

ANALYSIS OF WEEKLY REPORTS RECEIVED FROM TRADERS

(NOVEMBER 2013)

[An analysis of all weekly reports for 4th November– 1st December 2013 received from licensed-traders]



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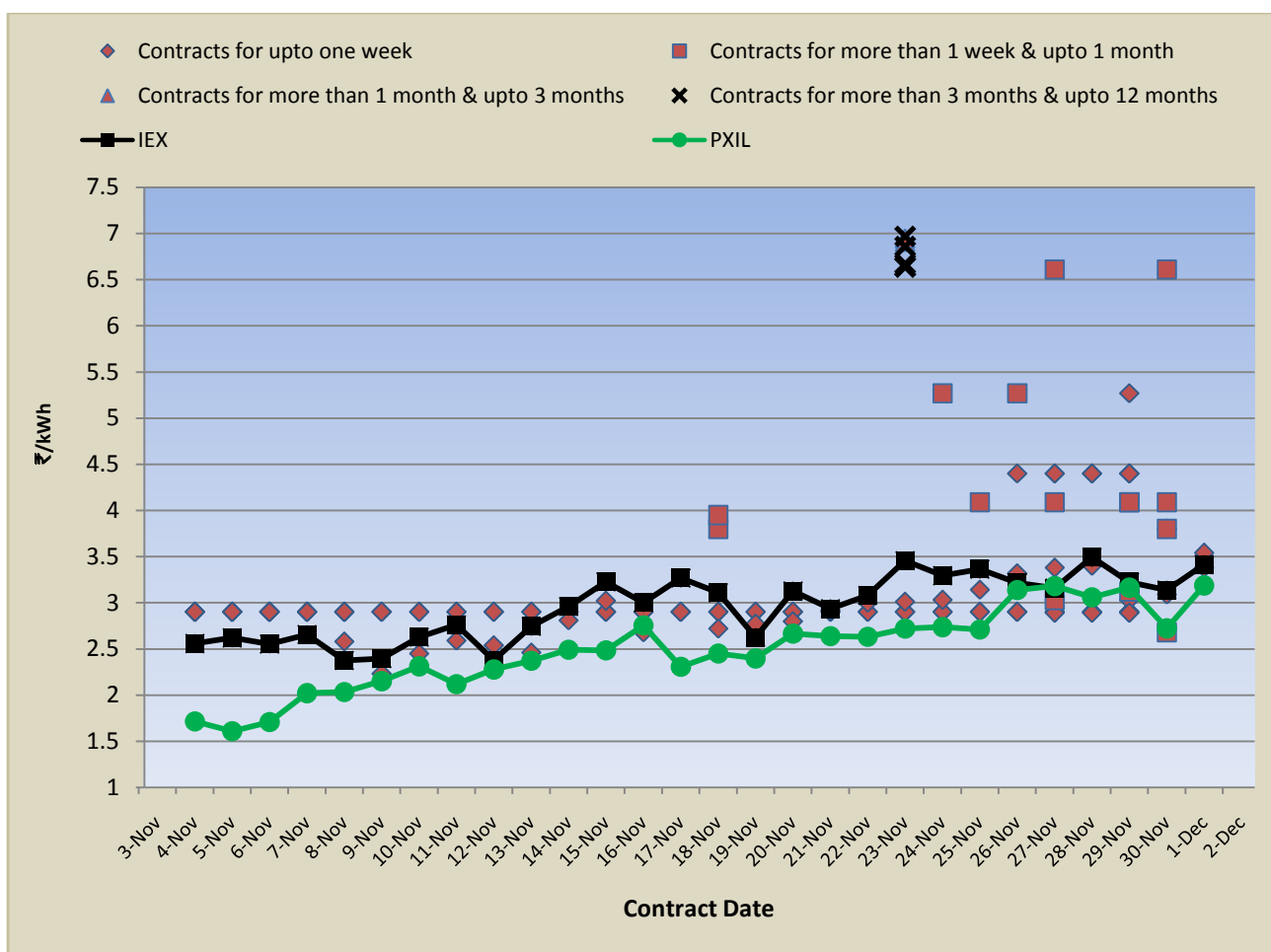
Snapshot for November 2013

- ✓ The reported short-term contract volume for November 2013 (analysis of four weeks) is 1585 MUs whereas the same was 2262 MUs for the month of October 2013 (analysis of five weeks). This is equivalent to about 12% decrease in average weekly volume transacted during October.
- ✓ 91% of total volume has been contracted at price of more than ₹4/kWh during November as compared to 85% of total volume contracted during October.
- ✓ Total number of contracts (including swap & banking) executed during November is 127 by 6 traders whereas in October the number of contracts executed was 273 by 9 traders.

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 November 2013. As seen in scatter diagram, the maximum number of contracts are executed in the fourth week of the period (refer to annexure I for contracts executed week-wise) and the overall price of OTC contracts executed was in the range of ₹2.23/kWh - ₹6.97/kWh whereas the prices on the Exchanges varied between ₹1.61/kWh - ₹3.49/kWh

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



Note: 1. 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 and Power Exchanges contracts should be seen in this light.

2. The categorization of the contracts have been slightly changed to include the last day of the duration also. For e.g. earlier the *contracts for less than a week* included contracts executed for period till the 6th day but did not include the 7th day. Now, the categorization of *contracts for upto one week* includes contracts that have been executed for duration till 7th day.

Table 1 below shows week-wise sale prices and total contracted volume reported by traders. Table 2 shows comparison between price discovered on Exchanges and price of contracts executed in OTC market.

Table 1: Price and Volume of OTC Contracts

Week	Range of Sale Price (₹/kWh)		Weighted Average of Sale Price (₹/kWh)	Total Volume (MUs)
	Min	Max		
4th Nov - 10th Nov	2.23	2.90	2.85	6.68
11th Nov - 17th Nov	2.46	3.02	2.87	5.77
18th Nov - 24th Nov	2.72	6.97	6.76	678.37
25th Nov - 1st Dec	2.68	6.61	4.21	776.14
Gross			5.38	1466.97

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

Contract Date	04-Nov-13	05-Nov-13	06-Nov-13	07-Nov-13	08-Nov-13	09-Nov-13	10-Nov-13	11-Nov-13	12-Nov-13	13-Nov-13	14-Nov-13	15-Nov-13	16-Nov-13	17-Nov-13
IEX* (₹/kWh)	2.56	2.62	2.55	2.65	2.37	2.40	2.63	2.76	2.38	2.75	2.96	3.23	3.00	3.27
PXIL* (₹/kWh)	1.71	1.61	1.71	2.02	2.03	2.15	2.31	2.12	2.28	2.37	2.49	2.48	2.76	2.31
OTC Contract* (₹/kWh)	2.85							2.87						

Contract Date	18-Nov-13	19-Nov-13	20-Nov-13	21-Nov-13	22-Nov-13	23-Nov-13	24-Nov-13	25-Nov-13	26-Nov-13	27-Nov-13	28-Nov-13	29-Nov-13	30-Nov-13	01-Dec-13
IEX* (₹/kWh)	3.11	2.62	3.13	2.94	3.08	3.46	3.29	3.36	3.22	3.16	3.49	3.22	3.14	3.41
PXIL* (₹/kWh)	2.45	2.40	2.66	2.64	2.63	2.72	2.74	2.71	3.14	3.18	3.06	3.16	2.72	3.19
OTC Contract** (₹/kWh)	6.76							4.21						

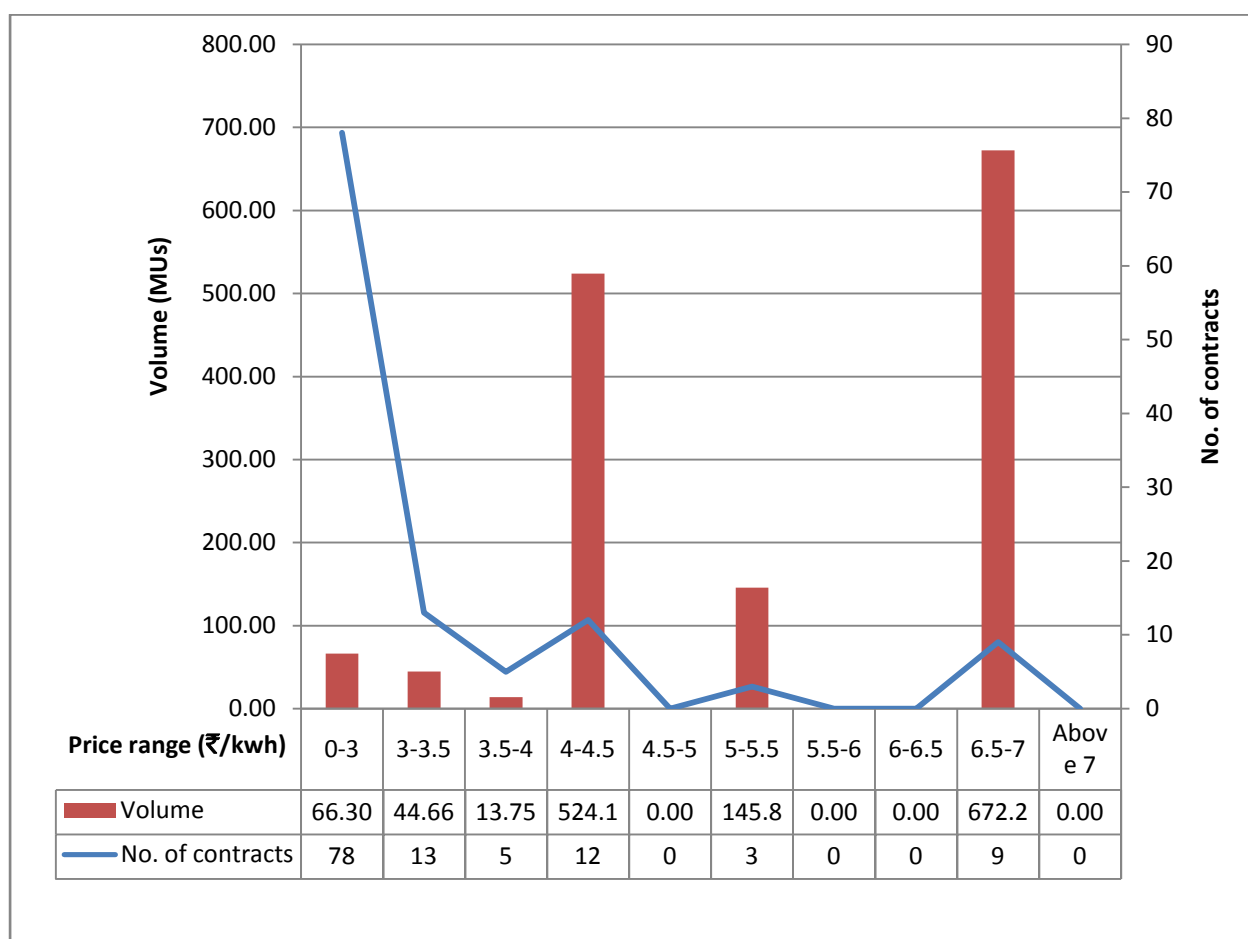
Observations

1. It is observed that weighted average OTC contract prices were usually higher than average daily prices on Exchanges during the reporting period. The minimum price in OTC market was ₹2.23/kWh (9th November 2013) for 'RTC' contract while on the exchanges it was ₹1.61/kWh (PXIL, 5th November 2013) and the maximum price in

OTC market was ₹6.97/kWh (23rd November 2013) for ‘RTC’ contract while for Day-Ahead market on the exchange the maximum price was ₹3.49/kWh (IEX, 28th November 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.)

- As far as the number of contracts is concerned, 24 out of 120* contracts were entered at sale price above ₹4/kWh. However, the cumulative volume traded at price above ₹4/kWh was 1342 MU which is 91% of total OTC contracts* volume for November 2013.

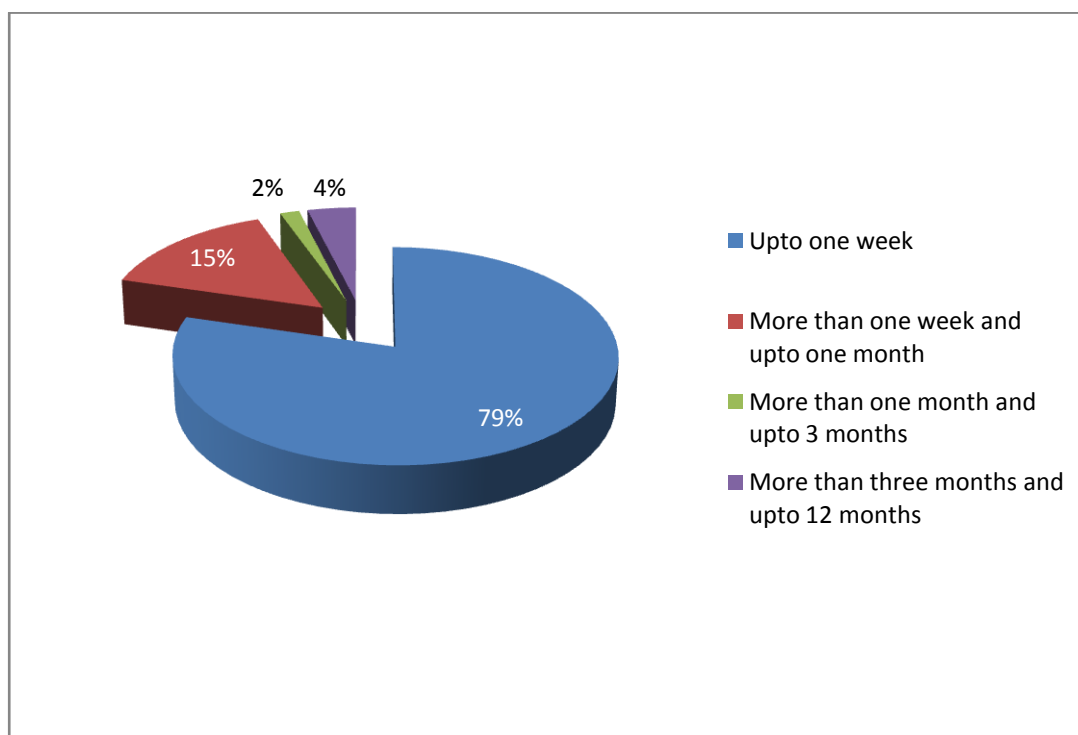
Chart 2: Frequency distribution of number & volume of OTC contracts



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

3. It is also observed that most of the volume is contracted in the price range of Rs 4-4.5 (524 MUs) and Rs 6.5-7 (672 MUs). The high price transactions in the range of Rs 6.5-7 have been undertaken in the southern region.
4. Also with the onset of winters, entities from states like Himachal Pradesh, J&K, Kerala and North Eastern states have started buying in the OTC market.
5. The following chart shows the percentage of contracts reported during the aforesaid period, categorized according to the period of power supply. There were a total 127 contracts including swap & banking reported for the period.. It can be observed that majority of the contracts executed were for a period upto a week followed by contracts executed for duration of more than one week to upto one month.

Chart 3: Percentage of contracts as per duration of power supply contracted in November 2013

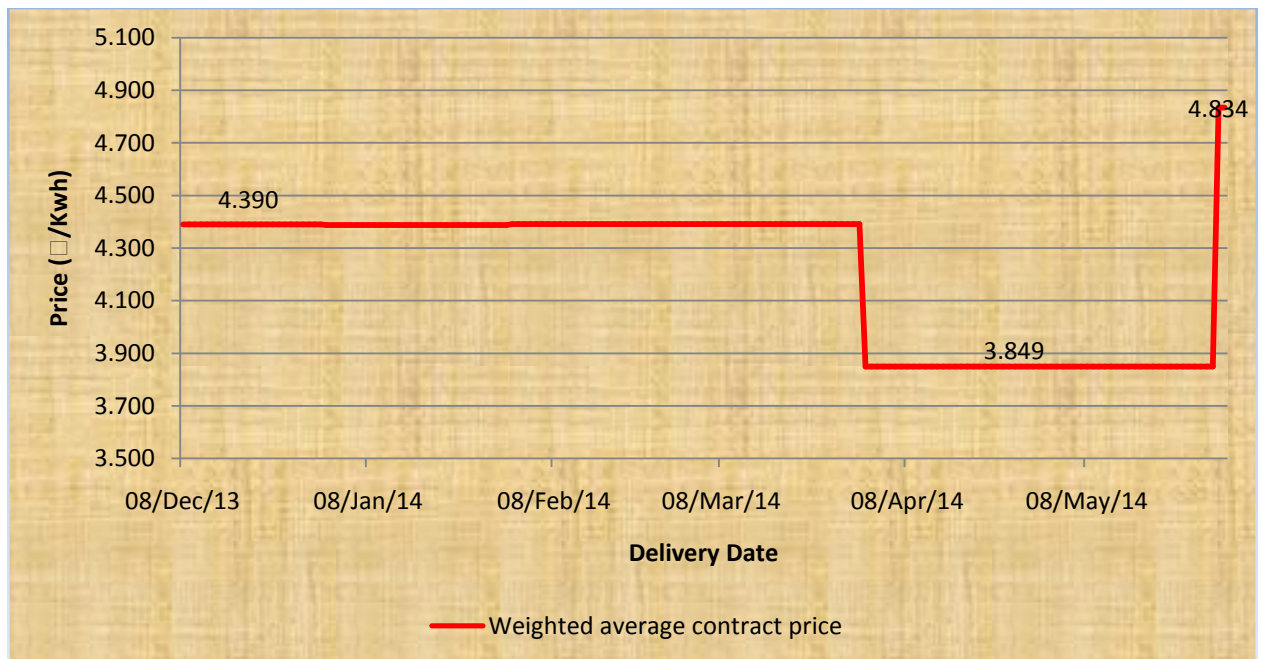


Note: The categorization of the contracts have been changed on lines of the changes made for Chart 1

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 curve have been drawn for December 2013 – May 2014 based on 120 contracts.

Chart 4: Forward Curve for the period December 2013 –May 2014



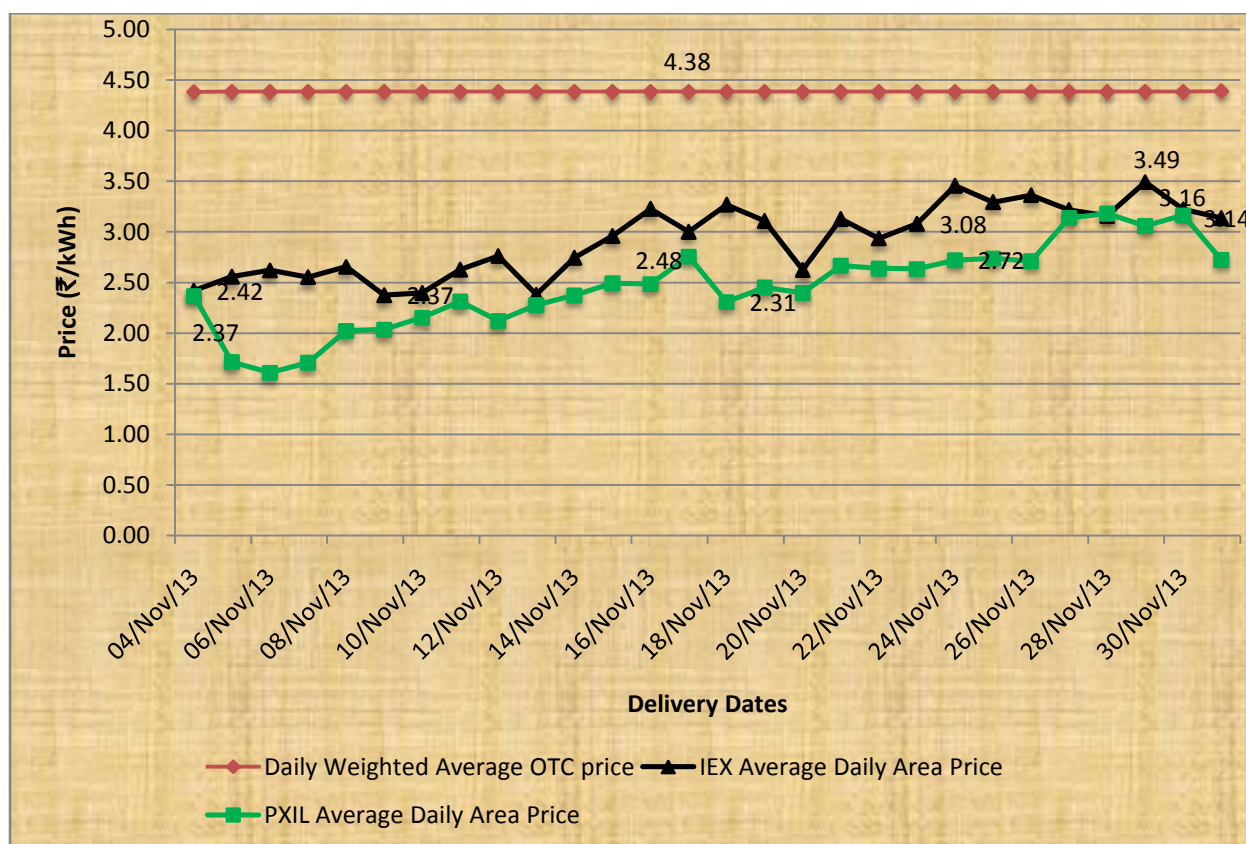
Observations

1. The Forward Curve for November 2013 is based on 120 reported contracts for the period up to 1st December 2013 and the tenure of the curve is for the period 8th December 2013 to 31st May 2014 (period of power delivery). The forward prices for December 2013 & January 2014 are based on 30 & 25 contracts respectively whereas the forward prices for April & May 2014 are based on only 5-7 contracts. Thus, the liquidity is high in terms of number of contracts in the nearer months in comparison to farther months and therefore the price indicators are better for nearer months.

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 November 2013



Observations

1. Weighted average delivery price of OTC contracts are almost constant at ₹4.38/kWh while the prices in power exchanges have fluctuated over a range of ₹1.61/kWh to ₹3.49/kWh. It can be seen that the weighted average OTC contracts prices were always higher than the power exchange average daily area prices. (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 November 2013*

Trader	4th Nov - 10th Nov	11th Nov - 17th Nov	18th Nov - 24th Nov	25th Nov - 1st Dec	Grand Total
PTC India Ltd	Y(26)	Y(20)	Y(21)	Y(29)	Y(96)
NTPC Vidyut Vyapar Nigam Limited	NIL	NIL	Y(4)	Y(16)	Y(20)
Tata Power Trading Co. Ltd	NIL	NR	Y(4)	NIL	Y(4)
JSW Power Trading Co. Ltd	NIL	NIL	Y(3)	NR	Y(3)
Mittal Processors Pvt. Ltd	NR	NR	NR	Y(3)	Y(3)
Instinct Infra & Power Ltd	NR	NIL	NIL	Y(1)	Y(1)
Grand Total	Y(26)	Y(20)	Y(32)	Y(49)	Y(127)

Note1: 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.*

Annexure-II: Process of Formulation

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 (upto an year) transactions of electricity. Each data-point represents contract sale-price on a particular contract date.

Varied shapes are used to depict contracts for different time-span, e.g. the diamonds are for contracts for upto one week, the squares are for contracts which have been executed for more than one week or upto one month ahead, the triangles represent contracts executed for more than one month or for upto three months and the crosses are for contracts more than three months or up to an year. In the diagram, no distinction has been made among the traders. The black and green 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 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) average prices of the 12 bid areas is being termed as average daily area price. The Power Exchanges' prices used in the report are calculated using following formulas:

$$\text{Average Daily Area Price (₹/kWh)} = (\sum_{i=1}^{96} (Pi))/96000$$

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