



मई, 2019 की मासिक मार्केट मॉनिटरिंग रिपोर्ट

Monthly Market Monitoring Report

May, 2019



भारत सरकार/ Government of India

विद्युत मंत्रालय/ Ministry of Power

केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority

आर. ए. प्रभाग/ Regulatory Affairs Division

मार्केट मॉनिटरिंग सेल /Market Monitoring Cell

TABLE OF CONTENTS

S.N.	Title	Page
1.	Day Ahead Market (DAM)	1
2.	Summary of the market in the power exchanges	1
3.	Term Ahead Market	2
4.	Analysis of movement of prices observed in DAM during MAY, 2019	3
5.	Definitions/ terminologies used in the Report	6

TABLES

1.	Table: 1 MCP of IEX and PXIL	1
2.	Table: 2 ACP of IEX.	2
3.	Table: 3 Scheduled Volume of IEX and PXIL for May, 2019 vs May, 2018	2

FIGURES

1.	Figure: 1 Comparison of Total Purchase, Sell bids along with FSV and Daly MCP	3
2.	Figure: 2 Comparison of Maximum, Minimum, Daily, Non Peak Time, Peak Time MCP (Rs/kWh)	4

ANNEXURES

1.	Annexure-I: All MCP viz: Peak Time MCP, Non-Peak MCP, Maximum MCP, Minimum MCP, Average MCP and Final Schedule Volume (MU)	7
2.	Annexure-II: Comparison of MCP w.r.t. Purchase Bid for 2976 Time Blocks during the month of May, 2019	8
3.	Annexure-III: Max. FSV, Min FSV, Max MCP and Min MCP w.r.t all Time blocks	9
4.	Annexure-IV: Top Ten Entity (Sellers and Purchaser) during the month of May, 2019	10

REPORT FOR MONTH: MAY, 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 May 2019 was 3,773.64 MU. The total energy supplied in the country during the month of May, 2019 was 1,20,020 MU. The volume of electricity traded on the power exchanges in DAM represents 3.14% of the total energy supplied in the country. The total volume of electricity transacted in May, 2018 was 4,915.98 MU which was 4.40% of the total energy supplied [1,11,590 MU].
- 1.2. The volume of electricity transacted on IEX and PXIL during May, 2019 are 3,772.47 MU and 1.17 MU respectively, which means that the total volume transacted on IEX is 99.97 % of the total volume on the power exchanges. Whereas, the total volume of electricity transacted during May, 2018 on IEX was 4,915.98 MU. As there was no transaction of electricity on PXIL in May, 2018, the total volume transacted on IEX was 100% of total volume on the power exchanges.
- 1.3. The Average Market Clearing Price (MCP) on IEX during the month May, 2019 was Rs 3.34/ kWh, which shows a decline of 28.48% when compared with average MCP for the month of May, 2018, which was Rs 4.67/kWh. Similarly, on PXIL, the Average MCP during May, 2019 was Rs 3.45/kWh. No electricity transaction happened on PXIL during May, 2018.

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

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

MCP (Rs/kWh)	IEX		PXIL	
	May, 2019	May, 2018	May, 2019	May, 2018
Minimum	2.37	2.87	1.90	--
Maximum	4.13	6.28	4.19	--
Average	3.34	4.67	3.45	--

-- There was no transaction during the month

Table: 1

- 2.2. The Maximum Area Clearing Price (ACP) in IEX was observed in all regions at **Rs 7.50 /kWh** during the time block 22:45-23:00 on 30th May, 2019. The MCP for this time-block was also **Rs 7.50/ kWh** and as there was no congestion in the transmission system, the ACP was same as MCP. However, the daily MCP on pan India basis on 30th May, 2019 was **Rs 4.13/ kWh**.
- 2.3. The Minimum ACP observed in IEX among all 13 bid areas was **Rs 1.25/kWh** during the time block 06:00-06:15 on 5th May, 2019. The MCP for this time-block was also **Rs 1.25/ 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 5th May 2019 was **Rs 2.47/ kWh**.
- 2.4. A comparison of the Minimum and Maximum ACP during the months of May, 2019 and May, 2018 in IEX are as given below:

ACP (Rs/kWh)	IEX	
	May, 2019	May, 2018
Minimum	1.25	2.12
Maximum	7.50	11.78

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 May, 2019 and May, 2018 are as given below:

Scheduled Volume (MU)	IEX		PXIL	
	May, 2019	May, 2018	May, 2019	May, 2018
Minimum	95.95	99.15	0.0228	--
Maximum	140.21	206.69	0.1600	--
Average	121.69	158.58	0.1065	--

-- There was no transaction during the month

Table: 3

3.0 TERM AHEAD MARKET (TAM)

- 3.1 The total traded volume of electricity transacted on both the power exchanges in term ahead market in May, 2019 was 448.82 MU (i.e. 326.72 MU on IEX and 122.10 MU on PXIL), which shows an increase of 71.49% when compared with total traded volume of electricity transacted during May, 2018, which was 261.72 MU (i.e. 208.51 MU on IEX and 53.21 MU on PXIL).

3.2 With respect to the total energy supplied during the month of May, 2019 in the country, the volume of electricity traded on the power exchanges in TAM represents 0.37% of the total energy supplied. The same was 0.23% in May, 2018.

4.0 ANALYSIS OF MOVEMENT OF PRICES OBSERVED IN DAM DURING MAY, 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 May 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 0.54. In effect, the regression reveals that the most important variable which determines market clearing price is the average purchase bid. The same relationship is visible from the analysis carried out from the plot in **Figure 1.**

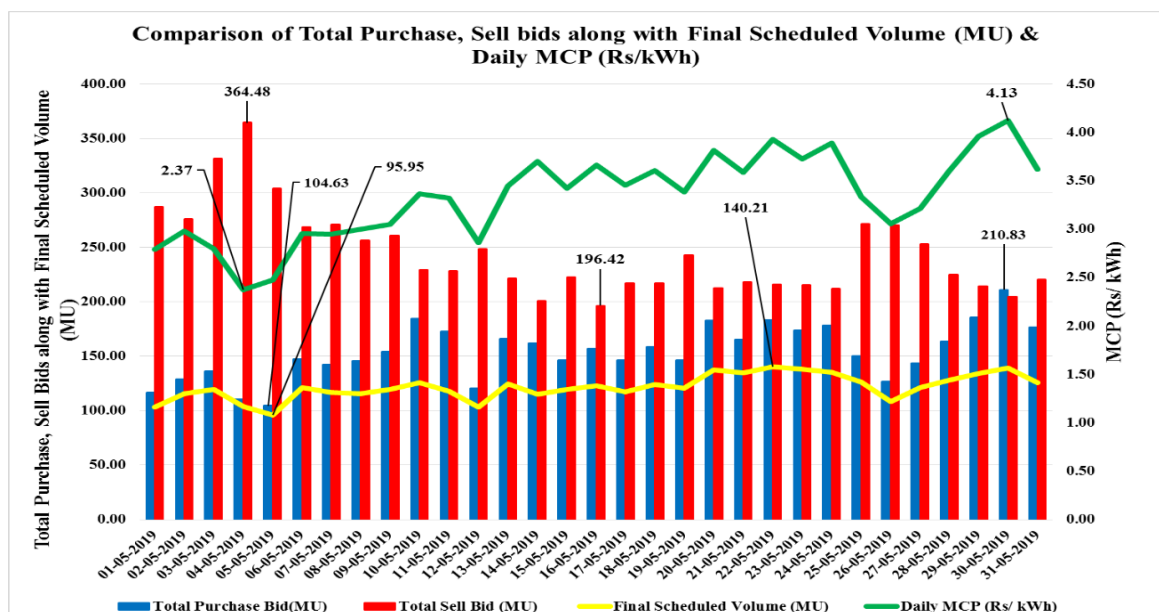


Figure -1

- 4.3 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]
- 4.4 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.

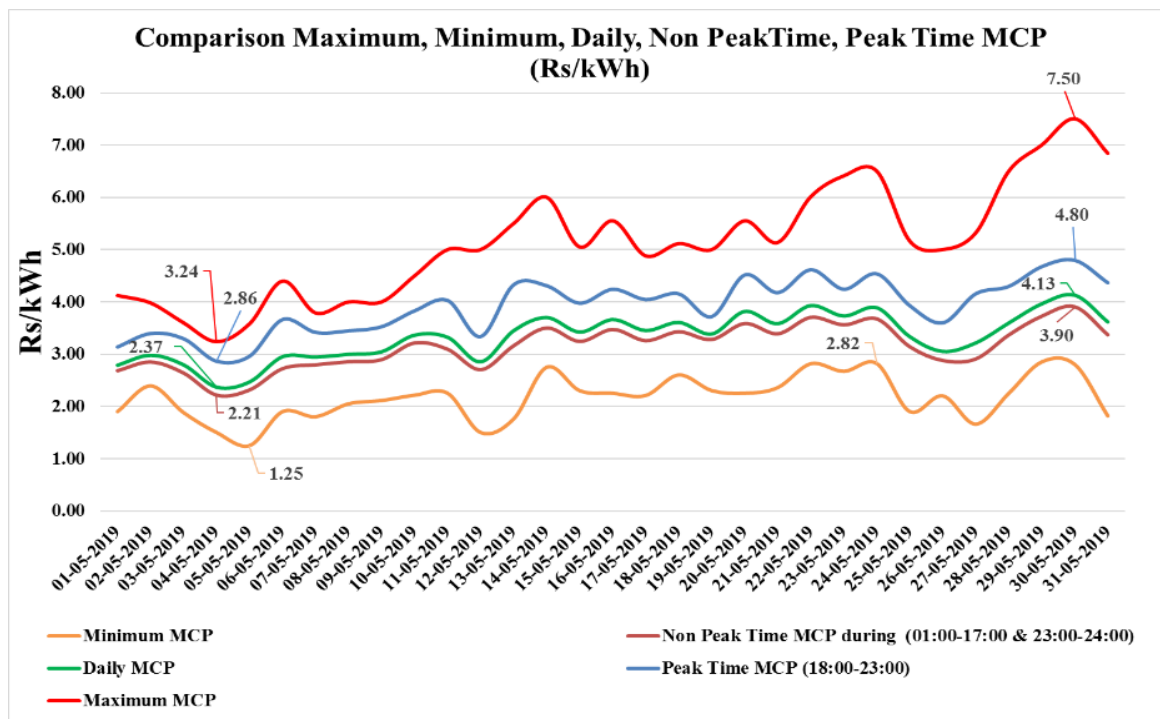


Figure -2

- 4.5 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.
- 4.6 On 24 days during the month, the maximum MCP occurred during the **time period 22:30 to 23:15 [Annexure III]**.
- 4.7 On 23 days during the month, the maximum FSV occurred during the **time period 20:45 to 22:15 [Annexure III]**.
- 4.8 The maximum demand met during the month of May, 2019 in the country occurred on **30th May, 2019 at 182.6 GW**, which is more compared to maximum demand during the month of **May, 2018 i.e.170.89 GW** which incidentally also happened on **30th May, 2018**.
- 4.9 One Nation One Price was observed for 29 days during the month including 2 days [29th & 30th May, 2019] on which there were real time curtailment due to transmission constraints. Further, there was congestion in southern region on 2 days during the month. Hence MCP was different from ACPs during these 2 days [3rd & 22nd May, 2019].

- 4.10 Due to real time transmission congestion, 0.217 MU could not be transacted on the IEX on 29th and 30th May, 2019. The curtailment happened on **29th May, 2019** during **67th to 96th time-blocks** and on **30th May, 2019** during **1st to 96th time blocks**. Further, there was no real time curtailment on PXIL.
- 4.11 The real time curtailment in May, 2019 was **0.217 MU** as compared to **1.54 MU** in May, 2018.
- 4.12 The top **10 sellers** on the power exchanges during the month are: **Teesta -3, Sembcorp Gayatri, Himachal Pradesh, Maharashtra, Assam, Telangana, Delhi, Rajasthan, Madhya Pradesh and Uttar Pradesh** which constituted 55.14%% of the market share [Annexure IV].
- 4.13 The top **10 purchaser** on the power exchanges during the month are: **Maharashtra, Bihar, West Bengal, Tamil Nadu, Andhra Pradesh, Telangana, Gujarat, Kerala, Orissa and Chhattisgarh** which constituted 76.64% of the market share [Annexure IV].

Definitions/ 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:** Orissa; **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.

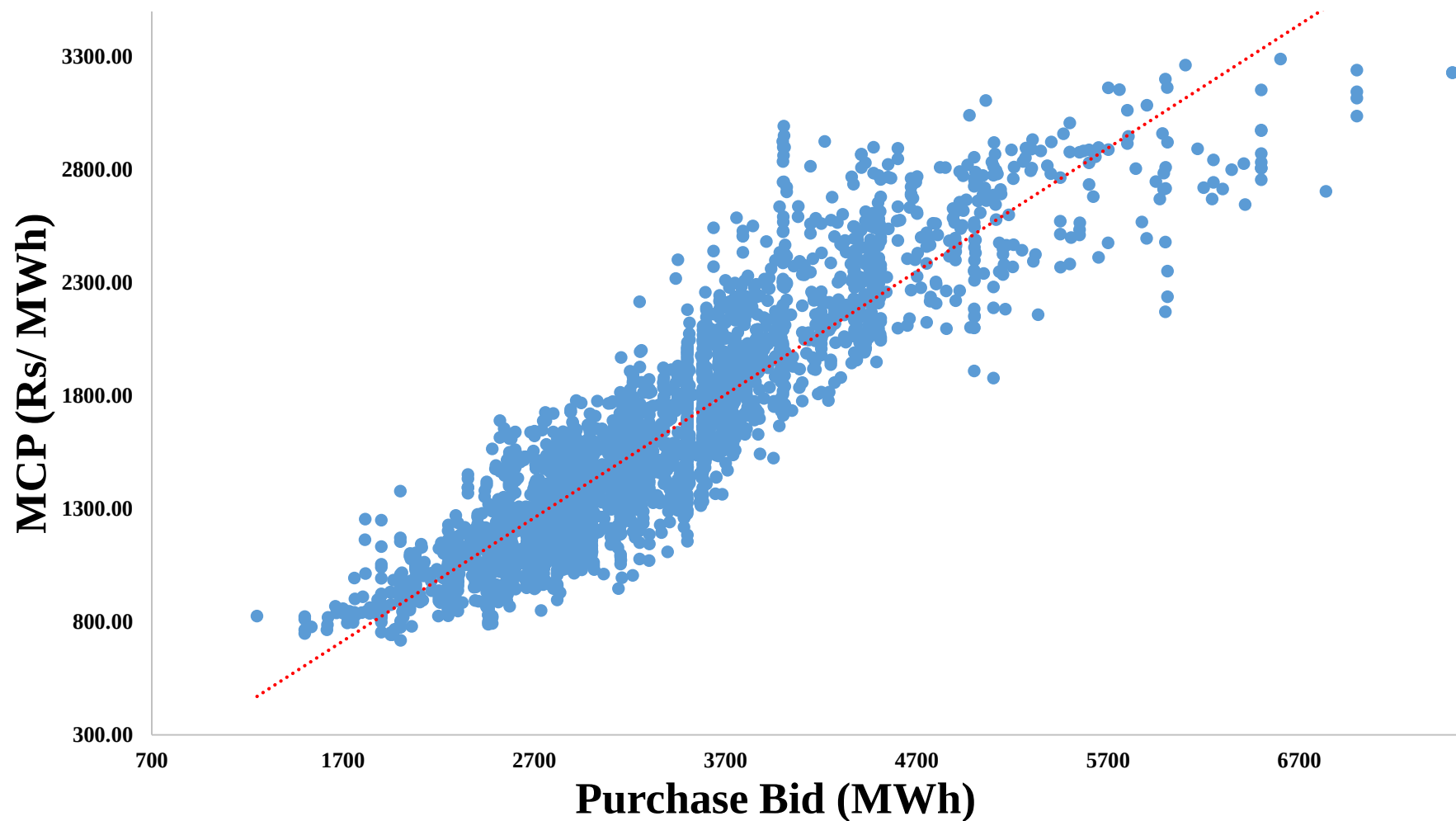
Annexure-I

Date	MCP during (01:00-06:00, 23:00-24:00)	MCP during (07:00-10:00)	MCP during (11:00-17:00)	Peak Time MCP during (18:00-23:00)	Non-Peak MCP during (01:00-17:00 & 23:00-24:00)	Maximum MCP	Minimum MCP	Average MCP	Final Scheduled Volume (MU)
01-05-2019	3.14	2.68	2.54	3.21	1.98	4.12	1.90	2.79	103.44
02-05-2019	3.40	2.84	2.68	3.15	2.60	3.98	2.39	2.98	115.89
03-05-2019	3.30	2.63	2.57	2.99	2.12	3.60	1.88	2.80	119.30
04-05-2019	2.86	2.21	2.24	2.34	1.95	3.24	1.50	2.37	103.68
05-05-2019	2.96	2.31	2.15	2.72	1.88	3.58	1.25	2.47	95.95
06-05-2019	3.66	2.72	2.75	2.90	2.35	4.40	1.90	2.95	121.50
07-05-2019	3.42	2.79	2.71	3.16	2.29	3.79	1.80	2.95	116.67
08-05-2019	3.45	2.85	2.70	3.25	2.41	4.00	2.05	3.00	115.77
09-05-2019	3.53	2.89	2.87	3.08	2.60	4.00	2.11	3.05	119.84
10-05-2019	3.83	3.21	3.19	3.54	2.68	4.50	2.21	3.37	125.73
11-05-2019	4.03	3.09	2.91	3.58	2.53	5.00	2.25	3.32	117.92
12-05-2019	3.34	2.70	2.54	3.31	1.90	5.00	1.50	2.86	103.50
13-05-2019	4.33	3.16	3.16	3.58	2.42	5.50	1.76	3.45	124.59
14-05-2019	4.31	3.49	3.45	3.82	2.99	6.00	2.75	3.70	114.85
15-05-2019	3.98	3.24	3.22	3.58	2.67	5.05	2.30	3.42	119.58
16-05-2019	4.25	3.47	3.33	3.89	2.96	5.55	2.25	3.66	122.93
17-05-2019	4.05	3.25	3.45	3.40	2.65	4.88	2.21	3.45	117.13
18-05-2019	4.16	3.42	3.32	3.83	2.89	5.11	2.60	3.61	123.97
19-05-2019	3.72	3.28	3.08	3.77	2.75	5.00	2.30	3.39	120.91
20-05-2019	4.52	3.58	3.74	3.84	2.85	5.55	2.25	3.82	137.74
21-05-2019	4.18	3.38	3.45	3.71	2.71	5.14	2.36	3.58	134.44
22-05-2019	4.62	3.70	3.49	4.19	3.20	6.01	2.81	3.93	140.21
23-05-2019	4.25	3.56	3.47	3.97	2.99	6.41	2.67	3.73	138.29
24-05-2019	4.54	3.67	3.57	4.06	3.17	6.50	2.82	3.89	135.20
25-05-2019	3.93	3.14	3.18	3.42	2.55	5.16	1.90	3.34	126.39
26-05-2019	3.60	2.87	2.73	3.31	2.35	5.00	2.20	3.05	108.49
27-05-2019	4.16	2.90	3.16	2.96	2.34	5.32	1.66	3.22	121.43
28-05-2019	4.30	3.36	3.37	3.73	2.70	6.50	2.25	3.60	128.08
29-05-2019	4.68	3.72	3.61	4.21	3.06	7.00	2.85	3.96	133.96
30-05-2019	4.80	3.90	3.87	4.33	3.21	7.50	2.80	4.13	139.14
31-05-2019	4.37	3.36	3.43	3.78	2.51	6.84	1.81	3.62	125.95
Maximum	4.80	3.90	3.87	4.33	3.21	7.50	2.85	4.13	140.21
Minimum	2.86	2.21	2.15	2.34	1.88	3.24	1.25	2.37	95.95
Average	3.92	3.14	3.09	3.50	2.59	5.14	2.17	3.34	121.69

MCP: Market Clearing Price (Rs/ kWh)

FSV: Final Scheduled Volume (MU)

Comparison of MCP w.r.t. Purchase Bid for 2976 Time Blocks during the month of May, 2019



Time Blocks during the Month [96 time blocks in a day x 31 days = 2976]

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
01-05-2019	23:15 - 23:30	1.61	22:45 - 23:00	4.12	09:00 - 09:15	0.70	06:45 - 07:00	1.90
02-05-2019	21:45 - 22:00	1.63	22:45 - 23:00	3.98	05:45 - 06:00	0.73	04:15 - 04:30	2.39
03-05-2019	14:45 - 15:00	1.63	23:00 - 23:15	3.60	07:00 - 07:15	0.85	08:30 - 08:45	1.88
04-05-2019	21:45 - 22:00	1.46	21:45 - 22:00	3.24	05:45 - 06:00	0.75	06:00 - 06:15	1.50
05-05-2019	21:15 - 21:30	1.57	22:45 - 23:00	3.58	05:45 - 06:00	0.74	06:00 - 06:15	1.25
06-05-2019	21:15 - 21:30	1.87	19:45 - 20:00	4.40	05:45 - 06:00	0.85	05:45 - 06:00	1.90
07-05-2019	21:45 - 22:00	1.65	21:00 - 21:15	3.79	08:00 - 08:15	0.88	08:15 - 08:30	1.80
08-05-2019	21:30 - 21:45	1.66	00:00 - 00:15	4.00	05:30 - 05:45	0.85	06:45 - 07:00	2.05
09-05-2019	21:45 - 22:00	1.79	22:45 - 23:00	4.00	05:45 - 06:00	0.85	05:45 - 06:00	2.11
10-05-2019	21:45 - 22:00	2.03	00:00 - 00:15	4.50	05:30 - 05:45	0.84	08:30 - 08:45	2.21
11-05-2019	21:45 - 22:00	1.75	22:45 - 23:00	5.00	05:45 - 06:00	0.85	08:30 - 08:45	2.25
12-05-2019	21:45 - 22:00	1.67	00:00 - 00:15	5.00	08:30 - 08:45	0.74	08:30 - 08:45	1.50
13-05-2019	22:00 - 22:15	1.86	22:45 - 23:00	5.50	05:45 - 06:00	0.80	07:45 - 08:00	1.76
14-05-2019	23:00 - 23:15	1.81	22:45 - 23:00	6.00	05:45 - 06:00	0.77	06:30 - 06:45	2.75
15-05-2019	22:45 - 23:00	1.88	22:45 - 23:00	5.05	07:45 - 08:00	0.87	07:45 - 08:00	2.30
16-05-2019	21:00 - 21:15	1.86	22:45 - 23:00	5.55	09:15 - 09:30	0.85	08:15 - 08:30	2.25
17-05-2019	21:45 - 22:00	2.04	22:30 - 22:45	4.88	05:45 - 06:00	0.73	06:30 - 06:45	2.21
18-05-2019	20:00 - 20:15	2.01	22:45 - 23:00	5.11	08:15 - 08:30	0.81	08:15 - 08:30	2.60
19-05-2019	21:15 - 21:30	1.87	00:00 - 00:15	5.00	07:00 - 07:15	0.83	09:15 - 09:30	2.30
20-05-2019	21:15 - 21:30	1.95	22:45 - 23:00	5.55	07:45 - 08:00	0.86	07:45 - 08:00	2.25
21-05-2019	21:45 - 22:00	2.17	22:45 - 23:00	5.14	07:00 - 07:15	0.88	06:00 - 06:15	2.36
22-05-2019	21:00 - 21:15	2.14	22:45 - 23:00	6.01	05:45 - 06:00	1.04	10:45 - 11:00	2.81
23-05-2019	21:00 - 21:15	2.19	22:45 - 23:00	6.41	05:45 - 06:00	1.04	08:00 - 08:15	2.67
24-05-2019	20:15 - 20:30	2.11	22:45 - 23:00	6.50	10:00 - 10:15	0.96	06:00 - 06:15	2.82
25-05-2019	21:15 - 21:30	1.92	22:45 - 23:00	5.16	05:45 - 06:00	0.89	08:45 - 09:00	1.90
26-05-2019	21:30 - 21:45	1.82	22:30 - 22:45	5.00	08:00 - 08:15	0.83	10:00 - 10:15	2.20
27-05-2019	21:45 - 22:00	1.98	22:30 - 22:45	5.32	06:30 - 06:45	0.80	06:00 - 06:15	1.66
28-05-2019	20:45 - 21:00	2.13	22:30 - 22:45	6.50	05:30 - 05:45	0.83	08:00 - 08:15	2.25
29-05-2019	20:45 - 21:00	2.22	22:30 - 22:45	7.00	05:45 - 06:00	0.90	06:00 - 06:15	2.85
30-05-2019	20:15 - 20:30	2.19	22:45 - 23:00	7.50	07:30 - 07:45	0.98	06:00 - 06:15	2.80
31-05-2019	19:30 - 19:45	2.03	22:30 - 22:45	6.84	04:45 - 05:00	0.77	08:15 - 08:30	1.81

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

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

Entity Name	Sell		Entity Name	Purchase	
	(MU)	Percent (%)		(MU)	Percent (%)
Teesta -3	545.63	14.46%	Maharashtra	515.95	13.67%
Sembcorp Gayatri	258.79	6.86%	Bihar	502.17	13.31%
Himachal Pradesh	246.06	6.52%	West Bengal	418.53	11.09%
Maharashtra	208.96	5.54%	Tamil Nadu	291.98	7.74%
Assam	195.29	5.17%	Andhra Pradesh	288.15	7.64%
Telangana	146.74	3.89%	Telangana	285.59	7.57%
Delhi	124.17	3.29%	Gujarat	185.31	4.91%
Rajasthan	122.61	3.25%	Kerala	167.30	4.43%
Madhya Pradesh	120.14	3.18%	Orissa	118.67	3.14%
Uttar Pradesh	112.57	2.98%	Chhattisgarh	118.43	3.14%
Total Volume in PXs[§]	3773.86		Total Volume in PXs[§]	3773.86	

§: Although, the total cleared volume on both the PXs was 3773.86 MU, due to real-time curtailment of 0.217 MU, the Final Scheduled Volume on PXs was 3773.64 MU.