Energy and Electricity Regulatory Overview of India

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In This Presentation…….

- Energy Sector - Overview
- Electricity Industry in India - Overview
- Regulatory Framework in India
  – Role of Regulator
  – Regulatory Initiatives
  – Challenges and Issues
  – Way Forward

ENERGY INDICATORS - OVERVIEW

Key Energy Indicators

S. No.	Parameter	World	India
1.	TPES* /GDP (Kgoe/'$PPP)	0.21	0.16
2.	Per Capita CO_2 Emission (Tonnes)	4.22	1.05
3.	TPES Per Capita (Toe /capita)	1.78	0.49
4.	Per Capita Electricity Consumption (kWh)	2596	631

Source: IEA's Publication, 'Key Energy Indicators-2007'

*TPES - Total Primary Energy Supply

Purchase Power Parity in $

Energy Requirement, Production & Imports

Fuel	Range of Requirement in Scenarios	Assumed Domestic Production	Range of Imports*	Import (%)
	(R)	(P)	(I)	(I/R)
Oil (Mt)	350-486	35	315-451	90-93
Natural Gas (Mtoe) including CBM	100-197	100	0-97	0-49
Coal (Mtoe)	632-1022	560	72-462	11-45
TCPES	1351-1702	-	387-1010	29-59
* Range of imports is calculated as follows:				
Lower bound = Minimum requirement - Maximum domestic production				
Upper bound = Maximum requiremnt - Minimum domestic production				

Notes: 1. Growth Rate 8%

2. Year 2031-32

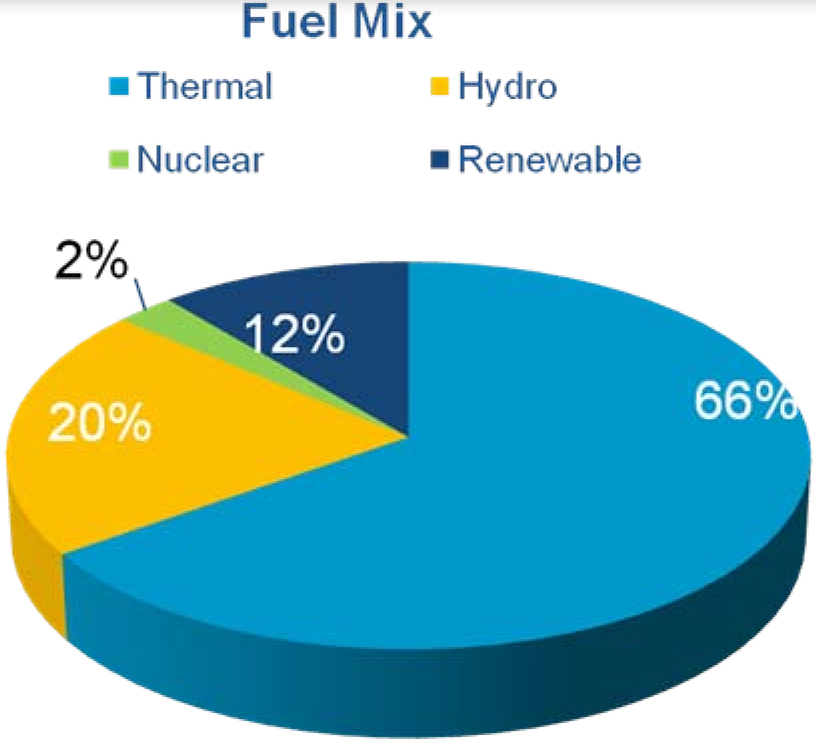
India will continue to import significant amount of its energy requirement.

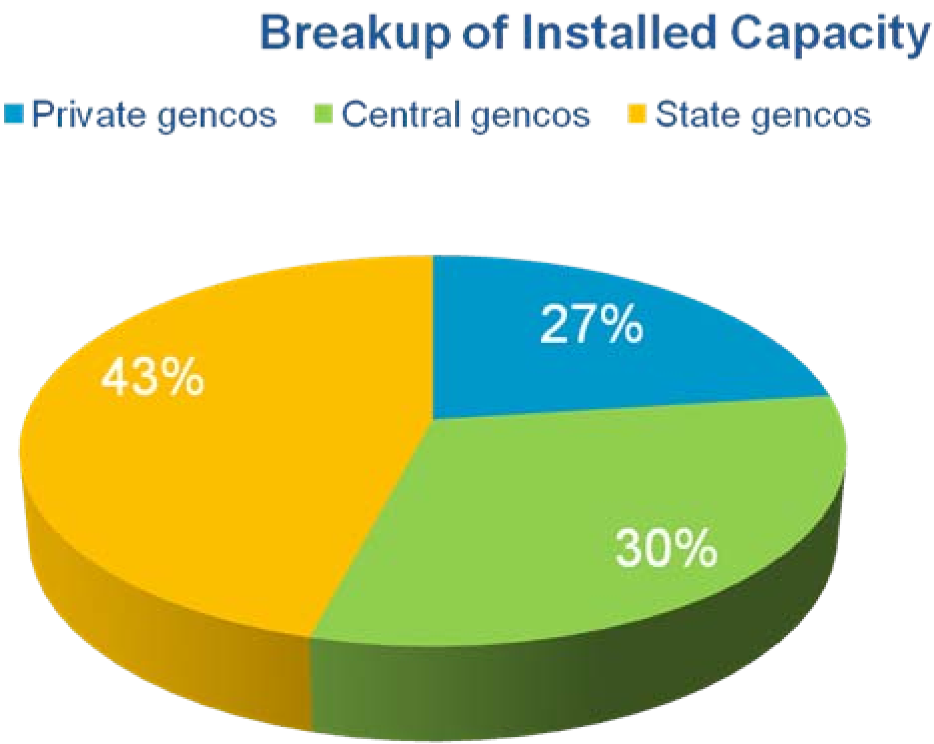
Energy Regulation in India

- No single regulator for entire energy sector
- Separate regulator based on domain knowledge requirement
- Presently separate regulator for Power and PNG (Petroleum and Natural Gas)
  - Separate Power regulators at Centre and in States
  - PNG: upstream regulation with Government (Directorate General of Hydrocarbons) and downstream regulation with PNGRB (Petroleum and Natural Gas Regulatory Board)
- Separate coal regulator proposed
- Common Appellate Tribunal for Power and PNG

Electricity Industry in India - Overview

Installed Generation Capacity in India

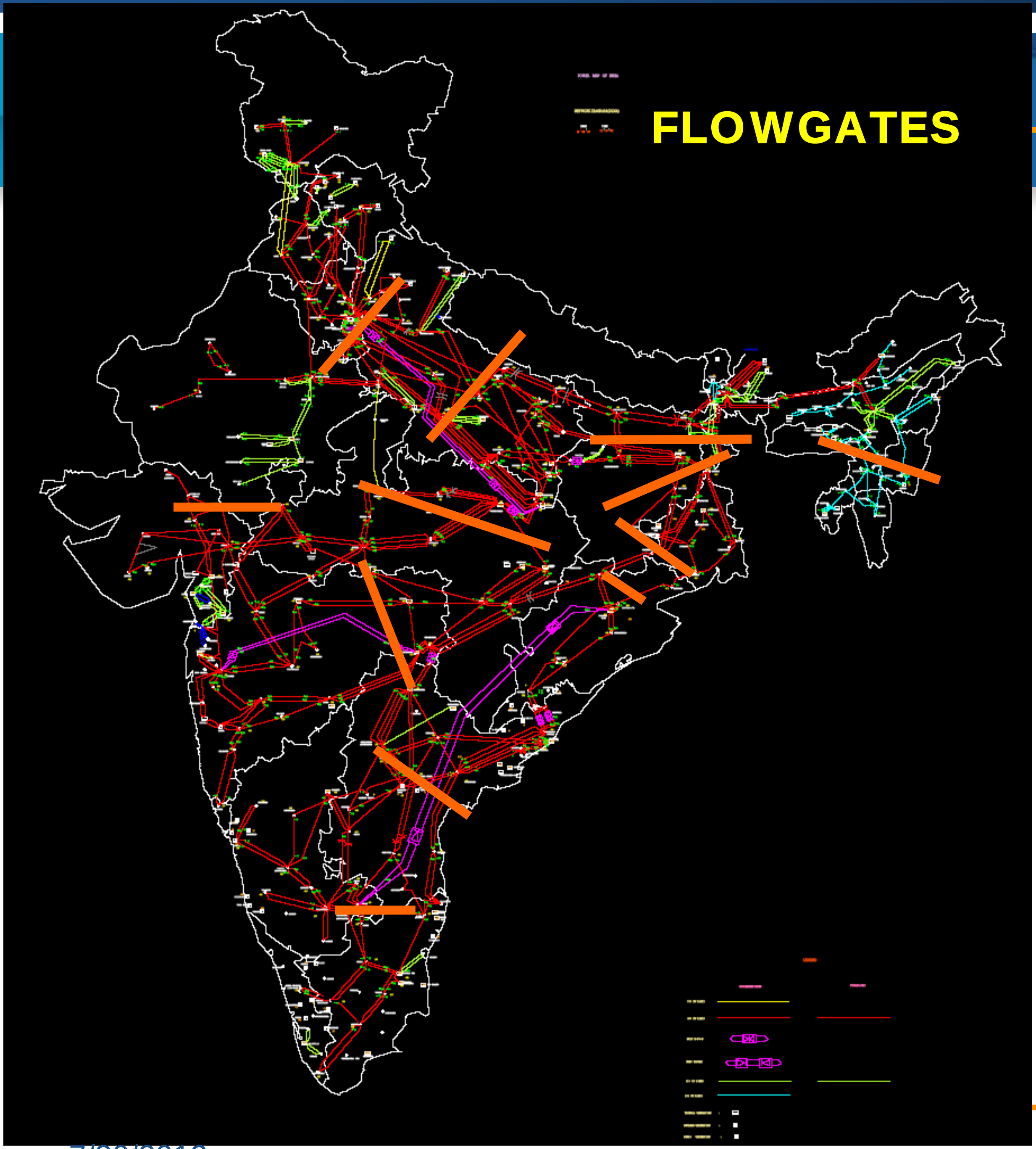




Total Installed Capacity (as on 31.03.2012)

- **199.8 GW**

Source: CEA



Pan India Market:
All India Economy & Efficiency

Optimal utilization of resources

Well Meshed Network

400 kV Backbone (~100,000 ckt kms)

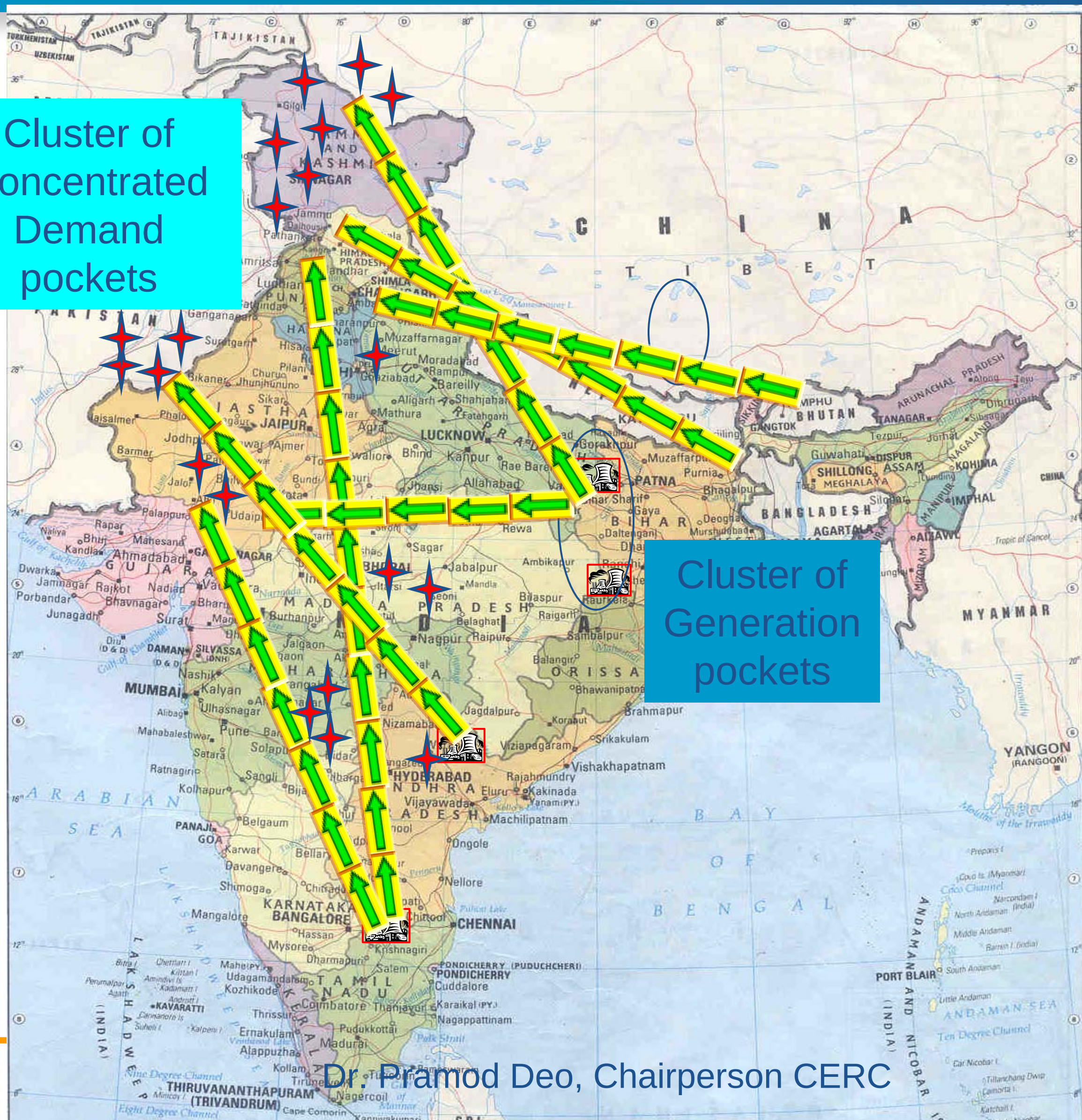
765 kV Operations commenced

Bulk transfer through HVDCs

High Capacity Corridors under construction

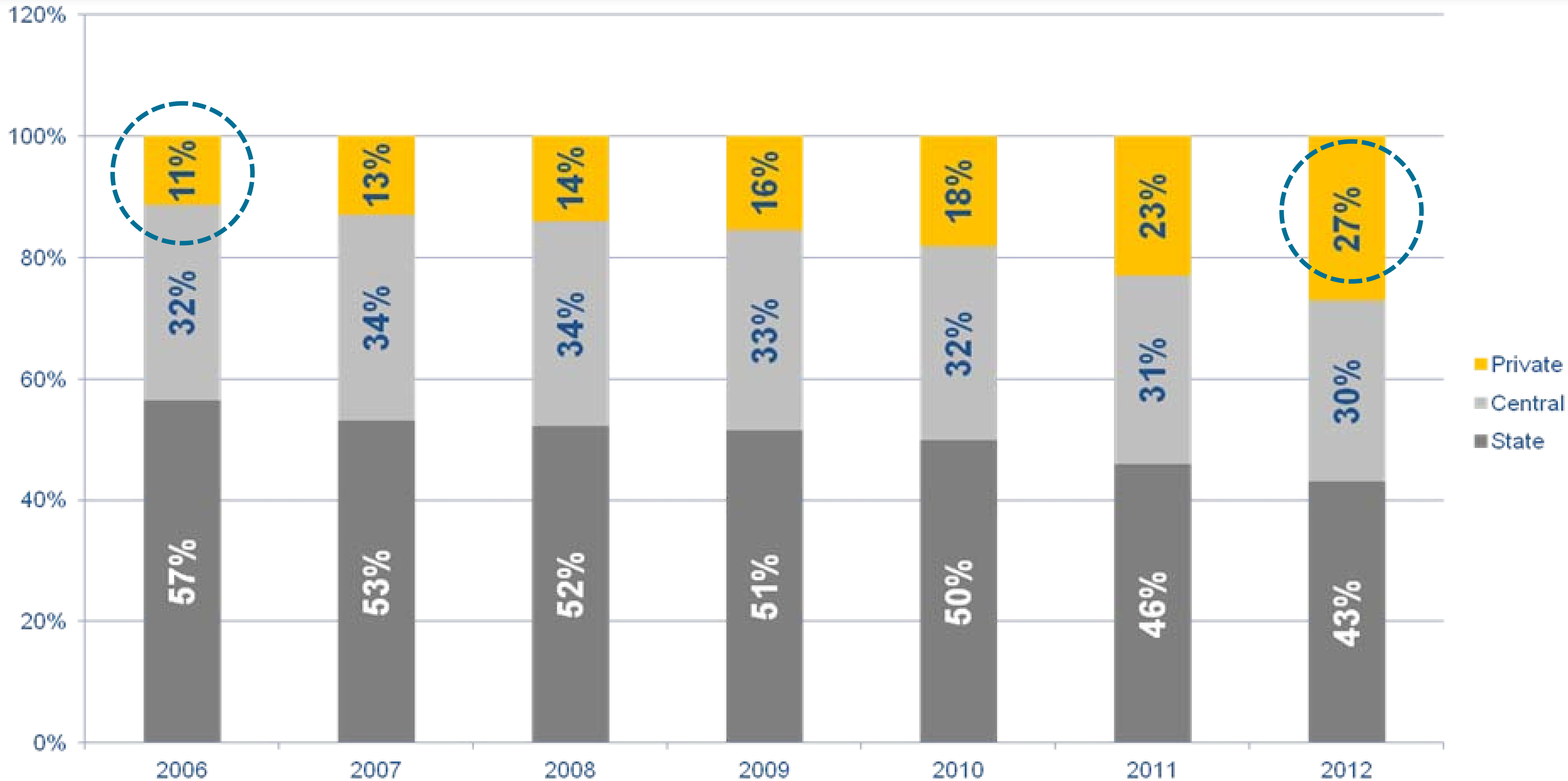
Creation of Transmission Highways

Cluster of Concentrated Demand pockets



Cluster of Generation pockets

Private Generation Ownership



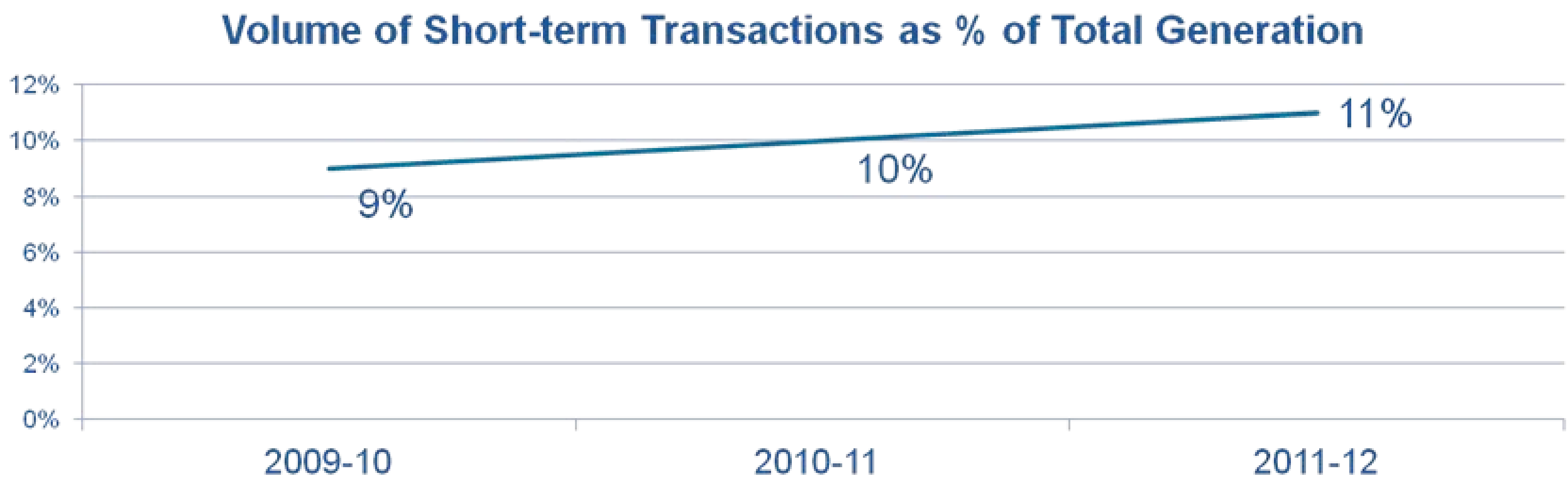
Source: Central Electricity Authority

Growth in Share of Private sector 11% to 27%

…Private Sector Ownership

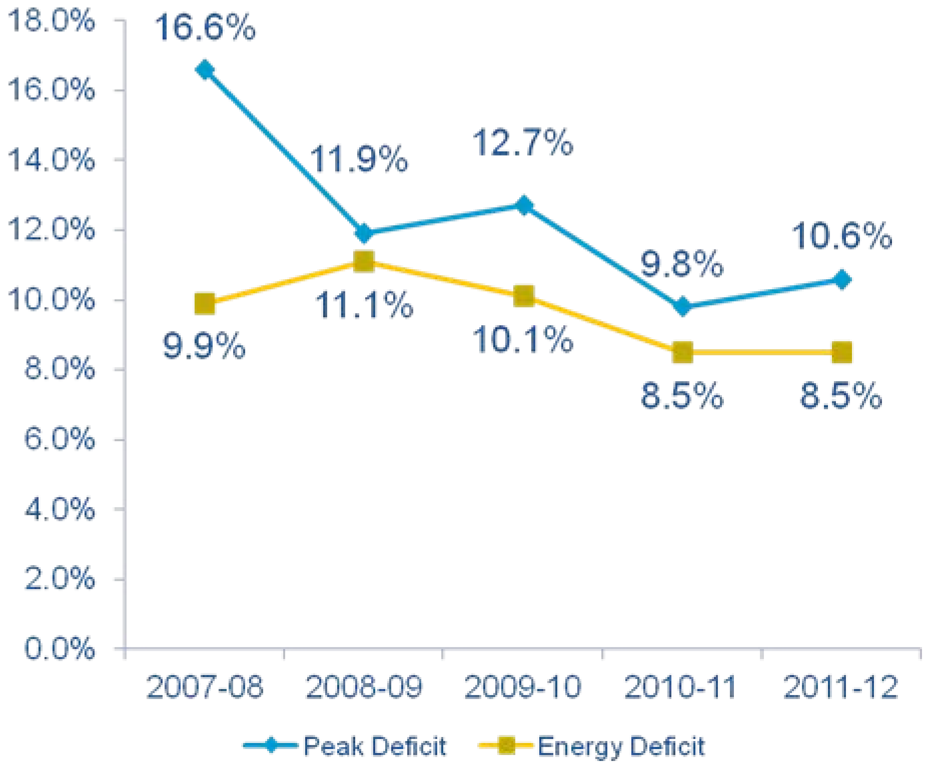
- Almost 100% of Electricity Transmission in India is owned by public sector
  - Is a Regulated monopoly business
  - New projects to be awarded through competitive bidding route
- About 13 % of Electricity Distribution in India is owned by private sector

Growth in short term transaction of electricity



Year	Total Volume of Short-term Transactions (BUs)	Total Electricity Generation (BUs)
2009-10	65.9	764.03
2010-11	81.56	809.45
2011-12	94.51	874.17

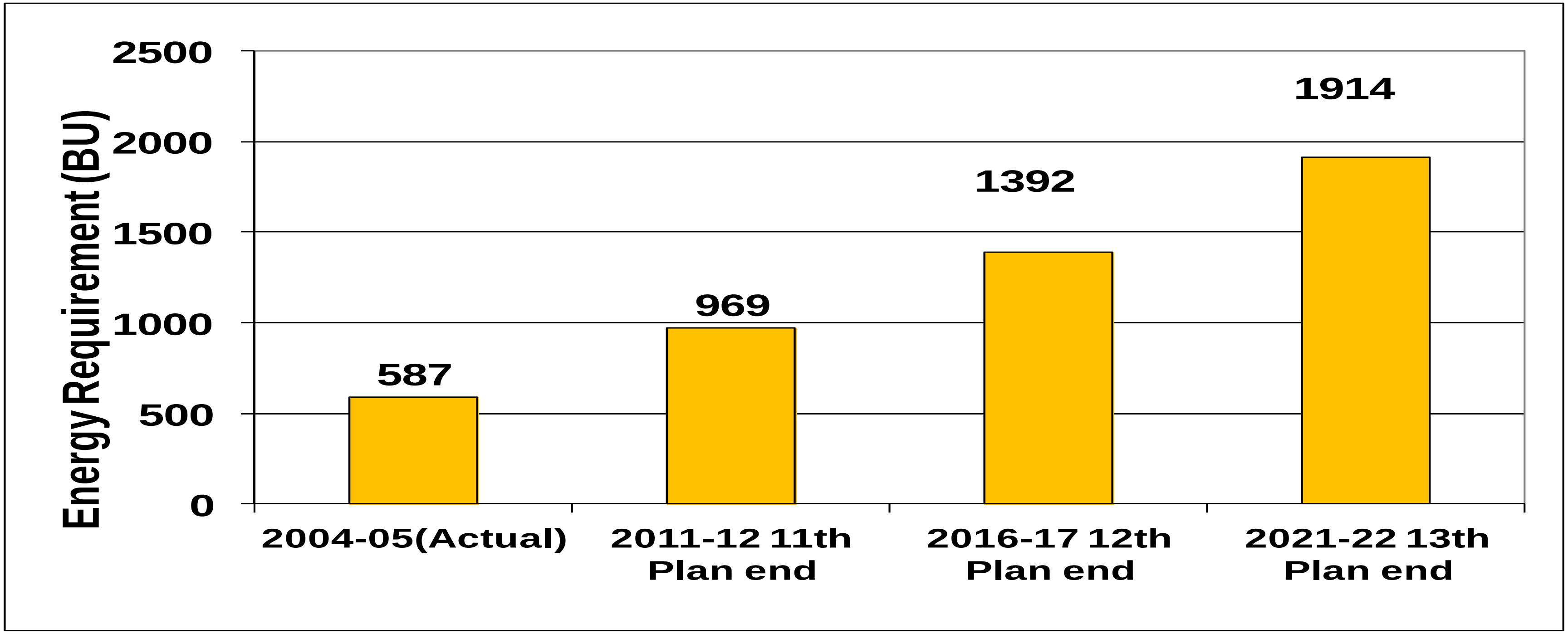
Power- Demand and Deficit



Year	Peak Demand (MW)	Energy Demand (BUs)
2007-08	109	739
2008-09	110	777
2009-10	119	831
2010-11	122	862
2011-12	130	937

Peak deficit is higher than energy deficit
Policy initiative for higher investment in peak load than base load required

Long Term Electricity Projections



Source: Central Electricity Authority

Five year Plan Projection	Capacity (MW)
2013 - 2017	1,24,000
2018 - 2022	1,10,000

Regulatory Framework in India

Evolution of Regulatory Framework

- Powers of Regulation historically with
  - Government/Government organization
- First attempt at **distancing of Government from regulation – in 1998**
  - Independent Regulatory authorities responsible primarily for **tariff** regulation
    - CERC (central level regulator); SERCs (state level regulator); JERC (joint regulator involving two or more states/UTs)
- Paradigm shift in 2003 – Electricity Act, 2003 – Complete distancing of Government from regulation.

Broad Responsibilities of Regulator

- Development of power market
  - Facilitating Open Access
  - Licensed traders
  - Power Exchanges
- Inclusive Growth
  - Consumer Protection
  - Promotion of Green Energy
- Licensing
  - Transmission, Trading, Distribution
- Tariff Regulation
  - Cost Plus basis
  - Competitive Bidding

Role of Regulator:

Market Development

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Competitive Market

- Private participation to promote competition and achieve greater efficiency.
- Enabling Framework: Non-discriminatory open access
- Framework for National Power Market

<u>Power Trading</u>

- Large number of licensed traders (43)
- Short Term Markets – Multiple buyers and sellers
- Promoted National Level Power Exchanges

Role of Regulator: Sustainable Development

Sustainable Development

Renewable – Regulatory Intervention.

- Preferential Tariff
- Renewable Purchase Obligation
- Facilitative framework for grid connectivity
- Renewable Energy Certificate (REC) market
  - To boost market development in renewable.

Sustainable Development- DSM & EE

- Regulators induce efficiency in operation through tariff framework
- Model DSM Regulations evolved by Forum of Regulators.
- Guidelines for preparation of DSM programmes by utilities and evaluation, monitoring and verification by the Regulator
- Bureau of Energy Efficiency driving energy efficiency measures in the country.

Role of Regulator: Inclusive Growth

Consumer Focus

- Mandatory Consumer Grievance Redressal Forum (CGRF) by the licensee for the consumers.
- Regulatory Commissions
  - Set and monitor Standards of Performance of Licensees.
  - Licensee to pay compensation to consumer for failure to comply with the standards.
  - Appoint Ombudsmen for redressal of grievances.
- **Universal Supply Obligation** on the licensee to give connection/supply power within stipulated time.

Emerging Challenges

Challenges and Issues

Fuel Supply

- Shortage of domestic fuel.
- Growing dependence on imported fuel.
- Increasing prices of imported coal.
- Critical issues- Timely development of coal blocks, Environment & Forestry clearances, Land Acquisition and R&R challenges.

Competitive Bidding of Power Projects

- More than 42,000 MW bid out through this process.
- Stakeholders have raised concerns regarding uncertainty in fuel availability and prices.

Challenges and Issues

Reforms implementation in a Federal structure	• Political Economy of Electricity.
Financial Health of DISCOMs	• Low tariffs ,Non-revision of tariffs • Unmetered and free power to agriculture sector • High T&D losses: Thefts, billing ,collection inefficiencies
Large capacity additions required to meet future demand for electricity	• Threat of Stranded Assets • Adequacy of Coal / Gas supply • Contract reneging and maintain market integrity
Implementation of Open Access at State level	• Ring fencing of SLDC • Financial Independence for functional independence

Steps to address the issues & challenges

- Diversification of energy resources
  - Promotion of Renewable Energy, DSM and Energy Efficiency.
- Distribution Franchisee Model in urban areas
  - for distribution loss reduction.
- Model Regulations for Multi-Year Distribution Tariff
  - Tariff Revision
  - Tariff Adequacy
  - Rationalize Tariff

Steps to address the issues & challenges

- Operationalisation of Consumer Grievance Redressal Forum – Regular monitoring by CERC.

- Forum of Regulators (FOR) model regulations on
  – Standard of Performance for Distribution Licensees.
  – Regulations for Protection of Consumer Interest.

Regulators in India have……

- Brought Transparency in Regulatory process
- Introduced Efficiency in Operation
- Created environment to attract private investment in Generation
- Promoted Competition in generation and transmission
- Created Market Structure in power sector
- Facilitated Sustainable development through promotion of Renewable Energy

Thank You

Promoting competition, efficiency and economy in power markets

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