

ExpertSpeak

Day-ahead market on Power Exchanges can assist utilities in maximizing gains by replacing bilateral banking transactions

With the availability of power in the power exchange market expected to increase manifold in the near future, entering into commercial transactions through spot market would be the most economical option for the utilities than entering into bilateral banking transactions, feel **Rohit Bajaj**, Vice President-Business Development and **Shruti Bhatia**, Vice President, Regulatory Affairs and Communications, Indian Energy Exchange Limited (IEX).



Rohit Bajaj, Vice President-Business Development, IEX



Shruti Bhatia, Vice President, Regulatory Affairs and Communications, IEX

A vibrant spot power market on power exchanges presents a feasible option to power utilities to replace their bilateral banking transactions. With over 1,000 participants participating in the spot market on a daily basis, there is ample liquidity and thus a robust price discovery. A brief analysis of bilateral banking transactions undertaken between the utilities vis-à-vis prices discovered on the exchange clearly shows that the utilities stand to gain in case they leverage the market to buy and sell electricity instead of entering into bilateral banking transactions. For instance, the hilly States of North have surplus power during summer and monsoon months due to excess hydroelectric generation, while there is deficit in winter months. Instead of entering into banking arrangement, the utilities in these States will gain financially if they sell surplus power on the power exchange platform in monsoon

Now states are rushing to surrender high cost power

months when rates are generally higher and buy electricity from the power exchange in winter month when there is ample power available at cheaper rates..

Overview:

The Electricity Act 2003 transformed the way power sector conducted its business. Prior to 2003, the sector was governed under an archaic framework through the Indian Electricity Act 1910 and the Electricity Supply Act, 1948. In 1998, almost five decades after the 1948 Electricity Supply Act, the Indian Parliament took the first step towards reforming and modernizing the governance framework by enacting The Electricity Regulatory Commissions Act which paved way for setting up of electricity regulatory commissions at Central and State level as autonomous and quasi-judiciary bodies to set up tariffs, advise the governments on matters of electricity and to promote competition, efficiency and economy in the sector. The Electricity Act 2003 consolidated all the earlier legislations

and brought with it a whole new remarkably different paradigm, positioning competition as the new building block and cornerstone for the sector. The 2003 Act reinforced competition in the sector with introduction of “open access”. While open access to transmission was introduced as soon as the legislation was enacted, the 2003 Act permitted State Electricity Regulatory Commissions (SERCs) time until 2009 to introduce open access in distribution for all consumers with demand of 1MW and above.

Another remarkable and game changing provision in the 2003 Act is recognition to “trading” as a distinct activity. This remarkable provision unfolded evolution of power market and led to creation of new institutional entities i.e.the trading licensees at the inter-state and intra-state level regulated by the Central Electricity Regulatory Commission (CERC) and the State Electricity Regulatory Commission (SERCs) respectively as well as the Power Exchanges, so far at the inter-state level, and thus regulated by CERC.

According to the CERC Market Report, the short-term market traded almost 100 BUs of electricity in fiscal 2015, representing a sizeable 9% of the annual total generation in the country.

The CERC initiated ground work on setting up of power exchange in the year 2006 and almost two years later, in the year 2008, two power exchanges came into inception. Operating in the short-term power market, the exchanges have been playing a meaningful role over the last eight years by connecting the regions which are surplus in electricity to those which are in deficit thereby enhancing efficiency and promoting optimum utilisation of resources, building the power market and promoting competition through transparent and robust price discovery. Today the exchange provides trading in electricity market on round-the clock basis. The state utilities have been actively leveraging the exchange market to not only balance their demand-supply portfolio but to also optimize their power procurement by replacing their high variable cost power with competitively priced power making gains which could then be shared with consumers. The States of Bihar and Delhi are stellar examples of this initiative.

The Indian Energy Exchange pioneered operationalisation of open access in distribution. Today the Exchange has more than 3,800 registered participants comprising 3,300 open access consumers, 55 Distribution Companies, 5 Union Territories and more than 300 private generators. The Exchange traded 92 MUs on an average daily basis in fiscal 2016 with 98% market share. On a cumulative basis, IEX has traded about 144 BUs of electricity in the last eight years.

Prior to 2003, when trading in electricity was not recognized formally, the Utilities traded by way of informal barter arrangements with each other. Barter is a system of exchange where goods or services are exchanged for other goods or services without using a medium of exchange, such as money. Banking

of electricity is akin to barter system wherein electricity is exchanged during different periods without involving any monetary transactions. Banking transactions have been continuing even after evolution of short term market, so perhaps time is now appropriate for utilities to weigh the options vis-à-vis options available in the power exchange market to maximise their gains.

Change in landscape: Transition from ‘Deficit’ to ‘Surplus’

The policy and regulatory framework unveiled apropos enactment of the Electricity Act 2003 has spurred

Today, many States boast of being surplus in power for a significant period of the year if not throughout the year. This phase is indeed different from what we have witnessed in the past when shortages used to be in double digits & every State wanted to enter into long term contracts without much of economic & commercial considerations

growth and vibrancy facilitating the sector transition to a new exciting phase from the earlier monotonous phase when sector was heavily licensed, utilities were vertically integrated with no competition whatsoever and power deficits were norm of the day. The delicensing of generation under the 2003 Act led to a huge surge in capacity addition. In the last five years, more than 20,000 MW has been added almost every year as is also evident from the ensuing table.

In the last six years, the capacity has increased by 1,24,905MW, but growth in demand has not been commensurate – in six years the demand has grown by only 44,454 MW. Consequently, today, many States boast of being surplus in power for a significant period of the year if not throughout the year. This phase is indeed different from what we have witnessed in the past when shortages used to be in double digits and every State wanted to enter into long term contracts without much of economic and commercial considerations. Now, the States are rushing to surrender high cost power as has also been the case in Delhi. Also, high energy (fuel) cost power plants are not getting scheduled on regular basis, since the States prefer to back down these stations for most parts of the year as they are comfortable in power supply. Over the years, the Plant Load Factor (PLF) of thermal power stations has come down drastically. Average PLF of coal/

Year	Installed Capacity (at the end of FY) (MW)	Peak Met (MW)
2009-10	1,59,398	1,04,009
2010-11	1,73,626	1,10,256
2011-12	1,99,877	1,16,191
2012-13	2,23,344	1,23,294
2013-14	2,43,029	1,29,815
2014-15	2,67,367	1,41,160
2015-16	2,84,303	1,48,463

Source: Central Electricity Authority (CEA)

Month	FY14-15			FY15-16		
	Bilateral (MUs)		Total Generation (MUs)	Bilateral (MUs)		Total Generation (MUs)
	Direct	Trader		Direct	Trader	
Apr	625	2870	87152	1612	2317	86161
May	843	2867	89662	1496	2770	94942
Jun	1102	3320	88480	2370	3424	88859
Jul	1940	3613	89491	2344	4256	92918
Aug	1978	3509	89859	2459	4225	95559
Sep	1953	2870	85718	2434	3381	95164
Oct	887	2314	90418	2555	2015	98462
Total	9328	21363	620779	15271	22389	652065

Source: CERC Market Monitoring report on short term transactions

lignite plants was 78% in 2007-08; this has come down to below 65% in the current fiscal. With there being no takers of high cost power, the States are unable to exit the contractual obligations laid under the Power Purchase Agreements, for good.

Banking Transactions: The context

Banking of power means exchange of electricity for electricity without involving any money transaction.

For example, under a banking agreement a power surplus state, say Himachal Pradesh (HP) will supply surplus power to deficit states in the summer and monsoon months and will take back slightly excess quantum i.e. quantum supplied plus banking margin in the winter months, when it needs power from external sources to meet its own requirements. Banking margin of about 2-5% in volume terms is returned extra to take care of time value of money.

The recent trends of short term market indicate that the quantum traded in banking transactions has been increasing. This segment is growing faster than any other segment. It may be seen from the data in the table below, that direct short term transactions have increased from 9.3 BUs to 15.2 BUs, increase of over 60% during the first 7 months of fiscal 2015-16.

This necessitates the need to understand the reasons behind increase in banking transactions among States even though a liquid and competitive power market is available. Are States really making any gains in undertaking such transactions or are these transactions merely undertaken for convenience with no regard to commercial considerations.

A few reasons for increase in banking transactions could perhaps be:

- The State utilities are unable to get right price of surplus power on the power exchange as they sell power on the basis of average marginal cost while other generators, i.e. the IPPs with access to cheaper coal

due to proximity with mines or coal availability from captive mines etc. sell power at very competitive rates.

- Banking transactions are cashless transactions since the utilities do not have to incur any cash flow while banking excess power with other States and take it back during their lean deficit period.

How day-ahead market on Power Exchanges can assist utilities in maximizing gains

With prices discovered in spot power market on power exchanges providing reference price for electricity, the rate at which banking transactions are undertaken can be compared with price discovered on the exchange. Through such a comparison, it can be easily inferred that in case of banking transactions, one entity gains while the other entity loses. The prices discovered in competitive exchange markets during summer/monsoon months are more than that in winter months.

The table below gives average monthly Area Clearing Prices (ACP) discovered at IEX for North Region (N1) in fiscal 2015 and fiscal 2016:

It may be seen from the prices of last two years that during summer/monsoon months prices on power exchange are higher than prices in the winter months.

Month	ACP for N1 bid area on IEX (Rs/Kwh) in 2014-15	ACP for N1 bid area on IEX (Rs/Kwh) in 2015-16
April	3.44	2.48
May	3.16	2.26
June	3.56	3.18
July	3.35	3.20
August	4.19	2.65
September	4.06	3.43
October	3.66	2.89
November	2.63	2.55
December	2.97	2.45
January	2.70	2.88
February	2.60	2.70
March	2.44	-
Average May- Sept	3.66	2.94
Average Nov-March	2.67	2.65

Source: IEX



The States having high hydroelectric potential like Himachal Pradesh, J&K have surplus power in the month of May to September. As rates at Power Exchanges are high during these months, these States will stand to gain if they would sell their surplus power at exchange platform

The States having high hydroelectric potential like Himachal Pradesh, J&K have surplus power in the month of May to September. As rates at Power Exchanges are high during these months, these States will stand to gain

if they would sell their surplus power at exchange platform. When these States require power, say in the months of November to March, they can buy power from Power Exchanges at lower rates thus again gaining in the bargain.

Month	Supplied by State - A to State - B (MUs)	IEX PRICE - Monthly average ACP (Rs/KWh)	Returned by State - B (MUs)	IEX PRICE - Monthly average ACP (Rs/KWh)
Nov'14	353	2.63		
Dec'14	364	2.96		
Jan'15	362	2.70		
Feb'15	249	2.60		
Jun'15			346	3.18
Jul'15			357	3.2
Aug'15			357	2.64
Sept'15			347	3.43
Total/ Weighted Average	1327	2.73	1406	3.11
Profit/Loss to State - B	Rs Crore	(74.45)		

Source: IEX

Thus, by replacing banking transaction with buying and selling through day-ahead market on the power exchange where there is ample liquidity available, States have an option to make significant gains. Cost of power purchase is about 80-85% of the total cost of any DISCOM which means that small reduction in purchase cost can help DISCOMs reduce their losses significantly. In today's scenario when a liquid power market is there, being indifferent to commercial and economical consideration is certainly not the best practice for utilities to follow. With the availability of power in the power exchange market expected to increase manifold in the near future, entering into commercial transactions through spot market would be the most economical option for the utilities, than entering into bilateral banking transactions.

To put the point into perspective, the table below attempts to analyze banking transaction undertaken between two States – A & B from November'14 to September'15:

It may be seen from the table above that State - B received power from State - A for the period Nov 14 to Feb 15 and State - B returned same quantum along with the banking margin in the period June'15 to September'15.

Now had State - B purchased this power from IEX, they would have paid only Rs 2.73 per kWh. Similarly State - B could have sold surplus power in the months of June to Sept 15 through exchange and would have realized Rs 3.11 per kWh. Thus in this particular transaction, State - B would have saved almost Rs 74 Crores had they bought and sold electricity through the power exchange. ➔

This article has been co-authored by Mr. Rohit Bajaj, Vice President-Business Development and Ms Shruti Bhatia, Vice President, Regulatory Affairs and Communications, Indian Energy Exchange Limited. The views expressed by the authors herein are personal and may not necessarily represent views of the organization. For any questions and/or clarifications, the authors may be reached at rohit.bajaj@iexindia.com / shruti.bhatia@iexindia.com

The views in the article of the author are personal For suggestions email at feedback@infraline.com