WEEKLY REPORTING OF OTC CONTRACTS: MONTHLY ANALYSIS

(AUGUST 2013)

[An analysis of all weekly reports (reported period 29th July- 01st September 2013) received from licensed-traders]

Economics and Power Market Division
Market Monitoring Cell
Central Electricity Regulatory Commission

Prepared on 11th September 2013

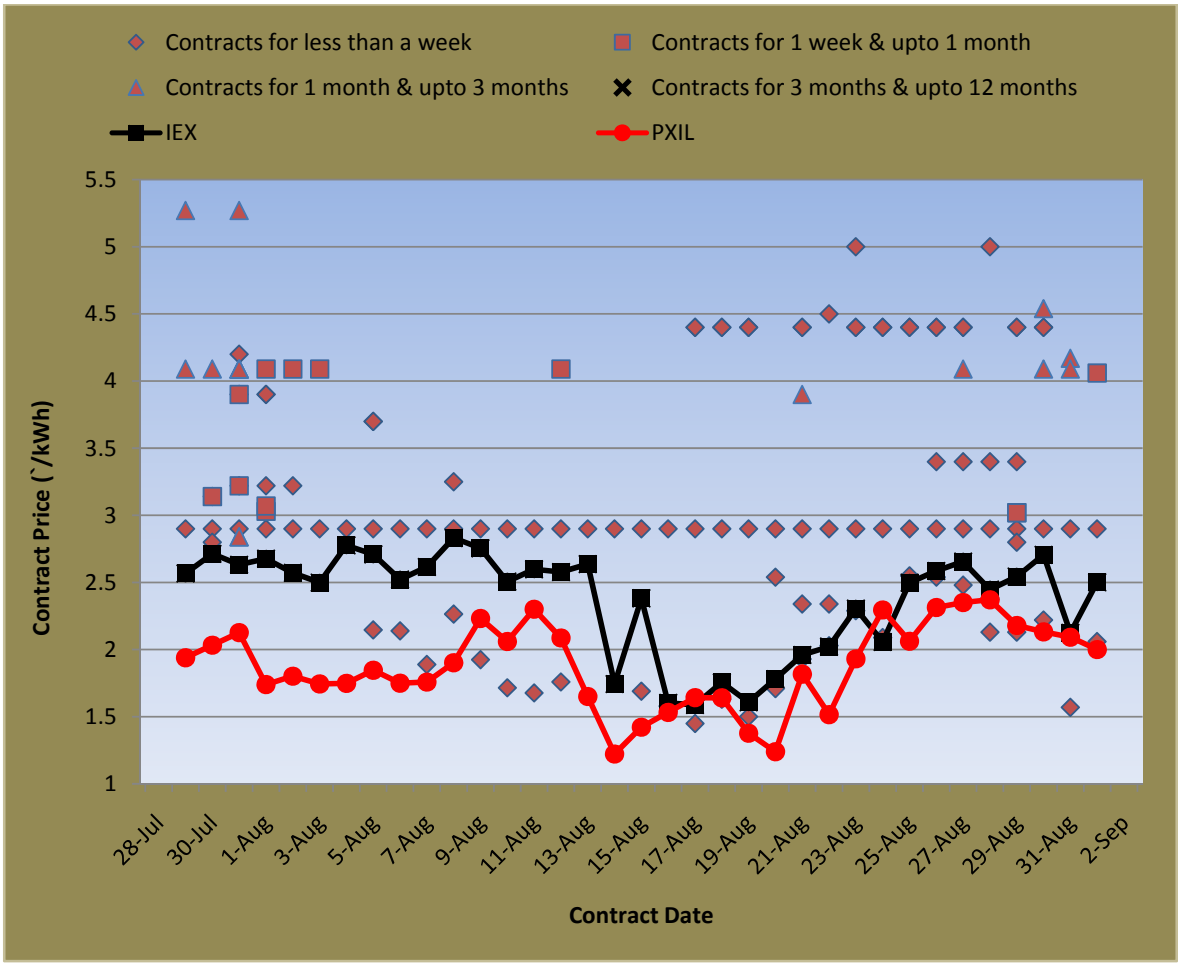
Snapshot for August 2013

- ✓ The reported short-term contract volume for August, 2013 (analysis of five weeks) is 1589.12 MUs whereas the same was 1686.91 MUs for the month of July (analysis of four weeks). This is equivalent to 25% decrease in reported average weekly volume transacted during July, 2013.
- ✓ 81% of total volume has been contracted at price of more than `4/kWh during August 2013 as compared to 92% of total volume contracted during July 2013.
- ✓ Total number of contracts (including Swap & Banking) executed during August, 2013 (analysis of five weeks) was 148 by 7 traders whereas in July (analysis of four weeks) the number of contracts executed was 97 by 7 traders.
- ✓ There is a marked increase in the number of contracts executed in August in comparison to July i.e. from 97 to 148. However, the total volume contracted has decreased from 1686.91 MUs to 1589.12 MUs.

I. Comparison of Short Term OTC contracts prices with Power Exchange prices (on Contracted Date)

The scatter diagram shows a comparative analysis of price movement in OTC and Power Exchange markets for August 2013. As seen in scatter diagram, the contracts are clustered over the 1st, 4th and 5th week of the reported period and the overall price of OTC contracts executed was in the range of `1.45/kWh - `5.27/kWh.

Chart 1: Scatter Diagram depicting price of electricity in OTC contracts and in Power Exchanges



Note: It may be noted that Power Exchange is a day ahead market with standardized contracts with no transmission corridor reservation while the OTC Contracts are weekly/monthly contracts with flexibility of customization and corridor reservation. The price comparison of OTC- Contracts and Power Exchanges should be seen in this light.

Table 1 shows the weighted average sale prices of all the contracts reported by traders in a particular week and total contracted volume for the same. (Weights being the respective contracted volume). Table 2 shows comparison between price discovered on Exchanges with prices contracted in OTC market.

Table 1: Price and Volume of OTC Contracts

Week of Contract Execution	Range of Sale Price (`/kWh)		Weighted Average of Sale Price (`/kWh)	Total Volume (MUs)
	Min	Max		
29th July - 4th August 2013	2.80	5.27	4.24	901.44
5th August - 11th August 2013	1.68	3.70	2.79	5.57
12th August - 18th August 2013	1.45	4.40	3.08	4.23
19th August - 25th August 2013	1.50	5.00	3.70	17.18
26th August - 1st September 2013	1.57	5.00	3.90	610.31
Total				1538.72

Table 2 Comparison of prices in Day Ahead Market and in OTC Contracts

Contract Date	29-Jul-13	30-Jul-13	31-Jul-13	1-Aug-13	2-Aug-13	3-Aug-13	4-Aug-13	5-Aug-13	6-Aug-13	7-Aug-13	8-Aug-13	9-Aug-13	10-Aug-13	11-Aug-13
IEX (`/kWh)	2.57	2.71	2.63	2.68	2.57	2.50	2.78	2.71	2.52	2.62	2.83	2.75	2.51	2.60
PXIL (`/kWh)	1.94	2.03	2.13	1.74	1.80	1.74	1.75	1.85	1.75	1.76	1.90	2.23	2.06	2.30
OTC Contracts (`/kWh)	4.24 (29th July – 4th August 2013)							2.79 (5th August - 11th August 2013)						

Contract Date	12-Aug-13	13-Aug-13	14-Aug-13	15-Aug-13	16-Aug-13	17-Aug-13	18-Aug-13	19-Aug-13	20-Aug-13	21-Aug-13	22-Aug-13	23-Aug-13	24-Aug-13	25-Aug-13
IEX (`/kWh)	2.58	2.64	1.74	2.38	1.60	1.59	1.76	1.61	1.78	1.96	2.02	2.31	2.06	2.50
PXIL (`/kWh)	2.09	1.65	1.22	1.42	1.53	1.64	1.64	1.38	1.24	1.82	1.52	1.93	2.30	2.06
OTC Contracts (`/kWh)	3.08 (12th August - 18th August 2013)							3.70 (19th August - 25th August 2013)						

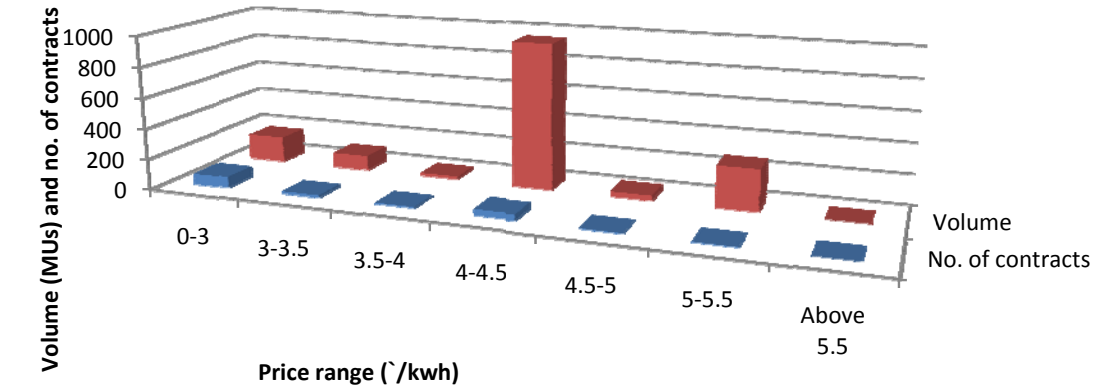
Contract Date	26-Aug-13	27-Aug-13	28-Aug-13	29-Aug-13	30-Aug-13	31-Aug-13	1-Sep-13
IEX (`/kWh)	2.59	2.66	2.45	2.54	2.71	2.13	2.50
PXIL (`/kWh)	2.31	2.35	2.37	2.18	2.13	2.09	2.00
OTC Contracts (`/kWh)	3.90 (26th August – 1st September 2013)						

Observations

1. It is observed that weighted average OTC contract prices were higher than IEX and PXIL simple average daily prices during the reporting period. The minimum price in OTC market was `1.45/kWh (17th August, 2013) while in the exchanges it was `1.22/kWh (PXIL, 14th August 2013) during August 2013 and the maximum price in OTC market was `5.27/kWh (29th July & 31st July, 2013) which was a 'RTC' power contract while for Day-Ahead market on the exchange it was `2.83/kWh (IEX, 8th August 2013). *(It may be noted that Power Exchange is a day ahead market with standardized contracts with no transmission corridor reservation while the OTC Contracts are weekly/monthly contracts with flexibility of customization and transmission corridor reservation. The price comparison of OTC - Contracts and Power Exchanges should be seen in this light.)*

2. As far as the number of contracts is concerned, 44 out of totals 136♣ contracts were entered at sale price above `4/kWh. However, the cumulative volume traded at price above `4/kWh was 1253.05♣MUs which is 81% of total OTC contracts volume for August 2013. There were a total 148 contracts including swap & banking during August 2013.

Chart 2: Frequency Distribution of Number, Volume and Price Range of OTC Contracts

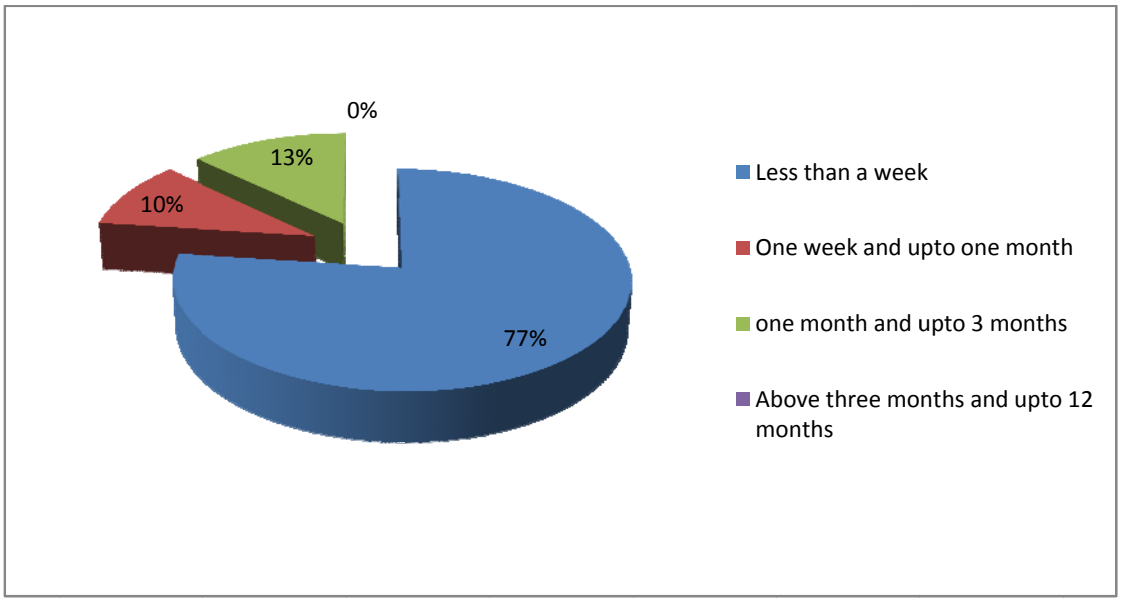


	0-3	3-3.5	3.5-4	4-4.5	4.5-5	5-5.5	Above 5.5
No. of contracts	70	15	7	39	3	2	0
Volume	170.34	97.49	17.84	949.87	32.94	270.24	0.00

♣ *Excluding swap /banking contracts since they do not have any sale price.*

3. The following chart shows the percentage of contracts reported during the aforesaid period, categorized according to the period of power supply. Total number of contracts reported is 148.

Chart 3: Percentage of contracts according to the period of power supply reported in August 2013



II. Forward Curve of Power Prices

A forward curve reflects present day's expectation of spot prices for a future period. Accordingly forward curves have been drawn based on prices of contracts executed for supply of power for future period. Forward curves have been drawn for September 2013 – May 2014 based on 136 contracts and for August 2013 – May 2014 based on 91 contracts.

Chart 4.1: Forward Curve for the period September 2013 –May 2014 as on 11th September, 2013

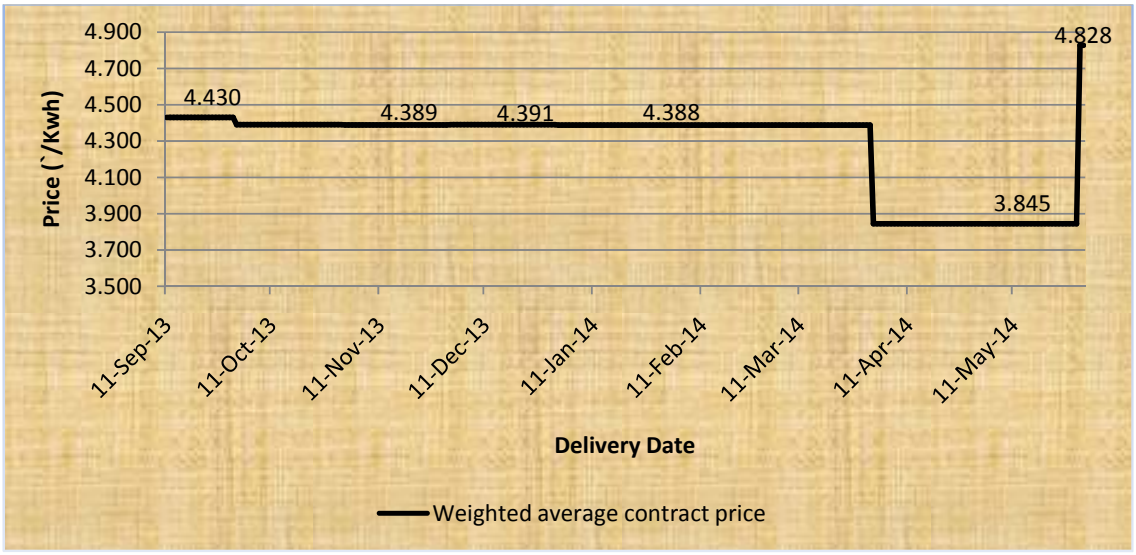
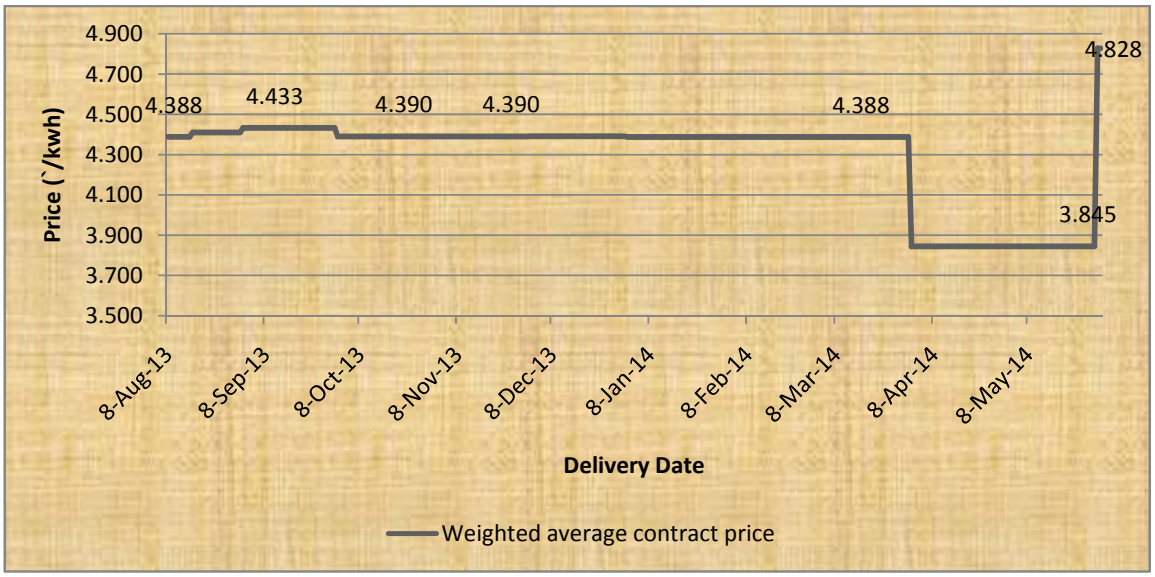


Chart 4.2: Forward Curve for the period August 2013 – May 2014 as on 8th August, 2013



Observations

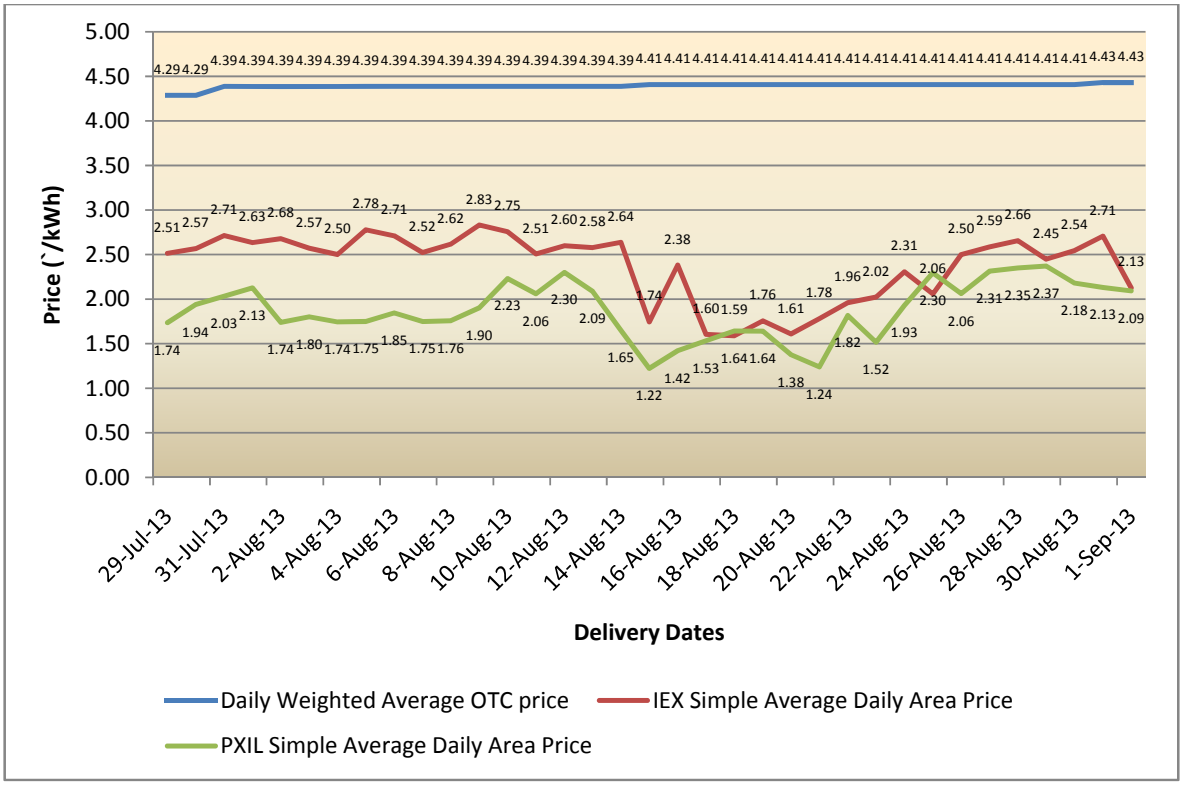
1. The Forward Curve as on 11th September 2013 is based on contracts reported up to 1st September 2013 and the tenure of the curve is for the period 11th September 2013 to 31st May 2014 (period of power delivery). The total numbers of contracts executed in the current reporting period for the deliveries in August, September, October and November 2013 were 110, 11, 6 and 5 respectively. This is in line with the general trend that liquidity is higher for nearer months compared to farther months.

2. A comparison of forward curves (Charts 4.1 & 4.2) gives us a picture of expected delivery price as on 11th September 2013 (Chart 4.1), vis a vis the expected delivery price last month, as was on 8th August 2013 (Chart 4.2). In general, the nature of both forward curves drawn in August and September 2013 are similar. This similarity is because the cumulative volume contracted in months prior to the current reporting period for the delivery period September 2013 – May 2014 far outweighs the volume contracted in the August 2013 for the delivery months September 2013 – May 2014. For example, weighted average price of contracts executed prior to the current reporting period for delivery in November 2013 is `4.390/kWh, while the weighted average price of contracts reported in the present reported period for delivery in November 2013 delivery is `4.128/kWh. However, owing to far higher volumes contracted in months prior to the current reporting period for delivery in November 2013, the weighted average sale price of contracted power for delivery in November 2013 including contracts executed in the current period decreased marginally from `4.390/kWh to `4.389/kWh.

III. Post-facto Comparison of Prices in OTC Contracts and in Power Exchanges (on Power Delivery Dates)

The post facto graph shows the average OTC price vis-à-vis power exchanges prices for the last month's power deliveries. Hence this compares the spot Power Exchange prices with OTC deliveries (OTC contracts may have been executed earlier but delivered on the same days as on the exchange spot deliveries). The methodology of calculating the data points of OTC prices is same as in the forward curve.

Chart 5: Comparison OTC Delivery price and Power Exchange Spot Delivery Price for August 2013



Observations

1. Weighted average delivery prices of OTC contracts have been in a very narrow range of `4.29 to `4.43/ kWh while the prices in power exchanges have fluctuated over a range of `1.22/kWh to `2.83/ kWh during August 2013. The weighted average OTC contracts prices were always higher than the power exchange prices in August 2013. (*It may be noted that Power Exchange is a day ahead market with standardized contracts with no transmission corridor reservation while the OTC - Contracts are weekly/monthly contracts with flexibility of customization and transmission corridor reservation. The price comparison of OTC - Contracts and Power Exchanges should be seen in this light.)*

Annexure-I: List of traders who have undertaken contracts in August 2013

Table 3: List of trading licensees who have undertaken contracts during 29st July – 1st September 2013*

	29th July - 4th August 2013	5th August - 11th August 2013	12th August - 18th August 2013	19th August - 25th August 2013	26th August - 1st September 2013	Total
PTC India	Y(8)	Y(15)	Y(18)	Y(24)	Y(23)	**Y(88)**
NVVN	Y(14)	Y(3)	Y(3)	Y(2)	Y(6)	**Y(28)**
GMR Energy Trading	Y(9)	NIL	NIL	Y1)	Y(4)	**Y(14)**
Tata Power Trading Company	Y(2)	NIL	NIL	Y(3)	Y(2)	**Y(7)**
Instinct Infra & Power	Y(2)	NIL	NIL	NIL	Y(2)	**Y(4)**
Mittal Processors Pvt. Ltd	Y(2)	Y(1)	NIL	NIL	Y(1)	**Y(4)**
JSW Power Trading Company	NIL	NIL	NIL	Y(2)	Y(1)	**Y(3)**
Grand Total	**Y(37)**	**Y(19)**	**Y(21)**	**Y(32)**	**Y(39)**	**Y(148)**

Note 1: *Y ( ): Contracts had been undertaken (Number of Contracts)*

NIL: No Contracts was made during the week

NR: Not Reported

**Note 2:* *This table shows list of traders who have reported & undertaken at least one contract during the reported period. There could be some traders who have reported but did not undertake any contracts.*

I. The Scatter Diagram: Comparison of prices of Short Term OTC Contracts with Power Exchange Prices (on Contracted Date)

The scatter diagram represents the details of OTC contracts undertaken by traders during any particular time period (e.g. for last four or five weeks) for short-term (up to an year) transactions of electricity. Each data-point represents contract sale-price on a particular contract date.

The varied shapes are to depict contracts for different time-span, e.g. the diamonds are for contracts for less than a week, the squares are for contracts which have been made for one week or up to one month ahead, the triangles are to represent contracts made for a month or more but for less than three months and the crosses are for three months or up to an year of contracts. In the diagram, no distinction has been made among the traders. The black and red markers connected with lines show the spot prices at the two power exchanges, viz. the Indian Energy Exchange (IEX) and the Power Exchange of India Ltd. (PXIL) on the respective contract dates.

II. The Forward Curve of Power Price

The forward curve has been made based on OTC sale prices reported every week by the traders. For a contract of a full month, the average monthly contract price is considered discretely as the price for each day. Finally, the average daily price for the forward curve is the weighted average daily price for all contracts existing in these days. (Weights being the respective contracted daily volume).

III. The Post-Facto Graph: Post-facto Comparison of Prices in OTC Contracts and Power Exchanges (on Power Delivery Dates)

The post facto graph shows the comparison of daily average OTC price vis-à-vis simple average daily area power exchanges prices for the last month's daily power deliveries. Daily average OTC price is calculated by considering all OTC contracts including daily, weekly, monthly and more than 3-month and up to one year contracts delivered in the period. The average daily price is the weighted average daily price for all contracts delivered on that day. (Weights being the respective contracted daily volume). For example for a weekly contract the same price is considered for discretely as the price for each day of the week, for monthly contract

the same price is considered discretely as the price for each day of the month. Then the daily volume weighted average of these weekly/monthly, as the case may be, is calculated and termed a daily average OTC price.

IV. The difference between Scatter Diagram and Post Facto Graph is as follows:

a) The scatter diagram represents the details of OTC contracts undertaken by traders during any particular time period (e.g. for last five weeks) for short-term (upto less than a year) transactions of electricity. Each data-point represents contract sale-price on a particular contract date.

b) The post facto graph shows the average OTC price vis-à-vis power exchanges prices for the last month's power deliveries. It gives a comparison between the spot delivered prices and OTC deliveries (OTC contracts may have been executed earlier but delivery was scheduled for the said dates).

V. The 96 Blocks (24 hours) simple average prices of the 12 bid areas is being termed as simple average daily area price. The Power Exchanges' prices used in the report are calculated using following formulas:

Simple Average Daily Area Price (`/kWh)

$$= (\sum_{i=1}^{96}(Pi))/96000$$

Where *Pi* is the price for different 15 minute time blocks in a day