



भारत सरकार/ **Government of India**

विद्युत मंत्रालय/ **Ministry of Power**

केन्द्रीय विद्युत प्राधिकरण/ **Central Electricity Authority**

आर. ए. प्रभाग/ **Regulatory Affairs Division**

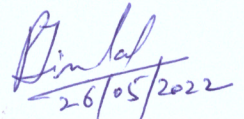
Subject: Monthly Market Monitoring Report for the month of February, 2022-reg.

In the month of February, 2022 a total of 108,032 MU of electricity was transacted in the country out of which 50,940 MU was transacted through ISTS, and the remaining through state controlled generating stations.

A total of 17,628 MU was transacted under Short Term Market, out of which 9,269 MU was transacted through Power Exchanges and remaining happened as bilateral transactions & deviations. Thus, the total short term trade in February, 2022 was 16.32 % of total volume of electricity traded in February, 2022 and 8.58 % was through Power Exchanges.

If we compare these transactions with respect to the electricity supplied through ISTS, the short term transactions constitutes about 34.61 % of ISTS transactions and power exchanges constitutes 18.20 %.

The monthly market monitoring report for the month of February, 2022 giving details of electricity transaction happened in the power exchanges and other short term markets is annexed below for reference.


26/05/2022

Pardeep Jindal

Chief Engineer (RA)

To

All Stake holders



सत्यमेव जयते

फरवरी, 2022 मासिक मार्केट मॉनिटरिंग रिपोर्ट

Monthly Market Monitoring Report February, 2022



भारत सरकार/ Government of India

विद्युत मंत्रालय/ Ministry of Power

केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority

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MARKET MONITORING REPORT
FOR THE MONTH OF FEBRUARY, 2022

SUMMARY

SUMMARY FOR MONTH: FEBRUARY, 2022

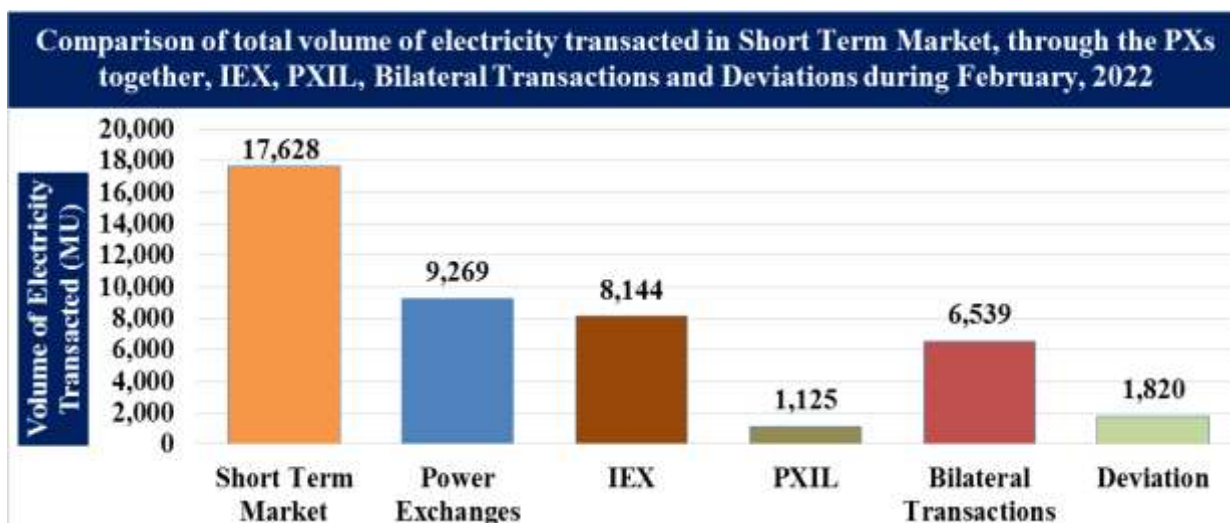
SUMMARY OF ELECTRICITY TRANSACTIONS ON POWER EXCHANGES IN INDIA

- A total volume of **9,269 MU** electricity was transacted in both the power exchanges i.e. IEX & PXIL, during the month of February, 2022. This volume of electricity is on delivery date basis and includes transactions through DAM, GDAM, RTM, TAM and GTAM market segments.

Segment	Transactions happened in PXs (IEX and PXIL combined)			
	FSV (MU)	Average MCP (Rs/kWh)	Congestion	Real Time Curtailment
DAM	5,612.83	4.44	0.00	0.00
GDAM	191.21	4.91	0.00	0.00
RTM	1,555.78	4.35	0.05	0.00
TAM	1,261.73	4.49	1.50	12.54
GTAM	647.32	4.69	0.00	0.00
Total in PXs	9,268.87	4.46*	1.55	12.54

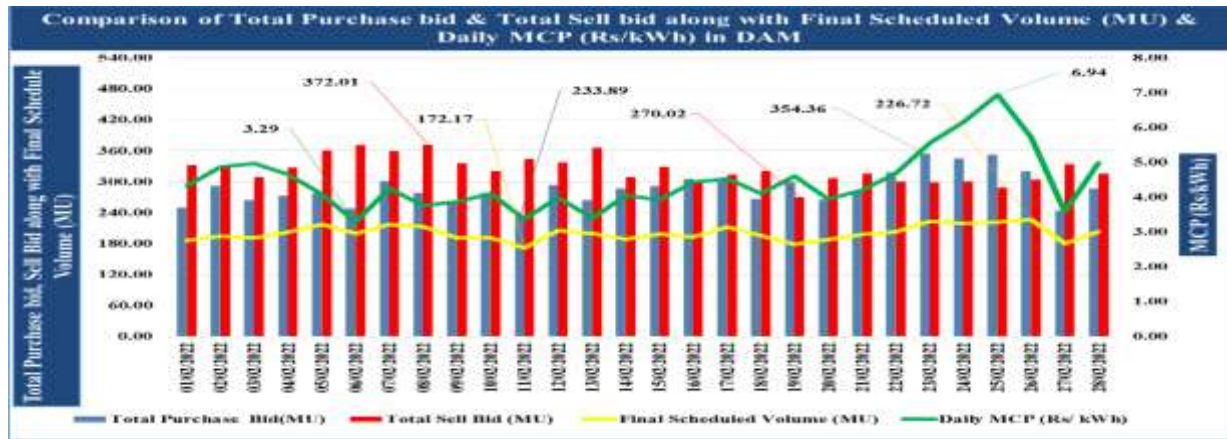
* The total average is weighted average of all market segments.

- Under the Bilateral trade a total of **6,539 MU** of electricity was transacted and **1,820 MU** was transferred as deviation. Thus a total of **17,628 MU** of electricity was transacted as short term trade. In the month of February, 2022 a total of **108,032 MU** of electricity was supplied in the country, thus the share of short term market in the total volume of electricity traded in February, 2022 was **16.32 %**.

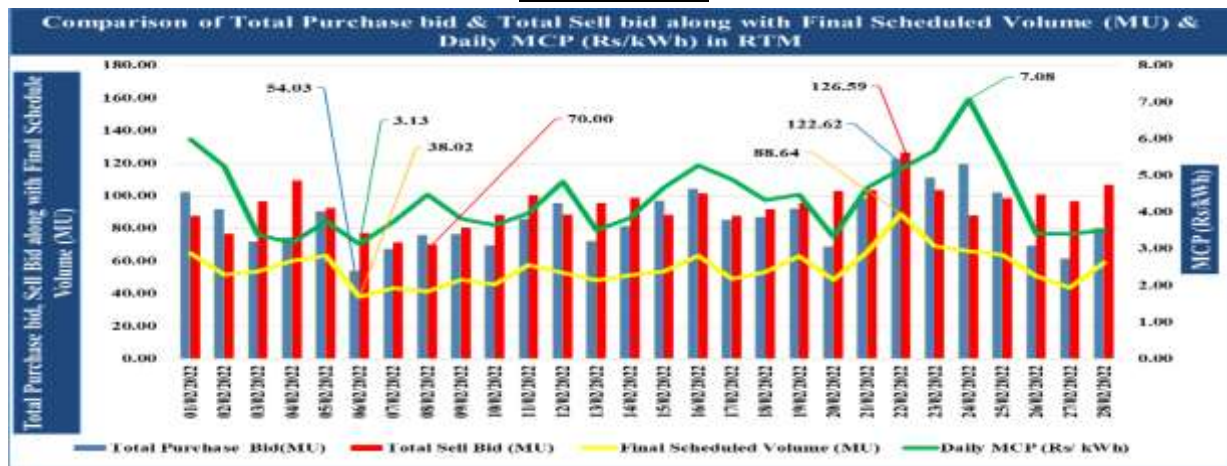


- The total volume of congestion that happened during the month of February, 2022 was **1.55 MU** which is only 0.017 % of the total volume of electricity transacted in the power exchanges and 0.0014 % of total energy supplied during the month of February, 2022. There was no congestion observed in DAM, GDAM and GTAM in February, 2022, whereas there was congestion in RTM on 26th & 28th February, 2022 and in TAM on 18th & 23rd February, 2022. The total volume of real time curtailment reported in the month of February, 2022 was only **12.54 MU**. The total volume of electricity scheduled at ISTS during the month of February, 2022 was **50,940 MU**. **The total volume of electricity transacted in the short term market was 34.61 % of total volume schedule at ISTS in the month of February, 2022.**
- The variation of Purchase and Sell bids, Final Scheduled Volume and Daily MCP in DAM and RTM during the month of February, 2022 are shown in following figures:

DAM Volume

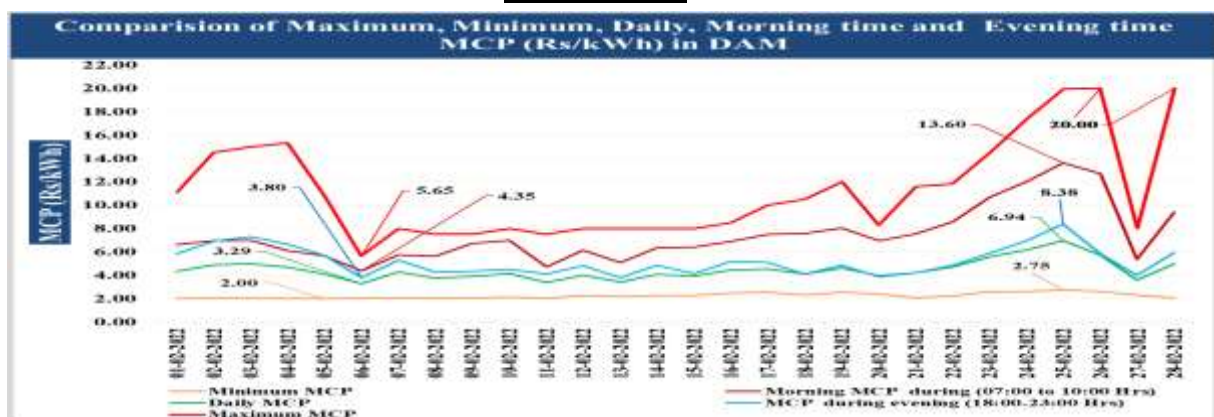


RTM Volume

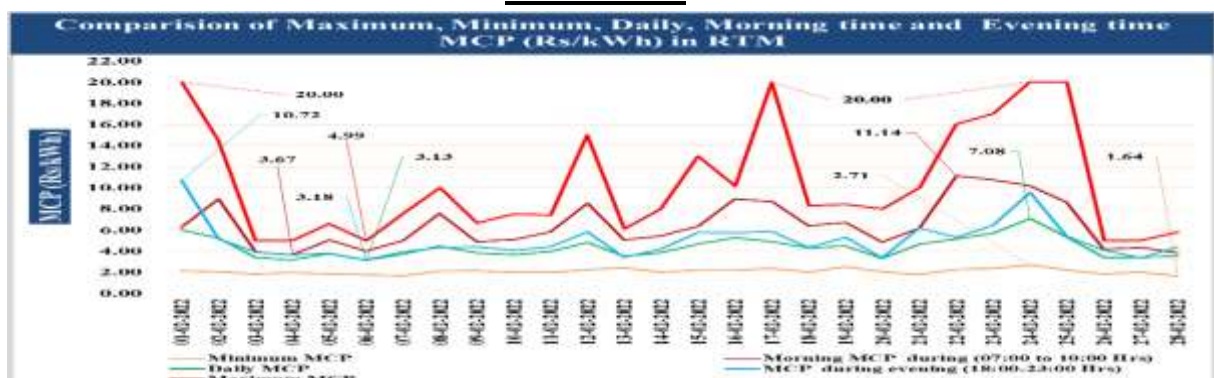


- The variation of Maximum, Minimum, Daily, Morning and Evening time MCPs in DAM and RTM during the month of February, 2022 are shown in following figures:

DAM Prices



RTM Prices



THE MARKET MONITORING REPORT FOR FEBRUARY, 2022

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 (DAM) in the month of February, 2022 was **5,612.83 MU**. The total energy supplied in the country during the month of February, 2022 was 108,032 MU. Thus, the volume of electricity transacted on both the power exchanges in DAM during February, 2022 was 5.20 % of the total energy supplied in the country. Comparing with the total volume of electricity transacted in DAM during the past month .i.e. January, 2022, it was **5,280.26 MU** which was 4.72 % of the total energy supplied [111,808 MU] in the country during January, 2022. Similarly, the total volume of electricity transacted in DAM during previous year .i.e. February, 2021, it was **5,107.19 MU** which was 5.09 % of the total energy supplied [103,252 MU] in the country during February, 2021.
 - 1.2. The volume of electricity transacted on IEX and PXIL during February, 2022 were **5,612.07 MU and 0.76 MU**, respectively, which means that the total volume transacted on IEX was **99.99 %** of the total volume on power exchanges. The volume of electricity transacted on IEX and PXIL during January, 2022 were **5,279.70MU and 0.56 MU**, respectively, which means that the total volume transacted on IEX was **99.99 %** of the total volume on power exchanges. Also, the volume of electricity transacted on IEX and PXIL during February, 2021, were **5,099.75 MU and 7.44 MU** respectively.
 - 1.3. There was Cross Border Transactions of Electricity of **262.01 MU** (i.e. 157.32 MU buy by Nepal and 104.69 MU buy by Bhutan) happened in DAM in IEX during February, 2022. Whereas, there was Cross Border Transactions of Electricity of **259.57 MU** (158.29 MU buy by Nepal and 101.28 MU buy by Bhutan) happened in DAM in IEX during January, 2022.
 - 1.4. The Average Market Clearing Price (MCP) on IEX during the month of February, 2022 was **Rs 4.44/kWh**, which shows an increase of **30.97 %** when compared with average MCP's for the month of January, 2022 and February, 2021, which were **Rs 3.39/kWh and Rs 3.39/kWh**, respectively. On PXIL, the average MCP during the month of February, 2022 was **Rs 5.14/kWh**, which shows an increase of **17.35 %** and **39.29 %** when compared with average MCP's for the month of January, 2022 and February, 2021, which were **Rs 4.38/kWh and Rs 3.69/kWh** respectively.
- ### **2. DAM MARKET CLEARING PRICE, AREA CLEARING PRICE AND FINAL SCHEDULED VOLUME OF DAM IN THE POWER EXCHANGES**
- 2.1. **A comparison of the Minimum, Maximum and Average of Daily MCP during the month of February, 2022 with that of January, 2022 and February, 2021 is given in Table- 1A & 1B:**

(a) February, 2022 vis- a -vis January, 2022

Daily MCP (Rs/kWh)	IEX			PXIL		
	February, 2022	January, 2022	% Change	February, 2022	January, 2022	% Change
Minimum	3.29	2.63	25.10	4.99	3.99	25.06
Maximum	6.94	4.45	55.96	5.86	4.99	17.43
Average	4.44	3.39	30.97	5.14	4.38	17.35

Table: 1A**(b) February, 2022 vis- a –vis February, 2021**

Daily MCP (Rs/kWh)	IEX			PXIL		
	February, 2022	February, 2021	% Change	February, 2022	February, 2021	% Change
Minimum	3.29	2.85	15.44	4.99	2.62	90.46
Maximum	6.94	4.54	52.86	5.86	4.73	23.89
Average	4.44	3.39	30.97	5.14	3.69	39.30

Table: 1B

- 2.2.** The maximum Area Clearing Price (ACP) of **Rs 20.00/kWh** in IEX was observed in all 13 regions during the time blocks 07:15-07:30 Hrs on 26th February, 2022 and on 07:15-07:30 Hrs, 07:30-07:45 Hrs on 28th February, 2022. As there was no congestion in transmission system, the MCP for these time-block dates was also **Rs 20.00/kWh**. However, the Daily MCP in IEX on 26th & 28th February, 2022 were **Rs 5.72/kWh & Rs 4.99/kWh, respectively**. Whereas, in PXIL, the maximum ACP of **Rs 5.99/kWh** was observed in all 13 regions during 12 consecutive time blocks from 08:00-08:15 Hrs to 10:45-11:00 HRs and from 17:30-17:45 Hrs to 17:45-18:00 Hrs on 5th February, 2022. As there was no congestion in transmission system, the MCP for these time blocks was also **Rs 5.99/kWh**. However, the Daily MCP in IEX on 5th February, 2022 was **Rs 5.77/kWh**.
- 2.3.** The minimum ACP of **Rs 2.00/kWh** in IEX was observed in all 13 regions during the time block **04:00-04:15 Hrs** on 5th February, 2022. As there was no congestion in transmission system, the MCP for this time-block was also **Rs 2.00/kWh**. However, the Daily MCP in IEX on pan India basis on 16th February, 2022 was **Rs 4.08/kWh**. Whereas, in PXIL, the minimum ACP of **Rs 3.99/kWh** was observed in all 13 regions during the time blocks 22:30-22:45 Hrs & 22:45-23:00 Hrs on 3rd February, 2022. As there was no congestion in transmission system, the MCP for these time blocks was also **Rs 3.99/kWh**. However, the Daily MCP in PXIL on 3rd February, 2022 was **Rs 5.59/kWh**.
- 2.4.** A comparison of the Minimum and Maximum Area Clearing Price (ACP) during the months of February, 2022 with that of January, 2022 and February, 2021 is given in Table-2A&2B:

(a) February, 2022 vis- a -vis January, 2022

ACP (Rs/kWh)	IEX			PXIL		
	February, 2022	January, 2022	% Change	February, 2022	January, 2022	% Change
Minimum	2.00	1.58	26.58	3.99	3.99	0.00
Maximum	20.00	11.27	77.46	5.99	4.99	20.04

Table: 2A**(b) February, 2022 vis- a- vis February, 2021**

ACP (Rs/kWh)	IEX			PXIL		
	February, 2022	February, 2021	% Change	February, 2022	February, 2021	% Change
Minimum	2.00	1.58	26.58	3.99	2.58	54.65
Maximum	20.00	8.75	128.57	5.99	13.95	-57.06

Table: 2B

2.5. A comparison of the Minimum, Maximum and Average of Final Scheduled Volume (FSV) of electricity transactions happened on IEX and PXIL for a day during the months of February, 2022 with that of January, 2022 and February, 2021 is given in Table-2C & 3D:

(a) February, 2022 vis- a- vis January, 2022

Final Scheduled Volume (MU)	IEX			PXIL		
	February, 2022	January, 2022	% Change	February, 2022	January, 2022	% Change
Minimum	172.17	136.74	25.91	0.01	0.01	0.00
Maximum	226.72	196.08	15.63	0.10	0.10	0.00
Average	200.43	170.31	17.69	0.03	0.04	-25.00

Table: 2C**(b) February, 2022 vis- a- vis February, 2021**

Final Scheduled Volume (MU)	IEX			PXIL		
	February, 2022	February, 2021	% Change	February, 2022	February, 2021	% Change
Minimum	172.17	152.98	12.54	0.01	0.09	-88.89
Maximum	226.72	203.71	11.30	0.10	0.47	-78.72
Average	200.43	182.13	10.05	0.03	0.27	-88.89

Table: 2D**3. REAL TIME MARKET (RTM)**

The transaction of Electricity in Real Time Market was started from 1st June, 2020 with the approval of the CERC in both the power exchanges - IEX and PXIL. The total volume of electricity transacted on both the power exchanges in Real Time Market in February, 2022 was **1,555.78 MU**, out of which, **1,555.78 MU** (100 %) was transacted in IEX and no transaction happened in PXIL. The Final Scheduled Volume (FSV), Daily Market Clearing Prices (MCP) and Area Clearing Prices (ACP) in Real Time Market during the month of

February, 2022 as compared with January, 2022 and February, 2021 are as given in table 3A, 3B & 3C:

(i) Final Scheduled Volume:

Exchange	Period	Final Scheduled Volume (MU)			
		Total	Minimum	Maximum	Average
IEX	February, 2022	1555.78	38.02	88.64	55.56
	January, 2022	1575.13	37.21	75.04	50.81
	Change % (Month over Month)	-1.23	2.18	18.12	9.35
	February, 2021	1118.45	28.28	52.73	39.94
	Change % (Year over Year)	39.10	34.44	68.10	39.11
PXIL	February, 2022	-	-	-	-
	January, 2022	-	-	-	-
	Change % (Month over Month)	NA	NA	NA	NA
	February, 2021	-	-	-	-
	Change % (Year over Year)	NA	NA	NA	NA

-: No transaction happened

NA: Not Applicable

Table-3A

(ii) Daily Market Clearing Price (MCP):

Exchange	Period	Daily MCP (Rs/kWh)		
		Minimum	Maximum	Average
IEX	February, 2022	3.13	7.08	4.35
	January, 2022	2.53	4.92	3.45
	Change % (Month over Month)	23.72	43.90	26.09
	February, 2021	2.66	4.72	3.31
	Change % (Year over Year)	17.67	50.00	31.42
PXIL	February, 2022	-	-	-
	January, 2022	-	-	-
	Change % (Month over Month)	NA	NA	NA
	February, 2021	-	-	-
	Change % (Year over Year)	NA	NA	NA

-: No transaction happened

NA: Not Applicable

Table-3B

(iii) Area Clearing Price (ACP):

Exchange	Period	ACP (Rs/kWh)	
		Minimum	Maximum
IEX	February, 2022	1.64	20.00
	January, 2022	0.50	20.00
	Change % (Month over Month)	228.00	0.00
	February, 2021	1.58	9.00
	Change % (Year over Year)	3.80	122.22
PXIL	February, 2022	-	-
	January, 2022	-	-
	Change % (Month over Month)	NA	NA
	February, 2021	-	-
	Change % (Year over Year)	NA	NA

-: No transaction happened

NA: Not Applicable

Table -3C

4. GREEN DAY AHEAD MARKET (GDAM):

The transaction of electricity in Green Day Ahead Market (GDAM) has been started in IEX from 27th October, 2021 with the approval of the CERC. The total volume of electricity transacted in GDAM in the month of February, 2022 was **191.21 MU** at an average price MCP of **Rs 4.91/kWh**. The Final Scheduled Volume (FSV), Daily Market Clearing Prices (MCP), Area Clearing Prices (ACP), Real Time Curtailment and details of Transmission Congestion under these 3 segments in Green Day Ahead Market during the month of February, 2022 are given below:

i) Final Scheduled Volume in IEX:

Segment	Period	Final Scheduled Volume (MU)			
		Total	Minimum	Maximum	Average
Solar	February, 2022	46.09	0.32	3.38	1.65
	January, 2022	56.63	0.33	3.64	1.83
	% Change (Month over Month)	-18.61	-3.03	-7.14	-9.84
Non Solar	February, 2022	145.12	3.99	6.16	5.18
	January, 2022	141.72	1.37	6.61	4.57
	% Change (Month over Month)	2.40	191.24	-6.81	13.35
Hydro	February, 2022	-	-	-	-
	January, 2022	-	-	-	-

-: No transaction happened

NA: Not Applicable

Table-4A

ii) Daily Market Clearing Price (MCP) and Area Clearing Price (ACP):

Exchange	Period	Prices (Rs/kWh)				
		Daily MCP (Rs/kWh)			ACP (Rs/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
Solar and Non Solar	February, 2022	3.55	6.68	4.91	2.50	18.00
	January, 2022	3.00	4.98	4.20	1.00	8.00
	% Change (Month over Month)	18.33	34.14	16.90	150.00	125.00

-: No transaction happened

NA: Not Applicable

Table-4B

- 4.1. In the month of February, 2022, there was no transmission congestion in IEX in Green Day Ahead Market, hence one nation one price was observed for all **28 days** during the month. Similarly, in the month of January, 2022, there was no transmission congestion in IEX in GDAM, hence one nation one price was observed for all **31 days** during the month.
- 4.2. There was **no** real time curtailment in IEX in Green Day Ahead Market during the month of February, 2022 and January, 2022, respectively.
- 4.3. The **top 10 sellers** on the power exchanges in **Green Day Ahead Market (GDAM)** in the month of February, 2022 were **Karnataka, Madhya Pradesh, Adani Green Solar Jaisalmer, Adani Hybrid Energy Jaisalmer Three Limited (Solar), J&K, NTPC Simhadri 25 MW Solar Project, Renew Solar Energy (Jharkhand Three) Pvt. Ltd.,**

Adani Hybrid Energy Jaisalmer Two Limited (Solar), Andhra Pradesh and Telangana, which constituted **96.33 %** of the market volume.

- 4.4. The top 10 purchasers** on the power exchanges in **Green Day Ahead Market (GDAM)** in the month of February, 2022 were **Dadra & Nagar Haveli, Assam, West Bengal, Odisha, Maharashtra, Delhi, Kerala, Karnataka, Haryana and Uttar Pradesh**, which constituted **94.12 %** of the market volume.

5. **TERM AHEAD MARKET (TAM)**

Term Ahead Market (TAM) (on Trade Date Basis)

- 5.1.** The total volume of electricity transacted on both the power exchanges in Term Ahead Market in February, 2022 on trade date basis was **1,400.36 MU**, out of which, **617.84 MU (44.12%)** was transacted on IEX and **782.52 MU (55.88%)** was transacted on PXIL.
- 5.2.** The total volume of electricity transacted on both the power exchanges in Term Ahead Market in January, 2022 on trade date basis was **601.76 MU**, out of which, **364.09 MU (60.50%)** was transacted on IEX and **237.67 MU (39.50%)** was transacted on PXIL.
- 5.3.** Similarly, total volume of electricity transacted during February, 2021 in Term Ahead Market on trade date basis on both the power exchanges was **749.56 MU**, out of which, **305.50 MU (40.76 %)** was transacted on IEX and **444.06 MU (59.24%)** was transacted on PXIL.
- 5.4.** With respect to the total energy supplied during month of February, 2022 in the country, the volume of electricity traded on power exchanges in TAM on trade date basis represents **1.30 %** of the total energy supplied. The same was **0.54 %** in January, 2022 and **0.73 %** in February, 2021.
- 5.5.** In the month of February, 2022, there was transmission congestion of **1.50 MU** in Day Ahead Contingency contract in IEX in TAM. Whereas, In PXIL there was no transmission congestion TAM in the month of February, 2022.
- 5.6. The comparison of total volume of electricity transacted and Average MCP on both the power exchanges in Term Ahead Market (TAM) during February, 2022 with January, 2022 and February, 2021 is given in Table- 5A, 5B & 5C:**

(a) February, 2022 vis- a- vis January, 2022 (on trade Date Basis)

Contract Type	IEX			PXIL		
	February, 2022	January, 2022	% Change	February, 2022	January, 2022	% Change
Intra Day (MU)	-	0.17	NA	1.41	0.26	442.31
Day Ahead Contingency(MU)	168.27	102.18	64.68	534.99	203.81	162.49
Daily/ AnyDay (MU)	449.57	261.74	71.76	246.12	33.60	632.50
Weekly (MU)	-	-	NA	-	-	NA

- : No Transaction happened

NA: Not Applicable

Table: 5A

(b) February, 2022 vis- a- vis February, 2021 (on trade Date Basis)

Contract Type	IEX			PXIL		
	February, 2022	February, 2021	% Change	February, 2022	February, 2021	% Change
Intra Day (MU)	-	1.31	NA	1.41	14.55	-90.31
Day Ahead Contingency(MU)	168.27	56.71	196.72	534.99	-	NA
Daily/ AnyDay (MU)	449.57	247.48	81.66	246.12	429.51	-42.70
Weekly (MU)	-	-	NA	-	-	NA

- : No Transaction happened

NA: Not Applicable

Table: 5B**(c) Average MCP, February, 2022 vis- a- vis February, 2021 and January, 2022 (on trade Date Basis)**

Exchange	Period	Average MCP (Rs/kWh)			
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly
IEX	February, 2022	-	5.88	4.67	-
	January, 2022	3.50	4.08	3.39	-
	%Change (Month over Month)	NA	44.12	37.76	NA
	February, 2021	3.36	3.42	2.94	-
	%Change (Year over Year)	NA	71.93	58.84	NA
PXIL	February, 2022	5.30	4.48	4.53	-
	January, 2022	8.00	3.66	3.41	-
	%Change (Month over Month)	-33.75	22.40	32.84	NA
	February, 2021	4.20	-	3.62	-
	%Change (Year over Year)	26.19	NA	25.14	NA

-: No transaction happened

NA: Not Applicable

Table: 5C**Term Ahead Market (TAM) (on delivery Date Basis)**

- 5.7. The total volume of electricity transacted on both the power exchanges in Term Ahead Market in February, 2022 on delivery date basis was **1,261.73 MU**, out of which, **526.80 MU** (41.75 %) was transacted on IEX and **734.93 MU** (58.25 %) was transacted on PXIL.
- 5.8. The total volume of electricity transacted on both the power exchanges in Term Ahead Market in January, 2022 on delivery date basis was **655.08 MU**, out of which, **390.27 MU** (59.58%) was transacted on IEX and **264.81 MU** (40.42%) was transacted on PXIL.
- 5.9. Similarly, total volume of electricity transacted during February, 2021 in Term Ahead Market on both the power exchanges on delivery date basis was **912.62 MU**, out of which, **432.24 MU** (47.36 %) was transacted on IEX and **480.38 MU** (52.64%) was transacted on PXIL.
- 5.10. With respect to the total energy supplied during the month of February, 2022 in the country, the volume of electricity traded on the power exchanges in TAM on delivery date basis

represents **1.17 %** of the total energy supplied. The same was **0.59 %** in January, 2022 and **0.88 %** in February, 2021.

5.11. In the month of February, 2022, there was real time curtailment of **12.54 MU** in TAM. Out of which **8.05 MU** (7.14 under Daily/Anyday contract and 0.91 MU under Day Ahead Contingency Contract) happened in IEX, whereas, in PXIL there was real time curtailment of **4.49 MU** (3.44 under Daily/Anyday contract and 1.05 MU under Day Ahead Contingency Contract) in TAM.

5.12. The comparison of total volume of electricity transacted and Average MCP in both the power exchanges in Term Ahead Market (TAM) on delivery date basis during February, 2022 with January, 2022 and February, 2021 is given in Table – 5D, 5E & 5F:

(a) February, 2022 vis- a- vis January, 2022 (on Delivery Date Basis)

Contract Type	IEX			PXIL		
	February, 2022	January, 2022	% Change	February, 2022	January, 2022	% Change
Intra Day (MU)	-	0.17	NA	1.41	0.26	442.31
Day Ahead Contingency(MU)	163.00	102.31	59.32	526.84	205.75	156.06
Daily/Any Day (MU)	363.80	287.79	26.41	206.68	58.80	251.50
Weekly (MU)	-	-	NA	-	-	NA

- : No transaction happened

NA: Not Applicable

Table: 5D

(b) February, 2022 vis- a- vis February, 2021 (on Delivery Date Basis)

Contract Type	IEX			PXIL		
	February, 2022	February, 2021	% Change	February, 2022	February, 2021	% Change
Intra Day (MU)	-	1.31	NA	1.41	14.55	-90.31
Day Ahead Contingency MU)	163.00	58.26	179.78	526.84	-	NA
Daily/ Any Day (MU)	363.80	372.67	-2.38	206.68	465.83	-55.63
Weekly (MU)	-	-	NA	-	-	NA

-: No transaction happened

NA: Not Applicable

Table: 5E

(c) Average MCP, February, 2022 vis- a- vis February, 2021 and January, 2022 (on Delivery Date Basis)

Exchange	Period	Average MCP (Rs/kWh)			
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly
IEX	February, 2022	-	5.88	4.10	-
	January, 2022	3.50	4.05	3.37	-
	%Change (Month over Month)	NA	45.19	21.66	NA
	February, 2021	3.36	3.46	2.94	-
	%Change	NA	69.94	39.46	NA

	Year over Year)				
PXIL	February, 2022	5.30	4.48	4.08	-
	January, 2022	8.00	3.65	3.25	-
	%Change (Month over Month)	-33.75	22.74	25.54	NA
	February, 2021	3.99	-	3.33	-
	%Change (Year over Year)	32.83	NA	22.52	NA

-: No transaction happened

NA: Not Applicable

Table: 5F

6. GREEN TERM AHEAD MARKET (GTAM):

The transaction of electricity in Green Term Ahead Market was started in IEX w.e.f. 21st August, 2020 onwards, whereas, in PXIL, GTAM (Non-Solar) was started w.e.f. 24th March, 2021 and GTAM (Solar) w.e.f. June, 2021 onwards. The total volume of electricity transacted in both the power exchanges in GTAM on trade date basis was **655.54 MU** (185.45 MU in Solar and 470.09 MU in non-Solar), whereas, the same on delivery date basis was **647.32 MU** (183.22 MU in Solar and 464.10 MU in Non-Solar), respectively. The total volume of electricity transacted in Solar Energy Segment in GTAM in Day Ahead Contingency, Intraday, Daily/ Anyday and Weekly contracts during February, 2022 on trade date basis and delivery date basis has been shown in Tables 6A to 6H.

6.1. Solar Energy Segment in GTAM (On Trade date basis)

The Final Scheduled Volume and the Price of electricity transacted in GTAM in IEX & PXIL during February, 2022 and its comparison with January, 2022 has been shown in Table 6A & 6B below.

(i) Final Scheduled Volume:

Exch -ange	Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	24.40	0.18	2.12	0.90
		January, 2022	19.39	0.03	2.15	0.67
		%Change (Month over Month)	25.84	500.00	-1.40	34.33
		February, 2021	35.76	0.15	2.08	1.28
		%Change (Year over Year)	-31.77	20.00	1.92	-29.69
	Intraday	February, 2022	1.39	0.05	0.53	0.09
		January, 2022	1.23	0.04	0.06	0.04
		%Change (Month over Month)	13.01	25.00	783.33	125.00
		February, 2021	1.72	0.05	1.04	0.57
		%Change (Year over Year)	-19.19	0.00	-49.04	-84.21
IEX	Daily/ Anyday	February, 2022	7.49	7.49	7.49	7.49
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2021	-	-	-	-

PXIL	Weekly	%Change (Year over Year)	NA	NA	NA	NA
		February, 2022	6.52	6.52	6.52	6.52
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Day Ahead Contingency	February, 2022	145.06	3.77	7.39	5.18
		January, 2022	101.49	0.58	5.87	3.27
		%Change (Month over Month)	42.93	550.00	25.89	58.41
	Intraday	February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Daily/ Anyday	February, 2022	0.59	0.59	0.59	0.59
		January, 2022	1.82	0.86	0.96	0.91
		%Change (Month over Month)	-67.58	-31.40	-38.54	-35.16
	Weekly	February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA

-: No transaction happened

NA: Not Applicable

Table-6A

(ii) Daily Market Clearing Price (MCP):

Exchange	Solar Energy Contract	Period	Prices(Rs/kWh)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	3.61	5.97	4.19
		January, 2022	2.39	4.50	3.75
		%Change (Month over Month)	51.05	32.67	11.73
		February, 2021	3.54	4.88	4.03
		%Change (Year over Year)	1.98	22.34	3.97
	Intraday	February, 2022	3.60	3.60	3.60
		January, 2022	3.50	3.60	3.52
		%Change (Month over Month)	2.86	0.00	2.27
		February, 2021	4.00	4.50	4.17
		%Change (Year over Year)	-10.00	-20.00	-13.67
	Daily/Anyday	February, 2022	3.96	3.96	3.96
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		February, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA

	Weekly	February, 2022	3.97	3.97	3.97
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		February, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	February, 2022	3.77	6.24	4.70
		January, 2022	3.46	4.77	3.92
		%Change (Month over Month)	8.96	30.82	19.90
	Intraday	February, 2022	-	-	-
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Daily/ Anyday	February, 2022	4.50	4.50	4.50
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Weekly	February, 2022	-		
		January, 2022	-		
		%Change (Month over Month)	NA		

-: No transaction happened

NA: Not Applicable

Table-6B

6.2. Solar Energy Segment in GTAM (On Delivery date basis)

The Final Scheduled Volume and the Price of electricity transacted in GTAM in IEX & PXIL during February, 2022 and its comparison with January, 2022 has been shown in Table 6C & 6D below.

(i) Final Scheduled Volume:

Exch-ange	Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	22.43	0.15	2.06	0.83
		January, 2022	102.31	0.96	7.04	3.30
		%Change (Month over Month)	-78.08	-84.38	-70.74	-74.85
		February, 2021	35.89	0.15	2.08	1.28
		%Change (Year over Year)	-37.50	0.00	-0.96	-35.16
	Intraday	February, 2022	1.39	0.05	0.53	0.09
		January, 2022	0.17	0.17	0.17	0.17
		%Change (Month over Month)	717.65	-70.59	211.76	-47.06
		February, 2021	1.72	0.05	1.04	0.57
		%Change (Year over Year)	-19.19	0.00	-49.04	-84.21
	Daily/Anyday	February, 2022	7.49	0.64	1.55	1.25
		January, 2022	287.79	4.18	11.98	9.28
		%Change (Month over Month)	-97.40	-84.69	-87.06	-86.53
		February, 2021	0.40	0.20	0.20	0.20

	Weekly	%Change (Year over Year)	1772.50	220.00	675.00	525.00
		February, 2022	6.52	0.93	0.93	0.93
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	February, 2022	145.39	3.77	7.39	5.19
		January, 2022	98.21	0.58	5.45	3.17
		%Change (Month over Month)	48.04	550.00	35.60	63.72
	Intraday	February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Daily/Anyday	February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Weekly	February, 2022	-			
		January, 2022	-			

-: No transaction happened

NA: Not Applicable

Table-6C

(ii) Daily Market Clearing Price (MCP):

Exchange	Solar Energy Contract	Period	Prices(Rs/kW)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	3.61	5.97	4.20
		January, 2022	2.91	5.55	4.05
		%Change (Month over Month)	24.05	7.57	3.70
		February, 2021	3.54	4.88	4.04
		%Change (Year over Year)	1.98	22.34	3.96
	Intraday	February, 2022	3.60	3.60	3.60
		January, 2022	3.50	3.50	3.50
		%Change (Month over Month)	2.86	2.86	2.86
		February, 2021	4.00	4.50	4.17
		%Change (Year over Year)	-10.00	-20.00	-13.67
	Daily/Anyday	February, 2022	3.96	3.96	3.96
		January, 2022	3.11	3.78	3.37
		%Change (Month over Month)	27.33	4.76	17.51
		February, 2021	4.50	4.50	4.50
		%Change (Year over Year)	-12.00	-12.00	-12.00
	Weekly	February, 2022	3.97	3.97	3.97
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		February, 2021	-	-	-

		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	February, 2022	3.77	6.24	4.72
		January, 2022	3.46	4.77	3.88
		%Change (Month over Month)	8.96	30.82	21.65
	Intraday	February, 2022	-	-	-
		January, 2022	-	-	-
		%Change (Month over Month)	NA		
	Daily/Anyday	February, 2022	-	-	-
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Weekly	February, 2022	-		
		January, 2022	-		

-: No transaction happened

NA: Not Applicable

Table-6D

- In February, 2022, there was no transmission congestion in GTAM (Solar) in both IEX and PXIL.
- In February, 2022, there was no real time curtailment in GTAM (Solar) in both IEX & PXIL.

6.3. Non-Solar Energy Segment in GTAM (On Trade date basis)

The total volume of electricity transacted on both the power exchanges in non-Solar Energy Segment in GTAM in Day Ahead Contingency, Intraday, Daily/ Anyday and Weekly contracts during February, 2022 on trade date basis and delivery date basis has been shown in Tables 6E to 6H.

The Final Scheduled Volume and the Price of electricity transacted in Non-Solar GTAM in IEX & PXIL during February, 2022 on trade date basis and its comparison with January, 2022 has been shown in Table 6E & 6F below.

(i) Final Scheduled Volume:

Exchange	Non- Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	216.42	2.24	13.45	7.73
		January, 2022	52.29	0.04	6.33	1.69
		%Change (Month over Month)	313.88	5500.00	112.48	357.40
		February, 2021	56.25	0.28	8.38	2.08
		%Change (Year over Year)	284.75	700.00	60.50	271.63
	Intraday	February, 2022	0.02	0.02	0.02	0.02
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/ Anyday	February, 2022	5.22	0.28	2.48	1.31
		January, 2022	8.52	1.92	2.40	2.13
		%Change (Month over Month)	-38.73	-85.42	3.33	-38.50
		February, 2021	-	-	-	-

PXIL	Weekly	%Change (Year over Year)	NA	NA	NA	NA
		February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2021	-	-	-	-
	Day Ahead Contingency	%Change (Year over Year)	NA	NA	NA	NA
		February, 2022	248.43	1.13	15.26	8.87
		January, 2022	52.92	0.22	7.59	1.71
		%Change (Month over Month)	369.44	413.64	101.05	418.71
		February, 2022	-	-	-	-
PXIL	Intraday	January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2022	-	-	-	-
	Daily/ Anyday	January, 2022	1.82	0.86	0.96	0.91
		%Change (Month over Month)	NA	NA	NA	NA
		February, 2022	-	-	-	-
	Weekly	January, 2022	-	-	-	-
		February, 2022	-	-	-	-
	Weekly	January, 2022	-	-	-	-
		February, 2022	-	-	-	-

-: No transaction happened

NA: Not Applicable

Table-6E

(ii) Daily Market Clearing Price (MCP):

Exchange	Non- Solar Energy Contract	Period	Prices(Rs/kWh)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	3.96	6.10	4.52
		January, 2022	3.75	4.23	3.95
		%Change (Month over Month)	5.60	44.21	14.43
		February, 2021	3.80	4.99	4.42
		%Change (Year over Year)	4.21	22.24	2.26
	Intraday	February, 2022	5.00	5.00	5.00
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		February, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/ Anyday	February, 2022	4.65	4.70	4.66
		January, 2022	4.65	4.65	4.65
		%Change (Month over Month)	0.00	1.08	0.22
		February, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Weekly	February, 2022	-	-	-
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA

PXIL		February, 2021	-	-	-
		% Change (Year over Year)	NA	NA	NA
		February, 2022	4.06	6.85	4.95
	Day Ahead Contingency	January, 2022	3.62	4.20	4.04
		% Change (Month over Month)	12.15	63.10	22.52
		February, 2022	-	-	-
	Intraday	January, 2022	-	-	-
		% Change (Month over Month)	NA	NA	NA
		February, 2022	-	-	-
	Daily/ Anyday	January, 2022	4.25	4.28	4.27
		% Change (Month over Month)	NA	NA	NA
		February, 2022	-	-	-
	Weekly	January, 2022	-	-	-
		February, 2022	-	-	-

-: No transaction happened

NA: Not Applicable

Table-6F

6.4. Non-Solar Energy Segment in GTAM (On Delivery date basis)

The Final Scheduled Volume and the Price of electricity transacted in GTAM in IEX & PXIL during February, 2022 and its comparison with January, 2022 has been shown in Table 6G & 6H below.

(i) Final Scheduled Volume:

Exch- ange	Non- Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	213.81	2.24	13.45	7.64
		January, 2022	52.75	0.04	6.33	1.70
		% Change (Month over Month)	305.33	5500.00	112.48	349.41
		February, 2021	55.13	0.28	8.38	2.04
		% Change (Year over Year)	287.83	700.00	60.50	274.51
	Intraday	February, 2022	0.02	0.02	0.02	0.02
		January, 2022	-	-	-	-
		% Change (Month over Month)	NA	NA	NA	NA
		February, 2021	-	-	-	-
		% Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	February, 2022	6.28	0.11	0.30	0.22
		January, 2022	7.02	0.12	0.30	0.29
		% Change (Month over Month)	-10.54	-8.33	0.00	-24.14
		February, 2021	0.14	0.07	0.07	0.07
		% Change (Year over Year)	4385.71	57.14	328.57	214.29
	Weekly	February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		% Change	NA	NA	NA	NA

		(Month over Month)				
		February, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	February, 2022	244.01	1.10	15.26	8.71
		January, 2022	57.96	0.22	7.59	1.87
		%Change (Month over Month)	321.00	400.00	101.05	365.78
	Intraday	February, 2022	-	-	-	-
		January, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Daily/Anyday	February, 2022	-	-	-	-
		January, 2022	2.78	0.10	0.10	0.10
		%Change (Month over Month)	NA	NA	NA	NA
	Weekly	February, 2022	-			
		January, 2022	-			

-: No transaction happened

NA: Not Applicable

Table-6G

(ii) Daily Market Clearing Price (MCP):

Exchange	Non- Solar Energy Contract	Period	Prices(Rs/kW)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	February, 2022	3.96	6.10	4.50
		January, 2022	3.75	4.23	3.94
		%Change (Month over Month)	5.60	44.21	14.21
		February, 2021	3.80	4.99	4.44
		%Change (Year over Year)	4.21	22.24	1.35
	Intraday	February, 2022	5.00	5.00	5.00
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		February, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	February, 2022	4.65	4.70	4.66
		January, 2022	4.65	4.65	4.65
		%Change (Month over Month)	0.00	1.08	0.22
		February, 2021	4.01	4.01	4.01
		%Change (Year over Year)	15.96	17.21	16.21
	Weekly	February, 2022	-	-	-
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		February, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	February, 2022	4.06	6.85	4.94
		January, 2022	3.62	4.20	4.02

		%Change (Month over Month)	12.15	63.10	22.89
	Intraday	February, 2022	-	-	-
		January, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Daily/Anyday	February, 2022	-	-	-
		January, 2022	4.25	4.40	4.31
		%Change (Month over Month)	NA	NA	NA
	Weekly	February, 2022	-		
		January, 2022	-		

-: No transaction happened

NA: Not Applicable

Table-6H

- In February, 2022, there was no transmission congestion in GTAM (Non-Solar) in both IEX and PXIL.
- In February, 2022, there was no real time curtailment in GTAM (Non-Solar) in both IEX & PXIL.

7. BILATRAL TRANSACTIONS:

The total volume of electricity transacted through **Bilateral transactions** in the month of February, 2022 was **6,539.03 MU**. The total buy volume of electricity transacted in bilateral market through direct transactions and traders in the month of February, 2022 were **1,713.02 MU** and **4,826.02 MU** respectively. The details of Bilateral transactions of Electricity happened during February, 2022 have been shown in Table Below:

February, 2022	Direct	Traders	Total Bilateral Transaction (MU)
Total	1,713.02	4,826.02	6,539.03
Minimum	1.83	3.36	-
Maximum	902.91	915.18	-

Table -7A

The region-wise maximum/ minimum volume of electricity transaction happened bilaterally during February, 2022 are given in table below:

(i) Region-wise Volume:

Region-wise Volume (MU)	ER		WR		NR		SR		NER	
	Direct	Trader	Direct	Trader	Direct	Trader	Direct	Trader	Direct	Trader
Total	207.24	931.68	1344.23	1324.69	124.44	1335.47	37.10	1106.84	0.00	127.33
Minimum	6.50	14.08	2.31	32.77	1.83	17.21	8.60	43.44	0.00	3.36
Maximum	126.91	652.44	902.91	915.18	75.82	440.79	28.51	597.36	0.00	76.15

Table-7B

7.1. The top 5 buyers on bilateral transaction through direct transactions in the month of February, 2022 were **Madhya Pradesh, Maharashtra, Jharkhand, AMNSIL_WR, and Haryana**, which constituted **82.85 %** of the market volume. Whereas **top 5 buyers** on bilateral transaction through traders in the month of February, 2022 were **Gujarat, Odisha, Tamil Nadu, Himachal Pradesh and Rajasthan**, which constituted **62.72 %** of the market volume. [Annexure III]

7.2. The **top 5 sellers** on bilateral transaction through direct transactions in the month of February, 2022 were **Punjab, Uttar Pradesh, DBPL, DVC and Adhunik Power**, which constituted **66.08 %** of the market volume. Whereas **top 5 sellers** on bilateral transaction through traders in the month of February, 2022 were **RPREL, Karnataka, JITPL, Delhi and ESSARMPL**, which constituted **41.81 %** of the market volume. [Annexure III]

7.3. **Deviation Volume** - The volume of Deviation observed in the month of February, 2022 in import and export were **1,812.94 MU** and **1,826.46 MU** respectively. The total volume of Deviation observed in the month of February, 2022 can be taken as **1,819.70 MU**.

7.4. A comparison of volume of electricity transacted through both the Power Exchanges together in DAM, TAM, RTM, GTAM, GDAM (on delivery date basis) with Bilateral transactions and Deviation in the month of February, 2022 is shown in **Figure 1**:

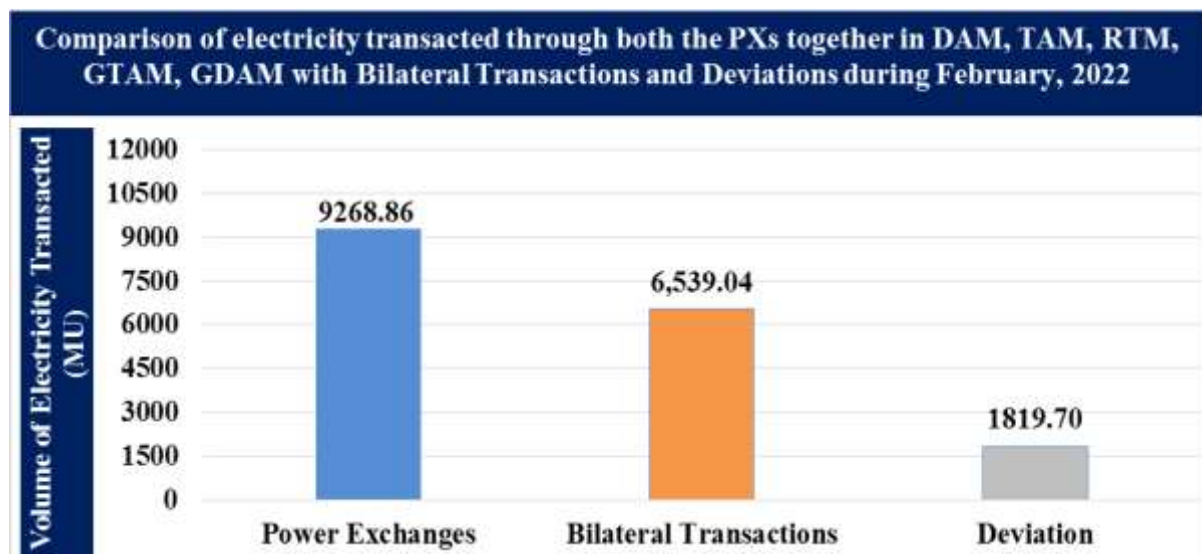


Figure -1

8. ANALYSIS OF MOVEMENT OF PRICES OBSERVED IN DAM DURING FEBRUARY, 2022

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 February, 2022 month. The observations made are as under:

- 8.1. 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, total purchase bid, total sell bid, coal generation, hydro generation, wind generation and solar generation.
- 8.2. 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 only significant variable was the total purchase bid, whereas all the other variables were found to be insignificant. Further, the regression analysis revealed that the elasticity of the Daily MCP with respect to total purchase bid was **1.20**, which signifies that there is high multicollinearity among the predictor variables/ independent variables used in regression analysis.

8.3. The same relationship is visible from the analysis carried out from the plot in **Figure 2**.

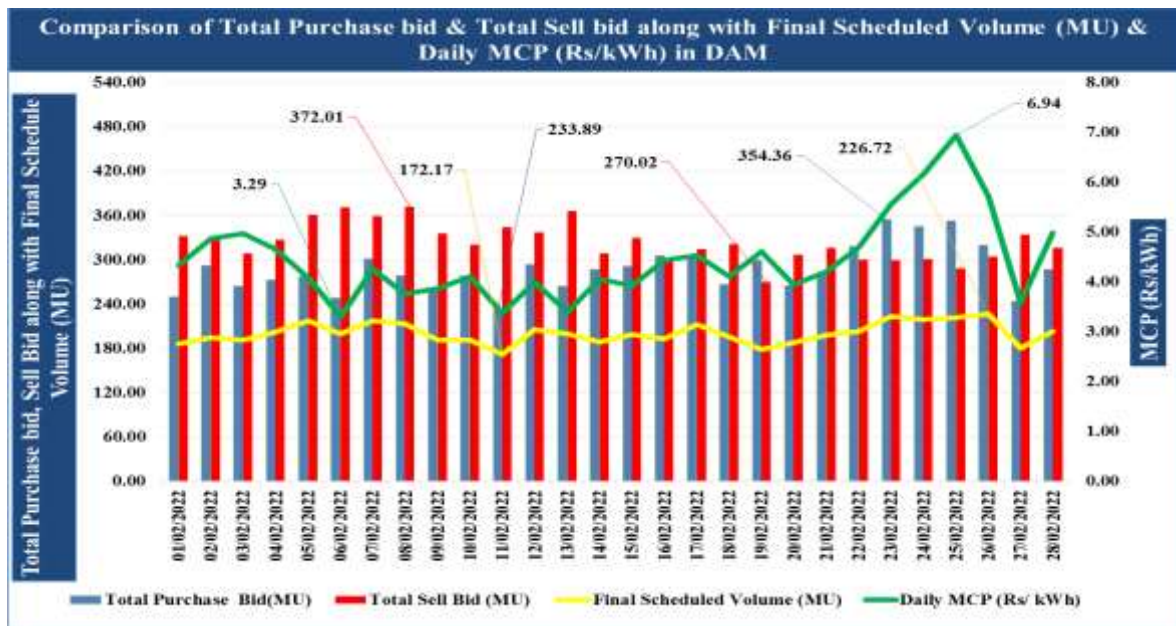


Figure -2

8.4. Invariably, the Final Scheduled Volume (MU) and the Daily MCP (Rs/kWh) showed decreasing trend on Sundays and increasing trend on Mondays as the demand of electricity in the country was less on Sundays as compared to other days of week. However, during the month of February, 2022, it is observed that on second Monday (14th February, 2022), FSV showed decreasing trend in comparison to second Sunday (13th February, 2022). Similarly, on third Sunday (20th February, 2022) also, the FSV showed increasing trend in comparison to third Saturday (19th February, 2022). The detailed analysis on this is given at **Appendix-I**.

8.5. A comparison of maximum, minimum, daily, evening time MCP is shown in **Figure -3**. The same are also tabulated in **Annexure-IV**.

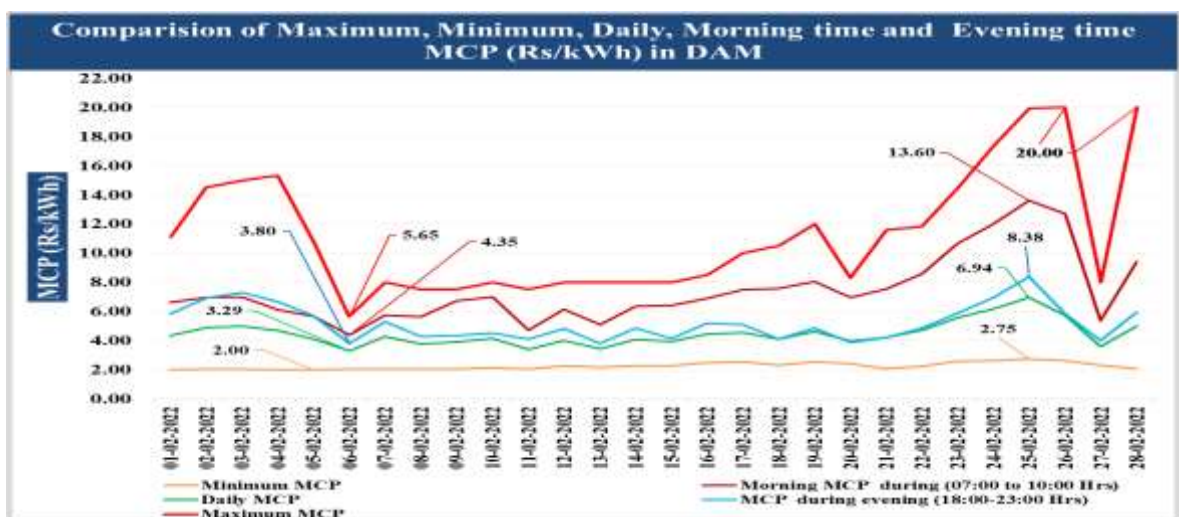


Figure -3

8.6. The Market Clearing Price duration curves for time block wise MCP for the month of February, 2022 is shown in **Figure 4**, whereas the day wise MCP duration curve for the period 1st April, 2021 to 28th February, 2022 is shown in **Figure 5**.

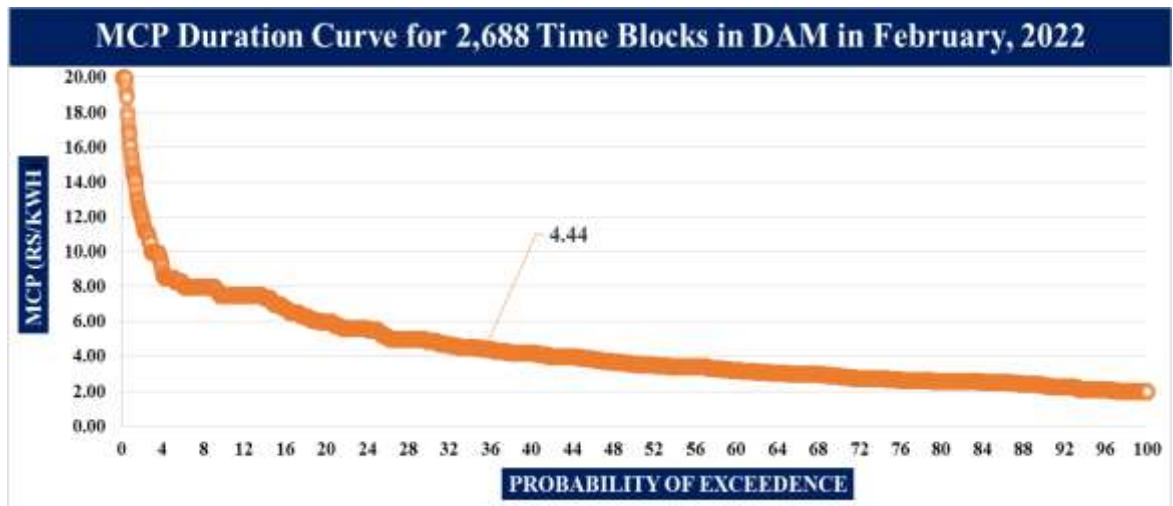


Figure-4

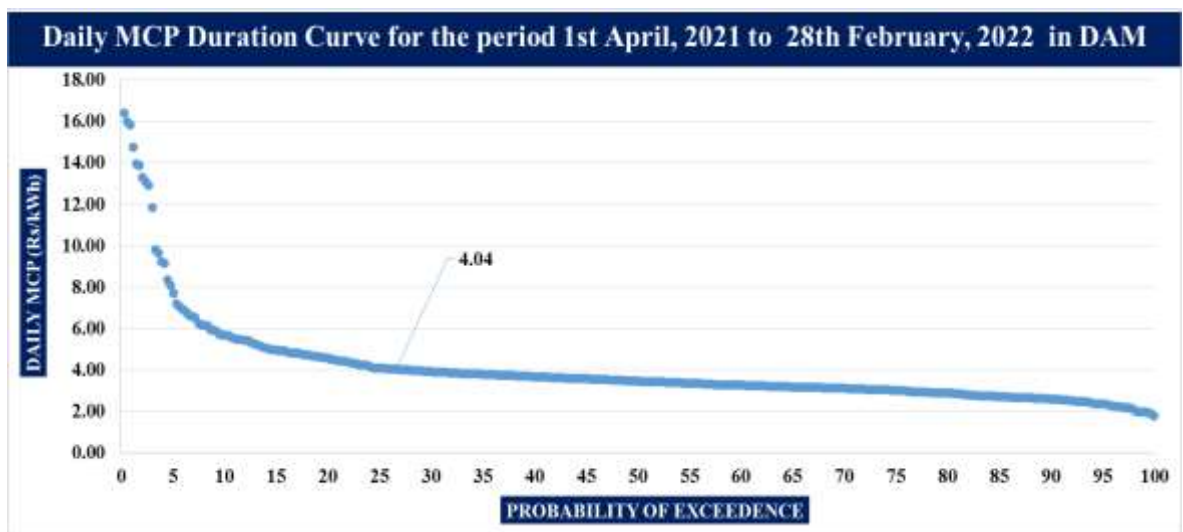


Figure-5

- 8.7. It can be seen in figure 4 above that in the MCP duration curve of February, 2022, for 35.14 % of the time MCP was above average MCP of the month (i.e. **Rs. 4.44/kWh**) and almost 64.86 % of the time MCP was below the average MCP of the month. Similarly, it can be seen in the cumulative MCP duration curve from 1st April, 2021 to 28th February, 2022 (figure-5), that for 26.94 % of the time the daily MCP was above the average MCP for the period (i.e. **Rs. 4.04/kWh**) and for 73.06 % of the time the daily MCP was below the average MCP for the period.
- 8.8. The Purchase Bids and the MCP discovered in each of the 15-minute time block during the month almost followed the same trend [Annexure V]. This is also corroborated with the outcome of regression analysis mentioned at **para 8.1 and 8.2 above**.
- 8.9. In February, 2022, the maximum FSV occurred mostly during the **time period 7-9 AM and 3-5 PM** (on 26 no. of days). Whereas, the maximum MCP occurred mostly during the **time period 7-8 AM and 6-7 PM** (on 26 no. of days). Similarly, the minimum FSV occurred mostly during the **time period 10 PM -12 AM** (on 20 no. of days). Whereas, the minimum MCP occurred mostly during the **time period 3-5 AM** (on 24 no. of days). [Annexure VI]
- 8.10. The maximum demand met during the month of February, 2022 in the country occurred on **25th February, 2022 at 193.65 GW**, which is 0.82 % more than the maximum demand

occurred during **January, 2022 [i.e. 192.08 GW on 31st January, 2022]** and is 2.92 % more than the maximum demand occurred during **February, 2021 i.e. [188.15 GW on 2nd February, 2021]**.

- 8.11.** In the month of February, 2022, One nation One Price was observed in IEX for **all 28 days** during the month, as there was no transmission congestion. Whereas, in PXIL also, there was no congestion in transmission system during February, 2022, so one nation one price was observed on all **22 days** during which transaction of electricity happened (i.e. 1st to 19th, 21st, 22nd and 27th February, 2022). While in the month of January, 2022, One nation One Price was observed in IEX for **all 31 days** during the month, as there was no transmission congestion. Whereas, in PXIL also, there was no congestion in transmission system during January, 2022, so one nation one price was observed on all **16 days** during which transaction of electricity happened (i.e. 6th to 08th, 11th to 13th, 18th to 22nd, 25th to 28th and 31st January, 2022). Similarly, in the month of February, 2021, there was no congestion in transmission system, so One nation One Price was observed for all **28 days** in IEX & PXIL in February, 2021.
- 8.12.** In the month of February, 2022, there was **no** real time curtailment in IEX and PXIL in February, 2022. Further, in the month of January, 2022 also, there was no real time curtailment both IEX and PXIL. In the month of February, 2021, there was no real time curtailment in IEX and PXIL, respectively.
- 8.13.** The **top 10 sellers** on the power exchanges in **Day Ahead Market (DAM)** in the month of February, 2022 were, **Uttar Pradesh, West Bengal, Bihar, Chhattisgarh, Jindal Power Ltd. Stg-II, Rajasthan, Madhya Pradesh, Odisha, Sembcorp Gayatri and Essar Power MP Ltd.**, which constituted **71.49 %** of the market volume. **[Annexure VII]**
- 8.14.** The **top 10 purchasers** on the power exchanges in **Day Ahead Market (DAM)** in the month of February, 2022 were, **Gujarat, Telangana, Tamil Nadu, J&K, Maharashtra, Andhra Pradesh, Haryana, Rajasthan, Uttarakhand and Uttar Pradesh**, which constituted **83.27 %** of the market volume. **[Annexure VII]**
- 8.15.** The total volume of electricity purchased by Discoms/Licensees in DAM in the month of February, 2022 was **5,311.82 MU**, which constituted **94.64 %** of total volume of electricity purchased on both the power exchanges.
- 8.16.** Similarly, the total volume of electricity sold by Discoms/Licensees in DAM in the month of February, 2022 was **3,984.10 MU**, which constituted **70.98 %** of total volume of electricity sold on both the power exchanges.

9. ANALYSIS OF MOVEMENT OF PRICES OBSERVED IN REAL TIME MARKET (RTM) TRANSACTIONS IN FEBRUARY, 2022

- 9.1.** Similar to the regression analysis carried out for Day Ahead Market, the regression analysis for Real Time Market was also done. The regression analysis revealed that the significant variables were the total purchase bid and total sell bid, whereas all the other variables were found to be insignificant. Further, the regression analysis revealed that the elasticity of the Daily MCP with respect to total Purchase Bid was **0.95**. In effect, the regression reveals that

the most important variable which determines daily market clearing price is the total purchase bid in the month of February, 2022 for RTM transactions.

- 9.2. The Purchase Bids and the MCP discovered in each of the 15-minute time block during the month almost followed the same trend [Annexure IX]. This is also corroborated with the outcome of regression analysis mentioned at **para 9.1 above**.
- 9.3. The Total Purchase Bid, Total Sell Bid, Daily MCP and FSV are shown in Figure-6 below:

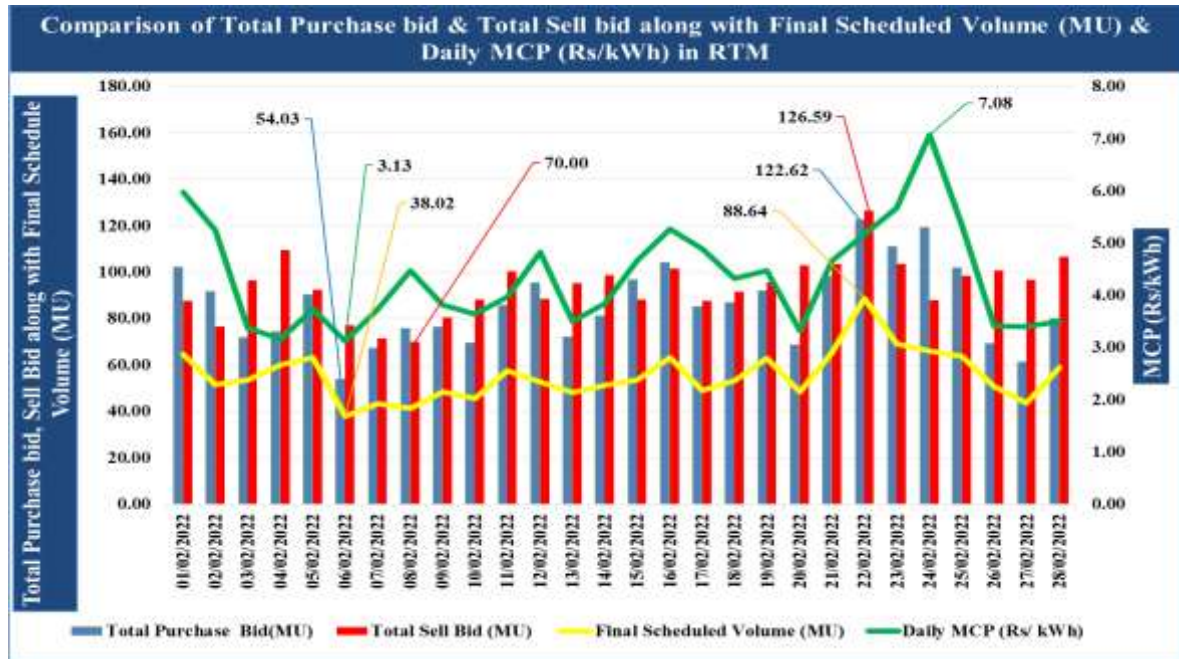


Figure-6

- 9.4. A comparison of maximum, minimum, daily, evening time MCP is shown in **Figure-7**. The same are also tabulated in **Annexure-VIII**.

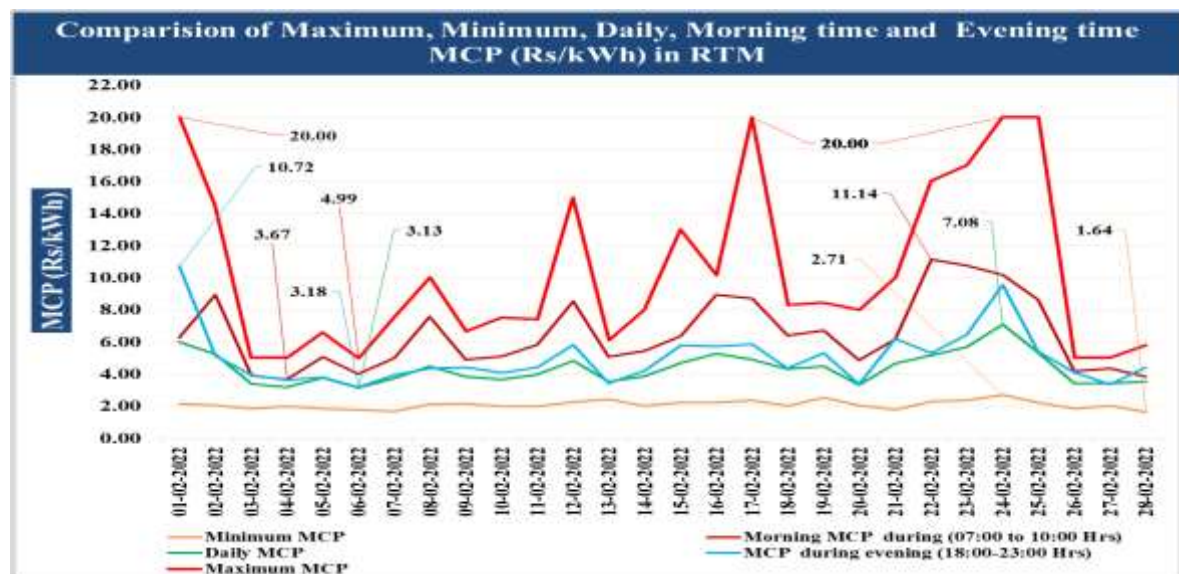


Figure-7

- 9.5. The Market Clearing Price duration curves for time block wise MCP for the month of February, 2022 is shown in **Figure 8**, whereas the day wise MCP duration curve for the period 1st April, 2021 to 28th February, 2022 is shown in **Figure 9**.

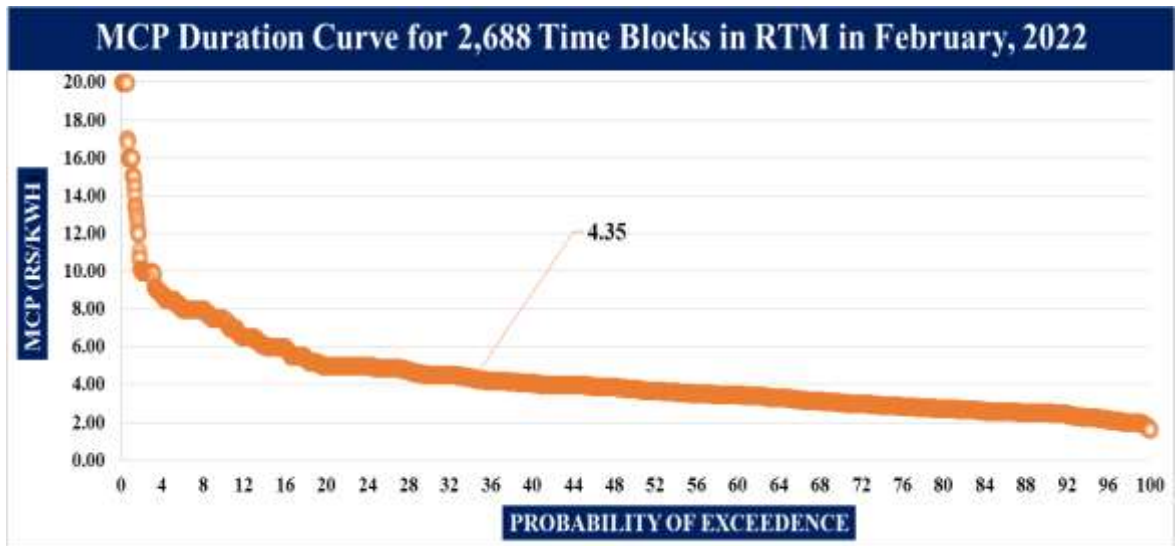


Figure-8

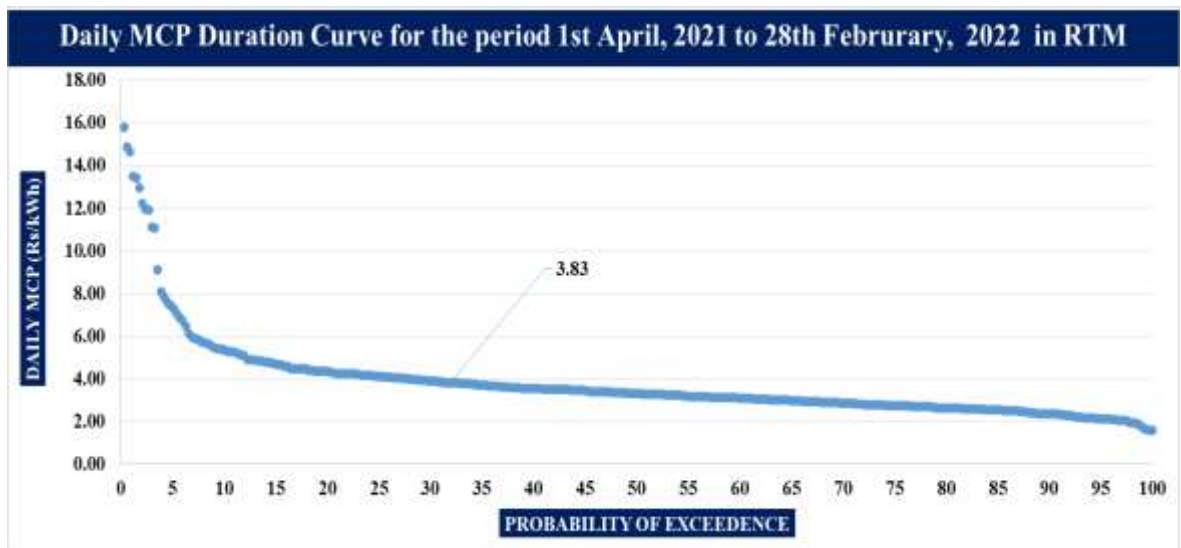


Figure-9

- 9.6. It can be seen in figure 8 above that in the MCP duration curve of February, 2022, for 32.23 % of the time the MCP was above the average MCP of the month (i.e. **Rs. 4.35/kWh**) and for 67.77 % of the time the MCP was below the average MCP of the month. Similarly, it can be seen in the cumulative MCP duration curve from 1st April, 2021 to 28th February, 2022 (figure 9) that, for 31.33 % of the time the daily MCP was above the average MCP for the period (i.e. **Rs. 3.83/kWh**) and for 68.27 % of the time the daily MCP was below the average MCP for the period.
- 9.7. In February, 2022, the maximum FSV occurred mostly during the **time period 7-8 AM & 7-8 PM** (on 13 no. of days). Whereas, the maximum MCP also occurred mostly during the **time period 7-8 AM & 7-8 PM** (on 19 no. of days). Similarly, the minimum FSV occurred mostly during the **time period 12-1 AM** (on 11 no. of days). Whereas, the minimum MCP occurred mostly during the **time period 2-4 AM** (on 19 no. of days). [Annexure X]
- 9.8. There was **no** real time curtailment in IEX in Real Time Market (RTM) during February, 2022 and January, 2022, whereas, no transaction of electricity happened in PXIL during February, 2022 and January, 2022. Similarly, in February, 2021, there was no real time

curtailment in IEX, whereas, no transaction of electricity happened in PXIL during February, 2021 in Real Time Market (RTM).

- 9.9.** In the month of February, 2022, there was congestion of **0.05 MU** in the transmission system in IEX on 26th & 28th February, 2022, hence one nation one price was observed for **26 days** in IEX during February, 2022, whereas, in PXIL, no transaction of electricity happened in February, 2022. Further, in the month of January, 2022, there was congestion of **0.005 MU** in the transmission system in IEX on 11th January, 2022, hence one nation one price was observed for **30 days** in IEX during January, 2022, whereas, in PXIL, no transaction of electricity happened in February, 2022. In the month of February, 2021, there was congestion of **0.61 MU** in transmission system in IEX in Real Time Market on account of congestion on eleven days (i.e. 4th to 6th, 9th, 12th, 15th to 17th, 21st, 27th to 28th February, 2021), hence, one nation one price was observed for **17 days** in IEX. Whereas, in PXIL, no transaction of electricity happened in February, 2021 in Real Time Market.
- 9.10.** The **top 10 sellers** on the power exchanges in **Real Time Market (RTM)** in the month of February, 2022 were **West Bengal, Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh, Orissa, Chhattisgarh, Delhi, Kerala and DVC**, which constituted **74.19%** of the market volume. **[Annexure XI]**
- 9.11.** The **top 10 buyers** on the power exchanges in **Real Time Market (RTM)** in the month of February, 2022 were **J&K, Andhra Pradesh, Telangana, Maharashtra, Gujarat, Tamil Nadu, Haryana, Rajasthan, Uttar Pradesh and Orissa**, which constituted **88.78%** of the market volume. **[Annexure XI]**
- 9.12.** The total volume of electricity purchased by Discoms/Licensees in RTM in the month of February, 2022 was **1,543.39 MU**, which constituted **99.20 %** of total volume of electricity purchased on both the power exchanges.
- 9.13.** Similarly, the total volume of electricity sold by Discoms/Licensees in RTM in the month of February, 2022 was **1,331.54 MU**, which constituted **85.59 %** of total volume of electricity sold on both the power exchanges.

-
- Source DAM, TAM and RTM data: IEX and PXIL
 - Source Entity wise sale and purchase on PXs data: NLDC
 - Source Total Energy supplied: CEA
 - Source Generation & other data for Regression: NLDC and IEX

Final Scheduled Volume, Average MCP and Real-Time Curtailment in Day Ahead Market (DAM) for the months of April, 2021 to March, 2022 of IEX and PXIL

Quarter	Months	Final Scheduled Volume (MU)		Market Clearing Price (Rs/kWh)		Real Time Curtailment (MU)	
		IEX	PXIL	IEX	PXIL	IEX	PXIL
Quarter -I	April, 2021	5,699.22	4.73	3.70	3.69	0	0
	May, 2021	4,363.88	3.32	2.83	3.06	0	0
	June, 2021	4,314.17	21.91	3.06	3.35	2.35	0
Total Quarter -I	April - June, 2021	14,377.27	29.96			2.35	0
Quarter- II	July, 2021	4,238.25	2.76	2.95	3.02	0	0
	August, 2021	6,648.76	5.12	5.06	4.72	5.13	0
	September, 2021	6,418.27	1.27	4.40	6.52	0	0
Total Quarter- II	July- September, 2021	17,305.28	9.15			5.13	0
Quarter -III	October, 2021	6,568.31	0.37	8.01	7.17	0	0
	November, 2021	4,718.76	0.74	3.08	3.71	0.41	0
	December, 2021	5,423.27	0.88	3.54	4.23	0	0
Total Quarter- III	October- December, 2022	16,710.34	1.99			0.41	0
Quarter -IV	January, 2022	5,279.70	0.56	3.39	4.38	0	0
	February, 2022	5,612.07	0.76	4.44	5.14	0	0
	March, 2022						
Total Quarter- IV	January- March, 2022	10,891.77	1.32			0	0
Total April, 2021 - March, 2022		59,284.66	42.42			7.89	0

Annexure-II**Final Scheduled Volume in Term Ahead Market (TAM) for the months of April, 2021 to March, 2022 of IEX and PXIL (Trade and Delivery date basis)**

Quarter	Months	Final Scheduled Volume (MU) on Trade Date Basis		
		IEX	PXIL	Total
Quarter -I	April, 2021	325.78	651.35	977.13
	May, 2021	425.63	344.03	769.66
	June, 2021	622.42	358.74	981.16
Total Quarter -I	April- June, 2021	1,373.83	1,354.12	2,727.95
Quarter- II	July, 2021	832.44	267.10	1,099.54
	August, 2021	483.31	284.40	767.71
	September, 2021	198.18	209.46	407.64
Total Quarter -II	July- September, 2021	1,513.93	760.96	2,274.89
Quarter- III	October, 2021	298.11	223.78	521.89
	November, 2021	291.20	282.24	573.44
	December, 2021	421.34	300.08	721.42
Total Quarter- III	October- December, 2021	1,010.65	806.10	1,816.75
Quarter -IV	January, 2022	364.09	237.67	601.76
	February, 2022	617.84	782.52	1,400.36
	March, 2022			
Total Quarter- IV	January- March, 2022	981.93	1,020.19	2,002.12
Total April, 2021 - March, 2022		4,880.34	3,941.37	8,821.71

Quarter	Months	Final Scheduled Volume (MU) on Delivery Date Basis		
		IEX	PXIL	Total
Quarter -I	April, 2021	348.58	576.72	925.30
	May, 2021	382.62	419.36	801.98
	June, 2021	640.91	312.66	953.57
Total Quarter -I	April- June, 2021	1,372.11	1,308.74	2,680.85
Quarter- II	July, 2021	761.26	332.72	1,093.98
	August, 2021	617.23	238.63	855.86
	September, 2021	192.87	251.17	444.04
Total Quarter -II	July- September, 2022	1,571.36	822.52	2,393.88
Quarter- III	October, 2021	224.78	234.56	459.34
	November, 2021	302.75	276.38	579.13
	December, 2021	379.77	263.23	643.00
Total Quarter- III	October- December, 2021	907.30	774.17	1,681.47
Quarter -IV	January, 2022	390.27	264.81	655.08
	February, 2022	526.80	734.93	1,261.73
	March, 2022			
Total Quarter- IV	January- March, 2022	917.07	999.74	1916.81
Total April, 2021 - March, 2022		4,789.30	3,893.78	8,683.08

Top Five Entities (Buyers and Sellers) in Bilateral transactions in the month of February, 2022

(i) Top five Buyers in Bilateral transactions

Entity Name	Direct		Entity Name	Through Traders	
	(MU)	Percent		(MU)	Percent
Madhya Pradesh	902.91	52.71%	Gujarat	915.18	18.96%
Maharashtra	187.28	10.93%	Odisha	652.436	13.52%
Jharkhand	126.907	7.41%	Tamil Nadu	597.36	12.38%
AMNSIL_WR	126.33	7.37%	Himachal Pradesh	440.79	9.13%
Haryana	75.82	4.43%	Rajasthan	421.03	8.72%
Total Volume	1,419.25	82.85%	Total Volume	3,026.80	62.72%
Total Volume in Bilateral	1,713.02		Total Volume in Bilateral	4,826.02	

(ii) Top five Sellers in Bilateral transactions

Entity Name	Direct		Entity Name	Through Traders	
	(MU)	Percent		(MU)	Percent
Punjab	452.10	28.75%	RPREL	531.88	10.71%
Uttar Pradesh	182.18	11.59%	KARNATAKA	472.56	9.51%
DBPL	149.36	9.50%	JITPL	460.94	9.28%
DVC	128.56	8.18%	Delhi	356.20	7.17%
Adhunik Power	126.91	8.07%	ESSARMPL	255.49	5.14%
Total Volume	1,039.11	66.08%	Total Volume	2,077.06	41.81%
Total Volume in Bilateral	1,572.41		Total Volume in Bilateral	4,967.61	

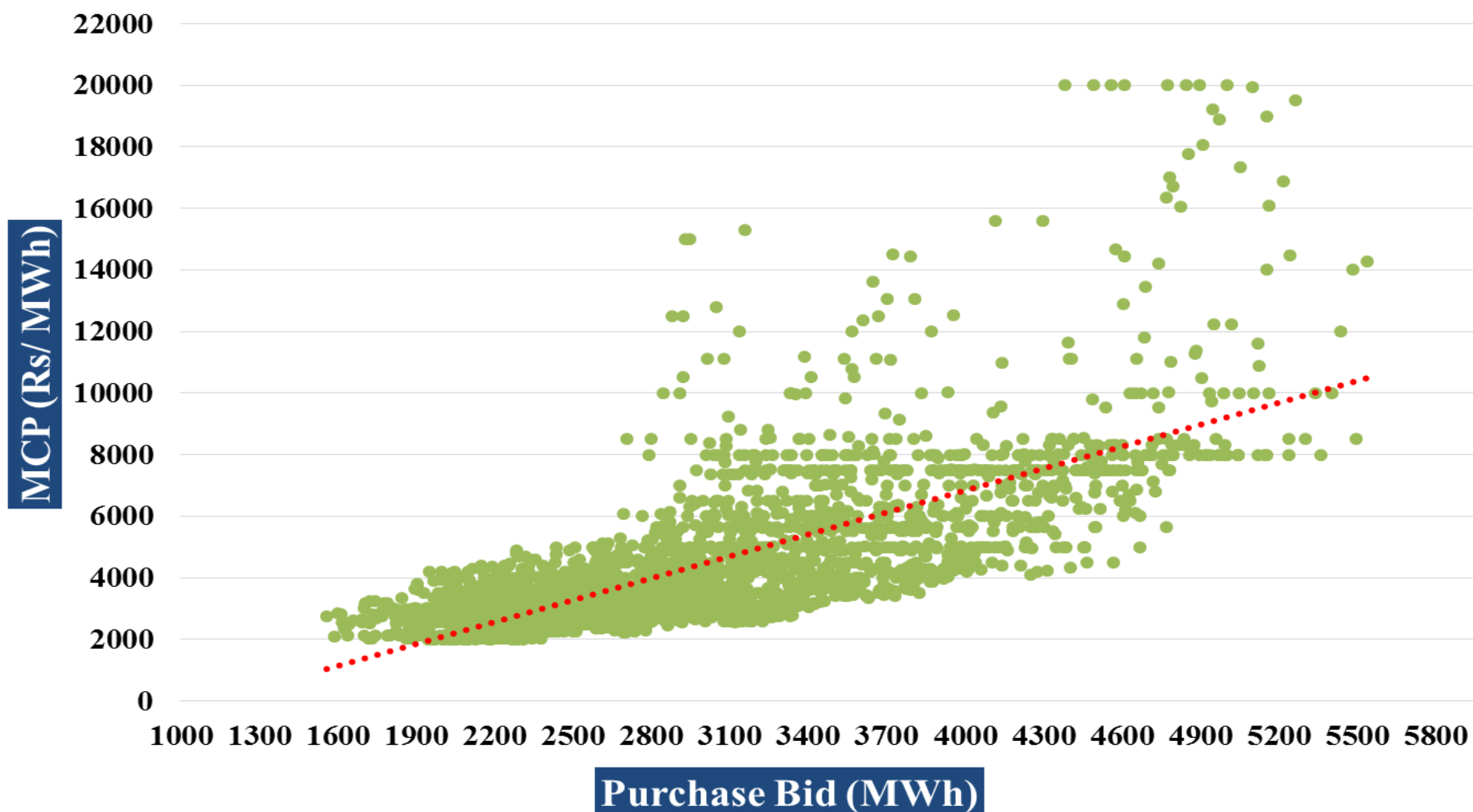
Annexure-IV**Evening, Day, Night, Morning, Maximum, Minimum, Average MCP (Rs/kWh) and Final Scheduled Volume (MU) in DAM**

Date	Morning MCP (07:00-10:00)	Day MCP (11:00-17:00)	Evening MCP (18:00- 23:00)	Night MCP (01:00- 06:00, 23:00-24:00)	Maximum MCP	Minimum MCP	Average MCP	Final Scheduled Volume (MU)
01-02-2022	6.61	3.88	5.81	2.22	11.11	2.00	4.33	186.30
02-02-2022	6.93	4.56	6.90	2.25	14.50	2.01	4.87	194.66
03-02-2022	6.98	4.48	7.30	2.31	15.00	2.02	4.97	191.25
04-02-2022	6.11	4.56	6.65	2.22	15.31	2.00	4.66	202.58
05-02-2022	5.66	3.65	5.68	2.23	10.78	2.00	4.08	217.46
06-02-2022	4.35	3.22	3.80	2.32	5.65	2.02	3.29	199.62
07-02-2022	5.74	4.53	5.29	2.27	8.00	2.02	4.26	217.70
08-02-2022	5.64	3.72	4.25	2.31	7.50	2.02	3.76	213.16
09-02-2022	6.73	3.38	4.34	2.34	7.50	2.02	3.87	191.65
10-02-2022	6.98	3.84	4.51	2.40	8.00	2.11	4.11	191.27
11-02-2022	4.71	3.12	4.10	2.23	7.50	2.01	3.37	172.17
12-02-2022	6.15	3.58	4.81	2.49	8.00	2.25	4.00	205.54
13-02-2022	5.07	2.93	3.77	2.59	8.00	2.14	3.40	199.60
14-02-2022	6.34	3.57	4.85	2.56	8.00	2.25	4.06	188.52
15-02-2022	6.42	3.68	4.12	2.54	8.00	2.25	3.92	198.43
16-02-2022	6.87	4.13	5.19	2.70	8.50	2.45	4.43	193.33
17-02-2022	7.50	4.17	5.06	2.75	10.00	2.54	4.54	212.62
18-02-2022	7.57	3.64	4.09	2.61	10.50	2.29	4.11	195.65
19-02-2022	8.04	4.26	4.85	2.76	12.00	2.54	4.60	178.20
20-02-2022	6.96	3.58	3.84	2.70	8.30	2.40	3.95	187.73
21-02-2022	7.54	4.07	4.20	2.43	11.60	2.06	4.20	198.12
22-02-2022	8.58	4.42	4.85	2.60	11.81	2.24	4.69	202.76
23-02-2022	10.67	5.13	5.85	2.83	14.49	2.57	5.56	223.09
24-02-2022	12.01	5.35	6.96	2.92	17.34	2.59	6.15	219.43
25-02-2022	13.60	5.79	8.38	3.07	19.95	2.75	6.94	221.34
26-02-2022	12.68	4.48	5.82	2.90	20.00	2.59	5.72	226.72
27-02-2022	5.34	3.14	4.00	2.67	8.00	2.30	3.59	180.29
28-02-2022	9.40	4.09	5.92	2.56	20.00	2.06	4.99	202.89
Maximum	13.60	5.79	8.38	3.07	20.00	2.75	6.94	226.72
Minimum	4.35	2.93	3.77	2.22	5.65	2.00	3.29	172.17
Average	7.40	4.03	5.19	2.53	11.26	2.23	4.44	200.43

MCP: Market Clearing Price (Rs/kWh)

FSV: Final Scheduled Volume (MU)

Comparison of MCP w.r.t. Purchase Bid for 2,688 Time Blocks during the month of February, 2022 in DAM



Time Blocks during the Month [96 time blocks in a day x 28 days = 2,688]

Annexure-VI**Maximum Final Schedule Volume (FSV), Minimum FSV, Maximum Market Clearing Price (MCP) and Minimum MCP in DAM**

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
01-02-2022	08:30 - 08:45	2.79	18:15 - 18:30	11.11	23:30 - 23:45	1.36	04:00 - 04:15	2.00
02-02-2022	08:30 - 08:45	2.89	18:30 - 18:45	14.50	23:30 - 23:45	1.39	23:45 - 24:00	2.01
03-02-2022	08:30 - 08:45	2.66	18:30 - 18:45	15.00	23:15 - 23:30	1.59	04:00 - 04:15	2.02
04-02-2022	08:15 - 08:30	3.07	18:30 - 18:45	15.31	22:45 - 23:00	1.47	04:00 - 04:15	2.00
05-02-2022	08:15 - 08:30	3.28	18:30 - 18:45	10.78	22:45 - 23:00	1.50	04:00 - 04:15	2.00
06-02-2022	08:00 - 08:15	3.15	06:45 - 07:00	5.65	22:45 - 23:00	1.44	04:00 - 04:15	2.02
07-02-2022	08:15 - 08:30	3.33	18:30 - 18:45	8.00	23:00 - 23:15	1.60	03:45 - 04:00	2.02
08-02-2022	08:00 - 08:15	3.26	07:30 - 07:45	7.50	23:45 - 24:00	1.57	03:45 - 04:00	2.02
09-02-2022	07:45 - 08:00	3.00	07:30 - 07:45	7.50	22:45 - 23:00	1.38	03:30 - 03:45	2.02
10-02-2022	08:30 - 08:45	2.76	07:45 - 08:00	8.00	23:00 - 23:15	1.32	03:45 - 04:00	2.11
11-02-2022	07:45 - 08:00	2.74	07:30 - 07:45	7.50	23:15 - 23:30	1.10	04:00 - 04:15	2.01
12-02-2022	07:30 - 07:45	3.02	07:45 - 08:00	8.00	00:00 - 00:15	1.48	03:30 - 03:45	2.25
13-02-2022	07:45 - 08:00	3.08	07:30 - 07:45	8.00	22:00 - 22:15	1.34	14:15 - 14:30	2.14
14-02-2022	16:30 - 16:45	2.58	18:45 - 19:00	8.00	22:45 - 23:00	1.37	04:00 - 04:15	2.25
15-02-2022	08:15 - 08:30	2.89	07:30 - 07:45	8.00	22:45 - 23:00	1.48	03:30 - 03:45	2.25
16-02-2022	08:15 - 08:30	2.81	07:30 - 07:45	8.50	21:15 - 21:30	1.45	03:00 - 03:15	2.45
17-02-2022	09:00 - 09:15	2.99	07:15 - 07:30	10.00	22:45 - 23:00	1.47	03:00 - 03:15	2.54
18-02-2022	08:30 - 08:45	2.97	07:45 - 08:00	10.50	22:45 - 23:00	1.22	02:45 - 03:00	2.29
19-02-2022	08:45 - 09:00	2.50	07:30 - 07:45	12.00	23:15 - 23:30	1.32	03:15 - 03:30	2.54
20-02-2022	08:00 - 08:15	2.90	07:30 - 07:45	8.30	22:00 - 22:15	1.20	03:00 - 03:15	2.40
21-02-2022	09:00 - 09:15	3.18	07:30 - 07:45	11.60	22:30 - 22:45	1.32	02:45 - 03:00	2.06
22-02-2022	15:30 - 15:45	2.68	08:00 - 08:15	11.81	22:15 - 22:30	1.56	03:15 - 03:30	2.24
23-02-2022	16:00 - 16:15	2.82	07:15 - 07:30	14.49	19:15 - 19:30	1.79	03:00 - 03:15	2.57
24-02-2022	15:30 - 15:45	2.90	07:15 - 07:30	17.34	19:45 - 20:00	1.74	03:15 - 03:30	2.59
25-02-2022	15:45 - 16:00	2.92	07:15 - 07:30	19.95	19:45 - 20:00	1.72	03:45 - 04:00	2.75
26-02-2022	16:30 - 16:45	2.99	07:15 - 07:30	20.00	21:15 - 21:30	1.89	03:15 - 03:30	2.59
27-02-2022	07:45 - 08:00	2.53	07:15 - 07:30	8.00	18:00 - 18:15	1.39	03:45 - 04:00	2.30
28-02-2022	16:15 - 16:30	2.73	07:00 - 07:15	20.00	21:15 - 21:30	1.73	03:30 - 03:45	2.06

MCP: Market Clearing Price (Rs/kWh)

FSV: Final Scheduled Volume (MU)

Annexure-VII**Sellers and Buyers in Day Ahead Market (DAM) in the month of February, 2022**

S. No.	Entity Name	Sell		Entity Name	Purchase	
		(MU)	Percent (%)		(MU)	Percent (%)
1.	Uttar Pradesh	852.59	15.19%	Gujarat	1282.42	22.85%
2.	West Bengal	802.00	14.29%	Telangana	605.28	10.78%
3.	Bihar	639.84	11.40%	Tamilnadu	581.68	10.36%
4.	Chhattisgarh	406.11	7.24%	J&K	433.14	7.72%
5.	Jindal Power Ltd. Stg-II	321.28	5.72%	Maharashtra	393.07	7.00%
6.	Rajasthan	256.09	4.56%	Andhra Pradesh	367.32	6.54%
7.	Madhya Pradesh	221.79	3.95%	Haryana	364.66	6.50%
8.	Orissa	187.26	3.34%	Rajasthan	238.12	4.24%
9.	Sembcorp Gayatri	186.45	3.32%	Uttarakhand	213.42	3.80%
10.	Essar Power MP Ltd	139.01	2.48%	Uttar Pradesh	194.81	3.47%
11.	Jaypee Nigrie	124.28	2.21%	Karnataka	170.78	3.04%
12.	Assam	118.70	2.11%	NVVN (SNA) - NEA	156.04	2.78%
13.	Jindal Power	115.52	2.06%	Punjab	147.21	2.62%
14.	Delhi	91.66	1.63%	DGPCL Bhutan	104.70	1.87%
15.	Raipur Energen	86.40	1.54%	Delhi	93.72	1.67%
16.	ACBIL	83.09	1.48%	Madhya Pradesh	71.45	1.27%
17.	MB Power	76.88	1.37%	Orissa	37.33	0.67%
18.	RKM Power	73.27	1.31%	ArcelorMittal Nippon	27.27	0.49%
19.	Teesta -3	71.87	1.28%	Kerala	26.37	0.47%
20.	Himachal Pradesh	68.98	1.23%	Himachal Pradesh	22.38	0.40%
21.	Jharkhand	66.84	1.19%	Dadra & Nagar Haveli	17.69	0.32%
22.	Telangana	64.94	1.16%	Assam	17.02	0.30%
23.	Kerala	46.70	0.83%	Meghalaya	16.57	0.30%
24.	Sembcorp Energy India Ltd.	36.70	0.65%	BALCO 2	7.79	0.14%
25.	Tripura	35.68	0.64%	Daman & Diu	4.48	0.08%
26.	JITPL	34.53	0.62%	Goa WR	3.99	0.07%
27.	Kameng HEP	33.38	0.59%	Jharkhand	3.52	0.06%
28.	Karnataka	29.21	0.52%	Railways	3.18	0.06%
29.	DB Power	28.39	0.51%	Chandigarh	1.96	0.03%
30.	Goa WR	27.08	0.48%	Bihar	1.71	0.03%
31.	Adhunik Power	23.88	0.43%	NEA-NR	1.28	0.02%
32.	Maharashtra	23.13	0.41%	Gandhar_NAPM	0.76	0.01%
33.	GMR Kamalanga	19.01	0.34%	Chhattisgarh	0.65	0.01%
34.	Andhra Pradesh	16.56	0.30%	West Bengal	0.36	0.01%
35.	Maruti Clean Coal Power	16.17	0.29%	Goa SR	0.31	0.01%
36.	DVC	15.95	0.28%	Arunachal Pradesh	0.27	0.00%
37.	Arunachal Pradesh	12.76	0.23%	Manipur	0.14	0.00%
38.	NLC TPS-II	12.27	0.22%			
39.	Jhabua Power	11.11	0.20%			
40.	Karcham Wangtoo	10.72	0.19%			

41.	AD Hydro	10.04	0.18%			
42.	Raigarh Energy Ltd.	9.39	0.17%			
43.	Palatana	9.22	0.16%			
44.	RGPPL	8.99	0.16%			
45.	Tashiding HEP	8.67	0.15%			
46.	Tamilnadu	8.17	0.15%			
47.	NLC TPS-II Stg-2	8.05	0.14%			
48.	Jorethang	7.94	0.14%			
49.	Shree Cement	7.15	0.13%			
50.	Sainj HEP	6.93	0.12%			
51.	J&K	6.45	0.11%			
52.	Sikkim	5.65	0.10%			
53.	KSK Mahanadi	4.55	0.08%			
54.	Dikchu	3.95	0.07%			
55.	Gujarat	2.92	0.05%			
56.	Singoli Bhagwati	2.31	0.04%			
57.	GMR Warora	2.15	0.04%			
58.	Nagaland	2.06	0.04%			
59.	Adani Hybrid Energy Jaisalmer	1.81	0.03%			
60.	SKS Power	1.20	0.02%			
61.	Sorang HEP, (Himachal Sorang	1.08	0.02%			
62.	Punjab	0.92	0.02%			
63.	Chuzachen	0.85	0.02%			
64.	Dhariwal	0.69	0.01%			
65.	Adani Wind Energy Kutchh Five	0.63	0.01%			
66.	Renew Surya Ravi Private	0.52	0.01%			
67.	Haryana	0.50	0.01%			
68.	Lanco Budhil	0.43	0.01%			
69.	Renew Solar Energy (Jharkhand	0.42	0.01%			
70.	Dadra & Nagar Haveli	0.39	0.01%			
71.	Mizoram	0.25	0.00%			
72.	Adani Green Solar Jaisalmer	0.25	0.00%			
73.	Renew Solar Urja Private	0.13	0.00%			
74.	Adani Hybrid Energy Jaisalmer	0.06	0.00%			
75.	Ostro Energy Private Limited (OEPL)	0.06	0.00%			
Total Volume of top 10		4,012.43	71.49%	Total Volume of top 10	4,673.92	83.27%
Total Volume in PXs		5,612.83		Total Volume in PXs	5,612.83	

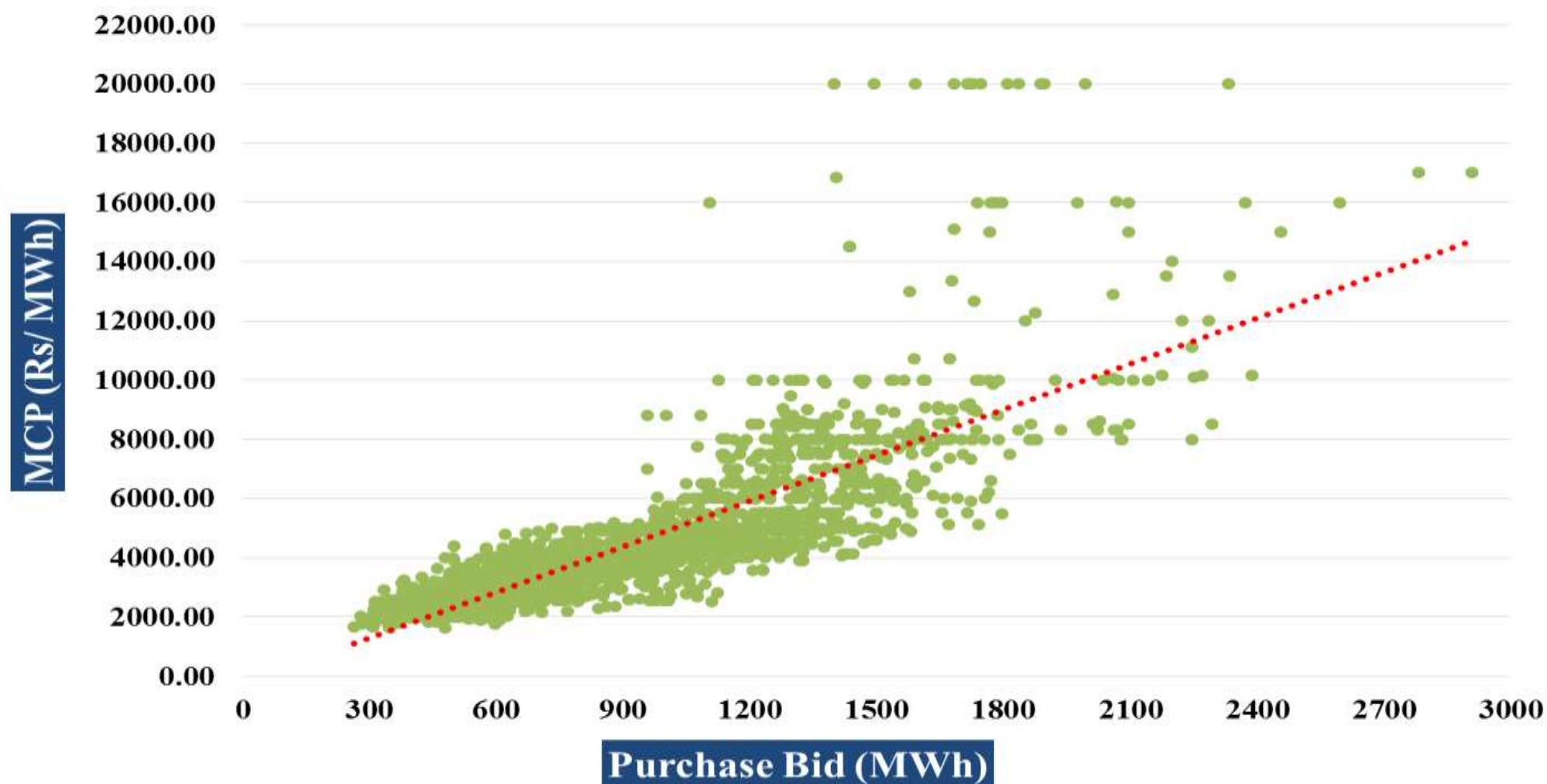
Annexure-VIII**Evening, Day, Night, Morning, Maximum, Minimum, Average MCP (Rs/kWh) and Final Scheduled Volume (MU) in RTM**

Date	Morning MCP (07:00-10:00)	Day MCP (11:00- 17:00)	Evening MCP (18:00- 23:00)	Night MCP (01:00- 06:00, 23:00-24:00)	Maximum MCP	Minimum MCP	Average MCP	Final Scheduled Volume (MU)
01-02-2022	6.26	4.85	10.72	2.87	20.00	2.15	5.98	64.52
02-02-2022	8.95	5.63	5.14	2.82	14.50	2.05	5.24	51.52
03-02-2022	3.90	3.58	3.93	2.38	5.00	1.84	3.37	53.42
04-02-2022	3.67	3.27	3.62	2.40	5.01	1.96	3.17	60.08
05-02-2022	5.07	3.84	3.79	2.86	6.60	1.83	3.75	63.10
06-02-2022	4.01	3.12	3.18	2.59	4.99	1.75	3.13	38.02
07-02-2022	5.01	4.10	3.94	2.47	7.50	1.68	3.74	43.28
08-02-2022	7.55	4.54	4.33	2.79	10.00	2.13	4.48	41.38
09-02-2022	4.90	3.91	4.40	2.62	6.64	2.13	3.82	48.34
10-02-2022	5.11	3.66	4.08	2.40	7.50	1.96	3.64	45.62
11-02-2022	5.82	3.73	4.40	2.78	7.40	1.96	3.97	57.49
12-02-2022	8.51	3.74	5.83	2.94	15.00	2.25	4.83	52.59
13-02-2022	5.07	3.35	3.40	2.87	6.11	2.42	3.51	48.26
14-02-2022	5.45	3.95	4.22	2.52	8.00	2.00	3.85	51.28
15-02-2022	6.37	4.51	5.79	2.90	13.00	2.21	4.67	53.44
16-02-2022	8.95	5.10	5.72	2.97	10.16	2.21	5.28	63.34
17-02-2022	8.69	3.92	5.84	2.91	20.00	2.34	4.90	49.02
18-02-2022	6.40	4.69	4.33	2.75	8.30	2.00	4.32	53.38
19-02-2022	6.69	3.98	5.30	3.01	8.46	2.54	4.48	62.84
20-02-2022	4.86	3.03	3.36	2.70	8.00	2.04	3.32	48.32
21-02-2022	6.16	4.55	6.21	2.59	10.00	1.75	4.66	65.46
22-02-2022	11.14	3.80	5.30	3.02	16.01	2.29	5.17	88.64
23-02-2022	10.75	4.65	6.43	3.14	17.00	2.35	5.67	69.21
24-02-2022	10.16	6.45	9.57	3.82	20.00	2.71	7.08	65.97
25-02-2022	8.61	5.22	5.40	3.55	20.00	2.20	5.34	63.78
26-02-2022	4.16	3.26	4.10	2.58	5.01	1.84	3.42	50.70
27-02-2022	4.33	3.18	3.34	3.17	5.00	2.00	3.41	43.68
28-02-2022	3.81	3.58	4.40	2.48	5.78	1.64	3.50	59.09
Maximum	6.89	5.27	8.03	2.79	20.00	2.25	4.92	75.04
Minimum	2.66	2.72	2.86	1.23	3.68	0.50	2.53	37.21
Average	4.19	3.68	4.24	2.11	7.52	1.52	3.45	50.81

MCP: Market Clearing Price (Rs/kWh)

FSV: Final Scheduled Volume (MU)

Comparison of MCP w.r.t. Purchase Bid for 2,688 Time Blocks during the month of February, 2022 in RTM



Time Blocks during the Month [96 time blocks in a day x 28 days = 2,688]

Maximum Final Schedule Volume (FSV), Minimum FSV, Maximum Market Clearing Price (MCP) and Minimum MCP in RTM

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
01-02-2022	20:45 - 21:00	1.09	18:15 - 18:30	20.00	00:15 - 00:30	0.27	03:30 - 03:45	2.15
02-02-2022	20:00 - 20:15	0.83	08:45 - 09:00	14.50	23:15 - 23:30	0.24	03:00 - 03:15	2.05
03-02-2022	19:15 - 19:30	0.93	19:00 - 19:15	5.00	04:15 - 04:30	0.25	00:00 - 00:15	1.84
04-02-2022	19:30 - 19:45	1.08	19:15 - 19:30	5.01	23:30 - 23:45	0.38	04:15 - 04:30	1.96
05-02-2022	09:30 - 09:45	1.02	08:00 - 08:15	6.60	00:00 - 00:15	0.34	23:30 - 23:45	1.83
06-02-2022	06:45 - 07:00	0.54	06:45 - 07:00	4.99	01:30 - 01:45	0.20	03:30 - 03:45	1.75
07-02-2022	17:30 - 17:45	0.88	10:15 - 10:30	7.50	03:00 - 03:15	0.21	03:15 - 03:30	1.68
08-02-2022	15:45 - 16:00	0.72	08:30 - 08:45	10.00	03:30 - 03:45	0.25	02:45 - 03:00	2.13
09-02-2022	19:45 - 20:00	0.87	19:30 - 19:45	6.64	00:15 - 00:30	0.18	02:30 - 02:45	2.13
10-02-2022	08:00 - 08:15	0.82	07:45 - 08:00	7.50	00:45 - 01:00	0.23	03:30 - 03:45	1.96
11-02-2022	09:00 - 09:15	0.95	07:30 - 07:45	7.40	02:30 - 02:45	0.25	03:00 - 03:15	1.96
12-02-2022	15:30 - 15:45	0.80	07:45 - 08:00	15.00	00:15 - 00:30	0.28	03:30 - 03:45	2.25
13-02-2022	08:30 - 08:45	0.74	07:30 - 07:45	6.11	22:30 - 22:45	0.28	18:00 - 18:15	2.42
14-02-2022	15:30 - 15:45	0.80	07:45 - 08:00	8.00	01:00 - 01:15	0.30	03:15 - 03:30	2.00
15-02-2022	16:30 - 16:45	0.93	19:15 - 19:30	13.00	00:00 - 00:15	0.29	03:00 - 03:15	2.21
16-02-2022	19:45 - 20:00	0.98	07:00 - 07:15	10.16	00:15 - 00:30	0.29	02:30 - 02:45	2.21
17-02-2022	07:15 - 07:30	1.18	18:30 - 18:45	20.00	13:00 - 13:15	0.27	02:30 - 02:45	2.34
18-02-2022	07:30 - 07:45	0.99	07:45 - 08:00	8.30	00:45 - 01:00	0.32	02:15 - 02:30	2.00
19-02-2022	07:30 - 07:45	1.11	18:30 - 18:45	8.46	23:45 - 24:00	0.32	02:15 - 02:30	2.54
20-02-2022	19:30 - 19:45	0.74	07:15 - 07:30	8.00	05:15 - 05:30	0.26	13:15 - 13:30	2.04
21-02-2022	07:30 - 07:45	0.95	19:15 - 19:30	10.00	01:00 - 01:15	0.45	03:15 - 03:30	1.75
22-02-2022	19:15 - 19:30	1.21	08:00 - 08:15	16.01	00:00 - 00:15	0.65	03:30 - 03:45	2.29
23-02-2022	08:15 - 08:30	1.26	07:30 - 07:45	17.00	22:30 - 22:45	0.35	03:15 - 03:30	2.35
24-02-2022	21:45 - 22:00	1.01	19:00 - 19:15	20.00	00:15 - 00:30	0.36	01:45 - 02:00	2.71
25-02-2022	07:15 - 07:30	1.00	07:30 - 07:45	20.00	01:00 - 01:15	0.37	22:30 - 22:45	2.20
26-02-2022	07:30 - 07:45	0.87	07:30 - 07:45	5.01	03:00 - 03:15	0.26	03:00 - 03:15	1.84
27-02-2022	07:15 - 07:30	0.76	07:15 - 07:30	5.00	04:30 - 04:45	0.26	21:00 - 21:15	2.00
28-02-2022	17:00 - 17:15	1.02	19:00 - 19:15	5.78	04:45 - 05:00	0.25	00:30 - 00:45	1.64

MCP: Market Clearing Price (Rs/kWh)

FSV: Final Scheduled Volume (MU)

Annexure-XI**Sellers and Buyers in Real Time Market (RTM) in the month of February, 2022**

S. No.	Entity Name	Sell		Entity Name	Purchase	
		(MU)	Percent (%)		(MU)	Percent (%)
1.	West Bengal	283.34	18.21%	J&K	383.36	24.64%
2.	Bihar	183.97	11.82%	Andhra Pradesh	205.93	13.24%
3.	Madhya Pradesh	135.46	8.71%	Telangana	158.84	10.21%
4.	Rajasthan	129.64	8.33%	Maharashtra	152.86	9.83%
5.	Uttar Pradesh	112.05	7.20%	Gujarat	138.34	8.89%
6.	Orissa	106.28	6.83%	Tamilnadu	88.16	5.67%
7.	Chhattisgarh	89.01	5.72%	Haryana	83.93	5.39%
8.	Delhi	45.47	2.92%	Rajasthan	73.57	4.73%
9.	Kerala	37.30	2.40%	Uttar Pradesh	60.25	3.87%
10.	DVC	31.76	2.04%	Orissa	36.07	2.32%
11.	MB Power	27.98	1.80%	Punjab	30.30	1.95%
12.	Jindal Power Ltd. Stg-	26.62	1.71%	Delhi	30.28	1.95%
13.	RKM Power	26.25	1.69%	Uttarakhand	17.49	1.12%
14.	Telangana	26.22	1.69%	Assam	15.60	1.00%
15.	Tripura	25.94	1.67%	West Bengal	13.82	0.89%
16.	Kameng HEP	19.47	1.25%	Meghalaya	13.43	0.86%
17.	Sembcorp Gayatri	18.56	1.19%	Bihar	9.43	0.61%
18.	Jharkhand	17.75	1.14%	BALCO 2	8.02	0.52%
19.	GMR Warora	17.40	1.12%	Kerala	7.35	0.47%
20.	Himachal Pradesh	17.21	1.11%	Himachal Pradesh	7.09	0.46%
21.	Manipur	16.15	1.04%	Chhattisgarh	6.10	0.39%
22.	Assam	15.84	1.02%	Madhya Pradesh	4.40	0.28%
23.	J&K	14.67	0.94%	Karnataka	3.61	0.23%
24.	Jindal Power	14.17	0.91%	ArcelorMittal Nippon	3.01	0.19%
25.	Maharashtra	13.81	0.89%	Manipur	0.96	0.06%
26.	Karnataka	11.05	0.71%	Maruti Clean Coal	0.77	0.05%
27.	Raipur Energen	10.07	0.65%	Arunachal Pradesh	0.76	0.05%
28.	Jhabua Power	6.35	0.41%	DVC	0.59	0.04%
29.	KSK Mahanadi	5.94	0.38%	Daman & Diu	0.52	0.03%
30.	DB Power	5.59	0.36%	Jindal Power Ltd. Stg-II	0.29	0.02%
31.	Sembcorp Energy India	5.14	0.33%	Railways	0.29	0.02%
32.	Sikkim	5.07	0.33%	Dadra & Nagar Haveli	0.14	0.01%
33.	NLC TPS-II	4.11	0.26%	Sikkim	0.09	0.01%
34.	Sasan UMPP	3.92	0.25%	Goa WR	0.06	0.00%
35.	Talcher Stg-2	3.75	0.24%	Tripura	0.04	0.00%
36.	Andhra Pradesh	3.52	0.23%	Jharkhand	0.03	0.00%
37.	Punjab	3.32	0.21%			
38.	Gujarat	3.16	0.20%			
39.	NLC TPS-II Stg-2	2.55	0.16%			
40.	GMR Kamalanga	2.15	0.14%			
41.	Palatana	2.02	0.13%			

42.	Ramagundam Stg-1	1.93	0.12%			
43.	Essar Power MP Ltd	1.79	0.12%			
44.	ACBIL	1.71	0.11%			
45.	Goa WR	1.63	0.10%			
46.	Singoli Bhagwati	1.44	0.09%			
47.	Raigarh Energy Ltd.	1.34	0.09%			
48.	NLC	1.34	0.09%			
49.	Adhunik Power	1.32	0.08%			
50.	AD Hydro	1.11	0.07%			
51.	Neyveli New Thermal	1.08	0.07%			
52.	Tamilnadu	1.04	0.07%			
53.	Jorethang	0.83	0.05%			
54.	Renew Solar Energy	0.79	0.05%			
55.	Maruti Clean Coal	0.78	0.05%			
56.	Simhadri Stg-2	0.76	0.05%			
57.	NLC TPS-II Expn	0.74	0.05%			
58.	Ramagundam Stg-3	0.68	0.04%			
59.	Dadra & Nagar Haveli	0.63	0.04%			
60.	RGPPPL_Others	0.59	0.04%			
61.	RGPPPL	0.56	0.04%			
62.	SKS Power	0.53	0.03%			
63.	Ostro Energy Private	0.47	0.03%			
64.	Adani Hybrid Energy	0.40	0.03%			
65.	Dikchu	0.36	0.02%			
66.	Shree Cement	0.33	0.02%			
67.	AGTPP	0.27	0.02%			
68.	Haryana	0.20	0.01%			
69.	Renew Surya Ravi	0.18	0.01%			
70.	Renew Solar Urja	0.15	0.01%			
71.	Sainj HEP	0.15	0.01%			
72.	RGPPPL_IR	0.13	0.01%			
73.	AGBPP	0.12	0.01%			
74.	Karcham Wangtoo	0.11	0.01%			
75.	Ayana Renewable	0.08	0.01%			
76.	Sorang HEP,	0.06	0.00%			
77.	Nagaland	0.05	0.00%			
78.	Tashiding HEP	0.04	0.00%			
79.	Chuzachen	0.02	0.00%			
80.	Lanco Budhil	0.01	0.00%			
Total Volume of top 10		1,154.28	74.19%		1,381.31	88.79%
Total Volume in PXs		1,555.78		Total Volume in PXs	1,555.78	

Annexure-XII

Cross Border Electricity Transactions in Day Ahead Market (DAM) in IEX with Nepal and Bhutan during the month of February, 2022

S. No	Delivery Date	Buy Volume By Nepal (MU)	Buy Volume by Bhutan (MU)
1	01-02-2022	5.60	4.02
2	02-02-2022	5.25	3.97
3	03-02-2022	5.03	3.56
4	04-02-2022	6.61	3.69
5	05-02-2022	4.28	4.07
6	06-02-2022	6.17	3.43
7	07-02-2022	6.12	3.44
8	08-02-2022	6.62	3.37
9	09-02-2022	5.33	3.43
10	10-02-2022	5.08	3.60
11	11-02-2022	6.35	3.74
12	12-02-2022	5.01	3.87
13	13-02-2022	5.65	3.86
14	14-02-2022	5.97	3.98
15	15-02-2022	6.00	3.67
16	16-02-2022	5.36	3.78
17	17-02-2022	5.20	3.47
18	18-02-2022	6.44	3.49
19	19-02-2022	5.38	3.48
20	20-02-2022	6.62	3.69
21	21-02-2022	6.25	3.95
22	22-02-2022	5.40	3.64
23	23-02-2022	5.01	3.84
24	24-02-2022	4.21	3.70
25	25-02-2022	4.14	3.93
26	26-02-2022	5.03	4.19
27	27-02-2022	6.83	3.87
28	28-02-2022	6.38	3.95
Total		157.32	104.70
		262.02	

∴ No transaction happened.

Note: *Cross Border Transactions of Electricity of 262.02 MU (157.32 MU purchase by Nepal and 104.70 MU purchase by Bhutan) happened during February, 2022 in IEX, which is included in DAM Volume of February, 2022 in IEX*

Appendix-I**Analysis for change in trend of Final Scheduled Volume in DAM on 2nd Monday & 3rd Sunday of February, 2022 (i.e. 14th February, 2022 & 20th February, 2022)**

Final Scheduled Volume (MU) and the Daily MCP (Rs/kWh) invariably shows decreasing trend on Sundays and increasing trend on Mondays as the demand of electricity in the country is less on Sundays as compared to other days of week. However, during the month of February, 2022, it is observed that on second Monday (14th February, 2022), FSV showed decreasing trend in comparison to 2nd Sunday (13th February, 2022). Similarly, on third Sunday (20th February, 2022), FSV showed increasing trend in comparison to 3rd Saturday (19th February, 2022). On analysis, it has been found as under:

- (i) On second Monday (14th February, 2022), although there was increase in purchase on power exchange by some of the States in comparison to second Sunday (13th February, 2022) by **19.09 MU** [i.e. Haryana (9.77 MU), Telangana (2.91 MU), Tamil Nadu (1.23 MU), Delhi (1.21 MU), Maharashtra (1.13 MU), Punjab (0.78 MU) and Dadar & Nagar Haveli (0.62 MU), etc.], there was also decrease in purchase on power exchange by some of the States by **30.18 MU** [i.e. Andhra Pradesh (20.82 MU), Gujarat (3.24 MU), Uttarakhand (2.70 MU), Karnataka (2.24 MU), Uttar Pradesh (0.99 MU), Madhya Pradesh (0.07 MU) and Kerala (0.04 MU), etc.]. This resulted in an overall decrease in FSV by **11.09 MU** on Monday (14th February, 2022) as compared to Sunday (13th February, 2022)
- (ii) On third Sunday (20th February, 2022), although there was decrease in purchase on power exchange by some of the States in comparison to third Saturday (19th February, 2022) by **33.13 MU** [i.e. Gujarat (11.86 MU), Haryana (8.23 MU), Tamil Nadu (5.39 MU), Karnataka (2.88 MU), Uttarakhand (2.86 MU), Dadar & Nagar Haveli (1.00 MU) and Odisha (0.44 MU), etc.], there was also increase in purchase on power exchange by some of the States by **42.64 MU** [i.e. Andhra Pradesh (21.85 MU), Telangana (5.65 MU), Maharashtra (4.39 MU), J&K (2.34 MU), Kerala (2.27 MU) and Rajasthan (1.96 MU), etc.]. This resulted in an overall increase in FSV by **9.51 MU** on Sunday (20th February, 2022) as compared to Saturday (19th February, 2022).

Appendix-II**Definitions/ Terminologies used in the Report**

1. **Area Clearing Price (ACP)** is price discovered in each time block of concerned bid area. 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. **Average MCP** is the average of daily MCP of the days during the month on which transaction happened.
3. **Bilateral Transaction** means a transaction for exchange of electrical energy (MWh) between a specified buyer and a specified seller, from a specified point of injection to a specified point of drawal for a fixed or varying quantum of power (MW) for any time block during a month.
4. **Daily MCP** is the average of MCP of all 96 Time Blocks of the day during which transaction happened.
5. **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.
6. **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.
7. **Energy Supplied** is the total energy (MU) available at the States' periphery.
8. **Final Scheduled Volume** is the total of scheduled volume of all 96 time blocks in a day during the month in which transaction happened.
9. **Green Term Ahead Market (GTAM)** is based on the principles of current Term Ahead Market (TAM) and will offer trade through Intra-Day Contracts, Day ahead contingency Contracts, Daily Contracts and Weekly Contracts for both solar and non-Solar Renewable Energy (RE) generation. GTAM is a market-based mechanism, where RE surplus and RE deficit States can trade RE Power and balance their RPO targets.
10. **Green Day Ahead Market (GDAM)** is based on the principles of current Term Ahead Market (TAM), where market participants purchase and sell electricity generated from renewable sources at financially binding day-ahead prices for the following day.
11. **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.

- 12. Real Time Market (RTM)** on the power exchanges is the market for electricity where market participants buy/ sell electricity on a half-hourly market and would commence with the end of the right to revision of schedule or declared capability and would end with gate closure. The auction sessions would be conducted every half an hour for the delivery of power for the duration of 30 minutes in two time blocks of 15 minutes each to commence from one hour after the closure of the RTM trading session.
- 13. Term Ahead Market (TAM)** on the power exchanges is the 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; Intra-day, Day Ahead Contingency, Daily and Weekly.