Open Access

Regulations & Operationalization

IIT Kanpur

1st March 2016

For Public Use

Indian Power Market … Historical Perspective

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

Legislative Enabler for Operationalization of Power Markets

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

Provision for Open Access in Electricity Act 2003

➢**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*"

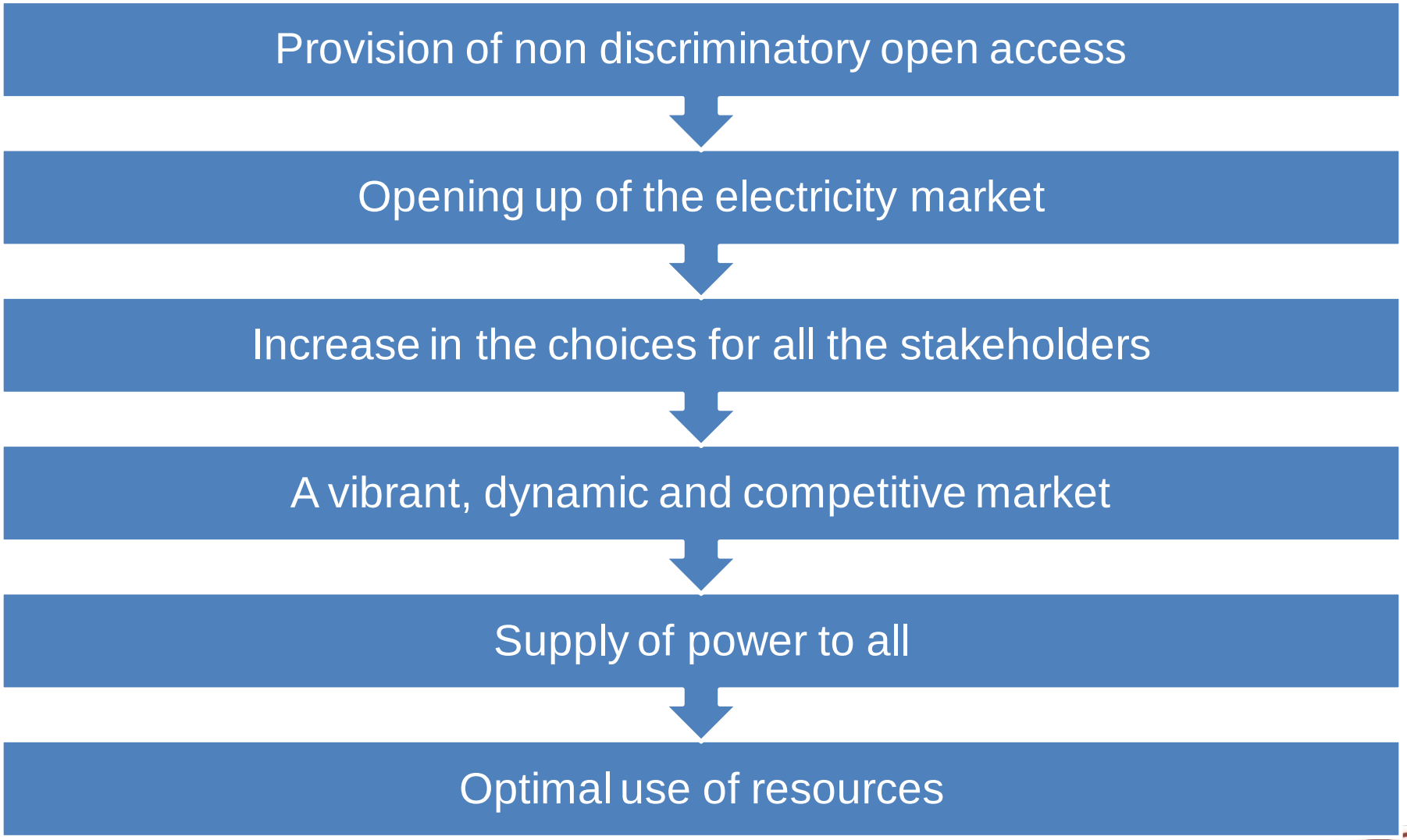
➢Section 42 of the Act is central to open access and reads as follows:

"(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……"

Opportunities for

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?



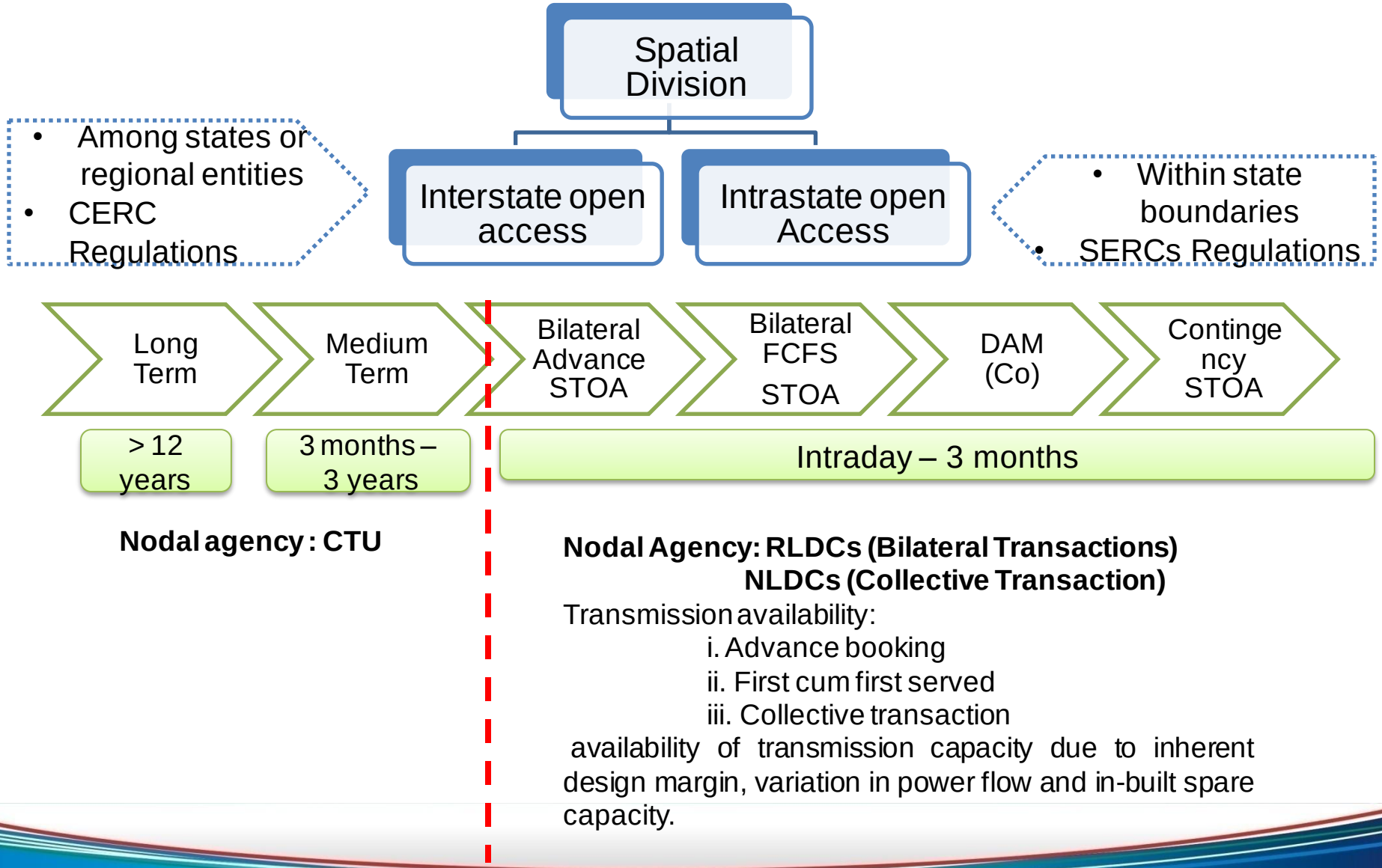
Regulations for Development of Open Access

- 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 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)

Nodal Agency for Open Access

Nature of Contract	Tariff Structure	Nodal Agency
Long Term	Two Part Tariff	POWERGRID for **Inter state** & STUs for **Intra State**
Medium Term	Either Two part or Single Tariff	Buyer RLDC for **Inter State** & SLDCs for **Intra State**
Short Term	Single Tariff	NLDC for "**Day Ahead Market**" & RLDCs for "**Term Ahead Market**"
Power Exchange	Single Tariff	

Open Access Segregation



Policy Initiative for Market Development

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 2006 & 2016

- Tariff to be +/-20% of cost of supply by 2010-11
- CSS to be within 20% of tariff

Criteria for Allowing Access

- 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

- Handing deviations from schedule
- Payment security
- Collection and disbursement of charges

Intra-State Open Access Regulations

- 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

Grant of Open Access by SLDC

- 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)

Open Access: Current Scenario

Intra State OA Framework: Technical requirements

As per state specific open access regulations

States	Minimum Load	Feeders	Other Conditions
Himachal Pradesh	1 MW and Above	Independent feeder or Mixed Feeder (all on Mixed to opt for OA)	OA consumers have to submit daily schedule of power to be purchased through Open Access to SLDC with copy to DISCOM by 10 am for the next day
Haryana	0.5 MW and above		
Uttarakhand	100 kVA and above		
Madhya Pradesh, DD & DNH, Southern Region	1 MW and Above		No special condition

- **Connectivity – Min 11 KV**
- **ABT Special Energy Meters required**

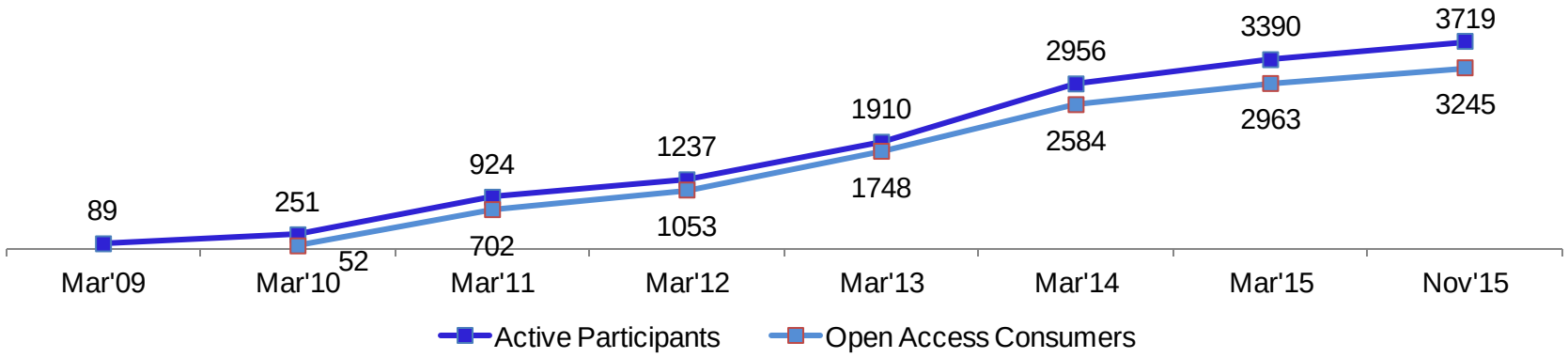
Intra State OA Framework: Technical requirements

As per state specific open access regulation for northern region

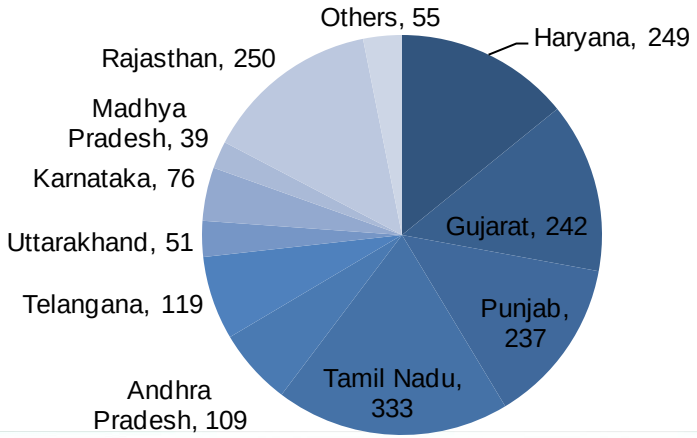
States	Minimum Load	Feeders	Other Conditions
Punjab & Gujarat	1 MW and Above	Independent or Mixed Feeder	The quantum of drawl OA Consumer from DISCOM during any time block of a day shall not exceed the admissible drawl of electricity by the OA Consumer from the distribution licensee in such time block wherein the schedule for Open Access drawl is the maximum
Delhi			Provision of partial & full Open Access
Rajasthan			OA consumers have to submit daily schedule of power to be purchased through Open Access to SLDC with copy to DISCOM by 10 am for the next day. The schedule so given shall be uniform at least for a period of 8 hours and the minimum schedule during the day shall at any time not be less than 75% of the maximum schedule of the day
Uttar Pradesh			Intrastate transmission congestion
Maharashtra			Only Week ahead allowed. Draft Regulations provide for Day ahead.

OA Consumers | Strong and Growing Base

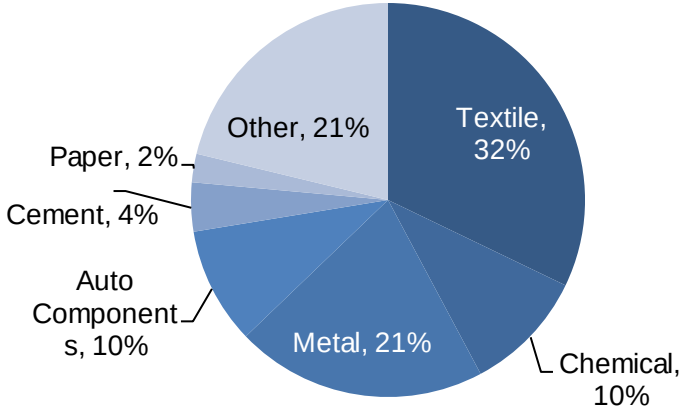
IEX IS THE #1 EXCHANGE IN THE WORLD IN TERMS OF NUMBER OF ACTIVE PARTICIPANTS



Open Access Consumers Present Across States



And Spread Across Industries



Total Open Access Consumers: 1,760 ((as on Nov'15)

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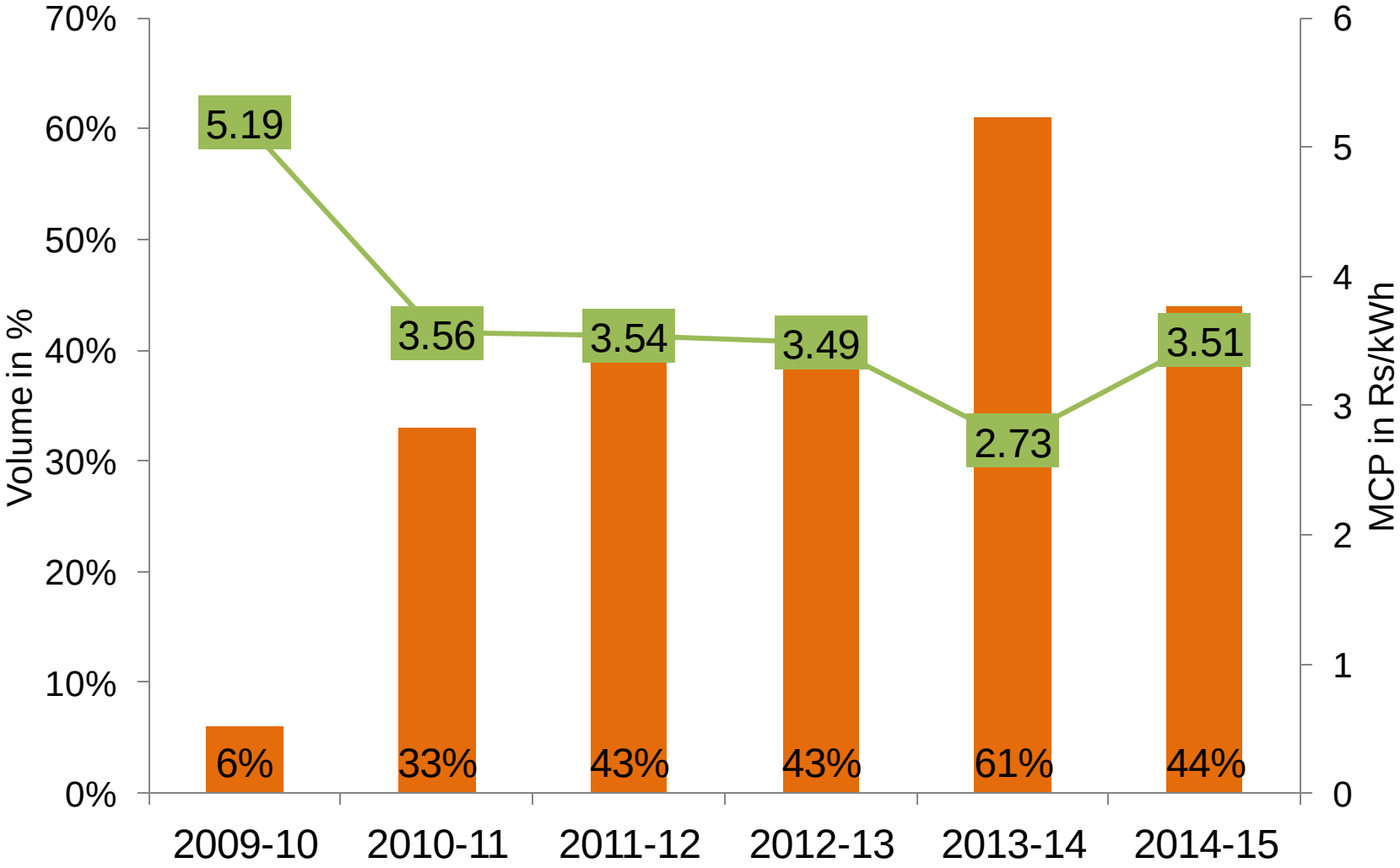
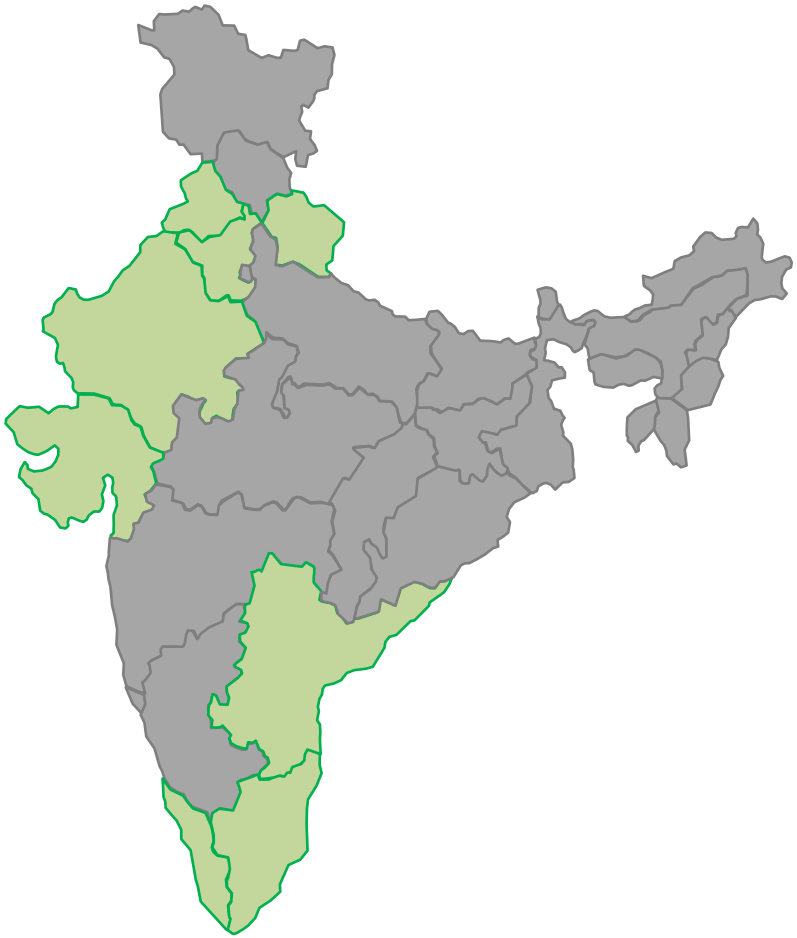
Share of OA Consumer in Total Purchase

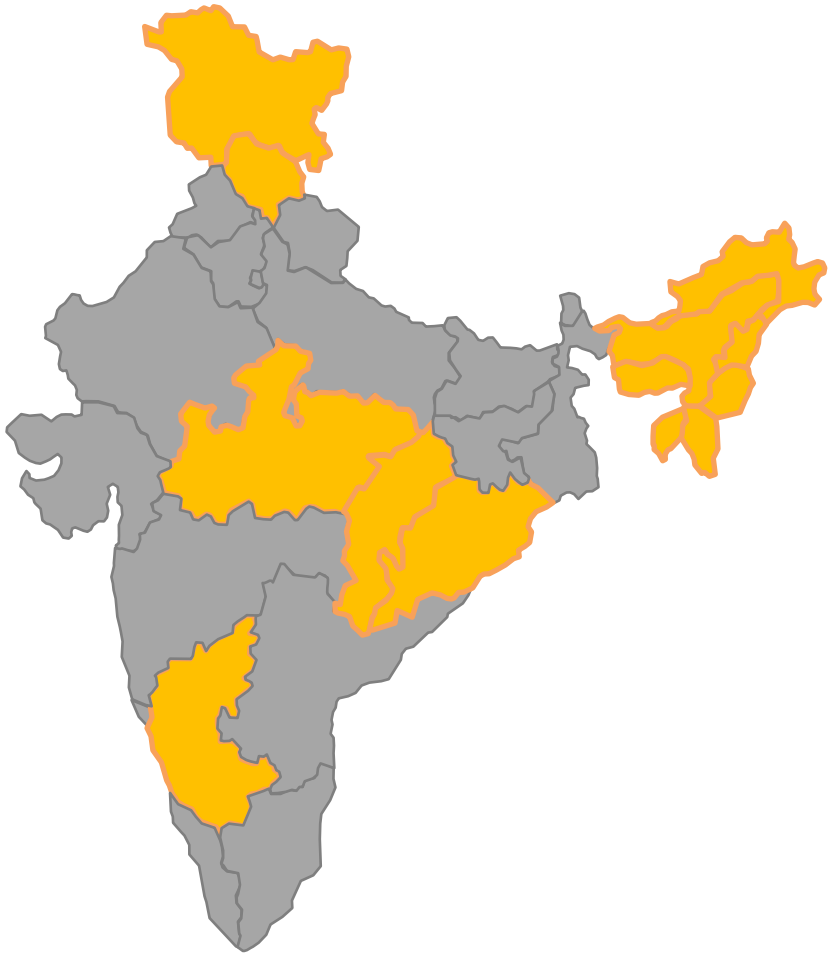


States Allowing Open Access



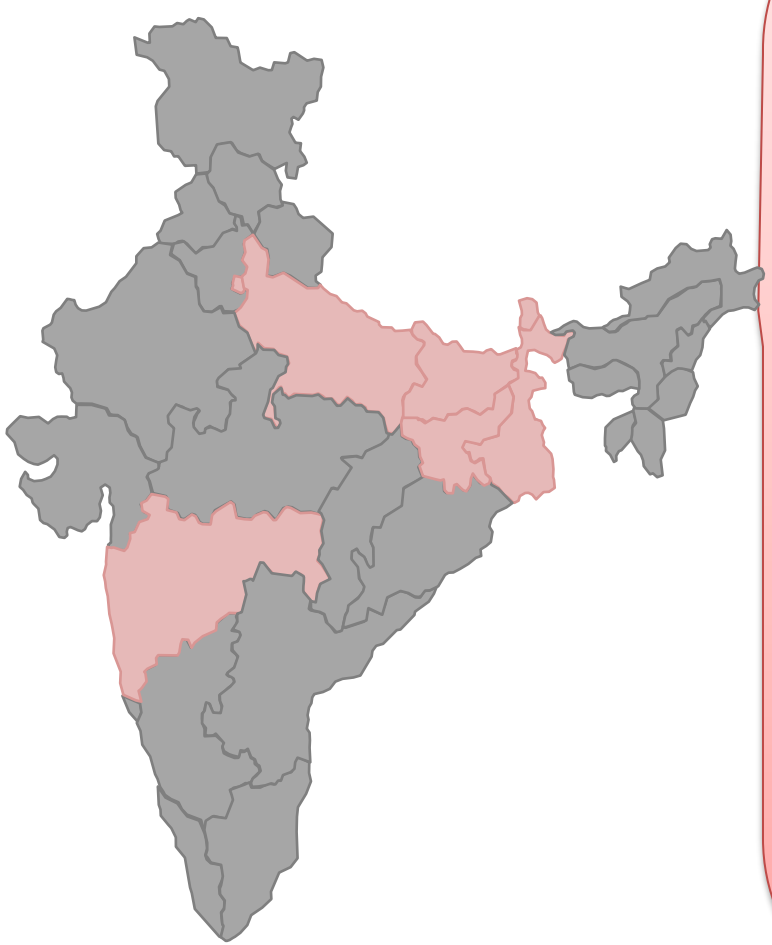
- **Haryana:** High CSS and additional surcharge
- **Punjab:** High CSS and high wheeling charges (same for all voltage)
- **Gujarat** Charges applicable on the reserved quantum (OA requested) & additional surcharge of 42p/unit
- **Rajasthan-** No issue
- **Tamil Nadu:** OA not allowed to Sellers, Sec-11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

Restrictive Open Access



- **High Open Access charges:**
  - **Chhattisgarh, Orissa, A.P, Tamil Nadu – 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, high Additional surcharge
  - **MP:** Approval from Discom, High CSS
  - **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

Enablers for facilitating implementation of Open Access

Legislative | Open Access Charges | Operational

- **Strengthen Sec 11, 37, 108** to remove ambiguity and facilitate OA

  - **Sec 11:** OA to generators restricted by state government by citing extraordinary circumstances
  - **Sec 37:** State governments can direct LDC to restrict power sale outside state in lieu of maintaining smooth and stable supply
  - **Sec 108:** Directions of state government will prevail where public interest is involved

- **Sec 42(4) :** Define uniform methodology of determination of additional surcharge

Strengthen EA 2003 by expanding, restricting and/or clarifying scope under certain statues concerning OA

Enablers for facilitating implementation of Open Access

Legislative | **Open Access Charges** | Operational

- **Sec 42 (2)** :"….Provided also that such surcharge and cross subsidies shall be progressively reduced in the manner as may be specified by the State Commission…"

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

- **NEP, 2005 Sec 5.8.3:** "…..the amount of surcharge and additional surcharge levied from consumers who are permitted open access should not become so onerous that it eliminates competition……."

Implement existing statutes in EA 2003 and NTP 2006

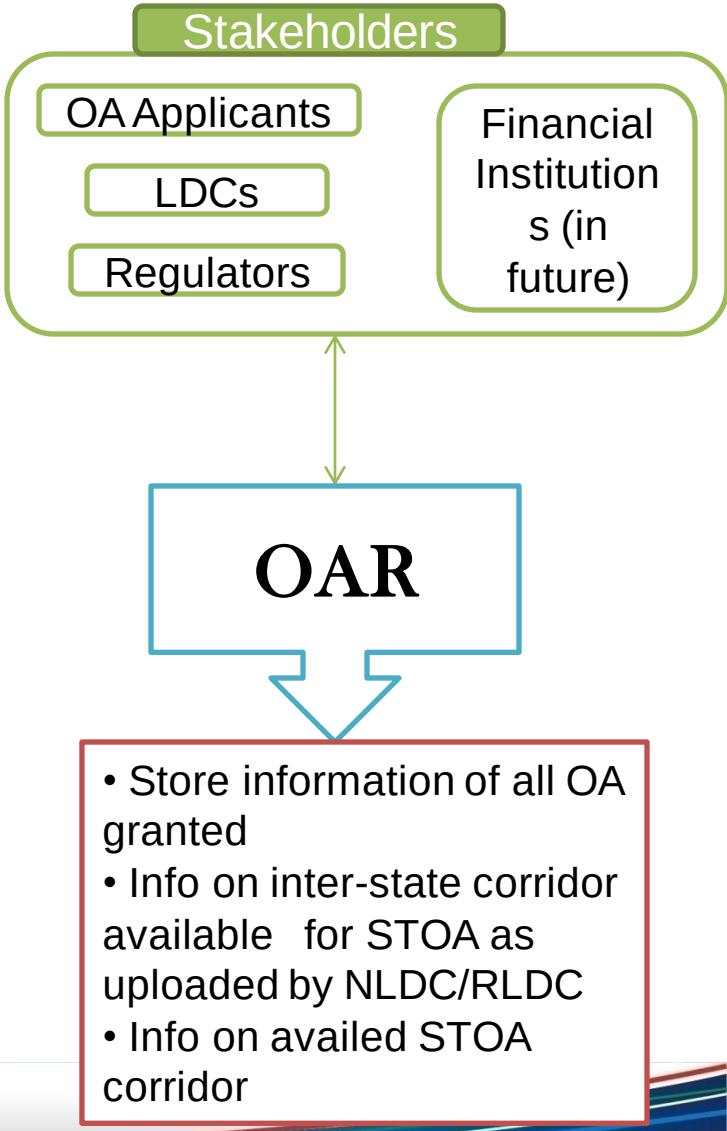
Enablers for facilitating implementation of Open Access

Legislative | Open Access Charges | **Operational**

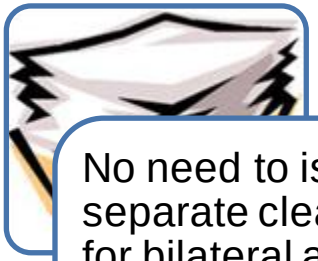
- **Equip SLDCs**
  - Use revenue accrued to SLDC from OA consumers for Infrastructure development, automation, capacity and capability building. 100 OA consumers imply a yearly revenue of appx Rs 9 crores to SLDC
  - Leverage technology solutions and automate processes for NOC issuance, energy scheduling and energy settlement
  - IEX has introduced SLDC interface to help manage NOCs of customers in the state of Punjab and Tamil Nadu. The same can be adopted for other states
- **Open Access Registry (OAR)**
  - **OAR** will bring in transparency and facilitate faster transactions using automatic rule-based open access clearance while removing manual discretions

Open Access Registry Framework

- 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.
- Central mechanism for consolidating and settling transactions instead of the NLDC/RLDCs settling each trade individually.
- Maintain current status of NoCs, STOA Approval for participants and Record of Information will be available to CERC, System Operators, OA Customers, Traders and PXs.

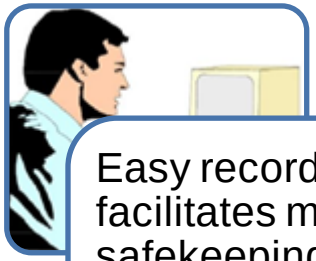


Benefits of OAR



No need to issue separate clearances for bilateral and collective

- Reduced transaction cost and less paperwork
- Information of beneficiary and transactions is readily available



Easy record keeping, facilitates movement & safekeeping of approvals

- Enabler for progressive, investor friendly image and easy customer interface
- Reduces chances of fraud

Faster and efficient scheduling and change over from one segment to another.

- For OA accounting and database
- Operated & maintained by independent body

Open Access is a win-win solution for all stakeholders

Industries

- Reliable power supply
- Source cheaper power
- Save the value of lost load (VOLL)

State utilities (Discom & SLDC)

- Cost savings , need not have to buy costly power as per merit order
- Serve retail consumers better
- Financial gains through open access charges

Open Access Benefits

State

- Increase in per capita consumption
- Revenue addition in terms of taxes
- Build up in generation capacities
- Employment generation
- Promote industrial & economic growth

Retail Consumers

- Increased availability
- Better reliability of power
- Benefits trickle down to consumers in terms of low prices of products

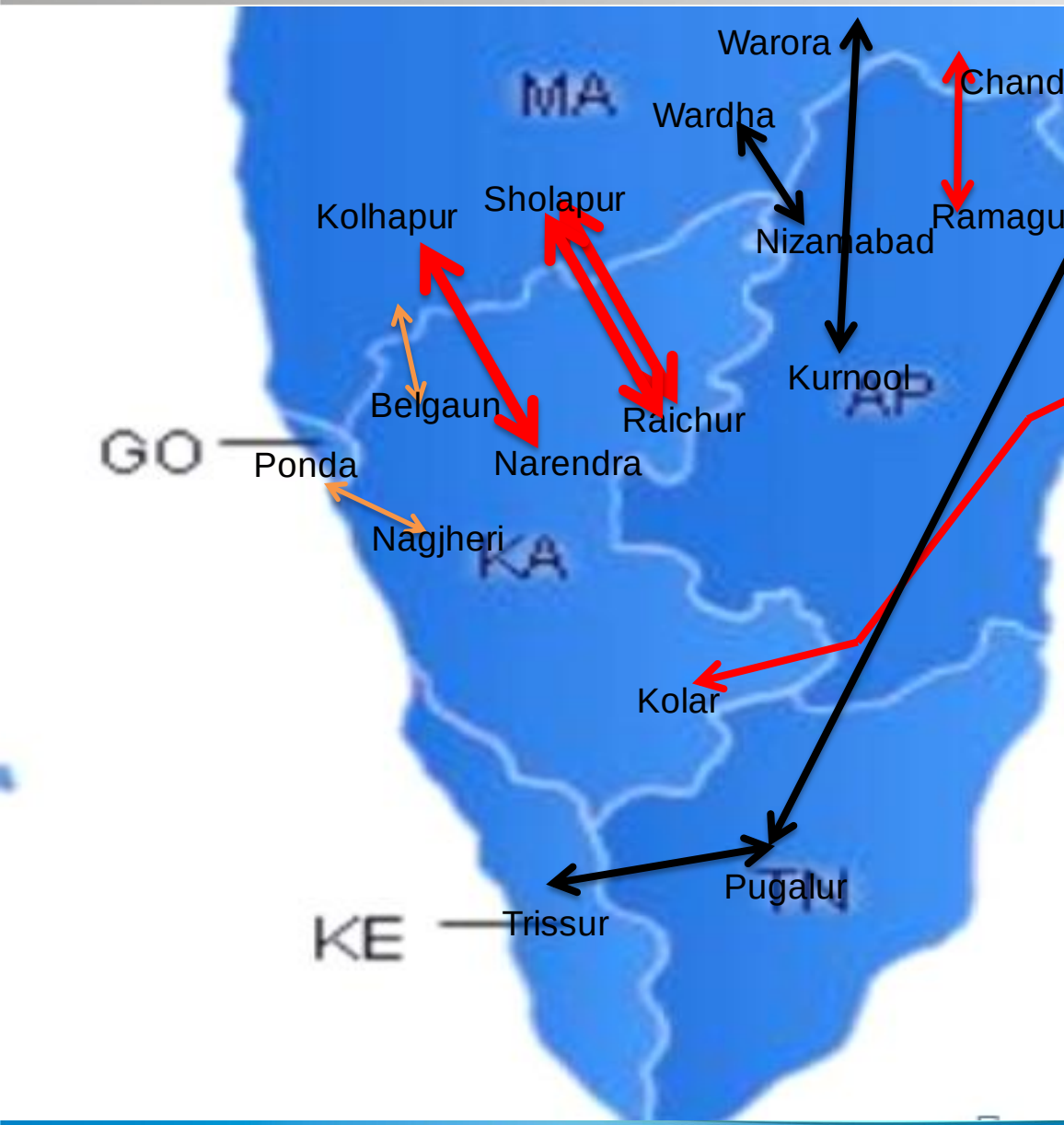
Proposed amendment in the Electricity Act, 2003

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 Capacity		(MW)
Gazuwaka B2B	ER-SR TTC	650
Talcher - Kolar		2000
ER-SR Reliability		0
ATC ER-SR		**2650**
Bhadravati B2B	WR-SR TTC	1000
Raichur-Sholapur		2300
Chikodi - Kolhapur		150
Narendra – Kolhapur		550
WR-SR Reliability		-750
ATC WR-SR		**3250**
Net SR Import Capacity		**5900**

Thank You for your attention

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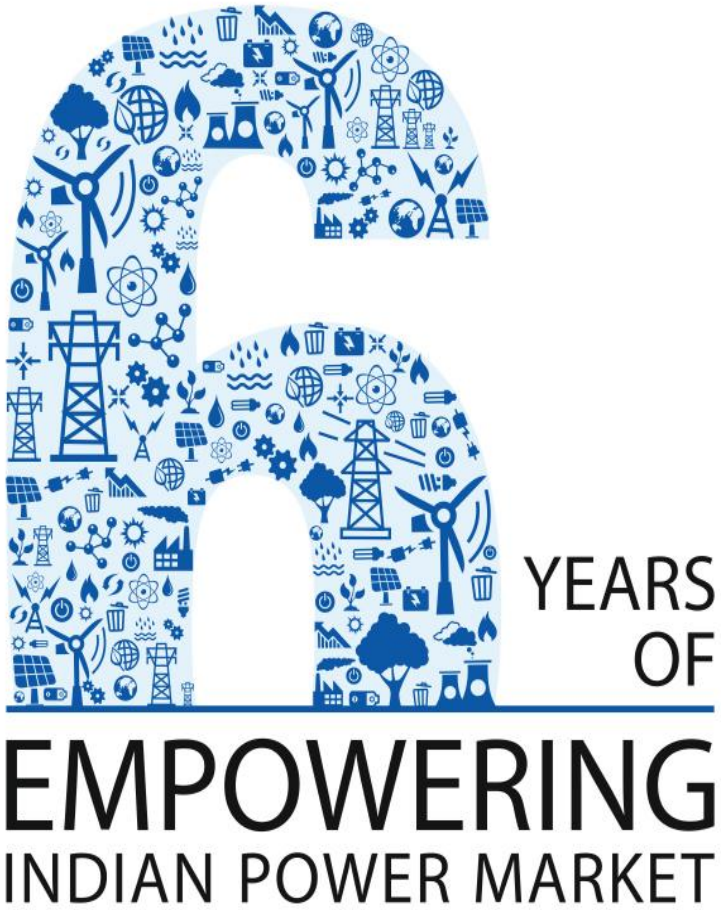

Best Power Exchange in India **– Enertia Awards '13**

Best Performing Power Exchange **– Power Line Awards '13 & '12**

Best E-enabled consumer platform **– India Power Awards '09**

Utilization of Existing Transmission capacity

Transmission Capacity - NLDC		(MW)
ER-SR TTC		2650
ER-SR Reliability Margin		0
WR-SR TTC		4000
WR-SR Reliability Margin		750
Total Transfer Capability (TTC)		6650
Reliability Margin		750
Available Transmission Capacity (TTC-RM)		**5900**
LTA		
Talcher-II		1700
Farakka		18
Kahalgaon		5
IGSTPS		700
JPL - TANGEDCO		400
BALCO-TANGEDCO		200
EMCO-TANGEDCO		150
KSK-TANGEDCO		500
DVB-TANGEDCO		208
DHARIWAL-TANGEDCO		100
ADHUNIK-TANGEDCO		100
MEJIA DVC -BESCOM		160
MAITHON DVC -KSEB		142
LTA - SUB TOTAL		**4391**
MTOA		
LANCO-TANGEDCO		100
KSK -AP		185
KSK - TG		215
NTPC SAIL		15
CSPDCL-KSEB		300
BALCO-KSEB		100
MTOA - SUB TOTAL		**915**
TOTAL LTA + MTOA		**5306**

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

Transmission Line SR

- **Status of upcoming links having impact on S1-S2:**
  - 400/230 kV Thiruvalam S/S and associated LILOs – Both ICTs and LILOs completed by Oct 2014.
  - 400 kV Thiruvalam – 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-Thiruvalam - Commissioned.
  - 400 kV Mettur- Singarapet- Thiruvalam – Jan 2015.
  - LILO of Kolar- Sriperumbudur at Thiruvalam – 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-Thiruvalam 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

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

Features of Power Market Regulations, 2010

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**

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