



जून, 2019 की मासिक मार्केट मॉनिटरिंग रिपोर्ट

Monthly Market Monitoring Report

June, 2019



भारत सरकार/ Government of India

विद्युत मंत्रालय/ Ministry of Power

केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority

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मार्केट मॉनिटरिंग सेल /Market Monitoring Cell

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REPORT FOR MONTH: JUNE, 2019

OVERVIEW OF ELECTRICITY TRANSACTIONS ON POWER EXCHANGES IN INDIA

1. DAY AHEAD MARKET (DAM)

- 1.1. The total volume of electricity transacted on both the power exchanges, viz., IEX and PXIL in the day ahead market in the month of June 2019 was 4,207.10 MU. The total energy supplied in the country during the month of June, 2019 was 116,946 MU. The volume of electricity transacted on the power exchanges in DAM represents 3.60% of the total energy supplied in the country. The total volume of electricity transacted in June, 2018 was 4,981.58 MU which was 4.58% of the total energy supplied [1,08,769 MU].
- 1.2. The volume of electricity transacted on IEX and PXIL during June, 2019 are 4,206.68 MU and 0.424 MU, respectively, which means that the total volume transacted on IEX is 99.99 % of the total volume on the power exchanges. Whereas, the total volume of electricity transacted during June, 2018 on IEX and PXIL was 4965.19 MU and 15.39 MU, respectively, which means that the total volume transacted on IEX is 99.69 % of the total volume on the power exchanges.
- 1.3. The Average Market Clearing Price (MCP) on IEX during the month June, 2019 was Rs 3.32/ kWh, which shows a decline of 10.99% when compared with average MCP for the month of June, 2018, which was Rs 3.73 /kWh. Similarly, on PXIL, the Average MCP during June, 2019 was Rs 3.48/kWh, which shows a decline of 3.60% when compared with average MCP for the month of June, 2018, which was Rs 3.61 kWh.

2. SUMMARY OF THE MARKET CLEARING PRICE, AREA CLEARING PRICE AND SCHEDULE VOLUME IN THE POWER EXCHANGES

- 2.1. A comparison of the Minimum, Maximum and Average of daily MCP during the months of June, 2019 and June, 2018 are as given below:

MCP (Rs/kWh)	IEX		PXIL	
	June, 2019	June, 2018	June, 2019	June, 2018
Minimum	2.45	2.80	3.41	2.53
Maximum	4.21	5.99	3.50	5.60
Average	3.32	3.73	3.48	3.61

Table: 1

- 2.2. The Maximum Area Clearing Price (ACP) in IEX was observed in all regions (all 13 bid areas) at **Rs 9.00 /kWh** during the time block 22:45-23:00 on 26th June, 2019. The MCP for this time-block was also **Rs 9.00/ kWh** and as there was no congestion in transmission system, the ACP was same as MCP. However, the Daily MCP on pan India basis on 26th June, 2019 was **Rs 4.21/ kWh**.
- 2.3. The Minimum ACP observed in IEX among all regions was **Rs 1.00 /kWh** [actual figure being Rs 999.63/ MWh] during the time block 07:30-07:45 on **18th June, 2019**. The MCP for this time-block was also **Rs 1.00/ kWh** and as there was no congestion in transmission system, the ACP was same as MCP. However, the Daily MCP on pan India basis on 18th June, 2019 was **Rs 2.91/ kWh**.
- 2.4. A comparison of the Minimum and Maximum ACP during the months of June, 2019 and June, 2018 in IEX are as given below:

ACP (Rs/kWh)	IEX	
	June, 2019	June, 2018
Minimum	1.00	1.99
Maximum	9.00	10.91

Table: 2

- 2.5. A comparison of the Minimum, Maximum and Average Scheduled Volume of electricity transactions happened on IEX and PXIL for a day during the months of June, 2019 and June, 2018 are as given below:

Scheduled Volume (MU)	IEX		PXIL	
	June, 2019	June, 2018	June, 2019	June, 2018
Minimum	108.50	133.44	0.035	0.14
Maximum	172.35	208.42	0.059	7.20
Average	140.22	165.51	0.053	0.86

Table: 3

- 2.6. During the months of April, May and June, 2019 the total volume of electricity transacted on both the power exchanges was 12,017.58 MU. A comparison of Total Scheduled Volume and the Average MCP for the months of April, May and June, 2019 are given below:

Day Ahead Market	April, 2019		May, 2019		June, 2019	
	IEX	PXIL	IEX	PXIL	IEX	PXIL
Total Scheduled Volume (MU)	4,005.41	31.43	3,772.47	1.17	4,206.68	0.424
Average MCP (Rs/kWh)	3.22	3.75	3.34	3.45	3.32	3.48

Table: 4

3. TERM AHEAD MARKET (TAM)

- 3.1 The total volume of electricity transacted on both the power exchanges in term ahead market in June, 2019 was **508.06 MU** which corresponds to **368.84 MU** on IEX and **139.22 MU** on PXIL. This means that the total volume transacted on IEX was 72.60% of total volume in term ahead market in both the power exchanges. Similarly, the total volume of electricity transacted during June, 2018 was **108.54 MU** which corresponds to 86.87 MU on IEX and 21.67 MU on PXIL, meaning thereby that the total volume on IEX was 80.04% of the total volume on the power exchanges.

Term Ahead Market	IEX		PXIL	
	June, 2019	June, 2018	June, 2019	June, 2018
Total Volume (MU)	368.84	86.87	139.22	21.67

Table: 5

- 3.2 With respect to the total energy supplied during the month of June, 2019 in the country the volume of electricity traded on the power exchanges in TAM represents **0.32%** of the total energy supplied. The same was 0.08% in June, 2018.

4. ANALYSIS OF MOVEMENT OF PRICES OBSERVED IN DAM DURING JUNE, 2019

A regression analysis has been carried out on the Day Ahead Market data taken from IEX website. Also, data was plotted in various graphs to observe patterns for each day of the June month. The observations made are as under:

- 4.1 In order to find out the determinants which are responsible for the Daily MCP, a regression analysis has been carried out where the Daily MCP is the dependent variable and the independent variables are peak demand, average purchase bid, average sell bid, generation from coal based plants, generation from hydro based plants, generation from wind based plants and generation from solar plants. Data pertaining to few months were utilized for this purpose.

4.2 A double log function was used so that elasticity of Daily MCP could be read off from the coefficients of independent variables. The regression analysis revealed that the significant variables were only the average purchase bid, average sell bid and generation from hydro projects. All the other variables were found to be insignificant. The regression analysis further revealed that the maximum elasticity of the Daily MCP was with respect to average purchase bid and elasticity figure was around 0.53. In effect, the regression reveals that the most important variable which determines market clearing price is the average purchase bid.

4.3 The same relationship is visible from the analysis carried out from the plot in **Figure 1**.

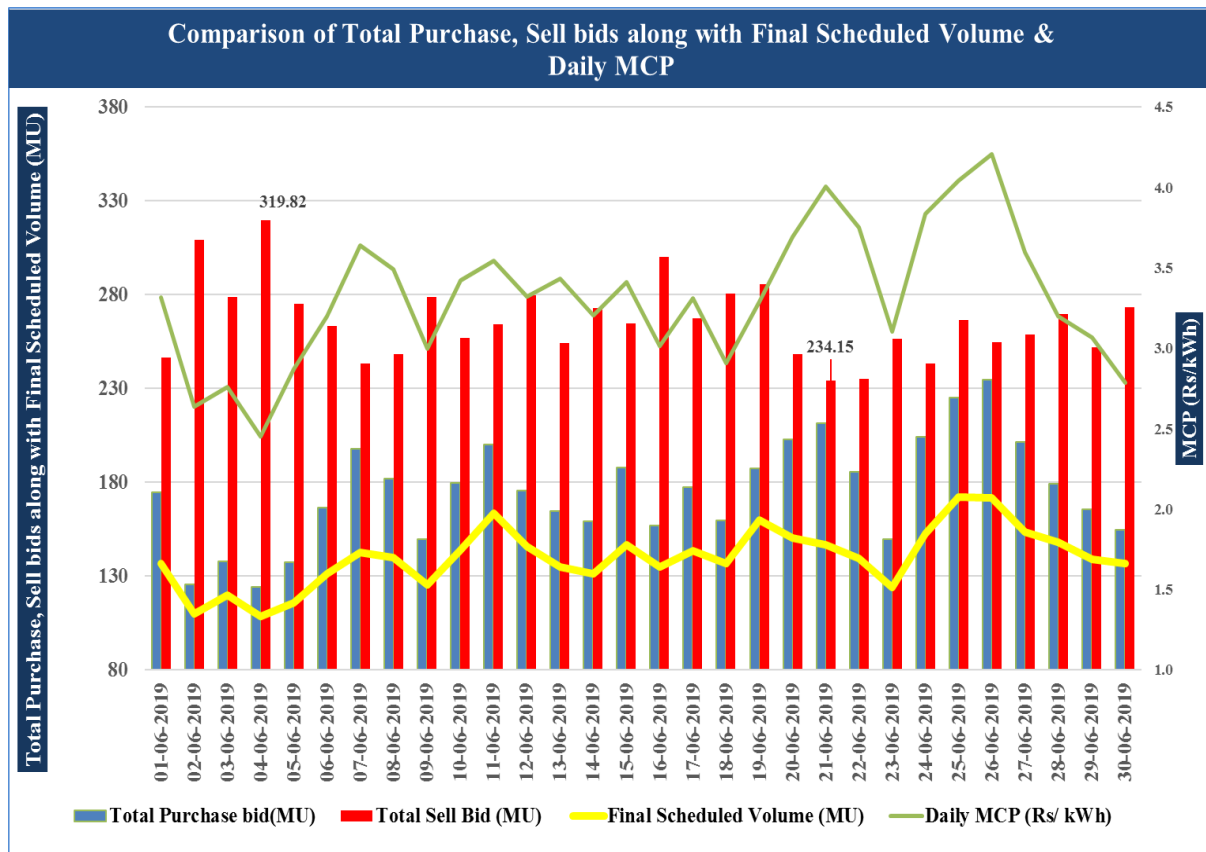


Figure -1

4.4 The Final Scheduled Volume (MU) and the Daily MCP (Rs/kWh) showed decreasing trend on Sundays as the demand is less compared to other days of week. [**Figure - 1**]

4.5 A comparison of maximum, minimum, daily, non-peak time, peak time MCP is shown in Figure -2. The same are also tabulated in **Annexure I**.

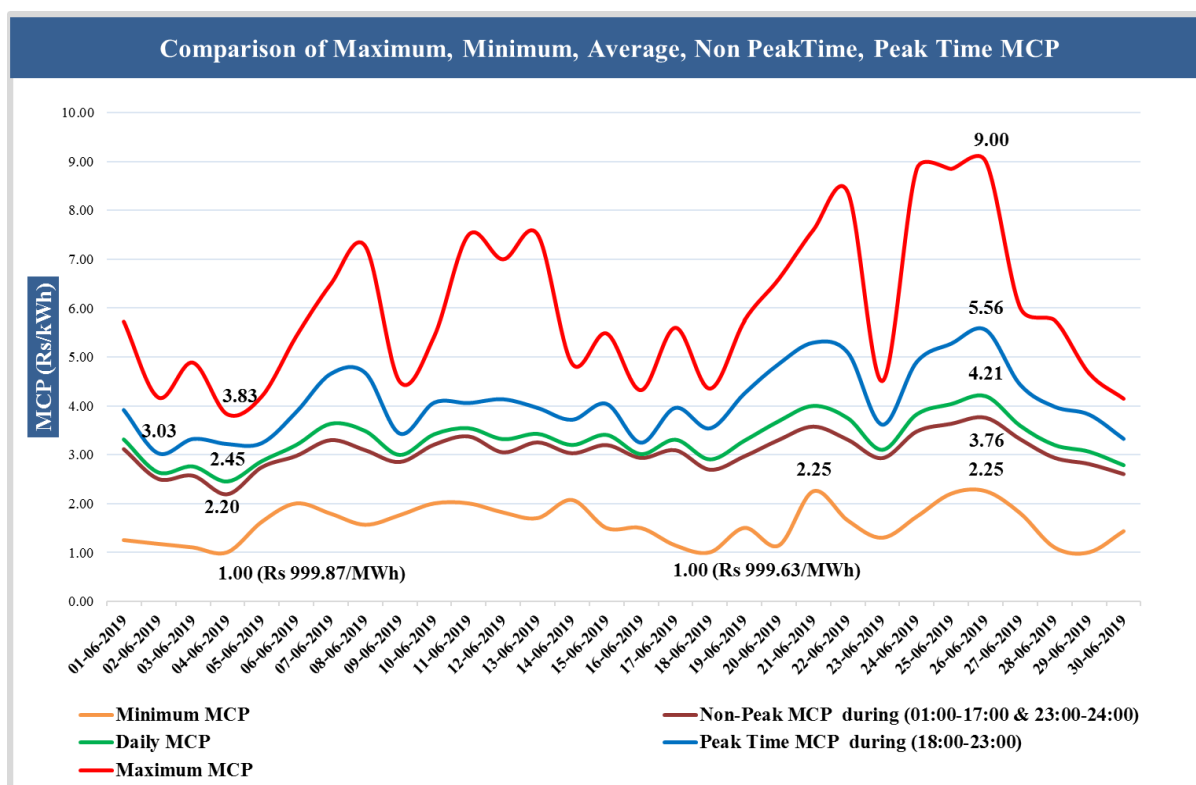


Figure -2

- 4.6 The Purchase Bids and the MCP discovered in each of the 15-minute time block during the month almost followed the same trend [Annexure II]. This is also corroborated with the outcome of regression analysis mentioned in at para 4.1 and 4.2 above.
- 4.7 On 13 days during the month, the maximum daily MCP occurred during the **time block 22:45 – 23: 00**. Also on 25 days, the maximum daily MCP occurred during the **time period 22:15 to 23:15** continuously (including 13 days above) [Annexure III].
- 4.8 On **23 days** during the month, the maximum FSV occurred during the **time period 20:45 to 22:00** continuously [Annexure III].
- 4.9 The maximum demand met during the month of June 2019 in the country occurred on **14th June 2019 at 182.6 GW**, which is more compared to maximum demand during the month of June, 2018 i.e. 170.24 GW on 22nd June, 2018. Incidentally the maximum demand met during the month of June 2019 is same as the previous month's maximum demand met.
- 4.10 One nation One Price was observed for **whole month** including the day [i.e. 4th June, 2019] on which there was real time curtailment due to transmission constraints. Further, there was no congestion in both the Power Exchanges during the month.
- 4.11 Due to real time transmission congestion, 4.91 MU could not be transacted on the IEX on **4th June 2019. The curtailment happened on 4th June, 2019 during 78th to 92nd time blocks**. Further, there was no real time curtailment on PXIL.

- 4.12 The real time curtailment in June, 2019 was 4.91 **MU** whereas there was no curtailment in June, 2018.
- 4.13 The cumulative real time transmission congestion of 8.22 MU was observed in DAM during April to June, 2019. During the period April to June, 2018, the real time congestion was 1.55 MU in DAM.
- 4.14 The **top 10 sellers** on the power exchanges during the month are: **Teesta -3, Himachal Pradesh, Sembcorp Gayatri, Jindal Power Ltd. Stg-II, Telangana, Maharashtra, Delhi, Jaypee Nigrie, JITPL and Thermal Powertech**, which constituted 55.16% of the market share. **[Refer Annexure IV]**
- 4.15 **The top 10 purchaser** on the power exchanges during the month are: **Bihar, West Bengal, Maharashtra, Tamil Nadu, Andhra Pradesh, Kerala, Gujarat, Odisha, Telangana & Rajasthan**, which constituted 75.65% of the market share. **[Refer Annexure IV]**

Definition/ Terminologies used in the Report

1. **Area Clearing Price (ACP)** is area clearing price in each time block in each of 13 bid areas. The country has been divided into 13 bid areas for the purpose of calculating prices in Power Exchanges

13 Bid area are as under:

N1: Jammu and Kashmir, Himachal Pradesh, Chandigarh, Haryana; **N2:** Uttar Pradesh, Uttaranchal, Rajasthan, Delhi; **N3:** Punjab; **E1:** West Bengal, Sikkim, Bihar, Jharkhand; **E2:** Odisha; **W1:** Madhya Pradesh; **W2:** Maharashtra, Gujarat, Daman and Diu, Dadar and Nagar Haveli, North Goa; **W3:** Chhattisgarh; **S1:** Andhra Pradesh, Telangana, Karnataka, Pondicherry (Yanam), South Goa; **S2:** Tamil Nadu, Pondicherry (Puducherry), Pondicherry (Karaikal), Pondicherry (Mahe); **S3:** Kerala; **A1:** Tripura, Manipur, Mizoram, Nagaland; **A2:** Assam, Arunachal Pradesh, Meghalaya.

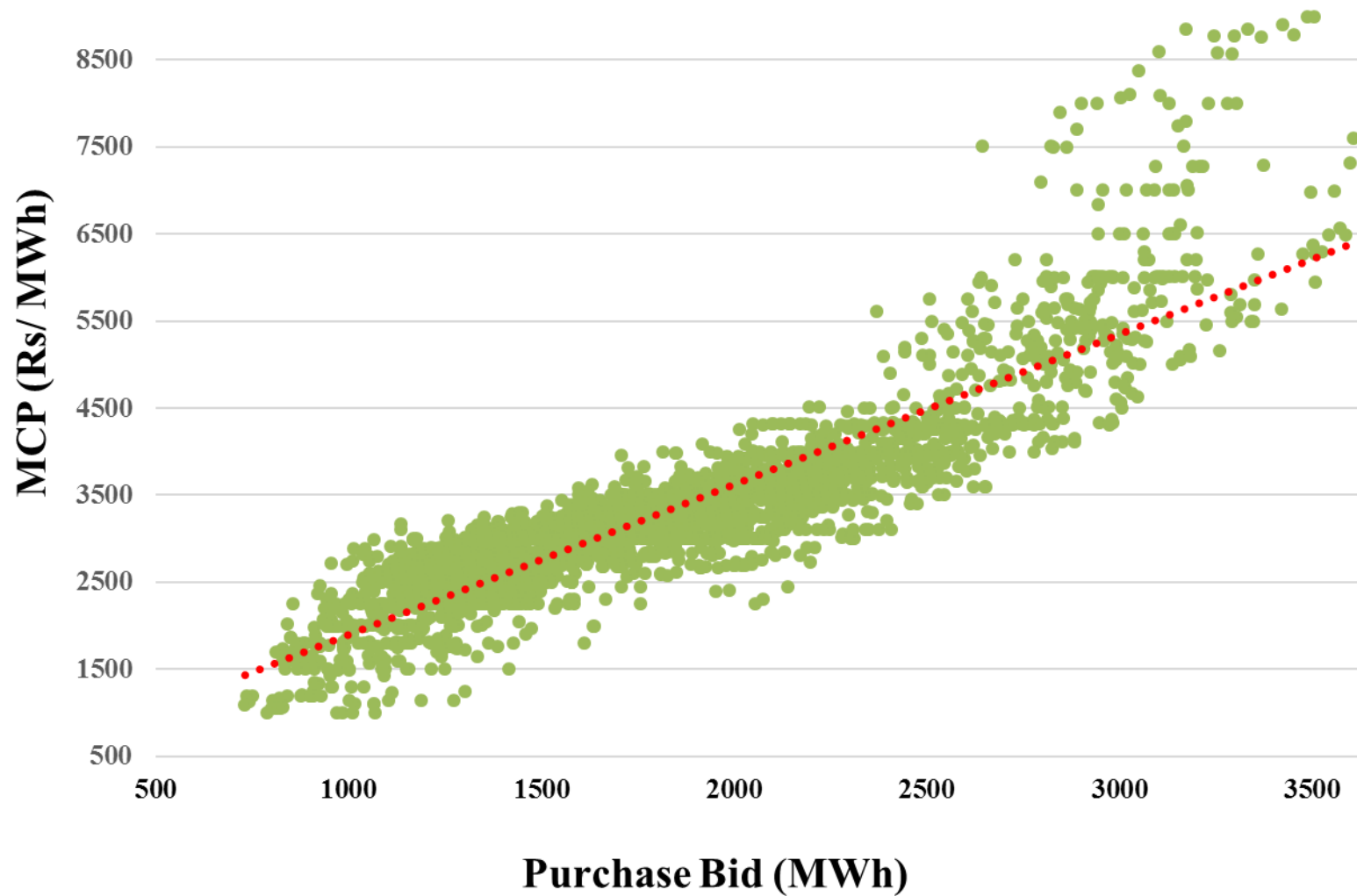
2. **Daily MCP** is the average of MCP of all 96 Time Blocks during the day.
3. **Day-Ahead Market (DAM)** on the power exchanges are market for electricity where market participants purchase and sell electricity at financially binding day-ahead prices for the following day.
4. **Elasticity** is percentage of change in MCP with respect to change in independent variable viz. peak demand, average purchase bid, average sell bid, generation from coal based plants, generation from hydro based plants, generation from wind based plants and generation from solar plants.
5. **Energy Supplied** is the total energy (MU) available at the States' periphery.
6. **MCP** is the price discovered in each of the 15 Minute Time Block. The day is divided in 96 time blocks of 15 minutes each.
7. **Term Ahead Market (TAM)** on the power exchanges are market for electricity where market participants buy/sell electricity on a term basis ranging from 3 hours before actual despatch (i.e. intra-day) and up to 11 days in advance. There are 4 types of contracts in TAM; namely, Intraday, Day Ahead Contingency, Daily and Weekly.

Annexure-I

Date	Night MCP (01-06, 24 Hrs)	Morning MCP (07-10 Hrs)	Day MCP (11-17 Hrs)	Peak Time MCP (18-23 Hrs)	Non Peak Time MCP (1-17 & 24 Hrs)	Maximum MCP	Minimum MCP	Daily MCP	Final Scheduled Volume (MU)
01-06-2019	3.27	2.49	3.33	3.92	3.12	5.73	1.25	3.32	136.62
02-06-2019	3.02	1.91	2.34	3.03	2.51	4.18	1.17	2.64	110.01
03-06-2019	2.51	1.95	2.99	3.32	2.57	4.89	1.10	2.76	119.77
04-06-2019	2.17	1.32	2.72	3.22	2.20	3.83	1.00	2.45	108.50
05-06-2019	3.04	2.17	2.78	3.24	2.75	4.20	1.62	2.87	115.63
06-06-2019	3.25	2.51	2.98	3.87	2.98	5.42	2.00	3.20	131.48
07-06-2019	3.80	2.55	3.23	4.66	3.30	6.49	1.79	3.64	142.79
08-06-2019	3.58	2.17	3.14	4.68	3.09	7.27	1.56	3.49	139.71
09-06-2019	3.40	2.32	2.62	3.43	2.85	4.50	1.76	3.00	125.33
10-06-2019	3.41	2.42	3.46	4.07	3.21	5.42	2.00	3.42	143.99
11-06-2019	3.90	2.63	3.28	4.06	3.38	7.50	2.00	3.55	163.48
12-06-2019	3.58	2.38	2.90	4.14	3.05	7.00	1.81	3.32	145.92
13-06-2019	3.57	2.78	3.21	3.96	3.25	7.51	1.70	3.43	135.04
14-06-2019	2.98	2.70	3.27	3.72	3.03	4.87	2.07	3.20	131.47
15-06-2019	3.70	2.38	3.17	4.04	3.20	5.48	1.50	3.41	146.64
16-06-2019	3.65	2.03	2.75	3.25	2.94	4.32	1.50	3.01	134.88
17-06-2019	3.25	2.35	3.36	3.96	3.09	5.60	1.14	3.31	143.58
18-06-2019	3.13	1.73	2.81	3.54	2.70	4.36	1.00	2.91	136.76
19-06-2019	3.60	2.29	2.73	4.25	2.97	5.75	1.50	3.29	159.93
20-06-2019	3.82	2.62	3.18	4.86	3.31	6.60	1.14	3.69	150.46
21-06-2019	4.21	2.97	3.29	5.30	3.58	7.60	2.25	4.01	146.96
22-06-2019	3.62	2.76	3.31	5.09	3.31	8.37	1.65	3.75	139.65
23-06-2019	3.28	2.35	2.92	3.62	2.93	4.51	1.30	3.10	124.03
24-06-2019	3.71	3.05	3.48	4.90	3.48	8.85	1.73	3.83	152.85
25-06-2019	4.40	3.16	3.13	5.28	3.63	8.85	2.20	4.04	172.35
26-06-2019	4.70	3.07	3.20	5.56	3.76	9.00	2.25	4.21	171.60
27-06-2019	3.78	3.03	3.02	4.43	3.32	6.01	1.80	3.60	153.53
28-06-2019	3.36	2.16	2.96	3.98	2.94	5.75	1.10	3.20	148.14
29-06-2019	3.31	2.20	2.66	3.82	2.81	4.67	1.00	3.06	138.92
30-06-2019	3.26	1.96	2.33	3.33	2.61	4.15	1.43	2.79	136.66
Maximum	4.70	3.16	3.48	5.56	3.76	9.00	2.25	4.21	172.35
Minimum	2.17	1.32	2.33	3.03	2.20	3.83	1.00	2.45	108.50
Average	3.48	2.41	3.02	4.08	3.06	5.96	1.58	3.32	140.22

MCP: Market Clearing Price (Rs/kWh)**FSV: Final Scheduled Volume (MU)****Annexure-II**

Comparison of MCP w.r.t. Purchase Bid for 2880 Time Blocks during the month of June, 2019



Time Blocks during the Month [96 time blocks in a day x 30 days = 2880]

Annexure-III

Date	Max. FSV (MU)		Max. MCP (Rs./kWh)		Min FSV (MU)		Min. MCP (Rs./kWh)	
	Time Block	Value	Time Block	Value	Time Block	Value	Time Block	Value
01-06-2019	20:00 - 20:15	2.48	22:15 - 22:30	5.73	06:00 - 06:15	0.86	18:00 - 18:15	1.25
02-06-2019	21:45 - 22:00	1.85	22:45 - 23:00	4.18	18:00 - 18:15	0.81	18:00 - 18:15	1.17
03-06-2019	21:15 - 21:30	2.23	22:30 - 22:45	4.89	05:45 - 06:00	0.75	18:00 - 18:15	1.10
04-06-2019	21:45 - 22:00	1.66	22:15 - 22:30	3.83	06:45 - 07:00	0.73	08:00 - 08:15	1.00
05-06-2019	22:30 - 22:45	2.10	22:45 - 23:00	4.20	04:45 - 05:00	0.81	18:00 - 18:15	1.62
06-06-2019	21:45 - 22:00	2.08	22:30 - 22:45	5.42	04:00 - 04:15	0.94	08:30 - 08:45	2.00
07-06-2019	21:00 - 21:15	2.12	22:45 - 23:00	6.49	08:30 - 08:45	1.09	08:30 - 08:45	1.79
08-06-2019	21:15 - 21:30	2.11	22:45 - 23:00	7.27	06:45 - 07:00	0.97	07:45 - 08:00	1.56
09-06-2019	22:45 - 23:00	1.95	22:30 - 22:45	4.50	07:45 - 08:00	0.97	07:45 - 08:00	1.76
10-06-2019	21:30 - 21:45	2.41	22:30 - 22:45	5.42	06:30 - 06:45	0.92	08:15 - 08:30	2.00
11-06-2019	21:45 - 22:00	2.29	22:30 - 22:45	7.50	08:00 - 08:15	1.15	07:15 - 07:30	2.00
12-06-2019	21:15 - 21:30	2.53	22:45 - 23:00	7.00	06:45 - 07:00	1.01	07:00 - 07:15	1.81
13-06-2019	21:15 - 21:30	2.13	22:45 - 23:00	7.51	05:45 - 06:00	0.80	18:00 - 18:15	1.70
14-06-2019	21:00 - 21:15	2.17	22:45 - 23:00	4.87	06:45 - 07:00	0.95	04:30 - 04:45	2.07
15-06-2019	21:00 - 21:15	2.37	22:45 - 23:00	5.48	06:30 - 06:45	1.07	18:00 - 18:15	1.50
16-06-2019	21:15 - 21:30	2.06	00:15 - 00:30	4.32	08:00 - 08:15	0.91	08:00 - 08:15	1.50
17-06-2019	21:00 - 21:15	2.45	23:30 - 23:45	5.60	04:45 - 05:00	0.92	18:00 - 18:15	1.14
18-06-2019	21:45 - 22:00	2.27	21:45 - 22:00	4.36	07:30 - 07:45	0.96	07:30 - 07:45	1.00
19-06-2019	19:30 - 19:45	2.39	23:00 - 23:15	5.75	08:15 - 08:30	1.16	08:15 - 08:30	1.50
20-06-2019	21:00 - 21:15	2.12	22:45 - 23:00	6.60	08:00 - 08:15	1.08	08:00 - 08:15	1.14
21-06-2019	21:00 - 21:15	1.98	22:45 - 23:00	7.60	04:45 - 05:00	1.21	07:45 - 08:00	2.25
22-06-2019	21:00 - 21:15	2.06	22:45 - 23:00	8.37	04:45 - 05:00	1.10	18:00 - 18:15	1.65
23-06-2019	21:15 - 21:30	1.70	22:45 - 23:00	4.51	08:30 - 08:45	0.91	08:45 - 09:00	1.30
24-06-2019	21:30 - 21:45	2.10	22:30 - 22:45	8.85	04:45 - 05:00	1.06	04:45 - 05:00	1.73
25-06-2019	15:00 - 15:15	2.08	22:30 - 22:45	8.85	18:00 - 18:15	1.32	18:00 - 18:15	2.20
26-06-2019	00:45 - 01:00	2.00	22:45 - 23:00	9.00	17:30 - 17:45	1.39	09:00 - 09:15	2.25
27-06-2019	19:30 - 19:45	2.00	21:45 - 22:00	6.01	05:00 - 05:15	1.23	18:00 - 18:15	1.80
28-06-2019	20:45 - 21:00	2.15	22:15 - 22:30	5.75	08:00 - 08:15	1.00	08:00 - 08:15	1.10
29-06-2019	21:00 - 21:15	2.03	22:15 - 22:30	4.67	08:00 - 08:15	1.06	08:00 - 08:15	1.00
30-06-2019	21:45 - 22:00	2.05	21:45 - 22:00	4.15	17:45 - 18:00	1.05	07:00 - 07:15	1.43

MCP: Market Clearing Price (Rs/kWh)**FSV: Final Scheduled Volume (MU)**

Annexure-IV**Top Ten Entity (Sellers and Purchaser) during the month of June, 2019**

Entity Name	Sell		Entity Name	Purchase	
	(MU)	Percent (%)		(MU)	Percent (%)
Teesta -3	657.03	15.60%	Bihar	626.34	14.87%
Himachal Pradesh	356.21	8.46%	West Bengal	580.56	13.78%
Sembcorp Gayatri	348.88	8.28%	Maharashtra	364.56	8.66%
Jindal Power Ltd. Stg-II	169.88	4.03%	Tamil Nadu	357.91	8.50%
Telangana	166.27	3.95%	Andhra Pradesh	276.02	6.55%
Maharashtra	146.63	3.48%	Kerala	225.34	5.35%
Delhi	130.93	3.11%	Gujarat	223.76	5.31%
Jaypee Nigrie	119.46	2.84%	Odisha	220.42	5.23%
JITPL	115.85	2.75%	Telangana	201.95	4.79%
Thermal Powertech	110.21	2.62%	Rajasthan	185.33	4.40%
Total	2,321.35	55.11%	Total	3,262.20	77.45%
Total Volume in PXs §	4,212.01		Total Volume in PXs §	4,212.01	

§: Although, the total cleared volume on both the PXs was 4, 212.01 MU, due to real-time curtailment of 4.91 MU, the Final Scheduled Volume on PXs was 4,207.10 MU.