

**TATA** CONSULTING ENGINEERS LIMITED

Beyond the  
**golden  
compass**

13th Annual Report 2011-12

*\*The 1st Annual Report was published in March 2000 when Tata Consulting Engineers Limited became a wholly-owned subsidiary of Tata Sons Ltd.*

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# Beyond the golden compass

“Then staid the fervid Wheelers, and in his hand  
He took the golden Compasses, prepar'd  
In Gods Eternal store, to circumscribe  
This Universe, and all created things:  
One foot he center'd, and the other turn'd  
Round through the vast profunditie obscure,  
And said, thus farr extend, thus farr thy bounds,  
This be thy just Circumference, O World.”

– John Milton, Paradise Lost bk vii, lns 224-31

The celestial compass helped God architect the world, creating discipline, for order to emerge from chaos. The theme 'Beyond the Golden Compass' signifies Tata Consulting Engineers' aspirations beyond 50 golden years since inception. Every decade connotes a significant modelling of the organisation on the path of its evolution. This report provides an 'auxiliary projection' of the company on an upwardly inclined growth trajectory. In this landmark Golden Jubilee year, Tata Consulting Engineers Ltd (TCE) casts its visionary eyes ahead and, the Golden Compass will, once again, reset its bounds and circumference to redefine the TCE universe.

# The evolutionary path

## 01 The Genesis – Building Knowledge

In 1962, a joint venture was established between Tata Electric Ltd and Ebasco Services, New York, USA, in an era when consulting services were extended arms of large government agencies. Tata-Ebasco (presently Tata Consulting Engineers Ltd) was set up to serve the captive needs of Tata's power companies, bring in foreign technology into India and build capabilities locally - which Tata-Ebasco successfully did. A 62.5 MW Unit was commissioned with Ebasco's technology but the 150 MW Unit was locally managed by the joint venture. Soon, about 60% of the country's power installations were managed by Tata-Ebasco. These were the first lessons in international alliances, technology transfer and building relationships. Ebasco's stake in Tata Ebasco was acquired by Tata Sons & thus Tata Consulting Engineers evolved. TCE in its formative years focussed on building capabilities.

## 02 Building Scale

The 60s and the 70s were characterised by rapid industrialisation in India marking a critical stage of economic growth for the country. As domestic industry grew, Tata Ebasco plunged into building up scale through diversification of its business segments. Self-sufficiency was the focus and India's nuclear program was underway. The Atomic Energy program provided downstream engineering activities for Tata-Ebasco. Further diversification came about with World Bank funded projects and the company moved into Infrastructure, Chemicals and Industrial sectors. In a country that was at a nascent stage of growth with delicate balance of payment positions, providing such services locally resulted in huge savings in foreign exchange. Scale of operations continued geographically too, with TCE working with foreign firms in the country to deliver projects in Malaysia, Nepal, Iraq, Egypt and Saudi Arabia.

## 03 Building Efficiencies

In the 70s through 80s, computing and IT systems were at a fledgling stage. Yet, driving operational efficiencies was a differentiator for TCE and automation systems, quality standards and streamlined processes were established with in-house technical resources. TCE developed in-house packages to automate complex design processes establishing an integrated engineering environment. Building efficiencies into the operations, the Procedurisation, Computerisation & Standardisation (PCS), an apex body for driving quality standards and computing enhancements, was set up which later formed the Research & Development arm. Uniformity in design processes, standard operating procedures and speed in execution were the benefits reaped. The seeds of Business Excellence were sown as early as the 70s.

## 04 Expanding the Compass

With the scale up of operations, the need for geographic diversity was addressed. Proximity to customers, better customer management and large scale projects that required sustained deployment of resources in specific locations necessitated TCE to set up a pan-India presence. Mumbai, Bangalore, Chennai, Pune, Jamshedpur, Kolkata and Qatar offices were established. Specific locations were ear-marked as Centres of Excellence for each Business Unit of TCE, providing greater focus to each business and sparking innovation in every segment. Leadership was aligned to provide strategic focus and management for each Centre of Excellence.

# Vision for the future

Tata Consulting Engineers Ltd has consolidated its presence in the most important segments providing engineering consultancy in eight Business units. The success of TCE until now has been its technical excellence, integrity and consistency. Going forward, success will depend on TCE's agility and adaptability to change. In this new world order where change renders the economic climate almost volatile, TCE will position itself amidst the top echelons of the engineering consulting fraternity through strategy, agility and innovation.

### TCE's ambitious vision by 2015-16:

- ▶ Three-fold growth
- ▶ Positioned amongst the top engineering consultants in the world
- ▶ Geographic base extended to some of the world's most promising countries (India, Africa (south, west, east), Qatar, Oman, UAE, Saudi Arabia, USA, UK)
- ▶ Service portfolio covering key sectors
- ▶ With sustainability and inclusive growth woven into the TCE DNA

# Celebrating five decades of excellence

1960s	<p><b>1965</b></p> <p>190 MW thermal unit in India.</p>	1970s	<p><b>1971</b></p> <p>Equatorially mounted cylindrical radio telescope at Ooty.</p>	<p><b>1978</b></p> <p>First seaborne coal handling system with marine unloading facility.</p>	<p><b>1979</b></p> <p>Asia's biggest water treatment plant of 2043 mld capacity per day.</p>						
	1980s		<p><b>1986</b></p> <p>Asia's biggest optical telescope (2.3 m dia).</p>	<p><b>1985</b></p> <p>The first computer based operator training simulator in India for a 500 MW thermal unit.</p>	<p><b>1984</b></p> <p>The first 500 MW thermal power unit in India.</p>	<p><b>1984</b></p> <p>Dismantling and transportation of 60,000 TPA DMT plant from USA and redesign and re-erection at Patalganga.</p>	1990s	<p><b>1999</b></p> <p>India's first marine outfall (under-sea tunnel) of 1,826 mld, 3.5 m diameter and 3.5 km length for sewage disposal system in Mumbai.</p>	<p><b>1997</b></p> <p>150 MW pumped storage at Bhira.</p>	<p><b>1996</b></p> <p>World's largest steerable radio telescope (GMRT)-30 dishes each 45 m diameter.</p>	<p><b>1995</b></p> <p>The first 220 kv gas insulated substation in India.</p>
2000s		<p><b>2000</b></p> <p>India's first 800 kv, 405 km long transmission line from Anpara to Unnao, Uttar Pradesh.</p>	<p><b>2004</b></p> <p>Asia's largest sewage pumping station of 1500 mld peak pumping capacity in Mumbai.</p>	<p><b>2003</b></p> <p>India's first 300 Mld water treatment plant with pulsator and aquazur V filters in Bangalore.</p>	<p><b>2005</b></p> <p>India's first under creek tunnel of 3.6 m diameter at Kasheli for water transmission system and four tunnels of 3 m diameter using tunnel boring machine in Mumbai.</p>	<p><b>2011</b></p> <p>India's first 800 MW supercritical thermal power station.</p>					

## Board of **Directors**

From left to right: **F N Subedar**, Director | **R P Singh**, Vice Chairman | **J P Haran**, Managing Director | **Prasad R Menon**, Chairman | **A P Mull**, Director | **A K Vora**, Director

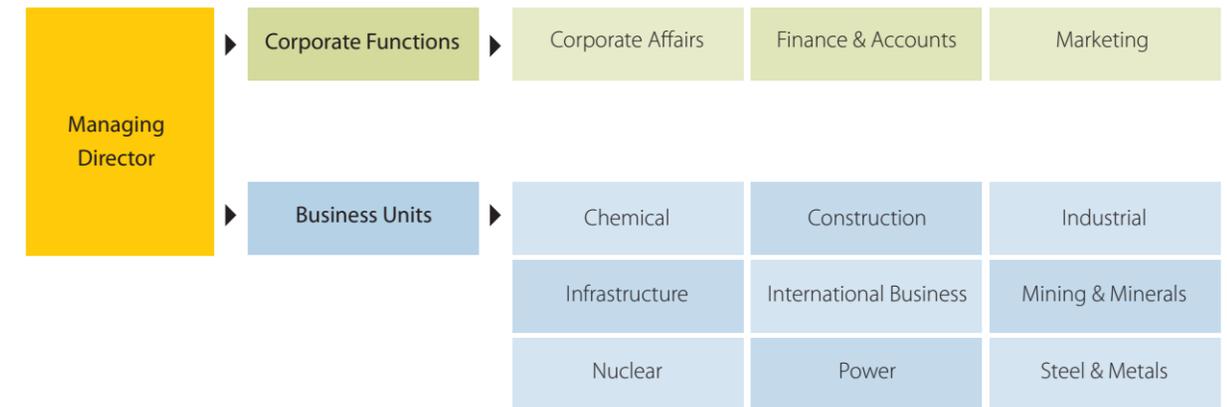


## Executive **management team**

From left to right: **Rakesh Gupta**, Corporate Affairs | **Risheshwar Prasad**, Finance & Accounts | **J P Haran**, Managing Director | **K Gopalakrishnan**, Legal, Compliance & Secretarial



## Organisational **structure**



## Organisational **ethos**

### Vision

To be an internationally respected engineering consultant offering comprehensive solutions

### Mission

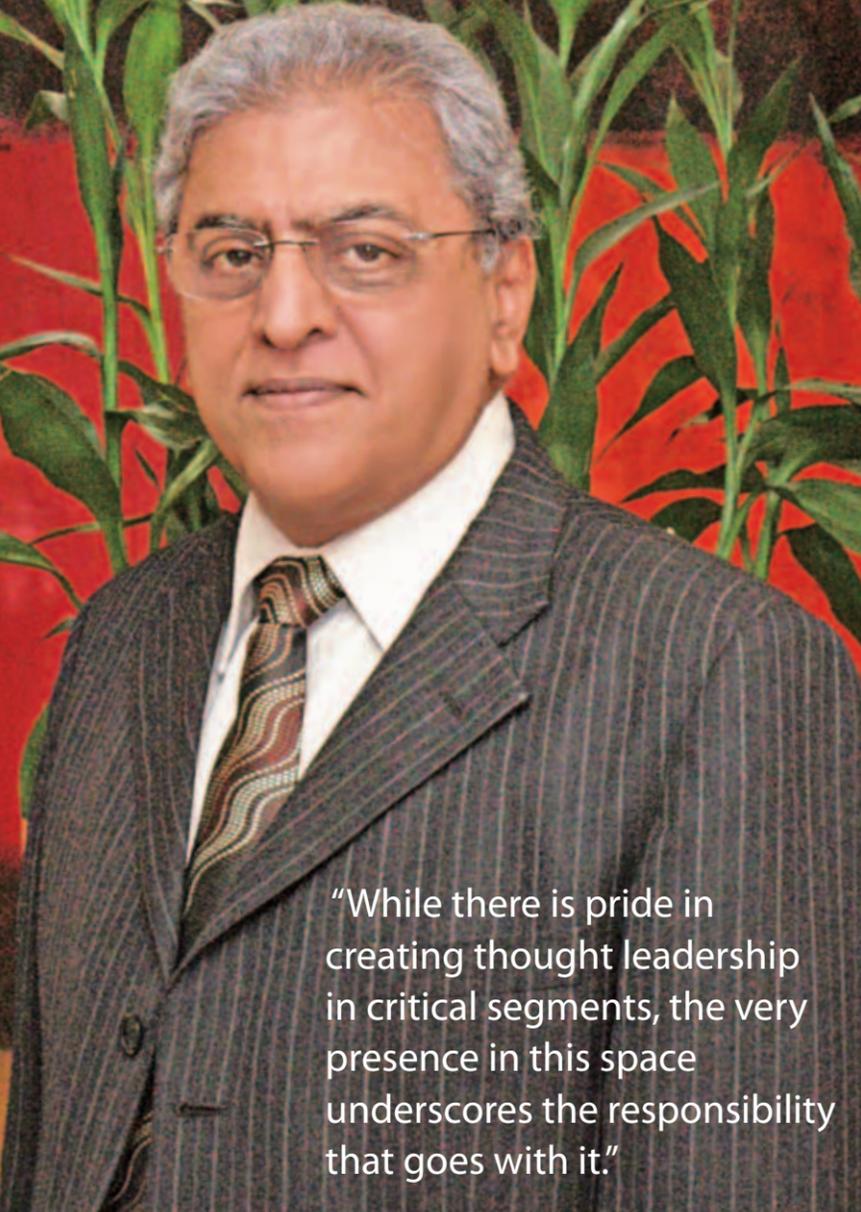
Provide technically excellent and innovative solutions, for adding value for all stakeholders, and operate globally as professional consulting engineers.

### Values

- ▶ Customer satisfaction and loyalty
- ▶ Employee dignity and self respect
- ▶ Technical excellence with professional ethics
- ▶ Organisational and individual growth
- ▶ Responsibility to society

Chairman's Statement

## Charting a new course



"While there is pride in creating thought leadership in critical segments, the very presence in this space underscores the responsibility that goes with it."

### Dear Stakeholders,

This is a momentous year, the Golden Jubilee Year for Tata Consulting Engineers Ltd (TCE) and a good time to reflect on charting a new course for the company. It is an exciting and challenging prospect – exciting because the canvas is vast in a volatile economic backdrop; challenging because TCE has been in the business for 50 years and change is always difficult. This report takes a thematic approach to discuss the company's process of evolution to the present stage and the strategies in place to follow a new direction in the coming years.

### Beyond the Golden Compass

The company has set its vision to scale to international heights, diversify its portfolio to offer comprehensive engineering solutions. Pursuing this vision, TCE has set its goal to be positioned amongst the top global engineering solutions companies. This, I believe, is not a tall order for a company that has evolved for 50 years, has consistently shown profitability in operations and contributed to the nation building process.

TCE has worked alongside large Indian and international organisations, providing conceptual design and engineering solutions to some of the nation's prestigious projects in sectors such as Infrastructure, Nuclear, Power, Chemicals and Steel. While there is pride in creating thought leadership in critical

segments, the very presence in this space underscores the responsibility that goes with it. Going forward, TCE will build into its solutions and processes, aspects such as social impact, environment conservation measures and economic viability.

With the geo-political changes in the world, there is a shift in focus towards Asia, primarily India and China, providing new opportunities for TCE at a global scale. TCE has put in place strategic initiatives to drive scale to stay competitive and increase profitability.

### Building a Responsible Consulting Practice

The change agents in the coming years will be responsible business practices. The year 2011-12 was characterised by several initiatives in this direction –

- ▶ Weaving a risk assessment and mitigation framework at the strategy formulation and business planning stage.
- ▶ Developing of processes and quality systems incorporating compliance measures.
- ▶ Strengthening corporate governance – TCE is governed by the Group cultural ethos and the tenets of integrity, business excellence and sustainable business practices are driven right from the top. These will be strengthened further in the coming years.
- ▶ Embedding sensitivity to natural resource optimisation, environmental consciousness and inclusive growth will form the core of TCE's business.

### Performance Overview

This year has been a difficult one for the Indian economy. The growth momentum has dropped, governance and policy uncertainty is affecting both the manufacturing sector as well as infrastructure. The European economic crisis is exacerbating this effect and investor confidence is being impacted. A depreciating rupee in the last quarter combined with high prices affected borrowings and increased operational costs. TCE's primary revenue sources are linked to the infrastructure, energy and minerals sector and these are the areas most affected. Within this macro economic framework, TCE's profits in 2011-12 showed a marginal decrease over the previous year. TCE recorded gross revenues of Rs 469.51 crores in 2011-12 on the strength of previous business acquisitions and active projects. The international segment contributed significantly to the company's order book in the year 2011-12 especially in the Middle East and Africa. TCE will implement an on-site off-shore model to leverage the opportunity and ensure profitability.

### Thinking Ahead

Management in tough times call for tough measures. Investments in IT-enabled process and compliance audits, automation of processes, a clear focus on reducing costs and improving profitability are the major objectives for the year and initiatives towards this end are in the pipeline. TCE is poised for

international expansion at a global scale, and managing this growth will be the key focus in the coming year. Diversification to growth-oriented sectors is an imperative for sustained profitability and building capabilities in new verticals will continue to gain steam. TCE's strength is its mother lode of knowledge base and skilled talent pool. Strengthening human resource practices to manage knowledge workers is critical to managing growth.

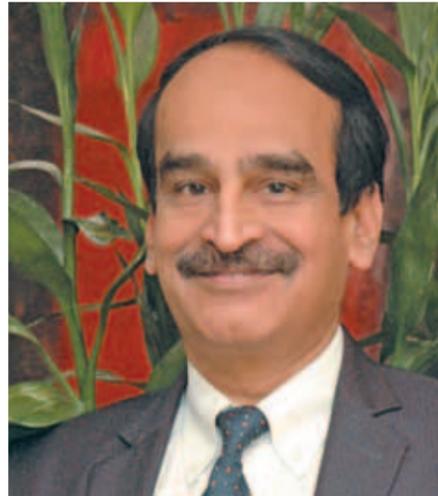
We are on the threshold of a new direction and I envisage a TCE success story rewritten with impetus from its skilled employees, a global footprint and the continued support of the Group. The Golden Jubilee Year is dedicated to the untiring efforts of the employees at TCE and the guidance provided by the leadership team.

Sincerely yours,

Prasad R Menon

Chairman

Managing Director's Overview



**“As we are poised to grow in the global markets, quality standards in delivery, agility and softer aspects of managing an international clientele will be imperative to drive customer delight.”**

*Dear Shareholders,*

In the world of business, many changes have ebbed and surged, recessions past and present blew over, instances of bursting growth and tectonic shifts that ripped through economies and business. There have been companies that endured – consolidating through the lows and pushing ahead through the highs. Tata Consulting Engineers is one of them and I am proud to be part of this organisation that has endured the test of time. The key success factors are –

- ▶ Technical excellence
- ▶ Customer relationships
- ▶ Brand equity
- ▶ Abiding by value systems – Integrity and ethical practices
- ▶ Allegiance and solidarity within the business units
- ▶ Sustainable business practices

These factors helped TCE to endure the test of economic tumult and to perform consistently. However, the present challenging times are certainly not one for resting on laurels past.

**The Path Ahead**

▶ The path ahead has been charted and TCE is well on track to realise its organisational vision and goals. We have set ourselves up to specific growth targets in a five-year time frame running up to 2015-16. We have also resolved to establish our presence in key geographies across the world.

The year 2011-12 was a pivotal year as we initiated an operational plan to realise our goals.

**Establish Strategic Alliances**

TCE has diversified into business units that gives the company a foothold in key sectors. The growth in the engineering consulting business has brought in large players with aggressive pricing and also smaller players with domain specific expertise. In such a fragmented market, the need for a collaborative front to capture market share is essential.

TCE's strategic planning process underscores:

- a) the need for building capabilities

through robust training methods as well as acquiring skills through partnering, acquisitions as seen appropriate.

b) build scale through further diversity in operations – specific verticals are Transportation, Oil & Gas, Petroleum/ Refinery & Mining

c) increase scope by moving up the value chain to gain a foothold in value-added process areas

Other partnerships will also be explored to cover upstream and downstream activities. This will –

- ▶ bring the gamut of services in the engineering procurement, concept /detail engineering and process engineering under one collaborative fold,
- ▶ distribute front end and back end aspects of engineering consultancy,
- ▶ improve turnaround time as activities are distributed among the collaborative partners,
- ▶ help TCE manage its resources cost effectively and optimally.

**Strategic Locations**

Going international was the mantra for the year 2011-12 with new businesses coming in from the Middle East and the African continent. India's technical prowess has gained traction globally and TCE is set to maximise its potential here. The year 2011-12 saw good growth in international business acquisitions.

Our international strategy is a multi-pronged one –

- ▶ Leverage the Group companies' first-mover advantage in emerging markets for a foothold and move up the value chain
- ▶ Build an on-site off-shore model that would ensure profitable operations and efficient deployment of manpower
- ▶ Establish delivery centres in key areas to raise the bar on our delivery process

At the domestic front, strategic locations across the country have been earmarked as Centres of Excellence for each Business Unit. These are focussed on the client clusters in and around the location and dedicated manpower required for the segment. This will also address manpower mapping and optimisation of resources.

**Customer Delight**

As we are poised to grow in the global markets, quality standards in delivery, agility and softer aspects of managing an international clientele will be imperative to drive customer delight. Some initiatives to drive customer delight:

- ▶ Investment in technology – TCE has deployed several IT systems such as Customer Relationship Management systems, complaint management systems and processes, Document Management System, 3-D Applications for concept

design engineering among others.

- ▶ Concerted efforts to achieve accuracy in deliverables
- ▶ Integrated service offering – TCE's diverse verticals covering most key segments and technical prowess will continue to serve as differentiators. The diversity of operations provides customers a one-stop solution front and this will be the thrust in rendering services.

**Sustainable Practices**

TCE has stood the test of time primarily on its allegiance to the Group ethos of integrity and sustainable business practices. We will continue to uphold these value systems in the years ahead. We have initiated IT systems for compliance audits, automation of processes, risk assessment and adequate mitigation plans in all aspects of the business. Our Corporate Sustainability initiatives have gained momentum and we will forge ahead on the path of inclusive growth. In the effort to assess and mitigate risk, incorporating safety systems in all our business functions will be mandated in the coming year. Safety and climate change aspects will need to be incorporated right from conception to delivery across business units. We have already put in place a structured safety management program and creating more awareness and training will be driven with greater zeal. Employee development and engagement is critical to TCE's continued progress. Initiatives to align employees to the larger organisational goal, building an agile and responsive culture to bring about customer delight were rolled out in the previous year. These programs will be scaled up in the coming year.

**Company Performance**

Despite a slackening in growth in the Indian economy and recessionary economic conditions prevailing, TCE's overall performance grossed revenues of Rs 469.51 crores (USD 93 million). Profit before tax stood at Rs 83.60 crores. New business acquisitions grossed Rs 723.28 crores (USD 143 million).

**The next decade- The Direction**

In the next decade we hope to take TCE into the global arena as a player of significance in the international engineering consulting business. Steps towards this end have already been initiated. Skilled consultants, greater diversity in the human resource profile of the organisation and cultural integration of an international workforce will be the way forward.

TCE will build a client profile of Government, private and international customers. TCE will drive a unique strategy for each business unit. Compliance, safety, environmental consciousness and cost consciousness will be religiously pursued.

We may have marched ahead in technological excellence but I would like to believe that we have distance to cover on the road to sustainability. This mindset, to me, is a sure way for continuous improvement. In the next decade, the TCE voice will echo in the corridors of success. “We think sustainability, therefore we endure.”

Sincerely yours,

**J. P. Haran**  
Managing Director

# Performance highlights and **growth trends**



## Business Review Infrastructure

Tata Consulting Engineers' Infrastructure Business Unit has created a strong brand in the business on the strength of the prestigious projects the business unit has successfully completed over the years. The complexity in the nature of the business has rendered the Infrastructure Business Unit, a diverse one, positioning it as one of the keystones of TCE. The Infrastructure Business Unit's involvement in several of the large urban development projects and other projects of national importance positions the company as proud contributors to the nation building process.

Growing in tandem with the Indian development and growth path, the Infrastructure Business Unit's portfolio mix is a balance of Government, private and public sector undertakings (PSU). In addition, the unit has supported several projects of the Tata Group Companies. The Infrastructure Business Unit has grown steadily, posting significant growth in the

last five years. The business unit's growth story was initially charted through steady businesses in the area of design engineering and construction management services and subsequently scaling up to mega projects by packaging comprehensive services to its clients in all areas. The business strategy is to build on its core strengths and diversity into the

new sectors to gain presence in all business segments of the Infrastructure market. Today, TCE's Infrastructure Business Unit is among the top 10 consultants in the market in India.

This has come about owing to several factors –

**Integrated Solutions:** Infrastructure engineering is a complex maze of services encompassing various industry segments and technical disciplines. TCE's strategy to provide diversity in service offerings is a primary differentiator. Working with cross functional teams, project service extending to water resource management, sewerage management solutions, irrigation projects, large water transmission projects, ports and buildings, environmental management projects, architectural and town planning services. An integrated solutions front providing an entire basket of services in construction, infrastructure, power, environment and other segments has helped TCE diversify into related domains. Efficient knowledge sharing processes, internal support among various business units has helped in new business generation.

**Consolidation of Core Strengths and Scale:** The Infrastructure Business Unit restructured its business by aligning its core strength into specific verticals and adding new verticals. Taking a focussed and targeted approach lead to the build up of business volume.

TCE's core strength in the infrastructure domain is Water and Urban Development. This has been a proven area with large scale

projects materialising in this which are financed by multilateral funding agencies. Most relationships built with customers have sustained to bring about repeat orders with extended scope in the projects awarded. In 2011-12, contract extensions and business from existing customers amounted to 58% of total acquisitions. Core strengths have been leveraged to enter and support new segments, mapped into new verticals to scale up the value chain.

**Working alliances and knowledge sharing:** TCE has also partnered with reputed EPC contractors to deliver projects. Many overseas engineering firms actively seek TCE's partnering in their projects in India and abroad. TCE has completed several landmark projects in all its verticals working with domestic and international partners. The strong ethical values, respect for IPR and sound processes have enabled smooth functioning and cementing of these relationships. Knowledge sharing and complemented services rendered to customers has also been the positive fall out of this exercise. Going forward, this strategy will be strengthened and built upon. For instance, the Infrastructure Business Unit has strong capabilities in the landside engineering of airport development and hence it becomes relevant for TCE to associate with specialists in other areas of airport development and provide unified services to customers.

**Expanded customer base:** The Infrastructure Business Unit's early years were characterised by infrastructure

projects that were primarily driven by the Government and had long gestation schedules. Post-liberalisation, there has been greater private-public partnership and several private investments. TCE has carefully built up a strong clientele with a healthy mix of Government, PSUs, private sector, and the Group companies. Year 2011-12 had businesses with a client mix drawn from the Government sector Tata Group companies and private sector. This has ensured steady volumes in acquisitions contributing to growth, profitability and consistent cash flows.

**Prestigious Projects:** Large scale projects in building and architecture were landmark achievements that helped build the brand equity of TCE's Infrastructure Business. This has provided tremendous visibility for TCE, in the buildings segment. Large water transmission projects and waste water management projects in towns and cities have positively impacted a large populace. TCE has focussed on business acquisitions that spell continuity, completion schedules, high-end clientele with strong investment capabilities and projects that have a huge impact in terms of visibility for TCE together with national importance.

**Sustainability:** Rising concerns with respect to resource conservation and environment protection has resulted in stringent regulatory measures imposed by the Government. TCE's Infrastructure Business Unit has undertaken several water resource management and urban development projects right from conception to commissioning. Applying its

all-round technological capabilities, the Infrastructure Business has provided solutions specific to environment and resource management. Desalination projects, irrigation systems that bring about efficiencies leading to water

conservation, waste water recycling and sewerage management, projects for pollution/emission management and measurement systems are some success areas with respect to environment-friendly solutions. TCE is conscious of its

obligations to society and ensures incorporation of sustainable solutions that protect the environment right from concept to delivery.

**The Infrastructure Business Unit is segmented into three major verticals:**



**Macro Drivers for the Business**

**Domestic**

- ▶ The Indian Government's 12th Five Year Plan encompasses investments in infrastructure to the tune of 8.37% of GDP in the base year.
- ▶ A rising middle class is driving the demand for better urban infrastructure and thereby the development of new cities and upgrading B and C towns.
- ▶ Government investments to build up infrastructure through development of ports, transportation, water supply and sanitation, desalination projects among others are also on the anvil.
- ▶ In an economy characterised by a slowdown in growth, there is a propensity for the Government to increase infrastructure spending to stimulate growth. This will present more opportunities for the Infrastructure Business Units.

**International**

The African continent represents a huge growth area with infrastructure development opportunities. TCE presently has established an operational base in the region which is proving to be beneficial. With an overall slowdown in the global economy, governments are more inclined to spend on infrastructure to ward off recessionary trends. The Middle Eastern countries are selectively increasing the spending in infrastructure sector. TCE's operational presence in Qatar, opens up opportunities to expand its market share in the region.

**Industry**

High interest rates, high inflation and a tight monetary policy have proved to be a challenge for industry, stalling many new projects in the last year. The pace of recovery is expected to be slow in the year 2012-13. From an industry perspective, the

engineering consultancy market has a large number of players with larger firms, especially EPC firms and international consulting houses joining the fray. The market is also getting fragmented with smaller players operating in domain-specific services at lower costs. This poses a challenge to consulting firms such as TCE that has invested heavily in building technological and infrastructure capabilities to provide holistic services to its clients. TCE is among the few companies that provide a comprehensive basket of services that cover multiple domains and engineering consulting activities. The broad-based service offering places TCE amongst the upper echelons of the consulting business, making it more relevant in high-end projects where its potential can be truly utilised.

**Performance Overview**

The year 2011-12 was an extremely good year for the Infrastructure Business Unit, with revenue growth at 40% over the previous year and meeting the year's projections. Business acquisition saw a two-fold growth over the previous year meeting 100% of projections. This was a consequence of several strategic initiatives taken by the business. Moreover, in a slow growth environment, government spending and clearances on critical

infrastructure projects have continued to keep afloat the growth momentum. Several large scale projects had taken off and continued. While the liquidity pressures hit the realty business, Infrastructure Business Unit had positioned itself in the high investment segment of IT Parks, SEZs, hospitals, townships and other such building and architecture projects. Working with EPC companies, several downstream services have also ensured continuous revenue streams.

The Infrastructure Business Unit also saw significant breakthrough in the international markets with about 25% of business acquisitions coming from overseas projects. The Middle East and Africa have been a focus for new businesses. TCE's core strengths in urban infrastructure, water resources, sanitation

and solid waste management augur well for its business prospects overseas. Even in a sluggish economy, development projects have been continuing with funding from World Bank, Asian Development Bank, Exim Bank and State & Central Government investments. TCE's involvement in these projects has stood the business in good stead both at the domestic and international fronts.

### Growth in the Year Ahead

TCE's Infrastructure Business Unit is targeting a three-fold growth in business acquisition over a five - year period. This quantum leap in growth is expected to be realised by several strategic initiatives being put in place –

▶ Ports & Transportation is a new focus growth area and is being targeted with

rising opportunities in high-speed rail corridor, multi-modal logistic parks in port development, transport upgrades in B and C towns among others. The challenge in these sectors is to build internal capabilities.

▶ Inorganic growth by acquiring firms in niche domains, collaborations to tap complementary skills under a unique service delivery model, alliances and partnerships to forge into new and promising verticals.

▶ There will be greater focus to build on the breakthrough made into new geographies such as Middle East and Africa. TCE's presence in Qatar has already yielded success. Building on the brand equity gained as part of the Tata Group and driving excellence and quality, the share of businesses in the overseas market is

expected to increase significantly.

▶ Operational restructuring internally will drive the business from the Infrastructure Business Units' regional presence across the country and outside. Locations have been earmarked for specific verticals and states for driving business acquisitions and customer relationship management. TCE has a pan-India presence with skilled resources in Bangalore, Jamshedpur, Pune, Delhi, Kolkata and Chennai with Mumbai continuing to be the Centre of Excellence (CoE) backing these locations. Offices established in Qatar and South Africa will drive the businesses on the international front. Going forward, in business acquisition the contribution from the other locations will increase significantly.

▶ While the Infrastructure Business Unit has built strong capabilities in sanitation, town planning and other urban development domains, the business will now shift focus to expand the scope of its services to participate in high value assignments in all segments where its technological prowess will be fully tapped.

▶ Infrastructure is primarily driven by Government spending and TCE has been successful in acquiring business with State and Central Government in the areas of core capabilities. TCE will structure itself to manage government liaisons and pre-contract processes more effectively, ensuring a higher percentage of success in the competitive bidding process. With these measures, TCE's Infrastructure

Business Unit will tap into rising opportunities in the domestic markets, across locations and international markets. The key focus area now is managing growth and delivering at the same quality levels. The key challenge in driving this focus will be increasing hires with key skills and retaining them. India is still the driver for growth along with China for the global economy in the throes of recession. This poses a lot of opportunities in the infrastructure domain in India. International players continue to look towards India for business opportunities. TCE will leverage its expertise and brand equity to build relationships to elevate its position in the infrastructure domain to be among the top players by 2015.



CNBC-TV18 Infrastructure Excellence Award for Best Design Project awarded to TCE

### Services

Verticals	Sub Sectors	Services
Water & Urban Development	Water	Water resources, Water & Waste water, Industrial waste water, Storm water drainage, Rain water harvesting, Irrigation/Dams, Desalination
	Urban Development	Integrated Infrastructure development, Special Economic Zones (SEZ)/Industrial Parks/Townships, Large urban redevelopment projects
	Environment	Environmental Impact Assessment (EIA)/HAZOP, Solid waste management, Air pollution control, Effluent Treatment Plants (ETP)
Buildings & Architecture	Building Designs	Hotels, Malls, Hospitals, IT Parks, Commercial & residential buildings
	PMC Services	Project Management Consultancy (PMC) Services for IT Parks, Malls among others
	Architecture	Heritage structures, Green buildings
Ports & Transportation	Ports	Port Planning, Dredging, Breakwater, Berth/Jetties, Port utilities, Port connectivity, Port material handling
	Transportation	Airports, Roads, Bridges, Railways



Business Review  
**Mining & Minerals**

Mining & Minerals Business Unit since becoming an independent business unit is gradually gaining steam, establishing a foothold in niche areas within the mining industry, through engagement primarily by the Tata Group companies.

Verticals under the Mining & Minerals Unit:

<p><b>01</b> Mining</p>	<p><b>02</b> Material handling</p>
<p><b>03</b> Mineral beneficiation</p>	<p><b>04</b> Mining support services</p>

**TCE's core strengths in Mining & Minerals Business Unit**

- ▶ Strong Geology and Mining expertise for both opencast and underground coal mines
- ▶ Geo-technical and hydro-geological studies
- ▶ Material Handling Services
- ▶ Environment Impact Assessment (EIA)/Environment Management Plant (EMP) study
- ▶ Specialised services such as slime dam, ash slurry transportation system for mine void filling, mine water management, study of hydro-geology, nala diversion among others.

**Mining Industry Overview**

The mining industry in India is expected to go through considerable change in the coming years, primarily from the focus of conserving natural resources that are fast depleting and to safeguard the interests of the community in and around the mines. The changes are structural and regulatory, with governments the world over, waking up to the concern of resource conservation, sharing of resources and resource optimisation. Mining and minerals are key inputs in fuelling growth and a demand supply gap will increase operational costs, denting profit margins. The two main minerals mined in India are coal and iron ore. India being a developing country, with increasing demand for Power, demand-supply gap of coal is widening year after year. Iron ore mining is mainly dominated by number of small mine owners and their interest in mining is restricted to high grade iron ore only. In

the current scenario, there is relevance for resource-endowed nations such as India to introduce protectionist measures to safeguard natural resources and optimise domestic consumption. The following is the scale of the Indian mining industry -

- ▶ India ranks among the top five nations in terms of tapping natural resources such as coal and iron ore.
- ▶ India is the third largest producer of coal in the world.
- ▶ Fourth largest producer of iron ore after China, Brazil and Australia with production at 210 million tonnes (2010-11).
- ▶ Fifth largest producer of bauxite in the world.

Considering the strategic impact of the Indian mining operations on the country's economy, most of the mining activities are vested with public sector undertakings (PSUs) such as SAIL, National Mineral Development Corp (NMDC) and Coal India.

However, in recent years owing to high demand, coal sector is liberalised with many coal properties being allocated to private and other public sectors. In the wake of this development huge potential in terms of consultancy in geological services, mine planning and mine infrastructure development has emerged.

Iron ore mining in India, all through could meet the increasing demand of the domestic Steel Industry and also the exported bulk of mined ore. High grade ores and easily mineable ores are getting depleted. Iron ore mining sector thus, is resorting to dependency on low grade iron ore mining and its beneficiation for

upgradation and utilisation in steel industry.

**The Black Gold Scenario - Coal**

From a coal mining perspective, India has overall about 85 billion tonnes of proved coal reserves and about 230 billion tonnes of indicated coal reserves. Yet the overall demand supply gap is considerable with key consumers importing coal at high costs. Shortage earlier was mainly for coking coal, however in recent years shortage of thermal power grade coal has increased.

About 88% of coal produced is by the Government- owned Coal India and Singareni Collieries Company Ltd., most of which is channelled for the generation of power. Post-liberalisation, private players were licensed to enter the coal mining sector for captive consumption for specific end-users such as power plants, fertiliser, cement and steel units.

Several factors have impacted coal mining operations:

- I) Forest land clearance
- II) Land acquisitions
- III) Relocation and Rehabilitation Concerns
- IV) Environmental clearance
- V) Infrastructure for coal evacuation

**Grade of produce and poor resource optimisation:** Coal mining processes and techniques used are predominantly unscientific and based on traditional systems. As a result, high grade minerals close to the surface are getting depleted. Moreover the coal reserves in India have inherently high ash content which calls for

washing units to decrease the ash content. Opencast or surface mining forms 90% of coal mining in India and mining activities have been focussed mainly to exploit coal closer to surface by opencast mining method. Technology to exploit and explore deep seated minerals is very limited and has not been fully applied.

### Iron ore Mining

**Fragmented operations:** The Indian iron ore mining operations have thus far been fragmented with several small operators in the market and the largest operator being public sector undertaking such as SAIL, NMDC. Several unlicensed operators have mushroomed and are difficult to track and monitor. The next few years are expected to see capacity additions in iron ore beneficiation of low grade ore and fines. The Indian Government is focussed on regulating the mining operations and optimising resources. Tapping into low grade iron ore, the process of beneficiation from 52% to 62% purity and pelletisation are huge business opportunities that TCE's Mining and Minerals Business Unit looks forward to.

### Changes Envisaged in Mining Operations in India

The proposed Mines and Minerals (Development and Regulation) Bill (MMDR Bill), 2011, is expected to bring about the much required amendment to the 1957 version resulting in greater transparency to the mining operations in the country. Among other things, the bill primarily sets

best practices in the bidding and at location of licenses, takes a technological approach to mine development, ensure sustainable development by providing a supportive framework for the community affected by the mining operation, empower states in the prospecting and bidding process, address and arrest illegal mining activities. The introduction of the MMDR Bill will help in developing the country's mining sector to its full potential so as to optimise the nation's mineral resources for national economic growth, and take a long term view in safeguarding national interest. Government regulation also stipulates the minimum grade of iron ore thereby ensuring quality of production.

### Rising prospects for TCE

The streamlining of the mining operations is likely to throw up new opportunities for TCE's Mining and Minerals Business Unit.

With pressure mounting to augment production, large opencast coal and iron ore projects are expected to go on stream.

A majority of mining in India is open cast. To ensure full utilisation of resources, there is a great thrust to set up large underground coal projects. This comes as new business opportunities for TCE in the area of mine planning and geological studies among others. It is pertinent here to note that among private consultants, TCE is the only consultant to have developed expertise in underground mine planning.

Specific areas of activities such as iron ore fines and ash slurry transportation for mine void filling and other logistics related activities will benefit TCE with new business.

70% of the Mining Business Units' new business in the coming year is expected from Mineral Beneficiation and Material Handling services.

### Challenges

In its present form, the mining industry is primarily driven by PSUs with structured processes. TCE will find it a challenge to gain ground in a highly regulatory environment, as an independent consultant. Greater involvement of foreign players in the business would help boost TCE's prospects in terms of strengthening of core technical processes. TCE hopes to enter into partnerships to provide integrated service to clients. Such partnerships will bring together complementary skills, pooling of core expertise and delivering value added services. Hence the approach of a consortium model to integrate services to cover all key processes and complement services through a strategic alliance is the way forward for TCE's Mining and Minerals Business in order to establish itself in this market.

The Mining & Minerals Business Unit is countering the challenges in the domestic market by positioning itself well to take on international projects. Several leading global players have been operating in the

country and TCE's alliances with them are expected to throw up new business opportunities globally. Ready for this eventuality, TCE has invested in technology upgrades and resources' training in the area of mining and geology related applications. Alliances with global players will not only provide new markets but also help provide world-class services to existing clients.

### Performance

The Mining & Minerals Business Unit was greatly impacted by the overall slowdown in the economy combined with developments in the industry. Several projects, especially coal mining, have not moved forward as expected and this impacted TCE's Mining & Minerals Business Unit revenues. New business acquisitions also fell slightly short of projections owing to the above mentioned factors. The year

2012-13 is expected to be better than 2011-12 with TCE's strategic alliances bearing fruit and pending projects gaining momentum. However the impact of potential opportunities will only be realised in the next couple of years.

Going forward, TCE is building competencies in new areas and taking both domestic and overseas business opportunities to new levels.

### Services

Verticals	Services
Mining	Geological studies and Mine Planning mainly for Coal and Iron Ore Mines <ul style="list-style-type: none"> <li>▶ Exploration Planning</li> <li>▶ Exploration Supervision Services</li> <li>▶ Interpretation of Exploration Data</li> <li>▶ 3D Modeling of Coal and Metal Deposits using Mining Softwares</li> <li>▶ Preparation of Geological Report</li> <li>▶ Statutory Mining Plan &amp; Preparation of DPR</li> <li>▶ Analysis of Slope Stability and Support System</li> <li>▶ Study of Hydro-geology, Nala Diversion among others</li> <li>▶ Design of Slime/Tailing Dam</li> </ul>
Material Handling	Crushing, Conveying Systems for all types of Minerals (Coal, Iron Ore, Limestone, Lignite) Scheme/Review/Detailed Engineering
Mineral Beneficiation	Mainly Coal Washing and Iron Ore Beneficiation
Mining Support services	Infrastructure, Slope Stability, Mine Support System, Mine Water Management, Design of Slime/Tailing Dam Ash Slurry disposal / Mine void filling



Business Review  
**Steel and Metals**

**Tata Consulting Engineers' (TCE) Steel & Metals Business Unit enjoys the continuous patronage of its customers, especially from within the Tata Group companies. A good share of TCE's revenues in the Steel & Metals Business Unit were realised from within the Tata Group in 2011-12.**

The Steel & Metals Business Unit is organised into two groups – ferrous metals and non-ferrous metals. The Unit's verticals are structured based on the various process units in the steel and metals industry.

01

Verticals under Ferrous Metals

02

Verticals under Non-Ferrous Metals

The key business focus for TCE in the ferrous metals group is Steel. The steel industry is driven by demand from the infrastructure and construction industry to the tune of 60% of total consumption, with automobiles, consumables and the manufacturing sector taking the remaining market share. The total crude steel production capacity is estimated to touch about 149 million tonnes by the year 2016-17. Current capacity additions between FY 13-FY 17 are projected at 44 million tonnes with investments to the tune of Rs 150,000 crores in the Indian steel manufacturing industry. With TCE's Steel & Metals Business Unit rapidly placing a foothold in more aspects of

consulting services in the industry, the year ahead looks very promising.

With the rising production costs and raw material optimisation constraints, steel manufacturers find it relevant to reduce hot metal production costs and ensure saleability of finished products. Hence at every point in the production process, technical and process innovation becomes critical to ensure cost efficiencies. TCE's service as an independent consultant is greatly relevant when it provides innovative solutions at every stage of the production process, calling for domain expertise in each of the processes along with database, design engineering and ancillary skills. TCE is highly focussed on

quality and error-free deliverables considering the criticality of the production processes. It is this focus that is driving TCE's Steel & Metals Business Unit to move into specific technology and process areas of consulting in this segment.

In the current scenario, there is a great drive to upgrade existing systems to comply with stringent environment-friendly norms, safety mechanisms, water conservation, waste management, zero discharge processes, pollution control and other compliance and risk mitigation measures. Leveraging on existing capabilities TCE is well-positioned to tap these opportunities.

**New Avenues**

The core technical processes in the production of metals is unique, but ancillary utilities like power management, in-plant/external logistics, emission management, material handling, water system management, among others are common aspects for production processes of other metals. These are areas that TCE has abundant expertise in and it is relevant for the Steel & Metals Business Unit to establish itself here. Aluminium production is driven by huge requirements of power with 40% of investments going into captive power plants dedicated for aluminium production. Strategically positioning its built-up capabilities and partnering with process experts, TCE had a breakthrough in 2011-12, making inroads into specific areas in the aluminium production industry. Going forward, the Steel & Metals Business Unit looks forward to moving up the spectrum in the non-ferrous metals segment, particularly technical and process related aspects of aluminium production engineering.

In the nascent stage of growth, the Steel & Metals Business Unit focussed primarily on consultancy services within the Group.

Building up a reference bank over the past few years, the unit has expanded its client profile to include customers outside the Group, as demand for steel has increased production capacities and facilities in the country.

**New Geographies**

TCE's Steel & Metals Business has strategically established its presence in close proximity to customers' production facilities at key locations. This has helped in early identification of opportunities and better customer relationship management – both critical to continuous customer engagement and repeat orders from existing customers.

TCE's successful relationships and alliances with leading EPC contractors have helped to jointly forge ahead into developing markets overseas. The Steel & Metals Business made inroads in the Middle East and African markets both in the ferrous and non-ferrous group. In the non-ferrous group (aluminium) - key technical expertise lie with established overseas players. The combined strength of such alliances, complementing each others' capabilities, is expected to help gain market share in a highly competitive market. TCE's new businesses in the pipeline are in Africa, South America and the Middle East. With the practice of working in close proximity to customers and alliance partners, TCE has dedicated resources and business development establishments in the relevant geographies. In the coming year, the Steel & Metals Business unit expects to expand its presence in the international markets, on the strength of the Group's brand equity and its own marketing efforts.

**Integrated Approach**

The Steel & Metals sector's plant establishment has to be viewed in totality, involving core production processes

together with ancillary supporting processes and systems. In effect, it is a conglomeration of sectors – mining, steel production, power systems, infrastructure such as water systems, logistics, among others, and construction. TCE, as an organisation, is among the very few consultants in the world that has developed capabilities to undertake consulting in all the ancillary sectors in the facility establishment process. The Steel & Metals Business approaches its clients with an integrated approach to delivery, rendering consultancy in all the aspects. The business unit has a ear-marked vertical – Shared Services, with dedicated resources available at the specific customer touch points providing consulting services in pre-commissioning services, power, transmission and distribution, infrastructure utilities and construction. From a customer perspective, TCE's Steel & Metals Business is a consolidated front providing holistic consultancy services to clients thereby simplifying the clients consulting needs.

With respect to the non-ferrous metals (aluminium), the Steel & Metals Business is in the process of forging alliances with global players dominating the core technological process areas and supporting them with shared ancillary areas. This would ensure that clients are benefitted with world class services under one umbrella. Such alliances will make the combined venture a formidable service unit and help TCE make inroads into new business opportunities.

TCE's team of highly skilled professionals have been sensitised to current trends in energy conservation, pollution management, SHE practices, land profile optimisation for green belt cover, among others. Environment engineering planning combined with our partners' process domain will provide value addition to our clients.

### Challenges

A key aspect of the steel and metals industry is that with increasing thrust on resource conservation, most governments across the world have taken a protectionist approach. This has resulted in large volumes of high value business opportunities arising from public sector enterprises both nationally and internationally. TCE has acquired considerable expertise in most of the verticals relevant to the steel and metals sector but hard-core reference banks in core sectors is a prerequisite that the business unit is not fully equipped with. Additionally, the consultancy business'

market share is getting eroded with EPC contractors using their in-house engineering services thereby blocking out small and mid-sized players. As the market gets more fragmented at both domestic and global levels, it becomes imperative for TCE to carve out niche areas in the process & technology side combined with ancillary services.

However, with several of the strategic measures taken by the business unit, the Steel & Metals Business hopes to overcome such hurdles and focus on services of international quality and profitability.

### Performance

TCE's Steel & Metals Business has maintained steady revenues since the spin-off into an independent business unit with the patronage of the Group companies. The unit's market share went up one notch higher in 2011-12. New business acquisitions grew considerably over the past year with a good mix of Greenfield, Brownfield and pre-commissioning projects. With several strategic plans and initiatives in place, particularly global opportunities, TCE's Steel & Metals Business Unit hopes to establish itself as a formidable player in this domain.

### Services

Verticals	Services
<b>Ferrous Metals-Steel</b> Raw Material Handling Iron Making (Blast Furnace, Sinter/Pellet/DRI Making, Coke Oven & By-product Plant, Lime Calcining) Steel Making & Ferro-Alloy Plant Rolling - Flat & Long Coating & Finishing	<ul style="list-style-type: none"> <li>▶ Concept Notes</li> <li>▶ Feasibility Studies</li> <li>▶ Detail Project Report</li> <li>▶ Due-diligence Report</li> <li>▶ EIA Report</li> <li>▶ Power System Study &amp; Transmission/Distribution Engineering</li> <li>▶ Basic Engineering Document</li> <li>▶ Design Basis Document</li> <li>▶ Detail Engineering Drawings                             <ul style="list-style-type: none"> <li>• Plant Layout &amp; Shop Configuration</li> <li>• Land Profiling &amp; Drainage System</li> <li>• Plant &amp; Equipment</li> <li>• Town Planning</li> <li>• Environment Engineering</li> <li>• Rail &amp; Road Transportation</li> </ul> </li> <li>▶ Procurement Specifications, Assistance &amp; Contract Management</li> <li>▶ As-built Drawings</li> <li>▶ Approval / Review Engineering of Vendor Drawings/Documents</li> <li>▶ Project Planning and Cost &amp; Schedule Monitoring Assistance</li> <li>▶ Inspection &amp; Expediting Assistance</li> <li>▶ Supervision &amp; Commissioning Assistance</li> </ul>
<b>Non-Ferrous Metals-Aluminium</b> Raw Material Handling Alumina Refinery Smelting Rolling/Fabrication	
<b>Shared Systems</b>	



Business Review  
**Power**

**The Power Business Unit is the genesis of Tata Consulting Engineers' (TCE) consulting foray. TCE's operations began with power projects in association with Ebasco, with most of its engineers deputed from Tata Electric.**

A slew of successful projects and 50 years hence, there has been no looking back. Power was and still remains the nerve centre for TCE with the rest of the business built on its success in Power projects. Power as a commodity cannot be stored, imported or exported (except in a limited way); power is also the only common input required for production of every other product and is always in demand, worldwide. A growth-driven Indian economy is ever so hungry for power - in spite of large installed capacities, there are over 300 million people who do not have access to power. India is generating power using various sources such as fossil energy (coal, oil, gas), nuclear energy, renewable energy such as

wind, solar and bio mass. While many countries in the world use natural gas to generate power, it is not a viable option for India due to its limited availability in India and high cost of imports. Renewable energy sources such as wind and solar power do not offer a cost effective option for the large scale requirements. Coal-fired power plants are the most cost effective option for power in India, primarily due to the abundance of coal. India is the world's third-largest producer of coal and has the world's fifth-biggest coal reserves. Power generation has been the mainstay for sustaining the economic growth momentum in the country and TCE's Power Business unit with over 50 years of

expertise and presence has had an extremely good run. The growth in Indian power market is expected to continue inspite of hurdles being faced by the industry at present and the economic slow down. TCE is well poised to leverage its leadership position through the next decade.

Aligned with the macro drivers in the power industry, TCE's Fossil vertical constitutes 80-85% of the entire Power Business Unit with Hydro, Renewable and T&D constituting the remaining 15-20%. Within this 80-85%, coal-fired power generation contributes to the majority of business acquisitions. Hydro power business presently constitutes a small share with pre qualification being a concern for large capacity (> 100 MW) plants. Renewable energy business commenced in 2009 and is still in a nascent stage. The scope in this field is solar, wind, bio-mass and geo-thermal energy. This is still a new domain and TCE

is gradually building capabilities in this field. TCE's Power Business Unit is currently exploring opportunities in the gas-based power generation segment and is focussed on gearing up to handle large scale projects in this vertical.

TCE supports the power industry offering design and engineering consultancy services that are end to end – from concept to commissioning of power plants. TCE has gained credibility in the market owing to its brand image, value systems and excellence in delivery

### Challenges Past & Present

Coal-fired power plants currently fuel 41% of global electricity and 69% of India's energy comes from coal-fired power plants. TCE's business is closely linked to the industry upheavals both in the power generation and transmission and distribution area. With a good measure of TCE's Power Business Unit depending on coal-fired fossil energy, the ramification in

the coal and the power industry was felt on TCE's Power Business' revenues in the year ended 2011-12. Coal supply in the domestic market is lagging way behind demand. Power companies are faced with feedstock bottlenecks and high price of imported coal is affecting the industry. Challenges related to land acquisition, forest & environmental clearance for mine development and the overall slowdown of the economy has affected the Indian power business. India was the fourth largest importer of coal with 90 MT of coal imported in 2010 (IEA 2011) and generation costs have remained high. Power tariffs in India are extremely low. From a transmission and distribution perspective, utility companies' ability to buy power at prevailing costs has been a challenge. The year ahead is expected to see an improvement in the situation with Government intervention and remedial measures. As the industry situation improves, TCE's business prospect will

increase concurrently.

Furthermore, from a consulting perspective, larger players have moved into the consulting domain challenging TCE's position in the market as a forerunner. The presence of many players and pricing strategy to acquire market share from competition, has put pressure on margins for TCE last year.

Countering the prevalent challenges in the domestic scenario, TCE was able to make successful inroads into the international markets. Opportunities in Africa has encouraged TCE to re-position itself by having a local presence in the promising geographies such as Africa and the Middle

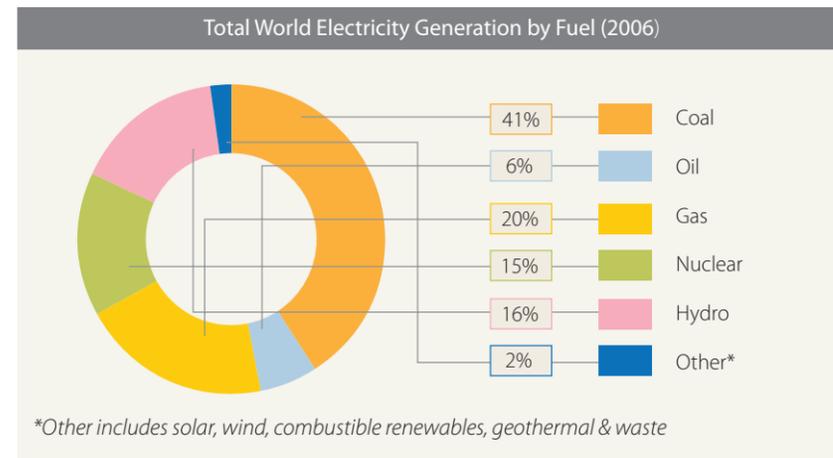
East. TCE is also partnering with EPC contractors and has representatives in the US and South Korea. Building on prevailing competencies TCE is targeting fossil and hydro plant and T&D opportunities to make a foray into new geographies.

### Performance and Progress

TCE's Power Business Unit has seen some golden years in the last few decades. The year 2011-12 saw a marginal decrease in revenues. However, the business from the international markets grew substantially. Outlook for the year ahead is expected to continue on similar lines TCE's order books are healthy in the domestic market and the international business

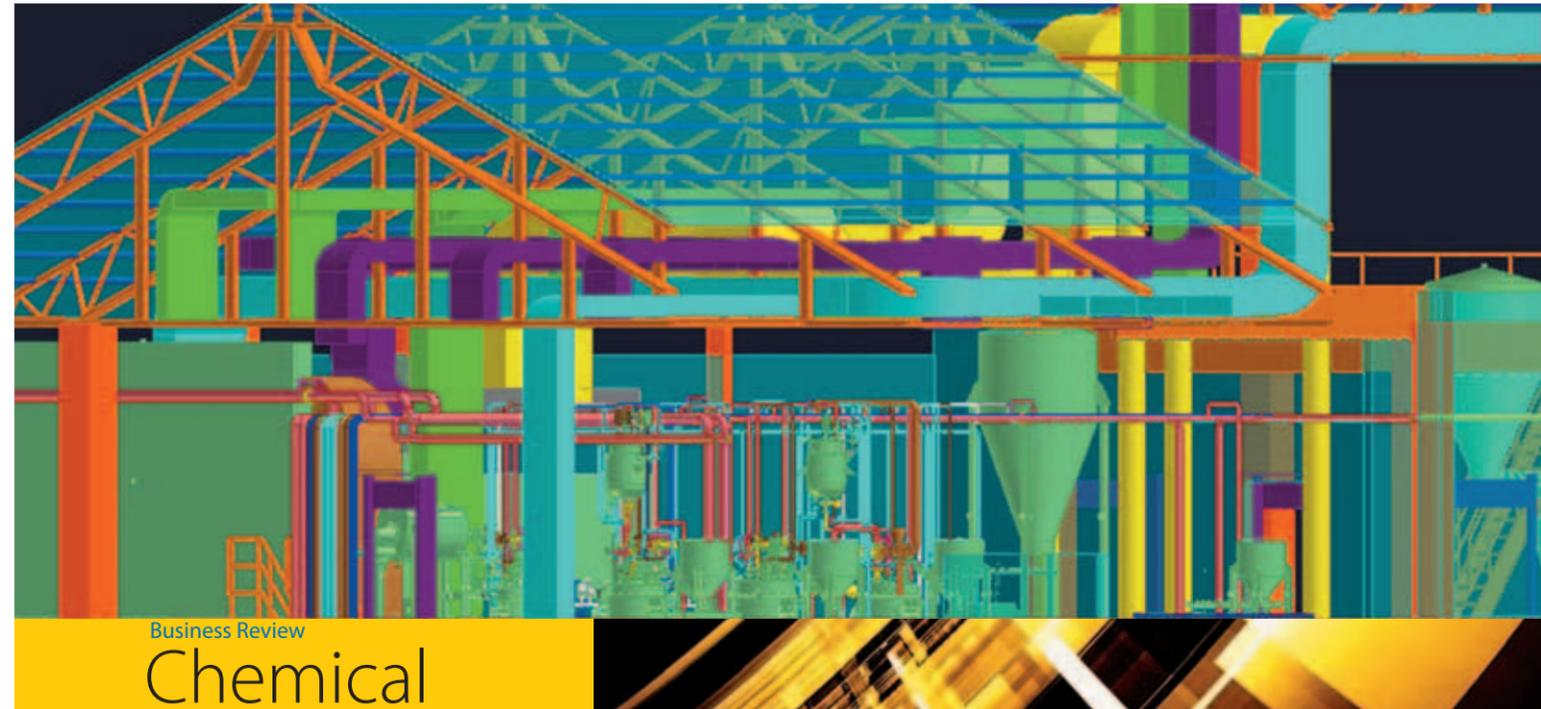
acquisition looks positive in the year ahead.

TCE has also strategically leveraged the advantages of customer proximity by establishing offices and deploying domain-specific skilled engineers in key customer centric locations such as Kolkata, Mumbai, Bangalore, Jamshedpur and supported by Chennai & Delhi. Going forward, TCE's Power Business Unit is focussing on building on its existing capabilities and positioning itself strategically in the right geographies and partnering with enterprises with complementary capabilities to ensure success.



### Services

Verticals	Services
<b>Power generation-</b> ▶ Fossil (coal, gas & oil) ▶ Hydro ▶ Renewable	Power plant- concept to commissioning services, site selection study, site investigation study, technology selection studies, feasibility and detailed project reports, EIA study, electrical system studies, due diligence reports project management services. Project development activities include pre-contract and post-contract activities such as concept/ basic studies, tender specification, bid evaluation, contract documents  Inspection and expediting services, Lender's engineering services, among others, detailed design engineering supply chain management, project management, inspection & expediting and site construction supervision monitoring of commissioning activities including witnessing of performance guarantee test.
<b>Transmission &amp; Distribution</b>	Sub station tower design, route survey, project management, supply chain management and other related commissioning services requiring techno-commercial capabilities.



Business Review  
**Chemical**

The Chemical Business Unit of TCE has its roots in the early years of TCE in the 60s. This period was typically a stage of rapid industrialisation and import substitution in India.

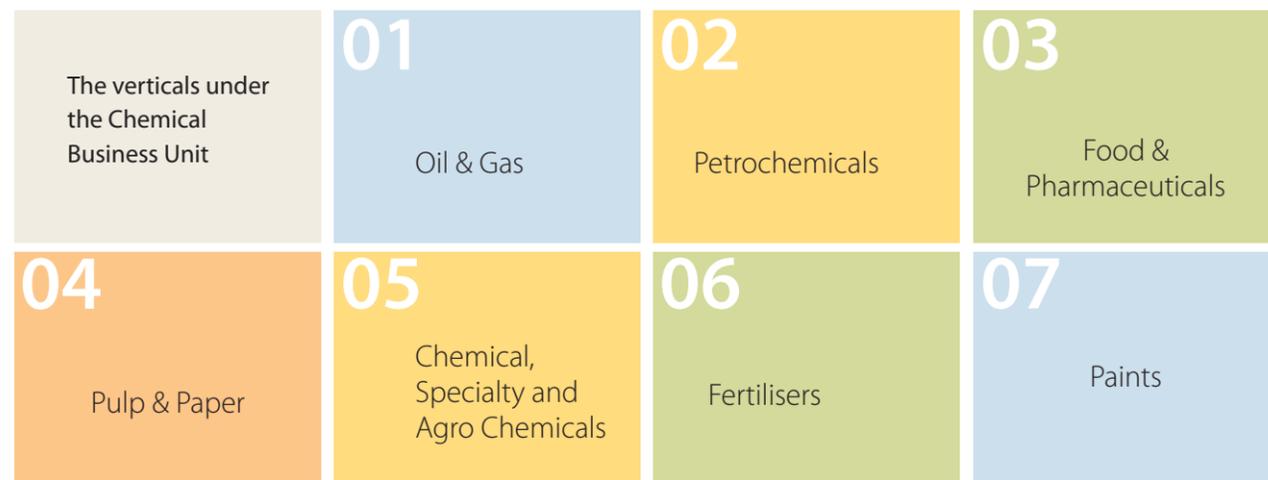
The Chemical Business Unit took shape right in those times, working with international companies such as CHEMICO, New York, an associate of Ebasco, TCE's partner then. The Chemical Business has focussed on key verticals where it has built

capabilities over the years, providing solutions from concept to commissioning in chemicals process units. Going forward, the Chemical Business Unit will leverage its competencies and deliver services in domains that ensures profitability in a

sustained manner.

**Vertical Focus**

The chemical industry being a fast and diverse one, it is imperative to focus on critical verticals that are profitable and those that TCE has competencies in.



**Special Projects:** The Chemical Business Unit has been active in the Oil & Gas vertical providing engineering procurement consulting management and activities in the 'Outside Battery Limit' (OSBL) area while building up the capacities in process areas, 'Inside Battery Limit' (ISBL). The success here has encouraged the Chemical Business unit to make inroads into the process engineering aspects using its technical capabilities. This vertical is dominated by public sector undertakings (PSU) that follow structured tender qualification norms. TCE is working around this challenge to strategically position itself to meet with the pre-qualification criteria for participation in major tenders. Oil & Gas industry is a feeder to several other downstream industries and there is continuous investment in refinery capacity building and crude enrichment. Demand and growth in the vertical is expected to sustain through the coming years. India imports around three-quarters of its oil and gas needs. High global crude prices and a depreciating rupee are affecting the bottom line of the large Oil & Gas companies. This drives the need for greater investments in building domestic refinery capacities to meet demand at viable costs. While TCE is successful in the non-process and OSBL activities involving large scale green field refinery projects, it will leverage opportunities to scale to more process related areas in the crude oil refining field. This will be achieved through strategic alliances with turnkey project consultants. This move is critical for TCE's growth in this vertical as Oil & Gas constitutes almost 30-35% of the chemical industry, making it an important sector to focus on. Likewise, in the Petroleum vertical, with the sector forming almost 40% of the chemicals industry, TCE is looking at making greater inroads in the sector. TCE has sustained its presence in the Chemical Business Unit

involving concept to commissioning projects, and targeting value-added engineering activities in a high net worth vertical, is the way forward for sustained growth.

**Collaboration is Key**

The chemical industry is varied spanning a range of domains. Owing to the diversity of the verticals, TCE has partnered with process consultants to provide detailed engineering, procurement, construction supervision and commissioning services. This model has equipped the Business Unit with both the technological insights and also the softer aspects of being successful in a collaborative environment. This skill will pave the way for a new model of collaboration where TCE will build up alliances for both upstream and downstream activities to position itself well in its focus areas. This will entail establishing delivery centres for managing the bottom of the pyramid activities and participating in activities that are more into the process side with specialists in the domain. High value projects undertaken in a collaborative setup will serve as a win-win for TCE and its partners and help compete as a formidable player in a highly fragmented market. This collaborative model will be extended to forging new relationships through inorganic expansion as well in the coming years taking a long term approach to growth and sustenance in a highly fragmented and competitive industry.

**Streamlined Operations**

The Chemical Business Unit has streamlined the operational setup to infuse sound processes and strategic initiatives to push growth for the business.

**Strategic Locations**

The Chemical Business Unit has a Centre of Excellence in Mumbai and is also expanding pan-India with Delhi in the

North, Kolkata in the East and Chennai in the South. Dedicated resources in Qatar focus on the Middle Eastern markets where there are opportunities in Oil & Gas and Petroleum. Going forward, delivery centres in tier-2 cities will be established to ensure greater responsiveness to customers. The location centres help manage customers better and provide a vertical-specific thrust to business development in locations where the target customers are present. From a business perspective these initiatives bring about cost efficiencies in operations.

**Strategic Business Acquisition Group**

The Chemical Business Unit has formed a Strategic Business Acquisition Group that includes a business development expert, a vertical expert with expertise in the vertical and a relationship manager to ensure lead generation. The linkages at every level – marketing, operations and project management – are tapped to generate new business. With more involvement from the operations level in lead generation, the process of new business acquisition becomes a team effort, keeping the team motivated. This approach has helped provide efficiency in deliverables, customer confidence, and customer delight. This team has proved successful in ensuring repeat orders.

**IT Applications & Quality Systems**

Driving quality and ensuring error-free deliverables, the Chemical Business Unit has invested in systems and IT applications. Upholding the concept of Integrated Engineering and Integrated Project Management the Chemical Business Unit invested in advanced 3-D applications, project management systems and document management systems. This is to ensure closed to zero-defect in deliverables and build in cost efficiencies to the customer, especially in large scale projects. Internally, the operational

structure has several committees to ensure quality at various levels. The Design Review Committee includes a Design Safety Review Committee that incorporates safety norms and environment-friendly norms into the delivery process right at the conceptual stage.

**Talent Management**

The diversity of the chemical industry requires special skills. In a competitive age, TCE has been successful in capitalising the experience of young talent of 30-35 years in age who form the core workforce. This demographic segment seeks excitement and challenges. Keeping them engaged and excited poses a challenge. Motivation for most engineers comes, among other things, from being part of the most attractive segments such as Oil & Gas or Petroleum. TCE is looking towards making greater inroads in these verticals especially in the top-of-the-pyramid activities which will motivate the talent pool. Going forward, initiatives in employee engagement and talent management will be the primary focus area and critical to managing attrition.

**Key Thrust Areas**

The Chemical Business Unit has the following key areas of focus in the year ahead:

- ▶ Developing 'Inside Battery Limit' (ISBL) capabilities in Fertilisers, Refineries, and Petrochemicals to enable scaling up the value chain in these verticals
- ▶ Develop expertise in formulation, sterile, anti-cancer drugs sectors
- ▶ Penetrate the process engineering domain in the food sector
- ▶ Exploit the opportunities in the EPC market by forging alliances
- ▶ Greater focus on customer relationship management to ensure sustained business from existing clients
- ▶ Greater collaboration with TATA group companies
- ▶ Enhancing international market presence (South Africa, US & Middle East)
- ▶ Talent Management

**Challenges**

- ▶ Competitive pricing in a fragmented market characterised by large MNCs
- ▶ Inability to participate as an independent

consultant in PSU-dominated domains such as Oil & Gas, Petroleum, among others that constitute about 30% of the chemicals industry

- ▶ Talent acquisition, retention and deployment in customer centric locations

**Performance Overview**

The year 2011-12 was a challenging year with the impact of the global recession felt in India. Faced with high inflation, a weak rupee and slowing investment in the domestic market, Indian industry saw a slowdown in its projected growth. In this backdrop, the Chemical Business Unit's revenue grew by 32% in 2011-12. Revenues from the international business posted robust growth over the previous year and going forward this will continue to contribute to TCE's growth. The year 2012-13 is expected to continue in the same trend. TCE's Chemical Business is committed to realising its optimistic targets through a multi-pronged approach of inorganic growth, collaborations, large value consulting projects and international projects.



**Services**

Verticals	Services
Oil & Gas	Basic Study, Front End Engineering, Due diligence services, Detailed Engineering, Project Management Services, Procurement, Inspection and expediting, As-built documentation.
Petrochemicals	
Food & Pharmaceuticals	
Pulp & Paper	
Chemical, Specialty and Agro Chemicals	
Fertilisers	
Paints	Custom made component design projects involving radio chemical processes for communication, nuclear, space organisations, research institutes, among others
Special Projects	

The Construction Business Unit is a key link in Tata Consulting Engineers' (TCE) integrated engineering consultancy services' value chain. This business is unique because it services customers a) directly by way of its own business acquisitions b) by serving the construction needs of other business units' customers.

The Construction Business unit delivers

<p><b>01</b></p> <p>Standalone construction related services</p>	<p><b>02</b></p> <p>Engineering and construction services soliciting in-house domain expertise</p>
<p><b>03</b></p> <p>Shared services for all TCE business units' projects by managing the construction aspect</p>	<p><b>04</b></p> <p>Safety service</p>

These services include project management, construction management, safety training and safety assessment.

Success in this business entails a whole new approach in customer relationship management, project management and resource management. The magnitude and variety of the client profile makes managing the business a complex affair calling for resources with versatility and understanding of all the business segments. The Construction Business Unit is a working example of internal co-operation - leveraging internal capabilities and providing integrated services to customers.

In order to manage a complex business efficiently, the business unit put in place an operational structure in the year 2011-12 –

- ▶ Regional representations covering east, west and south within India
- ▶ Regional representation in South Africa
- ▶ Appointment of regional managers to drive business development and customer relationship management in addition to the location specific and technology specific leadership
- ▶ A dedicated cell to address techno-commercial aspects of the business, interface with internal business units and translate client specifications into domain specific engineering solutions

The above measures have helped to funnel critical processes in customer management to the right touch points for smooth operations. This structure enables constant interaction with other business units, collaboration with customers and technical experts within TCE. Response time has greatly improved and issues are resolved faster.

The Construction Business unit services clients drawn from public sector

undertakings, private sector including TATA Group companies, Central Government, State Government and foreign Governments. Key segments that the business unit is involved in include Power, Infrastructure and Industrial sector.

### Relationship Management

The Construction Business works in close proximity to its customers – both internal and external. The project teams are deployed to various project sites and they work alongside the customers. Internally, the Construction Business works closely with other business units to tap opportunities across business segments. Building strong relationships with customers and delivering quality services, the business unit has been able to capture several repeat orders from its prime customers.

### Manpower Management Strategies

The Construction Business Unit's challenges are unique when it comes to human resource management as it entails keeping a remote work force connected and engaged. With diverse operations and people deployed at remote construction sites, acquiring and retaining talent in this sector is a challenge. Some concerns that the business unit is addressing –

- ▶ Reluctance of people to relocate to remote project sites
- ▶ Retaining talent in the wake of opportunities outside owing to the abundance of construction projects
- ▶ Providing continuous training for employees deployed at remote sites to maintain high delivery standards
- ▶ Diversity of projects and project-specific

skills requirement - regular hires with required specialised skills is not a cost effective option as the personnel would be redundant on completion of the project

Countering these challenges, TCE has several measures planned and initiated.

An E-learning program has been planned and is expected to be implemented by 2012-13.

Focussing on local hires with skills specific to the project and to address relocation costs, TCE has an FTC- based (fixed tenure contract) hiring program to appoint personnel on a rolling consultancy basis.

In line with the Tata Group's inclusive growth policy, the Construction Business drives several community initiatives right at the construction sites with participation from the employees. This goes a long way in employee engagement and helping the community around the vicinity.

### SHE Practices – a Key Priority

Safety, Health & Environment (SHE) is a key priority for the Construction Business and just as dynamic as the rest of the business operations. TCE works with various clients and the SHE programs are jointly and independently driven across sites, across locations and offices. No matter how challenging the implementation, TCE's Construction Business has never wavered from this focus. Driving safe practices, the Construction Business unit conducts mock drills, awareness programs, formal training and reporting of safety performance data. A new initiative to rank the best construction sites for safe practices every month was rolled out in the last quarter of the year.

### Safety training record for TCE employees and contractors' employees for 2011-12

	Number of persons trained	Locations
Construction BU Employees	225	Pune, Delhi, Bhopal, Jabalpur, JSR
Contractors' employees at site	3,84,878	90+ active sites across India & Zambia



### Performance Overview

The Construction Business' major revenue streams were from the Power, Infrastructure and Industrial sector in the last financial year. Captive power plants for thermal power, infrastructure related activities such as roads, bridges and waste water management, IT parks, hospitals and

commercial complexes, projects in the industrial sector in the automobile and cement industry - these were key drivers for growth for the business. Despite the slowdown, the construction business had a good year in 2011-12. Most projects are large scale projects that had already been initiated and in various stages of development. With greater drive for renewable energy, new opportunities are emerging in this sector which TCE hopes to leverage. State governments such as Maharashtra and Gujarat have introduced subsidies making solar and wind energy generation a viable option. Though the market share in this sector is small, TCE hopes to make a breakthrough here. The

foray into international markets have also contributed to opportunities in construction services in Africa, Middle East and Nepal.

The Construction Business posted increase in revenues of 35% over the previous year. New business acquisitions for the year 2011-12 increased by about 33% over 2010-11. The year 2012-13 is expected to see sustained growth for the Construction Business. The unit is targeting growth in business by 33% over the current year.

Going forward, TCE's Construction Business will put in place manpower management strategies to effectively manage costs and continue to sustain profitability.

### Services

Verticals	Services
Construction services	Project management, Construction management, Design engineering and construction services, Safety training and audits.
Shared services for other segments	
Safety services	



Business Review  
**Nuclear**

**Tata Consulting Engineers' (TCE) Nuclear Business Unit is a proud partner to India's indigenous civilian nuclear power program and its impressive growth story. With India not being a signatory of the Nuclear Non-Proliferation Treaty, and the embargo on nuclear technologies following the 1974 Pokhran underground test, the country powered its civilian nuclear power generation program wholly on the strength of indigenously developed technology.**

Public Sector Undertakings (PSU) such as Nuclear Power Corporation of India (NPCIL) Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI), Indira Gandhi Centre for Atomic Research (IGCAR), Uranium Corporation of India (UCIL) and Bhabha Atomic Research Centre (BARC) contributed to the establishment of several nuclear power reactors across the country, managed under the auspices of the Department of Atomic Energy (DAE). Public sector undertakings under DAE have built up 20 nuclear power units as of 2011. These 20 units have an installed capacity of 4780MW. Out of this

total, TCE was involved in the design of reactors totalling 3280 MW, participating in various aspects of the process. Involvement to the tune of 69% of the total nuclear power generating capacity of the world's largest democracy is indeed a feat to be proud of and speaks for TCE's technological prowess. TCE's involvement has been in almost all aspects of the nuclear power generation process – Nuclear reactor and power generation, fuel fabrication, fuel reprocessing and waste management but excluding uranium mining and enrichment facilities.

TCE's Nuclear Business' consulting and design services are structured under the following verticals:



**Current Realities & TCE Approach**

The underlying premise of the nuclear business is working within the confines of a tight regulatory framework. While the project gestation periods are sustained over an extended period of time, business acquisition processes are just as long and closely linked to government directives. TCE has carved a niche for itself on the strength of its technical skills and project execution excellence. Strong relationships built with customers and the quality of delivery has, over the years sustained TCE's order books which continue to grow through current and past associations. With 50 years of relationships and partnerships, TCE has become a dependable force to reckon with in the nuclear power generation business. In addition, the involvement in the Nuclear sector has provided TCE with spin-off benefits and development of special capabilities.

While TCE shares the success of India's civilian nuclear power program, its continued progress is closely linked to the developments in the country's nuclear power generation strategy. India has sourced the fuel for nuclear power from domestic uranium. The capacity utilisation factors of reactors rose from 60% in 1995 to 85% in 2001-02. However, shortage of uranium hit generation capacity. The Government is committed to fuel India's

economic growth at 6-9% and this can happen through availability of nuclear energy. Imported uranium, domestic uranium mining and additional capacity building will fill the fuel requirement gap. Additionally, the technology developed to using reprocessed fuel of its Pressurised Heavy Water Reactors (PHWRs) in the Fast Breeder Reactors and subsequently using the country's deposits of thorium as fuel will address the country's huge demand supply gap. This strategy came in as a boost to the order books of TCE's nuclear business. TCE's consulting services were deployed in setting up a 500MW Fast Breeder Reactor. Further, this has enhanced opportunities in the involvement in an Integrated Fast Reactor Fuel cycle facilities. However, Greenfield projects of imported Lightwater Reactors have run into bottlenecks – protests and agitations from the local communities, technological clearances post Fukushima, Nuclear Liabilities among others. This has come as a setback affecting TCE's projected business acquisition. Going forward, TCE envisages in building expertise in other core areas of the Nuclear Business such as safety analysis, fire hazard analysis, and in the area of nuclear fuel mining. Working with TCE's Mining & Metals business unit, TCE hopes to forge into new domains and tap into rising opportunities.

**International Opportunities**

India is a council member in the International Thermonuclear Experimental Reactor (ITER) project - an international initiative in the quest for alternative energy sources. The seven members of the international ITER organisation have created domestic agencies (ITER-India) to act as the liaison between national governments and the ITER. With dwindling resources of fossil fuel for generating power, renewable and nuclear energy is another option to tap into alternate sources for energy. TCE is involved in this landmark project for the past two years. Involvement in this project has helped TCE develop capabilities and specialised skills required to handle international projects. The strength of TCE's technological capabilities is relevant from the very presence of TCE in ITER.

TCE is looking for more opportunities to work with organisations worldwide.

**Talent management**

TCE's Nuclear Business requires high level of technical competence in specialised areas. TCE has carefully nurtured talent over the years, giving its workforce the opportunity to use their expertise in path-breaking projects. However, with the international markets opening up and new builds surfacing, the need to groom talent in newer areas is a challenge. Retaining

existing talent is also a key focus for the Company in the coming years. The projects that TCE's Nuclear Business Unit

employees handle are of high importance and contribute to the nation-building process. As such there is pride in

ownership among its workforce, but radical ways to nurture this specialised talent is the need of the hour.

### Progress & highlights

TCE's Nuclear Business is proud to be part of the nation- building process, contributing with innovative engineering solutions to mission critical projects. Some of the highlights are:

- First Submarine Intake Tunnel
- First time engineering for Nuclear Power Plant in Seismic Zone IV in alluvium
- Engineering first 540 MWe Pressurised Heavy Water Reactors (PHWR)
- First Fast Breeder Reactor (500 MWe)
- Fuelling Machine for 300 MWe Advanced Heavy Water Reactor (AHWR) that qualified for the INS Industrial Award for TCE
- Engineering the first Integrated Fast Reactor Fuel Cycle facility
- Engineering under Integrated Engineering Environment for the first 700 MWe PHWR

### Financial Performance

The overall slowdown in the domestic civil nuclear program reflected on the business unit's new business acquisitions for the past two years in a row with respect to its performance peak in 2008-09. However, new business acquisitions saw a rebound in the year 2011-12. The realisations in revenues post the business acquisition peak in 2008 began kicking off from the subsequent year. Revenues decreased

marginally in 2011-12. The year ahead is expected to remain steady with no significant change.

### The Way Forward

The next few years will be a defining year for TCE's Nuclear Business' growth both in new businesses and revenues. Post the 123 Agreement, the Nuclear Business Unit is banking on increased activity in nuclear commerce that will take TCE's consulting opportunities to more profitable

international projects. The unit's focus will be to drive profitability. With a shift in strategy that envisages a good portfolio balance of international projects, existing domestic projects that are work-in-progress and those in the pipeline, partnering with EPC firms and suppliers and forging new linkages to develop capabilities in new domains, particularly international, will pave the way for the success and growth of the business unit.

### Services

Verticals	Services
<ul style="list-style-type: none"> <li>Power generation</li> <li>Auxiliary Facilities</li> <li>Fuel Handling</li> <li>Waste disposal</li> <li>Fuel Fabrication</li> </ul>	<ul style="list-style-type: none"> <li>▶ Basic and Detail design encompassing Civil, Mechanical, Electrical and Controls &amp; Instrumentation .</li> <li>▶ 3-D modelling, Piping layout design, Machine/Component design, Structural integrity analysis, Seismic analysis for system qualification (NSSS &amp; SSSC), Feasibility reports, DPRs. Fire Hazard Analysis.</li> </ul>



## Business Review Industrial

The Industrial Business Unit is unique and different from other TCE Business Units in such a way that each sub industrial vertical under this BU is an industry segment by itself.

Downstream subsectors within each segment are vast, varied and specialised. The Industrial Business Unit has succeeded in this area on the strength of its strategy devised for each sector and the diverse domain expertise available within TCE. The

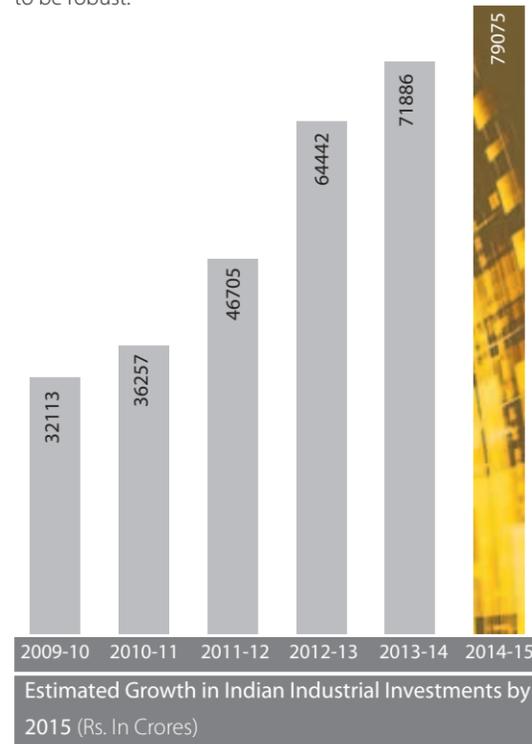
various subsectors within each vertical by themselves provide opportunities and TCE's Industrial Business Unit has mapped these to translate them into business acquisitions. Presently, the Business Unit is into more than 22 sub-sectors with a pan-

India presence. The Industrial Business Unit remains agile to follow the developments and establish itself in sectors with high growth potential. This agility combined with technical strength in the domain is a key success factor for the business.

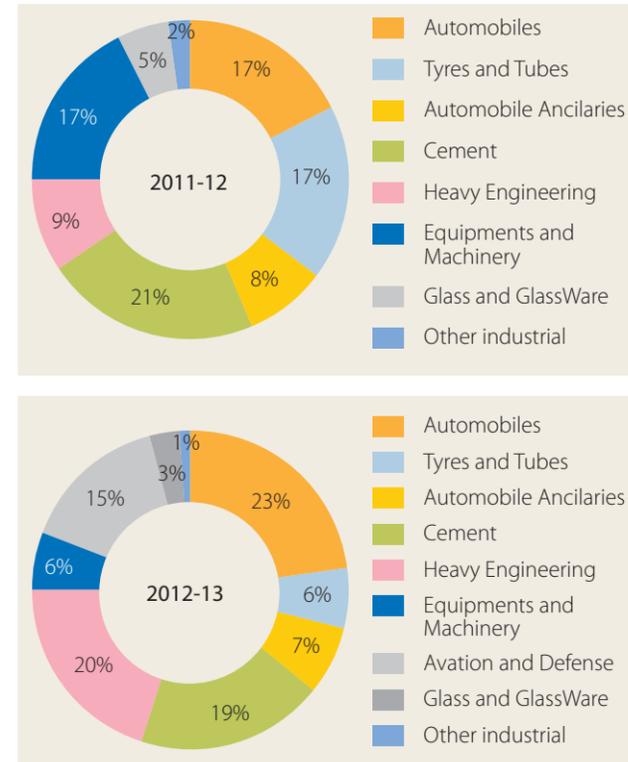
Industrial Business Unit's major Verticals:	01 Automobiles	02 Auto Components	03 Tyre & Tube	04 Heavy Engineering
	05 Aerospace & Defence	06 Glass	07 Cement	08 Special Projects
				09 General Purpose Machinery

### The Industrial Sector's Potential

India's industrial sector has been making tremendous progress across segments and the manufacturing sector is competitive globally. The Indian Industrial sector is projected to grow at a CAGR of 37% in the year 2012-13 and is expected to continue to be robust.



### YoY Investments in subsectors in the Indian industry



Following these trends, the Industrial Business Unit has pushed aggressively into sectors with growth potential such as Cement, Automobiles, Heavy Engineering, Aviation and Defence and General Equipment.

### Strategies in Place

The Industrial Business Unit's inherent strength has been providing engineering and Project management consulting (PMC) services required for construction of an industrial plant from under one roof. Operationally, capabilities to handle small to large scale projects coupled with a diversified geographical presence both in India and overseas augur well for the business. The brand equity that TCE has and the value systems in place in line with the Tata Group ethos has placed the company well amidst its customers.

The Industrial Business unit has put in

place several measures to build on inherent strengths and propel growth –

- Focus on key verticals with higher investments such as Automobiles, Heavy Engineering, Cement, Glass, among others
- Alliances with global and Indian EPCM & EPC firms among others to build on capabilities in existing as well as new subsectors
- Establish critical touch points with existing and new customers in sectors with growth potential for effective customer relationship management. This is planned by engaging relationship managers for critical verticals.

- Focus on sectors with high investment to ensure profitable growth such as Cement, Automobile, Glass & Tyre and Tube sectors
- Explore international opportunities in UK, USA, Africa, GCC and the Far East countries
- Investments in IT systems for efficiency in deliverables and project management
- Collaboration for offering services such as PLM, factory process simulation and project construction simulation services
- Talent retention initiatives
- Services of external and internal domain-specific experts to be tapped for diversification into new subsectors

### Key focus in the year ahead

The Industrial Business Unit works closely with large manufacturers in key sectors such as Aviation and Defence, Automobile sector, Tyre and Tubes. Several plant design projects for large customers are delivered working in a collaborative environment. While the ethical practices imbibed within the organisation are diligently followed, going forward, TCE will drive these with even more diligence and drive IPR protection measures. Safety and environment protection will also form the core of all services at TCE.

TCE has been agile in moving into promising new sectors. Going forward, the Industrial Business's new alliances with like-minded partners such as Dassault Systems, Invensys among others to move up the value chain will be another focus area. Hence, the value added aspects will include simulation services- plant simulation and construction planning simulation, factory automation and

warehouse management systems. This will help retain talent as the new challenges will motivate employees. Moving up the value chain includes premium services which in turn will help increase profitability.

### Challenges

Competitive pricing in the market with large to small players and EPC contractors poses a challenge to profitability. The Industrial Business Unit will raise the bar in its quality offerings, move up the value chain to offer premium services that cover the entire gamut of operations in the industrial operations and build alliances to tap critical segments. TCE will also devise a unique pricing strategy to ensure profitability along with volumes.

### Performance

The year 2011-12 has been a challenging one for the Indian industry with an overall slowdown and macro economic factors affecting growth. High inflation, a weak rupee, weak investor sentiment and a

slowdown in investment affected the industrial sector. High input costs and feedstock bottlenecks affected several sectors.

The Industrial Business Unit's revenue increased by 10% in the year 2011-12. The setback in the automobile sector which contributes a good share of the business unit's revenues impacted further growth. The Industrial Unit's new business acquisitions in 2011-12 was inline with the previous year. The year 2012-13 is expected to be more encouraging on the back of TCE's good credentials amongst customers and the expertise in the field. With new business acquisitions in the cement sub sector, the business is well poised to grow in the cement sector in the international as well as Indian markets

Going forward, the business unit will take a funnelling approach to drive the business in key verticals that have growth potential and is profitable.

### Services

Verticals	Services
Automobiles	Detailed Design Engineering, PMC & Construction Supervision Services
Auto Components	
Tyre & Tube	
Heavy Engineering	
Aerospace & Defence	
Glass	
Cement	
General Purpose Machinery	
Special Projects	



Tata Consulting Engineers' International Marketing Group moved from being the international marketing and commercial arm of TCE to become an independent business unit to drive the company's international strategy and plan. In the era of globalisation, the Tata Group's international presence was an area to be leveraged upon and TCE has since taken steps to test the waters on the global scene, availing opportunities as they arise. With TCE's proven track record in the power industry in the domestic markets, it was relevant to venture into global projects on the strength of its core capabilities. During the past 30 years, TCE has completed assignments in over 50 countries.

Presently, the International Business Unit of TCE has realigned its focus to -

- 01** Drive the business in specific geographies
- 02** Build a clientele relevant to the kind of integrated engineering solutions that TCE can offer
- 03** Target projects in key areas of competencies in various businesses such as Infrastructure, Power, Steel & Mining and Chemicals

### Strategic Roadmap

The International Business unit has built a strategic roadmap to seize the opportunities from all fronts.



Internally, the business will deliver solutions through its various Centres of Excellence established in ear-marked locations with a segment-specific focus. For instance, resources and skills pooled in Bangalore will function as the off-shore arm for the Power business aligning itself to the overseas location where the business opportunity is centred.

### Geographic pointers and business enablers

The geo-political shifts across the world and a shattered world economy has tilted the balance of economic interest to emerging markets of developing countries and under-developed countries. TCE's focus on specific geographic segments and a localised approach to service these emerging opportunities have reaped positive results for the International Business Unit.

#### Africa

The African region as an investment destination shows promise of sustained opportunities for the next five decades. Several factors drive this opportunity for India and the Indian private sector:

► **Economic & Political Stability:** Sustained efforts by governments to end conflict, macro economic policies that reduced inflation from 22% in the 90s to 8% post

2000, co-operation within the African countries energised the markets and created a climate for investment.

► **Bilateral trade agreements:** Under the South-South co-operation and exchange program there is increased trade between Africa and the developing countries. From 1990 through 2008, Asia's share of African trade doubled, to 28 percent, while Western Europe's portion shrank, to 28 percent, from 51 percent. India's own development through various stages of economic growth is a model that African countries can adopt in their own development. Several initiatives such as Preferential Trade Agreements and other policy initiatives facilitate Indian investments in the region.

► **Africa's structural shift towards industrialisation:** Africa's exports are primarily based on resource-based (RB) manufacture. While RB manufacturing exports can contribute to high growth

rates they involve relatively low value addition, increase vulnerability to external price volatility and do not benefit the economy with all round growth. Africa has since taken initiatives to make a structural shift from resource-based manufacture trading to indigenous industrialisation. This will ensure increase in GDP, develop local industry, generate employment, improve quality of exports and most of all conserve its resources.

► **India's efforts in African Development:** India, Kuwait, Saudi Arabia and the United Arab Emirates are also making significant investments in infrastructure in Africa (UNCTAD, 2010b).

► **Institutional Framework:** Trade and industry bodies such as CII, FICCI and their African counterparts have provided the framework to facilitate investment in the region. India-Africa Partnership Conclaves, India Africa Summit among others are

some of the enablers to Indian enterprise in Africa.

► **Lines of Credit (LOC):** Africa's development programmes are being funded by multi-lateral credit institutions. Exim India has 92 operative LOCs, totalling US\$ 3429.48 million, covering 32 countries as on February 2011. Exim India's initiative, Global Procurement Consultants Ltd (GPCL) in partnership with leading consultancy firms in India providing procurement-related advisory services to World Bank, African Development Bank and Asian Development Bank, facilitate South-South cooperation.

► **FDI:** FDI inflows to the region increased from \$2.8 billion in 1990 to \$58.6 billion in 2009. China and India account for almost 25% of FDI into Africa. Alliances, partnerships and subcontracting in Africa has provided opportunities for investments for Indian companies and Africa has benefited from local industrialisation and technology transfer.

► **Climate change:** African countries have obligations under the United Nations Framework Convention on Climate Change (UNFCCC) to incorporate mitigation targets into their industrialisation process. India can facilitate transfers of technology and know-how to Africa and assist in adapting technology.

► **Business prospects:** Africa has almost 60 percent of the world's uncultivated arable

land and a large share of the natural resources. The rate of return on investments for foreign investors is higher in Africa than other developing regions.

**Areas of opportunities for TCE :**

**Infrastructure** – Water resource management, Sanitation, Town planning.

**Mining** – End to end mining solutions.

**Energy** – Transmission and distribution, Captive power plants for mining and industry.

**Chemicals** – Currently, industries are import dependant and looking towards self sufficiency. TCE's technology solutions will be a value addition in resource optimisation.

**Construction** – End to end solutions covering entire life cycle of the project.

TCE has gradually scaled its boundaries to venture into the region on the strength of its capabilities and the Tata Group brand equity in the region. TCE has also set up a base in South Africa to drive the business and has a long-term strategy for strengthening its business prospects in the region.

**Middle East**

In stark contrast to the maverick markets of Africa, the Middle East is a mature market where a shift in focus to Asian countries for growth and capacity building is evident.

Countries in the Middle East such as Saudi

Arabia, Oman, Kuwait, Qatar, Abu Dhabi have high investment appetite. Being a well-developed market, the scope in this region lies in capacity building, upgrading and enhancements. Introducing productivity enhancements, resource optimisation and building up local capabilities in various sectors are the key drivers for opportunities here.

Technological adaptation is still low in the region and TCE looks towards working through alliances to provide engineering solutions for optimisation and productivity. By boosting private sector growth in the region, these countries aim to improve competitiveness and raise employment levels.

The demand supply gap in power drives large scale investments in this sector. Governments in these regions are driving localisation of their industries. Policies at the apex level are paving the way for Indian companies to bring in technology and expertise with local investments and build capabilities locally. TCE hopes to partner with global firms in these markets and TCE's subsidiary company based at Qatar provides the front end for the Middle Eastern operations providing support with business development and customer relationship management.

**Areas of Opportunities:**

Oil & Gas, Infrastructure, Industry Cement & Steel, Construction: Being a mature market, it is highly competitive with global

players. TCE has to work around its pricing strategy, service portfolio and partnerships to render value addition to succeed in the region.

**Rest of Asia**

TCE has taken its expertise in power and infrastructure to set up projects in countries such as Nepal. Going forward, TCE will capitalise on opportunities arising from countries such as Myanmar. TCE also looks towards alliances and partnerships with Korean and Japanese firms to provide technology solutions with EPC contractors who are also following the FDI route to enter new markets.

**The US & Europe**

Post the economic downturn, these regions are focused on cost competitiveness and the opportunities that TCE envisages is enhancements and refurbishment of existing facilities. While engineering solutions with an on-shore/off-shore model will provide the cost efficiencies, joint representation with alliance partners to participate in local projects is also a strategic plan that TCE is considering. Establishing global delivery centres to facilitate its business interests in the region is on the anvil. TCE is also looking at relationships with other global EPC firms to deliver engineering consultancy in the region and other developing markets. Additionally, TCE has certain key strengths in domains such as Power and Infrastructure and is positioned

well in some locations. TCE is considering diversifying into new segments by aligning with home-grown niche players confined to their regions and delivering consulting solutions to end customers in other regions. Hospital and Education sectors are areas where TCE is seeking knowledge partners. With TCE's strong technological capabilities and language being not a barrier, there is optimism in forging new alliances in the region.

**Challenges**

TCE has in the past undertaken several international projects but they have not been in a sustained manner. Currently, a renewed international focus and scale up of operations overseas poses new challenges -

- High level of competition from international players and competitive pricing
- Managing people and resistance to relocate
- Working with cross cultural teams
- Managing scale with large teams at the ground level

TCE is countering these challenges with several measures to be globally competitive. Talent management and addressing softer aspects of culture-management is a priority area. Focussing on cost competitiveness, TCE will also consider more of local hires and infusing diversity in its workforce. A multi-pronged

approach of recruiting people experienced and familiar with the regions of TCE's business interests, deploying employees within TCE who are flexible and adaptable to change and with the right capabilities are some solutions under consideration. The challenge may be huge but the advantages in terms of developing international standards and applying these standards to raise the bar in the domestic front far outweighs the challenges.

**Performance**

TCE's International Business Unit saw a five-fold increase in business acquisition in 2011-12 vis-a-vis 2010-11. This has built up optimism to target greater heights in the overseas markets. Going forward, the year-on-year growth potential is estimated at 50% growth. Revenue share for the International Business Unit is estimated at 20% of overall TCE revenues in the next five years.

With increasing opportunities for growth, TCE hopes to continue on its growth path through a tried and tested method of building capabilities in one sector and taking the expertise overseas. As opportunities arise in new sectors like renewable energy, carbon credits, operation maintenance, among others, TCE will build capabilities here and diversify geographically.



## Business Excellence

Tata Consulting Engineers is a signatory of the Tata BEBP Agreement – Brand Equity Business Promotion Agreement and is bound to the Tata Quality Management Systems. Applying the Tata Business Excellence Model (TBEM) processes, TCE strives for business excellence working within the framework of the Group ethos, values and processes. The journey in business excellence for TCE has progressed through various milestones in its drive for quality.

### The TCE Journey in Business Excellence

2006	<ul style="list-style-type: none"> <li>External assessment to ascertain key focus areas</li> </ul>	2010	<ul style="list-style-type: none"> <li>Formalising the innovation process/driving a culture of innovation</li> <li>Competition benchmarking on financial &amp; non-financial parameters</li> </ul>
2007	<ul style="list-style-type: none"> <li>Establishing strategy planning as a process, business impact assessment &amp; informed decision making</li> </ul>	2011	<ul style="list-style-type: none"> <li>Incorporating safety systems, processes and safety audits, formulated SHE Policy</li> </ul>
2008	<ul style="list-style-type: none"> <li>Developed Balanced Scorecard at the company level, five year growth plan charted</li> </ul>	2012	<ul style="list-style-type: none"> <li>Knowledge management processes and systems</li> </ul>
2009	<ul style="list-style-type: none"> <li>Cascaded Balanced Scorecard to the leadership system</li> <li>Established quality measurement processes</li> <li>Risk impact and error measurement process</li> </ul>	2012-13	<ul style="list-style-type: none"> <li>IT-enabled Audit Systems,</li> <li>Business critical IT enabled processes-</li> <li>Customer Relationship Management System(CRM), Document Management System (DMS), Enterprise Risk Management (ERM), Corporate Governance &amp; Compliance Processes</li> </ul>

TCE continues with the periodic TBEM assessment process and considering the levels reached until now, TCE hopes to surpass the high benchmarks set by the Group at the earliest.



## Corporate Sustainability

Corporate Sustainability at TCE is driven in line with the Tata Group value systems and responsible business practices. Building strong foundations in sustainability, TCE has established structured systems covering Safety, Compliance and Risk Management processes, and Corporate Social Responsibility. TCE will work with the group in driving its Affirmative Action program. Climate change management and environment friendly practices are part of the operational process within TCE. Going forward, TCE will drive these sustainability initiatives with greater zeal. TCE's Corporate Social Responsibility (CSR) policy emphasises on leveraging its core competencies and volunteering resources to serve and benefit the community. Accordingly, the organisation has a CSR Policy and has identified four thrust areas aligned to its competencies in engineering consulting:

- Engineering Services
- Community Service
- Educational Services &
- Environment Conservation

With this focus, TCE drives the CSR program with the total involvement of TCE employees, in kind and through services that impact the society. The year 2011-12 had TCE employees devote about 4000 man-hours towards CSR activities using their inherent skills to make a difference to the society.

### 1. Engineering Services

- Rendering engineering services for -
- Samarthanam (Hostel Building) Bangalore that Supports the visually impaired, disabled and underprivileged people in India.
  - Abalashram Bangalore a centre for rehabilitation of orphaned girls and destitute women
  - Electrical Protection Systems for Sri Ramanasramam, Tiruvannamalai.
  - AADI (Action for Ability Development & Inclusion) Delhi facilitates enabling environments in the best interest of the child and the adult
  - Energy Audit of the Hospital operated and maintained by Ramkrishna Mission Hospital at Howrah.

### 2. Educational Services

- Guidance to technical schools through lectures, presentations, serving as examiners and evaluators, conducting summer training programs, training on AUTOCAD for ITI students

### Awareness Creation

- Programs to create awareness on SHE, Green Engineering (The Mother's International School, New Delhi), Road Safety programs in association with Encourage India, CSR awareness at Rajiv Gandhi Institute of Technology were conducted.

### Educational assistance

- Donation of educational books to Noida Public Library, Government schools in Bangalore
- Setting up of elementary schools for labourers' children at construction project sites
- Providing school kits to needy children working with Seva Sahyog
- Talking Books – audio books created by TCE employees for Class 8 syllabus for the visually impaired

### 3. Community Service

- Blood donations across locations,
- Recycling of used paper and donating proceeds to be used as Braille writing material
- Medical camps at a 'basti' in Deonagar
- Working with NGOs such as Ekta Mission, Goonj to provide in kind assistance to the needy

### 4. Environment Conservation

- To reduce the carbon footprint of TCE Office at Bangalore, Diesel Generator Synchronisation was implemented resulting in Carbon Emission reduction by about 5.4 tonnes per annum.
- Awareness campaigns and initiatives were taken to drive the philosophy of 'Reduce, Reuse, Recycle'

# Corporate information

## Locations & Offices

MUMBAI		OVERSEAS SUBSIDIARY
<b>REGISTERED OFFICE</b> Matulya Centre 'A' 249 Senapati Bapat Marg Lower Parel (West) Mumbai – 400 013	<b>CORPORATE OFFICE</b> 4th Floor, Tower A 247 Park, L.B.S Marg Vikhroli (West) Mumbai – 400 083	<b>TCE QSTP-LLC</b> Qatar Science & Technology Park Doha, Qatar
BRANCHES		
<b>MUMBAI</b> Raj Plaza, L.B.S Marg Vikhroli (West) Mumbai – 400 083	<b>DELHI</b> Zamrudpur Commercial Complex Kailash Colony Extension New Delhi – 110 048	<b>KOLKATA</b> Technopolis Building BP4, Sector V, Salt Lake City Kolkata – 700 091
<b>BANGALORE</b> Sheriff Centre 73/1 St. Marks Road Bangalore – 560 001	<b>JAMSHEDPUR</b> Pipeline Road Sakchi, Jamshedpur – 831 001	<b>PUNE</b> Sai Trinity Pashan, Pune – 411 021
<b>CHENNAI</b> Janardhan Towers 133/2 Residency Road Bangalore – 560 025	<b>CHENNAI</b> SKCL Central Square-1 CIPET Road, Guindy Chennai – 600 032	
REPRESENTATIVE ADDRESSES		BANKERS
<b>US</b> 304 Park Avenue South New York 10010 New York State, USA  Suite 230A, 1288 Route 73 South Mt. Laurel, New Jersey 08054 USA Cell: +1 8563838207	<b>SOUTH AFRICA</b> Tata Consulting Engineers Limited C/o Tata Africa Holdings (SA) (Pty) Limited 29, Lincoln Road, Benoni 1502 Johannesburg, South Africa Ph: (27-11) 421 4000 Fax: (27-11) 421 3000 Cell: +27 731141549	HDFC Bank ICICI Bank Limited Bank of Baroda State Bank of India Yes Bank
		AUDITORS
		Deloitte Haskins & Sells Chartered Accountants

### Cautionary statement

This annual report and other statements – written and oral – that we periodically make contain forward-looking statements that set out anticipated results based on the management's plans and assumptions. We have tried wherever possible to identify such statements by using suitable words in connection with any discussion of future performance.

We cannot guarantee that these forward looking statements will be realised, although we believe we have been prudent in our assumptions. The achievement of results is subject to risks, uncertainties and even inaccurate assumptions. Should known or unknown risks or uncertainties materialise, or should underlying assumptions prove inaccurate, actual results could vary materially from those anticipated, estimated or projected.

We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise.

**TATA** CONSULTING ENGINEERS LIMITED

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TCE Corporate Affairs

