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POWER

September 2009

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The focus of this presentation is to discuss…

- Profile of Indian power sector
- Policies and regulations
- Opportunities in the Indian power sector

The Indian power sector has a history of over a 100 years … (1/4)

- 1897: First electrification with the setting up of a small hydel plant in Darjeeling
- 1899: Commercial production and distribution starts in Calcutta
- Indian Electricity Act, 1910
- 1947: Power generating capacity at 1,362 MW
- The Electricity (Supply) Act, 1948: Setting up state electricity boards (SEBs), creation of central generation companies and constitution of Central Electrical Authority (CEA)
- 1956: Industrial Policy Resolution reserves production of power for the public sector
- 1960s and 1970s: Impetus for expansion of rural electrification

The Indian power sector has a history of over a 100 years … (2/4)

- 1975: NTPC and NHPC set up
- 1989: Power Grid Corporation of India Ltd (PGCIL) set up
- 1991: Liberalisation; amendments in Electricity (Supply) Act
- 1992: Ministry of Power constituted
- 1995: Policy for mega power projects introduced
- 1998: Central Electricity Regulatory Commission (CERC) and State Electricity Regulatory Commissions (SERCs) set up
- 2001: Energy Conservation Act

The Indian power sector has a history of over a 100 years … (3/4)

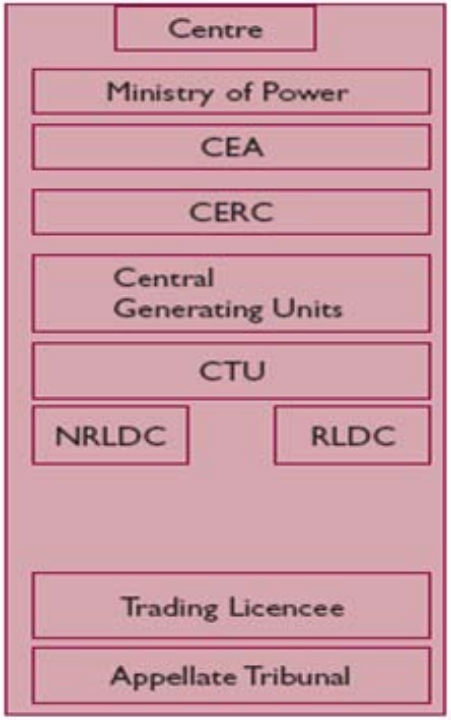
- 2003: New Electricity Act
- 2005: Competitive bidding guidelines for long-term power procurement issued
- 2005: National Electricity Policy
- 2006: National Tariff Policy
- 2007: New Relief and Rehabilitation (R&R) Policy
- 2008: New Hydro Policy
- 2008: Revised Mega Power Project Policy

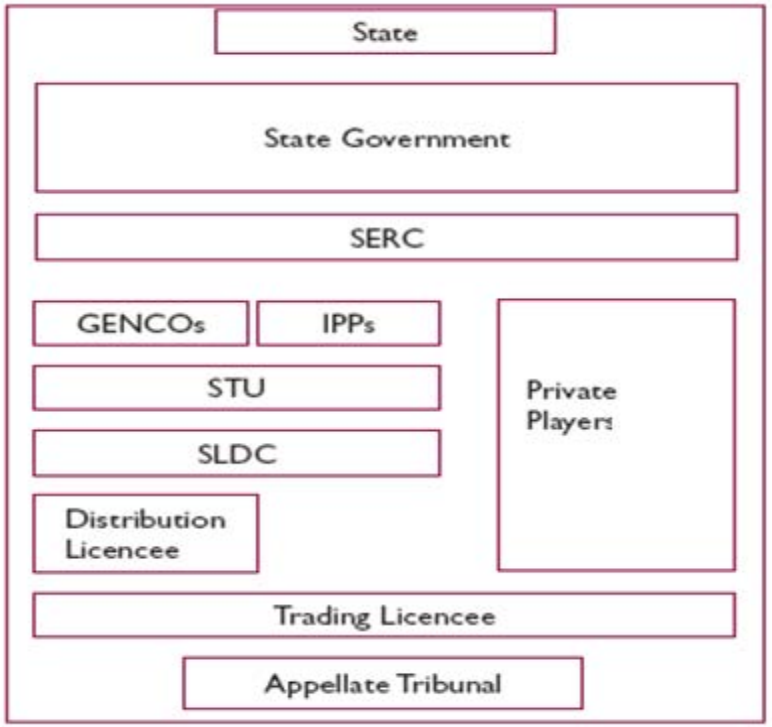
The Indian power sector has a history of over a 100 years … (4/4)

- 2008–09: Power generation stands at 724 billion units
- 2009: Amended guidelines for competitive bidding issued

The sector has multi-tier institutional arrangements

- The Ministry of Power is the primary agency responsible for the power sector in India; it started functioning on July 2, 1992.
- The Ministry of New and Renewable Energy (MNRE) is responsible for developing renewable power, for which the funding agency is the Indian Renewable Energy Development Agency Ltd (IREDA).





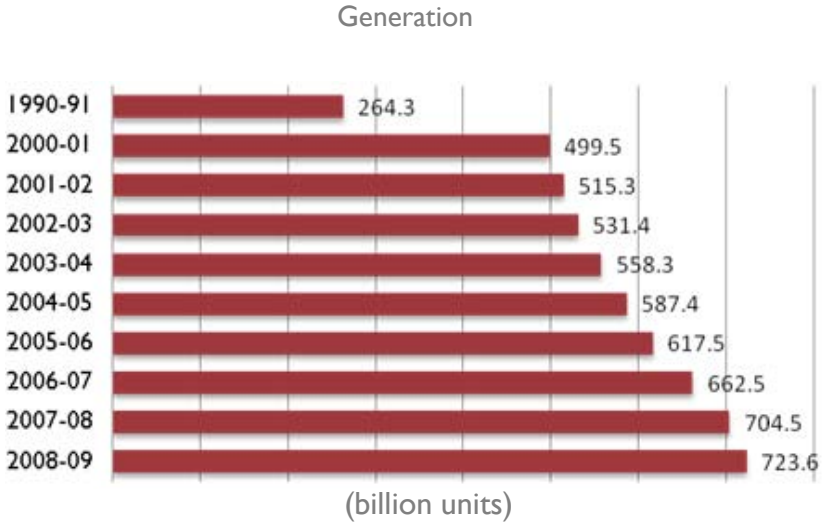
A range of key organisations perform several functions

Organisation	Established	Core Expertise
Damodar Valley Corporation (DVC)	1948	Generation, transmission and distribution in specified regions
Bhakra Beas Management Board (BBMB)	1967	Administration, operation and maintenance of projects under the board
Rural Electrification Corporation (REC)	1969	Financing and implementing rural electrification schemes
NTPC Limited	1975	Thermal plants: concept to commissioning and operations
NHPC Limited	1975	Hydro plants: concept to commissioning and operations
North Eastern Electric Power Corporation (NEEPCO)	1976	Developing power projects in the north-eastern region of the country
Power Finance Corporation (PFC)	1986	Financing of power development schemes
Tehri Hydro Development Corporation (THDC)	1988	Development of hydro potential in specific rivers/valleys
Satluj Jal Vidyut Nigam (SJVN)	1988	Development of hydro potential in a specific basin
PGCIL	1989	Transmission system for evacuation of Central sector power and establishment/operation of inter-regional grids, load dispatch centres
CERC/SERCs	1998	Regulatory bodies dealing with Central and state-level issues
Power Trading Corporation (PTC)	2001	Trading of power
Bureau of Energy Efficiency (BEE)	2002	Responsible for spearheading the improvement of energy efficiency
Appellate Tribunal for Electricity	2004	To hear appeals against the orders of the adjudicating officer or appropriate commission under the Electricity Act, 2003
National Load Dispatch Centre (NLDC)	2005	Scheduling and dispatch of electricity across inter-regional links and monitoring of the national grid

Generation has increased over the years

- From humble beginnings in the 1880s, the Indian power sector has come a long way.

- The sector has progressed from one small unit in the 1880s to 1,362 MW in 1947 to 147,965 MW in 2008–09 and 151,073 MW in July 2009.



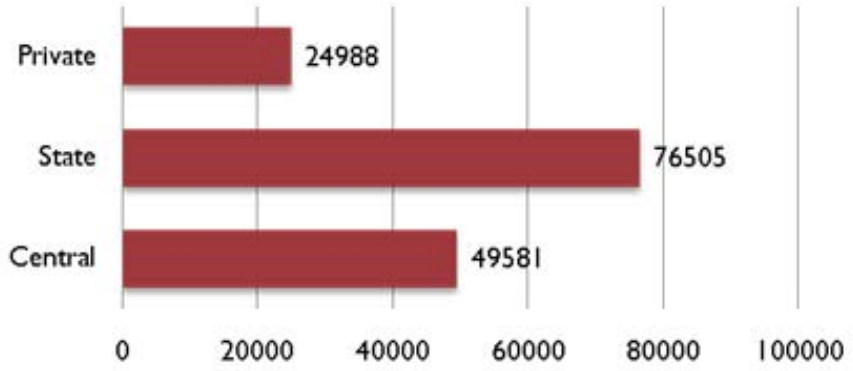
Source: CEA

Generation — installed capacity

- The states account for the largest share of installed capacity, followed by the Central and private sectors.

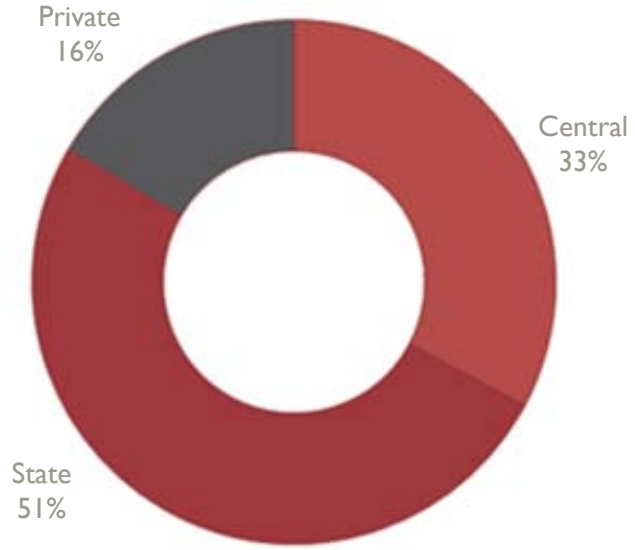
- An emerging trend is the increasing share of renewable power in the total installed capacity mix.

Installed capacity (Mega watt)



As on July 2009

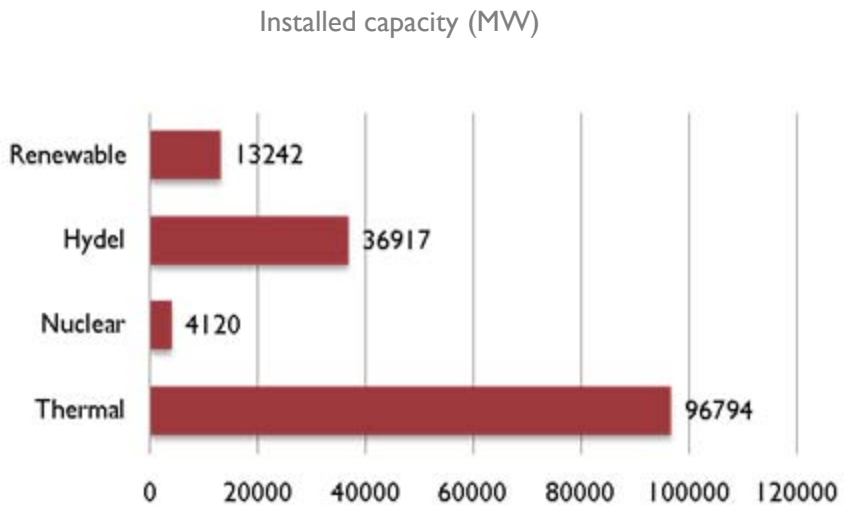
Installed capacity (%)

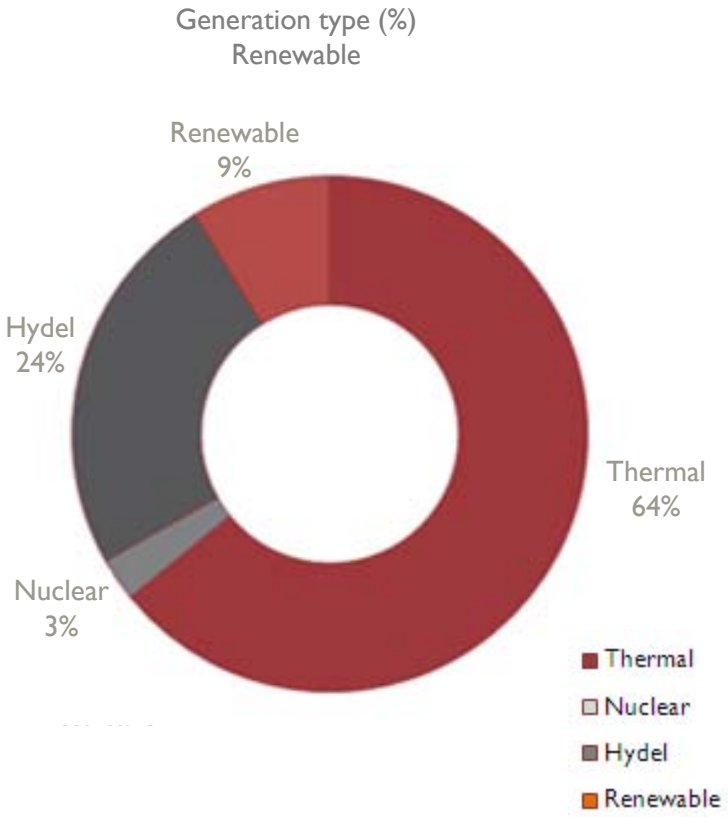


Source: CEA

Generation — shift in composition of conventional mix

- Thermal power accounts for much of the power produced in India, followed by hydro.
- Other means of generation, though negligible in comparison, are on the rise.

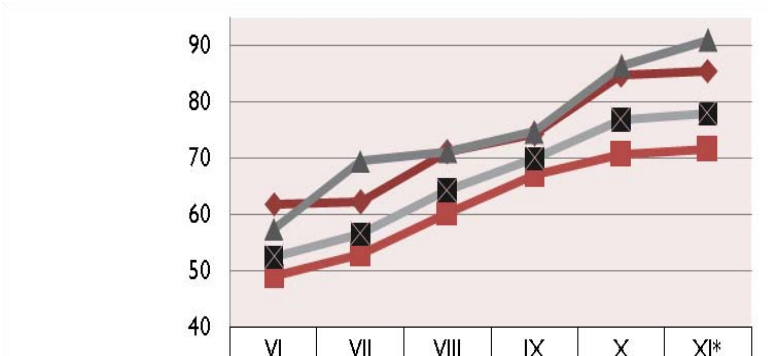




Generation — plant load factor has been improving

- The plant load factor (PLF) of generating plants has improved consistently over the last five plan periods.
- The average PLF of thermal plants reduced slightly to 77.19 per cent during 2008–09, with inadequate fuel availability and old age of plants being the key reasons.
- The PLF of Central plants during the period April to September 2008 was 84.3 per cent, while that of state sector units was 71.17 per cent.
- The PLF of private sector units improved to 91.01 per cent during the same period.

PLF (%) across various Five-Year Plans



	VI	VII	VIII	IX	X	XI*
Central Sector	61.9	62.2	71.1	74.3	84.8	85.6
State Sector	49.2	53	60.3	67	70.6	71.5
Private Utilities	57.5	69.5	71.2	74.7	86.4	90.9
Overall	52.4	56.5	64.4	69.9	76.8	77.9

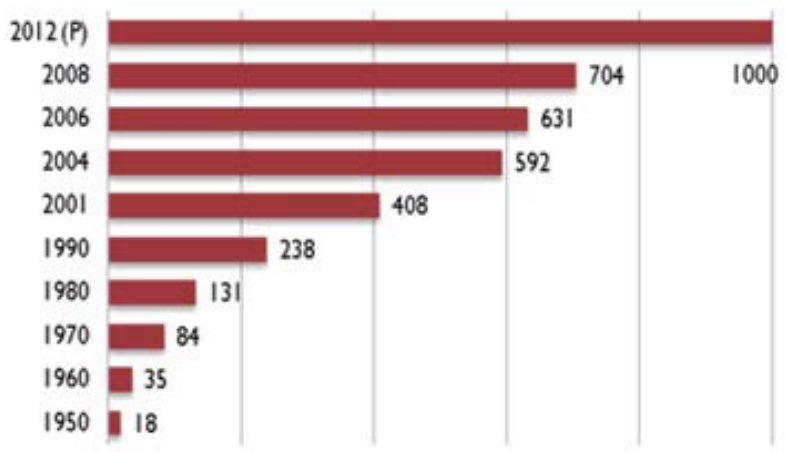
Source: CEA

* Until 2008–09

Per capita consumption has increased

- The per capita consumption of power in India has gone up significantly since the 1990s.
- The targeted per capita consumption at the end of the current Five-Year Plan (2011–12) is 1,000 kWh.

Trend in per capita consumption



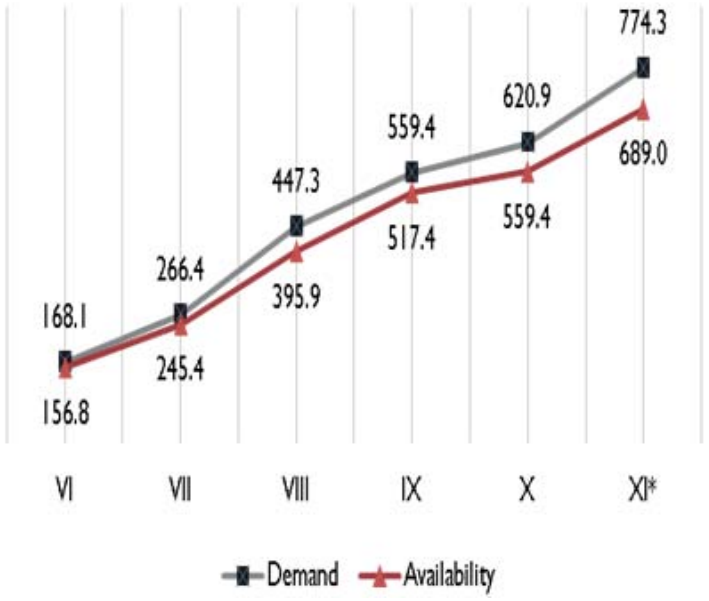
kilowatt hour (KWh)

P = Projected

The demand-supply gap is growing

- Energy requirement during the year 2008–09 was 774,324 million units (MU), while energy availability was 689,021 MU.
- As a result, an energy shortage of 11 per cent was recorded, as compared to 9.9 per cent in 2007–08.
- The peak demand for energy during 2008–09 was 109,809 MW, while peak demand met was 96,685 MW.
- The consequent peak shortage was 12 per cent, as compared to 16.6 per cent in 2007–08.

Demand supply gap (billion unit)



Source: CEA

*In 2008–09

Planned capacity additions (MW) in 11th Five-Year Plan period

- Significant additions to generation capacity have been planned under the 11th Five-Year Plan.

- With more than 70 per cent under construction, a larger portion of the target is likely to be met as compared to the past.

	Central	State	Private	Total
Hydro	8,654	3,482	3,491	15,627
Thermal	24,840	23,301	11,552	59,693
Nuclear	3,380	0	0	3,380
Total utility	36,874	26,783	15,043	78,700
Renewable	NA	NA	NA	14,000
Grand Total	36,874	26,783	15,043	92,700

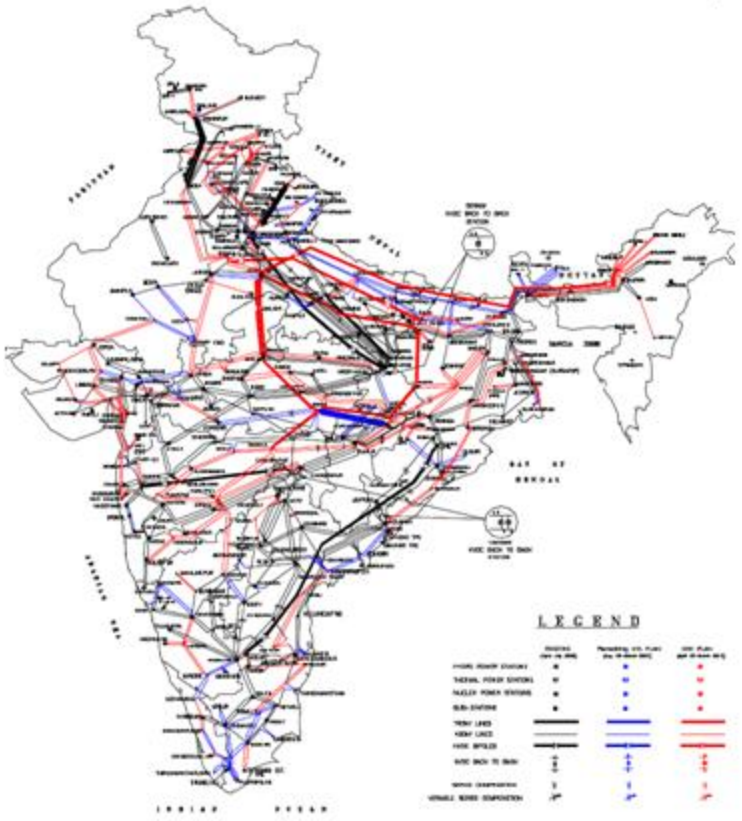
Generation backend — fuel outlook

Coal	Oil	Natural gas	Nuclear	Hydro	Renewables
• Vast reserves of mineable coal in excess of 2,800 million tonnes have been identified and captive coal blocks have been allocated to encourage private and Central sector developers.	• According to the Ministry of Petroleum and Natural Gas, India has estimated oil reserves of 700 million metric tonnes (MMT); however, the country's dependence on oil imports will continue in the long term.	• Natural gas to the tune of 700 sq billion cubic metres (bcm) has been discovered over the last decade; Reliance Industry Ltd commenced production at its block in the Krishna-Godavari basin in 2009.	• India has one of the largest reserves of the nuclear fuel thorium in the world. In addition, the passage of the Indo-US civilian nuclear deal provides an impetus to the Indian nuclear industry as several fuel/technology sourcing avenues have now opened up with countries such as Russia and France.	• The country has a potential of about 150,000 MW; only 25 per cent of it has been harnessed so far and the majority of the capacity addition is expected to take place in the north and north-east regions.	• There is vast potential in solar power, biomass and wind power; India has a renewable energy installed capacity of about 13,242 MW (as on July 31, 2009), which constitutes 9 per cent of total installed capacity. The country has the fourth-largest number of wind energy installations in the world. • Significant reserves of coal and gas exist and significant potential to harness renewable power.

Transmission network has grown significantly

- Transmission lines have grown from 3,708 circuit kilometres (ckm) in 1950 to more than 220,794 ckm now; it is targeted to increase the network to 293,372 ckm by 2012.
- The country is divided into five regions for transmission systems: northern, north-eastern, eastern, southern and western.
- Work is ongoing on creating a national grid.
- It is targeted to have 200,000 MW grid capacity and 37,000 MW inter-regional transmission capacity by 2012.
- Current sub-station capacity is 302,615 mega volt-ampere (MVA); it is planned to be increased by about 41 per cent to 428,000 MVA by 2012.

MAJOR TRANSMISSION NETWORK OF INDIA
400 kv AND ABOVE
EXISTING, APPROVED AND PLANNED – UPTO 2011-12



Source: National Transmission Plan, PGCIL annual reports

Extensive distribution networks but high losses

- An extensive network of sub-transmission and distribution systems has been set up in India.
- Network losses have been consistently on the higher side and are presently in the range of 18 per cent to 50 per cent in various states; in 2006–07, the average was 32 per cent.
- The Accelerated Power Development and Reform Programme (APDRP) was initiated in 2000–01 to improve efficiencies and the financial health of the power sector. The benefits of the programme are visible in implementation areas.
- The revised APDRP started during the Eleventh Plan and is being implemented in two parts; under the revised APDRP, funds are given directly to utilities rather than through state governments.
- The government push for 100 per cent meterisation has begun to yield results.

Financial performance

- Historically, state power companies have made losses and have needed government subsidies.
- Non-realisation of revenue for power generated has led to financial degradation and a spiral of worsening performance.
- The power sector in India suffers huge financial losses to the tune of US$ 6 billion per annum. These losses have accumulated over time and resulted in inadequate financial resources for capacity augmentation.
- Even now, gaps between revenue realised and costs are large, and increasing.

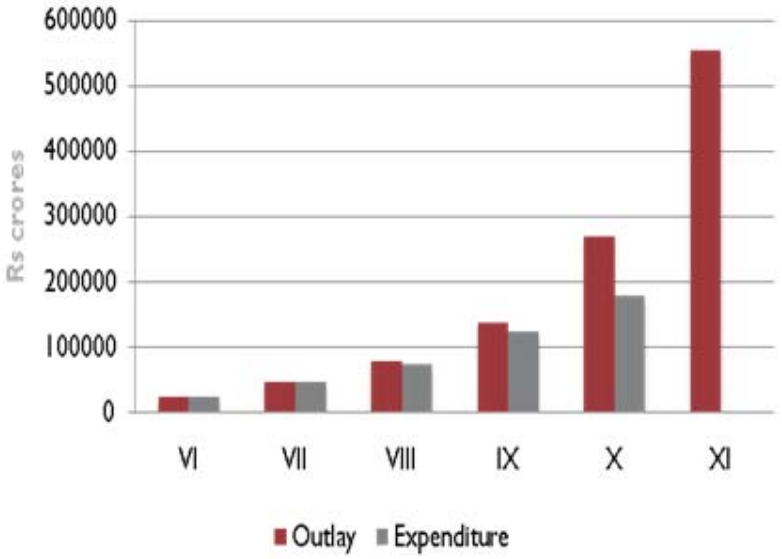
Financial performance of state power sector					
	2001–02	2005–06	2006–07	2007–08	2008–09
Energy sold/energy available (%)	66.02	69.58	71.35	72.42	74.55
Revenue from sale of electricity (Rs crore)	68135	101366	117267	123423	154398
Cost of electricity sold (Rs crore)	98541	129110	153036	173886	204800
Loss on sale of electricity (Rs crore)	30407	27743	35769	50463	50402
Average cost of supply (paise/kWh)	374.57	367.62	392.17	404.66	436.09
% increase/(-decrease)		-1.86%	4.70%	8.03%	16.42%
Average tariff (paise/kWh)	258.99	288.63	300.51	308.17	328.77
% increase/(-decrease)		11.44%	16.03%	18.99%	26.94%
Gap between the cost of supply and tariff (paise)	115.58	78.99	91.66	96.49	107.32

Note: Percentage figures are growth rates over 2001–02
Source: Planning Commission

Trends in public investment

- In the expectation of greater private investment, the Eighth Five-Year (1992–97) and the Ninth Five-Year (1997–2002) plans included a sharp reduction in plan allocation in proportion to total plan outlay.
- A not-so-encouraging response from private investors led to an enhancement in allocation for the Tenth Five-Year Plan (2002–07).
- Power sector outlay for Tenth Plan period was Rs 270,300 crore and estimated expenditure was Rs 179,400 crore.
- The Eleventh Plan Outlay for the sector has been more than doubled to Rs 554,700 crore.

Public sector spending



Source: Planning Commission

Key issues confronting the sector

- Socio-political influences
- High level of network losses
- High level of financial losses
- Demand-supply mismatch
- Poor quality of supply

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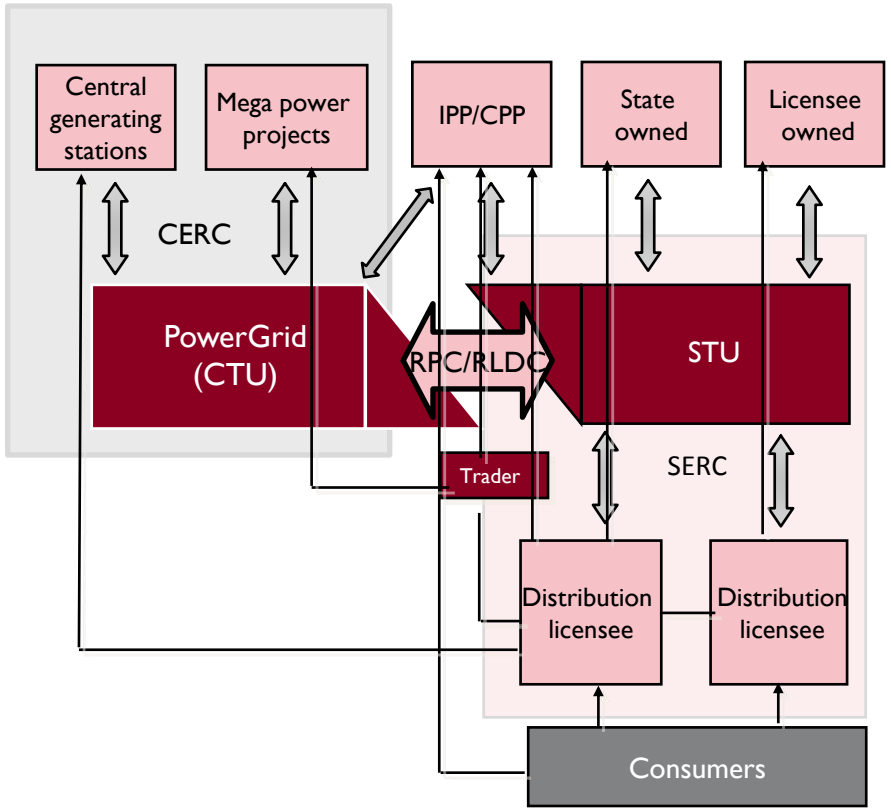
- Policies and regulations
- Opportunities in the Indian power sector

Power market structure

- The stakeholder outlook in the Indian power sector has gradually been improving.



Improved policy and regulation regimes … (1/2)

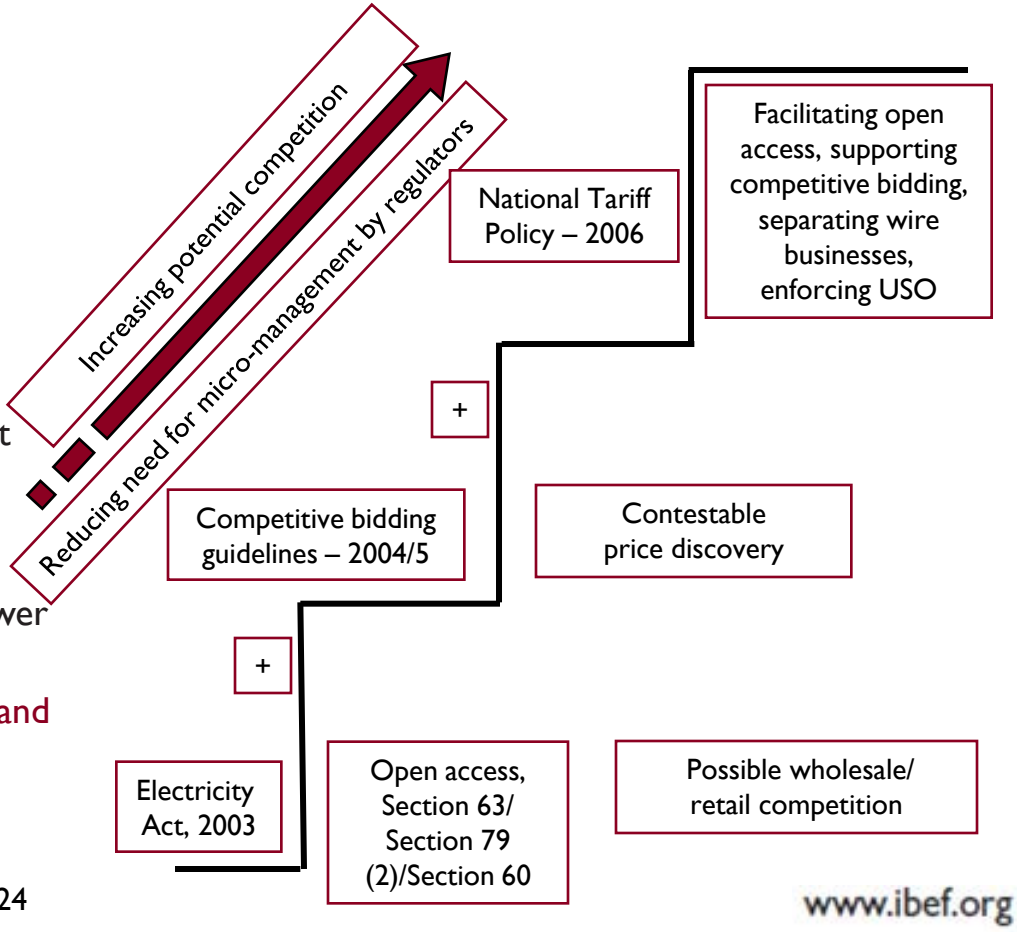
Recent policy/regulatory actions

Electricity Act, 2003

- Non-discriminatory open access to transmission
- Section 63: SERCs to follow competitive bidding process
- Section 79 (2): CERC to advise Government of India on promoting competition
- Section 60: Controlling abuse of market power

Market evolving with competitive structure and minimal regulatory micro-management

Evolving market structure in power sector



Improved policy and regulation regimes … (2/2)

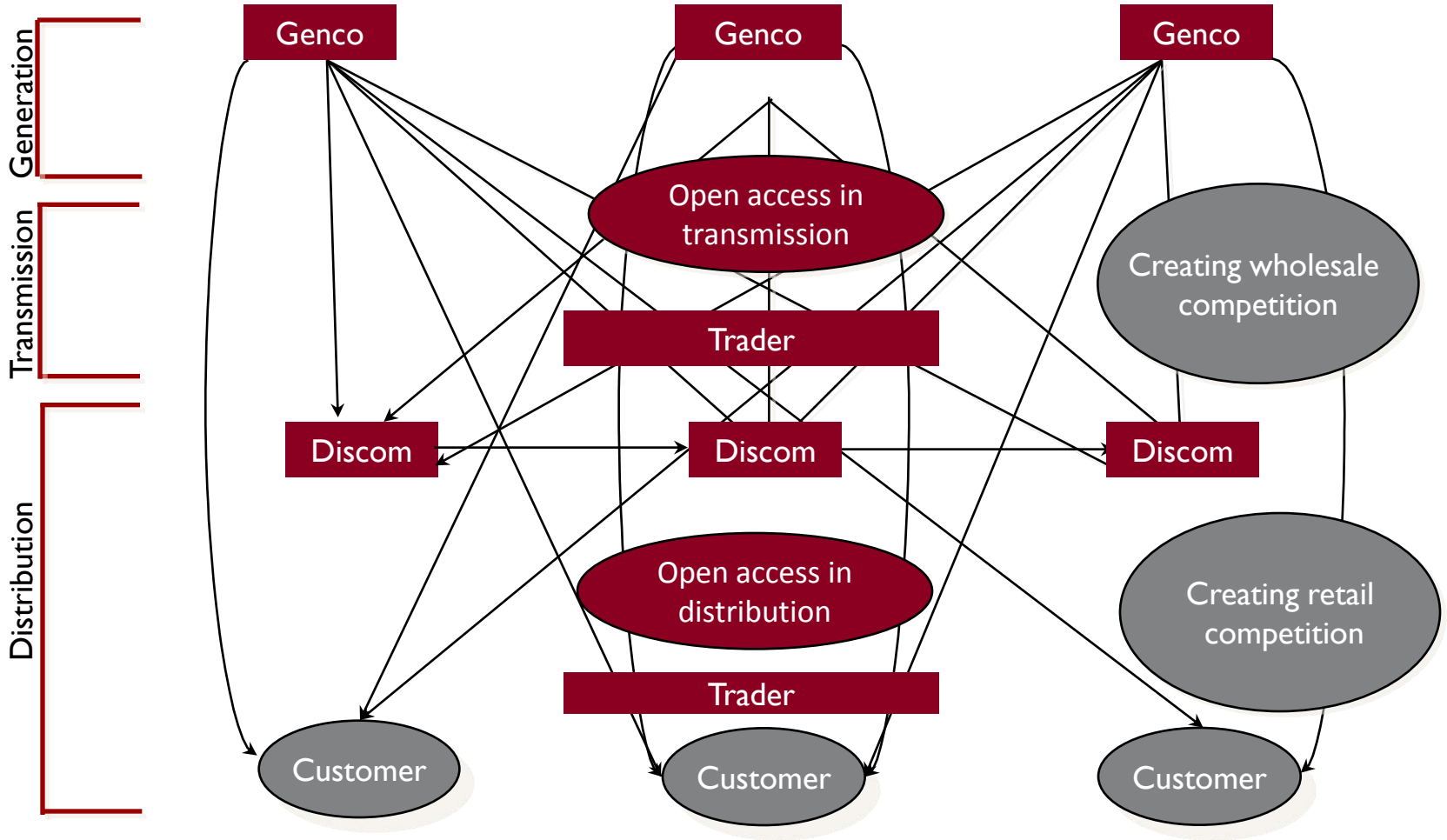
Competitive Bidding Guidelines – 2004/05

- Competitive acquisition of new generation contestability
- Guidelines updated in 2009 to streamline the process
- Required route for long-term power supply agreements between generation companies and distributors

National Tariff Policy – 2006

- Promoting retail competition
- Supporting power procurement through competitive bidding
- Enabling choice

Enabled market model under Electricity Act, 2003



Impact on industry structure under Electricity Act, 2003

Generator

- Long-term PPAs
- Licensing of capacity;
- Need for guarantees, extended project lead times
- Restrictions on captive generation

Transmission

- Bulk supply tariffs (BST)
- Single-buyer model (SBM)
- Natural monopolies
- No private investment

Distribution

- Retail supply tariffs
- Monopoly over consumers
- Lopsided tariff structure
- Power theft
- Poor collections

Consumers

- Unreliable supply
- Poor quality

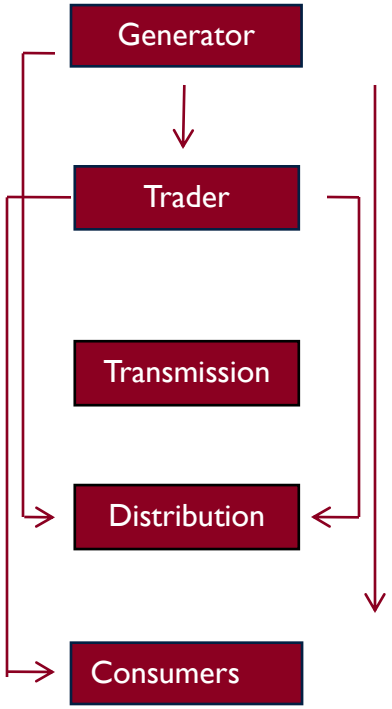
→

- Choice of access to consumers for choosing generator
- No restrictions on captive generation
- Reduced lead times
- Reduced financial and regulatory risk

- Provisions to develop a robust power trading market
- Will mitigate off-take risk for generators
- Will balance inter-regional disparities in power availability

- Non-discriminatory open access to transmission lines
- Multi-buyer model
- Private captive investment allowed

- Open access
- Surcharge on open access (not applicable to captive generation)
- No monopoly over consumers
- Parallel distribution networks allowed
- 100 per cent metering targeted



Electricity Act, 2003 provides institutional framework

Government-owned vertically integrated monopoly

Electricity Act, 2003 intervention

- Unbundled utilities
- Privatised distribution
- Multiple distribution licensees
- Non-discriminatory open access

Expected Outcome

- Reduction in losses
- Regulated cost-reflective tariff – phasing out cross subsidies
- Competition in generation and retail supply
- Internal resource generation
- Private sector resource mobilisation
- Improved reliability and quality of supply

A range of fiscal incentives have been introduced

Mega Power Project Policy

- Inter-state projects of 700 MW (thermal) and 350 MW (hydro) in Jammu & Kashmir and in north-eastern states; 1,000 MW (thermal) and 500 MW (hydro) in other states
- Zero customs duty on import of capital equipment
- Increased external commercial borrowing (ECB) capital limits
- State implementation support
- Decreased import duty on fuel, i.e., coal and liquid fuel
- Deemed export benefits to domestic bidders
- Price preference to public sector unit (PSU) bidders
- Tax holiday as per Section 80-IA
- Purchasing state must have ERC; Must agree, in principle, to privatise distribution in cities of >1 million population

100 per cent foreign direct investment (FDI) allowed in Indian power sector (except nuclear)

Rapid, large-scale capacity addition through ultra mega power projects … (1/2)

Ultra mega power projects (UMPPs)

- Nine projects targeted; each project size about 4,000 MW; total estimated investment of Rs 16,000 crore
- Projects to be completed on build-own-operate (BOO) basis
- Power Finance Corporation (PFC) is the nodal agency for setting up the special purpose vehicles (SPV) for the projects
- Successful bidder finalised on tariff-based competitive bidding; takes over SPV from PFC
- Projects to use supercritical technology based on pithead (captive block) or imported coal (coastal)
- Full exemption of central excise duty on goods procured under supercritical technology
- Five coastal sites identified; of these, Mundra in Gujarat awarded to Tata Power and Krishnapatnam in Andhra Pradesh awarded to Reliance Power

Rapid, large-scale capacity addition through ultra mega power projects … (2/2)

Ultra mega power projects

- Four pithead sites identified; of these, Sasan in Madhya Pradesh and Tilaiya in Jharkhand awarded to Reliance Energy
- Further sites being identified for expanding the number of UMPPs
- Power ministry to facilitate coordination with other ministries and state governments for:
  - coal block allocation/coal linkage, environment and forest clearances, water linkage, allocating power to different states, facilitating power purchase agreements (PPAs) and securing the payment mechanism at the state level
- PFC responsible for facilitating:
  - bidding process, land acquisition, clearances and approvals, and securing coal blocks, etc.
- First UMPP on course to be commissioned by 2012 in Mundra

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Opportunities — macro-perspective

- Total electrification of households country-wide targeted by 2010; about 44 per cent yet to be electrified

Perspective Announced: 2012

- Per capita availability of 1,000 units – 704 units in 2008
- Target installed capacity over 200,000 MW – 151,073 MW installed as on July 31, 2009.
- Inter-regional transmission capacity of 37,000 MW – 17,000 MW at the end of Tenth Plan
- Energy efficiency/conservation savings of about 15 per cent
- Improving quality and reliability of power supply

Source: Ministry of Power, GoI

Sustained GDP growth will require similar growth in the power sector

- An annual GDP growth rate of about 8 per cent would necessitate a 9 to 10 per cent growth rate in the Indian power sector.
- Though the growth rate of the economy was moderate in 2008–09, it is likely to pick up as the global recession fades.
- The existing power deficit in the country, as well as increasing demand, will necessitate large-scale addition in generation capacity.

Year	Total energy required (billion kWh)		Projected peak demand (GW)		Installed capacity required (GW)	
	At GDP growth rate of		At GDP growth rate of		At GDP growth rate of	
	8%	9%	8%	9%	8%	9%
2011–12	1,097	1,167	158	168	220	233
2016–17	1,524	1,687	226	250	306	337
2021–22	2,118	2,438	323	372	425	488
2026–27	2,866	3,423	437	522	575	685
2031–32	3,880	4,806	592	733	778	960

Incentives for ramping up investments

Foreign investment:

- 100 per cent FDI is allowed in all segments of the power sector, including trading.
- There is no discrimination between domestic and foreign investors.

Fiscal incentives:

- There is zero customs duty on import of capital goods for mega power projects.
- There is an income tax holiday for generating plants for10 years.

Required investment scale — ample scope for sector investments

- For a capacity addition programme of 100,000 MW, investments worth US$ 100 billion are needed.
- An additional US$ 100 billion is needed for the augmentation of the transmission, sub-transmission and distribution networks, and for rural electrification.
- Therefore, a total over US$ 200 billion worth of investments are required.
- 20 per cent of the total requirement is expected to met by private players.

Electricity Act, 2003 provides the enabling framework for attracting increased investments from both the public and private sectors

Power sector development scenario

Steps implemented

- Regulatory commissions constituted in 22 states
- Tariff orders, performance standards, terms and conditions for supply and tariff notified
- Unbundling of SEBs
- Distribution reforms initiated
- Mumbai, Orissa and Delhi distribution privatised
- Recovery from SEBs regularised after securitisation
- Principles of multi-year-tariff (MYT) regime proposed for tariff rationalisation
- Stability of past contracts (except Dabhol Power)
- Private franchise model introduced in Maharashtra for power distribution

Key policy measures encourage investments

Enablers

- Generation de-licensed
- Clear and transparent tariff setting principles
- Competitive bidding for power procurement by licensees
- Open access
- Captive policy
- Incentives for rural electrification
- Evolution of power markets
- New hydro and relief and rehabilitation (R&R) policies
- Captive coal mining blocks
- Second priority after fertiliser for gas allocations
- Development of other infrastructure such as ports, roads and railways, etc.

Emerging power sector scenario

Existing and new players increasing investments in the power sector

- Large capacity addition plans firmed up by Central PSUs and private sector majors (Tata Power, Reliance, Torrent)
- Smaller players also have major expansion plans (GVK, GMR, Adani, Lanco)
- Entry of fringe players (captive generators) in the independent power producer (IPP) sector (Jindal, Essar, Sterlite)
- Entry of greater number of private players in distribution
- System development plans initiated by discoms to meet SERC-determined loss reduction targets in many states

Opportunities across the power spectrum

Generation	Transmission	Distribution	Equipment and services
• Investment in IPPs, captive power plants (CPP) • Across coal, gas, nuclear, hydro and renewable energy	• Participate in transmission bids • Work with generation companies to evacuate power from new projects	• Participate in distribution franchisee privatisation • Operate distribution in special economic zones (SEZ) and industrial clusters	• Generation, transmission, distribution equipment and infrastructure support • Operation and maintenance services • Technical consulting, IT systems, loss detection and reduction solutions, etc.

Large generation opportunities exist

15,000 MW to 20,000 MW need to be added every year, a large step up from the current pace of capacity addition

Opportunities	Target markets
• IPP • CPP • Distributed generation	• Distribution licensees • Industrial consumers • Rural areas

Transmission opportunities opening up

Independent power transmission companies

- Private players can construct, operate and maintain transmission lines

The first transmission line, through a joint venture between M/s Tata Power and PGCIL, has been executed with the setting up of a transmission system for the Tala hydro electric project (HEP) and East-North inter-connector.

Competitive bidding for multiple transmission projects is an ongoing process.

Inter-regional link operations

- Private transmission facilities may either take the form of an independent power transmission company or a joint venture with state-owned transmission utilities

Key domestic players … (1/2)

Generation

NTPC Ltd	Tata Power	Reliance Energy Ltd	Torrent Power
• The company is the sixth-largest thermal power producer in the world and India's largest power producer. The state-owned player operates across the country.	• The Tata Group pioneered power generation in India nine decades ago. The group has a presence in all segments — thermal, hydro, solar, wind energy, and transmission and distribution.	• India's leading integrated power utility company in the private sector, it has a significant presence in generation and transmission and distribution in the states of Maharashtra, Goa and Andhra Pradesh. It is executing three UMPPs of about 4,000 MW each.	• Torrent entered the power sector by acquiring two, old Gujarat state-owned electricity companies and turned them into power utilities comparable with the best. It is also engaged in power distribution.

Key domestic players … (2/2)

Power equipment

Bharat Heavy Electricals Ltd (BHEL)
• BHEL has 14 manufacturing plants.
• It has installed 90,000 MW equivalent power generation units for utilities, captive and industrial plants.
• The company has supplied over 225,000 MVA transformer capacity and other equipment for transmission and distribution networks.
• Capacity being to augmented to 15,000 MW by end of 2009.
• BHEL has started manufacturing 800 MW and 660 MW super-critical boiler and turbines.
• It has an outstanding order book of Rs 117,400 crore to be executed in 2009–10 and beyond; 84 per cent of its business is from the power sector.

Select foreign investors in the Indian power sector

AES Corporation

Acciona Energy

CLP Group

CLP Group

Leveraging expertise for efficient project development

- The CLP Group started operations in India by acquiring the 655 MW Gujarat Powergen Energy Corporation Ltd (GPEC) project in Gujarat.
- It has successfully won a competitive bid in Haryana for setting up a 1,320 MW coal-based power project.
- CLP India has made significant investments in renewable energy in line with its global goal of becoming one of the least carbon-intensive power producers in the world.
- CLP is one of the largest investors in the Indian wind power sector with projects in Gujarat (100.8 MW), Karnataka (82.4 MW) and Maharashtra (113.6 MW).
- CLP's India arm posted a net profit of Rs 250 crore on revenues of Rs 1,300 crore in 2007–08.

Alstom India

Benefitting from full involvement in India's power sector

- Alstom and BHEL entered into a 15-year agreement for manufacture, supply and technology transfer of super-critical boilers in 2005.
- NTPC Alstom Power Service Limited (NASL) — a 50:50 joint venture between Alstom and NTPC Ltd— undertakes renovation, modernisation, retrofit and refurbishment of old power plants.
- It has established four manufacturing units in India.
- Alstom has ramped up its facilities at Vadodara in Gujarat into a world-class hub for hydro equipment manufacturing.
- It has also established a Global Technology Centre at Vadodara.
- Alstom is involved in the largest hydro project in India, the 2,000 MW Subansiri Lower Hydroelectric Power Plant, and several other smaller projects.

L&T-MHI Boilers Pvt Ltd

Adding equipment manufacturing capacity

- Joint venture established on April 18, 2007, by Larsen & Toubro Ltd (L&T) with 51 per cent share and Mitsubishi Heavy Industries (MHI) with 49 per cent share.

- Started at an investment of Rs 7,500 crore (US$ 167 million), the company has the capability to manufacture boilers with 3,000 MW to 4,000 MW capacity per annum.

- The company is located in Delhi and Surat.

Ansaldo Caldie (India)

Equipment and services

- The company is a joint venture between Italian company Ansaldo Caldaie (85 per cent) and GB Engineering (15 per cent).
- Its product range includes design, and manufacture and supply of utility boilers and heat recovery steam generators (HRSGs).
- The company's manufacturing facilities in India include a unit in Trichy (in JV with existing manufacturers) that specialises in manufacturing bays for products such as burners, lung storm air heaters, etc., and a unit in Tuticorin, which is a new facility to augment its manufacturing capability in India.

Select projects handled in India:

- 1980s — 3 X 200 MW coal-fired boilers for NTPC Ramagundam
- 1990 — 2 X 500 MW coal-fired boilers for NTPC Farakka
- 1998 — 1 X HRSG for 230 MW GT for Reliance Energy, Samalkot
- 2003 — 2 X 210 MW lignite-fired tower boilers for Neyveli Lignite Corp., Tamil Nadu

Toshiba Corporation

Expanding to super-critical turbine and generator manufacturing in the country

- Toshiba Corporation of Japan and Jindal South West (JSW) Group set up a 75:25 joint venture in 2008 to manufacture and market super-critical steam turbines and generators for thermal power plants.
- Expected investment of nearly US$ 250 million in plant and manufacturing equipment.
- Target production capacity of 3,000 MW per year.
- Toshiba has sold equipment for multiple hydro power projects in India.

Select projects handled by Toshiba in India:

- KOLDAM 4 x 200 MW, HEP
- TEESTA-V (3x170MW)
- UMIAM I&II HEP(4x10.5MW, 2x9MW)
- UMIAM-I R&M (2003)
- PURULIA PUMPED STORAGE, HEP (4x225MW)
- DAM (2x10.6MW turbine)
- HAMPI (2x10.6MW turbine, 1962)
- SSNNL (6 x 200 MW), HEP

VA Tech Hydro

Benefitting from hydro sector investments

- VA Tech Hydro is the first foreign company to set up hydro equipment manufacturing facilities in India.

- It has the capability for turnkey execution of complete electrical and electro-mechanical works.

- It has manufacturing facilities for:
- Turbines, governors, MIV and auxiliaries.
- Hydro generators, excitation, automation and protection systems
- Orders in hand/completed:
- Over 3,000 MVA installed/orders booked.
- Over 550 MW of compact hydro plants executed.
- Over 144 excitation systems installed/orders booked.
- Over 200 governors installed/orders booked.

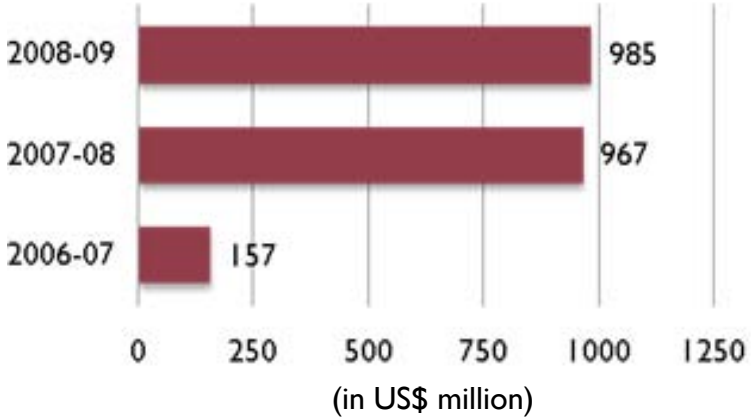
- The company supplies power equipment to 18 countries in five continents.

FDI outlook has been improving steadily

FDI inflows into the power sector have increased in the last couple of years

- The power sector provides large-scale investment opportunities.
- However, given the scale of investment requirements, FDI inflows need to increase multifold.
- Asset-backed investment with reasonable returns is an attractive proposition for international investors.

FDI equity inflows in power sector



Source: GoI

Increasing investment opportunities in Indian power companies

Growing opportunities to invest in Indian power companies

- Indian companies such as NHPC Ltd, Adani Power and India Bulls Power are slated to be among the majors initial public offerings (IPOs) on Indian bourses in 2009–10.

- Many more power companies are expected to raise capital through public issues or private placements.

FII holding in key companies on 31st march 2009

Source: NSE

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