



भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
आर. ए. प्रभाग/ Regulatory Affairs Division

सेवा में /To

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2. Secretary, Ministry of New & Renewable Energy, Atal Akshay Urja Bhawan, CGO Complex, Lodhi Road, New Delhi- 110003.
3. Secretary, CERC, Chanderlok Building, Janpath, New Delhi- 110001.

विषय: जनवरी, 2023 माह की मार्केट मॉनिटरिंग रिपोर्ट

Subject: Monthly Market Monitoring Report for the month of January, 2023.

महोदय/ Sir,

जनवरी, 2023 माह के लिए केंद्रीय विद्युत प्राधिकरण द्वारा तैयार की गई मासिक मार्केट मॉनिटरिंग रिपोर्ट (MMMR) की एक प्रति सूचना और अवलोकन के लिए संलग्न है। A copy of the monthly market monitoring report (MMMR) prepared by central Electricity Authority for the month of January, 2023 is enclosed herewith for kind information and perusal.

जनवरी, 2023 माह के दौरान मार्केट के संचालन की मुख्य विशेषताएं इस प्रकार रही। Key highlights of the market operation during January, 2023 are as under:

- (i) जनवरी, 2023 माह में देश में कुल 126,759 MU विद्युत का कारोबार किया गया, जिसमें से 59,710 MU का कारोबार अंतर्राज्यीय पारेषण प्रणाली (Inter State Transmission System) के माध्यम से किया गया था और शेष राज्य नियंत्रित उत्पादन स्टेशनों से अंतरराज्यीय पारेषण प्रणाली (Intra State Transmissions System) के माध्यम से किया गया। In the month of January, 2023 a total of 126,759 MU of electricity was transacted in the country out of which 59,710 MU was transacted through ISTS, and the remaining through state controlled generating stations through Intra State Transmissions System.
- (ii) अल्पावधि मार्केट के अंतर्गत कुल 20,466 MU का कारोबार किया गया था, जिसमें से 9,450 MU पावर एक्सचेंजों के माध्यम से कारोबार किया गया और शेष द्विपक्षीय कारोबार और विचलन (deviations) के रूप में हुआ। इस प्रकार अल्पावधि कारोबार, जनवरी, 2023 माह में ट्रेड की गई विद्युत की कुल मात्रा का 16.15 % था और 7.46

I/27861/2023

% पावर एक्सचेंजों के माध्यम से रहा। A total of 20,466 MU was transacted under Short Term Market, out of which 9,450 MU was transacted through Power Exchanges and remaining happened as bilateral transactions & deviations. Thus, the total short term trade in January, 2023 was 16.15 % of total volume of electricity traded in January, 2023 and 7.46 % was through Power Exchanges.

- (iii) यदि हम अंतर्राज्यीय पारेषण प्रणाली (ISTS) के माध्यम से आपूर्ति की गई विद्युत के संबंध में इन कारोबारों की तुलना करते हैं, तो अल्पावधि कारोबार अंतर्राज्यीय पारेषण प्रणाली (ISTS) कारोबार का लगभग 34.28 % रहा, जिसमें से पावर एक्सचेंजों के माध्यम से कारोबार 15.83 % रहा। If we compare these transactions with respect to the electricity supplied through ISTS, the short term transactions constitutes about 34.28 % of ISTS transactions, out of which transaction through the power exchanges constitutes 15.83 %.

भवदीय/ Yours faithfully,

(प्रदीप जिंदल/ Pardeep Jindal)

मुख्य अभियंता (आर.ए.)/ Chief Engineer (RA)

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7. COO, Hindustan Power Exchange Limited (HPX), World Trade Tower, 8th Floor, Sector 16, Noida, Uttar Pradesh - 201301.

CEA website (<https://cea.nic.in/market-monitoring-report/?lang=en>)



सत्यमेव जयते

मासिक मार्केट मॉनिटरिंग रिपोर्ट - जनवरी, 2023

Monthly Market Monitoring Report January, 2023



भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
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**जनवरी, 2023 की मासिक मार्केट
मॉनिटरिंग रिपोर्ट का सारांश**

**Summary of Market Monitoring Report
For the month of January, 2023**

जनवरी, 2023 माह के लिए सारांश Summary for Month: January, 2023

भारत में विद्युत एक्सचेंजों पर विद्युत के व्यापार का सारांश

Summary of Electricity Transactions on Power Exchanges in India

- जनवरी, 2023 के दौरान विद्युत एक्सचेंजों (यानी आईईएक्स, पीएक्सआईएल और एचपीएक्स) के माध्यम से कुल **9,450 MU** विद्युत का कारोबार किया गया। विद्युत की यह मात्रा डिलीवरी की तारीख के आधार पर है और इसमें DAM, GDAM, RTM, TAM और GTAM मार्केट खंडों के माध्यम से कारोबार शामिल हैं।

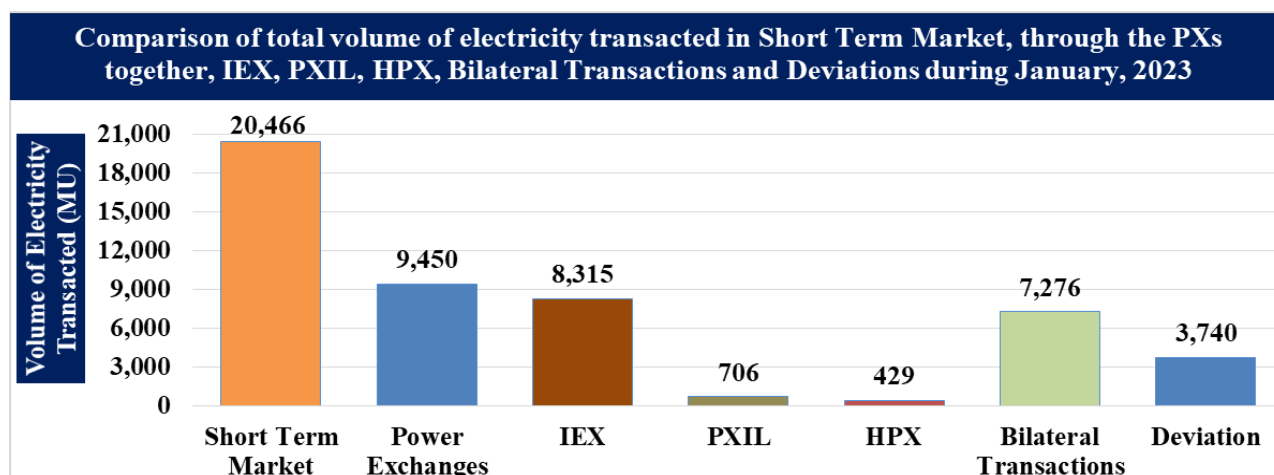
A total volume of **9,450 MU** electricity was transacted through power exchanges i.e. IEX, PXIL & HPX, during the month of January, 2023. This volume of electricity is on delivery date basis and includes transactions through DAM, GDAM, RTM, TAM and GTAM market segments.

Segment	Transactions happened in the PXs (IEX, PXIL & HPX combined)			
	FSV (MU)	Average MCP (₹/kWh)	Congestion (MU)	Real Time Curtailment (MU)
DAM	4,948	6.40	0.00	0.00
GDAM	285	6.44	0.00	0.00
RTM	2,102	6.08	0.00	0.00
TAM	1,990	6.15	0.00	0.87
GTAM	125	6.62	0.00	0.00
Total in PXs	9,450	6.28*	0.00	0.87

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

- द्विपक्षीय व्यापार के तहत कुल **7,276 MU** विद्युत का कारोबार किया गया और **3,740 MU** को विचलन के रूप में स्थानांतरित किया गया। इस प्रकार कुल **20,466 MU** विद्युत का कारोबार अल्पावधि व्यापार के रूप में किया गया था। जनवरी, 2023 के महीने में देश में कुल **126,759 MU** विद्युत की आपूर्ति की गई थी, इस प्रकार जनवरी, 2023 माह में कारोबार की गई विद्युत की कुल मात्रा में अल्पावधि बाजार का हिस्सा **16.15 %** था।

Under the Bilateral trade a total of **7,276 MU** of electricity was transacted and **3,740 MU** was transferred as deviation. Thus a total of **20,466 MU** of electricity was transacted as short term trade. In the month of January, 2023 a total of **126,759 MU** of electricity was supplied in the country, thus the share of short term market in the total volume of electricity traded in January, 2023 was **16.15%**.



- DAM, GDAM, RTM, TAM और GTAM में कोई संचरण जाम नहीं देखा गया। जनवरी, 2023 माह के महीने में रिपोर्ट की गई वास्तविक समय में विद्युत कटौती की कुल मात्रा केवल **0.87 MU** थी।

There was no congestion happened in DAM, GDAM, RTM, TAM & GTAM. The total volume of real time curtailment reported in the month of January, 2023 was only **0.87 MU**.

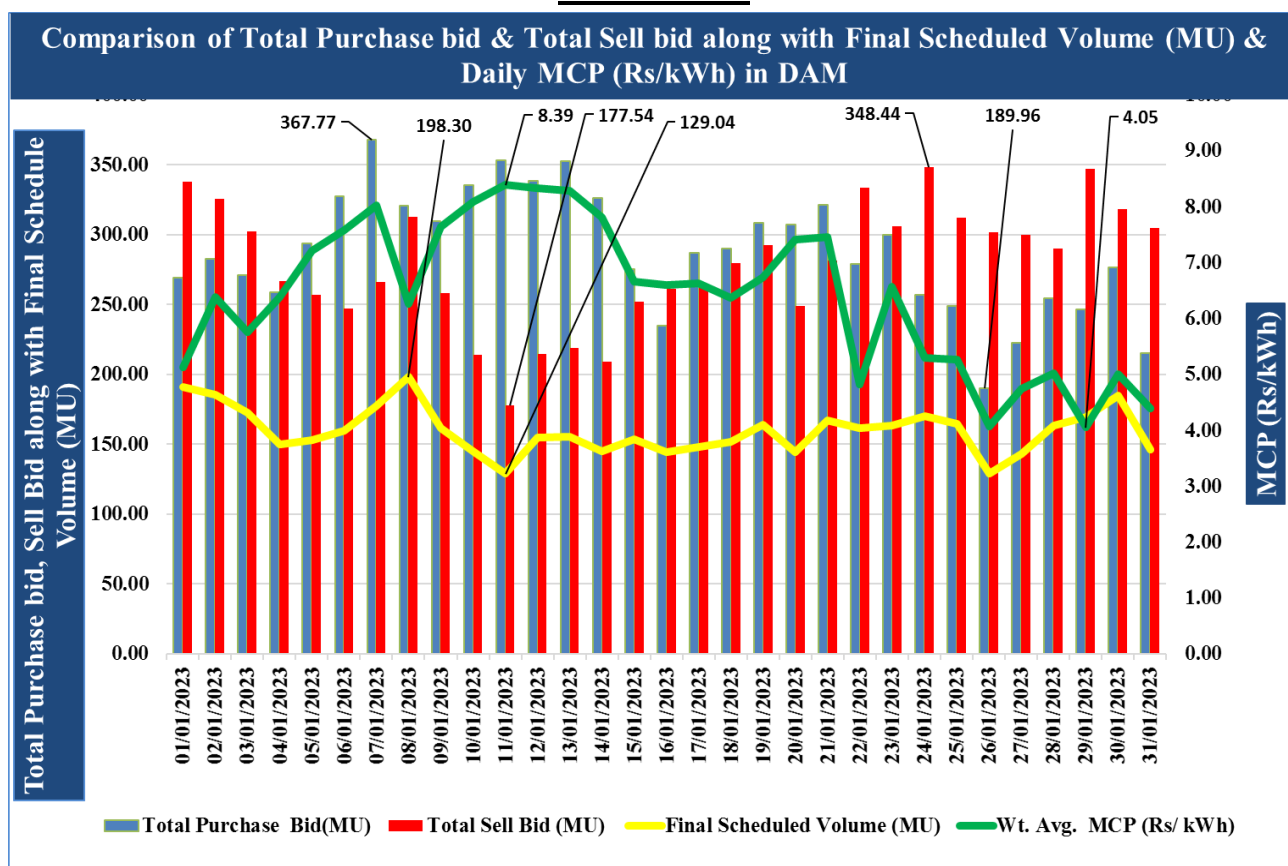
- जनवरी, 2023 माह के दौरान अंतर्राज्यीय पारेषण प्रणाली (ISTS) में निर्धारित अनुसूचित विद्युत की कुल मात्रा **59,710 MU** थी। जनवरी, 2023 के महीने में अल्पावधि बाजार में विद्युत का लेन-देन अंतर्राज्यीय पारेषण प्रणाली (ISTS) के माध्यम से अनुसूचित की गई कुल विद्युत की मात्रा का **34.28 %** रहा।

The total volume of electricity scheduled at ISTS during the month of January, 2023 was **59,710 MU**. The total volume of electricity transacted in the short term market was **34.28 %** of total volume schedule at ISTS in the month of January, 2023.

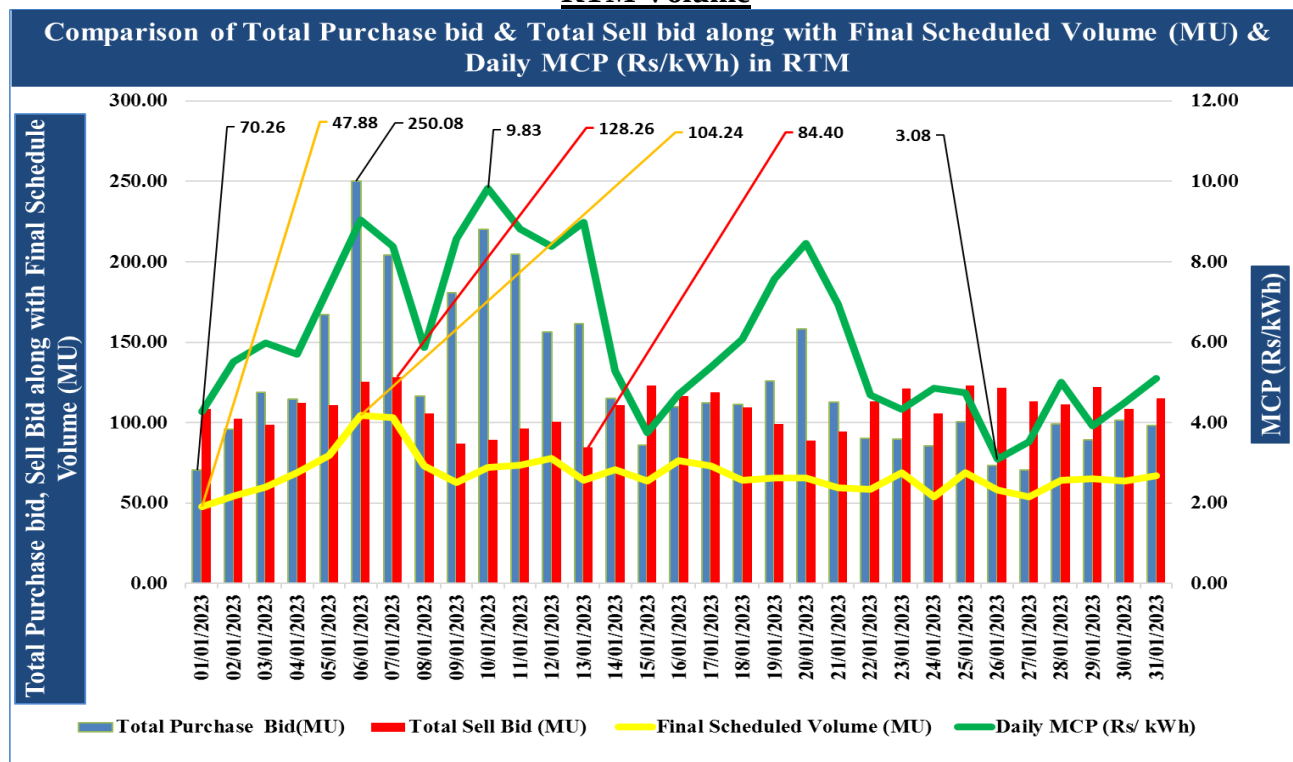
- जनवरी, 2023 माह के दौरान DAM और RTM में विद्युत की खरीद और बिक्री बोलियों, अंतिम अनुसूचित मात्रा और दैनिक औसत MCP की भिन्नता निम्नलिखित चित्रों में दर्शाई गई है:

The variation of Purchase and Sell bids, Final Scheduled Volume and Daily Avg. MCP in DAM and RTM during the month of January, 2023 are shown in following figures:

DAM Volume



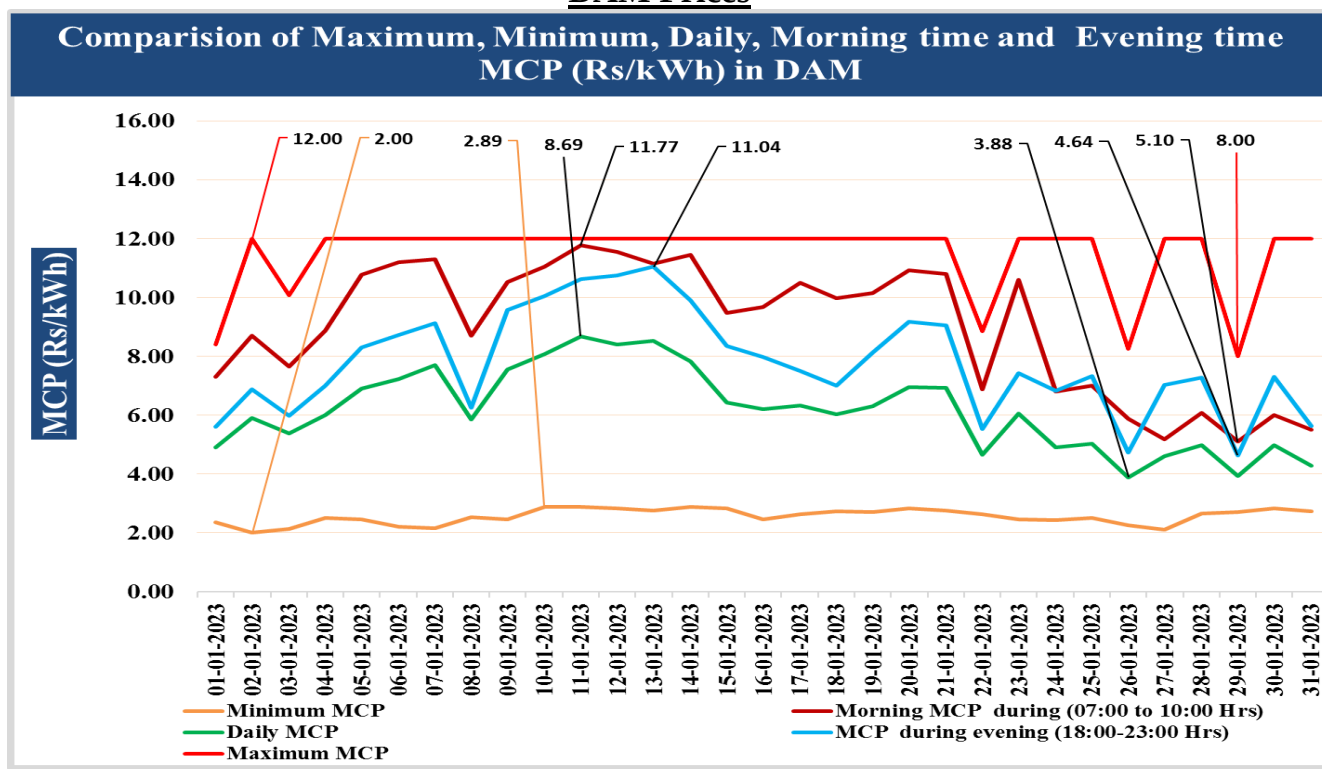
RTM Volume



- जनवरी, 2023 माह के दौरान DAM और RTM में अधिकतम, न्यूनतम, दैनिक, सुबह और शाम के समय MCP की भिन्नता निम्नलिखित चित्रों में दिखाई गई है:

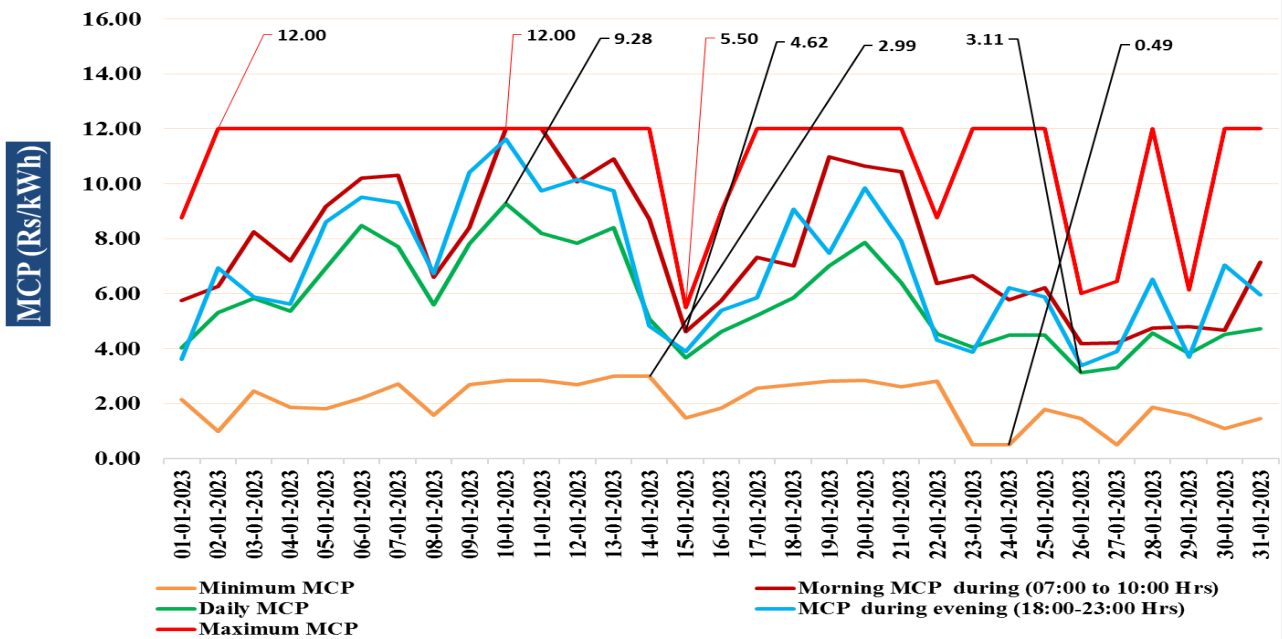
The variation of Maximum, Minimum, Daily, Morning and Evening time MCPs in DAM and RTM during the month of January, 2023 are shown in following figures:

DAM Prices



RTM Prices

Comparison of Maximum, Minimum, Daily, Morning time and Evening time MCP (Rs/kWh) in RTM



MARKET MONITORING REPORT DETAILS

Electricity Transactions on Power Exchanges in India

1. Day Ahead Market (DAM)

- 1.1.** The total volume of electricity transacted on the power exchanges, viz., IEX and PXIL in the Day Ahead Market (DAM) in the month of January, 2023 was **4,948.08 MU**. The total energy supplied in the country during the month of January, 2023 was 126,759 MU. Thus, the volume of electricity transacted on the power exchanges in DAM during January, 2023 was 3.90 % of the total energy supplied in the country. Comparing with the total volume of electricity transacted in DAM during the past month i.e. December, 2022, it was **4,977.44 MU** which was 4.08 % of the total energy supplied (121,913 MU) in the country during December, 2022. Similarly, the total volume of electricity transacted in DAM during previous year i.e. January, 2022, was **5,280.26 MU** which was 4.72 % of the total energy supplied (111,808 MU) in the country during January, 2022.
- 1.2.** The volume of electricity transacted on IEX and PXIL during January, 2023 were **4,947.96 MU** and **0.12 MU**, respectively, which means that the total volume transacted on IEX was **99.99 %** of the total volume on power exchanges. No transaction of electricity took place in HPX. The volume of electricity transacted during December, 2022 on IEX was **4,977.44 MU**. No transaction of electricity took place in PXIL and HPX, respectively. The volume of electricity transacted on IEX and PXIL during January, 2022, were **5,279.70 MU** and **0.56 MU** respectively.
- 1.3.** The DAM volume for January, 2023 in IEX is inclusive of Cross Border Transactions of Electricity with Nepal and Bhutan (details given at **Annexure XII**), which was **320.80 MU** (i.e. 232.79 MU buy by Nepal and 88.01 MU buy by Bhutan).
- 1.4.** The Average Market Clearing Price (MCP) on IEX during the month of January, 2023 was **₹ 6.40/kWh**, which shows an increase of 14.90 % & 88.79 % when compared with average MCP's for the month of December, 2022 and January, 2022, which were **₹ 5.57/kWh** and **₹ 3.39/kWh**, respectively. On PXIL, the average MCP during the month of January, 2023 was **₹ 11.33/kWh**, which shows an increase of 158.68 % when compared with average MCP for the January, 2022, which was **₹ 4.38/kWh** and no transaction of electricity took place in December, 2022 in PXIL. No transaction of electricity took place in HPX during January, 2023 and December, 2022.

1.5. DAM Market Clearing Price, Area Clearing Price and Final Scheduled Volume Of DAM in the Power Exchanges

Final Scheduled Volume (FSV), Daily Avg. Market Clearing Prices (MCP), Area Clearing Prices (ACP) in Day Ahead Market during the month of January, 2023 as compared with December, 2022 and January, 2022 is given in Table- 1A & 1B:

(a) Final Scheduled Volume:

Exchange	Period	Final Scheduled Volume (MU)			
		Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
IEX	January, 2023*	4947.96	129.04	198.30	159.61
	December, 2022*	4977.44	130.07	182.43	160.56
	%Change (Month over Month)	-0.59	-0.79	8.70	-0.59
	January, 2022	5279.70	136.74	196.08	170.31
	%Change (Year over Year)	-6.28	-5.63	1.13	-6.28
PXIL	January, 2023	0.12	0.12	0.12	0.12
	December, 2022	-	-	-	-
	%Change (Month over Month)	NA	NA	NA	NA
	January, 2022	0.56	0.01	0.10	0.04
	%Change (Year over Year)	-78.57	1100.00	20.00	200.00
HPX	January, 2023	-	-	-	-
	December, 2022	-	-	-	-
	%Change (Month over Month)	NA	NA	NA	NA

-: No transaction took place

NA: Not Applicable

* DAM Volume in IEX is inclusive of Cross Border Transactions of Electricity with Nepal and Bhutan

Table: 1A

(b) Daily Avg. Market Clearing Price (MCP) and Area Clearing Price (ACP):

Exchange	Period	Prices				
		Daily MCP (₹/kWh)			ACP (₹/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
IEX	January, 2023	4.05	8.39	6.40	2.00	12.00
	December, 2022	3.80	7.28	5.57	2.00	12.00
	Change% (Month over Month)	6.58	15.25	14.90	0.00	0.00
	January, 2022	2.63	4.45	3.39	1.58	11.27

Exchange	Period	Prices				
		Daily MCP (₹/kWh)			ACP (₹/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
	%Change (Year over Year)	53.99	88.54	88.79	26.58	6.48
PXIL	January, 2023	11.33	11.33	11.33	9.99	12.00
	December, 2022	-	-	-	-	-
	%Change Month over Month)	NA	NA	NA	NA	NA
	January, 2022	3.99	4.99	4.38	3.99	4.99
	%Change (Year over Year)	183.96	127.05	158.68	150.38	140.48
HPX	January, 2023	-	-	-	-	-
	December, 2022	-	-	-	-	-
	%Change Month over Month)	NA	NA	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table: 1B

1.6. The maximum Area Clearing Price (ACP) of ₹ 12.00/kWh in IEX was observed in all 13 regions during 534 time blocks on 2nd, 4th to 21st, 23rd to 25th, 27th, 28th, 30th & 31st January, 2023. As there was no congestion in transmission system, the MCP for these time blocks was also ₹ 12.00/kWh. Whereas, in PXIL, the maximum ACP of ₹ 12.00/kWh was observed in all 13 regions during 8 time blocks on 23rd January, 2023. As there was no congestion in transmission system, the MCP for these time blocks was also ₹ 12.00/kWh.

1.7. The minimum ACP of ₹ 2.00/kWh in IEX was observed in all 13 regions during the time block 02:45 - 03:00 Hrs on 2nd January, 2023. As there was no congestion in transmission system, the MCP for this time-block was also ₹ 2.00/kWh. Whereas, in PXIL, the minimum ACP of ₹ 9.99/kWh was observed in all 13 regions during 4 time blocks on 23rd January, 2023. As there was no congestion in transmission system, the MCP for this time block was also ₹ 9.99/ kWh

2. Real Time Market (RTM)

The total volume of electricity transacted on the power exchanges in Real Time Market in January, 2023 was **2,101.89 MU**, out of which **2,101.89** (100 %) was transacted in IEX and no transaction took place in PXIL and HPX. The Final Scheduled Volume (FSV), Daily Avg. Market Clearing Prices (MCP) and Area Clearing Prices (ACP) in Real Time Market during the month of January, 2023 as compared with December, 2022 and January, 2022 are as given in table 2A & 2B:

(i) Final Scheduled Volume:

Exchange	Period	Final Scheduled Volume (MU)			
		Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
IEX	January, 2023	2101.89	47.88	104.24	67.80
	December, 2022	1763.05	44.02	73.78	56.87
	% Change (Month over Month)	19.22	8.77	41.28	19.22
	January, 2022	1575.13	37.21	75.04	50.81
	% Change (Year over Year)	33.44	28.68	38.91	33.44
PXIL	January, 2023	-	-	-	-
	December, 2022	-	-	-	-
	% Change (Month over Month)	NA	NA	NA	NA
	January, 2022	-	-	-	-
	% Change (Year over Year)	NA	NA	NA	NA
HPX	January, 2023	-	-	-	-

-: No transaction took place

NA: Not Applicable

Table-2A

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

Exchange	Period	Prices (₹/kWh)				
		Daily MCP (₹/kWh)			ACP (₹/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
IEX	January, 2023	3.08	9.83	6.08	0.49	12.00
	December, 2022	3.38	7.08	5.41	0.50	12.00
	% Change (Month over Month)	-8.88	38.84	12.38	-2.00	0.00
	January, 2022	2.53	4.92	3.45	0.50	20.00
	% Change (Year over Year)	21.74	99.80	76.23	-2.00	-40.00
PXIL	January, 2023	-	-	-	-	-
	December, 2022	-	-	-	-	-
	% Change (Month over Month)	NA	NA	NA	NA	NA
	January, 2022	-	-	-	-	-
	% Change (Year over Year)	NA	NA	NA	NA	NA

Exchange	Period	Prices (₹/kWh)				
		Daily MCP (₹/kWh)			ACP (₹/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
HPX	January, 2023	-	-	-	-	-

-: No transaction took place

NA: Not Applicable

Table-2B

3. Green Day Ahead Market (GDAM):

The total volume of electricity transacted in GDAM in the month of January, 2023 was **285.16 MU** (i.e. **285.16 MU** in IEX) at an average MCP of **₹ 6.44/kWh** and no transaction took place in PXIL & HPX in GDAM. The Final Scheduled Volume (FSV), Daily Avg. 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 January, 2023 are as given in Table 3A and 3B:

i) Final Scheduled Volume in IEX:

Exchange	Segment	Period	Final Scheduled Volume (MU)			
			Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
IEX	Solar	January, 2023	26.06	0.18	1.40	0.84
		December, 2022	28.92	0.43	3.45	0.93
		% Change (Month over Month)	-9.89	-58.14	-59.42	-9.68
	Non Solar	January, 2023	259.10	4.11	11.58	8.36
		December, 2022	209.06	5.21	10.27	6.74
		% Change (Month over Month)	23.94	-21.11	12.76	24.04
	Hydro	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		% Change (Month over Month)	NA	NA	NA	NA
PXIL	Solar + Non Solar	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		% Change (Month over Month)	NA	NA	NA	NA
	Hydro	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		% Change (Month over Month)	NA	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table-3A

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

Exchange	Segment	Period	Prices (₹/kWh)				
			Daily MCP (₹/kWh)			ACP (₹/kWh)	
			Minimum	Maximum	Average	Minimum	Maximum
IEX	Solar and Non Solar	January, 2023	4.13	9.25	6.44	2.86	12.00
		December, 2022	4.08	6.94	5.32	2.90	12.00
		% Change (Month over Month)	1.23	33.29	21.05	-1.38	0.00
PXIL	Solar and Non Solar	January, 2023	-	-	-	-	-
		December, 2022	-	-	-	-	-
		% Change (Month over Month)	NA	NA	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table-3B

- 3.1 There was no transmission congestion in the power exchanges in Green Day Ahead Market during the month of January, 2023 and December, 2022, respectively.
- 3.2 There was no real time curtailment in the power exchanges in Green Day Ahead Market during the month of January, 2023 and December, 2022, respectively.
- 3.3 The **top 10 sellers** on the power exchanges in **Green Day Ahead Market (GDAM)** in the month of January, 2023 were **Karnataka, Adani Wind Energy Kutchh Five Limited, J&K, Andhra Pradesh, Ostro Energy Private Limited (OEPL), Ramagundam Floating Solar PV Station, SBSR Power Cleantech Eleven Private Limited, Madhya Pradesh, Simhadri FSP 15 MW and Telangana**, which constituted **96.75 %** of the market volume.
- 3.4 The **top 10 buyers** on the power exchanges in **Green Day Ahead Market (GDAM)** in the month of January, 2023 were **Maharashtra, DVC, Punjab, Daman & Diu - Dadra & Nagar Haveli, Karnataka, Delhi, Tamil Nadu, Odisha, Gujarat and BHARAT ALUMINIUM COMPANY LTD (Bulk Consumer)**, which constituted **95.49 %** of the market volume.

4. Term Ahead Market (TAM)

- 4.1. The total volume of electricity transacted on the power exchanges in Term Ahead Market in January, 2023 on delivery date basis was **1,990.15 MU**, out of which **918.74 MU** (46.16 %) was transacted on IEX, **661.11 MU** (33.22 %) was transacted on PXIL and **410.30 MU** (20.62 %) was transacted on HPX.
- 4.2. The total volume of electricity transacted on the power exchanges in Term Ahead Market in December, 2022 on delivery date basis was **1,601.22 MU**, out of which **822.47 MU** (51.37 %) was transacted on IEX, **545.79 MU** (34.09 %) was transacted on PXIL and **232.96 MU** (14.54 %) was transacted on HPX.
- 4.3. Similarly, the total volume of electricity transacted on 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.
- 4.4. In the month of January, 2023, the transaction of electricity in IEX under anyday single sided reverse auction contract was **153.71 MU**, whereas in PXIL, the same was **16.00 MU**. Similarly, under the long duration contracts (Daily, Weekly & Monthly) **37.20 MU** happened in Monthly contract in IEX, whereas in PXIL, under the long duration contracts **100.80 MU** happened in Daily contract, **16.80 MU** happened in Weekly contract and No transaction took place in monthly contract. No transaction took place in HPX under reverse auction and long duration contracts in the month of January, 2023.
- 4.5. With respect to the total energy supplied during the month of January, 2023 in the country, the volume of electricity traded on the power exchanges in TAM on delivery date basis represents **1.57 %** of the total energy supplied. The same was **1.31 %** in December, 2022 and **0.59 %** in January, 2022.
- 4.6. In the month of January, 2023, there was real time curtailment of **0.87 MU** in TAM, Out of which **0.38 MU** happened under Anyday Single Sided Reverse Auction contract in IEX. Whereas, in PXIL, there was real time curtailment of **0.49 MU** under Day Ahead Contingency contract & in HPX, there was no real time curtailment in TAM.
- 4.7. In the month of January, 2023, there was no transmission congestion in IEX, PXIL and HPX in TAM.
- 4.8. **The comparison of total volume of electricity transacted and Average MCP in the power exchanges in Term Ahead Market (TAM) on delivery date basis during January, 2023 with December, 2022 and January, 2022 is given in Table – 4A & 4B:**

(a) **Final Scheduled Volume (MU), January, 2023 vis- a- vis December, 2022 and January, 2022**

Exchange	Period	Final Scheduled Volume (MU)				
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly	Total
IEX	January, 2023	0.84	502.59	90.00	134.40	727.83
	December, 2022	0.10	530.80	92.38	100.80	724.08

Exchange	Period	Final Scheduled Volume (MU)				
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly	Total
	%Change (Month over Month)	740.00	-5.31	-2.58	33.33	0.52
	January, 2022	0.17	102.31	287.79	-	390.27
	%Change (Year over Year)	394.12	391.24	-68.73	NA	86.49
PXIL	January, 2023	5.13	522.38	-	-	527.51
	December, 2022	0.73	263.32	-	-	264.05
	%Change (Month over Month)	602.74	98.38	NA	NA	99.78
	January, 2022	0.26	205.75	58.80	-	264.81
	%Change (Year over Year)	1873.08	153.89	NA	NA	99.20
HPX	January, 2023	-	410.30	-	-	410.30
	December, 2022	-	232.96	-	-	232.96
	%Change (Month over Month)	NA	76.12	NA	NA	76.12

- : No transaction took place

NA: Not Applicable

Table: 4A

(b) Average MCP, January, 2023 vis- a- vis December, 2022 and January, 2022

Exchange	Period	Average MCP (₹/kWh)			
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly
IEX	January, 2023	12.00	7.14	4.85	6.25
	December, 2022	5.51	6.06	4.65	4.61
	%Change (Month over Month)	117.79	17.82	4.30	35.57
	January, 2022	3.50	4.05	3.37	-
	%Change Year over Year)	242.86	76.30	43.92	NA
PXIL	January, 2023	11.32	7.57	-	-
	December, 2022	7.93	6.27	-	-
	%Change (Month over Month)	42.75	20.73	NA	NA
	January, 2022	8.00	3.65	3.25	-
	%Change (Year over Year)	41.50	107.40	NA	NA
HPX	January, 2023	-	8.17	-	-
	December, 2022	-	5.60	-	-
	%Change (Month over Month)	NA	45.89	NA	NA

-: No transaction took place

NA: Not Applicable

Table: 4B

5. GREEN TERM AHEAD MARKET (GTAM):

The total volume of electricity transacted in the IEX, PXIL & HPX in GTAM on delivery date basis was **124.80 MU** (**0.20 MU** in Solar, **110.23 MU** in Non-Solar and **14.37 MU** in Hydro), respectively.

The total volume of electricity transacted in GTAM in Day Ahead Contingency, Intraday, Daily/Anyday and Weekly contracts during January, 2023 on delivery date basis has been shown in Tables 5A to 5F.

5.1 Solar Energy Segment in GTAM

The Final Scheduled Volume and the Price of electricity transacted in GTAM in Power Exchanges during January, 2023 and its comparison with December, 2022 and January, 2022 has been shown in Table 5A & 5B below.

(i) Final Scheduled Volume:

Exchange	Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
IEX	Day Ahead Contingency	January, 2023	-	-	-	-
		December, 2022	6.67	2.09	2.30	2.22
		%Change Month over Month)	NA	NA	NA	NA
		January, 2022	102.31	0.96	7.04	3.30
		%Change (Year over Year)	NA	NA	NA	NA
	Intraday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	0.17	0.17	0.17	0.17
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	287.79	4.18	11.98	9.28
		%Change (Year over Year)	NA	NA	NA	NA
	Weekly	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	January, 2023	-	-	-	-
		December, 2022	0.20	0.20	0.20	0.20
		%Change (Month over Month)	NA	NA	NA	NA

Exchange	Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
		January, 2022	98.21	0.58	5.45	3.17
		%Change (Year over Year)	NA	NA	NA	NA
	Intraday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Weekly	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
HPX	Day Ahead Contingency	January, 2023	0.20	0.20	0.20	0.20
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table-5A

(ii) Daily Avg. Market Clearing Price (MCP):

Exchange	Solar Energy Contract	Period	Prices((₹/kWh)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	January, 2023	-	-	-
		December, 2022	5.02	5.33	5.14
		%Change (Month over Month)	NA	NA	NA
		January, 2022	2.91	5.55	4.05
		%Change (Year over Year)	NA	NA	NA
	Intraday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	3.50	3.50	3.50
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-
		December, 2022	-	-	-

Exchange	Solar Energy Contract	Period	Prices((₹/kWh)		
			Minimum	Maximum	Average
		%Change (Month over Month)	NA	NA	NA
		January, 2022	3.11	3.78	3.37
		%Change (Year over Year)	NA	NA	NA
	Weekly	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	January, 2023	-	-	-
		December, 2022	5.87	5.87	5.87
		%Change (Month over Month)	NA	NA	NA
		January, 2022	3.46	4.77	3.88
		%Change (Year over Year)	NA	NA	NA
	Intraday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Weekly	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
HPX	Day Ahead Contingency	January, 2023	7.28	7.28	7.28
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table-5B

- In January, 2023, there was no transmission congestion in GTAM (Solar) in IEX, PXIL & HPX.
- In January, 2023, there was no real time curtailment in GTAM (Solar) in IEX, PXIL & HPX.

5.2 Non-Solar Energy Segment in GTAM

The Final Scheduled Volume and the Price of electricity transacted in GTAM in Power Exchanges during January, 2023 and its comparison with December, 2022 has been shown in Tables 5C & 5D below.

(i) Final Scheduled Volume:

Exchange	Non- Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
IEX	Day Ahead Contingency	January, 2023	41.41	0.08	3.19	1.53
		December, 2022	104.30	1.68	4.23	3.36
		%Change (Month over Month)	-60.30	-95.24	-24.59	-54.46
		January, 2022	52.75	0.04	6.33	1.70
		%Change (Year over Year)	-21.50	100.00	-49.61	-10.00
	Intraday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	January, 2023	5.57	0.10	0.26	0.18
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	7.02	0.12	0.30	0.29
		%Change (Year over Year)	-20.66	-16.67	-13.33	-37.93
	Weekly	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	January, 2023	44.84	0.11	2.24	1.45
		December, 2022	66.94	0.43	3.25	2.16
		%Change (Month over Month)	-33.01	-74.42	-31.08	-32.87
		January, 2022	57.96	0.22	7.59	1.87
		%Change (Year over Year)	-22.64	-50.00	-70.49	-22.46
	Intraday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA

Exchange	Non- Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	2.78	0.10	0.10	0.10
		%Change (Year over Year)	NA	NA	NA	NA
	Weekly	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		January, 2022	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
HPX	Day Ahead Contingency	January, 2023	18.41	0.10	1.13	0.68
		December, 2022	16.69	-	-	-
		%Change (Month over Month)	10.31	NA	NA	NA

∴ No transaction took place

NA: Not Applicable

Table - 5C

(ii) Daily Avg. Market Clearing Price (MCP):

Exchange	Non- Solar Energy Contract	Period	Prices(₹/kWh)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	January, 2023	4.32	8.64	6.45
		December, 2022	4.61	7.30	5.72
		%Change (Month over Month)	-6.29	18.36	12.76
		January, 2022	3.75	4.23	3.94
		%Change (Year over Year)	15.20	104.26	63.71
	Intraday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	January, 2023	5.70	6.10	5.82
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	4.65	4.65	4.65

Exchange	Non- Solar Energy Contract	Period	Prices((₹/kWh)		
			Minimum	Maximum	Average
	Weekly	%Change (Year over Year)	22.58	31.18	25.16
		January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	January, 2023	3.79	8.60	6.00
		December, 2022	3.86	6.64	5.22
		%Change (Month over Month)	-1.81	29.52	14.94
		January, 2022	3.62	4.20	4.02
		%Change (Year over Year)	4.70	104.76	49.25
	Intraday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	4.25	4.40	4.31
		%Change (Year over Year)	NA	NA	NA
	Weekly	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		January, 2022	-	-	-
		%Change (Year over Year)	NA	NA	NA
HPX	Day Ahead Contingency	January, 2023	4.48	10.06	7.25
		December, 2022	-	-	5.43
		%Change (Month over Month)	NA	NA	33.52

-: No transaction took place

NA: Not Applicable

Table - 5D

- In January, 2023, there was no transmission congestion in GTAM (Non Solar) in IEX, PXIL & HPX.
- In January, 2023, there was no real time curtailment in GTAM (Non Solar) in IEX, PXIL & HPX.

5.3 Hydro Energy Segment in GTAM

For the Hydro Energy Segment in GTAM, Final Scheduled Volume and Daily Average MCP in the Day Ahead Contingency, Intraday, Daily/ Anyday and Weekly contracts during January, 2023 on delivery date basis are shown in Tables 5E & 5F.

Hydro Energy Contract in GTAM

(i) Final Scheduled Volume:

Exchange	Hydro Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum (on a day)	Maximum (on a day)	Average (per day)
IEX	Day Ahead Contingency	January, 2023	14.37	0.28	0.71	0.46
		December, 2022	25.60	0.70	0.98	0.83
		%Change (Month over Month)	-43.87	-60.00	-27.55	-44.58
	Intraday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Weekly	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Intraday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
	Weekly	January, 2023	-	-	-	-
		December, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table: 5E

(ii) Daily Avg. Market Clearing Price (MCP):

Exchange	Hydro Energy Contract	Period	Prices(₹/kWh)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	January, 2023	5.45	11.85	8.58
		December, 2022	3.93	7.72	5.97
		%Change (Month over Month)	38.68	53.50	43.72
	Intraday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Weekly	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
PXIL	Day Ahead Contingency	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Intraday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Daily/Anyday	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Weekly	January, 2023	-	-	-
		December, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table – 5F

- In January, 2023, there was no transmission congestion in GTAM (Hydro) in IEX. No transaction took place in PXIL and HPX in GTAM (Hydro).
- In January, 2023, there was no real time curtailment in GTAM (Hydro) in IEX. No transaction took place in PXIL and HPX in GTAM (Hydro).

6. **Bilateral Transactions:**

The total volume of electricity transacted through **Bilateral transactions** in the month of January, 2023 was **7,275.68 MU**. The total buy volume of electricity transacted in bilateral market through direct transactions and trader in the month of January, 2023 were **3,376.11 MU** and **3,899.57 MU** respectively. The details of Bilateral transactions of Electricity during January, 2023 is shown in Table Below:

January, 2023	Direct	Traders	Total Bilateral Transaction (MU)
Total	3,376.11	3,899.57	7,275.68
Minimum	7.72	0.20	-
Maximum	1,214.47	608.22	-

Table -6A

The region-wise maximum/ minimum volume of electricity transacted bilaterally during January, 2023 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	190.91	151.63	1769.70	1000.89	1133.38	1127.13	282.12	1448.91	-	171.01
Minimum	7.72	16.65	68.26	29.26	28.59	1.77	21.21	23.80	-	0.20
Maximum	140.50	82.60	1214.47	376.73	653.97	608.22	150.51	518.94	-	115.32

Table-6B

6.1. The top 5 buyers on bilateral transaction through direct transactions in the month of January, 2023 were **Madhya Pradesh, Rajasthan, Maharashtra, Telangana** and **Haryana**, which constituted **75.36 %** of the market volume. Whereas **top 5 buyers** on bilateral transaction through traders in the month of January, 2023 were **Himachal Pradesh, Telangana, Andhra Pradesh, Maharashtra** and **Gujarat**, which constituted **58.84 %** of the market volume. [Annexure III]

6.2. The top 5 sellers on bilateral transaction through direct transactions in the month of January, 2023 were **Uttar Pradesh, Punjab, Chhattisgarh, ADHUNIK POWER LTD** and **AHEJ4LAHW**, which constituted **54.18 %** of the market volume. Whereas **top 5 sellers** on bilateral transaction through traders in the month of January, 2023 were **Punjab, JINDAL STAGE-II, RPREL, Delhi** and **JINDAL POWER**, which constituted **52.69 %** of the market volume. [Annexure III]

6.3. Deviation Volume -The volume of Deviation observed in the month of January, 2023 in import and export were **3,850.16MU** and **3,630.32 MU** respectively. The total volume of Deviation observed in the month of January, 2023 can be taken as **3,740.24 MU**.

6.4. A comparison of volume of electricity transacted through the Power Exchanges together in DAM, TAM, RTM, GTAM and GDAM (on delivery date basis) with Bilateral transactions and Deviation in the month of January, 2023 is shown in **Figure 1:**

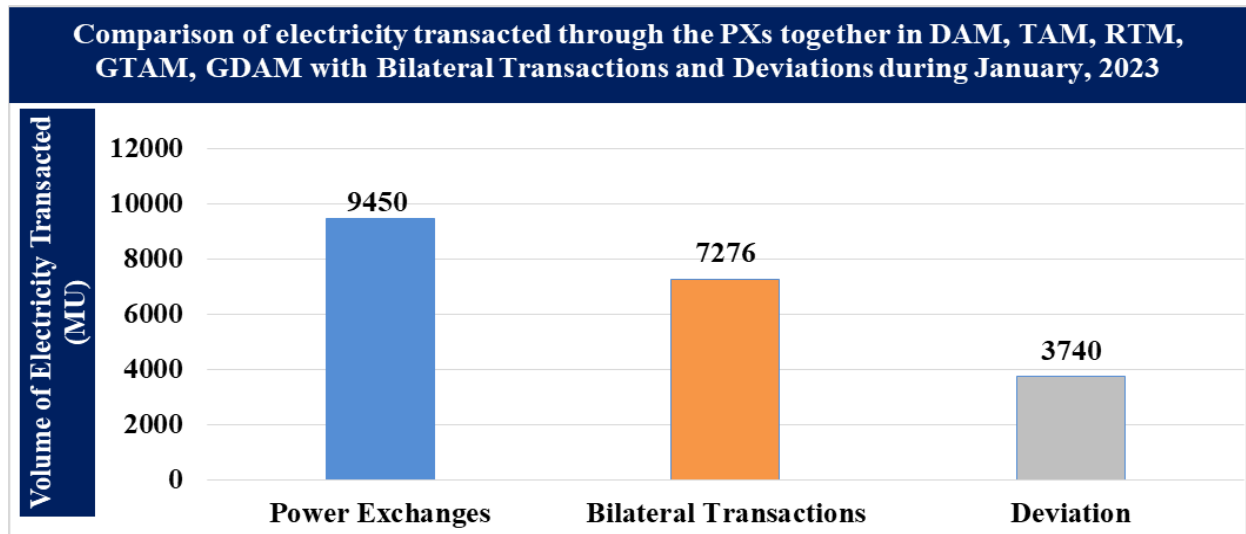
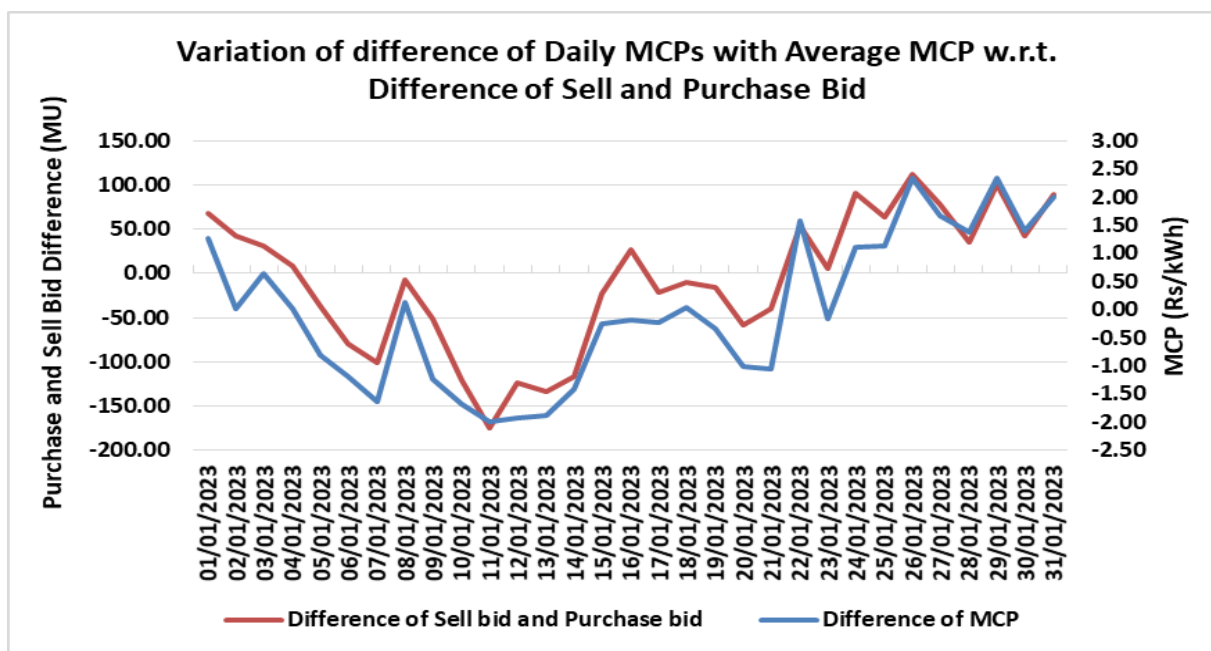


Figure -1

7. Analysis of movement of prices observed in DAM during January, 2023

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 January, 2023 month. The observations made are as under:

- 7.1. In order to find out the determinants which are responsible for the Daily Avg. MCP, a regression analysis has been carried out where the Daily Avg. 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.
- 7.2. A double log function was used so that elasticity of Daily Avg. MCP could be read off from the coefficients of independent variables. The regression analysis revealed that the most significant variables was the Peak Demand. Further, the regression analysis revealed that the elasticity of the Daily Avg. MCP with respect to Peak Demand was **6.43** in the month of January, 2023.
- 7.3. The variation of difference of Daily Avg. MCPs with Average MCP w.r.t Difference of Sell and Purchase bid is Shown below:



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

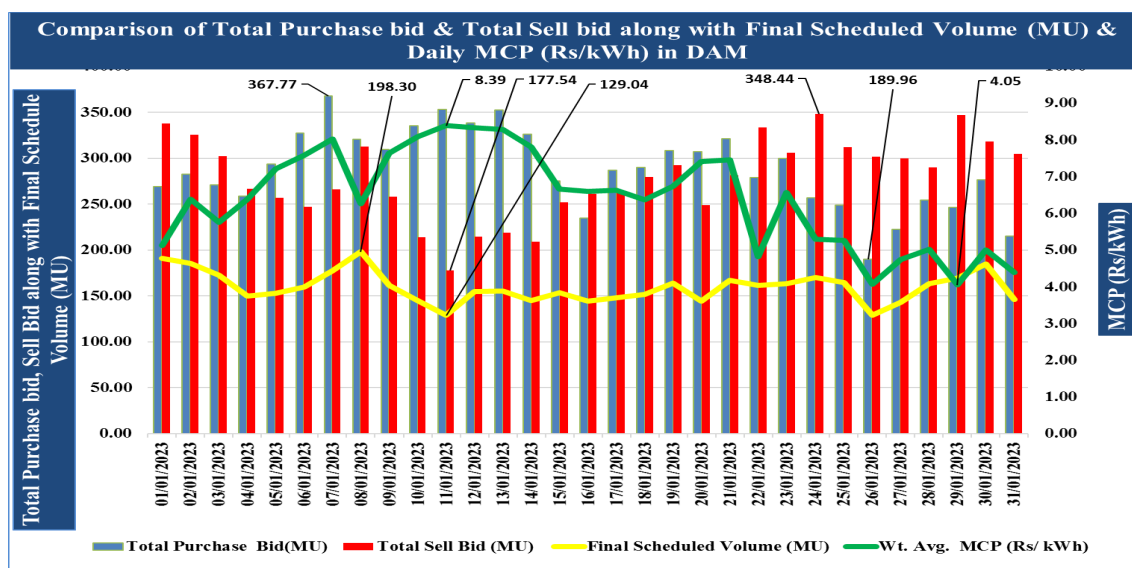


Figure - 2

7.5. Invariably, the Final Scheduled Volume (MU) and the Daily Avg. MCP (₹/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 January, 2023, it is observed that on second Sunday (08th January, 2023), FSV showed increasing trend in comparison to first Saturday (07th January, 2023), on third Monday (16th January, 2023), FSV showed decreasing trend in comparison to third Sunday (15th January, 2023), on fifth Sunday (29th January, 2023), FSV showed increasing trend in comparison to fourth Saturday (28th January, 2023). The detailed analysis on this is given at **Appendix-I**.

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

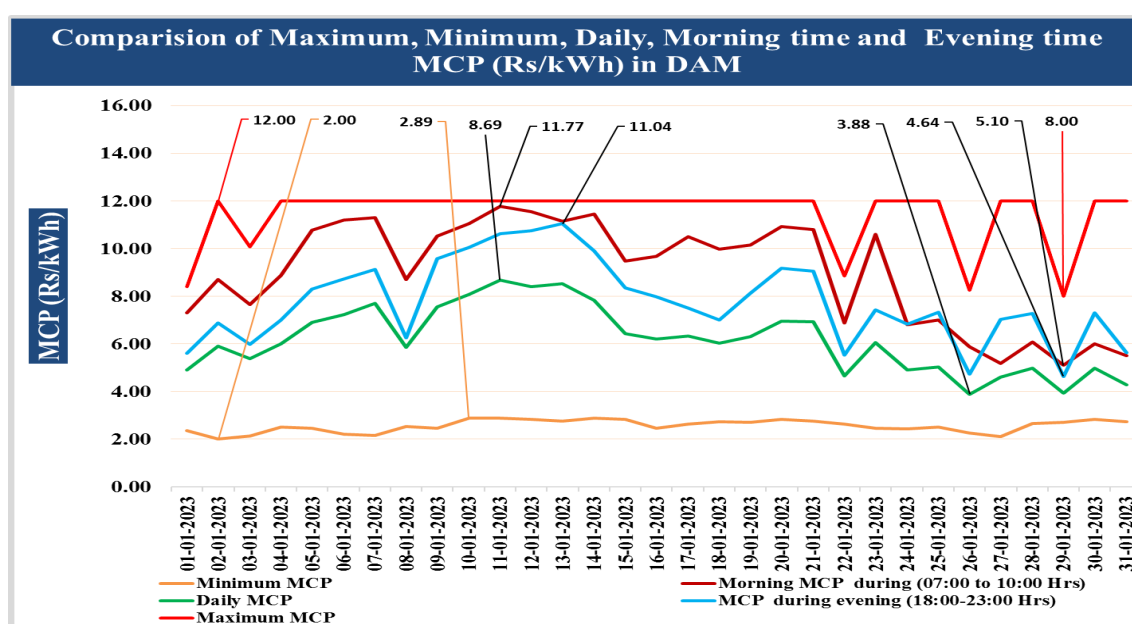


Figure-3

7.7. The Market Clearing Price duration curves for time block wise MCP for the month of January, 2023 is shown in **Figure 4**, whereas the time block wise MCP duration curve for the period 1st April, 2022 to 31st January, 2023 is shown in **Figure 5**.

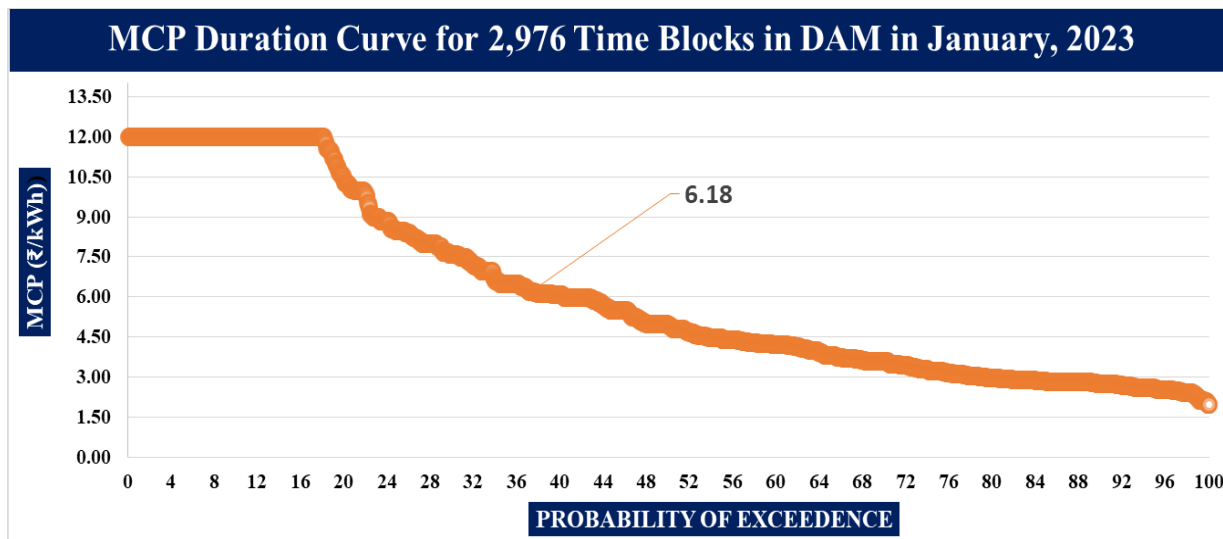


Figure – 4

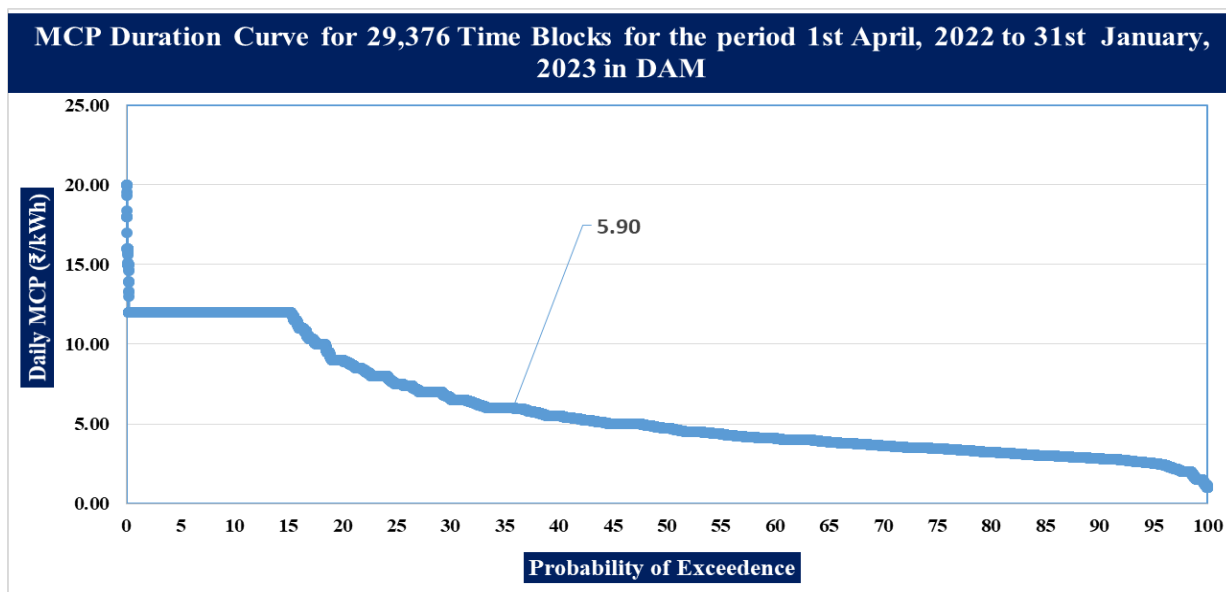


Figure-5

7.8. It can be seen in figure 4 above that in the MCP duration curve of January, 2023, for 38.00 % of the time MCP was above average MCP of the month (i.e. ₹ 6.18/kWh) and almost 62.00 % of the time MCP was below the average MCP of the month. Similarly, it can be seen in the MCP duration curve from 1st April, 2022 to 31st January, 2023 (figure-5), that for 35.00 % of the time the MCP was above the average MCP for the period (i.e. ₹ 5.90/kWh) and for 65.00 % of the time the Daily Avg. MCP was below the average MCP for the period.

7.9. 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 7.1 and 7.2 above**.

- 7.10.** In January, 2023, the maximum FSV occurred mostly during the **time period 06-07 Hrs** (on 21 no. of days). Whereas, the maximum MCP occurred mostly during the **time period 06-08 Hrs** (on 18 no. of days). Similarly, the minimum FSV occurred mostly during the **time period 23-24 Hrs** (on 16 no. of days). Whereas, the minimum MCP occurred mostly during the **time period 2-4 Hrs** (on 26 no. of days). **[Annexure VI]**
- 7.11.** In the month of January, 2023, there was **no** congestion in IEX & PXIL and no transaction of electricity took place in HPX during January, 2023. Further, in the month of December, 2022 and January, 2022, also there was no congestion in Power Exchanges.
- 7.12.** In the month of January, 2023, there was **no** real time curtailment in IEX & PXIL and no transaction of electricity took place in HPX during January, 2023. Further, in the month of December, 2022 and January, 2022 also, there was no real time curtailment in Power Exchanges.
- 7.13.** The **top 10 sellers** on the power exchanges in **Day Ahead Market (DAM)** in the month of January, 2023 were **Uttar Pradesh, West Bengal, Bihar, Chhattisgarh, Jaypee Nigrie, Odisha, Raipur Energen, JITPL, Maharashtra and Jindal Power Ltd. Stg-II**, which constituted **67.18 %** of the market volume. **[Annexure VII]**.
- 7.14.** The **top 10 purchasers** on the power exchanges in **Day Ahead Market (DAM)** in the month of January, 2023 were **Gujarat, J&K, Andhra Pradesh, Maharashtra, Punjab, Rajasthan, Telangana, Uttar Pradesh, Tamil Nadu and NVVN (SNA)- NEA**, which constituted **82.09 %** of the market volume. **[Annexure VII]**
- 7.15.** The total volume of electricity purchased by Discoms/Licensees in DAM in the month of January, 2023 was **4,559.45 MU**, which constituted **92.15 %** of total volume of electricity purchased on the power exchanges.
- 7.16.** Similarly, the total volume of electricity sold by Discoms/Licensees in DAM in the month of January, 2023 was **3,508.03 MU**, which constituted **70.90 %** of total volume of electricity sold on the power exchanges.

8. Analysis of movement of prices observed in Real Time Market (RTM) transactions in January, 2023

- 8.1. 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 was the Peak Demand. Further, the regression analysis revealed that the elasticity of the Daily Avg. MCP with respect to Peak Demand was **9.09** in the month of January, 2023.
- 8.2. 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 8.1 above**.
- 8.3. The Total Purchase Bid, Total Sell Bid, Daily Avg. MCP and FSV are shown in Figure-6 below:

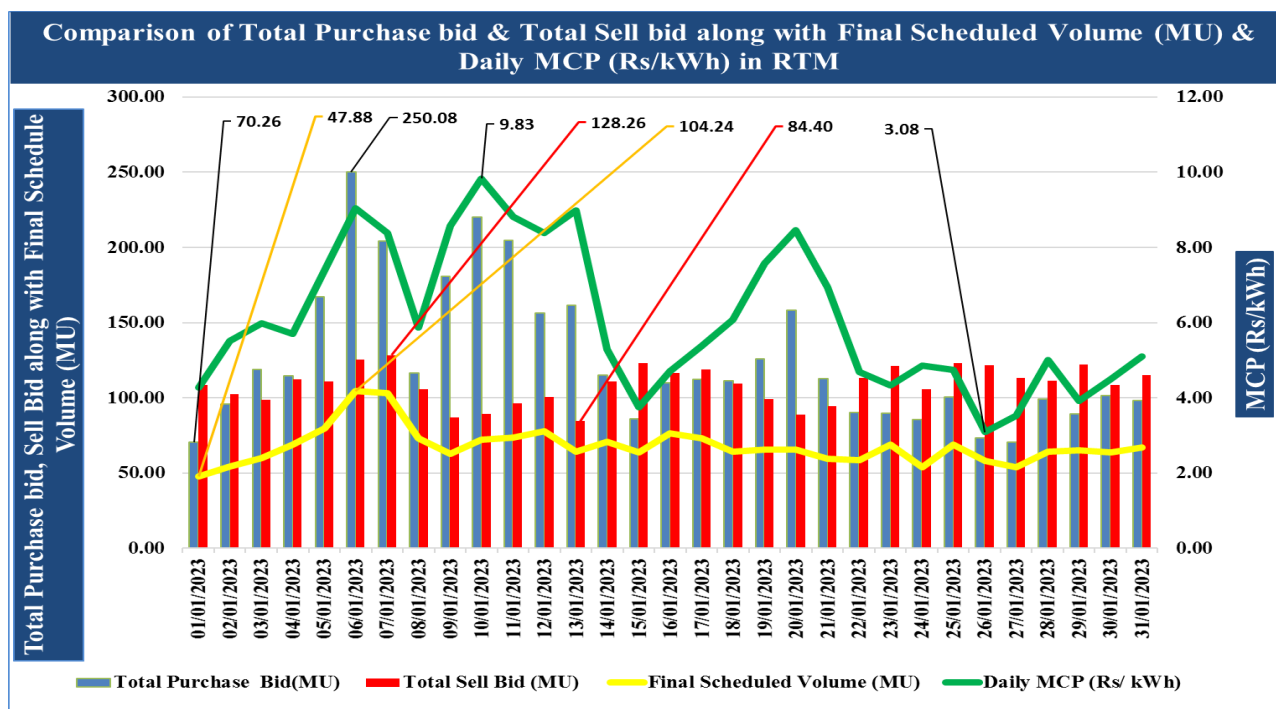


Figure-6

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

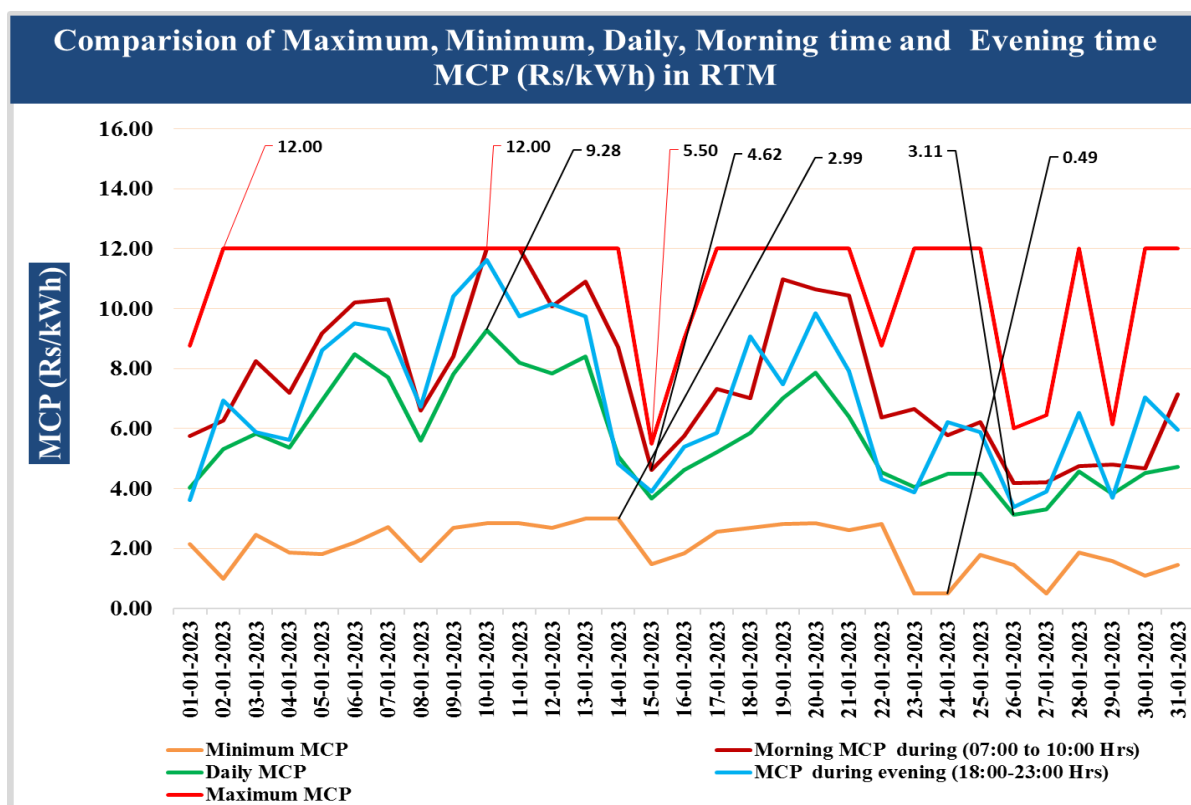


Figure-7

8.5. The Market Clearing Price duration curves for time block wise MCP for the month of January, 2023 is shown in **Figure 8**, whereas the day wise MCP duration curve for the period 1st April, 2022 to 31st January, 2023 is shown in **Figure 9**.

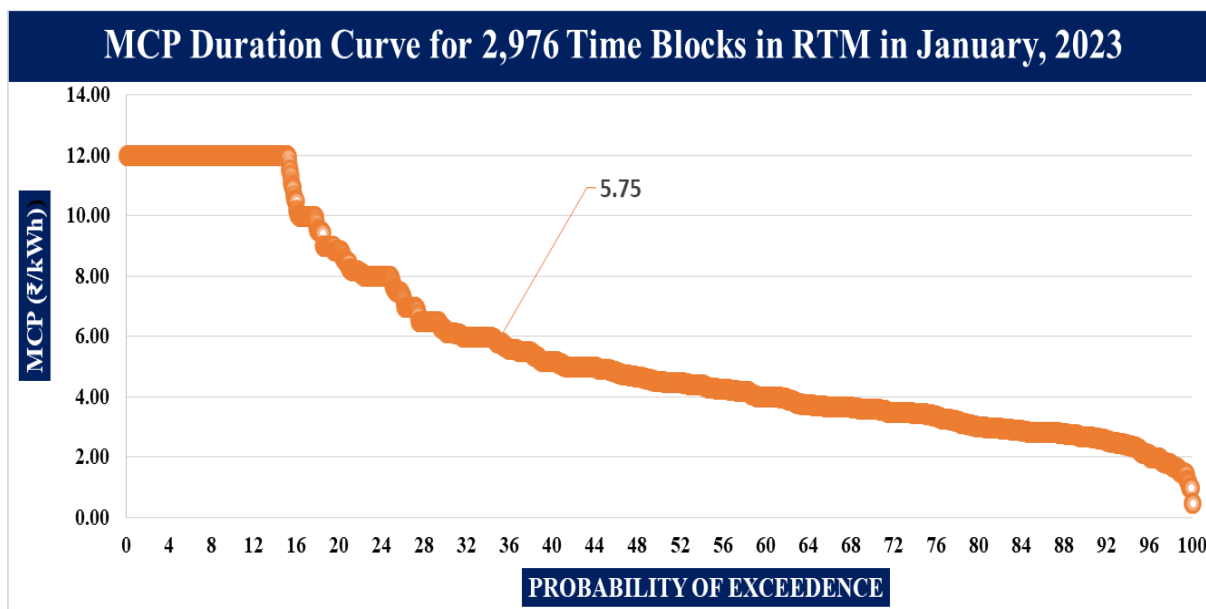


Figure-8

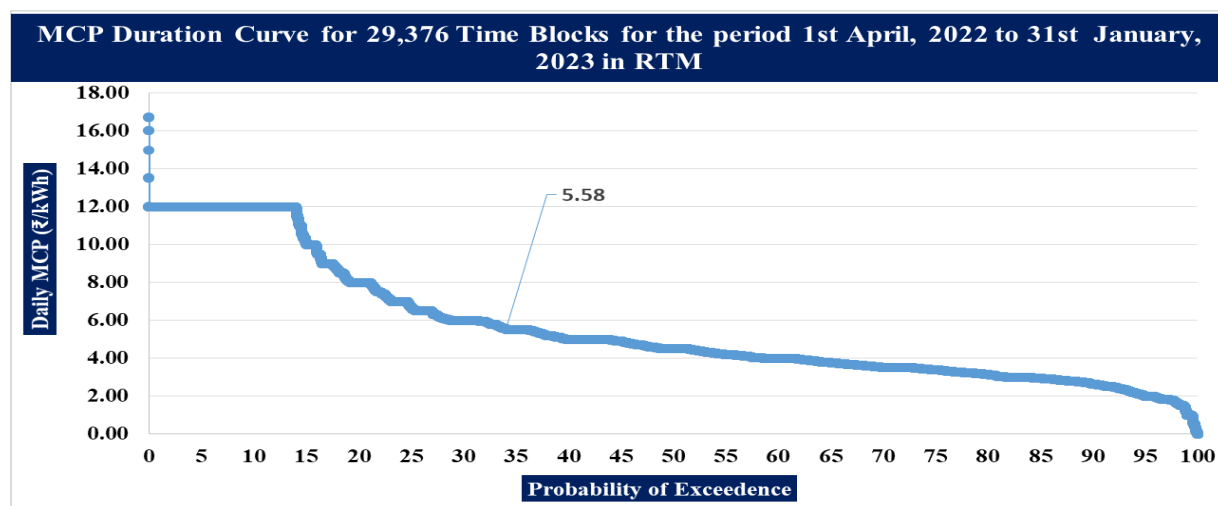


Figure-9

- 8.6.** It can be seen in figure 8 above that in the MCP duration curve of January, 2023, for 35.00 % of the time the MCP was above the average MCP of the month (i.e. ₹ 5.75/kWh) and for 65.00 % 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, 2022 to 31st January, 2023 (figure 9) that, for 36.00 % of the time the Daily Avg. MCP was above the average MCP for the period (i.e. ₹ 5.58/kWh) and for 64.00 % of the time the Daily Avg. MCP was below the average MCP for the period.
- 8.7.** In January, 2023, the maximum FSV occurred mostly during the **time period 10-12 Hrs** (on 10 no. of days). Whereas, the maximum MCP also occurred mostly during the **time period 08-10 Hrs** (on 12 no. of days). Similarly, the minimum FSV occurred mostly during the **time period 22-24 Hrs** (on 10 no. of days). Whereas, the minimum MCP occurred mostly during the **time period 01-03 Hrs** (on 13 no. of days).[Annexure X]
- 8.8.** There was **no** real time curtailment in IEX in Real Time Market (RTM) during January, 2023 and no transaction happened in PXIL and HPX. Further, in December, 2022 **no** real time curtailment occurred in IEX, whereas, no transaction happened in PXIL and HPX. Similarly, in January, 2022, there was no real time curtailment in IEX & PXIL.
- 8.9.** In the month of January, 2023 there was **no** congestion in IEX and no transaction happened in PXIL & HPX. Further, in the month of December, 2022, there was **0.01 MU** congestion in the transmission system in IEX and no transaction happened in PXIL & HPX. In the month of January, 2022, there was **0.005 MU** congestion in the transmission system in IEX and no transaction happened in PXIL.

8.10. The **top 10 sellers** on the power exchanges in **Real Time Market (RTM)** in the month of January, 2023 were **Bihar, Madhya Pradesh, West Bengal, Uttar Pradesh, Odisha, NTPC North Karanpura STPS, Delhi, Chhattisgarh, Maharashtra and Rajasthan**, which constituted **69.17 %** of the market volume. **[Annexure XI]**

8.11. The **top 10 buyers** on the power exchanges in **Punjab, Rajasthan, Telangana, Maharashtra, Gujarat, Haryana, Andhra Pradesh, Tamil Nadu, Uttar Pradesh and J&K**, which constituted **80.85 %** of the market volume. **[Annexure XI]**

8.12. The total volume of electricity purchased by Discoms/Licensees in RTM in the month of January, 2023 was **2,066.54 MU**, which constituted **98.32% %** of total volume of electricity purchased on the power exchanges.

8.13. Similarly, the total volume of electricity sold by Discoms/Licensees in RTM in the month of January, 2023 was **1,678.07 MU**, which constituted **79.84% %** of total volume of electricity sold on the power exchanges.

-
- Source DAM, GDAM, TAM, GTAM and RTM data: IEX, PXIL and HPX
 - 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, 2022 to January, 2023 of IEX and PXIL							
Quarter	Months	Final Scheduled Volume (MU)		Market Clearing Price (₹/kWh)		Real Time Curtailment (MU)	
		IEX	PXIL	IEX	PXIL	IEX	PXIL
Quarter -I	April, 2022	4,113.65	0	10.06	0	8.86	0
	May, 2022	3,172.50	13.02	6.80	4.30	0	0
	June, 2022	4,084.99	116.20	6.49	6.61	0	0
Total Quarter -I	April - June, 2022	11,371.14	129.22	7.87	6.38	8.86	0
Quarter -II	July, 2022	3,516.65	31.78	5.50	5.01	0	0
	August, 2022	3,528.70	10.12	5.26	6.42	0	0
	September , 2022	4,049.65	12.89	5.73	6.19	0	0
Total Quarter -II	July - September , 2022	11,095.00	54.79	5.51	5.55	0.00	0.00
Quarter -III	October, 2022	4,325.01	3.01	3.96	4.64	0	0
	November, 2022	5,083.85	0	4.79	0	0	0
	December, 2022	4,977.44	0	5.57	0	0	0
Total Quarter -III	October - December , 2022	14,386.30	3.01	4.81	4.64	0.00	0.00
Quarter -IV	January, 2023	4947.96	0.12	6.40	11.33	0	0
Total April, 2022 – January, 2023		41,800.40	187.14	6.02	6.11	8.86	0.00

Annexure-II

Final Scheduled Volume in Term Ahead Market (TAM) for the months of April, 2022 to January, 2023 of IEX, PXIL and HPX (Delivery date basis)					
Quarter	Months	Final Scheduled Volume (MU)			
		IEX	PXIL	HPX	Total
Quarter -I	April, 2022	1,171.50	1,746.85	-	2,918.35
	May, 2022	1,188.60	1,157.77	-	2,346.37
	June, 2022	759.03	759.58	-	1,518.61
Total Quarter – I	April - June, 2022	3,119.13	3,664.20	-	6,783.33
Quarter-II	July, 2022	439.81	531.89	221.96	1,193.66
	August, 2022	722.89	486.80	253.48	1,463.17
	September , 2022	875.43	480.06	103.95	1,459.44
Total Quarter - II	July - September , 2022	2,038.13	1,498.75	579.39	4,116.27
Quarter -III	October, 2022	523.90	299.40	90.78	914.08
	November, 2022	547.33	492.13	155.43	1,194.89
	December, 2022	822.47	545.79	232.96	1,601.22
Total Quarter - III	October - December , 2022	1,893.70	1,337.32	479.17	3,710.19
Quarter -IV	January, 2023	918.74	661.11	410.30	1,990.15
Total April, 2022 - January, 2023		7,969.70	7,161.38	1,468.86	16,599.94

Top Five Entities (Buyers and Sellers) in Bilateral transactions in the month of January, 2023

(i) Top five Buyers in Bilateral transactions

Entity Name	Direct		Entity Name	Through Traders	
	(MU)	Percent		(MU)	Percent
Madhya Pradesh	1214.47	35.97%	Himachal Pradesh	608.2	15.60%
Rajasthan	653.97	19.37%	Telangana	518.9	13.31%
Maharashtra	380.66	11.28%	Andhra Pradesh	501.3	12.86%
Telangana	150.51	4.46%	Maharashtra	376.7	9.66%
Haryana	144.71	4.29%	Gujarat	289.4	7.42%
Total Volume	2,544.32	75.36%	Total Volume	2,294.61	58.84%
Total Volume in Bilateral	3,376.11		Total Volume in Bilateral	3,899.57	

(ii) Top five Sellers in Bilateral transactions

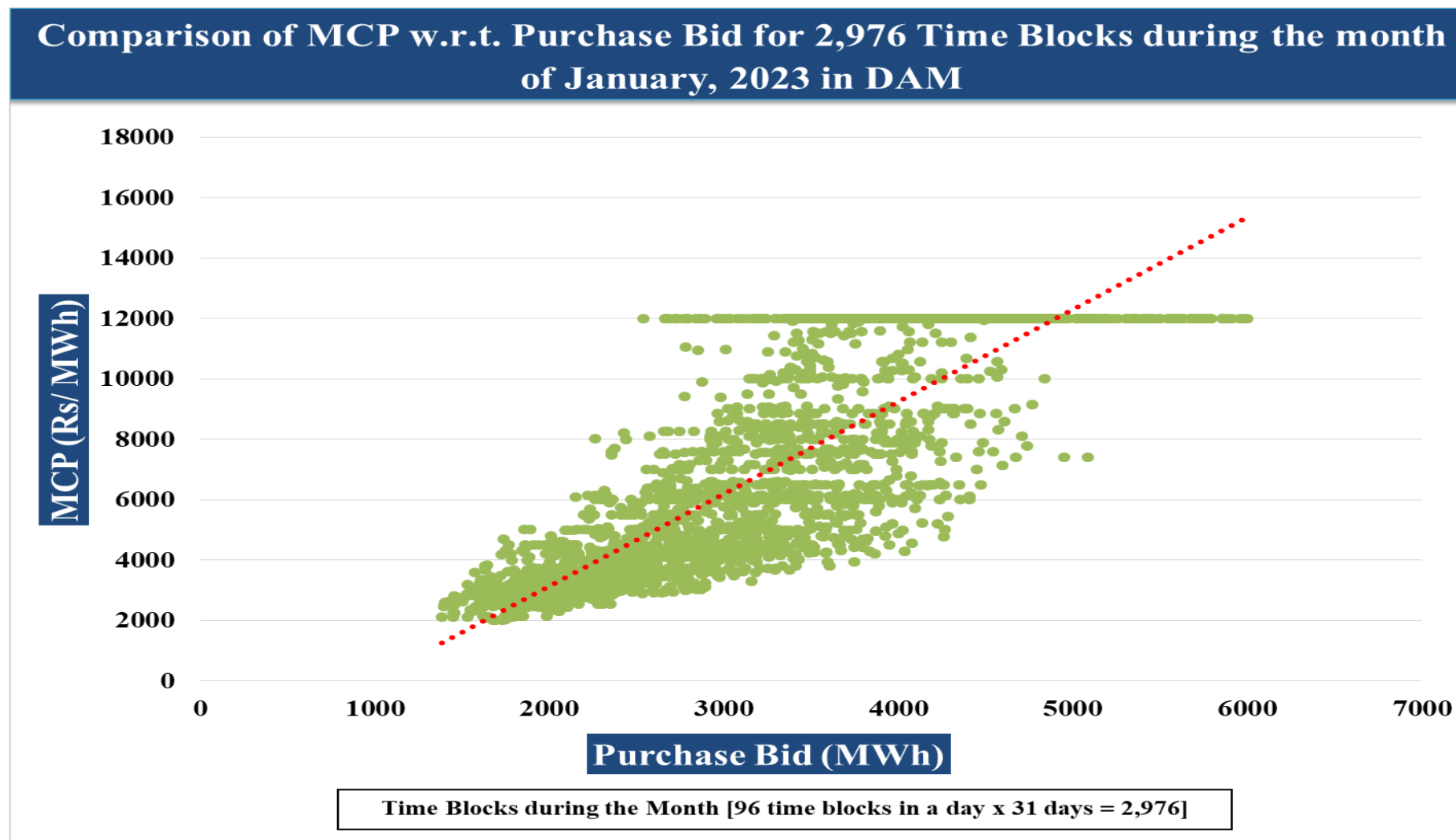
Entity Name	Direct		Entity Name	Through Traders	
	(MU)	Percent		(MU)	Percent
Uttar Pradesh	725.26	21.48%	Punjab	541.6	13.89%
Punjab	689.74	20.43%	JINDAL STAGE-II	530.4	13.60%
Chattisgarh	142.57	4.22%	RPREL	373.7	9.58%
ADHUNIK POWER LTD	140.50	4.16%	Delhi	305.8	7.84%
AHEJ4LAHW	131.00	3.88%	JINDAL POWER	303.2	7.78%
Total Volume	1,829.08	54.18%	Total Volume	2,054.79	52.69%
Total Volume in Bilateral	3,376.11		Total Volume in Bilateral	3,899.57	

Annexure-IV**Evening, Day, Night, Morning, Maximum, Minimum, Average MCP (₹/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)
01-01-2023	7.30	5.18	5.60	2.71	8.40	2.36	4.92	190.89
02-01-2023	8.70	6.96	6.87	2.42	12.00	2.00	5.91	185.36
03-01-2023	7.65	6.32	5.98	2.61	10.07	2.14	5.37	172.50
04-01-2023	8.87	6.69	7.01	2.86	12.00	2.50	6.02	149.96
05-01-2023	10.78	7.57	8.31	2.84	12.00	2.45	6.91	152.70
06-01-2023	11.20	8.07	8.74	2.83	12.00	2.20	7.23	159.53
07-01-2023	11.31	9.34	9.13	2.78	12.00	2.15	7.70	177.27
08-01-2023	8.71	6.89	6.25	2.84	12.00	2.54	5.85	198.30
09-01-2023	10.52	8.76	9.59	2.91	12.00	2.45	7.55	161.49
10-01-2023	11.05	9.52	10.05	3.27	12.00	2.89	8.09	145.17
11-01-2023	11.77	10.32	10.61	3.64	12.00	2.89	8.69	129.04
12-01-2023	11.54	9.71	10.74	3.33	12.00	2.84	8.41	154.71
13-01-2023	11.14	10.15	11.04	3.24	12.00	2.77	8.52	155.55
14-01-2023	11.44	8.40	9.89	3.44	12.00	2.89	7.83	145.19
15-01-2023	9.49	6.16	8.36	3.29	12.00	2.84	6.43	153.71
16-01-2023	9.66	5.96	7.97	2.96	12.00	2.45	6.21	144.14
17-01-2023	10.50	6.29	7.50	3.01	12.00	2.63	6.34	147.85
18-01-2023	9.98	5.90	7.00	3.05	12.00	2.74	6.02	152.02
19-01-2023	10.16	5.84	8.13	3.02	12.00	2.70	6.31	164.26
20-01-2023	10.92	6.66	9.16	3.10	12.00	2.82	6.96	144.37
21-01-2023	10.79	6.79	9.05	3.06	12.00	2.76	6.94	167.17
22-01-2023	6.87	4.42	5.53	2.92	8.86	2.63	4.67	161.25
23-01-2023	10.60	5.41	7.42	2.90	12.00	2.45	6.04	163.59
24-01-2023	6.80	4.39	6.83	2.71	12.00	2.43	4.91	170.40
25-01-2023	7.01	4.21	7.33	2.77	12.00	2.50	5.04	164.74
26-01-2023	5.89	3.07	4.74	2.82	8.25	2.25	3.88	129.24
27-01-2023	5.19	4.19	7.03	2.64	12.00	2.12	4.62	143.34
28-01-2023	6.09	4.41	7.27	2.96	12.00	2.66	4.98	163.36
29-01-2023	5.10	3.61	4.64	3.00	8.00	2.70	3.94	169.74
30-01-2023	6.02	4.32	7.31	3.03	12.00	2.82	4.98	184.87
31-01-2023	5.51	3.79	5.63	2.94	12.00	2.73	4.29	146.25
Maximum	11.77	10.32	11.04	3.64	12.00	2.89	8.69	198.30
Minimum	5.10	3.07	4.64	2.42	8.00	2.00	3.88	129.04
Average	8.99	6.43	7.77	2.96	11.47	2.56	6.18	159.61

MCP: Market Clearing Price (₹/kWh)

FSV: Final Scheduled Volume (MU)



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 (₹/kWh)		Min FSV (MU)		Min. MCP (₹/kWh)	
	Time Block	Value	Time Block	Value	Time Block	Value	Time Block	Value
01-01-2023	06:15 - 06:30	2.79	09:45 - 10:00	8.40	23:45 - 24:00	1.36	03:00 - 03:15	2.36
02-01-2023	06:30 - 06:45	2.83	08:15 - 08:30	12.00	22:45 - 23:00	1.25	02:45 - 03:00	2.00
03-01-2023	06:15 - 06:30	2.80	09:30 - 09:45	10.07	22:00 - 22:15	1.04	02:45 - 03:00	2.14
04-01-2023	06:15 - 06:30	2.42	17:45 - 18:00	12.00	22:15 - 22:30	1.05	03:00 - 03:15	2.50
05-01-2023	06:00 - 06:15	2.39	07:00 - 07:15	12.00	23:15 - 23:30	1.12	03:15 - 03:30	2.45
06-01-2023	06:00 - 06:15	2.55	06:30 - 06:45	12.00	23:15 - 23:30	1.10	02:30 - 02:45	2.20
07-01-2023	06:00 - 06:15	2.88	06:30 - 06:45	12.00	23:45 - 24:00	1.20	02:30 - 02:45	2.15
08-01-2023	06:30 - 06:45	3.07	08:30 - 08:45	12.00	23:45 - 24:00	1.25	03:30 - 03:45	2.54
09-01-2023	06:30 - 06:45	2.56	07:30 - 07:45	12.00	23:45 - 24:00	1.24	03:30 - 03:45	2.45
10-01-2023	06:30 - 06:45	2.31	06:45 - 07:00	12.00	23:15 - 23:30	1.07	03:30 - 03:45	2.89
11-01-2023	05:45 - 06:00	2.38	06:15 - 06:30	12.00	17:45 - 18:00	0.88	03:30 - 03:45	2.89
12-01-2023	06:00 - 06:15	2.63	06:30 - 06:45	12.00	17:45 - 18:00	1.17	03:15 - 03:30	2.84
13-01-2023	06:00 - 06:15	2.67	06:45 - 07:00	12.00	17:45 - 18:00	1.12	03:00 - 03:15	2.77
14-01-2023	05:45 - 06:00	2.43	06:30 - 06:45	12.00	23:00 - 23:15	1.02	03:45 - 04:00	2.89
15-01-2023	06:30 - 06:45	2.26	07:30 - 07:45	12.00	23:30 - 23:45	1.17	03:00 - 03:15	2.84
16-01-2023	06:30 - 06:45	2.30	07:30 - 07:45	12.00	23:45 - 24:00	0.94	03:00 - 03:15	2.45
17-01-2023	06:30 - 06:45	2.34	07:00 - 07:15	12.00	23:00 - 23:15	1.09	03:00 - 03:15	2.63
18-01-2023	06:30 - 06:45	2.35	07:45 - 08:00	12.00	00:00 - 00:15	1.07	03:00 - 03:15	2.74
19-01-2023	06:30 - 06:45	2.43	07:15 - 07:30	12.00	23:15 - 23:30	1.11	02:45 - 03:00	2.70
20-01-2023	06:30 - 06:45	2.23	06:45 - 07:00	12.00	23:15 - 23:30	0.89	03:00 - 03:15	2.82
21-01-2023	06:45 - 07:00	2.54	06:45 - 07:00	12.00	00:00 - 00:15	1.15	03:00 - 03:15	2.76
22-01-2023	06:45 - 07:00	2.53	09:30 - 09:45	8.86	23:30 - 23:45	1.11	03:00 - 03:15	2.63
23-01-2023	06:30 - 06:45	2.67	07:15 - 07:30	12.00	23:45 - 24:00	1.10	03:00 - 03:15	2.45
24-01-2023	09:00 - 09:15	2.89	18:30 - 18:45	12.00	00:00 - 00:15	1.13	03:30 - 03:45	2.43
25-01-2023	08:00 - 08:15	2.72	09:30 - 09:45	12.00	23:15 - 23:30	1.14	03:00 - 03:15	2.50
26-01-2023	19:00 - 19:15	1.81	07:15 - 07:30	8.25	22:00 - 22:15	0.99	14:30 - 14:45	2.25
27-01-2023	10:00 - 10:15	2.15	18:15 - 18:30	12.00	04:45 - 05:00	1.13	04:00 - 04:15	2.12
28-01-2023	08:00 - 08:15	2.57	18:00 - 18:15	12.00	19:00 - 19:15	1.14	04:00 - 04:15	2.66
29-01-2023	08:00 - 08:15	2.73	19:00 - 19:15	8.00	20:15 - 20:30	1.36	04:00 - 04:15	2.70
30-01-2023	08:15 - 08:30	2.76	18:15 - 18:30	12.00	19:00 - 19:15	1.34	04:00 - 04:15	2.82
31-01-2023	07:15 - 07:30	2.40	18:45 - 19:00	12.00	22:00 - 22:15	0.90	03:45 - 04:00	2.73

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

Annexure-VII

Sellers and Buyers in Day Ahead Market (DAM) in the month of January, 2023						
S. No.	Entity Name	Sell		Entity Name	Purchase	
		(MU)	Percent (%)		(MU)	Percent (%)
1	Uttar Pradesh	921.31	18.62%	Gujarat	889.98	17.99%
2	West Bengal	620.72	12.54%	J&K	526.80	10.65%
3	Bihar	590.75	11.94%	Andhra Pradesh	506.16	10.23%
4	Chhattisgarh	233.62	4.72%	Maharashtra	379.19	7.66%
5	Jaypee Nigrie	208.95	4.22%	Punjab	376.06	7.60%
6	Odisha	162.58	3.29%	Rajasthan	355.42	7.18%
7	Raipur Energen	158.48	3.20%	Telangana	349.85	7.07%
8	JITPL	150.22	3.04%	Uttar Pradesh	254.18	5.14%
9	Maharashtra	145.69	2.94%	Tamil Nadu	229.63	4.64%
10	Jindal Power Ltd.	131.57	2.66%	NVVN (SNA) - NEA	194.65	3.93%
11	DB Power	130.27	2.63%	Haryana	151.44	3.06%
12	Sembcorp Gayatri	129.82	2.62%	Daman & Diu - Dadra	91.81	1.86%
13	Delhi	124.54	2.52%	Uttarakhand	88.33	1.79%
14	Madhya Pradesh	107.51	2.17%	ArcelorMittal Nippon	62.67	1.27%
15	Karnataka	94.00	1.90%	West Bengal	59.48	1.20%
16	Tamil Nadu	76.93	1.55%	Delhi	52.62	1.06%
17	Assam	75.76	1.53%	Kerala	45.35	0.92%
18	Gujarat	68.05	1.38%	Odisha	40.98	0.83%
19	Jindal Power	66.48	1.34%	Karnataka	40.59	0.82%
20	Mahan Energy	65.13	1.32%	NEA-NR	38.14	0.77%
21	Tripura	48.46	0.98%	Madhya Pradesh	34.65	0.70%
22	RKM Power	41.99	0.85%	Assam	30.01	0.61%
23	ACBIL	40.64	0.82%	Jharkhand	25.45	0.51%
24	Goa WR	37.99	0.77%	Chhattisgarh	11.98	0.24%
25	Kerala	31.48	0.64%	Chandigarh	10.15	0.21%
26	Jhabua Power	30.26	0.61%	Goa WR	4.73	0.10%
27	Maruti Clean Coal	29.89	0.60%	Railways	3.80	0.08%
28	Jindal Steel	26.59	0.54%	Himachal Pradesh	2.70	0.05%
29	Sembcorp Energy	24.17	0.49%	IL&FS	1.31	0.03%
30	SKS Power	23.70	0.48%	Bihar	0.72	0.01%
31	Telangana	23.63	0.48%	DVC	0.49	0.01%
32	Rajasthan	23.61	0.48%	Meghalaya	0.45	0.01%
33	Jharkhand	23.23	0.47%	Sikkim	0.23	0.00%
34	Andhra Pradesh	22.47	0.45%	BHARAT	0.05	0.00%
35	MB Power	19.47	0.39%			
36	Teesta -3	18.14	0.37%			
37	Shree Cement	14.55	0.29%			
38	Haryana	13.18	0.27%			
39	Uttarakhand	12.96	0.26%			
40	DVC	12.82	0.26%			
41	Adhunik Power	11.96	0.24%			
42	GMR Warora	10.86	0.22%			
43	Adani Green Energy	10.64	0.21%			
44	Sainj HEP	9.45	0.19%			

45	J&K	8.55	0.17%			
46	Karcham Wangtoo	8.10	0.16%			
47	Renew Surya Ravi	7.69	0.16%			
48	BALCO 2	7.36	0.15%			
49	Arunachal Pradesh	7.06	0.14%			
50	Raigarh Energy Ltd.	6.97	0.14%			
51	Chandigarh	6.96	0.14%			
52	Sikkim	5.70	0.12%			
53	Talcher Stg-2	5.17	0.10%			
54	Himachal Pradesh	5.02	0.10%			
55	Adani Wind Energy	3.59	0.07%			
56	Bongaigaon	3.37	0.07%			
57	Sorang HEP,	2.96	0.06%			
58	Ostro Energy Private	2.77	0.06%			
59	AD Hydro	2.76	0.06%			
60	NTPC Kudgi	2.46	0.05%			
61	Nagaland	2.27	0.05%			
62	Dikchu	1.87	0.04%			
63	Ramagundam Stg-1	1.44	0.03%			
64	Simhadri Stg-2	0.95	0.02%			
65	Chuzachen	0.95	0.02%			
66	Dhariwal	0.94	0.02%			
67	PARBATI II HE	0.93	0.02%			
68	Mizoram	0.77	0.02%			
69	Lanco Budhil	0.68	0.01%			
70	Kameng HEP	0.66	0.01%			
71	SBSR Power	0.50	0.01%			
72	Coastal Gujrat	0.48	0.01%			
73	Meghalaya	0.38	0.01%			
74	Ramagundam	0.28	0.01%			
75	Jorethang	0.25	0.01%			
76	Tashiding HEP	0.25	0.00%			
77	Ramagundam Stg-3	0.16	0.00%			
78	Simhadri FSP 15	0.09	0.00%			
79	GMR Kamalanga	0.07	0.00%			
80	NTPC Simhadri 25	0.06	0.00%			
81	Punjab	0.04	0.00%			
Total Volume of top 10		3,323.89	67.18%	Total Volume of top 10	4,061.93	82.09%
Total Volume in PXs		4,948.08		Total Volume in PXs	4,948.08	

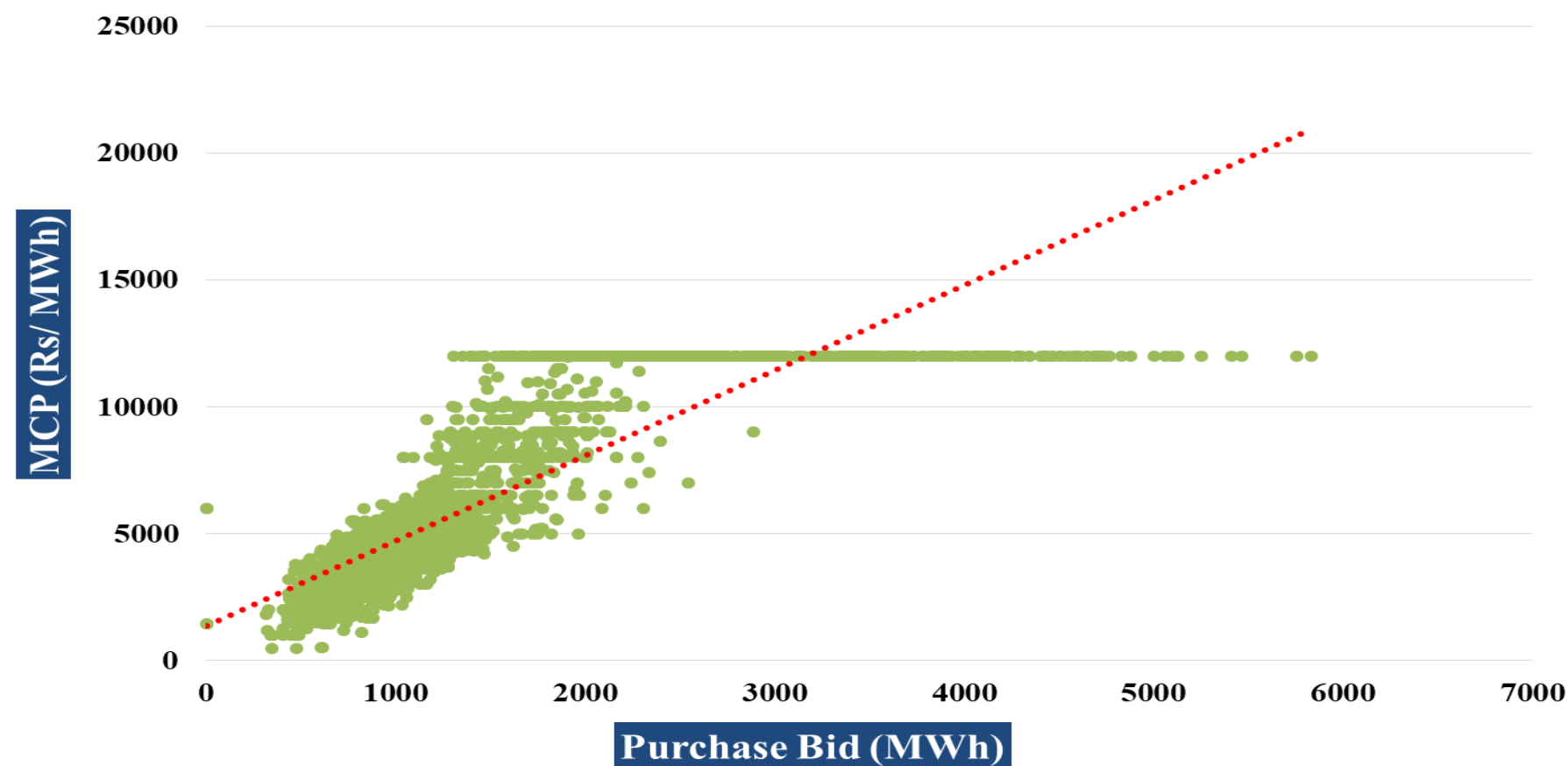
Annexure-VIII**Evening, Day, Night, Morning, Maximum, Minimum, Average MCP (₹/kWh) and Final Scheduled Volume (MU) in RTM**

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)
01-01-2023	5.75	4.67	3.62	2.77	8.75	2.15	4.03	47.88
02-01-2023	6.27	6.23	6.94	2.44	12.00	1.00	5.31	54.02
03-01-2023	8.25	7.08	5.87	3.14	12.00	2.45	5.83	59.97
04-01-2023	7.21	6.40	5.61	2.81	12.00	1.86	5.36	68.84
05-01-2023	9.18	8.53	8.60	2.66	12.00	1.80	6.95	79.83
06-01-2023	10.20	12.00	9.51	3.08	12.00	2.19	8.48	104.24
07-01-2023	10.31	9.34	9.31	3.18	12.00	2.72	7.70	103.06
08-01-2023	6.61	6.18	6.72	3.46	12.00	1.59	5.59	73.19
09-01-2023	8.40	9.68	10.41	3.36	12.00	2.70	7.81	62.89
10-01-2023	12.00	10.81	11.63	4.20	12.00	2.85	9.28	72.06
11-01-2023	12.00	8.74	9.74	4.21	12.00	2.85	8.21	73.70
12-01-2023	10.07	8.98	10.17	3.42	12.00	2.70	7.84	77.87
13-01-2023	10.89	10.37	9.74	3.83	12.00	2.99	8.39	64.29
14-01-2023	8.71	4.67	4.83	3.60	12.00	2.99	5.07	70.57
15-01-2023	4.62	3.46	3.91	3.16	5.50	1.49	3.68	63.71
16-01-2023	5.75	5.01	5.40	2.90	9.00	1.85	4.62	76.10
17-01-2023	7.31	5.50	5.85	3.22	12.00	2.55	5.22	73.25
18-01-2023	7.00	5.22	9.07	3.06	12.00	2.70	5.85	64.16
19-01-2023	10.98	7.95	7.48	3.38	12.00	2.82	7.01	65.40
20-01-2023	10.65	8.85	9.84	3.56	12.00	2.85	7.85	65.68
21-01-2023	10.43	5.75	7.93	3.40	12.00	2.60	6.39	59.42
22-01-2023	6.38	4.78	4.31	3.46	8.75	2.82	4.55	58.49
23-01-2023	6.65	4.37	3.87	2.39	12.00	0.50	4.05	68.80
24-01-2023	5.78	4.68	6.22	2.12	12.00	0.49	4.50	53.81
25-01-2023	6.22	4.24	5.89	2.58	12.00	1.79	4.50	68.86
26-01-2023	4.18	2.99	3.39	2.40	6.00	1.46	3.11	58.00
27-01-2023	4.22	3.80	3.90	1.78	6.45	0.49	3.30	53.66
28-01-2023	4.76	4.58	6.52	2.78	12.00	1.88	4.57	64.26
29-01-2023	4.81	4.25	3.70	2.96	6.15	1.57	3.83	65.19
30-01-2023	4.67	4.55	7.04	2.26	12.00	1.10	4.52	63.54
31-01-2023	7.13	4.50	5.95	2.54	12.00	1.46	4.73	67.14
Maximum	12.00	12.00	11.63	4.21	12.00	2.99	9.28	104.24
Minimum	4.18	2.99	3.39	1.78	5.50	0.49	3.11	47.88
Average	7.66	6.39	6.87	3.04	10.92	2.04	5.75	67.80

MCP: Market Clearing Price (₹/kWh)

FSV: Final Scheduled Volume (MU)

Comparison of MCP w.r.t. Purchase Bid for 2,976 Time Blocks during the month of January, 2023 in RTM



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

Date	Max. FSV (MU)		Max. MCP (₹/kWh)		Min FSV (MU)		Min. MCP (₹/kWh)	
	Time Block	Value	Time Block	Value	Time Block	Value	Time Block	Value
01-01-2023	10:45 - 11:00	0.79	10:00 - 10:15	8.75	15:00 - 15:15	0.28	17:15 - 17:30	2.15
02-01-2023	07:15 - 07:30	0.94	18:45 - 19:00	12.00	01:00 - 01:15	0.32	01:30 - 01:45	1.00
03-01-2023	07:00 - 07:15	1.07	08:30 - 08:45	12.00	01:30 - 01:45	0.36	02:15 - 02:30	2.45
04-01-2023	06:45 - 07:00	1.12	09:30 - 09:45	12.00	15:45 - 16:00	0.38	02:45 - 03:00	1.86
05-01-2023	07:00 - 07:15	1.39	08:15 - 08:30	12.00	00:30 - 00:45	0.40	02:00 - 02:15	1.80
06-01-2023	06:45 - 07:00	1.70	07:15 - 07:30	12.00	23:15 - 23:30	0.61	01:45 - 02:00	2.19
07-01-2023	11:00 - 11:15	1.75	07:30 - 07:45	12.00	23:30 - 23:45	0.49	01:15 - 01:30	2.72
08-01-2023	11:00 - 11:15	1.22	19:00 - 19:15	12.00	22:15 - 22:30	0.40	01:15 - 01:30	1.59
09-01-2023	11:00 - 11:15	1.06	08:30 - 08:45	12.00	04:00 - 04:15	0.23	03:45 - 04:00	2.70
10-01-2023	13:15 - 13:30	1.41	06:00 - 06:15	12.00	00:45 - 01:00	0.42	03:30 - 03:45	2.85
11-01-2023	12:15 - 12:30	1.28	06:00 - 06:15	12.00	00:00 - 00:15	0.35	23:45 - 24:00	2.85
12-01-2023	21:45 - 22:00	1.34	08:30 - 08:45	12.00	04:45 - 05:00	0.47	05:00 - 05:15	2.70
13-01-2023	20:45 - 21:00	1.18	08:15 - 08:30	12.00	23:15 - 23:30	0.36	01:30 - 01:45	2.99
14-01-2023	10:00 - 10:15	1.09	09:00 - 09:15	12.00	22:30 - 22:45	0.40	05:15 - 05:30	2.99
15-01-2023	10:45 - 11:00	0.87	09:00 - 09:15	5.50	00:30 - 00:45	0.41	13:15 - 13:30	1.49
16-01-2023	13:45 - 14:00	1.13	19:15 - 19:30	9.00	04:30 - 04:45	0.49	03:00 - 03:15	1.85
17-01-2023	11:45 - 12:00	1.16	19:00 - 19:15	12.00	22:00 - 22:15	0.52	05:00 - 05:15	2.55
18-01-2023	20:00 - 20:15	1.09	17:45 - 18:00	12.00	22:15 - 22:30	0.35	04:15 - 04:30	2.70
19-01-2023	19:45 - 20:00	1.22	07:15 - 07:30	12.00	04:45 - 05:00	0.32	02:45 - 03:00	2.82
20-01-2023	14:00 - 14:15	1.11	07:15 - 07:30	12.00	00:30 - 00:45	0.26	01:45 - 02:00	2.85
21-01-2023	10:30 - 10:45	0.93	07:30 - 07:45	12.00	00:00 - 00:15	0.31	03:15 - 03:30	2.60
22-01-2023	11:00 - 11:15	0.99	09:30 - 09:45	8.75	04:45 - 05:00	0.38	02:30 - 02:45	2.82
23-01-2023	18:30 - 18:45	1.12	09:00 - 09:15	12.00	04:30 - 04:45	0.41	02:00 - 02:15	0.50
24-01-2023	20:45 - 21:00	0.94	18:30 - 18:45	12.00	00:15 - 00:30	0.26	00:45 - 01:00	0.49
25-01-2023	09:00 - 09:15	1.14	18:30 - 18:45	12.00	04:45 - 05:00	0.34	05:00 - 05:15	1.79
26-01-2023	07:45 - 08:00	0.81	09:00 - 09:15	6.00	19:15 - 19:30	0.27	17:00 - 17:15	1.46
27-01-2023	18:45 - 19:00	1.08	19:00 - 19:15	6.45	17:00 - 17:15	0.33	05:45 - 06:00	0.49
28-01-2023	18:15 - 18:30	1.13	18:30 - 18:45	12.00	23:00 - 23:15	0.31	02:45 - 03:00	1.88
29-01-2023	14:45 - 15:00	1.09	10:30 - 10:45	6.15	00:15 - 00:30	0.31	23:45 - 24:00	1.57
30-01-2023	07:15 - 07:30	1.19	18:00 - 18:15	12.00	23:30 - 23:45	0.25	03:00 - 03:15	1.10
31-01-2023	10:15 - 10:30	1.14	09:30 - 09:45	12.00	23:15 - 23:30	0.42	04:45 - 05:00	1.46

MCP: Market Clearing Price (₹/kWh)

FSV: Final Scheduled Volume (MU)

Sellers and Buyers in Real Time Market (RTM) in the month of January, 2023						
S. No.	Entity Name	Sell		Entity Name	Purchase	
		(MU)	Percent (%)		(MU)	Percent (%)
1	Bihar	355.24	16.90%	Punjab	369.49	17.58%
2	Madhya Pradesh	232.54	11.06%	Rajasthan	344.21	16.38%
3	West Bengal	219.75	10.45%	Telangana	184.62	8.78%
4	Uttar Pradesh	150.96	7.18%	Maharashtra	138.55	6.59%
5	Odisha	146.29	6.96%	Gujarat	126.04	6.00%
6	NTPC North	92.65	4.41%	Haryana	121.77	5.79%
7	Delhi	79.25	3.77%	Andhra Pradesh	119.32	5.68%
8	Chhattisgarh	62.77	2.99%	Tamil Nadu	108.31	5.15%
9	Maharashtra	57.59	2.74%	Uttar Pradesh	103.39	4.92%
10	Rajasthan	56.87	2.71%	J&K	83.64	3.98%
11	Himachal	55.08	2.62%	Odisha	59.06	2.81%
12	Kameng HEP	38.66	1.84%	Delhi	58.98	2.81%
13	Sembcorp	37.32	1.78%	West Bengal	56.73	2.70%
14	J&K	36.74	1.75%	Uttarakhand	25.01	1.19%
15	Telangana	36.73	1.75%	Assam	22.68	1.08%
16	Tamil Nadu	35.86	1.71%	ArcelorMittal Nippon	22.03	1.05%
17	RKM Power	31.79	1.51%	DVC	21.35	1.02%
18	Kerala	29.55	1.41%	Chhattisgarh	20.56	0.98%
19	Karnataka	29.39	1.40%	Karnataka	19.32	0.92%
20	Palatana	19.47	0.93%	Kerala	18.77	0.89%
21	Jhabua Power	17.02	0.81%	Himachal Pradesh	17.07	0.81%
22	Gujarat	16.85	0.80%	Daman & Diu - Dadra	13.76	0.65%
23	TRN Energy	15.28	0.73%	Madhya Pradesh	11.49	0.55%
24	Mahan Energy	15.26	0.73%	Manipur	9.36	0.45%
25	Jindal Power Ltd.	14.65	0.70%	BHARAT	5.54	0.26%
26	Andhra Pradesh	14.20	0.68%	Mahan Energy	2.63	0.13%
27	Jharkhand	12.78	0.61%	Chandigarh	2.55	0.12%
28	BALCO 2	11.78	0.56%	Sikkim	2.36	0.11%
29	DVC	10.04	0.48%	Jindal Power Ltd.	2.12	0.10%
30	Coastal Gujrat	8.90	0.42%	Bihar	1.85	0.09%
31	NTPC	8.24	0.39%	Railways	1.78	0.08%
32	Sasan UMPP	8.03	0.38%	Jharkhand	1.69	0.08%
33	ACBIL	7.99	0.38%	Tripura	1.46	0.07%
34	Sikkim	7.57	0.36%	Goa WR	1.36	0.06%
35	Assam	7.54	0.36%	Meghalaya	1.35	0.06%
36	Tripura	7.32	0.35%	Maruti Clean Coal Power	1.25	0.06%
37	MB Power	7.22	0.34%	Arunachal Pradesh	0.44	0.02%
38	Haryana	6.93	0.33%			
39	NTPL	6.48	0.31%			
40	SKS Power	6.45	0.31%			
41	Khargone STPP	5.95	0.28%			
42	Raipur Energen	4.74	0.23%			
43	Mouda Stg-2	4.69	0.22%			

44	Jindal Power	4.53	0.22%			
45	Ramagundam	4.44	0.21%			
46	Kahalgaon-II	3.79	0.18%			
47	Uttarakhand	3.77	0.18%			
48	NTPC Kudgi	3.69	0.18%			
49	NTPC Sholapur	3.48	0.17%			
50	Ostro Energy	3.44	0.16%			
51	Sembcorp Energy	3.25	0.15%			
52	Bongaigaon	3.11	0.15%			
53	Mouda Stg-1	2.62	0.12%			
54	Maruti Clean	2.58	0.12%			
55	JITPL	2.44	0.12%			
56	Daman & Diu -	2.30	0.11%			
57	GMR Warora	2.11	0.10%			
58	Kahalgaon	2.07	0.10%			
59	DB Power	1.82	0.09%			
60	Manipur	1.77	0.08%			
61	Ramagundam	1.47	0.07%			
62	Goa WR	1.31	0.06%			
63	Adhunik Power	1.30	0.06%			
64	Singoli Bhagwati	1.18	0.06%			
65	Raigarh Energy	1.17	0.06%			
66	Shree Cement	1.04	0.05%			
67	Chandigarh	0.56	0.03%			
68	Adani Wind	0.43	0.02%			
69	Renew Surya	0.40	0.02%			
70	Arunachal	0.35	0.02%			
71	Sorang HEP,	0.32	0.01%			
72	Punjab	0.20	0.01%			
73	Sainj HEP	0.13	0.01%			
74	Karcham	0.10	0.00%			
75	Jaypee Nigrie	0.07	0.00%			
76	GMR Kamalanga	0.06	0.00%			
77	Teesta -3	0.03	0.00%			
78	Jorethang	0.02	0.00%			
79	Lanco Budhil	0.01	0.00%			
80	Meghalaya	0.01	0.00%			
Total Volume of top 10		1453.90	69.17%	Total Volume of top 10	1699.32	80.85%
Total Volume in PXs		2101.88		Total Volume in PXs	2101.88	

Cross Border Electricity Transactions in Day Ahead Market (DAM) in IEX with Nepal and Bhutan during the month of January, 2023

S. No	Delivery Date	Buy Volume By Nepal (MU)	Sell Volume by Nepal (MU)	Buy Volume By Bhutan(MU)
1	01-01-2023	6.04	0.00	0.85
2	02-01-2023	5.76	0.00	1.56
3	03-01-2023	5.98	0.00	1.26
4	04-01-2023	6.29	0.00	1.30
5	05-01-2023	5.92	0.00	1.23
6	06-01-2023	6.16	0.00	1.24
7	07-01-2023	5.32	0.00	1.53
8	08-01-2023	8.40	0.00	2.11
9	09-01-2023	6.95	0.00	2.18
10	10-01-2023	6.72	0.00	2.15
11	11-01-2023	6.22	0.00	2.22
12	12-01-2023	7.00	0.00	1.98
13	13-01-2023	6.68	0.00	2.17
14	14-01-2023	6.41	0.00	2.03
15	15-01-2023	7.92	0.00	2.35
16	16-01-2023	8.03	0.00	2.74
17	17-01-2023	7.54	0.00	2.81
18	18-01-2023	8.70	0.00	3.99
19	19-01-2023	8.86	0.00	4.72
20	20-01-2023	8.14	0.00	5.06
21	21-01-2023	6.84	0.00	3.82
22	22-01-2023	8.32	0.00	4.43
23	23-01-2023	8.06	0.00	3.99
24	24-01-2023	8.57	0.00	3.89
25	25-01-2023	8.44	0.00	3.98
26	26-01-2023	9.06	0.00	4.28
27	27-01-2023	9.22	0.00	4.18
28	28-01-2023	8.67	0.00	3.88
29	29-01-2023	9.45	0.00	3.79
30	30-01-2023	8.95	0.00	3.09
31	31-01-2023	8.15	0.00	3.24
Total		232.79	0.00	88.01
Grand Total		320.80		

-: No transaction took place

Note: Cross Border Transactions of Electricity of 320.80 MU (i.e. 232.79 MU buy by Nepal and 88.01 MU buy by Bhutan) with Nepal happened during January, 2023 in IEX, which is included in DAM Volume of January, 2023 in IEX.

Analysis for change in trend of Final Scheduled Volume in DAM on 2nd Sunday, 3rd Monday & 5th Sunday of January, 2023 (i.e. 8th, 16th & 29th January, 2023)

Final Scheduled Volume (MU) and the Daily Avg. MCP (₹/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 January, 2023, it is observed that on second Sunday (08th January, 2023), FSV showed increasing trend in comparison to first Saturday (07th January, 2023), on third Monday (16th January, 2023), FSV showed decreasing trend in comparison to third Sunday (15th January, 2023), on fifth Sunday (29th January, 2023), FSV showed increasing trend in comparison to fourth Saturday (28th January, 2023).

- (i) On second Sunday (08th January, 2023), although there was decrease in purchase on power exchange by some of the States in comparison to first Saturday (07th January, 2023) by **21.87 MU** [i.e. Andhra Pradesh (7.07 MU), Tamil Nadu (6.55 MU), Gujarat (5.83 MU), West Bengal (1.17 MU) and Himachal Pradesh (0.26 MU), etc.], there was also increase in purchase on power exchange by some of the States by **42.90 MU** [i.e. Rajasthan (16.54 MU), J&K (9.32 MU), Telangana (3.80 MU), Uttar Pradesh (2.94 MU) and NVVN (SNA) - NEA (2.82 MU), etc.]. This resulted in an overall increase in FSV by **21.03 MU** on Sunday (08th January, 2023) as compared to Saturday (07th January, 2023).
- (ii) On third Monday (16th January, 2023), although there was increase in purchase on power exchange by some of the States in comparison to third Sunday (15th January, 2023) by **26.03 MU** [i.e. Haryana (8.31 MU), Punjab (8.01 MU), West Bengal (2.12 MU), Maharashtra (1.94 MU) and Daman & Diu - Dadra & Nagar Haveli (1.51 MU), etc.], there was also decrease in purchase on power exchange by some of the States by **35.60 MU** [i.e. Telangana (11.95 MU), Rajasthan (6.21 MU), Gujarat (5.14 MU), Uttar Pradesh (4.64 MU) and ArcelorMittal Nippon steel (ESIL) (3.39 MU), etc.]. This resulted in an overall decrease in FSV by **9.57 MU** on Monday (16th January, 2023) as compared to Sunday (15th January, 2023).
- (iii) On fifth Sunday (29th January, 2023), although there was decrease in purchase on power exchange by some of the States in comparison to fourth Saturday (28th January, 2023) by **18.35 MU** [i.e. Punjab (6.87 MU), Andhra Pradesh (3.55 MU), Haryana (2.94 MU), West Bengal (1.43 MU) and Maharashtra (0.95 MU), etc.], there was also increase in purchase on power exchange by some of the States by **24.73 MU** [i.e. Gujarat (10.38 MU), Tamil Nadu (3.46 MU), Telangana (2.92 MU), Uttar Pradesh (1.53 MU) and Delhi (1.50 MU), etc.]. This resulted in an overall increase in FSV by **6.38 MU** on Sunday (29th January, 2023) as compared to Saturday (28th January, 2023).

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.
The 13 Bid areas 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 Avg. 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 Average MCP** is the average of MCP of all 96 Time Blocks of the day during which transaction happened.
- 5. Day-Ahead Market (DAM)** means a market where Day Ahead Contracts are transacted on the Power Exchanges, wherein Collective Transactions occur on day (T) and delivery of electricity is on the next day (T+1).
- 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 for Solar, Non-Solar and Hydro Renewable Energy (RE) generation.

- 10. Green Day Ahead Market (GDAM)** is based on the principles of current Day Ahead Market (DAM), where market participants purchase and sell electricity generated from renewable sources.
- 11. Long Duration Contracts** on the power exchanges is a product segment under which the participants are allowed to trade for delivery of power upto 90 Days (Delivery Starting from T+2 to T+90 Days).
- 12. 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.
- 13. Real Time Market (RTM)** means a market where Real-Time Contracts are transacted on the Power Exchange(s), i.e. a contract other than Day Ahead Contract or Intraday Contract or Contingency Contract. In RTM collective transactions occur on day (T) or day (T-1) and delivery of electricity is on day (T) for a specified delivery period.
- 14. Term Ahead Market (TAM)** means a market where Term Ahead Contracts are transacted on the Power Exchange(s), i.e. a contract wherein transactions occur on day (T) and physical delivery of electricity is on a day more than one day ahead (T + 2 or more).