



POWER

Tata Consulting Engineers Ltd (TCE) Power Business has a track record of 6 decades in concept to commissioning solutions in every aspect of the energy sector. TCE's Power Business commenced in the early stages of India's electrification program and has now grown to be a market leader. The Power Business prides itself in its capabilities to design, build and upgrade all kinds of energy generation facilities, transmission

and distribution solutions and value additions for power generation efficiencies.

TCE's Power Business has strategically positioned itself to provide services relevant to its customers in specific regions. The services offered are sector specific with a portfolio of solutions customised to the business needs of customers.



Major Focus Areas

Thermal

Coal-fired, Gas-fired & Fuel based power plants – Planning, Design and Project Management

Renewables

Solar, Hydro & Wind – Feasibility studies, Technical Advisory services, Commissioning support, O & M Advisory, Engineering support for Build, Own, Operate model; Power evacuation system design, Wind resource assessment, Engineering support for hydro power stations, Waste to Energy projects

Nuclear

Nuclear Power Plant, Fuel Fabrication and handling, Nuclear Waste Management – Plant design and Project Management Consultancy, Other Nuclear Power Auxiliary Services

Transmission & Distribution

System Studies / Planning, AIS & GIS Sub-stations, U-HVDC, FACTS (STATCOM, FSC & TCSC), Transmission Lines, Distribution systems, Smart Metering, Smart Grid / Energy Management / SCADA

Automation

Engineering, Testing and Commissioning of Automation Systems including DCS and PLC's. Creation of HMI dynamic mimics, Open / Closed Loop Controls, Hardware Allocation Drawings, Interconnectivity and Configuration Design. Support for Migration, Modernization and Revamping of obsolete and legacy Control Systems to the latest state of Art Technology

Digital Solutions

OPEX and Asset Digitization solutions for efficiencies in power generation process, OEM design solutions, Combined Cycle Power Plants, Re-engineering for conversion of power generation facilities, 3D-4D digital solutions & IIOT applications for power plants. Also, Energy Audit/Analysis, Performance Assessment, Renovation/ Modernization, Residual life Assessment, Plant Retrofitting for Emission control

Industrial

Plant Design Solutions for Cogen / Captive plants



Power generation encompassing Fossil, Hydro and Renewable, Transmission and Distribution & Digital Solutions

Quick Facts

Engineered Over....

100+ GW

Coal Fired Plants

25+ GW

Combined & Simple Cycle Gas-fired Plants

6+ GW

Hydro Power Plants

11+ GW

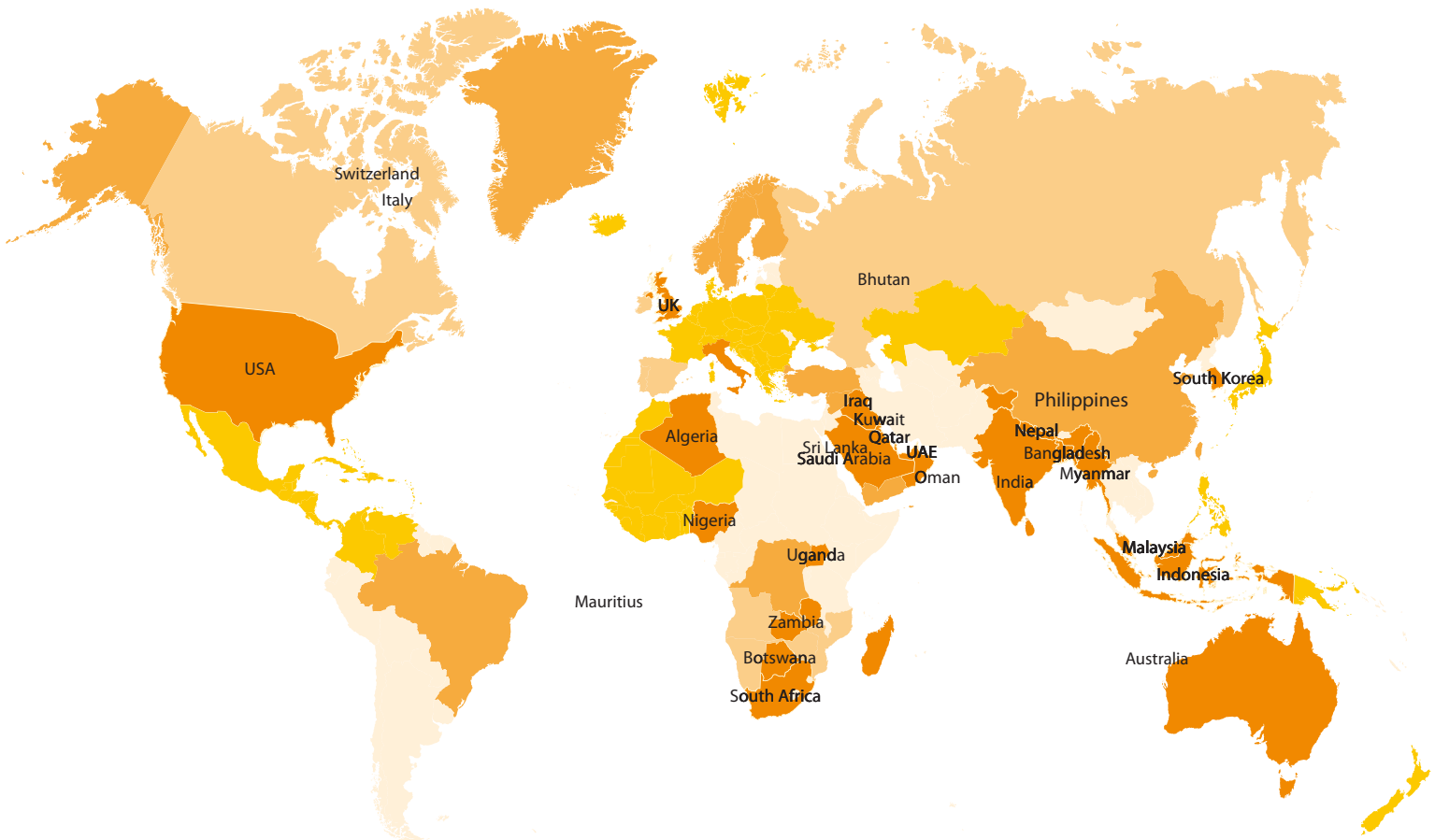
Solar Plants

7+ GW

Nuclear Power Plants

1.5+ GW

Wind Farms

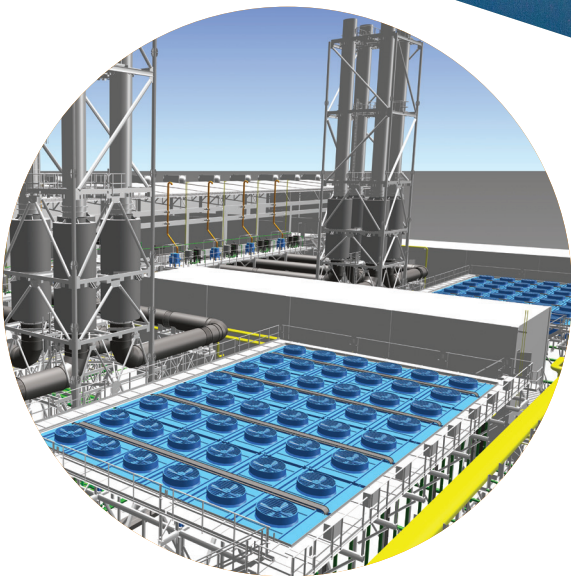
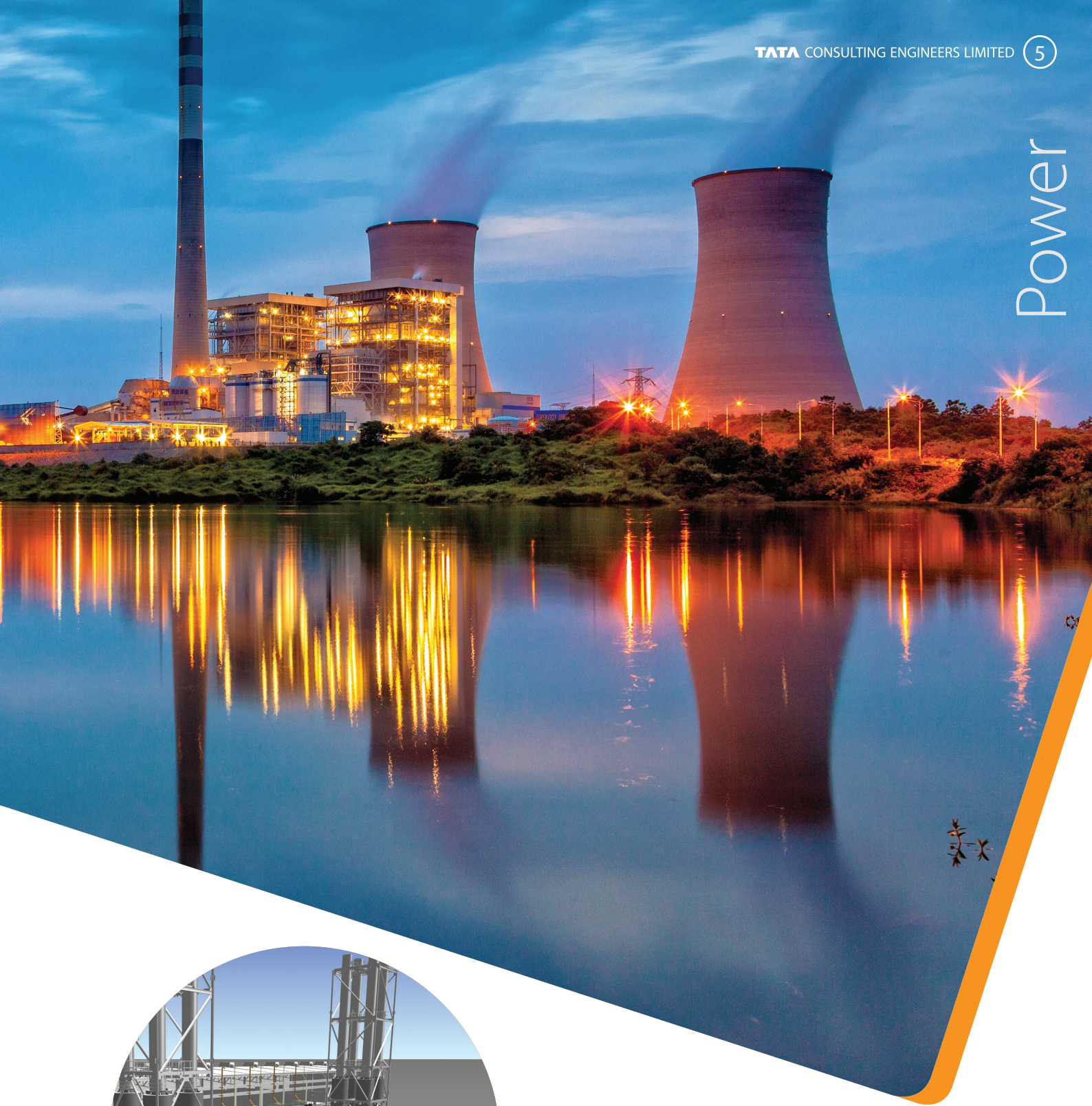




Services

TCE's Power BU's strategic offerings are positioned as

- › Concept to commissioning for power generation – (thermal, gas, fuel), renewable (solar, wind and hydro) and nuclear power; capabilities in different roles from being an architect engineer consultant, detailed engineering consultant to EPC contractors, owner's engineer consultant to performing the role of lender's engineer consultant for Indian and international markets
- › Diverse experience of working in all conventional and non-conventional mode of power generation – coal and oil fired plants, gas turbine based open and combined cycle plants, DG plants, hydel station, renewable (Solar, Wind and Biomass) projects and nuclear plants, captive power plants and reference plants
- › Extensive experience in transmission and distribution from line design to substation design, distribution system studies and automation systems and smart grids
- › Collaboration with EPC players providing engineering expertise; successfully managing such collaborations with Korean and Japanese customers for projects across the globe
- › Partnership with OEMs for plant engineering and modularised engineering solutions for country-specific plants
- › Dedicated engineering centres for large clients in gas-based/thermal power plants and modularised reference plants



- › Installation of flue gas desulphurisation systems within a brownfield environment to meet stringent environmental norms
- › Advisory services for environmental/regulatory compliance upgrades, plant modernisation, asset life cycle management
- › Digitisation and 3D modelling and simulation services for power plants, nuclear power plants, power OEMs, construction simulation, IIoT Applications for power plants, etc.



Case Study

1000 MW ultra supercritical thermal power plant in Malaysia delivered as an engineering partner to a Korean EPC

The 1000 MW ultra supercritical thermal power plant undertaken by TCE is a testimony to world class engineering and a fine example of collaboration for shared value creation. TCE is the first Indian engineering company to design a 1000 MW single unit capacity plant.

The Energy BU through this project stretched and scaled its expertise, expanding knowledge envelope from 800 to 1000 MW and supercritical to ultra-supercritical plant design. The greatest challenge was to meet aggressive timelines and schedule demands of the Korean EPC, a long-standing collaborative partner for the Energy BU. The plant was successfully synchronised on schedule bringing about both partner and customer delight!

Some value additions delivered

- Successful project delivery in a multi-cultural environment
- Collaboration model with Korean EPC and TCE engineers as one team with one goal;

it was a coming together of two culturally diverse teams to put up a single front to the end customer that was Malaysian. Onshore and offsite team deployment, global engineering talent, competency and skill enhancement working on first of its kind project, cultural assimilation of teams (Korean, Indian, Malaysian) are the hallmarks of the human capital value creation.

Complex project management & quality solutions

- Plant successfully synchronised with grid on schedule bringing customer delight; ultra-supercritical technology deployed with most environment, friendly processes; enhanced relationships due to quality and timely delivery as one unified team with all stakeholders (EPC, contractors, suppliers, owner). Typically such large scale projects are extremely complex in nature due to the numerous suppliers and contracting parties involved, demanding a high level of project management and coordination.



Creating value for society

- Expansion of Manjung plant has helped enhance power delivery for Malaysian grid, enabling development of industry as a whole and help achieve growth; ultra-supercritical technology is most technologically advanced and it was a great transfer of knowledge to the local partners due to TCE's presence.

Environment-friendly solutions

- Ultra-supercritical technology is most environment friendly for the society; the plant has technologies for deNOx and deSOx, reducing the impact on the environment while providing cost efficient energy.

Financial value creation

- While the overall cost of ultra-supercritical plant on similar levels was on par with any supercritical technology, the benefits and value derived far exceeded most such plants. Plant commissioning as per schedule had an indirect positive impact on the financials as there were no cost overruns for this project due to delays, typical for such large projects.

Value additions in layout/sizing of feed water system resulted in cost optimisation (200K USD) and operational improvements (lifecycle cost reduction and ease of operation) for this plant.

Key Achievements

Project details	Value additions delivered
India's first super critical power plants with 5 units of 800 MW each	World class project with solutions in coal blending and management of imported coal; value engineering solutions to OEMs for improvisation, bringing about cost savings for customer
Flue Gas Desulphurisation (FGD) System for coastal power plant for an Independent Power Producer in India	Process innovation in FGD Systems providing huge savings for client and managing compliance requirements with minimal capital expenditure and savings due to reduced project timelines
Biomass project for Mecomb Sembcorp JV, Malaysia	Integrated Gasification Combined Cycle (IGCC) technology; Power generation through agro waste and forest residue; Generated electricity supplied to grid; Gasifier based system; Reciprocating engines
Engineering solutions for reference plants serving as a partner to international marquee clients	Providing modularised solutions and reference plant design that helped reduce client's go-to-market timelines and bringing about cost savings
500 MWe Prototype Fast Breeder Reactor (PFBR) Project for Indira Gandhi Atomic Research	Design engineering and procurement assistance provided; Nuclear Island was conceived as building consisting of 9 buildings interconnected as one integral complex; PFBR – Sodium cooled – was first of its kind in India
Engineering partner to Engineering Procurement Contractors	Sustained market leadership by partnering with Korean & Japanese EPC players to increase international footprint in the energy segment, providing value engineering solutions to clients across the Energy business
DC line from Raigad, Chhattisgarh to Pugalur in Tamil Nadu in India	Transmission and distribution solutions to largest high voltage DC line spanning Central India to Southern India
World Bank funded T & D project in Jharkhand, India	22 substations and 3000 km of transmission lines in Jharkhand, India contributing to electrification of remote areas

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