



# Short Term Power Procurement and Open Access

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We bring life  
to power

- **PTC Overview**
- **Indian Power Market and Short term Power Procurement**
- **Deliberation on Short term Power Procurement**
- **Open Access for Short term Power Procurement**
- **Deliberation on Issues and proposed Remedial measures in Short Term Power Procurement**

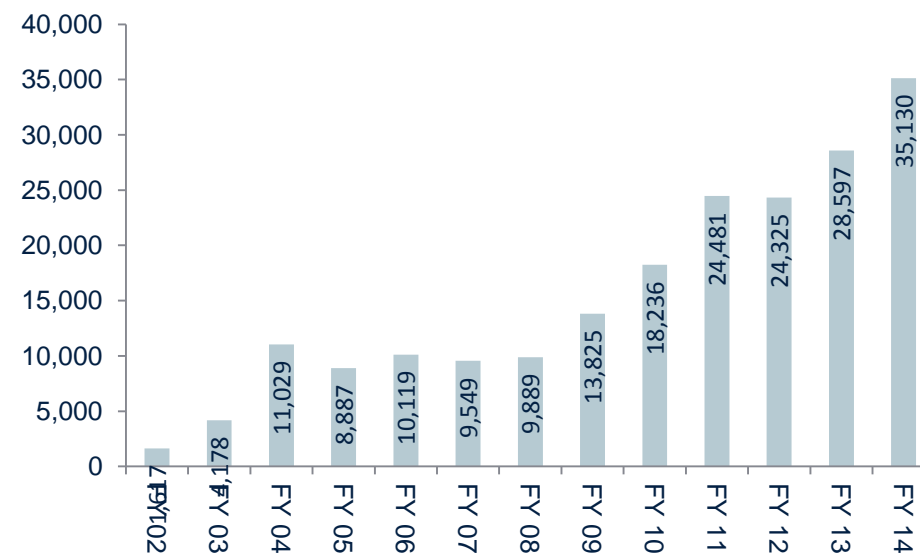
# PTC Overview

## Genesis of PTC

- Set up in 1999 at the initiative of Government of India with the following objectives:
  - Promoting power trading to optimally utilize the existing resources;
  - Facilitate development of power projects under private sector
  - Development of power market for market based investment in the Indian Power Sector; and
  - Promote exchange of power with neighboring countries.
- Promoted by industry participants with a credible track record and significant sector experience
  - **NTPC** - India's leading power generator
  - **POWERGRID** - India's largest Central Transmission Utility (CTU)
  - **PFC** – Development Financial Institution (DFI) dedicated to the power sector
  - **NHPC** -Leading hydroelectric power generator in India
- Played a pivotal role in creation of power market in India
  - Sale of MUs increased from 1,617 MUs\* in FY 2002 to 35,130 MUs in FY 2014
  - Revenue for FY2014 - INR 11510 Crs.

\* MUs: Million Units

## PTC Today



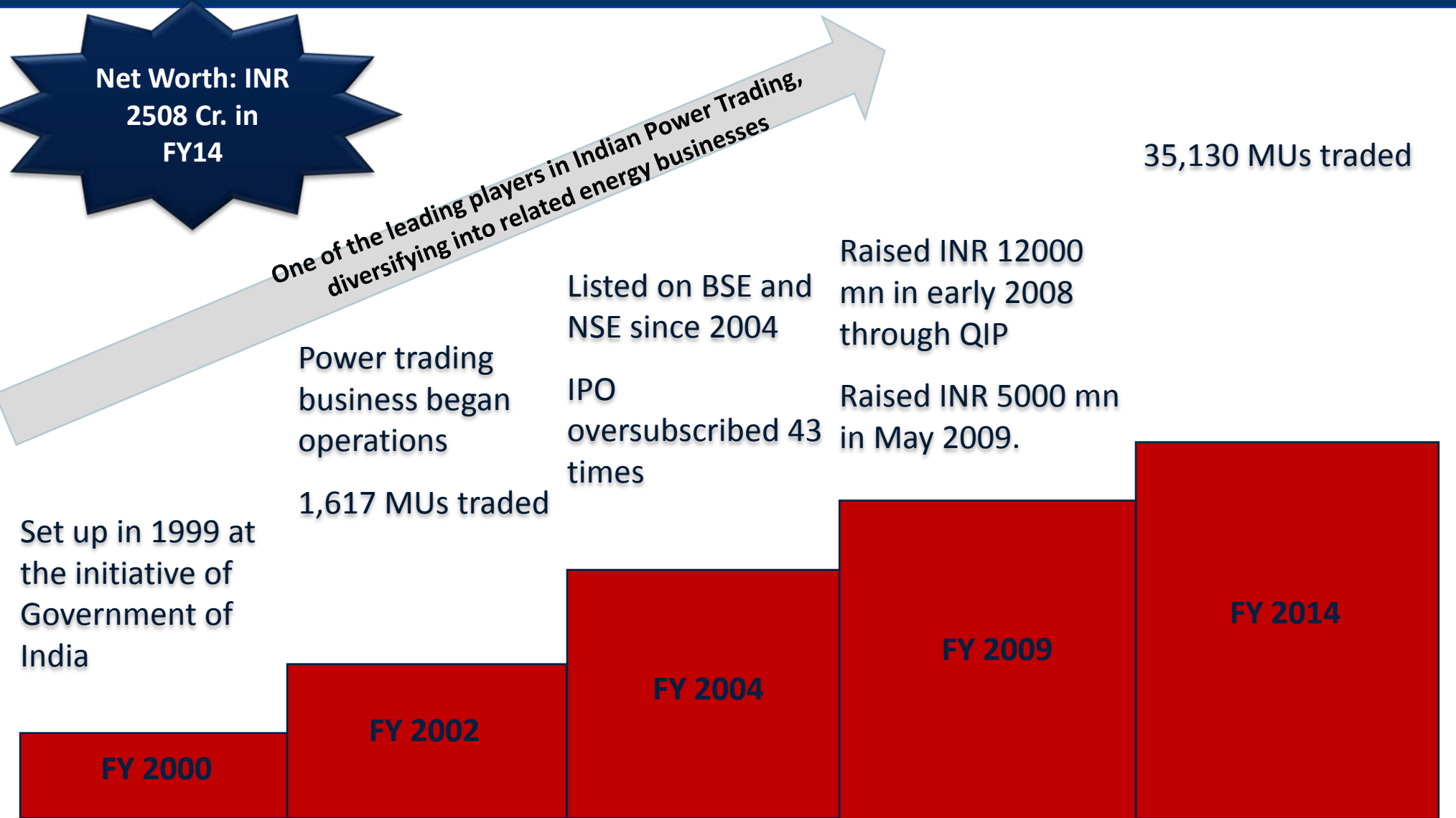
Total MUs Traded

# PTC- An integrated Energy Player



- **Presence across different value chains of Power Industry**
  - PTC India Financial Services Ltd
  - PTC Energy Limited
  - Equity investments in various Power Projects
  - Cross Border operations- Nodal Agency for Power Trade with Bhutan and Nepal
    - Tala ( 1020 MW)
    - Chhukha (336 MW)
    - Kurichhu (60 MW)

# Proven Track Record of Value Creation



# Pioneer in Power Trading Concept



- Market leader in power trading for more than a decade with transactions cover most of the State Electricity Utilities in the country and all five electricity Regions.
- Credited to deliver various innovative products to Indian power market: RTC, Evening or Morning peak/Afternoon or Night off-peak power, Energy Banking ,Power tolling etc.
- Finalized Long term Power Supply agreements of over 6500 MWs for Long term contracts
- Nodal Agency for Cross Border trade with Nepal and Bhutan
- Undertakes supply of power from Tala (1020 MW), Chukha (336 MW) and Kurichhu (60 MW) Hydro Electric projects in Bhutan. (Around 5000 MUs every year).
- Supplies short term power to Nepal every year during winters. PSA signed with NEA for export of 150 MW coal-based thermal power on long-term basis. The power may start flowing in next 2-3 years. PTC is a member of Indo-Nepal Power Exchange Committee
- PTC has received Lol from Bangladesh for supply 250 MW power for a period of three years starting from November 2013, being supplied through 400kV Baharampur (India)- Bheramara double circuit line

# **Indian Power Market and Short term Power Procurement**



# Power Supply position in India

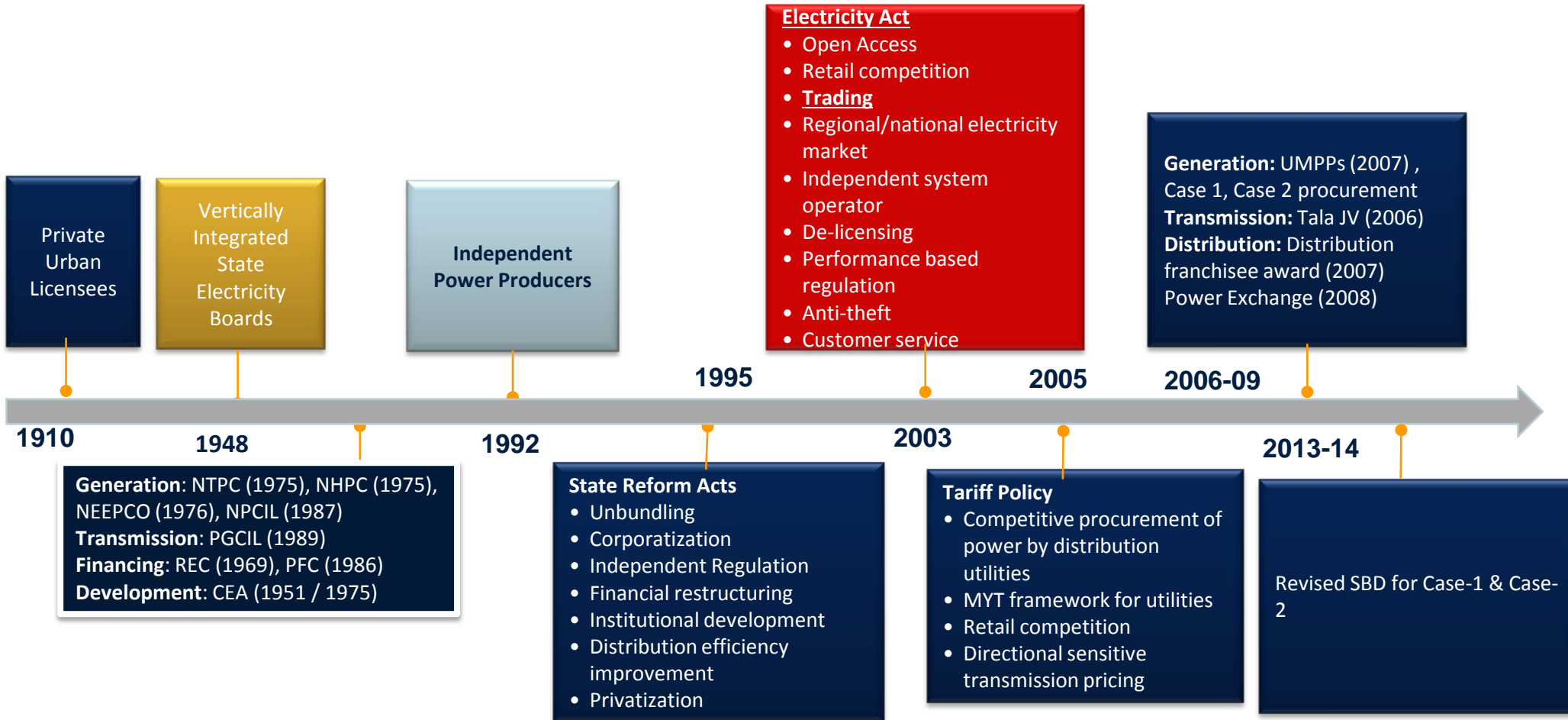
## All India Installed Capacity (MW) – Sector Wise as on 30.11.2014

Sector	Thermal				Nuclear	Hydro	RES	Grand Total
	Coal	Gas	Diesel	Total				
Central	46525	7428	0.00	53953	4780	10622	0.00	69356
State	55890	6974	602	63467	0.00	27482	3803	94753
Private	51155	8568	597	60320	0.00	2694	2788	90902
All India	153570	22971	1199	177741	4780	40798	31692	255012

## Supply Demand Scenario

	Energy				Peak			
	Required	Available	Surplus/Deficits		Demand	Peak Met	Surplus /Deficit	
	(MU)	(MU)	(MU)	(%)	MW	MW	MW	%
2009-10	830594	746644	-83950	-10.1	119166	104009	-15157	-12.7
2010-11	861591	788355	73236	-8.5	122287	110256	-12031	-9.8
2011-12	937199	857886	79313	-8.5	130006	116191	-13815	-10.6
2012-13	998114	911209	86905	-8.7	135453	123294	-12159	-9
2013-14	1002045	959614	42431	-4.2	135918	129815	-6103	-4.5

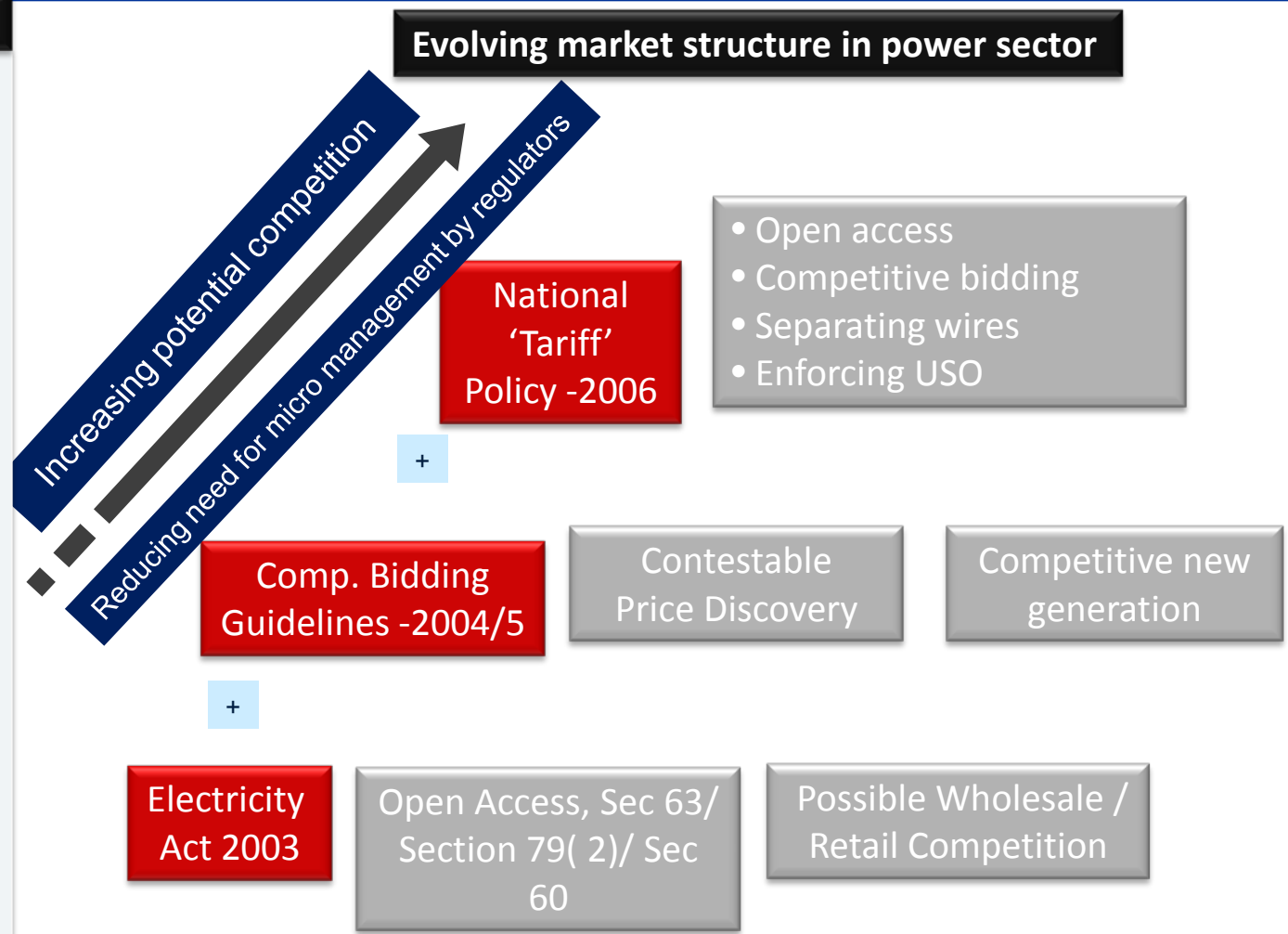
# Legislative Background



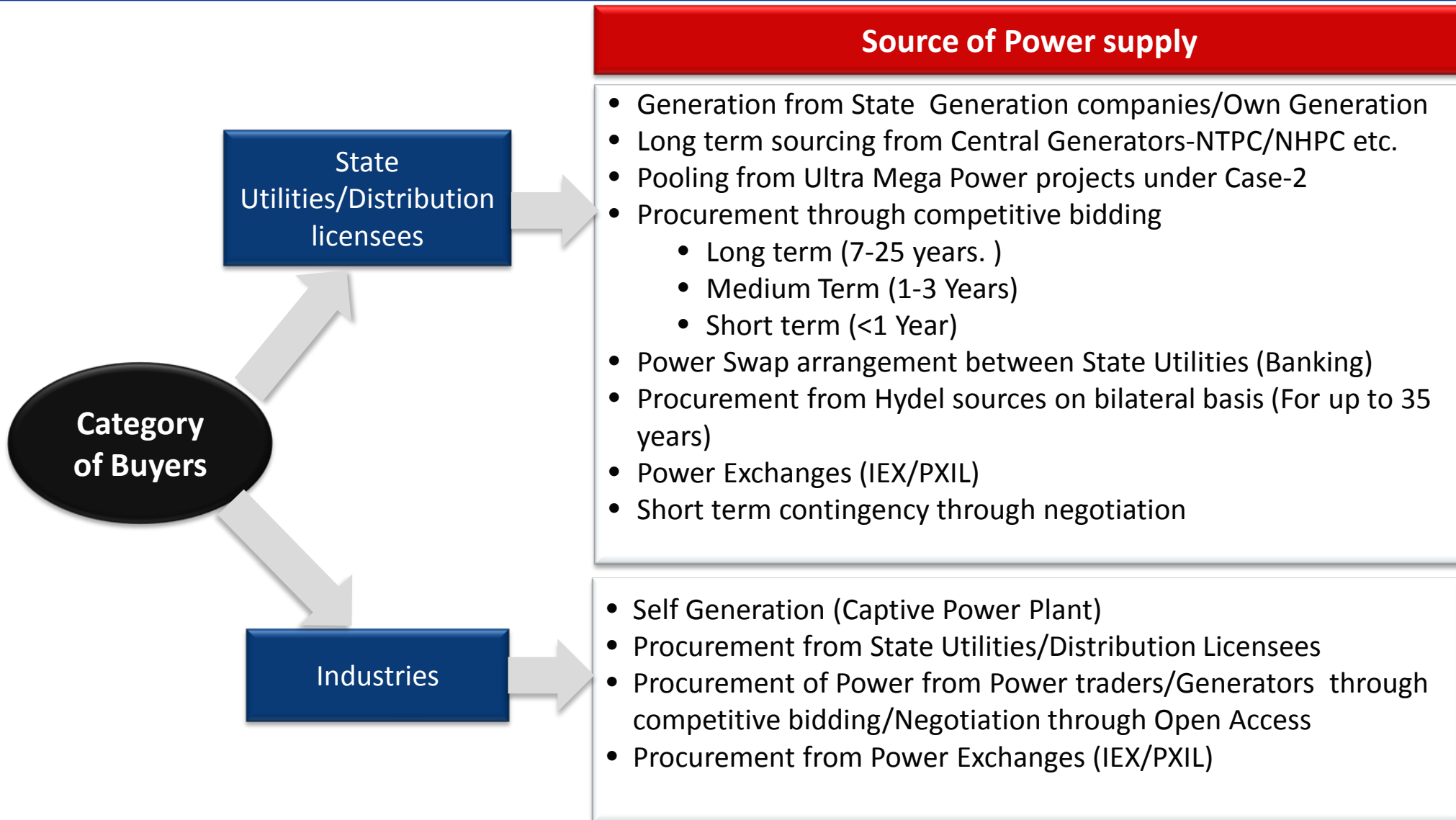
# The Reforming Power Sector in India - Evolving towards creating a competitive market structure in all segments

## Policy actions

- ◆ **EA 2003 introducing**
  - Non-discriminatory open access transmission
  - Sec 63 - ERCs to follow competitive bidding process
  - Sec 79(2) - CERC to advise Gol on promoting competition
  - Section 60 – Controlling abuse of market power
  
- ◆ **Competitive Bidding Guidelines - 2004/5 –**
  - Competitive acquisition of new generation
  
- ◆ **National Tariff Policy – 2006**
  - Promoting retail competition
  - Supporting competitive acquisition of generation capacity
  - Enabling choice



**CERC's advice to MoP to procure power only through competitive bidding from January 2011 is the testimony to this**



# Indian Power Market: Components

## Bilateral Trading (Through Traders)



- Largest component of Short-term Market
- Facilitated by traders
- Negotiable Contracts
- Long-term/Medium-term (Case-1)/Short-term
- Banking transactions

## Direct Bilateral Trading



- Directly between Utilities or between generators and Utilities
- Banking transactions

## Power Exchanges



- Day Ahead Market
- Term Ahead Market
- Various Open Access Consumers

Trading is done through Power Traders as well as through direct participation

# Design of Indian Power Market

Nature of Contract	Duration of Contract	Transmission Open access availability
Long Term	> 7 years and up to 25 years (35 years for Hydro)	Long term open access is available for a period of 12 years to 25 years
Medium Term	> 1 years and up to 7 years	Medium term open access is available for a period of 3 months to 3 years
Short Term –Bilateral	Upto 1 year	For a period of up to 3 months
Short Term –Power Exchange	Day Ahead Market (1 day)	1day (corridor left after short term bilateral)
	Term Ahead Market (up to 7 days)	Up to 7 days in advance
Deviation Settlement Mechanism	Real time balancing mechanism for settling deviation from schedule	

# Short term Power Market- A Snapshot



Year	Total ST (BU)	% of Total Electricity Generation	Through Trader (BU)	Through PX (BU)	Trader+ PX (BU)	% of Short Term	Top 5 trader
2008-09	51.43	7%	21.92	2.77	24.69	48%	79.80%
2009-10	65.9	9%	26.72	7.19	33.91	51%	83.32%
2010-11	81.56	10%	27.7	15.52	43.22	53%	85.43%
2011-12	94.51	11%	35.84	15.54	51.38	54%	78.49%
2012-13	98.94	11%	36.12	23.54	59.66	60%	70.41%
2013-14	104.64	11%	35.11	30.67	65.78	62.8%	68.37%

*Emergence of a robust PX Marketplace!*

# Expanding Short term market

## Market Size

Term	Size of bilateral trader Market (Rs. Crore)	Size of Power Exchange Market (Rs. Crore)	Total Size of Market (Rs Crore)
2010-11	13268	5389	18657
2011-12	14979	5553	20532
2012-13	15624	8648	24272
2013-14	15061	8891	23952

## Tariff trend

Term	Bilateral trader(Rs./kWh)	Power Exchanges (Rs./kWh)	UI (Rs./kWh)
2010-11	4.79	3.47	3.91
2011-12	4.18	3.57	4.09
2012-13	4.33	3.67	3.86
2013-14	4.29	2.90	2.05



# **Deliberation on Short term Power Procurement**

# Short term Power procurement- Mechanism

## Power Exchanges

Day-Ahead-Market (DAM)	<ul style="list-style-type: none"> <li>▪ Trading of 15 minute contracts</li> <li>▪ Double-sided anonymous auction bidding process</li> <li>▪ Clearance obtained from SLDC by buyers and sellers based on availability of network and ABT meters</li> <li>▪ Congestion Management through market splitting and determining Area Clearing Price (ACP) specific to an area</li> </ul>
Term-Ahead-Market (DAM)	<ul style="list-style-type: none"> <li>▪ Trading of Region specific contracts</li> <li>▪ Firm Delivery</li> </ul> <p>The contracts under Term Ahead Market can be used to ensure delivery of electricity for a few days in advance.</p> <ul style="list-style-type: none"> <li>▪ Delivery Blocks:   RTC   Day   Night   Peak   Hourly  </li> <li>FBA -- Firm Base – 24 Hrs.</li> <li>FNT -- Firm Night – 8 Hrs. (0-7 &amp; 23-24)</li> <li>FDY -- Firm Day – 11Hrs. (7-18)</li> <li>FPK -- Firm Peak – 5 Hrs. (18-23)</li> </ul>

# Short term Power procurement- Mechanism

## Bilateral

Contingency	<ul style="list-style-type: none"> <li>▪ By Utilities mainly for meeting contingency demands</li> <li>▪ Utilities finalize the tariff based on prevailing market condition within a blanket tariff approval given by SERCs</li> </ul>
Contracts for more than 15 days to 1 year	<ul style="list-style-type: none"> <li>▪ Under the provision of Section 63 of EA 2003</li> <li>▪ MoP has issued Guidelines for Short term power procurement (SBD) by Distribution licensees through tariff based Competitive bidding process in May 2012</li> <li>▪ Almost all Utilities nowadays are referring to the SBD with some modification as suitable to them (<a href="#">Comparision</a>) (<a href="#">SBD Vs. various NITs</a>)</li> </ul>
Power Banking arrangement	<ul style="list-style-type: none"> <li>▪ Utilities enter into power swap agreement to utilize the seasonal variation in their load pattern</li> <li>▪ Forward banking Utility returns the banked energy to other utility with some agreed premium at a pre decided date</li> <li>▪ Undertaken directly or through Power Traders primarily on negotiation basis</li> <li>▪ Need of a transparent guideline for Swap arrangement is felt</li> </ul>

# **Open Access for Short term Power Procurement**

# Open Access –Regulatory framework

- Availability based tariff (ABT) introduced in 1998.
- ***ABT is a commercial mechanism in which fixed and variable cost components are treated separately. And variable cost is paid as per the schedule and the Difference between schedule and actual is paid as per system condition(Frequency) known as unscheduled interchange(UI). Power is scheduled by SLDC's on merit order based on the variable cost.***
- All earlier Acts and Rules enacted were repealed by enactment of Electricity act 2003
- CERC (Procedure, Terms & Conditions for grant of Trading License and other related matters) Regulations, 2004.
- CERC (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010.
- CERC (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations,2009.
- CERC (Deviation Settlement Mechanism and related matters) Regulations, 2014.
- CERC Open-Access regulation,2008-included collective transaction for mechanism of operation of PX keep the identity of buyer/ seller unknown to bidders
- CERC (IEGC) regulations 2010 (IEGC Grid code)

# Open Access –Short term

- **ADVANCE SCHEDULING:**
  - Three months in advance (Month wise Transactions)
- TimeLine for submission **Last date for submission (-10/-5/0 days prior to end of current month MO– for transaction in M1,M2,M3)**
- Cut-off time of application:17:30Hrs. Of last day (Day0)
- **Request for concurrence(RLDC)–by12:00Hrs. Next day (Day1)**
- Concurrence-by 20:00 Hrs (Day1)
- **Congestion Information to Applicant by nodal RLDCs–Next day12:00 Hrs (Day2)-Format-IV (Congestion information-Advance scheduling)**
- Revised Request–next day 11:00 Hrs. (Day3)-Format-V-Request for revision due to congestion)
- **E-bidding–in case of Congestion (Day4)**
- Acceptance/Refusal of Scheduling Request –(Day5) -Format-VI-Acceptance for scheduling by nodal RLDCs.

# Open Access –Short term

- **FIRST-COME-FIRST-SERVED**

**FCFS shall be considered only when transactions are commencing & terminating in the same calendar month**

- Processing time –3 clear days on submission of Application
- Application received up to 1730 hrs in a day to be processed together –same priority
- Application Received after 17:30 Hrs. -to be considered as received next day
- Congestion Management –pro-rata

# Open Access –Short term

## Day Ahead Bilateral Transaction

- Applications received within 3 days prior to the day of Scheduling and upto 15:00 Hrs. of the day immediately preceding the day of scheduling shall be treated as same priority
- Processing only after approval of the Collective Transactions of the Power Exchange(s)

## Contingency/Same Day Transactions

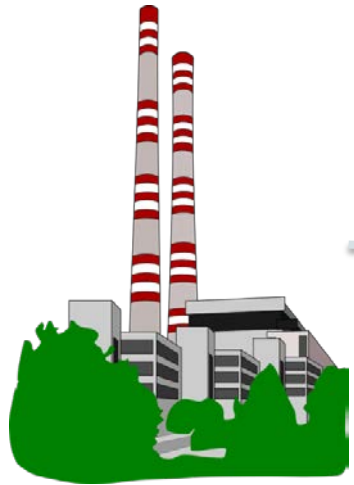
- Application to the Nodal RLDC To be considered after 1500 hrs. of the day immediately preceding the day of scheduling
- In case of Intra-day/same day–scheduling from 6<sup>th</sup> time block



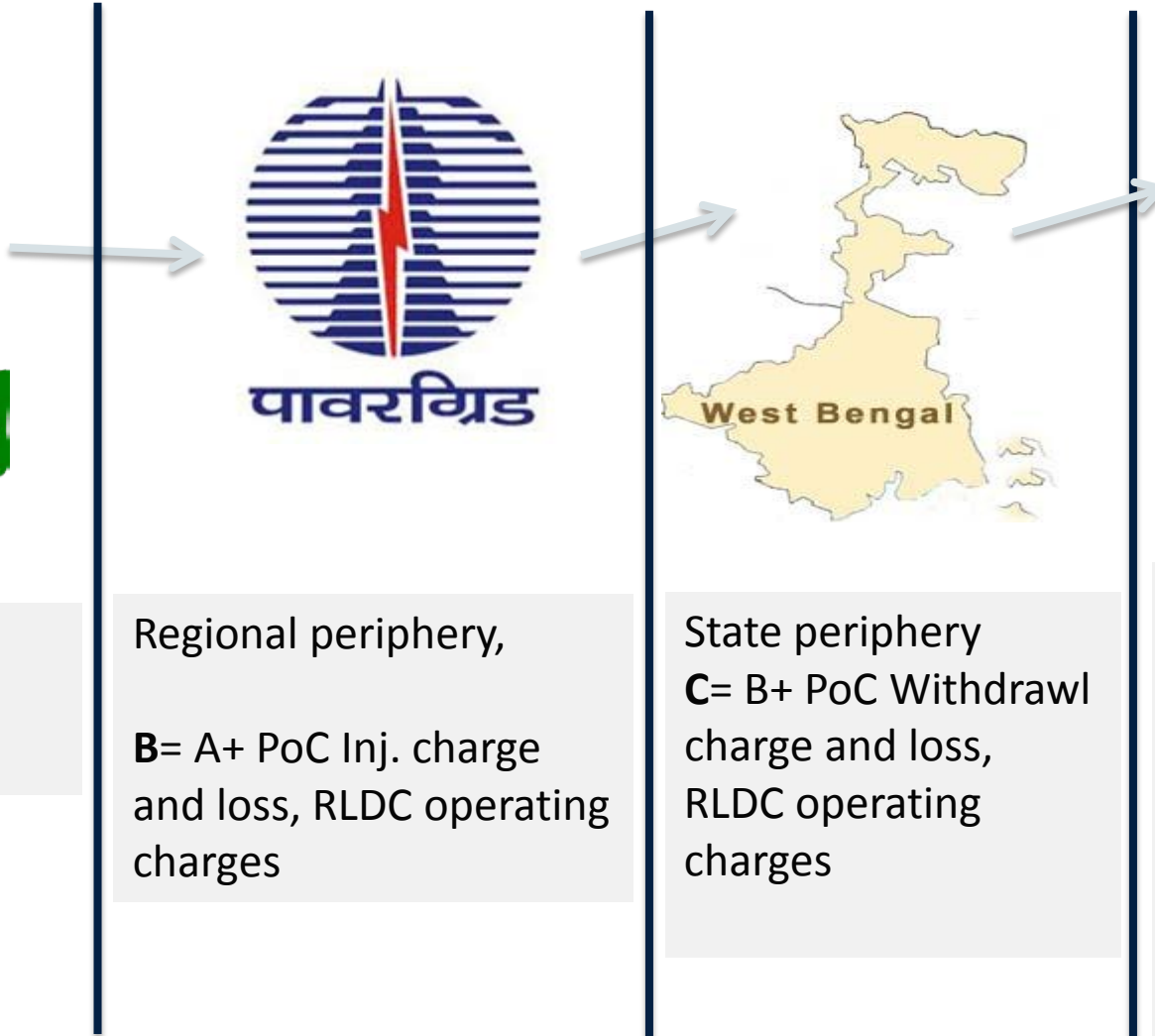
# E-Bidding for Congestion

- Invitation of Bids from the concerned applicant
  - Period of congestion
  - RTS/IR corridor –expected to get over stressed
  
- Only Registered Users User ID & Password
  - Electronic submission –website of CTU
  - Bid Closing time as specified
  - Single Price Bid
  - No Modification/withdrawal once submitted
  
- Bid Price-in addition to Open Access Transmission Charges
- Multiples of Rs.10/MWh. (Min.Rs.10/MWh)
- Mandatory-Non-participation–Rejection of Application
- Acceptance-Decreasing order of Price Quoted
- Equal Price Bids–Pro-rata
- Applicants getting less quantum than applied shall pay the charges quoted by him.
- Applicant getting equal quantum of what sought by him shall pay the charges quoted by the last Applicant getting approval of its full scheduling request.

# Landed tariff Calculation



Delivery point-  
Plant Periphery  
Tariff- **A**/Unit



Regional periphery,  
**B**= A+ PoC Inj. charge  
and loss, RLDC operating  
charges

State periphery  
**C**= B+ PoC Withdrawl  
charge and loss,  
RLDC operating  
charges

Consumer plant  
periphery  
**D**= C+ State  
Transmission charge  
and loss +  
SLDC operating charges  
+ ED+ CSS

# Short term Open Access – Operation

Concurrence from DIC as per FORMAT-II (Bilateral) by Buyer/Seller or by Trading Licensee on behalf of Buyer/Seller

Application to Nodal RLDC as per FORMAT-I (Bilateral) for Acceptance of Schedule and reservation of Transmission Corridor

Acceptance by Nodal RLDC and issue of Open Access Charges as per FORMAT-VI (Bilateral)

Physical flow of power through the reserved transmission corridor.  
Payment of Open Access Charges to Nodal RLDC within 3 days of issuance of Acceptance of Schedule

Provisional Billing by Trading Licensee based on implemented schedules issued by Nodal RLDC.

Final Settlement of bill by incorporating the actual energy flow based on Regional Energy Account (REA) issued by Regional Power Committees (RPC)

# **Deliberation on Issues and proposed Remedial measures in Short Term Power Procurement**

- Poor financial health of Utilities
- Inadequate fuel availability
- Inadequate transmission capacity
  - Little margin in transmission network for short term transactions
  - Bottleneck in State transmission infrastructure
- Grid Uncertainty
  - Most of the industries not on independent feeders
  - In case of load shedding in there area they will also not get power
- DISCOMS charging very high stand-by charges
- High Cross subsidy surcharge
- Section 11
- Section 49 : Contract Demand Reduced. Any increase in demand leads to temporary tariff

# Transmission Constraint

Corridor	Total Transfer Capability (TTC)	Reliability Margin	Available Transfer Capability (ATC)	Margin Available for Short Term Open Access
NR-WR	2500	500	2000	945
WR-NR	4700	500	4200	0
NR-ER	2000	200	1800	1442-1507
ER-NR	3400	300	3100	369
W3-ER	1800	300	1500	1149
ER-W3	1000	300	700	0
WR-SR	2500	750	1750	0
ER-SR	2650	0	2650	65
ER-NER	650	50	600	390-460
NER-ER	540	30	510	550
S1-S2	3720	315	3405	600*

ATC for Feb 2015 \_NLDC

\* Has improved only recently due to LGBR Revision by constituents & KKNPP Unit-1, commissioning of Coastal Energen Unit-1.

# Proposed Remedial measures



- Proposed amended in Electricity Act 2003
  - Enhancing Grid safety and security: Enhanced penalties for violations of SLDCs/RLDCs
  - Separation of Carriage & Content in the Distribution sector (Supply License)
  - Promotion of Renewable Energy
    - National Renewable Energy Policy,
    - Renewable Generation Obligation
    - Cross Subsidy exemption
  - Tariff Rationalization
    - Timely filing of tariff petitions by utilities and timely disposal of the same by the Appropriate Commission.
    - Powers to Appropriate Commissions for initiating suo-motu proceedings for determination of tariff in case the Utility/Generating Companies do not file their petitions in time.
  - Promotion of Ancillary services
  - CSS not to exceed 20% of the tariff applicable to the category of consumer seeking open access
- Introduction of General Network Access – Likely to remove the existing Transmission constraint

# Thank You



# Cross Subsidy surcharge

## Existing Surcharge formula:

- $S=T-[C(1+L/100)+D]$
- S is the surcharge
- T is the Tariff payable by the relevant category of consumers;
- C is the Weighted average cost of power purchase of top 5% at the margin excluding liquid fuel based generation and renewable power
- D is the Wheeling charge
- L is the system Losses for the applicable voltage level, expressed as a percentage

## Proposed Surcharge formula:

- $S=T-[C/(1-L/100)+D+R]$
- S is the surcharge
- T is the Tariff payable by the relevant category of consumers;
- C is the per unit weighted average cost of power purchase by licensee
- D is the aggregate of transmission, distribution and wheeling charge applicable to the relevant voltage level
- L is the aggregate of transmission, distribution and wheeling losses applicable to the relevant voltage level
- Where R is the per unit cost of carrying Regulatory assets (include previously-incurred losses that are in the nature of deferred expenditure and that can be recovered from consumers in future provided allowed by regulatory authorities)

# Cross Subsidy Surcharges of various states

Indicative Cross Subsidy Charges in States	Rs. /kWh
Haryana	2.02
Punjab	1.07
Tamil Nadu	3.57
Gujarat	0.81
West Bengal	2.16
Orissa	1.97