

Power Exchanges a Boon or Bane: A Case- Study of Indian Power Sector

Vebhav Gupta

Abstract- Electricity brought about during the last few years in various power markets around the world have revolutionized the way in which the markets have typically viewed electricity. Electricity sector reforms have enabled a transition from a vertically integrated private or public monopoly market structure to one of competitive wholesale and retail mechanism with market places like power exchange. The instantaneous and perishable nature of electricity and the sporadic demand –supply mismatch at geographical level calls for a market place where surpluses can be disposed off efficiently or a real time basis to optimize resource allocation on short term bases. This short-term trading shall be organized on a transparent, equitable and efficient platform, Power exchanges .Energy is crucial to any country, especially a rapidly developing one such as India. Regulatory changes has led to creation of Indian Energy Exchange (IEX) &Power Exchange of India Ltd. (PXIL), a vibrant, transparent market on which buyers and sellers can trade electricity contracts and meet the diverse needs of their consumers nationwide.

Index Terms- MCP (Market clearing price), IEX (Indian Energy Exchange), PXIL (Power Exchange of India Ltd), CERC (Central Electricity Regulatory Commission), UI (Unscheduled Interchange), PTC (Power Trading Corporation)



1 INTRODUCTION

The Power sector in India is undergoing fundamental transformation of its institutional structure after the enactment of Electricity Act 2003. One of the important transformation is the creation of Power Market. The objective of creating power market is to unleash market forces to improve efficiencies, stimulate technical innovation and promote investments. Currently 95% of the capacity is tied up in long term power purchase agreements. It provides power security to buyers and payment security to the suppliers. But in order to cater to the seasonal demand, it is necessary for the distribution utilities to look for short term contracts.

The latest addition is Power Exchanges in addition to Bilateral, Traders and UI for short term contracts. Power exchange is in its nascent stage right now and the progress has been slow. Power exchanges have been in operation for more than a year, transaction through them only accounts for 6% of the total power generation. Since the power exchanges are the latest and emerging trends in the power market vis-à-vis the established conventional tools like the trading and bilateral it is pertinent to assess their role in the 'Development of Power Market in India'.

Economy is growing in India and so is its demand for energy to fuel industrialization and transformation. According to a recent KMPG report on the Indian Electricity market, the Indian electricity has grown 8-10% and is expected to grow 8% annually in the next decade. Government is of the view that in order to provide better quality and more reliable services to the consumer's competition in the power sector should be enhanced. It passed Electricity Act 2003 and provided for open access to the market place. Out of this Act came two power exchanges Indian Energy Exchange & Power Exchange of India Limited., the country's nationwide, automated and online electricity trading platforms. These exchanges were conceived to catalyze and modernize the electricity sector in India by introducing a transparent and neutral market through a technology enabled electronic trading platform.

*Ms. Vebhav Gupta, pursuing doctorate in Management in Maharishi
Markandeshwar University, Mullana, India Contact No.:
09868842791, 09650991627. E-mail:veb1979@yahoo.co.in*

Before the Act, India has a vertical electricity industry, controlled by the monopolistic state electricity boards. Because of the monopolies and a regulated pricing system, it was difficult to improve in the efficiency in the electricity sector. In India a disparity in the power demands of different states and regions results in seasonal surpluses in some areas and deficit in others. This demand-supply mismatch can be alleviated by the introduction of a bidding platform that brings power industry participants together to buy and sell electricity in an auction based system

Recognizing the fact, CERC kick started the process of organizing the electricity market by realizing the staff paper for developing a common platform for trading electricity in July 2006. On 6th February 2007, the CERC issued guidelines for grant of permission to set up power exchanges in India. India Financial responded by proposing then tentatively named 'Indian Power Exchange Ltd' and applied for permission to set it up and operate it within the parameters defined by CERC and other relevant authorities. Based on the oral hearing on July 10, the CERC accorded its approval vide its order dated 31st August, 2007. IEX thus moved from the conceptual level to firmer grounds. On 9th June 2008 CERC accorded approval to IEX to commence its operations and 27th June 2008 marked its presence in the history of Indian Power Sector as Indian Energy Exchange Ltd (IEX)

Indian Energy Exchange was the first exchange in the country to start operations, IEX is promoted by Financial Technologies (India) Ltd. and PTC Financial Services and counts other major power producers, financial institutions and distributor trading companies as its shareholders. Opting for the suggested auction based model, IEX was the first to propose and launch an exchange and today controls about 95% of the market. Power Exchange India Limited (PXIL) started its operation on October 22, 2008.

2 LITERATURE REVIEW

Power Exchanges is the latest reform in the sector and is expected to increase competition in the sector.

According to Satyajit Ganguly, Operations, Power Exchange India Ltd., "An organized

electricity market will inspire a lot of confidence amongst the people who want to invest in the Indian Power Sector. It will not only provide them with a transparent easy-to-access market but also, as spot market prices get accepted by the market at large, give an impetus to the development of hedging mechanisms for mitigating the volatility associated with electricity prices.”

According to Prabhajit Kumar Sarkar, AVP, Power exchange of India Limited “By Establishing power exchanges, regulators and policy makers in India have taken an important step towards the development of competitive market. Power Exchanges bring in transparency in power trading by eliminating information asymmetry and provide free, fair and transparent market where a large no. of market participants can interact through appropriate products and services, at prices both determined by both long term & short term demand considerations.”

According to Sunil Wadhwa, CEO, North Delhi Power Ltd. “The Electricity Sector of India is undergoing fundamental transformation of its institutional structure after the Enactment of Electricity Act 2003, One of the crucial transformations is the creation of Indian Power Market, the objective of the Power Market is to is to unleash power forces to improve efficiencies, stimulate technical innovations and promote investments so as to bring economic benefits for the consumers and societies in the long run.”

Thus the presence of Power Exchanges is expected to optimize the resources & give the fair deal to customers by increasing the competition. On the basis of above literature the following objective is proposed.

3 OBJECTIVE

The purpose of this paper is to provide an overview of power exchange and how it helps in resource optimization and real time balancing of demand-supply

Hypothesis:-

Null Hypothesis (H0):- There is no significant relationship between power tariffs and selling bids.

Alternative Hypothesis (H1):- There is significant relationship between power tariffs and selling bids.

4 RESEARCH METHODOLOGY: - The data is the quantitative data and pertains from April 09 – May10. The data is secondary in nature

and has been collected from the monthly Power Journal ‘Parivartan’ of Power Exchange of India Limited. Correlation Analysis has been used to determine the relationship between power tariffs and selling bids.

5 DATA ANALYSIS & INTERPRETATION

To find the relationship between selling bids and power tariff one year data pertaining from April 09- May 2010 of PXIL has been studied

TABLE 1

Month (2009-2010)	Total Buy Bids	Total Sell bids	Market Clearing Price (MCP)
Apr	55.08	60.45	8.21
May	22.14	95.85	4.87
June	138.51	123.57	6.07
July	170.66	492.30	4.75
August	199.12	188.77	6.28
Sep	144.83	242.09	4.23
Oct	197.37	221.60	4.79
Nov	164.57	479.39	3.33
Dec	141.50	388.26	3.10
Jan	220.75	318.58	3.32
Feb	209.63	320.72	3.32
Mar	205.05	173.67	6.18
Apr	261.05	128.61	7.65
May	156.64	177.42	4.43

(Source: Power Exchange of India Limited)

TABLE 2

Zero degree & partial correlation has been applied to find correlation between Total Sell Bids and MCP

When zero degree correlation is applied there is a strong negative relationship between the two variables. And when partial correlation is applied keeping controlling buying bids the relationship gets even much stronger indicating that more the number of selling bids the lower will be the price resulting in rejection of null hypothesis.

So the analysis clearly shows that more the availability of power on real time basis the lesser will be the prices, all other factors remaining constant.

Significance of the Study: India being a predominantly agrarian economy, power demand is seasonal, weather sensitive and there exists substantial difference in demand of power during different hours of the day with variations during peak hours and off peak hours. Further, the geographical spread of India is very large and different parts of the country face different types of climate and different types of loads. Power demand during the rainy seasons is low in the States of Karnataka and Andhra Pradesh and high in Delhi and Punjab. Whereas many of the States face high demand during evening peak hours, cities like Mumbai face high demand during office hours. The Eastern Region has a significant surplus round the clock, and even normally power deficit states with very low agricultural loads like Delhi have surpluses at night. This situation indicates enough opportunities for trading of power. This would improve utilization of existing capacities and reduce the average cost of power to power utilities and consumers. This Research paper is significant as it exhibits the evolution and growth of Power Exchanges in our country and how their presence help in optimizing the resources and real time balancing of demand and supply.

6LIMITATIONS OF STUDY Since Power Exchanges is a very new concept for Indian Power Sector, There was difficulty in availability of data. Thus the analysis was restricted on the data pertaining to single year.

7 CONCLUSION

Although Indian Power Market with support of

Correlations

Control Variables		Total buy bids	Average MCP	Total sell bids
total buy bids	Correlation	1.000	-.095	.301
	Significance (2-tailed)	.	.747	.296
	df	0	12	12
average market clearing price	Correlation	-.095	1.000	-.720
	Significance (2-tailed)	.747	.	.004
	df	12	0	12
-none-a total sell bids	Correlation	.301	-.720	1.000
	Significance (2-tailed)	.296	.004	.
	df	12	12	0
total sell bids	Correlation	1.000	.184	
	Significance (2-tailed)	.	.548	
	df	0	11	
total sell bids	Correlation	.184	1.000	
	Significance (2-tailed)	.548	.	
	df	11	0	

government, regulators and stakeholders is developing in the right direction but impediments like inadequate supply, lack of adequate transmission capacity an improper congestion management are still acting as hurdles in the way of smoother power market development. Presence of Power Exchanges is expected to overcome these hurdles.

This is the first small step in the long journey of capacity building, efficient working of power sector & resource optimization. It will make our country surplus power state from deficit one. The increasing participation at exchanges clubbed with the lower prices justifies the aptness of the vision and initiative of the regulators and policy makers in the power exchanges.

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