

Open Access Regulations & Operationalization

IIT Kanpur



Pre 2003

- Bundled Utilities
- Single buyer model
- Few transactions (month-wise)
- Generation – Licensed activity

2003-2008

- Unbundling of SEBs.
- Emphasis on market Development
- Large no. of transactions – Bilateral market
- Trading on Day and ToD basis

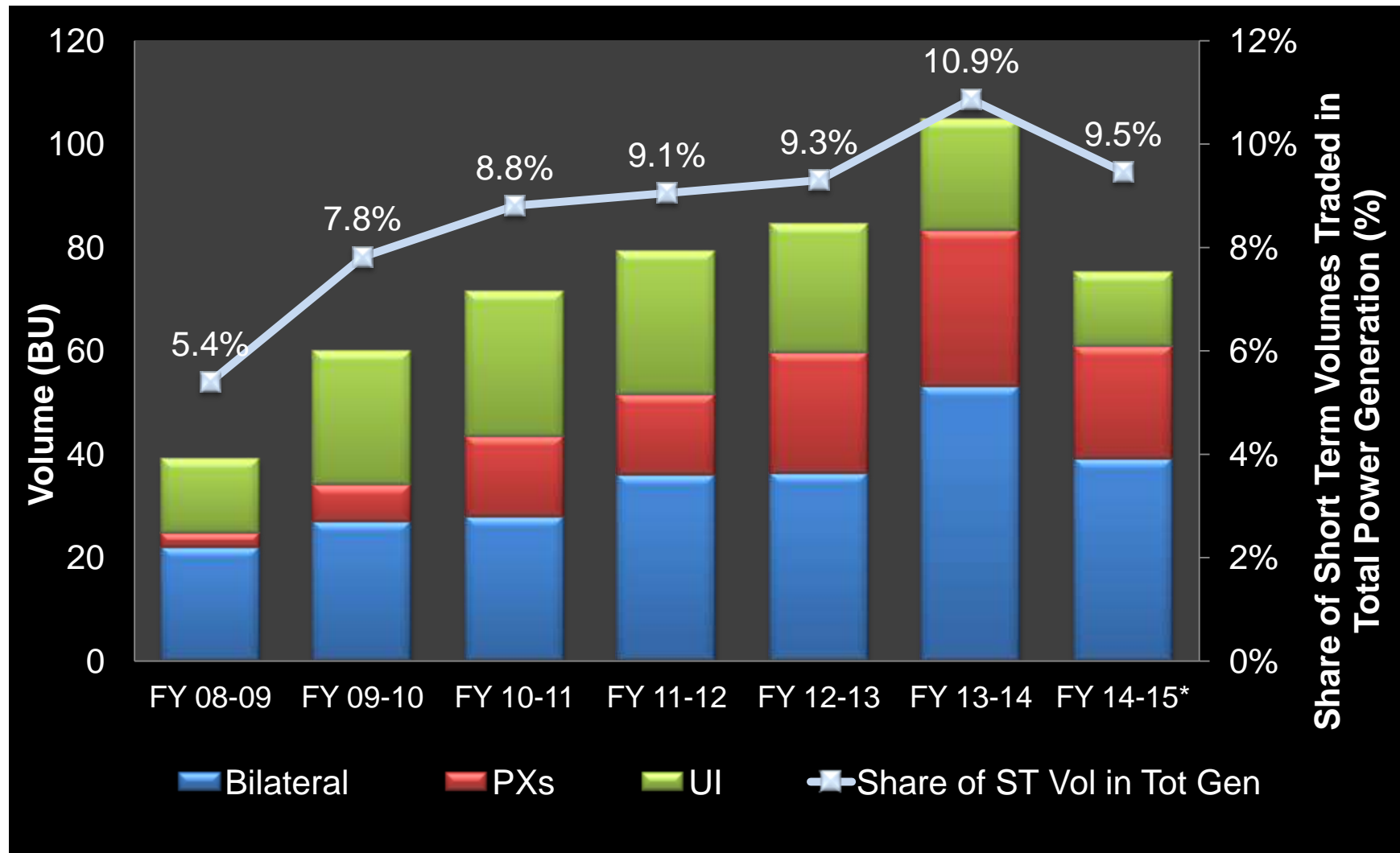
Post 2008

- Power Exchanges commence
- **Multilateral transactions**
- Different products at PXs to manage power portfolios

Electricity Act, 2003

- Intent of the Act was **to promote competition** by “freeing” all possible avenues of procurement and sale of power:
 - De-licensing of generation
 - Development of a multi-buyer multi-seller market in power
 - Trading – licensed activity.
 - **Non Discriminatory open access**
 - **Development of Power Market**
 - Section 66 of the Electricity Act 2003 gives powers to the regulatory commissions to develop the power market including trading

Growth Trend of Short Term Power Markets



Source: Monthly MMC Reports Up to Dec'14

➤ **Section 2(47) of the Act** defines Open Access to mean “*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*”

➤ Section 42 of the Act is central to open access and reads as follows:

"(2)The State Commission shall introduce open access 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 open access 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.....”

1. Generating Companies

- No license required for developing a Gen station;
- could sell power to any person through OA;
- Easy change in purchaser in the event of default in honoring contract by purchaser.

2. Consumers

- Buy power from anywhere – could explore cheaper sources; specially useful for high demand IND / COM consumers.
- Industrial houses could consolidate power supply to plants at various locations & build captive power plant to achieve economy

Why Open Access?

Provision of non discriminatory open access



Opening up of the electricity market



Increase in the choices for all the stakeholders



A vibrant, dynamic and competitive market



Supply of power to all



Optimal use of resources

Regulations for Development of Open Access

- 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 Licence 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)

Nature of Contract

Long Term

Medium Term

Short Term

Power Exchange

Tariff Structure

Two Part Tariff

Either Two part or Single
Tariff

Single Tariff

Single Tariff

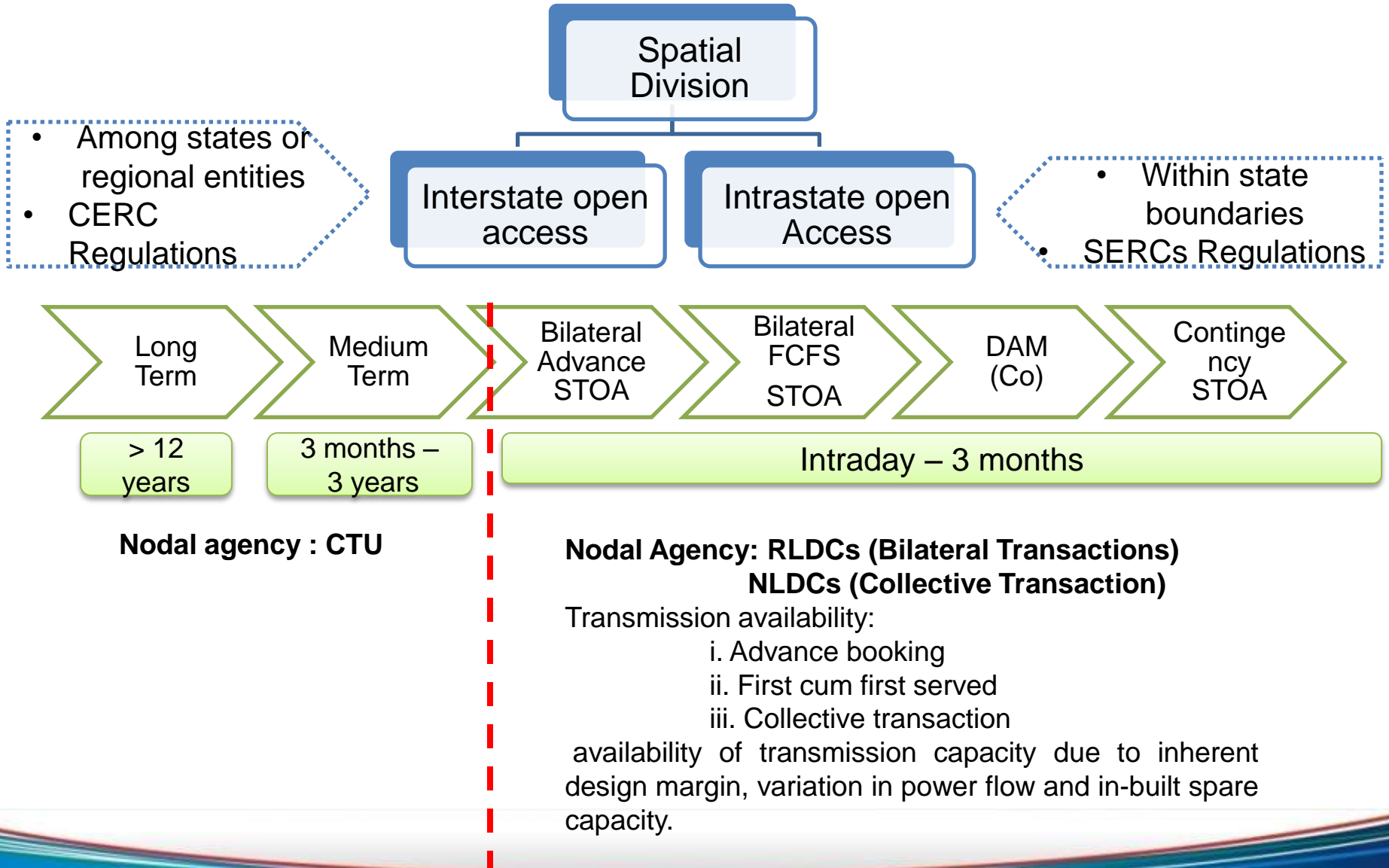
Nodal Agency

POWERGRID for **Inter state** & STUs for **Intra State**

Buyer RLDC for **Inter State** & SLDCs for **Intra State**

NLDC for “**Day Ahead Market**” & RLDCs for “**Term Ahead Market**”

Open Access Segregation



National Electricity Policy, 2005

- **~15% of new generation can be sold outside PPA**
 - To increase the depth of power markets
 - Additional alternative to generators and licensees/consumers to sell/purchase power which would facilitate reduction in tariff in long run
 - As power markets develop, financing projects with competitive generation costs outside long-term PPA would be feasible
- **Development of Power Market by Central and State Commission with due consultation with stakeholders**
- **CSS:** “the amount of surcharge and additional surcharge levied from consumers who are permitted open access should not become so onerous that it eliminates competition.....”

National Tariff Policy

- 8.3.2: Tariff to be +/-20% of cost of supply by 2010-11

Inter-State Open Access Regulatory Framework



CERC (Open Access Regulations) 2008
Last Amendment: 2013

- Specifies roles of different agencies system operators, CTU & Transmission licensees and others
- Specifies Timelines
- Provide for congestion management- Setting relative priorities
- Separate procedures for 'Day-Ahead Market (collective transactions) and OTC transactions on inherent margins

CERC (Grant of connectivity, Long Term Access and Medium Term Open Access) in inter state transmission Regulation, 2009
Last Amendment: 2013

- Nodal agency for grant of Long and Medium access: **CTU**
- Defines criteria for grant of access and application procedure for medium and long term access

Procedure for Scheduling STOA in Interstate Transmission (Collective Transaction) (Bilateral Transaction)

- **Collective Transaction:** Application procedure, treatment of losses, congestion management at PXs
- **Bilateral Transaction:**
 - Procedure for Advance Scheduling/FCFS/Day-Ahead Bilateral/Contingency Transaction

- Long-Term Access
 - Based on transmission planning criteria stipulated in the Indian Electricity Grid Code.
- Medium & Short Term Access
 - Subject to availability of transmission capacity due to inherent design margin, margin available due to variation in power flow and margin available due to in-built spare capacity.
- Allotment Priority of long term customers higher than that of Medium term & Short term customers.

Open Access in Inter-State Transmission



- Regulation Implemented w.e.f. 6-May-2004, revised Regulations w.e.f 1st April 2008 and amended in May 2009. Last amended in 2013

Products

- Monthly bilateral
 - Advance /FCFS
- Day ahead bilateral
- Collective Transactions through Power Exchange
- Intra day bilateral

Nodal Agency

- Bilateral : RLDCs & Collective : NLDC

Transmission Charges moved from “Contract Path” to “Point of Connection” for Collective/Bilateral

Other Commercial Issues

- Handling deviations from schedule
- Handling reactive energy supply/drawl
- Payment security
- Collection and disbursement of charges

- Each SERC defines the Terms and Conditions for intra-state open access regulations
- Typically the regulations define :
 - Connectivity and Technical Requirements for open access
 - Application Procedure and approvals for long term, medium and short term access for intra-state open access
 - Open Access charges applicable on the entities availing open access

- Thrust on Empowerment of SLDCs
- SLDC Concurrence [Clause 8]
 - NOC/Standing Clearance to be obtained by State Utilities/Intra-State Entities
 - Conditions to be verified by SLDC
 - Existence of metering and accounting infrastructure
 - Availability of Surplus transmission capacity
 - SLDC to communicate clearance within 3 working days
 - Deemed Clearance- in case of Non-communication
 - SLDCs may charge appropriate fee for such NOC/Standing Clearance (as per SERC or Rs. 2000 (Bilateral) or Rs. 5000 (Collective)if not notified by SERC)

Intra State OA Framework: Technical requirements

As per state specific open access regulation for northern region



States	Minimum Load	Connectivity	Meters	Feeders
Jammu & Kashmir	1 MW and Above	Minimum 11 kV	ABT Special Energy Meters	-
Himachal Pradesh				-
Haryana	Even less than 1 MW allowed			Independent feeder or Mixed Feeder (all connected to opt for OA with group contract demand above 1 MW)
Punjab	1 MW and Above			Independent or Mixed Feeder
Chandigarh				-
Uttarakhand	100 kVA and above			Not a requirement
Delhi	1 MW and Above	ABT Special Energy Meters	-	
Rajasthan			-	
Uttar Pradesh			-	



Open Access: Current Scenario

Status of Open Access

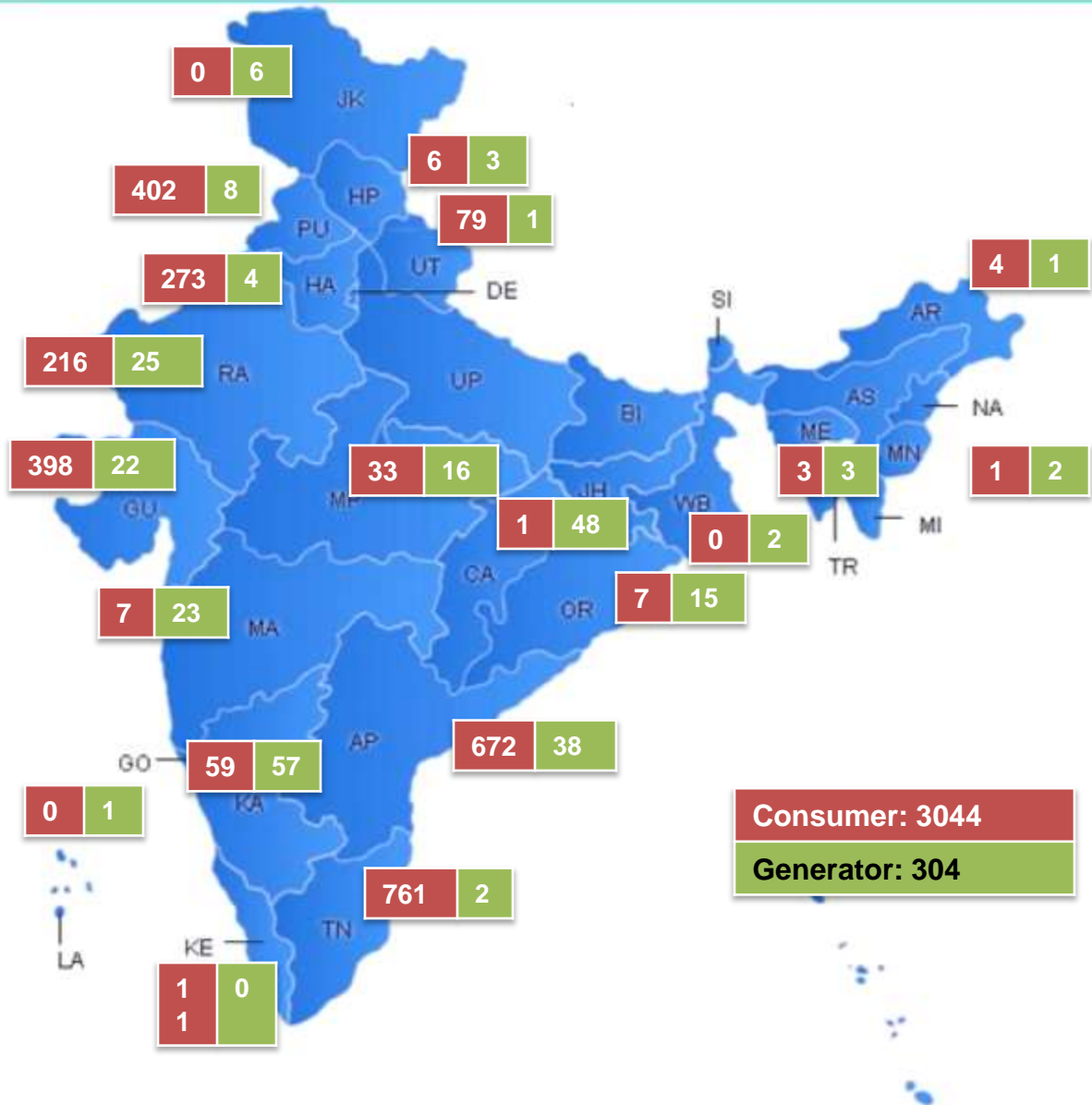
- Electricity Act, 2003 envisages States to implement open access for 1MW+ customers by Jan, 2009

- IEX pioneered operationalisation of retail open access, first transaction was in August, 2009

- Several operational and regulatory impediments have led consumers to choose **partial** open access and **not full** open access

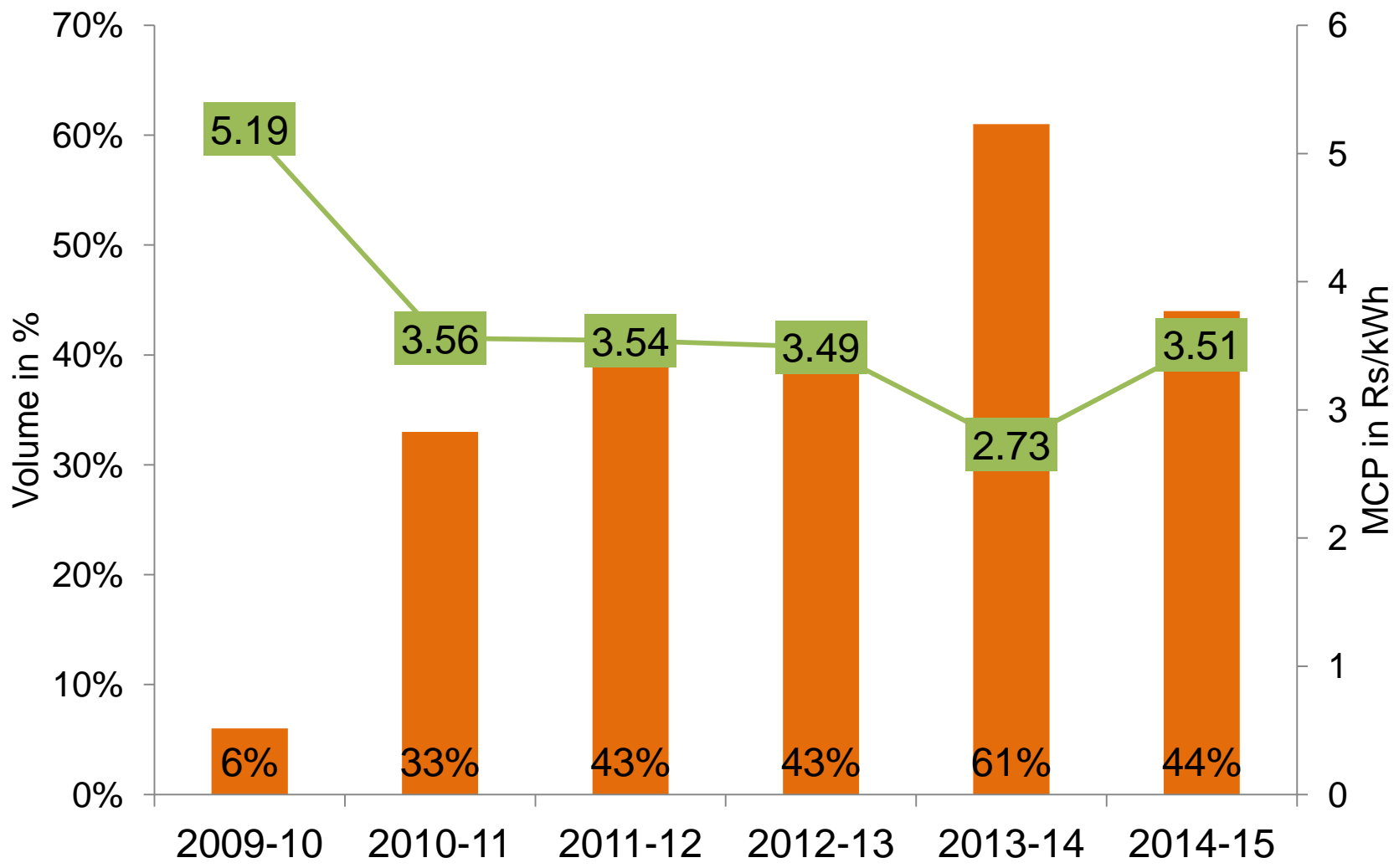
- Consumer maintains its supply agreement with local distribution company and **leverages market for economical and contingency power.**

Participation at IEX

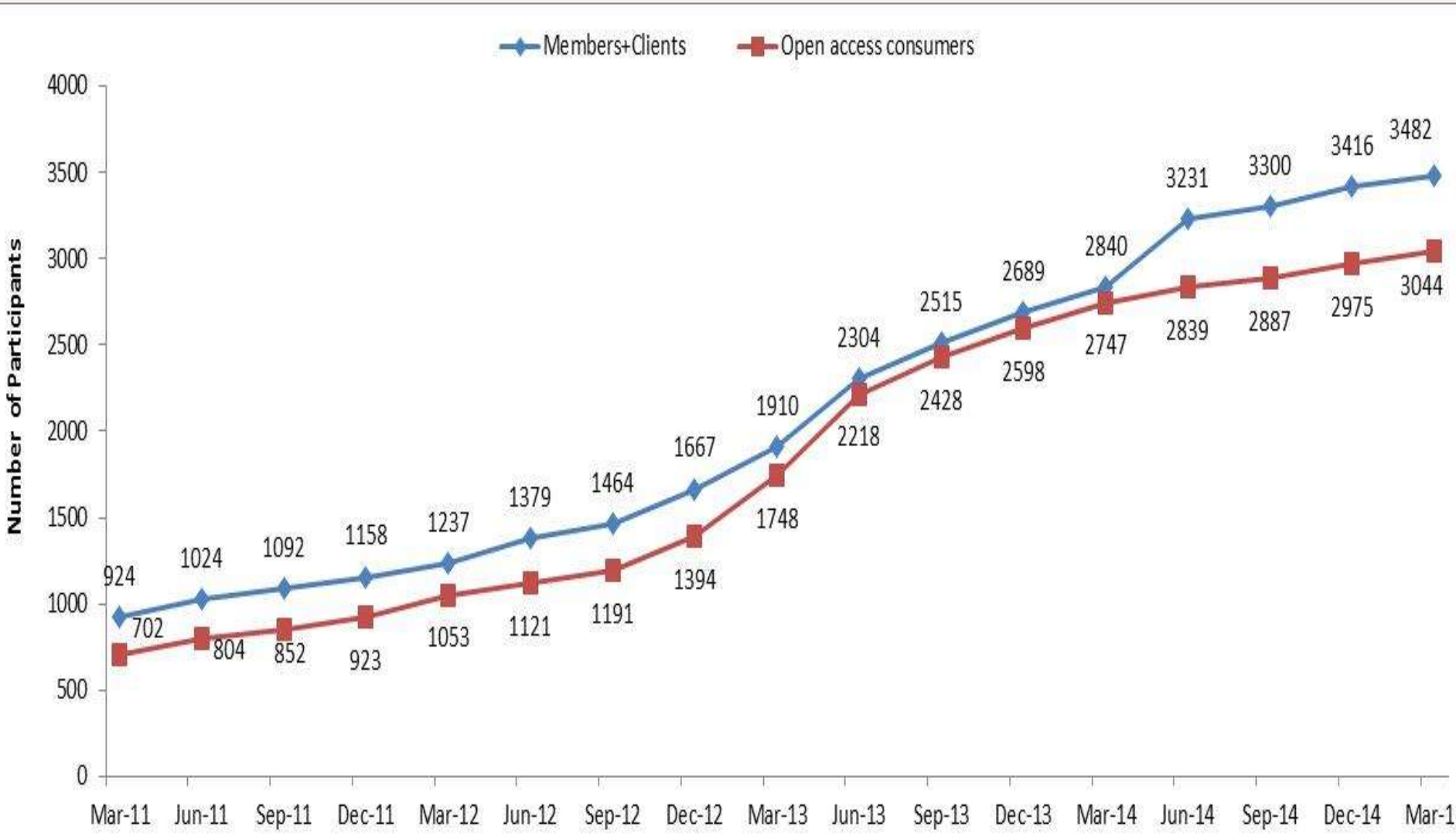


No Open Access	
Consumers	Generators
Uttar Pradesh	Uttar Pradesh
Jammu & Kashmir	Delhi
Himachal Pradesh	Bihar
Delhi	Jharkhand
Bihar	Tamil Nadu
Goa	Kerala
Jharkhand	Union Territories
Sikkim	
DVC	
Chattisgarh	
West Bengal	NE States (except Meghalaya)
Union Territories (except Daman & Diu)	
NE States (except Assam, Meghalaya & Arunachal Pradesh)	

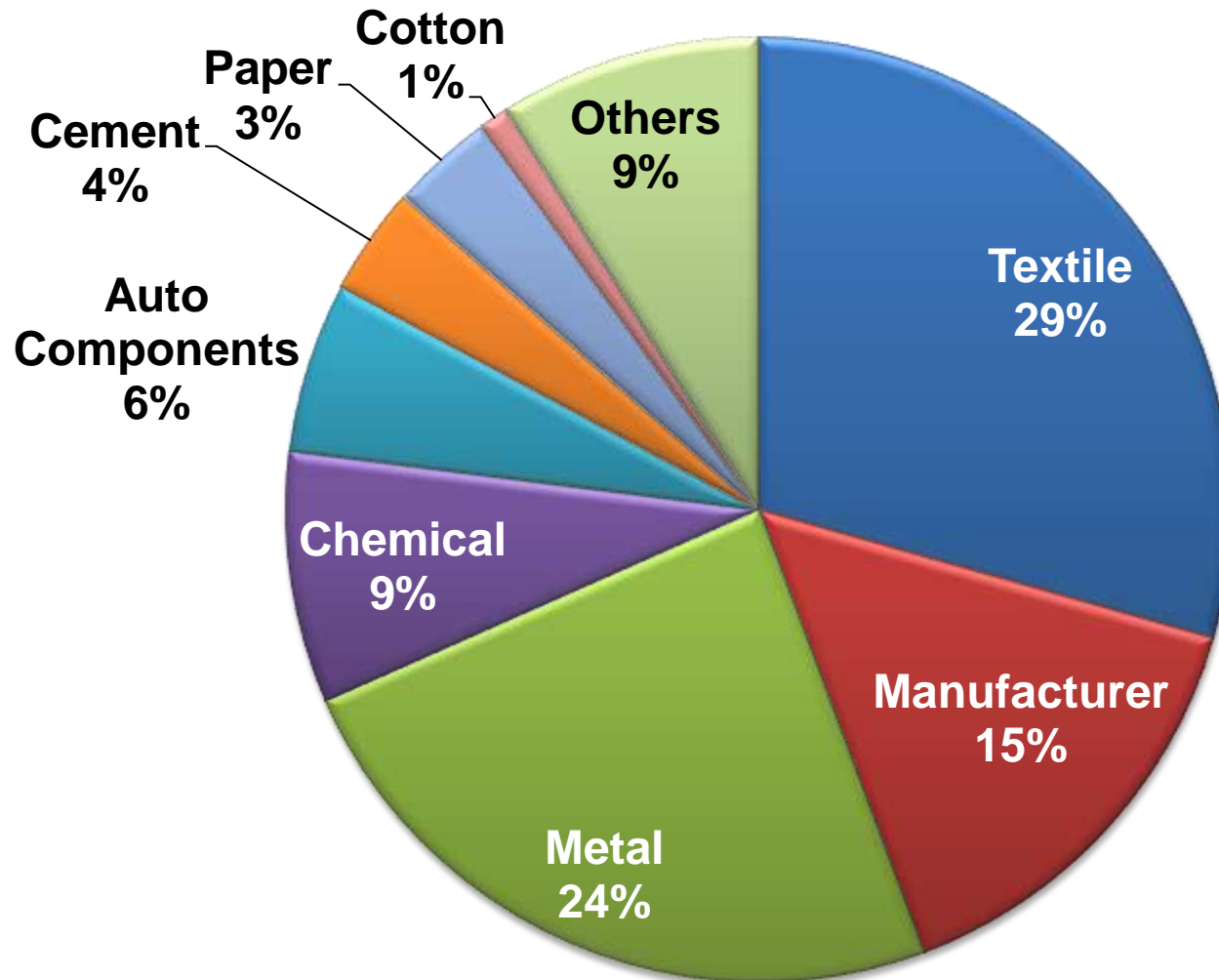
Share of OA Consumer in Total Purchase



Participation at IEX



Industrial segments with IEX



Open Access: What a consumer pays

Charges

PoC charges

- Inter-State Transmission charges payable by the open access consumer

Transmission Charges or STU Charges

- Payable to the state transmission utility for the use of the transmission system for availing power through open access.

Wheeling charges

- Charge to the Discom for conveyance of electricity through open access as determined by the SERCs

Cross Subsidy Surcharge

- Subsidising open access consumer has to pay a cross subsidy surcharge to the Discom.

Others

- Additional Charges, if any
- NLDC application fee, scheduling and operating charges, SLDC Charges
- IEX transaction charges/Trading Margin

Open Access: What a consumer pays

Losses

- An open access consumer has to bear in kind the following losses as defined by the relevant regulations

Point of connection (PoC) loss

- Inter-State transmission system loss

Transmission loss or state loss

- Consumer to absorb apportioned energy losses in the transmission system as per the relevant regulations

Wheeling loss

- Technical losses in the distribution system determined at various voltage level by the state commissions.



Barriers to Open Access

Prohibitive Open Access Charges

- High Cross subsidy surcharge
- High wheeling charges
- Additional surcharge

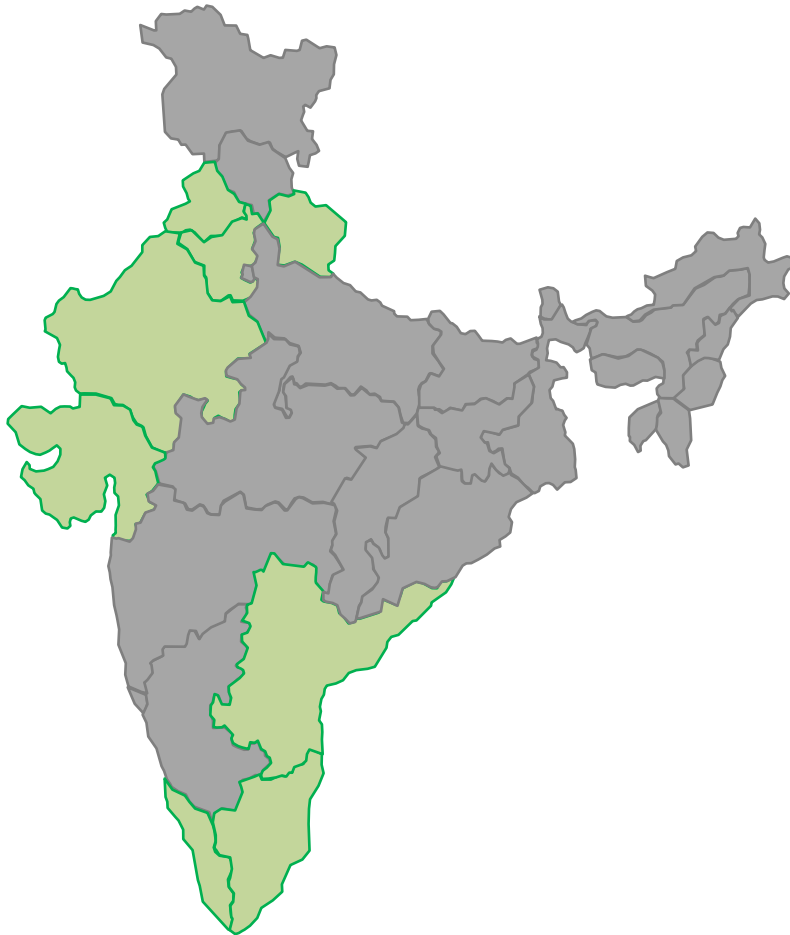
Legislative Impediments

- Gross misuse of certain statutes in the EA 2003 (Section 11, Section 37, Section 108, etc.)

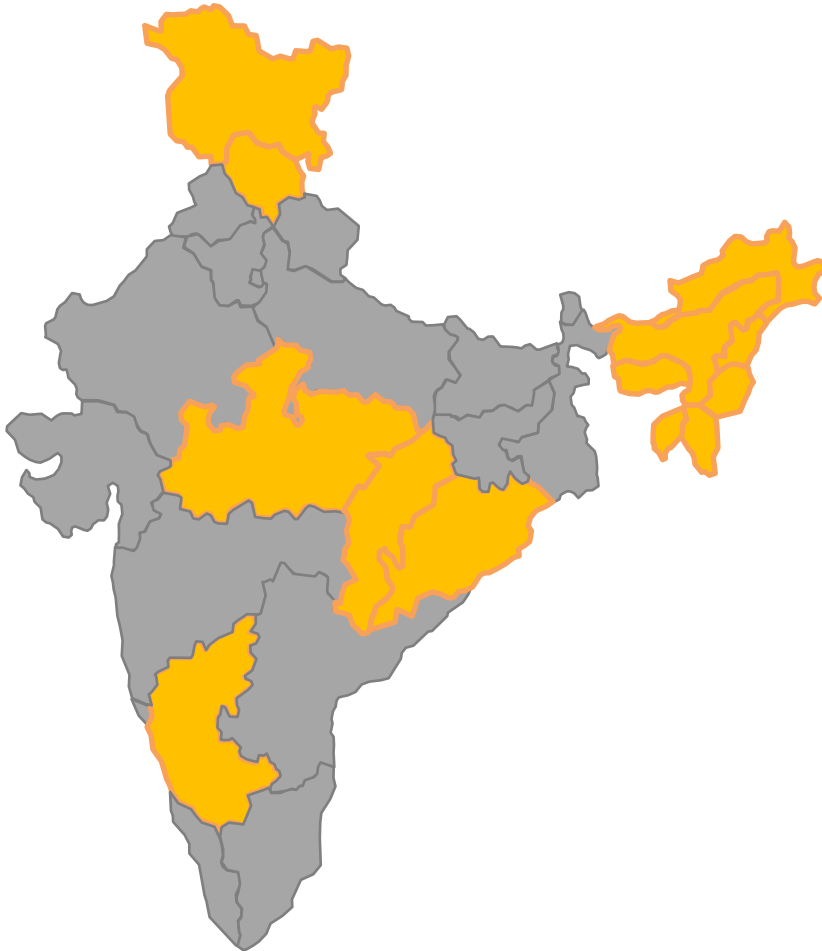
Operational Hurdles

- Unwilling /Incapable SLDC
- Procedural Bottlenecks
- Physical infrastructural constraints

States Allowing Open Access

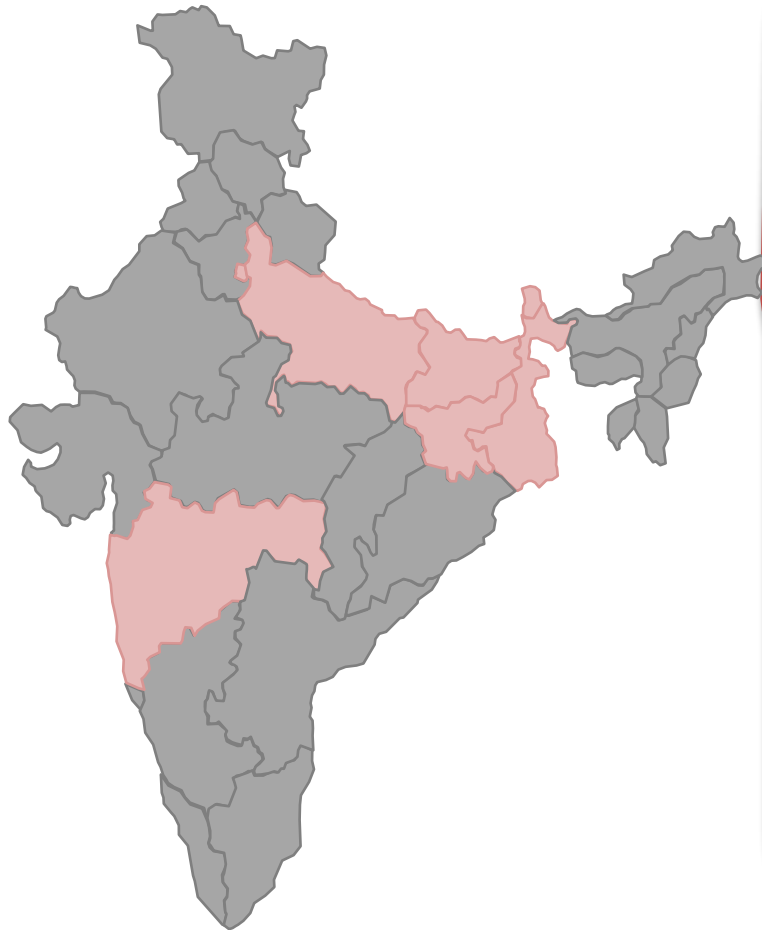


- **Haryana:** High CSS and additional surcharge of 50 p/unit
- **Punjab:** High CSS and high wheeling charges (same for all voltage)
- **Gujarat** Charges applicable on the reserved quantum (OA requested) & additional surcharge of 42p/unit
- **Rajasthan-** No issue
- **Tamil Nadu:** OA not allowed to Sellers, Sec-11 invoked



- **High Open Access charges:**
 - **Chhattisgarh, Orissa, Assam – High CSS**
 - **Meghalaya:** OA charges for full day on highest quantum in a time block,
- **Approvals and additional requirements:**
 - **Himachal :** Requires exact schedule a day in advance for purchase through Discom
 - **MP:** Approval from Discom
 - **Karnataka:** Imposed Sec 11. Consumers OA is possible.
- **Infrastructure Constraints:**
 - Tripura, Mizoram, Manipur, Nagaland, Arunachal Pradesh, J&K

States Not Allowing Open Access

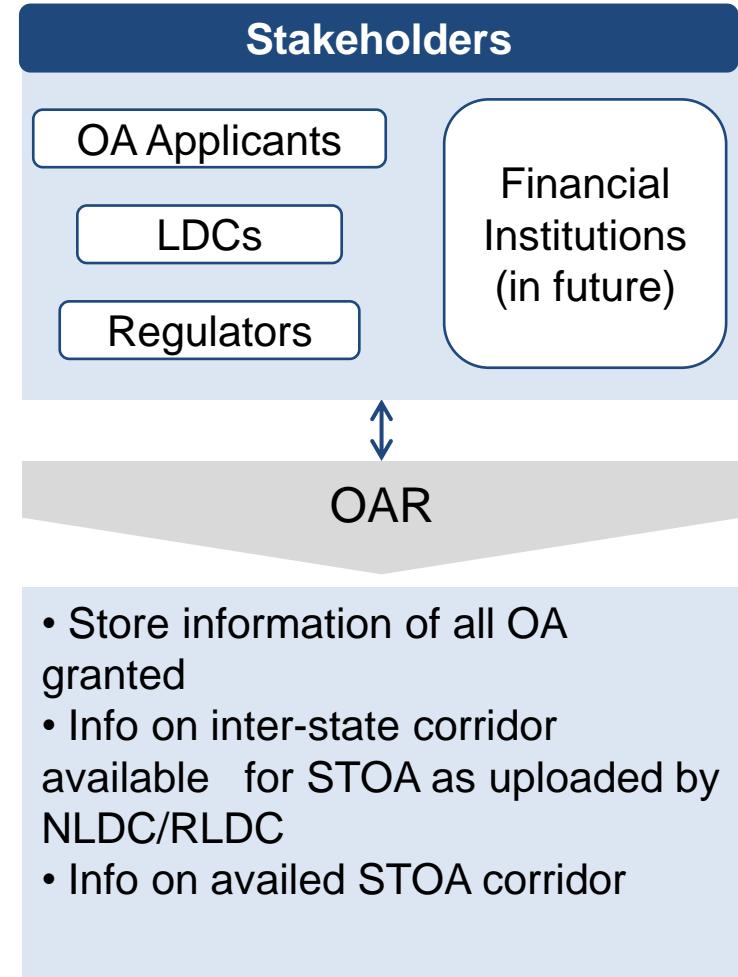


- **SLDC Hindrance**
 - Uttar Pradesh, Bihar, Jharkhand - Approvals not given
- **Absence of adequate regulatory framework**
 - **Maharashtra:** OA only for week ahead basis
 - **Sikkim:** Regulatory inadequacy
- **Open Access made unviable through high charges**
 - **West Bengal:** High CSS and flat tariff
 - **Jharkhand:** High CSS

- Financial Settlement
 - Delay in Energy Credits (Haryana)
 - UI Settlement
 - No credits for under-drawals
- NoC for longer periods (3-6m)
- Same NoC applicable for intra-day transactions
 - Procedures to be issued by NLDC

Open Access Registry Framework *Proposal for implementation*

- This will bring in transparency and facilitate faster transactions using automatic rule-based open access clearance while removing manual discretions
- Integrated IT based system
- All OA approvals automated
- Function as an interacting medium between the OA Participants, Trade Intermediaries/PXs and National/Regional and State LDCs.
- Record of Information will be available to CERC, System Operators, OA Customers, Traders and PXs



Proposed amendment in the Electricity Act, 2003

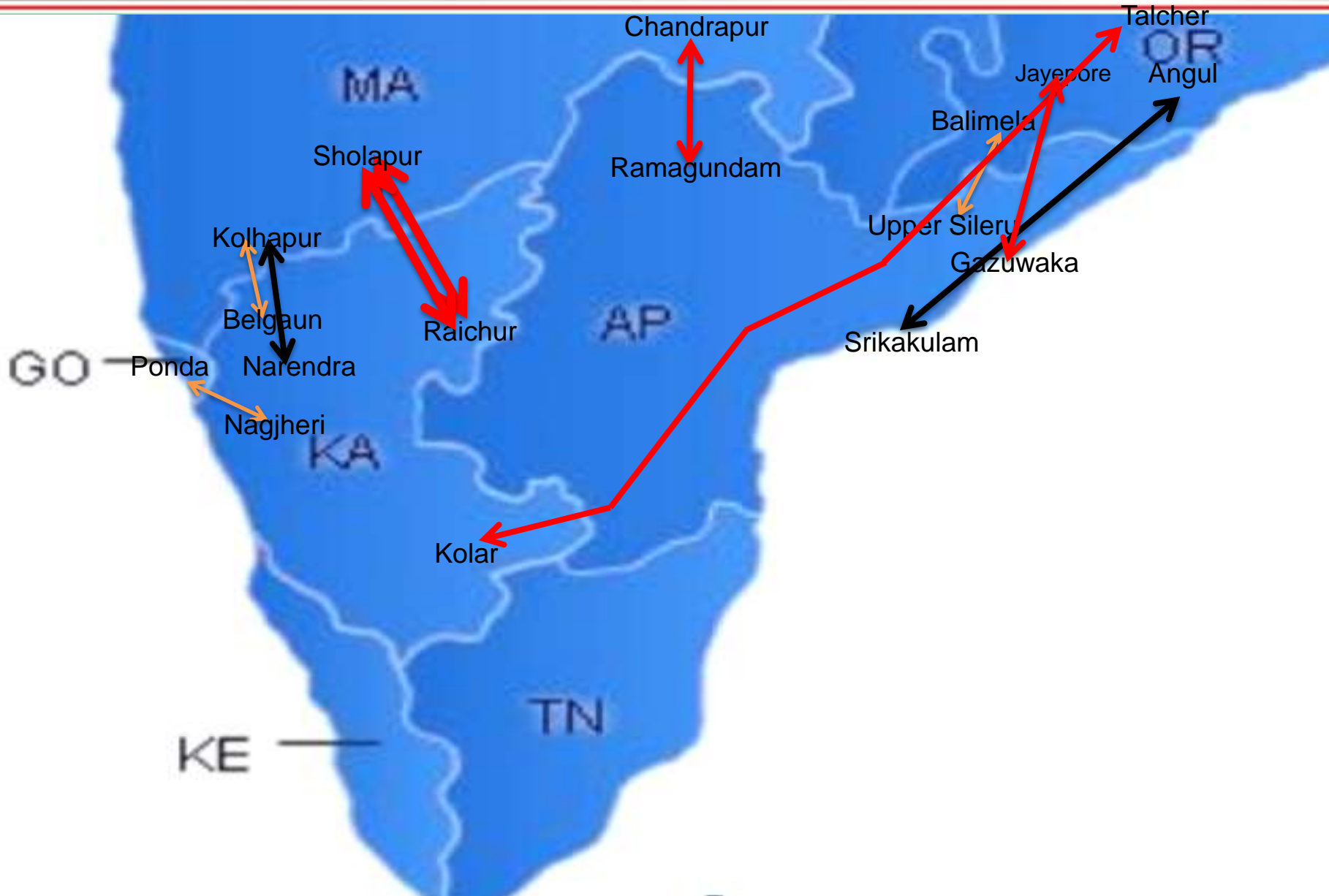
Separation of Carriage & Content



- **Broad Principles**
 - **Distribution and Supply shall be recognized as separate licensed activity**
 - **Distribution Licensee:** To be responsible for development, operation and maintenance of distribution network business and shall have an obligation to provide connection on demand to any consumer in its area of distribution
 - **Supply Licensee:** Clear unbundling from existing distribution licensee
 - Responsible for arranging supply of electricity to all consumers in the area of supply. The areas of supply for the incumbent supply licensee to be the same as area of distribution for the distribution licensee
 - Competition among suppliers for eligible customers (1MW+)
- **We can adopt EC directives which deal with all issues of unbundling**
- **We need to deal with India-specific issues**
 - Cross subsidy elimination Roadmap
 - T&D Loss Treatment (Supplier Vs Distributor)
 - Exempt small utilities from Unbundling

Transmission Lines Update

Transmission link detail : ROI-SR



Transmission Line: SR



- **Associated Transmission System in respect to 765 kV Raichur-Sholapur lines:** Out of 18 sub link connecting Raichur-Sholapur line from WR to SR, 12 line has been commissioned.
- ATC from S1-S2 would be enhanced in stages with commissioning of 765 kV Salem – Madhugiri line, 400 kV Mettur- Thiruvallam D/C lines, 400 kV Mysore – Kozhikode D/C lines and 400 kV Somanahalli – New Salem D/C lines . ATC would also depend on the commissioning of KKNPP (2,000 MW), NTPL (1,000 MW), NLC TS-II Expn (500 MW) BHAVINI (500 MW) and NTECL Vallur 3rd Unit (500 MW) etc.
- A Study Group has been formed and will look into various ATC related issues with commissioning of lines and Generation. CTU agreed to associate with the Study Group.

- **Status of upcoming Inter-Regional links:**

	<u>Sch COD</u>	<u>Ant COD</u>
✓ Narendra-Kolhapur 765 kV D/C line -	April 2015	Dec 2015
✓ Wardha - Nizamabad 765 kV D/C line	Tender has been Floated.	
✓ WR-SR 6000 MW HVDC Bipole Link [Raigarh (Chhatisgarh) -Pugalur/Trichur (TN/KER)]	Matter has been forwarded to PGCIL and MoP, and the matter would be further deliberated in the Standing Committee on Power System planning.	
✓ Angul - Srikakulam PS 765 kV D/C line	Jun 2015	Jun 2015

*NTPL – NLC Tamil Nadu power Ltd (Joint Venture)

Existing and Expected Transmission Capacity

(As of 3rd Mar, 15)



	Mar-June	July-December	CY 2016
Transmission capacity			
HVDC-Bhadrawati	1,000	1,000	1,000
Jeypore-Gazuwaka	1,000	1,000	1,000
Talcher Kolar	2,500	2,500	2,500
Others	250	250	250
Associated Transmission system of Sholapur Raichur HVDC		1,000	
765 kV Angul-Srikakulam			1,000
765 kV Narendra-Kolhapur			1,000
TTC	4,750	6,750	7,750
TRM	750	750	750
Net Capacity (TTC-TRM)	4,000	5,000	7,000
LTA			
Talcher	8	8	8
Talcher II	1,796	1,796	1,796
Farakka	18	18	18
Kahalgaon	5	5	5
IGSTPS	700	700	700
JPL	200	200	200
JPL II	150	150	150
Sub-total	2,877	2,877	2,877
MTOA			
APL>TN	200	200	200
KSK MAHANADI>KL,TG,AP	400	400	400
CSEB>KL	174	174	174
LANCO ANPARA>TN	100	100	100
Sub-total	874	874	874
STOA (Sterlite> ...,Jaypee Nigrie>...)	85	85	85
ATC (A-(B+C+D))	164	1,164	3,164

Thank You for your attention

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Cross Subsidy Surcharge - NTP



- Surcharge formula: $S = T - [C (1 + L / 100) + D]$
 - Where 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

- **Status of upcoming links having impact on S1-S2:**

- 400/230 kV Thiruvalem S/S and associated LILOs – Both ICTs and LILOs completed by Oct 2014.
- 400 kV Thiruvalem – Melakottaiyur – Commissioned on 24.07.2014.
- 400 kV Somanahalli- New Salem – June 2015 (Approval for enhanced compensation is awaited from CC,PGCIL)
- 400 kV Pugalur- Kalavindapattu – Both Ckt Commissioned.
- 765 kV Kurnool-Thiruvalem - Commissioned.
- 400 kV Mettur- Singarapet- Thiruvalem – Jan 2015.
- LILO of Kolar- Sriperumbudur at Thiruvalem – March 2014.
- 400 kV Mysore-Kozhikode – May 2015 (Held up due to forest KPTCL clearance and RoW issue)
- 400 kV Mangalore (UPCL) –Kasargode – Kozhikode – KPTCL Reviewing the necessity of Line.

- **Other upcoming Intra-regional transmission elements**

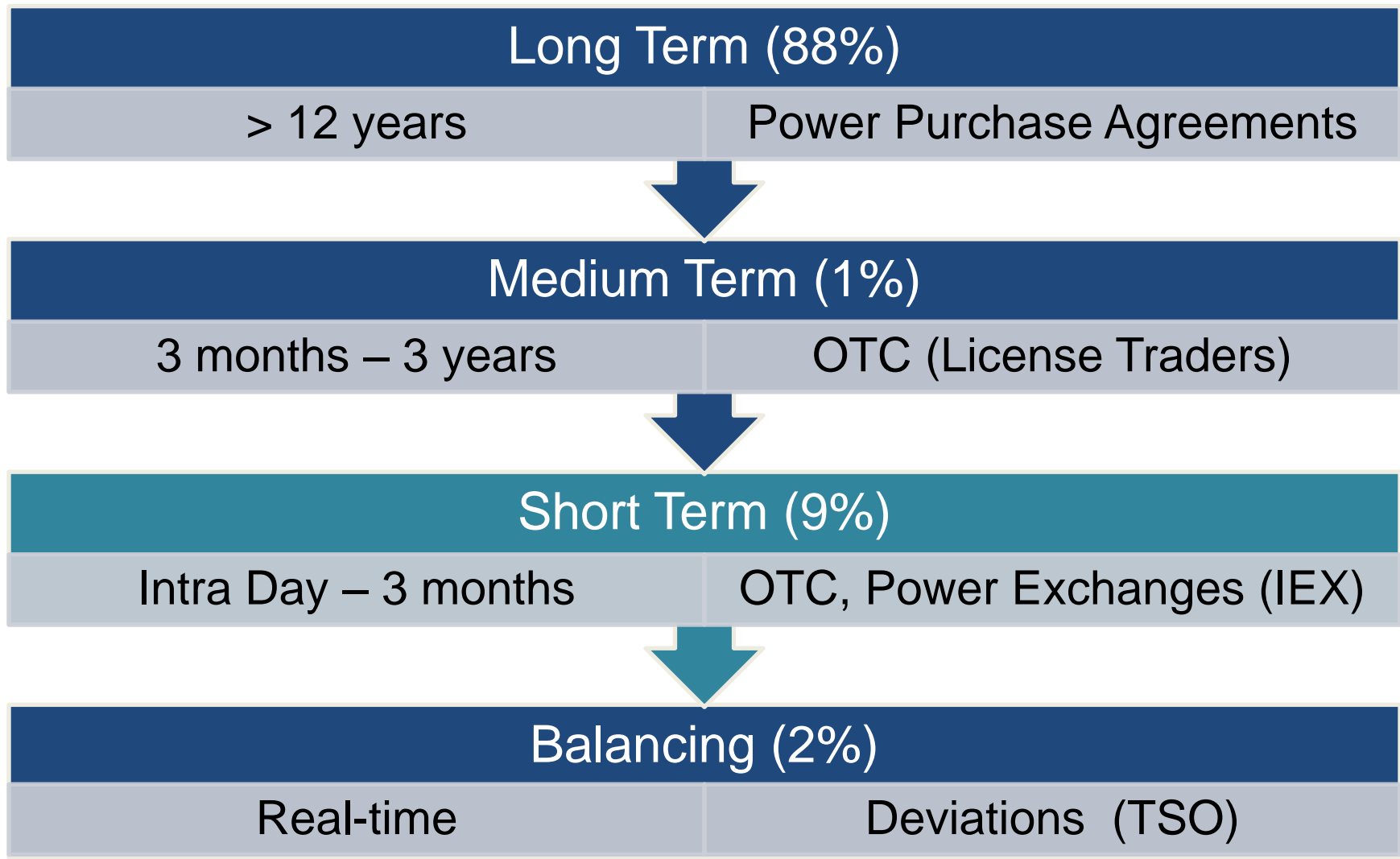
- 765 kV Salem- Madhugiri – December 2015 (Several RoW problem near Madhugiri)
- 400kV Krishnapattanam- Chittoor – March 2015
- 400kV Almathy-Thiruvalem D/C line – Jan 2015 (ROW issues at 17 locations).
- 400 kV Edamon-Kochi - Held up due to RoW issue KSEB informed that GO for compensation is awaited. KSEB was requested to settle the compensation issues within one month to enable PGCIL to initiate works

Inter-Regional Transmission Lines: Status

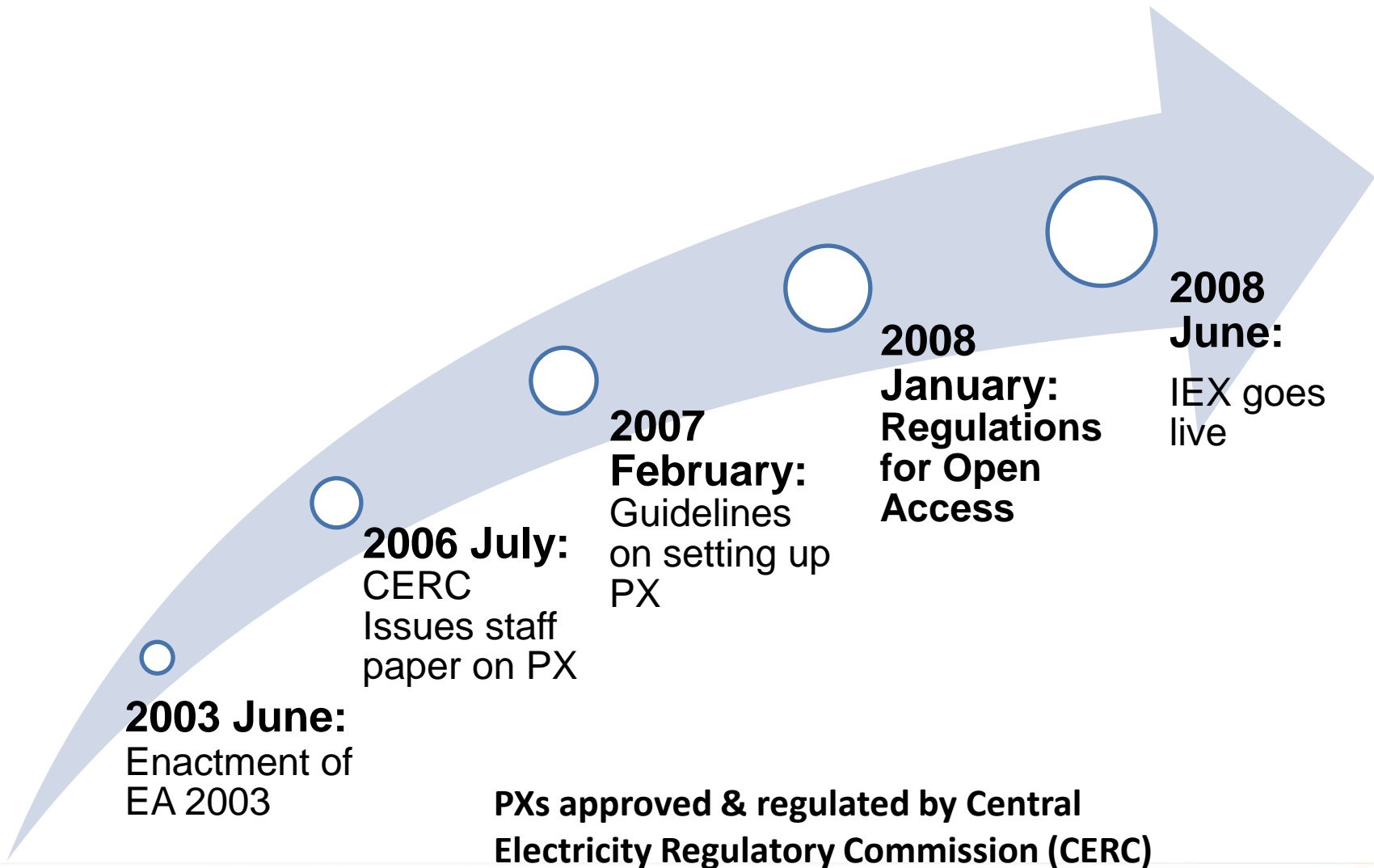


S.No	Corridor	Link	Voltage Level	Status as on 31st March 15
1	WR - SR	Raichur-Sholapur #1	765kV S/C	Commissioned
2	WR - SR	Raichur-Sholapur #2	765kV S/C	Apr'14
3	WR - SR	Narendra(Kudgi) (GIS) – Kolhapur (new) D/C line (initially charged at 400 kV)	765 kV	Dec'15
4	WR - SR	Raigarh (Chhattisgarh)-Puglur (TN) HVDC line		-
5	WR - NR	Gwalior-Jaipur #1	765kV S/C	Jul'15
6	WR - NR	Gwalior-Jaipur #2	765kV S/C	Aug'15
7	WR - NR	Champa-Kurukshetra +/-800kV 6000MW HVDC bipole line, Ph.-I		Dec'15
8	WR - ER	Jharsuguda Pooling Station - Dharamjaigarh	765 kV D/C	Dec'15
9	WR - ER	Ranchi- Dharamjaigarh	765kV S/C	Feb '15
10	ER - NR	Sasaram-Fatehpur line #2	765kV S/C	Commissioned May'13
11	ER - NR	Barh II-Gorakhpur	400kV D/C	www.iexindia.com Apr'15

Power Market: Present Status



Development of Power Exchanges



Indian Power Market: Present Status



Long Term
Upto 25 Years

Power Purchase Agreements

89%

Medium Term
3 months- 3years

OTC
Licensed traders (61)

6%

Short-Term
Intraday - 3 months

OTC Intraday- 3 months

Exchanges

- 1. Intra-day
- 2. DAM
- 3. DAC
- 4. Daily
- 5. Weekly

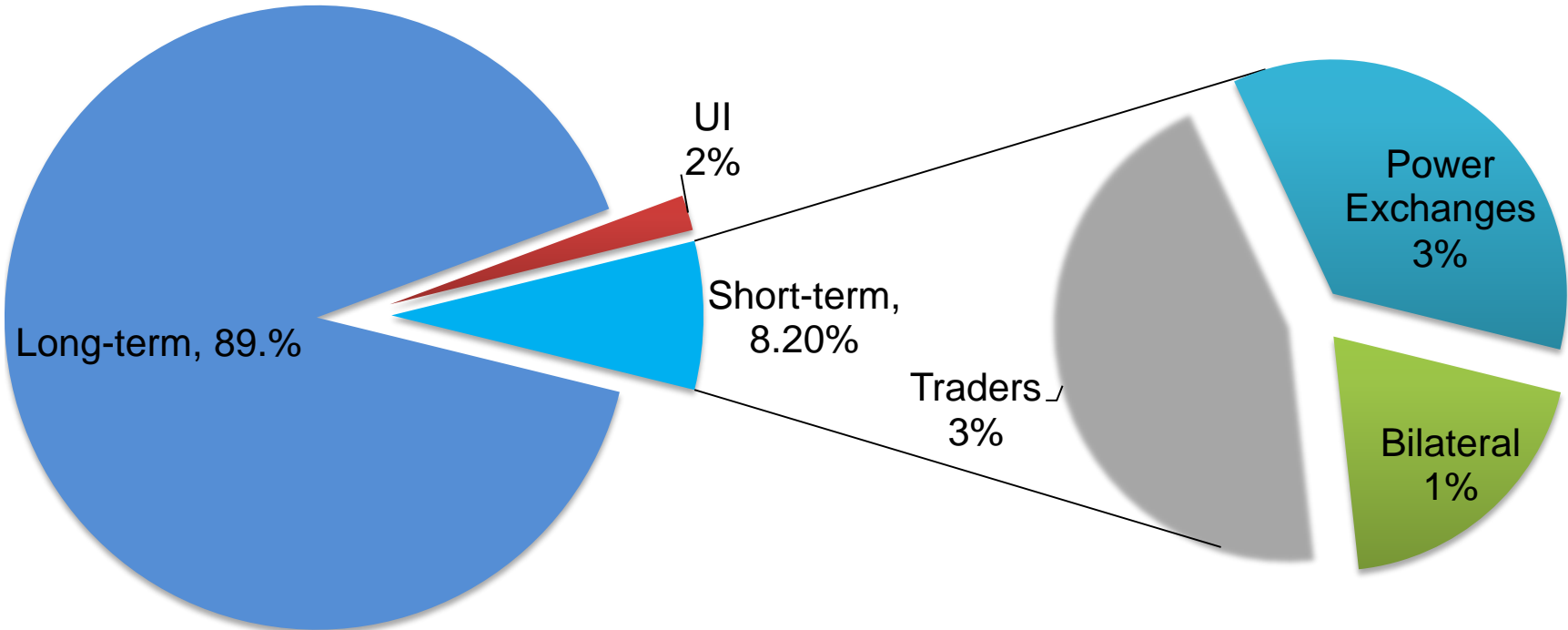
3%

Balancing Market
Real Time

Unscheduled Interchange

2%

Share of Power Markets in India



Source: CERC MMC Monthly Reports FY 15 (up to Dec)

Indian Power Market

Long
Term

Medium
Term

Short Term

Case-1 bids
(DBFOO)

Case-2 bids
(DBFOT)

Bilateral

Power
Exchanges

Deviation
Settlement
Mechanism

From two
hours
ahead up
to 3 month
advance

Day Ahead
Term Ahead

Real Time

Indian Power Market - Design



Nature of Contract	Duration of Contract	Transmission Open access availability
Long Term	> 7 years and up to 25 years	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		
Short Term – Bilateral	Up to 1 year	For a period of up to 3 months
Short Term – Power Exchange	Day Ahead Market (1 day)	1 day (corridor left after short term bilateral)
	Term Ahead Market (up to 10 days)	Up to 10 days in advance
Deviation Settlement Mechanism	Real time balancing mechanism for settling deviation from schedule	

Evolution of Power Markets in India: Regulatory Framework

First CERC OA Regulations, 2004

- Reservation of transmission capacity: Long Term and Short Term Access
- Short term open access granted on inherent margins

2006-07: CERC Staff paper for PX
Feb 2007: CERC Guidelines for grant of permission
for setting and operation of PX

2008 & 2009: CERC OA Regulations and Amendments

- Defined 'Power Exchanges'
- Transaction categorized as Bilateral or Collective (thru PXs)
- Transmission charges: 'PoC' Method for collective transaction

2008: Procedure for Scheduling of Collective
Transactions

2010: Power Market Regulations

Role of PXs defined and norms for setting up and operating PX

- Procedure for application, eligibility criteria, shareholding pattern, Net worth, risk management by PX,

CERC approval for setting up a PX and oversight for contracts offered

Objectives for PX

- Ensure fair, neutral, efficient and robust price discovery
- Provide extensive and quick price dissemination
- Design standardised contracts and work towards increasing liquidity in contracts

Defined principle of price discovery for the exchange

- Economic principle of social welfare maximisation
- **Closed double sided bidding, uniform price discovery, market splitting for congestion management**