

**MINUTES OF THE 14<sup>TH</sup> MEETING OF THE CENTRAL ADVISORY  
COMMITTEE (CAC) HELD ON 20TH SEPTEMBER, 2010  
AT NEW DELHI**

**VENUE : “MAGNOLIA” HALL, INDIA HABITAT CENTRE,  
LODHI ROAD, NEW DELHI – 110 003.**

The meeting was chaired by Dr. Pramod Deo, Chairperson, CERC. A list of participants is attached at *Annexure-I*.

2.0 In his opening remarks, Chairperson, CERC emphasized on the need of developing electricity markets with the twin objectives of discovery of efficient prices and fulfilling the needs of the buyers and sellers. He also requested the members of the committee to give their views on development of ancillary market.

3.0 A presentation was made by Secretary, CERC summarizing the issues and the suggestions contained in the agenda note which was circulated for consideration in the meeting. A copy of the presentation is attached at *Annexure-II*. Mr. S.K. Soonee, CEO, POSOCO also made a presentation which is at *Annexure-III*. Two other short presentations were made by Tata Trading and IEX on their views regarding various issues contained in the agenda note.

4.0 The following views were expressed by the members of the CAC on the issues contained in the agenda note :

**(1) What should be the optimal size of the short-term market? Should there be quantitative restrictions on the overall short-term market volume?**

- i) There was a consensus that the SERCs should mandate and enforce acquisition of long term adequacy by the distribution companies in terms of both power procurement to meet demand forecast and commensurate transmission corridor availability. The distribution utilities should be required to achieve complete adequacy in a period of next five years and the SERCs should monitor progress regularly.
- ii) Mr. Soonee mentioned that the short-term volumes have crossed even 12% of total generation on some days and this was not a healthy situation. There was a need to contain the short-term transactions within a limit of 10%. Many members of CAC felt that it would not be appropriate to impose quantitative caps on purchase or sale by an entity because there could be few days in a year when the demand deviate significantly from the forecast and in such situations the entity

concerned might be compelled to transact more than the cap in the market. Moreover, such caps may result in unsold quantities even through there are shortages in other areas.

- iii) Several members expressed concerns on rampant load shedding by the distribution utilities even though prices in short-term market were prevailing at reasonable levels. They urged that load shedding should be minimized and the SERCs should exercise regulatory oversight on load shedding through load shedding protocols. It was suggested that CERC could come out with guidelines in this respect which could be adopted by the SERCs.
- iv) The representative of IDFC said that the quantitative restrictions were not desirable as it might send a very strong negative message to the capacity addition expected from private sector. She was of the view that occasional short-term price cap would be a better intervention if at all required. However, CMD PTC said that price caps may not help in situations of desperation such as drought.
- v) Many members also expressed a view that day ahead market on power exchanges should be utilized primarily for meeting the unforeseen demand fluctuations and should not be depended upon for power procurement on a sustained basis.
- vi) The representative of UPPCL said that regulatory interventions in short-term market in some situations would be necessary because very high prices in short-term markets could lead to sellers not bidding in medium term and long term markets and even going to the extent of breaching the existing contracts.
- vii) There was also a view that the negative externalities like CO<sub>2</sub> emission should also be kept in view while preparing future procurement plans.

## **(2) Transmission corridor allocation**

### **(a) Between Licensed Traders and Power Exchanges**

- i) Mr. Soonee said that power exchanges offer better management of load through collective transactions because anticipated congestion for bilateral transactions can be addressed by dispatch of electricity through alternative corridors.
- ii) IEX suggested that the transmission corridors should be auctioned to achieve economic efficiency.

- iii) Tata Power said that if power exchanges were to be given a preferential treatment in terms of transmission corridor, the exchanges should then be non-profit organizations.
- iv) After discussions on this issue, there was a consensus that congestion should be localized by increasing the number of bid areas in the power exchanges. Mr. Soonee however added that state utilities should be required to declare transfer capabilities for their corridors in order to implement this suggestion.

### **Transmission corridor allocation**

#### **(b) Between Power Exchanges – Market Coupling**

There was a consensus that pro-rata allocation of transmission corridor between the exchanges was not the optimum solution and there was a need to study the feasibility and appropriateness of adopting market coupling models.

#### **(3) Intraday and Contingency Market on Power Exchange.**

There was a consensus that the prior standing clearance obtained by an intra-state entity may be used both for day-ahead or intraday/ contingency transactions irrespective of any particular power exchange. This should be, however, subject to the real time operational instructions by SLDC, if any, to address unforeseen congestion in STU system.

#### **(4) Month ahead monthly contracts on Power Exchange.**

- i) CEO, IEX said that there were about 300 open access consumers who were buying power from exchanges and monthly contract on power exchange is likely to be useful for such consumers. He added that if the supply under such contract is scheduled to commence in less than 11 days from the date of contract, it would not be a forward contract within the meaning of FCRA.
- ii) The representatives of KPTCL and WBSEDCL supported the suggestion for month-ahead monthly contracts. But the sellers and buyers in monthly contract would require some flexibility to take care of unforeseen difficulties in generation or unexpected dip in demand. There was also a suggestion that even fortnightly contract could be attempted.

- iii) However, many members of CAC suggested that the working of the existing weekly contracts needed to be improved in terms of definite timelines for contract clearance so that there was no scope for telephonic negotiations. There was a suggestion for adopting closed auction method for weekly or monthly contracts so as to enhance transparency. The representative of IEX agreed that these suggestions needed to be considered.

**(5) Modifications in market design in Power Exchange.**

**(a) Evening Market**

- i) There was no consensus on introduction of evening day-ahead market. The representative of JSW PTC said that it might induce non-serious bids in the morning market and there could also be problems of funds transfer and scheduling.
- ii) However, there was also a view that the priority in allocation of transmission corridor would still make morning market preferred one and that the argument about non-serious bids was not correct.
- iii) Mr. Soonee strongly supported the suggestion of introducing evening market as it would facilitate satisfying additional demand to the extent of available power.
- iv) Prof. S.C. Srivastava of IIT Kanpur suggested that the day-ahead market needed to be taken closer to dispatch so that the participants can bid more accurate quantities.

**Modifications in market design in Power Exchange.**

**(b) 15 minute bidding**

- i) Many members of CAC said that the proposal of 15 minute bidding should not be tagged with evening market and it should be seen as a separate modification. Tata Power, PXIL, IEX and Mr. Soonee supported the introduction of 15 minutes bidding. It was also appreciated by the members that 15 minute bidding would also reduce the period of congestion.
- ii) However, the dominant view was in favour of adopting 15 minute bidding for the contracts which are closer to dispatch time such as contingency contracts, renewable energy contracts and ancillary contracts. CMD, WBSEDCL said that 15 minute block bidding would require introduction of intra-state ABT.

- iii) There was a view from a generating company that generator might face difficulty if he is not cleared for some intervening 15 minute blocks. It was explained by Chief (Engg.), CERC that such a generator would always have freedom to quote block bids.
- iv) The representative of KPTCL said that 15 minute block bidding would not be much useful for distribution companies as the demand planning is on the basis of peak hours and off peak hours.
- v) IEX said that there are not many contracts in OTC markets for part of an hourly time block.

**(6) Rationalization of Net worth of License Traders**

IEX fully supported the suggestion of excluding the volumes transacted on power exchanges from permissible turnover for electricity traders. Tata Power, however, said that there risk was involved even in transactions through power exchanges in case the trader is providing credit facility to the buyers.

**(7) Availability Declaration by Merchant Power Plants**

There was a consensus that merchant power plant should be mandated to declare its date of commercial operation and they must also plan transmission corridor in advance for scheduling. Representative of KPTCL said that a power generator should not get full UI rate for sale of infirm power and there should be a reasonable cap on the applicable UI rate on the lines of the recently amended UI regulations.

Shri S.K. Soonee said that the merchant capacity of a power plant should be metered separately so that there is no mix up between the open access priorities. He said that further feedback/suggestions in the matter would be forwarded to CERC.

**(8) Other Issues**

- i) CMD, MSEDCL and MD, KPTCL said that market determined prices were not compatible with the model of retail tariff structure regulated by SERCs because generally the SERCs are not in a position to pass on the cost of short-term power purchase to many consumer categories such as agricultural or households having limited consumption. There was also an element of large cross-subsidies. However, the representative of UPPCL said that the growth of short-term electricity market was proving useful to

the distribution companies enabling better load management and ensuring grid discipline.

Chairperson, CERC said that most of the distribution companies were still functioning as extension of State Governments and the issue of their compatibility to the market based competition as envisaged in the Electricity Act needed to be discussed at an appropriate forum. Electricity Regulatory Commissions are discharging their statutory mandate to develop electricity markets. He suggested that TOD tariff should be adopted for all categories of consumers so as to truly reflect the power purchase costs in retail tariff.

- ii) It was suggested by many members of CAC that representatives of SERCs should also be invited to meetings of the CAC so that the state level perspective was available to CAC.
- iii) The representative of the Ministry of Railways suggested rationalizing the wheeling charges as these charges were very high in some of the states.
- iv) Mr. Vinod Dhall said that there was a need to identify issues in power sector which have bearing on competition aspect and also those of such issues which required consultation with Competition Commission of India. He said that the relevant aspects of consumer choice and competition law needed to be properly understood so that the power sector players did not find them in violation of competition law.
- v) The representative of Prayas said that there should be greater focus on improving efficiency in OTC market as four times the transactions of power exchanges were taking place through OTC market.

In the end, Chairperson placed on record deep appreciation of CAC for the assistance provided by Shri Alok Kumar, Secretary CERC to the Committee in organizing and conducting its meetings during his tenure.

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

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**LIST OF PARTICIPANTS ATTENDED THE FOURTEENTH MEETING**

**OF**

**CENTRAL ADVISORY COMMITTEE (CAC)**

**HELD AT INDIA HABITAT CENTRE, NEW DELHI**

**ON 16<sup>TH</sup> JUNE, 2010**

<b>S. No.</b>	<b>NAME</b>	
01.	Dr. Pramod Deo Ex-Officio, Chairperson, CAC	Chairperson, CERC
02.	Shri S. Jayaraman Ex-Officio Member, CAC	Member, CERC
03.	Shri V.S. Verma Ex-Officio Member, CAC	Member, CERC
04.	Shri M. Deena Dalayan ExOfficio Member, CAC	Member, CERC
05.	Shri Vinod Dhall Former-Member	Competition Commission of India (CCI)
06.	Shri T.L. Sankar Advisor	Administrative Staff College of India (ASCI)
07.	Shri Ajoy Mehta Chairman	MSEDCL
08.	Shri Hemant Sharma Managing Director	GRIDCO
09.	Shri Pradeep S. Mehta Secretary General	Consumer Unity & Trust Society (CUTS)
10.	Ms. Pamposh Bhat Chairperson	Jwala (NGO dealing in CDM & Renewables)
11.	Prof. S.C. Srivastava	Indian Institute of Technology (IIT)
12.	Shri T.N. Thakur Chairman & Managing Director	PTC India Limited
13.	Shri R.K. Madan CEO (Power)	Adani Enterprises Limited
14.	Shri Satish Jindal Senior Vice-President	JSW Power Trading Company Limited
15.	Ms. Ritu Anand Principal Advisor & Chief Economist	Infrastructure Development Finance Co. Limited (IDFC)

16.	Shri Bhasker U. Mete President, GEA	Maharashtra State Electricity Power Gen. Corpn. Limited
17.	Shri Kirti J. Amin President	Kisan Vikas Sangh
18.	Shri R.N. Lal Member (Electrical)	Representative of Railway Board
19.	Shri Arun Kumar Executive Director (Comml.)	Representative of POWERGRID Limited
20.	Shri M.S. Babu Executive Director (Comml.)	Representative of NHPC Limited
21.	Shri V.K. Padha General Manager (Comml.)	Representative of NTPC Limited
22.	Shri Sabyasachi Dasmohapatra Director (Energy)	Representative of Confederation of Indian Industry (CII)
23.	Shri K. Ramanathan Distinguish Fellow	Representative of The Energy & Resources Institute (TERI)
24.	Shri R. Ashokachari Chief Engr. (Comml.)	Representative of APTRANSCO
25.	Shri J.S. Jorolia Additional Vice-President	Representative of RIL
26.	Shri Shantanu Dixit	Representative of Prayas (Energy Group), Pune
27.	Shri Alok Kumar Secretary	CERC
	<b>SPECIAL INVITEES</b>	
28.	Ms. G. Latha Krishna Rao Managing Director	KPTCL
29.	Shri Malay Kumar De Chairman & Managing Director	WBSEDCL
30.	Shri S.K. Soonee CEO	POSOCO
31.	Shri Jayant Deo CEO	Indian Energy Exchange Limited (IEX)
32.	Shri Amulya Charan Managing Director	Tata Power Trading Company Limited
33.	Shri S.K. Agarwal Director (Finance)	Representative of UPPCL
34.	Shri Sumer Singh Yadav Chief Engr.	DHBVNL
35.	Shri S. Ganguly Vice-President	Power Exchange India Limited (PXIL)





# Annexure II

# Measures to make Power Markets more efficient



Central Advisory Committee Meeting  
20 September 2010



## Presentation Outline

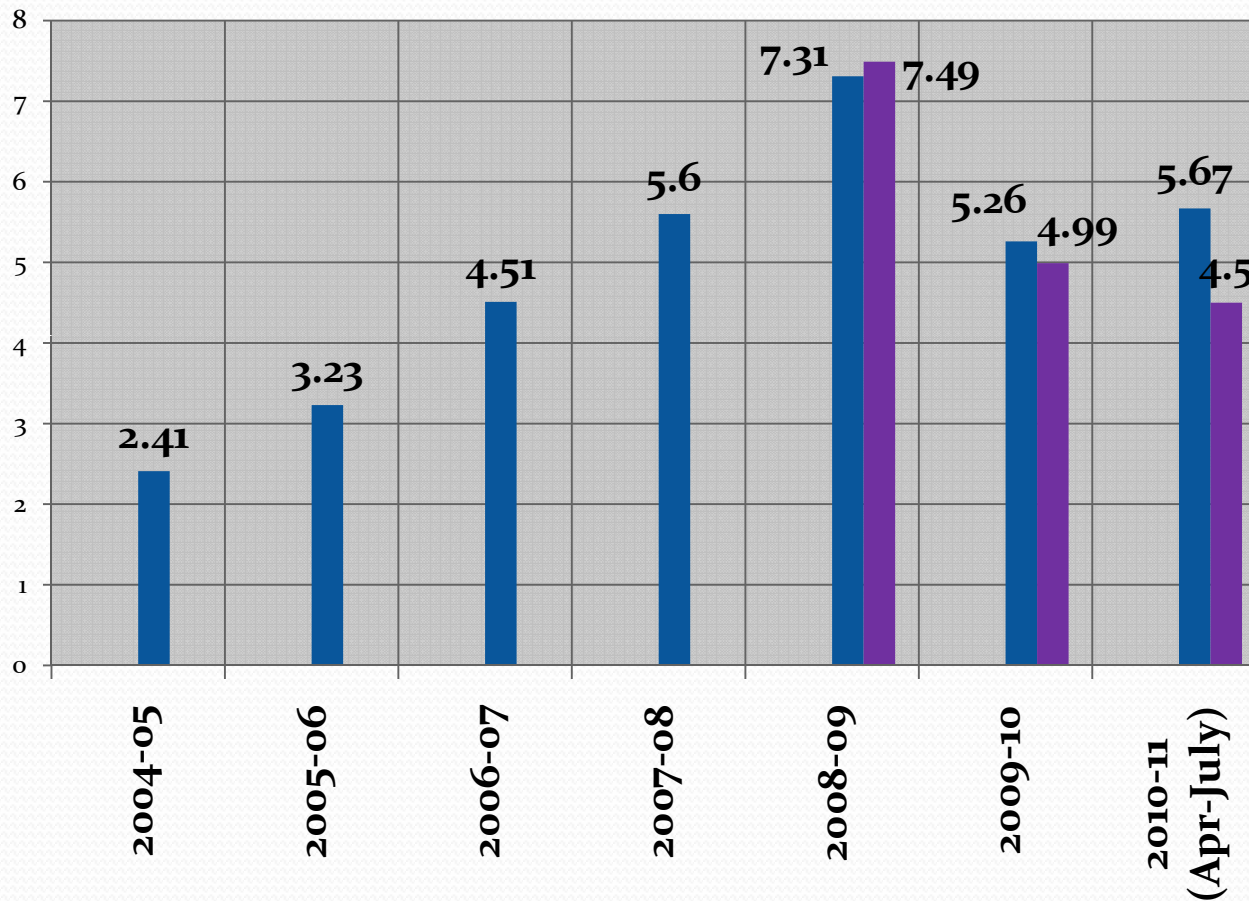
- Market Data Analysis
- Discussion Issues
  - Size of short term market – Any quantitative restriction required?
  - Transmission Corridor allocation
    - Between Licensed Traders and Power Exchanges
    - Between Power Exchanges -Market Coupling
  - Intraday and Contingency Market on Power Exchange
  - Month ahead monthly contracts on Power Exchange
  - Modifications in market design in Power Exchange
    - Evening Market
    - 15 minute bidding
  - Rationalization of Net worth of Licensed Traders
  - Availability Declaration by Merchant Power Plants



# Market Data Analysis

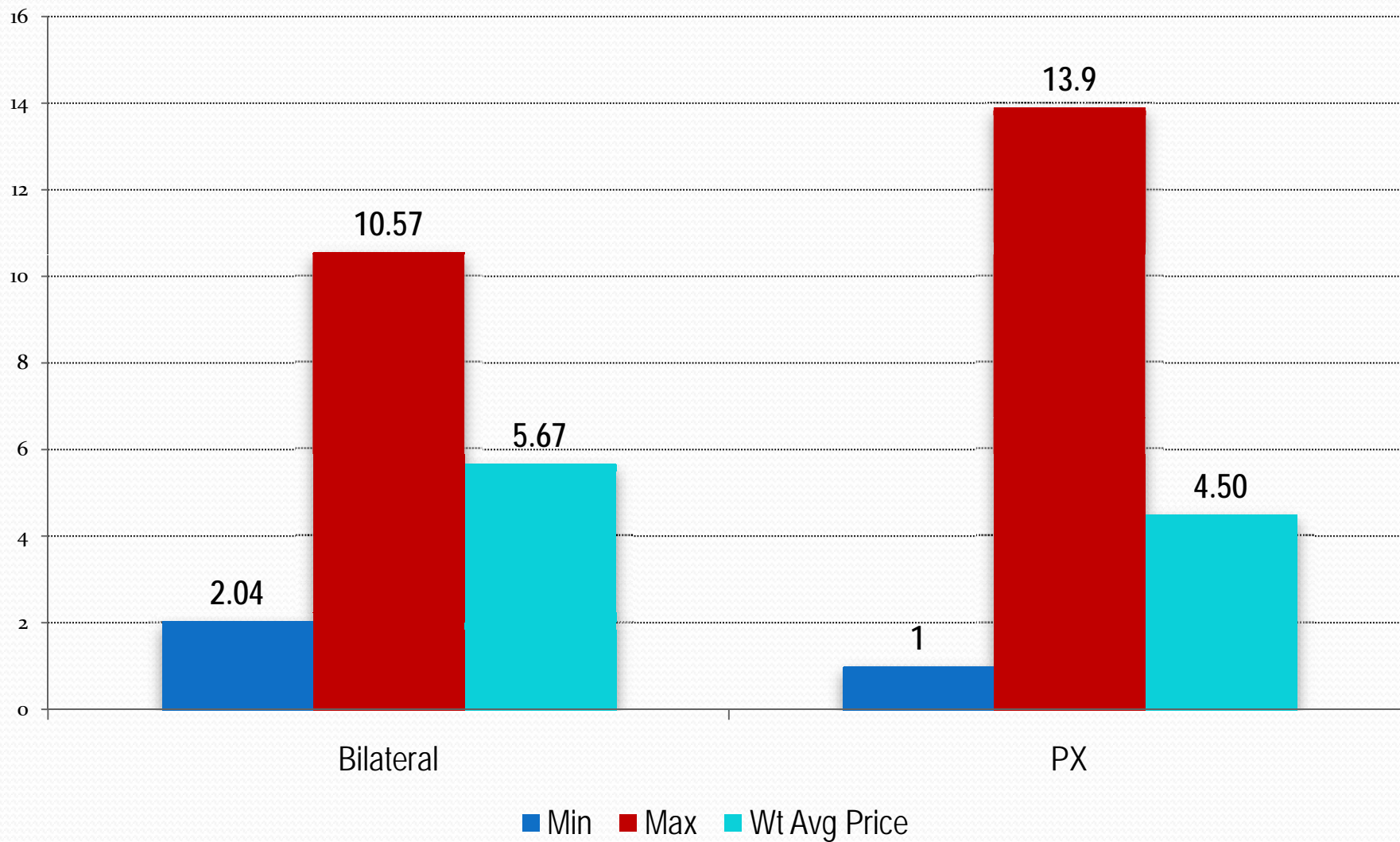


## Yearly Average Price in OTC (through traders) and Power Exchanges



- Traders: Weighted Average Price (Rs./kWh)
- Power Exchanges: Weighted Average Price

## Price Range and Weighted Average Price in Bilateral and Power Exchanges during April-July 2010



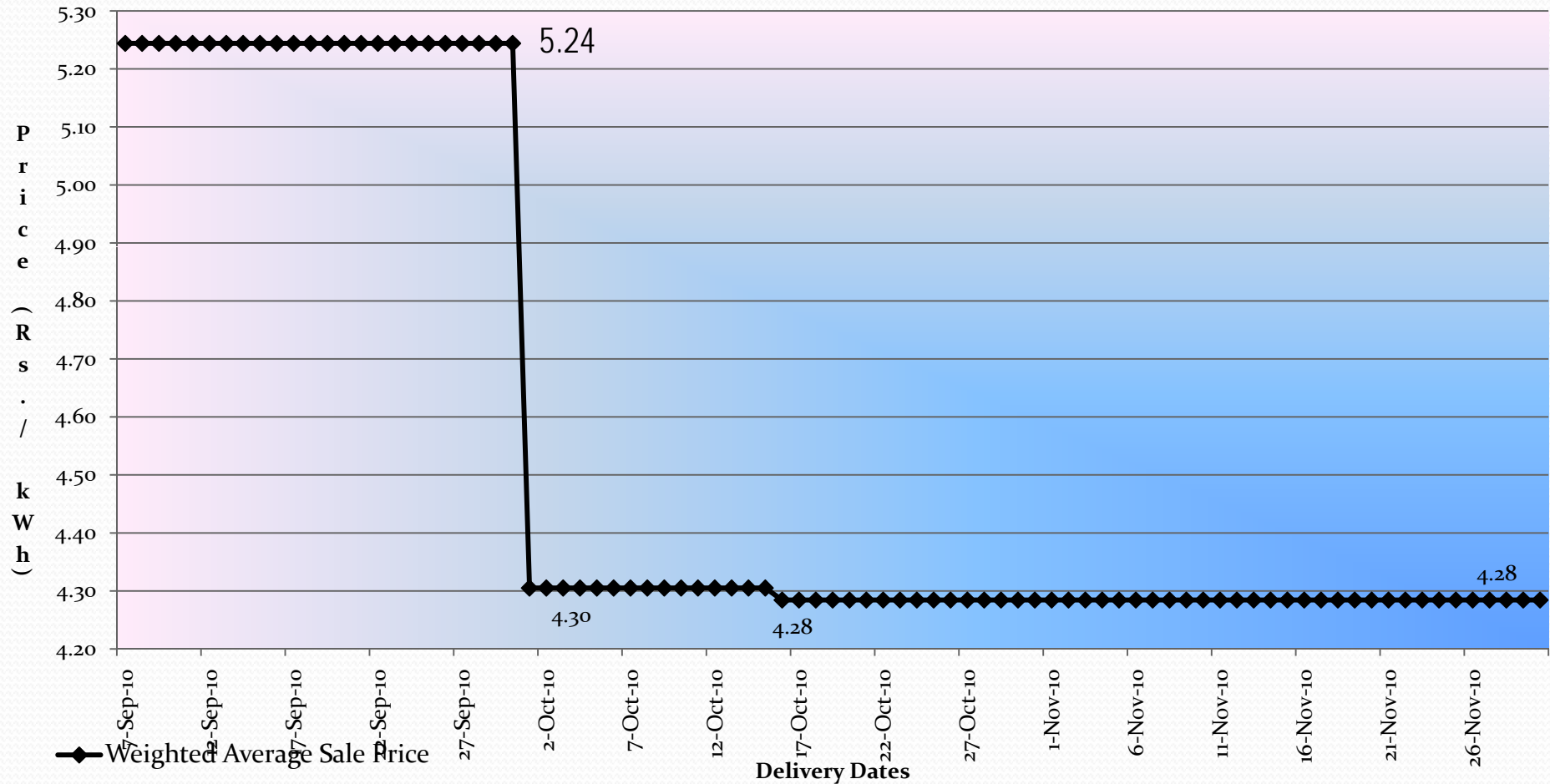
# Weekly Contracts on Power Exchange

Weekly Products on Power Exchange				
	IEX		PXIL	
Transaction Month	Volume	Price ( Rs/ Kwh)	Volume	Price ( Rs/ Kwh)
June-10	105.6	3.61	25.2	3.71
July-10	120.61	3.83	306	3.81
Total Volume and Weighted Average Price	226.21	3.73	331.20	3.80
Weighted Average Price of Both PX	3.77			





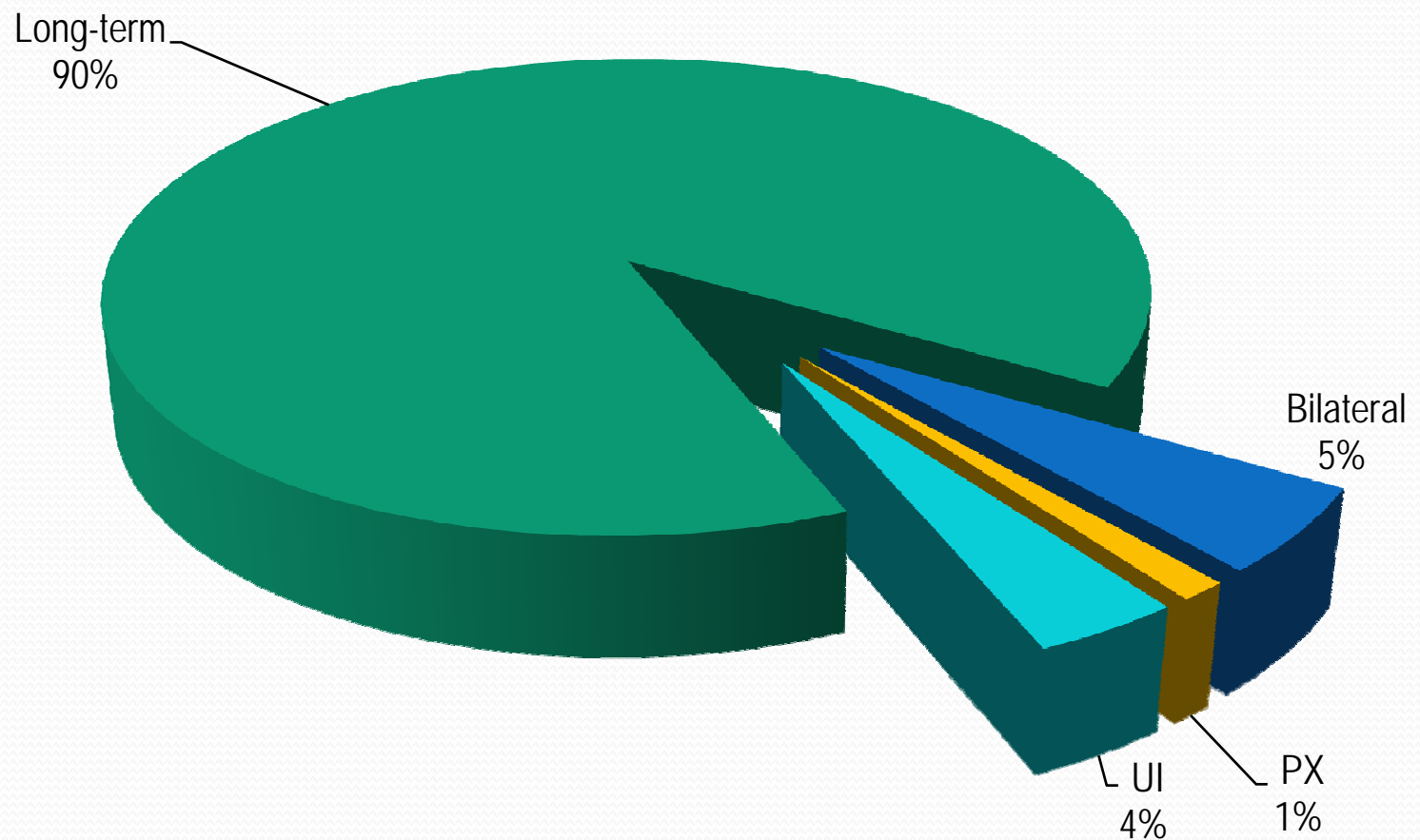
## Forward Curve for OTC Market September-November 2010



Forward incurve is downward sloping , expectation that price will decrease

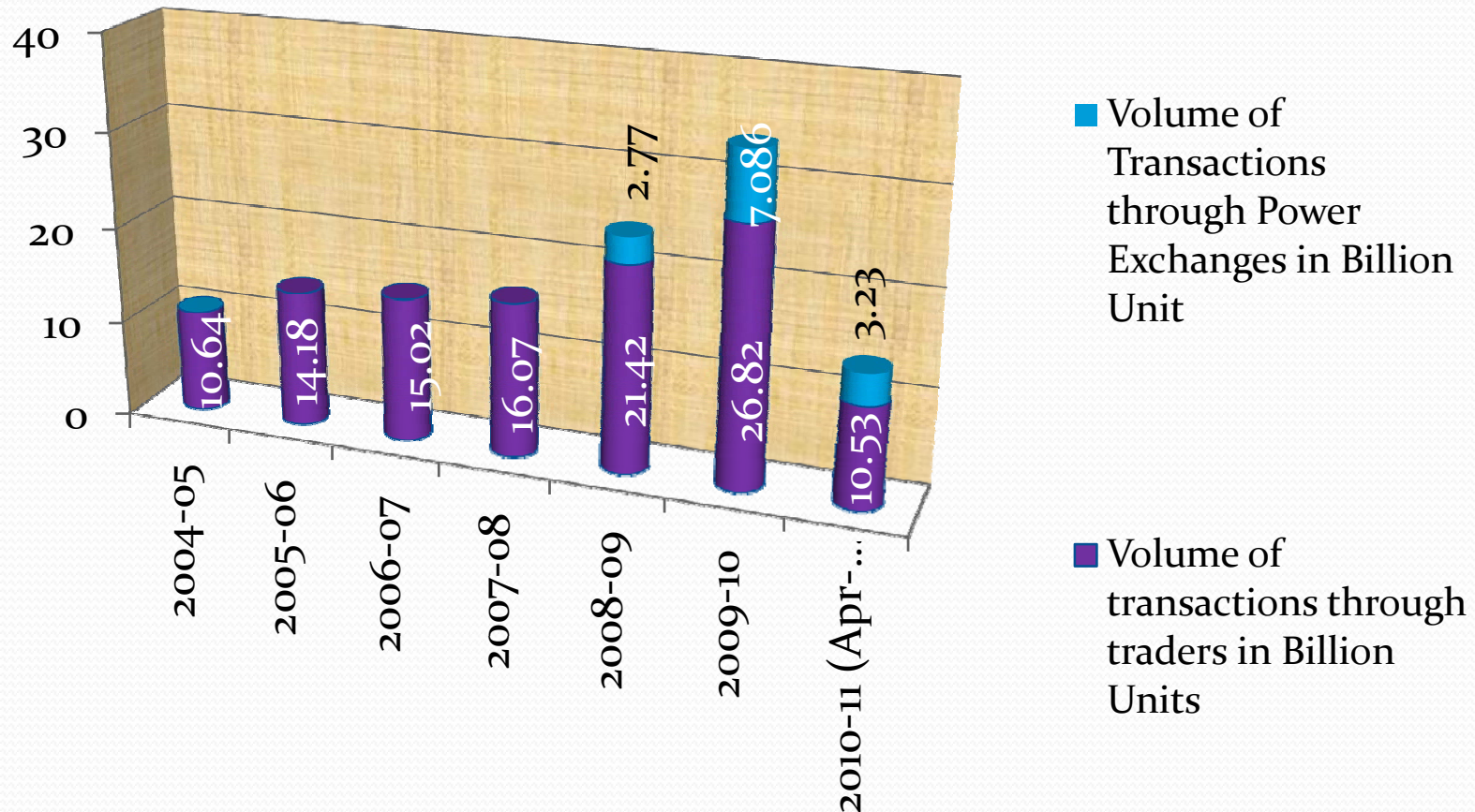


## Percentage Share of Electricity Transaction through various forms in Total Electricity Generation during April-July 2010





## Volume of Transactions through Short Term Market in Billion kWh (units)



Short term volumes are increasing over years

In 2010-11 expected volume is approx 41 BU ( if we extrapolate 4 months to 12 months ) which is 22 % growth.



# Discussion Issues

# Size of short term market – Any quantitative restriction required? ...Contd

## Pros ( Volume should be restricted )

- Discom should do long term demand projection and tie up for supply adequacy
- Long term contracts help in financial closure of generation projects
- Short term market is a balancing market not a supply procurement market
- Large power flows lead to system operation incase of sudden power flow variation
- Transmission planning becomes difficult with large short term volume

# Size of short term market – Any quantitative restriction required?

## Cons (No restriction in volumes)

- Short term market acts as payment security mechanism
- Short term market provides price signal for investment and competition
- Generators need long term fuel contracts to lock into long term PSA else exposed to price risk
- Discom cannot take advantage of price fall if locked into long term contracts
- Retail market mix should decide proportion of long term or short term in wholesale market

SERC to monitor price impact of short term purchase on overall cost of procurement of Discoms



# Transmission Corridor Allocation between Electricity Trader and Power Exchange

- Presently Traders book corridor through advance reservation procedure (STOA)
- Limited transmission corridor margins left for exchange on a day ahead basis
  - Leads to congestion, market splitting and increase in price in deficit bid areas
- Transmission infrastructure does not have infinite capacity, congestion is unavoidable at times
  - Congestion occurs in two or three specific corridors only: S<sub>1</sub>- S<sub>2</sub>, South – Rest of India, North – Rest of India corridors happens in specific seasons
- Advance reservation difficult in Day ahead market as these are collective transactions ( buyers and sellers not identified) , hence which corridor to book cannot be identified and cannot be cancelled

Increase number of bid areas to make congestion localised phenomenon

Day ahead transmission allocation to remain as it is

Month ahead contracts similar to bilateral transaction can be introduced in PX

# Transmission Corridor Allocation between Power Exchanges

- Presently day ahead markets is with implicit transmission capacity auction i.e. energy cleared also gets corridor
  - System operator pro rates transmission corridor in the ratio of unconstrained market cleared volumes , any left over corridor again pro rated with new power flow after market splitting
- Corridor split up between two exchange leads to sub optimal corridor utilization
- European markets handle congestion through market coupling
- Markets are integrated and bids of all exchanges combined to find price – volume solution as a single market with given transmission corridor by system operator
- In market coupling ,Exchanges loose flexibility , harmonization of bidding parameters needed
- Lead to increase overall social welfare and improves transmission corridor utilization

Simulation on historic PX bid data to be done to ascertain benefits in Indian scenario


# Intra Day and Contingency Markets on Power Exchange

- Recent amendment to UI regulation has stipulated high penalty for overdrawl by Discom
  - For Discoms UI tool extensively used for dynamic load management not available any more
- Renewable energy sources like wind and solar energy cannot be schedule too early due to inherent characteristics
- Presently intraday contracts closes five hours before real time dispatch, not serving its true purpose
  - Individual contract SLDC clearance required , clearance required at odd hours ( night time )
- Need to bring scheduling of intraday contracts closer to real time dispatch
- Make SLDC clearance easier and faster

Prior Standing SLDC clearance can be used both for day ahead or intraday transactions and irrespective of any particular power exchange



# Month Ahead Monthly Contracts on Power Exchange

- Weekly contracts in Power exchange – Liquidity has improved , average prices Rs 3.77/ Kwh 
- Prices in OTC contracts higher as these are customized contracts, provide firm transmission corridor and hence surety of supply
- Allow Month ahead monthly contracts by Power exchange
  - Will lead to lower market prices
- Regulatory overlap with FMC ( commodity regulator)
  - As per FMC power exchange to register under Sec 14 A, electricity is notified good
- CERC's opinion -Month ahead Monthly contracts are NTSD
- Forward Contract Regulation Act ( FCRA) carves out NTSD under Sec

18

Persuade GOI to exempt month ahead monthly contracts under Sec 27 of FCRA

# Evening Markets in Power Exchange

## Pros

- Uncleared supply get another chance to sell in evening else supply is lost
- Discoms to take a more informed decision wrt weather related information and load pattern for next day
- Another opportunity for participants to optimize their portfolio
- Better utilization of available margins on unutilized transmission corridors
- Shift transaction volumes from the Unscheduled (UI) to the scheduled market( evening market)
- Low investment to try the project

# Evening Markets in Power Exchange ...Contd

## Cons

- Grid management and market operation should not be mixed . Grid management is a complex task whereas hourly bidding model is simple, elegant and intuitive to understand
- Price discovery in 96 time blocks will be confusing for market participants
- Block bids will be difficult to handle as their acceptance is based on iterative process
- Discom do not plan load management an on a 15 min basis, 15 min bidding will be of no use to them

Try out on a pilot basis for a period of six months to observe the response of the market as present infrastructure can be harnessed easily



# 15 Minute Bidding time block in Power Exchange

## Pros

- Attract wind generators and solar generators to power exchanges as they carry a higher risk in bidding and committing supply for time blocks of 1 hour.
- Hourly bids results in high ramp rates at hour boundary(kink), particularly at start and end of morning /evening peak hours.
- Disocoms shall get more flexibility to plan for load and hence reduce UI
- Value of electricity is dependent on the time when it is consumed, 15 min makes pricing better
- Reduce Transmission Congestion , presently if congestion is in a particular 15 min block, one full hour's flows has to be curtailed

# 15 Minute Bidding time block in Power Exchange

## Cons

- Grid management and market operation should not be mixed . Grid management is a complex task whereas hourly bidding model is simple, elegant and intuitive to understand
- Price discovery in 96 time blocks will be confusing for market participants
- Block bids will be difficult to handle as their acceptance is based on iterative process
- Discom do not plan load management an on a 15 min basis, 15 min bidding will be of no use to them

Morning session continues with hourly bidding and evening market which more of a balancing market 15 minute time block for bidding.



# Rationalization of Networth of Licensed Traders

- Annual trade turnover limit of licensed traders is a function of their networth.
  - Both OTC as well as Power exchange transactions are included for turnover calculation
  - A higher net worth is required to undertake higher trade turnover
  - Present calculation based on portfolio tenure of 3 months and hence can be churned 4 times in a year without increasing any risk
- Day ahead transactions on power exchange have a robust risk management practice
  - Members require 100 % of order value as margin to be brought in before their clients order is accepted
- Hence no probability of default and no systemic risk issue
- Extra capital requirement reduces the Return on networth and is a strain especially on smaller category of licensed traders

Trade Turnover accruing from day ahead transactions on Power Exchange by licensed traders can be carved out of the networth requirement of licensed traders

# Availability declaration by Merchant Power Plants ...Contd

## Pros

- MPP should declare date of commercial operation
- System Operator should know available capacity of all generators (including MPP) on a day to day basis
  - Else as more merchant capacity is added , it could create operational difficulties
- Merchant plant is interconnected to a common transmission grid and has to abide by common rules
- Generators are like public utilities
- Market power and gaming can be avoided with declaration

# Availability declaration by Merchant Power Plants

## Cons

- Are private generators promoted with private capital
- Risk –Return payoff is their own and no assured returns like other regulated assets
- Do not have Long term contracts
- Should have fair opportunity to maximize profits
- New rules change the risk profile of business
- Create regulatory risk for generator

Commercial Date of Operation to be declared ,Daily Availability declaration to System Operator





# Conclusion

- Markets are a continuously evolving process
- These measures are expected to make power market more competitive, efficient and liquid.

**Thank You**

# Meeting of the Central Advisory Committee, CERC

***20 – September – 2010***

# Size of Short Term Market (1)

- **Vividness Bias: Long term vis-à-vis Short Term View**
- Generic Issue: Long term Adequacy
- Agency responsible for ensuring generation and transmission adequacy in all time horizons
  - CEA? CERC? SERC? CTU? STU? System Operators?
- Internationally
  - Adequacy Statement for next 5 – 7 year horizon
- Medium to Long term adequacy statement to address
  - Generation capacity in the state (including IPPs, merchant plants etc.)
  - Demand Forecast
  - Capacity tied up by distribution licensees in the state through Case-1 or case-2 bidding
    - Long term (7 years and above)
    - Medium term (1 year and above up to 7 years)
  - Expected Surplus/shortfall
- Short Term Procurement cannot be a part of the Adequacy Statement
  - To take care of Contingencies
  - To facilitate Economy Interchange

## Deficit in Peak Power Portfolio 2012: Top 10

Sr. No.	STATE	Demand (MW)	Availability (MW)	DEFICIT (MW)	(%)
1	PUNJAB	11000	5488	-5512	-50
2	TAMIL NADU	14224	9575	-4649	-33
3	MAHARASHTRA	21954	18322	-3632	-17
4	UTTAR PRADESH	13947	10630	-3317	-24
5	BIHAR	3607	1225	-2382	-66
6	ANDHRA PRADESH	14721	12357	-2364	-16
7	RAJASTHAN	8482	6644	-1839	-22
8	HARYANA	6839	5192	-1647	-24
9	JHARKHAND	2332	987	-1345	-58
10	MADHYA PRADESH	8462	7555	-907	-11

Source: CEA

# Size of Short Term Market (2)

- Requirement for Transmission
  - Genesis lies in the generation adequacy statement
    - “where to build and how much”
  - Need for declaration of transfer capability by the Planners
    - NLDC / RLDCs already doing this for Short Term
  - Impact of the new Transmission Pricing Methodology
    - Forecasting transmission requirement implicitly
- Market Design Issue: Settlement System
  - Long Term: Multi Part
  - Short Term: Single Part, Energy only, Prone to manipulation / gaming
- Honoring Long Term Contracts / PPAs

# Size of Short Term Market (3)

- Procurement Perspective: Market View Point
  - Products
    - Long Term – Medium Term – Short Term – Real Time
  - Product preference a function of variables such as
    - flexibility, convenience, degree of certainty, price of power, paying capacity, availability, socio political compulsions, etc.
- Need for analysis of any Systemic Weaknesses
  - Long term Product:
    - Why unattractive?
    - Examination of the success stories in Case – 1 and Case – 2 Bidding
  - Medium Term Product:
    - Yet to take off
  - Short term market: Vividness bias
    - Shifting of focus from addressing long term reliability issues
- Enforcement of Service Obligations
  - Reliability of supply to the end consumer
  - Reasonable prices

# Transmission Corridor Allocation between Bilateral & Collective Market Segments

- Indian Electricity Market Structure
  - Long term, Medium Term, Short Term, Real Time
- Priorities in order
  - Long term, Medium Term, Short Term, Real Time
- Competing market segments
  - OTC
  - Power Exchanges
- Hallmarks of the Indian Electricity Market
  - Voluntary participation
  - Freedom and Choice
- Reservation of Transmission Corridors
  - Many associated issues like transmission rights, etc.
  - Implementation difficult in Indian context because of meshed network
    - How much to reserve?
    - In what direction?
    - In which corridor?
  - Fragmentation
  - Under utilization

# Transmission Corridor Allocation Between Power Exchanges (1)

- Unique feature of Power Exchange implementation in India
  - Multiple Power Exchanges implemented in the same physical delivery market
- Issue
  - Sharing of available margins between the PXs
- Methods:
  - Priority Based Rules:
    - Lowest MCP, Highest MCV, Highest MCP x MCV, Maximization of Social Welfare, consumer surplus, etc.
    - May not lead to an overall economy
  - Explicit Auction
    - Interdependencies, difficult to implement
  - Market Coupling
    - Price Coupling
    - Volume Coupling
- Solution presently implemented
  - Pro-rata
- CERC Order dated 18th January 2007 in Petition No. 155/2006 (Suo Moto)



# Transmission Corridor Allocation Between Power Exchanges (2)

- Market Coupling in International Context
  - Being explored in Europe in the recent past
  - Being tried internationally for physically different delivery markets
- India's Unique Position
  - Multiple Power Exchanges in a single delivery market !!
- Central Western Europe
  - Joint Auction Office
- Czech – Slovak Market Coupling
  - Market operators alternate in operating the implicit auction
- Underlying core Issue
  - Harmonization of practices
  - Issues for harmonization
    - Definitions & Rules, Products, Participation requirements, Financial guarantees, Bid formats, Payment modalities, Secondary market principles, Roles and responsibilities of the participants, Contract terms and conditions

# Transmission Corridor Allocation Between Power Exchanges (3)

- NLDC Proposal dated 18-Sep-2008
  - Merging the bids obtained by all the exchanges
  - One of the exchanges can be designated as a lead & the same may be asked to find the solution by merging bids received on all the exchanges.
  - Alternatively, all the exchanges may be asked to work out the same.
  - The merging of bids can be carried out using suitable coding methodology, in order to take care of the confidentiality requirement
- Akin to Price Coupling
- Need for an 'Indian' solution

# Intra – Day & Contingency Market

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- Products already available
    - OTC: Advance, FCFS, Day-ahead, Contingency
    - PX: Day ahead, term ahead
  - Term ahead product in the Power Exchanges
    - Lukewarm response by the participants
    - Utility of the product
    - Need for introspection
  - Implemented as per procedures for bilateral transactions
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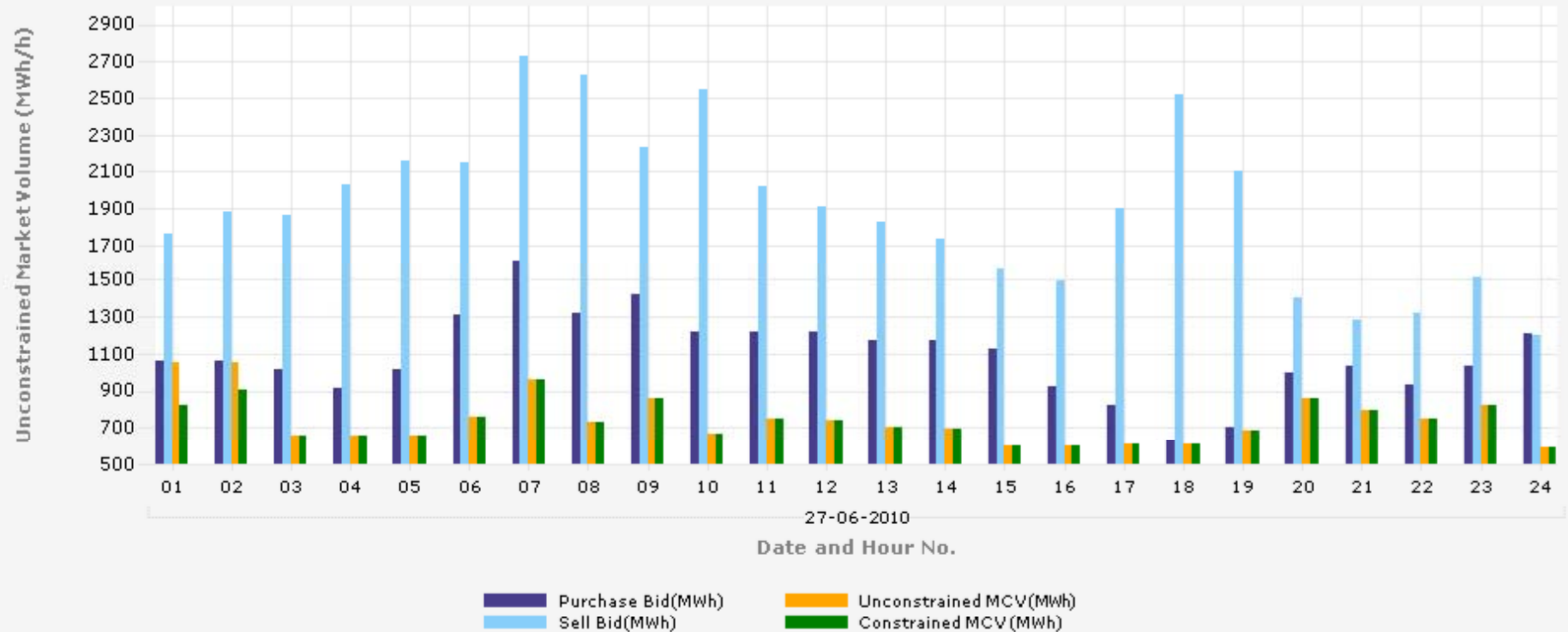
# Month Ahead Monthly Market on PX

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- Implementation just like in Bilateral
  - Framework already in place
  - Jurisdiction issues need to be resolved
-

# Market Snapshot: 27<sup>th</sup> June 2010 (source: IEX)

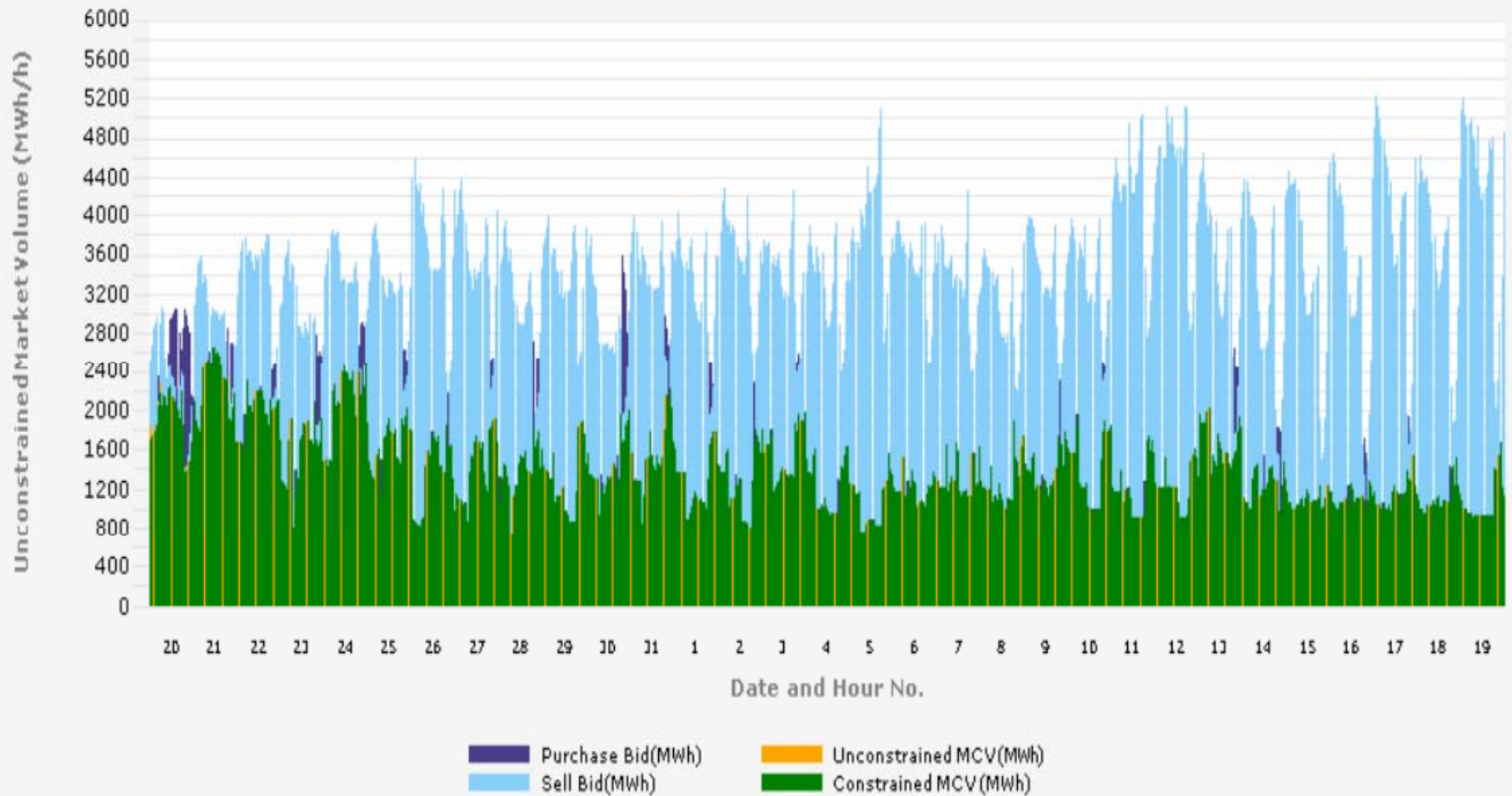
Market Snapshot



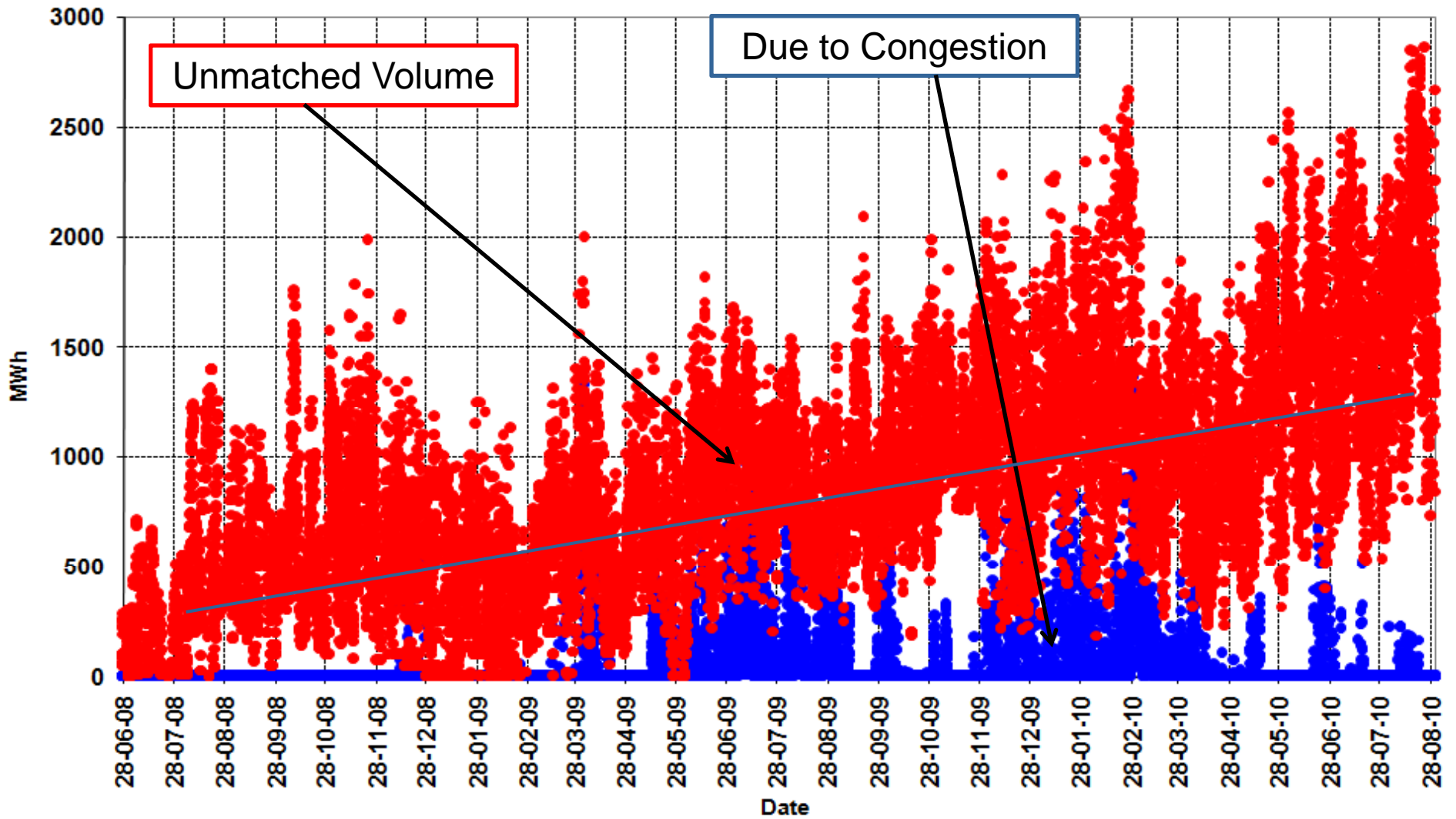
Date Time		Purchase Bid (MWh)	Sell Bid (MWh)	Unconstrained MCV (MWh)	Constrained MCV (MWh)	Unconstrained MCP (Rs/MWh)
		27-06-2010	00-01	1063.60	1758.70	1056.20
	01-02	1063.20	1882.20	1055.80	902.20	2499.72
	02-03	1013.20	1862.20	655.80	655.80	2495.94
	03-04	913.20	2026.60	655.80	655.80	2492.79

# Market Snapshot Last 31 Days (IEX)

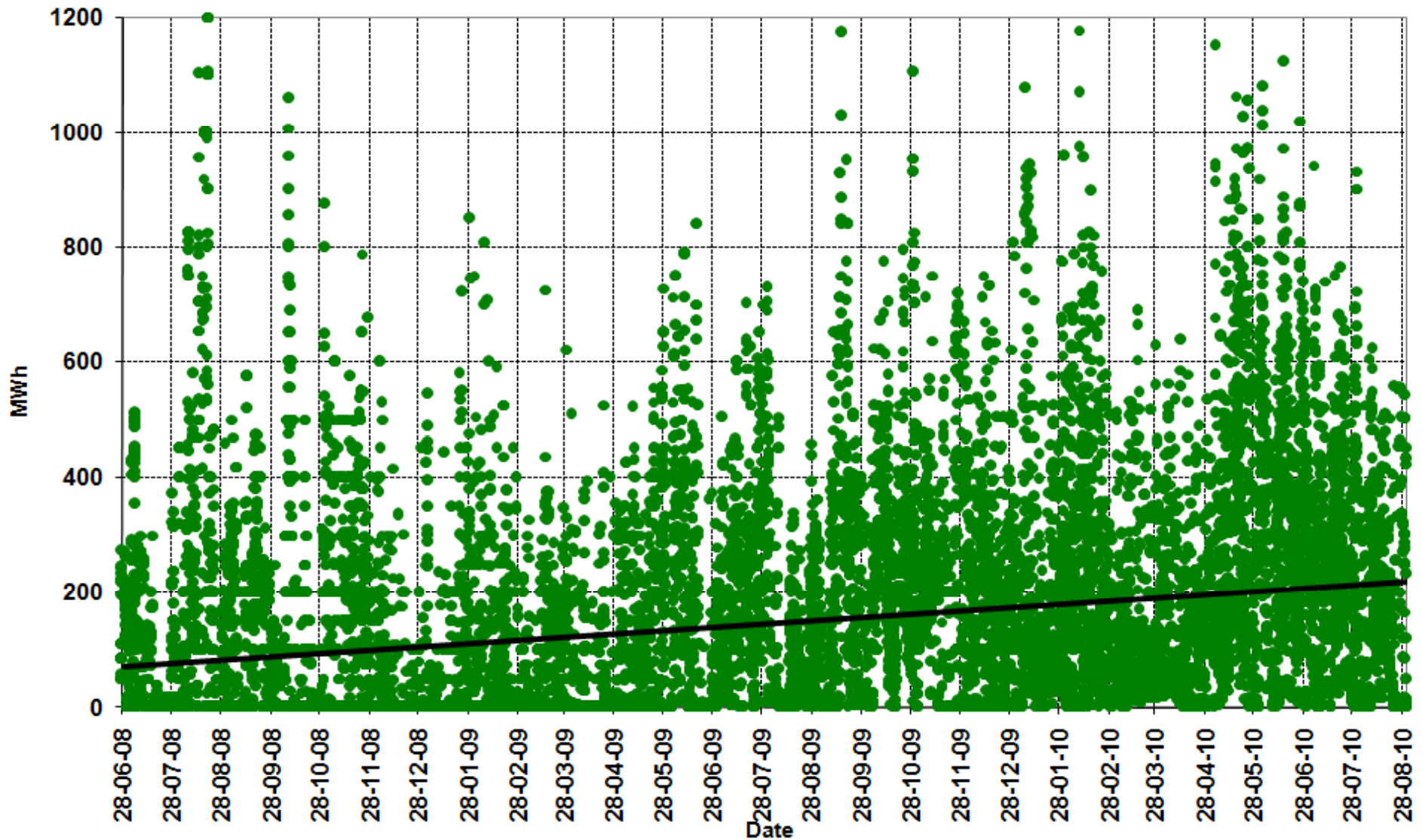
Market Snapshot



# Missed Opportunity



# Potential Volume for Evening Market





# Corridor Utilization



Congestion  
Observed  
Seasonally

Only towards  
NR, SR and  
S1 – S2

Only a couple of  
corridors  
congested  
out of  
a dozen

# Prevailing Scenario

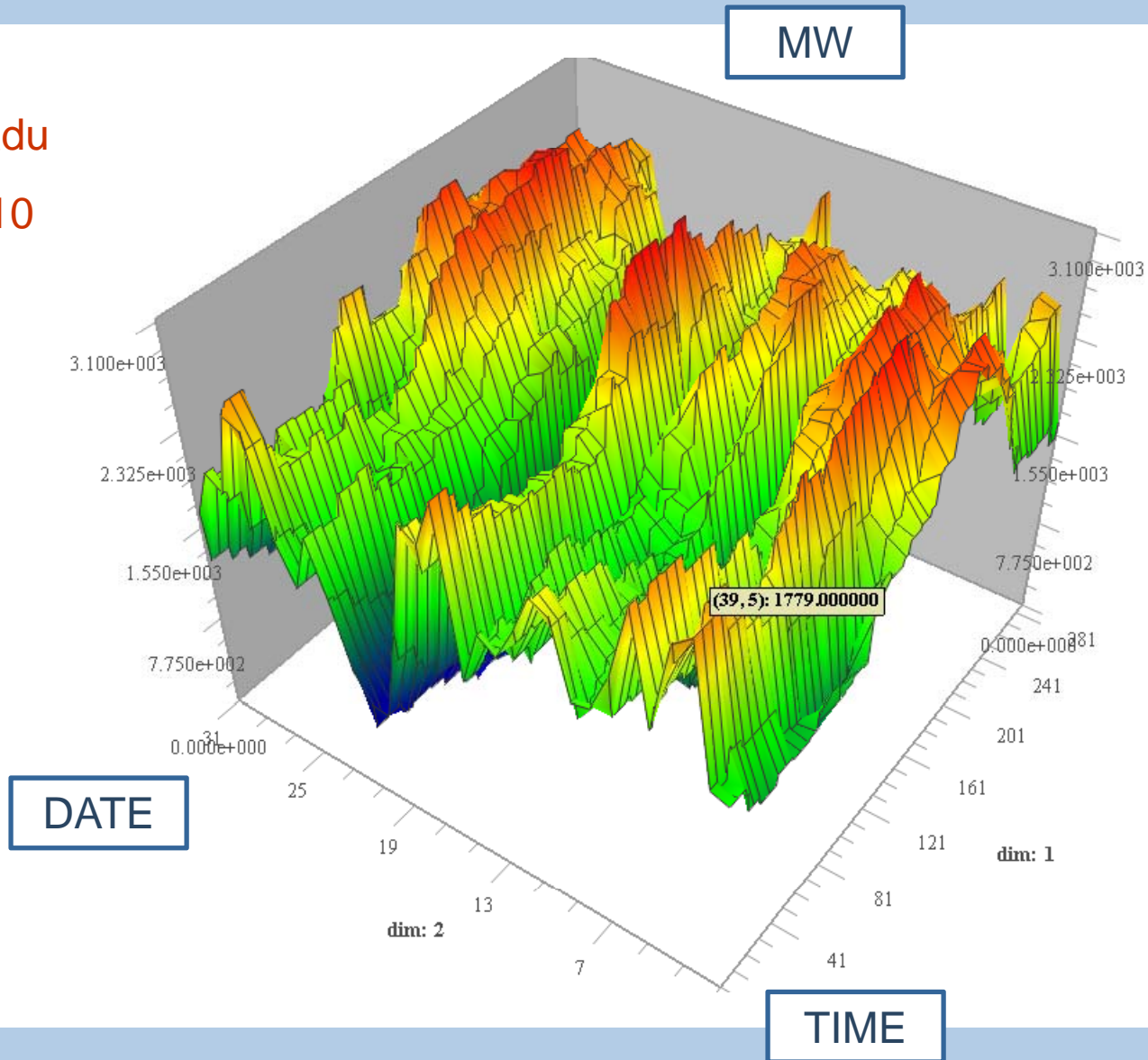
- Shortages
  - Round the clock and in all regions
- In many hours
  - Sale bids >> Purchase bids
- Volume lost due to price mismatch is substantial
- Congestion
  - During night hours
  - Only couple of corridors facing mild congestion
  - Margins available on other corridors
  - Market split by as low as 1 p/u difference !!
- Need for an Evening Market in the Power Exchanges

# Advantages of the Proposed Evening Market

- Consumers
  - More choice and satisfaction
- Sellers
  - Another opportunity
- Further optimization of the portfolio
- Take a more informed position in the market
- Better utilization of uncongested and under-utilized corridors
- More economy and efficiency
- Social welfare maximization
- Change in strategy and an overall improvement
- Likely that more volume is cleared
- Movement to the next level

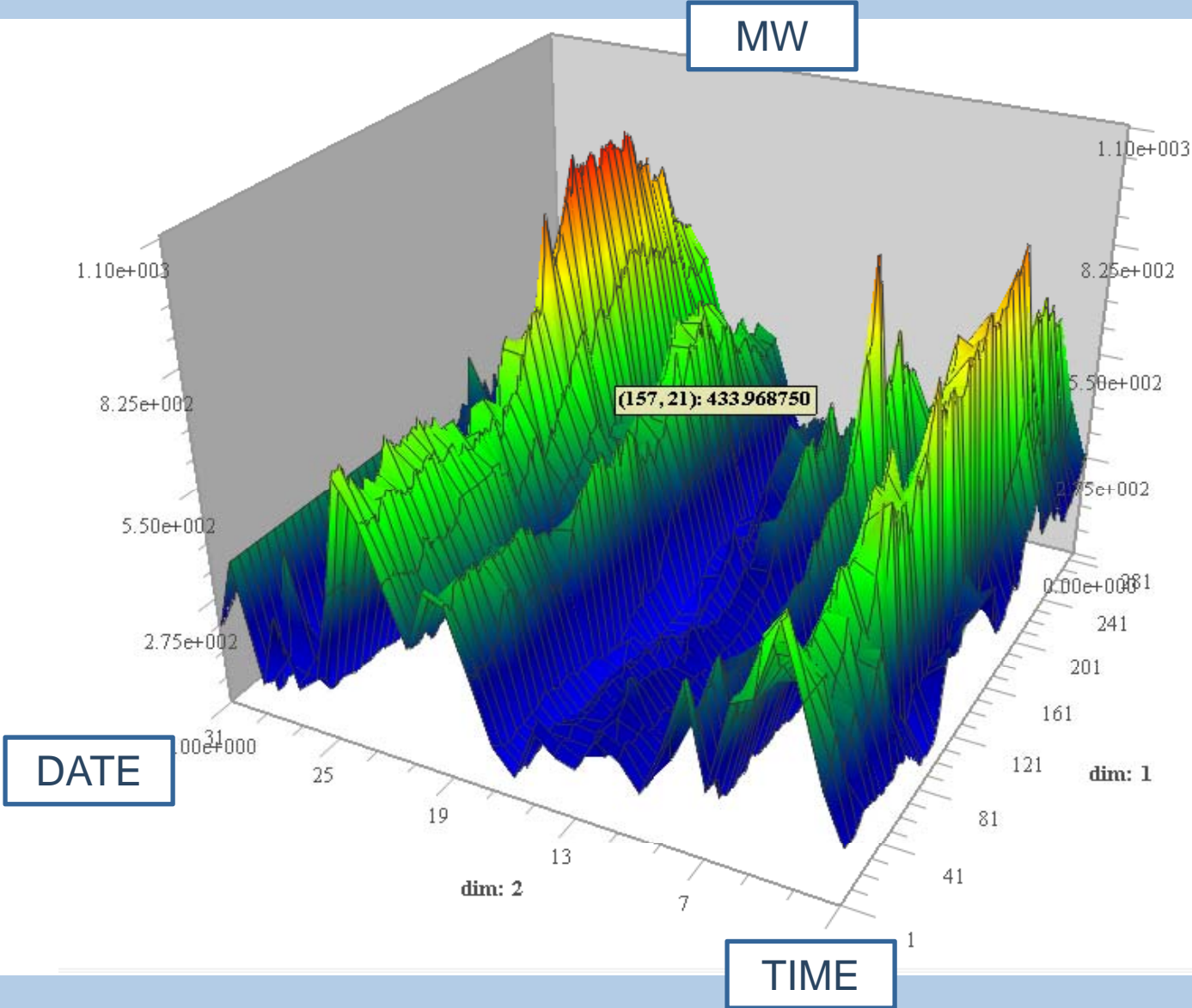
# Fluctuations in Wind Generation

Tamil Nadu  
Aug 2010

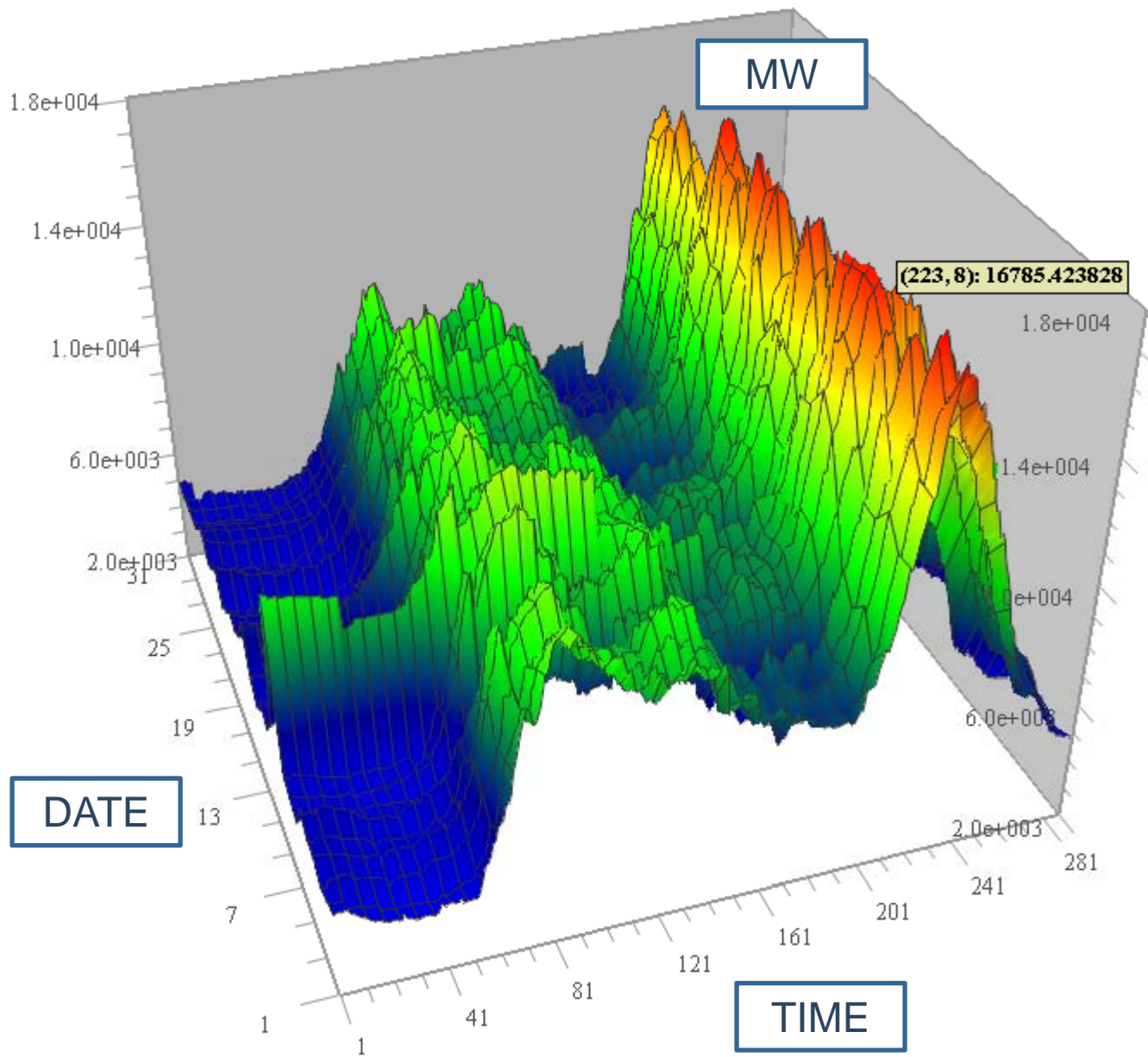


# Fluctuations in Wind Generation

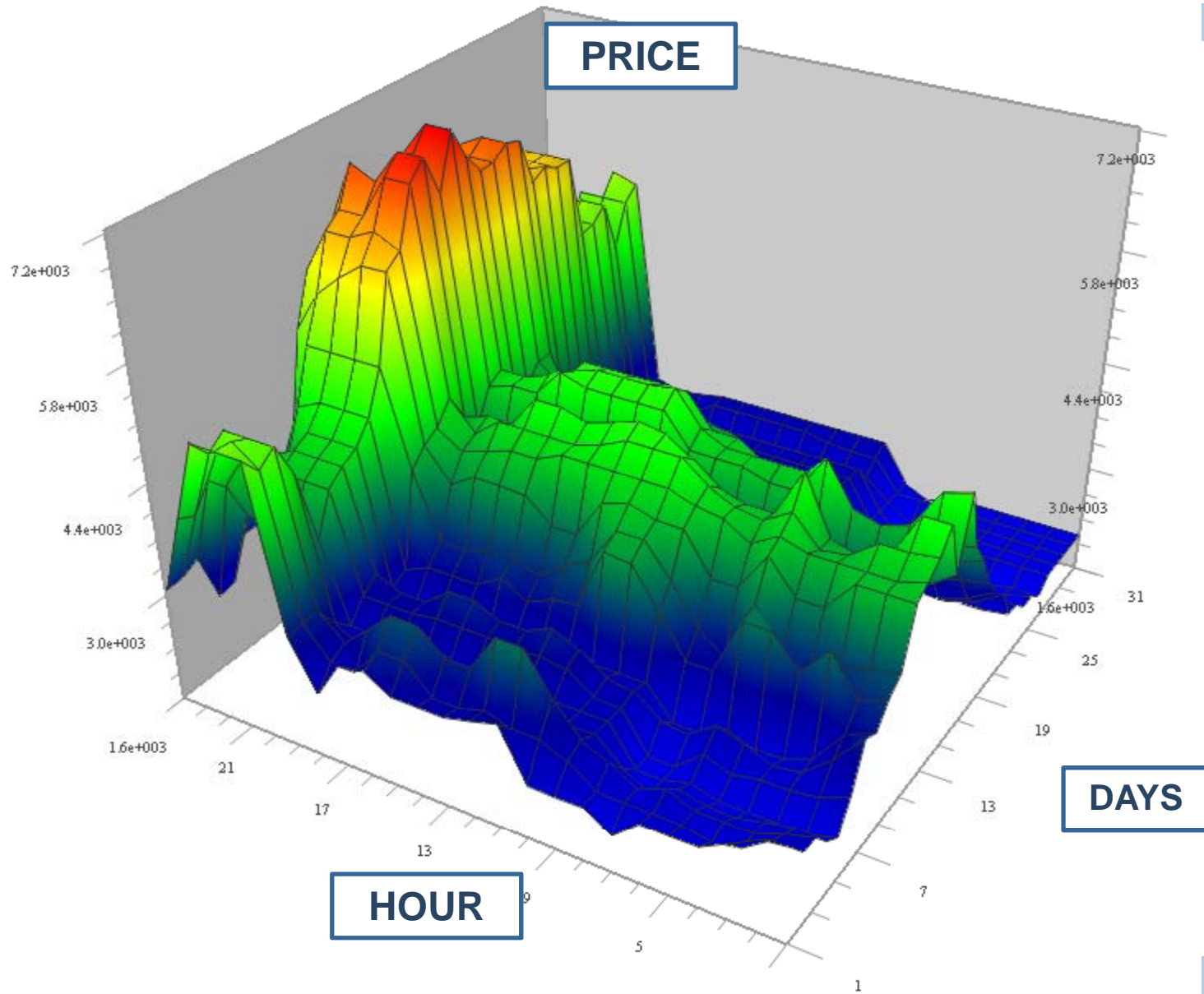
Gujarat  
Aug 2010



# All India Hydro Generation



# Sharp Price Movements (Aug '10)



# 15 – Minute bidding in PX (1)

- USP of the Indian Market Structure
  - 15 Minute Scheduling
  - 15 Minute Metering
  - 15 Minute Accounting
- Ramping Rate
  - Hour boundary: high ramp rate (1000 MW)
    - Large Changes in HVDC set points (NEW – SR) in operation
  - 15 minute bidding
    - facilitate gradual ramping up and down
    - provide operational ease to the participants
- Better portfolio management
- Better management of imbalances
  - Deviations from the schedule



# 15 – Minute bidding in PX (2)

- Encourage participation by the Renewable Energy Sources
  - Australian Market has adopted 5 minute interval for facilitation of renewable energy sources
- Prices discovered in PX and UI Prices
  - Hourly prices on the Power Exchanges
  - UI Prices are on a 15 minute interval
  - ***Introduction of 15 minute bidding would make the two comparable***
- Both the Morning and the Evening Markets should have 15 – minute bidding interval

# Availability Declaration by Merchant Generators(1)

- A new type of actor in the Indian Electricity Market
- Control Area Jurisdiction
  - Metering, Scheduling, Accounting and Settlement
  - Communication – voice and data
  - SCADA data
- Connectivity issues
- Long Term access
  - Without an identified beneficiary
- Payment of Transmission Charges
  - PoC Charges

# Availability Declaration by Merchant Generators (2)

- Plants with a mix
  - Long term, Medium term and Merchant Capacity
  - Interplay between different segments
  - Fuel related issues
    - Shortage declared for long term / medium term
    - Full merchant generation
  - Temptation to breach PPAs in the long term/medium term
- Settlement
  - Single part or multi part?
  - Single part prone to gaming/manipulation
- Merchant capacity
  - Should essentially be a separate control area
- Assessment of Transfer Capability
  - 360° Transfer Capability?

Thank You !!

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