

The Indian Power Sector

By

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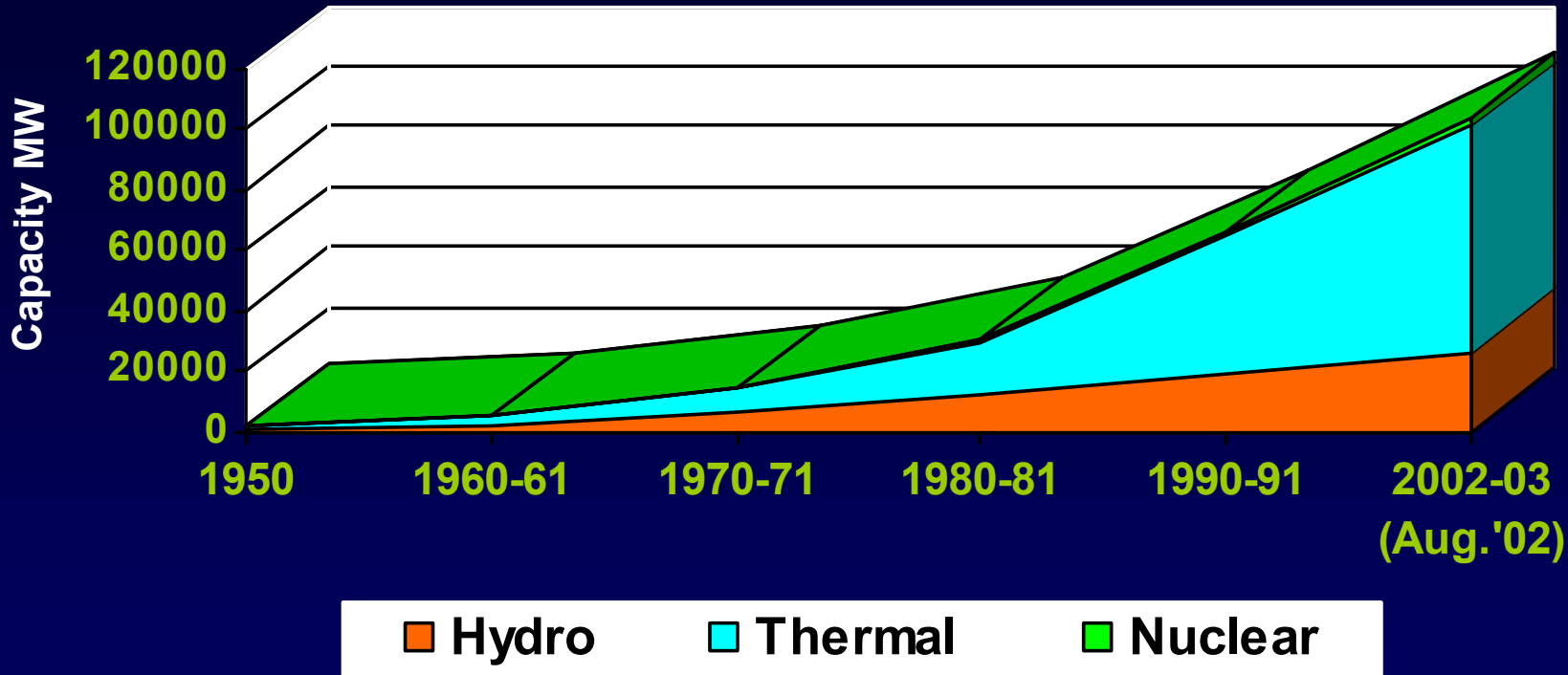
5th March, 2003

I – The Indian Power Sector Today

Power Development in India



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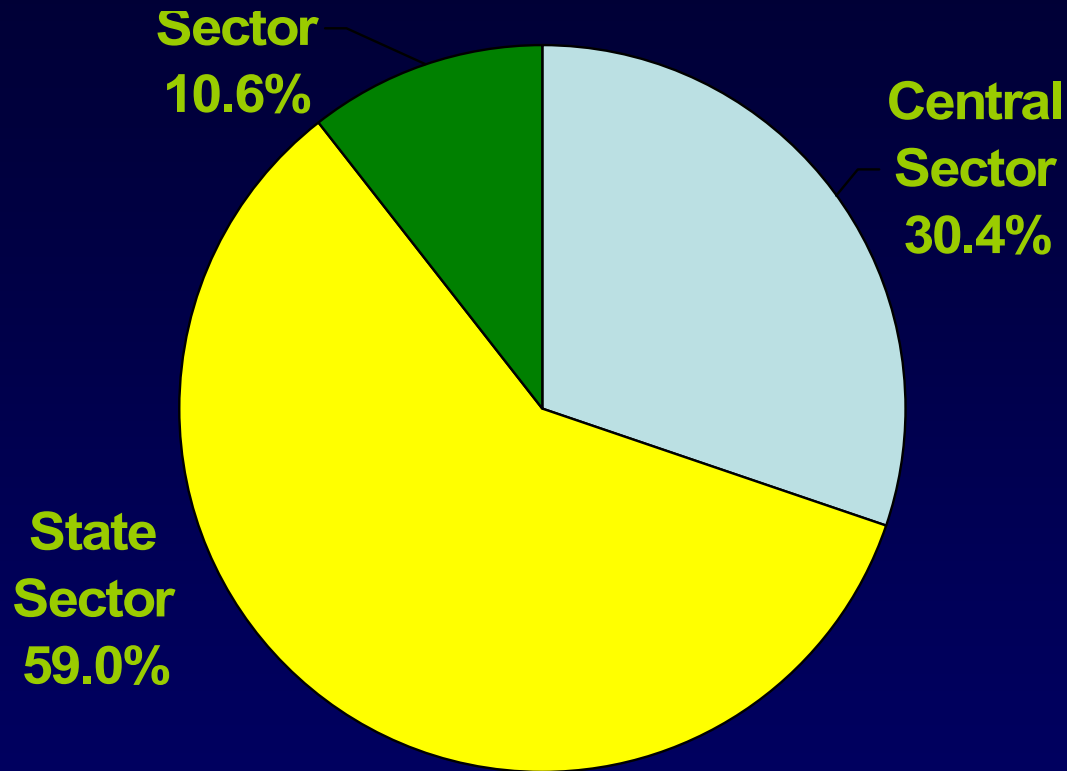


Year	Hydro	Thermal	Nuclear	Wind	Total (MW)
1950	559	1153	0	0	1712
2002	26302	75005	2720	1629	105,656

Sector-wise Generating Capacity



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Total Installed Capacity 105,656 MW

Per-Capita Energy Consumption



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(Kwh per Year per Capita)	
Indonesia	303
India	360
China	804
Mexico	1642
UK	5760
USA	12,211
Canada	15489

Indian Power Sector

Outlook



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- **Vision 2012 (G O I) – “ Power for All by 2012 ”**
 - **Generating Capacity to be increased from 105,000 MW to 212,000 MW**
 - **Share of the Private Sector to be increased from 10% to 16.5%**
 - **Hydel Generation to be increased from 25% to 30%.**
 - **Inter-regional transfer capability to be increased from 4850 MW to 30,000 MW.**
 - **Recovery of the power cost through the realised tariff from 70% to 100%.**
 - **T. & D. Losses to be reduced from 40% to 13%.**
 - **100% rural electrification from the existing 86%.**

Indian Power Sector Outlook (contd.)



- **Peak Energy Shortage to be brought down to 0 from the existing 13%.**
- **Average Energy Shortage to be brought down to 0 from the existing 8%.**
- **Industrial tariff, which is presently about 10 cents per unit to be brought down to 3 - 5 cents per unit to support global competitiveness.**
- **Commercial losses of Rs. 26,000 crores to be eradicated and the sector made financially viable.**

Existing Legislation



- **The Indian Electricity Act – 1910**
 - Legislative framework for the Electricity Industry, including licensing, works of licensees and provision for rules.
- **The Electricity (Supply) Act -- 1948**
 - Framework for the formation of the State Electricity Boards (SEBs), The Central Electricity Authority (CEA), financial principles governing licensee operations.
- **The Electricity Regulatory Commissions Act – 1998**
 - Framework for setting up independent Central and State Electricity Regulatory Commissions to set rational tariffs, settle disputes, advise Governments on power matters.

Facilitating Measures



- **Electricity Bill 2001 introduced in Parliament**
Main features of the Bill are :
 - **Generation free from licensing except for hydro units**
 - **Requirement of techno economic approval done away with**
 - **Captive generation free from controls**
 - **Open access to transmission lines**
 - **Setting up of SERC mandatory**
 - **Open access in distribution to be allowed by SERC in phases**
 - **Retail tariff to be determined by regulatory commission**
 - **Trading distinct activity permitted with licensing**
 - **Central Government to prepare National Electricity policy and Tariff policy**

Reforms - So Far



- **The Central Electricity Regulatory Commission established and functional**
- **9 States have passed reform law.**
- **9 States have unbundled State Electricity Boards.**
- **21 States have constituted State Electricity Regulatory Commissions.**
- **12 State Electricity Regulatory Commissions have issued tariff orders.**

- **Liberalized Policy notified in 1991; reviewed from time to time.**
- **Automatic approval for foreign equity : no upper limit.**
- **Relaxation of 40% cap for debt exposure to FIs.**
- **Authority to approve schemes de-centralised.**
- **Requirement of Techno-economic Clearance liberalized.**
- **Hydro Policy to augment addition of hydro capacity**
- **Revised norms with specific delegation to State Governments for environment clearance to power projects.**

Privatisation of Distribution



- **Private distribution stable and successful in Mumbai, Kolkata, Ahmedabad and Surat.**
 - **Distribution privatisation undertaken in Orissa in 1999.**
 - **Problems due to upvaluation of Assets and under assessment of T&D losses in the absence of metering.**
 - **Distribution privatized recently in Delhi.**
 - **Privatisation planned in A.P., Karnataka, Rajasthan and some towns in U.P.**
- # Need to generate investors' interest. More players needed.**

Delhi Privatization Model



.....→ Assets
————→ Liabilities & Equity

Delhi Vidyut Board (DVB)

1. DVB Assets & liabilities acquired by GoNCTD

2 A. Liabilities transferred to Holding Company.
2 B. Equity of Holding Company issued to GoNCTD

GoNCTD

Holding Company

3. Assets transferred from GoNCTD to successor entities.
Assets value = serviceable liabilities.

4. Equity & Debt in successor entities = Serviceable liabilities issued to Holding Co.

GENCO

*Indraprastha Power
Generation
Company Ltd.*

TRANSCO

*Delhi Power
Supply Company*

DISCOM-I

*Central-East
Delhi Electricity
Distribution
Company Ltd.*

DISCOM-II

*South-West Delhi
Electricity
Distribution
Company Ltd*

DISCOM-III

*North Delhi
Power Ltd.
(NDPL)*

Annual break up of Commitments

	2002-03	2003-04	2004-05	2005-06	2006-07
Annual improvements of losses	0.50%	2.25%	4.50%	5.50%	4.25%
Loss levels at the end of year	47.6%	45.35%	40.85%	35.35%	31.10%

Total commitment for loss reduction in 5 years - 17.00%
Opening loss level as decided by Regulator - 48.10%
Closing loss level after 5 years - 31.10%

The Accelerated Power Development Reforms Programme



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➤ Objectives :

- Reduction of T. & D. losses to around 13%.
- Up-gradation of sub-transmission and distribution system.
- 100% metering
- Renovation and modernisation of power plants.
- Improving the quality and reliability of power supply.

The Accelerated Power Development Reforms Programme



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- **Investment Assistance**
 - ◆ *25% grant, 25% loan from GOI.*
 - ◆ *Balance 50% IGR / FIs*

- **Incentive Scheme**
 - ◆ *Reward for actual cash loss reduction*

- **Fund release based on achievement of milestones**

Investor Friendly Power Sector



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- **Steadily growing demand for power**
- **Well established and extensive Transmission & Distribution network**
- **Availability of Engineering, Technical, Managerial and Financial personnel.**
- **Excellent Educational & Training Institutions**
- **Regulatory mechanism for tariff setting**
- **Independent judiciary with established legal system**
- **Efficient and profitable utilities**
NTPC / Tata Power / BSES / Powergrid
- **Legislation enacted for Energy Conservation and Energy audit**
- **Electricity Bill 2001 presented to the Parliament.**

Sectoral Opportunities -- Generation



- **Hydro share to be raised from 24% to 27% in next five years.**
- **Expansion of existing stations.**
- **Coal Pit head stations.**
- **Coastal stations.**
- **Generation delicensing.**
- **Captive capacity utilization.**
- **Joint Ventures of Central Undertakings with States**

Sectoral Opportunities -- Transmission



- **National Grid**
 - **4950 MW to 30,000 MW of interregional transfer capability by year 2012 .**
- **Technology up-gradation – 800 KV A.C. and 500 KV D.C.**
- **RLDCs modernization.**
- **Reliability improvement, reactive compensation.**
- **Private participation via**
 - **Independent Power Transmission Co.**
 - **Joint Venture with Powergrid**

Sectoral Opportunities -- Distribution



- **Refurbishment of sub-transmission and distribution networks.**
- **Energy accounting and MIS**
- **Metering and meter reading systems.**
- **LT – Less High Voltage Distribution Systems**
- **Technology enhancement for improved reliability**
 - **SCADA, Advanced Communications, Mobile Facilities and GIS.**
- **Web enabled facilities for consumers.**

Investment Needed During Next Ten Years



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	<u>US\$ million</u>
Generation projects	131,000
Transmission schemes	30,000
Distribution network	17,000
Rural Electrification	17,000
Renovation & Modernization	7,000
TOTAL	200,000

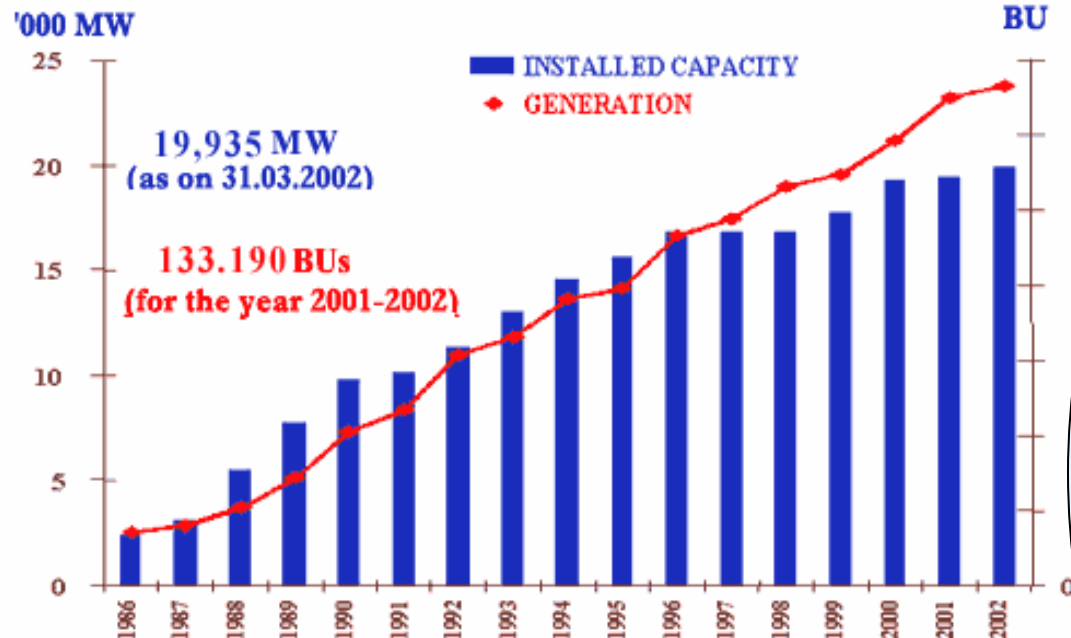
II – Power Utilities in India

NTPC – World Class and World Size Power Utility



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GROWTH OF NTPC INSTALLED CAPACITY & GENERATION



- Sixth Largest Thermal Generating Company in the World.
- Second in capacity utilisation Worldwide.
- 21,250 MW Installed Capacity as on date, constituting 19% of India's installed capacity
- 26% of India's energy generation.
- Turnover of U.S. \$ 4 Billion. PAT of U.S. \$ 740 Mio.
- U.S.\$ 7 Billion of Gross Fixed Assets

NHPC – Largest Hydel Power Utility in India



- **2200 MW of capacity in operation.**
- **2600 MW of capacity under construction.**
- **6200 MW of capacity under active development.**

- **9700 MUs of generation.**
- **High Machine Availability of 97%.**
- **Turnover of U.S. \$ 270 Mio. PAT of U.S.\$ 98 Mio.**
- **U.S.\$ 3.2 Billion of Gross Fixed Assets**

The Power Grid Corporation of India Limited



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- **Single Largest Transmission Utility in the World**
 - **Over 41,000 Circuit Kms. of EHV Transmission Network spanning the length and breadth of India.**
- **34,000 MVA of Transformer capacity.**
- **Transmits 40% of power generated in India.**
- **Turnover of U.S. \$ 600 Mio. PAT of U.S.\$ 165 Mio. (FY 2001)**
- **U.S.\$ 2.5 Billion of Gross Fixed Assets**

The Bharat Heavy Electricals Limited (BHEL)



TATA POWER

- **Manufactures 180 Products (30 Major Product Groups) at 14 Manufacturing Units.**
- **Product Range includes equipment for power generation, transmission and distribution, transportation, telecom.**
- **62,000 MW of power generation capacity supplied for utilities, industries and captive use.**
- **Turnover of U.S. \$ 1.6. Billion ; PAT of U.S. \$ 140 Mio.**
- **U.S.\$ 700 Million of Gross Fixed Assets**

III - The Tata Group

Tata Group – In Seven Main Businesses



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THE 7 BUSINESS SECTORS OF THE TATA GROUP



Materials



Chemicals



Engineering



Energy



**Communications
& IT**



Consumer goods



Services

Tata Group – Major Indicators



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The Tata name is a unique asset representing leadership with trust.

					<i>All Figures in U.S. \$ Mio.</i>	
Year	Total Turnover	Sales Turnover	Value of Assets	Profit After Taxes	Exports	
FY 2002	10304	10000	10242	715	2620	
FY 2001	8853	8590	9591	235	1396	
FY 2000	8854	8520	9572	456	1151	

Five core Tata values integrated into its business operations are:

- Integrity
- Understanding
- Excellence
- Unity
- Responsibility

- The Tata Group contributes 2.4% to India's GDP.
- Market Capitalization of U.S. \$ 4.6 Billion
- 225,000 Employees

Tata Group – Firsts to Its Credit



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- **India's first**
 - large hydro power plant
 - integrated Iron & Steel works
 - chain of 5 -star luxury hotels
 - indigenous passenger car
 - state-of-the-art leather manufacturing unit
- **India's largest**
 - private sector steel producer
 - manufacturer of soda ash
 - private sector power utility
 - commercial vehicle plant
- **Asia's largest software exporter**
- **The World's largest integrated tea operations**
- **The World's sixth largest manufacturer of watches**

IV - The Tata Power Company Limited

The Tata Power Company Limited



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- India's largest private sector power utility with almost 2300 MW generation capacity.
 - 465 MW of hydros + renewables
 - Multi-fuel capabilities – coal, oil and gas
- In the service of the power sector and the country for over 90 years
 - Providing reliable and economic power supply to the city of Mumbai, the commercial capital of India.
 - Now spread out in other states with captive and independent power projects.
- Over 400 MW of captive and IPP generation in Jharkhand and Karnataka.

Tata Power – Powering Initiative



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Tata Power – on the forefront of Technology Application

- First **150 MW thermal unit** in the country
- First **500 MW thermal unit** in the country
- First to Commission **Gas Insulated Switchgear** 220 kV and 110 kV
- **Touch screen-based** Distributed Digital Control and Energy Management Systems
- **Computerised** Grid Control and Energy Management Systems
- **150 / 500 MW Training Simulators**
- **220 kV Transmission Lines In Four-Circuit Towers**
- **220 kV Cable Transmission Network**
- **Flue Gas De-sulphurisation Plant** using sea water
- First to Introduce **SCADA and Fibre Optic Ground Wire Communication**
- First **Pumped Storage Unit** in the country of 150 MW capacity

Mumbai Power is Tata Power



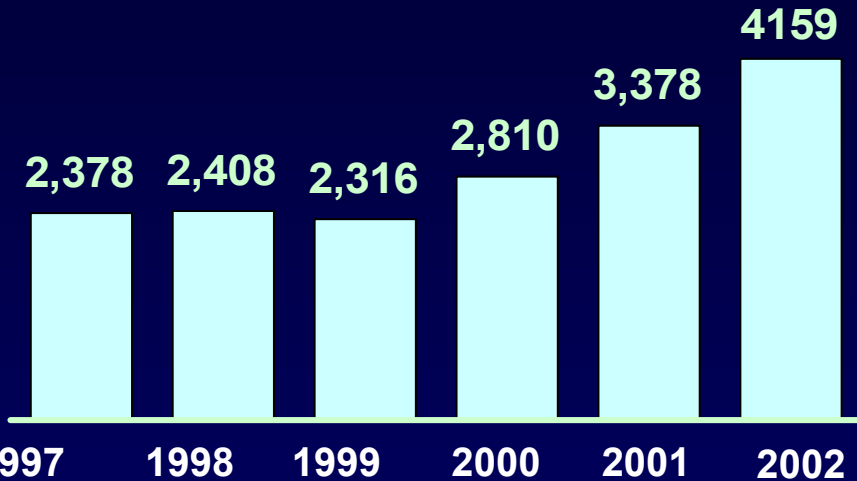
Strong and Consistent Financial Performance



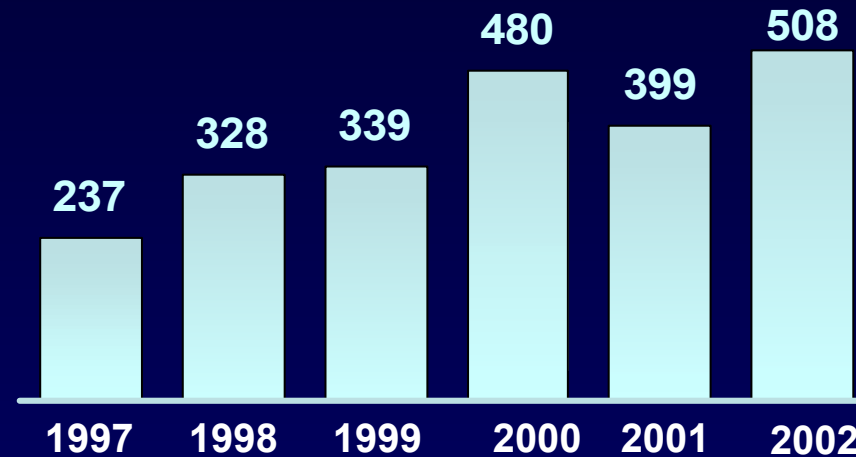
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All Figures in Rupees Crores

• Revenues



• PAT



Revenues for 9 month period ending 31st December, 2002 stood at Rs. 3390 crores (equivalent to U.S. \$ 706 Mio. And PAT at Rs. 365 crores (equivalent to U.S. \$ 76 Mio.)

Tata Power in Transmission



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- **TPC presently owns and operates over 3000 circuit Kms. of HT Transmission Lines at 110 KV and 220 KV.**
 - ✓ **Supported by state-of-the-art receiving, distribution and load-dispatch equipment**
- **TPC first started HT Transmission, way back in 1915.**
 - ✓ **Its 100 KV transmission line was amongst the highest voltage used anywhere in the world at that time.**
- ✓ **The first to introduce 4 circuit 220 KV Transmission Towers.**

Landmark Joint Venture with Powergrid Corporation of India



TATA POWER



- 1200 km long 400 KV Transmission Line from Tala in Bhutan to New Delhi.
- Project envisaged on a BOO basis
- To transfer 1020 MW of power from the Tala Hydro Power Plant
- First project to be executed as a joint venture with a private power utility.
 - ✓ TPC 51% majority partner in the Joint Venture.
 - ✓ Selection process involved international competitive bidding

Tata Power in Distribution



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- Mumbai License Area :
 - Own a widespread distribution network of 13 major receiving stations and almost 300 minor distribution sub-stations.
 - Connected by an underground cable network of over 1000 ckt. kms. from 220 KV downwards.
 - TPC also first to introduce indoor HT Gas Insulated Switchgear at 110 KV and 220 KV.

Tata Power in Distribution



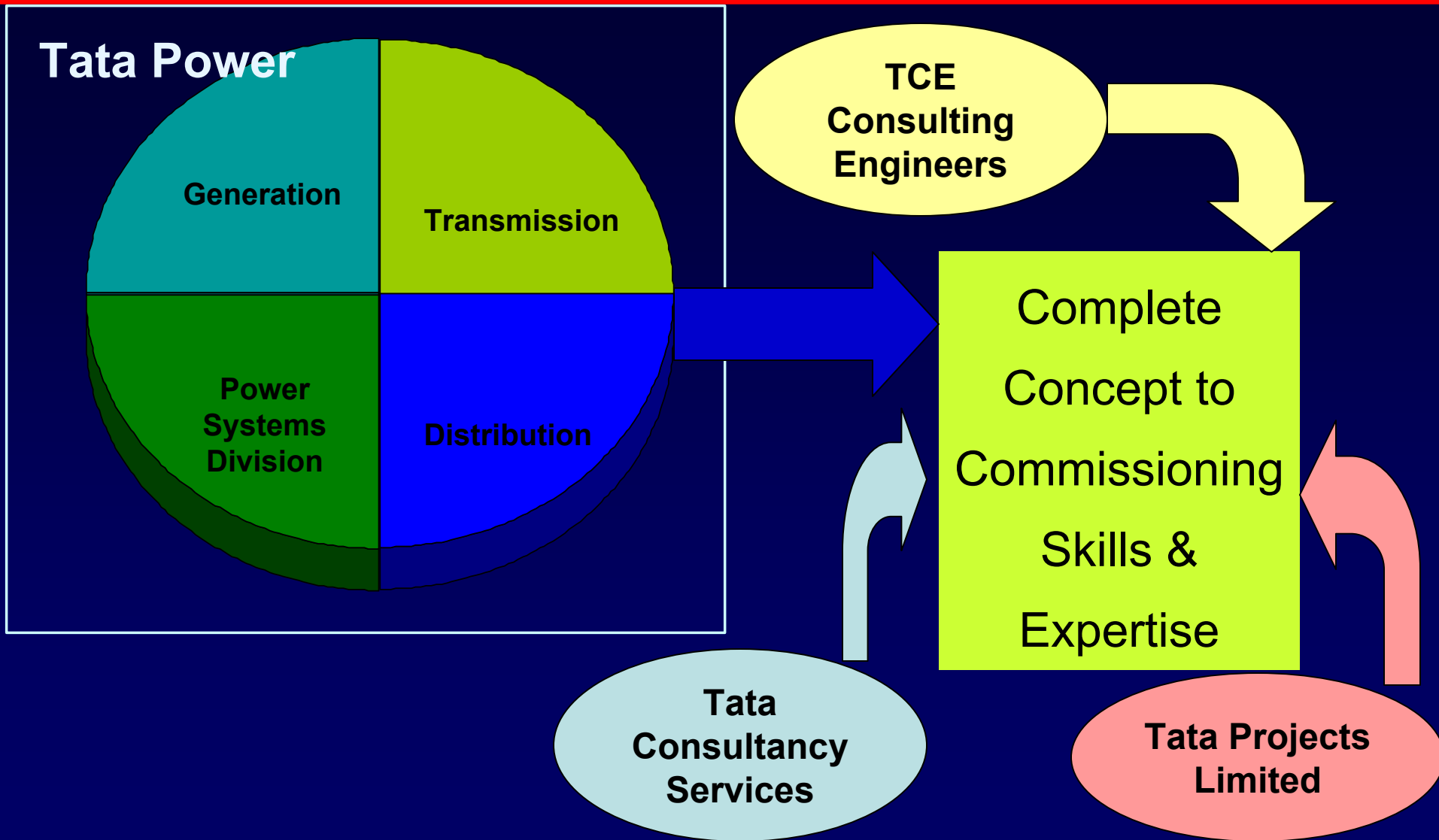
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- **North Delhi Power Limited :**
 - TPC's maiden foray outside Mumbai into distribution.
 - Entire circle plagued by high A. T. & C. losses in excess of 50% (almost 15% of which is theft)
 - Distributing 6000 MUs of electricity over a consumer base of almost 8 lakhs spread out over 570 sq. kms.
 - Distribution networks of over 40 major and 3000 minor receiving and distribution stations connected by a network of over 2600 ckt. Kms.

Comprehensive Skills Availability



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Capability

- **The Power Systems Division of the Company operates basically in three distinct business areas :**
 - (1) Turnkey execution of transmission line projects on EPC basis.
 - (2) Turnkey execution of substation projects on EPC basis.
 - (3) Trading of electrical equipment for transmission lines and substations.
- **Contracts Expected shortly :**
 - 400 KV Double Circuit Raipur-Chandrapur Transmission Line (200 K.M approx.)
Rs. 49 crores
 - 132/220 KV Sub-transmission Lines in North Bihar (360 K.M approx.) Rs. 48 crores

Power Systems Division – Major **Contracts**



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- **Power Grid Corporation of India Ltd. 400 KV Double/Single circuit Kishenpur-Thathar and Thathar-Wagoora Transmission Lines in Jammu & Kashmir (178 K.M) Rs. 149 crores.**
- **Myanmar Electric Power Enterprise - Supply of various electrical equipment under credit-line of Govt. of India (Rs. 25 crores)**
- **Power Grid Corporation of India - 400 kv Double Circuit Biharsharif-Sasaram Transmission Line (192 K.M) - Rs. 50 crores.**
- **Andhra Pradesh Transmission Corporation Ltd. (APTRANSCO) - 400 kv Double Circuit Mandalapalli-Khammam Transmission Line (101 K.M) - Rs. 15 crores**
- **Electricity Generating Authority of Thailand - 230 kv Krabi-Thungsong Transmission Line under turnkey basis (78 K.M) - Rs. 25 crores**
- **Nepal Electricity Authority - Kali Gandaki Hydroelectric Project 132 kv Transmission Lines (120 K.M) and 2 nos. Substations - Rs. 65 crores**
- **Provincial Electricity Authority of Thailand - Supply of 115 KV Transmission Line towers - Rs. 5 crores**

V - Conclusion

Conclusion



- **The Indian Power Sector is on the move.**
- **Legislation is in place and Reforms are in progress.**
- **Ambitious capacity addition target of 1,07,000 MW by 2012, with matching capacities in Transmission and Distribution.**
- **Inter-regional power transfer capacity to be augmented to 30,000 MW**
- **Estimated investment of about U.S. \$ 200 Billion over 10 years.**
 - **Huge opportunity for global equipment suppliers, traders and investors.**

Conclusion



- **India is home to global size companies with world class competence in design, manufacturing, construction, commissioning and operations in the power sector .**
 - ✓ **Thermal Generation – NTPC ;**
 - ✓ **Hydel Generation – NHPC ;**
 - ✓ **Transmission – PGCIL ;**
 - ✓ **Equipment Manufacturing and Supply and Power EPC – BHEL ;**
 - ✓ **World Class Private Utilities – TPC and BSES.**
- **Can offer equipment, know-how and services encompassing the complete gamut of the power sector.**

Thank You !