# Open Access in Transmission and Distribution and Railway

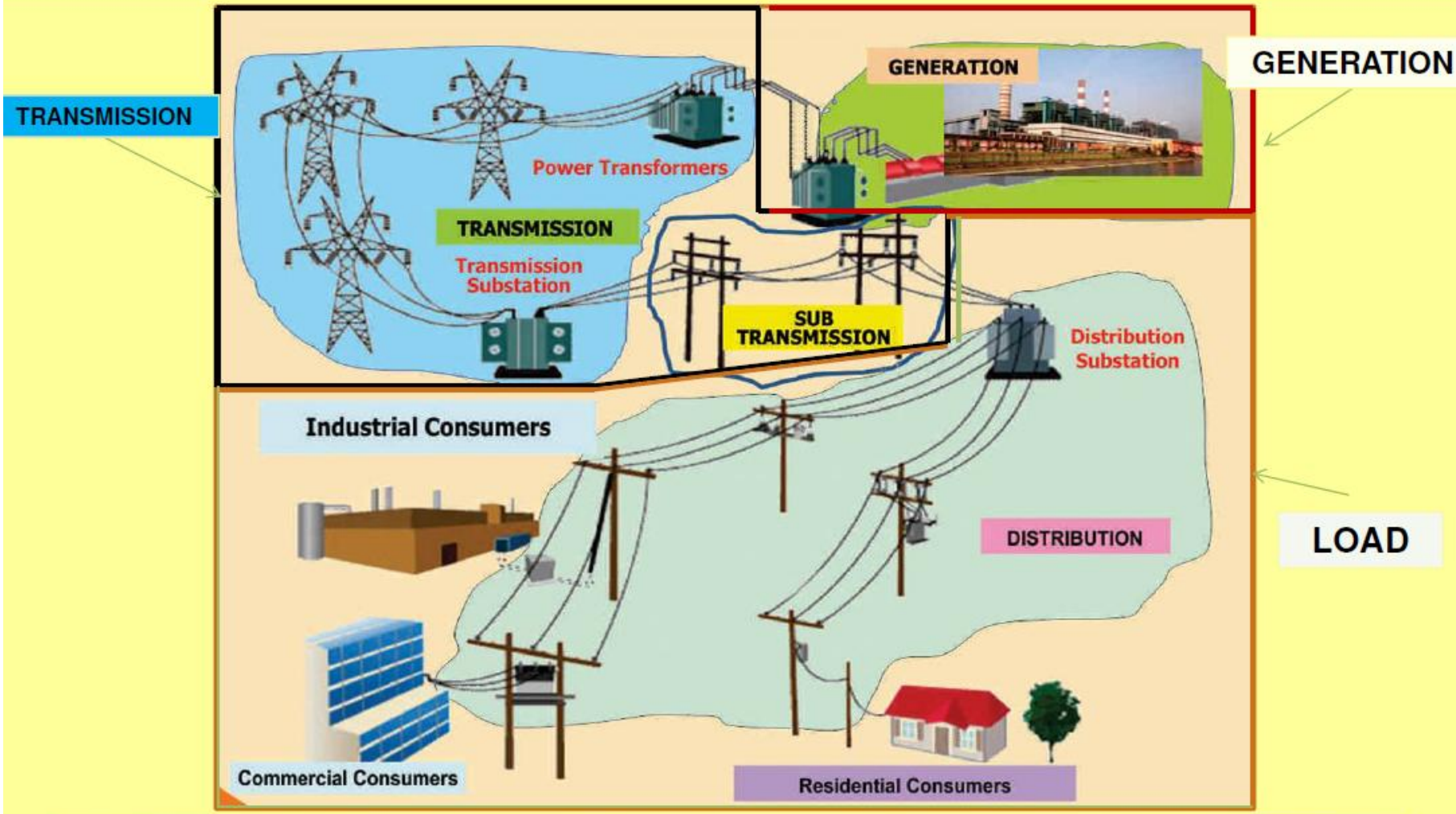
By

S C Shrivastava

Chief (Engg), CERC

# Overview

# Power Supply Value Chain



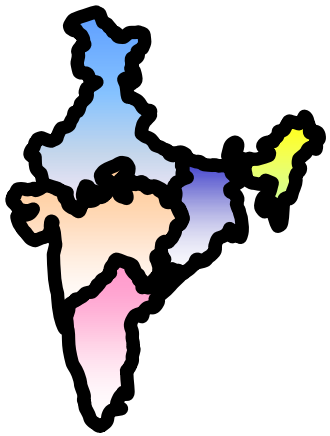

**All Segments need to be Strengthened Simultaneously & Harmoniously**

# Transmission System

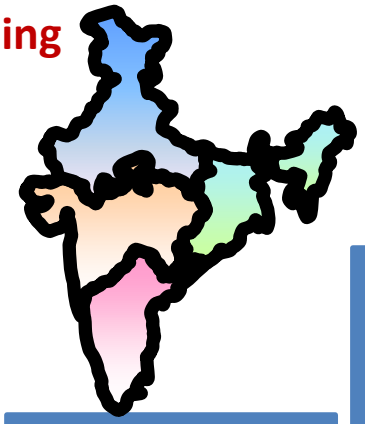
- Electricity is a concurrent subject – central and State Govt. responsible for its development
- Pursuant to electricity sector reforms, erstwhile monolithic entities vertically disintegrated into separate cos. Responsible for
  - Generation,
  - Transmission and
  - Distribution
- Transmission utilities created at Central and State level
  - Central Transmission Utility (POWERGRID) – Inter-State transmission system
  - State Transmission Utility – Intra-State Transmission System

# Evolution of Indian Grid and Electricity Market

2004: Open Access
2008: Power Exchange
2009: Imbalance (UI)
2009: Congestion Management
2009: Trading License
2009: Connectivity, LTA and MTOA
2010: Power Market, REC
2011: Transmission Pricing (POC)
2012: 15 Min Bidding
2014: Deviation Settlement
2015: RE Framework
2015: Ancillary Services
2016: 55% - Flexibility

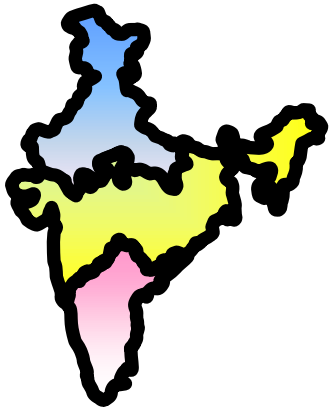


Pre 1991:
Five Regional Grids - Five Frequencies



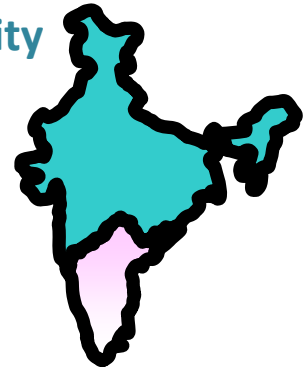
October 1991: East and Northeast synchronized

Merchant Power



March 2003: West synchronized with East & Northeast

Electricity Act, 2003



August 2006: North synchronized with Central Grid

Merging of Markets

Dec 2013: All India Synchronized Grid

500/660/1000 MW units and HVDC, 765 kV, UMPP, Common Carrier – Trans.

175 GW RE, Changing Load Profile, Distribution System Operators (DSOs), Electric Vehicles

Maps not to scale

# Legal Framework

# Salient Features of Electricity Act 2003

- De-licensing of Generation except Hydro generation
- Non-discriminatory Open access in Transmission and Distribution
- Trading of Electricity as a distinct activity
- Introduction of Competition and Development of Market
- Development and integration of renewable in the grid

# Definition of Open Access in EA 2003

- means the non-discriminatory provision for the use of transmission lines or distribution system or associated facilities with such lines or system by any licensee or consumer or a person engaged in generation in accordance with the regulations specified by the Appropriate Commission;

# Open Access for Captive Power Plants

**9** (2) Every person, who has constructed a CPP and maintains and operate such plant, shall have the right to OA for the purposes of carrying electricity from his CPP to the destination of his use:

Provided that such OA shall be subject to availability of adequate tr. facility and such availability of tr. facility shall be determined by the CTU or STU, as the case may be:

Provided further that any dispute regarding the availability of tr. facility shall be adjudicated upon by the CERC/ SERC.

# Section 38 of the Electricity Act, 2003

- Central Transmission Utility (CTU) to provide non-discriminatory open access to its transmission system for use by
  - any licensee or generating company on payment of the transmission charges; or
  - any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the Central Commission.

# Open Access in State Transmission System

39 (2) (d) The function of the STU shall be to provide non-discriminatory OA to its tr. system for use by-

(i) any licensee or generating company on payment of the transmission charges; or

(ii) any consumer as and when such OA is provided by the SERC under 42 (2), on payment of the tr. charges and a surcharge thereon, as may be specified by the SERC:

# Open Access by Transmission Licensee

- 40 (2) (d) The Tr. Licensee to provide non-discriminatory OA to its tr. system for use by-
- any licensee or generating company on payment of the transmission charges; or
- any consumer as and when such OA is provided by the SERC under 42 (2), on payment of the tr. charges and a surcharge thereon, as may be specified by the SERC:
- Provided that such surcharge shall be utilised for the purpose of meeting the requirement of current level cross-subsidy:
- Provided further that such surcharge and cross subsidies shall be progressively reduced in the manner as may be specified by the SERC:

# Open Access in Distribution System

- 42 (2) The SERC shall introduce OA in such phases and subject to such conditions, (including the cross subsidies, and other operational constraints) as may be specified within one year of the appointed date by it and in specifying the extent of OA in successive phases and in determining the charges for wheeling, it shall have due regard to all relevant factors including such cross subsidies, and other operational constraints:
- Provided that such OA shall be allowed on payment of a surcharge in addition to the charges for wheeling as may be determined by the SERC:

# Open Access in Distribution System

42 (2) Contd -----

- Such surcharge shall be utilised to meet the requirements of current level of cross subsidy within the area of supply of the distribution licensee :
- Such surcharge and cross subsidies shall be progressively reduced in the manner as may be specified by the SERC:
- Such surcharge shall not be leviable in case OA is provided to a person who has established a CPP for carrying the electricity to the destination of his own use:
- SERC shall, not later than five years from the date of commencement of the Electricity (Amendment) Act, 2003, by regulations, provide such OA to all consumers who require a supply of electricity where the maximum power to be made available at any time exceeds one megawatt.

# Open Access in Distribution System

42 (3) Where any person, whose premises are situated within the area of supply of a distribution licensee, (not being a local authority engaged in the business of distribution of electricity before the appointed date) requires a supply of electricity from a generating company or any licensee other than such distribution licensee, such person may, by notice, require the distribution licensee for wheeling such electricity in accordance with regulations made by the SERC and the duties of the distribution licensee with respect to such supply shall be of a common carrier providing non-discriminatory OA.

# Open Access in Distribution System

- Section 49. (Agreement with respect to supply or purchase of electricity):
- Where SERC has allowed OA to certain consumers under sec 42, such consumers, notwithstanding the provisions contained in clause (d) of sub-section (1) of sec 62, may enter into an agreement with any person for supply or purchase of electricity on such terms and conditions (including tariff) as may be agreed upon by them

# Function of SERCs- Section 86 (1) (a)

- Determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State:
- Where OA has been permitted to a category of consumers under section 42, the SERC shall determine only the wheeling charges and surcharge thereon, if any, for the said category of consumers;

# Introduction of Open Access in Inter-State Transmission

# Regulations on OPEN ACCESS in Inter-State Transmission System

| Date | Regulations |
|---|---|
| 30th Jan 2004 | CERC (Open Access in Inter-State Transmission) Regulation 2004 |
| 25th Jan 2008 | CERC (Open Access in Inter-State Transmission) Regulation 2008 |
| 1st Jan 2010 | CERC( Grant of Connectivity, Long-term Access and Medium-term Open Access in Inter-State Transmission and related matter) Regulation 2009 |
| 3rd Sept 2010 | First Amendment to Connectivity Regulations 2009 |
| 21st Mar 2012 | Second Amendment to Connectivity Regulations 2009 |
| 26th Mar 2012 | Third Amendment to Connectivity Regulations 2009 |
| 12th Aug 2014 | Forth Amendment to Connectivity Regulations 2009 |
| 15th May 2015 | Fifth Amendment to Connectivity Regulations 2009 |

# CERC (Open Access in Inter-State Transmission) Regulations, 2004

- Two products
  - Long Term Access
  - Short Term Open Access
- The application for Long Term Open Access (LTOA)
  - to inform point of drawl i.e. firmed up beneficiaries and
  - quantum of drawl for LTOA.
  - The request for long term open access deemed to include the request for connectivity.
  - Transmission system augmentation/ strengthening was undertaken based on long term open access,
- Short term open access was to be accommodated within the available spare capacity created for long term.

# CERC Open Access Regulations, 2008

- Transactions are categorized as Bilateral and Collective (through Power Exchange)
- NLDC was designated as the nodal agency for Collective Transactions. RLDCs were the Nodal agencies for the bilateral transactions.
- Transmission losses were applied at both the points of injection and drawl. The sellers are required to inject more and the buyers draw less than the traded quantum to compensate for the losses.
- Empowerment of the SLDCs. NOC/Standing Clearance was required to be obtained by State Utilities/Intra-State Entities from the SLDC.
- The methodology of application of transmission charges moved from "Contract Path" to a methodology closer to the "Point of Connection Charge" for Collective Transaction. A transmission charge of Rs. 100 per MWh was made payable by both the buyers and sellers in the case of Collective transactions. However at present PoC Rates are applicable separately for injection and withdrawal.

## CERC( Grant of Connectivity, Long-term Access and Medium-term Open Access in Inter-State Transmission and related matter) Regulation 2009

- Introduced Connectivity as a separate product
- Introduced Medium-term Open Access
- Introduced Long-term Access to Target Region

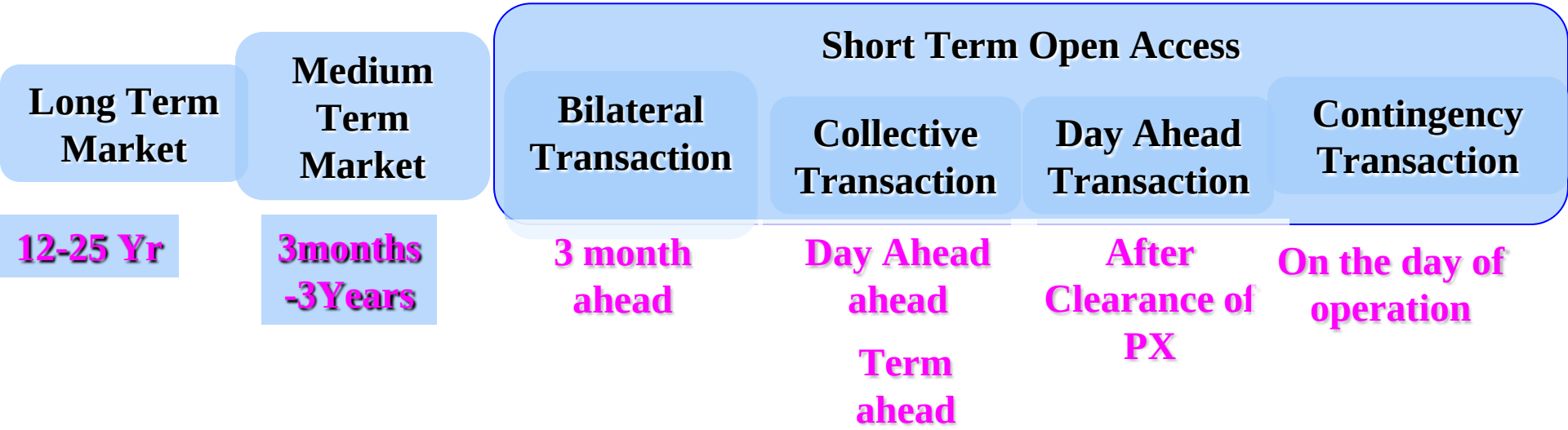
# Market Design conceived for the Power Sector

- Future procurement of power by Discoms through competitive bidding under Case1and Case 2
  - preferably for long term
  - Procurement to be in line with demand
- Adequate generation capacity addition commensurate with demand
  - Major capacity to be tied up in long term
  - Adequacy of fuel resources
  - Connectivity to the transmission network

# Market Design conceived for the Power Sector

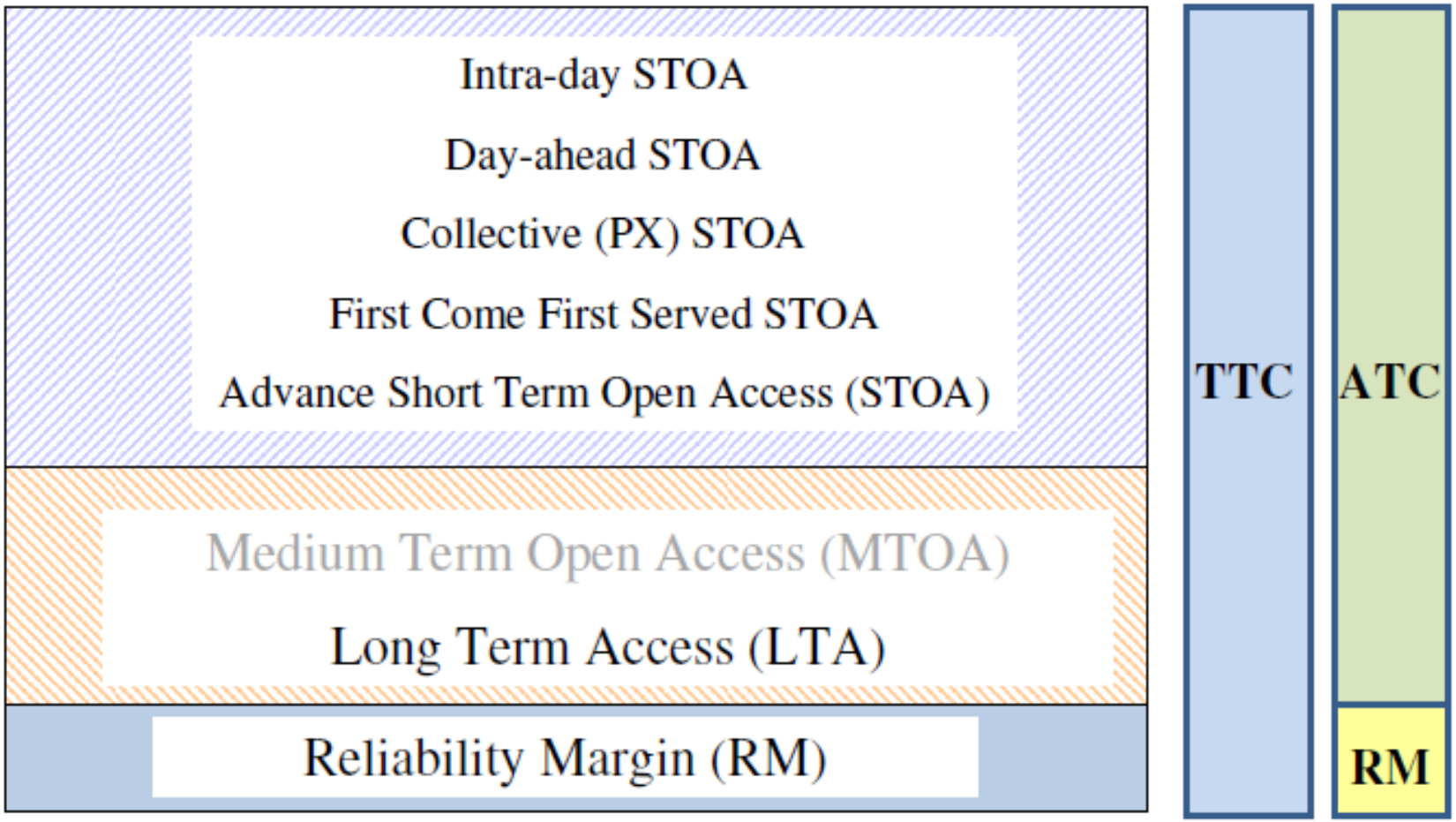
- Non- discriminatory Open Access in transmission and distribution
  - Long term Access (LTA-point to point)
  - Long term access ( LTA to a region)
  - Medium term Open Access
  - Short term Open Access
    - Bilateral
    - Through Pxs
- Augmentation of transmission network/ capacity
  - Co-ordinated transmission planning
  - Based on long term tie ups
  - Injection point and drawl point should be known well in advance- deterministic planning approach
  - Quantum of injection/drawal should be known

# Present Market at a Glance




**Schedules**

**Deviation Settlement Mechanism**
**( Real Time Operation )**




**Available Transfer Capability is**

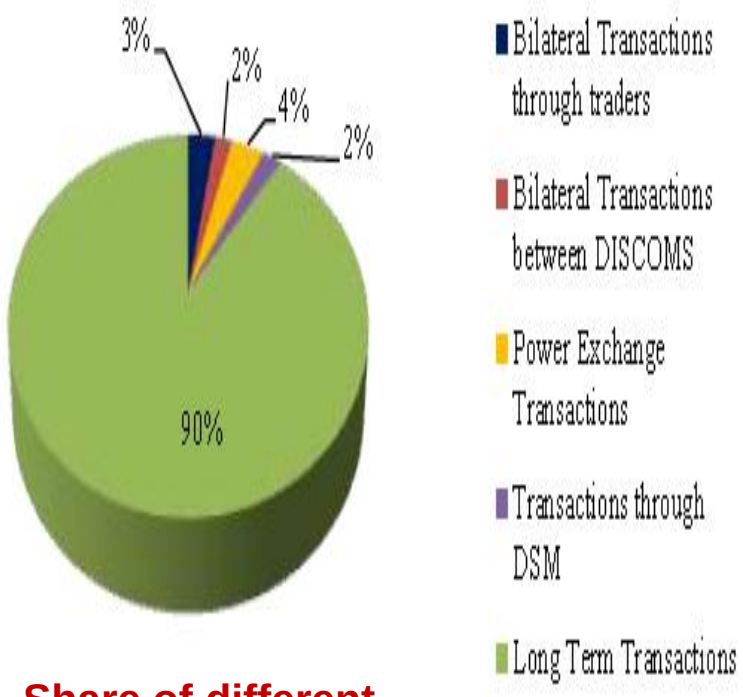
**Total Transfer Capability less Reliability Margin**

# Nodal Agency

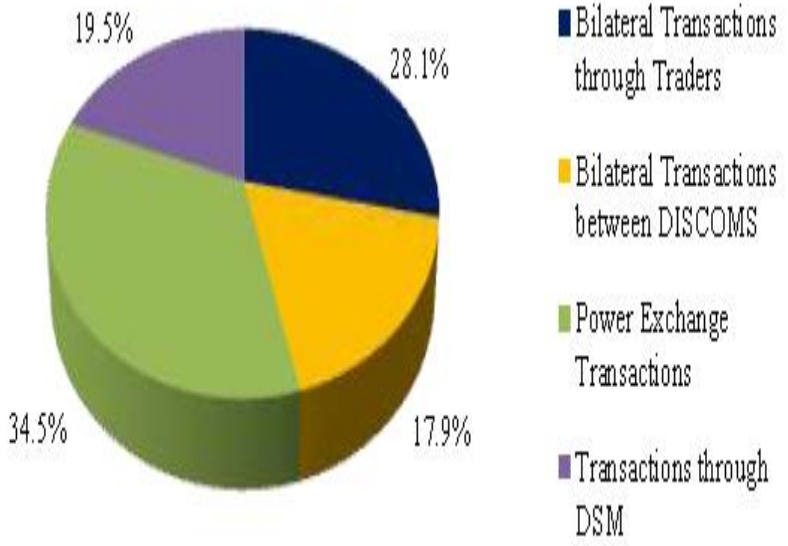
- The nodal agency for bilateral transactions shall be the Regional Load Despatch Centre of the region where point of drawal of electricity is situated and
- in case of the collective transactions, the nodal agency shall be the National Load Despatch Centre.
- For Long & Medium Term Customers Nodal Agency is Central Transmission Utility (CTU),

# Snap shot of Open Access in India

# Market Segment-wise Trading Volume



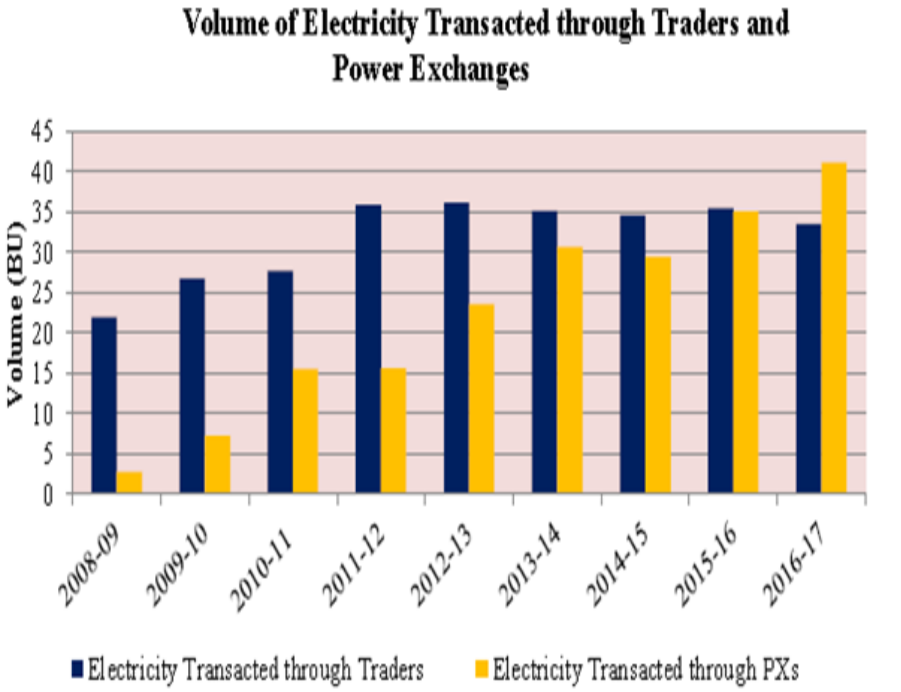

**Share of different Market Segments in Overall Transactions**

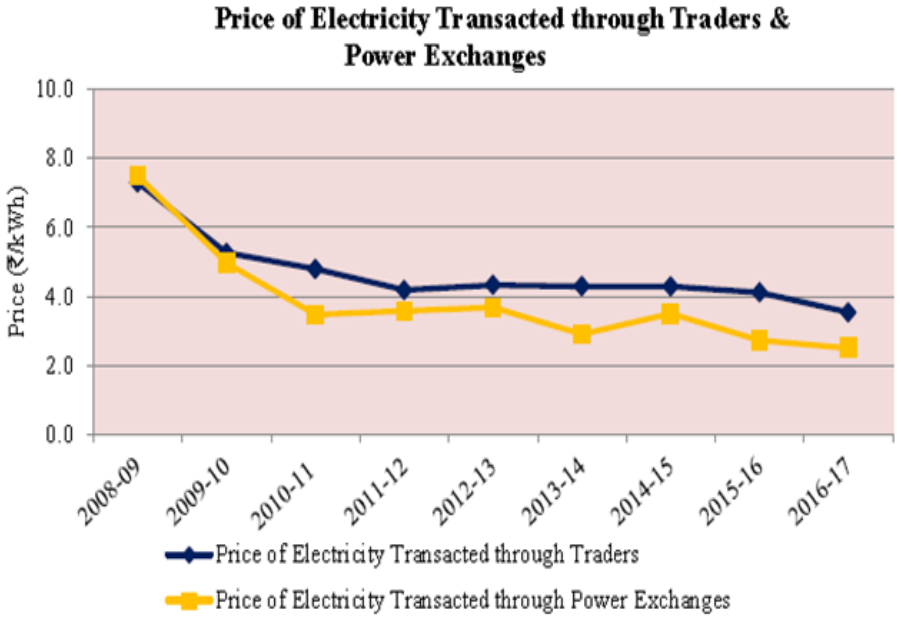



**Share of Different Market Segments in Short Term Transactions**

# Market Segment-wise Trading Volu

| Year | Volume of Short-term Transactions of Electricity (BU) | Total Electricity Generation (BU) | Volume of Short-term Transactions of Electricity as % of Total Electricity Generation |
|---|---|---|---|
| 2009-10 | 65.90 | 768.43 | 9% |
| 2010-11 | 81.56 | 811.14 | 10% |
| 2011-12 | 94.51 | 876.89 | 11% |
| 2012-13 | 98.94 | 912.06 | 11% |
| 2013-14 | 104.64 | 967.15 | 11% |
| 2014-15 | 98.99 | 1048.67 | 9% |
| 2015-16 | 115.23 | 1107.82 | 10% |
| 2016-17 | 119.23 | 1157.94 | 10% |



# Further Developments

# Current Market Scenario for the Power Sector

- Future procurement of power by Discoms through competitive bidding under Case 1 and Case 2 not happening as envisaged
- Generation capacity tie up by State Discoms not in line with demand projections
- Lack of transmission planning in State
- Generators are unable to tie up major capacity in long term in the absence of adequate Case 1 & Case 2 bidding-firming up of beneficiary and drawl point not happening

# Current Market Scenario for the Power Sector

- The possible reason for LTA not happening
  - Slow/Lack of development of long term market through competitive bidding due to following reasons
    - Aggressive bidding by the IPPs/ opening of PPAs due to Change in law in foreign country
    - Delay in execution or development of project due to domestic coal shortages and domestic gas shortages, High cost of imported fuels and Opening of PPAs
    - Review of Standard bidding documents for the competitive bidding
  - Apathy of Developers/Buyers to enter into long term commitment of supply of power due to poor financial condition of most of the discoms and high cost of imported fuels
  - Apathy of Buyers to enter into long term commitment specially in case of high cost power
  - To avoid payment of Transmission Charges in the absence of Long term agreements for supply of power
  - Termination of long term PPAs by IPPs with an eye on short term market

# Recent Development

- Staff paper of CERC on Connectivity, open access and GNA
- Mata Prasad Committee on Connectivity and Open Access
- Draft CERC Regulation on Connectivity and GNA

# GNA: Benefits

- A market friendly transmission service product
- More accountability of planners to anticipate and remove congestion
- A new and dynamic approach to planning required for GNA would help in improving system reliability
- GNA is point based. PoC pricing is also point based. Thus the users will be able to get the full benefit of PoC transmission pricing which is free from pan caking

# GNA: Benefits to Generators

- Generators to get all India access with flexibility to change point of drawal
- Generators not be liable to pay for notional point of drawal charges
- Generators will not have to declare target beneficiaries
- Connectivity will be linked to GNA so that it does not result in congestion

# GNA: Benefits to Drawing Entities

- Can get the system created for buying power from anywhere in the market.
- Reliable access for short term and medium term market. This will be a great comfort to OA consumers as well as Discoms.
- States empowered to determine their GNA requirement and get the ISTS built for it.
- Drawing entities will also be allowed to import power beyond GNA subject to margins. The transmission premium will go to the GNA holders.
- Discoms will be able buy cheap power with certainty through the PX where the competition is intense which will benefit the consumers.

# Status of Railway

# Provisions of Railways Act

- Section 2(20): Defines Government Railway to mean “railways owned by Central Government
- Section 2(31): railway means a railway, or any portion of a railway, for the public carriage of the passengers or goods, and includes-

---

---

(c) all electrical traction equipment's, power supply and distribution installations used for the purposes of, or in connection with, a railway;

# Provisions of Railways Act

- Section 11(g):
  - “erect, operate, maintain or repair any electric traction equipment, power supply and distribution installation in connection with the working of the railway;

# 3rd Proviso to Section 14 of EA 2003

- "Provided also that in case an Appropriate Government transmits electricity or distributes electricity or undertake trading in electricity, whether before or after the commencement of this Act, such Government shall be deemed to be a licensee under this Act, but shall not, be required to obtain a licence under this Act."

# Section 173 of EA 2003

- “173. Inconsistency in laws

  Nothing contained in this Act or any rule or regulation made thereunder or any instrument having effect by virtue of this Act, rule or regulation shall have effect in so far as it is inconsistence with any other provisions of the Consumer Protection Act, 1986 or the Atomic Energy Act, 1962 or the Railways Act 1989.”

# CERC Order dated 5.11.2015 in Petition No 197/MP/2015

- Railway is an authorized entity under the Railways Act to undertake transmission and distribution activities in connection with the working of railways, independent of its status under the Electricity Act. (Supreme Court Judgment in UOI Vs UPSEB)
- The Railway is a deemed licensee under third proviso to Section 14 of the Electricity Act and no separate declaration to that effect is required from the Appropriate Commission.

# CERC Order dated 5.11.2015 in Petition No 197/MP/2015

- All concerned RLDCs, State Transmission Utilities and SLDCs were directed to facilitate long term access and medium term access in terms of Connectivity Regulations from the generating stations or other sources to the facilities and network of Indian Railways.

# Thanks

scschandra@hotmail.com