



TATA CONSULTING ENGINEERS LIMITED

25th ANNUAL REPORT 2023-24

DESIGNING THE FUTURE



ANNUAL REPORT 2023-2024

APPROACH TO REPORTING

The Annual Report is aimed at meeting the information requirements of all Tata Consulting Engineers (TCE) Stakeholders, including Investors, Customers, Suppliers, Employees, Contractors, Competitors, Press, Analysts, the Government and others.

SCOPE OF THE REPORT

TCE has presented the information on all its business units in a fair, balanced and understandable manner. The performance disclosure is reported for the period FY 2023-24.

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.

FORWARD-LOOKING STATEMENT

This Annual Report and other statements – written and oral – that TCE periodically publishes contain forward-looking statements that set out anticipated results based on the Management's plans and assumptions. The Company has tried, wherever possible, to identify such statements using suitable words in connection with any discussion on future performance. TCE cannot guarantee that these forward-looking statements will be realised, although the Company believes it has been prudent in its assumptions.

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

MATERIALITY

The Report includes information that the Senior Management of TCE believes is material to the Company's Stakeholders. It presents an overview of TCE businesses and associated activities that help in short, medium and long-term Value Creation. The Company has presented information around its strategic approach.

REPORTING PRINCIPLE

Through the Report, TCE is attempting to present its '*Integrated Thinking*' process by aligning its 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 resources of TCE 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 in **Infrastructure, Power, Resources - Hydrocarbons and Chemicals and Resources - Mining and Metallurgy** sectors.

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

DESIGNING THE FUTURE

Tata Consulting Engineers Limited (TCE) stands at the forefront of engineering excellence and innovation, committed to designing sustainable and future-ready solutions that address global challenges. As an integral part of the Tata Group, TCE adheres to the ethos of leadership with trust, empowering communities and pioneering industries. With over six decades of expertise, TCE has catalysed significant advancements across diverse sectors, including infrastructure, power and resources, thereby contributing to national and international developmental goals.

Our global presence, enriched by offices in major economic centres and projects in over 60+ countries, positions us uniquely to harness worldwide expertise and local insights. TCE's multidisciplinary team of over 5,000+ engineers embodies a blend of youth and experience, driven by a shared vision to engineer a better tomorrow. This year, we continued to leverage cutting-edge technologies and methodologies, including digital engineering, artificial intelligence, sustainability offerings and green technologies, reinforcing our commitment to innovation and excellence in engineering solutions.

External Environment

The past year has been characterised by dynamic changes in the global economic, technological, and environmental landscapes. The engineering sector, in particular, has witnessed rapid transformations driven by technological advancements and shifting regulatory frameworks to promote sustainability.

Economic Trends: Despite the challenges posed by global economic volatilities, the engineering sector has seen resilient growth, buoyed by increased investments in infrastructure development, renewable energy sources, and technological innovation. Emerging markets have exhibited robust demand for engineering services, presenting new opportunities and challenges.

Technological Advancements: The acceleration in digital transformation has reshaped the engineering landscape, with trends such as the Internet of Things (IoT), Artificial Intelligence (AI), and predictive analytics becoming integral to project design and execution. TCE has been at the forefront of adopting these technologies to enhance operational efficiencies and project outcomes.

Regulatory and Environmental Factors: Increasing emphasis on environmental sustainability has led to stricter regulations across the globe, including carbon neutrality goals and waste reduction mandates. TCE has proactively adapted to these changes by integrating sustainable practices into all aspects of our work, from design to delivery, ensuring compliance and leadership in eco-friendly engineering.

Social Dynamics: The increasing public awareness of environmental issues has shifted consumer and business priorities towards sustainability. TCE's commitment to social responsibility and its initiatives in community engagement and development are aligned with these evolving expectations, further strengthening our brand and community ties.

In navigating these external conditions, TCE remains dedicated to its mission of designing the future—anticipating trends, embracing innovation, and committing to a sustainable and prosperous world. Our ongoing projects and strategic initiatives are tailored to leverage these external dynamics, ensuring long-term growth and relevance in a rapidly evolving world.

CORPORATE SNAPSHOT

62+
Years of
Engineering
Excellence

1,406 Cr
Total
Consolidated
Income in
FY 2023-24

12,000+
Projects
Delivered

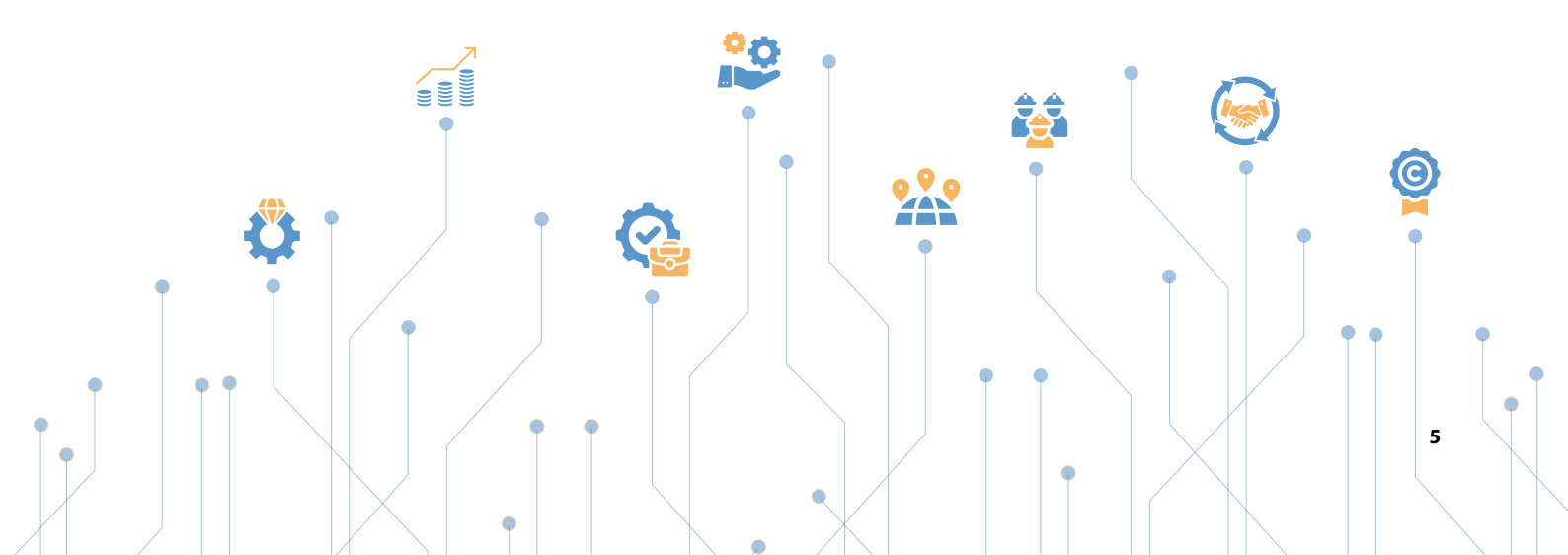
\$35 Bn
Worth Projects
Under
Management

in **65+**
Countries

6,039
Workforce on
31st March
2024

07
Patents

2,156 Cr
Business
Acquisition



PILLARS OF SUCCESS



Vision

To be an internationally respected Engineering Consultant offering Comprehensive Solutions



Mission

Provide Technically Excellent and Innovative Solutions, for adding value for all Stakeholders, and Operate Globally as Professional Consulting Engineers



Values

- Customer Satisfaction & Loyalty
- Technical Excellence with Professional Ethics
- Responsibility to Society
- Employee Dignity & Self-respect
- Organisational & Individual Growth

OUR VALUE DRIVERS

Customer Focus

At TCE, prioritising customer needs is essential. We emphasise customer focus, maximising loyalty and nurturing a customer-first culture. By understanding and anticipating future needs, we design solutions that are relevant today and visionary for tomorrow

Thought Leadership

As a thought leader TCE is shaping industry mindsets, pioneering new domains, and delivering complex, unique projects. Through our value engineering efforts, we consistently set industry standards and lead the way in sustainable, forward-thinking solutions.

Innovation Culture

TCE encourages creativity through employee participation in Pride and Tata Innovista contests. We capture value additions at the project level and share these learnings with other teams. Our focus on innovation ensures we design the future with cutting-edge solutions and breakthrough technologies.

System Mindset

TCE's system mindset ensures a consistent experience and delivery for our customers. Applications like SmartSite™ and Suraksha offer real-time and paperless project management experiences. These smart systems are designed to meet future demands, ensuring efficiency and sustainability in all our projects.

Industry Expertise

TCE's extensive domain expertise across various industries gives us a competitive edge, enabling the design of innovative solutions that save our customers time and money. Our deep industry knowledge allows us to anticipate trends and create forward-thinking solutions for future challenges and opportunities.

World-Class Talent

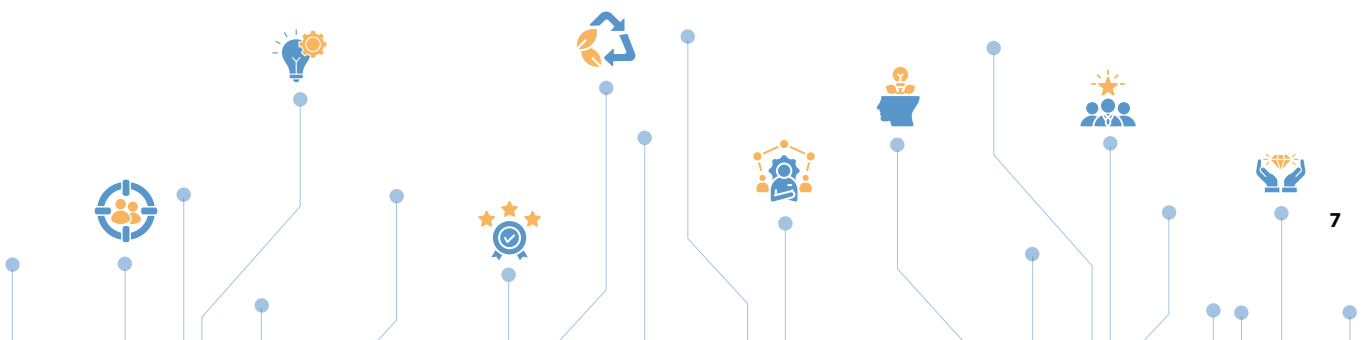
Our people are TCE's most valuable asset. We believe in continuously upskilling our talent to keep pace with evolving times. TCE promotes an inclusive, innovative, meritocratic, and people-centric culture. By investing in our talent, we are designing the future workforce capable of meeting the challenges of tomorrow.

Sustainability and Environmental Stewardship

TCE is committed to sustainability by incorporating environmentally responsible practices into all projects. We minimise our ecological footprint with energy-efficient designs, sustainable materials, and waste reduction. TCE aims to create a resilient, environmentally friendly future through sustainable core designs and solutions.

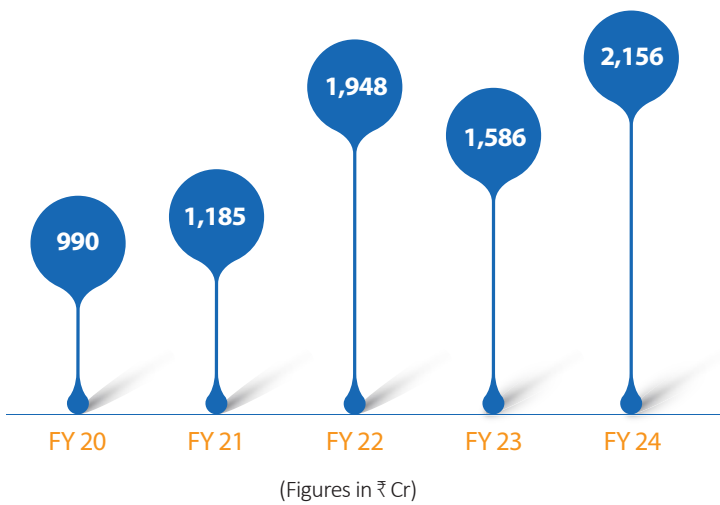
Tata Values

TCE is dedicated to integrity and adheres strictly to the Tata Code of Conduct (TCoC). We have institutionalised stringent practices and processes to maintain high ethical conduct and compliance standards. Our commitment to Tata values ensures that we design an ethical, sustainable, and responsible future.

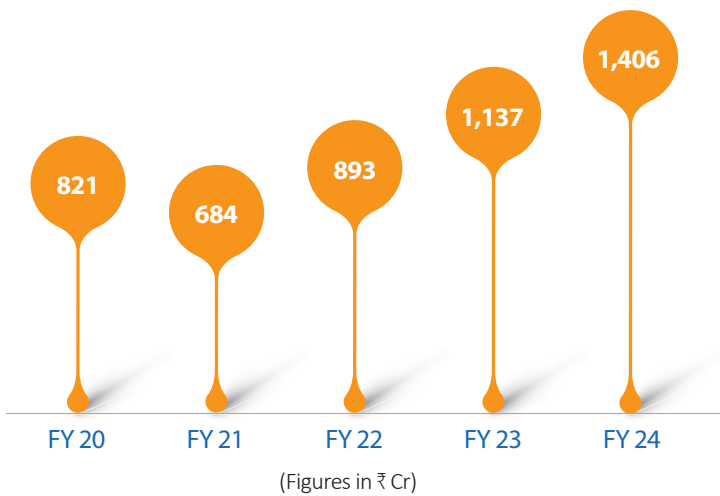


PERFORMANCE HIGHLIGHTS

Business Acquisition



Total Consolidated Income



Financial Capital

The financial year 2023-24 was a landmark period for the Company, marked by significant achievements and milestones that accentuate our commitment to designing the future.

We reached a record total consolidated income of ₹ 1406 Crores and achieved an order acquisition of ₹ 2156 Crores.

1,406 CR
Total consolidated Income

2,156 CR
Business Acquisition

24%
Growth in income Over previous year

Natural Capital

At TCE, we prioritise efficient operations and the optimal use of natural resources to minimise the environmental impact of all our business activities.

Our technology-enabled solutions enhance our sustainability efforts and assist our clients in preserving natural resources. By integrating advanced technologies and innovative practices, we strive to lead by example in environmental stewardship.



Social & Relationship Capital

Guided by flagship programs and numerous volunteering initiatives, TCE actively fulfils its social responsibility. Our Corporate Sustainability Policy framework provides a strong foundation for developing initiatives that promote social well-being by leveraging TCE's core strengths.

Our primary focus areas include Sustainable Livelihood, Education, Infrastructure, as well as Health and Hygiene. We also work closely with local communities to understand their specific needs, ensuring that our efforts have a meaningful and relevant impact.

Through building strong relationships and supporting community development, our goal is to bring about enduring positive change. This commitment is embodied in our CSR brand, TCEndeavour.



Manufactured Capital

TCE's manufactured capital encompasses the materials, equipment, tools, and technologies utilised throughout various stages of project design, engineering, construction, maintenance, and management. By integrating advanced technologies and efficient practices, we ensure high-quality outcomes and sustainable project execution.

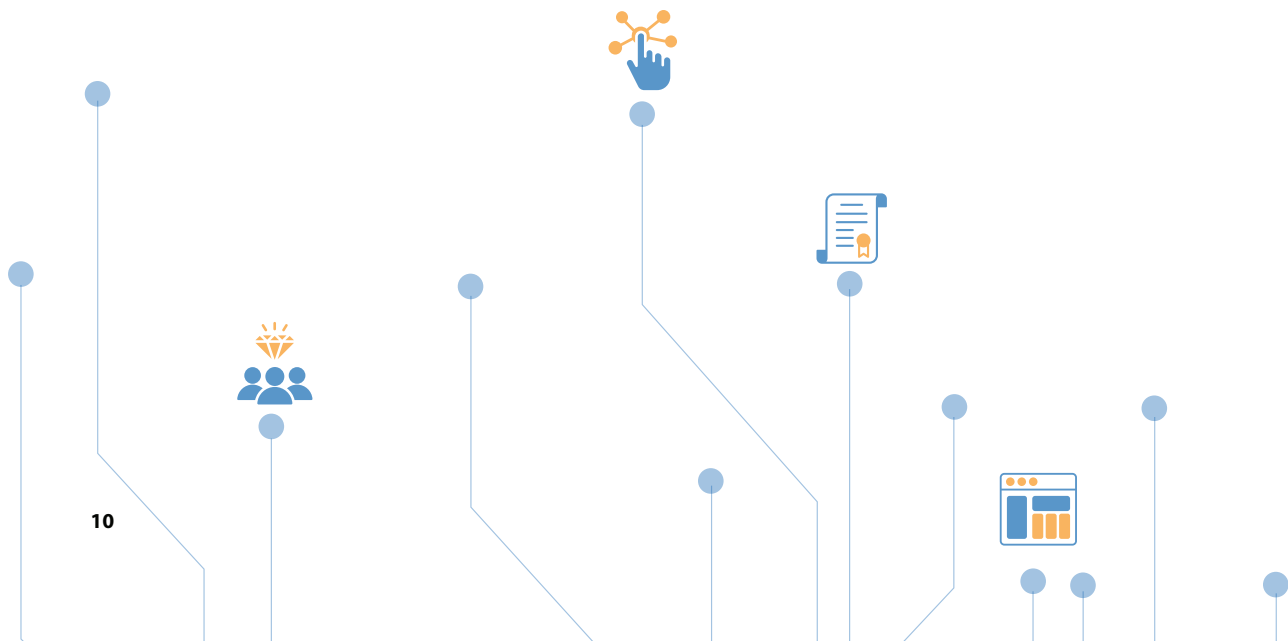
Our focus on continuous improvement and strategic resource utilisation allows us to deliver exceptional value to our clients and stakeholders.



Intellectual Capital

The technology group of TCE serves as the driving force behind the Company's intellectual capital. Tasked with continuously generating and disseminating knowledge, this team meticulously analyses projects to provide critical technical insights that enhance project design and delivery. Their expertise ensures the highest standards of innovation and quality and fosters a culture of continuous learning and improvement.

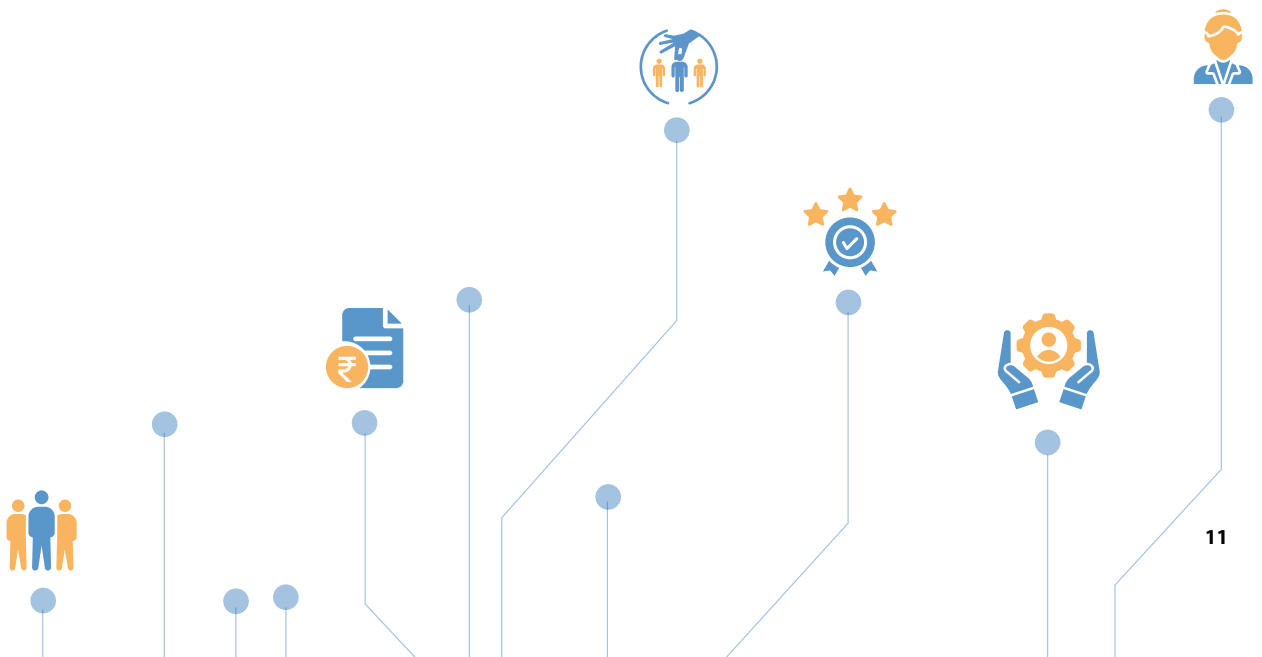
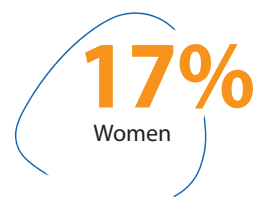
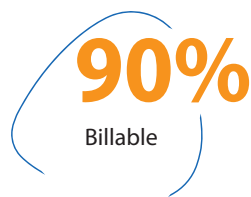
By staying ahead of industry trends and integrating cutting-edge solutions, the technology group helps TCE maintain its competitive edge. This commitment to intellectual excellence enables us to deliver our clients innovative, efficient, and sustainable solutions.



Human Capital

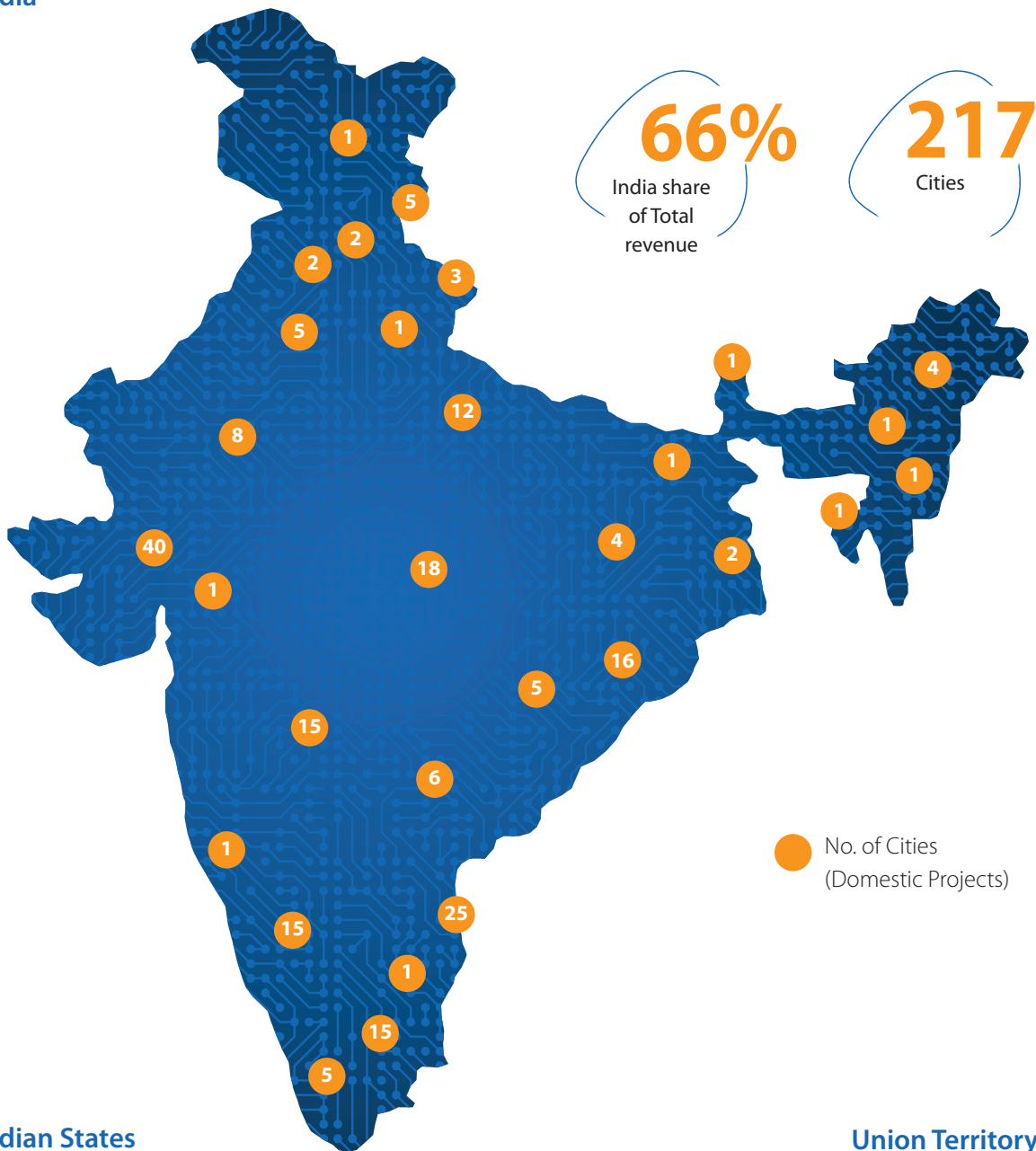
At TCE, our people are our most valuable asset. Our talent's collective skills, knowledge, and capabilities are essential in meeting and surpassing customer expectations. We invest heavily in their development by providing continuous learning and growth opportunities to nurture their capacity and capability. Our commitment to fostering a supportive and innovative work environment ensures that our team is well-equipped to address complex challenges and deliver exceptional results.

By promoting a culture of collaboration and excellence, we empower our workforce to drive the Company's success and contribute to its vision of shaping the future. Additionally, we prioritise employee well-being and engagement, recognising that a motivated and satisfied workforce is crucial to sustaining our competitive edge and achieving long-term growth.



PRESENCE

India



Indian States

- | | | |
|---------------------|--------------------|----------------|
| 1. Andhra Pradesh | 8. Jharkhand | 15. Mizoram |
| 2. Assam | 9. Karnataka | 16. Nagaland |
| 3. Bihar | 10. Kerala | 17. Odisha |
| 4. Chhattisgarh | 11. Madhya Pradesh | 18. Punjab |
| 5. Gujarat | 12. Maharashtra | 19. Rajasthan |
| 6. Haryana | 13. Manipur | 20. Sikkim |
| 7. Himachal Pradesh | 14. Meghalaya | 21. Tamil Nadu |

Union Territory

1. Chandigarh
2. Dadra & Nagar Haveli
3. Delhi
4. Jammu and Kashmir
5. Puducherry
6. Ladakh

North America

1. Canada
2. Mexico
3. USA

South America

4. Brazil

Europe

5. France
6. Germany
7. Italy
8. Netherlands
9. Portugal
10. Spain
11. Switzerland
12. Turkey
13. UK
14. Ukraine

Africa

15. Algeria
16. Congo
17. Egypt
18. Ethiopia
19. Ghana
20. Kenya
21. Liberia
22. Libya
23. Malawi
24. Mauritania
25. Mauritius
26. Mozambique
27. Nigeria
28. Rwanda
29. Senegal
30. Seychelles
31. Sierra Leone
32. South Africa
33. Sudan
34. Tanzania
35. Uganda
36. Zambia

Australia

37. Brisbane
38. Sydney

Asia

39. Bahrain
40. Bangladesh
41. Bhutan
42. China
43. Fiji Islands
44. India
45. Indonesia
46. Japan
47. Jordan
48. Kuwait
49. Laos
50. Lebanon
51. Malaysia
52. Myanmar
53. Nepal
54. Oman
55. Philippines
56. Qatar
57. Saudi Arabia
58. Singapore
59. South Korea
60. Sri Lanka
61. Thailand
62. UAE
63. Uzbekistan
64. Vietnam
65. Yemen

34%
International share of total revenue



BOARD OF DIRECTORS



L. Krishnakumar

Chairman
(w.e.f. April 22, 2024)

L. Krishnakumar is a seasoned finance and corporate governance leader with vast experience across consulting, manufacturing, service, and consumer industries both in India and internationally. A member of the Institute of Chartered Accountants of India, the Institute of Cost Accountants of India, and the Institute of Company Secretaries of India, he began his career at A.F. Ferguson and Co. and held significant roles at Larsen and Toubro Ltd. before joining the Tata Group in 2000. At Tata, he has driven key initiatives and held leadership positions, including VP - Finance at IHCL and Group CFO of Tata Consumer Products.



Dr Alka Mittal

Independent Director

Dr. Alka Mittal, former CMD and Director (HR) of ONGC, as well as former Chairperson of the ONGC Group of Companies, has had a remarkable career. She was the first woman to head ONGC and the first woman Functional Director in its history. With over 37 years of experience, Dr. Mittal holds a postgraduate degree in Economics, an MBA in HRM, and a doctorate in Corporate Governance. She has spearheaded major strategic HR programs, led impactful CSR projects, and served on various boards, including IIM Trichy and the National HRD Network. Recognised globally, she has been named among Fortune's Global Top Ten Women CEOs and received numerous prestigious awards.



Amit Sharma

Managing Director & CEO

Amit Sharma is the MD & CEO of TCE, India's largest private sector engineering and project consultancy. His extensive experience spans design and engineering consulting, project and plant engineering, and asset lifecycle management. Amit has championed governance, business models, and digital toolsets for transformation and collaboration. Before TCE, he was the Resident Director of Atkins India and served with Infosys in London, managing global clients across various sectors. At TCE, Amit drives growth and innovation, focusing on energy transition and sustainability. He is also a Central Governing Council Member of SEPC and a General Council member of CEAI, advocating for the consulting engineering community in India.

Previous Board of Directors



Ashok Sethi

Chairman
(Till April 03, 2024)



Sriram Kadiyala

Director
(Till March 31, 2024)



Anjali Kulkarni

Director
(Till April 30, 2024)

MANAGEMENT TEAM

Business Enabling



Sridhar Radhakrishnan
Chief Financial Officer



Ms. Nidhi Mehandiratta
Head - HR, CSR & Ethics



Sachin Mishra
Head - Legal & Company Secretary



Atul Choudhari
Chief Technology Officer



Rajeev Tanna
Head – Risk Management, Internal Compliance & Strategy

Business Facing



Rajashekhar R Malur
Cluster Head - Plant Engineering & Design



Rajat Kaushal
Head - International Marketing & Business Development



B R Parthasarathy
Cluster Head - Infrastructure



Pravinchandra R Shahu
CIO & Head - Digital

Subsidiaries

EcoFirst Services Limited



Chitrnanjan Kaushik
Chief Operating Officer, Ecofirst

Board of Directors

Amit Sharma
Chairman

Rajashekhar R Malur
Director

B R Parthasarathy
Director

Tata Engineering Consultants Saudi Arabia



Ashwani Sadhu
General Manager

COMPANY AWARDS

National Award for Best Governed Company Unlisted Segment: Medium Category
by Institute of Company Secretaries of India (ICSI)

HR Excellence in Effective Communication & Feedback Strategies
by CHRO Vision & Innovation Summit & Awards

Engineering Innovation Award for Riverfront Development of Tunga in Shivamogga Smart City
by CEAI National Awards

Tata Affirmative Action Programme (TAAP) Adoption Award
by Tata Business Excellence Group

Innovative Product/Service Award for Retractable Arm for Satellite Launches
by Golden Peacock Awards

Gold Award for Excellence in Employee Retention Strategy
by Economic Times Human Capital Awards

Best Tax Technology Implementation
by Tax Strategy & Planning Summit and Awards

Platinum Industry Excellence Award
by the Institute of Engineers India (IEI)

Top Innovative Company in Services Large Segment
by CII Industrial Innovation Award

HR Excellence in Corporate Social Responsibility
by CHRO Vision & Innovation Summit & Awards

Masters of Risk in Real Estate and Infrastructure Sector Mid-Cap Category
by India Risk Management Awards

Design Honour Award for Innovation and Design of AFLASS
by Tata Innovista



COMPANY AWARDS

Award for Use of Pathbreaking Construction Technology

by Civil Engineering & Construction Review

Winner in the Medium Category for the Highest Number of Volunteering Hours

by Tata Engage

Best Legal Team Award

by Indian Achievers Forum

Best Digital Finance Team of the Year Award

by CFO Confex & Awards

Leadership Development Award

by Brandon Hall Group

Best Finance Strategy & Execution Award

by CFO Confex & Awards

Top 25 Safest Workplaces in India

by KelpHR

Top 50 Innovative Companies in India

by CII Industrial Innovation Award

Winner in the Medium Category for the Highest Number of Volunteering Hours during TVW 19

by Tata Engage

Winner in the Medium Category for the Highest Number of Volunteering Hours during TVW 18

by Tata Engage



SECTORS



PLANT ENGINEERING CLUSTER



Power Sector

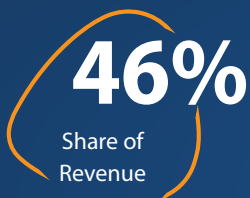
Nuclear, Hydroelectric, Renewable, Thermal, Transmission & Distribution

Resources - Hydrocarbons & Chemicals Sector

Green & Sustainable Chemicals, Chemicals & Speciality Chemicals, Refineries & Petrochemicals, Agrochemicals & Fertilisers

Resources - Mining & Metallurgy Sector

Ferrous Metals, Non-Ferrous Metals, Mineral Beneficiation



INFRASTRUCTURE CLUSTER



Infrastructure Sector

Water, Built Environment, Transportation, Environmental Engineering, Sustainable Infrastructure

EcoFirst Services Limited (Subsidiary)

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

SERVICES



Design & Engineering

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



Digital & Advanced Technologies

Unified 3D Engineering, 4D, 5D Simulation, Building Information Management, Asset Digitisation & Asset Information Management, Industry 4.0 & Asset Performance Management, Product Engineering - Design and Analysis, Turnkey Machine Development



Sustainability and Energy Transition Solutions

Clean and Renewable Energy, Green Infrastructure, Green Fuels and Chemicals, Green Steel & Cement, Energy Transition Technologies



Project Management & Safety

Project Management, Engineering & Constructability Review, Construction Management / Supervision, Program Management, Interface Management, Quality & Safety Audits, Outage & Opex Management, Procurement Management

CHAIRMAN'S STATEMENT



L. Krishnakumar
Chairman

The fiscal year 2023-24 was marked by significant achievements, led by a revenue growth of 24%. Domestic revenues accounted for 66%, while international business contributed 34% of the total revenue. We surpassed the ₹ 1,400 crore mark, achieving a consolidated total income of ₹ 1,406 crores.

I am honoured to address you as Chairman of Tata Consulting Engineers in our 2023-24 Annual Report for the first time. It has been a remarkable year for the company, marked by strong financial performance, transformation, and the delivery of pioneering projects that position us well to "Engineer for the Future" and exceed customer expectations.

Financial Performance

The fiscal year 2023-24 was marked by significant achievements, led by a revenue growth of 24%. Domestic revenues accounted for 66%, while international business contributed 34% of the total revenue. We surpassed the ₹ 1,400 Cr mark, achieving a consolidated total income of ₹ 1,406 Cr.

Profit before tax at ₹ 293 Cr increased more than proportionately by 42%, driven by a better mix of orders and benefits from transformation initiatives. Our business acquisitions reached ₹ 2,156 Cr, and we maintain a strong order book going into the next fiscal year.

Transforming Engineering Services

The landscape of engineering services has undergone a significant transformation, and we have been at the forefront of this change. Driven by our customers' demands for quicker project completion at reduced costs and the need for solutions to meet sustainability objectives, we have embraced digital technologies. These technologies, including innovative 3D/4D modelling and simulation processes, have empowered us to exceed customer expectations by offering innovative, custom-built, value-engineered solutions. This transformation is a testament to our adaptability and forward-thinking approach.




In FY 2023-24, our commitment to innovation was not only evident in our work but also recognised by the industry. We were honoured with several prestigious awards, including the CII Industrial Innovation Award for Most Innovative Services Company and for being among India's Top 50 Innovative Companies.

TCE also received the IEI Industry Excellence Award, the Golden Peacock Innovative Services Company Award, the CEAI National Award for Excellence in Engineering Innovation and Design, and the Tata Innovista Honour for Excellence in Innovation for the second consecutive year. These accolades are a testament to our dedication to pushing the boundaries of engineering services.

We are in an era of disruption driven by sustainability, circularity, energy transition, and digital transformation. Businesses need to adopt a holistic approach to assess the impact of these trends, encompassing products, services, supply chains, and waste management.

TCE is at the forefront of this transformation, offering integrated end-to-end solutions across all segments. Our extensive domain experience across sectors has allowed us to develop a robust portfolio of solutions, including green and clean energy generation, energy storage, green technology, rapid transportation, digitisation, and the application of advanced technology in traditional domains.

Our Sustainability Solutions

Infrastructure 	Power 	Resources 
<ul style="list-style-type: none"> • Net Zero Development • ESG Policy & Implementation • Sustainable Building Designs • Green Building Certification • Carbon Reduction Solutions • Smart Cities, Sustainable Transport, Multi-Modal Hubs, Green Ports • Smart Factories with Zero Solid, Liquid, and Gas Discharge • Infrastructure Waste Recycling & Utilisation 	<ul style="list-style-type: none"> • Renewable Power • Clean (Nuclear) Power • Battery Energy, Pumped Storage Energy (PSP), Hydrogen Energy • Waste to Energy • Nuclear Fission (Fleet Mode & Small Modular Reactors) • Plant Retrofits with Carbon Capture & Utilisation 	<ul style="list-style-type: none"> • Green Chemicals: Hydrogen, Ammonia, Methanol, etc. • Green Fuels: Bioethanol, Sustainable Aviation Fuel • Green Cement • Green Metals: Steel, Environmental Services, Waste Management Circularity / Recycling, Carbon Capture and Utilisation (CCU)

Leading Pioneering Projects

TCE spearheads several first-of-its-kind projects, such as green ammonia, green hydrogen, green methanol, energy storage, and bioethanol. Our involvement in solar and wind energy projects and multiple Pumped Hydro Storage projects aligns with India's goal of increasing renewable energy's share in the energy mix. We are also engineering one of India's largest Solar PV Panel manufacturing facilities.

The growth of the electric vehicle market has prompted the consideration of several battery manufacturing plants, with TCE playing a key role in establishing some of the first plants in India. Our presence in the entire value chain of energy transition technologies, including providing sustainable solutions for hard-to-abate industries like steel making, highlights our strategic vision and talented workforce. We are also collaborating with leading global majors to deliver transportation solutions.

As our economy expands, we are increasingly managing much larger-scale projects, even in traditional areas like infrastructure, and managing associated complexities with technology and improved project management solutions. Some marquee projects we helped deliver include Ayodhya Temple, Chandrayaan 3, Central Vista and High-Speed Rail.

Governance and Risk Management

TCE is a leader in good governance practices, supported by robust systems and processes. Our risk management processes are designed to address and mitigate material risks effectively. Recognitions such as Masters of Risk - Real Estate and Infrastructure Sector - Mid-Cap Category, National Award for Excellence in Corporate Governance by ICSI, and being among the top 25 Safest Workplaces in India for the second time in a row reflect our commitment to risk management and safety.

Corporate Social Responsibility (CSR)

TCE's CSR initiative, TCEndeavour, focuses on education, sustainable livelihood, infrastructure development, and healthcare. Our projects aim for holistic development and sustainable social impact, including quality education in STEM fields, skill development, and disaster recovery. Our employees are actively encouraged to create an impact through volunteering. In FY 2023-24, 3,377 volunteers contributed 17,443 person-hours, earning multiple awards for our volunteering efforts.

Our People

TCE's success is intrinsically linked to the success of our employees. Our Employee Value Proposition (EVP) emphasises that our employees are our most valuable asset. Our workforce grew by 19% this year, and we invested over 10 person-hours per employee in training. Recognitions such as HR Excellence awards in Learning and Development and awards for Employee Retention Strategy and Leadership Development underline our commitment to nurturing talent and fostering a supportive work environment.

At Tata Consulting Engineers (TCE), we are dedicated to designing the future by strategically managing our human resources. Our total workforce is 6,039, with 90% of them being billable. The average age of our employees is 34.5 years, and we boast an average of 14 years of experience across our team. Despite an attrition rate of 12.1%, we maintain a dynamic and diverse workforce, with women comprising 17% of our total employee base.

Looking Ahead

The opportunities for services offered by our company are immense, driven by traditional infrastructure needs in India and new investments in alternative energy and emission reduction solutions. Rapid mass transportation upgrades and new capacity creation necessary in the world's fastest-growing economy also augur well for the company's growth prospects. In addition, the country's talent pool of engineers is yet to be fully tapped by the developed world to meet their demands for climate change and modernisation in these markets. This, too, offers multiple opportunities for our company. TCE is poised to deliver on these opportunities and continue its accelerated growth.

Thank you for your unwavering support and dedication to our journey.

Warm regards,

L. Krishnakumar

Chairman

Tata Consulting Engineers

MANAGING DIRECTOR'S STATEMENT



Amit Sharma
Managing Director
& CEO

Our strategic focus was on decarbonisation, sustainability, and electrification. We launched several initiatives in these areas, including a strategic project for a global steel major, our inaugural Gigafactory for EV Cell manufacturing, and various assignments in green energy solutions such as Pumped Hydro Storage and Green Ammonia plants.

Under our guiding principle, "Engineering a Better Tomorrow," Tata Consulting Engineers Limited (TCE) has once again exceeded expectations with iconic projects and achieved significant financial milestones over the past fiscal year. Our involvement in the Chandrayaan 3 Moon landing captured global attention, not only making every Indian proud, but also enhancing the prestige of both TCE and the Tata Group. The initiation of indigenous 700 MWe PHWRs, with the first unit now operational and the second having achieved critical status, marks a significant achievement in our energy sector. Construction milestones in the iconic Ayodhya temple project, coupled with our continued success in the Defence and Space sectors, underscore our capabilities in managing complex, strategic assignments. Furthermore, our contributions to the High-Speed Rail and Central Vista projects have reinforced our reputation for delivering iconic infrastructure developments.

This year, our strategic focus was on decarbonisation, sustainability, and electrification. We launched several initiatives in these areas, including a strategic project for a global steel major, our inaugural Gigafactory for EV Cell manufacturing, and various assignments in green energy solutions such as Pumped Hydro Storage and Green Ammonia plants.

Our projects on production, recycling, expansions and revamping of metals such as Aluminium, Copper, Nickel reflect our commitment to Decarbonisation and a sustainability focus. Additionally, we have expanded our influence in the Nuclear sector, both in Fusion and Fission, and have set the groundwork for India's Small Modular Reactor technology.

Our thought leadership has been demonstrated through numerous white papers and presentations at global forums, focusing on decarbonisation, circularity, and sustainability. These efforts have positioned us as leaders in engineering consulting and earned us considerable recognition and several prestigious awards, including:

- National Award for Excellence in Corporate Governance by ICSI
- Top 25 Safest Companies in India for two Consecutive Years by Kelp HR
- CII Industrial Innovation Award Most Innovative Services Company
- CII Industrial Innovation Award Top 50 Innovative Companies in India
- Masters of Risk (Mid-Cap Category) at CNBC Awards
- ET Award for Excellence in Employee Retention Strategy
- Brandon Hall Group Award for Leadership Development
- IEI Industry Excellence Award
- Golden Peacock Innovative Services Company Award
- CEAI National Award for Excellence in Engineering Innovation
- Design Honour for 2nd Consecutive Year by Tata Innovista
- Highest Volunteering Hours TVW – 18 (Medium) by Tata Sustainability Group
- Highest Volunteering Hours TVW – 19 (Medium) by Tata Sustainability Group
- Highest Volunteering Hours 2023 (Medium) by Tata Sustainability Group
- TAAP Adoption Award by Tata Business Excellence Group

As TCE transitions into FY 2024-25, we reflect on a year defined by significant global challenges and opportunities in FY 2023-24.

Amid evolving international macroeconomics, socio-political dynamics, energy security concerns, and shifts in global supply chains, alongside an increased focus on sustainability, TCE has remained vigilant about the potential for global growth deceleration. Despite cost pressures on global Owners/OEMs in developed economies potentially increasing engineering outsourcing, rising protectionism posed counterbalancing risks.

Throughout FY 2023-24, TCE remained acutely aware of the risks presented by the ongoing Russia-Ukraine war, the deepening debt crisis in developing countries, the decoupling of the world economy, and the impacts of climate change. However, these global dynamics also provided the impetus for nations to bolster energy security, realign supply chains for critical and core materials with local production strategies, and escalate investments in line with the growing decarbonisation drive. These factors were actively incorporated into TCE's strategic business continuity plans and organisational strategies.

On the domestic front, India's growth story continued robustly with strong domestic consumer demand, steady forex reserves, and solid credit growth. The FY 2023-24 budget was mainly positive, emphasising increased capital expenditure and higher allocations for infrastructure development in rail transportation, urban development, and schemes like the Production Linked Incentive (PLI) to stimulate investment in the manufacturing sector.

Significant progress was also made in Sustainability and Energy Transition initiatives, propelled by the Indian Government's commitment to the Energy Transition and the launch of the Green Hydrogen Mission. Most government organisations and private enterprises began moving towards stringent net-zero targets.

Additionally, TCE observed rapid advancements in related technologies and business models, notably the "Energy as a Service" approach that combines renewables, energy storage, and smart grids. This shift poses challenges and opportunities for TCE's clients, especially those in hard-to-abate industries, as they strategise to reduce their carbon footprint and explore new business and growth models.

TCE is determined to be a leader in shaping sustainable infrastructure and the Net Zero journey. The company is committed to working with its clients, partnering with leading academic and industry leaders, and collaborating closely with policymakers and Tata Group Companies to deliver its promise of Engineering Sustainable Solutions for a Better Tomorrow.

Performance Review

FY 2023-24 saw the highest growth in the company's 62-year history. Total revenues grew 24% over the previous year, closing at ₹1,406 crores. A well-balanced portfolio and the right mix of domestic and international projects helped achieve these numbers. In FY 2023-24, the new sales order intake closed at ₹ 2,156 crores at the consolidated level.

TCE moved up to 106th place in the ENR Top 225 International Design Firms. In FY 2023-24, 67% of revenues and 33% of business acquisitions came from international markets.

Talent retention is an essential aspect of any consulting business. In FY 2023-24, the attrition improved from 20.6% to 12.1%.

Our efforts in mapping the evolving Energy transition over the last five years have yielded promising results with multiple pilot plant projects. Made possible through leadership participation with policymakers and industry leaders, the projects are in various stages, focusing on Hydrogen, Methanol Ammonia, Renewables, Nuclear and related areas of Circular Economy and Waste Management.

We deepened its strategic connect with Tata Steel, Aramco-Sabic, Reliance, Adani, and Vedanta, to name a few, working across projects ranging from Circularity, Decarbonisation, and Green Energy focus across multiple projects and global locations.

TCE accelerated its Non-Fossil fuel Energy focus with the NPCIL 5 & 6 – 2 x 700MW PHWR NPP expansion at ITER-France. The Company is also taking leadership in creating the roadmap for the emerging area of Small Modular Nuclear Reactors. Our existing large projects, such as High-Speed Rail, Ayodhya temple, CIDCO, etc., are progressing well and are on track. The Company is also working on various strategic projects with multiple central and state entities across the Infrastructure, Transportation, Education, and Energy sectors.

We have also built our competency, capability and know-how on areas such as EV battery, Semiconductor fabrication plants, Outsourced Semiconductor Assembly and Test plants and Solar PV cells. This has been achieved by signing partnerships and teaming with niche players having such capabilities in US, Europe, Asia, hiring experts and by training our existing workforce in areas such as clean rooms, heavy civil and structural, etc that are specific to plants in this space. We are building long term partnerships and signing up projects with focus on both Capex and Opex phases on these areas with our customers and prospects.

TCE teams won awards at various forums for the Company's Best in Class and Benchmarked practices in CSR, Ethics, HR, Branding, Project Execution, and Work Practices.

Our projects on production, recycling, expansions and revamping of metals such as Aluminium, Copper, Nickle reflect our commitment to Decarbonisation and a sustainability focus. Additionally, we have expanded our influence in the Nuclear sector, both in Fusion and Fission, and have set the groundwork for India's Small Modular Reactor technology.

TCE’s Core Assets – People

At Tata Consulting Engineers (TCE), our people are key to retaining our competitive edge. We are continuously working to create an environment of empowerment through well-defined policies and practices that reflect empathy, celebrate meritocracy, and provide ample professional and personal development opportunities.

We consider our employees critical to our success. Our People strategy is outlined to build better organisational capabilities, hire and retain the best talent and create a culture that delivers long-term value and sustains competitiveness in the global marketplace.

TCE takes pride in hosting a diverse workforce representing a range of ethnicities, regions, and cultures. With a multi-generational staff, we benefit from a diverse mix of educational and professional backgrounds.

Our employees are embraced within secure work environments shaped by our core principles of diversity, equity, inclusion, and integrity, providing them with a nurturing environment to thrive.

In FY 2023-24, we conducted 17,610+ person-hours of training on TCoC/ POSH and Compliance across stakeholder segments. TCE had participated in Annual Compliance Reporting, which entails an annual assessment of Tata companies for the implementation of the Leadership of Business Ethics framework. Tata Companies are rated on 4 levels of maturity ratings for each pillar of the LBE framework (Leadership, Compliance Structure, Communication & Training, and Measurement of Effectiveness). In 2023, TCE attained an “Advanced” level of maturity rating in all pillars of the LBE framework for two consecutive years.



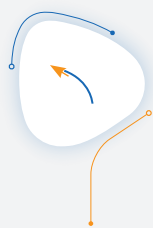
Revenue
(INR 1,406 Cr)



Profit
(INR 219 Cr)



International Revenue
(34%)



RoE
(29%)



Dividend Payout
(100 Cr)



Zero Debt Since 2020

Future Outlook

Designing the Future with Integrated, Sustainable Offerings

As India continues to ascend its growth trajectory, the commitments made during COP28 and ongoing global climate initiatives underscore the pivotal role of milestone-based NetZero commitments for policymakers and corporations. TCE foresees a future brimming with opportunities for growth, innovation, and inventions. Central to this vision are:

- **Sustainable Infrastructure:** Commitment to building resilient, future-ready infrastructure.
- **Energy Transition and Electrification:** Accelerating the transition to renewable energy sources and expanding electrification across industries.
- **Green Chemistry and Circular Economy:** Transitioning to sustainable chemical processes and implementing circular economy principles to minimise waste and reuse resources.
- **Emerging Energy Pathways:** Exploring new energy pathways and the potential renaissance of nuclear energy as part of a diversified energy strategy.
- **Decarbonisation Focus:** Strong emphasis on R&D, intellectual property (IP) creation, and basic research to drive low-carbon solutions and decarbonisation.
- **Advanced Facility and Atmanirbhar Bharat:** We are committed to the Gol Atmanirbhar Bharat ideology and building capability and partnerships to design projects in advanced facilities such as Battery, EV, Semi-conductor, Solar Cells, Hydrogen Electrolysers, Green Molecular and Green Energy areas along with working in space, nuclear and defence.

By 2030, projections indicate that India will double its electricity generation and triple its steel production. The development of a robust domestic manufacturing ecosystem for semiconductors, energy storage, and chemicals, coupled with world-class infrastructure, positions TCE uniquely due to its capabilities across diverse domains such as Infrastructure, Power Utilities, Nuclear, Chemicals, Mining & Metals, Project Management Consultancy (PMC), and Digital solutions.

By leveraging these capabilities, TCE is poised to deliver integrated solutions that enable the creation of smart infrastructure, factories, cities, and transportation systems, pioneering the drive towards smart, sustainable urban development.

Value and Volume Driven Growth

As a consultancy, TCE navigates the complexities of divergent customer needs by maintaining technological leadership and investing in high-end capabilities to address complex, bespoke customer requirements. This approach involves engaging seasoned subject matter experts (SMEs) and adaptable delivery models. Simultaneously, TCE addresses large-scale engineering projects by offering scalable capabilities marked by efficiency, systematic delivery, and competitive pricing.

Vision and Commitment

TCE aims to lead the shaping of sustainable infrastructure and advance the NetZero journey. This vision involves deep collaboration with group companies, leading academic institutions, and industry technology leaders while closely working with policymakers.

As the world embraces new solutions and technologies, TCE is committed to offering differentiated, benchmarked, and value-engineered solutions that support its clients' sustainability goals and desired outcomes. In alignment with its vision, TCE continues to invest in its most crucial asset—its people—ensuring a safe, nurturing, and invigorating learning environment. Building on a 62-year legacy, TCE envisions itself as a vibrant, youthful entity poised to drive growth and prosperity for its stakeholders.

Warm regards,

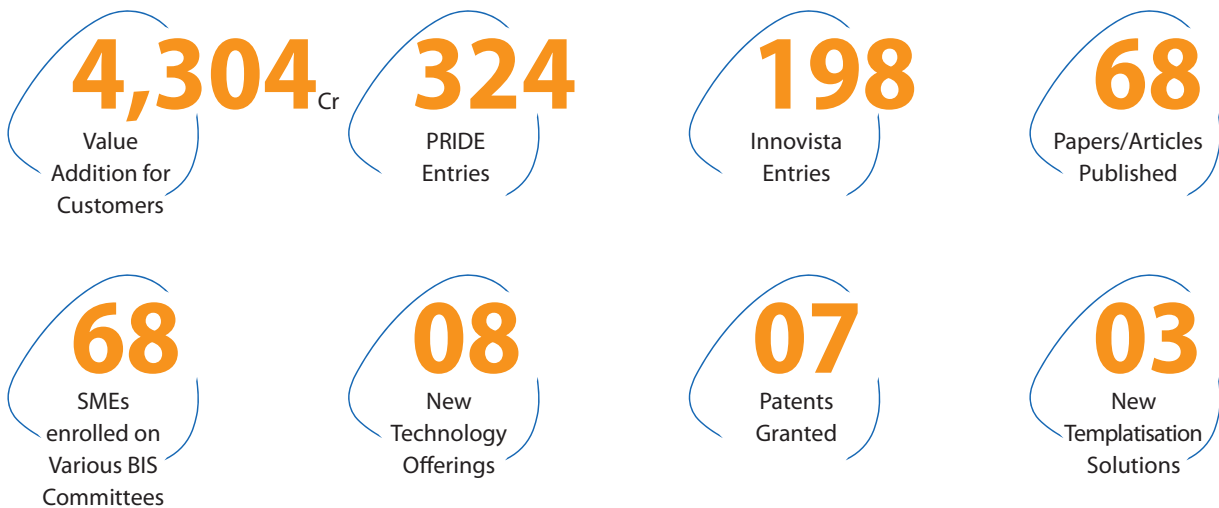
Amit Sharma

MD & CEO

Tata Consulting Engineers

TRANSFORMING ENGINEERING FOR A SUSTAINABLE FUTURE

Engineering is deeply intertwined with technological innovation, driving solutions to complex challenges across diverse domains. At Tata Consulting Engineers (TCE), we recognise that technology is the foundation of modern engineering, enabling our experts to push boundaries and deliver advancements that shape the world.



In the realm of design and simulation, engineering software is indispensable. Computer-aided design (CAD) empowers engineers to create intricate 3D models with precision and efficiency. TCE's access to advanced 3D tools and a highly skilled workforce allow us to seamlessly integrate various packages and systems within a typical project. These virtual models undergo rigorous analysis and optimisation through simulation software, enabling our engineers to predict performance, identify potential issues, and refine designs before physical construction. This saves time, reduces costs, and minimises risks, leading to more robust and reliable final products.

Effective technology utilisation becomes paramount as project scales and complexities increase, coupled with the demand for compressed schedules.

TCE leverages cloud-based project management tools, collaborative platforms, and virtual meeting software to facilitate real-time information sharing and collaboration among engineering teams regardless of geographical location. This fosters teamwork, enhances productivity, and ensures high-quality outcomes.

Moreover, technology is crucial in monitoring, maintaining, and optimising engineering systems. TCE employs digital solutions based on data analytics and predictive maintenance algorithms to enable real-time equipment performance monitoring, anomaly detection, and proactive maintenance interventions. TCE optimises system operations by harnessing data-driven insights, maximising efficiency and minimising downtime, leading to improved performance, longevity, and cost-effectiveness.

Intelligent System Engineering Tools

Piping and Instrumentation Diagrams (P&IDs) are vital blueprints in engineering and industrial settings, offering a visual representation of processes, instrumentation, and control systems. TCE enhances P&IDs with smart features, leveraging digital platforms like WRENCH for real-time updates and remote accessibility. These solutions facilitate collaborative revisions, ensuring all stakeholders access the latest information, thereby fostering efficiency and accuracy.

Working towards future customer requirements based on global megatrends, TCE teams are trained to incorporate intelligent systems, such as IoT sensors and predictive analytics, further elevating the utility of digital platforms. TCE engineers are prepared to address futuristic technology requirements, such as interactive simulations and virtual reality models, that offer immersive training opportunities. These allow operators to familiarise themselves with equipment and procedures in a risk-free environment. Ultimately, at TCE, engineering for the future involves maximising the use of innovative and intelligent tools, software, and systems that empower users with actionable insights, streamline operations, and enhance safety and efficiency across industrial processes.

Engineering Energy Transition

The energy transition encompasses more than just reducing carbon emissions; it must also address energy access, security, and economic growth. The World Economic Forum defines an effective energy transition as a timely shift toward a more inclusive, sustainable, affordable, and secure energy system. TCE is at the forefront of this transition, providing end-to-end solutions for energy projects across various industry sectors.

Hydrogen is a promising alternative for clean energy, and TCE has taken the lead in executing multiple green hydrogen projects. These include engineering retail outlet stations in the USA, pilot plants in India, and one of India's most significant green ammonia projects. TCE is also involved in designing facilities to generate clean hydrogen from biomass and working on hydrogen and its derivatives for the steel industry.

From renewable energy generation to clean hydrogen production and its utilisation or conversion into ammonia or methanol, TCE is uniquely positioned to provide comprehensive engineering solutions across all project lifecycle stages. TCE's domain experts and technology team continuously update decarbonisation pathways for various industrial sectors, such as petrochemicals, chemicals, steel, cement, and fertilisers. Our detailed in-house studies form the basis for early customer engagement and finalising decarbonisation roadmaps.

Carbon capture technologies are not new; however, reusing or converting captured carbon dioxide into valuable products remains a significant challenge. Collaborating with relevant stakeholders, TCE is working on engineering solutions and multiple pathways for producing sustainable aviation fuel (SAF), which can effectively decrease carbon emissions compared to conventional jet fuels. As technology readiness levels advance and market demand grows, SAF is poised to play a pivotal role in shaping the future of aviation, mitigating environmental impact, and meeting global climate goals. Collaboration, innovation, and policy support will be instrumental in realising the full potential of SAF.

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In the biofuels space, TCE is executing one of India's first bioethanol generation facilities based on first- and second-generation technologies for making ethanol. The global focus on reducing carbon dioxide emissions has increased interest in blending hydrogen with natural gas. Currently, the hydrogen content ranges from 5% to 20% worldwide. However, there is growing interest in increasing the hydrogen content further to improve environmental sustainability. However, concerns regarding the potential embrittlement effect on transmission mediums demand attention. In this regard, TCE has published a whitepaper, "Hydrogen Blended Natural Gas – Accelerating Low Carbon Economy," addressing challenges related to hydrogen diffusion velocity, concentration, and material strength.

As intermittent renewable energy sources continue to increase, the need for efficient energy storage solutions becomes more pressing. TCE has published a whitepaper on "Hydrogen Storage Technologies," which delves into different hydrogen storage methods such as gaseous compressed hydrogen, cryogenic liquid storage, and solid-form storage using metal hydrides. Each method has its advantages and challenges. The whitepaper provides an in-depth analysis of hydrogen storage alternatives, considering recent advancements in hydrogen storage technologies.

With an urgent need to limit greenhouse gas emissions globally to restrict the temperature rise to less than 2°C compared to pre-industrial levels, nuclear power plays a crucial role in achieving net zero by providing reliable, low-carbon, cost-effective, and round-the-clock energy. As of today, nuclear power is the largest source of clean electricity generation in developed economies and the second largest globally, thus providing a solid foundation towards decarbonisation. TCE, having extensive and unique experience in engineering close to a total of 5.6 GW of currently installed 7.5 GW nuclear power plant installations in India, is now poised to take the lead in providing engineering solutions for the upcoming small modular reactor technology in India.

Research and Development Through Academia Collaboration

As a global powerhouse, India is emerging as a key player in advanced energy solutions. With its large population, substantial economy, and significant carbon emissions, India's role in shaping the world's energy future is pivotal. Academia-industry collaboration is essential in driving sustainable technologies and facilitating the energy transition.

TCE is associated with premier academic and research institutes such as IIT Bombay, IISc Bangalore, National Chemical Laboratories Pune, and National Institute of Advanced Studies Bangalore for promoting research in new sustainable technologies. These projects are aligned with UN sustainable development goals, such as affordable and clean energy (Goal 7), climate action (Goal 13), and industry innovation and infrastructure (Goal 9).

CSR funding is responsible for developing new horizon technologies such as supercritical carbon dioxide applications, efficient electrolytic hydrogen generation, and alternate decarbonisation pathways for utilising carbon dioxide. By nurturing future technology pioneers and collaborating with research institutes, TCE contributes to the Government of India's 'Aatmanirbhar' technology vision, helping to create a sustainable energy future.

While challenges exist, such as aligning academic curricula with industry needs, India's commitment to sustainable development drives progress. Research centres, incubators, and joint projects facilitate knowledge exchange. TCE aims to accelerate the adoption of sustainable technologies by emphasising interdisciplinary research.



Knowledge Management Systems

Knowledge management systems (KMS) are invaluable at TCE, where expertise and information are the lifeblood of success. For the retention of knowledge, TCE relies heavily on the expertise of its employees. KMS ensures that valuable knowledge is captured, stored, and made accessible, even when key personnel leave the organisation. This prevents knowledge loss and ensures continuity in service delivery. In a field where decisions can have significant implications, having access to the correct information at the right time is crucial. A dedicated team of domain experts at TCE manages KMS systematically and structurally, providing a centralised knowledge repository. This allows our engineers to make informed decisions based on past experiences, best practices, and lessons learned.

Engineering and consulting projects often involve multidisciplinary teams working across different locations; KMS facilitates collaboration by enabling team members to share insights, documents, and expertise in real-time. This fosters innovation, accelerates problem-solving, and improves project outcomes. At TCE, our engineers and consultants can quickly solve complex problems by accessing relevant case studies, technical documents, and expert opinions. This accelerates the problem-solving process, reduces rework, and enhances client satisfaction. By providing several useful platforms for employees, such as the Ask Expert, Value Addition and Innovation portal, and Lessons Learned portal, our extensive knowledge management system fosters a collaborative environment where knowledge is actively exchanged and leveraged for collective growth.



Some Elements of KMS Systems at TCE:

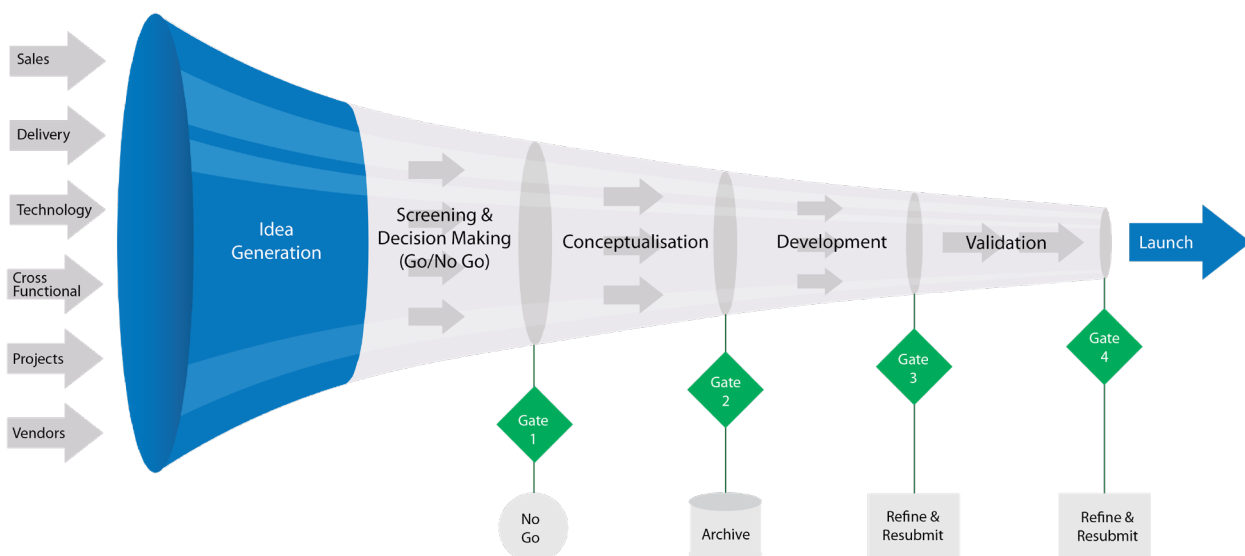
- Mentoring Program:** This knowledge capture initiative involves identifying, capturing, and documenting tacit and explicit knowledge from various sources, including employees, documents, databases, and external sources.
- Technical Document Management System:** This platform provides a structured repository for storing knowledge that is easily searchable and retrievable, categorised by topic, project, or expertise area. Our engineers can quickly search and retrieve relevant knowledge using robust search functionalities, filters, and metadata tags.
- Ask Expert System:** This system resolves queries on specific problems or first-time activities, where our experts provide solutions and address new issues.
- Other Systems:** The value addition portal helps utilise multiple design optimisation concepts on respective projects. The lessons learned database serves to avoid recurring past incidents on ongoing projects. The domain experts of TCE also represent several committees of BIS standard codes. The Community of Practice, an in-house initiative, helps in knowledge sharing and upgrading the contents of the technical depository.
- Knowledge Security:** TCE incorporates appropriate measures to safeguard sensitive information and ensure compliance with data privacy regulations.

Building a Culture of Value Addition and Innovation

TCE's leadership is committed to building a value-addition and innovation culture with continuous learning and a supportive environment. Conducting value engineering workshops at the front end of all projects is a routine practice involving multidisciplinary teams and customer representation. For FY 2023-24, TCE successfully lowered the capital expenditure of mega projects by providing alternate pathways and innovative solutions. This demonstrates the importance of building a substantial value addition and innovation culture at TCE.

A positive culture that values innovation and collaboration helps TCE attract top talent across the industry and fosters a workplace where engineers can contribute meaningfully and grow professionally.

A strong engineering culture fosters a mindset of innovation, encouraging engineers to think outside the box, explore new ideas, and experiment. This is evident from TCE's success in winning prestigious industrial innovation awards, such as the Golden Peacock, CII Innovation Award, and Tata InnoVista Award. Combining innovation and engineering culture has positively impacted an increase in TCE's IPR portfolio. TCE is a unique engineering and consulting firm in India with many patented IPR cases and more awaiting patent grants without any process technology licensing business.



Concluding Remarks

Designing for the future requires foresight, adaptability, and responsibility. TCE focuses on sustainability, selecting technologies that consider energy security and affordability. Innovation, collaboration, flexibility, and adaptability are key aspects of our approach. By embracing these principles, TCE offers solutions that address current needs and lay the foundation for a sustainable, equitable, and resilient future.


Our dedicated team of experts continues to monitor trends and prepare the organisation to be future-ready. It involves anticipating the needs and challenges of tomorrow while considering the long-term impacts of today's decisions. Sustainability is a core focus, encompassing innovative engineering solutions towards environmental sustainability and selecting suitable technologies that ensure energy security and affordability. TCE advocates for processes that minimise environmental harm while ensuring that products and systems contribute positively to society and support equitable economic development.

Innovation is another crucial aspect of designing for the future, pushing the boundaries of what is possible through technological advancements, new materials, and novel approaches to problem-solving. Collaboration is essential in future-oriented design, requiring input from diverse perspectives, including experts from various fields and insights from the communities affected by the design.


By fostering collaboration with technology providers, original equipment manufacturers, customers, suppliers, and related stakeholders, TCE harnesses collective intelligence to develop more effective and inclusive solutions.

Flexibility and adaptability are crucial qualities in designing for an uncertain future. Rapid technological advancements, demographic shifts, and environmental changes necessitate designs that can evolve and respond to new circumstances. TCE's robust knowledge management system continuously integrates potential future scenarios and builds flexibility into creations to ensure resilience in the face of change.

In summary, designing for the future requires a holistic approach that integrates sustainability, innovation, collaboration, adaptability, and ethics. By embracing these principles, TCE offers solutions that address current needs and lay the foundation for a more sustainable, equitable, and resilient future. TCE remains at the forefront of the engineering industry, committed to excellence, technological innovation, and sustainable practices, ensuring we design a better future for all.

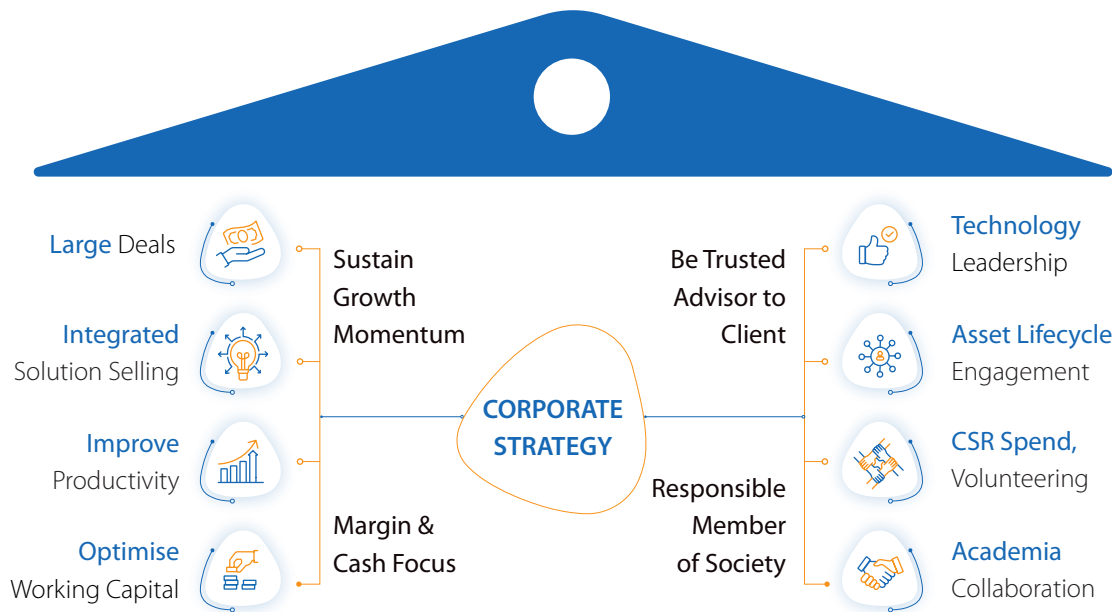


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STRATEGY FOR DESIGNING THE FUTURE

Tata Consulting Engineers (TCE), with its extensive presence across various industry segments in India and overseas, aims to leverage its unique offerings as Owner's Engineers and Project Consultants (OEPC)™. These services encompass the entire project lifecycle from concept to commissioning, incorporating digital solutions and sustainability practices.



The global economy has shown resilience in adversity, with steady growth trajectories projected across key sectors. Global headline inflation is expected to fall from an annual average of 6.8% in 2023 to 4.5% in 2025, with advanced economies returning to their targets sooner than emerging and developing economies. The latest forecast for global growth five years from now, at 3.1%, is at its lowest in decades (Source: World Economic Outlook 2024, IMF).

The world faces an uncertain future with challenges on multiple fronts, including geopolitics, trading blocks, new alignments, technology, and climate change. In 2024, more than half of the global population will vote, potentially leading to political changes and policy shifts that may impact businesses worldwide. Organisations must adapt their strategies to align with evolving priorities and strategic objectives. Multilateral cooperation is needed to mitigate the costs and risks of geo-economic fragmentation, accelerate energy transition initiatives, and facilitate economic incentives for a balanced approach to global challenges.

In this fast-evolving landscape, technological trends such as artificial intelligence, machine learning, sustainable infrastructure, the Industrial Internet of Things (IIoT), and digitalisation are reshaping industries and presenting avenues for growth and differentiation for engineering consulting firms. Understanding the pulse of the world economy and the latest technological advancements is essential as we craft our strategic roadmap for the future.

Strategy Alignment with Vision, Mission, and Values

At the heart of our strategic endeavours lies a steadfast alignment with our company's Vision, Mission, and Values (VMV). Our Vision sets the course for our aspirations, guiding us toward our ultimate destination. Grounded in our Mission, we strive to deliver excellence in every endeavour, driven by integrity, innovation, and collaboration. Our Values serve as the moral compass that steers our actions, ensuring that we stay true to our Purpose and Principles.

We have developed a Strategy Map that connects our Vision, Mission, and Values with the typical Balanced Scorecard (BSC) Parameters of Finance, Customer, Process, and Learning.

The interconnection blocks act as drivers of our strategic objectives, which are developed based on careful consideration of multiple factors such as core competencies, strategic advantages/challenges, and strategic opportunities to meet the requirements of key stakeholders. While some objectives focus on leveraging and expanding existing Core Competencies and Strategic Advantages to drive and expand existing business, others concentrate on resolving Strategic Challenges, including internal areas of improvement or external threats.

Our approach to Designing the Future integrates several key dimensions:

- **Innovation and Technology:** Leveraging cutting-edge technologies and innovative solutions to drive efficiency and enhance project outcomes.
- **Sustainability:** Focusing on environmentally sustainable practices to minimise the carbon footprint and promote green initiatives.
- **Customer-Centricity:** Placing the needs and expectations of our clients at the forefront of our strategies to deliver tailored solutions.
- **Global Reach:** Expanding our presence and influence across international markets to tap into new opportunities and foster growth.
- **Operational Excellence:** Continuously improving our processes and methodologies to achieve excellence in project delivery and client satisfaction.

Additionally, TCE uses the BSC framework to categorise strategic objectives and measure related BSC KPIs to ensure balance concerning multiple stakeholders, including shareholders, customers, workforce, and the community.

Strategy Development and Planning Process

TCE's strategic planning and deployment process is conducted annually. This leads to creating or updating TCE's Long-Term Strategy (LTS) document. The strategy planning process is consultative and involves business and functional leadership. The strategy planning process combines elements of both bottom-up and top-down approaches.

While the senior leadership team establishes overarching direction, individual Business Units (BUs) formulate tailored strategies for sales and delivery, considering the specific needs and dynamics of the sectors they serve.

The outcomes of the strategy planning process are two key documents:

1. A validation and refresh of the Long-Term Strategy (LTS) prepared with a 3-5-year horizon.
2. The Annual Business Plan (ABP) outlines goals, past performance analysis, and strategies to achieve annual business goals for the next financial year.

The ABP and LTS documents are presented to TCE's Board for guidance and approval.

Strategy Planning Process:

Multiple input sources, including past performance, economic environment, technology trends, competition, policy changes, and stakeholder expectations, are analysed to determine TCE's strategic advantages, disadvantages, opportunities, and challenges and identify intelligent risks.

A SWOT analysis is conducted to identify strategic challenges, advantages, risks, and opportunities. Current and future core competencies are assessed, and intelligent opportunities for strategic endeavours are identified. ABP documents are developed for each BU, and the LTS document is validated. Action Plans are developed to execute strategic initiatives.

Strategy Implementation Process:

Rigorous business reviews are conducted at multiple organisational levels, including the Board, Executive Committee (EC), and Corporate Management Committee (CMC). These reviews provide a platform for assessing the progress of our strategic initiatives and making necessary adjustments to stay on course.

At the BU level, periodic reviews analyse the performance of our Balanced Scorecard (BSC) metrics. This allows us to track key performance indicators (KPIs) and identify areas for improvement. In addition to BSC reviews, specific reviews focusing on operational and sales strategies are also conducted.

Under our Rhythm continuous improvement program, various improvement projects are undertaken across different tracks, including Customer, Operations, Technology, and People. Regular reviews of Rhythm initiatives are conducted to ensure their alignment with our strategic goals.

Feedback from all reviews, including BU reviews, BSC assessments, and Rhythm initiative evaluations, is carefully analysed and utilised for continuous strategic planning improvement. This feedback loop enables us to incorporate new insights and adjust our strategy planning process for the next cycle. This process ensures that our strategy supports organisational agility and builds organisational resilience, helping TCE overcome multiple past crises and remain profitable.

Business Excellence

Business excellence underlines our unwavering commitment to continuously enhancing all key processes through data-driven decision-making, organisational learning, knowledge management, innovation, leadership commitment, and workforce development. TCE has fully embraced the Tata Business Excellence Model (TBEM) framework, reflecting significant progress in our organisational excellence journey during FY 2023-24. We drive structured continuous improvement initiatives through four essential Rhythm Improvement Tracks: Customer, Operations, People, and Technology.

Critical initiatives undertaken in FY 2023-24 include a focus on key and strategic accounts, large deals, deal pipeline augmentation, expedited billing and collections, employee engagement, skill development, onboarding and exit processes, value engineering, innovation culture, standardisation, knowledge management, branding and advocacy, new technology offerings, and academia collaboration.

To further strengthen our continuous improvement journey, TCE is investing in building capabilities in Business Excellence through the development of BE Champions and Assessors and Data Excellence through Data Champions and Assessors. Our assessors have participated in external assessments of other Tata Group companies, fostering synergy and sharing best practices across the Tata Group.

TCE Growth Strategy

As we embark on our journey towards strategic growth, navigating the ever-changing technological landscape and business environment precisely is imperative. At TCE, we have meticulously identified five pillars guiding our expansion efforts, ensuring sustainable and impactful growth in the engineering consulting domain.



Grow Domestic Market

- Use TCE's strength to expand presence in specific sectors.
- Focus on large capex projects
- Leverage TCE multi-industry experience to drive consolidated solution selling



Enter New Areas

- Focus on segments such as Refineries, HSR/Metro, Defence; select partnerships where required
- Explore targeted JVs with partners with specific expertise in domestic & international market



International Thrust in Select Geographies

- Enhance focus to provide long term services both for CAPEX & OPEX to large Corporates.
- Select Large Capex - Pursue select deals with clear risk mitigation strategies



Digital Business Opportunities

- Expand Asset Digitisation practice in domestic and international by leveraging current credentials: undertake pilots in industry 4.0 space
- Expand Product Engineering adjacent sectors



Focus on Energy Transition Opportunity

- Leverage TCE's process expertise and experience across sectors to offer integrated solution offering to meet the rapidly increasing energy transition needs in the market
- Collaborate with Academia to develop innovative modular solutions

Focus on Sustainability and Energy Transition

In today's dynamic market, the energy landscape is profoundly shifting towards sustainability and efficiency. As an engineering consulting firm, it's imperative that we not only acknowledge this transition but actively seize the opportunities it presents. We strive to deliver value-added services aligned with our customers' goals, whether they are reducing their carbon footprint, enhancing operational efficiency, or ensuring regulatory compliance.

From renewable energy integration to sustainable infrastructure development, our firm is uniquely positioned to lead the charge by offering integrated solutions that combine our diverse strengths. Our core promise is to deepen our understanding of our customer's needs and expectations and deliver value. By aligning our strategy with their needs and leveraging our expertise to drive innovation, we can thrive in this new era and contribute meaningfully to shaping a more sustainable world for future generations.

VALUE CREATION MODEL

Inputs

- Financial Capital**
 - 806 Cr Net Assets
 - 258 Cr Consolidated Cash & Cash Equivalent
- Human Capital**
 - 6,039 Workforce on 31st March 2024
 - 10 days average annual training days per employee
- Intellectual Capital**
 - 34 Technology team employees
 - 90% total billable workforce
 - 4,000+ Standard Documents
 - 200+ Automation Programs
- Natural and Manufactured Capital**
 - 4.8+ lakh sq. ft. office space
 - 19.09 Cr capex spent on tech infrastructure
 - 14 Sustainability Service Offerings
- Social and Relationship Capital**
 - 3.2 Cr invested in CSR programs
 - 1,500+ total number of active clients
 - 10+ active projects engineering sustainable solutions

Process and Strategy

SERVICES WE OFFER

- Design & Engineering
- Digital & Advanced Technologies
- Sustainability and Energy Transition Solutions
- Project Management & Safety



SECTORS WE SERVE

- Power
- Infrastructure
- Hydrocarbons & Chemicals
- Mining & Metallurgy

Outputs

Financial Capital

- ₹ 1,406 Cr Total Consolidated Income
- ₹ 2,156 Cr New Order Acquisition
- 34% International Share in Revenue
- 21% of business from Opex Services

Human Capital

- 2,551 New Workforce in FY 2023- 24
- 17% Women workforce (1027 No)
- 697 Trainees Hired

Intellectual Capital

- 4,304 Cr value additions for the customers
- 68 Papers/articles published
- 07 Patents granted
- 08 New Technology offerings

Natural and Manufactured Capital

- 24 environmentally conscious offices

Social and Relationship Capital

- 17,500 Students benefitted from various targeted Education Initiatives
- 51,672 total beneficiaries in all CSR programs
- 17,443 Corporate volunteering clocked

Outcomes

- Prestigious projects bagged include 2 x 700 MW PHWR Units 5 & 6 at Kaiga in Karnataka, Lithium Battery Manufacturing Plant at Chennai, VCM – PVC Plant – Detailed Engineering for a Japanese Major, Smart Cities in Gujarat and Madhya Pradesh

- Safe and inclusive workplace
- Awarded for excellence in employee retention strategy
- Awarded for leadership development and effective communication

- Processes were strengthened through several automation applications. A strong focus on innovation led TCE to secure the prestigious CII Innovation, Golden Peacock Innovation and Tata Innovista Award.

- Safe, healthy and productive workspaces for employees

- Significantly enhanced educational opportunities for students
- Positively transformed lives across various communities through our comprehensive CSR initiatives and dedicated corporate volunteering efforts.

Stakeholders



Customers



Employees



Shareholders



Government



Communities

INFRASTRUCTURE CLUSTER



INFRASTRUCTURE

PROJECT MANAGEMENT

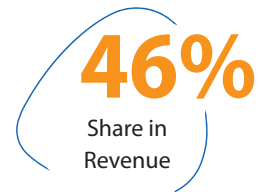
ECOFIRST



INFRASTRUCTURE BUSINESS OUTLOOK



B R Parthasarathy
Cluster Head - Infrastructure






The Cluster is always proud to significantly contribute to India’s growth story of becoming a self-reliant nation by improving manufacturing competitiveness and strengthening infrastructure. India’s journey towards becoming a developed nation by 2047 hinges significantly on improving its infrastructure. Today’s world subscribes to fostering liveable, climate-resilient, and inclusive cities that drive economic growth. India’s commitment is evident through its allocation of capital at 3.3% of GDP to the infrastructure sector in 2024-25, an increase of 11% from the previous fiscal year, focusing on enhancing logistics and transportation segments.

The Cluster continued its commitment to active participation in nation-building initiatives by enhancing its workforce capabilities to deliver projects of national importance. While making the workforce future-ready for India’s ambitious growth vision, we are equally leveraging the gender dividend at construction sites by nurturing women-led project development initiatives under the Kalpana 2.0 program.

Envisioning the Future

The Cluster envisions its critical role in delivering large and complex projects in urban public transport, logistic hubs, manufacturing, and renewable energy. India is making significant strides in infrastructure development, with the capital investment outlay for infrastructure increasing by 11.1% to ₹ 11.11 lakh crore (US\$ 133.86 billion) in the fiscal year 2024-25, representing 3.4% of GDP.

INFRASTRUCTURE 	PROJECT MANAGEMENT AND SAFETY 	ECOFIRST 
<ul style="list-style-type: none"> • Water • Built Environment • Transportation • Environmental Engineering, Sustainable Infrastructure 	<ul style="list-style-type: none"> • Project Management • Engineering & Constructability Review • Construction Management / Supervision • Program Management • Interface Management • Quality & Safety Audits • Outage & Opex Management • Procurement Management 	<ul style="list-style-type: none"> • Sustainable Integrated Design of Buildings • Urban Design • Sustainable Engineereconomics • Climate and Sustainability Services • Program Management • Digital & Modelling

This budget allocation supports various sectors, including roads, railways, and renewable energy. India is the second-largest urban system in the world, with almost 11% of the global urban population living in Indian cities. In this period of planned urbanisation, growing cities will require resilient infrastructure to address issues like lack of availability of serviced land, traffic congestion, pressure on civil infrastructure, extreme air pollution, urban flooding, and water scarcity.

India is now undertaking the world's most extensive planned urbanisation programme to address water security, waste management, waste-to-energy plants, urban spaces, and public transport systems to support the urbanisation process under various initiatives, including AMRUT, CITIS, and Swachh Bharat Mission. TCE will continue to be a preferred partner to the nation in achieving inclusive and resilient infrastructure for its urbanisation plans.

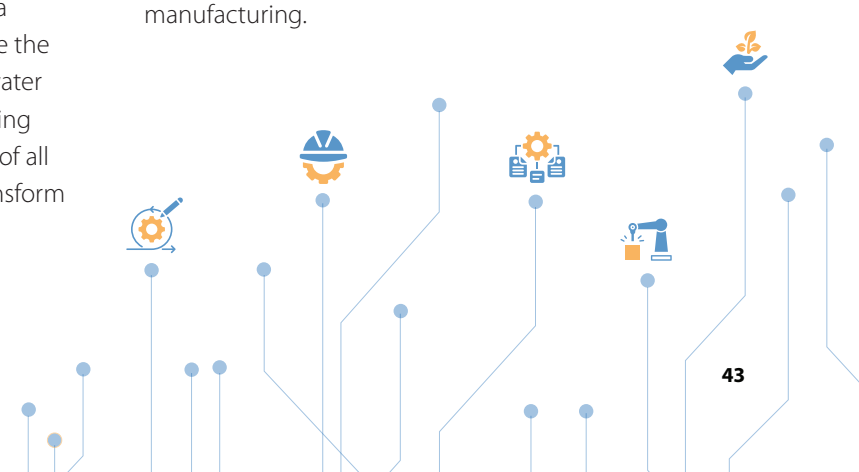
Water and Wastewater Management

The Infrastructure Cluster will continue to dominate water and wastewater management as an integrated water solution across several states. India needs more desalination projects where the Cluster has good expertise. Further, the government of India also proposed River Interlinkages work to resolve the regional imbalance of water, which is creating water distress at various locations in India. We are looking forward to managing the design and execution of all river interlinkages, which will fundamentally transform India's river system.

The program implementation would require multiple studies on the hydro-meteorological impact, such as the terrestrial water cycle, groundwater recharge, monsoon, etc. The Cluster, one of the Water segment's leaders, is technically equipped to execute DPRs, Feasibility reports, basic and detailed engineering, and construction management for this critical infrastructure.

Supporting Electric Vehicle (EV) Adoption

India's vibrant cities are also undergoing a remarkable shift in their transportation framework through quicker adoption of Electric Vehicles (EVs). To assist in the acceptance of EVs in the country, the central government launched several promotional measures along with the National Mission on Transformative Mobility and Battery Storage. The mission aims to drive strategies for transformative mobility and Phased Manufacturing Programmes for EVs, EV Components, and Batteries. In partnership with the PED Cluster, the Infra Cluster is geared up to play its crucial role in supporting the industry in localising production across the entire EV value chain. We have already partnered within Tata Group companies and are consistently working towards technology adoption to strengthen the nation's economics in Electronics and EV manufacturing.



Enhancing Urban Transportation

India needs a reliable and efficient urban transportation network to sustain its rapid economic growth. The significance of urban transport in India stems from its role in improving market access. The Indian government has allocated ₹ 2.78 lakh crore (US\$ 33.4 billion) for the Ministry of Road Transport and Highways in 2024-25. The National Highways Authority of India (NHAI) plans to award 1,000-1,500 km of projects under the Build-Operate-Transfer (BOT) model. India's logistics market, which accounted for 5% of GDP, is projected to grow from US\$ 317.26 billion in 2024 to US\$ 484.43 billion by 2029, reflecting a CAGR of 8.8%. The manufacturing and service sectors are mainly concentrated in large cities, necessitating the development of dependable and effective urban transportation networks for facilitating workforce transport and linking production sites to the supply chain.

The Infra Cluster envisions its role in establishing itself as a leader in adopting comprehensive design standards in the sector to ensure a fast, safe, and reliable transportation system. To sustain its progress, the sector requires continued focus on technology transfer and skill development. TCE is committed to playing its crucial role in adopting advanced technologies and sustainable practices to improve the safety and efficiency of a rapidly evolving transportation landscape.

The Railways have been allocated ₹ 2.55 lakh crore (US\$ 30.72 billion), marking a 5.8% increase over the previous year. The total revenue for Indian Railways is expected to reach ₹ 2,64,500 crore (US\$ 31.81 billion) by the end of 2023-24. Multi-modal transportation hubs are emerging as a key solution to overcome the challenges posed by the vast geography and diverse transportation needs. The Cluster would focus on delivering multi-modal transport hubs for public and private customers. It will play a significant role in designing and constructing cost-effective and efficient multi-modal transportation hubs.

Energy Transition Initiatives

In the whole infrastructure transition process, energy transition is critical to ensure energy security and ward off the threat of climate change and environmental pollution. India is pursuing energy transition in various sectors, including electricity, manufacturing, transportation, agriculture, cooking, etc. The National Green Hydrogen Mission's identification of critical minerals with a focus on exploring these contributes to India's ambition to be self-reliant in the clean energy space. Now, focused thrust is envisaged towards floating solar, integrated PV, off-shore wind, nuclear including SMRs, bio-power, waste-to-energy, the full value chain of solar panels, reversible turbines for pumped storage, mirrors for solar thermal, and green hydrogen, etc. The Infra Cluster is gearing up its capabilities in Design and Project Management of Energy Transition initiatives along with the Plant, Engineering, and Design Cluster.

Sustained Progress and Global Outreach

The Infra Cluster will continue to partner with the nation in executing projects of importance by extending its multi-disciplinary expertise for sustained progress and capacity enhancement in various urbanisation, industrialisation, transportation, and energy transition sectors. The Cluster also aspires to partner with many other developing nations in their endeavour to step-increase their national infrastructure to alleviate growth constraints, respond to urbanisation pressures and meet their crucial development, inclusion, and environmental goals through design and project management capabilities.

Conclusion

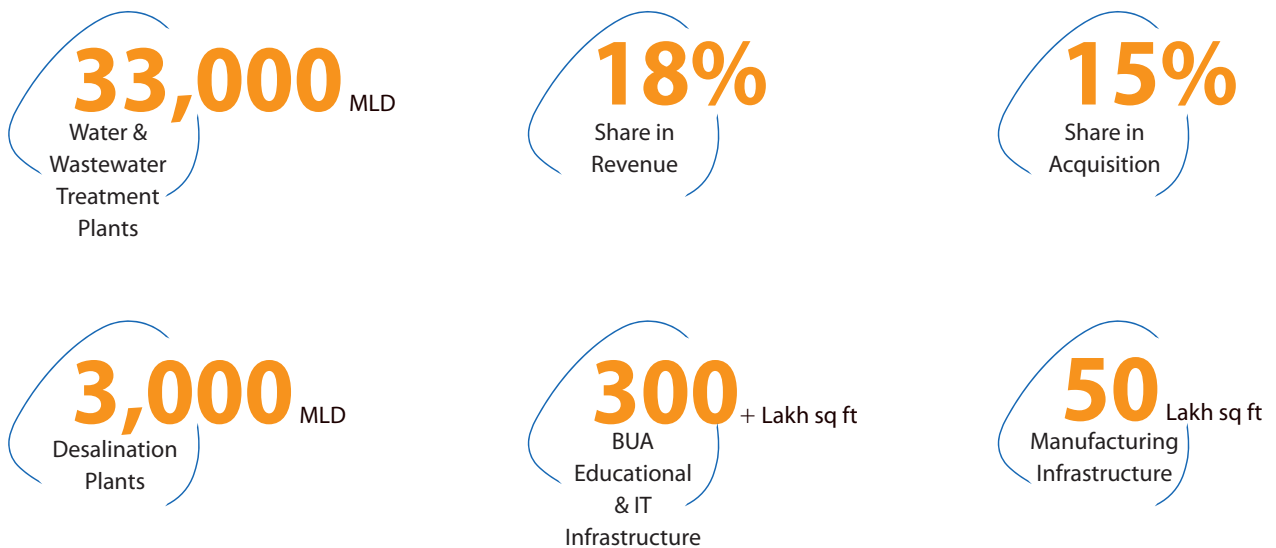
As we look ahead, TCE remains steadfast in its mission to contribute to India's growth story. By leveraging our expertise, nurturing talent, and adopting cutting-edge technologies, we are committed to designing the future and playing a pivotal role in India's journey towards becoming a developed nation by 2047.

The Cluster envisions its critical role in delivering large and complex projects in urban public transport, logistic hubs, manufacturing, and renewable energy.

INFRASTRUCTURE BUSINESS

The Infrastructure Business Unit (IBU) of Tata Consulting Engineers (TCE) has established a benchmark for excellence through its unwavering commitment to innovation and sustained transformation in large-scale infrastructure projects. In FY 2023-24, the IBU made significant strides by acquiring mega infrastructure projects such as the Kharghar Turbe Tunnel Road and the Eastern Freeway project. IBU has broadened its horizons to encompass a diverse array of ventures, from energy transition projects to the establishment of electronic manufacturing plants, the development of desalination plants, and the implementation of skill development projects.

One notable highlight is the repeat job received by the IBU to design energy-efficient infrastructure in GIFT City through a District Cooling system. Here, cutting-edge solutions have been deployed to create a sustainable infrastructure for future generations. Looking ahead, the IBU remains steadfast in its commitment to work on nation-building projects across all built environment sectors, water management, and transportation.



Key Trends Shaping the Industry:

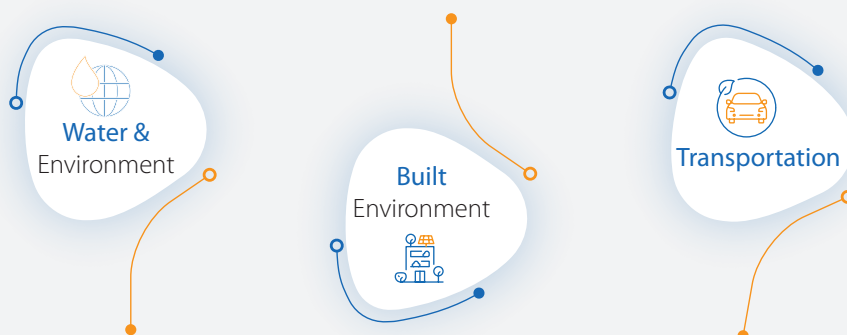
- Viksit Bharat 2047:** The Government of India (GoI) prioritises creating modern infrastructure at par with international standards to transform India into Viksit Bharat by 2047, marking 100 years of independence.
- Urbanisation:** By 2050, approximately 50% of India's population will live in cities. This rapid urbanisation will require upgrading existing infrastructure, expanding rail and transit-oriented development. Additionally, climate-resilient infrastructure will be needed to mitigate climate change impacts and create energy-efficient infrastructure.
- Water Security:** Integrated water resource management, including river interlinkages and the rejuvenation of water bodies, is crucial. The Jal Jeevan mission aims to ensure water for all, focusing on water neutrality, water-positive cities, and the circular water economy. Sustainable irrigation, green agriculture, desalination for industrial and green hydrogen, and digital twins for asset management to improve operational efficiency are critical components of this strategy.

- **India – Attracting Global Investments:** Developing industrial corridors, defence corridors, electronic and manufacturing clusters, and multi-modal logistic parks will position India as a premier manufacturing and investment hub. The establishment of EV manufacturing plants along the EV value chain is essential. With approximately 46% of India's population aged below 25, the government is actively developing skill-development institutions to leverage this demographic advantage.
- **Logistics and Transport:** Investment in high-speed rail (HSR), multimodal integration, ports, airports, and expressways is critical to enhance efficiency and reduce logistics costs. The development of three major railway corridors will further enhance connectivity, optimise resource transportation, and improve overall efficiency.
- **Tourism:** The government envisions transforming tourist destinations to provide a world-class visitor experience. This involves destination-based master planning to ensure the holistic development of tourist places, enhancing their appeal and infrastructure.
- **AI & ML and Digitisation:** The industry increasingly leverages AI and ML for various applications, including design generation, charting pathways to net zero for entire cities, flood forecasting, and categorising affected regions. Automated designs, drawings, and preliminary documentation are becoming standard. Digital twin technology, AR/VR for better decision-making processes, and predictive analytics for asset maintenance transform how infrastructure projects are managed and executed.

Key Areas of Expertise

- **Water & Environment:** At TCE, we provide comprehensive engineering solutions in the Water & Environment sector, addressing critical issues such as water and wastewater management, desalination, stormwater drainage, and irrigation projects. Our commitment to water conservation and leakage management ensures sustainable water usage and resource optimisation. We deliver end-to-end solutions for the Solid Waste Management sector, encompassing the design, transaction, and management of waste-to-energy, waste-to-compressed biogas, and Secured Landfill (SLF) projects. Our expertise extends to Environmental and Social Impact Assessments (ESIA) and Environmental Management Plans (EMP), ensuring compliance with environmental regulations and promoting sustainable practices.

Our focus on Climate Change, Ecology and biodiversity, and Sustainability in urban projects drives our initiatives in environmental conservation and sustainable urban development. We specialise in designing and constructing underground tunnels for water supply and wastewater conveyance, improving water distribution systems to reduce Non-Revenue Water, and conducting comprehensive Water and Energy Audits. Additionally, we manage and enhance environmental ventures such as heritage conservation, rainwater harvesting, pollution control, and biodiversity conservation. Our holistic approach ensures that we contribute positively to the environment and create sustainable solutions for the future.



- **Built Environment:** In the Built Environment sector, TCE excels in building sustainable cities through complete infrastructure planning, design, and commissioning services. Our engineering solutions for large-capacity industrial units and manufacturing facilities are tailored to meet the specific needs of various industries, ensuring operational efficiency and sustainability.

We leverage advanced 3D platforms for Engineering Modelling of complex buildings, providing precise and efficient design solutions. Our expertise is developing nationwide institutional infrastructure and supporting the growth and development of educational, healthcare, and governmental facilities. We also play a pivotal role in infrastructure development for Projects of National Importance, contributing to the nation's progress and economic growth. Our Green Buildings Solutions promote environmentally responsible and resource-efficient buildings that align with global sustainability standards.

- **Transportation:** Our Transportation expertise encompasses the design of standalone urban transport infrastructure, including airports, rail systems, and ports. We provide development and commissioning support to enhance connectivity between cities and large Special Economic Zones (SEZ), facilitating economic growth and regional development.

Our integrated approach ensures that transportation projects are efficient, reliable, sustainable, and environmentally friendly. Through our innovative engineering solutions, we aim to create a seamless and interconnected transportation network that supports the dynamic needs of urban and regional mobility.

Key Achievements

TCE has demonstrated an unwavering commitment to sustainability through innovative approaches and value engineering. Our efforts have resulted in conserving millions of water via intelligent metering and distribution systems, reusing and recycling wastewater, and rejuvenating several lakes and water bodies.

TCE's dedication to sustainable practices has significantly aided industries, institutions, and government organisations in achieving sustainable development goals. Since 2017, we have made notable strides in this domain.

In alignment with the Swachh Bharat Mission (SBM) guidelines, TCE has developed Detailed Project Reports (DPRs) for over 100 Urban Local Bodies (ULBs) to enhance Solid Waste Management (SWM).

Our involvement in Waste-to-Energy (WtE) projects in India and internationally has facilitated the conversion of tons of waste into electricity, contributing to a cleaner and more sustainable environment.

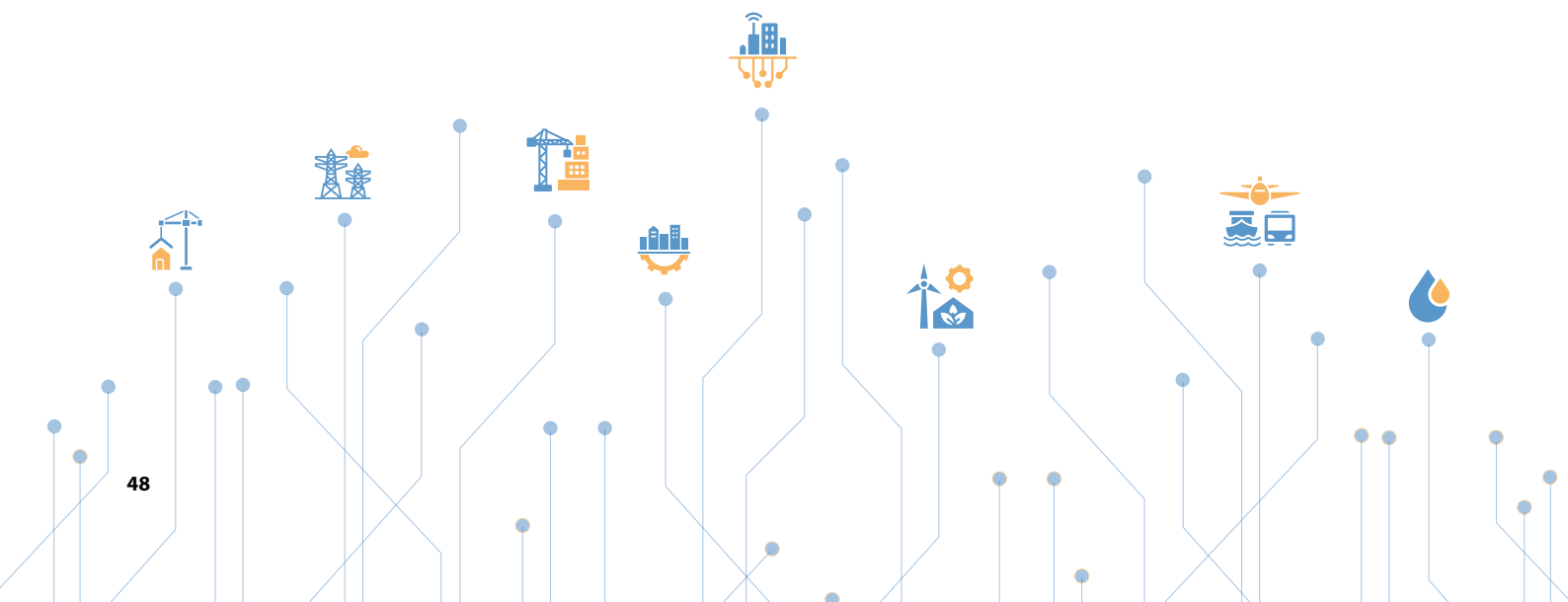
TCE has also undertaken a comprehensive study to develop a National Enabling Policy Framework for promoting Bio-methanation Technology in Municipal Solid Waste Management. Furthermore, TCE holds accreditation from the National Accreditation Board for Education & Training (NABET) under the Quality Council of India. This accreditation authorises us to conduct Environment Impact Assessment (EIA) studies for selected sectors and Environmental and Social Assessments.

The Infrastructure Business Unit (IBU) of Tata Consulting Engineers (TCE) has established a benchmark for excellence through its unwavering commitment to innovation and sustained transformation in large-scale infrastructure projects. In FY 2023-24, the IBU made significant strides by acquiring mega infrastructure projects such as the Kharghar Turbe Tunnel Road and the Eastern Freeway project.

Key Initiatives that Helped Provide Benchmark Results

- **Urban Development and Planning:** Our Infrastructure Business Unit has focused on comprehensive urban development and planning projects, contributing significantly to the growth and modernisation of metropolitan areas.
- **Water Reuse and Recycling:** By implementing advanced water reuse and recycling techniques, we have supported sustainable water management practices, ensuring efficient use of resources.
- **High-Speed Transport:** Our involvement in high-speed transport projects has set new benchmarks in travel efficiency and infrastructure development.
- **Healthcare and Social Infrastructure:** We have substantially contributed to healthcare and social infrastructure, enhancing the quality of life and accessibility to essential services.
- **Green Transport:** Our commitment to green transport solutions has resulted in projects that reduce environmental impact and promote sustainable mobility.
- **River Interlinkages:** We have supported projects that address water scarcity and flood control by improving water management and distribution through river interlinkages.
- **Digitisation:** Through digitisation initiatives, we have leveraged digital technologies to enhance project efficiency, transparency, and innovation.
- **Climate Change and Resilience:** Our climate change and resilience initiatives have strengthened communities' ability to withstand and adapt to environmental changes.
- **Sustainability Initiatives:** We have integrated sustainability into our projects, ensuring that our developments contribute positively to the environment and society.
- **Energy Transition:** Embracing the global shift towards sustainable energy, we have expanded our portfolio to include initiatives in energy transition, focusing on renewable energy sources and energy efficiency.
- **Multimodal Integration:** Through multimodal integration projects, we have enhanced connectivity and transportation efficiency, improving the movement of people and goods across various transportation modes.
- **Specialised Projects of National Importance:** Our expertise has been pivotal in executing specialised projects that hold significant national importance, driving progress and development.

With our extensive presence across India and proven capability to manage large-scale projects, we are well-equipped to capitalise on new opportunities. Our goal is to remain at the forefront of innovation and excellence in consulting, contributing to the advancement and prosperity of our nation while meeting the evolving needs of our clients and stakeholders.



PROJECT CASE STUDY

Rising Sun - Leading the Renewable Revolution

TCE, with its unique expertise, played a pivotal role in the ambitious project Rising Sun, which aims to lead the renewable energy revolution in India. This project underlines our commitment to establishing state-of-the-art manufacturing facilities and investing in green technologies. It involves the construction of a new greenfield 4GW solar cell and 4GW solar module manufacturing plant in Tamil Nadu.

The project encompasses various advanced manufacturing and support facilities, including cell and module manufacturing plants, an EVA/POE factory, and utility buildings. Additionally, storage facilities for raw materials, finished goods, and hazardous waste were developed. Infrastructure includes non-plant buildings such as administration, canteen, security cabins, a 230kV switchyard, an 11kV substation, and comprehensive site amenities.

Scope of Services:

TCE was engaged as the local engineering consultant and entrusted with a comprehensive engineering service consultancy. The scope of work included infrastructural design, 220 kV switchyard work, sustainability integration services, and developing a 3D BIM REVIT model for precision and efficiency.

IMPACT

- This project fortifies TCE's position as a leader in sustainable energy and demonstrates its capability to deliver large-scale, innovative engineering solutions.
- The successful completion of this project will not only significantly boost India's renewable energy capacity but also foster economic growth and sustainability, paving the way for a greener and more prosperous future.

TCE, driven by a steadfast commitment to sustainability, remains at the forefront of innovation and excellence in consulting. We are dedicated to contributing to the advancement and prosperity of our nation while meeting the evolving needs of our clients and stakeholders, reassuring them of our unwavering dedication. The "Rising Sun" project exemplifies this commitment, showcasing our expertise in engineering and sustainability.



PROJECT CASE STUDY

Tunga River Front Development Project

Shivamogga, a city renowned for its rich heritage and cultural significance, has long flourished along the banks of the Tunga River. The old town, stretching over 2.60 km in length and 0.5 km in width, is a testament to historical and cultural evolution. This area has significant landmarks, including the Shivappa Nayaka Palace, the Ganapathi Temple of Ramanna Shresti Park, Kote Marikamba Temple, and Mandakki Bhatti.

To mitigate the perennial threat of monsoon floods, a high flood protection retaining wall was constructed along the left bank of the river in 2009-10. Despite these efforts, a 6.5-hectare strip of wasteland remained between the flood protection wall and the old city, presenting both a challenge and an opportunity for urban development.

Scope of Services:

TCE was appointed to transform this narrow strip of wasteland into a vibrant green and blue corridor, integrating heritage and cultural elements while enhancing the quality of public spaces. The project sought to create a dynamic public area that would become an integral part of daily life in Shivamogga, acting as a catalyst for the city's overall development.

Development Themes

- Rejuvenation of Public Spaces
- Green and Blue Corridor
- Waterfront Revitalisation
- Park Development
- Ferry Connection
- Activation of Public Spaces
- Enhancement of Heritage Sites
- ICT Interventions

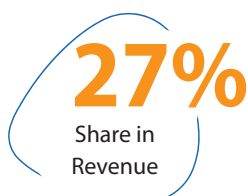
IMPACT

- The existing flood protection wall safeguards the historic city area and its monuments from seasonal flooding.
- The project has significantly improved aesthetic appeal, making it more attractive to residents and visitors.
- Creating green spaces and recreational areas has enhanced citizens' overall quality of life.
- The revitalised riverfront catalyses further development in the surrounding areas, driving economic growth and urban development.



PROJECT MANAGEMENT BUSINESS

With its pivotal role, the Project Management Business Unit (PMCBU) of Tata Consulting Engineers is instrumental in driving the company's strategic vision of excellence in engineering and project management services. Our focus on innovation, efficiency, and customer-centric solutions sets us apart. Leveraging our vast expertise, we manage complex projects across diverse sectors. Our commitment to designing the future is reflected in our robust project portfolio, cutting-edge digital tools, and a highly skilled workforce dedicated to exceeding client expectations and setting new industry benchmarks. We value the significant role of our stakeholders in this journey, and their contributions are invaluable to our success.



Key Trends Shaping the Industry

The project management consultancy industry is undergoing significant transformations driven by technological advancements, evolving work practices, and increasing societal expectations. These key trends are not just shaping the industry but revolutionising it:

- Generative AI and Automation:** Integrating generative AI and automation into project management is a trend and a revolution. AI tools are not just enhancing task automation, planning, and reporting; they provide real-time data and insights that reshape our work. This technological advancement is expected to drive substantial productivity gains and transform project management, particularly in high-income countries. Adopting AI is increasingly seen as crucial for project managers, as it is a game-changer that enables them to manage projects more efficiently and effectively.
- Hybrid Project Management:** Adopting hybrid project management methodologies, which combine elements of Agile, Scrum, and Waterfall, is becoming more prevalent. This approach allows for greater flexibility and adaptability to meet specific project needs. The shift towards hybrid methodologies is driven by the necessity for more dynamic and tailored project management practices.

- Digital Transformation:** Digital transformation remains a pivotal trend, with organisations seeking strategic partners to guide them through adopting new technologies. Consultants focus on providing holistic solutions that integrate digital tools into business processes, thereby driving efficiency and innovation.
- Sustainability and Green Project Management:** There is an increasing focus on sustainability within project management. This involves adopting eco-friendly practices, reducing waste, and utilising renewable materials. Project managers must integrate sustainable practices into their plans, aligning with broader corporate sustainability goals.
- Data-Driven Project Management:** Data analytics in project management is rising. AI-powered analytics give project managers real-time insights, enabling informed decision-making and more effective project management. This trend highlights the importance of data literacy among project managers.
- Integration of Projects and Organisational Strategy:** Project managers take on more strategic roles, aligning project outcomes with organisational goals. This trend signifies a shift from traditional project execution to a more integrated approach, where project management contributes directly to achieving strategic business objectives.

Growth Overview

In the fiscal year 2023-24, the Project Management Business Unit (PMCBU) of Tata Consulting Engineers celebrated significant achievements, marked by the acquisition of contracts totalling ₹ 589 Crore. The unit successfully met its ambitious revenue tagline of ‘One-Crore-A-Day’, closing the year with an impressive ₹ 365.93 Crore.

Our strategic focus was unwaveringly on driving growth in order bookings, revenues, and profits while maintaining agility and proactive readiness for fluctuating market scenarios.

The BU explored new paradigms and service offerings, ensuring cost competitiveness to attract customer interest and bolster revenue streams. Efforts were concentrated on optimising resource utilisation, refining role ratios, enhancing revenue realisation, and prioritising cash flow through strengthened collection capabilities.

The BU's collective and determined efforts resulted in another year of remarkable achievements. The BU strengthened its workforce to 1,792 engineers with diverse expertise across India and abroad, continuing its growth at an unprecedented pace.



Digital Transformation and Innovations

Implementing TCE SmartSITETM has become increasingly prevalent across all our sites, fostering greater robustness and transparency in data-driven decision-making.

Our ongoing commitment revolves around aligning with global leaders in promoting the adoption of digital tools to enhance productivity, advance the industry towards a more data-centric approach, and streamline project tracking and planning processes.

This digital transformation journey is supported by a vast group of engineers, backed by a capable team of Regional Managers, a Pune-based PMO, and a specialised Technical Excellence team comprising Subject Matter Experts. Together, they form a strong alliance dedicated to achieving excellence in project delivery and propelling innovation throughout the organisation.

Future Focus

The BU will concentrate on increasing market penetration in the domestic core areas of water, buildings, and urban infrastructure. In FY 2023-24, we made significant inroads into the domestic transportation and speciality chemicals sectors and painted through projects such as the MMRDA Tunnel, Orange Gate, and the Reliance EPCM. We will continue to explore and enhance our presence in these sectors through advocacy and partnerships.

Our thrust areas in the international market will be bolstered through assignments from EPCs and owners in Africa, the Middle East, and Southeast Asia. The Project Management Business Unit of Tata Consulting Engineers remains committed to designing the future with innovative solutions, strategic growth, and a dedicated focus on excellence in project delivery. As we progress, we are poised to seize new opportunities, embrace challenges, and continue our legacy of delivering outstanding engineering solutions that shape the future.

The BU's collective and determined efforts resulted in another year of remarkable achievements. The BU strengthened its workforce to 1,700+ resources with diverse expertise across India and abroad, continuing its growth at an unprecedented pace.



PROJECT CASE STUDY

Augmentation of Inventory Management for Maintenance, Repair, and Overhaul

TCE was tasked with supporting maintenance operations by automating inventories in the warehouses in Delhi and Mumbai. TCE's RFID-integrated solutions provided a customised, innovative approach to aircraft maintenance operations. By automating inventory management through RFID tagging, TCE ensured compliance, accelerated data transfers, and enabled rapid monitoring of aircraft components. We integrated a Management Information System (MIS) dashboard, streamlined tasks, minimised discrepancies, and enhanced maintenance efficiency. With high-speed scanning capabilities, RFID technology ensures smooth warehouse operations and theft prevention. This turnkey solution empowered the client to optimise MRO processes and achieve unparalleled efficiency and reliability.

The TCE team, including the Project Management Consultancy Business Unit (PMCBU) and the Digital and Analytics Business Unit (DATBU), analysed the project into two main sub-tasks:

Dashboard Development: A live tracking dashboard was developed to integrate seamlessly with the client's ERP module. This dashboard provides a comprehensive view of all critical monitoring parameters on a single screen, allowing for efficient inventory management related to maintenance, repair, and overhaul (MRO) activities.

RFID Tagging Solution: The team devised an indigenous RFID tagging process to analyse serviceable material tracking, monitoring, and stock records. This in-house-developed RFID tagging system significantly improved auditing purposes and ensured better inventory management. The integration of RFID technology with a dynamic MIS dashboard represented a pioneering leap in the aviation industry, marking TCE's commitment to innovation and efficiency.

IMPACT

- Improved operational efficiency with RFID, which enables quick material search, inventory auditing, and automatic recording of logistical transactions.
- A dynamic dashboard provided instant insights and agile decision-making, boosting aircraft uptime through its dashboard summary on Material Requests (MR), Purchase Orders (PO), and Repair Orders (RO) analysis.
- Cost Savings and Transparency
- Replaced manual and handheld reader material searches, thus reducing time and cost.



PROJECT CASE STUDY

Transforming Infrastructure through the ABADHA Scheme

Under the ABADHA Scheme, TCE's Project Management Consultancy (PMC) successfully executed and managed a series of transformative projects in Puri, showcasing our dedication to designing the future and enhancing urban infrastructure.

Projects Undertaken

- **Puri Municipal Market, Bada Danda:** This five-floor building, featuring parking facilities and numerous shops, now provides modern amenities and enhanced shopping experiences for the community.
- **Multi-Level Car Parking at Jail Road:** This four-floor parking facility addresses the critical need for organised parking in Puri.
- **Mahodadhi Market Complex, Mochi Sahi:** This seven-floor complex includes parking, shops, and office spaces, boosting local commerce with modern facilities.
- **Pandit Utkalmani Gopabandhu Das Birthplace Memorial and Museum, Suando:** Includes a memorial, museum, visitor centre, and landscaping, preserving cultural heritage and transforming the site into a significant tourist and educational destination.
- **Odia University:** This project, which covers 8.6 acres and includes various educational and administrative facilities, enhances educational infrastructure.

- **JBPC and Shree Setu:** Improves connectivity and urban development in Puri, contributing to the city's growth and modernisation.
- **Musa River Development Phase I:** Focused on enhancing riverfront development and environmental conservation, aims to improve the ecological and aesthetic value of the Musa River.
- **Samangha Parking:** Expands parking infrastructure to meet the growing urban demands, alleviating congestion and improving accessibility in Puri.
- **Dharmshala, Baselisahi:** Provides accommodation and amenities for pilgrims and visitors.

IMPACT

- TCE's Program Management Consultancy under the ABADHA Scheme transforms Puri's urban landscape and sets new benchmarks in project execution and infrastructure development.
- Our unwavering commitment to innovation and excellence drives us to contribute to the nation's advancement while meeting the evolving needs of our clients and stakeholders.



ECOFIRST BUSINESS

Ecofirst, a 100% subsidiary of Tata Consulting Engineers, stands at the leading edge of sustainable development and is committed to delivering innovative and eco-friendly solutions. As a pioneering entity, Ecofirst integrates advanced technologies and sustainable practices to design and implement projects that significantly reduce environmental impact. With a focus on green building design, energy efficiency, and sustainable urban planning, Ecofirst embodies the vision of creating a resilient and sustainable future, aligning seamlessly with the values and legacy of Tata Consulting Engineers. Ecofirst aims to transform industries and communities through its dedicated efforts, ensuring a healthier planet for future generations. Key Numbers

45%

Growth in total
Revenue YoY

42%

CAGR over 3
Years

196+

Workforce on
31st March
2024

800+

Projects

Key Trends Shaping the Industry

- **Sustainability and ESG Awareness:** There is growing awareness and demand for sustainability, ESG, climate change impact mitigation, and Net Zero initiatives.
- **Competitive Pricing:** Increasingly aggressive pricing strategies among consultants and competitors, intensifying market competition.
- **Integrated Services Recognition:** Enhanced recognition of the value of integrated services drives demand for comprehensive solutions.

Ecofirst continues to pursue the theme of "Designing the Future," setting new benchmarks in sustainable and integrated design and establishing itself as a leader in creating resilient and future-ready built environments.

Key Areas of Expertise:



Sustainable Integrated Design of Buildings

- Master Planning
- Architecture
- Landscape Design
- Façade Design
- Structural Designs
- Building Engineering (MEP)
- Land Development and Wet Infrastructure
- BIM 7D/Digital Twin
- Vertical Transport and Crowd Mobility
- Signage Design
- Interior Design
- Traffic & Transport Modelling



Climate and Sustainability Services

- Net Zero Designs
- Zero Carbon Development and Carbon Reduction Solutions
- Climate Impact Assessments, Flood Modelling
- Life Cycle Assessment
- ESG Assessments and Handholding
- Sustainability Audits
- Green Building Certification
- Energy & Light Simulations
- Sustainability Monitoring (Post Occupancy Evaluation)
- Testing & Commissioning



Program Management

- Redevelopment of Buildings
- Heritage Building Repurposing/ Renovation
- Special Buildings
- Repair and Rehabilitation of Buildings



Key Achievements & Differentiators

- **New Client Acquisition:** We are proud to have successfully added Birla Real Estate as a new client, securing three projects in the winning category. This significant achievement highlights our market appeal and expertise and sets the stage for further growth and success.
- **City-Level Sustainable Planning:** Ventured into city-level sustainable planning and design with the NAIANA development area in Navi Mumbai, marking one of our biggest project wins in collaboration with an external planning agency.
- **Net Zero Projects:** Maintained our Net Zero momentum with three projects, including GPL Carmichael and two MLDL projects, demonstrating our leadership in sustainable design.
- **ESG Services:** Secured our first ESG services for two corporate clients, reflecting our expanding expertise in sustainability and governance.
- **New Market Penetration:** Acquired a new client in Indore for Sustainable Integrated Designs (SID), showcasing our ability to enter new markets with significant potential upside.
- **Redevelopment Segment Entry:** Entered the redevelopment segment with a significant win in project management, broadening our service portfolio.
- **Notable Project Completion:** Completed the Tata Steel R&D Centre design phase in Jamshedpur, underscoring our design excellence.

- **Climate Change Services:** Strengthened our climate change adaptation services, particularly flood modelling solutions, and worked extensively with Leh, Ladakh, and Kargil UT on multiple mandates, enhancing our reputation in climate resilience.

Key Initiatives Providing Benchmark Results

- **Comprehensive Redevelopment Services:** Our push for comprehensive redevelopment services has led to other clients' recognition and adoption of these services, setting a benchmark in the industry.
- **Climate Change Risk Assessment:** Initiating climate change risk assessment, particularly flood modelling, has established our credentials and market recognition in this critical area.
- **Repair and Rehabilitation Expertise:** Gained distinct recognition for our expertise in repairing and rehabilitating old buildings, particularly in the South Mumbai market, reinforcing our reputation for excellence in this niche.

By focusing on these core areas and achievements, Ecofirst continues to pursue the theme of "Designing the Future," setting new benchmarks in sustainable and integrated design and establishing itself as a leader in creating resilient and future-ready built environments.

The power industry is undergoing a significant transformation driven by the need for energy transition and decarbonisation. PBU is aligned with these industry needs, focusing on renewable energy, energy storage, and clean energy solutions.

PROJECT CASE STUDY

Suresh Bhavan, Mumbai

Nestled alongside Mumbai's iconic Queen's Necklace, Suresh Bhavan is a testament to architectural brilliance. The building embraces the city's vibrant spirit with panoramic views of the Arabian Sea. It seamlessly blends with landmarks like the Hanging Garden, Marine Drive, and the Gateway of India. This heritage landmark building was entrusted to Ecofirst for architectural restoration, including restoration work, architectural design, and recommendations on common spaces' interiors.

Project Scope and Objectives

The primary objective of the Suresh Bhavan project was to restore and modernise the building while preserving its historical integrity. Heritage rehabilitation focuses on keeping the external façade intact while modernising the internal spaces to meet contemporary needs.

Design and Implementation

Suresh Bhavan spans four floors, each meticulously designed to cater to diverse needs. The ground and first floors are dedicated to retail spaces, inviting visitors into a world of luxury and convenience. The second and third floors house modern office spaces, fostering creativity and productivity. Finally, the fourth floor boasts a luxurious penthouse, offering unparalleled luxury and comfort.

Ecofirst provided the client with three distinctive design options, each catering to different aesthetic sensibilities and functional requirements. Inspired by the Grand Canyon, the selected option focused on unfolding spaces representing light and volume quality. This design featured large curvilinear sculptural spaces inviting light and landscape into the atrium's centre. Repetitive patterns created a spatial illusion, fostering interaction and engagement.

IMPACT

- The client appreciated the proposed design options, particularly the chosen concept of unfolding spaces. The project will move to the finalisation and implementation stage, with Ecofirst undertaking the PMC scope during implementation.
- Suresh Bhavan's restoration and modernisation project models how heritage buildings can be revitalised to meet contemporary needs while preserving their historical significance.



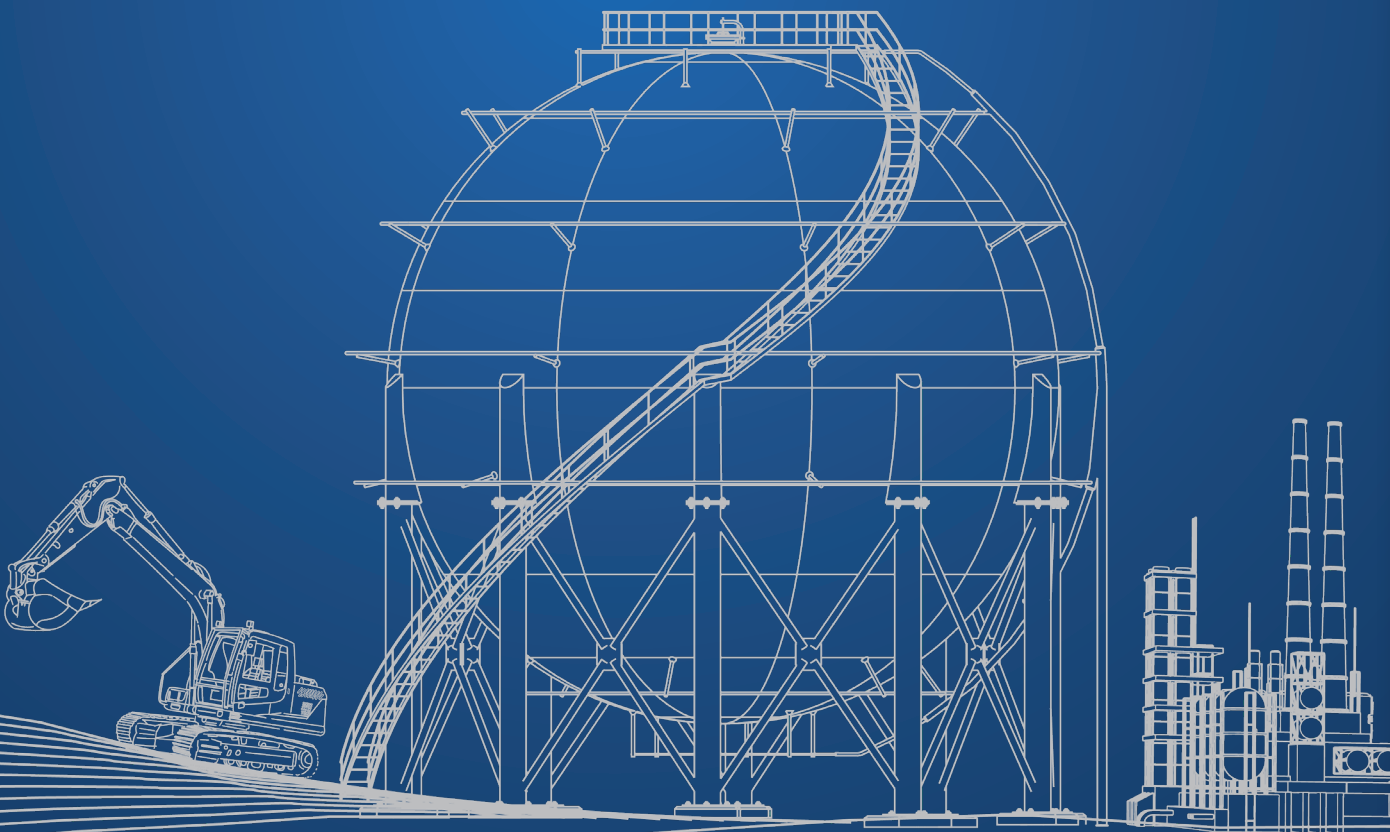
PLANT ENGINEERING AND DESIGN (PED) CLUSTER



POWER

RESOURCES - HYDROCARBONS & CHEMICALS

RESOURCES - MINING & METALLURGY



PLANT ENGINEERING & DESIGN BUSINESS OUTLOOK



51%

Share in the Acquisition

50%

Share in Revenue

52%

International Share in Cluster Acquisition

78

Projects in Tata Innovista

The PED Cluster played a substantial role in our accomplishments in FY 2023-24. It was responsible for 51% of TCE's acquisition, 50% of revenue, and 55% of PBT. This year, the Cluster soared to new heights, showcasing remarkable acquisition, revenue, PBT, billing, and collection growth. Over the previous fiscal year, the cluster's order book expanded by 35% (excluding DECs and Annuity businesses). This financial performance again highlighted the cluster's resilience and capacity to scale new peaks.

The individual businesses bid for and won some of the largest deals ever for the cluster, collaborating effectively with the international marketing group. International accounts contributed 52% of business acquisition and 50% of revenue for the cluster.

Large deals accounted for 42%, and new areas (Energy Transition, Digital, Battery, Semiconductor Manufacturing, etc.) accounted for 27% of cluster acquisition. Multiple BU cross-sells represented 24%, reflecting a growing trend of enterprise selling in the cluster.

The cluster secured projects in the CIS region (Uzbekistan) and various other countries, including the USA, Kuwait, Philippines, Australia, Tanzania, Liberia, Mauritania, Egypt, Nigeria, and others. This reinforced the importance of a balanced business mix for achieving targets. Customer feedback remained positive, and the cluster delivered an impressive performance against the competition. The cluster continued its synergies with group companies such as Tata Steel, Tata Power, Tata Chemicals, and TCNA and established new relationships with Agratas and Tata Electronics.

Energy Transition and the adoption of new technologies, a strategic focus for the PED Cluster in FY 2023-24, present a promising future. This focus not only aligns with global trends but also presents ample opportunities for us to decarbonise the chemicals, steel, and power sectors. The Hydrocarbons and Chemicals business explored key opportunities in green hydrogen and derivatives, battery and semiconductor manufacturing, and maintained its focus on biofuels. With an enormous deal from the Emirates, the mining and metals business added aluminium recycling to the existing opportunities for decarbonising steel in Europe and India.

Our nuclear team partnered with Niti Aayog as a knowledge partner to write a whitepaper on small modular reactors, which was released at a G20 Energy Transition Working Group conference in May 2023. Work on 2x700MW fleet reactors at Kaiga, and our involvement in ITER continued with an effective partnership ecosystem. Green Power (renewables and hydro) registered an impressive year with a renewed focus on pumped storage and large ground-mounted solar projects.

The cluster recognises that early forays into new technologies focusing on learning and development pave the way for future growth. Cluster revenues from Energy Transition projects grew to 30%, reflecting significant progress in this strategically important area. Our association with the Indian Institute of Science made good progress. We completed a basic design and engineering package for a pilot green hydrogen plant from biomass and commissioned a transcritical carbon dioxide refrigeration cycle for the Indian Navy. The cluster achieved 31 entries for Innovista.

Outlook FY 2024-25

Globally, there has been a realignment of supply chains and a renewed thrust on domestic manufacturing. India is witnessing a flurry of activities related to solar cells, battery, and semiconductor manufacturing, with the group establishing entities to foray into these areas. The cluster has capabilities in manufacturing processes for metallurgical-grade silicone and electronic-grade silicon, as well as ingots to wafers to cells to module manufacturing. The cluster has just completed a 4GW solar cell manufacturing facility, work is ongoing on a 10GWhr battery manufacturing facility, and discussions are being held with global customers for further opportunities in both these areas. Gigafactories are being set up for semiconductor OSAT and display FAB facilities in India, with large-scale investments announced that can potentially bring in mega deals. Productivity and capex-linked incentive schemes by the government of India are the impetus for the growth of solar cell, battery, and semiconductor manufacturing in India.

The supply chain realignment has also focused on petrochemicals, speciality chemicals, and metals (steel, copper, and aluminium). The per capita consumption of most of these metals and chemicals in India is one-third of the global average, and manufacturing capacities are about one-tenth of China's. Significant capex investments are happening in these sectors, which are expected to result in large deals from key customers. In the recent India Energy Forum 2024, the Prime Minister announced the expansion of refining capacities from 250 to 400 MMTPA by 2030. The cluster intends to seize these opportunities by establishing a partnership ecosystem with the best in the business and recruiting global expertise in these areas.

The cluster recognises that early forays into new technologies focusing on learning and development pave the way for future growth. Cluster revenues from Energy Transition projects grew to 30%, reflecting significant progress in this strategically important area.

POWER

- Nuclear
- Hydroelectric
- Renewable
- Thermal
- Transmission & Distribution

**RESOURCES
HYDROCARBONS &
CHEMICALS**


- Green & Sustainable Chemicals
- Chemicals & Speciality Chemicals
- Refineries & Petrochemicals
- Agrochemicals & Fertilisers

**RESOURCES
MINING &
METALLURGY**


- Ferrous Metals
- Non-Ferrous Metals
- Mineral Beneficiation

In the recent COP28 held in UAE, 118 governments committed to tripling renewables. The electric car industry is expected to grow to USD 1.5 trillion by 2030, providing battery manufacturing opportunities. The green building materials (cement and steel) market is set to reach USD 1 trillion by 2030. Thirty-nine countries have endorsed the UAE Hydrogen Declaration of Intent, a certification standard that accelerates trade in green hydrogen. New green shipping corridors are being identified exclusively for green fuel production, port construction, and logistics. India alone would need INR 57 lakh crores for adaptation till 2030, with 2023-24 as the base year.

The need of the hour is to develop innovative large-scale funding mechanisms to triple clean energy investments in emerging and developing economies. Energy Transition continues to provide global opportunities in Green Power, Green Chemicals, and Green Metals. Our association with international players in decarbonising steel and aluminium will continue. Additionally, green hydrogen and derivatives bring potentially large annuity businesses from global hydrocarbon and downstream petrochemical industry majors. India is leading from the front in Clean Power with annual plans for indigenous 2x700MW PHWRs.

The FBR has achieved long-awaited criticality, and new opportunities are expected to emerge in Phase II of India's Nuclear Program. Work on Small Modular Reactors is scheduled to begin earnestly, with several meetings with key stakeholders completed. The privatisation of nuclear power is also a development to watch closely. As announced by the Prime Minister at the IEF 2024, 450 GW of renewable capacities are expected by 2030.

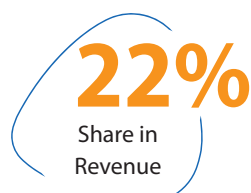
Viability Gap Funding targeting 10GW of offshore wind capacity by 2030 has been announced in the provisional budget for 2024-25. The budget also provided funding for 100T of coal gasification, liquefaction capacity, and schemes for biomanufacturing in polymers, plastics, pharmaceuticals, and agri-inputs.

The National Hydrogen Mission is bringing domestic opportunities in green hydrogen and derivatives. SECI has released auction results for 450,000 MTPA of Green Hydrogen and 1500MWPA Electrolyser bids, and MNRE has announced a scheme for Green Steel Pilots. To provide the required base load for the vast variable renewable capacity additions, there has been a surge in both public and private investments in thermal power capacity additions, with large orders on the verge of closure.

While the continuous flow of jobs from dedicated engineering centres, opex and annuity businesses, group synergies, and key accounts bring in business sustainability, the cluster has some large deals on its plate in battery and semiconductor manufacturing facilities, green hydrogen and derivatives, petrochemicals and speciality chemicals, steel and non-ferrous metals, nuclear, hydro, pumped storage, and renewables. For FY 2024-25, the PED Cluster has ambitiously targeted 45% growth in business acquisition and 37% growth in revenue over the previous year. With 70% of cluster revenue already available in its jobs in hand and confirmed additions from annuity businesses, the cluster is expected to repeat its benchmark performance in FY 2024-25.

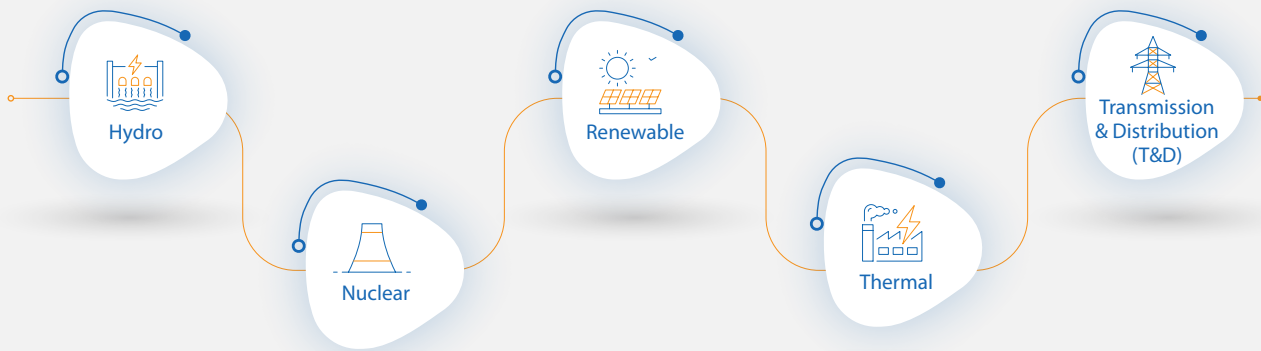
POWER BUSINESS

With over six decades of experience, the Power Business Unit (PBU) of Tata Consulting Engineers is a leading player in India's power plant design engineering services. PBU boasts an impressive portfolio, having designed over 250 GW of power across thermal, nuclear, hydro, and renewable sectors, contributing to 85% of India's nuclear power, over 10,000 ckm of transmission and distribution lines, and 200+ substations. Our expertise spans clean and green energy solutions, thermal control, and transmission and distribution, supporting our customers through the entire lifecycle of power plants - from feasibility studies and conceptual design to commissioning and operational support.



Key Trends Shaping the Industry

- **Energy Transition and Decarbonisation:** The power industry is undergoing a significant transformation driven by the need for energy transition and decarbonisation. PBU is aligned with these industry needs, focusing on renewable energy, energy storage, and clean energy solutions.
- **Renewable Energy Expansion:** The penetration of renewable energy is accelerating with advancements in land-mounted Solar PV, Onshore Wind, Floating Solar PV, and Offshore Wind power plants. Energy storage applications, such as Battery Energy Storage Systems (BESS) and Green Hydrogen, are being pursued to ensure power supply stability.
- **Hydropower Development:** Hydropower is gaining traction as a source of green power. Large hydro plants, Pumped Storage Projects (PSPs), and retrofitting older plants are crucial for balancing supply and demand, improving efficiency, and ensuring reliability and safety.
- **HVDC Transmission:** High-voltage direct Current (HVDC) transmission lines enable long-distance transmission with less power loss than high-voltage AC transmission.
- **Solar and Wind Resources:** Solar and wind resources provide economical green power options. Wind-solar hybrid systems with BESS are emerging as a solution to enhance grid stability and reliability. The Indian government's energy transition initiatives drive key players towards renewable energy.
- **Nuclear Energy Commitment:** The Government of India's strategic commitment to nuclear clean energy aims to achieve 100 GW by 2047. Research and development in Small Modular Reactors (SMR) are also gaining global interest.
- **Thermal Power Plant Flexibilisation:** The integration of renewable energy into thermal power plants (TPPs), repurposing TPPs, biomass and ammonia co-firing, carbon capture, utilisation, and sequestration (CCUS), and green hydrogen blending are evolving industry trends.
- **Digital Solutions:** Advanced process controls, digital solutions, and asset performance management are implemented to improve predictive maintenance and plant performance. Data analytics tools are also used for equipment health forecasting and proactive action.



Key Areas of Expertise

- Hydro:** PBU excels in hydrological analyses, water availability optimisation, reservoir management, flood control, drought mitigation, and comprehensive services from concept to commissioning of hydropower plants and PSPs. We also specialise in dam strengthening, safety reviews, and renovation of hydropower stations.
- Nuclear:** Our expertise covers engineering plant facilities related to fission reactors, fusion reactor utilities, and the nuclear fuel cycle. We also conduct seismic re-evaluation and margin assessments for operating nuclear power plants.
- Renewable:** We provide comprehensive services for planning, designing, and engineering Solar, Wind, BESS, and Floating Solar PV (FSPV) plants, as well as hybrid power plants from concept to commissioning.
- Thermal:** PBU specialises in the design engineering of capex fossil fuel-based power plants, green hydrogen project development, and opex services for plant assessment, performance improvement, and retrofitting. We also offer digital solutions for thermal plant performance and reliability enhancement.
- Transmission & Distribution (T&D):** Our expertise includes designing and engineering substations (AIS/GIS/HVDC), transmission line networks, and technical due diligence of substations and transmission line assets. We also conduct power system studies and engineer grid-connected BESS projects.

Key Achievements

- First off-river PSP in India with 1680 MW capacity.
- IIT Roorkee approved the dynamic analysis and design of the 80-meter-high dam in the Himalayan region and high seismic zone.
- Owner's engineering services for an 8 MW Floating Solar project.
- Consultancy services for a 1000 MW Solar PV plant in Kutch.
- Detailed engineering services for a Solar PV plant in KSA.
- Engineering of 875.5 MWp Qatar Energy Industrial City.
- DE Service for 550 MW Hybrid Renewable Plant (Wind & Solar) in Maharashtra.
- Integrated 3D engineering of 2 x 700 MWe Units 5 & 6 at Karnataka.
- Deployed over 60 IPAs (Project Assistants) onsite in France.
- RE Integration with 2x660MW STPP for generating 782 MUs.
- Heat rate improvement of 300MW TPP through digital process control solutions.

- Studies for repurposing old TPPs in India for the Energy Transition Council.
- Pre-bid engineering services for decarbonisation readiness in Saudi Arabia.
- Improvement through innovative cooling tower project at Jamshedpur.
- Independent engineer services for eight TBCB 765/400/220kV transmission line cum substation projects.
- Techno-commercial due diligence studies of the 220kV transmission line.
- Renewable integration studies as per the latest POSOCO guidelines.
- Dedicated Engineering centre for two large MNC customers.

Critical Initiatives for Benchmark Results

- Developed new competencies in subsea cable engineering, HVDC design, PSPs, BESS, digital solutions, and green hydrogen.
- Adopted automation processes in detailed engineering and project management.
- Completed automation of several engineering processes aligned with the 3D working method.
- Expanded customer base and geographies, ensuring continuous growth and innovation in the power sector.

Tata Consulting Engineers' Power Business Unit is poised to lead the power industry into a sustainable and innovative future, driven by our extensive expertise, commitment to clean energy, and strategic alignment with emerging industry trends.

The power industry is undergoing a significant transformation driven by the need for energy transition and decarbonisation. PBU is aligned with these industry needs, focusing on renewable energy, energy storage, and clean energy solutions.

PROJECT CASE STUDY

Electrical System Studies for Train-3 Project at Port Harcourt, Nigeria

As part of an expansion plan, a central industrial facility in Port Harcourt, Nigeria, enhanced its Ammonia and Urea manufacturing capacity by constructing a third production train (IFL-3). This new train was designed to produce an additional 2,300 tons per day (TPD) of ammonia and 4,000 TPD of urea. Tata Consulting Engineers (TCE) was engaged to perform a comprehensive power system study for the electrical network, assess the adequacy of the existing system, and support the client in preparing an inquiry for a new Electrical Distribution Management System (EDMS).

Scope of Work for Power System Study

- Network Development of an electrical network model in ETAP for the proposed Train-3.
- Load Flow and Short Circuit Study to verify equipment ratings and network adequacy.
- Motor Starting Study on EDG to analyse emergency scenarios.
- Relay Settings Configuration for 33 kV, 3.3 kV, and other new switchboards.
- Unit Protection of new equipment in the Train-3 facility.
- Load Shedding and Contingency Analysis to Optimise the new EDMS system.
- Calculate the Sheath Voltage Limiter (SVL) to ensure voltage control for the 33 kV long cable.

Scope of Work for New EDMS System

- Technical Specification Preparation for the new EDMS system.
- EDMS Architecture system design.
- Bill of Material Preparation of required components.
- Bid Document Review and Recommendation of EDMS vendors.

IMPACT

- System Reliability and Stability achieved through comprehensive power system analysis.
- Mitigation of High Fault Current via the introduction of Is-Limiter in parallel with a series reactor.
- Resolution of Voltage Dip Issues by introducing an Is-Limiter to prevent LT contactor dropouts during transformer energisation.
- Enhanced relay coordination for improved protection using Adaptive Relay Settings.
- Implemented intermittent earthing and a Sheath Voltage Limiter (SVL) to manage high induced voltage.
- Introduced Dynamic Load Shedding Scheme with scalability for future expansions.



PROJECT CASE STUDY

MP30 Gandhi Sagar 1920 MW Pumped Storage Project

The project is being developed in Khemla village, Neemuch district, Madhya Pradesh and aims to enhance energy storage capabilities and support renewable energy integration. It comprises two reservoirs: the upper reservoir (proposed) with a gross storage of 2.397 TMC (1.413 TMC live storage and 0.97 TMC dead storage) and the existing Gandhisagar lower reservoir with an available gross capacity of 258.47 TMC.

The project features a 6.319 km long, approximately 32 m high Geomembrane Faced Rockfill Dam (GFRD) as the upper dam, eight diffuser type upper intakes, eight buried penstocks/pressure shafts each 7.5m in diameter and approximately 560m long, a surface pit type powerhouse, and nine Francis type vertical shaft reversible pump turbines with a combined installed capacity of 1920 MW.

The powerhouse dimensions are 310m long, 25.5m wide, and 53m high. It includes seven larger units, each with 240 MW capacity, and two smaller units, each with 120 MW capacity. The tailrace system includes nine circular tailrace tunnels and an unlined trapezoidal-shaped tailrace channel about 4 km long and 320m wide at the base, discharging into the Gandhisagar reservoir.

The consultancy services for detailed design engineering of civil and hydro-mechanical (H&M) works were awarded to a consortium of Tata Consulting Engineers.

Key Challenges

- Managing seepage of water during the operation of the 6.3 km long GFRD.
- Excavating an 85m bottomless pit with a rock support system in shale presents significant geological challenges.
- Excavation in deplorable geological conditions requiring specialised techniques and solutions.
- To prevent water loss, construction and provision of an adequate water sealant for the cofferdam in the lower reservoir.

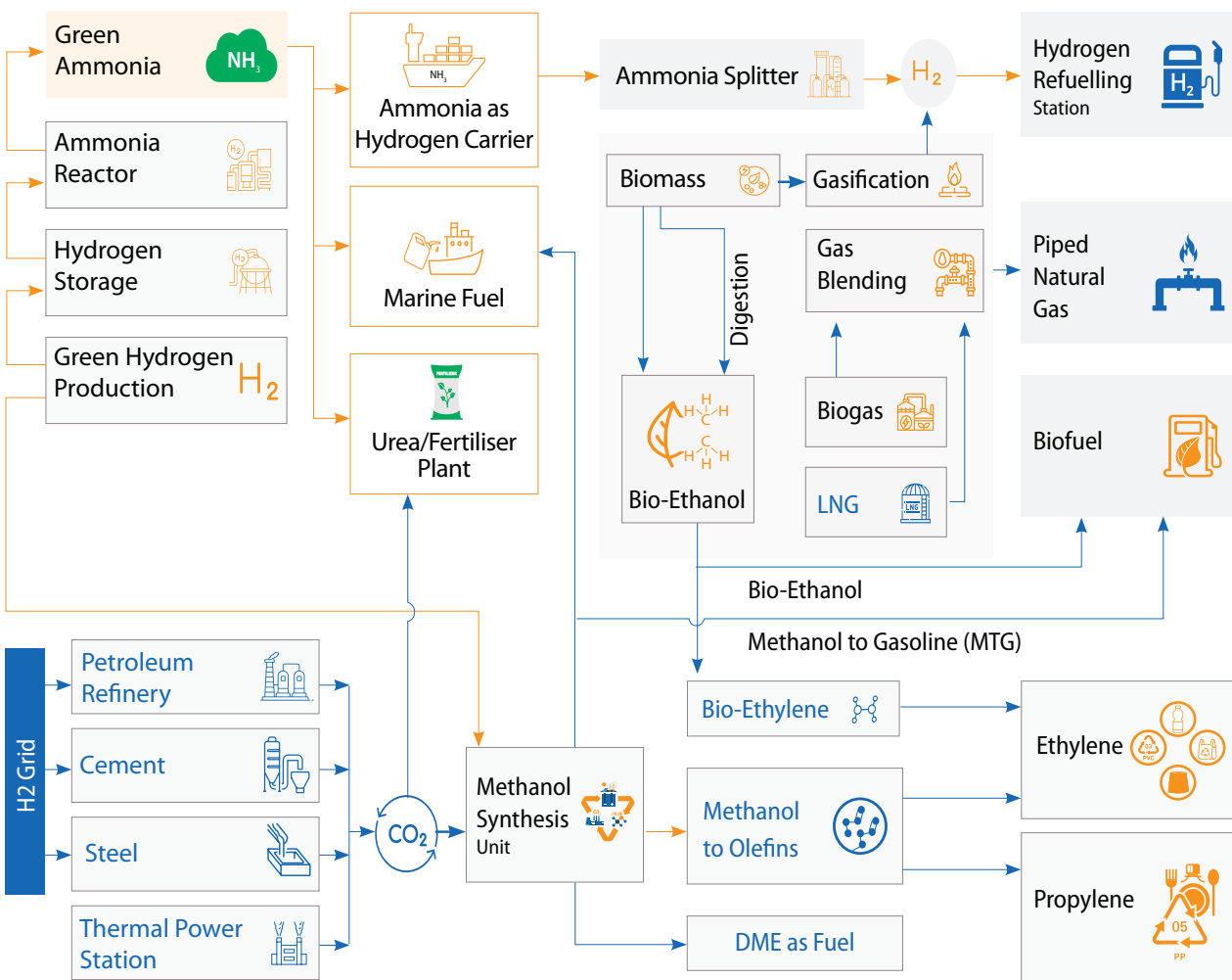
IMPACT

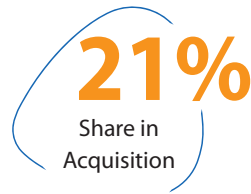
- **Seepage Mitigation:** Implementing proposed treatment measures effectively avoided seepage through the foundation, ensuring the dam's integrity and associated structures.
- **Innovative Excavation Techniques:** The multi-drifing method with pipe roofing was proposed to handle challenging geological conditions, ensuring safe and efficient excavation.
- **Effective Water Sealant Solutions:** A rockfill cofferdam with a central sheet pile was proposed as a water sealant, effectively addressing the challenge of water loss in the lower reservoir.



HYDROCARBONS AND CHEMICALS BUSINESS

Tata Consulting Engineers (TCE) has pioneered engineering excellence, spearheading innovation and sustainability across various industries. Our Hydrocarbons and Chemicals business is a testament to our unwavering commitment to designing the future. With a wealth of experience and a robust portfolio of projects, we offer comprehensive engineering solutions that cover the entire value chain of the hydrocarbons and chemicals sectors. From green and sustainable chemicals to cutting-edge advancements in semiconductor manufacturing, our multidisciplinary teams consistently deliver exceptional value through innovative design, efficient project management, and strategic partnerships. Our unwavering focus on sustainability, technological advancement, and customer-centric solutions ensures that we not only meet the current demands of the industry but also anticipate and shape future trends.





Key Trends Shaping the Industry

Green & Sustainable Chemicals

Green Ammonia & Green Methanol: The global green ammonia market is poised for remarkable growth, with an estimated market size reaching USD 82.4 billion by 2023 and a projected compound annual growth rate (CAGR) of 68% from 2023 to 2033. By 2033, the market value is expected to soar to approximately USD 14,761.3 billion. Historically used as fertiliser, green ammonia has expanded its applications to include shipping and marine fuel, industrial feedstock, and renewable energy.

Similarly, the global green methanol market is on a trajectory of significant expansion. It is currently valued at USD 622.26 billion in 2022 and is projected to grow at a CAGR of 55.0% from 2023 to 2030. The increasing use of green methanol in formaldehyde and mineral turpentine oil (MTO) is a key driver of this growth, finding applications in industries such as paints, coatings, agrochemicals, cosmetics, food, and pharmaceuticals. Derived from renewable sources like biomass or captured carbon dioxide, green methanol is crucial for clean energy production and eco-friendly fuels.

Semiconductors: Despite facing challenges during the COVID-19 pandemic and geopolitical tensions, the semiconductor industry is set to rebound in 2024. Global chip sales are forecasted to reach USD 588 billion, a 13% increase from 2023 and 2.5% higher than the record revenues of USD 574 billion in 2022. Key drivers for the industry include:

- Generative AI and Accelerator Chips
- Smart Manufacturing
- Assembly and Test Capacity Expansion
- Cybersecurity Challenges
- Geopolitical Factors and Export Controls

The semiconductor industry navigates challenges and opportunities driven by AI innovations and complex geopolitical dynamics.

Battery & Battery Energy Storage Systems (BESS)

The battery manufacturing sector is scaling up, with lithium-ion technology maintaining dominance. Global demand drives substantial investments, positioning battery production as a pivotal element in achieving sustainability and resilience in the transition towards cleaner energy.

Chemicals & Specialty Chemicals

The chemicals industry, including bulk and speciality chemicals, is expanding significantly due to supply chain realignments and geopolitical influences. The sector is forecasted to grow at a CAGR of 12.4%.

Key Areas of Expertise

Our company actively engages in various green projects, including green hydrogen, green ammonia, and methanol. These projects are managed from concept to commissioning, covering basic engineering review, FEED preparation, EPC contractor selection, and execution monitoring. We are also involved in biomass-to-hydrogen conversion and several biofuel projects. Our team has expertise in engineering services for electronics-grade silicone manufacturing plants and PV solar panel glass production.

We have initiated engineering services for a pilot line for Outsourced Assembly and Testing (OSAT) facilities in the semiconductor industry, demonstrating our capabilities in this field. In lithium-ion cell manufacturing, we handle multiple projects on a complete EPCM basis.

We have established Dedicated Engineering Centres (DECs) for SABIC and Tata Chemicals, providing program management for large annuity accounts. Discussions are underway with international petroleum majors to serve as DECs for them. Our multidisciplinary experience spans speciality chemicals, paint, oil and gas, petrochemicals, and fertilisers.

Key Achievements

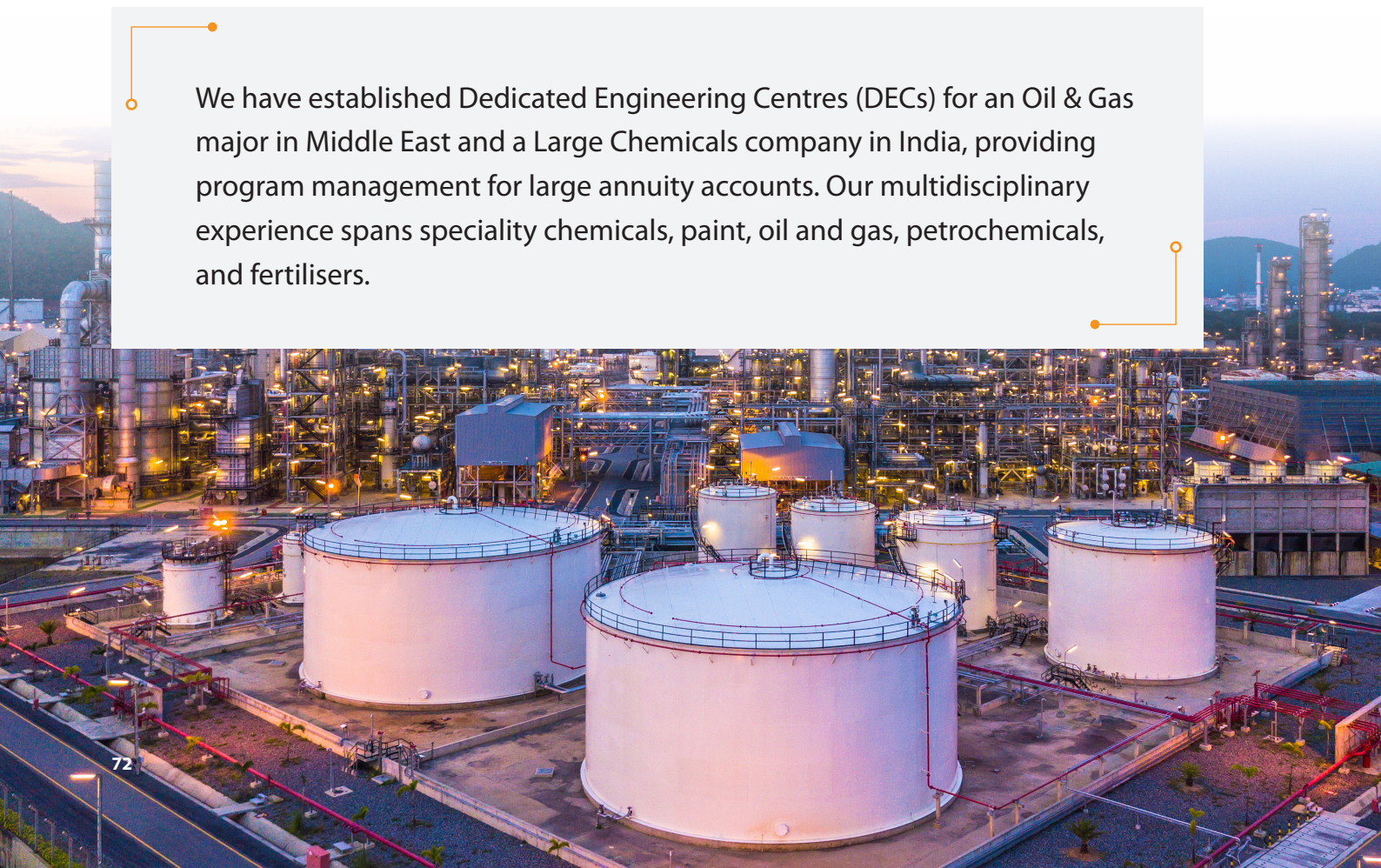
We have secured significant orders in the Chemical & Specialty Chemical and Green & Sustainable Chemicals sectors, including:

- Chlor Alkali (CA) Plant at Dahej, Gujarat
- Two Soda Ash plants, both in Gujarat
- Gigafactory for Lithium-Ion Cell Battery Manufacturing at Sanand, Gujarat
- Ultra Clear Figured Glass Plant at Jamnagar, Gujarat
- Speciality Chemical projects (Hydro Fluoric Acid) at Dahej, Gujarat
- Green Ammonia project in Odisha
- EPCM services for Offsites & Utilities for Train 3 – Urea & Ammonia plant in Nigeria
- Inorganic chemicals (such as Zinc Oxide and its derivatives) at Dahej, Gujarat
- Partnership established for Gigafactory & Semiconductor industries
- Other notable achievements include the highest-ever acquisition, accrual, PBT, billing, and collection for the business unit and securing the most significant order for HCBU.

Key Initiatives Driving Benchmark Results

- Focus on Large Deals, Key Accounts, Green & Sustainable Chemicals, and Advanced Technologies
- Leveraged the Accelerate Delivery Centre (ADC) for plant design and engineering, enhancing productivity and reducing person hours.
- Increased focus on KSA EPCs and expanded OPEX/DEC services.
- Established partnerships in the Gigafactory & Semiconductor industries.
- Intensive collaboration with the Technology team to enter new and emerging sectors, from proposal preparation to identifying value engineering opportunities and critical design.
- Empanelment of industry experts.

We have established Dedicated Engineering Centres (DECs) for an Oil & Gas major in Middle East and a Large Chemicals company in India, providing program management for large annuity accounts. Our multidisciplinary experience spans speciality chemicals, paint, oil and gas, petrochemicals, and fertilisers.



PROJECT CASE STUDY

Chlor-Alkali Project

A prominent petrochemical complex at the Dahej Manufacturing Division (DMD) aims to expand its PVC production capacity. To achieve this, the complex is set to enhance its facilities by including a new Chlor-Alkali (CA) Plant, an Ethylene Dichloride (EDC) Plant, a Chlorinated Polyvinyl Chloride (CPVC) Plant, and associated Offsite and Utility facilities (OSBL). Tata Consulting Engineers (TCE) has been entrusted with the Engineering, Procurement, and Construction Management (EPCM) execution services for the CA Plant.

Project Overview

The CA Plant is designed with a total production capacity of 1035 KTA (3105 TPD) of 100 wt% Chlorine at the plant's battery limit, alongside an equivalent quantity of caustic soda lye, approximately 1187 KTA (3561 TPD) on a 100% dry caustic basis. The plant is engineered to operate for 8000 hours annually. The designed production capacity, with a 10% margin, is 3415.5 TPD of 100 wt% Chlorine based on 8760 operating hours per year. All equipment is designed for a minimum of 50% turndown. 100% of the Chlorine product will be utilised in an adjoining Ethylene Dichloride plant within the same complex. The plant will be designed with two trains for the cell house and a standard upstream section downstream of the cell house.

SCOPE OF SERVICES

- Project Management
- Project Controls
- Quality Assurance
- Health, Safety, Environment, and Fire
- Residual Basic Engineering and Detail Engineering & Design
- Participation in HAZID, HAZOP, and SIL Studies
- Procurement Management Services
- Construction Management Services
- Project Information Management and Automation
- Inputs to Asset Digital Twin
- Project Governance

TCE is also responsible for managing project interfaces, information automation, project control, and associated services such as expediting, inspection coordination, logistics support, material management, quality and safety assurance, and project close-out.



PROJECT CASE STUDY

Gigafactory of Lithium-Ion Cell Battery Manufacturing Plant at Sanand, Gujarat

The project entails designing and constructing a state-of-the-art 20GWh Gigafactory for manufacturing Lithium battery cells in its first phase, located in Sanand near Ahmedabad, Gujarat, India. This ambitious greenfield project spans a plot area of 130 hectares and is poised to become a pivotal player in the energy storage solutions market.

Type of Cell: LFP Prismatic + Winding

Tata Consulting Engineers (TCE) is entrusted with the project's Residual Basic Engineering and Detailed Engineering, ensuring precision and excellence in every aspect of the design and construction phases.

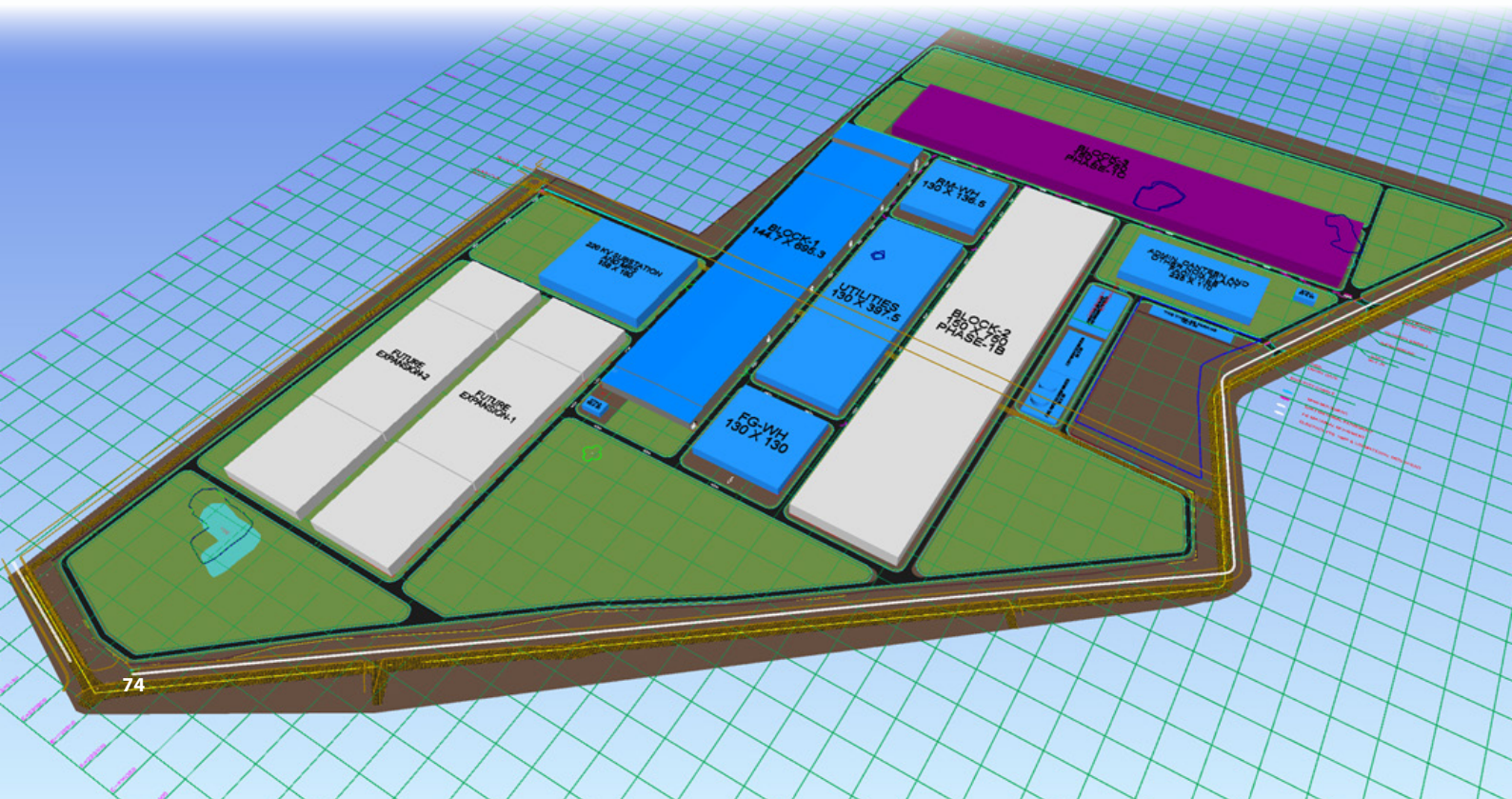
Utilities Required

To support the seamless operation of the Gigafactory, a comprehensive array of utilities required comprise of Dry Compressed Air, Nitrogen, Chilled Water System, Cooling Water System, Steam Boiler, Water Treatment / DI Water, Clean & Dry Rooms for Process Areas, Effluent Treatment Plant (ETP), Sewage Treatment Plant (STP), Emergency Generator (GEG), Fire Detection and Alarm System (FDAS) and Fire Protection System, Public Address/Access Control System.

FACILITIES

The Gigafactory boasts several high-capacity process blocks and essential facilities:

- **Process Blocks:** The factory includes 2 to 3 process blocks, each with an estimated capacity of 7 to 10 GWh. The estimated size of each process building, constructed as PEB (pre-engineered buildings), ranges from 150 m x 650 to 750 m.
- **Warehouses:** Dedicated raw material and finished goods warehouses, designed as PEB buildings, support the efficient flow of materials.
- **Administrative Block:** The administrative block includes non-plant buildings and facilities, covering an area of 13,000 to 170,000 sq. ft.
- **Electrical Substation:** A 220 KV electrical substation is established to ensure a stable and reliable power supply.
- **Utility Generation Area:** A common utility generation area caters to 20 GWh production capacity.



MINING & METALLURGY BUSINESS

The Mining and Metals business of TCE is at the forefront of innovation and sustainability, delivering comprehensive engineering solutions to the global mining and metals industry. With a solid commitment to excellence, TCE leverages its extensive expertise and cutting-edge technologies to drive growth and efficiency across ferrous and non-ferrous sectors. Our strategic focus on decarbonisation, digital transformation, and sustainable practices is not just about meeting our clients' evolving needs but also about contributing to a greener, more sustainable future. By partnering with TCE, clients gain access to a trusted advisor capable of navigating the complexities of the modern mining and metals landscape, ensuring long-term success and industry leadership, and fostering a more hopeful future for our planet.



Key Industry Trends:

The global economy is on a promising growth trajectory, with GDP projected to rise by 3.1% in FY 2023-24 and 3.2% in 2025. India's economic outlook is exceptionally bright, poised to become the world's third-largest economy by 2030. The 'Low Touch' economy presents many opportunities for businesses to boost productivity and efficiency. The Indian government's increasing focus on speciality steel production is gaining traction, heralding positive developments for the manufacturing sector. Copper (Cu), Aluminium (Al), and Zinc (Zn) continue to be pivotal growth metals, while Lithium (Li) and Nickel (Ni) are emerging as crucial metals for battery technology and renewable energy. The importance of metal recycling is on the rise, promoting sustainability and resource conservation.

TCE is fully committed to the industry's aim for 'No Net Loss' by 2030 and 'Nature Positive' by 2050. This unwavering commitment drives our increased conservation efforts and adoption of sustainable consumption and production practices. Tata Group's Project Aalingana presents a significant opportunity for TCE to establish itself as a trusted partner in achieving these sustainability goals.

The Iron & Steel industry is transforming with investments in scrap recycling and Direct Reduced Iron - Electric Arc Furnace technology. The availability of affordable and clean electrical energy is crucial for the viability of DRI-EAF technology. Investments in existing Blast Furnace-Basic Oxygen Furnace technology are likely to continue until 2030, reflecting the need for a balanced transition. Our commitment to these goals should reassure our stakeholders of our dedication to a sustainable future.

The Engineering and Construction (E&C) industry is adopting digital technologies, transforming project planning, execution, and maintenance. Key trends include Project Management Information Systems (PMIS) for streamlining workflows and improving collaboration, Building Information Modelling (BIM) for better design coordination and lifecycle management, and Advanced Data Analytics for data-driven decision-making, improved risk management and optimised project performance. Digital twins, virtual replicas of physical assets, provide real-time insights into performance and condition. The global digital twins market is expected to reach \$48.2 billion by 2026, indicating significant potential within the E&C sector.

Key Areas of Expertise

- **Decarbonisation Expertise:** We offer comprehensive support in developing decarbonisation programs for integrated steel plants, helping clients achieve their sustainability goals.
- **Owner's Engineer Services:** Our extensive experience as owner's engineers ensures seamless project execution for integrated steel plants, encompassing multiple projects and offering expert guidance throughout the lifecycle.
- **Large Project Execution in the Non-Ferrous Sector:** We have a proven track record of delivering large-scale projects in the non-ferrous sector, including copper smelters, zinc, and aluminium ore processing plants.
- **Front-End Engineering (FEED) Services:** Our FEED services encompass CAPEX and OPEX estimations, optimised process route selection, and feasibility studies, ensuring informed decision-making at the outset.
- **Asset Integrity Management:** We offer a comprehensive approach to asset integrity management (AIM), including structural/machinery inspections, risk assessments, and front-end engineering solutions, ensuring safety, quality, and risk mitigation throughout the project lifecycle (HSE, Quality Assurance).
- **Sustainable Tailings Management:** Our team is adept at identifying solutions for tailings management, adhering to the latest Global Industry Standard for Tailings Management (GISTM) 2020.
- **Digital Engineering Solutions:** We leverage multi-disciplinary 3D models (BIM) from concept to detail engineering, facilitating improved collaboration and project visualisation.
- **Value Engineering:** We provide value engineering services to optimise air pollution control systems, building structures, and bulk material handling systems, ensuring cost-effectiveness and efficiency.

- **Project Management Expertise:** Our team excels in project schedule development and management, cost control, financial analysis, and risk assessment, delivering projects on time and within budget.
- **Procurement and Delivery:** We offer e-procurement services to streamline procurement activities and provide inspection & expediting services to ensure material quality and timely delivery. Additionally, we utilise an Electronic Document Management System (EDMS) for efficient project document delivery and control.

Highlighting Success: A Track Record of Excellence

- **Market Leadership:** Strong presence across the ferrous and non-ferrous metals sectors, including Aluminium (Al), Copper (Cu), and Zinc (Zn).
- **Sustainability Champion:** Completed a Front-End Loading (FEL) study for a decarbonisation program in an integrated steel plant. Played a crucial role in optimising a client's CAPEX portfolio.
- **Project Delivery Expertise:** Executing Indonesia's largest copper smelter project and India's largest copper concentrator project.
- **Circular Economy Advocate:** Supporting scrap recycling initiatives, contributing to a more sustainable future.
- **Global Standards Adherence:** Early adopter of the Global Industry Standard for Tailings Management (GISTM).
- **Client Commitment:** Long-term Master Service Agreements (MSAs) with clients in both ferrous and non-ferrous sectors. Sustained excellence in Asset Integrity Management (AIM), ensuring the safety and longevity of clients' assets. Positive customer feedback and zero customer complaints.
- **Financial Strength:** Consistently exceeding revenue, billing, and collection targets. Maintaining low locked working capital and achieving healthy margins.



Key Initiatives: Driving Innovation and Efficiency

- Strategic Partnerships: Collaborating with SMEs and technology vendors to expand capabilities and offer cutting-edge solutions.
- Tailored Client Solutions: Delivering custom-made solutions for specific project requirements.
- Digital Transformation: Establishing a Design Engineering and construction (DEC) model and utilising multidisciplinary 3D models (BIM).
- Account-focused Growth: Ensuring a deep understanding of client needs leads to better opportunity identification and a strong pipeline for recurring business.
- Enhanced Project Management: Implementing daily work meetings for internal alignment and proactive issue resolution.
- Matrix Organisation Structure: Balancing account focus on project delivery with quality through discipline-specific expertise.
- EPCM Capabilities: Building competency and capacity to deliver projects as a full-service EPCM (Engineering, Procurement, Construction, and Management) partner.
- Portfolio Optimisation: Prioritising a healthy mix of CAPEX and OPEX projects.
- Global Delivery Model: Leveraging an onsite-offshore delivery model for AIM and OPEX services, optimising resource allocation and cost-effectiveness.
- Compliance Excellence: Focusing on robust systems and processes to ensure compliance with industry standards, achieving the highest compliance score among TCE business units for three consecutive months.
- Sustainability Leadership: Implementing GISTM-compliant improvement projects and serving as Engineer-on-Record for tailings management projects.

TCE is fully committed to the industry's aim for 'No Net Loss' by 2030 and 'Nature Positive' by 2050. This unwavering commitment drives our increased conservation efforts and adoption of sustainable consumption and production practices. Tata Group's Project Aalingana presents a significant opportunity for TCE to establish itself as a trusted partner in achieving these sustainability goals.



PROJECT CASE STUDY

Pioneering Aluminium Recycling in the UAE

A leading aluminium producer in the UAE aims to revolutionise its production processes by incorporating advanced recycling techniques. The new facility will process post-consumer aluminium scraps, such as used window frames, and pre-consumer scrap from extrusion production. This ambitious project is expected to reduce energy consumption by 95% compared to primary aluminium production, significantly lowering the environmental impact.

TCE secured the project through competitive bidding, demonstrating superior expertise and commitment. Critical factors in TCE's selection included:

- **Strategic Expertise:** TCE deeply understands the aluminium industry and its specific challenges.
- **Tailored Solutions:** A customised approach that aligns perfectly with the client's requirements.
- **Unwavering Commitment:** Dedication to exceeding expectations and building robust, lasting partnerships.

TCE's role in this project involves meticulous planning, innovative engineering solutions, and rigorous management practices to ensure the facility meets its sustainability goals. The recycling plant will minimise the environmental footprint of aluminium production and set a new standard for the industry in the region.

SCOPE OF SERVICES

As the appointed Engineering, Procurement, and Construction Management (EPCM) consultant, TCE provides a comprehensive suite of services, ensuring seamless project execution from start to finish. These services include:

- Basic & Detailed Engineering with 3D Modelling
- Review Engineering
- Project Management
- Procurement Services
- Inspection Services
- Construction Management
- Safety and Site Services (erection, testing, commissioning)
- Project Acceptance Certificate (PAC) and Final Acceptance Certificate (FAC) Facilitation
- Order Closure and Facility Handover



PROJECT CASE STUDY

Decarbonising Steel Production at Port Talbot

TCE spearheads a significant decarbonisation project at the historic Port Talbot Works, a central steel production facility in the UK. This initiative aligns with the UK's net-zero emissions target for 2050, aiming to revolutionise steelmaking by transitioning from a traditional blast furnace-basic oxygen furnace (BF-BOF) route to a more sustainable electric arc furnace (EAF) technology.

Port Talbot Works has a legacy of over a century in steel production but faces the challenge of being one of the UK's largest carbon dioxide emitters. To address this, the plant is set to undergo a significant transformation to drastically reduce its CO₂ emissions.

The primary objectives of the decarbonisation project are:

- **Reduce CO₂ Emissions:** Achieve a 70% reduction in total emissions by transitioning to EAF technology.
- **Optimise Costs:** Implement a more cost-effective operational model through EAF technology.
- **Manage Asset Lifecycle:** Phase out ageing infrastructure such as the coke oven plant, sinter plant, blast furnaces, and BOS plant.
- **Utilise Available Resources:** Leverage the UK's surplus scrap metal as a sustainable feedstock for steel production.

SCOPE OF SERVICES

TCE has been a trusted partner at Port Talbot for nearly seven years, bringing deep process expertise and strategic insights to the project. Our involvement began with completing the FEL 2 (Front-End Loading) engineering study and continues with the current FEL 3 phase.

TCE's success in securing this project can be attributed to:

- **Strategic Expertise:** A thorough understanding of the steel industry and its unique challenges.
- **Tailored Solutions:** Customising our approach to meet the specific requirements of the decarbonisation project.
- **Long-Term Commitment:** Demonstrating our unwavering dedication to supporting the client's sustainability goals.

This decarbonisation project is poised to transform the future of steel production in the UK by significantly reducing CO₂ emissions and optimising operational costs.



DIGITAL AND ADVANCED TECHNOLOGY



DIGITAL AND ADVANCED TECHNOLOGY BUSINESS

The Digital & Advanced Technologies Business Unit (DATBU) was established to spearhead TCE's digitisation initiatives, positioning itself as a leading provider of advanced technology services. By leveraging our 60 years of domain expertise and a talented pool of engineers, we aim to drive innovation and transformation in the industry, firmly aligned with the theme of 'Designing the Future.' Our digitisation initiatives have already begun to reshape the industry, instilling confidence in our stakeholders about the future of DATBU.



Key Trends Shaping the Industry

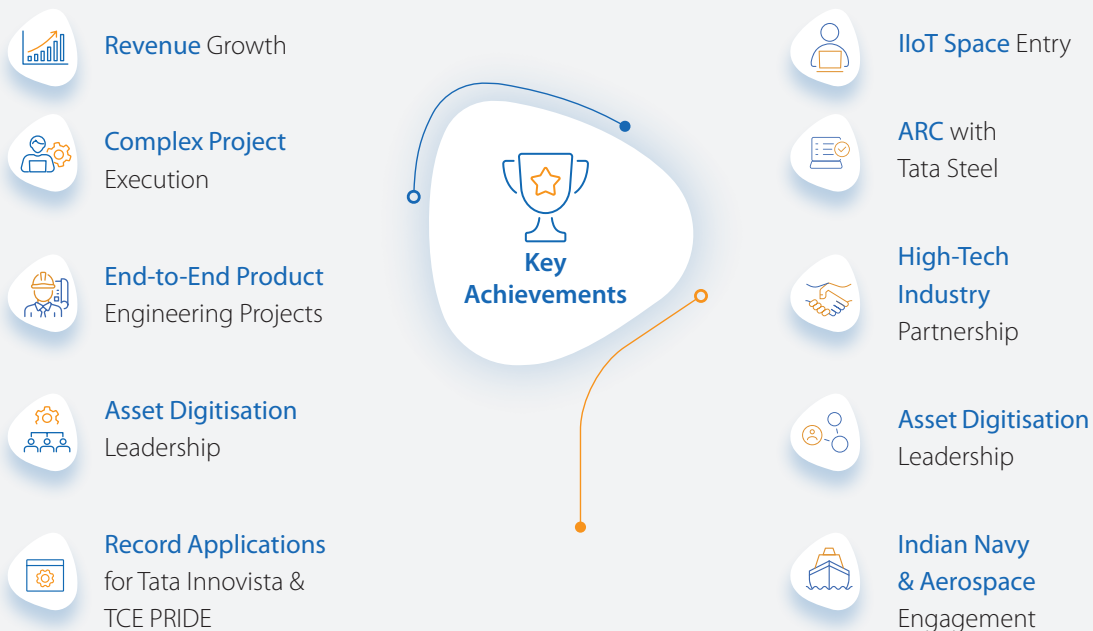
- Modernisation and Self-Reliance in the Indian Defence Market:** The Indian defence market is placing a strong emphasis on modernisation and self-reliance, with the government actively promoting Indigenous production, research, and development in defence technologies. This aligns with the "Make in India" initiative, fostering partnerships with both domestic and international defence companies to enhance capabilities and reduce import dependency. These trends present significant growth opportunities for DATBU, fostering optimism about our future.
- Digital Technology Adoption:** Digital technology adoption is projected to result in a 20% reduction in carbon emissions by 2050, playing a crucial role in designing a sustainable future.
- AI/ML-Based Solutions:** Adopting AI/ML-based solutions will help locate viable sources of critical metals and renewable resource locations for solar and wind energy. These solutions will also improve operation and equipment efficiency, predict failures, extend equipment life, and reduce waste, all contributing to future-ready infrastructure.
- Product Engineering Opportunities:** There are significant opportunities in product engineering to develop small-scale, containerised green hydrogen solutions for energy storage and hydrogen production for process requirements, fostering energy innovation for the future.
- Decarbonisation Initiatives:** Various industries are accelerating digitisation and digitalisation efforts in response to decarbonisation initiatives and regulations, driving the future towards a greener planet.

DATBU's continued focus on innovation, client satisfaction, and leveraging national initiatives positions us firmly for future growth and success, embodying the theme of 'Designing the Future.'

Key Achievements

DATBU has experienced steady year-on-year growth since its inception, with significant milestones achieved in FY 2023-24:

- Revenue Growth:** Our revenues grew by approximately 155% yearly, with profit margins increasing by over 50% in FY 2023-24.
- Complex Project Execution:** We have successfully executed complex projects in product engineering for niche sectors such as defence, space, and astrophysics research, demonstrating our capability to design future technologies.
- End-to-End Product Engineering Projects:** Completed TCE's first turnkey product engineering project for the defence sector and wind turbine blade mould manufacturing. We also secured a second project to indigenise a gravitational mixer in the defence sector, marking significant strides in designing defence technologies for the future.
- Asset Digitisation Leadership:** We have consolidated our position as a leader in the asset digitisation space by securing a significant deal with an Indian exploration major.
- Record Applications for Tata Innovista & TCE PRIDE:** Received the highest number of applications for Tata Innovista and TCE PRIDE competitions, reflecting our continuous innovation and future-oriented approach.
- IIoT Space Entry:** Entered the IIoT space by acquiring an HRI improvement project for a thermal power plant and a prestigious client in the Middle East, highlighting our role in designing intelligent industrial systems for the future.
- ARC with Tata Steel:** Signed an ARC with Tata Steel for IT-OT integration projects, further cementing our role in designing integrated operational technologies.
- High-Tech Industry Partnership:** Strengthened our partnership with the high-tech industry by integrating mechanical, environmental, and process variables into equipment for error-free chip delivery in their fabs, showcasing our commitment to designing the future of semiconductor manufacturing.
- Indian Navy & Aerospace Engagement:** We made inroads into the Indian Navy and aerospace domains through empanelment with CNAI (Indian Navy) and HAL (Hindustan Aeronautics Ltd.), participating in various bids, positioning ourselves as key players in designing the future of defence and aerospace technologies.



Awards and Recognitions:

- Won the Tata Innovista-2023 Design Honour for the Automated Film Loading & Stacking System (AFLASS).
- Awarded the 'Golden Peacock Innovative Product/Service Award 2024 for the retractable arm for satellite launches, exemplifying our vision in designing innovative future technologies.

Key Initiatives Driving Benchmark Results

- **Increased Inter-BU Collaboration:** Enhanced collaboration between business units to ensure optimised solutions for our clients.
- **Standardised Delivery Processes:** Implemented standardised delivery processes across product lines to ensure timely delivery with minimal defects.

- **Increased Client Stickiness:** Substantially improved client retention and satisfaction.
- **Leveraged National Initiatives:** Capitalised on the Atmanirbhar Bharat and Make In India initiatives to expand our footprint in the product engineering space, contributing to the national vision of a self-reliant future.
- **Cross-training and Cross-Skilling:** Conducted cross-training and cross-skilling programs for resources to increase utilisation and flexibility, ensuring our workforce is future-ready.

DATBU's continued focus on innovation, client satisfaction, and leveraging national initiatives positions us firmly for future growth and success, embodying the theme of 'Designing the Future.'

Digital technology adoption is projected to result in a 20% reduction in carbon emissions by 2050, playing a crucial role in designing a sustainable future.



PROJECT CASE STUDY

Digitisation of P&IDs, Drawings and Documents to Intelligent Format

The client is India's largest crude oil and natural gas Company, contributing around 71% to Indian domestic production. The primary goal of this project was to digitise existing Process and Instrumentation Diagrams (P&IDs), electrical and instrumentation drawings, and other essential documents into an intelligent format. This transformation aimed to enhance operational efficiency, improve accessibility, and ensure the integrity and accuracy of technical data.

Scope of Services:

- Digitise P&IDs, electrical, and instrumentation drawings into an intelligent format.
- Convert paper drawings to digital format.
- Enable access to all intelligent drawings within an integrated network or environment.

IMPACT

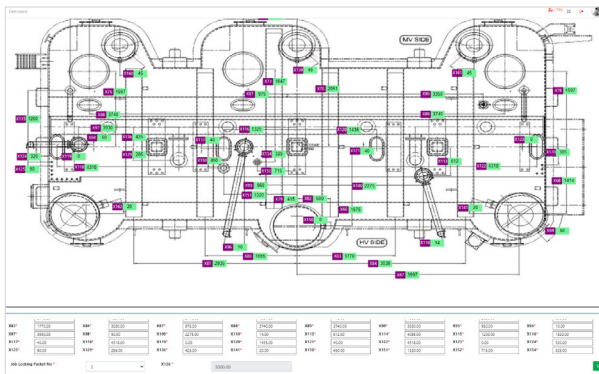
- The digitisation project significantly improved the efficiency and effectiveness of offshore operations: digitised 1079 P&IDs, 4844 instrumentation drawings, 4517 electrical drawings, and 34 platform operation manuals.
- The intelligent formats enhanced data accessibility, reduced the risk of errors and streamlined maintenance and operational activities.
- This project highlights TCE's commitment to leveraging technology for operational excellence and supporting the advancement of critical national infrastructure.



PROJECT CASE STUDY

Design Automation of Power Transformers

The client is India's largest transformer design and manufacturing organisation. This project aimed to transition a 2D design practice to a 3D design automation system for power transformer design, focusing on seven main power transformers to significantly boost turnover and automate the design process for transformer variants. This would enhance productivity and efficiency in design release activities, create detailed drawings of parts, sub-assemblies, and general assemblies (GA), and generate Bills of Materials (BOM). The project also included a user-friendly UI for variable tracking, automated creation of PDFs and .dxf files for detailed drawings, Excel-based BOM generation for released projects, and data storage solutions for released projects.

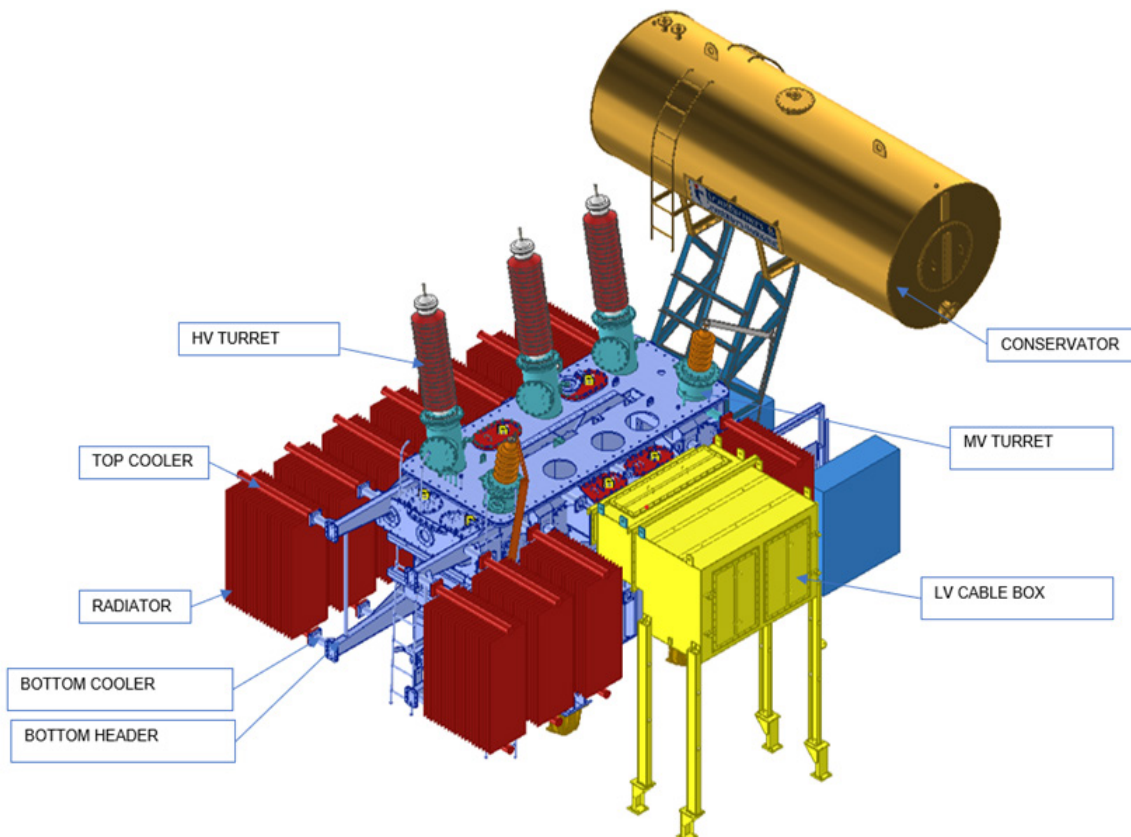


Scope of Services:

- Develop parametric 3D solid modelling techniques, configure subassembly-assembly configurations, and produce detailed drawings.
- Create a master library for standard parts with iParts and iAssembly configurations.
- Develop APIs to manage the interdependency of parts and subassemblies.
- Design a user-friendly UI for variable tracking and create a utility dashboard for streamlined operations.

IMPACT

- Automating the design process increased productivity, enhanced efficiency, higher accuracy, and improved turnover.
- The client experienced significant growth by reducing the time required for design activities, minimising delays, and ensuring higher design precision.



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 the 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 to fulfil its responsibilities for all its stakeholders. TCE's Corporate Governance traits include ethical business conduct, commitment to values and integrity, which enhance and retain stakeholders' trust. The Management Committee takes business decisions in consultation with the Board.

Company's Philosophy on Corporate Governance

Good Governance practices stem from the 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 hallmarks inherited from the Tata culture and ethos.

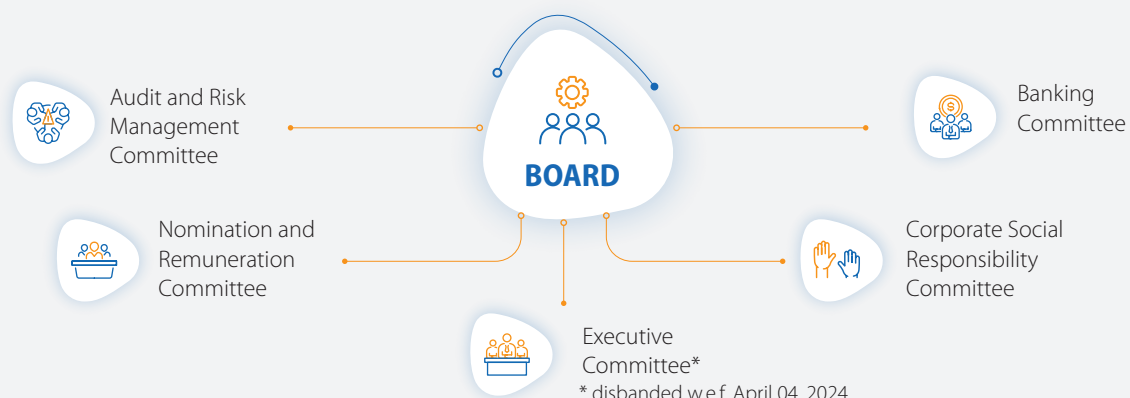
The Company has a strong legacy of fair, transparent and ethical governance practices. The Company has adopted a Code of Conduct for its employees, including the Managing Director. In addition, the Company has adopted a Code of Conduct for its Non-Executive Directors.

As per Section 149 of the Companies Act, 2013 ("the Act") and as of the financial year ended March 31 2024, the Company does not fall under the requirement of mandatorily having an Independent Director on the Board of the Company or the Committees like the Audit & Risk Management Committee and Nomination & Remuneration Committee.

However, the Board has voluntarily appointed an Independent Woman Director, and accordingly, the Code of Conduct laid down under Schedule IV of the Act has been adopted for the said Independent Director.

The Company adheres to the Tata Board and Committee Governance Charter 2015, as amended from time to time, and its applicable provisions, for its voluntarily constituted Committees, namely the Audit & Risk Management Committee and the Nomination and Remuneration Committee. The Committees, i.e., Audit & Risk Management Committee, Nomination and Remuneration Committee, Corporate Social Responsibility Committee, Executive Committee & Banking 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.

The Company was awarded as the "Best Governed Company Unlisted Segment: Medium Category" in the 23rd edition of the ICSI National Awards for Excellence in Corporate Governance.



Board of Directors

As of March 31, 2024, the Company has 5 Directors. Of the 5 Directors, 4 (i. e. 80%) are Non-Executive Directors including one Women Director. A brief resume of all Directors, the nature of their expertise in specific functional areas etc. is available at <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.

5 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 24, 2023	4	4	100
July 05, 2023	4	4	100
July 31, 2023	4	4	100
November 16, 2023	4	4	100
March 20, 2024	5	5	100

The necessary quorum was present for all the meetings.

Name of the Director	Category	Number of Board Meetings attended during FY 2023-24	Whether participated at the last AGM held on May 19, 2023 (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	5	Yes	0	2	-	2	2
Mr Amit Sharma (Managing Director & CEO) (DIN 03212568)	Non-Independent, Executive	5	Yes	1	1	-	-	2
Ms Anjali Kulkarni*** (DIN 06993867)	Non-Independent, Non- Executive	5	Yes	-	6	-	1	6
Mr Sriram Kadiyala** (DIN 08449772)	Non-Independent, Non- Executive	5	No	-	-	-	-	-
Mr L Krishnakumar (DIN 00423616)	Non-Independent, Non- Executive	1#	NA	-	1	1	0	1
Dr Alka Mittal (DIN 07272207)	Non- Executive, Independent	NA##	NA	-	-	-	-	-

*Mr. Ashok Sethi ceased from the office of directorship of the Company due to superannuation w.e.f. April 03, 2024 (closure of business hours)

** Mr. Sriram Kadiyala ceased from the office of directorship of the Company due to resignation w.e.f. March 31, 2024 (closure of business hours)

*** Ms. Anjali Kulkarni ceased from the office of directorship of the Company due to resignation w.e.f. April 30, 2024 (closure of business hours)

#Mr. L Krishna Kumar has been appointed as an Additional Director, Non Executive Non Independent Category w.e.f. March 01, 2024

##Dr. Alka Mittal has been appointed as an Additional Director, (Independent Category) w.e.f. April 23, 2024

- The Directors have made necessary disclosures regarding Committee positions in other Public Companies as of March 31, 2024. None of the Directors are related to each other.
- The Board periodically reviews the compliance reports of all the laws applicable to the Company.
- Details of equity shares of the Company held by the Directors as of March 31, 2024: Not Applicable
- 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"), names of other 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, 2024, 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 is a member of more than ten committees or Chairman of more than five committees across all the Public Companies in which they are a Director. Committees considered for the aforesaid limit's evaluation are Audit Committee and Stakeholder Relationship Committee.

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 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.
- **Financial Expertise:** Proficiency in financial management, financial reporting process, budgeting, treasury operations, audit and capital allocation. Ability to monitor the effectiveness of the risk management framework and practices.
- **People Management:** Experience of developing talent, planning succession and driving changes towards long-term growth. General know-how of business management, talent management and development, workplace health & safety.

Nomination and Remuneration Committee - Other Details

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. 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 through salary, benefits, perquisites and allowances (fixed component) and variable component to its Managing Director and employees. Annual increments are recommended by the Nomination and Remuneration Committee within the salary scale approved by the Board and Members, wherever required, and are effective from April 1, each year.

The Board of Directors, on the recommendation of the Nomination and Remuneration Committee, decides the annual bonus payable to the Managing Director and the Non-Executive Directors out of the profits for the financial year.

The annual bonus and commission is decided 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 ₹ 40,000 per meeting to its Non-Executive Directors (Not in Tata employment) and ₹ 20,000 per meeting to its other Non-Executive Directors for attending Board meetings and committees meetings of the Board. The Company also determines to pay commission to the Non-Executive Directors within the ceiling of 1% 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.

Committees of the Board

In the financial year 2023-24, the Board has accepted all recommendations of its committees. The draft Minutes of the Committee Meetings are circulated to the respective Committee members for their comments and the final Minutes are thereafter entered into the Minutes Book. Minutes of the proceedings of Committee meetings are circulated to the Directors and placed before Board meetings for noting. The details about various Board Committees as of March 31, 2024, which comprises 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 and CSR Annual Action Plan 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. Monitor the Corporate Social Responsibility Policy of the Company from time to time. 	<p>Ms Anjali Kulkarni, Member Chairman</p> <p>Mr Ashok Sethi, Member Director</p> <p>Mr Amit Sharma, Member Director</p>	<p>During the year under review, the Company held 2 Corporate Social Responsibility Committee Meetings.</p>
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>	<p>During the year under review, the Company held 3 Nomination and Remuneration Committee meetings as a good corporate governance practice.</p>
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 Gift Policy. 	<p>Mr Sriram Kadiyala, Member Chairman</p> <p>Mr Ashok Sethi, Member Director</p>	<p>During the year under review, the Company held 3 Audit & Risk Management Committee Meetings as a good corporate governance practice.</p>
Executive Committee	<p>The Executive Committee oversees the operational review and strategic planning implementation review at the Business & Cluster Level.</p> <ul style="list-style-type: none"> Review and Achievements of Annual Business Plan. Review of Key Commercial Bidding Strategy. 	<p>Mr Ashok Sethi, Member Chairman</p> <p>Mr Amit Sharma, Member Director</p>	<p>During the year under review, the Company held 2 Executive Committee meetings.</p>

Number of Board & Committee Meetings Held and Attendance Record (FY 2023-24)

Name of the Committee	Audit & Risk Management Committee	Nomination and Remuneration Committee	Board	Corporate Social Responsibility Committee	Executive Committee
No. of Meetings held	3	3	5	2	2
Date of Meetings	April 24, 2023 July 31, 2023 November 16, 2023	April 24, 2023 October 03, 2023 February 29, 2024	April 24, 2023 July 05, 2023 July 31, 2023 November 16, 2023 March 20, 2024	April 24, 2023 July 31, 2023	November 16, 2023 February 29, 2024
No. of Meetings Attended					
Mr Ashok Sethi*	3	3	5	2	2
Mr Sriram Kadiyala**	3	3	5	-	-
Ms Anjali Kulkarni***	-	3	5	2	-
Mr Amit Sharma	-	-	5	2	2
^Mr. L Krishna Kumar	-	-	1	-	-
<p>*Mr. Ashok Sethi ceased from the office of directorship of the Company due to superannuation w.e.f April 03, 2024 (closure of business hours) ** Mr. Sriram Kadiyala ceased from the office of directorship of the Company due to resignation w.e.f March 31, 2024 (closure of business hours) *** Ms. Anjali Kulkarni ceased from the office of directorship of the Company due to resignation w.e.f April 30, 2024 (closure of business hours) ^Mr. L Krishna Kumar has been appointed as an Additional Director, Non Executive Non Independent Category w.e.f March 01, 2024 and has been inducted in the Committees (Audit & Risk Management Committee, Nomination & Remuneration Committee, Corporate Social Responsibility Committee and Banking Committee w.e.f April 04, 2024). Further, he has been designated as the Chairman of the Company w.e.f April 22, 2024</p>					
Whether a quorum was present for all the Meetings			The necessary quorum was present for all the above Board & Committee Meetings		

General Body Meetings

a. Annual General Meeting (AGM)

Financial Year	Date	Time	Venue
2020-21	Friday, June 04, 2021	11.30 A M	Through Video Conferencing ("VC") / Other Audio-Visual Means ("OAVM"). Deemed Venue: Registered office, i.e., Matulya Centre 'A', 249, Senapati Bapat Marg, Lower Parel (West), Mumbai 400 013
2021-22	Tuesday, July 05, 2022	11.00 A M	Through Video Conferencing ("VC") / Other Audio-Visual Means ("OAVM") Deemed Venue: Registered Office, i.e. Elphinstone Building, 10, Veer Nariman Road, Fort, Mumbai - 400 001
2022-23	Friday, May 19, 2023	11.30 A M	Through Video Conferencing ("VC") / Other Audio-Visual Means ("OAVM") Deemed Venue: Registered Office, i.e. Elphinstone Building, 10, Veer Nariman Road, Fort, Mumbai - 400 001

b. **Extraordinary General Meeting:** No Extraordinary General Meeting of the members was held during FY 2023-24.

c. **Special Resolution(s) for FY 2023-24:** No Special Resolution for FY 2023-24.

The Secretarial Auditor M/s Amrita Nautiyal & Associates, Practicing Company Secretaries, have confirmed that the Board of the Company is duly constituted and processes relating to the changes in the composition of the Board were carried out in compliance with the provisions of the Act.

M/s B S R & Co. LLP Chartered Accountants (FRN 101248W/W-100022) have been re-appointed as the Company's Statutory Auditors as approved in the 23rd AGM, i.e., for five years block starting from FY 2022-23 till FY 2026-27. The particulars of payment of the Statutory Auditors' fee, on a consolidated basis, are given in the Statutory Section of the Annual Report.

Other Disclosures

Particulars	Regulations	Details	Website Link for more information/policy
Related Party Transactions	As defined under the Act	The details of the Related Party Transactions are provided in the Board 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 an 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/corporate-governance/
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.	https://www.tce.co.in/corporate-governance/
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 the Annual Report.	
Appointment of Independent Director	As per the Act	The terms & conditions of Appointment of Independent Director are uploaded on the website of the Company.	https://www.tce.co.in/wp-content/uploads/2024/05/Terms-and-Conditions-of-Appointment-of-Independent-Directors.pdf

ENTERPRISE RISK MANAGEMENT

The world faces multifaceted, evolving challenges as we navigate through an era marked by unprecedented uncertainties across various dimensions, such as geopolitics, emerging country blocs, technological advancements, and climate change. 2024, often called "The Year of Elections," will witness over half the world's population casting votes across more than 60 countries, including India. This widespread electoral activity is anticipated to bring significant policy uncertainties and potential disruptions in the business environment due to varying governmental ideologies.

Indian Economic Outlook

Amidst the global upheaval, the Indian economy has not only weathered the storm but also emerged as a beacon of hope. It has showcased remarkable resilience in the post-COVID-19 era, positioning itself as one of the fastest-growing economies on the worldwide stage in the mid-term, as affirmed by leading global economists. This economic stability, coupled with the upswing in government capital expenditures and a steady policy environment, has paved the way for a plethora of opportunities for businesses to not just survive, but to truly flourish.

Complexity and Risk

As opportunities increase, so does complexity, which in turn escalates the associated risks. It is crucial to align these opportunities with organisational strategies and risk appetite to ensure sustainable long-term growth. From a risk management perspective, our focus is on building organisational resilience to mitigate the impacts of internal and external events, while also seizing the opportunities these events present.

Enterprise Risk Management (ERM) Framework

Tata Consulting Engineers has not just crafted, but meticulously honed a robust Enterprise Risk Management (ERM) framework. This framework stands as a testament to our unwavering commitment to addressing potential risks and their impact on the company's performance.

It is intricately woven into our business value chain and draws upon best practices from esteemed standards such as ISO 31000 and the COSO framework. Our risk management procedures are meticulously designed to capture and evaluate risks at every project lifecycle stage, from the bid stage to project closure, ensuring that we are always one step ahead.

The ERM framework supports risk reviews, mitigation, monitoring, and reporting through comprehensive dashboards and reports, tracking key parameters such as risk scores, high-risk bids and projects, and mitigation plans.

The central Risk Function is led by the Chief Risk Officer (CRO), with guidance from the Managing Director, Audit & Risk Management Committee (ARMC) and Board. The Corporate Risk team and Business unit-level Risk Officers (BUROs) support the CRO in integrating and deploying risk frameworks across various BUs.

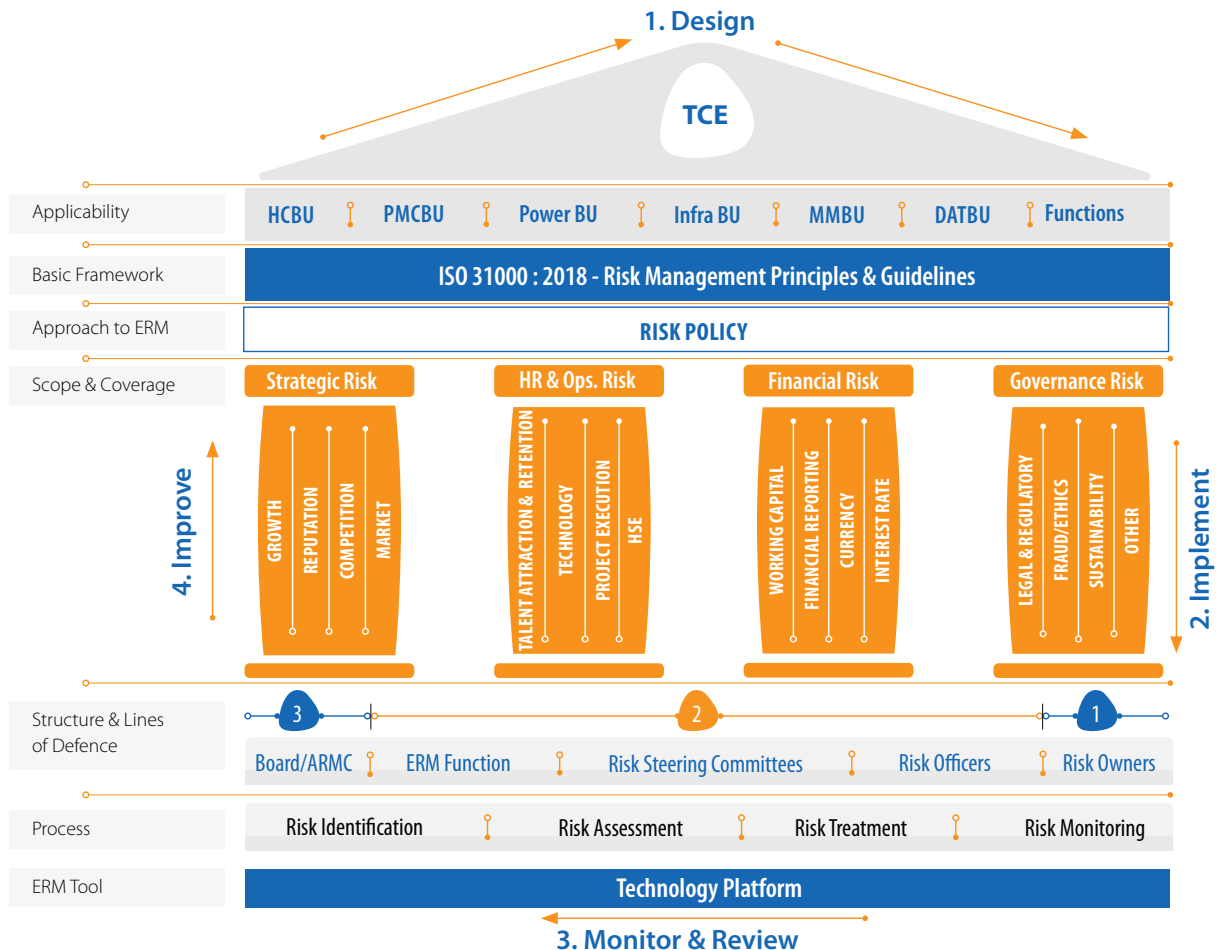
Key Initiatives and Measures

- **Detailed Bid Reviews:** Conduct thorough bid risk analysis based on threshold values
- **Monthly Risk Reviews:** Conduct regular project reviews of key projects from each BU.
- **Strategic Risk Inputs:** Provide risk inputs to the strategy, covering business and sector-wise updates in terms of risks and opportunities.
- **Annual Business Plan (ABP) Risk Challenge:** Evaluate potential risks that may impact the ABP, considering optimistic, pessimistic, and base scenarios.
- **Portfolio Analysis:** Analyse projects within a specific sector to understand the risk-return potential.
- **Revision of Risk Registers:** Update BU and Function risk registers regularly.
- **Country Profiles:** Prepare and share profiles covering risks and opportunities to aid informed decision-making.
- **JV Partnership Risk Management:** Develop framework to identify and mitigate partnership related risks throughout the lifecycle of the project.
- **Strengthening Risk Culture:** Train key stakeholders, including BU Risk Officers, Business Development, and Project Management Teams.
- **Customised Training Modules:** Develop and deliver new training modules that are tailor-made from TCE perspective for JV risk assessment, Business Development and Delivery teams.
- **External Risk Management Services:** Offer risk management services to external clients.

Governance and Reporting

The ERM team periodically presents risk assessments and mitigation procedures to the Corporate Management Committee (CMC) and the Audit & Risk Management Committee (ARCM) of the Board, enhancing the effectiveness of company’s risk management process and feedback or new suggestions from ARMC are suitability factored in the process/framework of the company.

TCE Enterprise Risk Management Framework

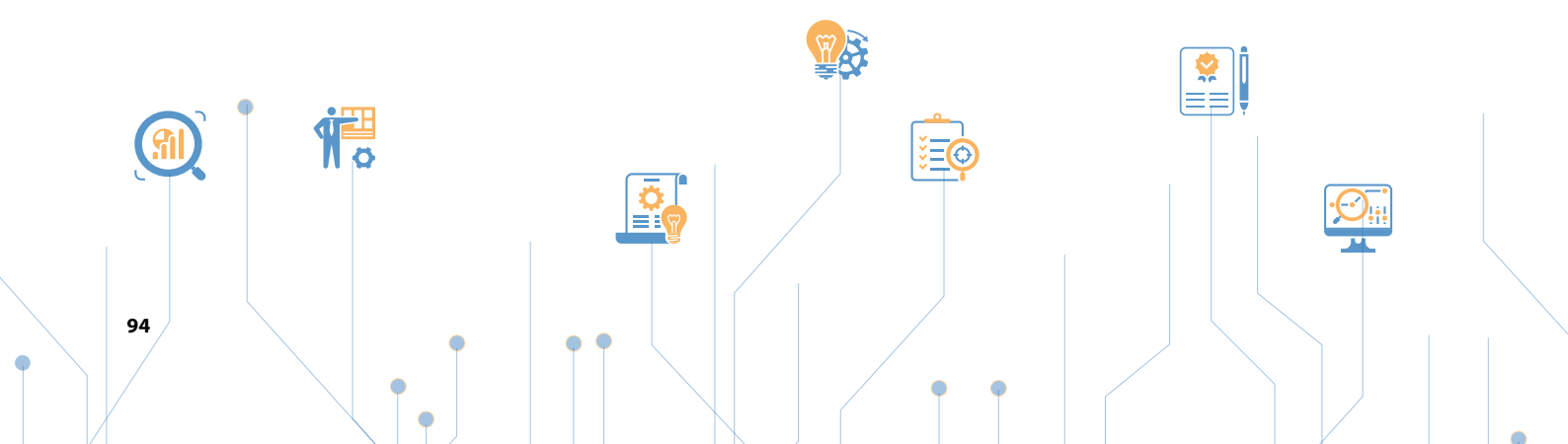


Risk Management Organisation

The central Risk Function is led by the Chief Risk Officer (CRO), with guidance from the Managing Director, Audit & Risk Management Committee (ARMC) and Board. The Corporate Risk team and Business unit-level Risk Officers (BUROs) support the CRO in integrating and deploying risk frameworks across various BUs.

Key Risk Areas and Mitigation Strategies

Risk Category	Key Risk Areas	Areas Impacted	Mitigation Strategies
Economic Risk	<ul style="list-style-type: none"> Demand for the company's services is mainly capex-based. Economic downturns may impact sectors in which the company's clients operate, reductions in government or private spending, and political & economic uncertainty. Uncertainties presented by rise in inflation, geopolitical aspects like Israel-Iran/Hamas tensions, Russia-Ukraine conflict, supply chain issues, rise in freight costs, oil price hike, etc., may impact project viability, which may delay owner's capex plans, or it may hit their ability to make timely payments in existing projects 	<ul style="list-style-type: none"> Ability to generate new business and revenue targets, generate revenue out of existing business, make collections for current and past dues, project delays leading to cost increase, etc. 	<ul style="list-style-type: none"> TCE has multiple Business Units (BU) across sectors, making it less dependent on any single industry and enabling us to capture new opportunities. Proper due diligence of clients, ensuring project viability, funding tie-up, etc., are in place
Business Acquisition & Revenue Flow	<ul style="list-style-type: none"> External factors such as geopolitical issues, economic trends, wars, and politics-inflicted issues like government change, policy changes, market conditions, pandemics, etc., may impact the business acquisition. Delays or reductions in new orders may affect the targeted revenues. Revenue generation could also be negatively impacted due to internal issues like the inability to deploy the right workforce, inadequate planning 	<ul style="list-style-type: none"> Reduced jobs in hand/ order book Revenues, cashflows and profits 	<ul style="list-style-type: none"> Identify sectors/geographies/ business models for growth. Develop new key accounts/ customers & enter new areas through partnerships, etc. Deepen customer connect



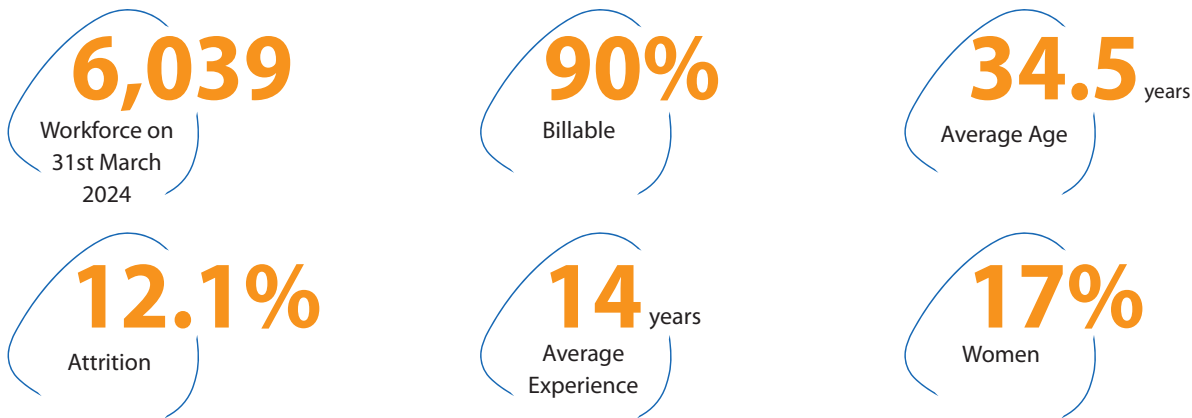
Risk Category	Key Risk Areas	Areas Impacted	Mitigation Strategies
Loss of Confidential Information / Data Violation/Breach	<ul style="list-style-type: none"> Processes are being followed to correctly identify confidential information of the company & other stakeholders and prevent leakage. However, there remains a risk of loss of confidential information. 	<ul style="list-style-type: none"> Loss of sensitive information Negative impact on reputation and brand value Loss of business 	<ul style="list-style-type: none"> Training and sensitisation of employees Obtaining specific NDAs / Confidentiality agreements from employees/partners Tightening of IT security measures
Human Resources	<ul style="list-style-type: none"> Shortfall of key resources in case of high attrition in select BUs Competition and the company's ability to attract talent in current market conditions may be challenging. Unexpected incidents and risks like war, pandemic, and climate risks may impact the company's ability to deploy workforce at sites worldwide. 	<ul style="list-style-type: none"> Delay in deliverables/projects Reduction in revenue and profits Increased workforce costs in case of any immediate hiring required for a key position 	<ul style="list-style-type: none"> Enhancing employee engagement practices Developing specific learning and re-skilling programs by providing adequate training Proactive strategies to attract suitable talent from various sources. Focus on providing a safe environment and ensuring employee's well-being
Locked Working Capital and Cash Flow	<ul style="list-style-type: none"> Many of the company's contracts have milestone-based payment terms, due to which significant costs may be incurred before actual billing and collection 	<ul style="list-style-type: none"> Impact on working capital & higher cost of financing Negative cashflow 	<ul style="list-style-type: none"> Enhanced focus on contract & claims management to ensure project delivery with profitability Due diligence and factoring in locked capital or cash flow impact in the bid pricing. Negotiating contracts with better payment terms, especially with private clients or tenders where deviations are allowed
Concentration Risk	<ul style="list-style-type: none"> Dependency on specific key clients, types of business models, geographies or sectors may hurt revenues. Despite good relationships and performance by TCE, such client(s) may have to reduce, delay, or cancel their contracts due to changed business scenario 	<ul style="list-style-type: none"> Volatility or fluctuations in business performance Inability to achieve acquisition, revenue, anticipated profitability / operational targets in case over-dependent aspect gets impacted/faces any issues 	<ul style="list-style-type: none"> Conscious efforts to reduce dependence or concentration on any single client, geography, or sector. Develop newer key or large accounts. Strengthening of business relationships with clients at all levels

Risk Category	Key Risk Areas	Areas Impacted	Mitigation Strategies
Liabilities	<ul style="list-style-type: none"> Company’s project execution activities may result in liability as per Contract conditions Force Majeure conditions being activated The company could be exposed to monetary damages, claims or reputation risks due to deficiencies in service, any catastrophic event at the company’s project sites, etc. 	<ul style="list-style-type: none"> Unexpected costs to correct deficiencies may lead to an increase in overall cost Negative impact on profitability Increased litigations / legal disputes 	<ul style="list-style-type: none"> Adequate professional liability insurance at the organisation level Proper due diligence at bid time to avoid taking up significant liabilities, adhering to contract requirements and professional best practices to avoid imposing penalties or liabilities. Project-specific insurance wherever there are specific requirements.
Safety Risk	<ul style="list-style-type: none"> The company may be exposed to safety issues if the quality is not adhered to or / the process is not followed while formulating the design and review of safety mechanisms during the project’s construction phase as per contractual terms. Safety issues for employees deployed/ in-transit for official purposes at difficult locations due to geography-specific or geopolitical concerns like wars, unsafe environments, etc 	<ul style="list-style-type: none"> Reputational impact Injuries/loss of life 	<ul style="list-style-type: none"> Stringent internal process checks by an independent team to ensure desired quality parameters are met Training on safety aspects/ processes to concerned employees to ensure safety. Before entering a new geography, Country profiles are prepared to cover aspects like the economy, politics, security, legal aspects, relations with India, etc., apart from risks and opportunities, to ensure that jobs are chosen at international locations that are safe and in line with the organisation’s strategy.
Joint Ventures (JVs) / Partnerships	<ul style="list-style-type: none"> TCE works on specific contracts as a member of JV, in partnership, and similar arrangements. There is a risk that the company’s partners may be unable to fulfil their contractual obligations to the company or clients. The company would have limited ability to control the actions of the JV partners, including non-performance, default, bankruptcy, or legal compliance 	<ul style="list-style-type: none"> Impact on time and quality of project deliverables. Loss of revenue and profit. Increased litigations and hence loss of reputation 	<ul style="list-style-type: none"> Proper due diligence of JV partner during pre-bid/bid stage, esp. on financial ability, experience, and track record Strong back-to-back contractual arrangement to pass on liabilities and penalties to JV commensurate with their share in the partnership The JV/Partnership risk assessment framework has been prepared, and staff is being trained to ensure JV partnership-related risks are managed efficiently throughout the lifecycle of the project

Risk Category	Key Risk Areas	Areas Impacted	Mitigation Strategies
<p>Cost Overrun</p>	<ul style="list-style-type: none"> Costs may increase in projects due to various reasons like: <ul style="list-style-type: none"> » Higher quantum of resources required » Schedule delays » Resources being unoccupied while being deployed on the project 	<ul style="list-style-type: none"> Lower profitability Disputes with client 	<ul style="list-style-type: none"> Ensuring vital bid-stage contractual review and study of primary/secondary data to identify issues/risks, quantify them, and factor them into the prices. Strengthening claims preparation and submission process. Follow project and contract management best practices to avoid cost overruns
<p>Intellectual Property (IP)</p>	<ul style="list-style-type: none"> Although the company protects its intellectual property through contractual arrangements, registration, licensing, NDAs, etc, it may not be able to prevent infringement of IPs completely Company's employees could inadvertently or purposely cause infringement of 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 	<ul style="list-style-type: none"> Unexpected and huge costs Consumption of a significant amount of senior management's attention and time. Negative impact on reputation and brand value 	<ul style="list-style-type: none"> Strengthen processes, contracts & other mechanisms to safeguard the company's IP, confidential information & trade secrets Provide training to employees on the importance of respecting the IPs of the company and those of other stakeholders and the high price that the company might become liable to pay in case of IP infringements
<p>International Operations</p>	<ul style="list-style-type: none"> The company's international operations are exposed to additional risks and uncertainties, including unfavourable political developments and weak economies. For example, unexpected changes in government or its policies, geopolitical issues, potential non-compliance with regulations and evolving industry standards, renegotiation or nullification of existing contracts, social, political, and economic instability, currency fluctuations, etc. 	<ul style="list-style-type: none"> Loss of business Safety and security risk of personnel Impact on revenue and profits Impact on the global footprints of the company 	<ul style="list-style-type: none"> Perform and maintain country risk analysis on an ongoing basis for clearly identifying new geographies as Go / No-go Proper due diligence regarding country or location risk during bid time. Avoid excessively risky, unsafe, economically unstable, or weak countries or geographies. Establish systems and processes to ensure compliance with all key regulatory, government, and contractual compliances, standards, laws, etc.

By proactively addressing these risks and embedding resilience within our organisational structure, TCE is committed to "Designing the Future." Our strategic approach to risk management protects our interests and empowers us to seize new opportunities, ensuring sustainable growth and success in an ever-evolving global landscape.

HUMAN CAPITAL



At Tata Consulting Engineers, our approach to "Designing for the Future" in human resources goes beyond preparing our workforce for future challenges and opportunities. We strategically identify and nurture talent, enhance leadership capabilities, foster continuous learning, and equip our employees with future-ready skills. This approach aims to build a resilient and agile workforce, ensuring our employees are prepared to navigate a rapidly evolving industry landscape and drive innovation and sustainable growth. Our employees' career growth is a testament to the success of our human capital strategies, and we are committed to their continuous development and success.

Our dedication to creating an empowering environment is reflected in our well-defined policies and practices rooted in empathy, meritocracy, and ample professional and personal development opportunities. Our strategy focuses on building robust organisational capabilities, attracting and retaining top talent, and fostering a culture that delivers long-term value, ensuring our sustained competitiveness in the global marketplace. We take pride in our diverse workforce and firmly believe diversity and inclusion are fundamental to our success.

Talent Attraction & Recruitment

Our workforce is our most valuable asset, and our talent attraction and recruitment efforts are focused on cultivating and advancing talent. We prioritise recruiting young professionals from diverse academic backgrounds, evidenced by a 19% growth in our workforce strength. This year, we launched the YEDP-Campus Ambassador Program to strengthen alumni engagement and foster a sense of community.

By leveraging the experiences and insights of our Young Engineers Development Program (YEDP) graduates, we invited them to share their stories with current and future YEDP colleagues through our On-Campus Connect sessions themed "Know Your Campus Alumni." This initiative aims to reinforce our bonds and celebrate our alumni community's achievements. We welcomed 697 fresh postgraduates and graduates this year through our esteemed campus recruitment program.

Our campus recruitment programs and the HEADSTART - Young Engineer Internship Program (YEIP) exemplify our commitment to infusing young talent and providing enriching career opportunities. Designed for final-year engineering students, YEIP welcomed 41 interns at our Mumbai and Pune locations. This program aims to harness young engineers' skills and provide hands-on learning, shaping them into future leaders. The program includes business orientation, mentoring, and technical training, empowering the next generation of engineers to excel in their careers and contribute meaningfully to TCE and beyond.

Learning & Development

Continuous learning and development are vital to our work culture, promoting collaboration, innovation, high performance, and agility. We have partnered with renowned institutions and new learning platforms to enhance upskilling and reskilling experiences.

Strategic Talent Advancement and Readiness Program (STAR): Our annual fast-track career advancement initiative identifies and nurtures high-performing and high-potential employees. Participants, selected through aptitude assessments, virtual assessment centres, and talent council interviews, embark on a 10-month intensive development program. This includes specialised courses from institutions like IIM-Kozhikode, IIM-Calcutta, IIT-Delhi, SP Jain Global, NMIMS, BITS-Pilani, and Tata Management Training Center (TMTC).

Leadership Excellence through Awareness and Practice (LEAP): Our flagship program aims to transform 75 transitioning managers into thought leaders. It promotes a growth mindset, strategic thinking, change management, diversity, equity, and inclusion. The journey includes peer-to-peer learning, speed coaching, action learning projects for real-time insights, and 360-degree feedback as part of the Manager Score Card for ongoing action planning.

Tata Group Strategic Leadership Seminar: Hosted by the Tata Management Training Centre, this seminar gathers industry leaders to share insights, exchange best practices, and explore innovative strategies for navigating modern business complexities. Through interactive sessions, workshops, and panel discussions, senior management gains valuable perspectives from industry veterans, thought leaders, and subject matter experts.

Communities of Practice (COP): To expand our expertise through reskilling and upskilling, we introduced the COP model. This model employs a matrix approach to training, ensuring capability-building efforts are disseminated and executed across all organisational levels. COPs, created around strategic disciplines aligned with TCE's growth story, comprise diverse representatives from different business units. With over 240 SMEs in 34 COPs driving capability building, it marks the next chapter in advancing TCE's intellectual capital. These COPs are governed and guided by the Technology team and TCE discipline heads.

ProMPT Program: Now in its third edition, TCE's Project Management Professional Training (ProMPT) program aims to enhance our project management capabilities. Recognising project management as a core competency, this year's ProMPT offers a flexible format, allowing participants to choose between immersive boot camps or self-paced learning journeys. This approach caters to individual interests and developmental needs, equipping participants with the tools, knowledge, and confidence needed to excel in diverse project environments. Currently, TCE has 376 certified Project Managers.



Learning & Development



Young Engineers Development Program (YEDP): TCE's flagship training program for recent graduates enhances young engineers' skills and expertise, equipping them with the knowledge and experience to excel in their careers. This comprehensive program includes frequent assessments and feedback sessions to maintain high performance and professional standards. This year, the program successfully trained 363 young engineers.

Accelerated Designer Proficiency Training Program (ADePT): Each year, the ADePT program trains numerous diploma freshers through a mix of behavioural and technical modules. This experiential journey from campus to corporate provides practical experience navigating the business world's complexities, rewards, and challenges. This year, 278 employees underwent training as part of this initiative.

SMILe (System for Managing Individual Learning)

LinkedIn Learning: At TCE, we provide comprehensive learning solutions for our employees. In FY 2023-24, we elevated our Learning Experience Platform (LXP) with the SMILe-LinkedIn Learning Experience Platform, offering over 20,000 courses and 35,000+ hours of content. This platform provides personalised, on-demand learning tailored to individual goals, with over 3200 colleagues taking advantage of it.

Learning Premier League: We champion innovative practices to embed learning throughout the organisation. In its fourth season, the Learning Premier League, a gamified annual event, saw 2883 employees dedicating over 33,514 hours to technical and behavioural learning. We also launched a week-long Learning Treasure Hunt to introduce the new platform and foster engagement and collaboration.

Qlik2Learn: This virtual learning academy offers instructor-led training aligned with employee needs and organisational goals. In FY 2023-24, we held 15+ sessions of the Technology Lecture Series, covering new technology areas such as energy transition, 5G integration, and asset integrity management, with over 4000 participants.

Mentorship in New Dimension (MIND) Program: This program fosters transformative growth through a year-long journey of collaboration and innovation for young talent. Guided by experts and business heads from the Technology Vertical team, the program ensures that our 18 participants remain at the forefront of cutting-edge technologies and industry best practices. Launched in January 2024, the program began with kickoff events, icebreaker sessions, and project reviews. Each participant receives personalised mentorship tailored to their professional development needs, promoting individual growth and career alignment.

SHINE Mentoring Program: In collaboration with Group HR, SHINE Mentoring empowers young female leaders at TCE. This program offers mentoring relationships to foster professional growth and leadership development. Participants receive personalised guidance from seasoned mentors, helping them navigate their career paths effectively. With our diversity, equity, and inclusion values, SHINE Mentoring supports our commitment to enhancing gender diversity. Under the Career pillar, we launched the "Inspire to Aspire" program on International Women's Day, 8th March 2024. This workshop addresses the needs of young women in our workforce, providing experiential learning, interactive discussions, and group coaching. It equips participants with the confidence and skills to advance their careers and contribute to TCE's journey towards greater diversity and inclusion.



Employee Engagement

At TCE, employee engagement is the key to a thriving workplace. Our commitment to fostering a supportive and dynamic environment ensures that every team member feels valued, motivated, and connected to our mission. Through various initiatives and programs, we strive to cultivate a culture of collaboration, innovation, and continuous learning, empowering our employees to contribute their best and achieve their fullest potential. By prioritising engagement, we enhance job satisfaction and performance and drive our collective success and growth.

Engagement Programs: In FY 2023-24, our Happiness Week initiative, designed to promote peer acknowledgement and gratitude, saw over 1,000 employees actively engage in recognition "drops" in person and on Yammer. This significantly enhanced professional relationships, workplace atmosphere, and overall happiness levels. Our commitment to wellness extends further with initiatives like the World Heart Day Medical Camp, International Yoga Day Celebration, and wellness sessions on mindful breathing techniques. We also organised the Lil'Champ Summer Camp and the Super-Mums and Superhero Father's Day, which celebrated the diversity of our workforce and fostered a sense of belonging within our extended TCE family. Our Independence Day celebrations exemplified our inclusive culture, with employees participating in patriotic activities and quiz competitions commemorating "Azadi ka Amrit Mahotsav." These events foster a sense of belonging and inclusivity within our TCE family.

Fostering a Culture of Openness and Trust: At TCE, we prioritise a culture of openness and trust, encouraging employees to share their ideas freely through platforms like iThink, Reflexions, and Problems Worth Solving. Over the past year, we've enhanced communication and listening via Town Hall meetings, leadership connects, and virtual informal sessions, strengthening team bonds and navigating challenges effectively. Listening to employee feedback is crucial for maintaining a positive workplace culture. We actively seek and incorporate feedback through various channels, using it to guide improvements in policies, processes, and workplace culture. Our Town Hall meetings provide invaluable opportunities for employees to interact with leadership and gain business insights. In April '23, we launched "Chai Pe Charcha", an initiative fostering transparency and open communication. Over 2500 employees participated in 100+ sessions, engaging in cross-functional and cross-business unit dialogues. These sessions generated actionable insights, ensuring employee voices were heard and acted upon. This initiative has fortified our communication channels and reinforced our commitment to valuing every individual's contributions.

Celebrating Creativity: Colours of TCE, our annual art competition, has celebrated employee creativity for two decades. This year, during the Holi festival, the competition focused on "Sustainable Solutions for a Better Tomorrow", reflecting our commitment to environmental stewardship and social responsibility.



Employee Engagement





Employee Engagement



We received 32 entries from various delivery centres, evaluated by a distinguished panel of four jury members. The winning artworks, showcasing the finest creativity and vision, were displayed across our locations and featured on custom greeting cards sent to employees on their birthdays.

Career Conversations and High-Performance Culture: Throughout the fiscal year, TCE has focused on fostering a high-performance culture and facilitating career conversations through various performance management initiatives. Critical programs such as the Career Fair, continuous performance management process, and Competency Assessment underscore our commitment to professional development and strategic alignment. The Career Fair is a cornerstone event, offering over 100 employees insights into their career trajectories through discussions with 40 seasoned career coaches. This initiative fosters a sense of direction and strengthens the bond between employees and their career objectives. Our continuous performance management process, PRISM, is crucial to employee development. It includes goal setting, self-reflection, and project manager and team lead reviews. This comprehensive approach provides invaluable insights into individual contributions, forming the basis for targeted developmental strategies. Career Conversations are integral to our high-performing culture. This structured process encourages regular reviews by team leads, fostering open communication and accountability. Ongoing dialogue ensures achievements are recognised, and areas for improvement are promptly addressed, promoting agility and responsiveness.

The Compass framework's Competency Assessment assesses performance and charts future career trajectories. It aligns personal ambitions with organisational objectives, emphasising the importance of understanding current performance relative to role expectations.

Building a Culture of Intrapreneurship: To foster innovation and intrapreneurship, we introduced the iThink-Shark Tank edition, a dynamic platform for creative thinking, collaboration, and inventive problem-solving. This edition aimed to achieve two ambitious goals by 2028: doubling TCE's revenue from 1100 Crores to 2000 Crores and increasing diversity from 17% to 30%. The inaugural season saw 56 entries from teams and individuals across the organisation. Participants showcased their solutions through rigorous evaluation and mentoring stages: Pre-Seed, Seed, Series A, and Going Public. Participants engaged in captivating pitch battles, presenting their solution designs, delivery roadmaps, and financial impacts. Two winning teams emerged, distinguished by their innovative ideas, clear implementation roadmaps, scalability potential, and overall viability. Under the themes "Growth at Scale" and "Unity in Diversity," these teams challenged conventional thinking. They embraced inclusivity as a catalyst for change—their impassioned presentations and determination aimed to redefine innovation in today's evolving landscape.

Championing Inclusivity & Excellence through Sports

TCE Women's Cricket Tournament: In a landmark year for TCE Sports, the inaugural Women's Cricket Tournament was a resounding success. With ten teams and 105 participants, the tournament highlighted the talent and commitment within our organisation, promoting inclusivity and sporting excellence. Guided by the TCE Sports Committee, the best 15 players from each Delivery Centre formed our elite team, representing TCE in the prestigious Inter Tata Executive Cricket tournament. Our women's cricket team advanced to the Quarterfinals, a historic milestone reflecting our support for gender equality and women's empowerment.

Annual Sports Events and Championships: At TCE, we organise various sports events to promote wellness and team spirit. Our employees actively participate in both Intra-TCE and Inter-Tata Sports Championships, with events featuring cricket, futsal, carrom, and table tennis. The Futsal League, where CMC leaders build teams through an auction, fosters camaraderie and team bonding. Over 700 employees participate in various sports events throughout the year, cultivating a fitness, fun, and friendly competition culture.

Tata Mumbai Marathon 2024: Over 160 colleagues and family members enthusiastically participated in the Tata Mumbai Marathon 2024. This initiative promoted health, teamwork, and brand visibility. Team TCE supported training, registrations, and goodies distribution, strengthening company culture and community presence.

Our strategy focuses on building robust organisational capabilities, attracting and retaining top talent, and fostering a culture that delivers long-term value, ensuring our sustained competitiveness in the global marketplace. We take pride in our diverse workforce and firmly believe diversity and inclusion are fundamental to our success.



Championing Inclusivity & Excellence through Sports



Rewards and Recognition

Acknowledging achievement is integral to TCE's commitment to excellence. We celebrate significant milestones and daily victories, fostering a culture of recognition.

Our digital instant recognition platform, Kudos, has seen a remarkable surge in usage, highlighting our appreciation for employees' relentless efforts. Alongside Kudos, our recognition programs, including Value Awards continuously empower employees to acknowledge their peers, promoting high performance and values alignment. This year, we introduced the inaugural Superstar Team Awards, recognising 48 high-performing teams across TCE. Teams were evaluated by an esteemed panel of 8 jury members against criteria such as Process Improvement, Sustained Business Results, Business Benefits, and Collaboration & Teamwork. These awards highlight the collaborative spirit and collective achievements within each Business Unit.

Industry Recognitions

- TCE received the Gold award in Leadership Development from Brandon Hall Group's Human Capital Management Excellence Awards 2023 for the Leap Leadership Journeys with ProventusHR.
- TCE was awarded the Impactful Learning Program of the Year at the L&D Confex & Awards 2024 for the STAR program and received the Gold award for Excellence in Employee Retention Strategies at the Economic Times Human Capital Awards 2024.
- TCE was awarded Excellence in Feedback and Communication Strategies award at the 7th CHRO Vision and Innovation Awards 2024.

Our dedication to creating an empowering environment is reflected in our well-defined policies and practices rooted in empathy, meritocracy, and ample professional and personal development opportunities.

Tata Consulting Engineers Limited



BUILDING AN ETHICALLY EMPOWERED WORKPLACE

17,610
 Person-Hours
 Training on
 TCoC/POSH

Advanced
 Maturity on
 all four pillars
 of the LBE
 framework

In today's rapidly evolving global landscape, business ethics has transcended mere compliance to become a foundation of sustainable success. Tata Consulting Engineers (TCE) fosters an ethically empowered workplace that adheres to legal standards and prioritises moral principles in decision-making. This commitment cultivates a culture of integrity, accountability, and social responsibility, positioning TCE as a leader in designing the future of ethical business practices.

At the heart of TCE's operations lies our commitment to upholding fundamental values such as honesty, transparency, fairness, and stakeholder respect. Our robust governance and operational controls ensure lawful, ethical, and responsible conduct. The Tata Code of Conduct (TCoC) articulates these values, guiding all group companies and demonstrating our commitment to stakeholders, including the communities we serve. We are proud to say that our ethical practices have a positive and lasting impact on the communities we operate in, fostering trust and mutual respect.

Ethical behaviour is intrinsic to our business conduct. TCE's leadership, guided by our unwavering commitment to ethical leadership, plays a pivotal role in setting the tone for ethical practices by demonstrating integrity, fostering open communication, and guiding stakeholders. Compliance with regulatory laws, corporate governance guidelines, and global best practices reflect our unwavering commitment to ethical leadership, inspiring confidence in our future.

At TCE, we understand that maintaining ethical standards requires a robust governance structure. This structure includes Location Ethics Counsellors (LECs), an Internal Committee (IC) for the Prevention of sexual harassment (POSH), a Compliance Officer for matters related to Bribery and Corruption, and Ethics Champions.

Governance Structure

At TCE, we understand that maintaining ethical standards requires a robust governance structure. This structure includes Location Ethics Counsellors (LECs), an Internal Committee (IC) for the Prevention of sexual harassment (POSH), a Compliance Officer for matters related to Bribery and Corruption, and Ethics Champions. The Chief Ethics Counsellor (CEC), reporting to the CEO and MD (the Principal Ethics Officer), is at the forefront of driving these initiatives, ensuring that ethics remain a top priority at TCE.

We are committed to navigating ethical challenges and promoting responsible business conduct. To this end, we have enhanced our ethics compliance structure, incorporating technology and digitalisation. These measures ensure that we uphold high ethics and local compliance standards while delivering world-class projects globally. Key policies that reinforce these practices include the Tata Code of Conduct, Corporate Social Responsibility Policy, Whistle Blower Policy, and others, all of which are accessible at TCE Ethics and Compliance.

Cultivating Ethical Excellence through Communication and Training

TCE prioritises ethics and integrity, positively impacting employee motivation and engagement. Training and communication programs, encompassing classroom and e-learning sessions, reinforce TCoC and related policies. Mandatory e-learning training programs on TCoC, POSH, ABAC, AML, and other policies ensure ongoing ethical education.

In FY 2023-24, TCE conducted over 17,610 person-hours of training on TCoC, POSH, and compliance. Our digital tool, "Ethos," available on TCE's intranet, is a comprehensive solution for ethics-related governance systems and processes. The Ethics webpage and Yammer's "Ethics: DecodeTheCode" enhance TCoC awareness.

Bi-annual Ethics Week celebrations, with themes like "Empowered Ethics" and "Ethics in the Digital Era," foster a culture of integrity and responsibility. Virtual awareness sessions and social media campaigns engage stakeholders, promoting ethical decision-making and accountability.





Governing Principles and Policies Practiced in the Company

Leadership and Recognition

TCE's senior leaders are role models, participating in Ethics Master Classes and communicating TCoC-related messages across various forums. Ethical behaviour is integral to employee growth and recognition, with Value Awards and designations like Ethics Flag Bearers and Ethics Champions celebrating extraordinary ethical efforts.

Prevention of Sexual Harassment (POSH)

TCE ensures a safe, inclusive, and respectful work environment through a gender-neutral POSH policy, detailed procedures, and consistent training. Recognised as one of India's Top 25 Safest Workplaces, TCE maintains high standards in preventing sexual harassment and upholding workplace dignity.

Transparent Supplier Evaluation

TCE engages with multiple third parties in India and abroad to ensure size and geographic spread growth. Third parties can be vendors, suppliers, or partners in an individual capacity or as an entity. In today's increasingly connected world, it is crucial to safeguard TCE from ethical risks arising from third parties. Such risks can range from project level to business or enterprise level.

We developed and implemented a robust "Third-Party Due Diligence (TPDD)" process to safeguard the organisation from such risks.

The TPDD practice aims to assess, identify, and mitigate ethical and other compliance risks associated with third parties. At TCE, we ensure that we engage with entities or individuals aligned with or ready to abide by our values and policies. This objective is achieved methodically and embedded in TCE's culture, powered by IT-backed digital processes. The TPDD process's features have been recognised by the internal auditors (external party) and are appreciated as promising practices by the Tata Group Ethics Office.

TCE epitomises ethical principles in interactions with all stakeholders. We follow the Tata Code of Conduct globally and expect all suppliers to adhere to these principles. Our Supplier Code of Conduct and TPDD practices ensure integrity and compliance in all engagements.

By designing an ethically empowered future, TCE continues to lead with integrity, fostering a culture of ethical excellence that sets new industry benchmarks.

CORPORATE SOCIAL RESPONSIBILITY

Over the years, Tata Consulting Engineers (TCE) has dedicated itself to enhancing community well-being by strategically reinforcing our core competencies. Our Corporate Social Responsibility (CSR) initiatives, known as TCEndeavour, is meticulously crafted to elevate current living standards and lay the groundwork for resilient communities in the future. These initiatives have not only made a significant impact on the lives of the community members but have also set the stage for a more sustainable and prosperous future. We aim to foster holistic community engagement through precisely targeted interventions, driving lasting changes across diverse facets of life.

TCEndeavour


CSR INITIATIVE OF TATA CONSULTING ENGINEERS LIMITED

TCEndeavour program is categorised into distinct impact areas, each aligned with our overarching policy at TCE: Education, Sustainable Livelihood, Infrastructure Development, and Healthcare. These initiatives encompass a spectrum of interventions, from enhancing STEM education at grassroots levels to bridging the opportunity divide through employability programs. Additionally, we address fundamental community challenges to foster sustainable income streams and elevate living standards. Our commitment also extends to disaster recovery efforts, focusing on restoring educational institutions in affected regions.


Collaboration with external partners and our dedicated workforce is at the heart of our initiatives' effectiveness. Initiatives such as Tata Volunteering Week 19 & 20 and ProEngage 18 & 19 epitomise our collaborative ethos, uniting the collective efforts of our employees as volunteers with those of our partners.

Reflecting on our CSR journey, we remain steadfast in our commitment to driving meaningful change and nurturing resilient communities for generations. We are inspired by our progress and hopeful for the future, knowing that we can continue to make a difference together.



Education 
81,370
Lives Touched



Health & Hygiene 
36,244
Lives Touched



Infrastructure Development 
39,660
Lives Touched



Sustainable Livelihood 
11,080
Lives Touched

EDUCATION PROJECTS

Vigyaan

Recognising the critical need to address disparities in STEM education, TCE embarked on the Vigyaan initiative in FY 2023-24. This program aims to bolster STEM education in secondary government schools through a collaborative partnership with the Nehru Planetarium. The project spans all Navi Mumbai Municipal Corporation schools and is implemented in a phased manner over consecutive years.



Objectives:

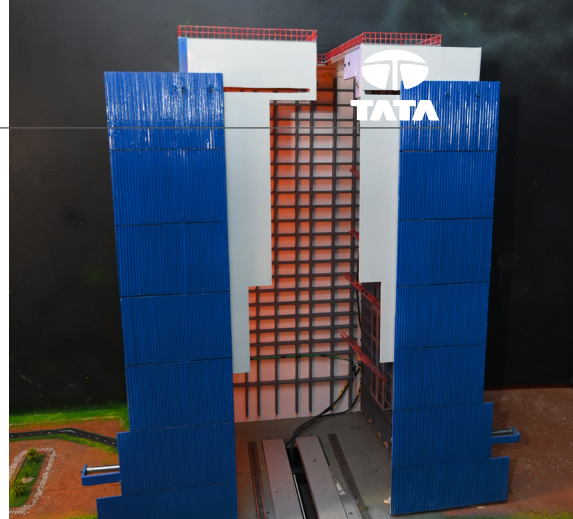
- Inspire interest and encourage exploration of Science, Technology, Engineering, and Mathematics (STEM) disciplines among school students.
- Complement formal science curriculum in schools by providing opportunities for students to engage in STEM learning beyond the classroom.
- Promote Citizen Science through public engagement in scientific research and raise public awareness of Astronomy and India's Space Research.

Approach to Bridge the Gap:

1. School Program: Workshops for students and teachers focused on hands-on learning and interactive teaching methods to bridge the gap and provide equitable opportunities for STEM education.
2. Citizen Science Program: Installation of a fully functional prototype of the Chandrayaan Mission 3 at the Nehru Planetarium, attracting over 7,000 weekly visitors.

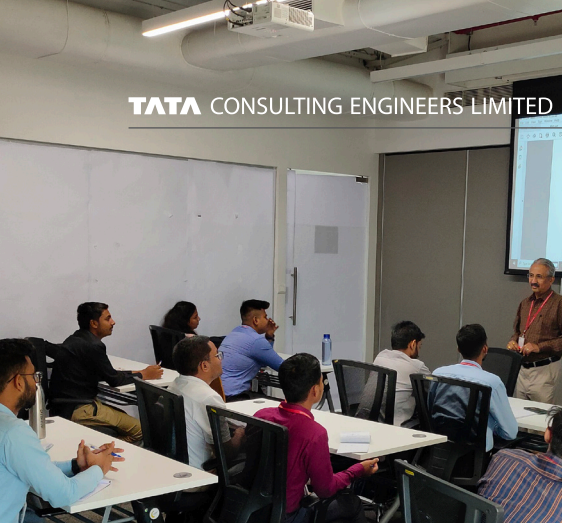
Major Outcomes:

- 600 students and 25 teachers participated in 25 workshops supported by 120 TCE volunteers.
- 100% of schools reported a positive impact on student learning outcomes.
- 96% of students showed improvements in concepts after the workshop.
- 48% of participating students were girls, with 66% from marginalised backgrounds.
- 25 teachers trained, indirectly impacting 3,500 students.



Vigyaan





Utkarsh



Utkarsh

Utkarsh aims to address the skill gap among diploma engineering students, ensuring their readiness for employment aligns with industry demands. The program enhances technical skills and employability through collaboration with academia and industry experts.



Phased Approach:

1. **Expectation Gathering Survey:** Involving 50 industry experts and 5000 students.
2. **Curriculum Gap Analysis:** Conducted by a cross-functional team of subject matter specialists.
3. **Content Creation and Validation:** Collaboration with TCE, technical partners, and MSBTE.
4. **Training:** Hands-on training sessions for faculty members.

Social Impact:

- 162 marginalised youth trained, with 98% securing full-time employment.
- 73 faculty members trained, indirectly benefiting 15,000 students.

TCEndeavour program is categorised into distinct impact areas, each aligned with our overarching policy at TCE: Education, Sustainable Livelihood, Infrastructure Development, and Healthcare.

INFRASTRUCTURE PROJECTS

In partnership with other Tata Group companies, TCE reconstructed seven government school buildings in Odisha and Hyderabad, providing site supervision and design engineering support services.

1,760
Students

Major Outcomes:

- Two schools in Odisha and one in Hyderabad were handed over to the Education Department, benefiting 1,760 students.



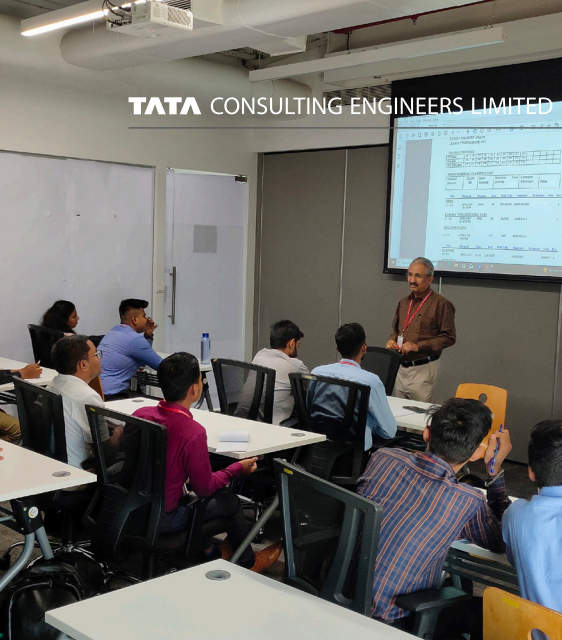
RESEARCH AND DEVELOPMENT

Through CSR funding, TCE supports basic research in sustainable technologies, aligning with UN Sustainable Development Goals.

Key Projects:

- **IIT Bombay:** CO₂ to syngas conversion, green hydrogen production, eco-efficient concrete.
- **Indian Institute of Science, Bangalore:** Research of renewable energy and green chemicals.
- **National Chemical Laboratory, Pune:** Artificial photosynthesis for methanol production.
- **National Institute of Advanced Studies, Bangalore:** GIS technologies for small modular reactors.





VOLUNTEERING INITIATIVES

TCE's participation in Tata Sustainability Group initiatives highlights our commitment to sustainability. Our volunteers contributed a total of 17,443 hours through various programs.



Major Programs:

- **Tata Volunteering Week 20 and 21:** 4,239 volunteers reached 51,672 beneficiaries 17,443 Hours.
- **Tata ProEngage:** Long-term projects like proposal writing, mentoring, and literacy programs. 78 volunteers and 2604 volunteering hours

AWARDS AND RECOGNITION

- TCE won three prestigious awards within the Tata Group for active volunteering.
- TCE received the HR Excellence in CSR award at the CHRO Vision & Innovation Summit in 2023.

TATA VOLUNTEERING WEEK 20 & 21



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