-feasibility & Feasibility Reports, Detailed Project Reports, Environmental Study Reports, System Studies, Frontend Engineering Design (FEED), OE Services and Detailed Engineering



Our Presence

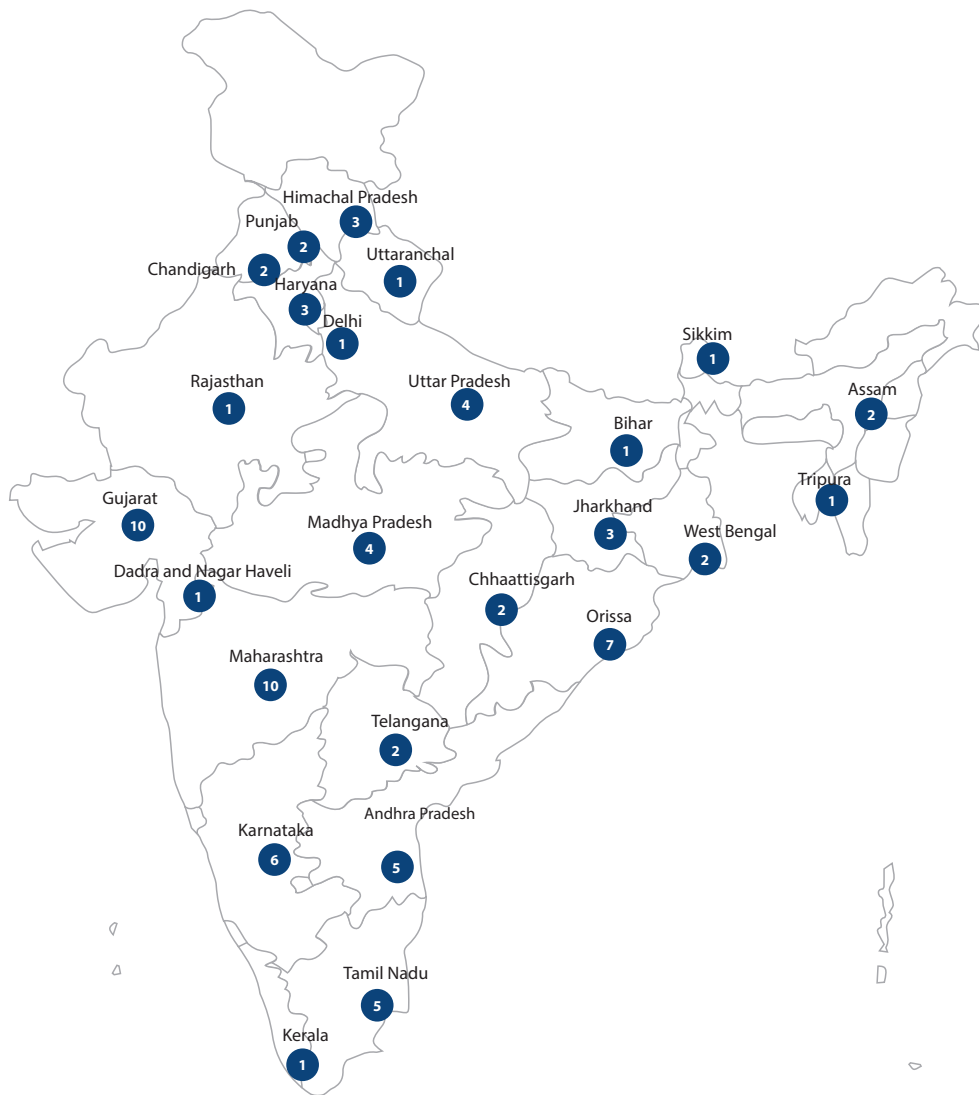


59%
Share of Total Revenue

INDIA

INDIA

- Assam**
 - Dibrugarh
 - Guwahati
- Andhra Pradesh**
 - Kakinada
 - Shriharikota
 - Vijaywada
 - Visakhapatnam
 - Yeddumailaram
- Bihar**
 - Patna
- Chhattisgarh**
 - Raipur
 - Durg
- Chandigarh**
 - Mohali
 - Naya Raipur
- Dadra and Nagar Haveli**
 - Silvassa
- Delhi**
 - New Delhi
- Gujarat**
 - Ahmedabad
 - Baroda
 - Bharuch
 - Dahod
 - Gandhidham
 - Gandhinagar
 - Jamnagar
 - Rajkot
 - Surat
 - Vadodara
- Haryana**
 - Faridabad
 - Gurgaon
 - Jhajjar
- Himachal Pradesh**
 - Kinnaur
 - Kullu
 - Shimla
- Jharkhand**
 - Jamshedpur
 - Ranchi
 - Noamundi
- Karnataka**
 - Bangalore
 - Belagavi (Belgaum)
 - Bellary
 - Bidadi
 - Hubballi
 - Shimoga
- Kerala**
 - Thiruvananthapuram



- Madhya Pradesh**
 - Bhopal
 - Nepanagar
 - Satna
 - Ujjain
- Maharashtra**
 - Aurangabad
 - Chandrapur
 - Mumbai
 - Navi Mumbai
 - Pune
 - Ratnagiri
 - Shirdi
 - Solapur
 - Tal Khed, Dist. Pune
 - Thane
- Orissa**
 - Banharpali
 - Bhubaneswar
 - Dhenkanal
 - Gopalpur
 - Narendrapur
 - Paradeep
 - Rourkela
- Punjab**
 - Bathinda
 - Mansa
- Rajasthan**
 - Jaipur
- Sikkim**
 - Gangtok
- Telangana**
 - Hyderabad
 - Secunderabad
- Tamil Nadu**
 - Chennai
 - Hosur
 - Sriperumbudur
 - Thoothukudi
 - Tuticorin
- Tripura**
 - Agartala
- Uttar Pradesh**
 - Allahabad
 - Bulandshahr
 - Noida
 - Sonbhadra
- Uttaranchal**
 - Dehradun
- West Bengal**
 - Kolkata
 - Medinipur

● No. of Cities (Domestic Projects) Map not to scale



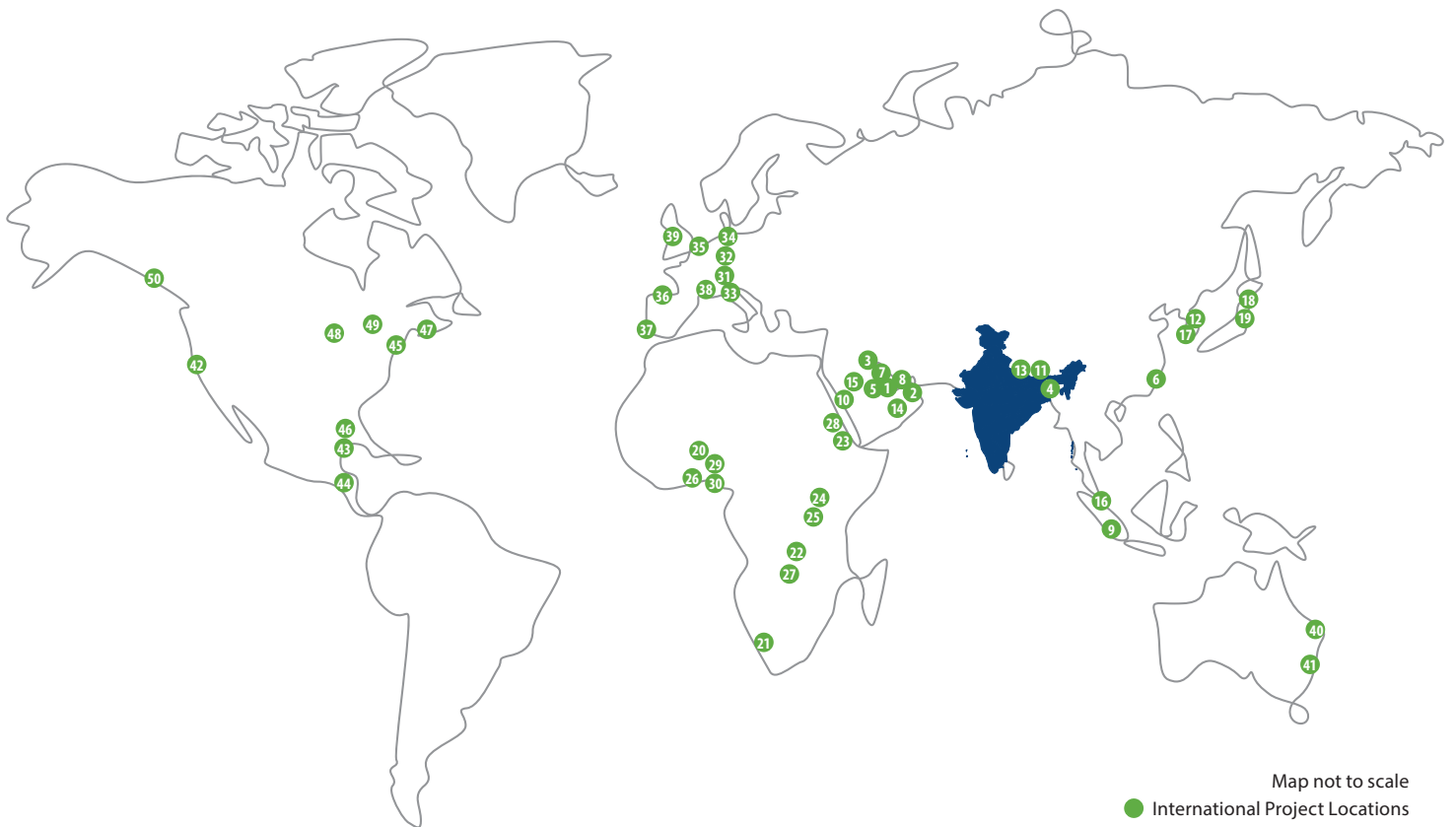
30%
Share of
International
Revenue

**MIDDLE EAST &
AFRICA (MEA)**



70%
Share of
International
Revenue

**REST OF
WORLD
(ROW)**



Map not to scale

● International Project Locations

ASIA & MIDDLE EAST

1. Abu Dhabi, UAE
2. Barka, Oman
3. Dammam, Saudi Arabia
4. Dhaka, Bangladesh
5. Doha, Qatar
6. Dongguan, China
7. Dubai, UAE
8. Fujairah, UAE
9. Jakarta, Indonesia
10. Jeddah, Saudi Arabia
11. Kathmandu, Nepal
12. Korea, South Korea
13. Lalitpur, Nepal
14. Ras Al Khaimah, UAE
15. Riyadh, Saudi Arabia
16. Selangor, Malaysia
17. Seoul, South Korea
18. Tokyo, Japan
19. Yokohama, Japan

AFRICA

20. Abuja, Nigeria
21. Aggeneys, South Africa
22. Chingola, Zambia
23. Djibouti, Ethiopia
24. Kampala, Uganda
25. Kigali, Rwanda
26. Lagos, Nigeria
27. Lusaka, Zambia
28. Mekelle, Ethiopia
29. Port Harcourt, Nigeria
30. Rivers State, Nigeria

EUROPE

31. Baden, Switzerland
32. Berlin, Germany
33. Gallarate, Italy
34. Hamburg, Germany
35. Handelsregister, Netherlands
36. Leioa, Spain
37. Lisboa, Portugal
38. Saint Paul Lez Durance, France
39. Northwich, UK

AUSTRALIA

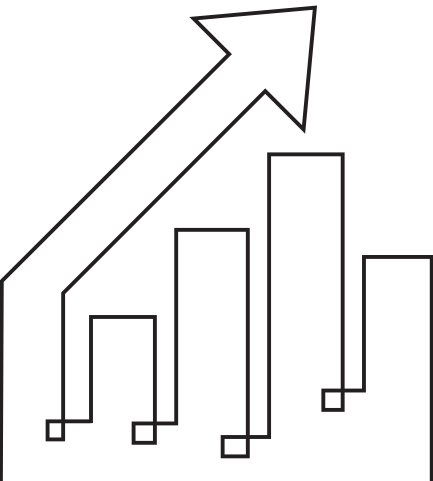
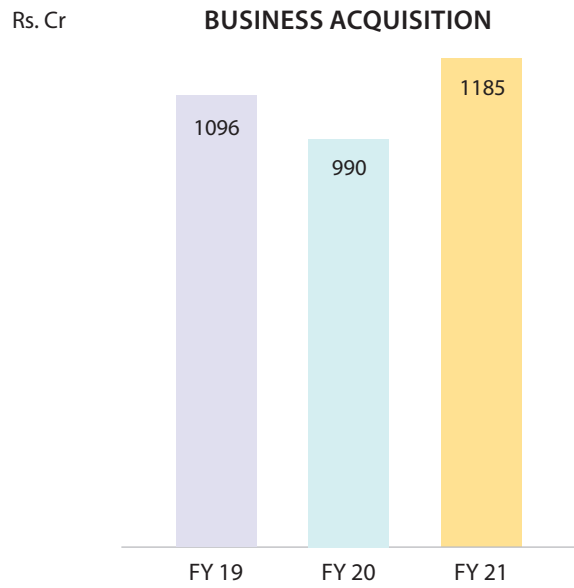
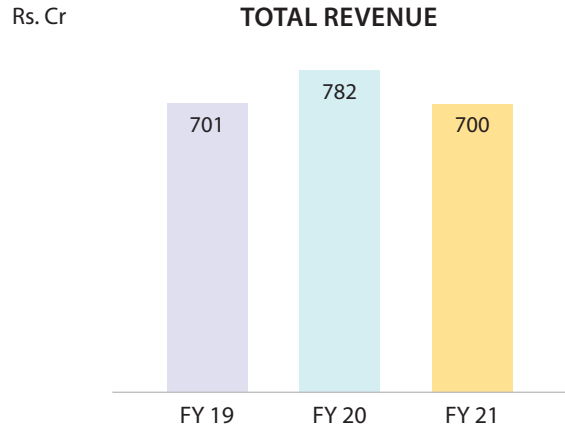
40. Brisbane
41. Sydney

NORTH AMERICA

42. California, USA
43. Houston, USA
44. Mexico City, Mexico
45. New Jersey, USA
46. New Waverly, USA
47. New York, USA
48. Oakbrook Terrace, USA
49. Ohio, USA
50. Vancouver, Canada

Performance HIGHLIGHTS

FY 2020-21 saw a COVID-19 impact on the financials, but the business acquisition was the best ever in the company's 59 year history. The year closed at Rs. 700 Cr in Revenue.



700 Cr
TOTAL REVENUE

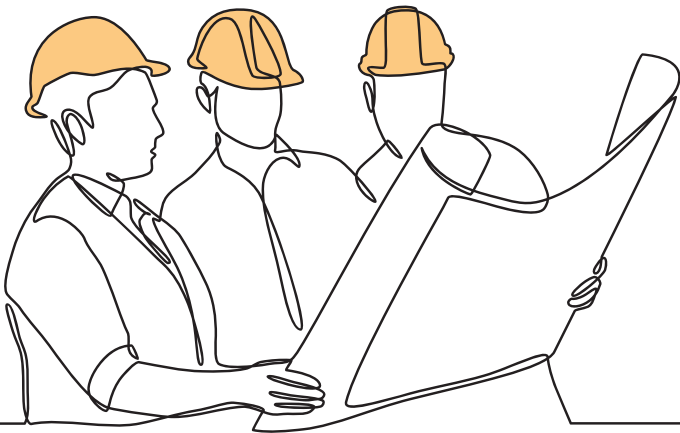
1185 Cr
BUSINESS ACQUISITION

21%
GROWTH IN BUSINESS ACQUISITION OVER PREVIOUS YEAR

FINANCIAL CAPITAL



MANUFACTURED CAPITAL



16

Project, Sales & Branch Offices

Project design, engineering, construction, maintenance and management are the stages when we use materials, equipment, tools and technologies all form our manufactured capital.

HUMAN CAPITAL



81.5%

Utilisation of People



85% Men

15% Women

Diversity



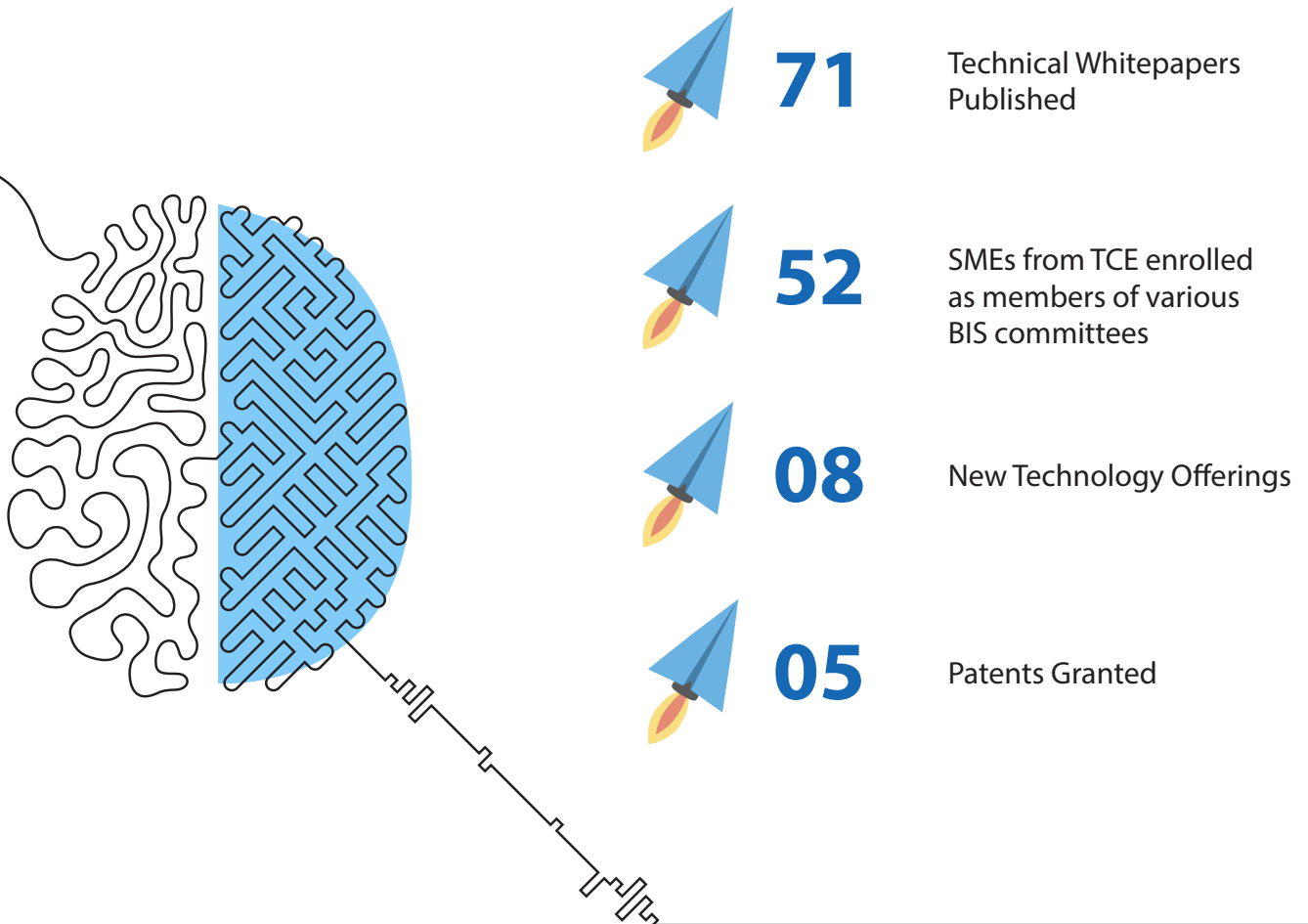
13.1

Training Person days per employee

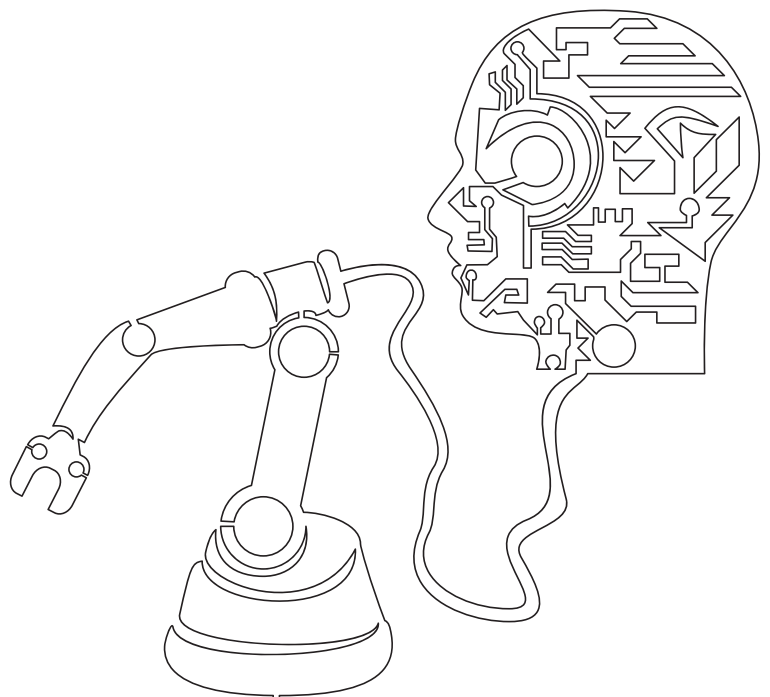
People are at the heart of our business. Collective skills, knowledge and capabilities of our employees and contract staff is core to reimagining, reinventing and growing.



INTELLECTUAL CAPITAL



Innovations around technologies for increasing project efficiency and creating knowledge continuously establishing the company as thought leaders



NATURAL CAPITAL



1672 kWh

Energy Consumption
by TCE Offices



As a consulting organisation, our natural capital is measured by our offices. Due to the COVID-19 Pandemic and resulting Work from Home, the energy consumption got augmented to employee homes. We take pride in efficient operations and optimal use of natural resources to ensure all our business activities have minimal impact on the environment.

Through our technology-enabled solutions, we also help our clients in preserving natural resources. Some of the projects that we undertake in water, waste management, smart cities, mining & metals, etc. are specifically addressed at natural capital enhancement for the environment as a whole



SOCIAL AND RELATIONSHIP CAPITAL

Powered by our different flagship programmes, along with various volunteering initiatives, we are delivering on our social responsibility. Our Corporate Sustainability Policy framework offers the foundation to build our social well-being programmes by leveraging our core capabilities. Our primary focus areas are Sustainable Livelihood, Education, Infrastructure, Health and Hygiene, and Research and Development.



5027

Corporate Volunteering
Person hours



Rs. 205 lakhs

Invested in CSR projects



8450

Lives Touched



1914

Employees Volunteered



Chairman's Statement

Dear Stakeholder,

In these Pandemic times, I wish and pray you and your families to remain safe and well. Today all of us are witnessing the second wave of the Pandemic, and people worldwide are suffering losses in family and business. Your Company, too, suffered. I am deeply saddened to report that we lost eight of our young and talented team members. I want to assure you that we are standing in support of the concerned families and are doing all that we possibly can to ensure that the families are financially independent.

I sincerely wish safety and wellbeing for you and your loved ones'. As you know, this Pandemic second wave has severely affected India. There is a great ray of hope as more and more people get vaccinated. I am happy that all our employees and their family members have taken at least one vaccination dose. Your Company is doing what it takes to keep our family protected while continuing to deliver. With the experience of managing the Pandemic and getting accustomed to working from home to the extent possible and the vaccination drive, the economic and health situation is expected to improve this year. But we have to keep taking care until the situation comes under control and the third wave is avoided altogether. However, given this turmoil, this year again will remain challenging and test our skills, empathy and agility. Let me assure you that your company leadership has taken cognisance of the challenges and has prepared a detailed strategy focusing on invigorated sales efforts, cost optimisation, efficient collections, forged partnerships and continuing to open new business lines.

“ I am also pleased to share that your Company played an integral part in helping the country combat the COVID-19 crisis with innovative engineering solutions. The Company worked on solutions to quickly generate oxygen by converting the existing PSA nitrogen plant to produce oxygen and has prototyped an open-source oxikit oxygen concentrator. Your Company also supported new oxygen plants by procuring and setting up a process of due diligence in distributing the essential commodity. ”

Your Company started the year based on the foundation built in FY20 to change gear and enter into new areas of consulting. It was a challenge through Pandemic times, and it gives me

Ashok Sethi
CHAIRMAN



immense pride to share that your Company has completed a year of record business acquisition, especially in new areas. FY 2020-21 saw the highest business acquisition since its inception. Your Company also improved its ENR ranking of 'top international engineering firms' in FY 2020-21 to an all-time best of 116. I am sure your Company will soon achieve within 100 ENR ranking. I am proud to report that your Company is actively engaged in reimagining and reinventing itself to ensure that it continues on the growth path.

It also gives me immense pride to inform you that your Company has been awarded some pride of the Nation projects like Central Vista, Ayodhya Temple, High-Speed Rail and CIDCO affordable housing projects.

Your Company has successfully aligned with the new business order and new business lines and has also moved rapidly to strengthen its IT systems and processes to ensure complete security, data protection and employee productivity while Working from Home.

Post Pandemic world will be a very different place. Cloud and a new class of collaboration tools are helping people discover that they can collaborate just as well while working from home, as they did in person in the pre-COVID-19 era. We are already in a disruptive period driven by technological advances and digital innovation, which will accelerate with the emergence of 'low-touch economies' post-COVID-19. This is already evident in the engineering consulting business, as most present and prospective clients embark on their digital transformation journey. With its strong domain expertise, your Company is already working with its customers and has created new digital services offerings in tandem with customers' changing requirements.

Your Company also focuses on offering sustainable design and services across industries. The Company is actively working on Energy Transition and Hydrogen Economic solutions to help combat the climate change crisis for its clients. The Company also aims to strengthen its footprint in mass transport, low-cost housing, sustainable infrastructure, metal and mining process designs, clean energy, energy transmission, ports, green chemicals, refining and Digital services. The Company also aims to increase its client base by entering into MSME sector needs.

Satisfactory Financial Results with a Strong Order Book

TCE maintains a leadership position within the Consulting Industry by promoting excellence, creating value, seeking new and pioneering technologies, and delivering for clients, despite market and economic volatility. Your Company for the FY 2020-21 achieved consolidated total revenue of Rs. 700 Crore (previous year 782 Crore) with consolidated profit before tax Rs.86 Crore (previous year Rs. 128.70 Crore). Despite Pandemic and other difficulties like various project getting delayed, the Company has made sure that the future is bright. The business acquisition for FY 2020-21 was the highest ever in your Company's history at Rs.1185 Crore, out of which International was Rs. 303 Crore, amounting to 26% of the total acquisition. On the strength of its strong credentials, I am optimistic that your Company will scale newer heights.

Into the Future - Cluster Approach & Strategy:

After a detailed discussion on the Company's strategy for transforming its portfolio and setting the foundation to achieve the 2025 vision, your Company has decided to reorganise into the following three clusters, focused on innovation and continued transformation to build upon its position as the leading engineering solutions provider.

1. Infrastructure Cluster

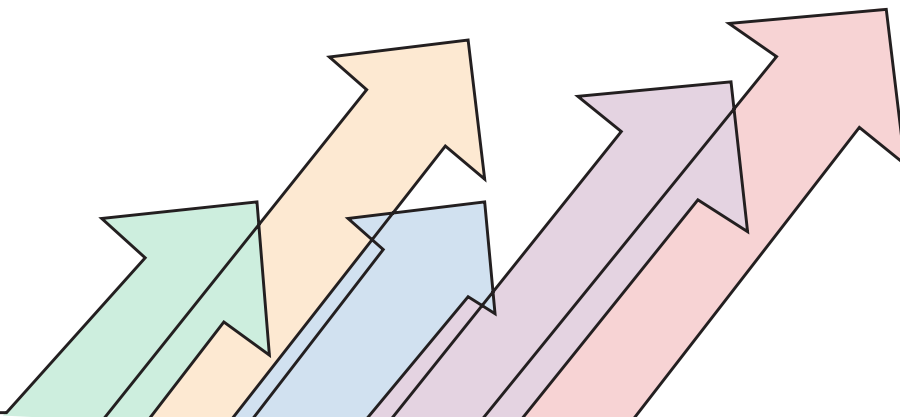
Providing Engineering Services for Water & Environment, Urban Infrastructure, Buildings & Facilities, Ports, Transportation, Sustainability Services (via the wholly-owned subsidiary M/s EcoFirst) and Project Management Services across sectors.

2. Plant Engineering Cluster

Providing Engineering Services for Oil & Gas, Petrochemicals, Chemicals, Food and Pharma, Geology & Mining, Ore Beneficiation, Metal Extraction, Material Handling, Power Generation (Thermal, Renewable, Nuclear), Transmission and Distribution, Energy Storage.

3. Digital, Innovation & Technology Cluster

Providing Digital Services such as plant digitisation, asset information modelling, digital handover, Industry 4.0 solutions and niche Product Engineering Solutions.



Governance & Systems

Your Company has always focused on good governance practices and established systems and processes to enforce the same. Anti-bribery & Anticorruption, Prevention of Sexual Harassment (POSH) at the workplace, adherence to General Data Protection Regulation (GDPR), Whistle-Blower Framework and others have been institutionalised through policies and guidelines. Business processes have been strengthened through IT systems, making for a transparent mechanism to protect client IPR and build client confidence. The risk management process has been reinforced with a clear focus on addressing and mitigating material risks to your Company. It is a matter of pride that systems and processes led to no governance issues in the company.

People

TCE is among the few organisations with a large congregation of engineers who form the backbone for the Company's success. The immensely talented workforce, passionate about projects, has, time and again, helped deliver significant value to its customers. An eight-month-long virtual leadership training module was conducted by Tata Management Training Centre, the group's leadership institute.

This particular year your Company gave special impetus to ensuring that employee morale remains positive to deliver the results. Several online virtual programs were launched to ensure that they feel connected with the organisation while working in the silos of their homes.

Conclusion

Globally, the next few years will continue to see disruptions in redefining businesses in many ways. The 'new normal' bet will undoubtedly lead to an enhanced focus on digital and OPEX. In the physical realm as well, there will be more standardisation, modularisation and a shift towards more efficient, sustainable and greener technologies. The strategic plans for the coming year factor in these global and Indian trends, and I am confident that your Company is well prepared to embrace the 'new normal' with a relentless focus on value, innovation, and excellence.

In all, it has been a momentous year for your Company. My best wishes to all employees, customers and partners who have placed their trust in TCE. I also thank the Management and the Board members of TCE for their valuable contribution to the Company's success.

I look forward to TCE delivering enhanced value for you in the year ahead and beyond.

Sincerely yours,
Ashok Sethi





Ashok Sethi

Chairman



Sriram Kadiyala

Director



Anjali Kulkarni

Director



Amit Sharma

CEO & Managing Director

Managing Director's Overview

Reimagine, Reinvent, Grow

A once in a century Pandemic is challenging the world, and as the waves return, it continues to surprise and evade preparedness. However, humanity will indeed unite and rise together with a firm resolve to fight back and prevail.

COVID-19 has been exerting an overwhelming influence on many aspects. It will surely force each one of us to Reimagine, Reinvent and seek sustainable Growth with innovative and more nature-friendly approaches aligned to the UN sustainable development goals. It is ironic but true that humanity needs to change at a faster rate than the variant itself. While the apparent immediate focus shall be on Infrastructure, Healthcare, Sanitation and Pharmaceutical, etc., the most profound impact shall be felt on the global supply chain, focusing on sustainability, green energy transition, and the need for countries worldwide to ensure self-reliance on identified and earmarked key and strategic areas.

The Pandemic has had a devastating impact on the citizens, and the economic impact will surely reverberate far in the future. And with sorrow and grief, we also know that last year has profoundly impacted our employees, customers, projects teams and their near and dear ones, my heartfelt condolences to all those who have been adversely affected.

When the Pandemic first emerged in the early part of 2020, everyone was caught unaware, and there was uncertainty about the future. At TCE, our team demonstrated leadership, agility, rapid learning and quickly adapted to the new scenario and switched to working from home within two weeks of the first lockdown announcement in late March 2020. This was attributed to the resilience, flexibility and learnability of our leadership and talented employees. These inherent traits that each TCE'ite exemplified were aided by our company's systems and tools, enablers adopted over the past few years. Our strategy of Growth and thrust on internationalisation of operations, standardisation of processes and protocols, and aligned strategy execution, with carefully planned and executed investments over the last eight years, ensure seamless digital operations across TCE. It includes collaboration technologies, 3D



Amit Sharma
CEO & MANAGING DIRECTOR

toolset, engineering software, cybersecurity and various online tools across Order to Delivery, Project Lifecycle Management, Document Management and SAP for Financials. With such a strong foundation and enablers, we ensured safe and secure switchover to 100% work from home and delivered our customer promises and projects.

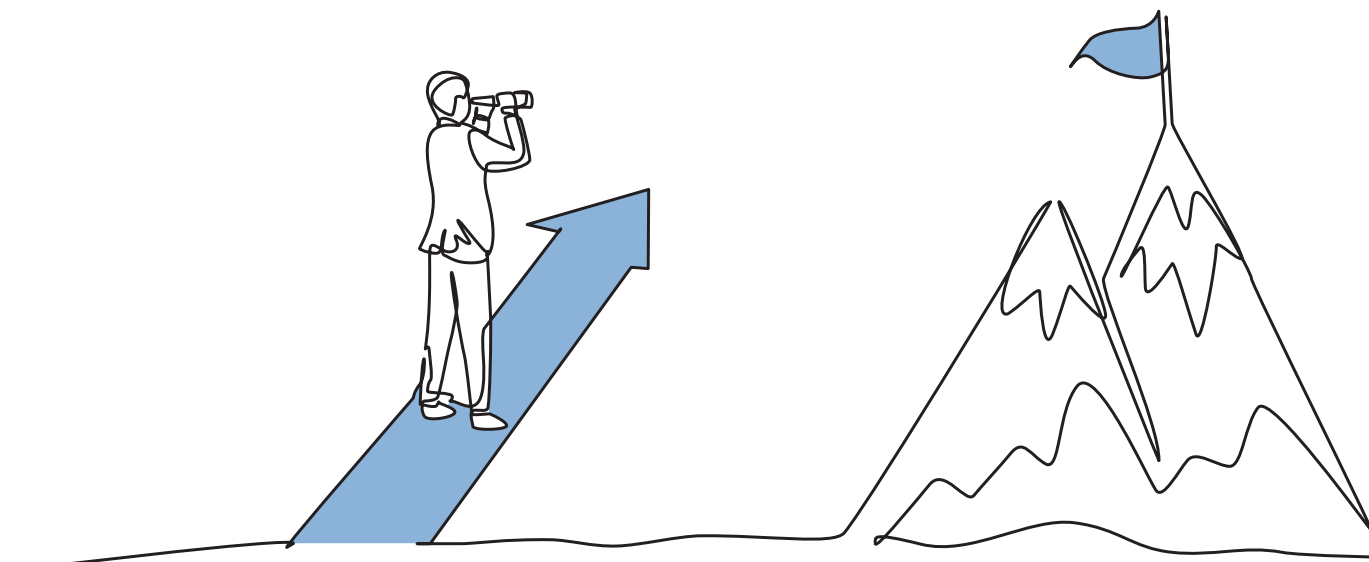
TCE demonstrated flexibility and resilience to ensure operational continuity to hedge the unknown that the Pandemic was challenging us with, few examples such as:

- Proactively working with customers and planning the best possible delivery options and ways to deal with the immediate impacts of the Pandemic.
- Upskilling people, project teams and vendors and leveraging technology to help with seamless operations while working from home across different locations, project, and client sites.
- Ensuring employment security for our employees and ensuring their wellbeing. Embracing togetherness using virtual means to help bring mental wellness, motivation, and agility.
- Enabling enhanced health insurance coverage along with top-up plans.
- Refined and upgraded our business continuity plans to deal with challenges posed by COVID-19 to ensure proper risk management of emerging issues of employee safety, customer connect, enabling work from home operations, delivery of assignments in India & overseas, IT support, and other support operations.
- Engineering Consulting Solutions and concepts to aid in the joint fight against the Pandemic.

Looking back at 2020, I am proud of what we have achieved and how our teams quickly adapted to the change. Today we stand together as a more resilient team ready to **Reimagine, Reinvent and Grow**.

Performance Review

- In FY 2020-21, the new sales order intake was the highest ever, closing at Rs 1185 Crore at the consolidated level, despite a slight reduction in the contribution of our international orders. While the top-line revenue took a dip of 11% YoY, we ensured a healthy bottom line and sustainable operations. TCE became a ZERO debt and cash positive company, a significant milestone achieved in FY 2020-21 due to focused efforts on collecting our dues. COVID-19 specific measure, limited travel and limited use of office infrastructure were responsible for lower operational expenses.
- TCE moved up in ranks in the ENR Top 225 International Design Firms to 116. In FY 2020-21, 41% of our revenues and 26% of the business acquisition came from international markets. FY 2020-21 has been an aberration wherein international signings have been delayed due to deferment of both CAPEX and OPEX spends by customers. The Pandemic, too, had a bearing on our overseas acquisitions.
- Talent retention is an essential aspect of any consulting business. In FY 2020-21, the attrition dropped from 13% to 5%. We had to freeze all new hiring and optimise outsourcing.
- TCE launched TCE SmartSite™ to manage our projects site using digital enablers and reduce paper-based work methods. The SmartSite™ app works alongside real-time safety app Suraksha and survey drones, and other data acquisition devices. The digital SmartSite™ app has made the progress review real-time, with virtual reviews between remote teams and customers. It has also helped to keep our employees safe during the Pandemic.
- With the increasing impetus by the government of India on infrastructure development, FY 2020-21 has seen an upward trend in Capex investments. This year 82% of the revenues came from clients' Capex investments.



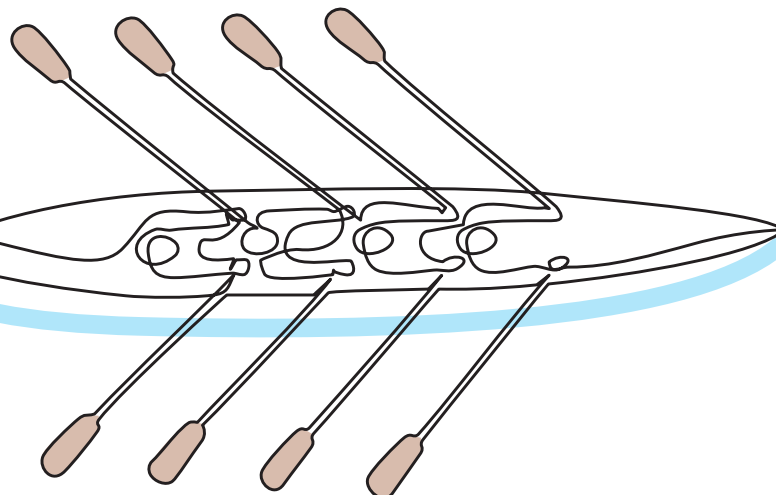
- Our focus on sustainability and energy transition has resulted in our involvement in Aluminium, Zinc and Copper projects across the globe as well as renewable energy projects and the biofuels arena.
- We are the primary consultant for 14 Smart Cities and 50 Amrut Cities in India. We are working on various initiatives at the state and city level to improve healthcare, sanitation, housing and utilities.
- Our Project Management team stood on the ground as front line warriors to ensure the continuity of construction across many sites in India during the Pandemic. They coordinated with all the stakeholders on-site for strict compliance with COVID-19 HSE norms and safe construction works. This was well recognised by important Government projects, Industrial and Pharma Industry
- Strategic accounts contributed 51% to our total revenues, reaffirming the faith in TCE as a value-adding partner of choice.
- TCE once again had the privilege of associating itself with some key landmark projects like Central Vista, CIDCO Mass Housing, Ayodhya and Puri Temple, National High-Speed Rail and ITER, to name a few.
 - The national high-speed rail is one of the most iconic and strategic projects in the nation and one of the largest project globally. TCE is the lead consortium member and partnered with two domestic and one Japanese consulting firm. We are delighted to have emerged the winners of this keenly contested bid and are awaiting our Letter of Award in FY 2021-22. This eight year long project has a total order value is upwards of INR 1200 Crore.
 - TCE is proud to be associated with ITER, the world's massive fusion experiment in collaboration with thirty-five nations. Our enhanced and long-term association with ITER reinforces the value TCE adds to a global collaborative project aimed at a sustainable future.

- Our continued focus on the customer, delivery excellence, innovative solutions, targeting strategic geographies and agile delivery methodologies augured well.

Strategy and Operations

COVID-19 has impacted the businesses worldwide. We saw a decline in both CAPEX and OPEX spends by our customers. However, with a well-diversified regional, sectoral and client spread, TCE will be able to navigate these unprecedented times. After a record FY 2020-21 year where TCE secured the highest order book. The company has taken measures to ensure FY 2021-22 performance is per plan despite the challenging Pandemic and unpredictable market conditions. In FY 2020-21, while there was enhanced exploratory activity and related efforts put in by our teams on the Digital front and Industrial Internet of Things (IIoT), the actual spend was muted, though the intense exploratory activity bodes well for such investments to take off in the coming years.

The resilient team at TCE has demonstrated resolve, perseverance, customer focus, innovation, and learnability – aligning with our core values, vision, and mission. With “Work from Home” becoming the new norm, our teams are geared to deliver from anywhere, working closely with the customers. Detailed impact analysis with the new COVID-19 Wave 2 and Wave 3 is ready with various scenario-based financial modelling, actions, responses, and goals. All this will help guide us in times of uncertainties, and we are confident of delivering sustainable performance in times to come. We aim to enable and support our workforce and their families to get vaccinated in the coming months and, in parallel, work on a roadmap to gradually have a balanced hybrid model between office and Work-from-home.



Employee Specific Initiatives:

1. Leadership and Managerial Transformation Training to adapt to change and lead was delivered to top 2% of TCE leaders. An eight-month-long virtual leadership training module was conducted by Tata Management Training Centre, the group's leadership institute.

2. Enabled Work from Home:

More than 95% employees were enabled to work from home within the first week of the lockdown, and workstations & devices shipped home wherever required.

3. Actively Communicated with Employees through regular connect calls, Intranet, Internal Social Media Mailers on:

- COVID-19 Do's and Don'ts
- Visual SOPs and Precautionary Protocols
- Regular TEAM calls and Wellness Sessions

4. Regular sanitisation, masks and social distancing across Delivery Centers

5. Enhanced communication forums & employee touchpoints:

- Numerous companywide TEAM calls (30+) attended by more than 90%+ employees were conducted.
- Continuous support and connect was established with employees during the Pandemic.
- Weekly Connect Calls, Leadership Connects, HR Connect, e-Townhall, DC Communication held with employees.

6. Launched COVID-19 Kavach Insurance Top Up:

- Conducted drive for higher enrolment of employees for COVID-19 Specific policy.
- Encouraged employees to seek additional insurance cover by opting for a top-up on the existing cover.
- Extensive communication, including emails and virtual group calls across locations, were conducted to clarify employee queries on the available options.
- Enhanced efforts for employees to opt for Group Voluntary Policy options covering employees family and top up options for voluntary parents' policy.

7. Mutual Family Relief Scheme:

Money disbursed to employees family for relief in case of untimely demise. Consideration of spouse /children for suitable job roles based on company policies and adequate qualification and skill.

8. Leave Bank Policy: Encouraged employees with surplus leaves to donate to colleagues in need.

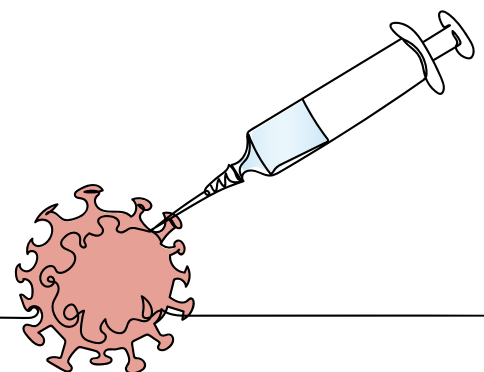
9. COVID-19 Vaccination Drive: Drove rigorous communication through TEAM calls, mailers, and internal social media platforms to create awareness on COVID-19 and encouraged employees to opt for vaccination. Also empanelled with Tata Group companies and external healthcare providers for vaccinating the employees and their family members at our offices PAN India.

10. COVID-19 Recovery Retreat: Launched a series of programs for employees who have recently recovered from COVID-19. Recovery Retreat brings a special session on Breathing Techniques to revitalise lung capacity, build immunity and help them achieve an inner equilibrium.

11. Emergency COVID-19 Support:

- Facilitated Hospitalisation by connecting with Hospitals, ensuring RTPCR Testing, Tele Consultation and timely admission and care.
- 24x7 COVID-19 taskforce set up to address employee concerns & queries related to COVID-19, ensuring timely support for isolation, medication, transportation, and hospitalisation.
- Ensured timely medicine availability by establishing direct connects with the manufacturers for procurement of emergency medicines.
- Created COVID-19 care centres equipped with oxygen support by converting guest houses and some office space across 7 locations in India. The centre caters to mild and asymptomatic patients.

12. The Pandemic has, to date, impacted 403 employees, our sincere and heartfelt condolences to the eight employees who lost the fight.



COVID19 Specific Engineering Solutions by TCE

As the impact of the Pandemic was being felt from March 2020 onwards, and while the teams were working on rewiring our operations and taking other prudent measures, there was a deep sense of responsibility towards contributing to the fight against the Pandemic. Our key currency is the intellectual horsepower, thought leadership and innovative mindset of our talents, we took a firm resolve to use this currency and contribute effectively to the cause. To date, close to 15,000+ consulting person-hours have been devoted to fighting the Pandemic. Our efforts focused on ideating, conceptualising, designing, engineering, and enabling various innovative initiatives as a Pro-Bono activity by TCE.

The ongoing Pandemic second wave requires urgent actions towards enhancing the country's healthcare, medical oxygen generation, and distribution capacity. Our teams have made humble efforts towards contributing our bit on this critical requirement, focusing on Agility, Indigenisation aligned to self-reliance, quality and cost competitiveness. Our actions have leveraged collaboration, teamwork, and partnerships externally to achieve more together in the shortest possible time.

Emergency COVID-19 Infrastructure:

Our teams from TCE and our subsidiary Ecofirst worked on war footing to conceptualise and design both modular units for COVID-19 patients and emergency jumbo COVID-19 hospital structures. We also collaborated with the Group Companies and multiple External Firms to provide these concepts and solutions for implementation and actual rollout.

1. OXYGEN – Engineering LIFE

• OXYGEN Ventilators:

An engineering, feasibility and viability study was conducted on multiple ventilators, and a viable opensource ventilator was identified. The learnings were shared with group entities for evaluation and appropriate next steps were suggested for mass manufacturing related tie-ups.

• OXYGEN Distribution Supply Chain:

To enable last-mile oxygen distribution and supply chain logistics, TCE researched and presented the concept of conversion of cylinders such as Co₂, CNG, LPG (for gas) etc. Suitable precautions, colour coding and planning

for Gaseous Oxygen distribution across the country leveraging the existing LPG bottling and distribution network was also detailed and shared with PESO.

• OXYGEN Generation PSA Plant Scale:

To leverage the existing infrastructure in the country, the concept of conversion of PSA Nitrogen plant to PSA Oxygen plants was developed by TCE and successfully piloted along with IIT Bombay. Close to 75+ PSA Nitrogen plants (more expected to add up to 100+) are currently being converted for Oxygen generation.

• OXYGEN Plant Critical Raw Material:

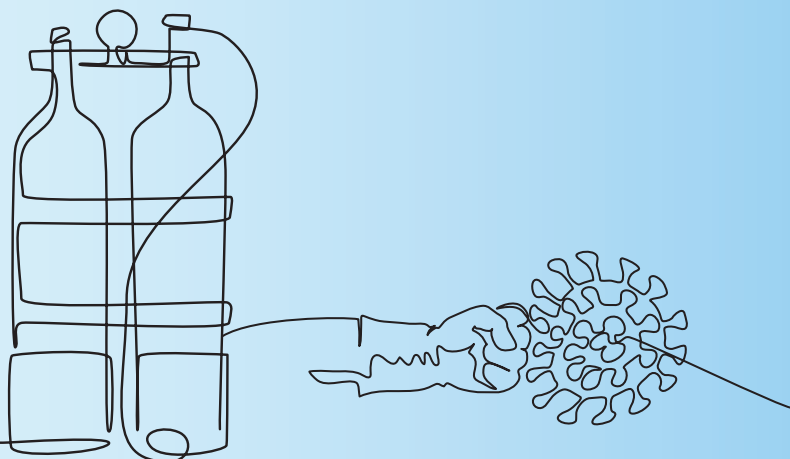
Jointly as a team, Tata Consulting Engineers, Tata Chemicals and IIT-Bombay were able to garner GOI support for emergency airlift of Zeolite from Germany with the support from BASF leadership. The Implementation of this concept is being done with the help of the Ministry of Environment entity Central Pollution Control Board (CPCB) as assigned by the GOI and project managed by TCE.

• OXYGEN Generation using O₂ Concentrator:

Prototyped opensource design (www.oxikit.com) in less than five (05) working days with benchmark results of 10-20 LPM with 90-94% oxygen concentration. Necessary design changes and process refinements were incorporated to ensure benchmarked results under Indian conditions. Except for the Zeolite, locally available Indian parts for the prototype were used. The Opensource oxygen concentrator design is actively being explored by startups, entrepreneurs and MSME's across India.

• OXYGEN Infrastructure within Hospitals:

Our teams are assisting various Central efforts, State Governments, Startups, NGOs and Hospitals on all of the above topics. We are also providing consultancy for new PSA Oxygen plants, hospital oxygen infrastructure, pipelines and related checklists and audits. We have responded to more than 3000+ requests for information and support in the last three weeks.



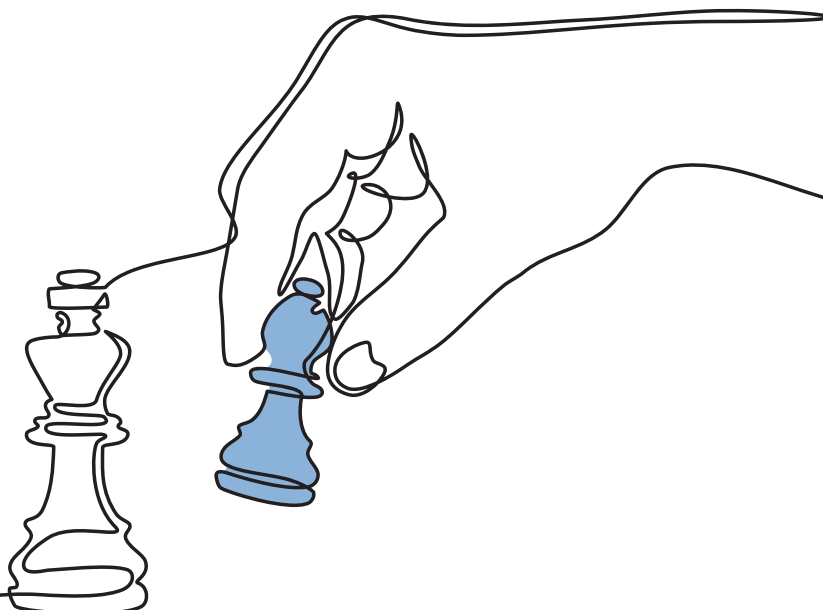
TCE Thought Leadership and Brand Recall

With the Pandemic triggered travel restriction, our teams have leveraged online virtual means to remain relevant, connected, and closer to our customers, policymakers, and thought leaders. The financials, order book, active queries and website visits clearly show the effectiveness of these virtual modes of connect and brand recall.

1. **Online Webinars:** 85+ speaker sessions by TCE across various industry and thought leadership forums. These ranged from being part of the Global Horasis panel to various leading publication, reputed entities like TERI and policymakers across multiple ministries and public sector entities.
2. **Whitepapers Published:** 40+ white papers, brochures, manuals, and reputed technical publications.
3. **Indian Standards Committees:** 50+ TCE employees as members on various BIS committees.
4. **Advocacy:** More than 75+ sessions were held with the Government and Senior Stakeholders at the Centre and State level across various Ministries.
5. **C-Level Customer TEAM Sessions:** Close to 60+ client sessions at C-level/Senior Executive level were organised.
6. **Social Media Posts and Updates:** Published 150+ Linked posts with 3.35 lacs+ followers, 30+ Youtube videos uploaded, 100+ Twitter tweets.
7. **COVID-19 Solution Support:** 200+ business queries generated online and 3000+ COVID-19 specific questions responded. Held 100+ telecons and sessions on COVID-19 solutions to help Central and State Governments. MSME and entrepreneurs keen to manufacture COVID-19 specific open-sourced solutions by TCE .
8. **TCE Website Visitor Statistics:** TCE website saw an average of 28k+ unique visits per month.

9. Industry-Academia Collaboration

- The construction sector is one of the top contributors to the Gross Domestic Production (GDP) of India. From both cost optimisation and environmental sustainability point of view, it is imperative to look for increased recycling of construction waste materials while meeting future construction demands given the national importance and growing need to develop low-cost housing. TCE is sponsoring a technological solution that is being co-developed with IIT Bombay. The focus is on leveraging 3D civil printing, reusing 100% recycled construction and demolition waste material to minimise environmental impact. This project shall support and offer sustainable and eco-friendly solutions embedding the latest technologies and contribute to the "Make in India" campaign for Nation building.
- Municipal solid waste (MSW) is a colossal problem vitiating environmental safety in India, where at present we rely on landfill due to various constraints. Incineration of Indian MSW is challenging due to its high organic fraction, moisture content, inert content, and low heating value. Due to its unfavourable physical properties, incineration of Indian wastes is feasible only with an additional fuel supply. A small-scale combustor has been designed and fabricated by IIT Bombay, which would run on MSW feed. TCE is further sponsoring this project to carry out the experimental investigations. The proposed Municipal solid Waste combustion technique would benefit the overall environment tremendously. Proper process development for waste combustion could curtail human dependence on fossil fuels. The massive pile of MSW across the globe would be considered a new renewable source for energy soon.



Future Readiness

As the global Pandemic evolves, it is redefining and rewiring businesses and economies the world over. We already see an increased thrust in digital cloud-based solutions along with more resilient location-specific Infrastructure. We reaffirm our commitment to “Engineering a Better and Sustainable Tomorrow”, while listening to our client needs and future demands. We are enhancing our thrust on sustainable solutions and designs. We have been actively pursuing our focus on Energy Transition and see ourselves playing an essential role in the Hydrogen Economy, Green Chemicals, Circularity, IIoT and Electrification of Everything in the Ecosystem. Apart from this, we are also actively pursuing Bio-based technologies for Solid waste collection, management, handling, recycling and waste to energy conversion; Sustainable generation of chemicals for industrial application and food processing industries; Improvement of water distribution networks for reduction of losses using sensors; GIS mapping and host of other digital technologies.


TCE is today more agile and nimble, eagerly waiting to effectively contribute towards our client needs and be their strategic partners aligned to their future evolution roadmaps in the post-Pandemic normal. Our stress-tested, proven and enhanced processes, frameworks and technology investments have helped future proof the company. A sense of admiration, respect, and satisfaction humbles me, observing our teams working together to help our clients, internal teams and

employees, and various stakeholders amidst work from home and other challenges posed by the Pandemic on the personal front. My sincere thanks to each TCE’ite and their family members who have supported and have been an integral part of ensuring and delivering TCE performance while handling their personal needs and demands. I would also like to thank our customers for their understanding, support, and flexibility while jointly tackling various challenges and situations over the last fifteen months. On similar lines, my appreciation and thanks to our vendors and suppliers who have worked seamlessly with us as a well-knit team. And finally, thanks to our Chairman and Board members, who supported, motivated, and guided the team throughout the year.

Together with our teams, I am optimistic and excited to meet and exceed our customer needs and demands, deliver shareholder value and work alongside passionate innovators, disrupters, and technologists to deliver sustainable performance and outcomes in the coming years. I seek your continued support, trust and collaboration.

Sincerely yours,
Amit Sharma






S Vidyanand
President - Technology, Process, Digital & IT




Tapan Choudhury
President - Power & Resources



K Ramesh
President - Infrastructure, Sustainability and PMC Services



Gurunandan Molahalliker
Chief Financial Officer (Since May 16, 2020)




Ms. Nidhi Mehandiratta
Head - HR, Ethics & CSR



Rajat Kaushal
Head - International Business Dev Mktg & Key Engagement Accounts



Aditya Kumar Mishra
Head - Strategy, Business Excellence & Brand



Himanshu Joshi
Head - Strategy and M&A



Sachin Mishra
Head Legal & Company Secretary

SUBSIDIARY



Chitranjan Kaushik
Chief Operating Officer, Ecofirst

Ecofirst

Board of Directors

Amit Sharma
Chairman

S Vidyanand
Director

K Ramesh
Director

Tata Engineering Consultants

Saudi Arabia

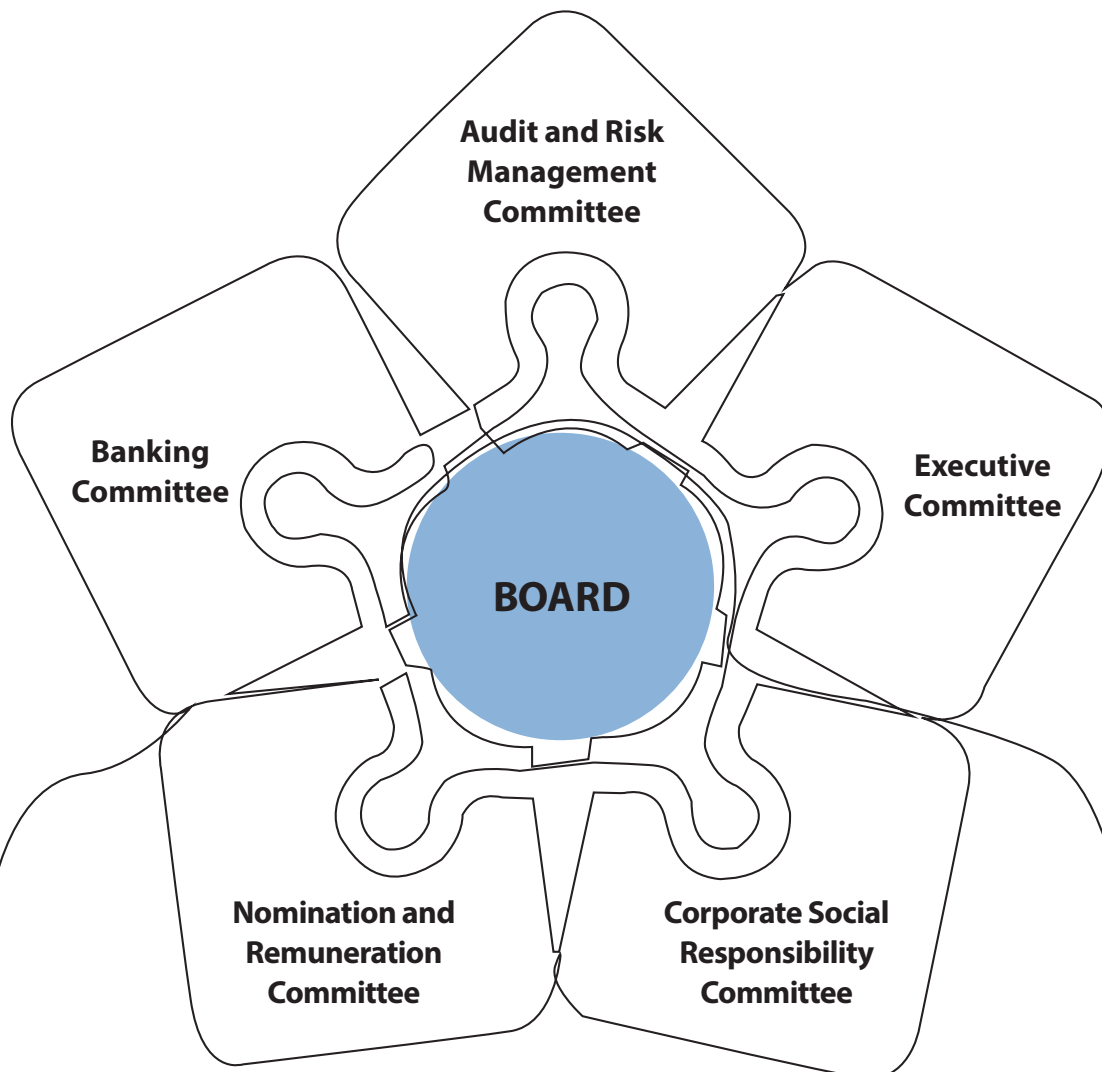


Ashwani Sadhu
General Manager

Corporate Governance

Tata Consulting Engineers Limited (hereinafter referred to as 'TCE' or 'Company') has a strong legacy of following fair, transparent and ethical governance practices. Our Board of Directors and Management Committee comprising enlightened leaders work together to drive the core values that form TCE's guiding philosophy that good governance is an essential element of business, which helps the Company fulfil its responsibilities to all its stakeholders. Ethical business conduct, commitment to values and integrity, which enhance and retain stakeholders' trust, are TCE's Corporate Governance traits. The Management Committee takes business decisions in consultation with the Board.

Our Governance Framework



COMPANY'S PHILOSOPHY ON CORPORATE GOVERNANCE

Good Governance practices stem from our culture and the mindset of the organisation. Your Company considers fair and transparent Corporate Governance as one of its core management tenets.

TCE follows the best governance practices with the highest integrity, transparency and accountability. Strong leadership and effective corporate governance practices have been the Company's hallmark inherited from the Tata culture and ethos.

The Company has a strong legacy of fair, transparent and ethical governance practices. The Company has adopted a Code of Conduct for its employees, including the Managing Director. In addition, the Company has adopted a Code of Conduct for its Non-Executive Directors.

As per Section 149 of the Companies Act 2013, the Company doesn't fall under the requirement of having an Independent Director on Board or the Committees like Audit & Risk Management Committee and Nomination & Remuneration Committee. Hence, the Code of Conduct for Independent Directors does not apply to the Company. However, the Company follows the Tata Board and Committee/s Governance Charter 2015. The Committees, i.e. Audit & Risk Management Committee, Nomination and Remuneration Committee, Corporate Social Responsibility Committee are functional in TCE as a good corporate governance practice. The Company's corporate governance philosophy has been further strengthened through the Tata Business Excellence Model.

BOARD OF DIRECTORS

As of March 31, 2021, the Company has 4 Directors. Of the 4 Directors, 3 (i.e. 75%) are Non-Executive Directors. The profile of the Directors is available on the Company's website (<https://www.tce.co.in/our-leadership/>). The Composition of the Board conforms with Section 149 of the Act. None of the Directors on the Board hold Directorship in more than ten public companies.

8 Board Meetings were held during the year, and the gap between the two meetings did not exceed one hundred and twenty days. The dates on which the said meetings were held are given below:

Date of Board Meetings	Number of Directors present at the Board Meeting	Total Number of Directors	Attendance (%)
April 27, 2020	4	4	100
May 15, 2020	4	4	100
July 03, 2020	4	4	100
August 21, 2020	4	4	100
September 01, 2020	4	4	100
November 10, 2020	4	4	100
January 28, 2021	4	4	100
March 31, 2021	4	4	100

The necessary quorum was present for all the meetings.

- The Directors have made necessary disclosures regarding Committee positions in other public companies as of March 31, 2021. None of the Directors are related to each other.
- The names and categories of the Directors on the Board, their attendance at the Board Meetings held during the year under review and at the last Annual General Meeting ("AGM"), name of other listed entities/ public companies in which the Director is a Director and the number of Directorships and Committee Chairmanships / Memberships held by them in other Public Limited Companies as of March 31, 2021, are given hereinbelow. Other Directorships do not include Directorships of private limited companies, foreign companies and companies registered under Section 8 of the Act. Further, none of them is a member of more than ten committees or Chairman of more than five committees across all the Public Companies in which he/she is a Director.

Name of the Director (DIN)	Category	Number of Board Meetings attended during FY 2020-2021	Whether attended last AGM held on 24th Sept. 2020 (Yes/No)	Number of Directorships in other Public Companies		Number of Committee positions held in other Public Companies		Directorship in other Listed Entity (Category of Directorship)
				Chairman	Member	Chairman	Member	
Mr Ashok Sethi (Chairman) (DIN 01741911)	Non-Independent, Non- Executive	8	Yes	0	1	-	5	-
Mr Amit Sharma (Managing Director) (DIN 03212568)	Non-Independent, Executive	8	Yes	1	1	-	-	-
Mr Anjali Kulkarni (DIN 06993867)	Non-Independent, Non- Executive	8	Yes	-	7	-	7	-
Mr Sriram Kadiyala (DIN 08449772)	Non-Independent, Non- Executive	8	Yes	-	-	-	-	-

- iii. The Board periodically reviews the compliance reports of all laws applicable to the Company.
- iv. Details of equity shares of the Company held by the Directors as of March 31, 2021, are given below: **Not Applicable**
- v. The Board has identified the following skills/expertise/competencies fundamental for the effective functioning of the Company which are currently available with the Board:

Global Business	Understanding global business dynamics across various geographical markets, industry verticals and regulatory jurisdictions.
Strategy and Planning	Appreciation of long-term trends, strategic choices and experience in guiding and leading management teams to make decisions in uncertain environments.
Governance	Experience in developing governance practices, serving the best interests of all Stakeholders, maintaining Board and Management Accountability, building long-term effective Stakeholder engagements and driving Corporate Ethics and Values.

COMMITTEES OF THE BOARD

The details about various Board Committees as of March 31, 2021, which comprises of the Statutory Committees as well are as follows:

Name of the Committee	Extract of Terms of Reference	Category and Composition	Other Details
Corporate Social Responsibility Committee	<p>The Committee is constituted in line with the provisions of Section 135 of the Act.</p> <ul style="list-style-type: none"> Formulate and recommend to the Board a CSR Policy indicating the activities to be undertaken by the Company as specified in Schedule VII of the Act. Recommend the amount of the expenditure to be incurred on the activities mentioned in the CSR Policy. 	<p>Ms Anjali Kulkarni, Member Chairman</p> <p>Mr Ashok Sethi, Member Director</p> <p>Mr Amit Sharma, Member Director</p>	During the year, the Company held 2 Corporate Social Responsibility Committee Meetings.
Nomination & Remuneration Committee	<p>The Committee is constituted in line with the provisions of Section 178 of the Act.</p> <ul style="list-style-type: none"> Recommend to the Board the setup and composition of the Board and its committees. Recommend to the Board the appointment/re-appointment of Directors and Key Managerial Personnel. Support the Board and Independent Directors in evaluating the performance of the Board, its Committees and Individual Directors. Recommend to the Board the Remuneration Policy for Directors, Executive Team or Key Managerial Personnel, and the rest of employees. Oversee familiarisation programs for the Directors. 	<p>Mr Ashok Sethi Member Chairman</p> <p>Ms Anjali Kulkarni Member Director</p> <p>Mr Sriram Kadiyala Member Director</p>	During the year, the Company has held 4 Nomination and Remuneration Committee meetings as a good Corporate Governance practice
Audit & Risk Management Committee	<p>The Committee is constituted in line with the provisions of Section 177 of the Act.</p> <ul style="list-style-type: none"> Oversight of financial reporting process. Reviewing with the management the Annual Financial Statements and Auditors' Report thereon before submission to the Board for approval. Evaluation of internal financial controls and Risk Management systems Recommendation for appointment, remuneration and terms of appointment of auditors of the Company. Approve policies in relation to the implementation of the Related Party Transactions. To consider matters with respect to the Tata Code of Conduct, Anti-Bribery and Anti-Corruption Policy and Gifts Policy. 	<p>Mr Sriram Kadiyala, Member Chairman</p> <p>Mr Ashok Sethi, Member Director</p>	During the year, the Company held 4 Audit & Risk Management Committee Meetings as a Good Corporate Governance Practice
Executive Committee	<p>The Executive Committee oversees the operational review, strategic planning implementation review at the Business & Cluster Level.</p> <p>Review and Achievements of Annual Business Plan.</p> <p>Review of Key Commercial Bidding Strategy.</p>	<p>Mr Ashok Sethi Member Chairman</p> <p>Mr Amit Sharma, Member Director</p>	During the year, the Company held 4 Executive Committee Meetings as a Good Corporate Governance Practice.

NOMINATION AND REMUNERATION COMMITTEE - OTHER DETAILS

- Performance Evaluation Criteria for Independent Directors:**

An indicative list of factors on which evaluation is carried out includes participation and contribution, commitment, effective deployment of knowledge and expertise, integrity and maintenance of confidentiality and independence of behaviour and judgment by a Director.

- Remuneration Policy**

The Remuneration Policy of the Company is designed to create a high-performance culture. It enables the Company to attract, retain and motivate employees to achieve results. Our business model promotes customer centricity and requires employee mobility to address project needs. The Remuneration Policy supports such mobility through pay models that are compliant with local regulations. In each country where the Company operates, the Remuneration structure is tailored to the regulations, practices and benchmarks prevalent in the industry.

The Company pays remuneration by way of salary, benefits, perquisites and allowances (fixed component) and commission (variable component) to its Managing Director and employees at large. Annual increments are recommended by the Nomination and Remuneration

Committee within the salary scale approved by the Board and Members and are effective from April 1, each year.

The Board of Directors, on the recommendation of the Nomination and Remuneration Committee, decides the commission payable to the Managing Director and the Non-Executive Directors out of the profits for the financial year and within the ceilings prescribed under the Act, based on the Board evaluation process considering the criteria such as the performance of the Company as well as that of the Managing Director and each Non- Executive Director.

The Company pays sitting fees of Rs. 20,000 per meeting to its Non-Executive Directors for attending meetings of the Board and meetings of committees of the Board. The Company also determines to pay commission to the Non-Executive Directors within the ceiling of 1 per cent of the Company's net profits as computed under the Act's applicable provisions, with the members' approval. The said commission is decided each year by the Board of Directors, on the recommendation of the Nomination and Remuneration Committee and distributed amongst the Non-Executive Directors based on the Board evaluation process, considering criteria such as their attendance and contribution at the Board and Committee meetings, as well as the time spent on operational matters other than at meetings.

NUMBER OF BOARD & COMMITTEE MEETINGS HELD AND ATTENDANCE RECORD

Name of the Committee	Audit & Risk Management Committee	Nomination and Remuneration Committee	Board	Corporate Social Responsibility Committee	Executive Committee
No. of Meetings held	4	4	8	2	4
Date of Meetings	May 15, 2020 June 24, 2020 November 09, 2020 January 28, 2021	June 24, 2020 September 01, 2020 January 27, 2021 March 19, 2021	April 27, 2020 May 15, 2020 July 03, 2020 August 21, 2020 September 01, 2020 November 10, 2020 January 28, 2021 March 31, 2021	June 24, 2020 January 27, 2021	August 18, 2020 October 27, 2020 December 23, 2020 December 29, 2020
No. of Meetings Attended					
Mr Ashok Sethi	4	4	8	2	4
Mr Sriram Kadiyala	4	4	8	-	-
Ms Anjali Kulkarni	-	4	8	2	-
Mr Amit Sharma	-	-	8	2	4
Whether quorum was present for all the Meetings			The necessary quorum was present for all the above Board & Committee Meetings		

GENERAL BODY MEETINGS

- i. General Meeting
 - a. Annual General Meeting (AGM)

Financial Year	Date	Time	Venue
2017-2018	July 02, 2018	3.30 P.M	Tata Sons Limited. Meeting Room No 67, 6th Floor, Dr Dadabhai Naoroji Road, Fort, Mumbai 400001
2018-2019	July 08, 2019	11.30 A.M	Tata Sons Limited. Meeting Room No 301, 3rd Floor, Bombay House, 24 Homi Mody Street, Fort, Mumbai 400001
2019-2020	September 24, 2020	11.00 A.M.	Through Video Conferencing ("VC") / Other Audio-Visual Means ("OAVM"). Deemed Venue: - Bombay House, 24 Homi Mody Street, Fort, Mumbai 400 001

- b. Extraordinary General Meeting:
No Extraordinary General Meeting of the members was held during FY 2020-21.
- c. Special Resolution(s) for FY 2019-20:
Re-Appointment of Mr Amit Sharma as Managing Director w.e.f 27th September 2020

A certificate has been received from M/s Robert Pavrey & Associates, Practicing Company Secretaries, that none of the Directors on the Board of the Company has been debarred or disqualified from being appointed or continuing as Directors of companies by the Ministry of Corporate Affairs or any such statutory authority and Compliance of the relevant laws under the Companies Act 2013.

M/s B S R & Co. LLP Chartered Accountants (Firm Registration No. 101248W/W-100022) have been appointed as the Company's Statutory Auditors. The particulars of payment of Statutory Auditors' fees, on a consolidated basis, is given in the Statutory Section of the Annual Report.

OTHER DISCLOSURES

Particulars	Regulations	Details	Website Link for details/policy
Related Party Transactions	As defined under the Act	The details of the Related Party Transactions are provided in the Boards' Report forming part of the Statutory Section. Transactions entered into with related parties during the financial year were in the ordinary course of business and at arms' length basis and were approved by the Audit and Risk Management Committee. The Board's approved policy for Related Party Transactions is uploaded on the website of the Company.	https://www.tce.co.in/ethics-and-compliance/
Whistle Blower Policy and Vigil Mechanism	As per the Act	The Company has a Whistle Blower Policy and has established the necessary Vigil Mechanism for Directors and employees to report unethical behaviour concerns. No person has been denied access to the Chairman of the Audit & Risk Management Committee. The said policy has been uploaded on the website of the Company.	
Disclosure under the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2018	As per the Act	The details have been disclosed in the Board's Report forming part of the Statutory Section of Annual Report.	



Risk Management Overview

In the rapidly changing business environment, the company is exposed to several risks that could impact its businesses adversely. It is imperative to identify, analyse and address such risks and at the same time leverage opportunities for achieving our objectives.

Tata Consulting Engineers (TCE) has adopted the Enterprise Risk Management (ERM) process that recognises and seeks to address the key risks across the bid stage and execution stage for projects while also evaluating strategic, financial, operational, legal and reputational risks for Business Unit's (BU) & TCE. However, the risk management process and its elements continue to evolve and are enhanced further based on stakeholder feedback/inputs to support organisation strategy requirements.

Risk managers prepare their organisations for all types of risks, but very few would have imagined that they would one day be faced with a global Pandemic that could strike swiftly and with such a broad impact, with no predictable end date. In such a situation with multiple parameters, it is imperative to have an agile approach to business continuity and strategic risk management.

Steps taken by the company to deal with risks in these highly uncertain times are:

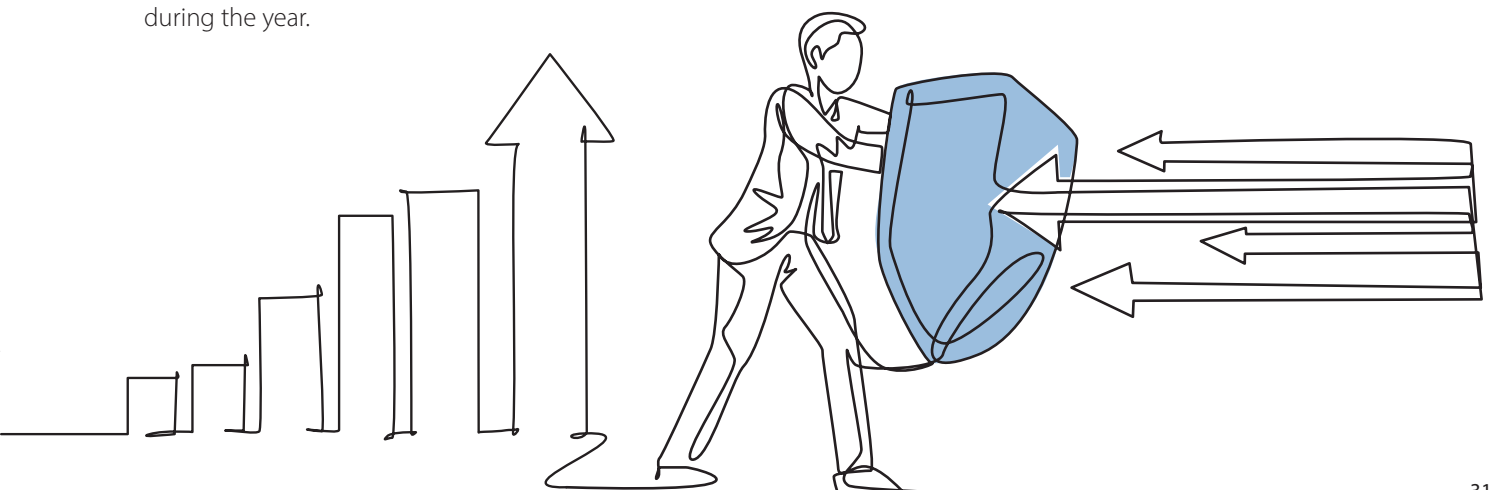
- We developed COVID-19 specific Addendum to our existing Business Continuity Plan. The document covered various aspects of business, like People Safety, Customer Connect, Operations, Delivery of assignments in India and overseas, Working Capital, Emerging challenges, etc.
- Risk management has been elevated to a more Strategic Management level. We have had daily management calls to deal with all kinds of risks/uncertainties that cropped up during the year.

- Various steps and initiatives were undertaken by central support functions like HR, Administration, IT, Legal, Central Resources Team to facilitate our business operations through the year.
- At the start of the year, we started examining various scenarios in this volatile environment and shared them with the management to prepare the Business Plans for the year. We also looked at multiple risks & opportunities in India and overseas markets due to the Pandemic in each of our Business Units and Sectors to provide inputs to strategy and budgeting exercise.

All of the above steps have helped in strengthening our Governance and Risk Framework to aid decision making. It has also helped increase senior executives' confidence in their decisions while assuring the Board that risks have been appropriately addressed.

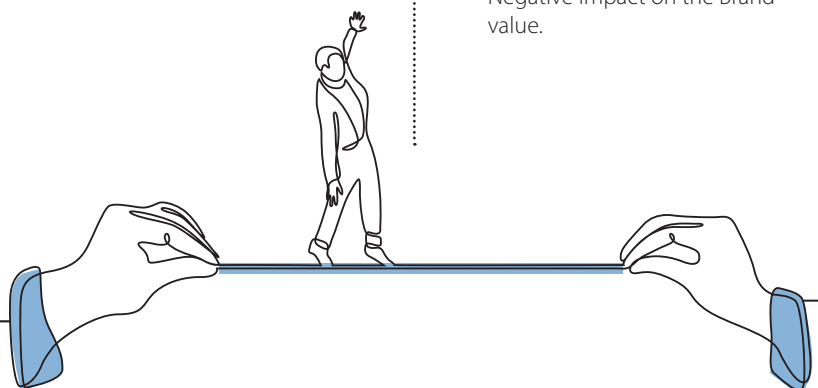
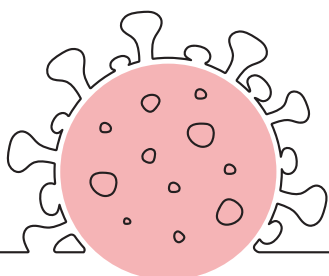
Risk Management Organisation: Chief Risk Officer primarily drives the Risk Function at the Central level with guidance from the MD and the Board. Business Unit level Risk Officers (BUROs) assist the Corporate Risk Team in deploying Risk Frameworks to embed risk process in the day to day business activities.

During the year, we emphasised identifying, training and handholding BUROs on live assignments with specific responsibilities towards enhancing risk culture within the individual Business Units on an ongoing basis.



Key Risks and How We Mitigate Them

	ECONOMIC RISK	BUSINESS ACQUISITION & REVENUE FLOW	HUMAN RESOURCES
KEY RISK AREAS	<ul style="list-style-type: none"> • Demand for our services is mainly Capex based. Sectors in which our clients operate may get impacted by economic downturns, reductions in government or private spending, political and economic uncertainty, etc. • Uncertain global economic and political conditions on account of Pandemic may negatively impact the ability and willingness of our clients to announce or fund projects, pay our invoices in time. • Varying degree of likely growth forecasts across countries, regions, etc. 	<ul style="list-style-type: none"> • Acquisition depends on several factors external to TCE like economic trends, risks like Pandemic cycles, government policy, market conditions, etc. • Delays or reduction in new orders affects the targeted revenues. • Revenue generation could also be negatively impacted due to internal issues like lack of matching skill sets, inadequate planning, etc. 	<ul style="list-style-type: none"> • People are our company's most important resource; hence ensuring their safety and well-being is our main priority. • During times of reduced business, the challenge would be to effectively train resources in required skill sets and utilise the available workforce profitably.
MITIGATION STRATEGIES	<ul style="list-style-type: none"> • TCE has multiple Business Units (BU) across sectors, making it immune to the downturn in any single industry and also enable us to capture new opportunities which can come up during the Pandemic. • Diversify business across sub-sectors, geographies, Opex vs Capex, look for adjacencies, etc. • Proper due diligence of clients, projects to ensure at bid time that viability, funding tie-up etc. are in place. 	<ul style="list-style-type: none"> • Identify new sectors / areas / adjacencies of growth • Develop new key accounts & enter new areas through partnerships, etc. • Build customer connections & deepen the relationship, especially with key accounts. • Ensure rigorous but flexible project risk management. 	<ul style="list-style-type: none"> • Developing specific learning and re-skilling programs. • Better and flexible workforce planning practices • Enhancing employee engagement practices.
AREAS IMPACTED	<ul style="list-style-type: none"> • Ability to generate new business, generate revenue out of existing business as well as make collections for current and past dues. 	<ul style="list-style-type: none"> • Reduced revenues and profits. • Employee morale affected. 	<ul style="list-style-type: none"> • Reduction in revenue and profits. • Quality of deliverables affected. • Negative impact on the Brand value.



KEY RISK AREAS

LOCKED WORKING CAPITAL AND CASHFLOW

- Many of our contracts have milestone-based payment terms, due to which we may incur high costs before we can raise bill and receive payment.
- Cash flows from projects can fluctuate significantly over the execution period depending on the delays, contingencies, etc.
- Due to the current Pandemic, our clients could be severely stressed in terms of funding ability and liquidity which may negatively impact our cash flows.

LOSS OF CONFIDENTIAL INFORMATION / DATA VIOLATION / BREACH

- Processes are being followed to properly identify confidential information of the company & other stakeholders and prevent leakage. However, there remains a risk of loss of confidential information. The chances of data breach have increased in a Work from Home scenario.

CONCENTRATION RISK

- The loss of or a significant reduction in business from the key client(s) will harm the revenues.
- Despite good relationships and performance by TCE, such client(s) may sometimes be forced to delay or cancel their contracts due to changing business scenarios.

MITIGATION STRATEGIES

- Follow-up to get the collection in line with the contract terms
- Enhanced focus on contract & claims management through review rigour at various levels to ensure project delivery with profitability
- Due diligence and factoring in locked capital or cash flow impact into our bid pricing.
- Where possible, negotiating for favourable payment terms and granular milestones

- Training and sensitisation of employees about the importance of maintaining confidential information.
- Obtaining specific NDAs / Confidentiality agreements from employees/partners.
- Tightening of IT security measures.

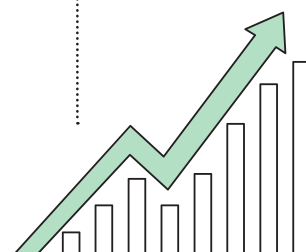
- Conscious efforts at dependence or concentration on any single client or sector.
- Develop newer key or large accounts.
- Strengthen business relationships with clients at all levels.

AREAS IMPACTED

- Impact on working capital.
- Higher cost of financing.

- Unexpected and huge costs.
- Loss of business.
- Negative impact on reputation and brand value.

- Inability to achieve acquisition and revenue targets.
- Impact on profits.



KEY RISK AREAS

COST OVERRUN

- Costs may increase in projects due to various reasons like:
 - Higher quantum of resources required.
 - Schedule delays.
 - Resources being unoccupied while being deployed on the project.

LIABILITIES

- Our project execution activities may result in liability as per Contract conditions.
- Force Majeure conditions being activated.
- We could be exposed to significant monetary damages, claims or reputation risks due to deficiencies in service, any catastrophic event at our project sites, etc.

INTELLECTUAL PROPERTY (IP)

- Although we protect our intellectual property through contractual arrangements, registration, licensing, NDAs, etc., we may not be able to prevent our IPs' infringement completely.
- Our employees could inadvertently or purposely cause an infringement of the client's or third party's IP rights.
- Litigation to determine the scope of IP rights, even if ultimately successful, could prove to be costly.

MITIGATION STRATEGIES

- Studying secondary data to identify issues/risks, quantify the same and factor into the prices.
- Follow project and contract management best practices to avoid cost overruns.

- Adequate professional liability insurance at the organisation and project level.
- Proper due diligence at bid time to avoid taking up significant liabilities, adhering to contract requirements and professional best practices to prevent the imposition of penalties or liabilities.

- Strengthen process, contracts & other mechanisms to safeguard our IP, confidential information & trade secrets.
- Provide training to employees on the importance of respecting IPs of our company and those of other stakeholders, and the high price that we might become liable to pay in case of IP infringements.

AREAS IMPACTED

- Lower profitability.
- Disputes with client.

- Unexpected and huge costs.
- Negative impact on profitability.
- Negative impact on reputation and brand value.

- Unexpected and huge costs.
- Consumption of a significant amount of senior management's attention and time.
- Negative impact on reputation and brand value.



KEY RISK AREAS

JOINT VENTURES (JV) / PARTNERSHIPS

- We perform certain contracts as a member of JVs, partnerships, and similar arrangements. There is a risk that our partners may not fulfil their contractual obligations to us or our clients.
- We would have limited ability to control the actions of our JV partners, including non-performance, default, bankruptcy or legal compliance.

INTERNATIONAL OPERATIONS

- Our international operations are exposed to additional risks and uncertainties, including unfavourable political developments and weak economies. E.g. unexpected changes in the Government policies, potential non-compliance with regulations and evolving industry standards, renegotiation or nullification of our existing contracts, social, political, and economic instability, currency fluctuations, etc.

MITIGATION STRATEGIES

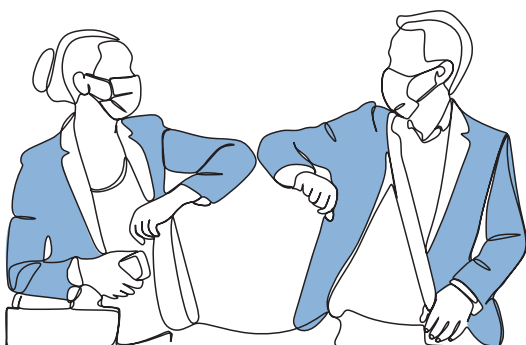
- Proper due diligence of JV partner during pre-bid/bid stage, esp. on financial ability, experience and track record.
- A strong back-to-back contractual arrangement to pass on liabilities and penalties to JV commensurate with their share in the partnership.

- Proper due diligence during bid time in terms of country or location risk. Avoid excessively risky, unsafe, economically unstable or weak countries or geographies.
- Have systems and processes to ensure compliance to all key regulatory, Government and contractual compliances, standards, laws, etc.

AREAS IMPACTED

- Impact on quantity and quality of project deliverables.
- Loss of revenue and profit.
- Loss of reputation.
- Legal costs and waste of time

- Loss of business.
- Safety and security risk of personnel.
- Impact on revenue and profits.
- Impact on strategic targets of improving our global footprint.



Value Creation Model

At TCE, we are constantly reimagining and reinventing our offerings to deliver customer aspirations and ensure growth. Providing best in class solutions using the latest technology and innovative solutions not only ensures timely delivery it also helps save costs for the customer, thus making us a partner of choice. Creating value for all the stakeholders and taking actions aligned to our strategic focus areas helps us create sustainable long-term value.

STRATEGIC FOCUS AREAS

CUSTOMERS

- Offer cross business and integrated solutions across customer asset lifecycle
- Trusted advisor to marquee clients
- Customer engagement and customer satisfaction

FINANCIAL

- Focus on profitability with working capital optimisation
- Acquire business in new sectors; 50: 50 international domestic mix of orders
- Focus on large deals and work with consortiums and partnerships

PROCESSES

- Strengthening processes for operational, technology excellence
- Productivity improvement & cost optimisation

PEOPLE AND LEARNING

ATTRACT, RETAIN AND RETRAIN TALENT

RESPONSIBLE MEMBER OF SOCIETY

RESOURCES AND RELATIONS

TECHNOLOGY & MANAGEMENT INSIGHTS

- Design Engineering
- Project Management
- Consultancy
- OPEX optimisation
- Knowledge Management

MATERIALS, TOOLS & EQUIPMENT

- Design suite
- Application licenses
- Hardware

FINANCING

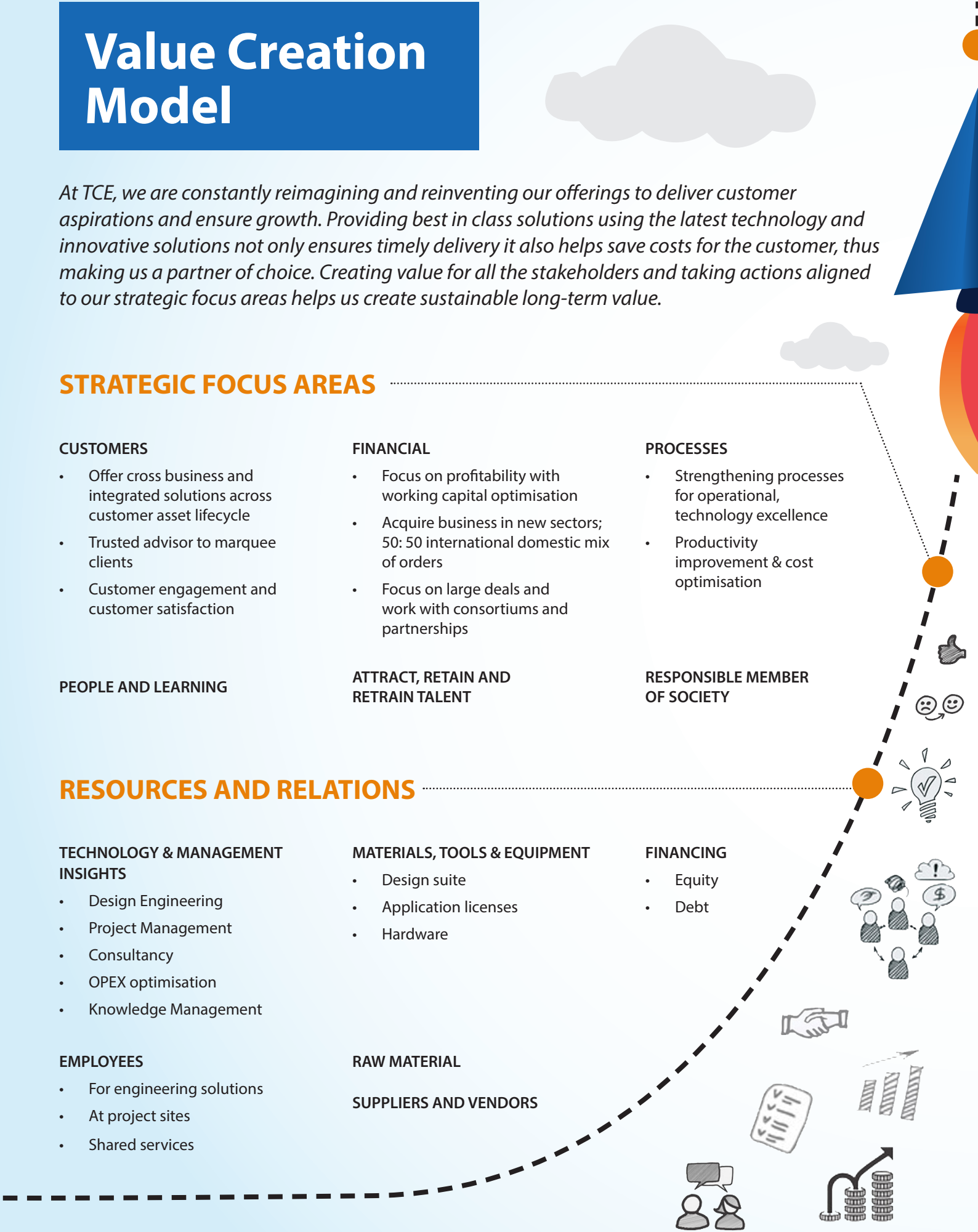
- Equity
- Debt

EMPLOYEES

- For engineering solutions
- At project sites
- Shared services

RAW MATERIAL

SUPPLIERS AND VENDORS





OUTCOMES

- Total Revenue of 700 Cr; New order acquisition highest ever at 1185 Cr
- 41% business from international markets
- 18% of new business from Opex Services
- Consortium-based approach established: TCE a leader in Smartcities and water projects
- Bagged some significant pride of India Projects like Ayodhya Temple, Central Vista, CIDCO to name a few

CUSTOMERS

- 17% of business orders through cross selling and offering integrated solutions
- 51% sales revenues from key/strategic accounts
- Customer feedback index at 72%

PROCESSES

- Processes were strengthened through several automation applications for technology (knowledge management), people process, sales & operations, streamlined deliveries and improved sales process along with long-term relationships with customers. Given the Pandemic and work from home situation, IT and Data Security was strengthened up with world class cloud solutions.

LEARNING/PEOPLE

- Focus was on reskilling and training. All-round training was at 13 person-days per employee & technology training was at 4 person-days per employee. Attrition of key talent was curtailed at 2%.
- Safety was a key focus on site and in offices. Safety index was 4.0 at sites. Given the Pandemic, remote employee engagement and safety and well being remained key focus areas

RESPONSIBLE MEMBER OF SOCIETY

- Infrastructure solutions for making tribal villages water positive was successful in the model village.
- Total CSR spends were at Rs. 205 Lakhs
- Corporate volunteering clocked 5027 hours
- 96 volunteering programs were organised
- A Combating COVID-19 task force was setup and innovative solutions proposed which helped the country tide over the Oxygen Crisis. The details are available on <https://www.tce.co.in/tce-combating-covid/>

Strategic Framework



APPROACH

- Leverage Strengths
- Minimise Risks

1



PLAN

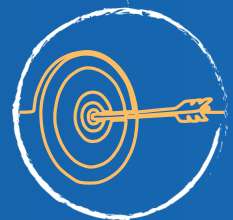
- Expand footprint in Hydrocarbons and Transportation sectors
- Focus on Energy Transition & Sustainability Solutions
- Develop Digital Practice

3

2

FOCUS

- Aspire
- Innovate
- Scale



Rs. 1,000 Cr Revenue by 2022

- Within ENR 100 rank (w. r. t. revenue from outside home country)
- International - Domestic Revenue Mix 50:50
- Trusted advisor to strategic clients & preferred partners in their growth business (75/25)
- Asset lifecycle footprint of minimum 30% OPEX

4

PEOPLE

- Attract, retain and develop talent and prepare for the workplace of the future
- Be a responsible member of society



INFRASTRUCTURE CLUSTER



41%

Growth in
New Orders



63%

Contribution to
Business Acquisition



51%

Contribution
to Revenue



Infrastructure

Business Review

- Urban Development
- Water and Wastewater
- Environment
- Urban Transport
- Ports & Harbours
- Industrial Facilities
- Buildings

Project Management

Business Review

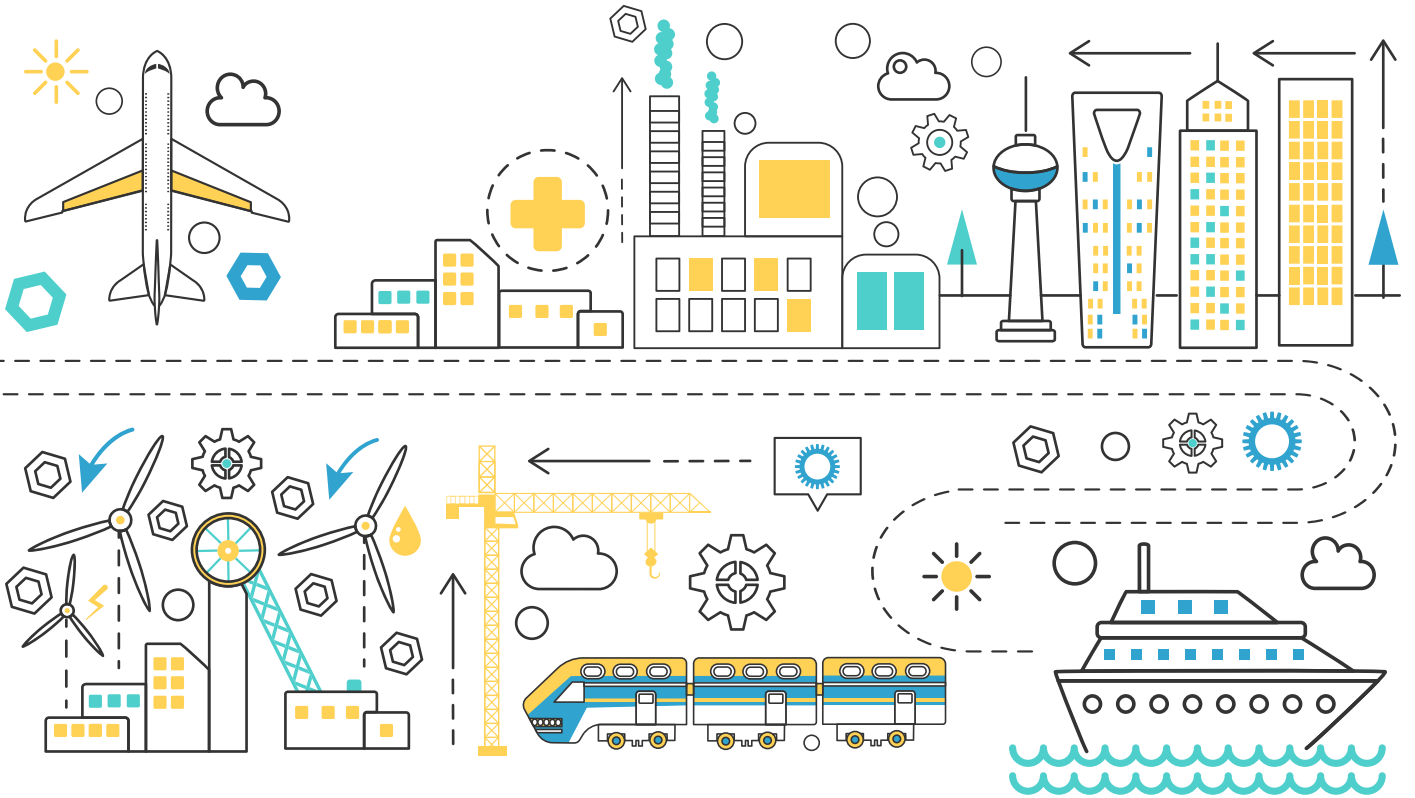
- Engineering Review
- Construction Management/Supervision
- Program Management
- Interface Management
- Specialised Services
- Quality & Safety Audits
- Outage Management

EcoFirst

Review

- Sustainable Integrated Design of Buildings
- Urban Design
- Sustainable Engineering Economics
- Climate and Sustainability Services
- Program Management
- Digital & Modelling





INFRASTRUCTURE BUSINESS REVIEW

The Infrastructure Business Unit of Tata Consulting Engineers impacts the everyday lives of ordinary people and is continuously striving to improve their quality of life. To achieve this, we work closely with public and private sector players in the Infrastructure space, including Government and local authorities and international funding institutions. We plan and design sustainable townships and cities, waterways and water distribution and transportation. We have successfully managed complex engineering projects across the spectrum, securing a high degree of excellence in building large-scale infrastructure.

 **30000 MLD**
Water & Wastewater Treatment Plants

 **22.5 Million Sq. Ft**
of Logistics Parks & Warehouses

 **30000 MLD**
Desalination Plants

 **13.36 Million Sq. Ft**
Training Institutes

 **44 KM**
Underground Tunnel for Water Conveyance

 **1620**
Bed Hospital Facility

 **1 DDC**
For Agra Metro

 **1**
Container Terminal Project in Bangladesh

AREAS OF EXPERTISE

Water and Environment:

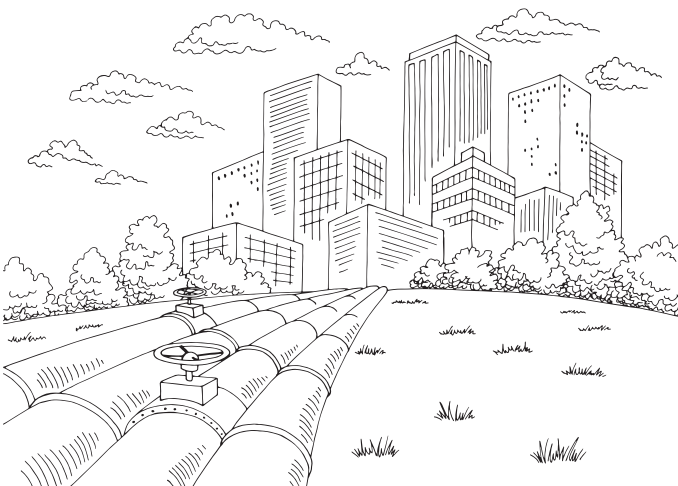
- Engineering solutions in water, wastewater management, desalination, stormwater drainage, irrigation projects, and partnering with water conservation and leakage management authorities.
- Solid waste management, Waste to Energy Projects, EIA, EMP
- Underground tunnels for water supply and wastewater conveyance.
- Improvement of Water Distribution for reducing Non-Revenue Water
- Water & Energy Audit
- Managing and improvising environment ventures such as heritage conservation, rainwater harvesting, pollution control, biodiversity conservation.

Built Environment:

- Building a city with complete infrastructure planning, design and commissioning offerings
- Providing engineering solution for large capacity industrial units and manufacturing facilities
- Leveraging 3D platform for Engineering Model of complex buildings
- Developing nationwide institutional infrastructure
- Infrastructure development for Projects of National importance
- Green Buildings solutions

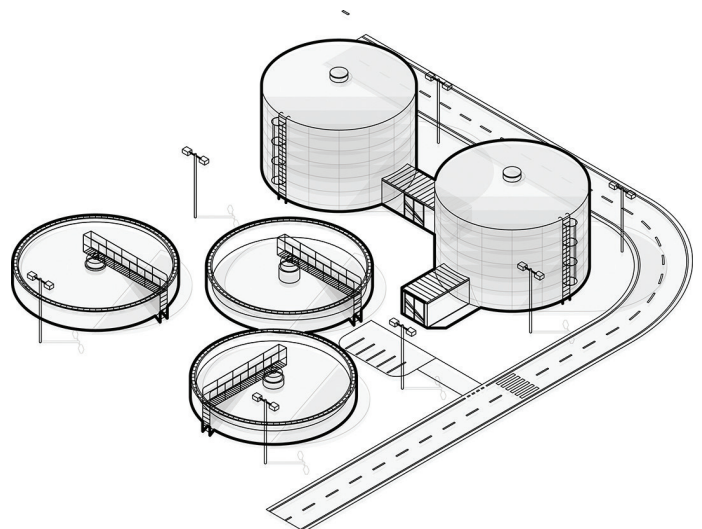
Transportation:

- Designing standalone urban transport infrastructure including airports, rail systems and ports.
- Development and commissioning support in connecting tech cities and large SEZ spaces.



KEY TRENDS SHAPING THE INDUSTRY:

- An ever-increasing focus from the Government on the need for nationwide infrastructure and National Infrastructure Pipeline (NIP) has been formulated for different industry domains.
- With an upward trend in urbanisation and the need for sustainable infrastructure, many medium to large-sized greenfield townships/affordable housing schemes are planned in many Tier-II and Tier-III cities and up-gradation of existing infrastructure in Metro cities.
- The introduction of 'Make in India' and 'Production Linked Incentive (PLI)' schemes will push new industries and Logistic Parks to set up pan India. TCE will leverage its innovation excellence and project expertise to establish enduring relationships to stay relevant amid a rapidly changing world.
- Expand its presence in metro rail services, ports, river interlinkages and transportation; and look for assignments in Data Centres and assignments of Ministry of Defence.
- Exploration of partnerships or collaborations for high-speed rail networks.
- As the population grows with urbanisation and industrialisation, more efficient transportation services are in high demand, mainly mass commuting services Intra & Intercity.
- Due to extreme weather conditions and high water stress levels, there is a growing demand around identifying alternate water sources and efficient distribution of good quality water in towns and cities. The role of private players in the water industry is expanding, panning out a wide range of opportunities for smart water management, alternative water sources - desalination and water reuse/recycling.
- The company is also keenly exploring establishing a sizable footprint in Defence and Data Centres

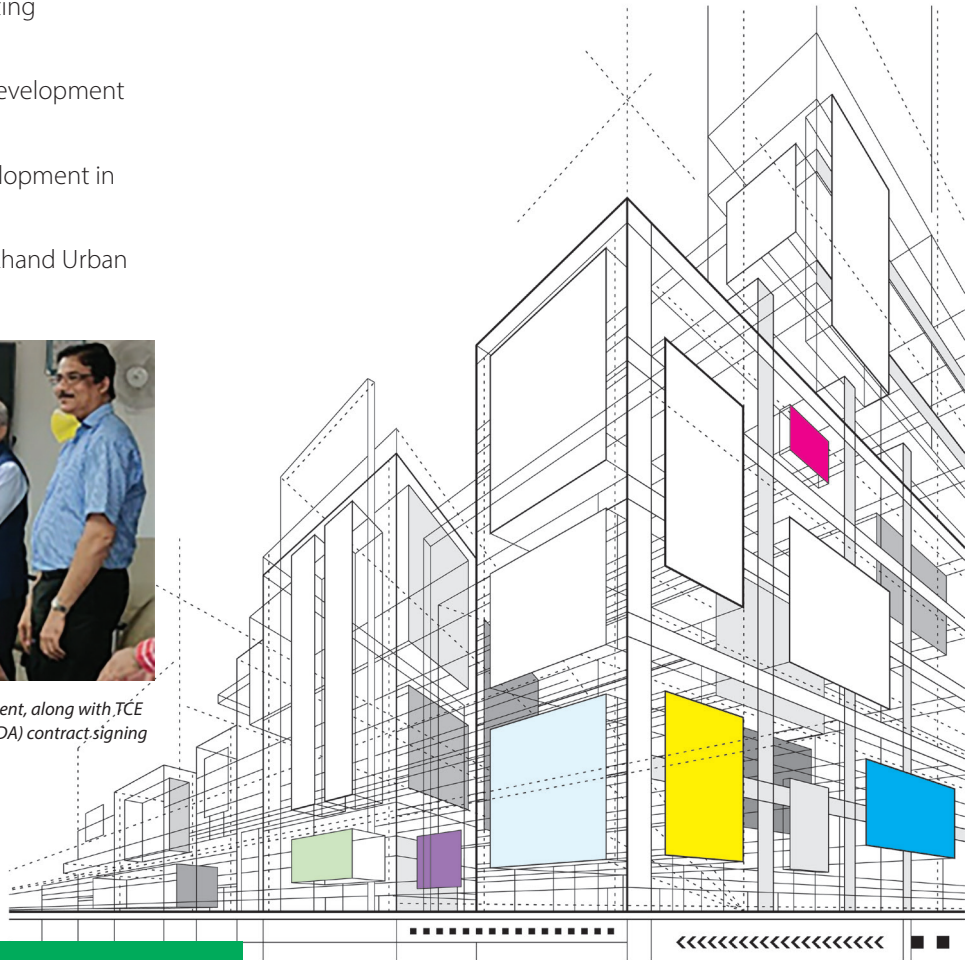


KEY ACHIEVEMENTS:

- Amongst the top three Infrastructure Consulting companies in India.
- Associated with prestigious Central Vista Redevelopment Project in New Delhi
- Bagged PgMC project for Infrastructure Development in Odisha
- Bagged PMC services for ADB funded Uttarakhand Urban State Development Agency.



Manmohan Soman, Infrastructure Business Unit Head and Vice President, along with TCE Water team for Uttarakhand Urban Sector Development Agency (UUSDA) contract signing with Mr Vinay Mishra Program Director (UUSDA)



A PROJECT
Transformation of Central Vista

A yet another pride of nation project, the Central Vista aims to build an icon of governance in India with modern, sustainable, efficient & effective facilities.

TCE is providing Consulting Services for Structural Engineering & External Infrastructure services to CPW. Our Scope includes providing Engineering Consultancy Services for Infrastructure Master Plan & Detailed Engineering of External Infrastructure with Sustainable solutions comprising of Planning and Mechanical, Plumbing and Fire Fighting solutions for the buildings, IBMS, Security & Surveillance and integrated IT services for the Project

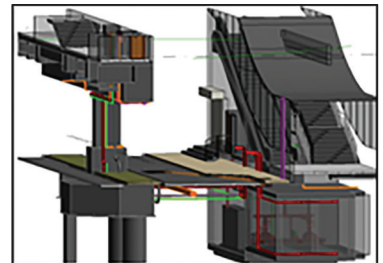
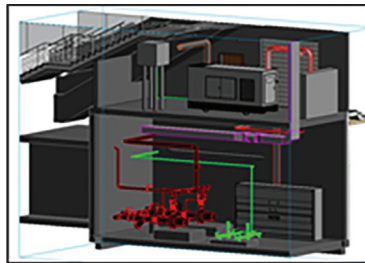
The Contractor is on board, and work is underway for the new Parliament Building and Central Vista Avenue. Tenders are due to be floated for the Central Secretariat.

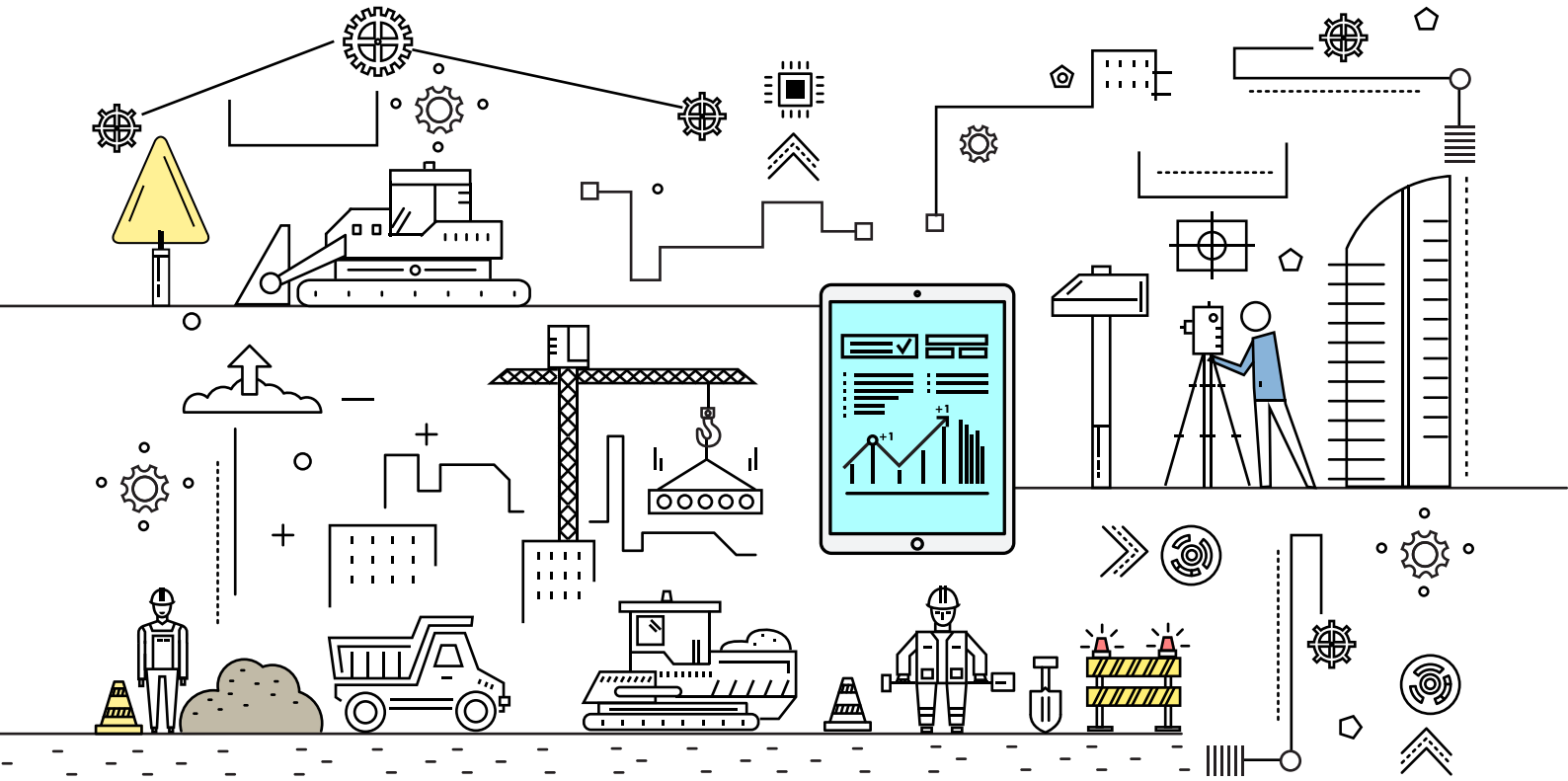


A PROJECT
AGRA METRO Detail Design Consultancy

Tata Consulting Engineers and consortium partners have bagged the Detailed Design Consultancy for Agra Metro Works under Uttar Pradesh Metro Corporation Limited. The team has completed Concept Planning, Tendering Activities, Detail design works on BIM – LOD 350+ platform for Architecture, Civil, Building Services, VAC, ECS, TVS, BMS, SCADA, Traction Services for Elevated Stations (3 Nos), Underground stations (7 Nos), Depot (1 No) and Traction - RSS (2 Nos). The tender for Under Ground (UG) station, tunnel and traction work is ready for floating. The 48 month long projects' Scope consists of:

- Elevated Stations: 6 Nos
- Under Ground Stations: 7 Nos
- Depot: 1 No
- RSS: 2 Nos
- Viaduct: 6.569 km
- Tunnel/ Ramp: 7.681 km
- Traction: 750 V DC – Third Rail





PROJECT MANAGEMENT BUSINESS REVIEW

Every project has its own set of challenges, whether relating to budgets, logistics, timing, materials or people. At Tata Consulting Engineers (TCE), we provide a dedicated and bespoke Project Management Service as we believe every project is unique. Our knowledge-based approach ensures we understand your exact requirements and translate those into tangible solutions resulting in delivering the project efficiently and cost-effectively.

As experts in delivering complete projects, we ensure the project is managed seamlessly from initial concept to commissioning through Stakeholder Management, Procurement, Design, and Construction. We understand that projects have the best outcomes when managed smartly from start to finish, so we put the technology to best use. Our Tata value system helps ensure high Ethical practices and International standards in safety and quality.

505 cr
Record order booking with 10 New Logos

186 cr
Revenue (~31% higher than expected)

212 cr
Record billing to the customer in a single year

237 cr
Record collection in a single year

>90%
Effort Utilisation

Our Project Management team comprises highly experienced and solutions-driven project managers who have first-hand technical expertise in large scale multi-disciplinary projects across Power, Infrastructure and Resources. The offerings span EPCM services, Project Management, Commissioning Support, Engineering Programme Management and Planning, Quality, Inspection and Expediting. We have expertise ranging from Architectural Engineering, Basic Engineering, Detailed Engineering, Project Management and Construction Management.

Over time, the construction industry has overcome various challenges, but the impact seen from COVID-19 was unprecedented. Construction being a significant stakeholder and mass employer, was a victim of this Pandemic. The effect was severe due to the global nature of projects involving complexities, mainly on the supply chain and workforce front. While almost everyone saw this as a threat to the “normal”, the team at TCE saw this as an opportunity to reimagine “Safety”. The team took charge of the sites and circulated a well thought Visual Standard Operating Procedure (SOP) to restart Site operations after Lockdown. With close monitoring of the number of cases, timely tracking and isolation of suspected patients, the TCE team facilitated site operations to return to normal, thus adding value to all our stakeholders through providing technically excellent and innovative solutions.



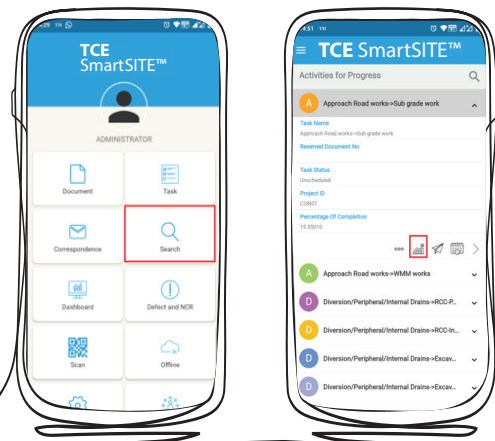
The SOP included topics critical for safe working on sites like Safety Induction, Responsibilities of Stakeholders, Restricted access, Disinfection of the premises, Monitoring and Control.

The construction industry is infamous for having very low productivity and majorly depended on the efficiency of the manual workforce, especially in India. This is mainly due to their slow adoption of systems & processes, lack of standardisation and technology innovations. With the ever-increasing complexity of projects, construction players can either adopt new technologies to improve productivity or continue to suffer losses.

TCE has been consistently adapting to the dynamic industry demands using State of the Art Technologies like BIM adoption, IIOT, Mobile Project Dashboards and Aerial Monitoring through UAVs. Taking a quantum leap towards Digitalisation, TCE added a new offering to its basket, the ‘TCE SmartSite™’ App accessible on Mobiles.

TCE SmartSite™ App supports Digital Collaboration and Mobility, identified as one of the key trends to help construction players in their Digital Transformation. The app is the unison of 60 years of experience in TCE and agility brought by real-time information sharing. The app users have easy access to all the standard processes, checklists and way of working developed by TCE with the experience gained while working across various sectors and geographies, right on their mobile phone.

The accessibility to past data on the SmartSite™ App helps in analysis and data-driven decision making. The inputs like activity progress, project risks, quality, safety issues and snags are summarised in dashboards used to monitor key metrics like open/close status of issues, planned v/s actual completion of milestones, look-ahead plans, mitigation plans, etc. to depict the project health accurately.



The app helps in:

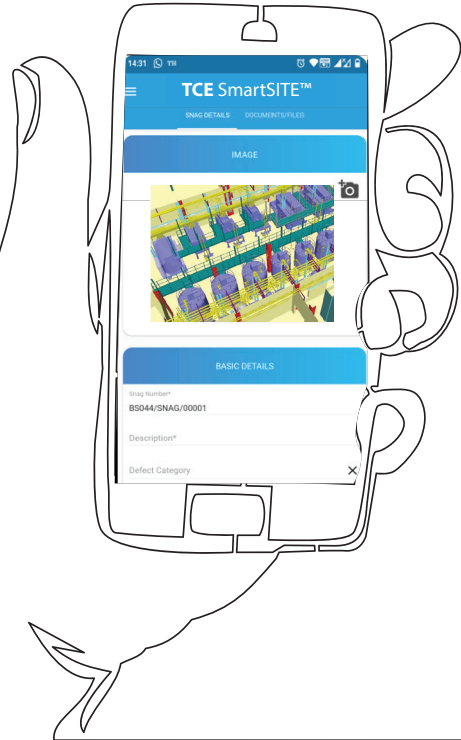
- Quick onboarding supported with assigning and monitoring of roles & responsibilities
- Paperless way of working - A sustainability initiative with an added benefit of avoiding multiple touchpoints in the current COVID-19 scenario
- Cloud-based data storage, accessible from mobiles and desktops
- Enables collaboration across Stakeholders (documentation, communication and tracking)

During the unprecedented times of COVID-19 lockdown, there were significant setbacks in the market due to issues in logistics of men and material, supplemented with low fluidity of cash, leading to reduced expenditures across the globe.

However, PMC BU was determined not to slack the pace at which it has been growing and decided to take a structured approach to counter the issues at hand. The structured approach focused on the sustenance of both Order Booking and Profits by remaining agile and proactively ready for the market scenarios. The BU focused on exploring new paradigms and offerings over and above existing offerings while staying cost-competitive, attracting customer mindshare towards enhanced revenue measures, optimising resource utilisation,

working on role ratios, improving revenue realisation, and focusing on Cash flow by enhancing our ability to collect.

As fruition to our collective and determined efforts, the BU achieved record numbers on all fronts.



A PROJECT

Shri Ramjanmabhoomi Project

The Ram Janmabhoomi Teerth Kshetra Trust has been entrusted with constructing Shree Ram Janmabhoomi Teerth Kshetra Temple at Ayodhya, Uttar Pradesh. Tata Consulting Engineers (TCE) is the Project Management Consultant. The proposed temple area is situated on the banks of River Sarayu (Approximately 1 km from the riverbank).

The main temple consists of Garbhagriha, and the temple elevated platform consists of Gudhmandap, Rang Mandap, Nrutya Mandap, Pradakshina, and Chowky. The temple is designed by a specialist Architect Consultant, as a Traditional structure, in a Nagara style of temple architecture. The Parkota around the boundary of the temple will have temples of other Gods and Goddesses. The Temple structure shall be integrated with the Ram Janmabhoomi Complex Master plan.

The temple structure will be constructed using a traditional stone structure made up of sandstone. The structural elements are joined together by tongue and groove joints. Its dimensions are approx. 380x250 feet. The main dome over Garbhagriha is 161 feet high.



Artefacts found 9-10 m below the current ground level, likely to be more than 1000 years old.

Impact of COVID-19 on Construction

COVID-19 Pandemic has impacted commercial activities and industries worldwide and includes the construction industry, representing 13 per cent of global GDP. The Pandemic resulted in an execution slowdown in construction projects and created workforce-related issues, especially the shortage of migrant workers forced by the situation to return to their native countries and towns.

Firms in the construction industry were faced with a plethora of financial problems, including, but not limited to, liquidity crisis, pressure on cash flows and profitability, debt servicing challenges, etc. Many companies faced legal issues and found it extremely difficult to deliver as per contractual commitments.

As a PMC, we faced our own set of problems such as lower revenue realisation and increased costs due to work stoppages at sites, poor progress on lumpsum jobs, revenue leakages due to restricted mobility of engineers, ensuring proper Safety standards for restarting Site operations, understanding and supporting Contractual implications of both Client and Contractor sides and suggesting measures in the best interest of the Projects, etc. All these challenges were reviewed by the cross-functional periodic meetings to ensure agile planning and implementation of appropriate action points. These cross-functional taskforces helped in the mobility of our Engineers across States and Countries (approx. an average of 45 Engineers were working in Africa and South-East Asia out of a total average of 800 Engineers), tracked workforce at Sites and ensured the implementation of COVID-19 guidelines and SOP for Health & Safety of every Stakeholder, understood Project Risks and suggested mitigation measures and catch up plans in the best interest of Projects.

Amidst all this, TCE also understood the importance and increased its thrust in accelerating adoption of digital and other innovative technologies like 5-D BIM, Rapid Digital Mapping, Digital Collaboration & Mobility, IIoT, Modular Construction, etc. and enhanced its pace to make these more relevant to

ensure higher efficiency and efficacy of construction activities, decreasing dependence on physical records and increasing safety in the post-COVID-19 scenario. TCE SmartSite™ was made hygiene across all Sites, leading to more robustness and transparency in data-driven decision-making. And, we continue our aspirations to join the global leaders in ensuring adoption of Digital Mechanism for improving productivity, making Industry more data-driven, efficient tracking and intermediate planning of Projects, etc.

KEY TRENDS SHAPING THE INDUSTRY

Different industries and markets are following different trends for their optimal growth, often at varying speeds. However, in a post-COVID-19 scenario, all the industries, including Construction, are finding it apt to make their businesses well-connected in a more digitised way. Hence, Digitalisation finds its place at the top in the present scenario of the Construction industry.

Following the trend, PMCBU has pledged itself towards digital workflows ranging from the adoption of SmartSite™ to drone-powered scanning and getting friendly with prefabricated technologies and its automation to embracing BIM. Acknowledging that the future of Construction lies in digital tools and automated workflows, the BU is putting continual efforts into training and adopting technology-enabled tools to improve efficiency, productivity, and collaboration at Construction sites.

The above shift requires the support of remote worksites through Mobile access to real-time data, real-time inspections, onsite accountability, including approval workflows and accurate measurements taken from a mobile phone camera. The post-COVID-19 scenario has mandated that teams continue to collaborate without physical access to materials, spaces, or even other teammates.



A PROJECT

Rourkela Smart City

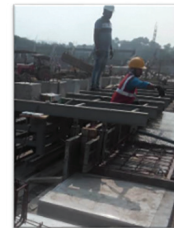
Building on its steel foundation, natural setting and cosmopolitan character, Rourkela will be an inclusive, sustainable and self-reliant city propelling regional economic development with best-class infrastructure. There are 23 projects taken under Rourkela Smart City, including Smart Road, Citizen Friendly Parks, Football Stadium, Indoor Stadium, Auditorium, Museum, Command Control Centre, Pond Beautification, River Side Beautification, Smart Vending Zones, Smart Parking, Market Complexes etc.

CHALLENGES

All significant projects like Birsa Munda Football Stadium, Smart Road, Biju Patnaik Indoor Stadium, Rourkela One started after the lockdown period in April 2020. The projects continue their progress with all due diligence as per plan with no impact on the original completion date. The project team has adopted the latest technologies like Post Stressed Concrete, Lean Technology, Slip Form type Form work for Precast work to expedite the work progress. As the city is ancient, retrofitting all the roads is very challenging. Due to the existing utilities in the ROW and densely populated area, the project team overcame all challenges to execute as planned and ensure proper traffic management. Other challenges include Encroachments, Multi-level approvals, Rehabilitation, High traffic, Low traffic management, Multiple players on the same site, Unorganised existing services and Variable Soil Strata, which we overcame with some strategic planning and sound engineering solutions.

TECHNOLOGIES

Technologies and effective way of working were the reason. We could achieve our targets. In Birsa Munda Stadium, using Post Stressed Technology, we reduced our concrete work and de-shuttering time considerably. Also, taking benefit of Lean Processes, we reduced logistic time for material movement. We saved considerable time in precast concrete



work as we used slip form shuttering at the precast yard. In continuation to above, we also took necessary care to avoid Kota finishing in sitting areas of the stadium by replacing the same with an excellent precast finish, thus saving cost and time. The project team has taken due diligence to achieve targets by adopting such equipment that was not considered earlier, like the Pile Rig machine for piling work and saved considerable time lost due to COVID-19.



A PROJECT

CIDCO-Package 4



Considering the importance of providing affordable and quality housing, CIDCO has undertaken a housing scheme in various nodes of Navi Mumbai. These projects comprising roughly 89,777 flats are being developed near railway stations & bus depots to bring down travelling distance and encourage public transport use.

Package-IV was awarded to M/s L&T Ltd. for Construction of approx. 23,432 dwelling units under the category of EWS and LIG. Tata Consulting Engineers (TCE) is the Project Management Consultant. The project is located at four sites Bamandongri, Kharkopar (E), Kharkopar (W) & Taloja

Sector-39, under various plots. Principally all these housing complexes are being developed with amenities & facilities under part of the PMAY – Pradhan Mantri Awas Yojana Govt. scheme. EWS type houses are to be built with 322 sq. ft. carpet area, and LIG type houses are to be built with carpet area varying from 384 to 552 sq. ft.

Salient features:

- Building type is EWS (Economy Weaker Section) & LIG (Lower Income Group)
- Precast Technology, PT slab & Mivan Technology are being used for Construction at Kharkopar
- Engaged workforce –Labours approx. 4000 nos. & employees approx. 400 nos.
- No. of Buildings / Tenements - 187 nos. / 22,973 nos.
- Built-up area - 1,79,84,058 Sq.Ft

Key Challenges:

- The project started during the COVID-19 Pandemic. The mobilisation was a critical issue.
- The restriction on workforce movement due to lockdown situation.
- The statutory clearances from Government authorities in time.
- Encroachment at project acquired land.
- Rerouting / Relocation of existing infrastructure (utilities-sewer, water & electrical).

Achievements of Projects:

- Arranging & handling the enormous task force on such a massive project during the Pandemic situation. Almost 4500 people are working on this package alone.
- WRENCH (Design) & TCE SmartSite™ (PMC) management system has been implemented for effective drawings and documents flow in the project. All major stakeholders, i.e. M/s. AHC and M/s. L&T Construction adopts the system.
- BIM 4D is implemented at the site using Revit (Autodesk) / Tekla (Precast), Primavera P6 & 4D Visualization – Navisworks (Autodesk) software.
- Five million Safe person-hours achieved.



ECOFIRST BUSINESS REVIEW

(A 100% subsidiary of Tata Consulting Engineers)

At Ecofirst, we provide comprehensive and holistic Integrated Design solutions across the project lifecycle. Sustainable by Design is our supreme motto. Sustainability for us is about taking care of the environment and social concerns and meeting the financial goals of capital and operational excellence, reflecting through our design philosophy.

We specialise in creating sustainable designs and responsible development solutions by seamless integration of Architecture, Engineering & Environmental Technology. Our work in Retail, Townships, High Rise, IT Parks & Warehousing Industries ranges PAN India. We strive to provide our associations with expertise in conceiving and developing performative, operative and feasible solutions.

 **12%**
CAGR Revenue

 **60+**
People Resources

 **250+**
Projects

AREAS OF EXPERTISE

Sustainable Integrated Design of Buildings

- Master Planning
- Architecture
- Landscape Design
- Facade Design
- Structure Designs
- Building Engineering (MEP)
- Site Engineering (Infrastructure)

Digital & Modelling

- Energy & Light Modelling
- Flood Modelling
- Vertical Transport
- Traffic Simulations
- Crowd Modelling
- BIM 3D-7D/Revit
- Digital Twin

Urban Design

- City & Street Planning
- Urban Design
- Urban Planning

Sustainable Engineering

- Building Engineering (MEP)
- Land Development and Wet Infrastructure
- BIM 7D
- Flood Modelling and Stormwater Management
- Vertical Transport and Crowd Mobility
- Technical Due Diligence

Program Management

- Self – Redevelopment Programs
- Heritage Buildings
- Special Buildings
- Sports Infrastructure

Climate and Sustainability Services

- Climate Change Vulnerability Assessment
- Life Cycle Assessment
- SDG Implementation Handholding
- Design Enhancement
- Sustainability Audits
- Green Building Certification
- Sustainability Monitoring (Post Occupancy Evaluation)
- Testing & Commissioning

KEY TRENDS SHAPING THE INDUSTRY:

- With increasing awareness about sustainable living, increasing trends are visible for demand in sustainable designs and buildings. Both public and private players are increasingly looking for solutions to coexist with nature.
- The digital revolution is also visible with growing impetus on Digital Modelling and Building Information Modelling (BIM) requirements to intelligently manage built spaces.
- Aggressive pricing by all Consultants/Competitors.
- Reduced willingness to pay for quality/comprehensive work
- Tendency towards EPC mode
- Smaller consultants coming together to provide single point services
- Longer validity period due to uncertainty on project completion timelines

In line with the market trends, Ecofirst is gearing up to provide sustainable solutions and continuously update its portfolio with the changes in the environment. The subsidiary has proven its mettle with flawless execution and delivery of several mega projects. It has achieved Platinum & Gold certifications to establish itself as a leading player in the sustainable solutions space.

SOME HIGHLIGHTS:

- Successfully started New initiatives for:
 - Climate Change Vulnerability Assessment (Flood Modelling)
 - Redevelopment of Societies
 - Warehouse & Data Centre
- **Volume program for sustainability:** Entering into new areas or volume programs like pre-investment due diligence with funding agencies, Technical due diligence for real estate players and climate change risk assessments with volume players in warehousing, data centre or other commercial properties.
- **Sustainable Integrated Designs (SID):** Acquired new projects from real estate, strengthening the portfolio further.
- Signing **MOU with Earl Carl Wash** for a long term partnership for sustainable technology implementation support program pan India.
- Acquired and delivered assignments **for IMF** (pre-investment assessment)



A PROJECT

Sustainable Integrated Design for Agami Township, Pen, Maharashtra

Ecofirst was appointed as the sustainability design consultant with responsibilities that included complete master planning for the 12 acres site, architectural design of all the building typologies, sustainability consultancy services for net-zero carbon development, infrastructure design, MEP design and landscape design.

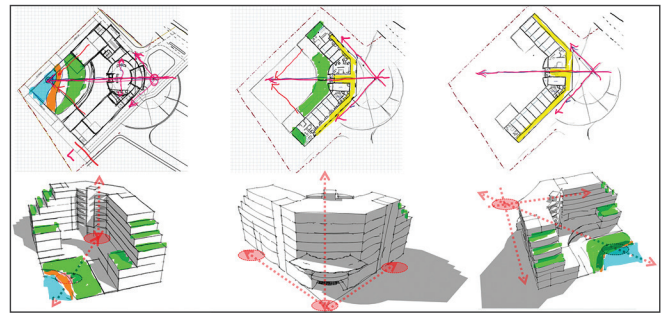
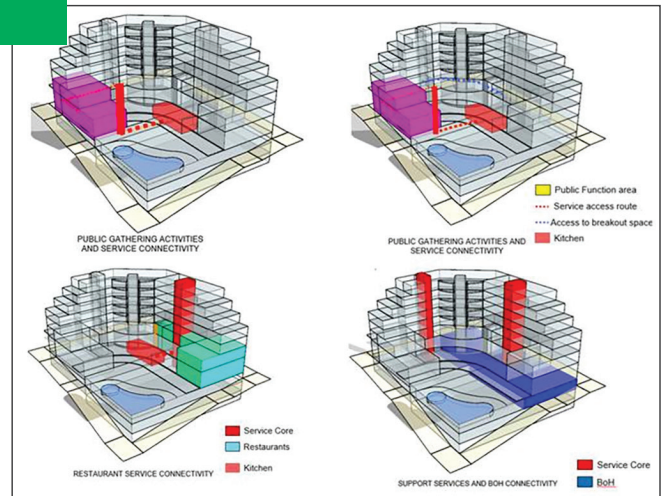
The primary challenge in this project was to design the site's existing terrain consisting of sharp inclines and narrow valleys. To deal with this, road network was strategically designed to minimise the cut-fill on site and to provide unhindered views of the surroundings to each residence. The other challenge was to create a seamless divide between the resort and the homes. The site's natural terrain was utilised to create different zones within site without creating any additional physical barriers. Two major nodes regulate the movement within the site, thus ensuring better access control and security within the gated development. While the township is centered around a large green open space which directs users into different zones of the plot, the residences are interspersed with pockets of green spaces to maintain a continuous connection to nature. Strategic locations for the houses ensure that there is no obstruction in the views. Public amenities are placed across a valley that has a seasonal waterfall. The resort is placed on the top-most portion of the site and its exclusivity is maintained by regulating vehicular movement.

Value Creation

Financial Capital - A strategic Eco-conscious master-planning approach was followed, optimising the cut-fill and thus reducing on the site earthwork cost. The terraced design provides more view to surrounding serene views, thus adding value to the property in terms of saleability. At the same time, the net-zero carbon footprint development approach added to the saving the overall operational cost in the project lifetime.

Intellectual Capital: Technical tools and practices helped carry out the entire exercise during COVID-19 lockdown with minimum site visits. Use of 3D platforms to analyse site challenges and design evaluation helped in more constructive interactions with the stakeholders including client.

Human Capital: The township is designed to act as a perfect getaway for people who wish to spend quality time with their close ones yet enjoying the luxury of modern living within close proximity to nature. This project is envisaged to cater the rising need of remote working facility supported with state-of-the-art technical facilities boosting their productivity while maintaining health, hygiene and quality personal time.



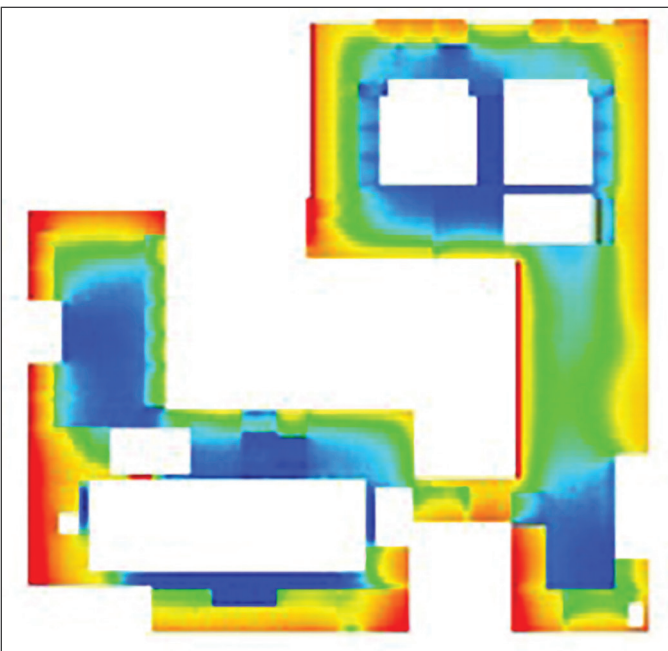
Natural Capital: From the design conceptualisation stage, the impact of nature and the environment has been a priority. Each component of the project - from design strategy to material selection, landscape and plant selection aims to reduce the adverse impact on environment and promote local materials and species to support its microclimate.

Relationship Capital: Ecofirst helped the client make informed decisions by exposing them to the potential of the development in terms of design interventions. A good relationship was established with the client by providing end-to-end solutions and technical expertise at each stage.

Social Capital: The Socio-cultural characteristics of the area has been embedded in the design. Further, this project will benefit the locals in Pen by creating new job opportunities, thus support the local economy and social upliftment. Being first of its kind in that region this project will attract investors and visitors from different places thus exposing the locality to new social and business engagement opportunities.

A PROJECT

Godrej One, Mumbai



As a part of the Green Building Certification services, Ecofirst facilitated IGBC Health and Wellbeing assessment to Godrej One, Mumbai- the headquarter building of Godrej. This is one of the first buildings of this scale/ footprint to be platinum-certified in this category.

The key role played by Ecofirst was to guide and coordinate with the facility management team of Godrej One concerning the execution of the occupant survey, on-site IEQ assessment and alignment of occupant health and wellbeing features across of project area. As it is an existing building, suggestions on Design and Infrastructural changes were limited.

IMPACT

- **Financial Capital:** Achieved reduction in energy cost due to specific temperature maintenance in the HVAC system and change in light operation schedules and daylight optimised spaces. Findings from the Indoor Environment quality assessment assisted the management team in making target specific investments. Improvements in IEQ will enhance the occupant's productivity, thereby facilitating monetary benefits for the company.
- **Intellectual Capital:** Our best technical/ quality practice helped improve the overall Indoor Environment quality and monitoring of the existing building.
- **Human Capital:** More than 80% of the operational times, the building is thermally comfortable (in terms of temperature and Relative Humidity) for the occupants. Carbon dioxide levels are monitored and are well within control. During the occupant's survey, it was observed that more than 80% of occupant were satisfied with the indoor comfort parameters. Enhanced hygiene and sanitisation facilities were made available for all occupants in work as well as leisure spaces.
- **Relationship Capital:** On-site interactions with the client, providing end-to-end solutions by exploring advanced IEQ enhancement measures, inculcating awareness concerning healthy spaces with the client has resulted in client satisfaction and long-term relationships. We have continued to receive similar work for other projects of the client.
- **Social Capital:** Encouraging healthy occupant spaces, policies and protocols in place for occupant well-being etc., has created a nourishing environment for all the staff and visitors of the office.

PLANT ENGINEERING CLUSTER



3%

Fall in New Orders



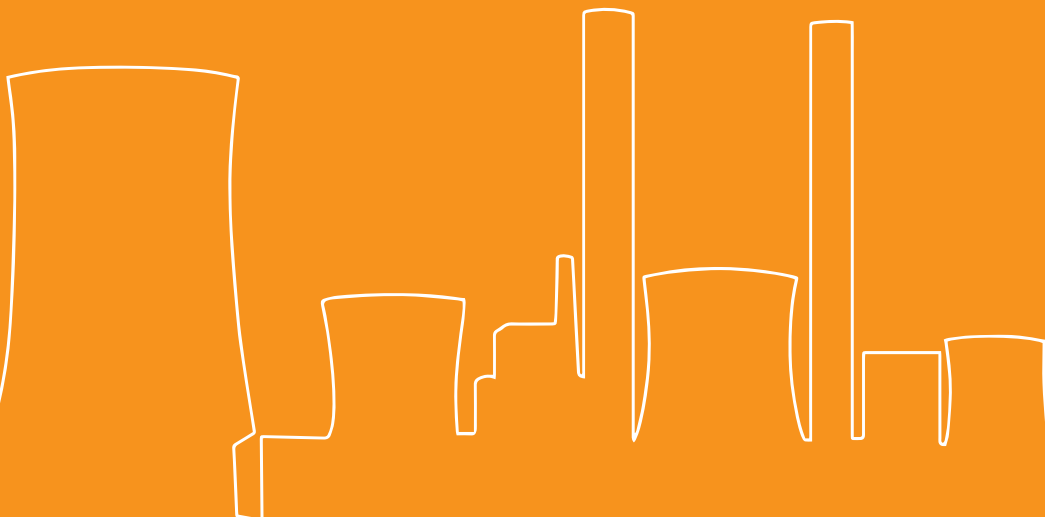
36%

Contribution to
Business Acquisition



47%

Contribution
to Revenue



Power

Business Review

- Renewable
- Hydro
- Nuclear
- Thermal
- Transmission & Distribution

Resources

Business Review

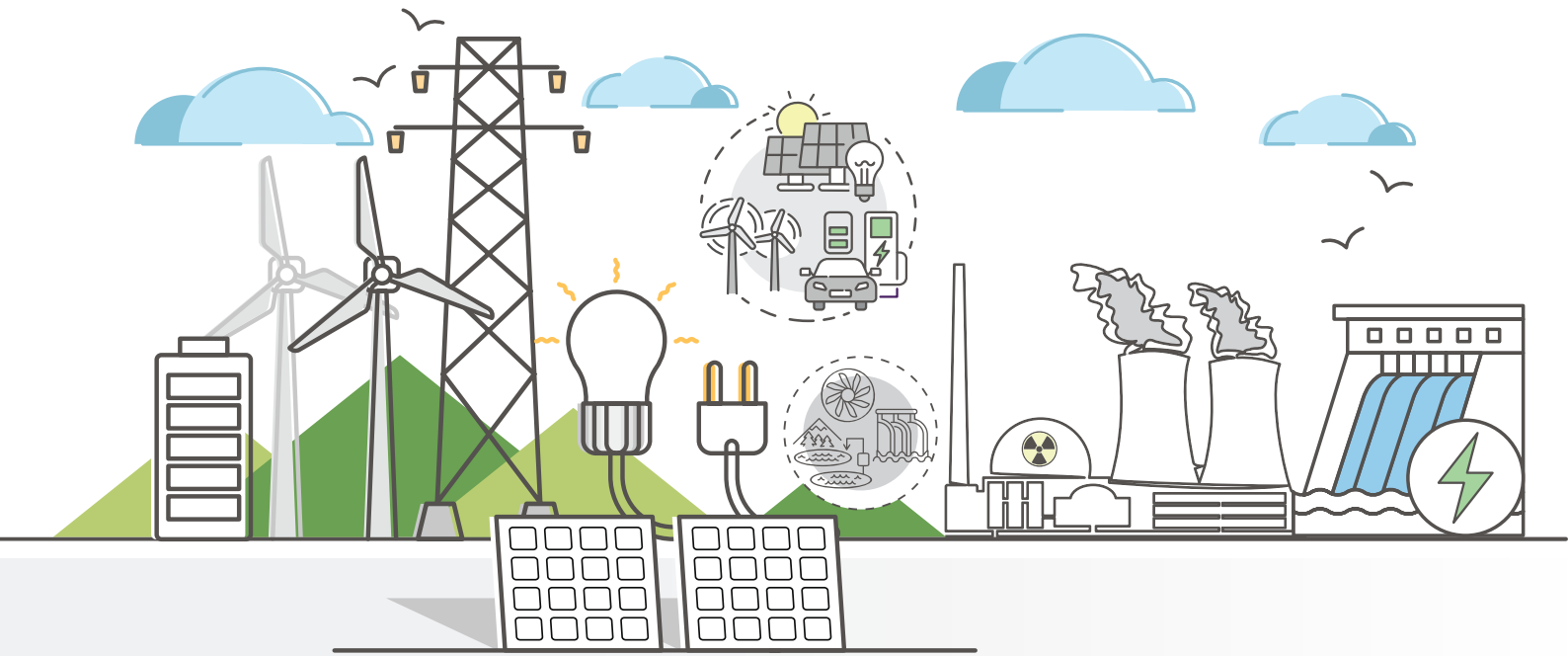
Mining & Metallurgy

- Iron & Steel
- Mining & Beneficiation of Ferrous & Non-ferrous
- Smelting and Processing
- Geology and Mine Planning
- Mineral Processing and Beneficiation
- Material Handling.

Hydro Carbons & Chemicals

- Oil, Gas and Petroleum Refineries
- Petrochemicals
- Fertilisers
- Chemicals & Specialty Chemicals
- Food & Pharmaceuticals
- Glass, Rubber, Cement and Allied Process Industries





POWER BUSINESS REVIEW

The Power Business of TCE is amongst the top two players in the Indian market, providing value-added engineering services from concept to commissioning and life cycle management services. With decades of experience in Power Generation, Transmission and Distribution, the business is geared up to deliver emerging customer aspirations. Having made its mark in engineering and project management of various thermal power plants globally, TCE’s Power Business has stayed relevant by adapting to the changing needs of energy transition towards greener and environmental-friendly power plants. The business unit offers innovative solutions to customer needs focusing on sustainability and environment.

Globally Engineered Till Date:

125 GW+
Thermal & Combined
Cycle Power Plants

40 GW+
Renewable and Large
Hydro Power Plants

08 GW+
Nuclear Power Plants

Energy Transition has demanded reinventing the services to ensure business sustainability. Power Business has matured capabilities in renewables - photovoltaics (PV), concentrated solar power (CSP) and onshore wind power. The same is now expanded to Offshore Windpower, Floating Solar power and Battery Energy Storage System (BESS). Variable Renewable Electricity (VRE) has mandated bundling of renewable power with other power generation sources to provide Round-The-Clock (RTC) power. Power Business has launched Sustainable Campus Solution for campuses of universities, hospitals, colonies, gated communities, R&D centres, and MSMEs to

generate green power and efficiently manage water and waste water using digital technologies. This aims to convert these campuses to future ready net-zero assets. To address the needs of peak power demand and energy storage requirements, solutions using pumped-storage schemes and flexibilisation of thermal power plants for quick responses to load demand through fast ramp-up/ ramp-down are offered. In FY2020-21, a record new business of 25 Cr has been achieved in the Hydro sector through pumped storage schemes, traditional hydro generation plants, renovation, and modernisation of existing assets.

Further, digital solutions for energy efficiency improvements, system and plant performance improvements and asset life cycle management solutions are being developed and offered to thermal asset owners. Power business has developed unique Industry 4.0 based Point Solutions to cater to the large base of installed thermal power plants. Opex services offered include environmental upgrades, renovation and modernisation of existing assets. Thermal Capex orders have been on a downward trend during last 3 to 4 years and will continue to face degrowth. Hence, the Power business is working around solutions for Energy Transition by forming a cross-functional team to develop Green Hydrogen solutions for use in other industrial plants.

The power business is also set to realise the Transmission and Distribution sector's full potential and is now focused on growth. This sector has considerable investments under National Infrastructure Pipeline for grid infrastructure upgrades, HVDC, distribution and smart metering. This sector has proven abilities on challenging grid-level energy storage, renewable integration, reduction of AT&C losses, resilient grid infrastructure, electrical system studies other than routine transmission lines and substations.

Power business has thus demonstrated the tenacity to be a sustainable business amidst energy transition. It is strategically focused on developing new technology solutions, digital and opex solutions and growth of nuclear, hydro, renewable and T&D sectors to offset thermal degrowth.

Nuclear has narrowed its gap with thermal and is set to overtake thermal as the largest sector in the power business. The domestic market continues to provide opportunities in PHWR Fleet Reactors, with Gorakhpur 1&2 2x700MW set to complete engineering activities and Kaiga 5&6 2x700MW set to begin in FY2021-22. Power business has entered into strategic partnerships with technology providers to ensure a pie out of imported Bulk Reactors set to take off in FY2021-22. A large team of 60+ engineers from TCE is stationed in France, working with ITER (International Thermonuclear Experimental Reactor), the first fusion reactor. The sector is actively scouting for opportunities in the European market, having made forays in immediate neighbourhood, Rooppur Bangladesh, other than ITER in France.

KEY ACHIEVEMENTS

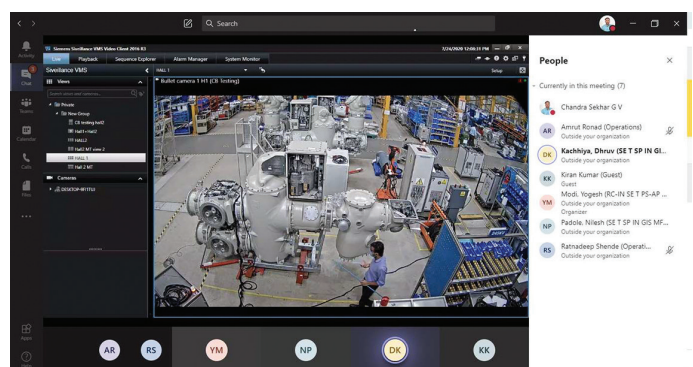
- **Integrated CSP & sCO₂ based Power Plant for Department of Science and Technology, Government of India in association with Indian Institute of Science, Bengaluru**

A first of its kind effort to prepare a Detailed Project Report for an integrated CSP (Concentrated Solar Power) & sCO₂ (Super-critical Carbon Dioxide) based power plant is in an advanced stage of completion. The report includes the basic design details, cost estimates and a road map for scaling up and indigenising the manufacture of the equipment in India under Aatma-Nirbhar initiative.



- **eFAT of 66kV GIS & 11kV Switchgear for Wipro**

During the Pandemic, conducting & witnessing Factory Acceptance Test (FAT) of electrical equipment became a significant challenge as factory visits were restricted. Any delay in equipment supply to the project site impacts the project completion schedule. TCE proposed an online FAT [eFAT] option for 66kV Breaker & 11kV Switchgear. This innovative idea was well received and appreciated by customer & vendors. Three 360° cameras were used at the manufacturer's shop to enable this digital inspection, which offered a real inspection environment and visualisation of test readings from the remote.



● **Distribution Sector**

The Power Distribution system is a weak link due to high Aggregate Technical & Commercial (AT&C) losses, erroneous metering, imperfect revenue realisation, and inadequate infrastructure maintenance. Power Business is actively providing services like

- Power distribution network resilient to Cyclone. Work in progress for Tata Power Central Odisha Distribution Ltd.
- Work in progress on Analysis of Transmission and Distribution Losses for Ministry of Power, Energy and Mineral Resources, Bangladesh.
- Completed Feasibility Study of Underground power distribution networks for the urban cities of Khulna, Jessore and Barisal, Bangladesh (ADB Funded).
- Work in progress for Project Management Consultancy Services for Smart Metering System at Yanbu, Kingdom of Saudi Arabia.

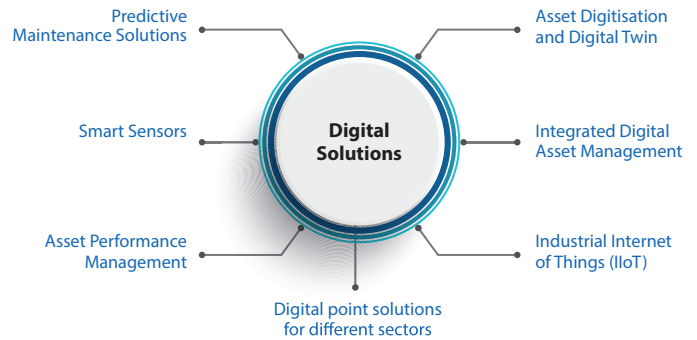


● **Digital Solutions**

Power Business is leveraging its multi-disciplinary, multi-sector expertise to deliver advanced digital technologies and Industry 4.0 solutions across different business sectors for carrying out performance analysis, real-time detection of performance deviation, assistance to the operator with accurate root cause analysis with suggested corrective actions to enhance performance.

TCE's Digital Point Solutions (DPoS) combine the best possible application of Artificial Intelligence (AI) / Machine Learning (ML) and domain expertise in plant engineering/operation to provide holistic solutions for the plant operators.

The team has developed the capability to build APR (Advanced Pattern Recognition) model, RCM (Reliability Centered Maintenance) implementation, and digital PoS and has validated these offerings in operating power plants.



KEY DIFFERENTIATORS:

- Proven mettle in the Power sector, contributing to about 170 GW+ of power generation.
- Capabilities in all forms of renewable power – ground-mounted solar, rooftop solar, floating solar to CSP projects, onshore and offshore wind, energy storage and hybrid plants, biomass and waste to energy projects.
- An established player in Micro, Mini, Small, Medium and Major Hydro Power Plants, Pumped Storage Systems, Dam Rehabilitation and Renovation and Modernisation of Hydro Power Plants.
- Market leader in Nuclear power plant engineering with more than 85% market share in India. Successful international forays with ITER and other European opportunities.
- Rich experience in Environmental upgrades, Renovation & modernisation, and Plant due diligence, including plant safety review for all types of power plants.
- 75% of revenues for the business comes from Key and Strategic Customers demonstrating focused account management aided by quality and timely delivery. Top 10 Customers account for 80% of business acquisition.

AREA OF EXPERTISE:

- **Renewable Power:** Solar – PV, CSP, floating solar; wind – onshore & offshore, biomass, hybrid, battery energy storage and waste-to-energy. Micrositing, Yield Assessments, Technology Evaluation, Detailed Project Reports, Site Data Analysis, Grid Integration.
- **Hydro Power:** Hydrological and Hydraulic Studies, Hydro-mechanical and Hydro-structural engineering, Seismic studies, Water resources, control and instrumentation.
- **Nuclear Power:** Power generation, fuel fabrication, fuel reprocessing, waste disposal.
- **Thermal Power:** Coal, gas, captive and cogeneration. Energy transition to Hydrogen and sCO₂ power cycle.
- **Opex Services:** Plant renovation, modernisation, emission retrofits and performance improvement projects and various Industry 4.0 digitalisation solutions in existing facilities.
- **T&D:** Transmission lines, substation, distribution, smart metering and system studies.

KEY TRENDS SHAPING THE INDUSTRY:

- Sustainable Development Goals are driving Energy Transition across sectors with a focus on clean and green energy. Renewable growth focus across geographies. Floating solar PV projects gaining momentum, Offshore wind power gaining traction and GW scale Solar/Wind Hybrid parks being developed in India. Interests in waste to energy and offshore wind projects are on the rise. Net Zero, Carbon-free Infrastructure, Digital, EV and Green Hydrogen Economy expected to pick pace in India in coming years.
- Flexibilisation of thermal plants, tariff-based competitive bidding for Round the Clock (RTC) power with Variable Renewable Electricity (VRE) bundled with underutilized thermal plants are being awarded. Green Term Ahead Market (GTAM) that allows renewable buyers and sellers to trade without long term PPAs is launched. This governs the market dynamics going forward.
- With ten units of 700MW PHWRs in fleet mode and imported bulk reactors opportunities, the nuclear sector is set to overtake thermal. Overseas opportunities with ITER, Korean and European majors offer international growth unexplored thus far.
- Hydro plants up to 25MW capacity are considered as renewables and are eligible for similar benefits. Pumped Storage Schemes (PSPs) receiving massive attention due to their simplicity, flexibility and quick turnaround to replace VRE.
- No new utility-scale thermal plants expected, and the focus in the sector is on digital, flexible power and environmental upgrades.
- Transmission and distribution infrastructure upgrades in India receiving due attention. Higher investments expected in transmission infrastructure, HVDC and FACTS, smart grids, distribution automation, load forecasting, microgrids, smart metering, WAMS etc. The Asia Pacific and MENA regions offer international opportunities.
- Large-scale renewable integration and adoption of mini & microgrids will impact the power flow in the grid and necessitate a new approach for grid planning studies in the future. Adoption of electric vehicles (EVs), Digitalisation and Distribution system Privatisation is also facilitating growth.
- Distribution system enhancement will bring in new players in DISCOMs and new opportunities in the areas of due diligence, AT&C loss reduction, infrastructure upgrades, energy storage, smart grids, smart meters and grid automation.
- Focus on digitalisation, IIOT and opex services for better plant operation and asset lifecycle management.

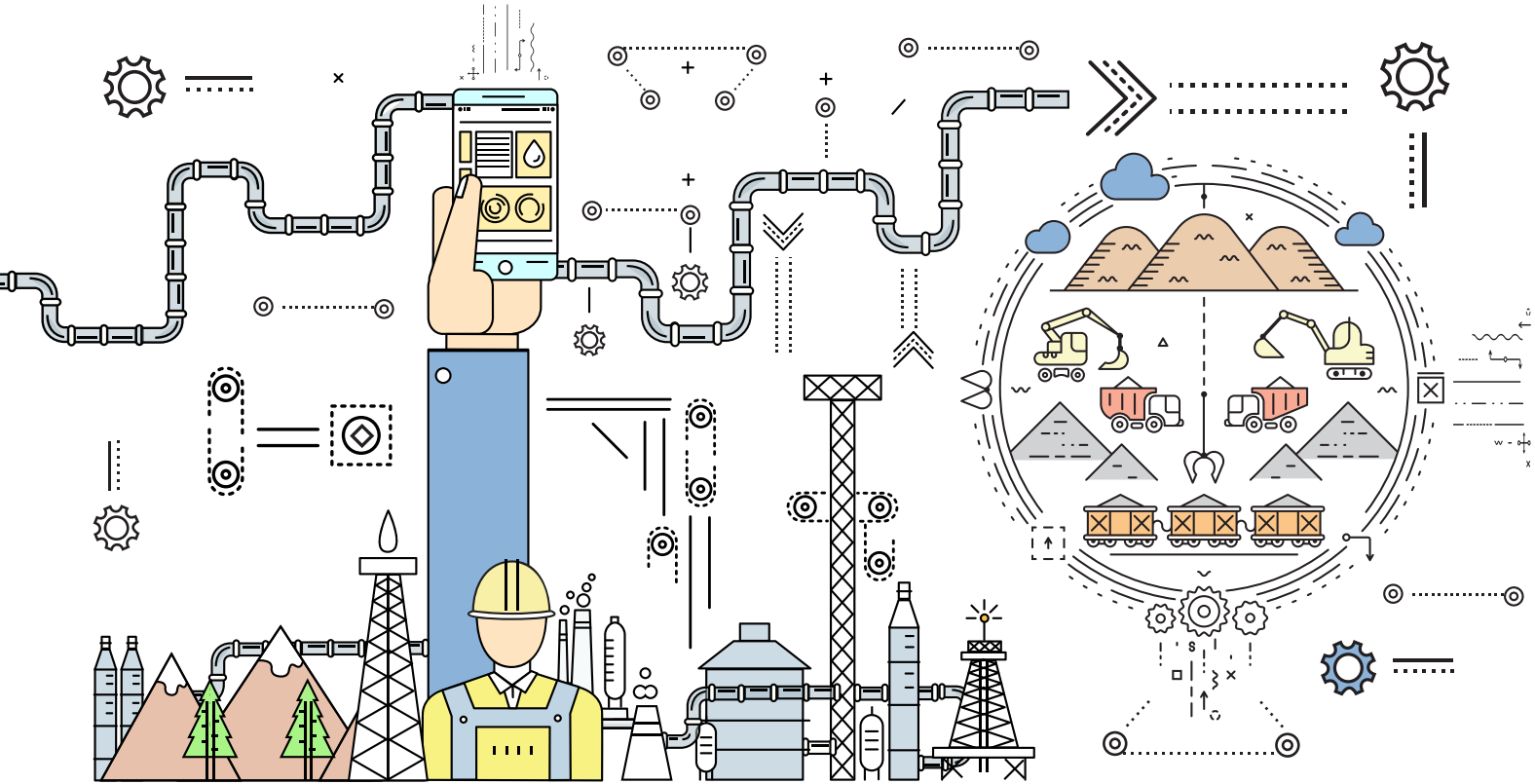
A PROJECT

Sustainable Alternatives to Karappara Kuriarkutty Irrigation Project – Kerala (SAKKIP)



Dr Rajashekhar Malur, Power Business Unit Head and Vice President, submitted the Inception Report to Honorable Minister for Water Resources, Government of Kerala, on 18th February 2021 in Palakkad

- SAKKIP is an Inter Basin Water Transfer (IBWT) project transferring water from Karappara stream of Chalakkudy basin to rain shadow regions in Palakkad district of Bharathapuzha basin
- This multi-purpose project is catering to irrigation, hydropower generation, drinking water supply and flood control. Also, it is sustainable both environmentally and socially as no sanctuary area is involved, no submergence of forest land, no rehabilitation and resettlement is required
- A Detailed Project Report (DPR) of SAKKIP covering survey, investigation, design drawings and cost estimates for the most feasible solution is complete.
- If implemented, this would be the fulfilment of a long-cherished dream of the community in the rain shadow belts in Kerala.



RESOURCES BUSINESS REVIEW

TCE's Resources sector has a proven track record of providing comprehensive engineering services from concept to commissioning, consistently delivering intelligent engineering solutions for its customers across the value chain. The Resources business has two sub-sectors, namely: Hydrocarbons & Chemicals and Mining & Metallurgy.

TCE is among the leading players in this industry segment, providing one-stop solutions for its valued customers from mines to metal manufacturing and processing. TCE's vast experience in the mining sector serves as a closed-loop solutions outfit, including Metals Processing, Ancillary Infrastructure and Raw Material Management, right from Exploration Planning.

With decades of experience in providing comprehensive engineering services (Concept to commissioning). Safety in Design and operations is critical in the Hydrogen and Chemical Industry; hence, the HCBU workforce is oriented into the Safety Instrumented System (SIS), one of the essential layers of protection against accidents and hazards of the industry.



10%

MMBU Contribution to Revenue



12%

HCBU Contribution to Revenue

HYDROCARBON AND CHEMICALS

FY2020-21 was an incredibly challenging year for companies across the globe. Plant Engineering has traditionally been collaborative; there was a belief that such work cannot work from home. However, the Pandemic forced people to think otherwise and find ways to deliver. Within a very short period of 10 days, the computer hardware was shipped to our engineers and CAD personnel. New and ingenious ways were tried and perfected for remote collaboration using MS Teams and

other technological tools. Daily scheduled MS Teams meeting assigned work, discussed progress and resolved interdisciplinary coordination etc. Reviews and quality checks were conducted over MS Teams. Even 3D Model reviews were conducted online with Clients (some in different time zones/continents). The situation motivated people to devise ingenious ways to ensure continuity of delivery, ensuring efficiency and quality despite working remotely from their homes.

AREAS OF EXPERTISE

Under this sector, TCE provides comprehensive EPCM services to clients in the fields of:

- Oil, Gas and Petroleum Refineries
- Petrochemicals
- Fertilisers
- Chemicals & Speciality Chemicals
- Food & Pharmaceuticals
- Glass, Rubber, Cement and Allied Process Industries

KEY TRENDS SHAPING THE INDUSTRY

The Hydrocarbons and Chemicals sector envisages growth opportunities in the Indian markets fueled by higher consumption associated with rising living standards and rapid urbanisation in India. The growing realisation about the risk associated with the large concentration of Chemicals manufacturing in one country will present good opportunities as many large MNCs may plan to de-risk by diversifying their expansion locations.

Significant investments are planned in the refinery sector (both Public and Private Sector), Petrochemicals, and Speciality Chemicals sectors. Good demand is expected from the Construction Chemicals sector as well.

The Government of India aims to increase the share of natural gas in its energy mix from 6% to 15% by 2030. The government also plans to create a National Gas Grid, requiring the installation of additional Gas Pipeline Infrastructure

There is a thrust to utilise indigenously available Coal for manufacturing liquid fuel and Chemicals using Coal Gasification Technology. This will help in reducing the country's Crude Import bill.

India's refining capacity is planned to increase from 230 MMTPA to 440 MMTPA by 2030. All the refineries are now integrated with downstream petrochemical complexes to improve ROI and cater to the increasing demands of plastic polymers in the domestic market. Apart from the Capex projects in the domestic market, we expect to have good opportunities in the global market for the following types of projects to meet the need for sustainability and tighter emission controls:

- Plant upgrades, Automation and Revamps
- Asset Integrity Management
- Energy Optimisation Studies
- Efficiency improvement & Debottlenecking

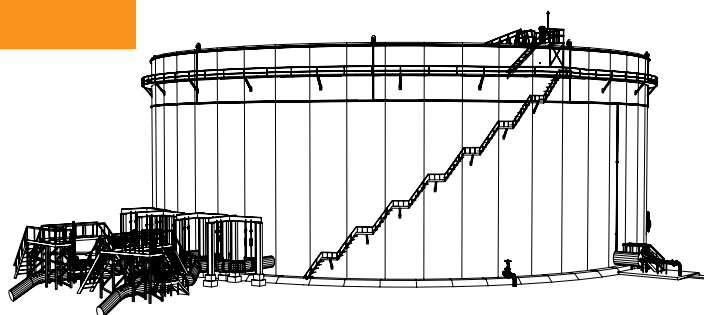
We see opportunities in bioethanol investments in India. Government of India has given a very challenging target of blending 20% Ethanol into Petrol by 2025. This will require massive addition of Ethanol manufacturing capacity. Unfortunately, the 2G Ethanol manufacturing units are not financially viable in stand-alone mode and require Viability Gap Funding from the Government of India.

The sector is well poised to leverage these opportunities with a healthy mix of domestic and international clients. This strategy is expected to help the industry maintain its growth momentum in the coming years. FY 2020-21 saw the strengthening of TCE's relationships with marquee clients, and more such long-term engagements are in the pipeline.

New and Important Projects

During FY2020-21, HCBU secured some outstanding and challenging projects on which the engineering work is progressing well despite the COVID-19 situation. Some of the noteworthy projects won during the year are:

- Greenfield Fluorochemical Manufacturing Plant for one of our strategic client in the western part of India.
- FEED Review and Project Management Consultancy Project for manufacturing Gas Processing and Methanol manufacturing plant for Brass Chemicals Nigeria
- A capacity expansion project for the manufacture of PVC for another strategic client in the southern part of India.



- Restart at the new location of WAN and TAN manufacturing project in Eastern Part of India
- Engineering Services for a countrywide program of Petroleum Fuel Retail Outlets for an Oil Marketing company.

MINING AND METALS

AREAS OF EXPERTISE

This sector continues to deliver creative solutions to customers worldwide across the value chain of:

- Iron & Steel
- Mining & Beneficiation of Ferrous & Non-ferrous
- Smelting and Processing

The focus areas in the mining sector are:

- Geology and Mine Planning
- Mineral Processing and beneficiation
- Material Handling.

Our areas of expertise are:

- Concept to Commissioning Services with interface management
- Portfolio Management Services
- Process Engineering & Interface Management
- Layout & Logistics
- Sustainability & Environmental Engineering
- Waste Management
- Asset Integrity Management

M&M BU has built its strength in Capex and Opex areas for the Iron & Steel Industry by providing services in building some of the largest plants in Iron & Steel making and Finishing areas and rebuilding the existing world in close coordination with the world reputed technology suppliers. For the last five years, the diversification has also resulted in customer orientation in providing services related to productivity improvement, operational assistance and asset integrity management throughout the life cycle of the assets. In the non-ferrous area, the sector strategy has resulted in innovative solutions to the reputed customers in the green metal entire value chain.

The experiences gained in the OPEX services has now been expanded to the non-ferrous areas to meet the present business objective. A separate dedicated team is working on identified initiatives like Energy Transition, Clean technology, High-value product differentiation, and Digital point solution to identified Industrial problems and partners.

The sector approach will be towards reskilling the entire workforce to orient in changing Industry need and the drivers enforcing the changes - Re-envisioning talent management in the digital age.

A PROJECT

Establishing viability of a Copper Smelter Project in Indonesia

TCE was inducted into the project at a critical juncture, with a brief of doing a Gap Analysis of the FEED document. For TCE, it was a first of a kind (FOAK) assignment on the captive copper smelter.

During the process, due to the high project Cost Estimate, TCE was asked to take the additional task of optimisation and value engineering to bring down the overall Project Cost. TCE studied and analysed the project and carried out trade-off studies on multiple ideas (termed 'M-15 Initiatives'). Based on these studies, the capacity of the project was changed to 900 kTPA and accordingly, the entire project was re-structured and re-engineered. TCE carried out a fresh Cost Estimation based on the M-15 Initiatives. The new Capex Figure arrived at was almost 2/3rd of the FEED estimate and made the project financial far more attractive than it was. Further fine-tuning was done to show a positive NPV for the project, which finally established viability.

SoW of TCE was further extended to include preparation of LSTK bid document, techno-commercial adjudication culminating into submission of Evaluation Report with clear Recommendation.



In re-structuring and re-engineering to downsize the plant, various other areas were also identified with the potential of cost optimisation. In this endeavour, TCE objectively analysed each of these ideas based on their technicality, cost-effectiveness and operational suitability. Trade-off studies were also carried out wherever applicable to establish the suitability of one option over the other. This part of the SoW has also been successfully concluded, and the bids received from the bidders are within $\pm 10\%$ of the TCE Estimate.

KEY TRENDS SHAPING THE INDUSTRY

The Mining & Metals (M&M) industry is facing new challenges. In the past, the mining sector had to plan their production based on “highest volumes at the lowest production cost”. Today, they have to be profitable and productive and sustainable under new & upcoming regulations. The Mining and Metals (M&M) sector is returning to growth, but companies face a transformed competitive and operating landscape.

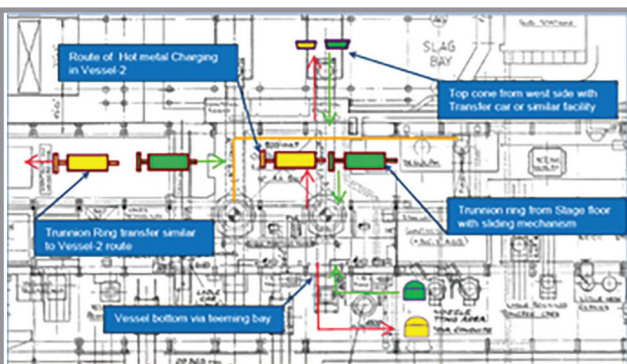
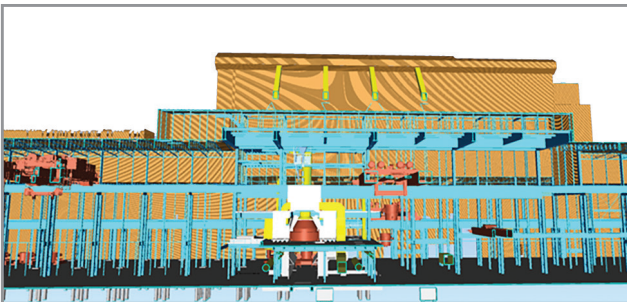
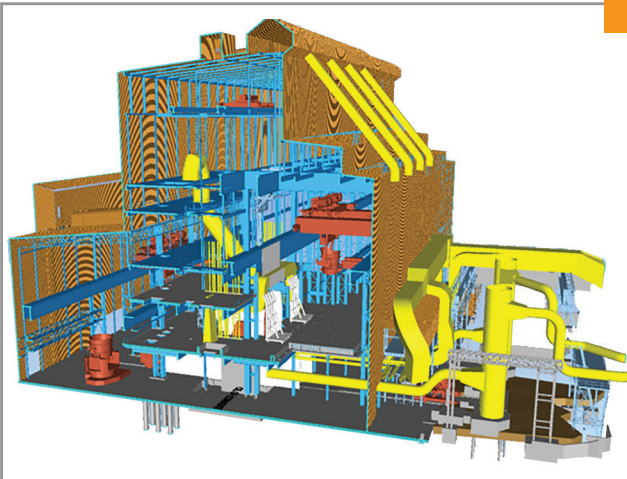
Key drivers for the next decade for this sector are the following :

- Import substitution strategy (Resource Security) with redefined globalisation
- Climate change and environmental sustainability without compromising competitiveness

- Energy transition and Net-Zero based redesign approach
- Adopting Controlled-Tower methodology in new normal conditions
- Innovate and integrate various functions to bring greater capital efficiency
- Adoption of Industry 4.0/5.0, digitalisation and remote-controlled centre for plant operations

A PROJECT

Vessel replacement in Steel Melt Shop



Among 2 - 330T capacity Converter vessel inside a Steel Melt Shop, one old Converter was planned to be replaced keeping other Converter under operation to meet the production requirement. TCE was awarded to prepare an Option Selection Report with 3 most suitable cost-effective Concept for Converter replacement work, keeping downtime for replacement work as minimum as possible, with minimum building structure alteration, maintaining all safety aspects during construction work & safety regarding ongoing production in another converter vessel.

A 3D model of the 330T capacity Converter vessel with its associated parts, Dog House structure, Duct work, Building structure, Operated Cranes inside the plant in different bays, other relevant facilities and installation at the vicinity of the converter vessel was prepared based on the 3D scan data, As-Built drawing & Drone survey to transform the asset into a digital platform, with zero site visit from engineering office. The most advanced jacking & skidding system used in construction work are being explored to facilitate removal & installation of the vessel in blowing stand through a confined corridor.

Based on a detailed study for 3 options, activities for replacing the existing vessel are being identified. Relevant structural analysis, Design and other necessary calculation are being done to estimate the quantity of modification work required. Finally, digital technical specifications for the vessel replacement work & building structure alteration shall be issued to collect fit-for-purpose offers with minimum human intervention at the site.

DIGITAL, INNOVATION & TECHNOLOGY CLUSTER



05

Strategic
Partnerships



3000+

Employees Enabled
to Work from Home



03

Critical Digital
Projects Completed
and Handed Over

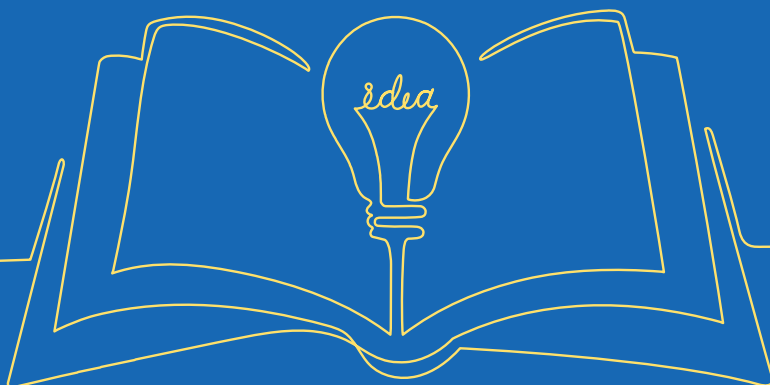


Digital & Advanced Technology

Business Review

- Intelligent P&ID
- 3D Modeling, 4D/5D Simulation
- BIM
- Asset Digitisation
- Asset Information Management
- Digital Handover
- Engineering IT Implementation Services
- Digital Roadmap Advisory
- Asset Performance Management
- Digital Workforce Solutions
- Industry 4.0 Point Solutions
- Asset Life Assessment
- Product Engineering – Design, Analysis
- Machine Development/ Localisation
- Special Projects

Technology Group Review





DIGITAL & ADVANCED TECHNOLOGY

Digital technologies are transforming all industries, redefining business models, and creating new opportunities for proactive, innovative, and agile organisations. Organisations that enjoy a monopoly or significant market share today can no longer take comfort in their market leadership. In the traditional model of competition, the competitors are clearly identifiable. But in the digital era, the lines of competition are blurred, with erstwhile outsiders becoming real-time competitors (e.g., IT players, Management Consultants etc., in the field of engineering consultancy). These new competitors start offering unique value proposition by leveraging digital technologies and use new business models to serve customers. Business model changes will soon become one of the critical factors driving the viability of many businesses in the future.

Recognising the rapidly changing market dynamics, TCE decided to form a separate Digital Cluster to give sharper focus on growth in digital services, building innovation culture and contributing to digital transformation within the organisation. Digital Cluster plans to leverage TCEs strong domain expertise in offering differentiated digital services to customers, carve out a dominant position in the market, and support the future-proofing of TCE.

The Digital cluster comprises three groups - Digital and Advance Technology Business Unit, Technology Organisation

and Corporate IT team. The Digital cluster also manages the Accelerated Delivery Centre (ADC).

While Product engineering and Asset digitisation services are established practices, Asset Management or Industry 4.0 business is under incubation. The target is to commercialise and start a business in this area this year.

Digital and Advance technology (DAT) Business Unit offers services shown in Fig-1.

DAT BU has 3 distinct offerings aligned to emerging customer needs in the plant lifecycle

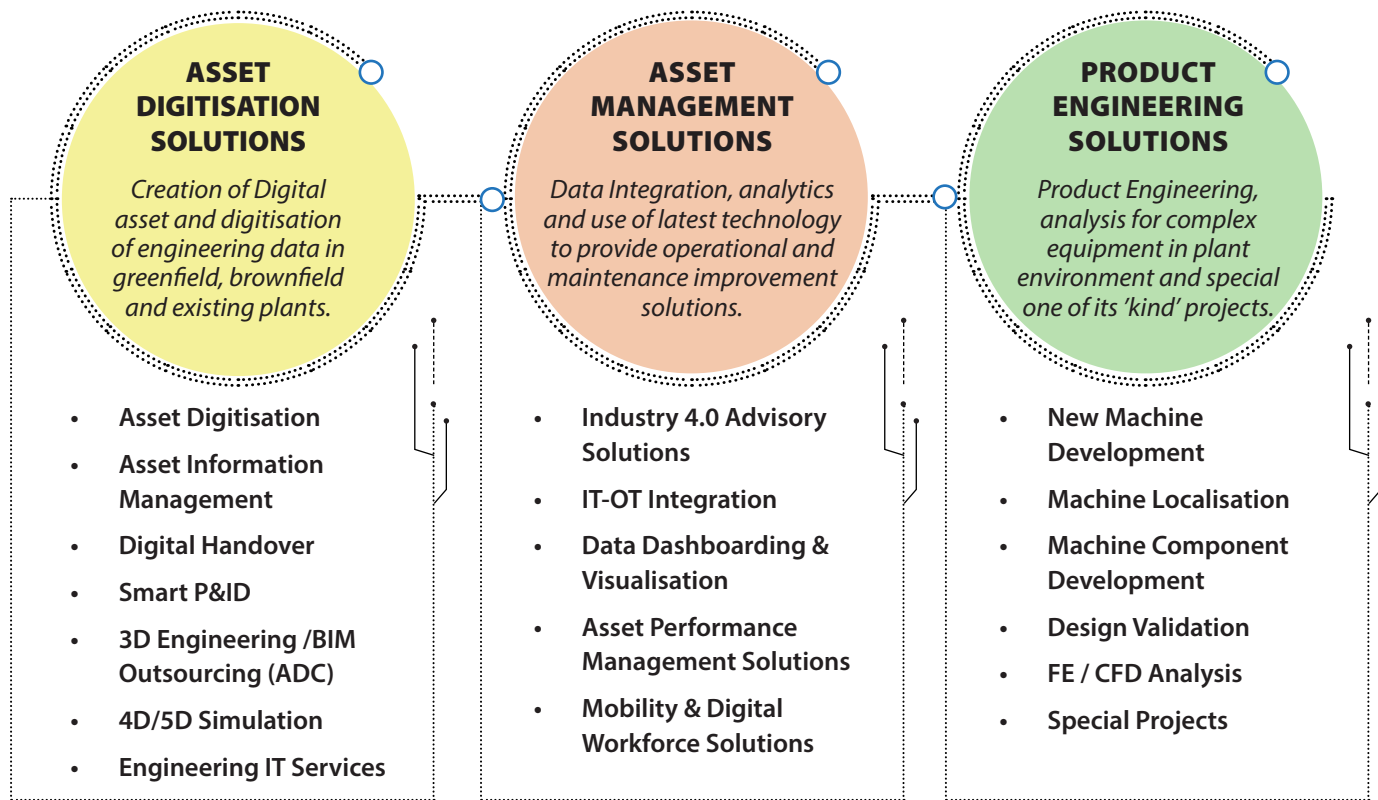


Fig-1 DAT BU Services

KEY TRENDS SHAPING THE INDUSTRY:

● **COVID-19 has led to increased awareness and opened Client mindset towards Digital Adoption:**

COVID-19 and related business disruptions faced by most clients have led to a change in mindset towards digital adoption from 'good to have' to a 'must have'. Clients are now looking for solutions that can provide them with enhanced performance, reliability and information availability to take faster, better decisions and reduce risk—another area of high interest in 'low touch' technologies that reduce dependence on physical human presence.

● **However, the economic uncertainties are making most firms hold back on significant investments:**

While PSUs and prominent private industrial players are floating formal RFQs of substantial value for a wide range of digital handover requirements, asset digitisation, APM, digital workforce, etc. the decision making on these tenders is witnessing much delay. Most medium-sized firms are waiting for the economic scenario to become more stable before proceeding with digital investments. The focus of many companies currently is more on investments in modernising their IT infrastructure like supply chain management, logistics, Cloud migration etc. while investments in the adoption of digital technologies

in OT areas like improvements in efficiencies, maintenance, throughput etc. are getting postponed.

● **The emergence of new-age digital project management solutions:**

With increasing business uncertainty and reducing access to stable capital, Capex investments are at risk, and there is immense pressure on project teams to optimise sanctioned Capex projects. Many clients are beginning to look for the next set of smart project management solutions that help them optimise costs, reduce/delay risks and provide better real-time visibility of ground realities.

● **Digital engineering and digital tools:**

Creation and management of assets using digital tools and the interfacing and collaboration of physical and digital assets. Building Information Modelling (BIM) is expected to gain ground as a reliable, shared knowledge resource for information and decision-making.

In line with the above key trends, we plan to strengthen our business on Industry 4.0, FEA and BIM. We also aim to grow our asset digitisation business and are focused on building an internal centre of excellence for digital engineering.

KEY ACHIEVEMENTS

● **Some of the major projects completed by the DAT business unit include**

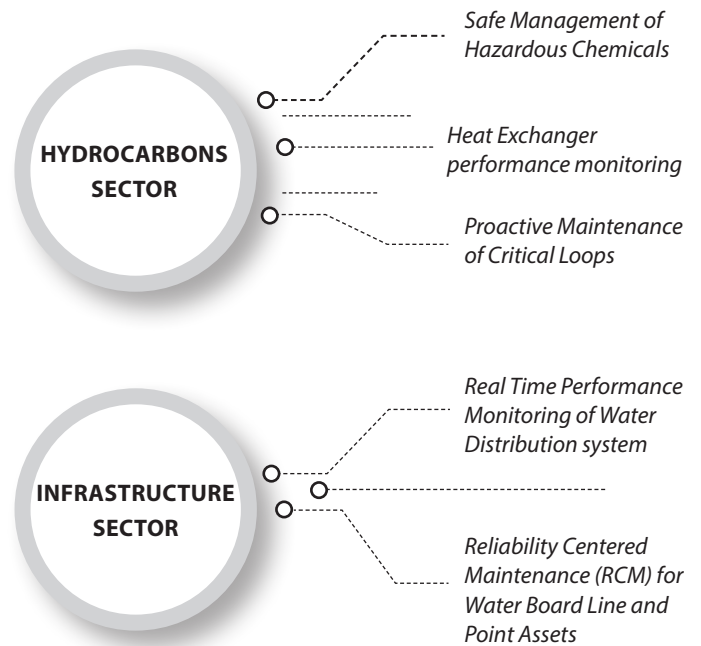
1. Phase 1 of IOCL TDMS project – digitised and integrated 6 Lakh documents (drawings, 3D models, P&IDs, equipment datasheets) to create a contextualised engineering database (asset information model)
2. Laser scanning and asset modelling project for Nayara Energy and HPCL (5 units)
3. Detailed engineering of mobile launch pedestal for ISRO GLSV MK III Vehicle (to be used for India's Gaganyaan mission).
4. Detailed engineering of an integrated cryogenic engine test facility for ISRO – design and detailed engineering of special-purpose equipment

Further to play the role of a System integrator, it is imperative to build a network of reliable partners for software, hardware, networking, cybersecurity, OEMs. Good progress has been achieved in this direction in FY 2020-21

● **Commercialisation of Point solutions**

As part of digitalisation services offerings, apart from introducing appropriate third party solutions in system integrator role, DAT BU, in collaboration with design business

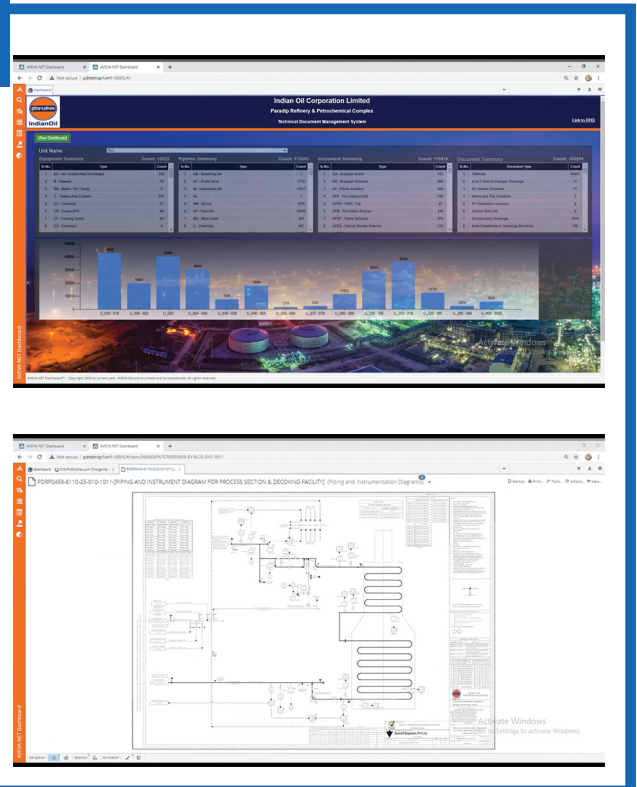
units are developing and commercialising TCE's Digital Point Solutions (DPOs), which is designed to address certain specific operational problems by deriving deep insights using domain knowledge and data analytics. Some of the solutions under various stages of development and commercialisation include

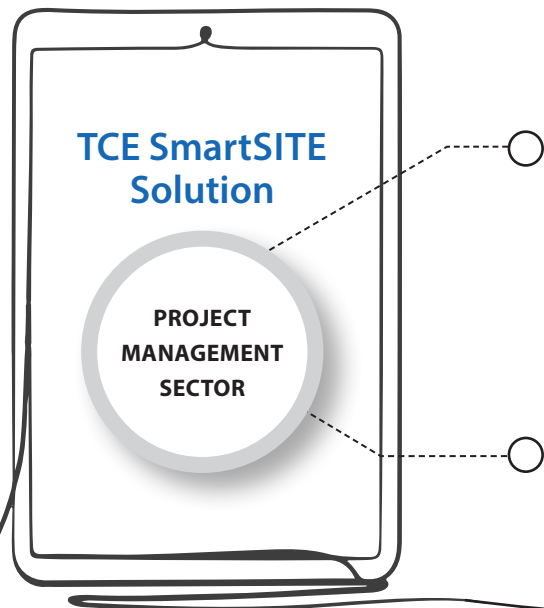
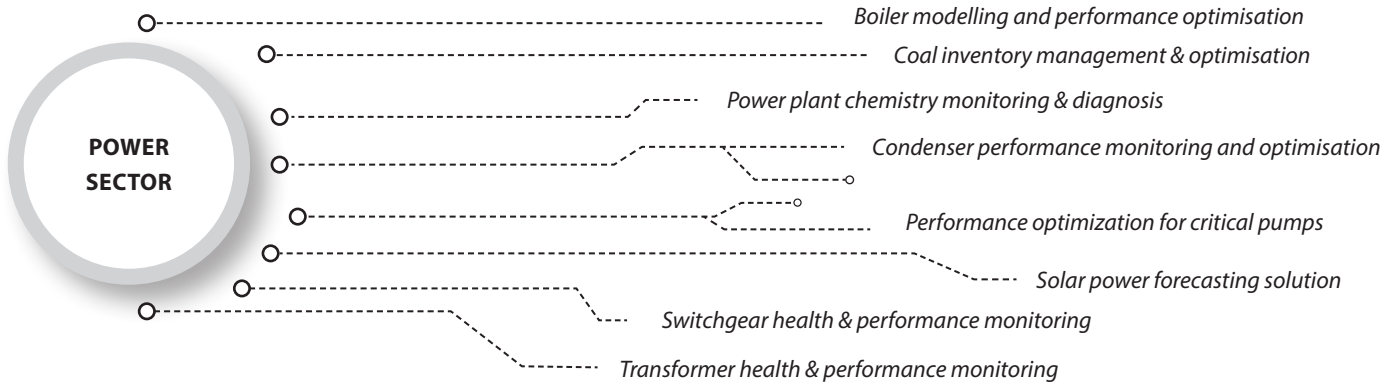


A PROJECT
Technical Document Management System (TDMS) at IOCL

Designed, supplied and installed TDMS compatible/conformed with ISO 15926 architecture standards or platform with all associated system architecture, hardware and software components, dependencies, licenses, installations, testing, training, and maintenance for refineries division of Indian Oil Corporation Limited.

- TDMS shall facilitate day-to-day information accessibility to the users via a web-based Interface and be a focal point for information for future engineering modifications, upgrades and plant operation
- Formulation and finalisation of tree structure type browser for all Refineries
- Any single document/information updated on any refinery that should be reflected at all refineries with a back-up at Refinery Head-Quarter
- Within a single click of a button, manage the 1D/2D/3D information





- Paperless / Low Touch Construction Processes
- Dynamic Dashboard reporting from site to PMO / All Stakeholders
- Making Site members 'MOBILE' with cell phone application
- Collaborative Communication platform for all
- Safety Data Analysis - Suraksha portal - Real time Analysis of Safety Data
- Knowledge / Experience capture from Projects with EDMS and JCR
- Virtual Command Control Centre - SME Support in resolving technical issues
- Progress monitoring with drones and PTZ cameras

A PROJECT Implementation of Electronic Project Data & Document management system (EPDDMS)

Implementation of Electronic Project Data & Document management system for Visakh Refinery Modernization Project (VRMP) of M/S Hindustan Petroleum Corporation Limited, Vishakhapatnam (Andhra Pradesh) India


- EPDDMS shall facilitate day-to-day information accessibility to the users via a web-based Interface and be a focal point for information for future engineering modifications, upgrades and plant operation
- As-built data as handover to ensure that HPCL can leverage this data for Plant Operations and Maintenance
- Expected **5 Lakhs** documents and **2 Lakhs** Tags and **10 3D** Models
- To increase engineering efficiency and productivity in terms of Project Handover







TECHNOLOGY GROUP

The agility of response defines an organisation’s ability to overcome challenges posed by disruptive technologies or natural disasters, which can render well-planned policies and risk mitigation measures ineffective. The COVID-19 Pandemic that affected multiple businesses and geographies prompted the organisation to rethink business strategies to survive and turn the adversity into a growth opportunity.


 **03** New Productisation / Templatisation

 **23** Presentations in various conferences and **5** Panel Discussions


 **08** New Solution Offerings

 **27** Papers published in reputed journals/ magazines

 **10** YouTube Videos

 **52** SMEs from TCE enrolled as members of various BIS committees

 **13** Whitepapers on the TCE website

 **31** Articles written and uploaded on the company website

Technology group, which has traditionally been the knowledge backbone in consulting business, had to reinvent and accelerate work strategies aligned to business requirement. Business continuity plans required strong Work from Home (WfH) strategy implementation leveraging the digital platform.

In addition to revitalising and enhancing the organisation’s existing knowledge base, the technology group also helped develop new technology area work resulting in business acquisition in emerging fields of green hydrogen and industrial energy transitions.

The technology group also took the leading role in promoting innovation culture in the organisation. The new initiatives of creating an innovation framework and promoting value engineering practice in projects are aimed to bring a difference in service to the customer. These initiatives were integrated with the business plans of the Business Units (BU's).

The significant contributions from technology group in the journey of reimagining, reinventing, and growth are:

TCE BRANDING

Publications and conference presentations reflect the depth of knowledge and rich experience of the organisation. The technology group and subject matter experts authored and facilitated such branding work at the national and international level, TCE's insight on technology trends, showcasing unique designs, and various services. TCE co-hosted a webinar on energy transition with TERI where initiatives on collaboration for strategies to mitigate climate change were discussed.

TCE is actively involved in the development of design standards and is associated with the BIS committee. Fifty-two subject matter experts from TCE currently represent various BIS committees for revising existing codes/developing new codes. 22 new members are awaiting confirmation. TCE is collaborating with renowned institutions like IIT-Bombay and IISc Bangalore to research and develop new and emerging technology areas for future commercialisation.

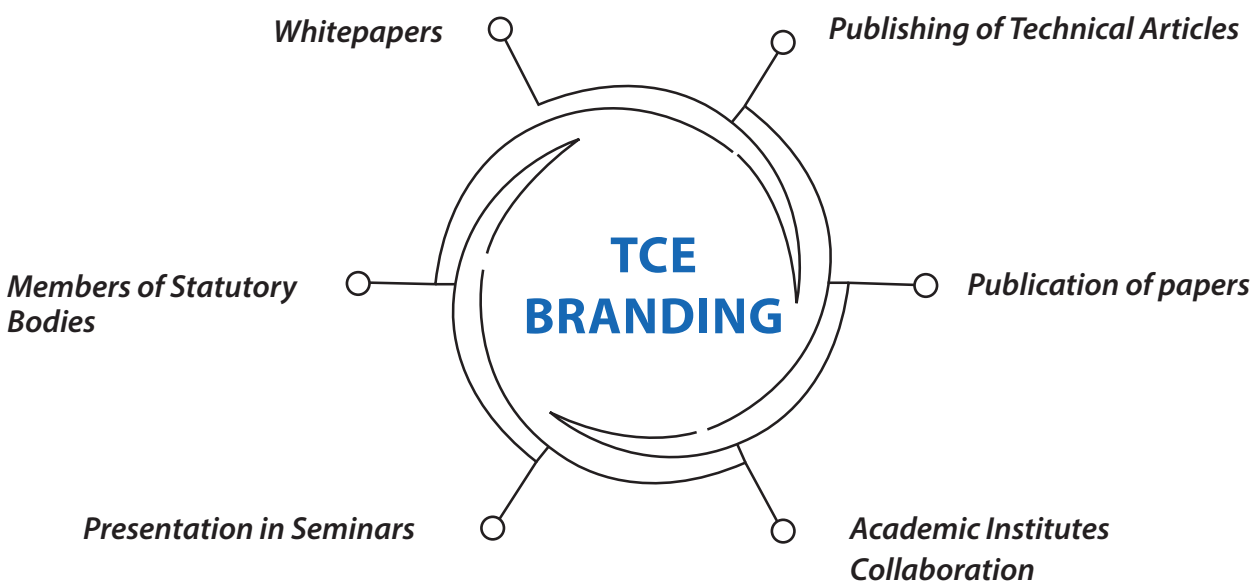
Institution of Engineers organises a flagship event every year, providing a broad technology platform.

TCE presented four technical papers in the 35th edition of the Indian Engineering Congress, a virtual event based on the theme "Engineering for Self-Reliance and Sustainable Goals". The paper titled "Green Hydrogen- A perspective" was adjudged as the best paper in the environmental engineering division.

To further enhance the connection with current and future customers, videos on trending technologies, biodiversity studies and complex and critical project solutions were created and uploaded on the company YouTube channel.

KNOWLEDGE SHARING VIA DIGITAL WAY

Knowledge sharing is fundamental to the collective knowledge, intelligence and abilities of an organisation. Virtual platforms served as essential means of knowledge dissemination under the Work from Home (WfH) scenario. Technology lecture series introduced under the Qlik2Learn initiative addressed technical training needs on state of the art engineering and technology to a broad audience across the organisation. Through 34 lecture sessions, domain experts expounded on a wide range of trending and exciting topics, followed by lively Q&A sessions. These lectures were recorded and available anytime, providing training on demand to the internal users. Such initiatives have helped TCE maintain and enhance service offerings to customers during the WFH scenario.



TCE Branding initiatives by Technology Group

PROJECT INNOVATIONS IN DESIGN ENGINEERING (PRIDE):

With an apt acronym PRIDE, this initiative allowed project teams to showcase and share the achievements in building value to our customers and help create a sense of pride in being part of such a unique team.

The second virtual knowledge-sharing e-Pride session was conducted in a new format. Separate sessions were conducted for each Business Unit (BU) involving 100 teams. Around 57 teams were shortlisted for the final presentation round, which was a live event. The participating teams submitted a pre-recorded video which was evaluated by a jury panel, and winners announced.

INNOVATION FRAMEWORK:

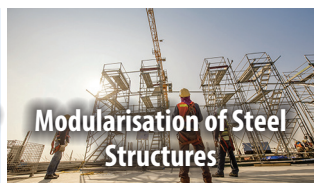
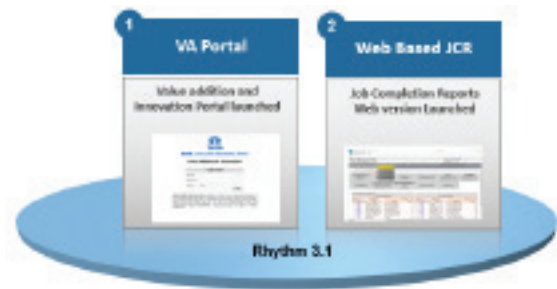
The ability to develop and launch new products & services relevant to the market on a sustainable basis defines any organisation. TCE's mission is "To provide Technically Excellent and Innovative Solutions for adding value for all stakeholders and operate globally as professional consulting engineers".

Innovation processes focus on creating and maximising value to the business, revenue generation through IP, differentiated value-added services, and creating market disruption to stay ahead of the competition. To promote an innovative culture in TCE, an innovation framework was set up with a detailed project plan, and clear objectives and deliverables monitored and reviewed. FY 2020-21 saw record number of 92 Innovista entries of which 23 moved to 2nd round.

CRITICAL PROJECT SUPPORT:

To meet the challenges of remote working on technically challenging tasks, Discipline Heads engaged directly with project teams on various critical and challenging projects in new work domains. This included the Metro projects, High-Speed Rail terminal project, MSME projects where the Delivery Heads (DH's) handheld the team members to guide design solutions and create opportunities for developing standard design tools and products.

Highlights of the contribution by the Technology Group:



TECHNOLOGY DEVELOPMENT
Tech Strategies & New Tech Offerings
Productisation and Templatisation

QA/QC
Error Free Deliverables

TECHNICAL BRANDING
Improve Brand Value
Seminars, Conferences



ACADEMIA COLLABORATION
Program Partnership
CSR Funded Research Programs

KNOWLEDGE MANAGEMENT
Enhanced Productivity
Capture & Dissemination of Knowledge

BUSINESS ENABLEMENT
Technically Superior Solutions
Value Additions & Innovations

IT Initiatives during COVID-19

The COVID-19 induced lockdown last year caught everyone unaware. The employees were anxious and clueless about how to work and meet customer commitments. The traditional working methods were challenged, and organisations were forced to introduce Work from Home (WFH).

Suddenly the IT Department, which functioned silently in the background, became the centre around which the entire company operation revolved. Everyone realised the importance of these silent warriors.

Just like the employees, the lockdown was unexpected for the IT team as well. Transforming an entire organisation into a virtual workforce overnight was a herculean task for any IT team. Fortunately, TCE had its infrastructure ready. Within a short time, we could plan and align the resources to cater to the new ways of working and thus enabled business continuity.

The first step was to conduct user profiling based on the category of users, applications they used, and the mode of operation. Quickly actions were initiated to get each type up and running:

- Individual computing assets were moved to their residences
- For some, remote access to the office workstation over a secure VPN through their personal system was enabled.
- In some cases, secondary assets were arranged for employees who didn't have any personal computer for initiating remote access to their office systems.

OUR PILLARS OF SUCCESS:

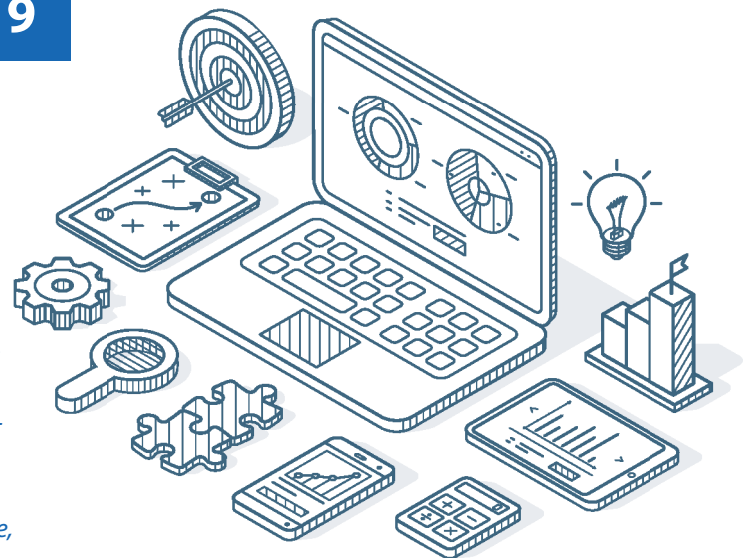
1. Security

While we moved away from the office ecosystem and continued performing our roles from the home office, the organisation needed visibility of its people, assets, and data. As we move out of our corporate network's secured and protected environment to an open and unsecured internet, we needed to safeguard our systems and protect the data from external attacks, intruders, or leakage.

Enterprise Mobility Suite helped us extend Conditional Access, where only authorised company assets could access the data and download it, preventing data leak. In addition, we migrated our on-prem antivirus solution to AI/ML-based NextGen Antivirus and EDR solution on the cloud with more features and functionality, ensuring more visibility and control of end-user devices and better protection from cyberthreats. We also enhanced our Data Security layer by rolling out a DLP solution for endpoints.

2. Productivity

We enabled our employees with secured access to the project data and ported the required software licenses to their systems in advance, giving them an edge right from day 1. Subsequently, we migrated most of our licenses to the cloud to ensure continuous availability, concurrency, and effective utilisation.



3. Collaboration

TCE has been using Microsoft Teams, SharePoint and Integrated Document Management System and has practised collaborative work culture for many years. This helped our employees get acquainted with the remote work culture faster.

4. End-user Support and Awareness

IT Helpdesk team provided support to our employees round the clock over all communication channels to help this transition. We ensured that our task force gets the necessary support from hardware vendors at their doorstep. IT Team engaged in frequent communications with all the employees to keep their systems safe and advised them to follow standard security hygiene practices. Periodic emailers were sent out to all employees to reiterate the awareness of Phishing, Malware, Ransomware and other online threats.

5. Infrastructure, the Next Steps

Being a future-focused organisation, we took proactive steps to address possible chances of network clogging that may arise in the future. Bandwidth was ramped up at all Internet gateways. Secondary communication links were introduced to avoid loss of productivity due to link failures.

Virtual Desktop Infrastructure was deployed to enable a smooth and enhanced remote work experience for 3D engineering application users. This solution could address the need for high graphic requirements, data availability, data security, and ease of access.

With work from home becoming a way of life, we at TCE are prepared to serve our customers from anywhere at any time.



TALENT MANAGEMENT



81.5%

Utilisation of People



85%

Men

15%

Women

Diversity



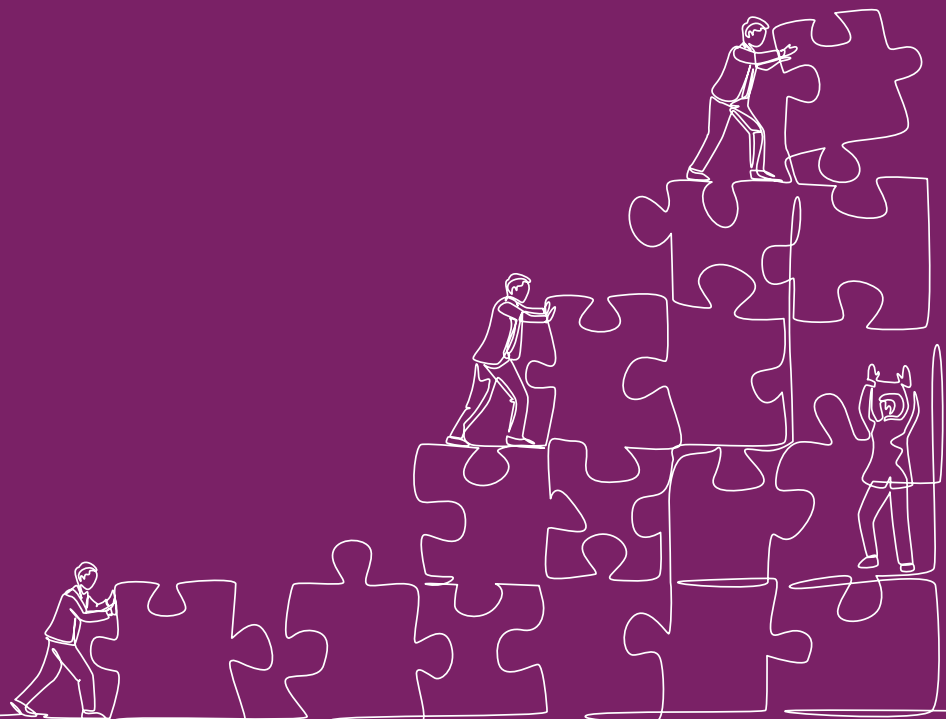
2%

Attrition of Key Talent



13.1

Training Person-days per employee



Human resource isn't a thing we do, it is the thing that runs our business.

By Steve Wynne





TALENT MANAGEMENT

2020 was, in many ways, an extraordinary year. It brought many unprecedented challenges and opportunities, heightening the need for our people strategy to keep pace with the fast-changing tide. At TCE, our workforce is the life force of our business, and ensuring their well-being is the bedrock of our people agenda. Thus, even in the face of the impending Pandemic, we galvanised our efforts and responded promptly with clear priorities and measures to keep our people safe. Understanding and responding to the trends shaping the future of work enabled us to create the best possible virtual environment for our distributed workforce.

Our agile people processes and digital readiness ensured that we could architect an intelligent digital workplace to navigate shifting employee expectations and firmly position them for success in a remote setup.

Our commitment to ensuring an inclusive, innovative, meritocratic, and people-centric culture has not wavered in these challenging times, translating into all aspects of our people processes, including onboarding, engagement, training, performance management, etc.

ENHANCED EMPLOYEE EXPERIENCE THROUGH CONNECTION AND COMMUNICATION

For TCEites, the COVID-19 year introduced us to the new work culture and brought us closer together. We embarked on a journey of enhanced employee experience to ensure that our employees were equipped with the right know-how and positive mindset to navigate the ensuing uncertainty.

At the onset, we began by connecting with employees on virtual calls across all the delivery centres and project sites based in various geographies - both domestic and international. These calls helped us carry regular health check-ins with our employees and their families, and more importantly, helped us understand their challenges and state of their well-being during the Pandemic. These calls between Business and HR leaders with the employees helped establish a sense of reassurance and reinforced the Tata culture of compassion and empathy at TCE.



work from home

We also kept our employees abreast with the latest updates on the business front to ensure we all remain connected and engaged through these times. Across multiple forums, our business leaders, right from the Team Leads, BU Leadership to the apex leaders, including our Managing Director, continued to regularly communicate with all our employees, updating them on the team and business unit performance, the overall health of our business and on the adoption of new strategies ensuring that our company is strongly forging its way ahead.

We held an organisation-wide LIVE e-Townhall session chaired by our MD, Mr Amit Sharma, immediately following the lockdown, where employees from across the globe participated.

This helped us assuage the employees' concerns regarding the Pandemic, sharing TCE's COVID-19 Response plan and BCP (Business Continuity Plans) and guidelines on effectively working from home. This was followed by quarterly e-Townhalls across all our Delivery Centres (DCs), which helped us share continuous business updates, project success stories, check on employees' family well-being and keep them updated on the Do's and Don'ts pertaining to the Pandemic and lockdown. These measures certainly enhanced our employee engagement quotient. All our employees were now fully armed with all information related to business and TCE's future growth plans, thereby ensuring they continue to align with TCE's goals and Vision, Mission & Values.

Employee Well Being at the heart of Employee Experience

At TCE, our employees' well-being has always been paramount to us. Thus, during this Pandemic period, their health and well-being have been at the heart of TCE's response plan. We continued to promote a positive environment in the remote workplaces, support employees' physical, mental and emotional well-being, and help them overcome their challenges during this time.

To create a remote workplace that supports well-being, we initiated a virtual wellness campaign, *WellnessHQ*, that focused on the following elements:

- *Enhancing the Culture of Wellbeing* – Empowering our employees through raising awareness on mental health and making well-being conversations commonplace.
- *Education and Anticipation* – Building capability on well-being by providing on-demand access to self-help wellness tools for individuals and teams, including bite-sized capsule modules on managing stress and forging ahead with resilience & perseverance.
- *Encouraging Support* – Encouraging managers to take responsibility for their teams' well-being and build empathy towards team members in these challenging times.

As part of this campaign, we conducted several well-being sessions every month with a different theme each month. The initiatives included offering our employees a series of physical well-being sessions such as *Virtual Yoga Masterclasses* on *Breathing Techniques*, sessions on *Heart N Health*, *Wellbeing for Women* and even social well-being such as *Art of Photography*.

We believe that fostering a fun work environment can make employees less stressed, more productive, more creative, and more engaged. In the past year, Fun@Work metamorphosed into Fun@WfH (work from home). As part of our social well-being initiative, we created Delivery Centre wise, Virtual DC Breakout rooms to keep the spirit of Fun@Work intact, with hosting multiple team activities in the breakout rooms such as various brain-boosting games, virtual retreats and exciting activities such as virtual celebrations, hosting webcasts, live talent show and other performances on several occasions. We also extended the invite to the family members of our employees, whom we like to address as our extended TCE family, as they graciously joined us along with excitement and fervour.

Boosting Employee Morale

To recognise the indomitable spirit of TCEites who have shown a brave face to the challenges, we revamped several of our recognition programs such as our Virtual Kudos to facilitate recognition of team members using the virtual mode, launching peer-to-peer recognition program #ThankYouBuddy, driving online platforms of recognition to keep the employee morale high and celebrating the innovation and value addition showcased by our employees through e-PRIDE Poster Sessions.



We also conducted a virtual Happiness Week to spread cheer and bring more positivity to the teams. Over five days, employees across the organisation shared recognition drops with one another based on the theme of the day and celebrated moments that mattered.

ENHANCING PEOPLE DEVELOPMENT AS A FORCE FOR CHANGE

TCE's development interventions are systematically designed, amalgamated and executed to construct and perpetuate a high-performance workforce. Our Talent Management programs focus on the holistic development of our employees via cultivating a Learning culture in the organisation.

There is an enhanced focus on developing talent through programs related to leadership journeys – with the mode of delivery becoming virtual but equally effective.

Leadership Journey Redefined

To cater to our dynamic business requirement, it's imperative that our leaders demonstrate a collaborative mindset and can tackle the accelerating change to create disruptive growth. With this intent, we conceptualised and launched the PIVOT leadership program in partnership with Tata Management Training Centre (TMTTC). Pivot lays a strong learning foundation for our Senior management and focuses on developing global leadership competencies to navigate an increasingly complex business environment.

This program is an immersive learning journey of six months, having well embedded scientific and adaptive tools like psychometric assessment, Self-paced learning, Virtual classroom, access to the digital platform of Tata Tomorrow University and industry expert talks.

The program is received very well by our senior management, and we are continuously striving to bring in a richer learning experience for them.

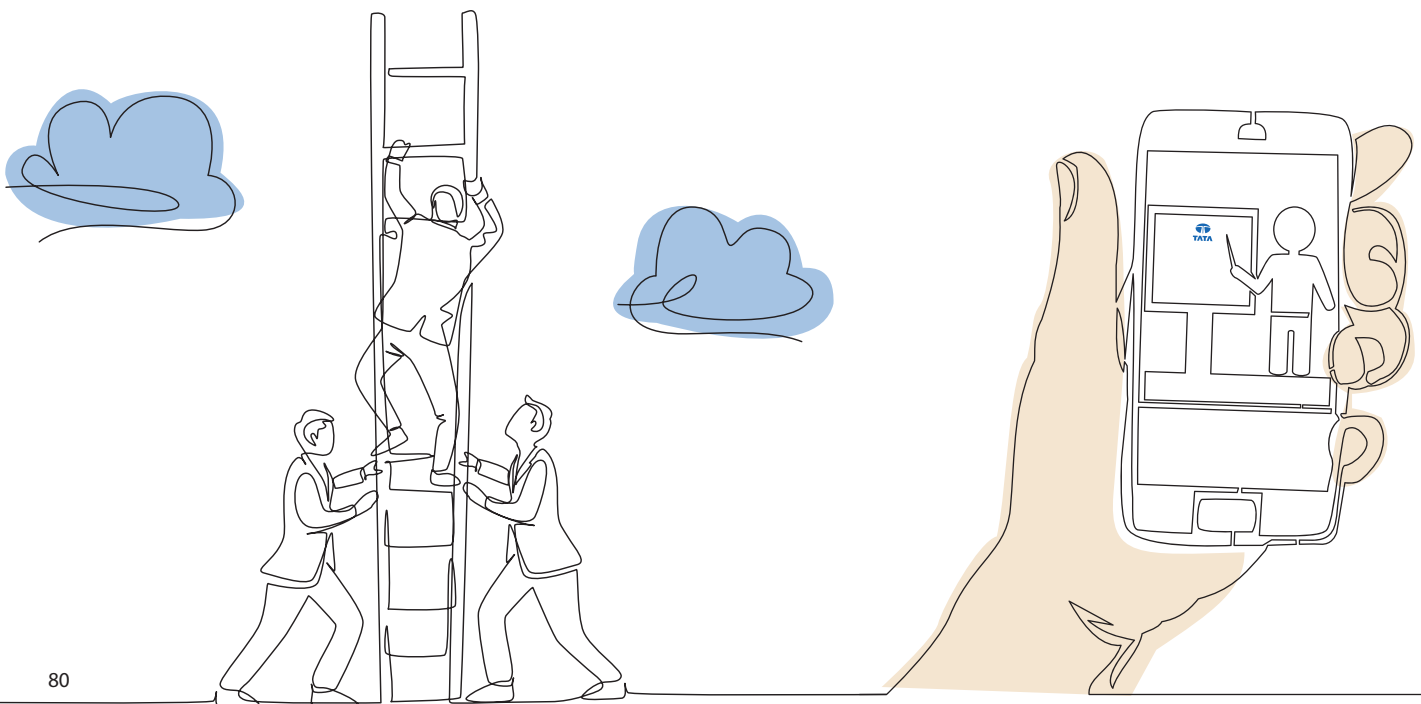
Another flagship program of TCE to catalyse the transition of managers to thought leaders is coined as LEAP. Leadership Excellence through Awareness and Practice (LEAP) commenced in August 2020 to foster a growth mindset, strategic thinking, managing change & diversity. The pedagogy includes integrative and reflective learning.

This augmented journey is spanned over five months and is delivered over a high-impact virtual environment. To provide participants with real-time insights, we incorporated peer-to-peer learning, Speed coaching, Action learning projects as a part of the development journey. The program focuses on four aspects of capability building, i.e. Leading Self, Leading and Growing Team, Leading with Trust and Leading with Influence.

AUGMENTING DIGITAL LEARNING

We capitalised on technology to create engaging and enriching training opportunities for our employees. Our interactive Virtual Learning Academy, Qlik2Learn, added a new dimension to the entire learning experience. It enabled our employees to access a plethora of learning modules to take charge of their self-development, such as live learning events, e-learning programs, videos, open-source programs, and blogs across various categories like FutureFit Softskills Masterkey and WellnessHQ.

Another step in ushering in the digital learning experience was the launch of our virtual onboarding program, In-Touch 2.0. The program encapsulates pre-onboarding and



orientation elements, with all new hire journey touchpoints right from manager connect, buddy interaction to detailed orientation sessions being held virtually. The digital pre-onboarding program is delivered through our cloud-based advanced learning platform iBridge, designed to ensure that the experiential methodology is retained in virtual training through interactive elements in the learning modules, topical assessments, and real-time interaction with in-house subject matter experts and social learning elements such as peer interactions, etc.

To accelerate growth and create an unhindered platform for nurturing and developing talent, we recently launched our immersive learning platform, SMILe-Percipio, powered by cutting-edge learning technology.

The new virtual learning academy empowers our employees with the convenience and comfort of learning from anywhere. This customised, bite-sized and self-paced learning provides one-click access to 500 pre-curated learning channels with thousands of learning content in the form of videos, books, podcasts and many more. The platform has integrated AI technology to help learners get more personalised learning recommendations and encourage active learning. We also launched a virtual gamified learning tournament called Learning Premier League (LPL), spanning one week to catalyse behavioural and technical competency development among employees by incentivising learning engagement and adoption. The program created a renewed interest in learning and self-development at TCE, seeing enthusiastic participation from employees across locations and business units.

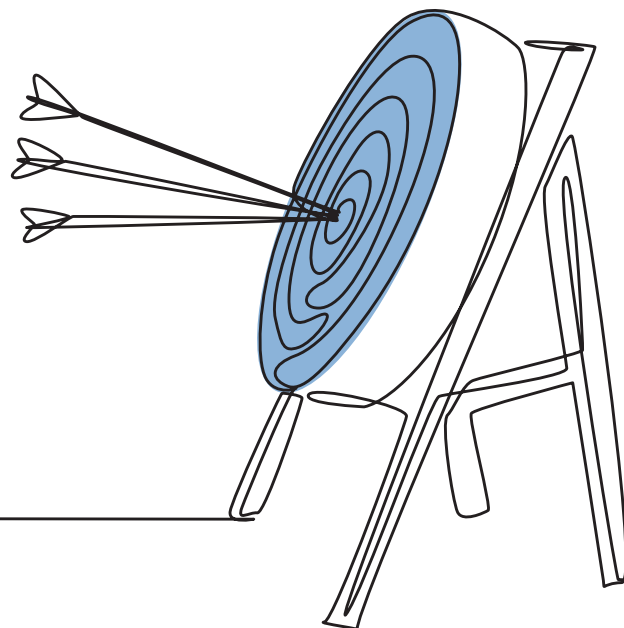
MANAGING PERFORMANCE FOR SUCCESSFUL DELIVERY IN A VIRTUAL WORLD

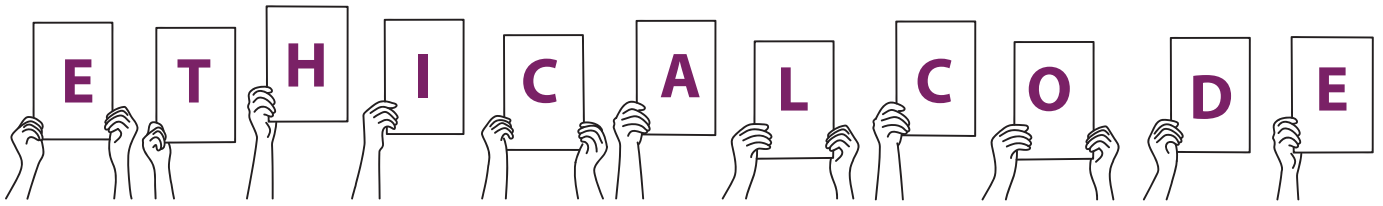
With the transition to a predominantly virtual workforce, and with fewer day-to-day touchpoints between managers and their teams, we reinforced the following elements in our performance management process, which are critical to ensure the realisation of organisational objectives in the Pandemic era:

1. Cascading organisation goals to individuals and alignment to changing business priorities.
2. Communicating clear performance expectations and prioritisation of work to ensure successful performance delivery.
3. Checking in regularly to monitor team and individual performance with structured feedback mechanisms.

At TCE, we believe that our performance management process is one of the most critical anchors of our culture of empathy. Hence, we ensured weaving in compassionate feedback mechanisms in every stage of the process, encompassing multi-dimensional business, team, and individual elements.

Our digital performance management platform, PRISM, helped us ensure holistic goal-setting and effective tracking of individual performance to bolster our high-performance culture. Further, with a continued focus on structured mid-term reviews, quarterly feedback discussions and ongoing performance conversations, we were able to setup our teams for success.





LIVING THE ETHICAL CODE AT TCE

Our code of conduct confirms our commitment to being an equal opportunity employer with no discrimination or harassment.

Imbibing TCoC among new and existing employees continued to be a focus area. It was further strengthened through focused communication by conducting "Ethics Week" in October 2020 and March 2021 to enhance awareness of the Tata Code of Conduct (TCoC) LBE framework. A mascot named "Dr Owlivia" – ethics advisor was launched during Ethics Week to promote an ethical environment and resolve ethical dilemmas employees and other stakeholders face.

Several communication programs, e-learning programs, Quiz based on Case Studies were conducted virtually (due to the COVID-19 Pandemic) in TCoC, POSH, Gift and Hospitality, Whistle Blower Policy, ABAC and AML for all stakeholders, including third Party workforce and Supplier /Partners. TCoC / POSH related communication was done by Senior Leadership in various communication forums such as Offsite, COCs.

Learnings from FY 2020-21 concerns were shared during CHRO connect calls and Quarterly DC Communications by Senior Leadership. LBE Survey on Ethics was conducted in July 2020

to measure the progress/ effectiveness of the LBE framework. External subject matter experts trained ethics Counsellors and POSH IC members. A dedicated section on Ethics was introduced in TCEExpression to enhance awareness across employee segments. Group Ethics Office recognised the process for "Third Party Due Diligence" implemented by TCE as one of the Promising Practices followed by Group Companies.

Disclosures as per the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013:

The company has zero tolerance for sexual harassment at the workplace. It has adopted a Policy on prevention, prohibition and redressal of sexual harassment at the workplace in line with the provisions of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 and the Rules thereunder for prevention and redressal of complaints of sexual harassment at workplace.

Three complaints have been reported under the Prevention of Sexual Harassment Act in FY 2020-21. 2 complaints were duly investigated and closed within the timeline stipulated as per the Act. One complaint was received at the end of February 2021, and the investigation is in progress.

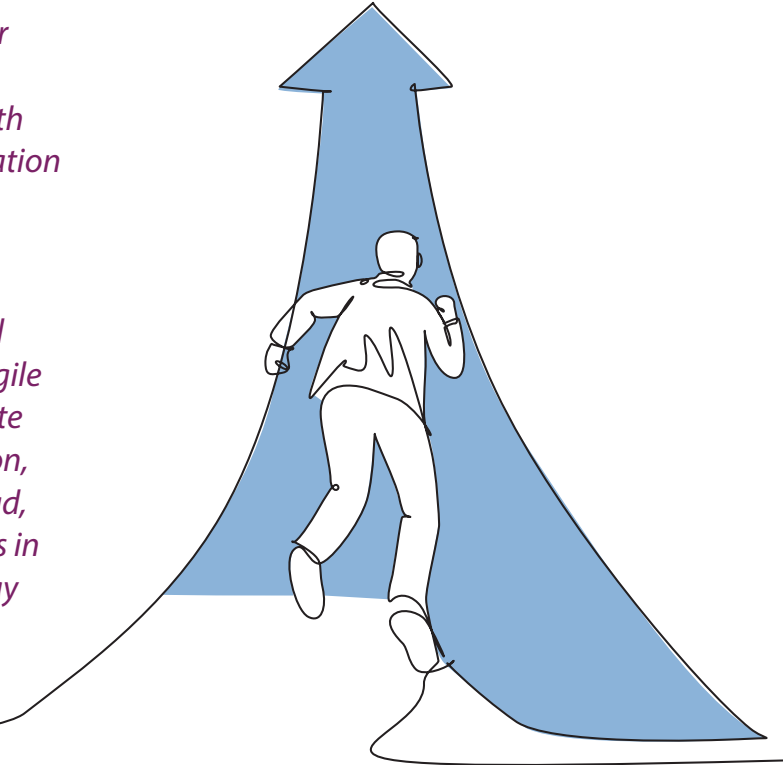
A mascot named "Dr Owlivia" – ethics advisor was launched during Ethics Week to promote an ethical environment and resolve ethical dilemmas employees and other stakeholders face.



THE ROAD AHEAD

As the newer ways of working are still unfolding before us, HR at TCE is steadfast in its commitment towards a people-first philosophy. The Pandemic has further underscored the importance of creating rich employee experiences and engaging in synergistic solutions.

As we continue to scout for opportunities to partner with the business in creating a differentiated talent pool, we shall endeavour to focus on speed, simplicity and scale while being sensitive to employee expectations. With technology taking the reins of the transformation story of TCE, HR shall continue to play a pivotal role in driving innovation as a culture and propel growth by facilitating scaling of talent development and realisation of the full potential of our workforce while bolstering agile processes and systems. We are poised to create a thriving workplace that breeds collaboration, engagement and contribution. Looking ahead, we are excited to discover unexplored terrains in our human capital journey and define the way forward to something bigger and better than before.



CORPORATE SOCIAL RESPONSIBILITY



5027

Corporate Volunteering Person hours



8450

Lives Touched



Rs. 205 Lakhs

Invested in CSR projects



1914

Employees Volunteered



TCEndeavour

CARE | SHARE | RESTORE

- Sustainable Livelihood
- Infrastructure
- Education
- Health and Hygiene
- Research





CORPORATE SOCIAL RESPONSIBILITY

Powered by our flagship programmes and various volunteering initiatives, we are delivering on our social responsibility. Our Corporate Sustainability Policy framework offers the foundation to build our social well-being programmes by leveraging our core capabilities. Our primary focus areas are Sustainable Livelihood, Education, Infrastructure, Health & Hygiene and Research.

TCE’s fundamental principle in enriching the communities it serves is sharing its core skills and capabilities to benefit society. With every project the Company undertakes, TCE reviews the value creation in terms of long-term sustainability for its communities.

The programs are reviewed periodically with the working partners and the beneficiaries and course corrections adopted in consultation with the apex CSR Committee.

The Committee deliberates on the proposal and approves the programs. The Committee also guides & approves the program evaluation and monitoring.

Sustainable Livelihood
375
 People Benefitted

Education
6075
 Kids Benefitted

Health & Hygiene
1625
 People Benefitted

Infrastructure
375
 People Benefitted

SUSTAINABLE LIVELIHOOD PROGRAM



With close to 42% of rural India engaged in agrarian pursuits, we understand this segment's plight and lack of opportunities. Challenges like seasonal dependence, knowledge scarcity, dearth of resources, etc., plague the growth of this sector. However, we believe that armed with the right resources and opportunities, there is tremendous scope for the rural economy to rise above these challenges and unlock its potential to thrive.

Thus, we have been undertaking several initiatives to address the urgent need of stabilising and diversifying farm-based livelihoods in rural areas. One such Initiative is the Water Management and Income Generation Program in Jawhar block, Maharashtra. Further, we worked extensively to scale the Khoripada program to include two new clusters in Hateri Dapti & Malghar as they are especially susceptible rural regions of Maharashtra. This Initiative has led to a significant lasting impact among close to 2000 lives. Some of the key initiatives under this program are:

- Water Management through Farm pond fencing**
 In the face of little groundwater and the absence of any perennial water source, rainwater harvesting is the saving grace that creates protective irrigation in the Dapti and Malghar villages of Maharashtra. Since its inception, this Initiative has helped build a total of 12 ponds totalling a capacity to harvest rainwater up to 1.80 Crore litres of water at one time. Five ponds with a capacity of 75 Lakhs litres were added in FY 2020-21. Harvested rainwater helps to store surface water for use both during and after the monsoon. It is used for the protective irrigation of horticulture plots and jasmine crops in the region, thus powering prosperity and growth. Through this protective irrigation, 35 acres of horticulture plantation was propagated by the farmers, along with rabbi vegetable cultivation by 14 farmers and propagation of jasmine plots by 44 farmers.
- Capability Building to foster Sustainable Livelihood**
 Capability building has been a core focus area for our sustainable livelihood initiative. We believe that skill development can contribute leaps and bounds to alleviate the challenges in distressed agrarian zones. Several training initiatives were undertaken on farm cultivation, collective



marketing, fertiliser preparation, etc. These programs significantly improved the lives of the community both in terms of income and health.

Around 65 farmers were supported with the cultivation of various types of crops such as leguminous crop, Groundnuts, in Kharif season, which they successfully cultivated, resulting in an average yield of 26kg groundnut from 3kg of seed support. With the availability of excess yield, families could use a portion for home consumption as well. Through the course of this program, several farmers were trained in the cultivation of commercial vegetables. They successfully cultivated kharif and rabbi vegetables such as bitter gourd, chilli, brinjal, tomato, fenugreek, and ridge gourd. This was further made possible due to the availability of harvested pond water. They were also supported with the cultivation of moisture crops like gram and beans to ensure utilisation of the field after harvesting paddy crops. As a result of this program, net income per farmer significantly improved due to increased area under cultivation and yield from the field. The Initiative successfully resulted in an overall yield worth Rs. 3.5 Lakhs.

As part of the floriculture program, over 44 farmers joined the jasmine cultivation program. They were provided with regular training, exposure visits, field demonstration on aftercare, plant protection, and propping practices. Among them, 9 farmers initiated collective marketing for one month resulting in a successful sale of 19kg flowers at Rs 400/kg.

Another initiative under this program was establishing 30 guava and jack fruit model plots of high yielding variety, 700 mango grafts and plantation of 700 cashew grafts by 35 farmers in individual plots. In addition to this, over 4500 saplings of bamboo, teak, and acacia were also planted on the boundaries of these plots.

Training on organic fertiliser preparation was imparted to the farmers to help them understand and adopt low-cost organic techniques in cultivation. Further, to strengthen the existing kitchen garden of the villagers, we promoted the perennial saplings of curry leaves, guava, lemon across 150 families. This also involved an intervention to ensure the quality of health of the villagers through the installation of glass tiles and smoke tiles in the kitchen to allow clear passage of daylight and reduction of smoke due to cooking.

A series of 5 training was also conducted, focusing on various topics such as Jasmine plot layout and its pit filling of Wadi pits, plantation and staking of horticulture plants, Organic techniques, Wadi aftercare and stacking, weeding etc. This was followed by a field exposure visit to a nearby project area to train over 30 farmers on soil water conservation and aftercare interventions.



All these interventions have helped the farmers to incorporate the latest know-how into their daily operations. Enhancing their operations with these tools has led to the enhancement of farmers' knowledge in these areas and helped them adopt profitable, environmentally sound practices and contribute to the quality of life.

- **Empowering Self-Help Groups (SHGs)**

To empower Self Help Groups in the region with financial acumen and know-how, we organised a training session on effective record keeping and regular saving. The training helped raise awareness among 6 SHGs and led to a significant improvement in their financial planning behaviours. We went a step further to conduct field exposure visits for selective members of the SHG group to existing wadi plots and the oil extraction unit at Pimpalshet village. This field visit helped them get hands-on exposure to the best practices in this sector, empowering them with renewed approaches and techniques.

- **Facilitating rural banking through eDost Initiative**

Enabling access to banking and financial services in these remote villages is a key focus area of our sustainable livelihood initiative. This has been made possible by leveraging technology and partnering with BAIF Institute for Sustainable Livelihoods and Development to provide last-mile access in Malghar village. In the absence of banking services in this village, the villagers would have to walk miles away to the nearest Taluka to avail of this service leading to the loss of 1 full day of productive work.

Hence, we promoted the eDost Initiative, which provides services like withdrawal of money, mobile recharge, fund transfer, checking of account balance, electricity bill payment, etc., through the convenience of a digital application. This Initiative helped equip the villagers with easy and timely access to banking services, thereby saving time, effort, and money.

HEALTH & HYGIENE



The first COVID-19 case in India was reported on January 30, 2020, and the first death in India due to COVID-19 happened on March 12.

We recognised the need to take care of the weak and underprivileged, daily wagers whose livelihoods were impacted. Provisions, supplies and hygiene kits were arranged to reach such sections, and healthcare workers, through our partner organisation.

In partnership with Prime Education Health Learning Services (PEHL), we distributed COVID-19 Kits to 277 families containing sanitiser, pulse oximeter, digital thermometer, material for cloth masks to a resident of Malghar, Navapada, Khoripada and Dapti villages.

Together with our partner organisation, Community Health workers in these villages received a demonstration on using Digital thermometer, Oxygen saturation checking and registration of villagers. Local linkages and contact details were provided in case of emergency.

The COVID-19 Pandemic is causing many changes in the daily lives of people around the world. However, some things can be done to maintain a healthy lifestyle in these difficult times. Various Community awareness programs were held in the Jawhar Cluster, including sessions on preventive measures of COVID-19, which health workers and 112 villagers attended. Further, a critical awareness session was conducted for the villagers in September on the Role of Nutrition during

COVID-19 to ensure adequate intake of essential nutrients to increase immunity that the villagers and health workers attended. Nutrient kit containing Turdal-2kg, Oil 1 kg, Salt -1kg and Turmeric- 100gm was distributed to 208 families in these villages.

To enhance the competencies and build the capacity of Community Health workers, detailed sessions on preventive measure for the COVID-19 Pandemic were conducted in October.

A community awareness session on Food Security and Public Distribution System was conducted in December to educate the Health workers about the eligibility criteria, types of cards, functioning of the PDS, obtain a new ration card and other relevant forms.

In January 2021, Health workers training conducted on Self Help Groups (SHGs), 6 health workers and 28 villagers attended.

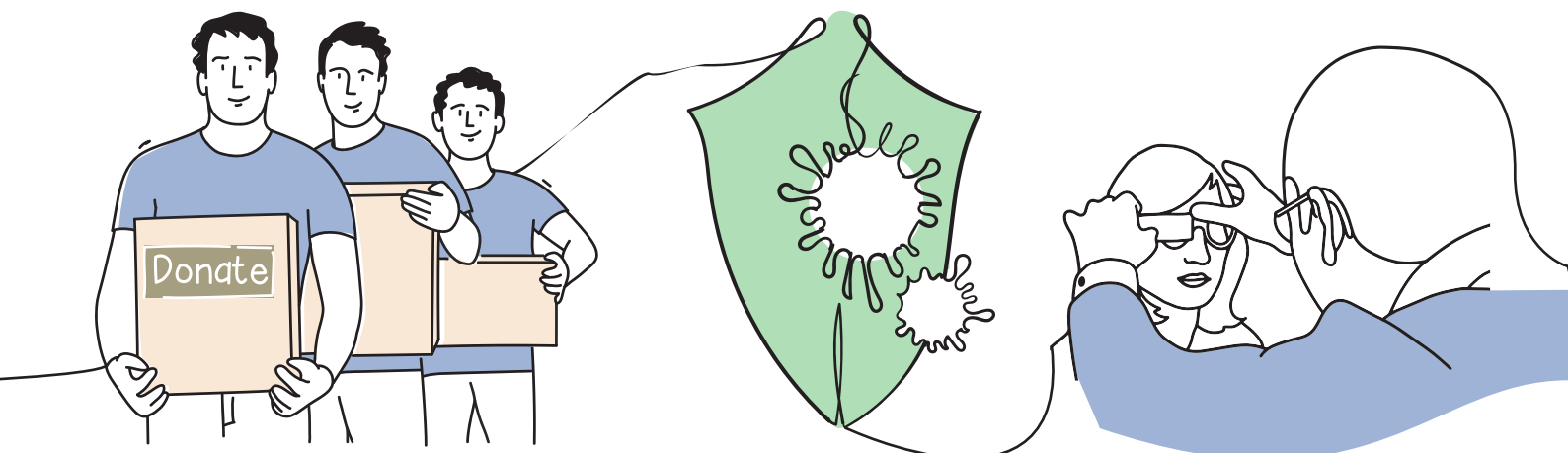
As the COVID-19 Pandemic persists, governments face the challenge of promoting preventive behaviours. Simultaneously, they must ensure that enough individuals choose to get themselves vaccinated to achieve herd immunity.

As the nation embarked on another mass vaccination campaign, it was pertinent to raise awareness through campaigns & community awareness sessions.

In February Community Awareness Program addressing queries on COVID-19 & the potential benefits of the vaccine was held. The program benefitted Community health workers as well as 32 villagers in Malghar & Dapti villages.

More than 160 villagers were screened for various eye-related disorders during a free eye camp organised in 2 of the villages in Jawhar block in the month of February 2021. The camp aimed at providing free treatment to the villagers suffering from eye-related disorders also brought awareness about diseases that lead to vision loss.

A team of eye specialists examined around 160 people, along with free consultation, free medicines and eye drops were distributed to patients. Of the people screened, a total of 12 people was referred for surgery to correct cataracts, and free spectacles were provided to 57 patients.



EDUCATION



TCE is a technology company and has been supporting projects on enhancing education standards in the country. TCE recruits and trains hundreds of engineers every year. It partners with other non-profits like Door Step School to improve the quality of education for underprivileged children. It seeks to ensure pre-primary and primary education for all children up to 14, leading to their overall development.

- **School on Wheels**

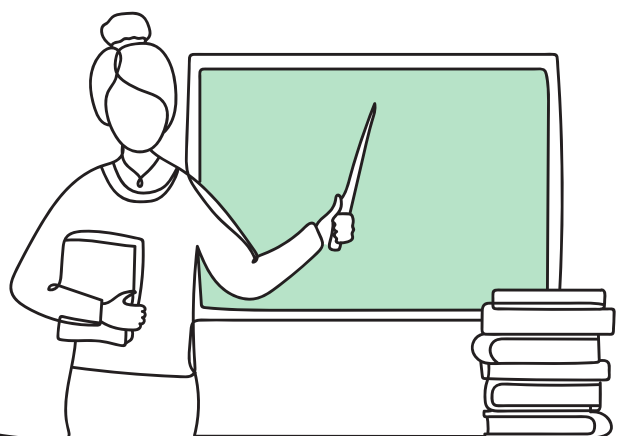
The School on Wheels (SoW) is a Door Step School's signature program. The key component of the project is a bus designed as a mobile classroom to provide alternate educational facilities to children in different locations such as pavement dwellings, road construction sites, temporary slums and areas where street children are found in large numbers, and there is a lack of space for conducting classes.

Since the inception, the project has benefitted thousands of children between 3-18 years.

In a day, the School on Wheels visits 2 or 3 locations, and 2-hour sessions are held in each location. In FY 21, School on Wheels has reached out to more than 834 children.

COVID-19 impacted the project as the lockdown was enforced in the country, creating a terrible effect on the students' lives. Since migrant workers moved to their natives and work in large construction sites slowed down, the children's education started to get badly impacted, and students started to drop out.

SoW immediately conducted a diagnostic study to understand the needs and challenges considering the Pandemic, post which an action plan was created and deployed. In the new plan, we moved classes closure to their home. SOW started with online WhatsApp classes 45minutes session, the library was opened, and study material and practise worksheets to all the students were distributed.



The parents and elderly family members were onboarded to the program to support virtual learning. This new form of knowledge has helped the onboarding parents. Parents have also started taking an interest in their children's education and engaging with teachers on children's challenges.

Efforts are being made to enroll these children in formal schools at the beginning of the next financial year

Other key components of the project include a community-based educational program, a school partnership program, and adolescent children from the community.

• Career Awareness

In partnership with one of the non-profits firms, TCE has been helping students from low-income groups studying in government schools to acquire skills that help them get employment and stable careers.

TCE has been able to help 117 students from marginalised communities studying in government schools by providing them job-oriented skilling programs to make them employable through phase I, II, III, IV of the programs. The students were offered vocational skills covering 30 courses offered by 15 Institutes. The partnership has helped underprivileged students access quality education and training in vocational programs and achieve their dreams.

Out of 117 students, 101 (86%) beneficiary students are in the age group 18-25 years, and 42 (36%) of the students were females.

81 (69%) students have completed their course, and 68 students post-completion are employed. The students received an average salary of Rs 16,500; the balance 13 students pursued advanced study/higher education.

• CSR Grants for Research Programs:

As part of CSR, TCE has engaged with Academia in the following areas: -

Laboratory Support for Supercritical Carbon Dioxide Thermal Cycle at Inter-disciplinary Centre for Energy Research with IISc Bangalore – This lab supports the development of technology that uses CSP (Concentrated Solar Power) Super-critical CO₂ thermal cycle.

Large Scale Grid Integration of Renewable Power with IISc Bangalore – Integration of large-scale solar power with the grid will result in grid stability issues. This study finds the scale at which this happens and the remedial measures.

Digital Twins for Mechanical Components with IIT Bombay – This project aims to combine physics-based models with real-time data analytics and machine learning to predict the behaviour of mechanical components.

Design and Develop printable alkali activated mortar with construction and demolition waste. This project has started in March 2021 and aims to develop a framework for the systematic characterisation of construction and demolition wastes. A systematic and straightforward mixture design procedure for 3D printable mortar using alkali activation. Development of materials proportions suitable for printing alkali activated mortar with CDW. Demonstration and one-day training of making the alkali activated mortar with CDW and using the same for extrusion with the 3D printer at IIT Bombay for the TCE team. mortar/concrete with industrial by-products/residues as binders. Printing ability of alkali activated binders with CDW using 3D printing technology.



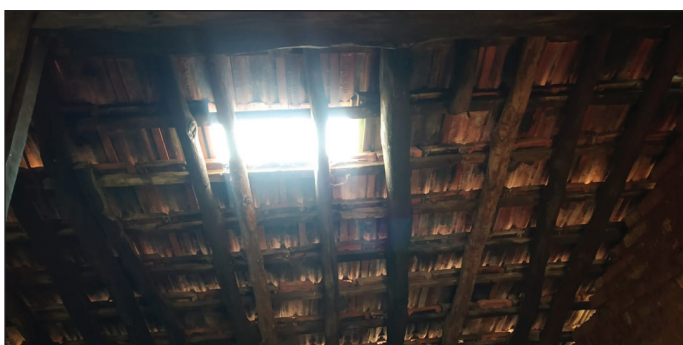
INFRASTRUCTURE



At TCE, we strive to achieve balanced rural infrastructure imperatives by facilitating the setting up of projects designed to ensure sustainable and secure growth for the rural areas. We continue to contribute to rural development through our unceasing endeavours to electrify rural households, create infrastructure, and engage in community-based interventions. As part of this program, we have successfully supported developmental initiatives in the 3 hamlets of the Malghar cluster of Maharashtra. One of the key areas of impact includes the renovation of 2 schools and the creation of playgrounds. The program also included providing rechargeable LED lamps to 150 households and installing 9 solar streetlights in all three hamlets. Village electrification has significantly impacted these regions as it has mitigated the problems arising due to frequent power cuts and low voltage.

- **Disaster Management**

TCE has been actively supporting disaster relief schemes. We continue to do our bit towards the post-disaster relief, rehabilitation and reconstruction efforts in the affected areas. Recently, TCE has played a pivotal role in bolstering infrastructure development in six schools in the Krushnaprasad and Brahmagiri block of Odisha, severely impacted by Cyclone Fani. Our endeavours included providing services of project planning, cost estimation, tender enquiry and preliminary architectural drawings. This has significantly helped save time, efforts and money and ensure unhindered access to professional services for rehabilitation in this region.



TATA VOLUNTEERING WEEK



The fourteenth edition of Tata Volunteering Week (TVW14), launched on 5th September 2020, was successfully concluded on 7th October 2020. TVW14 offered a range of company-organised virtual volunteering opportunities and witnessed the participation of senior leaders, colleagues, family members from across the locations, who came together to join in the 'Work From Heart' campaign, a special edition where a large part of the volunteering was done remotely for the first time due to the Pandemic.

37 volunteer programs, including Career Counselling, COVID-19 Awareness, Mask Making, Teaching School Kids, Scientist in Making, etc., were conducted by our volunteers. A special session on the theme of Poshan Maah (Nutrition Month) 2020 was held for caregivers and teachers, which demonstrated how to grow and consume nutrient-rich microgreens, along with a workshop on kitchen gardening.

The 15th edition of Tata Volunteering Week (TVW15), launched on 3rd March 2021, successfully concluded on 31st March 2021. The theme for the TVW15 edition was Shatter the Status Quo, and the program encompassed unique activities which were executed both virtually and on-ground with utmost safety precautions. We had a total of 55 volunteering programs which included career counselling, e-mentoring, teaching school students, safety awareness for construction site workers, Women's Day celebration, virtual heritage tour etc.

ProEngage-12

ProEngage is a part-time, skill-based volunteering programme that offers unique opportunities to contribute domain expertise and lead exciting projects that can help civil society achieve its goals faster. The duration of the activity undertaken as part of the program can range from one to six months, and volunteering is mainly done during weekends and holidays.

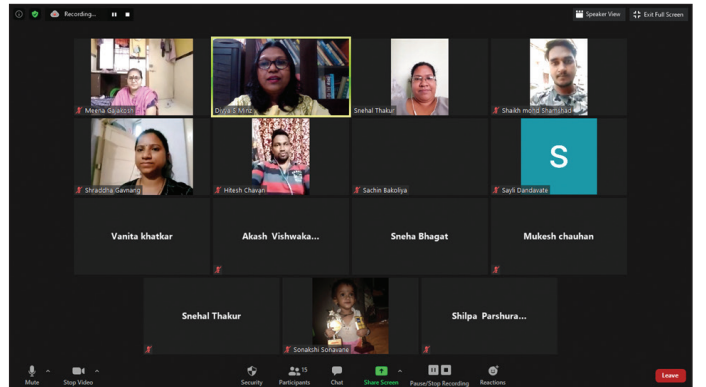
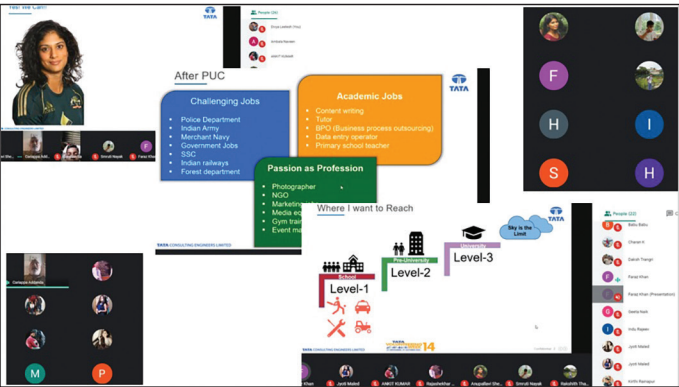
This year the program saw enthusiastic participation from 14 volunteers, including two family members of TCE employees, who completed their projects across various domains. The volunteers rendered their time and skills in helping partner



organisations in projects such as conducting soft-skills sessions for youth, researching "Climate action in Rural India", creating a fundraising strategy, designing a Performance Management System, conducting online sessions for students on various topics, Value-Based Holistic Education, writing out an Annual Report, creating a Project Management Framework, conducting telephonic spoken English sessions for youth, recording audiobooks for the visually impaired and writing blogs.

OVERALL CSR FIGURES FOR FY21:

Through these initiatives in FY2020-21, with 1914 volunteers, we successfully clocked 5027 hours across 96 programs while impacting 8450 lives. The overall CSR investment for the year stood at Rupees 205 lakh.



A BIG ROUND OF APPLAUSE TO ALL THE CHAMPIONS OF THE CAUSE!



THANK YOU FOR VOLUNTEERING WITH TIME, SKILL AND PASSION TO HELP US IN SHATTERING THE STATUS QUO!

Mr. Raghavan, a senior leader, invested 27 hours and guided students of an orphanage on evaluating various career options and choosing the one most suited for them. He also spent quality time with the students and delivered a lecture while hosting an essay competition



RESPONSIBLE LEADER

R RAGHAVAN

Associate Vice President,
Head of Delivery, Power Business,
TATA Consulting Engineers Limited

Corporate Information

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Jamshedpur - 831 001

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BANKERS

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- Bank of Baroda
- Citibank
- EXIM Bank
- HDFC Bank
- ICICI Bank Limited
- State Bank of India
- Yes Bank

AUDITORS

- B S R & Co. LLP, Chartered Accountants (Statutory Auditors)
- Aneja Associates (Internal Auditors)
- Robert Pavrey & Associates, Company Secretaries (Secretarial Auditors)

DIRECTORS

- Mr Ashok Sethi
- Ms Anjali Kulkarni
- Mr Sriram Kadiyala
- Mr Amit Sharma

VISION

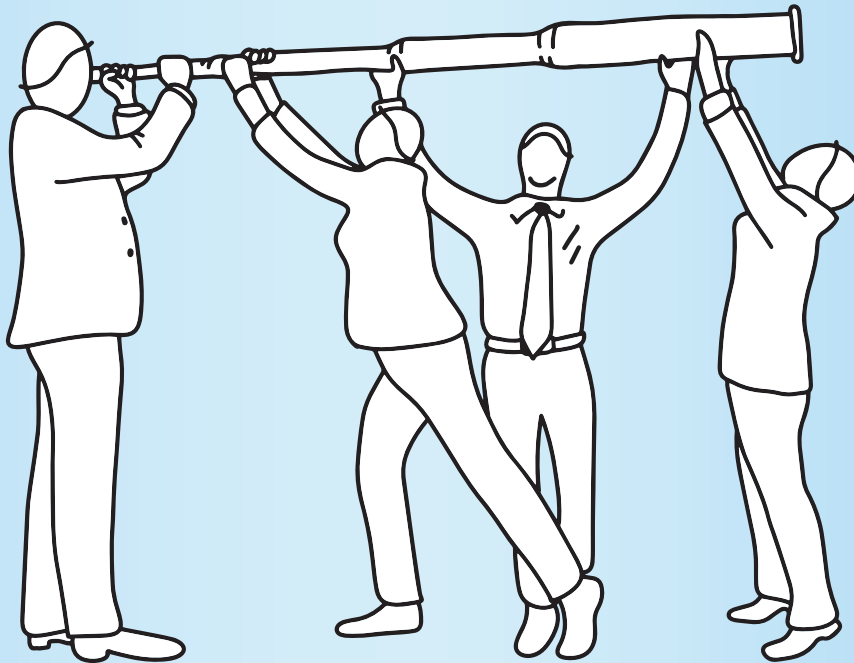
To be an internationally respected engineering consultant offering comprehensive solutions

MISSION

Provide technically excellent and innovative solutions for adding value to all stakeholders, and operate globally as professional consulting engineers

CORE VALUES

- Customer Satisfaction and Loyalty
- Technical excellence with professional ethics
- Responsibility to society
- Employee dignity and self-respect
- Organisational and individual growth



TATA CONSULTING ENGINEERS LIMITED

Engineering a Better Tomorrow
Over Five Decades

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JUNE 2021