# ANALYSIS OF WEEKLY REPORTS RECEIVED FROM TRADERS

## (SEPTEMBER 2013)

[An analysis of all weekly reports for2nd September – 29th September2013 received from licensed-traders]

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Prepared on 9th October 2013

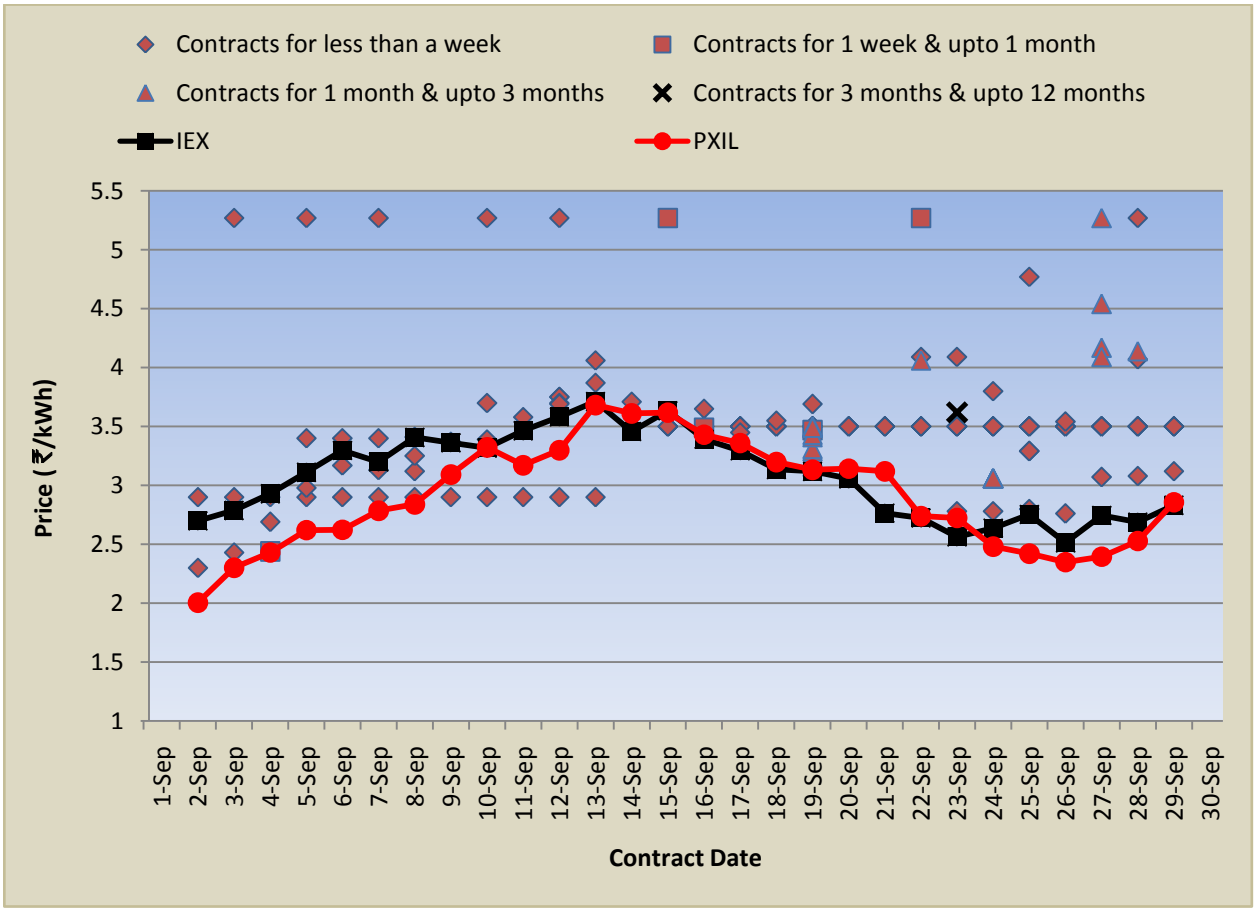
Snapshot for September 2013

- ✓ The reported short-term contract volume for September 2013 (analysis of four weeks) is 1529 MUs whereas the same was 1589 MUs for the month of for August 2013 (analysis of five weeks). This is equivalent to about 20% increase in average weekly volume transacted during August.
- ✓ 36% of total volume has been contracted at price of more than ₹4/kWh during September as compared to 81% of total volume contracted during August.
- ✓ Total number of contracts (including swap & banking) executed during September is 180 by 9 traders whereas in August the number of contracts executed was 148 by 7 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 September 2013. As seen in scatter diagram, the contracts are clustered over the 3rd and 4th week (refer to annexure I for contracts executed week-wise) and the overall price of OTC contracts executed was in the range of ₹2.30/kWh - ₹5.27/kWh whereas the prices on the Exchanges varied between ₹2.01/kWh - ₹3.71/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 and Power Exchanges contracts should be seen in this light.*

Table 1 shows week-wise sale prices and total contracted volume reported by traders. Table 2 shows comparison between price discovered on Exchanges with those contracted 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 | | |
| 2nd-8th Sep | 2.30 | 5.27 | 3.08 | 29.63 |
| 9th-15th Sep | 2.90 | 5.27 | 4.50 | 28.97 |
| 16th-22nd Sep | 3.16 | 5.27 | 3.53 | 728.37 |
| 23rd-29th Sep | 2.76 | 5.27 | 4.06 | 722.32 |
| Total | | | | 1509.29 |

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

| Contract Date | 2-Sep-13 | 3-Sep-13 | 4-Sep-13 | 5-Sep-13 | 6-Sep-13 | 7-Sep-13 | 8-Sep-13 | 9-Sep-13 | 10-Sep-13 | 11-Sep-13 | 12-Sep-13 | 13-Sep-13 | 14-Sep-13 | 15-Sep-13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IEX* (₹/kWh) | 2.70 | 2.79 | 2.93 | 3.11 | 3.30 | 3.20 | 3.41 | 3.36 | 3.32 | 3.46 | 3.58 | 3.71 | 3.46 | 3.63 |
| PXIL* (₹/kWh) | 2.01 | 2.30 | 2.43 | 2.62 | 2.62 | 2.79 | 2.84 | 3.09 | 3.32 | 3.17 | 3.30 | 3.68 | 3.61 | 3.62 |
| OTC Contract** (₹/kWh) | 3.08 | | | | | | | 4.50 | | | | | | |

| Contract Date | 16-Sep-13 | 17-Sep-13 | 18-Sep-13 | 19-Sep-13 | 20-Sep-13 | 21-Sep-13 | 22-Sep-13 | 23-Sep-13 | 24-Sep-13 | 25-Sep-13 | 26-Sep-13 | 27-Sep-13 | 28-Sep-13 | 29-Sep-13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IEX* (₹/kWh) | 3.39 | 3.29 | 3.14 | 3.12 | 3.06 | 2.76 | 2.72 | 2.56 | 2.64 | 2.75 | 2.51 | 2.75 | 2.69 | 2.83 |
| PXIL* (₹/kWh) | 3.43 | 3.36 | 3.20 | 3.13 | 3.14 | 3.12 | 2.74 | 2.72 | 2.48 | 2.42 | 2.35 | 2.39 | 2.53 | 2.86 |
| OTC Contract** (₹/kWh) | 3.53 | | | | | | | 4.06 | | | | | | |

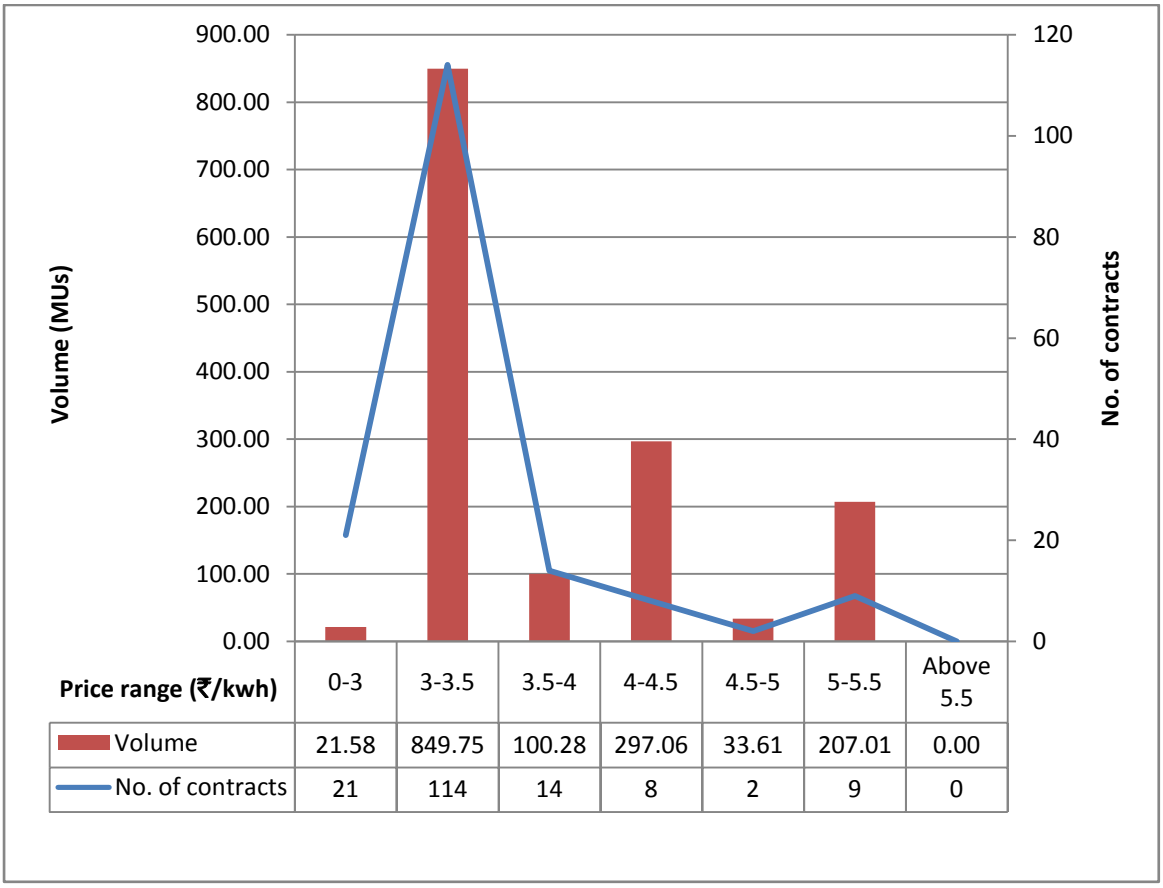
## Observations

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 ₹2.30/kWh (2nd September 2013) while on the exchanges it was ₹2.01/kWh (PXIL, 2nd September 2013) and the maximum price in OTC market was

₹5.27/kWh for nine (9) contracts which were either 'RTC' or 'Peak' contract and were executed on various days while for Day-Ahead market on the exchange the maximum price was ₹2.83/kWh (IEX, 13th September 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, 19 out of totals 168♣ contracts were entered at sale price above ₹4/kWh. However, the cumulative volume traded at price above ₹4/kWh was 537.68♣MUs which is 36% of total OTC contracts volume for September 2013. There were a total 180 contracts including swap & banking reported for the period.

**Chart 2: Frequency distribution of number, volume of OTC contracts**

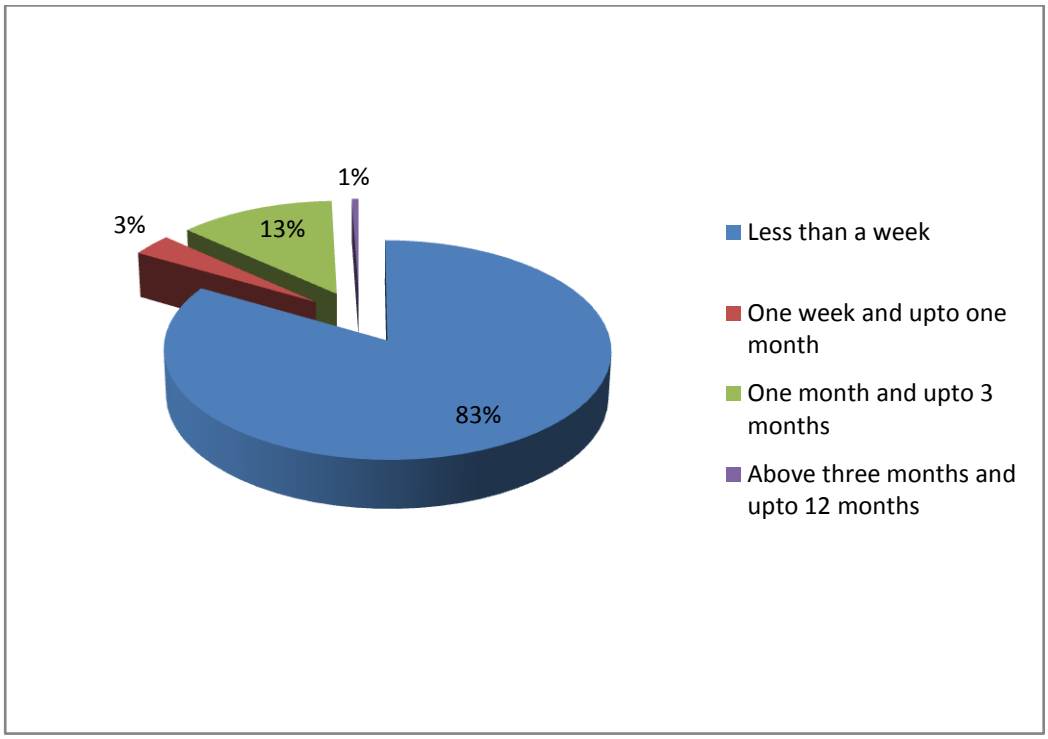



| Price range (₹/kwh) | 0-3 | 3-3.5 | 3.5-4 | 4-4.5 | 4.5-5 | 5-5.5 | Above 5.5 |
|---|---|---|---|---|---|---|---|
| Volume | 21.58 | 849.75 | 100.28 | 297.06 | 33.61 | 207.01 | 0.00 |
| No. of contracts | 21 | 114 | 14 | 8 | 2 | 9 | 0 |

♣ *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 180. It can be observed that majority of the contracts executed were for a period of less than a week followed by contracts executed for duration of 1 month to 3 months.

**Chart 3: Percentage of contracts as per duration of power supply contracted in September 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 curve have been drawn for October 2013 – May 2014 based on 168 contracts and for comparison forward curve has been drawn for September 2013 – May 2014 based on 136 contracts.

Chart 4.1: Forward Curve for the period October 2013 –May 2014

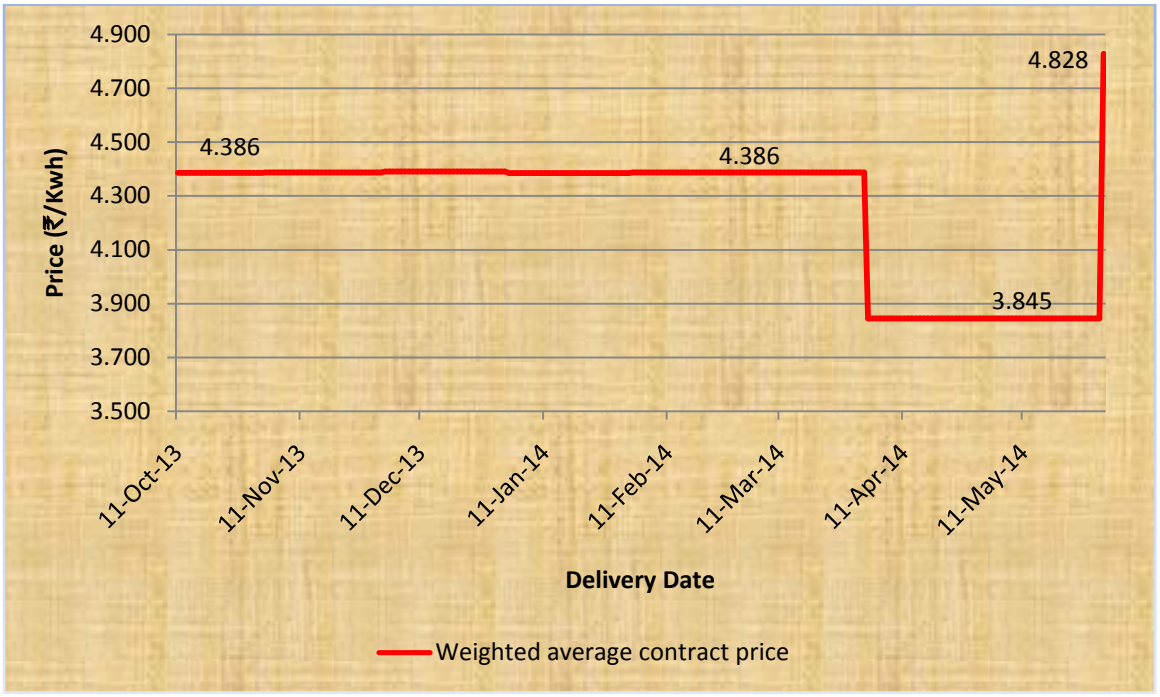
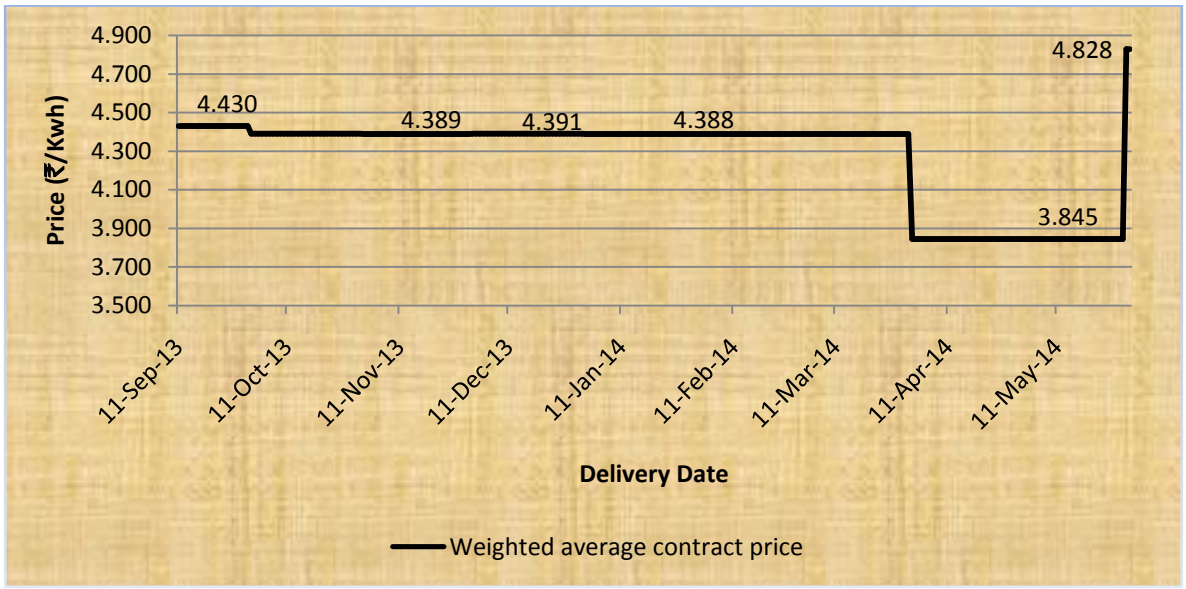



Chart 4.2: Forward Curve for the period September 2013 – May 2014



**Observations**

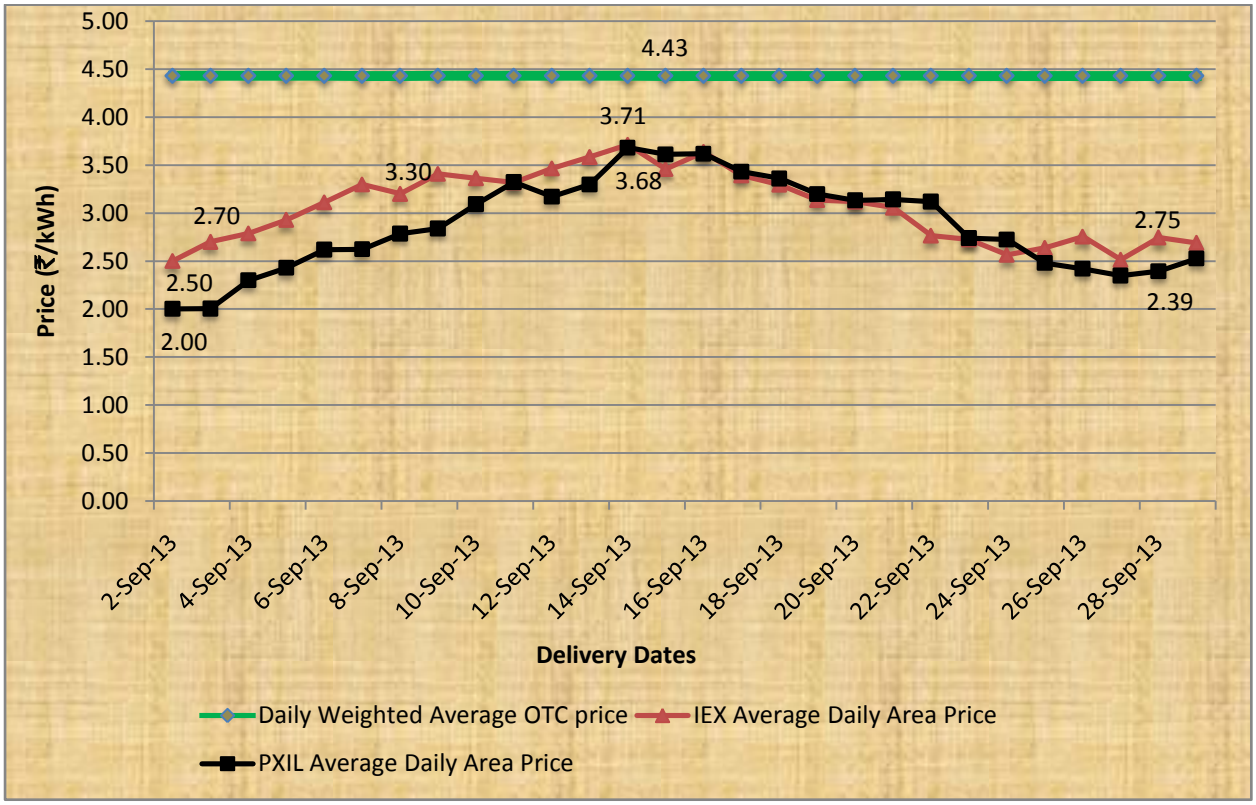
1. The Forward Curve for September 2013 is based on reported contracts executed up to 29th September 2013 and the tenure of the curve is for the period 11th October 2013 to 31st May 2014 (period of power delivery). The total numbers of contracts executed in the current reporting period for the deliveries in September & October 2013 is 152 for 475 MUs whereas for February and March 2013 the number is only 3 for 158 MUs. 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 October 2013 (Chart 4.1), vis a vis the expected delivery price last month, as was on 11th September 2013 (Chart 4.2). In general, the nature of both forward curves drawn in September and October 2013 are similar. This similarity is because the cumulative volume contracted in months prior to the current reporting period for the delivery period October 2013 – May 2014 far outweighs the volume contracted in the September 2013 for the delivery months October 2013 – May 2014.

## 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 September 2013**




### Observations

1. Weighted average delivery price of OTC contracts are almost constant at ₹4.43/kWh while the prices in power exchanges have fluctuated over a range of ₹2.00/kWh to ₹3.71/ 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 September 2013

| Trader / Week | 2nd -8th Sep | 9th -15th Sep | 16th -22nd Sep | 23rd -29th Sep | Grand Total |
|---|---|---|---|---|---|
| PTC India Ltd | Y(19) | Y(23) | Y(39) | Y(45) | **Y(126)** |
| NVVN | Y(3) | Y(4) | Y(5) | Y(9) | **Y(21)** |
| Tata Power Trading Co. Ltd | Y(1) | Y(1) | Y(9) | Y(6) | **Y(17)** |
| Mittal Processors Pvt. Ltd | Y(2) | Y(3) | Y(2) | Y(1) | **Y(8)** |
| GMR Energy Trading Ltd | Y(3) | NIL | NIL | NIL | **Y(3)** |
| Adani Enterprises Ltd | NIL | NIL | Y(2) | NIL | **Y(2)** |
| JSW Power Trading Co. Ltd. | NIL | NIL | NR | Y(1) | **Y(1)** |
| Reliance Energy Trading Ltd | NIL | NIL | NIL | Y(1) | **Y(1)** |
| Shree Cement Ltd | NIL | NIL | NIL | Y(1) | **Y(1)** |
| **Grand Total** | **Y(28)** | **Y(31)** | **Y(57)** | **Y(64)** | **Y(180)** |

*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 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:

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