



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: अक्टूबर, 2022 माह की मार्केट मॉनिटरिंग रिपोर्ट।

Subject: Monthly Market Monitoring Report for the month of October, 2022.

महोदय/ Sir,

अक्टूबर, 2022 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 October, 2022 is enclosed herewith for kind information and perusal.

अक्टूबर, 2022 माह के दौरान मार्केट के संचालन की मुख्य विशेषताएं इस प्रकार रही। Key highlights of the market operation during October, 2022 are as under:

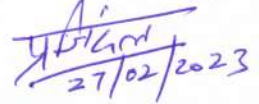
- (i) अक्टूबर, 2022 माह में देश में कुल 113,944 MU विद्युत का कारोबार किया गया, जिसमें से 51,988 MU का कारोबार अंतर्राज्यीय पारेषण प्रणाली (Inter State Transmission System) के माध्यम से किया गया था और शेष राज्य नियंत्रित उत्पादन स्टेशनों से अंतरराज्यीय पारेषण प्रणाली (Intra State Transmissions System) के माध्यम से किया गया। In the month of October, 2022 a total of 113,944 MU of electricity was transacted in the country out of which 51,988 MU was transacted through ISTS, and the remaining through state controlled generating stations through Intra State Transmissions System.
- (ii) अल्पावधि मार्केट के अंतर्गत कुल 15,247 MU का कारोबार किया गया था, जिसमें से 7,931 MU पावर एक्सचेंजों के माध्यम से कारोबार किया गया और शेष द्विपक्षीय कारोबार और विचलन (deviations) के रूप में हुआ। इस प्रकार अल्पावधि कारोबार, अक्टूबर, माह में 2022 ट्रेड की गई विद्युत की कुल मात्रा का 13.38% था और 96% पावर एक्सचेंजों के माध्यम से रहा। A total of 15,247 MU was transacted under Short

I/26438/2023

Term Market, out of which 7,931 MU was transacted through Power Exchanges and remaining happened as bilateral transactions & deviations. Thus, the total short term trade in October, 2022 was 13.38 % of total volume of electricity traded in October, 2022 and 6.96 % 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 29.33% रहा, जिसमें से पावर एक्सचेंजों के माध्यम से कारोबार 15.26 % रहा। If we compare these transactions with respect to the electricity supplied through ISTS, the short term transactions constitutes about 29.33 % of ISTS transactions, out of which transaction through the power exchanges constitutes 15.26 %.

Yours faithfully,



(प्रदीप जिंदल/ Pardeep Jindal)

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

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



सत्यमेव जयते

मासिक मार्केट मॉनिटरिंग रिपोर्ट - अक्टूबर, 2022

Monthly Market Monitoring Report October, 2022



भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
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**अक्टूबर, 2022 की मासिक मार्केट
मॉनिटरिंग रिपोर्ट का सारांश**

**Summary of Market Monitoring Report
For the month of October, 2022**

अक्टूबर, 2022 माह के लिए सारांश SUMMARY FOR MONTH: OCTOBER, 2022

भारत में विद्युत एक्सचेंजों पर विद्युत के व्यापार का सारांश

SUMMARY OF ELECTRICITY TRANSACTIONS ON POWER EXCHANGES IN INDIA

- अक्टूबर, 2022 के दौरान विद्युत एक्सचेंजों (यानी आईईएक्स, पीएक्सआईएल और एचपीएक्स) के माध्यम से कुल **7,931 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।

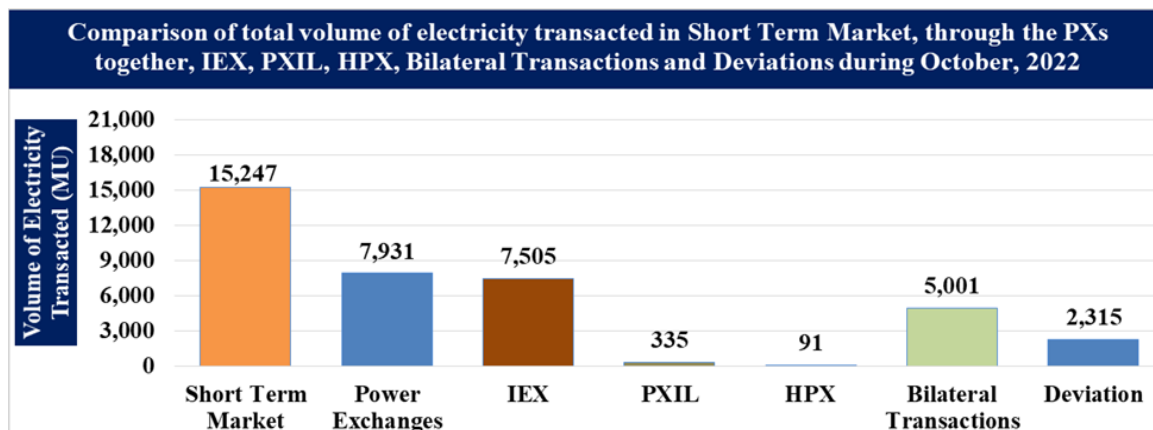
A total volume of **7,931 MU** electricity was transacted through power exchanges i.e. IEX, PXIL & HPX, during the month of October, 2022. This volume of electricity is on delivery date basis and includes transactions through DAM, GDAM, RTM, TAM and GTAM market segments.

Segment	Transactions happened in the PXs (IEX, PXIL & HPX combined)			
	FSV (MU)	Average MCP (₹/kWh)	Congestion (MU)	Real Time Curtailment (MU)
DAM	4,328	3.96	0.00	0.00
GDAM	293	4.03	0.00	0.00
RTM	2,265	3.78	0.00	0.00
TAM	914	4.08	3.34	1.37
GTAM	131	4.12	0.19	0.00
Total in PXs	7,931	3.93*	3.53	1.37

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

- द्विपक्षीय व्यापार के तहत कुल **5,001 MU** विद्युत का कारोबार किया गया और **2,315 MU** को विचलन के रूप में स्थानांतरित किया गया। इस प्रकार कुल **15,247 MU** विद्युत का कारोबार अल्पावधि व्यापार के रूप में किया गया था। अक्टूबर, 2022 के महीने में देश में कुल **113,944 MU** विद्युत की आपूर्ति की गई थी, इस प्रकार अक्टूबर, 2022 माह में कारोबार की गई विद्युत की कुल मात्रा में अल्पावधि बाजार का हिस्सा **13.38 %** था।

Under the Bilateral trade a total of **5,001 MU** of electricity was transacted and **2,315 MU** was transferred as deviation. Thus a total of **15,247 MU** of electricity was transacted as short term trade. In the month of October, 2022 a total of **113,944 MU** of electricity was supplied in the country, thus the share of short term market in the total volume of electricity traded in October, 2022 was **13.38%**.



- अक्टूबर, 2022 के दौरान संचरण जाम की कुल मात्रा **3.53 MU** थी, जो की विद्युत एक्सचेंजों में कारोबार की गई विद्युत की कुल मात्रा का केवल **0.04 %** है और अक्टूबर, 2022 के महीने के दौरान आपूर्ति की गई कुल ऊर्जा का **0.003 %** है।

The total volume of transmission congestion that happened during the month of October, 2022 was **3.53 MU** which is only 0.04 % of the total volume of electricity transacted in the power exchanges and 0.003 % of total energy supplied during the month of October, 2022.

TAM में 4 दिनों अर्थात् दिनांक 4, 13, 19 व 20 अक्टूबर, 2022 को और GTAM में 1 दिन यानी दिनांक 22 अक्टूबर, 2022 को संचरण जाम देखा गया। जबकि DAM, GDAM और RTM में कोई संचरण जाम नहीं देखा गया। अक्टूबर, 2022 माह के महीने में रिपोर्ट की गई वास्तविक समय में विद्युत कटौती की कुल मात्रा केवल **1.37 MU** थी।

Transmission congestion observed in TAM on 4 days i.e. 4th, 13th, 19th & 20th October, 2022, in GTAM on 1 day i.e. 22nd October, 2022, whereas, there was no congestion happened in DAM, GDAM & RTM. The total volume of real time curtailment reported in the month of October, 2022 was only **1.37 MU**.

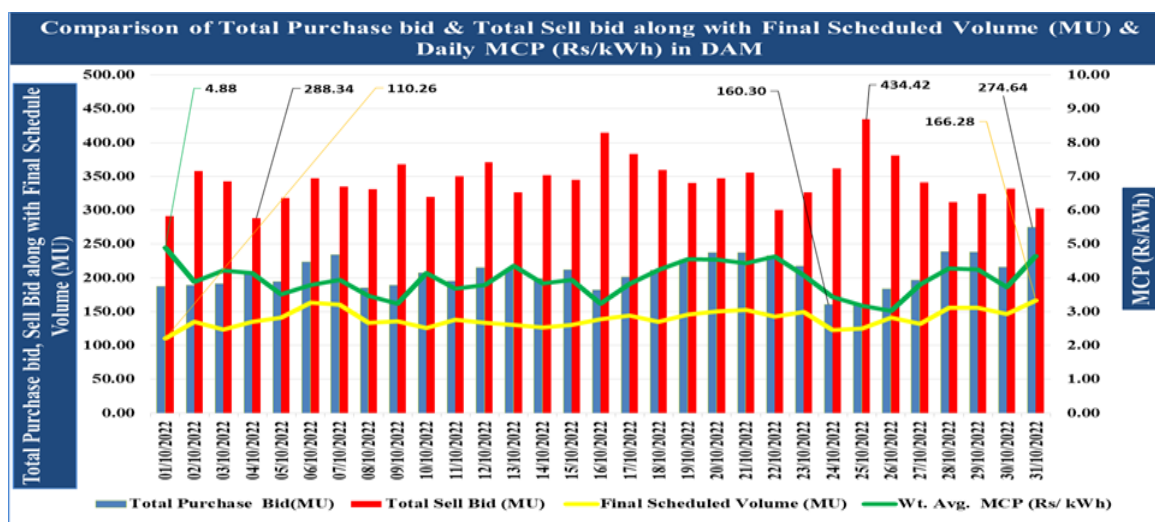
अक्टूबर, 2022 माह के दौरान अंतर्राज्यीय पारेषण प्रणाली (ISTS) में निर्धारित अनुसूचित विद्युत की कुल मात्रा **51,988 MU** थी। अक्टूबर, 2022 के महीने में अल्पावधि बाजार में विद्युत का लेन-देन अंतर्राज्यीय पारेषण प्रणाली (ISTS) के माध्यम से अनुसूचित की गई कुल विद्युत की मात्रा का **29.33%** रहा।

The total volume of electricity scheduled at ISTS during the month of October, 2022 was **51,988 MU**. The total volume of electricity transacted in the short term market was **29.33 %** of total volume schedule at ISTS in the month of October, 2022.

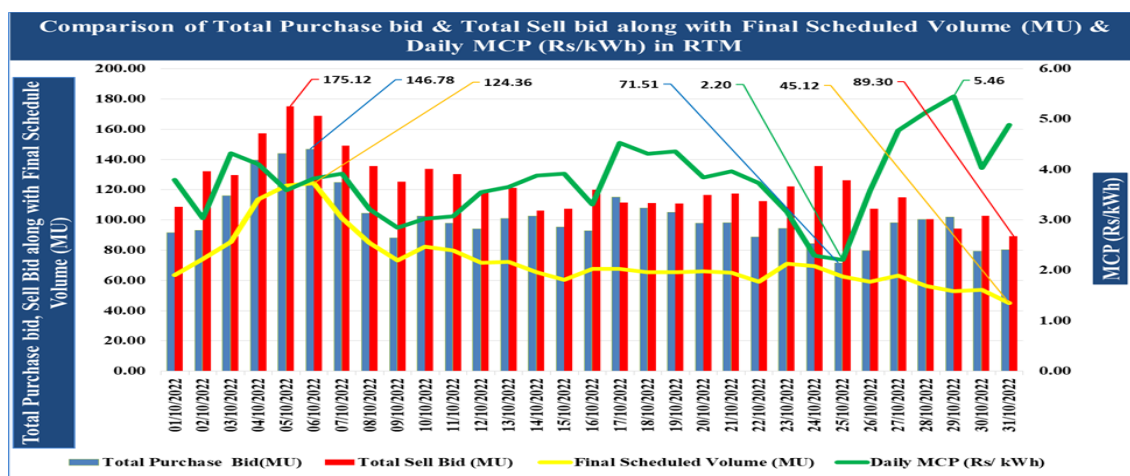
- अक्टूबर, 2022 माह के दौरान DAM और RTM में विद्युत की खरीद और बिक्री बोलियों, अंतिम अनुसूचित मात्रा और दैनिक औसत MCP की भिन्नता निम्नलिखित चित्रों में दर्शाई गई है:

The variation of Purchase and Sell bids, Final Scheduled Volume and Daily Avg. MCP in DAM and RTM during the month of October, 2022 are shown in following figures:

DAM Volume



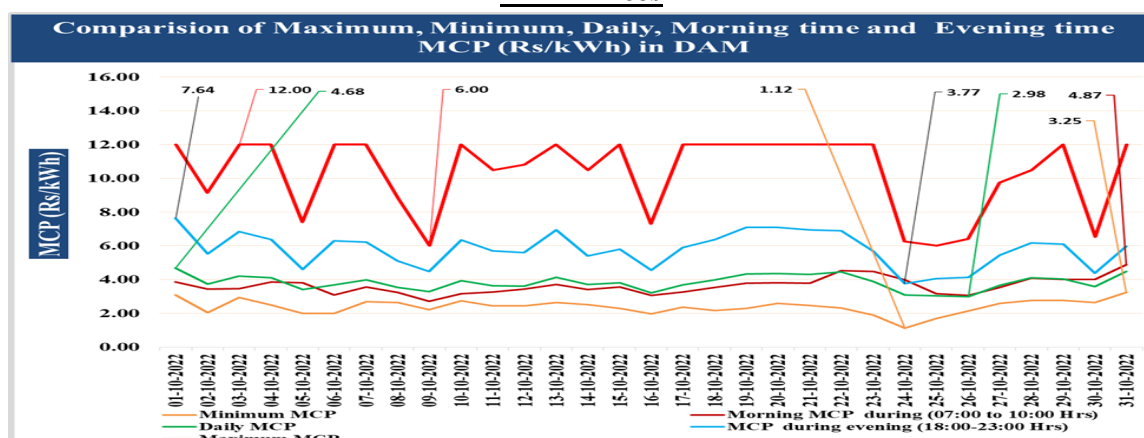
RTM Volume



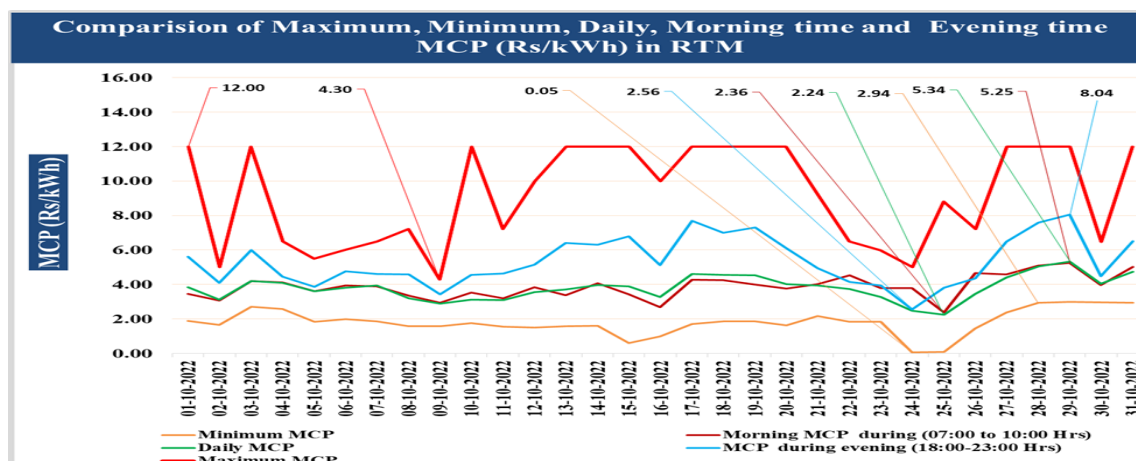
- अक्टूबर, 2022 माह के दौरान DAM और RTM में अधिकतम, न्यूनतम, दैनिक, सुबह और शाम के समय MCP की भिन्नता निम्नलिखित चित्रों में दिखाई गई है:

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

DAM Prices



RTM Prices



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 October, 2022 was **4,328.02 MU**. The total energy supplied in the country during the month of October, 2022 was 113,944 MU. Thus, the volume of electricity transacted on the power exchanges in DAM during October, 2022 was 3.80 % of the total energy supplied in the country. Comparing with the total volume of electricity transacted in DAM during the past month .i.e. September, 2022, it was **4,062.54 MU** which was 3.20 % of the total energy supplied [126,914 MU] in the country during September, 2022. Similarly, the total volume of electricity transacted in DAM during previous year .i.e. October, 2021, it was **6,568.68 MU** which was 5.82 % of the total energy supplied [112,797 MU] in the country during October, 2021.
- 1.2.** The volume of electricity transacted on on IEX and PXIL during October, 2022 were **4,325.01 MU** and **3.01 MU**, respectively, which means that the total volume transacted on IEX was **99.93 %** of the total volume on power exchanges. The volume of electricity transacted on IEX and PXIL during September, 2022 were **4,049.65 MU** and **12.89 MU**, respectively, which means that the total volume transacted on IEX was **99.68 %** of the total volume on power exchanges. Also, the volume of electricity transacted on IEX and PXIL during October, 2021, were **6,568.31 MU** and **0.37 MU** respectively.
- 1.3.** The DAM volume for October, 2022 in IEX is inclusive of Cross Border Transactions of Electricity with Nepal [details given at **Annexure XII**].
- 1.4.** The Average Market Clearing Price (MCP) on IEX during the month of October, 2022 was **₹ 3.96/kWh**, which shows a decrease of 30.89 % & 50.56 % when compared with average MCP's for the month of September, 2022 and October, 2021, which were **₹ 5.73/kWh** and **₹ 8.01/kWh**, respectively. On PXIL, the average MCP during the month of October, 2022 was **₹ 4.64/kWh**, which shows a decrease of 25.04 % and 35.29 % when compared with average MCP's for the month September, 2022 and October, 2021, which were **₹ 6.19/kWh** and **₹ 7.17/kWh** respectively.
- 1.5. DAM MARKET CLEARING PRICE, AREA CLEARING PRICE AND FINALSCHEDULED 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 October, 2022 as compared with September, 2022 and October, 2021 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	October, 2022*	4,325.01	110.26	166.28	139.52
	September, 2022*	4,049.65	107.43	192.24	134.99
	% Change (Month over Month)	6.80	2.63	-13.50	3.36
	October, 2021	6,568.31	115.18	281.82	211.88
	% Change (Year over Year)	-34.15	-4.27	-41.00	-34.15
PXIL	October, 2022	3.01	0.05	1.71	0.43
	September, 2022	12.89	0.01	1.80	0.52
	% Change (Month over Month)	-76.65	400.00	-5.00	-17.31
	October, 2021	0.37	0.03	0.16	0.09
	% Change (Year over Year)	713.51	66.67	968.75	377.78
HPX	October, 2022	-	-	-	-
	September, 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

Table: 1A

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

Exchange	Period	Prices				
		Daily Avg. MCP (₹/kWh)			ACP (₹/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
IEX	October, 2022	3.02	4.88	3.96	1.12	12.00
	September, 2022	3.41	8.89	5.73	1.20	12.00
	Change% (Month over Month)	-11.44	-45.11	-30.89	-6.67	0.00
	October, 2021	2.37	16.42	8.01	1.00	20.00
	%Change (Year over Year)	27.43	-70.28	-50.56	12.00	-40.00
PXIL	October, 2022	3.95	5.94	4.64	0.53	12.00
	September, 2022	3.16	10.13	6.19	3.16	12.00
	%Change Month over Month)	25.00	-41.36	-25.04	-83.23	0.00
	October, 2021	4.59	9.99	7.17	3.65	19.50
	%Change (Year over Year)	-13.94	-40.54	-35.29	-85.48	-38.46
HPX	October, 2022	-	-	-	-	-
	September, 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 67 time blocks on 1st, 3rd to 4th, 6th to 7th, 10th, 13th, 15th, 17th to 23rd, 29th & 31st October, 2022. 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 4 time blocks on 12th October, 2022. 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 ₹1.12/kWh in IEX was observed in all 13 regions during the time block 12:30-12:45 Hrs on 15th October, 2022. As there was no congestion in transmission system, the MCP for this time-block was also ₹1.20/kWh. Whereas, in PXIL, the minimum ACP of ₹ 3.16/kWh was observed in all 13 regions during 8 time blocks on 19th October, 2022. As there was no congestion in transmission system, the MCP for this time block was also ₹ 3.16/ kWh.

2. REAL TIME MARKET (RTM)

The total volume of electricity transacted on the power exchanges in Real Time Market in October, 2022 was **2,264.59 MU**, out of which **2,264.59 MU** (100 %) was transacted in IEX and no transaction happened 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 October, 2022 as compared with September, 2022 and October, 2021 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	October, 2022	2264.59	45.12	124.36	73.05
	September, 2022	2192.70	49.45	103.71	73.09
	% Change (Month over Month)	3.28	-8.76	19.91	-0.05
	October, 2021	1,999.17	28.16	96.91	64.49
	% Change (Year over Year)	13.28	60.23	28.33	13.27
PXIL	October, 2022	-	-	-	-
	September, 2022	0.55	0.10	0.25	0.18
	% Change (Month over Month)	NA	NA	NA	NA
	October, 2021	-	-	-	-
	% Change (Year over Year)	NA	NA	NA	NA
HPX	October, 2022	-	-	-	-
	September, 2022	-	-	-	-
	%Change (Month over Month)	NA	NA	NA	NA

-: 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 Avg. MCP (₹/kWh)			ACP (₹/kWh)	
		Minimum	Maximum	Average	Minimum	Maximum
IEX	October, 2022	2.20	5.46	3.78	0.05	12.00
	September, 2022	2.52	8.21	4.79	0.12	12.00
	% Change (Month over Month)	-12.70	-33.50	-21.09	-58.33	0.00
	October, 2021	2.53	15.81	6.91	0.50	20.00
	% Change (Year over Year)	-13.04	-65.46	-45.30	-90.00	-40.00
PXIL	October, 2022	-	-	-	-	-

	September, 2022	12.00	12.00	12.00	12.00	12.00
	% Change (Month over Month)	NA	NA	NA	NA	NA
	October, 2021	-	-	-	-	-
	% Change (Year over Year)	NA	NA	NA	NA	NA
HPX	October, 2022	-	-	-	-	-
	September, 2022	-	-	-	-	-
	%Change (Month over Month)	NA	NA	NA	NA	NA

-: 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 October, 2022 was **292.94 MU** (i.e. **292.94 MU** in IEX) at an average MCP of **Rs 4.03/kWh** and no transaction happened 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 October, 2022 are as given in Table 3A and 3B:

i) Final Scheduled Volume in IEX:

Exchange	Segment	Period	Final Scheduled Volume (MU)			
			Total	Minimu	Maximum	Average
IEX	Solar	October, 2022	145.40	1.20	8.13	4.69
		September, 2022	198.90	2.18	21.98	6.63
		% Change (Month over Month)	-26.90	-44.95	-63.01	-29.26
	Non Solar	October, 2022	147.53	2.98	8.33	4.76
		September, 2022	125.50	2.30	8.64	4.18
		% Change (Month over Month)	17.55	29.57	-3.59	13.88
	Hydro	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		% Change (Month over Month)	NA	NA	NA	NA
PXIL	Solar + Non Solar	October, 2022	-	-	-	-
		September, 2022	0.25	0.25	0.25	0.25
		% Change (Month over Month)	NA	NA	NA	NA
	Hydro	October, 2022	-	-	-	-
		September, 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 Avg. MCP (₹/kWh)			ACP (₹/kWh)	
			Minimum	Maximum	Average	Minimum	Maximum
IEX	Solar and Non Solar	October, 2022	3.40	4.97	4.03	2.58	12.00
		September, 2022	4.02	8.65	5.60	2.88	12.00
		% Change (Month over Month)	-15.42	-42.54	-28.04	-10.42	0.00
PXIL	Solar and Non Solar	October, 2022	-	-	-	-	-
		September, 2022	5.87	5.87	5.87	5.84	5.88

		% Change (Month over Month)	NA	NA	NA	NA	NA
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∴ 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 October, 2022 and September, 2022, respectively.
- 3.2** There was no real time curtailment in the power exchanges in Green Day Ahead Market during the month of October, 2022 and September, 2022, respectively.
- 3.3** The **top 10 sellers** on the power exchanges in **Green Day Ahead Market (GDAM)** in the month of October, 2022 were **Karnataka, Telangana, Andhra Pradesh, Adani Wind Energy Kutchh Five Limited, Uttar Pradesh, Ostro Energy Private Limited (OEPL), Ramagundam Floating Solar PV Station, Himachal Pradesh, Rajasthan and Sikkim**, which constituted **96.49%** of the market volume.
- 3.4** The **top 10 buyers** on the power exchanges in **Green Day Ahead Market (GDAM)** in the month of October, 2022 were **Maharashtra, Haryana, Delhi, DVC, Assam, Madhya Pradesh, Gujarat, Karnataka, Tamil Nadu and Kerala**, which constituted **85.18 %** 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 October, 2022 on delivery date basis was **914.08 MU**, out of which **523.90 MU** (57.31 %) was transacted on IEX, **299.40 MU** (32.75 %) was transacted on PXIL and **90.78 MU** (9.93 %) was transacted on HPX.
- 4.2. The total volume of electricity transacted on the power exchanges in Term Ahead Market in September, 2022 on delivery date basis was **1,459.44 MU**, out of which **875.43 MU** (59.98 %) was transacted on IEX, **480.06 MU** (32.89 %) was transacted on PXIL and **103.95 MU** (7.12 %) was transacted on HPX.
- 4.3. Similarly, the total volume of electricity transacted on the power exchanges in Term Ahead Market in October, 2021 on delivery date basis was **459.34 MU**, out of which, **224.78 MU** (48.94 %) was transacted on IEX and **234.56 MU** (51.06 %) was transacted on PXIL.
- 4.4. With respect to the total energy supplied during the month of October, 2022 in the country, the volume of electricity traded on the power exchanges in TAM on delivery date basis represents **0.80 %** of the total energy supplied. The same was **1.15 %** in September, 2022 and **0.41 %** in October, 2021.
- 4.5. In the month of October, 2022, there was real time curtailment of **1.37 MU** under Day Ahead Contingency contract in PXIL. Whereas, in IEX and HPX there was no real time curtailment.
- 4.6. In the month of October, 2022, there was transmission congestion of **3.34 MU** in TAM, Out of which **3.34 MU** happened under Day Ahead Contingency contract in IEX. Whereas, In PXIL and HPX, there was no transmission congestion in TAM during the month of October, 2022.
- 4.7. **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 October, 2022 with September, 2022 and October, 2021 is given in Table – 4A & 4B:**

(a) October, 2022 vis- a- vis September, 2022

Exchange	Period	Final Scheduled Volume (MU)				
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly	Total
IEX	October, 2022	-	523.90	-	-	523.90
	September, 2022	6.23	729.28	28.80	111.12	875.43
	%Change (Month over Month)	NA	-28.16	NA	NA	-40.16
	October, 2021	1.28	153.90	69.60	-	224.78
	%Change (Year over Year)	NA	240.42	NA	NA	133.07
PXIL	October, 2022	5.15	294.25	-	-	299.40
	September, 2022	6.79	473.27	-	-	480.06
	%Change (Month over Month)	-24.15	-37.83	NA	NA	-37.63
	October, 2021	4.17	230.39	-	-	234.56

	%Change (Year over Year)	23.50	27.72	NA	NA	27.64
HPX	October, 2022	-	90.78	-	-	90.78
	September, 2022	-	103.95	-	-	103.95
	%Change (Month over Month)	NA	-12.67	NA	NA	-12.67

- : No transaction took place

NA: Not Applicable

Table: 4A

(b) Average MCP, October, 2022 vis- a- vis September, 2022 and October, 2021

Exchange	Period	Average MCP (₹/kWh)			
		Intra Day	Day Ahead Contingency	Daily or Any Day	Weekly
IEX	October, 2022	-	4.08	-	-
	September, 2022	9.91	6.26	7.00	7.02
	%Change (Month over Month)	NA	-34.82	NA	NA
	October, 2021	6.25	7.01	7.58	-
	%Change Year over Year)	NA	-41.80	NA	NA
PXIL	October, 2022	7.67	4.30	-	-
	September, 2022	9.08	5.93	-	-
	%Change (Month over Month)	-15.53	-27.49	NA	NA
	October, 2021	11.38	8.24	4.03	-
	%Change (Year over Year)	-32.60	-47.82	NA	NA
HPX	October, 2022	-	3.85	-	-
	September, 2022	-	7.16	-	-
	%Change (Month over Month)	NA	-46.23	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 in GTAM on delivery date basis was **131.22 MU** (17.57 MU in Solar, 35.94 MU in Non-Solar and 77.71 MU in Hydro), respectively. No transaction of electricity happened in GTAM in HPX.

The total volume of electricity transacted in GTAM in Day Ahead Contingency, Intraday, Daily/Anyday and Weekly contracts during October, 2022 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 October, 2022 and its comparison with September, 2022 and October, 2021 has been shown in Table 5A & 5B below.

(i) **Final Scheduled Volume:**

Exchange	Solar Energy Contract	Period	Final Scheduled Volume (MU)			
			Total	Minimum	Maximum	Average
IEX	Day Ahead Contingency	October, 2022	6.14	0.14	2.01	0.77
		September, 2022	11.71	0.10	4.00	1.67
		%Change (Month over Month)	-47.57	40.00	-49.75	-53.89
		October, 2021	222.37	2.21	18.77	7.17
		%Change (Year over Year)	-97.24	-93.67	-89.29	-89.26
	Intraday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	3.26	0.04	1.68	0.14
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	October, 2022	3.90	0.30	0.30	0.30
		September, 2022	3.90	0.30	0.40	0.35
		%Change (Month over Month)	0.00	0.00	-25.00	-14.29
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Weekly	October, 2022	4.20	0.30	0.30	0.30
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	October, 2022	3.33	0.09	1.00	0.67
		September, 2022	3.93	1.80	2.13	1.96
		%Change (Month over Month)	-15.27	-95.00	-53.05	-65.82
		October, 2021	25.74	0.44	3.30	1.98

		%Change (Year over Year)	-87.06	-79.55	-69.70	-66.16
	Intraday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/ Anyday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Weekly	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
HPX	Day Ahead Contingency, Intra Day, Daily, weekly	October, 2022	-	-	-	-
		September, 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(₹/kW)		
			Minimum	Maximum	Average
	Day Ahead Contingency	October, 2022	3.50	7.04	4.95
		September, 2022	3.00	4.70	3.43
		%Change (Month over Month)	16.67	49.79	44.31
		October, 2021	3.25	4.84	3.91
		%Change	7.69	45.45	26.60
	Intraday	October, 2022	-	-	-
		September, 2022	3.05	3.05	3.05
		%Change (Month over Month)	NA	NA	NA
		October, 2021	3.00	4.02	3.51
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	October, 2022	4.50	4.60	4.55
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	4.60	4.60	4.60
		%Change (Year over Year)	-2.17	0.00	-1.09

	Weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	4.10	4.20	4.15
		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	October, 2022	3.50	3.50	3.50
		September, 2022	3.13	6.00	4.17
		%Change (Month over Month)	11.82	-41.67	-16.07
		October, 2021	3.40	5.53	3.99
		%Change (Year over Year)	2.94	-36.71	-12.28
	Intraday	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
HPX	Day Ahead Contingency, Intra Day, Daily, weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table-5B

- In October, 2022, there was no transmission congestion in GTAM (Solar) in IEX & PXIL and no transaction happened in HPX in GTAM (Solar).
- In October, 2022, there was no real time curtailment in GTAM (Solar) in IEX & PXIL and no transaction happened in 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 October, 2022 and its comparison with September, 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	October, 2022	4.60	0.07	0.54	0.24
		September, 2022	17.40	0.10	2.11	0.79
		%Change (Month over Month)	-73.56	-30.00	-74.41	-69.62
		October, 2021	114.40	0.30	14.04	3.94
		%Change (Year over Year)	-95.98	-76.67	-96.15	-93.91
	Intraday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	1.42	0.30	1.12	0.71
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	October, 2022	1.80	0.07	0.10	0.09
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	2.98	0.10	0.29	0.19
		%Change (Year over Year)	-39.60	-30.00	-65.52	-52.63
	Weekly	October, 2022	-	-	-	-
		September, 2022	0.80	0.11	0.11	0.11
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	0.84	0.12	0.12	0.12
		%Change (Year over Year)	NA	NA	NA	NA
PXIL	Day Ahead Contingency	October, 2022	29.53	0.60	1.25	0.95
		September, 2022	21.55	0.12	2.31	0.74
		%Change (Month over Month)	37.03	400.00	-45.89	28.38
		October, 2021	30.31	0.24	2.81	1.01
		%Change (Year over Year)	-2.57	150.00	-55.52	-5.94
	Intraday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
	Daily/Anyday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	3.66	0.18	0.24	0.22
		%Change (Year over Year)	NA	NA	NA	NA
	Weekly	October, 2022	-	-	-	-

		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	NA	NA	NA
		October, 2021	-	-	-	-
		%Change (Year over Year)	NA	NA	NA	NA
HPX	Day Ahead Contingency, Intra Day, Daily, weekly	October, 2022	-	-	-	-
		September, 2022	-	-	-	-
		%Change (Month over Month)	NA	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(₹/kW)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	October, 2022	3.50	5.80	5.00
		September, 2022	3.82	7.92	6.19
		%Change (Month over Month)	-8.38	-26.77	-19.22
		October, 2021	3.70	18.70	8.03
		%Change (Year over Year)	-5.41	-68.98	-37.73
	Intraday	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	14.69	20.00	17.35
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	October, 2022	5.70	5.70	5.70
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	4.90	14.00	8.88
		%Change (Year over Year)	16.33	-59.29	-35.81
	Weekly	October, 2022	-	-	-
		September, 2022	5.70	5.70	5.70
		%Change (Month over Month)	NA	NA	NA
		October, 2021	4.70	4.70	4.70
		%Change (Year over Year)	NA	NA	NA
PXIL	Day Ahead Contingency	October, 2022	3.19	5.12	4.40
		September, 2022	4.22	9.67	6.45
		%Change (Month over Month)	-24.41	-47.05	-31.78
		October, 2021	3.76	16.42	7.91
		%Change (Year over Year)	-15.16	-68.82	-44.37
	Intraday	October, 2022	-	-	-
		September, 2022	-	-	-

		%Change (Month over Month)	NA	NA	NA
		October, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
	Daily/Anyday	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	4.50	5.10	4.75
		%Change (Year over Year)	NA	NA	NA
	Weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
		October, 2021	-	-	-
		%Change (Year over Year)	NA	NA	NA
HPX	Day Ahead Contingency, Intra Day, Daily, weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table - 5D

- In October, 2022, there was transmission congestion of **0.19 MU** under Day Ahead Contingency contract in GTAM (Non Solar) in IEX. There was no transmission congestion in GTAM (Solar) in PXIL. And no transaction happened in HPX in GTAM (Solar).
- In October, 2022, there was no real time curtailment in GTAM (Non Solar) in IEX & PXIL. No transaction happened in HPX in GTAM (Solar).

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 October, 2022 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	October, 2022	77.71	1.17	3.57	2.51
		September, 2022	95.90	2.02	3.99	3.20
		%Change (Month over Month)	-18.97	-42.08	-10.53	-21.56
	Intraday	October, 2022	-	-	-	-
		September, 2022	-	-	-	-

	Daily/Anyday	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
	Weekly	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
	Day Ahead Contingency	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
PXIL	Intraday	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
	Daily/Anyday	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
	Weekly	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
	Day Ahead Contingency, Intra Day, Daily, weekly	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-
HPX	Day Ahead Contingency, Intra Day, Daily, weekly	%Change (Month over Month)	NA	NA	NA	NA
		October, 2022	-	-	-	-
		September, 2022	-	-	-	-

-: No transaction took place

NA: Not Applicable

Table: 5E

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

Exchange	Hydro Energy Contract	Period	Prices(₹/kW)		
			Minimum	Maximum	Average
IEX	Day Ahead Contingency	October, 2022	2.96	4.83	3.95
		September, 2022	3.33	9.35	5.78
		%Change (Month over Month)	-11.11	-48.34	-31.66
	Intraday	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Daily/Anyday	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA
	Weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		%Change (Month over Month)	NA	NA	NA

		September, 2022	-	-	-
		%Change (Month over Month)	-	-	-
PXIL	Intraday	October, 2022	NA	NA	NA
		September, 2022	-	-	-
		%Change (Month over Month)	-	-	-
	Daily/Anyday	October, 2022	NA	NA	NA
		September, 2022	-	-	-
		%Change (Month over Month)	-	-	-
	Weekly	October, 2022	NA	NA	NA
		September, 2022	-	-	-
		%Change (Month over Month)	-	-	-
HPX	Day Ahead Contingency, Intra Day, Daily, weekly	October, 2022	-	-	-
		September, 2022	-	-	-
		% Change (Month over Month)	NA	NA	NA

-: No transaction took place

NA: Not Applicable

Table – 5F

- In October, 2022, there was no transmission congestion in GTAM (Hydro) in IEX. No transaction happened in PXIL and HPX in GTAM (Hydro).
- In October, 2022, there was no real time curtailment in GTAM (Hydro) in IEX. No transaction happened in PXIL and HPX in GTAM (Hydro).

6. Bilateral Transactions:

The total volume of electricity transacted through **Bilateral transactions** in the month of October, 2022 was **5,011.33 MU**. The total buy volume of electricity transacted in bilateral market through direct transactions and trader in the month of October, 2022 were **2,113.16 MU** and **2888.17 MU** respectively. The details of Bilateral transactions of Electricity during October, 2022 is shown in Table Below:

October, 2022	Direct	Traders	Total Bilateral Transaction (MU)
Total	2113.16	2888.17	5001.33
Minimum	0.63	0.65	-
Maximum	823.96	493.91	-

Table -6A

The region-wise maximum/ minimum volume of electricity transacted bilaterally during October, 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	45.99	345.47	1231.15	1312.12	723.72	821.28	112.31	335.65	-	73.65
Minimum	6.96	10.50	45.72	41.07	9.35	47.72	0.63	0.73	-	0.65
Maximum	39.02	140.01	823.96	493.91	385.41	353.80	93.12	274.89	215.65	353.80

Table-6B

6.1. The top 5 buyers on bilateral transaction through direct transactions in the month of October, 2022 were **Madhya Pradesh, Rajasthan, Maharashtra, Haryana and Telangana**, which constituted **85.33 %** of the market volume. Whereas **top 5 buyers** on bilateral transaction through traders in the month of October, 2022 were **Maharashtra, Gujarat, Himachal Pradesh, Andhra Pradesh and Rajasthan**, which constituted **61.96 %** of the market volume. [Annexure III]

6.2. The top 5 sellers on bilateral transaction through direct transactions in the month of October, 2022 were **Punjab, Uttar Pradesh, Telangana, Adani Hybrid Energy Jaisalmer Four Limited AHS and Damodar Valley Corporation**, which constituted **56.62 %** of the market volume. Whereas **top 5 sellers** on bilateral transaction through traders in the month of October, 2022 were **Raipur Energen Limited, Delhi, Gujarat, Bihar and Jindal Power Limited, Stage-2**, which constituted **42.31 %** of the market volume. [Annexure III]

6.3. Deviation Volume -The volume of Deviation observed in the month of October, 2022 in import and export were **2,189.76 MU** and **2,440.64 MU** respectively. The total volume of Deviation observed in the month of October, 2022 can be taken as **2,315.20 MU**.

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

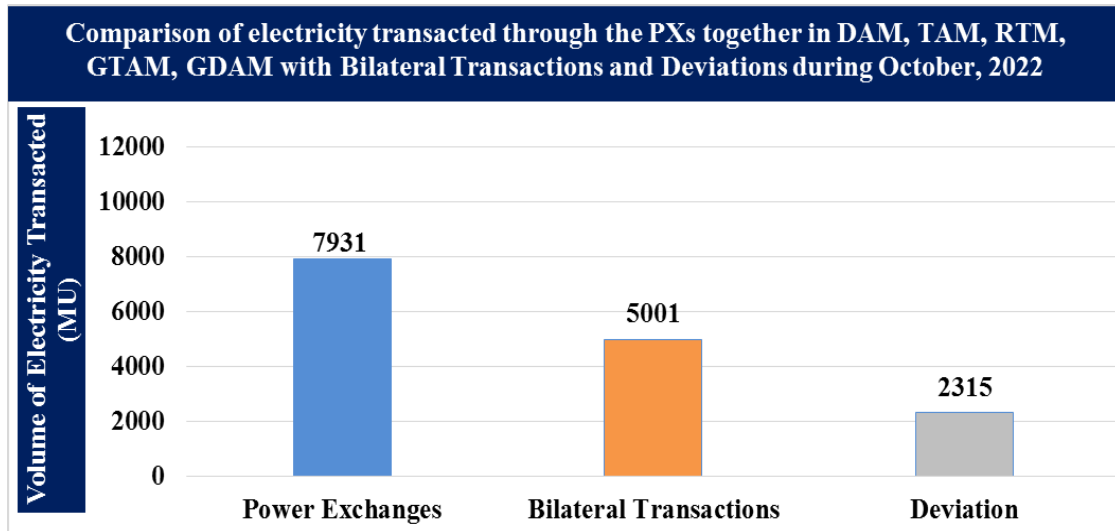


Figure -1

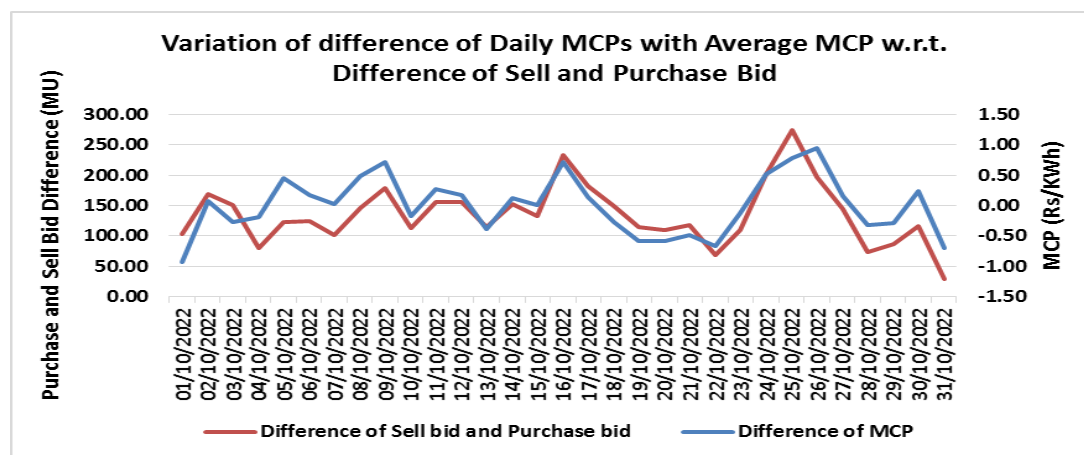
7. Analysis of movement of prices observed in DAM during October, 2022

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

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.

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 significant variables were the Peak Demand, Total Sell Bid and Solar Generation, whereas all the other variables were found to be insignificant. Further, the regression analysis revealed that the elasticity of the Daily Avg. MCP with respect to Total Peak Demand was **1.62** which signifies that there is high multi-collinearity among the predictor variables/ independent variables used in regression analysis.

- 7.1. The variation of difference of Daily Avg. MCPs with Average MCP w.r.t Difference of Sell and Purchase bid is Shown below:



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

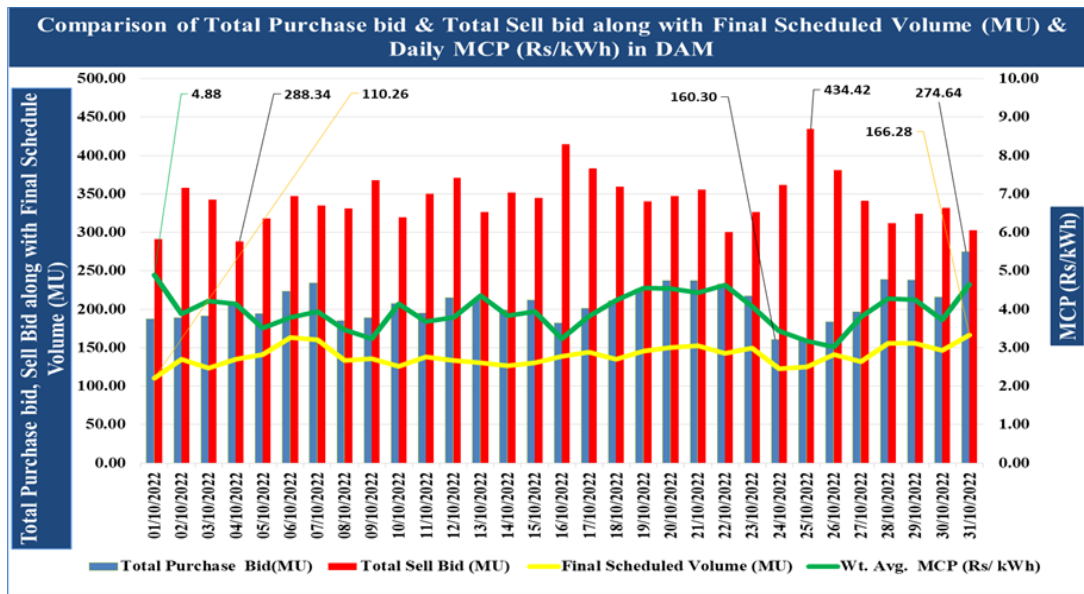


Figure - 2

7.3. 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 October, 2022, it is observed that on first Sunday (02nd October, 2022), FSV showed increasing trend in comparison to first Saturday (01st October, 2022), on third Sunday (16th October, 2022), FSV showed increasing trend in comparison to third Saturday (15th October, 2022), on fourth Monday (24th October, 2022), FSV showed decreasing trend in comparison to fourth Sunday (23th October, 2022). The detailed analysis on this is given at **Appendix-I**.

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

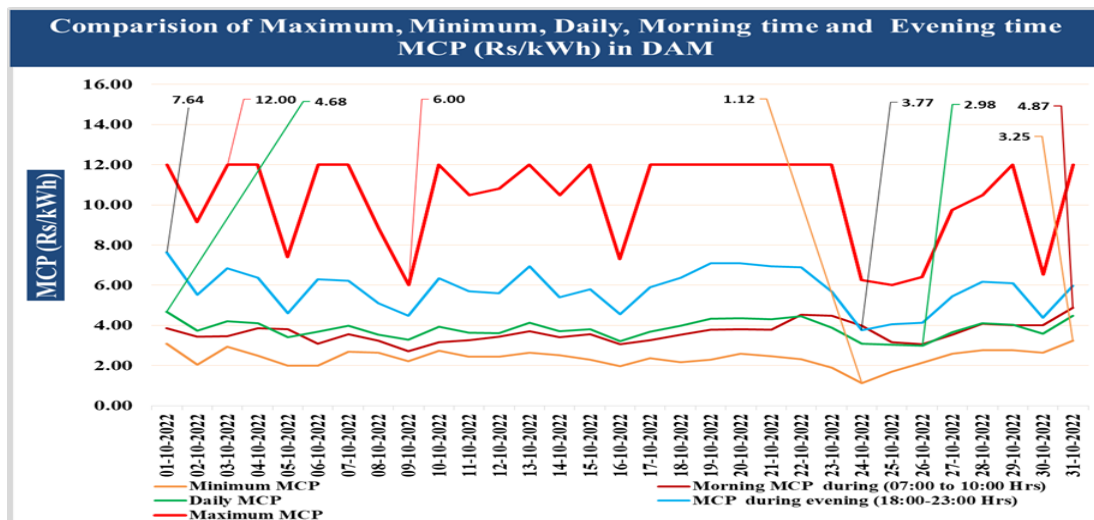


Figure-3

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

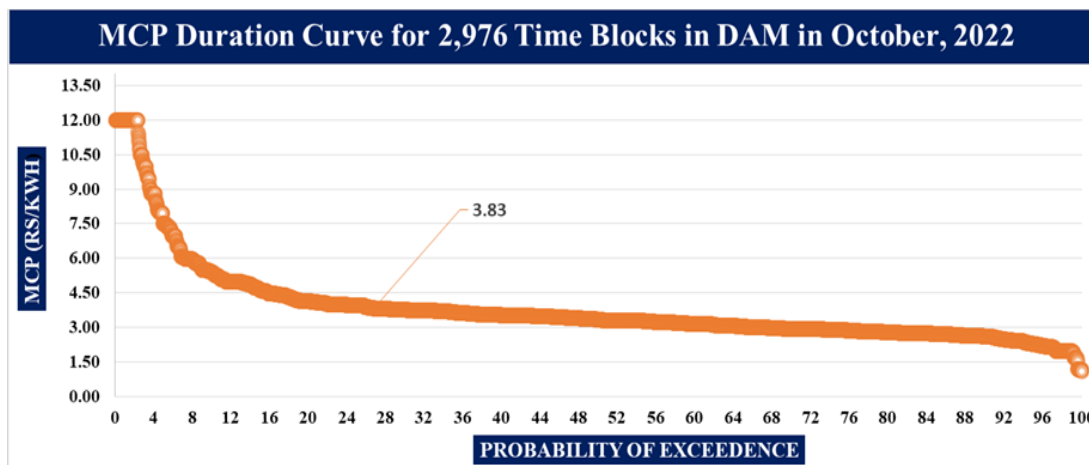


Figure - 4

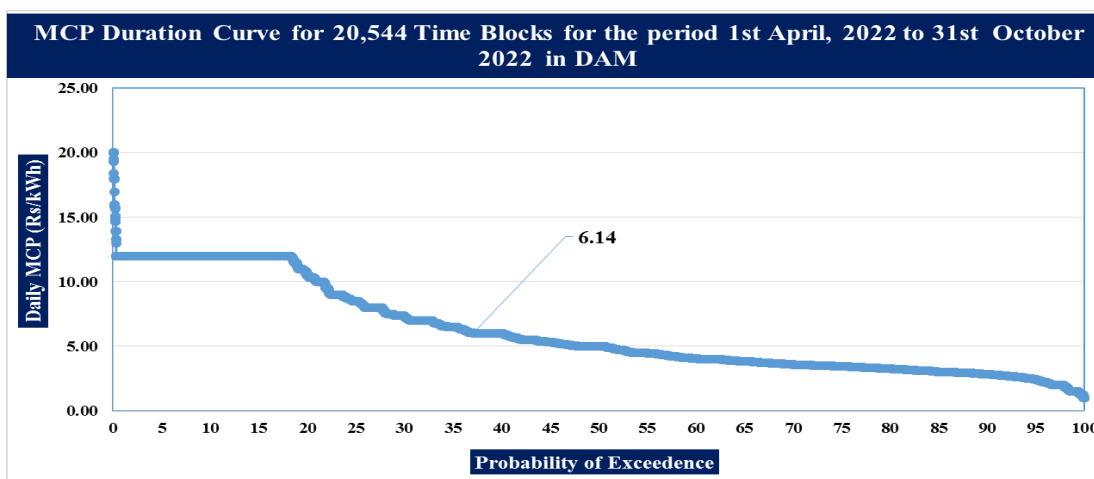


Figure-5

- 7.6. It can be seen in figure 4 above that in the MCP duration curve of October, 2022, for 27.00 % of the time MCP was above average MCP of the month (i.e. ₹ 3.83/kWh) and almost 73.00 % of the time MCP was below the average MCP of the month. Similarly, it can be seen in the MCP duration curve from 1stApril, 2022 to 31st October, 2022 (figure-5), that for 37.00 % of the time the MCP was above the average MCP for the period (i.e. ₹ 6.14/kWh) and for 63.00 % of the time the Daily Avg. MCP was below the average MCP for the period.
- 7.7. 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.

- 7.8. In October, 2022, the maximum FSV occurred mostly during the **time period 07-08 Hrs** (on 25 no. of days). Whereas, the maximum MCP occurred mostly during the **time period 18-19 Hrs** (on 19 no. of days). Similarly, the minimum FSV occurred mostly during the **time period 23-24 Hrs** (on 10 no. of days). Whereas, the minimum MCP occurred mostly during the **time period 13-14 Hrs** (on 17 no. of days). [Annexure VI]
- 7.9. In the month of October, 2022, there was **no** congestion in Power Exchanges. Further, in the month of September, 2022 and October, 2021, also there was no congestion in Power Exchanges.
- 7.10. In the month of October, 2022, there was **no** real time curtailment in Power Exchanges. Further, in the month of September, 2022 and October, 2021 also, there was no real time curtailment in Power Exchanges.
- 7.11. The **top 10 sellers** on the power exchanges in **Day Ahead Market (DAM)** in the month of **October, 2022** were **Uttar Pradesh, West Bengal, Telangana, Madhya Pradesh, Chhattisgarh, NVVN (SNA) – NEA, Teesta -3, Karnataka, Bihar and Himachal Pradesh**, which constituted **74.73 %** of the market volume. [Annexure VII].
- 7.12. The **top 10 purchasers** on the power exchanges in **Day Ahead Market (DAM)** in the month of October, 2022 were **Gujarat, Andhra Pradesh, Punjab, Rajasthan, Uttar Pradesh, Daman & Diu - Dadra & Nagar Haveli, Tamil Nadu, Arcelor Mittal Nippon steel (ESIL), Maharashtra and Odisha**, which constituted **84.36 %** of the market volume. [Annexure VII]
- 7.13. The total volume of electricity purchased by Discoms/Licensees in DAM in the month of October, 2022 was **3,956.83 MU**, which constituted **91.63 %** of total volume of electricity purchased on the power exchanges.
- 7.14. Similarly, the total volume of electricity sold by Discoms/Licensees in DAM in the month of October, 2022 was **3,391.55 MU**, which constituted **78.36 %** of total volume of electricity sold on the power exchanges.

8. Analysis of movement of prices observed in Real Time Market (RTM) transactions in October, 2022

- 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 Total Purchase Bid, Total Sell Bid and Hydro Generation, whereas all the other variables were found to be insignificant. Further, the regression analysis revealed that the elasticity of the Daily Avg. MCP with respect to Total Purchase Bid was **1.72** which signifies that there is high multi-collinearity among the predictor variables/ independent variables used in regression analysis.
- 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:

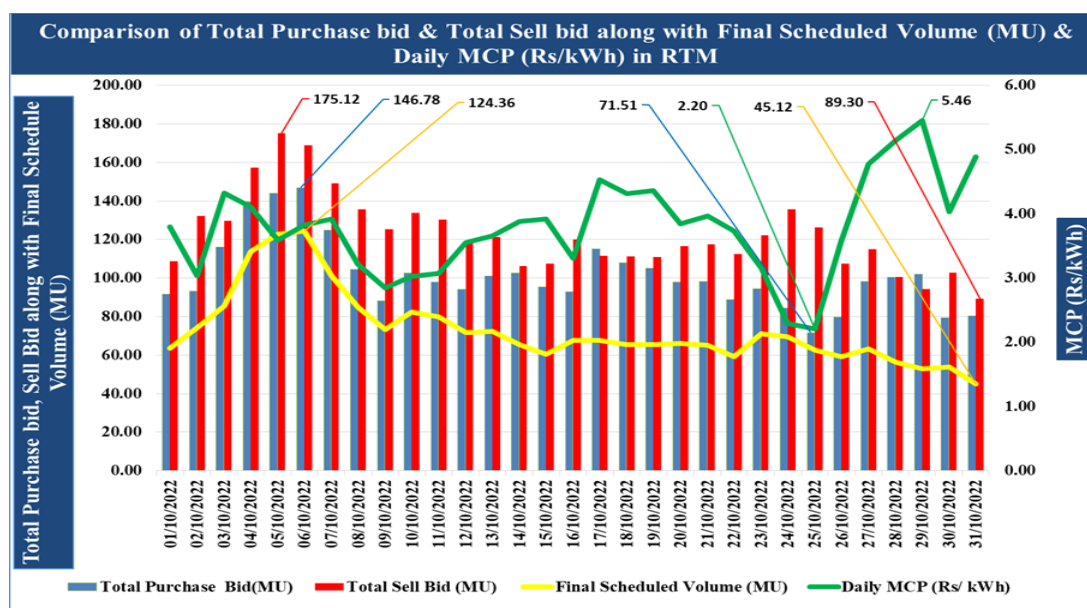


Figure-6

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

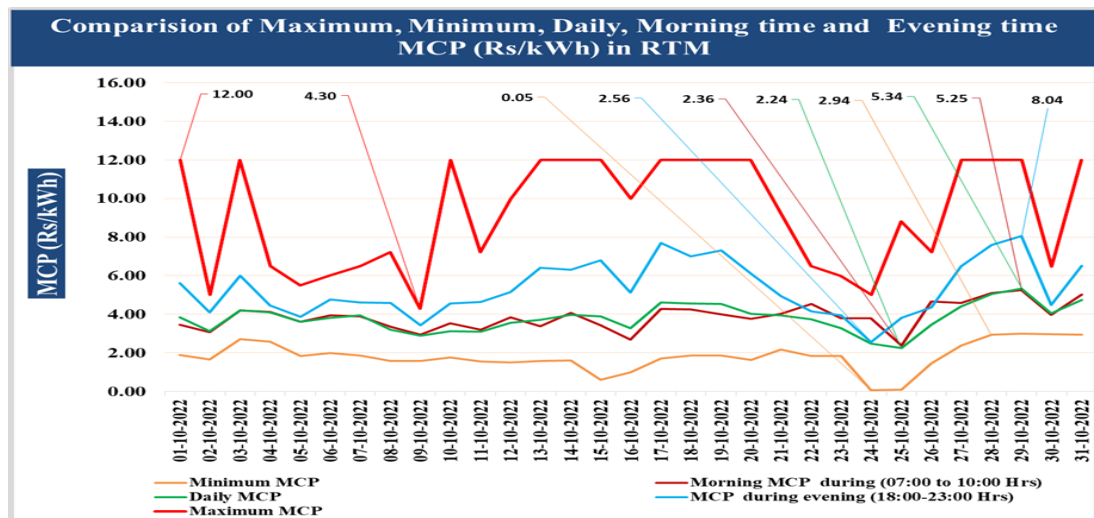


Figure-7

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

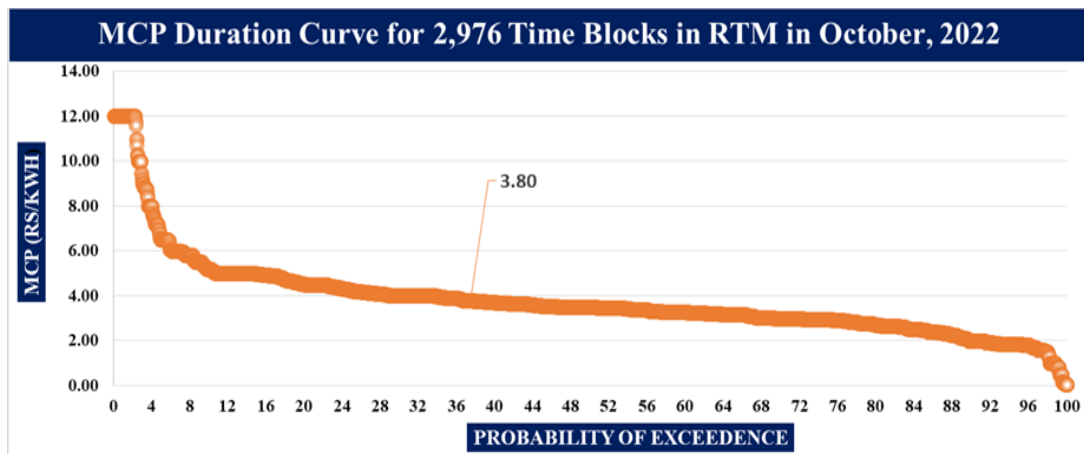


Figure-8

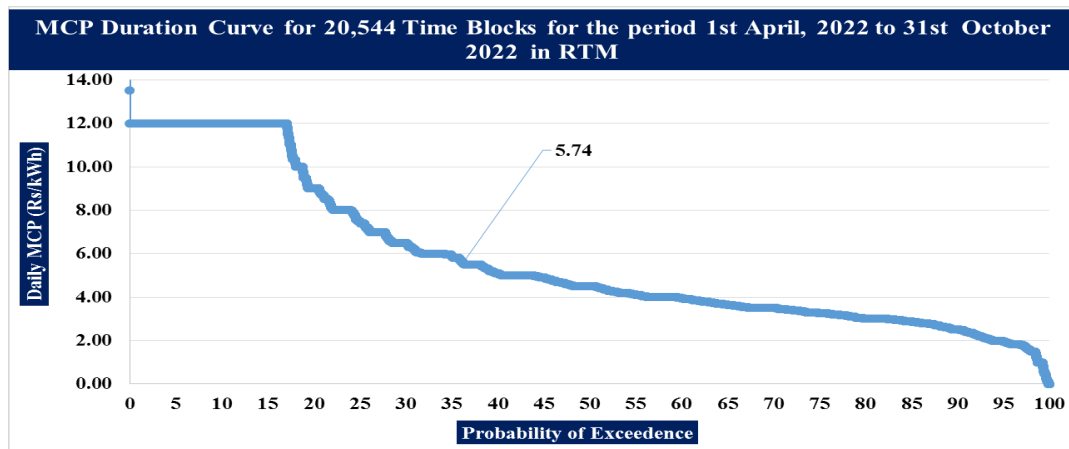


Figure-9

- 8.6. It can be seen in figure 8 above that in the MCP duration curve of October, 2022, for 38.00 % of the time the MCP was above the average MCP of the month (i.e. ₹. 3.80/kWh) and for 62.00 % 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 October, 2022 (figure 9) that, for 35.00 % of the time the Daily Avg. MCP was above the average MCP for the period (i.e. ₹. 5.74/kWh) and for 65.00 % of the time the Daily Avg. MCP was below the average MCP for the period.
- 8.7. In October, 2022, the maximum FSV occurred mostly during the **time period 14-16 Hrs** (on 11 no. of days). Whereas, the maximum MCP also occurred mostly during the **time period 18-19 Hrs** (on 13 no. of days). Similarly, the minimum FSV occurred mostly during the **time period 4-6 Hrs** (on 6 no. of days). Whereas, the minimum MCP occurred mostly during the **time period 13-14 Hrs** (on 20 no. of days).[Annexure X]
- 8.8. There was **no** real time curtailment in IEX and PXIL in Real Time Market (RTM) during October, 2022 and no transaction happened in HPX. Further, in September, 2022 **no** real time curtailment occurred in IEX, whereas, no transaction happened in PXIL and HPX. Similarly, in October, 2021, there was no real time curtailment in IEX and no transaction of electricity happened in PXIL.
- 8.9. In the month of October, 2022 there was **no** congestion in IEX & PXIL and no transaction happened in HPX. Further, in the month of September, 2022, there was congestion of **5.79 MU** in the transmission system in IEX, whereas, in PXIL, there was no congestion and no transaction happened in HPX. In the month of October, 2021, there was transmission congestion of **9.35 MU** in IEX, whereas, in PXIL, no transaction of electricity happened in October, 2021.
- 8.10. The **top 10 sellers** on the power exchanges in **Real Time Market (RTM)** in the month of October, 2022 were **Madhya Pradesh, Telangana, Bihar, Uttar Pradesh, West Bengal, Orissa, Himachal Pradesh, Karnataka, Andhra Pradesh** and **Kameng HEP**, which constituted **80.20 %** of the market volume. [Annexure XI]
- 8.11. The **top 10 buyers** on the power exchanges in **Real Time Market (RTM)** in the month of October, 2022 were **Rajasthan, Punjab, J&K, Maharashtra, Gujarat, Uttar Pradesh, Orissa, West Bengal, Delhi** and **Telangana**, which constituted **82.81 %** of the market volume. [Annexure XI]
- 8.12. The total volume of electricity purchased by Discoms/Licensees in RTM in the month of October, 2022 was **2,172.46 MU**, which constituted **95.93 %** 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 October, 2022 was **2,103.53 MU**, which constituted **92.89 %** 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**

Annexure-I

Final Scheduled Volume, Average MCP and Real-Time Curtailment in Day Ahead Market (DAM) for the months of April, 2022 to October, 2022 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
Total 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
Total April, 2022 – October, 2022		26,791.15	187.02	6.26	6.11	8.86	0.00

Annexure-II

Final Scheduled Volume in Term Ahead Market (TAM) for the months of April, 2022 to October, 2022 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
Total April, 2022 - October, 2022		5,681.16	5,462.35	670.17	11,813.68

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

(i) Top five Buyers in Bilateral transactions

Entity Name	Direct		Entity Name	Through Traders	
	(MU)	Percent		(MU)	Percent
Madhya Pradesh	823.96	38.99%	Maharashtra	493.91	17.10%
Rajasthan	385.41	18.24%	Gujarat	486.44	16.84%
Maharashtra	284.94	13.48%	Himachal Pradesh	353.80	12.25%
Haryana	215.65	10.21%	Andhra Pradesh	274.89	9.52%
Telangana	93.12	4.41%	Rajasthan	180.58	6.25%
Total Volume	1,803.08	85.33%	Total Volume	1,789.62	61.96%
Total Volume in Bilateral	2,113.16		Total Volume in Bilateral	2,888.17	

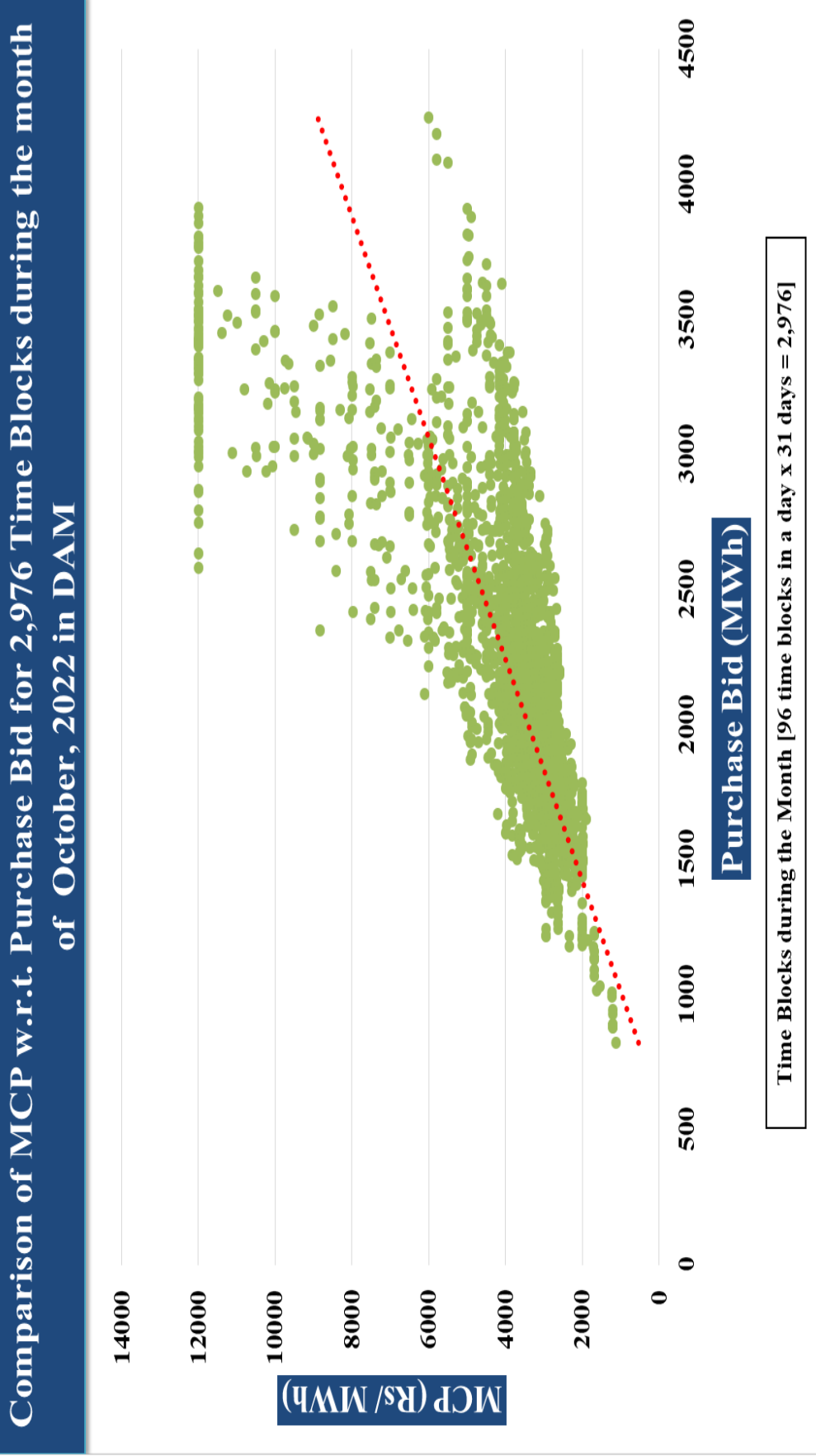
(ii) Top five Sellers in Bilateral transactions

Entity Name	Direct		Entity Name	Through Traders	
	(MU)	Percent		(MU)	Percent
Punjab	450.21	21.30%	Raipur energen limited	364.54	12.62%
Uttar pradesh	306.00	9.92%	Delhi	316.16	6.31%
Telangana	209.53	5.48%	Gujarat	182.30	6.23%
Adani hybrid energy Jaisalmer four limited	115.87	5.44%	Bihar	180.00	6.20%
Damodar valley corporation	114.88	21.30%	Jindal power limited, stage-2	179.09	12.62%
Total volume	1,196.49	56.62%	Total Volume	1,222.10	42.31%
Total Volume in Bilateral	2,113.16		Total Volume in Bilateral	2,888.17	

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 06:00, 23:00-24:00)	Maximum MCP	Minimum MCP	Average MCP	Final Scheduled Volume (MU)
01-10-2022	3.86	3.46	7.64	3.84	12.00	3.10	4.68	110.26
02-10-2022	3.43	2.70	5.51	3.42	9.15	2.04	3.74	135.19
03-10-2022	3.47	3.22	6.85	3.32	12.00	2.95	4.20	123.65
04-10-2022	3.85	3.09	6.37	3.34	12.00	2.50	4.11	134.61
05-10-2022	3.82	2.33	4.59	3.23	7.40	1.99	3.41	140.93
06-10-2022	3.08	2.83	6.30	2.63	12.00	2.00	3.68	163.51
07-10-2022	3.55	3.06	6.21	3.27	12.00	2.70	3.99	160.53
08-10-2022	3.23	2.84	5.10	3.05	8.82	2.64	3.53	133.62
09-10-2022	2.71	2.54	4.48	3.38	6.00	2.22	3.29	135.47
10-10-2022	3.17	3.14	6.36	3.05	12.00	2.75	3.92	125.61
11-10-2022	3.27	2.94	5.69	2.76	10.50	2.43	3.63	137.76
12-10-2022	3.43	2.83	5.61	2.78	10.80	2.43	3.61	133.62
13-10-2022	3.71	2.82	6.95	3.27	12.00	2.64	4.13	129.98
14-10-2022	3.42	2.76	5.40	3.36	10.50	2.53	3.70	126.84
15-10-2022	3.56	2.75	5.79	3.31	12.00	2.28	3.81	130.28
16-10-2022	3.07	2.30	4.56	3.05	7.30	1.97	3.21	139.02
17-10-2022	3.27	2.66	5.91	3.01	12.00	2.37	3.68	143.87
18-10-2022	3.54	2.70	6.36	3.45	12.00	2.18	3.97	135.05
19-10-2022	3.79	2.89	7.10	3.73	12.00	2.30	4.34	145.85
20-10-2022	3.80	3.08	7.08	3.62	12.00	2.58	4.36	150.43
21-10-2022	3.79	3.08	6.94	3.62	12.00	2.47	4.32	152.44
22-10-2022	4.54	3.18	6.88	3.60	12.00	2.31	4.46	142.79
23-10-2022	4.49	2.68	5.66	3.23	12.00	1.90	3.89	149.86
24-10-2022	3.99	1.64	3.77	3.40	6.27	1.12	3.08	122.37
25-10-2022	3.16	2.28	4.06	2.85	6.00	1.70	3.04	125.30
26-10-2022	3.05	2.44	4.14	2.50	6.42	2.15	2.98	141.17
27-10-2022	3.55	2.95	5.45	2.90	9.75	2.60	3.66	131.93
28-10-2022	4.09	3.38	6.16	3.09	10.50	2.77	4.11	155.32
29-10-2022	4.01	3.26	6.11	3.08	12.00	2.77	4.05	155.27
30-10-2022	4.00	3.11	4.37	3.17	6.53	2.63	3.59	146.22
31-10-2022	4.87	3.91	5.99	3.53	12.00	3.25	4.48	166.28
Maximum	4.87	3.91	7.64	3.84	12.00	3.25	4.68	166.28
Minimum	2.71	1.64	3.77	2.50	6.00	1.12	2.98	110.26
Average	3.63	2.87	5.79	3.22	10.32	2.40	3.83	139.52
MCP: Market Clearing Price (₹/kWh)				FSV: Final Scheduled Volume (MU)				



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
01-10-2022	07:00 - 07:15	1.72	18:30 - 18:45	12.00	04:45 - 05:00	0.75	14:00 - 14:15	3.10
02-10-2022	19:15 - 19:30	2.05	19:30 - 19:45	9.15	23:45 - 24:00	1.12	13:00 - 13:15	2.04
03-10-2022	07:00 - 07:15	1.97	18:30 - 18:45	12.00	23:45 - 24:00	0.92	03:45 - 04:00	2.95
04-10-2022	07:15 - 07:30	1.79	18:30 - 18:45	12.00	05:00 - 05:15	1.02	03:45 - 04:00	2.50
05-10-2022	06:45 - 07:00	1.93	19:00 - 19:15	7.40	23:45 - 24:00	1.14	12:00 - 12:15	1.99
06-10-2022	07:15 - 07:30	2.43	18:30 - 18:45	12.00	23:45 - 24:00	1.11	03:45 - 04:00	2.00
07-10-2022	07:15 - 07:30	2.53	18:30 - 18:45	12.00	00:00 - 00:15	1.05	03:45 - 04:00	2.70
08-10-2022	07:30 - 07:45	1.97	19:00 - 19:15	8.82	00:15 - 00:30	0.82	14:00 - 14:15	2.64
09-10-2022	09:00 - 09:15	1.84	19:00 - 19:15	6.00	23:45 - 24:00	0.86	13:30 - 13:45	2.22
10-10-2022	07:00 - 07:15	1.75	19:00 - 19:15	12.00	04:45 - 05:00	0.77	03:45 - 04:00	2.75
11-10-2022	07:00 - 07:15	1.88	19:00 - 19:15	10.50	23:45 - 24:00	0.93	03:15 - 03:30	2.43
12-10-2022	07:15 - 07:30	1.97	19:00 - 19:15	10.80	04:45 - 05:00	0.93	03:45 - 04:00	2.43
13-10-2022	07:00 - 07:15	2.07	18:15 - 18:30	12.00	00:00 - 00:15	0.82	13:15 - 13:30	2.64
14-10-2022	07:00 - 07:15	1.90	18:45 - 19:00	10.50	05:00 - 05:15	0.96	13:30 - 13:45	2.53
15-10-2022	07:00 - 07:15	2.00	18:45 - 19:00	12.00	05:00 - 05:15	1.11	13:15 - 13:30	2.28
16-10-2022	07:15 - 07:30	2.02	19:00 - 19:15	7.30	23:45 - 24:00	1.04	13:30 - 13:45	1.97
17-10-2022	07:00 - 07:15	2.06	18:45 - 19:00	12.00	23:45 - 24:00	1.05	13:15 - 13:30	2.37
18-10-2022	07:00 - 07:15	2.18	18:30 - 18:45	12.00	13:00 - 13:15	1.03	13:15 - 13:30	2.18
19-10-2022	07:00 - 07:15	2.31	18:15 - 18:30	12.00	13:00 - 13:15	1.03	13:15 - 13:30	2.30
20-10-2022	07:15 - 07:30	2.45	18:15 - 18:30	12.00	02:30 - 02:45	1.15	13:15 - 13:30	2.58
21-10-2022	07:00 - 07:15	2.44	18:15 - 18:30	12.00	03:30 - 03:45	1.20	13:15 - 13:30	2.47
22-10-2022	19:30 - 19:45	1.95	18:15 - 18:30	12.00	03:15 - 03:30	1.22	13:00 - 13:15	2.31
23-10-2022	19:00 - 19:15	2.05	18:30 - 18:45	12.00	02:15 - 02:30	1.21	13:15 - 13:30	1.90
24-10-2022	06:30 - 06:45	2.12	06:45 - 07:00	6.27	14:00 - 14:15	0.67	14:00 - 14:15	1.12
25-10-2022	07:15 - 07:30	2.07	19:00 - 19:15	6.00	03:15 - 03:30	0.91	13:00 - 13:15	1.70
26-10-2022	07:15 - 07:30	2.08	19:00 - 19:15	6.42	03:15 - 03:30	1.11	13:15 - 13:30	2.15
27-10-2022	07:15 - 07:30	2.32	19:00 - 19:15	9.75	03:45 - 04:00	0.95	13:15 - 13:30	2.60
28-10-2022	07:15 - 07:30	2.62	18:45 - 19:00	10.50	23:45 - 24:00	1.13	03:15 - 03:30	2.77
29-10-2022	07:30 - 07:45	2.52	18:30 - 18:45	12.00	23:45 - 24:00	0.95	03:15 - 03:30	2.77
30-10-2022	07:15 - 07:30	2.60	18:45 - 19:00	6.53	00:45 - 01:00	0.94	13:30 - 13:45	2.63
31-10-2022	07:30 - 07:45	2.72	18:30 - 18:45	12.00	03:15 - 03:30	0.97	03:45 - 04:00	3.25

MCP: Market Clearing Price (₹/kWh)

FSV: Final Scheduled Volume (MU)

Annexure-VII

Sellers and Buyers in Day Ahead Market (DAM) in the month of October, 2022						
S. No.	Entity Name	Sell		Entity Name	Purchase	
		(MU)	Percent (%)		(MU)	Percent (%)
1	Uttar Pradesh	759.04	17.54%	Gujarat	1435.97	33.18%
2	West Bengal	457.75	10.58%	Andhra Pradesh	467.49	10.80%
3	Telangana	451.63	10.44%	Punjab	373.99	8.64%
4	Madhya Pradesh	315.74	7.30%	Rajasthan	331.68	7.66%
5	Chhattisgarh	291.82	6.74%	Uttar Pradesh	279.59	6.46%
6	NVVN (SNA) - NEA	250.94	5.80%	Daman & Diu -	177.01	4.09%
7	Teesta -3	191.67	4.43%	Tamilnadu	175.40	4.05%
8	Karnataka	191.44	4.42%	ArcelorMittal Nippon	148.61	3.43%
9	Bihar	173.44	4.01%	Maharashtra	137.72	3.18%
10	Himachal Pradesh	150.78	3.48%	Odisha	123.68	2.86%
11	Sembcorp Gayatri	142.52	3.29%	J&K	99.65	2.30%
12	Odisha	118.39	2.74%	Madhya Pradesh	88.96	2.06%
13	Assam	77.17	1.78%	Uttarakhand	76.67	1.77%
14	ACBIL	71.26	1.65%	West Bengal	67.41	1.56%
15	Haryana	70.86	1.64%	Assam	63.44	1.47%
16	Kerala	36.03	0.83%	Karnataka	56.57	1.31%
17	Mizoram	30.07	0.69%	Telangana	46.24	1.07%
18	Jaypee Nigrie	28.18	0.65%	Railways	32.23	0.74%
19	Goa WR	27.34	0.63%	DVC	32.11	0.74%
20	JITPL	26.32	0.61%	Delhi	25.50	0.59%
21	DB Power	25.52	0.59%	Meghalaya	24.36	0.56%
22	Sainj HEP	25.50	0.59%	Kerala	14.62	0.34%
23	Chandigarh	25.25	0.58%	Goa WR	13.33	0.31%
24	Karcham Wangtoo	24.19	0.56%	Jharkhand	11.46	0.26%
25	Jharkhand	23.39	0.54%	Haryana	8.91	0.21%
26	Meghalaya	23.13	0.53%	Chhattisgarh	5.50	0.13%
27	Uttarakhand	22.93	0.53%	Goa SR	3.85	0.09%
28	Maharashtra	21.99	0.51%	Bihar	3.33	0.08%
29	Sikkim	21.42	0.49%	Chandigarh	1.68	0.04%
30	Arunachal Pradesh	20.26	0.47%	NEA-NR	0.49	0.01%
31	Delhi	18.68	0.43%	Tripura	0.48	0.01%
32	Andhra Pradesh	18.30	0.42%	Himachal Pradesh	0.10	0.00%
33	Jindal Power	16.74	0.39%			
34	Palatana	16.31	0.38%			
35	Jindal Power Ltd. Stg-II	14.51	0.34%			
36	Tamilnadu	12.19	0.28%			
37	Raipur Energen	12.15	0.28%			
38	Sembcorp Energy India	11.41	0.26%			
39	Adani Green Energy	10.97	0.25%			
40	Talcher Stg-2	9.81	0.23%			
41	AD Hydro	8.64	0.20%			
42	Rajasthan	7.81	0.18%			
43	Nagaland	7.28	0.17%			
44	Chuzachen	6.71	0.15%			
45	Gujarat	6.20	0.14%			
46	Punjab	5.53	0.13%			

47	Mahan Energy Limited	5.47	0.13%			
48	Jhabua Power	4.50	0.10%			
49	Dikchu	4.40	0.10%			
50	Adhunik Power	4.34	0.10%			
51	GMR Kamalanga	4.34	0.10%			
52	Renew Surya Ravi	3.95	0.09%			
53	Kameng HEP	3.21	0.07%			
54	DVC	2.99	0.07%			
55	J&K	2.69	0.06%			
56	Coastal Gujrat Power	2.63	0.06%			
57	GMR Warora	2.50	0.06%			
58	Lanco Budhil	1.76	0.04%			
59	Shree Cement	1.12	0.03%			
60	Bongaigaon	0.96	0.02%			
61	Sorang HEP, (Himachal	0.89	0.02%			
62	Ramagundam Stg-3	0.82	0.02%			
63	SKS Power	0.47	0.01%			
64	Ramagundam Stg-1	0.38	0.01%			
65	IL&FS	0.33	0.01%			
66	Talcher	0.28	0.01%			
67	Singoli Bhagwati	0.21	0.00%			
68	NTPL	0.19	0.00%			
69	Dhariwal	0.10	0.00%			
70	Farakka	0.10	0.00%			
71	Simhadri Stg-2	0.07	0.00%			
72	Ostro Energy Private	0.05	0.00%			
73	Kahalgaoon	0.05	0.00%			
74	KSK Mahanadi	0.03	0.00%			
Total Volume of top 10		3,234.24	74.73%	Total Volume of top	3,651.15	84.36%
Total Volume in PXs		4,328.02		Total Volume in	4,328.02	

Annexure-VIII

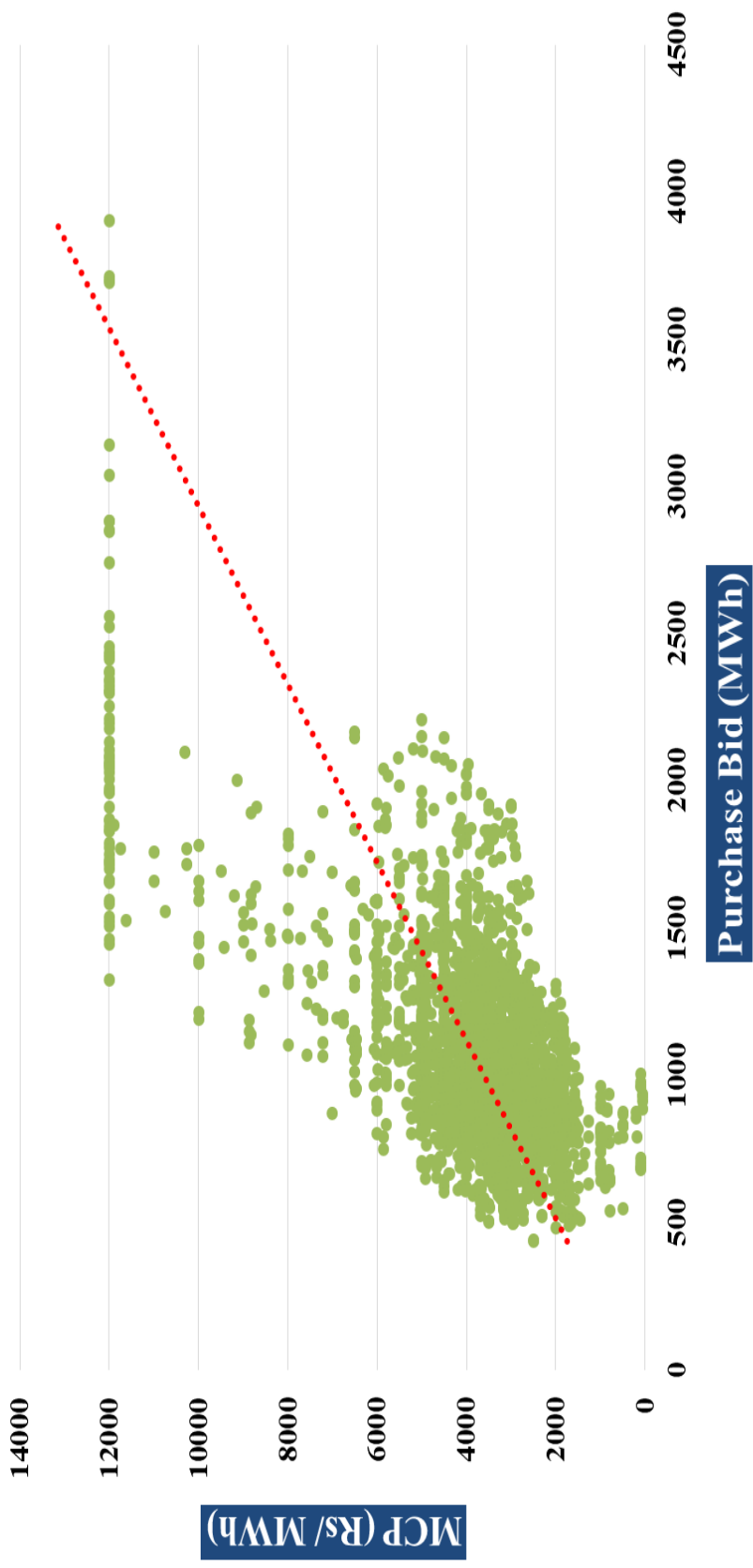
Evening, Day, Night, Morning, Maximum, Minimum, Average MCP (₹/kWh) and Final Scheduled Volume (MU) in RTM

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)
01-10-2022	3.46	3.01	5.60	3.38	12.00	1.90	3.84	63.41
02-10-2022	3.08	2.15	4.09	3.32	5.00	1.65	3.13	74.20
03-10-2022	4.19	3.64	6.00	3.25	12.00	2.70	4.21	85.53
04-10-2022	4.12	3.59	4.47	4.24	6.50	2.58	4.09	113.61
05-10-2022	3.62	3.30	3.86	3.67	5.50	1.84	3.60	122.70
06-10-2022	3.95	3.80	4.76	2.99	6.00	2.00	3.83	124.36
07-10-2022	3.89	3.16	4.61	4.19	6.50	1.87	3.95	101.04
08-10-2022	3.35	2.47	4.58	2.67	7.22	1.59	3.20	84.77
09-10-2022	2.95	2.29	3.43	2.96	4.30	1.59	2.88	73.13
10-10-2022	3.53	2.59	4.57	2.19	12.00	1.77	3.13	82.47
11-10-2022	3.21	2.16	4.63	2.63	7.22	1.55	3.09	79.73
12-10-2022	3.83	2.74	5.14	2.84	10.00	1.50	3.55	71.65
13-10-2022	3.37	2.52	6.41	2.81	12.00	1.59	3.72	72.38
14-10-2022	4.07	2.70	6.30	3.14	12.00	1.60	3.96	65.42
15-10-2022	3.44	2.45	6.79	3.12	12.00	0.60	3.89	60.38
16-10-2022	2.68	2.11	5.14	3.21	10.00	0.99	3.28	67.48
17-10-2022	4.28	3.31	7.71	3.50	12.00	1.70	4.62	67.72
18-10-2022	4.25	3.52	6.99	3.72	12.00	1.86	4.57	65.54
19-10-2022	4.01	3.37	7.31	3.65	12.00	1.86	4.54	65.32
20-10-2022	3.77	3.05	6.10	3.32	12.00	1.63	4.01	66.07
21-10-2022	4.02	3.49	4.94	3.52	9.21	2.18	3.95	64.96
22-10-2022	4.53	3.05	4.15	3.63	6.50	1.83	3.74	59.13
23-10-2022	3.80	2.36	3.93	3.34	5.98	1.83	3.28	71.18
24-10-2022	3.79	1.06	2.56	3.12	5.00	0.05	2.49	69.39
25-10-2022	2.36	1.20	3.82	1.84	8.82	0.10	2.24	62.53
26-10-2022	4.66	3.14	4.35	2.32	7.22	1.45	3.45	59.20
27-10-2022	4.59	4.07	6.48	2.87	12.00	2.37	4.41	63.31
28-10-2022	5.10	4.30	7.60	3.55	12.00	2.94	5.04	56.16
29-10-2022	5.25	4.59	8.04	3.82	12.00	3.00	5.34	52.86
30-10-2022	3.96	3.89	4.49	3.87	6.47	2.96	4.05	53.84
31-10-2022	5.02	4.40	6.51	3.43	12.00	2.94	4.75	45.12
Maximum	5.25	4.59	8.04	4.24	12.00	3.00	5.34	124.36
Minimum	2.36	1.06	2.56	1.84	4.30	0.05	2.24	45.12
Average	3.87	3.02	5.34	3.23	9.21	1.81	3.80	73.05

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 October, 2022 in RTM



Time Blocks during the Month [96 time blocks in a day x 31 days = 2,976]

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
01-10-2022	12:45 - 13:00	1.02	19:00 - 19:15	12.00	07:00 - 07:15	0.33	12:45 - 13:00	1.90
02-10-2022	14:45 - 15:00	1.12	17:45 - 18:00	5.00	21:15 - 21:30	0.54	13:30 - 13:45	1.65
03-10-2022	20:30 - 20:45	1.48	19:00 - 19:15	12.00	05:45 - 06:00	0.53	03:15 - 03:30	2.70
04-10-2022	15:15 - 15:30	1.78	19:15 - 19:30	6.50	03:45 - 04:00	0.72	12:45 - 13:00	2.58
05-10-2022	14:15 - 14:30	1.74	17:45 - 18:00	5.50	09:15 - 09:30	0.84	09:15 - 09:30	1.84
06-10-2022	15:00 - 15:15	1.80	19:00 - 19:15	6.00	05:45 - 06:00	0.95	02:00 - 02:15	2.00
07-10-2022	02:30 - 02:45	1.39	19:00 - 19:15	6.50	17:45 - 18:00	0.55	13:00 - 13:15	1.87
08-10-2022	21:30 - 21:45	1.15	19:00 - 19:15	7.22	02:15 - 02:30	0.53	12:15 - 12:30	1.59
09-10-2022	00:00 - 00:15	0.95	18:15 - 18:30	4.30	18:00 - 18:15	0.46	13:00 - 13:15	1.59
10-10-2022	12:00 - 12:15	1.26	18:15 - 18:30	12.00	06:15 - 06:30	0.52	00:00 - 00:15	1.77
11-10-2022	15:30 - 15:45	1.19	18:15 - 18:30	7.22	05:15 - 05:30	0.56	13:00 - 13:15	1.55
12-10-2022	15:30 - 15:45	1.03	18:30 - 18:45	10.00	07:00 - 07:15	0.49	13:30 - 13:45	1.50
13-10-2022	12:00 - 12:15	1.10	18:30 - 18:45	12.00	21:45 - 22:00	0.41	13:15 - 13:30	1.59
14-10-2022	15:00 - 15:15	1.17	19:00 - 19:15	12.00	21:30 - 21:45	0.30	13:00 - 13:15	1.60
15-10-2022	11:15 - 11:30	1.01	18:15 - 18:30	12.00	00:30 - 00:45	0.28	13:15 - 13:30	0.60
16-10-2022	15:00 - 15:15	1.08	18:15 - 18:30	10.00	02:15 - 02:30	0.37	09:00 - 09:15	0.99
17-10-2022	19:45 - 20:00	1.03	18:00 - 18:15	12.00	18:30 - 18:45	0.32	13:00 - 13:15	1.70
18-10-2022	13:45 - 14:00	1.22	18:15 - 18:30	12.00	04:00 - 04:15	0.30	13:00 - 13:15	1.86
19-10-2022	13:45 - 14:00	1.17	18:30 - 18:45	12.00	00:15 - 00:30	0.34	13:00 - 13:15	1.86
20-10-2022	13:30 - 13:45	1.10	18:15 - 18:30	12.00	18:15 - 18:30	0.38	13:15 - 13:30	1.63
21-10-2022	14:45 - 15:00	0.91	18:15 - 18:30	9.21	23:15 - 23:30	0.43	13:00 - 13:15	2.18
22-10-2022	14:30 - 14:45	1.07	06:45 - 07:00	6.50	03:30 - 03:45	0.28	13:15 - 13:30	1.83
23-10-2022	12:45 - 13:00	1.17	18:15 - 18:30	5.98	00:15 - 00:30	0.40	13:15 - 13:30	1.83
24-10-2022	23:30 - 23:45	1.04	06:30 - 06:45	5.00	01:30 - 01:45	0.23	13:00 - 13:15	0.05
25-10-2022	10:30 - 10:45	0.95	19:00 - 19:15	8.82	21:00 - 21:15	0.38	13:30 - 13:45	0.10
26-10-2022	07:45 - 08:00	0.98	18:45 - 19:00	7.22	04:45 - 05:00	0.36	01:45 - 02:00	1.45
27-10-2022	19:15 - 19:30	1.07	18:15 - 18:30	12.00	04:45 - 05:00	0.32	03:00 - 03:15	2.37
28-10-2022	15:30 - 15:45	0.93	17:45 - 18:00	12.00	01:00 - 01:15	0.30	23:45 - 24:00	2.94
29-10-2022	19:45 - 20:00	0.91	17:15 - 17:30	12.00	01:30 - 01:45	0.30	20:45 - 21:00	3.00
30-10-2022	13:30 - 13:45	0.91	17:45 - 18:00	6.47	06:30 - 06:45	0.32	13:45 - 14:00	2.96
31-10-2022	19:15 - 19:30	0.80	18:00 - 18:15	12.00	15:15 - 15:30	0.32	02:45 - 03:00	2.94

MCP: Market Clearing Price (₹/kWh)

FSV: Final Scheduled Volume (MU)

Annexure-XI

Sellers and Buyers in Real Time Market (RTM) in the month of October, 2022						
S. No.	Entity Name	Sell		Entity Name	Purchase	
		(MU)	Percent (%)		(MU)	Percent (%)
1	Madhya Pradesh	749.98	33.12%	Rajasthan	447.18	19.75%
2	Telangana	203.31	8.98%	Punjab	341.19	15.07%
3	Bihar	184.31	8.14%	J&K	232.01	10.24%
4	Uttar Pradesh	154.79	6.84%	Maharashtra	205.41	9.07%
5	West Bengal	126.26	5.58%	Gujarat	162.70	7.18%
6	Odisha	107.37	4.74%	Uttar Pradesh	114.91	5.07%
7	Himachal	94.48	4.17%	Odisha	100.25	4.43%
8	Karnataka	86.98	3.84%	West Bengal	97.95	4.33%
9	Andhra Pradesh	58.58	2.59%	Delhi	87.49	3.86%
10	Kameng HEP	50.26	2.22%	Telangana	86.34	3.81%
11	Chhattisgarh	49.48	2.19%	Tamil Nadu	77.36	3.42%
12	Delhi	40.55	1.79%	Andhra Pradesh	76.76	3.39%
13	Haryana	32.29	1.43%	ArcelorMittal	41.98	1.85%
14	Assam	31.60	1.40%	Daman & Diu -	34.19	1.51%
15	J&K	25.40	1.12%	Uttarakhand	28.92	1.28%
16	Sembcorp	23.02	1.02%	Haryana	21.36	0.94%
17	Tripura	22.45	0.99%	Assam	20.81	0.92%
18	Jharkhand	20.24	0.89%	Madhya Pradesh	13.61	0.60%
19	Maharashtra	19.86	0.88%	DVC	13.40	0.59%
20	Kerala	18.53	0.82%	Karnataka	11.08	0.49%
21	Tamil Nadu	14.53	0.64%	BALCO 2	10.52	0.46%
22	Rajasthan	13.01	0.57%	Himachal Pradesh	6.74	0.30%
23	Sasan UMPP	12.77	0.56%	Kerala	6.63	0.29%
24	DB Power	12.74	0.56%	Meghalaya	6.07	0.27%
25	Arunachal	10.74	0.47%	Tripura	4.30	0.19%
26	Sikkim	9.43	0.42%	Railways	3.67	0.16%
27	Palatana	7.94	0.35%	Manipur	3.41	0.15%
28	NTPL	7.26	0.32%	Bihar	2.76	0.12%
29	Jhabua Power	6.83	0.30%	Chhattisgarh	1.70	0.08%
30	Meghalaya	6.71	0.30%	Goa SR	1.56	0.07%
31	Nagaland	5.91	0.26%	Jharkhand	1.21	0.05%
32	Uttarakhand	4.65	0.21%	Goa WR	0.73	0.03%
33	Manipur	4.45	0.20%	Sikkim	0.18	0.01%
34	ACBIL	3.64	0.16%	ACBIL	0.14	0.01%
35	MB Power	3.50	0.15%	Sainj HEP	0.09	0.00%
36	Puniab	3.11	0.14%	Arunachal Pradesh	0.02	0.00%
37	Coastal Gujrat	2.80	0.12%			
38	Sembcorp Energy	2.63	0.12%			
39	GMR Kamalanga	2.47	0.11%			
40	Adhunik Power	2.47	0.11%			
41	Gujarat	2.40	0.11%			

42	Daman & Diu -	2.18	0.10%			
43	DVC	1.91	0.08%			
44	Dikchu	1.71	0.08%			
45	Jindal Power Ltd.	1.67	0.07%			
46	Teesta -3	1.60	0.07%			
47	Talcher Stg-2	1.50	0.07%			
48	Raipur Energen	1.44	0.06%			
49	Jindal Power	1.28	0.06%			
50	GMR Warora	1.25	0.06%			
51	Singoli Bhagwati	1.22	0.05%			
52	Mahan Energy	1.18	0.05%			
53	TRN Energy	0.90	0.04%			
54	Sainj HEP	0.87	0.04%			
55	AGTPP	0.74	0.03%			
56	Ostro Energy	0.67	0.03%			
57	Chuzachen	0.57	0.03%			
58	Karcham	0.41	0.02%			
59	Ramagundam	0.38	0.02%			
60	Renew Surya	0.37	0.02%			
61	Ramagundam	0.31	0.01%			
62	AD Hydro	0.28	0.01%			
63	Tashiding HEP	0.27	0.01%			
64	Jorethang	0.26	0.01%			
65	Sorang HEP,	0.26	0.01%			
66	Shree Cement	0.24	0.01%			
67	Chandigarh	0.23	0.01%			
68	IL&FS	0.17	0.01%			
69	SKS Power	0.17	0.01%			
70	Simhadri Stg-2	0.15	0.01%			
71	AGBPP	0.14	0.01%			
72	JITPL	0.13	0.01%			
73	Lanco Budhil	0.11	0.01%			
74	NTPC Kudgi	0.10	0.00%			
75	Ramagundam	0.09	0.00%			
76	Bongaigaon	0.03	0.00%			
77	Mouda Stg-1	0.03	0.00%			
78	Maruti Clean	0.02	0.00%			
79	Kahalgaon	0.02	0.00%			
80	KSK Mahanadi	0.01	0.00%			
81	Adani Wind	0.01	0.00%			
82	NTPC	0.01	0.00%			
Total Volume of top 10		Total	1,816.32	80.20%	Total	1,875.41
Total Volume in PXs		Total	2,264.59		Total	2,264.59

Cross Border Electricity Transactions in Day Ahead Market (DAM) in IEX with Nepal and Bhutan during the month of October, 2022			
S. No	Delivery Date	Buy Volume By Nepal (MU)	Sell Volume by Nepal (MU)
1	01-10-2022	-	8.62
2	02-10-2022	-	8.68
3	03-10-2022	-	8.73
4	04-10-2022	0.01	8.73
5	05-10-2022	0.02	8.73
6	06-10-2022	0.03	8.73
7	07-10-2022	0.01	8.73
8	08-10-2022	0.01	8.73
9	09-10-2022	0.01	8.73
10	10-10-2022	0.01	8.73
11	11-10-2022	-	8.73
12	12-10-2022	0.01	8.73
13	13-10-2022	0.01	8.73
14	14-10-2022	0.01	8.73
15	15-10-2022	0.04	8.66
16	16-10-2022	0.04	8.61
17	17-10-2022	0.06	8.61
18	18-10-2022	0.06	8.61
19	19-10-2022	0.05	8.61
20	20-10-2022	0.03	8.61
21	21-10-2022	0.04	8.59
22	22-10-2022	0.02	8.73
23	23-10-2022	-	8.73
24	24-10-2022	-	8.73
25	25-10-2022	-	6.39
26	26-10-2022	-	6.16
27	27-10-2022	-	5.82
28	28-10-2022	-	5.90
29	29-10-2022	-	6.10
30	30-10-2022	-	6.10
31	31-10-2022	-	5.91
Total		0.48	250.94
Grand Total		251.42	

-: No transaction happened

Note: Cross Border Transactions of Electricity of 254.28 MU with Nepal happened during October, 2022 in IEX, which is included in DAM Volume of October, 2022 in IEX.

Analysis for change in trend of Final Scheduled Volume in DAM on 1st Sunday, 3rd Sunday & 4th Monday of October, 2022 (i.e. 2nd, 16th & 24th October, 2022)

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 October, 2022, it is observed that on first Sunday (02nd October, 2022), FSV showed increasing trend in comparison to first Saturday (01st October, 2022), on third Sunday (16th October, 2022), FSV showed increasing trend in comparison to third Saturday (15th October, 2022), on fourth Monday (24th October, 2022), FSV showed decreasing trend in comparison to fourth Sunday (23th October, 2022).

- (i) On first Sunday (02nd October, 2022), although there was decrease in purchase on power exchange by some of the States in comparison to first Saturday (01st October, 2022) by **8.04 MU** [i.e. West Bengal (4.21 MU), Maharashtra (3.25MU), Karnataka (0.27 MU), Goa WR (0.24 MU) and Delhi (0.07 MU), etc.], there was also increase in purchase on power exchange by some of the States by **32.88 MU** [i.e. Orissa (9.78 MU), Punjab (4.31 MU), Tamil Nadu (3.54 MU), Gujarat (3.08 MU), and Daman & Diu - Dadra & Nagar Haveli (2.56 MU), etc.]. This resulted in an overall increase in FSV by **24.84 MU** on Sunday (02nd October, 2022) as compared to Saturday (01st October, 2022).
- (ii) On third Sunday (16th October, 2022), although there was decrease in purchase on power exchange by some of the States in comparison to third Saturday (15th October, 2022) by **10.95 MU** [i.e. Uttarakhand (1.90 MU), Maharashtra (1.79 MU), Rajasthan (1.62 MU), Assam (1.49 MU) and Karnataka (0.89 MU), etc.], there was also increase in purchase on power exchange by some of the States by **19.74 MU** [i.e. Punjab (6.08 MU), Gujarat (4.86 MU), Daman & Diu - Dadra & Nagar Haveli (4.27 MU), Tamil Nadu (2.87 MU) and Telangana (0.65 MU), etc.]. This resulted in an overall increase in FSV by **8.79 MU** on Sunday (16th October, 2022) as compared to Saturday (15th October, 2022).
- (iii) On fourth Monday (24th October, 2022), although there was increase in purchase on power exchange by some of the States in comparison to fourth Sunday (23th October, 2022) by **7.30 MU** [i.e. J&K (1.52 MU), Andhra Pradesh (1.42 MU), Odisha (1.31 MU), Arcelor Mittal Nippon steel (ESIL) (0.85 MU) and Karnataka (0.77 MU), etc.], there was also decrease in purchase on power exchange by some of the States by **35.03 MU** [i.e. Gujarat (13.91 MU), Rajasthan (5.99 MU), Daman & Diu - Dadra & Nagar Haveli (4.65 MU), Punjab (2.93 MU) and Delhi (2.60 MU), etc.]. This resulted in an overall decrease in FSV by **27.73 MU** on Monday (24th October, 2022) as compared to Second Sunday (23th October, 2022).

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)** 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 solar, non-Solar and hydro 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. 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)** 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.
- 14. 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.