

MINUTES OF THE 20TH MEETING OF THE

CENTRAL ADVISORY COMMITTEE (CAC) OF CERC

HELD ON 18TH APRIL, 2016 AT NEW DELHI.

VENUE : “CERC's CONFERENCE HALL", UPPER GROUND FLOOR (FRONT SIDE), CHANDERLOK BUILDING, 36, JANPATH, NEW DELHI.

The meeting was chaired by Shri Gireesh B. Pradhan, Chairperson, Central Electricity Regulatory Commission (CERC). A list of participants is **enclosed** at *Annexure-I*. Shri Pradhan welcomed the members of the Central Advisory Committee (CAC) of CERC and stated that this was the first meeting after re-constitution of the CAC.

2.0 In his opening remarks, Chairperson, CERC expressed his appreciation for the advice and valuable suggestions given by the Central Advisory Committee on several important issues facing the sector and the Central Commission in particular. The Commission benefitted immensely from the advice of the CAC in the past. He highlighted that the Indian power market faces a different set of challenges today. Lack of adequate demand for electricity, poor financial health of the Distribution Companies, inadequate transmission infrastructure and congestion in transmission system are some of the internal factors affecting the growth of the sector. It was in this context that the critical issue related to development of power market had been brought before the Central Advisory Committee for discussion.

3.0 Chairperson, CERC said that the objective was to brainstorm the issues around power market and the Commission looked forward to the considered views of the Members of the Central Advisory Committee.

4.0 The address of Shri Pradhan was followed by a presentation made by Dr. Sushanta K. Chatterjee, Joint Chief (Regulatory Affairs), CERC on "Development of Power Markets". A copy of the presentation is **enclosed** at **Annexure-II**. The presentation highlighted the issues relating to the (i) existing structure / pattern in contracting power by the utilities in the backdrop of large scale RE capacity addition / energy conservation / dip in consumer demand etc.; (ii) necessity for facilitative infrastructure for power markets including transmission infrastructure, regulatory principles for determination of transmission charges and losses, rules for market access etc.; (iii) requirement of new market products in addition to the currently available products owing to ancillary services, RE integration / RPOs / RECs, currently available clearing and settlement mechanism, open access framework; currently available limited product range on power exchanges; (iv) requirement of other facilitative frameworks in addition to the existing market framework available to the generators and buyers.

5.0 The presentations summed up the following issues for discussion (i) requirement for change in the duration / type of contract, (ii) Risk management / risk mitigation strategies for long term / medium term / short term contracts, (iii) Desirable regulatory interventions to facilitate the emerging trends of distributed energy resources, (iv) required regulatory interventions for facilitating transmission infrastructure creation, sharing of transmission charges and losses, relieving congestion and further easing market access for generators, suppliers and buyers, (v) requirement of any new product for more efficient operation of the market (vi) requirement of any new facilitative frameworks in the areas of information access, market monitoring and access, OA Registry etc. and (vii) Any other suggestion,

6.0 Discussion

The issues highlighted were discussed in detail and the following views were expressed by the members of the CAC :

The regulatory frameworks put in place by CERC and other regulatory interventions taken by CERC have brought in transparency, credibility and immensely helped developing the power markets.

Contracting of Power:

- a. Lack of pick-up in demand due to a combination of factors (RE, energy efficiency, financial condition of discoms and slowdown in/absence of manufacturing/industrial growth etc.) has resulted in generation capacity created in the recent past being at risk of being stranded. With most of this capacity contracted through long-term PPAs, the burden of capacity charge will fall on the consumers falling in the jurisdiction of discom contracting for the capacity. Any rise as a consequence in tariff would further exacerbate the demand pick-up and may act as a deterrent to investment activity. Obviously this scenario has emerged because the forecasts at the time of contracting capacity were much higher than what has happened.
- b. It is difficult to imagine that such forecast errors would not occur in any system where the demand for the commodity (electricity) is a derived demand and would depend upon the state of economy. In the Indian context, it may be further confounded by the interest /constraints of discoms which are not driven by purely commercial objectives. Their ability to expand access to retail consumers and provide them reliable power may be limited by the need to subsidize and/or supply to non-paying/subsidized consumers in addition to legacy of organizational weaknesses. Hence, the forecast based on expansion of access may remain optimistic for some more time to come.
- c. Decentralized planning of capacity addition can have several negative consequences. Any State which contracts capacity in excess will end up either inflicting its consumer's higher tariff (payment of stranded capacity charge) or selling the capacity in the market. As long as some other States have contracted inadequately, the State can even gain as happened a few

years back but when the overall excess capacity comes up, selling in the market at cheap price may not be viable and even if viable, still leaves the State consumers with high enough tariffs. A centralized and coordinated approach may not only provide a more coordinated and robust forecast but also more flexibility with multi-lateral contracting for capacity wherein the buyers can have flexibility in addition to firm contract for the capacity (somewhat similar to UMPP but with more options among the buyers). The contracts and the planning process have to be more complex than what it is today and the current framework does not explicitly permits this approach but the planning function envisaged for the CEA can be used to build on this.

- d. While relying on medium-term contracts can solve this problem and if there is extensive use (say 20-40%) of medium and short-term contracts this problem goes away. However, this is possible only if the short-term market has enough depth wherein such quantum can be delivered (feasible) and without facing any major price impact. That may require steps in deepening short-term market (OTC + exchange).
- e. Currently, the PPAs envisage payment of capacity charges based on availability and hence both the developer and financier of a generating unit don't take any risk on the demand or change in merit order. The assumption is that the discoms should bear the demand risk but if discoms have no significant risk (consequence) due to this error (as the consumers pay for it), then there is a case that the capacity charge should be linked with the use of the plant rather than mere availability. This will force developers and financiers to evaluate closely the risk of getting stranded due to demand or position in the merit order. Specific assets for peaking or ancillary support at the central level may be exempted from these clauses. Another way to signal dynamically the capacity situation is to revise debt: equity norms periodically increasing it when capacity addition is sought for and lower it when there is adequate capacity in the pipeline.

- f. The duration of long term / medium term / short term contracts for power procurement need to be re-examined. In this process, the banking sector needs to be consulted to understand the issues for alignment of financial closure with revision of contract duration. In the context of issues related to quality / continuity of fuel supplies, it may be appropriated to consult fuel suppliers as well. Currently, an impression is being disseminated that power market consists of short-term market only. The distribution utilities may be allowed to revise their power procurement strategy by appropriately factoring in for LT / MT / ST / PXs etc. In order to dispel the apprehensions regarding fulfillment of commitments on part of ST generators in the event of unforeseen plant shut-down, such generators may be allowed to purchase power from the market to meet their commitments.
- g. Long terms power procurement contracts are better suited for mitigation of risks for the developers as well as the buyers and hence normally lead to lower price as compared to short term contracts. The low Solar tariff discovered in NSM and NTPC projects recently has been possible due to long term contracts (25 years), which may not have been possible for any period less than 25 years. For attracting investment to the sector, Long term (25 years) power procurement route has to be kept open. From buyers' point of view, assurance of power to meet the base load requirement can be procured through long term contracts as opposed to the uncertain and speculative nature of the short term market route. The share of short term markets should be increased in a gradual manner. Under the Indian conditions, the shares of Long term could be 80 ~ 85% of the power procurement in the country.

Open Access to Consumers

- a. The framework for Open Access has been specified, but the actual number of OA Consumers is still nearly 3000, which is not an encouraging sign. Open access needs to be given in more transparent manner by the States to develop the market. CERC and the Forum of Regulators

(FOR) need to address the twin issues of excessive cross subsidy and lack of support from SLDCs to facilitate OA consumers.

- b. Pending separation of distribution network from supply, open access to the consumer today is limited because of the various tariff and non-tariff barriers enacted by discoms with the help of other State Government owned entities (SLDC, STC etc.). The problem is likely to worsen with low prices in the market due to excess capacity and high tariff within the discom jurisdiction. The current framework allows the open access consumers to have best of both worlds - they can buy from the market when it is cheap (in an era of excess capacity) and buy from the discom when it suits them (in an era of high market prices).
- c. The issue of deemed concurrence by SLDC on account of delay appropriately takes forward the implementation of market reforms. However, a suitable mechanism to track the implementation is required to be put in place.
- d. In view of the above, it is necessary that any consumer opting for open access has to avail of open access for a considerable period. In other words, a consumer opting for open access should continuously buy from the market and the seller/trader has to supply to the consumers even if it means buying from the discom to supply to the consumer. This is possible only when the short-term market has enough depth.
- e. In this regard, any move for facilitating and operationalizing Open Access registry is a welcome move. Such a framework would equally benefit the generators as well as the buyers.

Facilitative Infrastructure:

- a. In the present scenario, the data pertaining to availability of transmission and transformation capacities are lacking transparency. Therefore, it is highly necessary that the Transmission Reliability Margin (TRM) be decided judiciously. The transmission network at State level is

not yet fully geared to handle the future generation – load balance requirements. Therefore, as regards facilitative infrastructure, State transmission network needs to be augmented. In this regard, it was opined by the Members that Utilization of transmission systems must be monitored.

- b. In order to encourage augmentation of solar generation, the initiatives taken by the Government of India and the regulatory framework devised by the CERC are laudable. However, to further facilitation RE generation, the transmission losses and charges pertaining to transmission of renewable energy may required to be socialized across other generation segments.
- c. Regional markets have not fully developed and there is large scope for development of these markets. These regional markets partially address the issues of market imbalances. Therefore, it is necessary that regulatory initiatives are devised and put in place to develop the regional markets.

Developing Short-term market

Renewable Energy:

- a. The CERC has taken a number of initiatives to promote generation of renewable energy. Renewable Energy Purchase Obligation / REC is a mechanism devised to stimulate demand for RE power. However, due to non-compliance RPO targets, implementation of this mechanism still remains a challenge. In case of full-scale implementation / compliance of RPO, reduction of renewable energy is anticipated.
- b. Therefore, Green energy should be encouraged by the regulatory bodies and in this process the Commissions should ensure strict compliance of RPO targets by the utilities. However, while determining the RPO targets, the respective Regulatory Commission should consider

the cost implication on ARR of the distribution utilities and impact on the financial health of the discoms.

- c. The mechanism should contain appropriate incentivizing the dis-incentivizing provisions. In addition, as a measure towards stimulating the demand for renewable energy, the ERCs should consider facilitating the generators for combining the renewable energy generation with appropriate storage technologies. Demand for RE power could be further stimulated by facilitating inclusion of such upcoming technological solutions into the system.
- d. For better monitoring of compliance, instead of bunching the compliance at the year end, quarterly or half yearly compliance of RPO with credits or carry forward obligation can be imposed.
- e. Presently, a wide gap in price of the solar REC and non-solar REC is observed. The reasons for gap and level of accumulation and possible measures for stimulating the REC market need to be studied in detail.
- f. Currently, REC trading is not allowed on bilateral route, which has to be allowed to develop market for RECs. In case of trade on Power exchange platform, only one day is allowed for REC trade which is hampering the sale of RECs.

Market Products:

- a. Overall the transactions through the short-term markets are about 10% but the number of participants is few. In addition to preponderance of long-term PPAs, there are two major bottlenecks in the development of market- (a) the transmission availability / congestion, and (b) the fragmentation of market for open access by reservations on transmission capacity sequentially.
- b. Despite National Policy, the transmission planning is reactive to the demand and requires clearance from beneficiaries rather than an independent exercise based on emerging scenarios consistent with development of national grid. Like resource adequacy planning,

this function should be centralized. Even if the transmission capacity gives preference to long-term contracts and then medium term contracts, the remaining capacity at least six months in advance should be left open for all the subsequent contracts to be handled together.

- c. One can start with three months and extend it further based on review of experience. The information on balance unallocated capacity should be available in the public domain and should be dynamically updated. The transparency on all market relevant information is called for. Any contract or transmission system related information should be updated as quickly as is feasible and should cover ISTS, generators, STUs/CTU, all contracts, and LDCs.
- d. The intra-day transactions on the power exchanges with shorter notice periods allow the buyers and suppliers to respond to emerging situations and crises. In order to further facilitate, the notice period on PXs could further be reduced from three hours to one hour.
- e. The current mechanism of client – membership in Power Exchange creates a monopolistic situation, as the clients are locked for a period of one year. This is preventing competition and service to the client.
- f. Current practice of intra-day scheduling takes 3 hrs which can be reduced to take advantage of short term market by the buyers.
- g. There is a need to fix a minimum trading margin by CERC which can be linked to the price of the power also. This is required as traders are taking lot of risk and payments of open access charges to the concerned RLDC/SLDC in advance. Further, the traders are also providing all the tender related costs including furnishing of Earnest money, contract performance guarantee also.
- h. The generators should be allowed to buy power from the market to fulfill the commitments of supply to the buyer.

- i. The Power Exchanges have started functioning round the clock and the experience needs to be studied further, so that corrective measures required, if any, could be identified and implemented.
- j. There is substantial scope of development of OTC market and space for more traders to enter into the market. Hence, there is an urgent requirement for identifying the forbearance price in OTC market and further rationalization of trading margins, so that market could be further expanded and streamlined.
- k. Currently, the audit risk is reasonably aggregated. There is huge scope of disaggregation of audit risk through facilitating establishment of multiple settlement agencies. However, before arriving at any decision on this aspect, a detailed study needs to be carried out to understand the scope and extent of the capacity of requirement of the market for establishment of such agencies.

Other Issues:

- a. Considering availability of 290 GW of generating capacity and deficit in meeting peak load of 150 GW, it is necessary that a more realistic and field survey based demand estimation methodology needs to be adopted. Measures need to be taken to gather and maintain information related to load shedding at pan-India level.
- b. As regards facilitating development of and access to transmission infrastructure, it is understood that General Network Access has been under discussion for quite some time and the same is required to be finalized for effective implementation.
- c. Currently, for settlement on the power exchanges, the buyers and sellers do not have multiple options. Introduction of multiple financial settlement support products is likely to increase the volume of energy transactions and therefore, the Regulatory Commission should explore the possibility of facilitating the other options for financial settlement mechanism.

- d. Regular monitoring of key parameters would facilitate functioning of the regulatory institutions and progress on those parameters may be shared with Advisory Committee.
- e. CERC may publish their policy statements (on annual / bi-annual basis) highlighting key issues for examination during the ensuing period.
- f. CERC and Forum of Regulators need to play active role for institutionalizing independent feedback and monitoring mechanism on implementation and understanding the effectiveness of policy and regulatory initiatives.

Consensus:

- a. The tenure of long term and medium term power purchase contracts were established few decades back and since then the power market has undergone many changes. Therefore, it is necessary to further debate the tenure of LT / MT power purchase contract and examine in the light of changing scenario of power market and future developments.
- b. It is observed that the stakeholders are experiencing lack of transparency in terms of transmission capacity / transformation capability, which prevents them from taking well-informed decisions by them and in turn relieving congestion. There is an urgent need to examine the steps required to be taken for bringing in more transparency and facilitate the stakeholders in taking appropriate decisions.
- c. It is also observed that the merit order dispatch system currently followed in the market needs to be further examined to understand whether the system is adequate enough to meet the changing market scenario or if any changes in the mechanism need to be brought in to make the market more responsive and truly enhances the overall system efficiency.
- d. It is also felt that many smaller regulatory interventions are required to be taken at various levels to make the system stakeholder friendly, and facilitates expansion of volume of business for various products in the power market.

The Chairperson, CERC invited the Members of CAC to send their written comments / observations, if any, in addition to the discussion carried out today on the issues, which would facilitate the Commission to examine the issues in its entirety. If required, another session on these could be held subsequently to finalize the views of the Members on each of the issues.

He expressed gratitude for the suggestions given by the Members of the Central Advisory Committee and Members of CERC. He thanked the Officers of the Commission for their arduous efforts in organizing the Meeting.

The meeting ended with a vote of thanks to the Chair.

**LIST OF PARTICIPANTS ATTENDED THE 20TH MEETING OF
CENTRAL ADVISORY COMMITTEE (CAC)**

**HELD AT CERC, NEW DELHI
ON 18TH APRIL, 2016**

S. No.	NAME	
01.	Shri Gireesh B. Pradhan Ex-Officio, Chairperson, CAC	Chairperson, CERC
02.	Shri A.K. Singhal Ex-Officio Member, CAC	Member, CERC
03.	Dr. M.K. Iyer Ex-Officio Member, CAC	Member, CERC
04.	Shri A.K. Kapoor	Member (Electrical) Railway Board
05.	Shri R.V. Shahi	Former Secretary, MOP
06.	Shri Ajay Shankar	Former Secretary, DIPP and Special Secretary, MOP
07.	Dr. Balram Satish Agnihotri	Former Secretary, MNRE and Prof. IIT, Mumbai
08.	Shri Tulsi Tanti Chairman	SUZLON
09.	Prof. Ajay Pandey	Dean (Programmer) IIM, Ahmedabad
10.	Shri Gurdeep Singh Chairman & Managing Director	NTPC
11.	Shri K.M. Singh Chairman & Managing Director	NHPC
12.	Shri Jawed Akhtar Chairman & Managing Director	KPTCL
13.	Shri Deepak Amitabh Chairman & Managing Director	PTC India Limited
14.	Shri N.K. Sharma CEO	NVVNL
15.	Shri Bhasker U. Mete President, GEA	Maharashtra State Electricity Power Gen. Corpn. Limited
16.	Shri Abhijit J. Deshpande Director (Operations)	Representative of MSEDCL
17.	Ms. Seema Gupta Executive Director	Representative of PGCIL

18.	Ms. Ashwini Chitnis	Representative of PRYAS Energy Group
19.	Mr. Arun Srivastava	Representative of TATA Power Co. Ltd.
20.	Ms. Varsha Raut	Representative of Mumbai Grahak Panchayat
21.	Shri H.M. Sharma	Representative of ASEB & Assam Power Distribution Corporation Limited
22.	Ms. Srirupa Bhowmik	Representative of Confederation of Indian Industry (CII)
23.	Shri Sameer Ganju	Representative of Adani Power Limited



Development of Power Market

**20th Meeting of the
Central Advisory Committee**

**18.4.2016
CERC, New Delhi**

In this Presentation ...

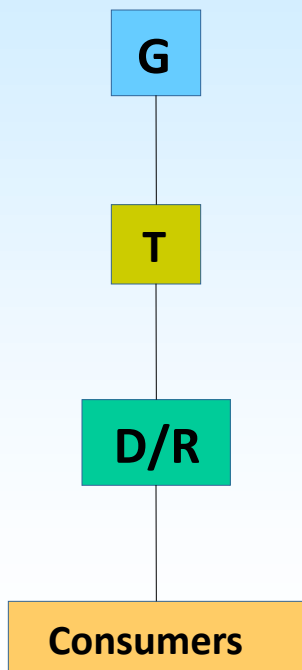
- **Evolving Market Structure**
- **Vision of Power Market**
- **Regulatory framework created by CERC**
- **Issues for Discussion**
 - **Contracting of Power**
 - **Facilitative Infrastructure**
 - **Market Products**
 - **Other Facilitative Frameworks**

Electricity Sector – Evolving Market Structure

Future (under discussion)

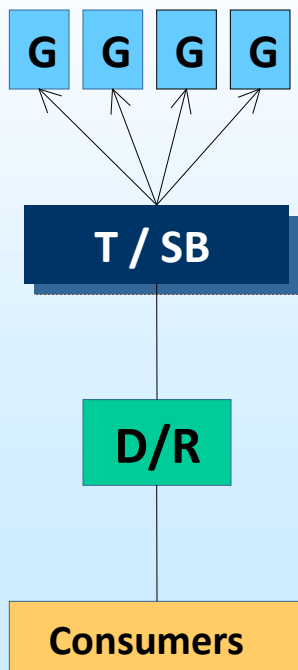
No Competition

- No choice
- Government makes decision



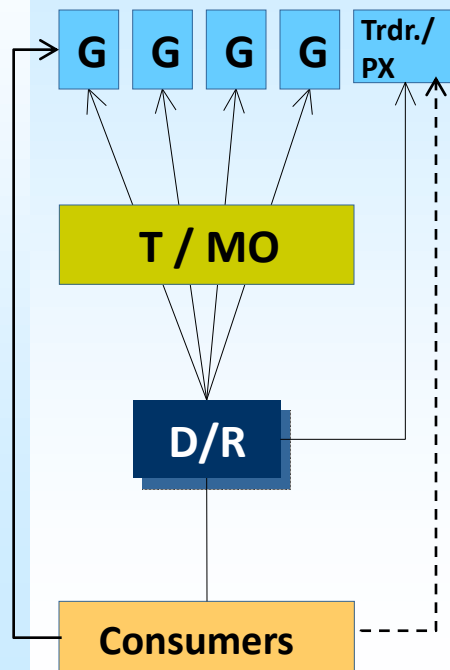
Generation Competition

- Single buyer has choice



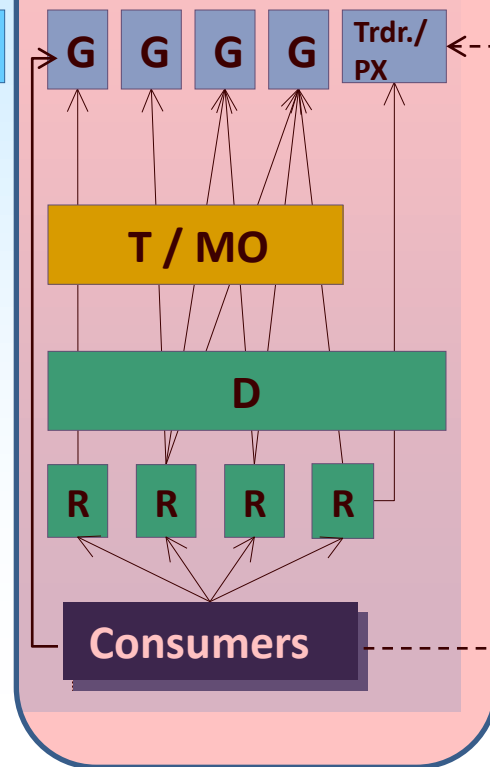
Wholesale Competition

- Distribution/retail companies have choice



Retail Competition

- Consumers have choice



= Who has choice
 MO = Market Operator
 Trdr. = Traders PX = Power Exchange

Vision of Power Market in the Act

Multiplicity of Players

Delicensing of Generation
Reorganization of SEBs
Transmission Companies
Traders
Power Exchanges

Market Access

Non-Discriminatory Open
Access
Long Term Access
Medium Term Open Access
Short Tem Open Access

Over-arching responsibility of Regulators to realize this vision

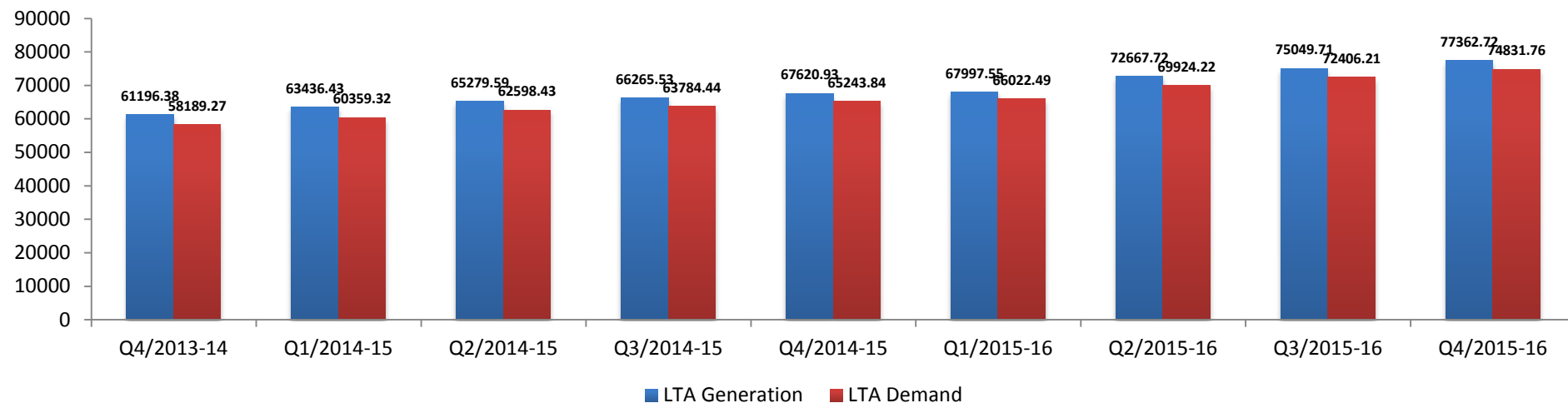
Multiplicity of Players – Status

- **600+ generators**
- **30+ Transmission licensees**
- **70+ Distribution Utilities**
- **2 Power Exchanges**
- **43 Trading Licensees**
- **1 NLDC, 5 RLDCs, All State SLDCs (system operators)**

Market Access – Facilitative framework

- **CERC Facilitated non-discriminatory Open Access through Regulations on**
 - **Grant of Connectivity, Long-Term Access and Medium-Term Open Access in Inter-state Transmission**
 - **Inter-State Transmission Charges & Losses**
 - **IEGC (scheduling code, operating frequency band etc) & Deviation Settlement Mechanism (commercial signals restraining deviation)**
 - **Staff paper on Transmission planning, connectivity, long /medium term access (Under discussion)**

Inter-State Open Access Transactions (MW)



	Q4 2013-14	Q1 2014-15	Q2 2014-15	Q3 2014-15	Q4 2014-15	Q1 2015-16	Q2 2015-16	Q3 2015-16	Q4 2015-16
LTA Generation	61196.38	63436.43	65279.59	66265.53	67620.93	67997.55	72667.72	75049.71	77362.72
LTA Demand	58189.27	60359.32	62598.43	63784.44	65243.84	66022.49	69924.22	72406.21	74831.76

MTOA Approved (Currently Stands approved excluding surrendered / relinquished / closed etc.) 6543.15 MW

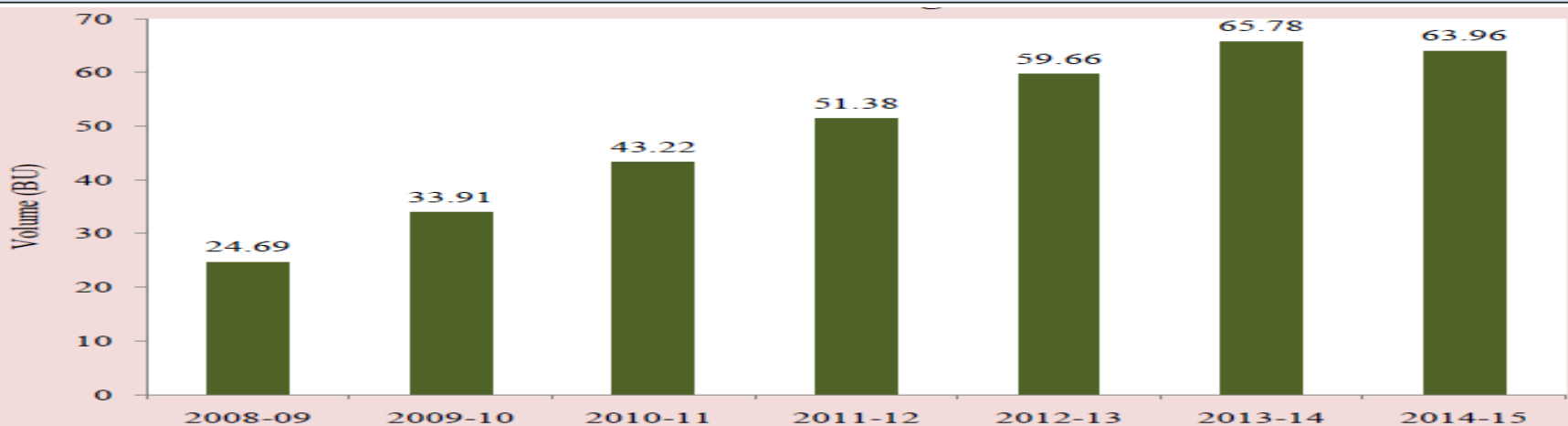
Development of Short Term Market

- **Creation of a Market Structure and Market Rules**
 - Terms and Condition for Trading License Regulations, 2009
 - Trading Margin Regulations, 2010
 - [Power Market Regulations, 2010](#)
- **License to Electricity Traders (43)**
- **Two Power Exchanges operational**
 - **Anonymous and Competitive price discovery on electronic platform**
 - **Based on real demand and supply & Quick Price dissemination**
- **Products include Day ahead, week ahead, intraday/contingency, RECs**
- **More than 3000 open access consumers procuring electricity through Power Exchanges regularly**
- **In FY 2014-15, Short Term Market constituted 9 % of total generation (1030 BU)**

Short Term Transactions (Vol. of Transactions)

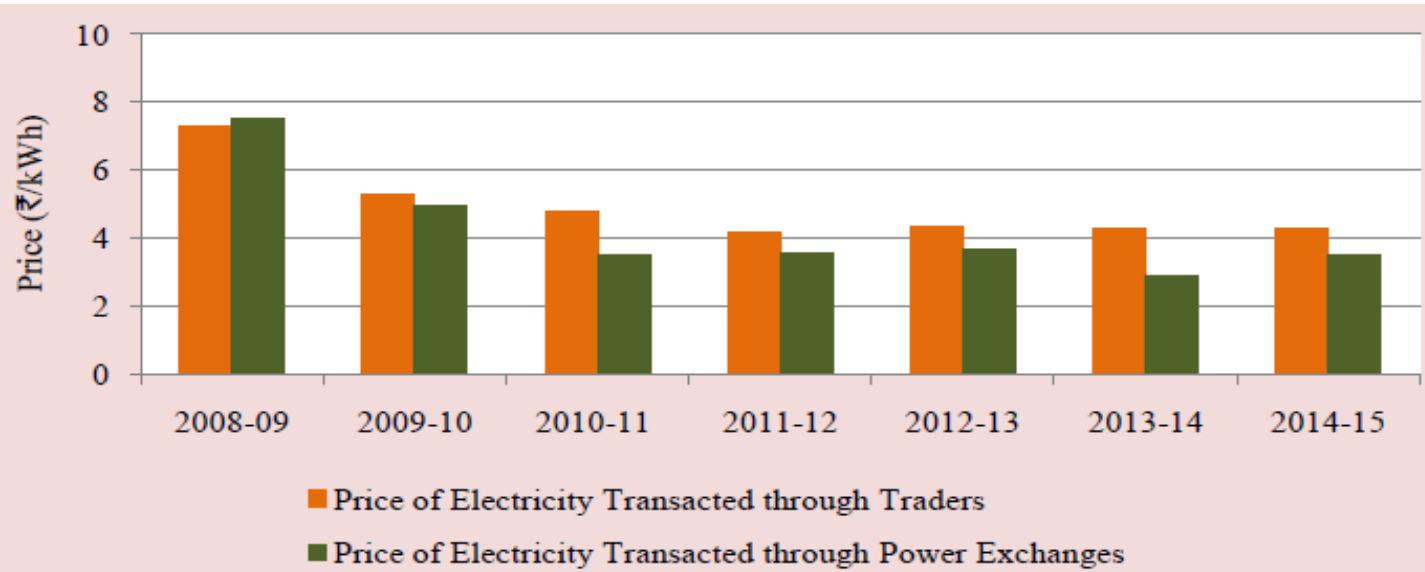
Year	Electricity Transacted through traders (BUs)	Electricity Transacted through IEX (BUs)		Electricity Transacted through PXIL (BUs)		Electricity Transacted through IEX and PXIL (BUs)	Total (BUs)
		Day Ahead Market	Term Ahead Market	Day Ahead Market	Term Ahead Market		
2008-09	21.92	2.62		0.15		2.77	24.69
2009-10	26.72	6.17	0.095	0.92	0.003	7.19	33.91
2010-11	27.70	11.80	0.91	1.74	1.07	15.52	43.22
2011-12	35.84	13.79	0.62	1.03	0.11	15.54	51.38
2012-13	36.12	22.35	0.48	0.68	0.04	23.54	59.66
2013-14	35.11	28.92	0.34	1.11	0.30	30.67	65.78
2014-15	34.56	28.12	0.22	0.34	0.72	29.40	63.96

Note: The volume of electricity transacted through traders in 2008-09 (April to July 2008) includes cross border trading and intra-state trading volume.



Short Term Transactions (Price in ₹/kWh)

Year	Price of Electricity transacted through Traders (₹/kWh)	Price of Electricity transacted through Power Exchanges (DAM+TAM) (₹/kWh)
2008-09	7.29	7.49
2009-10	5.26	4.96
2010-11	4.79	3.47
2011-12	4.18	3.57
2012-13	4.33	3.67
2013-14	4.29	2.90
2014-15	4.28	3.50



*-the delivery point of transaction through traders differ from that of the transactions through Power Exchanges.

Major Sellers through Traders (2014-15)

S.No.	Seller	State	Volume (MU)	Approximate Percentage of total volume transacted through Traders	Weighted Average Sale Price ₹/kWh
1	APL	Gujarat	2583.37	13.96%	3.88
2	JSWEL	Karnataka	2399.39	12.97%	5.68
3	JPL	Chattisgarh	1775.82	9.60%	3.32
4	GOHP	Himachal Pradesh	1704.26	9.21%	3.81
5	Sterlite Energy Ltd	Odisha	1542.21	8.33%	3.47
6	Simhapuri Energy Ltd	Andhra Pradesh	1039.63	5.62%	5.46
7	MEPL	Andhra Pradesh	650.26	3.51%	5.50
8	BMM-I	Karnataka	489.75	2.65%	5.56
9	HPSEB	Himachal Pradesh	464.65	2.51%	4.38
10	CSPDCL	Chattisgarh	460.08	2.49%	3.69

Note : Volume sold by major sellers and total volume transacted through traders does not include the volume through banking arrangement

Major Buyers through Traders (2014-15)

S.No.	Buyer	State	Volume (MU)	Approximate percentage of total volume transacted through traders	Weighted Average Purchase Price ₹/kWh
1	APPCC	Andhra Pradesh	5846.49	31.59%	5.09
2	PSEB	Punjab	2684.76	14.51%	3.83
3	BEST MSEB	Maharashtra	1846.47	9.98%	4.12
4	BSEB	Bihar	1291.08	6.98%	4.47
5	KSEB	Kerala	1233.59	6.67%	5.42
6	TPCL	Maharashtra	1076.82	5.82%	3.29
7	UPPCL	Uttar Pradesh	853.15	4.61%	3.59
8	UPCL	Uttarakhand	749.04	4.05%	3.40
9	NPCL	Uttar Pradesh	721.68	3.90%	3.58
10	MSEDCL	Maharashtra	592.99	3.20%	3.35

Note : Volume Bought by major buyers and total volume transacted through traders does not include the volume through banking arrangements

Major Sellers on Day Ahead Market, IEX (2014-15)

S.No	Name of Seller	State	Sell Volume (MU)	Percentage of the total volume transacted in IEX	Weighted Average Sale Price (₹/kWh)
1	GOHP	H.P.	2552.83	9.07%	3.29
2	Sesa Sterlite Ltd	Sterlite Energy	1798.58	6.39%	3.52
3	JPL	Jindal Power	1647.92	5.86%	3.19
4	JSPL	Jindal Steel and Power Ltd	1277.88	4.54%	2.96
5	MPPMCL	Madhya Pradesh	1106.79	3.93%	2.69
6	HPPC	Haryana	996.43	3.54%	3.53
7	GUVNL	Gujarat	984.87	3.50%	2.97
8	JPL Stage 2	Jindal Power Ltd Stage 2	901.66	3.20%	3.26
9	KWHEP	KarchamWangtoo HEP	757.31	2.69%	3.41
10	CSPDCL	Chhattisgarh	704.78	2.50%	3.20

Note: Total Volume transacted through Day Ahead Market in IEX was about 28140 MU.

Major Buyers on Day Ahead Market, IEX (2014-15)

S.No	Name of Buyer	State	Buy Volume (MU)	Percentage of the total volume transacted in IEX	Weighted Average Buy Price (₹/kWh)
1	Essar Steel India Ltd	Gujarat	1975.56	7.02%	2.98
2	MSEDCL GEPL	Maharashtra	1854.29	6.59%	3.81
3	UPPCL	U.P.	1771.04	6.29%	3.87
4	UPCL	Uttarakhand	1181.48	4.20%	3.15
5	BSPHCL	Bihar	1076.29	3.82%	3.90
6	WBSEDCL	West Bengal	986.81	3.51%	3.85
7	Torrent Power Ltd	Gujarat	958.75	3.41%	3.56
8	JVVNL	Rajasthan	939.91	3.34%	4.19
9	TSSPDCL	Telangana	882.26	3.14%	5.78
10	Reliance Infrastructure Ltd	Maharashtra	775.88	2.76%	3.62

Note: Total Volume transacted through IEX was about 28140MU.

Major Sellers on Day Ahead Market, PXIL (2014-15)

S. No	Name of the Seller	State	Sell Volume (MU)	Percentage of total volume transacted in PXIL	Weighted Average Sell Price (₹/kWh)
1	NDMC	Delhi	145.53	42.71%	3.10
2	GUVNL	Gujarat	54.69	16.05%	3.10
3	Jindal Steel Plant	Chhattisgarh	36.46	10.70%	2.68
4	Sterlite Energy Ltd	Odisha	19.22	5.64%	3.30
5	GRIDCO Ltd	Odisha	17.31	5.08%	3.67
6	Vandana Vidyut Ltd	Chhattisgarh	15.88	4.66%	3.39
7	CSPDCL	Chhattisgarh	13.88	4.07%	3.07
8	MSEDCL	Maharashtra	9.77	2.87%	2.20
9	JVVNL	Rajasthan	9.20	2.70%	3.00
10	MPPTCL	Madhya Pradesh	7.29	2.14%	2.51

Note : The Volume transacted in the Day Ahead Market of PXIL was about 340MU

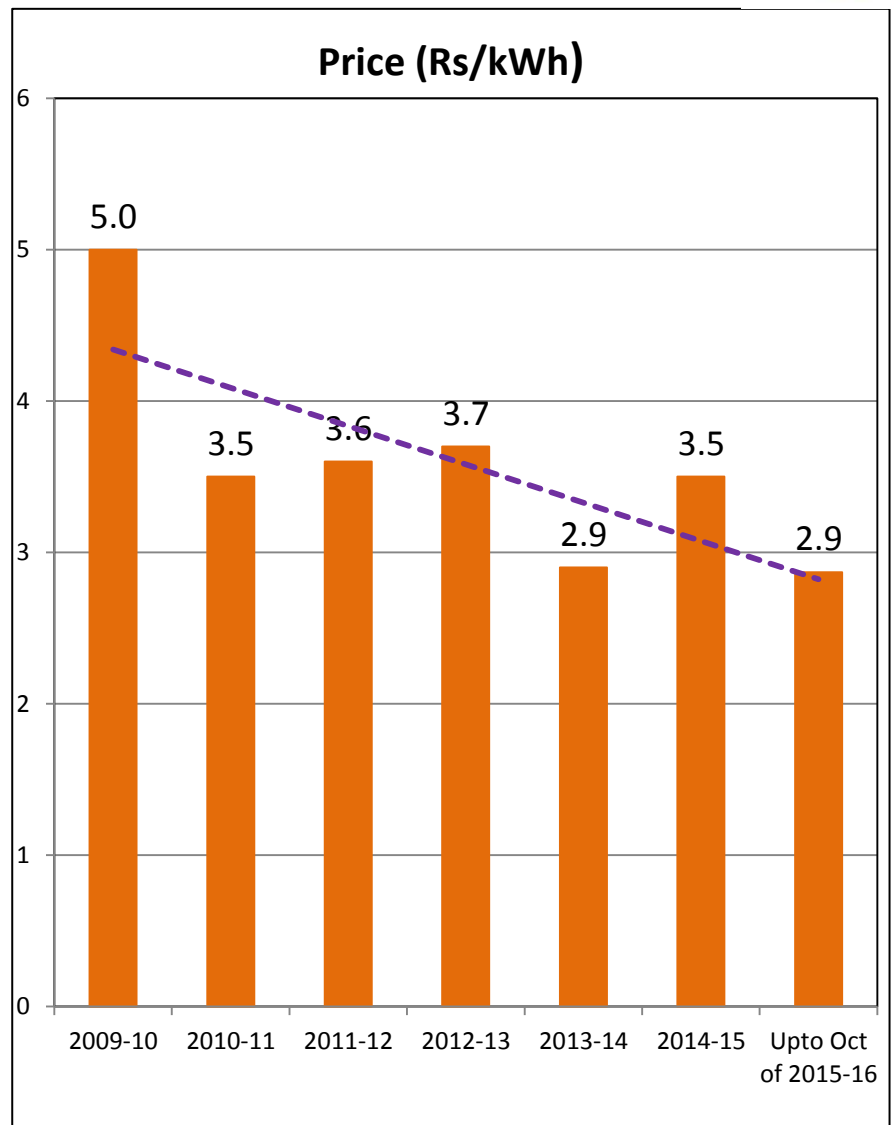
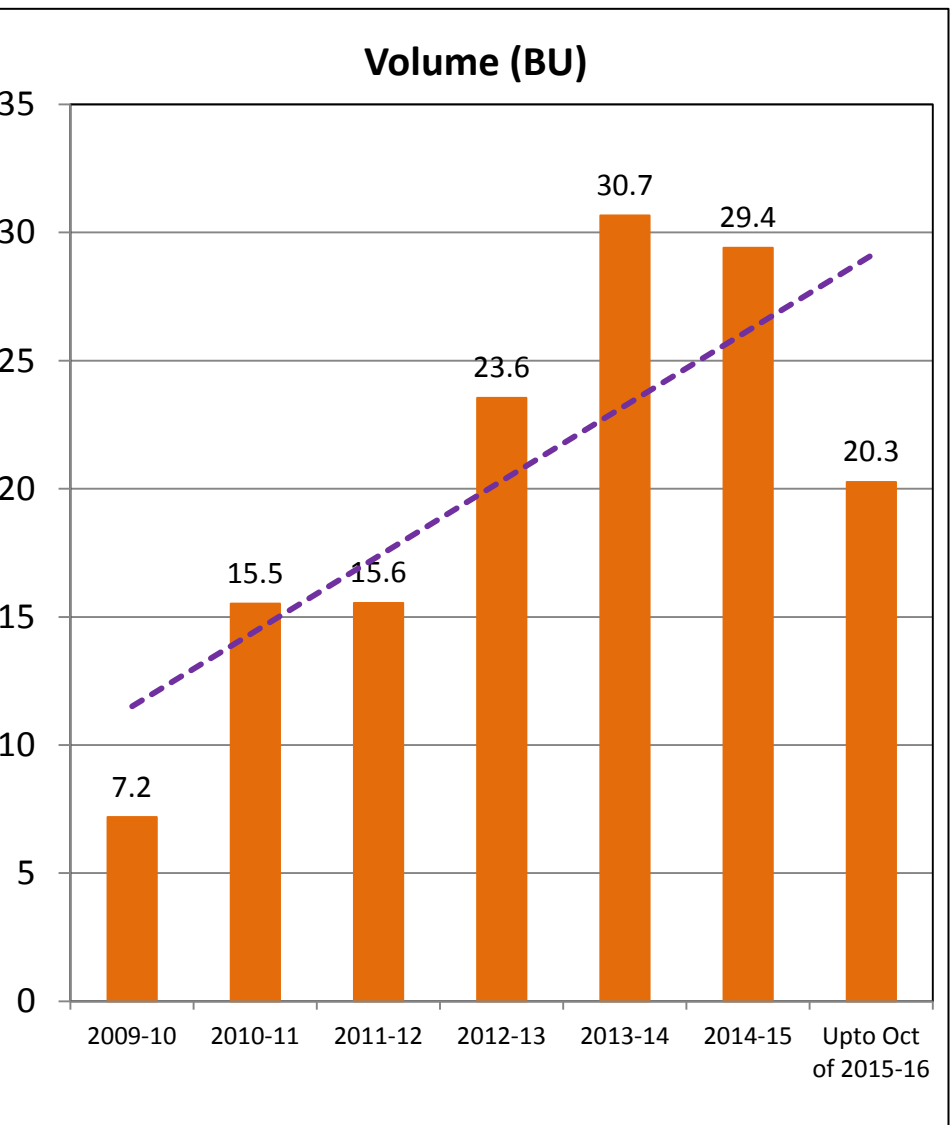
Major Buyers on Day Ahead Market, PXIL (2014-15)

S.No.	Name of the Buyer	State	Buy Volume (MU)	Percentage of total volume transacted in PXIL	Weighted Aaverage Buy Price ₹/kWh
1	UPCL	Uttarakhand	96.23	28.24%	2.85
2	UPPCL	UP	65.69	19.28%	3.63
3	Essar Steel India Ltd	Gujarat	38.94	11.43%	3.05
4	Bodal Chemical Ltd	Gujarat	14.66	4.30%	2.79
5	KSEB	Kerala	14.07	4.13%	3.46
6	Bhansali Engineering Polymers Ltd	Rajasthan	11.07	3.25%	2.85
7	IFFCO Plant Kandla	Gujarat	10.63	3.12%	2.90
8	BSPHCL	Bihar	8.77	2.57%	4.06
9	Oracle Granito Ltd	Gujarat	8.31	2.44%	2.72
10	Orient Abrasives Ltd	Gujarat	8.04	2.36%	2.81
<p><i>Note : Total Volume transacted in the Day Ahead Market of PXIL was about 340 MU</i></p>					

Buyers & Sellers on both Power Exchanges

	No. of Buyers			No. of Sellers		
	2012-13	2013-14	2014-15	2012-13	2013-14	2014-15
IEX	1541	2024	1736	137	218	246
PXIL	160	105	61	36	29	19

Functioning of Power Exchanges (Vol. & Price)



Issues for Discussion – (I) Contracting of Power

- More than 90% are LT contracts
- During FY 2014-15, ST Market constituted 9% of total generation
- Challenges include Poor financial health of Discoms, large scale RE capacity addition, efficiency measure, energy conservation, dip in consumer demand etc.....

.....leading to surrender of PPAs, stranded capacities.

Request for Surrender of Power by States (MW)			
Odisha	769	Sikkim	9.96
DVC	95.8	Delhi	2255
Rajasthan	9.75	M.P.	156.41
Meghalaya	53	Haryana	693
Total Request for Surrender 4041.92 MW			

- Need for accurate estimation of demand (by factoring in DERs and RE)

Views solicited on

- *Duration / type of contract in future*
- *Risk management / risk mitigation strategies for LT / MT / ST etc.*
- *Regulatory interventions required to take care of and facilitate the emerging trends of RE, EE, etc*

Issues for Discussion – (II) Facilitative Infrastructure

- Adequacy of transmission infrastructure for execution of contracts
- CERC granted licenses to transmission utilities under cost plus and competitive bidding regimes.
- Also notified principles for sharing transmission charges and losses
- Rules for market access have also been notified
- Floated a staff paper for further restructuring of transmission charges

Views solicited on....

- *further desirable regulatory interventions for facilitating transmission infrastructure creation, sharing of transmission charges and losses, relieving congestion and further easing market access for generators, suppliers and buyers.*

Issues for Discussion – (III) Market Products

- **Ancillary Services**
- Gencos that are regional entities and whose tariff is determined or adopted by the CERC for their full capacity shall be providing Reserves Regulation Ancillary Services (RRAS).
- In the long term, a market based framework is required for efficient provision of secondary reserves from all generators across the country.
- Requires revamping of the infrastructure, effective load forecasting and implementation of DSM by the states.
- **Renewable Energy Integration**
- Integration of RE power markets through the introduction of REC Mechanism, however, the results have not been encouraging.
- Real challenge, lies in RPO compliance which is a State level issue.

Issues for Discussion – Market Products....

- **Settling of trades in Power Market**
- **PMR provide for setting up of clearing and settlement organizations which specialize in processing the financial part of the transactions.**
- **Lack of economies of scale has not provided space for such entities.**

- **Open Access Challenge**
- **Existence of price & non-price barriers**
- **Rationalization of Transaction Charges**
- **Simplification of trading margin regulations**
- **Organizing of the OTC market network**

Issues for Discussion – Market Products...

- **DSM Price Vector**
- The price signals are crucial for ancillary services
- Is there a need for re-designing the price vector?

- **Power Exchange Products**
- Day ahead, week ahead, intraday/contingency, RECs
- Limited product range leading to competition for limited domain.
- Frequent clearing in PX/Gate closure nearer to real time
- Need to examine, if increase in product range facilitates scope of broad-based competition among different platforms

Views solicited on ...

- *new products, if any that the Commission should consider to introduce for more efficient operation of the market.*

Issues for Discussion – (IV) Other Facilitative Frameworks

- **Information Access**
 - Key information includes load & price forecasting, transmission corridor availability, outage situations of generators etc.
 - Information asymmetry promotes collusion / aids monopoly, if any.
 - Low conversion rate of data into information for the benefit of stakeholders
 - Dissemination through website / apps is just the beginning
- **Market Monitoring & Surveillance**
 - Building trust & confidence through scrutiny and independent information analysis
 - Measures for capturing anti-market activities
- **Open Access Registry**
 - Number of transactions are increasing day-by-day
 - Approval process – manual / e-mails
 - Need for Electronic Registry, which maintains complete transaction history
- *Views solicited on
the desirable regulatory interventions?*

Issues for Discussion

(I) Contracting

- *Duration / type of contract?*
- *Risk management / risk mitigation strategies for LT / MT / ST etc.?*
- *Desirable regulatory interventions to facilitate the emerging trends of DERs?*

(II) Infrastructure

- *Regulatory interventions for facilitating transmission infrastructure creation, sharing of transmission charges and losses, relieving congestion and further easing market access for generators, suppliers and buyers?*

(III) Market Products

- *Any new product for more efficient operation of the market?*

(IV) Other facilitative framework

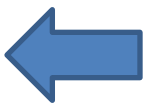
- *Information access, market monitoring and access, OA Registry?*

Any other suggestion!

Thank you

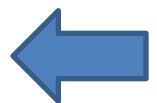
Steps Taken by CERC for Developing Power Markets

- **Open Access**
- **Open Access in transmission (more than 3000 OA Consumers)**
- **CERC provided deemed concurrence of SLDCs, if not given access within the time limit**
- **Notified Regulations for Connectivity, LTA, MTOA, providing transmission products of different varieties, standardization of procedures, defining timelines**
- **SERCs to specify various norms and charges, including cross subsidy surcharges, for availing of open access**



Steps Taken by CERC for Developing Power Markets

- **Power Market Regulations**
- Resource optimization by facilitating the transfer of surplus power to deficit regions in the country
- Facilitates functioning of market in a fair and transparent manner
- Aggregate Demand and Supply Day Ahead curves by Power Exchanges - Display on PXs websites has significantly contributed towards information dissemination, bring transparency in the markets and helped market participants to take informed price decisions.
- 24x7 Extended market session in Power Exchanges
- trading window is now open round the clock for delivery of power on the same day (minimum delivery period - 3 hours after contract execution subject to corridor availability)
- REC markets- REC can be traded only on power exchanges.
- Review of Power Exchanges initiated.



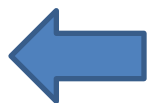
Steps Taken by CERC for Developing Power Markets

- **Deviation Settlement Mechanism and IEGC**
- **Notified Regulations on Deviation Settlement Mechanism in 2014 2014 (amended from time to time)**
- **Aimed at maintaining grid-discipline and grid security as envisaged under the Grid Code through the commercial mechanism for Deviation Settlement**
- **applicable to sellers and buyers involved in the transactions facilitated through short-term open access or medium-term open access or long-term access in inter-State transmission of electricity**
- **The Commission notified the Framework on Forecasting, Scheduling and Imbalance Handling for Variable Renewable Energy Sources (Wind and Solar) on 7th August, 2015.**
- **This framework is applicable for solar and wind generators that are regional entities.**
- **This Framework takes cognizance of the variable and uncertain nature of solar and wind sources, enables RLDCs to have much needed visibility into RE power being injected into the grid, incentivizes generators to forecast accurately and prevents gaming.**



Steps Taken by CERC for Developing Power Markets

- **Ancillary Services**
- This is a small but critical step towards the full spectrum of Ancillary Services roll-out in the country.
- Ancillary Services are support services which are required for improving and enhancing the reliability and security of the electrical power system.
- CERC notified Ancillary Services Operations Regulations 2015 in Aug'15.
- These regulations enable RLDCs to maintain load-generation balance on the grid, maintain critical grid parameters in acceptable range and counter any exigencies on the grid through both Regulation Up & Regulation Down services by regional generating stations.



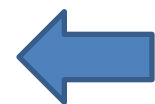
Regulations Notified by CERC

- Terms and Condition for Trading License Regulations, 2009
- Trading Margin Regulations, 2010
- [Power Market Regulations, 2010](#)
- [Open Access Regulations, 2008](#)
- Grant of Connectivity, Long-Term Access and Medium-Term Open Access in Inter-state Transmission” on 7th August 2009 separated connectivity from open access.
- Sharing of Inter-State Transmission Charges and Losses Regulations, 2010.
- IEGC & [Deviation Settlement Mechanism Regulations](#)
- [Ancillary Services Operations Regulations, 2015](#)
- Framework on Forecasting, Scheduling and Imbalance Handling for Variable Renewable Energy Sources (Wind and Solar), 2015
- General Network Access (GNA) - under discussion

Year	Day Ahead Market (BU)	Term Ahead Market (BU)	Total Volume (BU)	Total Volume as %age of total generation
2009-10	7.09	0.10	7.19	0.94%
2010-11	13.54	1.98	15.52	1.92%
2011-12	14.82	0.73	15.55	1.78%
2012-13	23.03	0.52	23.55	2.60%
2013-14	30.03	0.64	30.67	3.19%
2014-15	28.46	0.94	29.40	2.81%
Up to Dec, 15	25.35	0.81	26.14	3%

Estimation of Demand by States

State	Year	Energy Requirement	Efficiency Gains	Net Energy Requirement	Peak Demand
Andhra Pradesh	2014-15	56604	69	56535	9220
	2015-16	63012	399	62613	10211
	2016-17	69314	751	68563	11181
	2017-18	76245	1044	75201	12264
	2018-19	83870	1478	82392	13436
Assam	2014-15	5485	0	8527	1450
	2015-16	6772	0.39	8817	1526
	2016-17	8049	0.78	10345	1790
	2017-18	9440	1.96	12085	2091
	2018-19	10978	3.91	13967	2417
Bihar	2014-15			22226	
	2015-16	16134		27398	4112
	2016-17	24077		5925	5588
	2017-18	33050		7654	7088
	2018-19	43835		9604	8774
Chhatisgarh	2014-15				
	2015-16	18887		24298	4701
	2016-17	20721		26140	5058
	2017-18	22790		28163	5449
	2018-19	24973		30271	5857



Estimation of Demand by States

State	Year	Energy Requirement	Efficiency Gains	Net Energy Requirement	Peak Demand
Goa	2014-15	3141		3724	
	2015-16	3316		3922	668
	2016-17	3853		4521	770
	2017-18	4527		5300	903
	2018-19	4743		5480	934
Gujarat	2014-15				
	2015-16	75680		93412	14410
	2016-17	81452		99952	15419
	2017-18	87680		106973	16502
	2018-19	94402		114512	17665
Haryana	2014-15				
	2015-16	39377		51901	9407
	2016-17	43751		56350	10214
	2017-18	48624		61380	11126
	2018-19	54054		66821	12112
Jharkhand	2014-15			20668	3255
	2015-16			23127	3706
	2016-17			26647	4376
	2017-18			30118	4987
	2018-19			34164	6596

