

# Power trading in india economics essay

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PROJECT GUIDE: Prof SK Palhan Submitted By: Stuti Gandotra Roll No. – P-111050[2011-2013]

## **EXECUTIVE SUMMARY**

Electricity is not a simple commodity unlike other goods that can be easily stored. It is produced and consumed instantaneously. In India, where a huge section of consumers, who are power deprived, there is a significant installed capacity that is under-utilized. There is an imbalance in resources for power generation. The eastern region is rich in coal resources and the north eastern region holds a lot of hydro power potential. India, primarily being an agrarian economy, demand is seasonal and weather sensitive. Further, there exists substantial difference in demand of power during different hours of the day with variations during peak hours and off peak hours. Moreover, with a vast geographical spread, different parts of the country face different types of climate and different types of loads. As a result, the western and northern regions of the country suffer from a heavy deficit of power due to their immense industrial and agricultural load. Power trading will play an important role in maintaining a balance between power deprived and under-utilized capacity. Power trading is an effective way to procure electricity from the short-term market. Earlier, power was traded only through over-the-counter contracts. In 2008 two power exchanges were introduced in India, the Indian Energy Exchange (IEX) and the Power Exchange of India Ltd. (PXIL). It has been widely demonstrated around the world that power trading can enable to set up a competitive market and enrich the electricity sector. India is in its nascent stages of developing a power market and traders along with exchange can play a central role towards a successful market evolution

and transition to competition. Currently, Indian Energy Exchange (IEX) and Power Exchange India (PXI) are operational and they are trading about 2% of the total 800 billion units generated in the country. IEX's daily turnover is 65 million units while PXI handles 1 million units to 3 million units of transaction every day. Recently Power exchanges in India have greeted the government's decision to allow 49% foreign investment in the sector, as it will help inject capital and global practices in the vital interface between buyers and sellers of electricity, and make the market more competitive. Gains in the Power Market depends upon how far you can see, and how fast you can act. There are significant opportunities lost because of ignorance about market processes. India has approximately 20 GW of captive generating capacity. These plants are not running to their full capacity all the time. Surplus power from these plants can be sold in the short-term markets for good returns. This report will discuss about current scenario of power trading in India and the key players involved in it, covering the opportunity in trading and impact of FDI in power exchanges.

## **LITERATURE REVIEW**

### **Power Trading Market in India**

Electricity is not a simple commodity unlike other goods that can be easily stored. It is produced and consumed instantaneously. In a country like India, where the resources for power generation are so unevenly spread, power trading mechanism becomes imperative so that the regional surpluses and deficits are balanced. Power Trading as defined by EA-2003, is the purchase of electricity for resale thereof. Power trading is done with following rationale in India: To optimally utilize the existing resources in the sector

of power market based investment in the power sector and enhance the efficiency of the overall market. Promote exchange of power with the neighbouring countries. It has been widely demonstrated around the world that power trading can enable to set up a competitive market and enrich the electricity sector. India is in its nascent stages of developing a power market and traders along with exchange can play a central role towards a successful market evolution and transition to competition.

### Evolution of Power Trading in India

As an effect of liberalisation, privatisation and globalisation, Indian power sector was made bright to non-state players and other foreign players. During the post-liberalisation period, the generators of electricity like Central Generating Stations (CGS), State Electricity Boards (SEBs) and Independent Power Producers (IPPs) have all their capacities contracted through PPA route. As SEBs was handling both generation and distribution in their respective states, there was no need for fixing the generation tariff. Costs and profits were directly monitored by the State Ministry or Department of Electricity/ Power as operational in each state. Similarly, CPSU's (Central Public Sector Undertaking) capacities were usually allocated between adjacent states and SEBs used to draw its share without much say about price. Tariffs of IPPs were through negotiations between state government and private developers which at times haven't even involved SEBs. Hence, electricity trading during the pre-EA-2003 period was limited to bilateral contracts between SEBs. States or utilities with surplus power (like Orissa), or those unable to utilize their share of central pool would trade (rather sell) power to the deficit or needy ones. Merit order dispatch was the platform and Central Transmission Unit (CTU) was the prime agency involved in allocation of the surplus, non-scheduled power to the deficit utilities. In the

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year 1999, the Central Government established Power Trading Corporation (PTC) to facilitate in implementing its Mega Power Policy by carrying out short, medium and long term trading of electricity. PTC was mandated to purchase power from IPPs and sell it to identified SEBs suffering from power deficits. As the business and market evolved, PTC began to enable and arrange power trading between SEBs and, subsequently, PSUs. The EA'2003 recognised trading as a separate licensed activity and was given due weightage since it was considered as prominent tool for developing market and inducing competition. So, in the post-EA-2003 period, trading now had been recognised as inter-state and intra-state trading with the respective regulator having absolute control over it. Following EA-2003, various regulations regarding open access, trading, power market development, tariff fixation was notified by Central regulator. The market structures that prevailed during Pre-2003, Post-2003 and Present evolving one are pictured below.

Figure 1. 1 – Electricity Market Pre – 2003As shown in the picture single buyer model which was prevalent after liberalisation, the generators were mostly transacting with the state governed SEBs to sell their power. Sellers were either selling it to SEBs or the present day Transcos and discoms were mere distributors of electricity. Payment contracts are usually between genco and transco directly and there was no flexibility to look elsewhere.

Figure 1. 2 – Electricity Market Post – 2003Traders came into picture and they started playing a central role between generators and discoms though most of transactions were of long term in nature. Short term market started gaining importance after the launch of first energy exchange in 2008. Beyond term (seasonal) contracts, buyers and sellers now have day ahead, week ahead, and month ahead contracts in the market. With open

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access in place, bulk consumers are now encouraged to participate in the market. The evolving market structure doesn't make obligatory for any market participant to sell or buy with rigid terms and conditions. The evolving structure is illustrated through the following diagram which shows the " all-possible" transactions in the market. Figure 1. 3 - Evolving Electricity Market (Post - 2008)diagram-2. jpg

OVERVIEW OF ELECTRCITY MARKET/TRADING: Restructuring of the power industry aims at abolishing the monopoly in the generation and trading sectors, thereby, introducing competition at various levels wherever it is possible. Generating companies may enter into contracts to supply the generated power to the power dealers/distributors or bulk consumers or sell the power in a pool in which the power brokers and customers also participate. In a power-exchange, the buyers can bid for their demands along with their willingness to pay. Power generation and trading will, thus, become free from the conventional regulations and become competitive. Electricity sector restructuring, also popularly known as deregulation is expected to draw private investment, increase efficiency, promote technical growth and improve customer satisfaction as different parties compete with each other to win their market share and remain in business. Open access is the key to a free and fair electricity market. Power producers (sellers) and dealers/customers (buyers) have to share a common transmission network for wheeling the power from the point of generation to the point of consumption. Thus, interconnected transmission system is considered to be a natural monopoly so as to avoid the duplicity, the problem of right-of-the-way, huge investment for new infrastructure and to take the advantage of the interconnected network viz. reduced installed capacity, increased system reliability and improved system

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performance. Managing risk is primary tasks of any trading system. This task is perceived harder for electricity being a non-storable commodity. In competitive environment, the price is determined by stochastic supply and demand functions. The price can change at any time. As a consequence of increased volatility, a market participant could make trading contracts with other parties to hedge possible risks and get better returns. Congestion occurs when transmission lines or transformers are overloaded and this prevents the system operators from dispatching additional power from a specific generator. This may be prevented to some extent by means of reservations or rights. These rights are used to guarantee an efficient use of transmission system capacity and to allocate transmission capacity to users who value it most. A competitive electricity market should be supported by proper trading tools that take into account of special nature of electricity which is different from other commodities. A successful implementation of trading system in electric energy and its derivative markets could fulfill restructuring objectives, which include competition and customer choice and serve vital needs of electricity market participants. Trading is an activity in which transactions take place directly between two participants or indirectly through an exchange. Electricity trading through an exchange started for the first time in 1996 in New York Mercantile Exchange (NYMEX). Electricity trading has two main components, i. e. physical trading and financial trading. In physical trading, supply is balanced against demand and price is either determined in advance of trading or after trading. In financial trading, financial contracts take place between traders as agreements that give certainty to traders. Physical trading is generally done through an energy spot market or power pool while financial trading is through a financial

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market or exchange such as NYMEX or Chicago Board of Trade (CBOT).

Trading in an electricity market is a risky task because the electricity is much different from other commodities due to its special nature such as non-storable, generation-demand balance, limited demand elasticity, transmission constraints and electric price related with other volatile commodities. Electricity trading arrangements in USA, UK, Australia and some Latin American countries has undergone a profound transformation in last two decades. India has also started power trading from last four years.

## **METHOD OF DATA COLLECTION –**

The major and crucial activity in Research is collecting the data; we followed data collection as mentioned below.

## **SECONDARY DATA –**

The secondary data will give us an overall idea about the depth of research which we undertook. Sometimes it will also give the various dimensions of the research already undertaken. Moreover we can be confident with what we are doing and whether the research is on track. The secondary data will gives us a platform for comparison of our values. Sometimes it will help us in making corrections and adding values. Few of the research reports are -  
Research Reports from University of California  
Research Reports/articles  
EBSCO  
Various journals and websites  
Association of Power Exchanges  
Documents  
India Market data (Day ahead market, Term ahead market, REC's) from Indian Energy Exchange and Power exchange India Limited.  
Global market data from [www. theapex. org](http://www.theapex.org)  
Long term and short term market data from Power Trading Corporation of India Limited.



## **PRIMARY DATA -**

Conversation with experts from BSES Rajdhani Power Limited, Tata Power Trading Company Limited, CERC, IEX, PXIL etc. Speaking to Great Lakes IEMR faculty  
Telephonic conversations

## **Current Electricity Market Scenario**

Electricity market, where gencos, transcos and discoms used to negotiate, contract and transact electricity has now gradually moved to a stage where the intermediary, the transco's role has been made limited to wheeling and system operation. As of now, most of contracts in the market are in the name of power purchase agreement (PPA) signed by generating entity and procuring entity. Selling prices i. e. the generation tariff were either mutually agreed ones (single part tariff) or a regulated ones (cost-plus two part tariff). With the introduction of open access in transmission, a wholesale market has been created where the gencos and buyers are free to look for potential counter-parties across their state and regional boundaries. Though a wholesale electricity market was put in place, competition, the prime requisite for market efficiency failed to prevail to essential levels. Hence to induce competition, certain reformatory measures like standardised short term market, merchant concept, competitive bidding, etc. were introduced by Central regulator with the common consent from stakeholders. Hence in the current context, the buyers and sellers in Indian electricity market have the following four arrays in place to meet their needs and transact.

Market Characteristics	Duration	Long term market	Regulated route	PPA,
		Competitive bidding, Direct- Bilateral, Bilateral via trader	7, 12 - 25	years
	Medium term market	Direct - Bilateral, Bilateral via trader	1 - 7	

years  
Short term market  
OTC and Exchange route  
Less than a year  
Balancing market  
ABT regulated UI Pool  
Real time

## **Table - Different Arrays in Electricity Market**

The medium term market as shown above is the one which has been recently promoted by CERC vide its medium term open access regulations and the electricity traded through this route is minimal in proportion. Though UI-mechanism was originally proposed under the ABT regime as a balancing market but as a default considered as an option to meet short term energy needs. In fact, the amount of energy transacted through UI is far greater than the amount transacted through exchange. Hence, more than balancing, presently the UI pool is considered as a short term market in the present context. The total break-up of energy transacted through the above discussed arrays in the market are shown as a percentage of total electricity generated is shown below. Table – Volume of electricity transactions in total electricity generation during 2011-2012

The above chart pertaining to the transactions recorded during the 2011-2012 shows that, barring 11% (94.51 Billion kWh) of the generated electricity being traded in short term market, the remaining major chunk was transacted in long term market.

## **Key Players in the Power Trading Segment**

The key players in the short term market could be viewed from the following perspectives. Top selling entities  
Top buying entities  
Top trading entities  
Table below show the top ten states which were actively buying and selling in the short term market. It is seen that dominant sellers at both, the power exchanges and through licensed traders, are a mixed group comprising of independent power producers, distribution companies, state

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government agencies/bodies, and captive power plants. The major buyers in the short term market are mostly Northern and Southern discoms and SEBs from Rajasthan, Haryana, Punjab, Uttar Pradesh, Andhra Pradesh, Tamilnadu, and Karnataka. In the State of Tamilnadu, the state owned SEB – TNEB is the major buyer of electricity in short term market and the volume procured shows a poor efficiency in their planning and load management. In below tabulated states, the selling entities include the energy sold by generators connected to the state grid and under-drew discoms. Similarly, entities buying include the open access consumers and over-drew consumers. Table - Top buying entities during 2011-2012 Table - Top selling entities during 2011-2012

State	Top buying entities (MUs purchased through traders, exchange and UI)	Top selling entities (MUs sold through traders, exchange and UI)
Tamilnadu	8408	75
Punjab	6963	17
Delhi	5909	69
Maharashtra	5900	69
Rajasthan	5312	3
Haryana	5155	18
UP	4527	82
Karnataka	2447	27
Andhra Pradesh	2070	31
West Bengal	1415	98
Gujarat	7094	41
Chhattisgarh	5489	99
Delhi	4696	22
Jindal Power	4447	07
HP	3379	79
MP	2861	75
West Bengal	2735	27
Karnataka	2620	3
DVC	2451	86
J & K	2271	91

There were about 41 inter-state trading licensees as on 31. 3. 2012. However, of these, only 17 trading licensees were active in trading during the year 2011-12. The top trading entities on the basis of the volume which they transacted with buyers/ sellers and through power exchange are listed in the following table. Table - Top trading entities during 2011-2012

Entity	Share of Electricity traded by Licensees in 2011-2012
PTC India	33.05%
NTPC VNN	17.44%
Tata Power Trading Company	10.57%
National Energy Trading & Services Ltd. (LANCO)	9.96%
Reliance Energy Trading	7.47%
Adani Enterprises	4.58%
Knowledge Infrastructure	4.34%
JSW Power Trading Company	3.21%

Top

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5 trading licenses PTC, NVNNL, National Energy Trading & Services Ltd., Reliance and TATA were having dominant share of 78.49% in the total volume traded by all the trading licensees during the above analysed period.

6. Opportunities in Trading Segment The short term power market in India has witnessed further solidification during the year 2011-2012 it not only grew in absolute size in volume terms but its share as percentage of total electricity generation in the country also grew noticeably. Of the total electricity generation in India during 2011-2012, short term power market excluding trading through UI, comprises about 8%. UI volume is about 3% of total electricity generation and the balance 89% of the generation is being procured mainly by distribution utilities through long term contracts. Figure – Volume transacted through traders and exchanges as a % of total generation

### **The increase in volume traded registers a CAGR of 30.5% for the period 2007-11**

Source: CERCAs shown above, the short term market is showing rising trend and from 3.28% in 2008, this has increased to a level of 4.08% during the year 2009. Further it has reached to a level of 8% during 2011-2012. Main factors driving the growth would be increased competition, removal of imposition of cap on trading margin and trading restrictions on generation and trader to trader transactions, rationalization of transmission tariff and losses, regulatory and policy certainty, and non-discriminatory open access to enable utilization of surplus power with captive generators. The historical growth figures confirms the market potential to grow at an accelerated pace but it has been difficult for the field experts and regulators to put a number. Yet, it is estimates that by 2015, the traders and exchanges would alone deal

not less than 12% of the total electricity generated in the country. This denotes that by 2015, the traders and exchanges would transact more than 100 BUs. Assuming that two-third of the above said quantum is being handled by traders at an average trading margin of Rs 0. 4/unit, their probable revenue potential would be to the tune of Rs 3330 crores. When compared with other segment as the likes of generation, transmission and distribution, the capital investment and operating expenses in trading are relatively low and thus yields a sky-high return on investment. However to make high returns and sell power at premium prices, traders and exchange members need to excel in providing following services to their clients:-IT infrastructure for bidding on electronic exchange platform Advisory advices related to power prices and the follow on bidding strategy (e. g. weather related information, demand supply position etc.) Facilitation of procedures on behalf of his clients for delivery of power (e. g. SLDC standing clearances, co-ordination with NLDC etc.) Training And Client Grooming Market Monitoring And Client Alerting Apart from trading electricity, the upcoming generation projects have started roping in traders' investment (like PTC). More than staking in generation projects, there are certain breeding grounds like coal trading, capacity contracting, and power tolling etc. which are to be primarily focused by traders at large. These options and opportunities are briefly discussed in the opportunity matrix presented below.

Table - Opportunity Matrix & Promising Avenues for Traders in Power Sector	Avenues	Activities Involved
Case Study	Fuel Trading	The main activities involved are Participating in International fuel markets Dealing with logistics operators to import Selling to domestic players at competitive prices
PTC has entered into a MoU with an Indonesian coal mine for supply of 1mn tonnes of thermal coal annually for a		

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period of 15(+5) years  
**Power Tolling** Under power tolling the trader needs to operate two links of the electricity value chain. Procure fuel and supply at competitive rates to a generator Procure power from generator and sell at competitive rates in the electricity market PTC currently has Power Tolling Arrangements (PTAs) for 400MW with two power projects in Andhra Pradesh. It has signed a MoU with other two projects of 270 MW each.

**Clean Development Mechanism** The trader could facilitate the developers involved in Renewable, Conventional, Waste handling cum disposal and Energy Efficiency Projects in the key services like Project Development Services – Preparing Project Concept Note (PCN) & Project Design Document (PDD); Assisting in host country approval, validation & registration of the project; Monitoring services and assisting in trading of CERs

**Carbon Trading Services** – Inviting quotes for spot/ forward sale of CERs/ VERs; analysing the quotes and assisting in buyer identification; finalising the terms of ERPA and in transfer of CERs/ VERs. Structured Financial Solutions for the projects under CDM

Manikaran Power Ltd, a pioneer member of IEX with a considerable experience in electricity trading entered an association with Agrinergy Pte Ltd to provide services to the clients of Manikaran Power for all carbon offset mechanisms including CDM and Voluntary Carbon Standard (VCS).

**REC Mechanism** The prime operations that a trader can involve in are Accreditation of the project with state agency and registration of the same with central agency Issuance of RECs from Central Agency Trading of RECs on Power Exchanges Payment to RE generator

Tata Power Trading has created an expert professional team to provide REC related services to market participants. This particular opportunity has to be highly focussed by the traders in the market as CERC & IEX has prepared enough to launch trading

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in RECs. ESCO & Trading PAT Certificates As UMPPs and super critical technology being the buzzwords of the current market, energy accounting and conservation could be hype of the market in 10 years down the line.

[i]The major roles a trader can take part in energy efficiency projects are Influencing the clients and industrial consumers towards the benefits of energy efficiency Modelling energy conservation methods and help in financing the projects Taking responsibilities for endorsement of PAT certificates & trading them in the exchange as when launched

### **-Proposed**

Technical & Trading Services Arrangement The innovative concept proposed by me is that, the trader can enter into a strategic alliance with a O&M operator or can acquire resources talented in O&M practices and offer a customised solution to a generator (particularly SEBs). The major activities to be carried out by the alliance are The O&M team would be responsible for O&M services. Trader will be responsible for selling the extra power at competitive rates. The crux of the model is that the trader would be claiming for the share in the profits for the extra power sold due to improved PLF (or better O&M practices) instead of charging for the O&M operations. By this the trader takes more risk, and could get the confidence of the generator.

### **-Proposed**

Consultancy & Advisory Services As there is recent emphasis from the regulators and general public for low cost power, skilled traders could support its valued customers (discoms) on setting up effective internal / external business processes and share its experience in dealing with emerging issues in the development of power market. The range of services <https://assignbuster.com/power-trading-in-india-economics-essay/>

that could be offered by a trader are Preparation of RFP and RFQ for competitive bidding of power projects Assisting discoms in power procurement plans Establishment of trading desk Industry research and Price analysis Feedback Ventures has offered consultancy services for setting up of a trading desk for Gujarat Urja Vikas Nigam Limited. Similar opportunities with other discoms could be tracked by traders in the segment.

## **7. Grey Areas in Trading and Developing Competitive Market**

The short term market has grown significantly in recent years and to achieve sustained growth and meet the increasingly high level of expectations from the stakeholders is among the major challenges faced by this segment today. With the growing competition, regulatory uncertainties, limited availability of transmission corridors, reduction in surplus power with the utilities etc., pressure has built up on short term traded volumes which may exacerbate in future. The segment faces increased challenges in reducing the share of dominant players, profitability due to CERC regulation on trading margin, proposed volume ceiling in discoms monthly power procurement, attaining high levels of client satisfaction and acquiring talented and skilled manpower. The issues and challenges are pictured below and the major grey areas are further discussed at length. Figure – Grey Areas in Trading Segment



## **Why short term prices high? If it ultimately burdens the end-consumers, what could be economic motive behind the promotion of such market?**

An important of all the grey areas to be highlighted primarily is that India is perhaps the only country to have a growing power market in an overall deficit condition. In such a scenario, the benefits of trading cannot be sufficiently passed on the consumers. Therefore, it goes without mentioning that generation capacity addition to bridge the demand supply gap is a pre-condition to ensure efficiency of power markets. Besides, in a deficit market the participants face volume risk in addition to price risk. Hence in a constrained market, characterised by limited evacuation paths, lack of participation and overall shortage situation, it eventually leads to price spikes and further burdens the consumers. However, the motive behind developing this short term market is:-

### **To give an appropriate signal to investors:**

Say, when the short term market is not promoted, most of the capacities would be linked with long term PPAs. Assuming an extended shortage scenario, discoms would start entering into more long term contracts. Hence as long as the shortage continues to exist, whole system works well and there would not be a problem of surplus in the market. All at once when the demand stabilises, the discoms/ states will experience surplus and would merely end up in paying the capacity charges for the generators. This way, the interests of both buyer and seller are broken. Therefore to show a precise signal to the investors and procurers, the existence of STM becomes an imperative need of the sector.

**At times long term power costs more than short term power:**

Even in the present context, states which raced up in Case 1 and 2 bidding are finding it difficult to manage their surplus position at seasons. Discoms end up either in offering the surplus at lower prices or paying the capacity charges for the contract capacities. Gujarat would be an excellent case study in this context. Case Study: The Gujarat state government's decision to sell surplus power to power-deficient states did not find any takers on account of the high tariff demanded. The government has now decided to cut down the power generation from 5, 400 megawatts. When the power demand in the state went down, chiefly in the agriculture sector, due to unseasonal rains in the last one month, the government approached the power deficit states to sell the surplus power. The government also floated advertisements in various newspapers in those states. Source: Financial Express dated Dec, 02, 2010

**Long term reduction in tariff:**

Though it could be argued that electricity tariff in India are one of the highest in the globe and the short term prices are further prompting for tariff hike, it has to be noted that once participation increases, the competition also increases and would finally subside the prices in a long run. Such reduction of tariff in long run has been experienced by many international electricity markets and the central commission also views the same. However, to reduce the tariffs and improve the service, the right intervention will be bringing down the AT&C losses to international standards and any propagation against short term market would further exacerbate the situation.

## **Could electricity ever be traded as a commodity? If not what exactly prevents?**

Customarily, two technological problems prevent electricity being traded as a normal commodity in the long term market. The first one being the balancing problem is that the demand and supply of electricity have to be equal at any time. The second one is the constraints problem, is that the trading is restricted by congestion of the electricity grid. However, the short term market follows a different pricing mechanism where the prices are influenced more by demand supply interaction. Prices of the bilateral contracts are found be competitive bidding where traders participate with their bids. There is a room for allocating more weightage for a particular trader on the basis of risk profile and credibility. More than this bias, price is negotiated in most of the cases. Hence this way of short term trading could never substantiate the phrase – " electricity sold as commodity". Unlike bilateral contracts, the collective transactions at the exchange provide a solid platform where prices are purely decided by the forces of demand and supply. These forces are conflicting i. e. the seller wants premium prices while the buyer wants cheaper prices. These contradictory forces act against each other in an exchange, which leads to a point of equilibrium. This equilibrium point finds out the accurate price of electricity at a given time. In the whole process, the buyers and sellers remain anonymous to each other, so that the bigger players will not be in a position to influence the smaller players.

**In this level playing field for all the participants, it could be stated that electricity is almost commoditised.**

### **How UI could influence the electricity market?**

The historical price behaviour in the STM shows that the UI charges act as a reference to the prices of electricity discovered in an exchange. Buyers look for short term power first through UI, because of the ease with which power can be procured with no need for applications and approvals. Power through UI can be procured at the rate linked to the frequency at the time of drawl. But a limit of drawl is generally imposed by CERC, beyond which penalty is levied. According to Regulation 7(Limits on UI volume and consequences of crossing limits) of Central Electricity Regulatory Commission (Unscheduled Interchange charges and related matters) Regulations, 2009, The over-drawl of electricity from the schedule by any beneficiary or a buyer during a time block shall not exceed 12% of its scheduled drawl or 150 MW (whichever is lower) when frequency is below 49.5 Hz, and 3% on a daily aggregate basis. The under-injection of electricity from the schedule by a generating station or by a seller during a time-block shall not exceed 12% of the scheduled injection of such generating station or seller when frequency is below 49.5 Hz, and 3% on daily aggregate basis. In addition to UI Rate corresponding to frequency of 49.2 Hz, as stipulated under regulation 5, an Additional Unscheduled Interchange Charge at the rate equivalent to 40% of the UI Rate corresponding to frequency of 49.2 Hz shall be applicable for over-drawl or under-injection of electricity for each time-block when grid frequency is below 49.2 Hz. It is obvious that it is not in the interest of buyer to procure electricity through deviations beyond 12% of the scheduled drawl and would opt for short term market. Thus buyers always make a trade-off

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between power procurement through UI and power procurement through short term trading.

### **Are traders paid enough for their risks?**

Trading margin charged over the volume of transactions should be adequate enough to cover the following costs incurred in trading. Expenses borne to mitigate operational risks Expenses borne to mitigate market risks Operations and Maintenance Expenses of trader Return on Net Worth Traders are exposed to maximum risks in the long term buy-short term sell market (i. e. where trader has a long term power procurement contract with the seller takes an open position and sells this power on the basis of short term market requirements). Trader takes significant market risk (both on the price and volume side) in such contracts. These contracts where a trader is exposed to market risk for a certain duration before the trader is able to find a seller for the requisite volume are called non back-to-back contracts. Though the trading margin for such contracts is not regulated, the amounts of risks in such contracts are high enough to the extent that it can not be quantified. The other operational risks faced by traders irrespective of the type of contract they deal with are shown in the following table. Table 5. 8 – Risks borne by Traders

Typical Operational Risks	Description	Default risk	Default
Default risk	Default implies the non-payment of a buyer. Moreover some amount of the non payment remains unrecovered and ends up as bad debt		
Late payment risk	Late payment risk implies the risk of payment being delayed by a buyer beyond the payment due date.		
Contract dishonour risk	Contract dishonour risk implies the risk of violation of a contract by either a buyer or a seller.		

Even though in such cases the party that has dishonoured the contract must

be made liable to pay for penalties imposed, if any, it has been observed that the trader has been made to pay to the suffering party but has not been able to recover the penalties from the defaulting party. Inflationary risk In the absence of an inflation linked hike in trader's margin cap, the trader is unable to recover the increase in expenses through an increase in revenue accruing from margins Before commenting on the adequacy of trading margin with respect to the risks faced, it is worth to identify and value the O&M expenses usually incurred in trading activity. Table 5. 8 – Expenses incurred by Traders

Fixed Expenses	Variable Expenses
(1) Annual license fees to the CERC	(2) Power Exchange Membership fees (if membership taken)
(3) Employee expenses for bare minimum operations	(4) Office maintenance related fixed costs
(1) Bank charges (for LC/ BG etc)	(2) Employee expenses
(3) Business development expenses (Travelling, communication, EMD etc)	(4) Legal expenses
(5) Other miscellaneous expenses	

Source: CERCAs per a CERC's report on tariff margin, the average O&M expenses for the top five traders in the market was revealed to be Rs 0. 018/unit. Though the present margin structure seems attractive enough, traders were of the view that by allowing a fixed margin cap with the entire downside risk on the trader and no upside beyond the cap, traders are being forced to act as brokers i. e. they would never prefer to take market risks and would only sign back-to-back agreements. As observed in the international markets, a trader usually takes positions in the market and bears price risk for the commodity that it trades in. In some cases it makes profit while in others it makes losses. In the process, the trader facilitates a liquid and vibrant market for the commodity. Since currently in India, traders have limited their roles to that of brokers; they are unable to be as innovative as the traders in

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the global market and thus could not capture all the opportunities in the market

### **Some realities from transmission and system operation perspective...**

**Open Access:** One of the biggest external factors cited as a hurdle towards the development of trading market was the reluctance of State Utilities to enable open access in its true spirit. Still the top management of each state utility is of the view that transacting outside the state i. e. in a national level market would affect their business and revenue. Some of the recent happenings in the eastern region states (particularly in West Bengal and Orissa) reveal that, SLDCs are indirectly opposing the Captive generators to avail open access. Though these SLDCs are mandated to reply within seven working days stating the reasons for non-approval, the reason which was usually stated is the in-efficiency of the distribution infrastructure in the particular locality to support the load. Captive generators and Industrial consumers still have to fight for open access approval by proving the ability of the discom's infrastructure to support to load. Moreover, surplus states utilities like Andhra Pradesh, West Bengal allows to buy but not to sell and the case is reverse with deficit utilities like Maharashtra and Tamilnadu. The motive behind such opposition is that, these utilities or state governments have gained/ lost huge revenue in the short term market and they don't want that revenue to be shared among their independent selling entities. Hence, such a hostile environment and speculative behaviour would definitely not be a welcoming step for trading at an inter-state level

**Congestion:** Other factors that determine the prices of electricity in

trading are the available transfer capability (ATC) and anticipated congestion in interregional transmission links. ATC is the limit of power flow in a transmission corridor and is expressed in MW. RLDCs declare in advance the import capability and export capability of the interregional transmission links. When the power intended to flow through a transmission line is more than the ATC (import) of a line, and then congestion is anticipated by the RLDCs. The power intended to flow has to be curtailed so that it will be equal to the ATC (import). This is done by a method called market splitting in India, where the volume of relatively expensive sellers in surplus (upstream) area are curtailed and the volume of relatively cheaper buyers in deficit(Downstream) area are curtailed. Therefore, the prices for the deficit area increases and the prices for the surplus area reduce.

**The effect of congestion in the short term market could be made clearer by the fact that- During the year 2011, the actual volume transacted could have been about 17 percent higher, had there been no congestion prevalent in the system.**