

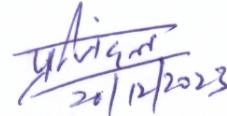


भारत सरकार/ Government of India
विद्युत मंत्रालय/ Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority
आर. ए. प्रभाग/ Regulatory Affairs Division

Subject: Annual Market Monitoring Report for the FY 2022-23-reg.

In the FY 2022-23, a total of **1,504 BU** of electricity was transacted in the country out of which a total of **222.68 BU** was transacted under Short Term Market. The total volume of electricity transacted in the power exchanges (IEX, PXIL & HPX) during FY 2022-23 was **102.99 BU**, which includes transactions through DAM, GDAM, RTM, TAM and GTAM market segments. The total transactions through bilateral trading and through deviations were **89.15 MU** and **30.54 BU**, respectively. Thus, the total short term trade in FY 2022-23 was 14.81 % of total volume of electricity traded in FY 2022-23 and 6.85 % was transacted through Power Exchanges.

The Annual Market Monitoring Report for the FY 2022-23 giving details of electricity transaction happened in the power exchanges is annexed below for reference.


20/12/2023

प्रदीप जिंदल/ Pardeep Jindal
मुख्य अभियंता/ Chief Engineer (RA)

To
All Stake holders



सत्यमेव जयते

वार्षिक रिपोर्ट 2022-23

ANNUAL REPORT 2022-23



भारत सरकार/ Government of India

विद्युत मंत्रालय/ Ministry of Power

केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority

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PREFACE

As per the provisions contained in Section 73 (i) and (j) of Electricity Act, 2003, CEA shall collect and record the data concerning the generation, transmission, trading, distribution and utilization of electricity and carry out studies relating to cost, efficiency, competitiveness and such like matters and make public from time to time the information secured under this Act, and provide for the publication of reports and investigations.

In furtherance of this, Ministry of Power vide letter dated 25.03.2019 requested CEA to establish and operationalize Market Monitoring in CEA for development and deepening of Electricity Market in India. Accordingly, a Market Monitoring was assigned to Regulatory Affairs Division, CEA. The functions include analysis of the spot market, monitoring of the volume and daily price movements and facilitates introduction of new products into the Power Exchanges, etc.

Accordingly, the Monthly Market Monitoring Reports and Annual Reports in respect of electricity transacted under various types of contracts executed through both the Power Exchanges (PXs) are being prepared by Regulatory Affairs (RA) Division, CEA since April, 2019. These reports are available on CEA's website on regular basis.

The Annual Market Monitoring Report of CEA for FY 2022-23 provides a snapshot of the short-term transactions of electricity through the power exchanges in India viz. Indian Energy Exchange (IEX), Power Exchange of India Ltd. (PXIL) and Hindustan Power Exchange Limited (HPX) in Day Ahead Market (DAM), Real Time Market (RTM), Green Day Ahead Market (GDAM), Term Ahead Market (TAM) and Green Term Ahead Market (GTAM). The dissemination of information for different stakeholders and consumers is the main aim of this Annual Report of CEA so as to ensure efficiency and competition in the Power Sector of India and Power Market in particular.

Definitions/ Terminologies

- 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.
- 2. Average MCP** is the average of daily average MCP of the days during the month on which transaction happened.
- 3. Congestion** in transmission system means a situation in a particular area where the demand for transmission capacity exceeds the Available Transfer Capability for that area.
- 4. Daily Average MCP** is the average of MCPs of all 96 Time Blocks of the day during which transactions 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. Delivery Date** in power exchanges is the date on which the actual scheduled volume of electricity is delivered and real time curtailments occurs, if any.
- 7. Elasticity** is percentage of change in MCP with respect to change in independent variables 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.
- 8. Energy Supplied** is the total energy (MU) available at the State's periphery.
- 9. Final Scheduled Volume (FSV)** is the total of scheduled volume (MU) of all 96 time blocks in a day during the month in which transaction happened.
- 10. Green Day Ahead Market (GDAM)** on the power exchanges is the market for electricity similar to Day Ahead Market, where market participants buy/sell electricity generated from renewable sources for the following day.
- 11. Green Term Ahead Market (GTAM)** on the power exchanges is the market for electricity similar to Term Ahead Market, where market participants buy/sell electricity generated from renewable sources on a term basis ranging from three (3) hours before actual dispatch (i.e. intra-day) and up to 11 days in advance. There are four (4) types of contracts in GTAM, namely; Intra-day, Day Ahead Contingency, Daily and Weekly.
- 12. Market Clearing Price (MCP)** is the price of electricity (₹/kWh) discovered in each of the 15 Minute Time Block. The day is divided in 96-time blocks of 15 minutes each.
- 13. Market Clearing Volume (MCV)** is the volume of electricity (MU) discovered in each of the 15 Minute Time Block. The day is divided in 96-time blocks of 15 minutes each.
- 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 three (3) hours before actual despatch (i.e. intra-day) and up to 11 days in advance. There are four (4) types of contracts in TAM, namely; Intra-day, Day Ahead Contingency, Daily and Weekly.
- 15. Trade Date** in power exchanges is the date on which trading of electricity takes place and transmission congestion occurs, if any.

- 16. Real Time Curtailment (RTC)** in Power Exchanges refers to volume loss (MU) between Cleared volume after accounting for transmission congestion and Final Scheduled volume allowed by the System Operator.
- 17. Real Time Market (RTM)** on the power exchanges are market for electricity, where market participants purchase and sell electricity in the 48 market sessions of 15-minute duration each. The auction sessions are conducted during even time blocks of the hour with delivery to be commenced 1-hour after closure of trade session.

ABBREVIATIONS

ACBIL	ACB (India) Limited
ACP	Area Clearing Price
AGBPP	Assam Gas Based Power Plant
AGTPP	Agartala Gas Turbine Power Plant
BALCO	Bharat Aluminum Company Limited
BRBCL	Bhartiya Rail Bijlee Company Limited
BU	Billion Unit
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
DAM	Day Ahead Market
DAC	Day Ahead Contingency
DB POWER	Diligent Power Pvt. Ltd.
DGEN MEGA POWER	DGEN Mega Power Project
DVC	Damodar Valley Corporation
FSV	Final Scheduled Volume
FY	Financial Year
GDAM	Green Day Ahead Market
GTAM	Green Term Ahead Market
HEP	Hydro Electric Plant
JITPL	Jindal India Thermal Power Ltd.
IEX	Indian Energy Exchange
IL&FS	Infrastructure Leasing & Financial Services Limited
kWh	kiloWatt hour
MCP	Market Clearing Price
MCV	Market Clearing Volume
MSW	Municipal Solid Waste
MW	Mega Watt
MU	Million Unit
NLC Ltd.	Neyveli Lignite Corporation Limited
NLDC	National Load Dispatch Centre
NTPC Ltd.	National Thermal Power Corporation Limited
NTPL	NLC Tamil Nadu Power Limited
RGPPL	Ratnagiri Gas and Power Private Limited
TAM	Term Ahead Market
TPS	Thermal Power Station
PXIL	Power Exchange of India Limited
PXs	Power Exchanges
RTC	Real Time Curtailment
RTM	Real Time Market
UT	Union Territory

EXECUTIVE SUMMARY

The Annual Report on Market Monitoring for FY 2022-23 comprises an overview of development of Electricity market in India, evolution of Power Exchanges, types of Contracts being executed in the Power Exchanges, Month-wise Final Scheduled Volume and Price of Electricity transacted in the Power Exchanges in Day Ahead Market (DAM), Real Time Market (RTM), Green Day Ahead Market (GDAM), Term Ahead Market (TAM) and Green Term Ahead Market (GTAM) during FY 2022-23 and transactions through Bilateral trade and Deviations.

The report also provides details of month-wise Minimum, Maximum daily volumes and Final scheduled volume in the month for electricity transacted in the Power exchanges viz. IEX, PXIL and HPX in Day Ahead Market (DAM), Real Time Market (RTM) and Green Day Ahead Market (GDAM) during FY 2022-23. Similarly, the report provides details of the month-wise and contract-wise Final Scheduled Volume and Price for electricity transacted in the Power exchanges viz. IEX, PXIL and HPX in Term Ahead Market (TAM) and Green Term Ahead Market (GTAM) during FY 2022-23.

The report further provides details of the minimum, maximum and average of daily average Market Clearing Price (MCP) of every month during FY 2022-23 for the electricity transacted in DAM, RTM, GDAM, TAM and GTAM in the exchanges. The report also contains details of the minimum and maximum Area Clearing Prices of a day discovered during each months of FY 2022-23 under DAM, RTM and GDAM.

The salient features of Annual Market Monitoring Report of CEA for FY 2022-23 are as under:

The total volume of electricity transacted on the power exchanges under the DAM, RTM, GDAM, TAM and GTAM segments on delivery date basis during the FY 2022-23 were **51,366 MU, 24,187 MU, 3,817 MU, 21,509 MU and 2,560 MU** respectively. The total energy supplied in the country during the FY 2022-23 was **1,504 BU**. The volume of electricity transacted on the power exchanges on delivery date basis was **102.99 BU**, which is **6.85 %** of the total energy supplied in the country. Out of this DAM, RTM, GDAM, TAM and GTAM represents **3.41 %, 1.61 %, 0.25 %, 1.40 % and 0.17%** of the total energy supplied in the country respectively.

Under DAM segment, the total volume of electricity transacted in IEX during FY 2022-23 was **51,177.54 MU** with an average MCP of **₹ 6.04/kWh**. In PXIL, the total volume of electricity transacted under DAM during FY 2022-23 was **187.14 MU** with Average MCP of **₹ 6.36/kWh**. Similarly, in HPX, the total volume of electricity transacted under DAM during FY 2022-23 was **1.43 MU** with Average MCP of **₹ 8.83/kWh**.

Under the RTM segment, the total volume of electricity transacted in IEX during FY 2022-23 was **24,174.38 MU** with an average MCP of **₹ 5.67/kWh**. In PXIL, total volume of electricity transacted during FY 2022-23 was **12.56 MU** with an average MCP of **₹ 11.59/kWh**.

Under GDAM segment, the total volume of electricity transacted in IEX during FY 2022-23 was **3,817.05 MU** with an average MCP of **₹ 6.07/kWh** and in PXIL, the total volume of electricity transacted during FY 2022-23 was **0.41 MU** with an average MCP of **₹ 5.23/kWh**. No transaction took place in HPX under GDAM.

Under the TAM segment, the total volume of electricity transacted in PXs during FY 2022-23 on delivery date basis was **21,059 MU** (**10,035 MU** in IEX, **8,237 MU** in PXIL and **2,787 MU** in HPX).

Under the GTAM segment, the total volume of electricity transacted in PXs during FY 2022-23 on delivery date basis was **2,560 MU** (**1,392 MU** in IEX, **1,097 MU** in PXIL and **70.96 MU** in HPX).

During the FY 2022-23, the average price of electricity transacted under segment TAM in IEX, PXIL and HPX on the delivery date basis were **₹. 7.02/kWh**, **₹. 7.68/kWh** and **₹. 6.51/kWh**, respectively.

Under the GTAM segment, the average price of electricity transacted on the delivery date basis were IEX (Solar: **₹. 4.45/kWh**, Non Solar: **₹. 7.77/kWh** & Hydro: **₹. 6.70/kWh**), PXIL (Solar: **₹. 7.89/kWh**, Non Solar: **₹. 7.85/kWh**) and HPX (Solar: **₹. 7.28/kWh**, Non Solar: **₹. 7.54/kWh**). No transaction of electricity took place under hydro segment in PXIL and HPX in GTAM during FY 2022-23.

The report also highlights the analysis on volume of real time curtailment, loss of final scheduled volume due to congestion in transmission system in the power exchanges and name of top 10 sellers and top 10 purchasers of electricity in the power exchanges taken together.

The report further depicts the regression analysis carried out using a double log function on monthly basis with average MCP as dependent variable and with peak demand, total sell bid, total purchase bid, thermal generation, hydro generation, wind generation and solar generation as independent variables to find the significant variables affecting the average Market Clearing Price. The regression analysis has been done for transactions through IEX only, as the transaction that happened in IEX in Day Ahead Market and Real Time Market were **99.63 %** and **99.95 %** of total transactions in the power exchanges. The regression analysis's results of each month of FY 2022-23 revealed that the most important variable, which determined the Daily Average Market Clearing Price was the **Total Purchase Bid in Day Ahead Market** and in Real Time Market (further details at Chapter-VIII).

The Report also depicts the variations in Final Scheduled Volume and Average Market Clearing Price (MCP) in the Power Exchanges during FY 2022-23.

Note: The data /information used for Annual Market Monitoring Report of CEA for the FY 2022-23 have been obtained from both the Power Exchanges (IEX, PXIL & HPX), National Load Dispatch Centre (NLDC).

CHAPTER-I

INTRODUCTION

1. Overview of Electricity Sector in India

Electricity is an essential component of infrastructure development of the country as it affects a country's economic growth and welfare. India's Electricity sector is one of the most diversified in the world. The sources of power generation in India range from conventional sources such as coal, lignite, hydro, nuclear, natural gas and oil, to renewable sources such as wind, solar, and biomass.

The Power Sector in India is undergoing a significant change that has redefined the industry outlook. It is also a key sector to promote sustained industrial growth. The total installed capacity as on 31st March, 2023 was **4,16,059 MW** out of which Thermal Capacity was **2,37,269 MW (57.03 %)**, Hydro Capacity was **46,850 MW (11.26 %)**, Nuclear capacity was **6,780 MW (1.63 %)** and Renewable Energy Source Capacity was **125,160 MW (30.08 %)**. The total electrical energy supplied in the country during the FY 2022-23 was **1,504 BU**.

2. Development of Electricity Market

2.1 Legal and Regulatory framework

Section 66 of Electricity Act, 2003 and Power Market Regulations, 2021 formulated by the Central Electricity Regulatory Commission (CERC) provide key legal and regulatory framework for development of a market for electricity in India. Section 66 of the Electricity Act, 2003 provides that the development of a market for electricity is responsibility of the appropriate Electricity Regulatory Commission. Accordingly, CERC took an initiative to develop a common platform for electricity trading with its staff paper on 20th July, 2006 in exercise of its powers conferred by aforementioned Section 66 and clause (y) of sub-section (2) of Section 178 of the Electricity Act, 2003.

2.2. Evolution of Power Exchanges in India

In the Electricity market, power can be traded either bilaterally or through Power Exchanges. Bilateral contracts are negotiated between two parties, one being buyer and the other being seller, with or without a trader. The contract price information is, therefore, limited only to the parties involved. In this type of contract, traders also have credit risk in case of default by counter party. On the other hand, the trading through Power Exchange is a collective trade and is more sophisticated way to explore and make deals in the market. The traders compete with each other to have more market share in both bilateral as well as collective trade markets.

The Power Exchanges in India were established with the intent of creating a comprehensive market structure and enabling the execution and contracting of different types of possible

transactions in electricity markets. In the Power Exchanges, the market participants can quote their buy and sell bids ahead of physical delivery. The Power Exchange aggregates the buy and sell bids separately and clears the market on the basis of supply-demand equilibrium. The intersection point of buy and sell curve determines the Market Clearing Price (MCP) and Market Clearing Volume (MCV). Such transactions are also known as collective transactions as buyers and sellers are anonymous to each other.

In India, two power exchanges viz., Indian Energy Exchange (IEX) and Power Exchange of India Ltd. (PXIL) are functioning with the approval of CERC. CERC vide its order dated 31st August, 2007 and 27th May, 2008 accorded approval to IEX and PXIL, respectively for setting up and operating Power Exchanges. Further, through its order dated 9th June, 2008 and 30th September, 2008, CERC accorded approval to rules, bye-laws and business rules of IEX and PXIL to start transactions in the DAM. Subsequently, CERC vide its order dated 31st August, 2009 accorded approval to IEX and PXIL to start trading TAM contracts and directed that both the PXs should commence their operation in the TAM. From, 1st June, 2020, the transaction of electricity have been started in the Real Time Market in both the power exchanges (i.e. IEX and PXIL) with the approval of the CERC. Later, CERC vide its order dated 17th August, 2020 accorded its approval for introduction of Green Term Ahead Market (GTAM) contracts on Indian Energy Exchange (IEX) and the transaction of electricity in Green Term Ahead Market was started in IEX w.e.f. 21st August, 2020 onwards, whereas with approval from CERC, the transaction of electricity in Green Term Ahead Market was also started in PXIL w.e.f. 24th March, 2021 onwards. Further, CERC vide order dated 17th October, 2021 accorded its approval to IEX for transaction of electricity in Green Day Ahead Market, hence from 27th October, 2021 onwards the trading of electricity has started in GDAM in IEX. The maximum ceiling price in the Power Exchanges for DAM and RTM contracts was changed from ₹. 20/kWh to ₹. 12/kWh vide CERC order dated 01.04.2022, later CERC vide its order dated 06.05.2022 changed the ceiling price for all the contracts (i.e. DAM, GDAM, RTM, TAM & GTAM) in Power Exchanges to ₹ 12/kWh. CERC vide its order no. 159/MP/2022 dated 27th June, 2022 accorded its approval to Hindustan Power Exchange (HPX) to start its transaction platform for trading of electricity under DAM, RTM, GDAM, TAM and GTAM contracts. The transaction of electricity in HPX had started w.e.f 06.07.2022. Now there are three power exchanges in India (i.e. IEX, PXIL and HPX).

3. Growth of Electricity transacted in Power Exchanges since its evolution

The transactions of electricity was initially started under DAM, and TAM only and now transactions of electricity in RTM, GTAM and GDAM has also started. Based on an overview of volume of Electricity transacted in the PXs from FY 2008-09 to FY 2022-23, it is noted that

the volume of electricity transacted through the power exchanges in India increased steadily across the years from **2.77 BU** in FY 2008-09 to **102.99 BU** in FY 2022-23.

4. Contracts executed in Power Exchanges in India during FY 2022-23

4.1. Day Ahead Market (DAM)

In the DAM, the electricity is traded in every 15-minute block interval through a closed double sided anonymous auction for physical delivery for the next day starting from 00:00 hrs. The market price for each block of the following day is determined based on purchase bids and sale bids submitted by the market participants. The bids may be simple price-quantity pairs, or come in standard blocks for several hours of the same day. In the latter case, they consist of duration, quantity and a minimum price, and are either accepted in full for all hours or denied in its whole. The price is discovered at the intersection of the aggregated demand and supply curves, and the market participants are charged or get paid this uniform price (marginal pricing principle). The DAM enables the distribution utilities to meet unplanned power requirements and facilitate sale of the surplus power.

4.2. Real Time Market (RTM)

The transaction of electricity in Real Time Market was started in both IEX and PXIL from 1st June, 2020 with the approval of the CERC. In the RTM, the electricity is traded in 48 market session of 15 minutes duration. The trading takes place during even time blocks of the hour with delivery commencing one hour after the closure of trade session. The price discovery mechanism is similar to that of Day Ahead Market. The RTM enables the trading entities to buy and sell power for delivery one hour after the closure of trade session, This helps in meeting unplanned/ unforeseen power requirement or sale of surplus of power.

4.3. Green Day Ahead Market (GDAM)

The transaction of electricity in GDAM is similar to that in Day Ahead Market. Only the electricity generated from renewable energy sources is traded in every 15-minute block interval through a closed double sided anonymous auction for physical delivery for the next day.

4.4. Term ahead Market (TAM)

The 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 four types of contracts in TAM, namely; Intra-day, Day Ahead Contingency, Daily/ Any Day and Weekly, which helps the participants to manage their electricity portfolio for different durations. Thus, the TAM provides a range of products allowing participants to buy/sell electricity. Transaction of electricity in Any Day Single Sided

Reverse Auction contracts and Long Duration Contracts (upto 90 days) started in Power Exchanges from June, 2022 onwards.

4.5. Green Term Ahead Market (GTAM)

The transaction of electricity in GTAM (Solar and Non-solar) was started in IEX from 21st August, 2020 onwards, whereas, in PXIL, GTAM (Non-Solar) was started from 24th March, 2021 and GTAM (Solar) from June, 2021. The transaction of electricity in GTAM (Hydro) contract in IEX started from 02nd May, 2022, whereas in PXIL, GTAM (Hydro) started from 05th May, 2022. Similar to TAM, the GTAM on the power exchanges is the market for trading renewable energy (Solar, Non Solar and Hydro) under the four contracts Intra-day, Day Ahead Contingency, Daily/ Any Day and Weekly. Trading in GTAM is continuous for Intraday, DAC and Daily, whereas double sided open auction bidding process for Weekly.

5. Bid areas in power exchanges

For the purpose of smooth transactions of Electricity through Power Exchanges in India, the five regions of India namely Northern Region, Western Region, Eastern Region, Southern Region and North Eastern Region have been further divided into another 13 mutually exclusive bid areas taking into account inter-regional and intra-regional corridor constraints.

The States covered under bid areas for different regions of Power Exchange have been shown in **Table-1**.

S. No.	Bid Area	Region	States Covered Under Bid Area
1.	N1	North Region	UT of J& K and Ladakh, Himachal Pradesh, Chandigarh, Harvana
2.	N2	North Region	Uttar Pradesh , Uttaranchal, Rajasthan, Delhi
3.	N3	North Region	Punjab
4.	E1	East Region	West Bengal, Sikkim, Bihar, Jharkhand
5.	E2	East Region	Odisha
6.	W1	West Region	Madhya Pradesh
7.	W2	West Region	Maharashtra, Gujarat, Daman and Diu, Dadar and Nagar Haveli, North Goa
8.	W3	West Region	Chhattisgarh
9.	S1	South Region	Andhra Pradesh, Telangana, Karnataka, Pondicherry (Yanam). South Goa

10.	S2	South Region	Tamil Nadu, Puducherry, Puducherry (Karaikal), Puducherry (Mahe)
11.	S3	South Region	Kerala
12.	A1	North East Region	Tripura, Manipur, Mizoram, Nagaland
13.	A2	North East Region	Assam, Arunachal Pradesh, Meghalaya

Table- 1

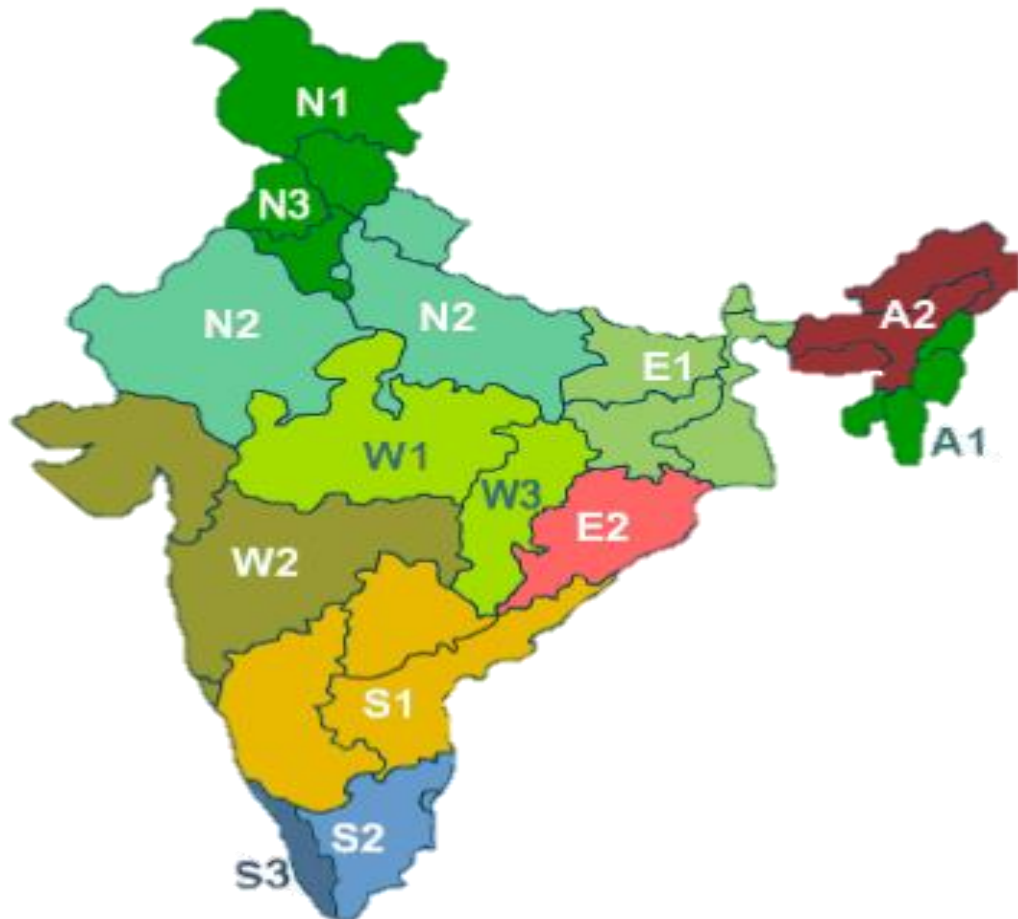


Figure: 1 Demarcation of Bid Areas in the country for Power Exchanges

CHAPTER-II

OVERVIEW OF POWER MARKET IN INDIA

1. Total Short Term Trade (Bilateral + Exchanges + Deviation)

During, 2022-23, a total of **1,504 BU** of electricity was supplied out of which **89.15 BU** was transacted through Bilateral trade, **102.99 BU** through Power Exchanges and **30.54 BU** through Deviations. Thus the short term trade (**222.68 BU**) constitutes 14.81 % of total energy supplied in the country during FY 2022-23, out of which bilateral trade constituted 5.93 %, trade through exchange constituted 6.85 % and remaining i.e. 2.03 % is by way of deviation. In the subsequent part of the report details of trade through power exchanges have been highlighted.

2. Volume of Electricity transacted during FY 2022-23

The total volume of electricity transacted on the power exchanges, viz., IEX, PXIL and HPX on delivery date basis during the FY 2022-23 was **102,989 MU**, out of which in the Day Ahead Market (DAM), Real Time Market (RTM), Green Day Ahead Market (GDAM), Term Ahead Market (TAM) and Green Term Ahead Market (GTAM) constituted **51,366 MU, 24,187 MU, 3,817 MU, 21,059 MU** and **2,560 MU** respectively. The total energy supplied in the country during the FY 2022-23 was **1,504,263 MU**. The volume of electricity transacted on the power exchanges represents 6.85 % of the total energy supplied in the country, out of which DAM, RTM, GDAM, TAM and GTAM represents 3.41 %, 1.61 %, 0.25 %, 1.40 % and 0.17 % respectively.

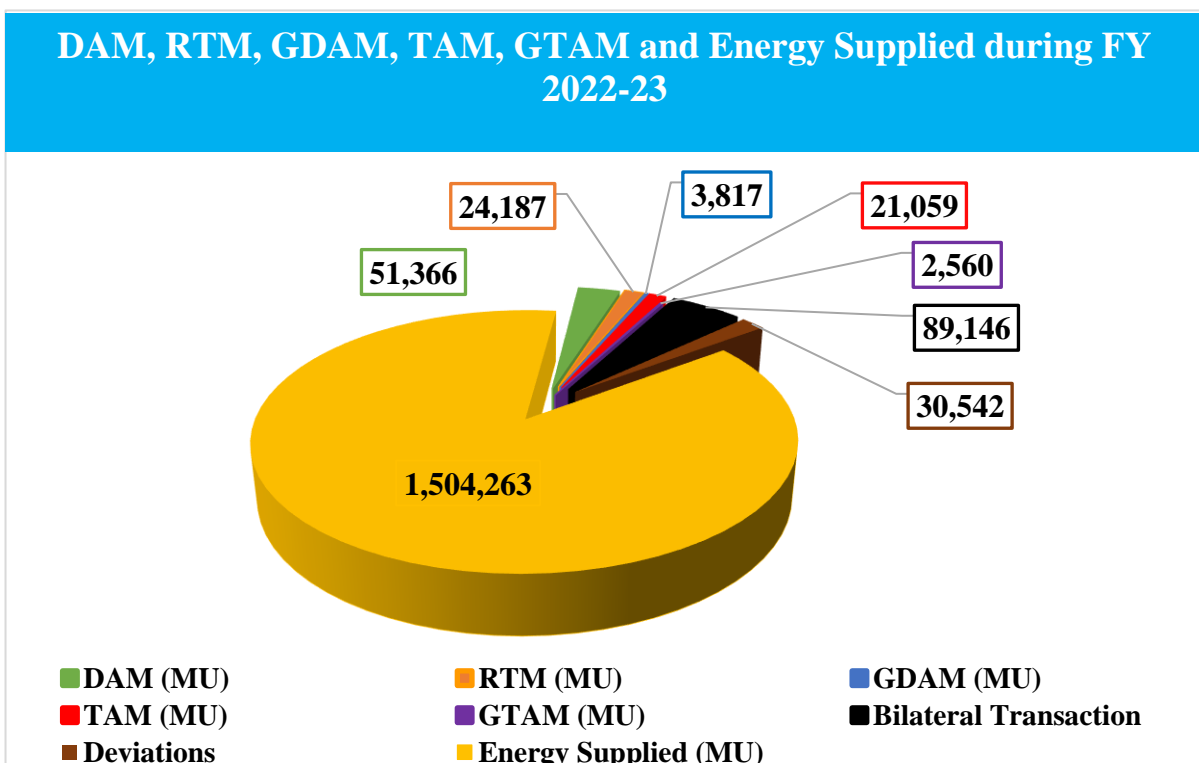


Figure: 2

3. Transactions in Short Term Market w.r.t. total Energy Supplied in the country during FY 2022-23

The total volume of electricity transacted through short term market during FY 2022-23 was **222,677 MU** (i.e. **102,989 MU** through PXs, **89,146 MU** through Bilateral transactions and **30,542 MU** through Deviations). The total volume of electricity transacted through the power exchanges under DAM, RTM, GDAM, TAM and GTAM together on delivery date basis during FY 2022-23 was **102,989 MU** (**90,596 MU** in IEX, **9,534 MU** in PXIL and **2,859 MU** in HPX). The total energy supplied during the FY 2022-23 was **1,504 BU**. Thus the total volume transacted in power exchanges was **6.85 %** of total electrical energy supplied during FY 2022-23.

The month-wise transactions in Short Term Market (Power Exchanges, Bilateral Transactions & Deviation) and Total Energy Supplied in the country during FY 2022-23 are shown in Table 2:

Month	Power Exchanges	Bilateral Transactions	Deviation	Total Short Term Market (MU)	Total Energy Supplied (MU)
Apr, 2022	9,280.56	7,592.35	2,109.57	18,982.48	132,028
May, 2022	8,883.49	8,237.02	4,488.84	21,609.35	135,156
Jun, 2022	8,529.20	7,940.75	2,542.12	19,012.07	133,263
Jul, 2022	7,616.61	7,946.1	2,788.86	18,351.57	128,255
Aug, 2022	7,764.83	7,862.84	2,703.64	18,331.31	130,390
Sept, 2022	8,195.07	8,011.73	2,440.83	18,647.63	126,914
Oct, 2022	7,930.84	5,001.33	2,315.20	15,247.37	113,944
Nov, 2022	8,136.76	5,038.09	1,912.17	15,087.02	110,252
Dec, 2022	8,800.09	6,725.84	1,812.51	17,338.44	121,913
Jan, 2023	9,450.08	7,275.68	3,740.24	20,466.00	126,759
Feb, 2023	8,883.51	7,657.82	1,566.57	18,107.90	118,564
Mar, 2023	9,518.01	9,856.49	2,121.54	21,496.04	126,825
Total	102,989.05	89,146.04	30,542.09	222,677.18	1,504,263

Table: 2

The graphical representation of total volume of electricity transacted under DAM, RTM, GDAM, TAM and GTAM in PXs on delivery date basis is given in **figure: 3**

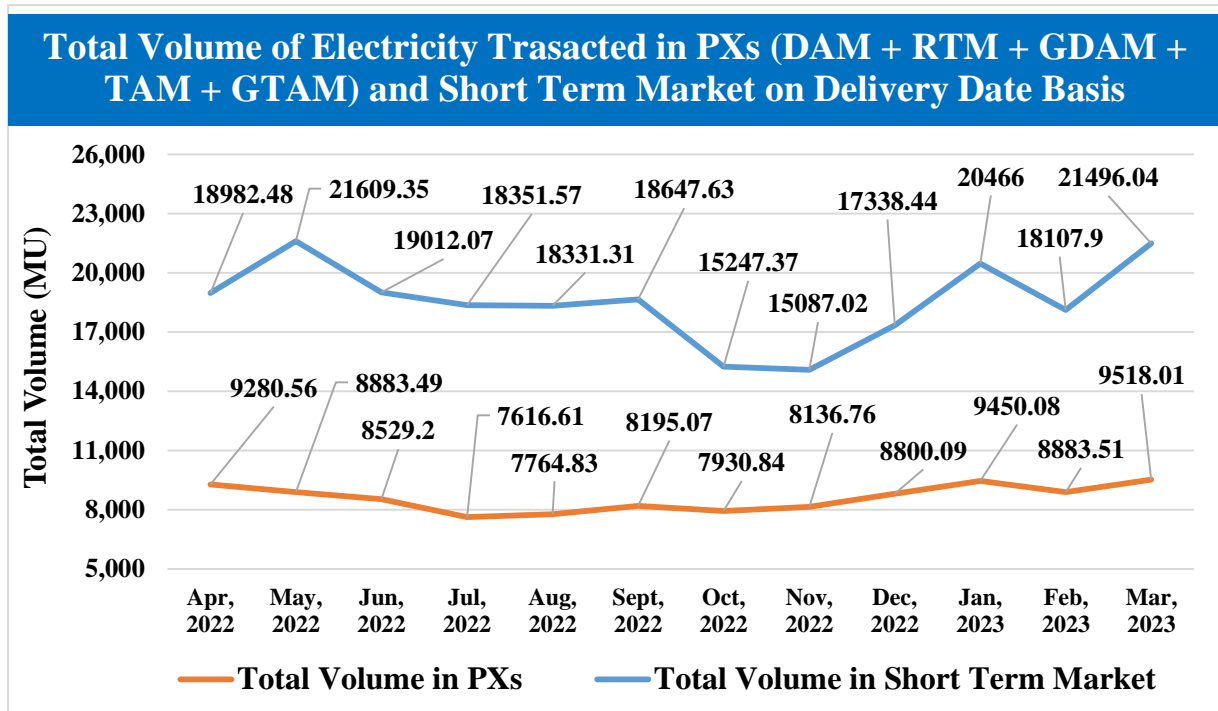


Figure: 3

The maximum volume of transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in the Power Exchanges happened in March, 2023 and the minimum transaction happened in July, 2022.

The maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in IEX took place in the month of January, 2023 and the minimum transaction happened in July, 2022. In PXIL, the maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) took place in April, 2022 and the minimum transaction happened in October, 2022. In HPX, the maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) took place in March, 2023 and the minimum transaction happened in October, 2022

The month-wise transactions in PXs (on delivery date basis), total energy supplied and total ISTS volume in the country during FY 2022-23 are shown in Table 3:

Month	IEX	PXIL	HPX	Total (MU)	Total Energy Supplied (MU)	Total ISTS Volume (MU)
	DAM+RTM+GDAM+TAM+GTAM (MU)	DAM+RTM+GDAM+TAM+GTAM (MU)	DAM+RTM+GDAM+TAM+GTAM (MU)			
Apr, 2022	7,324.93	1,955.63	Transactions in HPX started from July, 2022	9,280.56	132,028	60,398
May, 2022	7,325.71	1,557.78		8,883.49	135,156	63,292
Jun, 2022	7,591.66	937.54		8,529.20	133,263	52,383
Jul, 2022	6,676.30	626.17	314.14	7,616.61	128,255	62,587
Aug, 2022	6,952.93	558.42	253.48	7,764.83	130,390	63,161
Sept, 2022	7,571.89	519.23	103.95	8,195.07	126,914	61,637

Month	IEX	PXIL	HPX	Total (MU)	Total Energy Supplied (MU)	Total ISTS Volume (MU)
	DAM+RTM+GDAM+TAM+GTAM (MU)	DAM+RTM+GDAM+TAM+GTAM (MU)	DAM+RTM+GDAM+TAM+GTAM (MU)			
Oct, 2022	7,504.79	335.27	90.78	7,930.84	113,944	51,988
Nov, 2022	7,402.18	579.15	155.43	8,136.76	110,252	52,574
Dec, 2022	7,937.51	612.93	249.65	8,800.09	121,913	57,397
Jan, 2023	8,315.10	706.07	428.91	9,450.08	126,759	59,710
Feb, 2023	7,694.79	599.98	588.74	8,883.51	118,564	53,871
Mar, 2023	8,297.96	545.59	674.46	9,518.01	126,825	61,279
Total	90,595.75	9,533.76	2,859.54	102,989.05	1,504,263	700,277

Table: 3

4. Volume of electricity transaction through power exchanges on delivery date basis and Short Term Market as percentage (%) of total volume through ISTS and total electrical energy supplied in the country during FY 2022-23

The total volume of electricity transacted through power exchanges & short term market on delivery date basis as percentage (%) of total volume transacted in ISTS & the total electrical energy supplied in the country during FY 2022-23 are given in **Table: 4**.

Month	% of PXs w.r.t. Total Volume in Short Term market	% PXs w.r.t. Total Energy Supplied	% of PXs w.r.t. ISTS transactions	% of Short Term Market w.r.t. ISTS transaction	% of Short Term Market w.r.t. Total Energy Supplied
Apr, 2022	48.89%	7.03%	15.37%	31.43%	14.38%
May, 2022	41.11%	6.57%	14.04%	34.14%	15.99%
Jun, 2022	44.86%	6.40%	16.28%	36.29%	14.27%
Jul, 2022	41.50%	5.94%	12.17%	29.32%	14.31%
Aug, 2022	42.36%	5.96%	12.29%	29.02%	14.06%
Sept, 2022	43.95%	6.46%	13.30%	30.25%	14.69%
Oct, 2022	52.01%	6.96%	15.26%	29.33%	13.38%
Nov, 2022	53.93%	7.38%	15.48%	28.70%	13.68%
Dec, 2022	50.75%	7.22%	15.33%	30.21%	14.22%
Jan, 2023	46.17%	7.46%	15.83%	34.28%	16.15%
Feb, 2023	49.06%	7.49%	16.49%	33.61%	15.27%
Mar, 2023	44.25%	7.50%	15.51%	35.06%	16.94%
FY 2022-23	46.25%	6.85%	14.71%	31.80%	14.80%

Table: 4

The graphical representation of the total volume of electricity transacted on delivery date basis in power exchanges as percentage of the short term market volume, ISTS volume and total electrical energy supplied in the country during FY 2022-23 are displayed in **Figure: 5**.

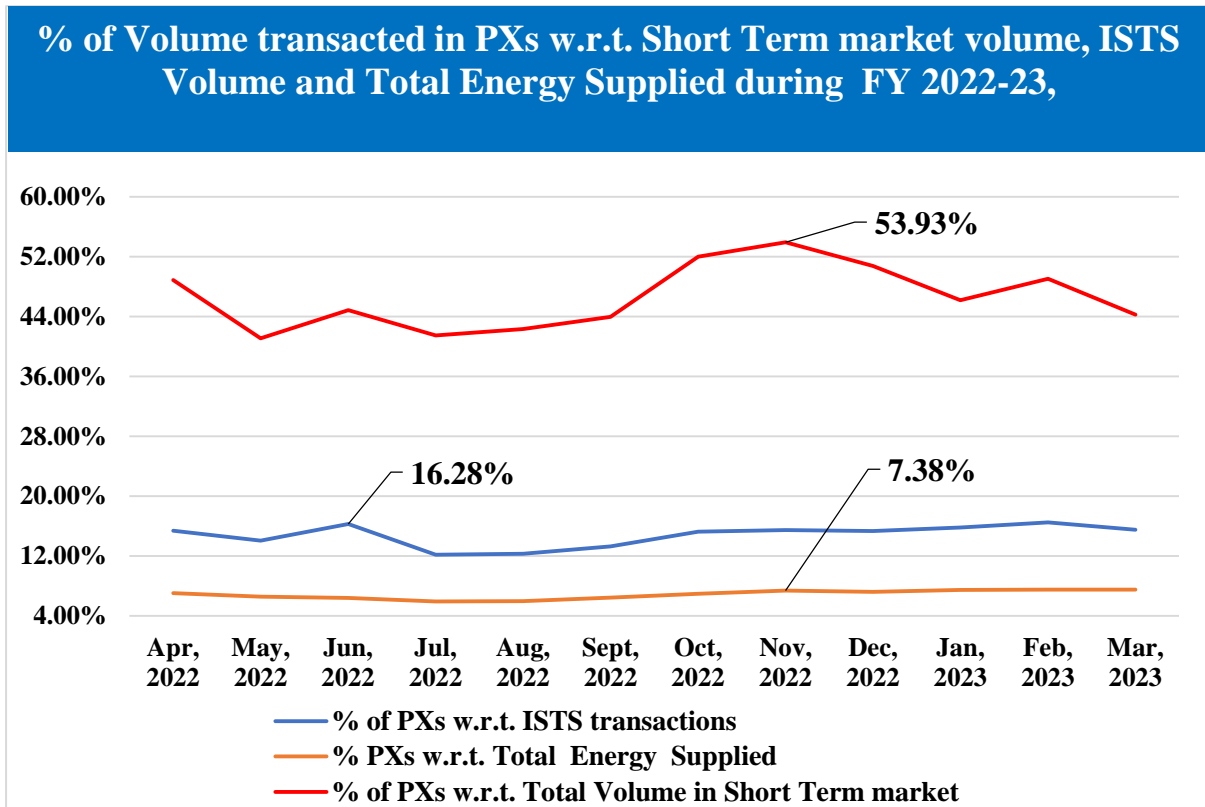


Figure: 4

CHAPTER-III**DAY AHEAD MARKET (DAM)****1. Volume and Price of Electricity transacted under DAM**

The total volume of electricity transacted in PXs under DAM on delivery date basis during FY 2022-23 was **51,366.11 MU** (**51,177.54 MU** in IEX, **187.14 MU** in PXIL and **1.43 MU** in HPX) with an average MCP of **₹ 6.01 /kWh**.

2. Volume and Price of Electricity transacted in IEX

The total volume of electricity transacted in IEX under DAM on delivery date basis during FY 2022-23 was **51,177.54 MU** with an average MCP of **₹ 6.01 /kWh**. In IEX, the maximum volume of transaction of electricity happened in November, 2022 which was **5,084 MU** with an average MCP of **₹ 4.79 /kWh**. The minimum volume of transaction of electricity happened in May, 2022, which was **3,172 MU** with average MCP of **₹ 6.80 /kWh**.

The total volume of electricity transacted in IEX under DAM was **99.63 %** of the total volume on the power exchanges.

3. Volume and Price of Electricity transacted in PXIL

The total volume of electricity transacted in PXIL under DAM on delivery date basis during FY 2022-23 was **187.14 MU** with Average MCP of **₹ 6.11/kWh**. In PXIL, the maximum volume of transaction of electricity happened in June, 2022, which was **116.20 MU** with average MCP of **₹ 6.61 /kWh** and the minimum volume of transaction of electricity happened in January, 2023, which was **0.12 MU** with average MCP of **₹ 11.33 /kWh**. The total volume of electricity transacted in PXIL under DAM was **0.36 %** of the total volume on the power exchanges.

4. Volume and Price of Electricity transacted in HPX

The transaction of electricity in HPX under DAM started from July, 2022 onwards. The total volume of electricity transacted in HPX under DAM on delivery date basis during FY 2022-23 was **1.43 MU** with Average MCP of **₹ 8.83/kWh**, which happened in July, 2022 only. Whereas no transaction took place in all other months of FY 2022-23 in HPX under DAM. The total volume of electricity transacted in HPX under DAM was **0.003 %** of the total volume on the power exchanges.

5. Monthly Volume and Price of Electricity transacted in IEX, PXIL & HPX

The month-wise total of Final Scheduled Volume and Average MCP of electricity transacted in the Power Exchanges under DAM are shown in **Table 5**:

Month	Final Scheduled Volume MU)				Average MCP (₹/kWh)			
	IEX	PXIL	HPX	Total	IEX	PXIL	HPX	Wt. Avg.
Apr, 2022	4,113.65	-	NA	4,113.65	10.06	NA	NA	10.06
May, 2022	3,172.50	13.02	NA	3,185.52	6.80	4.30	NA	6.79

Month	Final Scheduled Volume MU				Average MCP (₹/kWh)			
	IEX	PXIL	HPX	Total	IEX	PXIL	HPX	Wt. Avg.
Jun, 2022	4,084.99	116.2	NA	4,201.19	6.49	6.61	NA	6.49
Jul, 2022	3,516.65	31.78	1.43	3,549.86	5.50	5.01	8.83	5.50
Aug, 2022	3,528.70	10.12	-	3,538.82	5.26	6.42	NA	5.26
Sept, 2022	4,049.65	12.89	-	4,062.54	5.73	6.19	NA	5.73
Oct, 2022	4,325.01	3.01	-	4,328.02	3.96	4.64	NA	3.96
Nov, 2022	5,083.85	-	-	5,083.85	4.79	NA	NA	4.79
Dec, 2022	4,977.44	-	-	4,977.44	5.57	NA	NA	5.57
Jan, 2023	4,947.96	0.12	-	4,948.08	6.40	11.33	NA	6.40
Feb, 2023	4,658.76	-	-	4,658.76	6.61	NA	NA	6.61
Mar, 2023	4,718.38	-	-	4,718.38	5.40	NA	NA	5.40
Total	51,177.54	187.14	1.43	51,366.11				
Average FY 2022-	4,264.80	26.73	1.43	4,280.51	6.01	6.36	8.83	6.01

- : No transaction took place

NA- Not applicable

Table: 5

The graphical representation of month wise total FSV under DAM is displayed in **Figure: 5**.

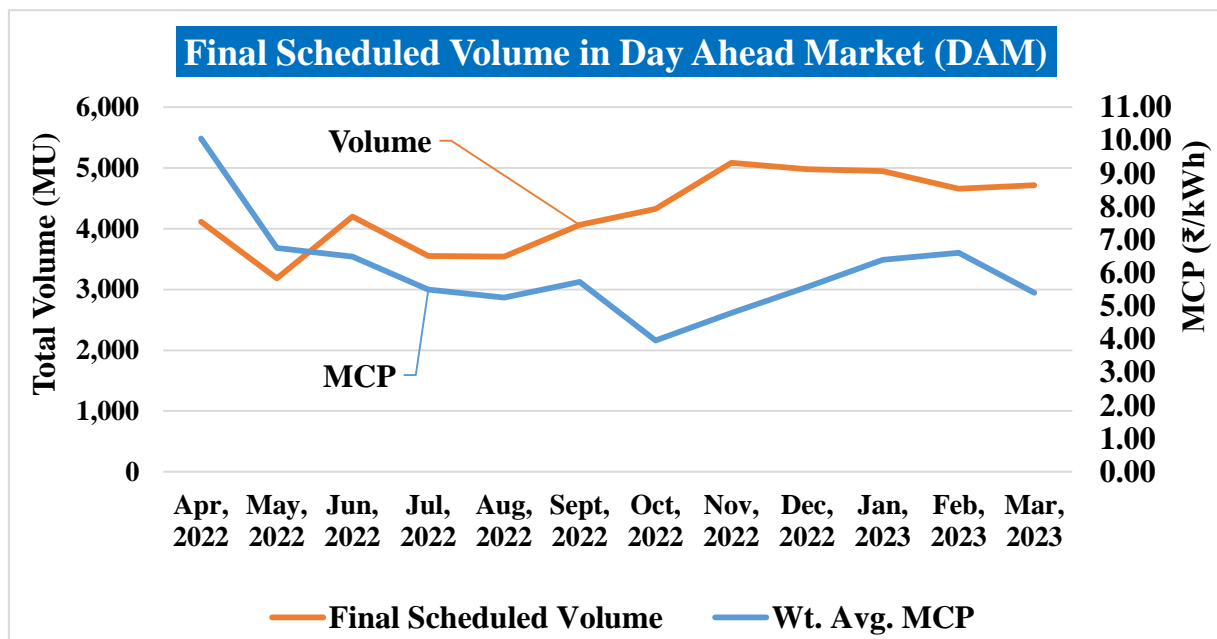


Figure: 5

6. Maximum/ Minimum Final scheduled Volume (FSV) for a Day under DAM during FY 2022-23

The maximum Final Scheduled Volume (FSV) for transaction of electricity for a day in IEX under Day Ahead Market was observed in February, 2023 during the FY 2022-23, whereas, in PXIL the maximum FSV was observed in June, 2022. The minimum FSV in any particular day in IEX was observed in April, 2022 while in PXIL, the minimum FSV was observed in August, 2022. In HPX, the transaction of electricity took place only in the month of July, 2022.

The month- wise Maximum/Minimum FSV for a day during various months of FY 2022-23 are shown in **Table 6**:

Month	Minimum FSV (MU)		Maximum FSV (MU)	
	IEX	PXIL	IEX	PXIL
Apr, 2022	45.33	-	196.81	-
May, 2022	70.12	0.25	140.29	6.13
Jun, 2022	101.28	1.39	166.38	8.88
Jul, 2022	84.42	0.39	159.86	1.88
Aug, 2022	67.25	0.002	157.3	2.06
Sept, 2022	107.43	0.01	192.24	1.8
Oct, 2022	110.26	0.05	166.28	1.71
Nov, 2022	153.34	-	192.41	-
Dec, 2022	130.07	-	182.43	-
Jan, 2023	129.04	0.12	198.3	0.12
Feb, 2023	136.09	-	203.00	-
Mar, 2023	108.25	-	175.95	-

- : No transaction took place

Table: 6

The graphical representation of month wise maximum & minimum FSV under DAM is displayed in **Figure: 6 & 7**

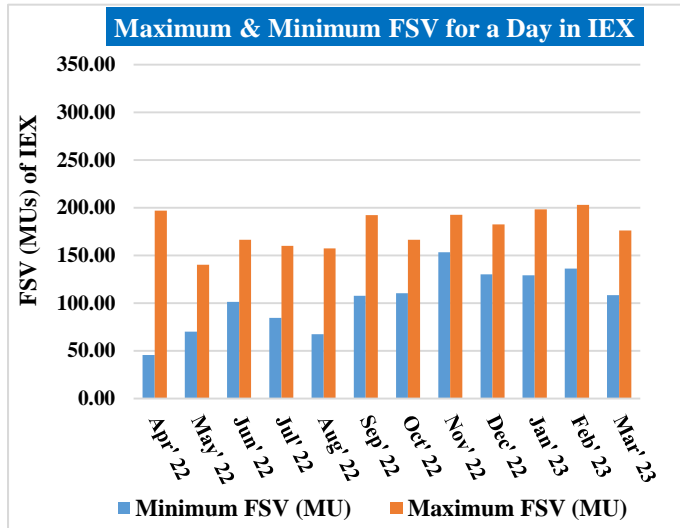


Figure: 6

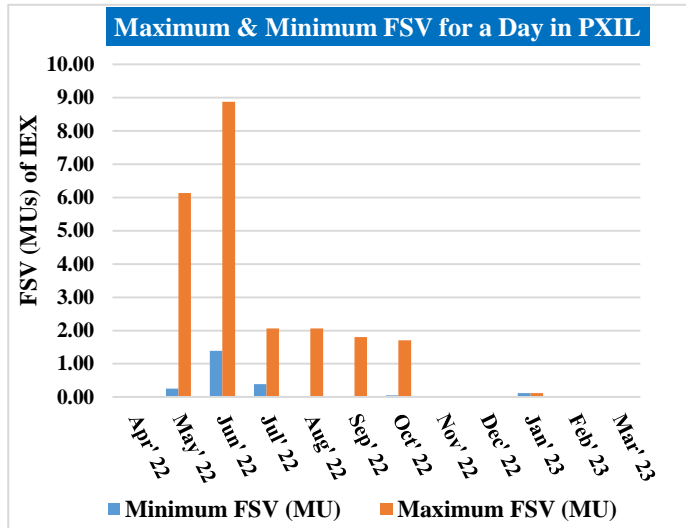


Figure: 7

7. Maximum, Minimum & Average of Daily Average MCP under DAM during FY 2022-23

The maximum daily average MCP for transaction of electricity in IEX was observed in April, 2022 (₹. 13.76 /kWh) during the FY 2022-23, in PXIL, it was ₹. 11.33 /kWh, which was observed in the month of January, 2023. The minimum daily average MCP of ₹. 2.89 /kWh in IEX was observed in May, 2022. In PXIL, the minimum MCP of ₹. 1.56 /kWh was also observed in May, 2022. The month-wise Maximum, Minimum and Average MCP are shown in **Table 7**:

Month	Maximum Daily Average MCP (₹/kWh)		Minimum Daily Average MCP (₹/kWh)		Monthly Average MCP (₹/kWh)	
	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2022	13.76	-	4.50	-	10.06	-
May, 2022	12.00	8.00	2.89	1.56	6.80	4.30
Jun, 2022	10.14	10.20	3.54	3.66	6.49	6.61
Jul, 2022	7.41	6.58	3.00	3.49	5.50	5.01
Aug, 2022	7.43	9.12	3.22	3.00	5.26	6.42
Sept, 2022	8.89	10.13	3.41	3.16	5.73	6.19
Oct, 2022	4.88	5.94	3.02	3.95	3.96	4.64
Nov, 2022	5.36	-	3.92	-	4.79	-
Dec, 2022	7.28	-	3.80	-	5.57	-
Jan, 2023	8.39	11.33	4.05	11.33	6.40	11.33
Feb, 2023	8.83	-	4.36	-	6.61	-
Mar, 2023	9.41	-	3.23	-	5.40	-

- : No transaction took place

Table: 7

The graphical representation of month wise maximum, minimum & average of daily average MCP is displayed in **Figure: 8 & 9**

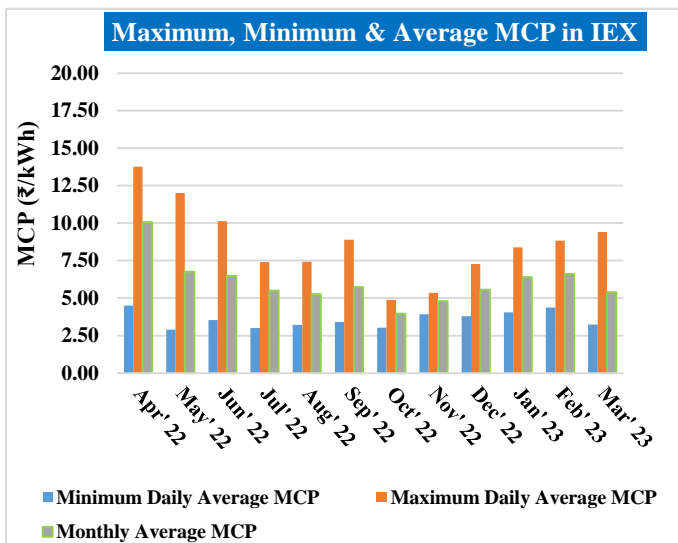


Figure: 8

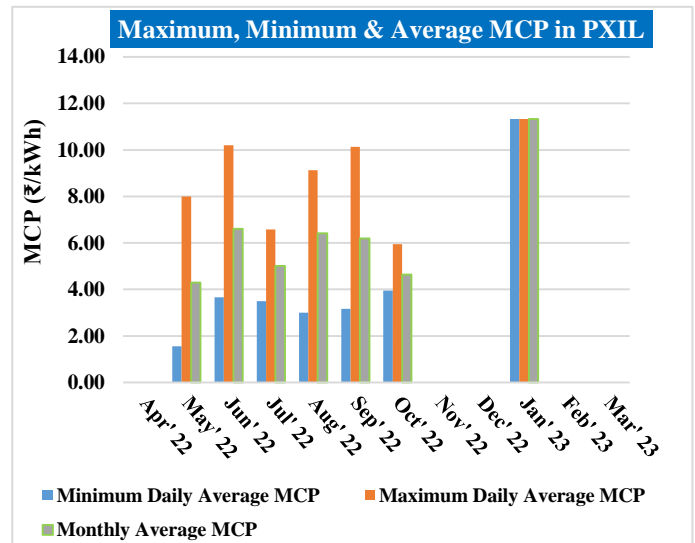


Figure: 9

8. Maximum/ Minimum Area Clearing Price (ACP) under DAM during FY 2022-23

The maximum ACP of ₹. 20.00 /kWh in IEX during the FY 2022-23 was observed during April, 2022 and the minimum ACP of ₹. 1.00 /kWh in IEX was observed in May, June & August, 2022. The maximum ACP of ₹. 12.00 /kWh in PXIL during the FY 2022-23 was observed during May, 2022 to October, 2022 & January, 2023 and the minimum ACP of ₹. 0.53 /kWh in PXIL was observed in October, 2022.

The month wise Maximum/Minimum ACP are shown in **Table 8:**

Month	IEX		PXIL	
	Min. ACP (₹/kWh)	Max. ACP (₹/kWh)	Min. ACP (₹/kWh)	Max. ACP (₹/kWh)
Apr, 2022	2.70	20.00	-	-
May, 2022	1.00	12.00	3.36	12.00
Jun, 2022	1.00	12.00	1.99	12.00
Jul, 2022	1.50	12.00	2.00	12.00
Aug, 2022	1.00	12.00	2.00	12.00
Sept, 2022	1.20	12.00	3.16	12.00
Oct, 2022	1.12	12.00	0.53	12.00
Nov, 2022	2.71	12.00	-	-
Dec, 2022	2.00	12.00	-	-
Jan, 2023	2.00	12.00	9.99	12.00
Feb, 2023	2.82	12.00	-	-
Mar, 2023	2.22	12.00	-	-

- : No transaction took place

Table: 8

9. Congestion under Day Ahead Market in PXs

From the table, it may be seen that under DAM, the total transmission congestion of **5.14 MU** happened in IEX whereas **no** transmission congestion happened in PXIL during FY 2022-23. The congestion was only 0.010 % of the total volume of electricity transacted under DAM.

The month wise details of transmission congestion under DAM are tabulated in **Table: 9**

Month	IEX		PXIL		Total	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2022	0.69	3 days	0.00	NA	0.69	3 days
May, 2022	0.00	NA	0.00	NA	0.00	NA
Jun, 2022	0.00	NA	0.00	NA	0.00	NA
Jul, 2022	4.45	3 days	0.00	NA	4.45	3 days
Aug, 2022	0.00	NA	0.00	NA	0.00	NA
Sept, 2022	0.00	NA	0.00	NA	0.00	NA
Oct, 2022	0.00	NA	0.00	NA	0.00	NA
Nov, 2022	0.00	NA	0.00	NA	0.00	NA
Dec, 2022	0.00	NA	0.00	NA	0.00	NA
Jan, 2023	0.00	NA	0.00	NA	0.00	NA
Feb, 2023	0.00	NA	0.00	NA	0.00	NA
Mar, 2023	0.00	NA	0.00	NA	0.00	NA
Total	5.14	6 days	0.00	NA	5.14	6 days

NA: Not Applicable

Table: 9

10. Real Time Curtailment under Day Ahead Market in PXs

The total volume of real time curtailment of **8.86 MU** happened under DAM in IEX during FY 2022-23, whereas no real time curtailment happened in PXIL during same period. As a result, **8.86 MU** could not be transacted due to real time curtailment in the power exchanges. This is only 0.017 % of the total volume of electricity transacted under DAM.

The month wise details of real time curtailment under DAM are tabulated in **Table: 10**

Month	IEX Curtailment (MU)	PXIL Curtailment (MU)	Total (MU)
Apr, 2022	8.86	0.00	8.76
May, 2022	0.00	0.00	0.00
Jun, 2022	0.00	0.00	0.00
Jul, 2022	0.00	0.00	0.00
Aug, 2022	0.00	0.00	0.00
Sept, 2022	0.00	0.00	0.00
Oct, 2022	0.00	0.00	0.00
Nov, 2022	0.00	0.00	0.00
Dec, 2022	0.00	0.00	0.00
Jan, 2023	0.00	0.00	0.00
Feb, 2023	0.00	0.00	0.00
Mar, 2023	0.00	0.00	0.00
Total	8.86	0.00	8.86

Table: 10

CHAPTER-IV**Real Time MARKET (RTM)****1. Volume and Price of Electricity transacted under RTM**

The total volume of electricity transacted in PXs under RTM on delivery date basis during FY 2022-23 was **24,186.94 MU** (**24,174.38 MU** in IEX, **12.56 MU** in PXIL and no transaction took place in HPX under RTM) with an average MCP of **₹ 5.67 /kWh**.

2. Volume and Price of Electricity transacted in IEX

The total volume of electricity transacted in IEX under RTM on delivery date basis during FY 2022-23 was **24,174.38 MU** with an average MCP of **₹ 5.67 /kWh**. In IEX, the maximum transaction of electricity happened in May, 2022 which was **2,319 MU** with an average MCP of **₹ 5.88 /kWh**. The minimum volume of electricity happened in November, 2022, which was **1,407 MU** with average MCP of **₹ 4.94 /kWh**.

3. Volume and Price of Electricity transacted in PXIL

The total volume of electricity transacted in PXIL under RTM on delivery date basis during FY 2022-23 was **12.56 MU** with an average MCP of **₹ 11.59 /kWh**. In PXIL, the maximum transaction of electricity happened in July, 2022 which was **10.73 MU** with an average MCP of **₹ 11.99 /kWh**. The minimum volume of electricity happened in April, 2022, which was **0.10 MU** with average MCP of **₹ 10.33 /kWh**.

No transaction of electricity took place in HPX under RTM during FY 2022-23.

4. Monthly Volume and Price of Electricity transacted in IEX and PXIL

The month-wise values of Final Scheduled Volume and Average MCP of electricity transacted in both the Power Exchanges under RTM are shown in **Table 11**

Month	Final Scheduled Volume (MU)			Average MCP (₹/kWh)		
	IEX	PXIL	Total	IEX	PXIL	Wt. Avg.
Apr, 2022	1,704.28	0.10	1,704.38	9.55	10.33	9.55
May, 2022	2,318.75	-	2,318.75	5.88	-	5.88
Jun, 2022	2,214.24	1.03	2,215.27	6.56	8.49	6.56
Jul, 2022	2,130.98	10.73	2,141.71	4.88	11.99	4.88
Aug, 2022	2,265.25	0.15	2,265.40	4.96	3.21	4.96
Sept, 2022	2,192.70	0.55	2,193.25	4.79	12.00	4.79
Oct, 2022	2,264.59	-	2,264.59	3.78	-	3.78
Nov, 2022	1,406.88	-	1,406.88	4.94	-	4.94

Month	Final Scheduled Volume (MU)			Average MCP (₹/kWh)		
	IEX	PXIL	Total	IEX	PXIL	Wt. Avg.
Dec, 2022	1,763.05	-	1,763.05	5.41	-	5.41
Jan, 2023	2,101.89	-	2,101.89	6.08	-	6.08
Feb, 2023	1,714.05	-	1,714.05	7.15	-	7.15
Mar, 2023	2,097.72	-	2,097.72	4.95	-	4.95
Total	24,174.38	12.56	24,186.94			
Average FY 2022-23	2,014.53	2.51	2,015.58	5.67	11.59	5.67

- : No transaction took place

Table: 11

The graphical representation of month wise total FSV in RTM is displayed in **Figure: 10**.

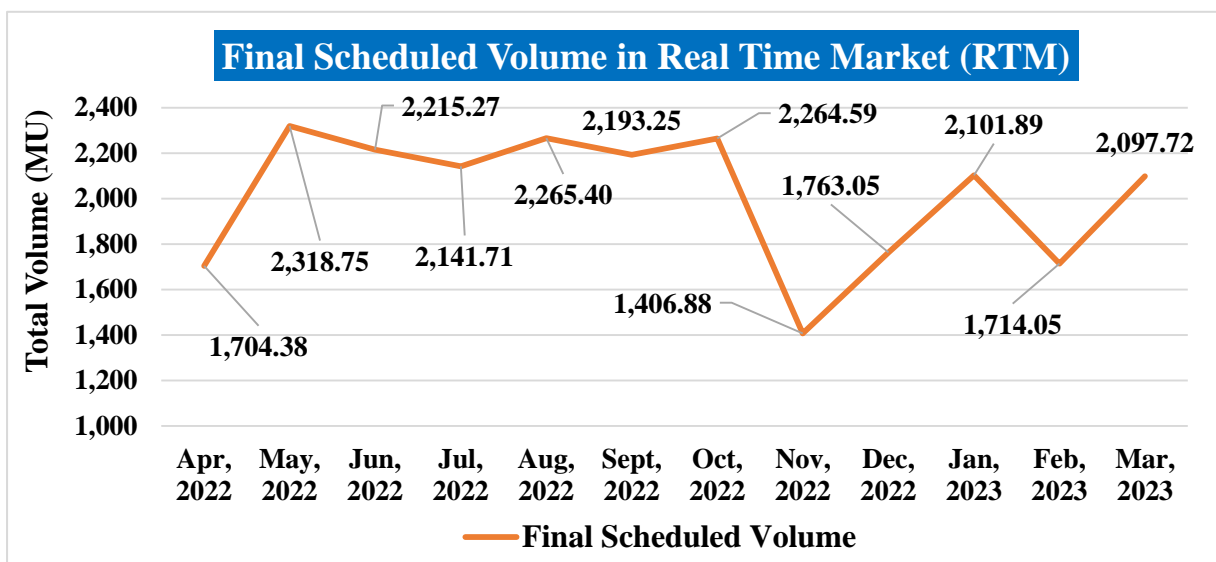


Figure: 10

5. Maximum / Minimum Final Scheduled Volume (FSV) for a Day under RTM during FY 2022-23

The maximum Final Scheduled Volume (FSV) for transaction of electricity in any particular day in IEX in Real Time Market was observed in May, 2022, whereas, the minimum FSV in any particular day was observed in November, 2022 during the FY 2022-23. In PXIL, maximum Final Scheduled Volume (FSV) for transaction of electricity in any particular day in PXIL in Real Time Market was observed in July, 2022, whereas, the minimum FSV in any particular day was observed in April, 2022 during the FY 2022-23.

The month-wise Maximum/Minimum FSV for a day during various months of FY 2022-23 are shown in **Table 12**:

Month	Minimum FSV (MU)		Maximum FSV (MU)	
	IEX	PXIL	IEX	PXIL
Apr, 2022	23.92	0.001	98.97	0.075
May, 2022	42.02	-	104.40	-
Jun, 2022	57.36	0.08	96.43	0.45
Jul, 2022	53.64	0.4	89.17	2.69
Aug, 2022	52.11	0.004	104.18	0.04
Sept, 2022	49.45	0.1	103.71	0.25
Oct, 2022	45.12	-	124.36	-
Nov, 2022	34.85	-	58.78	-
Dec, 2022	44.02	-	73.78	-
Jan, 2023	47.88	-	104.24	-
Feb, 2023	47.19	-	76.13	-
Mar, 2023	48.13	-	98.49	-

- : No transaction took place

Table: 12

The graphical representation of month wise maximum & minimum FSV in IEX in RTM is displayed in **Figure: 11**

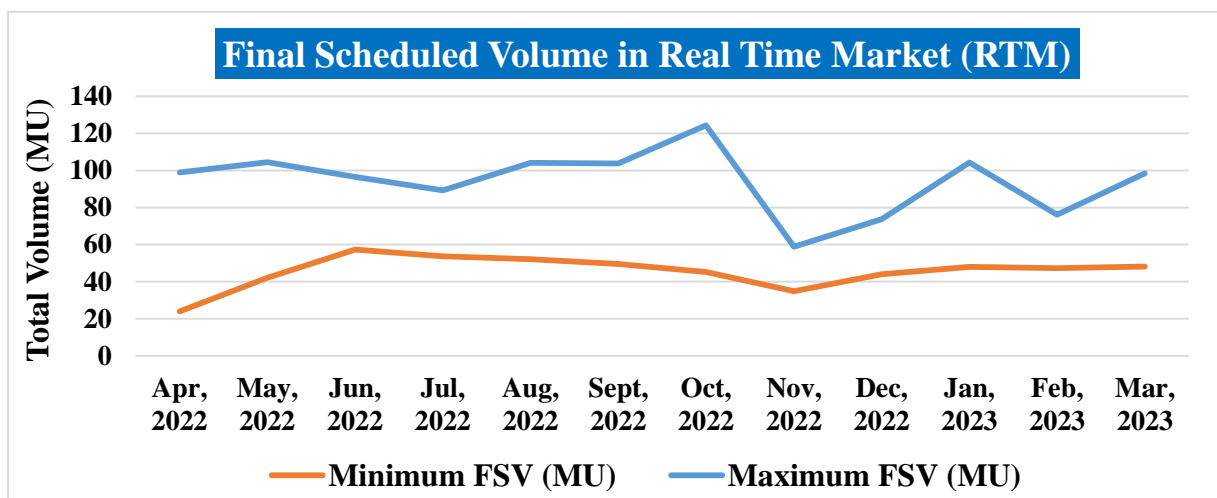


Figure: 11

6. Maximum, Minimum & Average of Daily Average MCP under RTM during FY 2022-23

The maximum MCP for transaction of electricity in IEX was observed in the month of April, 2022 (₹. 12.00 /kWh) and the minimum MCP of ₹. 5.46 /kWh in IEX was observed in October, 2022. In PXIL, the maximum MCP for transaction of electricity was observed in April, June, July & September 2022 (₹. 12.00 /kWh) and the minimum MCP of ₹. 3.25 /kWh was observed in August, 2022.

The month-wise Maximum, Minimum and Average MCP are shown in **Table 13**:

Month	Maximum MCP (₹/kWh)		Minimum MCP (₹/kWh)		Average MCP (₹/kWh)	
	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2022	12.00	12.00	5.23	7	9.55	10.33
May, 2022	8.92	NA	2.56	NA	5.88	NA
Jun, 2022	10.4	12	2.96	4.92	6.56	8.49
Jul, 2022	7.11	12	2.87	11.9	4.88	11.99
Aug, 2022	8.66	3.25	2.39	3.2	4.96	3.21
Sept, 2022	8.21	12	2.52	12	4.79	12
Oct, 2022	5.46	NA	2.2	NA	3.78	NA
Nov, 2022	5.81	NA	4.15	NA	4.94	NA
Dec, 2022	7.08	NA	3.38	NA	5.41	NA
Jan, 2023	9.83	NA	3.08	NA	6.08	NA
Feb, 2023	9.91	NA	4.31	NA	7.15	NA
Mar, 2023	7.96	NA	2.63	NA	4.95	NA

NA: Not Applicable

Table: 13

The graphical representation of month wise maximum, minimum & average of daily average MCP in IEX & PXIL under RTM is displayed in Figure: 12 & 13

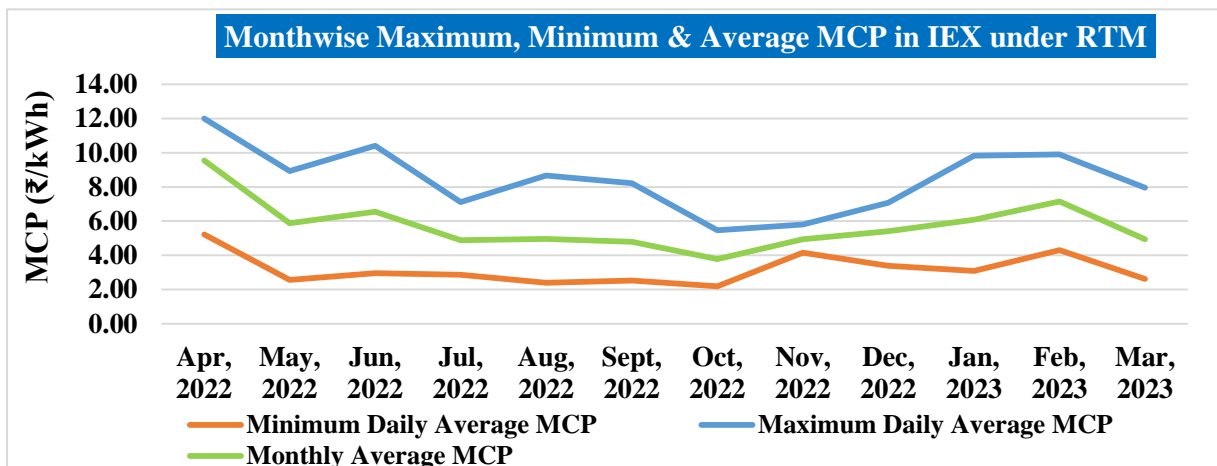


Figure: 12

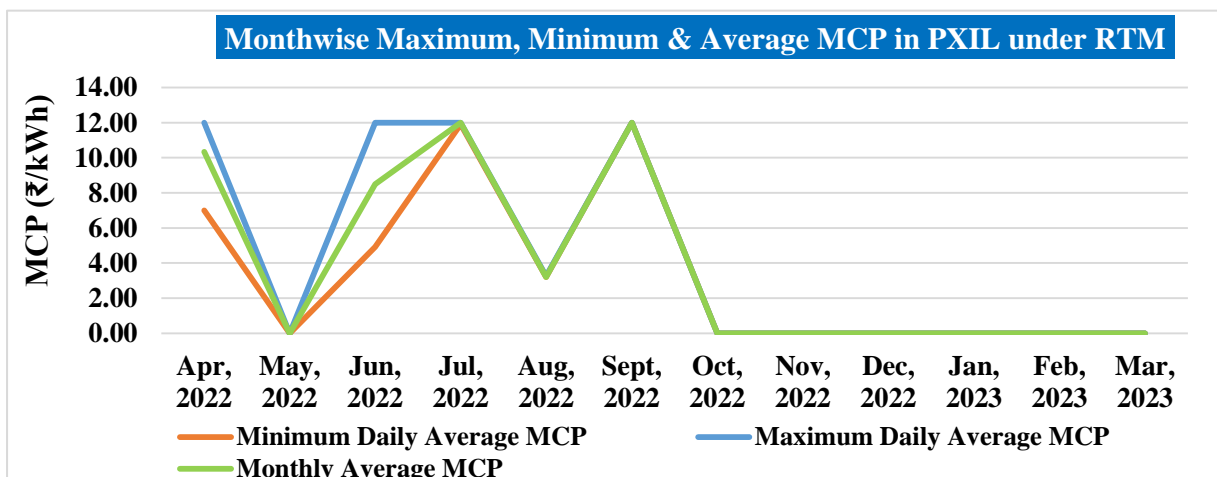


Figure: 13

7. Maximum / Minimum Area Clearing Price (ACP) under RTM during FY 2022-23

The maximum ACP of ₹. 16.74 /kWh in the month in IEX during the FY 2022-23 was observed in April, 2022 and the minimum ACP of ₹. 0.05 /kWh in IEX was observed in October, 2022. In PXIL, the maximum ACP of ₹. 12.00 /kWh was observed in April, 2022 & June to September, 2022 and the minimum ACP of ₹. 2.58 /kWh in PXIL was observed in August, 2022.

The month wise Maximum/Minimum ACP are shown in **Table 14**:

Month	IEX		PXIL	
	Max. ACP (₹/kWh)	Min. ACP (₹/kWh)	Max. ACP (₹/kWh)	Min. ACP (₹/kWh)
Apr, 2022	16.74	0.60	12.00	7.00
May, 2022	12.00	0.20	NA	NA
Jun, 2022	12.00	0.50	12.00	2.82
Jul, 2022	12.00	0.55	12.00	11.90
Aug, 2022	12.00	0.08	12.00	2.58
Sept, 2022	12.00	0.12	12.00	12.00
Oct, 2022	12.00	0.05	NA	NA
Nov, 2022	12.00	2.00	NA	NA
Dec, 2022	12.00	0.50	NA	NA
Jan, 2023	12.00	0.49	NA	NA
Feb, 2023	12.00	1.00	NA	NA
Mar, 2023	12.00	1.25	NA	NA

NA: Not Applicable

Table: 14

8. Comparison of Final Scheduled volume & Monthly average MCP of Day Ahead Market and Real Time Market during FY 2022-23

During the FY 2022-23, the volume of electricity transacted in Day Ahead Market and Real Time Market were **51,366 MU** & **24,187 MU**, respectively. Whereas, the average MCP's for DAM & RTM during FY 2022-23 were ₹. 6.01/kWh & ₹. 5.67/kWh, respectively.

The month-wise comparison FSV & MCP for DAM and RTM is shown in **Figures 14 & 15**:

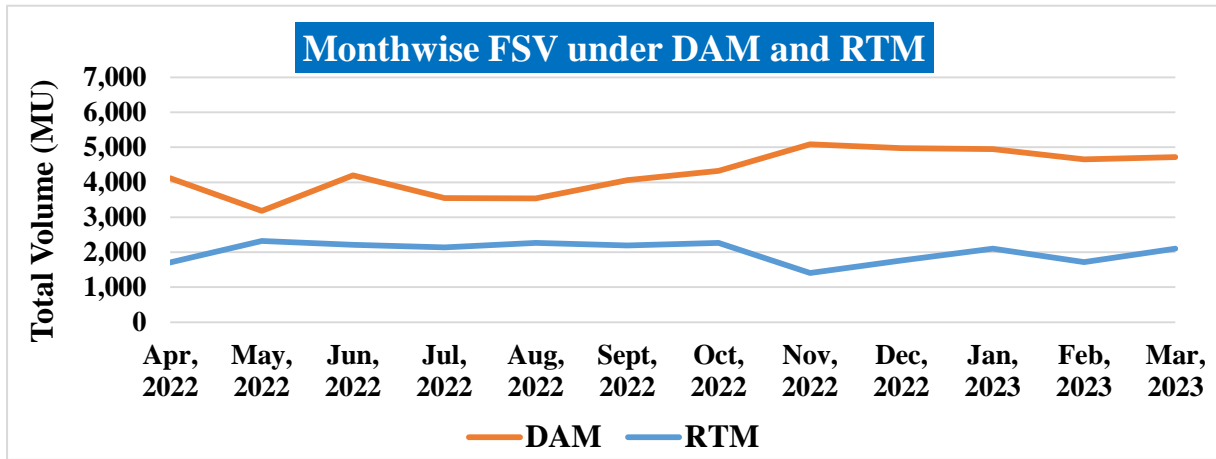


Figure: 14

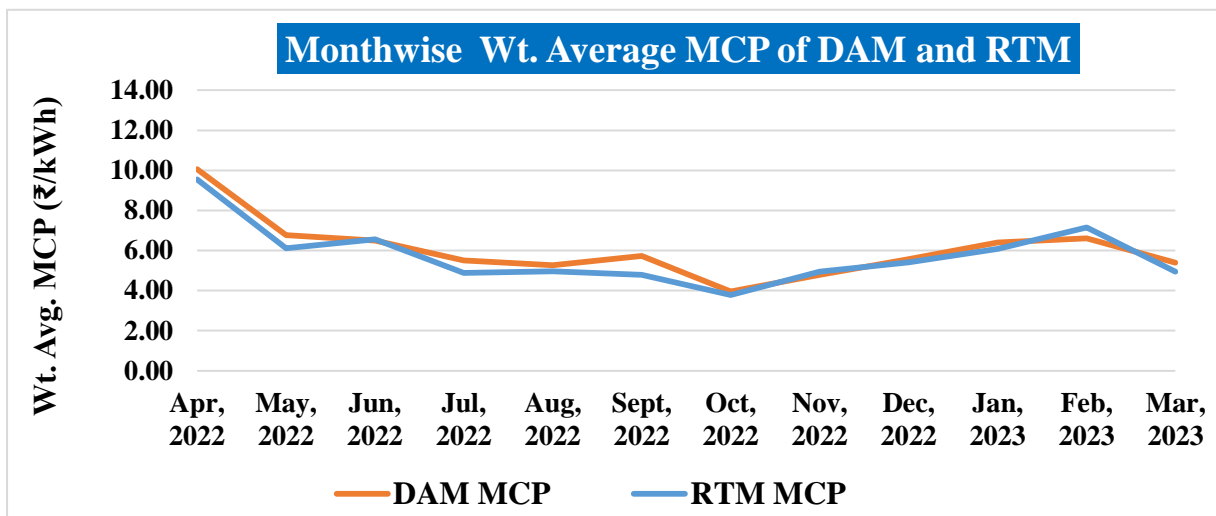


Figure: 15

9. Congestion under Real Time Market in IEX and PXIL

From the table, it may be seen that under RTM, the total transmission congestion of **9.98 MU** happened in IEX during FY 2022-23. Whereas, **no** congestion happened in PXIL. No transaction of electricity took place in HPX under RTM in FY 2022-23.

The month wise details of transmission congestion in RTM are tabulated in **Table: 15**

Month	IEX		PXIL		Total	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2022	0.56	7 days	0.00	NA	0.56	7 days
May, 2022	1.29	2 days	-	NA	1.29	2 days
Jun, 2022	0.98	4 days	0.00	NA	0.98	4 days
Jul, 2022	0.04	1 day	0.00	NA	0.04	1 day
Aug, 2022	0.35	3 days	0.00	NA	0.35	3 days
Sept, 2022	5.79	6 days	0.00	NA	5.79	6 days
Oct, 2022	0.00	NA	-	NA	0.00	NA
Nov, 2022	0.07	1 day	-	NA	0.07	1 day
Dec, 2022	0.01	1 day	-	NA	0.01	1 day
Jan, 2023	0.00	NA	-	NA	0.00	NA

Feb, 2023	0.00	NA	-	NA	0.00	NA
Mar, 2023	0.89	10 days	-	NA	0.89	10 days
Total	9.98	35 days	-	NA	9.98	35 days

- : No transaction took place

NA: Not Applicable

Table: 15

10. Real Time Curtailment under Real Time Market

There was **no** real time curtailment under Real Time Market in PXs during FY 2022-23.

CHAPTER-V**GREEN DAY AHEAD MARKET (GDAM)****1. Volume and Price of Electricity transacted under GDAM**

The total volume of electricity transacted in PXs in GDAM on delivery date basis during FY 2022-23 was **3,817.26 MU** (**1,584.08 MU** under Solar, **2,232.14 MU** under Non Solar and **1.23 MU** under Hydro) with an average MCP of **₹ 5.07 /kWh**. In IEX, the maximum transaction of electricity happened in May, 2022 which was **493.17 MU** with an average MCP of **₹ 7.17 /kWh**. The minimum volume of electricity happened in April, 2022, which was **214.73 MU** with average MCP of **₹ 10.21 /kWh**. In PXIL, transaction of electricity under GDAM happened place in July and September, 2022 only.

No transaction of electricity took place in HPX under GDAM.

2. Monthly Volume and Price of Electricity transacted in IEX under GDAM

The month-wise values of Final Scheduled Volume and Average MCP of electricity transacted in IEX under GDAM are shown in **Table 16**

Month	Final Scheduled Volume (MU)				Average MCP (₹/kWh)
	Solar	Non Solar	Hydro	Total	
Apr, 2022	89.13	125.60	-	214.73	10.21
May, 2022	276.46	216.71	-	493.17	7.17
Jun, 2022	240.78	121.46	-	362.24	7.60
Jul, 2022	251.00	195.43	-	446.59	4.63
Aug, 2022	151.46	169.05	-	320.51	5.49
Sept, 2022	198.90	125.50	-	324.40	5.60
Oct, 2022	145.40	147.53	-	292.94	4.03
Nov, 2022	72.59	215.74	-	288.33	4.90
Dec, 2022	28.92	209.06	-	237.98	5.32
Jan, 2023	26.06	259.10	-	285.16	6.44
Feb, 2023	22.55	230.45	-	253.00	6.69
Mar, 2023	80.42	216.10	1.23	298.00	5.62
Total	1,583.67	2,231.73	1.23	3,817.05	
Average FY 2022-23	131.97	185.98	1.23	318.09	6.07

- : No transaction took place

Table: 16

The graphical representation of month wise total FSV under GDAM is displayed in **Figure: 16**.

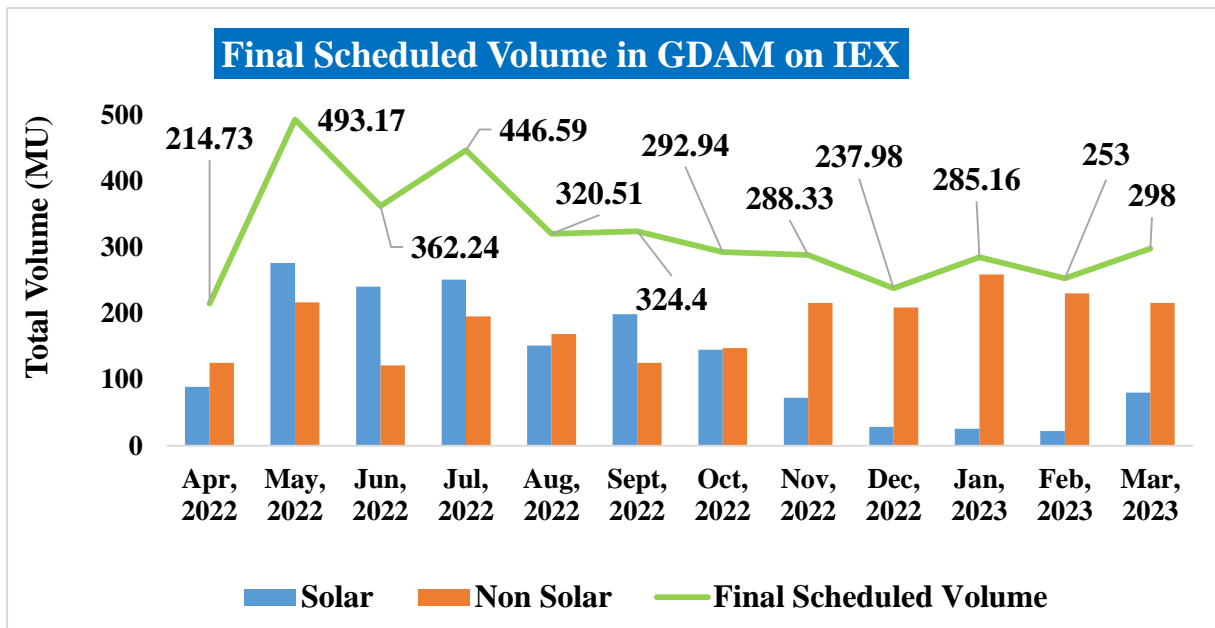


Figure: 16

3. Monthly Volume and Price of Electricity transacted in PXIL under GDAM

The month-wise values of Final Scheduled Volume and Average MCP of electricity transacted in PXIL under GDAM are shown in **Table 17**

Month	Final Scheduled Volume (MU)				Average MCP (₹/kWh)
	Solar	Non Solar	Hydro	Total	
Apr, 2022	-	-	-	-	NA
May, 2022	-	-	-	-	NA
Jun, 2022	-	-	-	-	NA
Jul, 2022	0.16	-	-	0.16	4.23
Aug, 2022	-	-	-	-	NA
Sept, 2022	0.25	-	-	0.25	5.87
Oct, 2022	-	-	-	-	NA
Nov, 2022	-	-	-	-	NA
Dec, 2022	-	-	-	-	NA
Jan, 2023	-	-	-	-	NA
Feb, 2023	-	-	-	-	NA
Mar, 2023	-	-	-	-	NA
Total	0.41	-	-	0.41	
Average FY 2022-23	0.21	-	-	0.21	5.23

- : No transaction took place

NA: Not Applicable

Table: 17

4. Maximum / Minimum Final Scheduled Volume (FSV) for a Day under GDAM during FY 2022-23

The month-wise Maximum/Minimum FSV for a day in IEX during various months of FY 2022-23 are shown in **Table 18**:

Month	Minimum FSV (MU)			Maximum FSV (MU)		
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro
Apr, 2022	0.40	2.45	-	4.79	6.05	-
May, 2022	1.19	1.48	-	21.25	24.50	-
Jun, 2022	4.42	0.82	-	17.27	8.74	-
Jul, 2022	3.69	2.95	-	18.11	16.62	-
Aug, 2022	2.11	2.83	-	14.50	8.42	-
Sept, 2022	2.18	2.30	-	21.98	8.64	-
Oct, 2022	1.20	2.98	-	8.13	8.33	-
Nov, 2022	0.52	5.62	-	5.16	9.12	-
Dec, 2022	0.43	5.21	-	3.45	10.27	-
Jan, 2023	0.18	4.11	-	1.40	11.58	-
Feb, 2023	0.51	5.73	-	1.91	12.81	-
Mar, 2023	0.49	3.79	0	8.05	11.43	0.22

- : No transaction took place

Table: 18

The month-wise Maximum/Minimum FSV for a day in PXIL during various months of FY 2022-23 are shown in **Table 19**:

Month	Minimum FSV (MU)			Maximum FSV (MU)		
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro
Apr, 2022	-	-	-	-	-	-
May, 2022	-	-	-	-	-	-
Jun, 2022	-	-	-	-	-	-
Jul, 2022	0.01	-	-	0.14	-	-
Aug, 2022	-	-	-	-	-	-
Sept, 2022	0.25	-	-	0.25	-	-
Oct, 2022	-	-	-	-	-	-
Nov, 2022	-	-	-	-	-	-
Dec, 2022	-	-	-	-	-	-
Jan, 2023	-	-	-	-	-	-
Feb, 2023	-	-	-	-	-	-
Mar, 2023	-	-	-	-	-	-

- : No transaction took place

Table: 19

5. Maximum, Minimum & Average of Daily Average MCP under GDAM during FY 2022-23

The maximum MCP for transaction of electricity in IEX was observed in June, 2022 (₹. 16.26 /kWh) during the FY 2022-23 and the minimum MCP of ₹. 5.04 /kWh was also observed in June, 2022. In PXIL, the maximum MCP for transaction of electricity was observed in September, 2022 (₹. 5.87 /kWh) and the minimum MCP of ₹. 3.96 /kWh was observed in July, 2022.

The month-wise Maximum, Minimum and Average MCP are shown in **Table 20**:

Month	Minimum MCP (₹/kWh)		Maximum MCP (₹/kWh)		Average MCP (₹/kWh)	
	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2022	4.59	NA	16.26	NA	10.21	NA
May, 2022	4.13	NA	12.00	NA	7.17	NA
Jun, 2022	5.04	NA	12.00	NA	7.60	NA
Jul, 2022	3.76	3.96	7.61	4.50	4.63	4.23
Aug, 2022	3.77	NA	8.16	NA	5.49	NA
Sept, 2022	4.02	5.87	8.65	5.87	5.60	5.87
Oct, 2022	3.40	NA	4.97	NA	4.03	NA
Nov, 2022	4.08	NA	6.08	NA	4.90	NA
Dec, 2022	4.08	NA	6.94	NA	5.32	NA
Jan, 2023	4.13	NA	9.25	NA	6.44	NA
Feb, 2023	4.65	NA	8.81	NA	6.69	NA
Mar, 2023	4.37	NA	7.47	NA	5.62	NA

NA: Not Applicable

Table: 20

The graphical representation of month wise maximum, minimum & average of daily average MCP in IEX under GDAM is displayed in **Figure: 17**

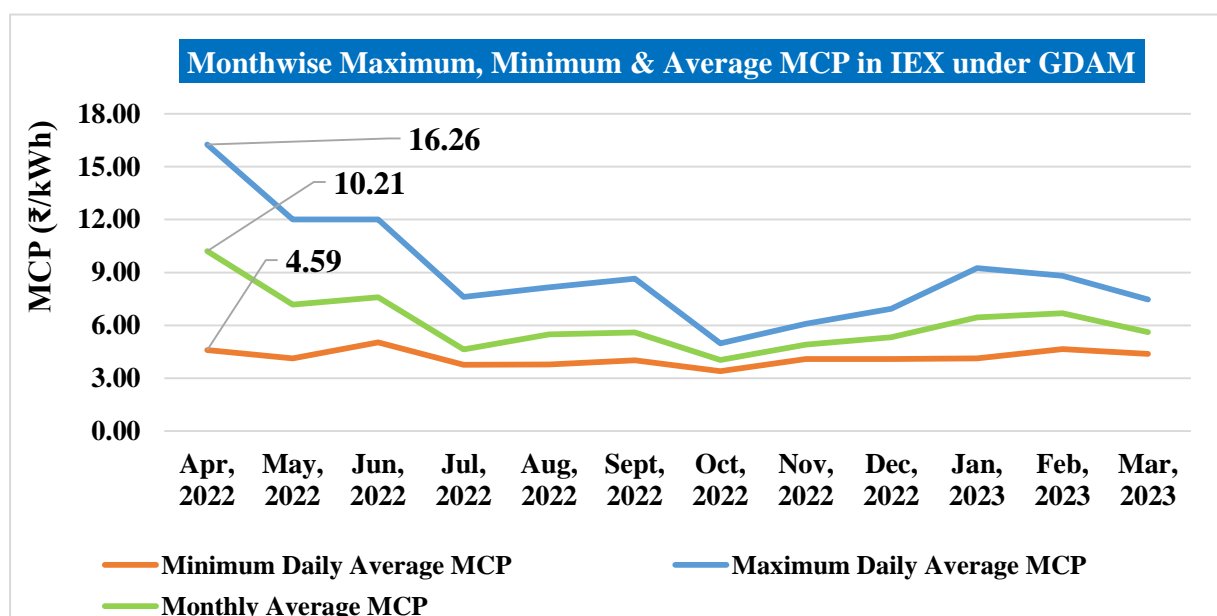


Figure: 17

6. Maximum / Minimum Area Clearing Price (ACP) under GDAM during FY 2022-23

In IEX, the maximum ACP of ₹. 20.00 /kWh was observed in April, 2022 and the minimum ACP of ₹. 1.90 /kWh was observed in August, 2022. In PXIL, maximum ACP of ₹. 5.88 /kWh was observed in September, 2022 and minimum ACP of ₹ 4.19 /kWh was observed in July, 2022.

The month wise Maximum/Minimum ACP are shown in **Table 21**:

Month	IEX		PXIL	
	Min. ACP (₹/kWh)	Max. ACP (₹/kWh)	Min. ACP (₹/kWh)	Max. ACP (₹/kWh)
Apr, 2022	3.65	20.00	NA	NA
May, 2022	3.00	12.00	NA	NA
Jun, 2022	2.97	12.00	NA	NA
Jul, 2022	2.80	12.00	4.19	4.90
Aug, 2022	1.90	12.00	NA	NA
Sept, 2022	2.88	12.00	5.84	5.88
Oct, 2022	2.58	12.00	NA	NA
Nov, 2022	2.71	12.00	NA	NA
Dec, 2022	2.90	12.00	NA	NA
Jan, 2023	2.86	12.00	NA	NA
Feb, 2023	2.99	12.00	NA	NA
Mar, 2023	3.34	12.00	NA	NA

NA: Not Applicable

Table: 21

7. Congestion under Green Day Ahead Market

There was transmission congestion of **0.69 MU** that happened in IEX only in July, 2022 during FY 2022-23 under Green Day Ahead Market. No transmission congestion happened in PXIL during FY 2022-23 under GDAM.

8. Real Time Curtailment under Green Day Ahead Market

There was **no** real time curtailment under Green Day Ahead Market in PXs during FY 2022-23.

CHAPTER- VI**TERM AHEAD MARKET (TAM)****1. Volume of Electricity transacted under TAM on Delivery date basis**

The total volume of electricity transacted in Power Exchanges under TAM on delivery date basis was **21,059 MU** (**10,035 MU** in IEX, **8,237 MU** in PXIL and **2,787 MU** in HPX) with an average MCP of **₹ 7.21/kWh**. In IEX, the maximum volume of **1,189 MU** was transacted in May, 2022 and the minimum volume of **440 MU** was transacted in July, 2022.

In PXIL, the maximum volume of **1,747 MU** was transacted in April, 2022, and the minimum volume of **172 MU** was transacted in November, 2022.

In HPX, the maximum volume of **546 MU** was transacted in February, 2023 and the minimum volume of **91 MU** was transacted in October, 2022. The transaction of electricity in HPX in Term Ahead Market contracts started from July, 2022 onwards.

The month wise TAM transaction details are given in **Table 22** below:

Month	Final Scheduled Volume (MU)				Wt. Average MCP ₹/kWh
	IEX*	PXIL*	HPX*	Total	
Apr, 2022	1,171.50	1,746.86	Transactions in HPX started from July, 2022	2,918.36	10.81
May, 2022	1,188.60	1,157.77		2,346.37	8.91
Jun, 2022	759.03	759.58		1,518.61	6.50
Jul, 2022	439.81	531.89	312.71	1,284.41	5.72
Aug, 2022	722.89	486.80	253.48	1,463.17	5.55
Sept, 2022	875.43	480.06	103.95	1,459.44	6.32
Oct, 2022	523.90	299.40	90.78	914.08	4.15
Nov, 2022	547.33	492.13	155.43	1,194.89	4.88
Dec, 2022	822.47	545.79	232.96	1601.22	5.79
Jan, 2023	918.74	661.11	410.30	1,990.15	7.35
Feb, 2023	978.01	560.69	565.85	2,104.55	7.71
Mar, 2023	1,086.94	514.79	661.69	2,263.42	5.83
Total	10,034.65	8,236.87	2,787.15	21,058.67	
Average	836.22	686.41	309.68	1,754.89	7.21

* The volume shown is inclusive of anyday single sided reverse auction contract and long duration (daily, weekly & monthly) contracts.

Table: 22

The graphical representation of month wise total FSV on delivery date basis under TAM is displayed in **Figure: 18**.

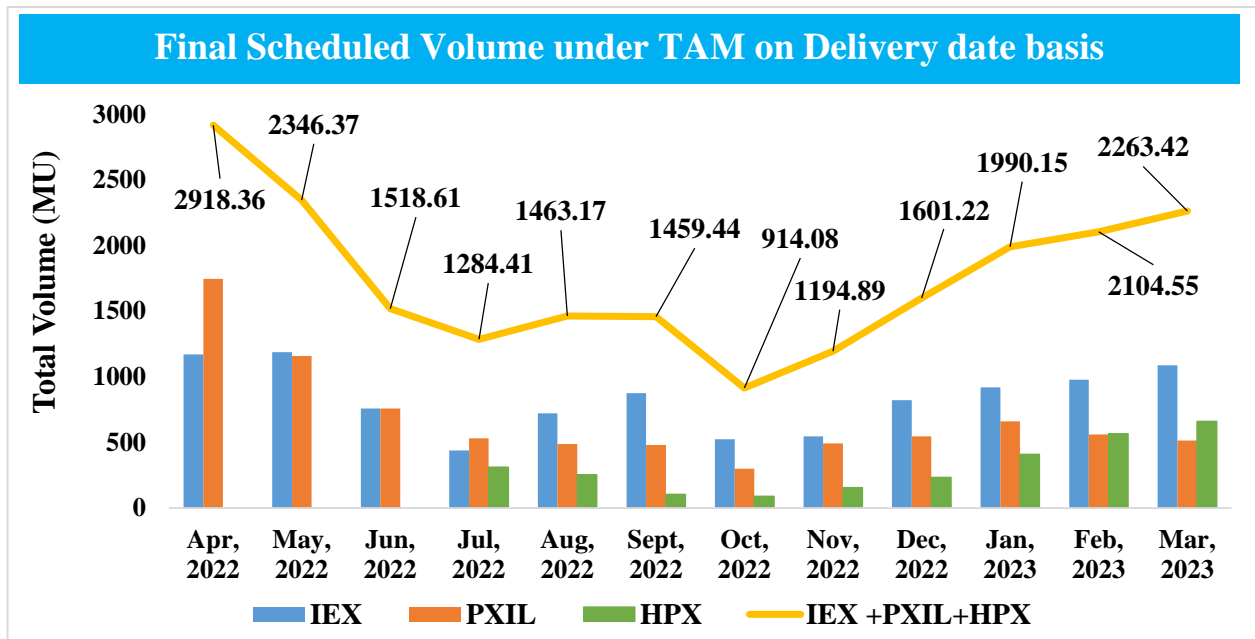


Figure: 18

2. Contract-wise Final Scheduled Volume and Weighted Average MCP under TAM in the Power Exchanges on Delivery date basis

The month wise transaction of electricity (FSV) on PXs in all 4 contracts under term ahead market on delivery date basis is shown below in **Table 23**:

Month	Final Scheduled Volume (MU)				
	Intraday	Day Ahead Contingency	Daily/ Anyday	Weekly	Total
Apr, 2022	35.15	1305.80	1558.69	18.72	2,918.36
May, 2022	20.21	784.09	1523.64	18.43	2,346.37
Jun, 2022	7.45	1348.71	162.45	-	1,518.61
Jul, 2022	6.22	1239.79	4.80	33.60	1,284.41
Aug, 2022	10.64	1330.13	-	122.40	1,463.17
Sept, 2022	13.02	1306.50	28.80	111.12	1,459.44
Oct, 2022	5.15	908.93	-	-	914.08
Nov, 2022	1.51	654.58	144.00	55.20	855.29
Dec, 2022	0.83	1027.08	92.38	100.80	1,221.09
Jan, 2023	5.97	1435.27	90.00	134.40	1,665.64
Feb, 2023	6.45	1780.39	108.00	-	1,894.84
Mar, 2023	0.53	1671.12	20.38	36.74	1,728.77
Total	113.13	14,792.39	3,733.14	631.41	19,270.07

- : No transaction took place

Table: 23

The month wise transaction of electricity (FSV) on PXs in Long Duration Contracts (Daily/Weekly/Monthly) and Anyday Single Sided Reverse Auction under Term Ahead Market on delivery date basis are shown below in **Table 24 & 25** :

Month	Final Scheduled Volume (MU)									Total
	LDC-Daily			LDC-Weekly			LDC-Monthly			
	IEX	PXIL	HPX	IEX	PXIL	HPX	IEX	PXIL	HPX	
Apr, 2022	-	-	-	-	-	-	-	-	-	-
May, 2022	-	-	-	-	-	-	-	-	-	-
Jun, 2022	-	-	-	-	-	-	-	-	-	-
Jul, 2022	-	-	-	-	-	-	-	-	-	-
Aug, 2022	-	-	-	-	-	-	-	-	-	-
Sept, 2022	-	-	-	-	-	-	-	-	-	-
Oct, 2022	-	-	-	-	-	-	-	-	-	-
Nov, 2022	-	42.00	-	-	98.40	-	-	-	-	140.40
Dec, 2022	-	72.00	-	-	36.00	-	4.09	-	-	112.09
Jan, 2023	-	100.80	-	-	16.80	-	37.20	-	-	154.80
Feb, 2023	-	-	-	-	-	-	-	-	-	0.00
Mar, 2023	-	-	-	-	-	-	297.60	-	148.80	446.40
Total	0.00	214.80	0.00	0.00	151.20	0.00	338.89	0.00	148.80	853.69

- : No transaction took place

Table: 24

Month	Final Scheduled Volume (MU)			
	IEX	PXIL	HPX	Total
Apr, 2022	-	-	-	-
May, 2022	-	-	-	-
Jun, 2022	-	-	-	-
Jul, 2022	-	-	-	-
Aug, 2022	-	-	-	-
Sept, 2022	-	-	-	-
Oct, 2022	-	-	-	-
Nov, 2022	19.20	180.00	-	199.20
Dec, 2022	94.30	173.74	-	268.04
Jan, 2023	153.71	16.00	-	169.71
Feb, 2023	189.84	-	19.87	209.71
Mar, 2023	47.70	-	40.55	88.25
Total	504.75	369.74	60.42	934.91

- : No transaction took place

Table: 25

The month wise weighted average MCP for transactions in all 4 contracts under term ahead market on PXs (delivery date basis) are shown below in **Table: 26**

Month	Weighted Average MCP (₹/kWh) for TAM in PXs				
	Intraday	Day Ahead Contingency	Daily/ Anyday	Weekly	Wt. Average
Apr, 2022	13.38	11.07	10.52	12.00	10.81
May, 2022	10.84	8.23	9.16	14.63	8.91
Jun, 2022	10.87	6.63	5.25	NA	6.50
Jul, 2022	11.72	5.74	4.00	4.00	5.72
Aug, 2022	11.19	5.51	0.00	5.49	5.55
Sept, 2022	9.48	6.21	7.00	7.02	6.32
Oct, 2022	7.67	4.13	0.00	NA	4.15
Nov, 2022	5.13	4.99	4.50	4.56	4.88
Dec, 2022	7.64	6.01	4.65	4.61	5.79
Jan, 2023	11.42	7.59	4.85	6.25	7.35
Feb, 2023	11.24	7.73	7.20	NA	7.71
Mar, 2023	7.67	5.62	12.00	11.99	5.83
Average	11.35	6.74	9.10	6.46	7.21

NA: Not Applicable

Table: 26

3. Contract-wise Final Scheduled Volume under TAM in the Power Exchanges on Delivery date basis

(i) Intraday contract

The total volume of electricity transacted in Power Exchanges in Intraday Contract under TAM was **113 MU** (**40 MU** in IEX and **73 MU** in PXIL). In IEX, the maximum volume of electricity of **18 MU** was transacted in April, 2022, and the minimum volume of **0.10 MU** was transacted in December, 2022. In PXIL, the maximum volume of **17 MU** was transacted in April, 2022 and the minimum volume of **0.42 MU** was transacted in March, 2023. No transaction took place in HPX during FY 2022-23 in intraday under TAM.

The month wise details of electricity transacted in Intraday Contract under TAM are tabulated in **Table: 27**.

Month	Final Scheduled Volume in Intraday Contract (MU)			
	IEX	PXIL	HPX	Total
Apr, 2022	18.23	16.92	NA	35.15
May, 2022	6.95	13.26	NA	20.21
Jun, 2022	3.67	3.78	NA	7.45

Month	Final Scheduled Volume in Intraday Contract (MU)			
	IEX	PXIL	HPX	Total
Jul, 2022	1.47	4.75	-	6.22
Aug, 2022	1.60	9.04	-	10.64
Sept, 2022	6.23	6.79	-	13.02
Oct, 2022	-	5.15	-	5.15
Nov, 2022	-	1.51	-	1.51
Dec, 2022	0.10	0.73	-	0.83
Jan, 2023	0.84	5.13	-	5.97
Feb, 2023	0.52	5.93	-	6.45
Mar, 2023	0.11	0.42	-	0.53
Total	39.72	73.41	0.00	113.13

- : No transaction took place

NA: Not Applicable

Table: 27

The month wise plot of FSV (MU) in intraday contract under TAM is displayed in **Figure: 19**

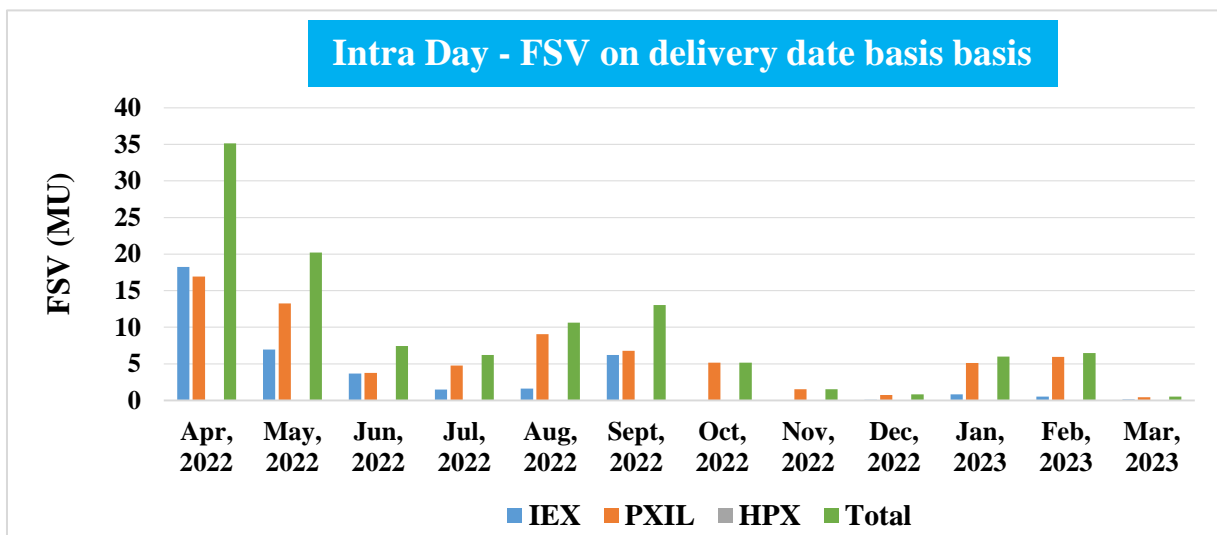


Figure: 19

(ii) Day Ahead Contingency (DAC) Contract

The total volume of electricity transacted in Power Exchanges in **Day Ahead Contingency Contract** under TAM was **14,807 MU** (6,590 MU in IEX, 5,629 MU in PXIL and 2,588 MU in HPX). In IEX, the maximum volume of **729 MU** was transacted in September, 2022 and the minimum volume of **329 MU** was transacted in November, 2022. In PXIL, the maximum volume of **772 MU** was transacted in April, 2022 and the minimum volume of **170 MU** was transacted in November, 2022. In HPX, the maximum volume of **546 MU** was transacted in February, 2023 and the minimum volume of **91 MU** was transacted in October, 2022.

The month wise details of electricity transacted in Day Ahead Contingency Contract under TAM are tabulated in **Table: 28**.

Month	Final Scheduled Volume in Day Ahead Contingency Contract (MU)			
	IEX	PXIL	HPX	Total
Apr, 2022	533.50	772.30	NA	1305.80
May, 2022	449.53	334.56	NA	784.09
Jun, 2022	624.11	724.60	NA	1348.71
Jul, 2022	399.94	527.14	312.71	1239.79
Aug, 2022	598.89	477.76	253.48	1330.13
Sept, 2022	729.28	473.27	103.95	1306.50
Oct, 2022	523.90	294.25	90.78	908.93
Nov, 2022	328.93	170.22	155.43	654.58
Dec, 2022	530.80	263.32	232.96	1027.08
Jan, 2023	502.59	522.38	410.30	1435.27
Feb, 2023	679.65	554.76	545.98	1780.39
Mar, 2023	689.29	514.37	467.46	1671.12
Total	6,590.41	5,628.93	2,587.84	14792.39

- : No transaction took place

NA: Not Applicable

Table: 28

The month wise plot of FSV (MU) in Day Ahead Contingency contract under TAM is displayed in **Figure: 20**

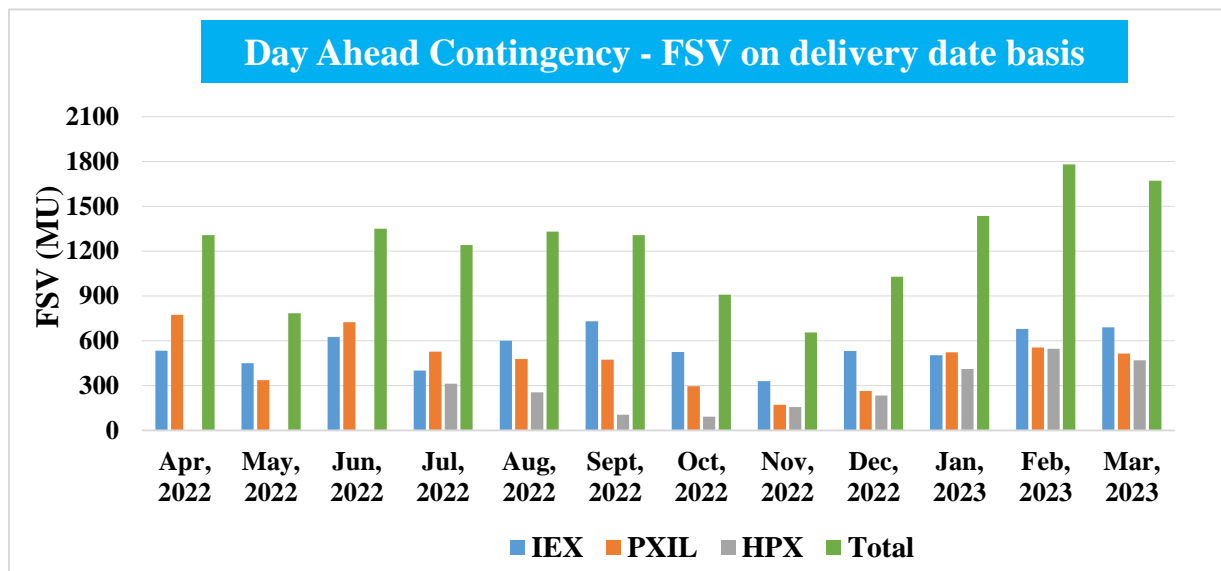


Figure: 20

(iii) Daily/Anyday Contract

The total volume of electricity transacted in Power Exchanges in Any day/Daily Contract under TAM was **3,733 MU** (**1,929 MU** in IEX, **1,799 MU** in PXIL and **4.88 MU** in HPX). In IEX, the maximum volume of **601 MU** was transacted in April, 2022 and the minimum volume

of **4.80 MU** was transacted in July, 2022. In PXIL, the maximum volume of **958 MU** was transacted in April, 2022 and the minimum volume of **31 MU** was transacted in June, 2022. In HPX, transaction of electricity took place only in March, 2023 in Daily contract under TAM during FY 2022-23.

The month wise details of electricity transacted in Daily/Anyday Contract under TAM are tabulated in **Table: 29**

Month	Final Scheduled Volume in Daily/ Anyday Contract (MU)			
	IEX	PXIL	HPX	Total
Apr, 2022	601.05	957.64	NA	1558.69
May, 2022	713.69	809.95	NA	1523.64
Jun, 2022	131.25	31.20	NA	162.45
Jul, 2022	4.80	-	-	4.80
Aug, 2022	-	-	-	0.00
Sept, 2022	28.80	-	-	28.80
Oct, 2022	-	-	-	0.00
Nov, 2022	144.00	-	-	144.00
Dec, 2022	92.38	-	-	92.38
Jan, 2023	90.00	-	-	90.00
Feb, 2023	108.00	-	-	108.00
Mar, 2023	15.50	-	4.88	20.38
Total	1,929.47	1,798.79	4.88	3,733.14

- : No transaction took place

NA: Not Applicable

Table: 29

The month wise plot of FSV (MU) in Daily/Anyday Contract under TAM is displayed in **Figure: 21**

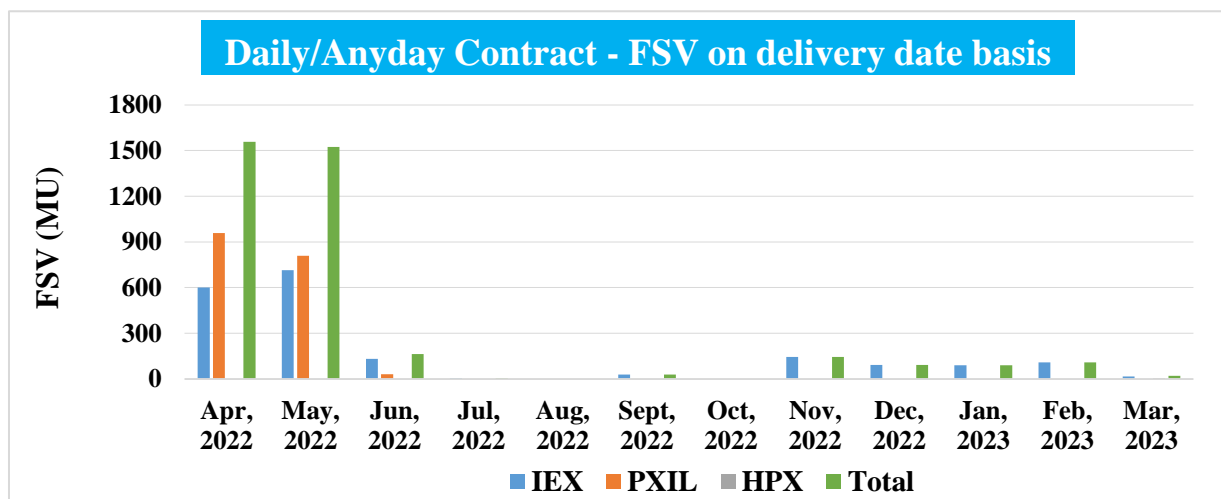


Figure: 21

(iv) Weekly Contract

During the FY 2022-23, transaction of electricity in weekly contract under TAM on delivery date basis took place in IEX only. The month-wise transactions are given below in **Table 30:**

Month	Final Scheduled Volume in Weekly Contract (MU)			
	IEX	PXIL	HPX	Total
Apr, 2022	18.72	-	NA	18.72
May, 2022	18.43	-	NA	18.43
Jun, 2022	-	-	NA	-
Jul, 2022	33.60	-	-	33.60
Aug, 2022	122.40	-	-	122.40
Sept, 2022	111.12	-	-	111.12
Oct, 2022	-	-	-	-
Nov, 2022	55.20	-	-	55.20
Dec, 2022	100.80	-	-	100.80
Jan, 2023	134.40	-	-	134.40
Feb, 2023	-	-	-	-
Mar, 2023	36.74	-	-	36.74
Total	631.41	0.00	0.00	631.41

- : No transaction took place

NA: Not Applicable

Table: 30

The month wise plot of FSV (MU) in Weekly Contract under TAM is displayed in

Figure: 22

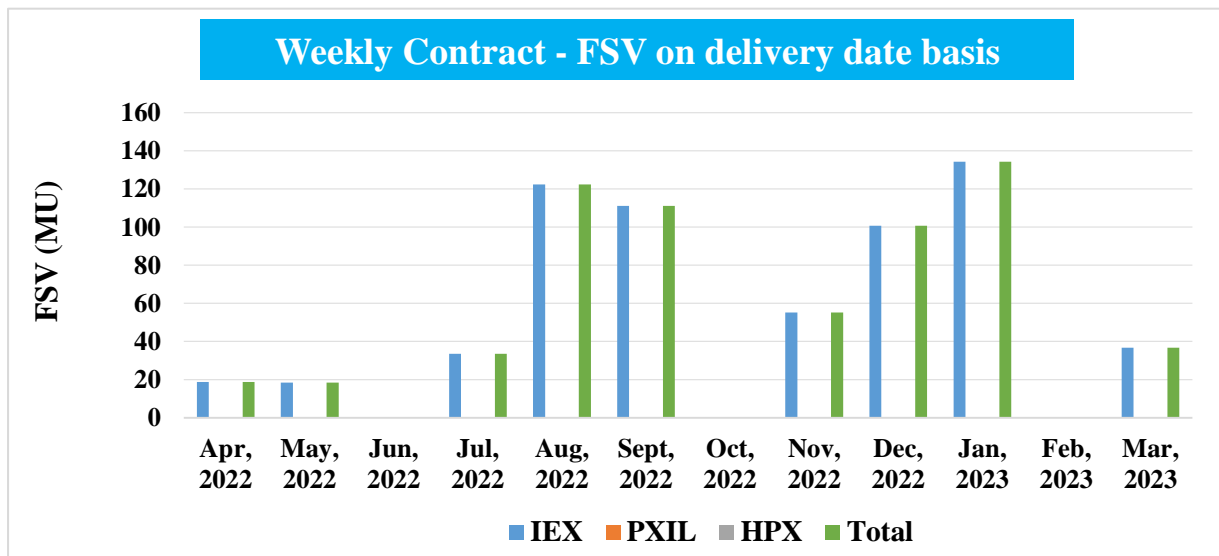


Figure: 22

4. Real Time Curtailment under Term Ahead Market

The total real time curtailment of **133.78 MU** happened in PXs during FY 2022-23. In IEX, real time curtailment of **31.19 MU** (Intraday-0.00 MU, Daily/Any day- 18.35 MU, DAC-18.35 MU & Weekly-3.38 MU) and **0.38 MU** (Anyday Single Sided Reverse Auction) happened under TAM during FY 2022-23. In PXIL, real time curtailment of **89.94 MU** (Intraday- 0.00 MU, Daily/ Any day - 79.19 MU, DAC-23.02 MU & Weekly- 0.00 MU) and **12.27 MU** (Anyday Single Sided Reverse Auction) happened under TAM during FY 2022-23. No real time curtailment happened under TAM in HPX during FY 2022-23.

The month wise and contract wise details of real time curtailment under TAM are tabulated in

Table: 31

Month	IEX Curtailment (MU)				PXIL Curtailment (MU)				Total Curtailment (MU)
	Intraday	Daily	DAC	Weekly	Intraday	Daily	DAC	Weekly	Total
Apr, 2022	0.00	5.15	0.76	0.00	0.00	6.88	15.41	-	28.20
May, 2022	0.00	11.48		1.49	0.29	60.0	1.09	-	74.10
Jun, 2022	0.00	0.00	1.01	-	1.63		3.33	-	4.34
Jul, 2022	0.00	0.00	1.58	0.00	1.44	-	0.00	-	1.58
Aug, 2022	0.00	-	2.01	0.00	0.08	-	0.95	-	2.96
Sept, 2022	0.00	0.00	0.39	0.00	0.00	-	1.75	-	2.14
Oct, 2022	-	0.00	1.37	-	0.00	0.00	0.00	-	1.37
Nov, 2022	-	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00
Dec, 2022	0.00	1.22	0.19	0.00	0.00	-	0.00	-	1.41
Jan, 2023	0.00	0.00	0.00	0.00	0.00	0.00	0.49	-	0.49
Feb, 2023	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00
Mar, 2023	0.00	0.12	2.53	1.89	0.00	0.00	0.00	-	4.54
Total	0.00	17.97	9.84	3.38	0.00	66.92	23.02	-	121.13
		31.19				89.94			

- : No transaction took place

Table: 31

The month wise details of real time curtailment in Daily/Anyday Contract is displayed in **Figure: 23**

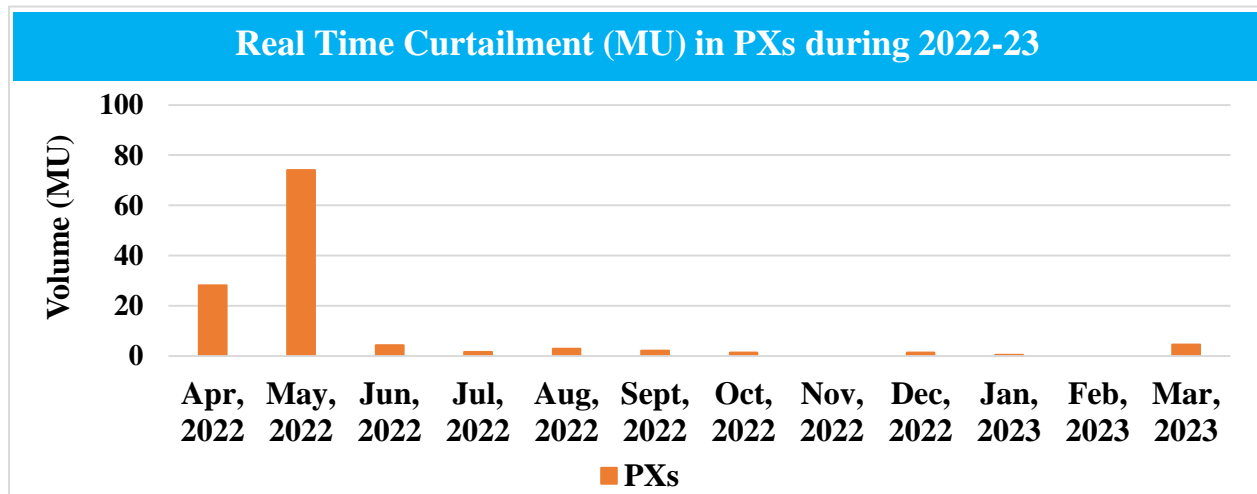


Figure: 23

5. Congestion under Term Ahead Market in IEX

The total transmission congestion of **319.15 MU** happened in IEX under TAM during FY 2022-23.

The month wise details of transmission congestion in IEX under TAM are tabulated in **Table: 32**

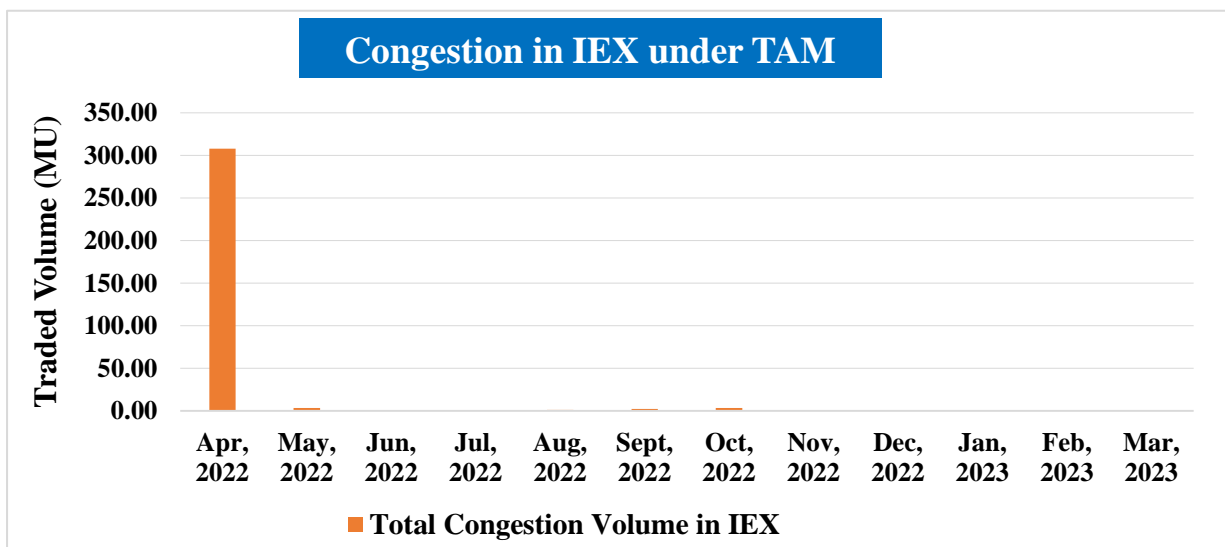
Month	Congestion in IEX under TAM								
	Intraday		DAC		Any Day/ Daily		Weekly		Total
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	
Apr, 2022	0.66	4 days	2.66	5 days	298.42	10 days	6.24	1 day	307.98
May, 2022	3.60	1 day	0.00	NA	0.00	NA	0.00	NA	3.60
Jun, 2022	0.00	NA	0.29	2 days	0.00	NA	-	NA	0.29
Jul, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00
Aug, 2022	0.01	1 day	1.13	4 days	-	NA	0.00	NA	1.14
Sept, 2022	0.18	1 day	1.94	3 days	0.00	NA	0.00	NA	2.12
Oct, 2022	-	NA	3.34	4 days	-	NA	-	NA	3.34
Nov, 2022	-	NA	0.00	NA	0.00	NA	0.00	NA	0.00
Dec, 2022	0.00	NA	0.19	1 day	0.00	NA	0.00	NA	0.19
Jan, 2023	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00
Feb, 2023	0.00	NA	0.49	1 day	0.00	NA	-	NA	0.49
Mar, 2023	0.00	NA	0.00	NA	0.00	NA	0.00	NA	0.00
Total	4.45	7 days	10.04	20 days	298.42	10 days	6.24	1 day	319.15

- : No transaction took place

NA: Not Applicable

Table: 32

The month wise plot of Congestion in IEX under TAM is displayed in **Figure: 24**

**Figure: 24**

6. Congestion under Term Ahead Market in PXIL

The total transmission congestion of **0.07 MU** happened in PXIL under TAM during FY 2022-23.

The month wise details of transmission congestion in PXIL under TAM are tabulated in **Table: 33**

Month	Congestion in IEX under TAM								
	Intraday		DAC		Any Day/ Daily		Weekly		Total
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	
Apr, 2022	0.00	NA	0.00	NA	0.00	NA	-	NA	0.00
May, 2022	0.00	NA	0.00	NA	0.00	NA	-	NA	0.00
Jun, 2022	0.00	NA	0.00	NA	0.00	NA	-	NA	0.00
Jul, 2022	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Aug, 2022	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Sept, 2022	0.00	NA	0.07	2 days	-	NA	-	NA	0.07
Oct, 2022	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Nov, 2022	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Dec, 2022	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Jan, 2023	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Feb, 2023	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Mar, 2023	0.00	NA	0.00	NA	-	NA	-	NA	0.00
Total	0.00	NA	0.07	2 days	0.00	NA	-	NA	0.07

- : No transaction took place

NA: Not Applicable

Table: 33

7. Congestion under Term Ahead Market in HPX

No transmission congestion happened in HPX under TAM during FY 2022-23.

8. Contract-wise Prices (₹. /kWh) on Delivery date basis under TAM during FY 2022-23

The month wise and contract wise prices of electricity transacted under TAM during FY 2022-23 on delivery date basis are tabulated in Table: 34.

Month	Intraday			Day Ahead Contingency			Daily/ Anyday Contract			Weekly Contract		
	IEX	PXIL	HPX	IEX	PXIL	HPX	IEX	PXIL	HPX	IEX	PXIL	HPX
Apr, 2022	13.21	13.57	NA	11.03	11.09	NA	9.57	10.20	NA	12.00	NA	NA
May, 2022	11.44	10.53	NA	8.92	7.31	NA	9.12	9.20	NA	14.63	NA	NA
Jun, 2022	10.59	11.14	NA	6.31	6.90	NA	5.10	5.87	NA	NA	NA	NA
Jul, 2022	11.93	11.65	NA	5.20	5.98	6.02	4.00	NA	NA	4.00	NA	NA
Aug, 2022	9.33	11.52	NA	5.74	5.30	5.37	NA	NA	NA	5.49	NA	NA
Sept, 2022	9.91	9.08	NA	6.26	5.93	7.16	7.00	NA	NA	7.02	NA	NA
Oct, 2022	NA	7.67	NA	4.08	4.30	3.85	NA	NA	NA	NA	NA	NA
Nov, 2022	NA	5.13	NA	4.83	5.29	4.98	4.50	NA	NA	4.56	NA	NA
Dec, 2022	5.51	7.93	NA	6.06	6.27	5.60	4.65	NA	NA	4.61	NA	NA
Jan, 2023	12.00	11.32	NA	7.14	7.57	8.17	4.85	NA	NA	6.25	NA	NA
Feb, 2023	10.35	11.32	NA	7.51	7.68	8.04	7.20	NA	NA	NA	NA	NA
Mar, 2023	11.28	6.72	NA	5.72	5.53	5.57	12.00	NA	12.00	11.99	NA	NA
Average (2022-23)	10.56	9.80	NA	6.57	6.60	6.08	6.80	8.42	12.00	7.84	NA	NA

NA: Not Applicable

Table: 34

The month wise movement of prices in Intraday, Day Ahead Contingency, Daily/Anyday and Weekly Contracts on delivery date basis is displayed in **Figures: 25, 26, 27 & 28**

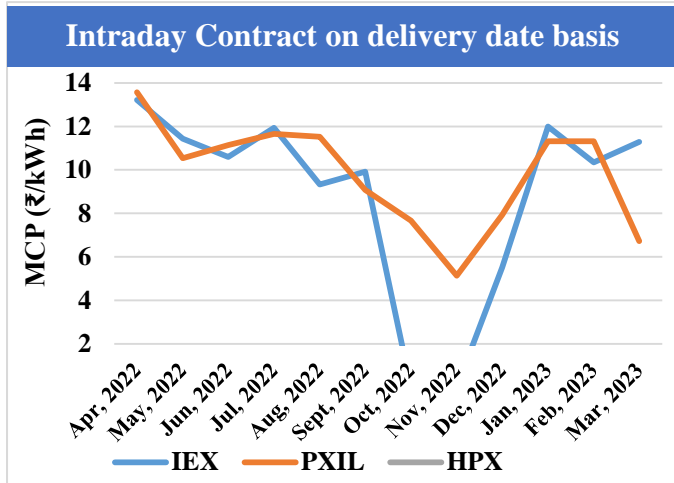


Figure 25

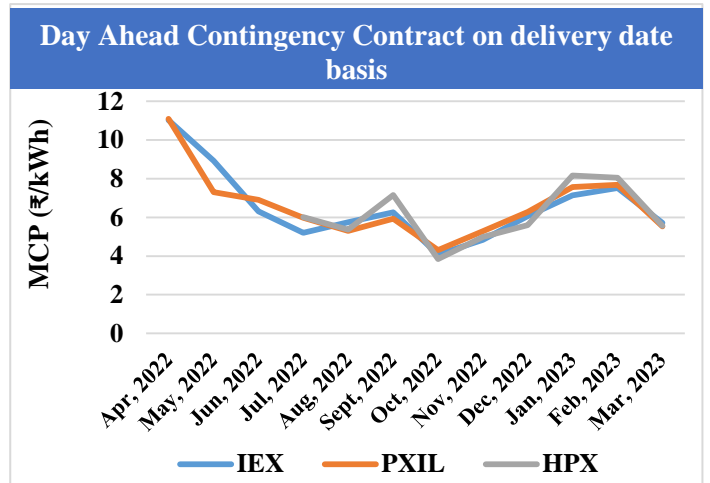


Figure 26

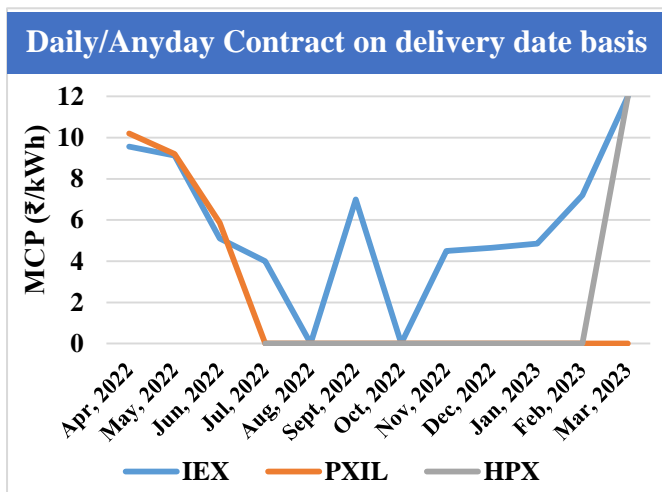


Figure: 27

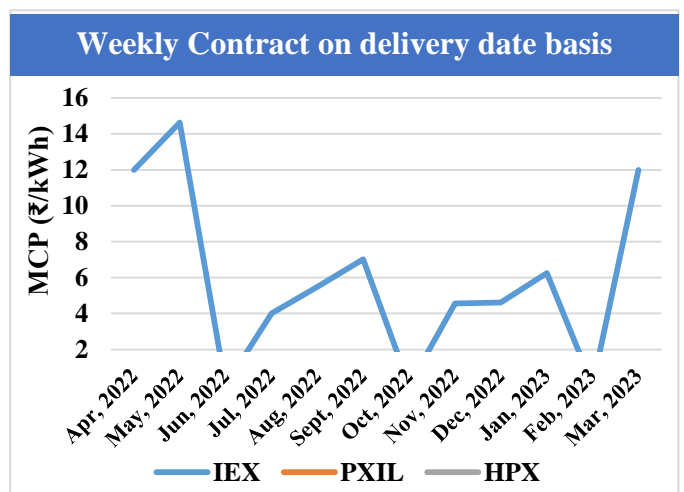


Figure: 28

9. Average Market Clearing Price (MCP) of Electricity transacted in IEX, PXIL & HPX under Term Ahead Market (TAM) during FY 2022-23 (on Delivery date basis)

The Average Market Clearing Price of electricity on delivery date basis transacted under TAM during FY 2022-23 is tabulated in **Table: 35**.

TAM MCP (₹./kWh)	IEX	PXIL	HPX
FY 2022-23	7.02	7.68	6.51

Table: 35

CHAPTER- VII**GREEN TERM AHEAD MARKET (GTAM)****1. Volume of Electricity transacted under GTAM on Delivery date basis**

The total volume of electricity transacted in the Power Exchanges under GTAM during FY 2022-23 was **2,560 MU** (**1,392 MU** in IEX, **1,097 MU** in PXIL and **70.96 MU** in HPX) with an average MCP of **₹ 6.57/kWh**. Out of this, the total volume transacted under Solar segment was **526 MU**, in Non Solar segment was **1,557 MU** and in Hydro segment was **477 MU**. Under the GTAM (Solar) segment, the maximum volume of **202 MU** was transacted in April, 2022 and the minimum volume of **0.20 MU** was transacted in January, 2023. Under the GTAM (Non-Solar) segment, the maximum volume of **394 MU** was transacted in February, 2022 and the minimum volume of **36 MU** was transacted in October, 2022. Under the GTAM (Hydro) segment the maximum volume of **96 MU** was transacted in September, 2022 and the minimum volume of **4 MU** was transacted in May, 2022. The majority of transactions in GTAM happened under Day Ahead Contingency Contract (**88.92 %**) on delivery date basis.

The month wise GTAM transaction details under solar, non-solar and hydro segments on delivery date basis are given in **Table: 36**

Month	Final Scheduled Volume (MU)				Wt. Average MCP (₹ /kWh)
	GTAM (Solar)	GTAM (Non Solar)	GTAM (Hydro)	Total	
Apr, 2022	202.05	127.39	-	329.44	8.81
May, 2022	142.46	393.68	3.54	539.68	7.85
Jun, 2022	38.40	148.22	45.27	231.89	6.31
Jul, 2022	36.56	89.51	67.81	193.88	5.87
Aug, 2022	38.11	52.77	86.05	176.93	4.86
Sept, 2022	19.54	39.75	95.90	155.19	5.77
Oct, 2022	17.57	35.93	77.71	131.21	4.12
Nov, 2022	24.42	102.13	36.26	162.81	4.96
Dec, 2022	6.87	187.93	25.60	220.40	5.57
Jan, 2023	0.20	110.23	14.37	124.80	6.62
Feb, 2023	-	143.62	9.53	153.15	6.99
Mar, 2023	-	125.98	14.51	140.49	5.98
Total	526.18	1,557.14	476.55	2,559.87	
Average	52.62	129.76	43.32	213.32	6.57

- : No transaction took place

Table: 36

The graphical representation of GTAM transaction details under solar and non-solar segments on delivery date basis is displayed below in **Figure: 29**

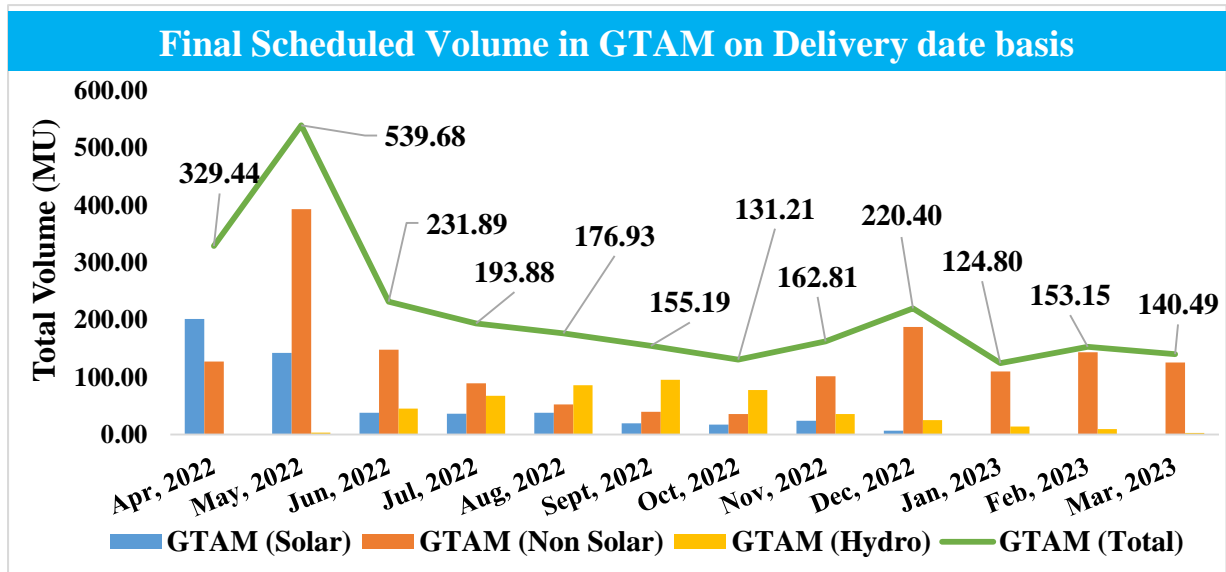


Figure: 29

2. Volume (MU) and Prices (₹./kWh) for Solar, Non Solar and Hydro segments under GTAM on Delivery date basis during FY 2022-23

The month wise GTAM transaction details for IEX, PXIL and HPX under solar, non-solar and hydro segments on delivery date basis are given in **Table -37** below:

Month	Final Scheduled Volume (MU)									Total
	IEX			PXIL			HPX			
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	
Apr, 2022	37.60	83.17	-	164.45	44.22	-	-	-	-	329.44
May, 2022	34.11	115.04	3.54	108.35	278.64	-	-	-	-	539.68
Jun, 2022	13.33	112.56	45.27	25.07	35.66	-	-	-	-	231.89
Jul, 2022	24.65	49.81	67.81	11.91	39.70	-	-	-	-	193.88
Aug, 2022	17.82	17.16	80.60	20.29	35.61	5.45	-	-	-	176.93
Sept, 2022	15.61	18.20	95.90	3.93	21.55	-	-	-	-	155.19
Oct, 2022	14.24	6.40	77.71	3.33	29.53	-	-	-	-	131.21
Nov, 2022	11.85	27.68	36.26	12.57	74.45	-	-	-	-	162.81
Dec, 2022	6.67	104.30	25.60	0.20	66.94	-	-	16.69	-	220.4
Jan, 2023	-	46.98	14.37	-	44.84	-	0.20	18.41	-	124.8
Feb, 2023	-	81.44	9.53	-	39.29	-	-	22.89	-	153.15
Mar, 2023	-	94.05	2.87	-	30.80	-	-	1.13	-	140.49*
Total	175.88	756.79	459.46	350.10	741.23	5.45	0.20	59.12	0.00	2,559.87*
	1,392.13			1,096.78			70.96			

- : No transaction took place

* The volume shown is inclusive of anyday single sided reverse auction contract and long duration (daily, weekly & monthly) contracts.

Table: 37

In the month of March, 2023, transaction of **11.64 MU** (**7.44 MU** in Non-Solar and **4.20 MU** in Hydro) of electricity took place in HPX under Anyday Single Sided Reverse Auction contract under GTAM.

The month wise and contract wise final scheduled volume (MU) of solar, non-solar and hydro transaction of electricity under GTAM during FY 2022-23 on delivery date basis are tabulated in **Table: 38**.

Month	Intraday (MU)			Day Ahead Contingency (MU)			Daily/Anyday Contract (MU)			Weekly Contract (MU)		
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro
Apr, 2022	-	0.20	-	183.64	112.45	NA	18.41	14.74	-	-	-	-
May, 2022	-	1.35	-	120.48	223.50	3.54	21.98	168.83	-	-	-	-
Jun, 2022	-	-	-	36.00	148.22	45.27	2.4	-	-	-	-	-
Jul, 2022	-	-	1.75	36.56	89.11	66.06	-	-	-	-	0.40	-
Aug, 2022	1.16	-	0.03	36.95	50.84	86.02	-	-	-	-	1.93	-
Sept, 2022	-	-	-	15.64	38.95	95.90	3.9	-	-	-	0.80	-
Oct, 2022	-	-	-	9.47	34.13	77.71	3.9	1.80	-	4.20	-	-
Nov, 2022	-	-	-	13.92	99.97	36.26	10.5	2.16	-	-	-	-
Dec, 2022	-	-	-	6.87	187.93	25.60	-	-	-	-	-	-
Jan, 2023	-	-	-	0.20	104.66	14.37	-	5.57	-	-	-	-
Feb, 2023	-	-	-	NA	139.42	9.53	-	4.20	-	-	-	-
Mar, 2023	-	0.35	-	NA	124.14	2.87	-	1.49	-	-	-	-
Total	1.16	1.90	1.78	459.73	1,353.32	463.13	61.09	198.79	0.00	4.20	3.13	0.00

- : No transaction took place

Table: 38

The month wise and contract wise prices of solar, non-solar and hydro transaction of electricity under GTAM during FY 2022-23 on delivery date basis are tabulated in **Table: 39**.

Month	Intraday (₹/kWh)			Day Ahead Contingency (₹/kWh)			Daily/Anyday Contract (₹/kWh)			Weekly Contract (₹/kWh)		
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro
Apr, 2022	NA	12.00	NA	8.03	10.45	NA	9.96	10.82	NA	NA	NA	NA
May, 2022	NA	6.41	NA	6.15	8.00	4.37	8.11	8.89	NA	NA	NA	NA
Jun, 2022	NA	NA	NA	4.27	8.10	7.45	4.60	NA	NA	NA	NA	NA
Jul, 2022	NA	NA	10.77	3.44	6.26	5.11	NA	NA	NA	NA	5.80	NA
Aug, 2022	3.10	NA	3.72	3.80	5.65	5.21	NA	NA	NA	NA	5.80	NA

Sept, 2022	NA	NA	NA	4.22	6.32	5.78	4.55	NA	NA	NA	5.70	NA
Oct, 2022	NA	NA	NA	3.23	4.70	3.95	4.50	5.70	NA	4.50	NA	NA
Nov, 2022	NA	NA	NA	5.04	5.19	4.98	4.50	5.73	NA	NA	NA	NA
Dec, 2022	NA	NA	NA	5.50	5.26	4.98	NA	NA	NA	NA	NA	NA
Jan, 2023	NA	NA	NA	7.28	6.57	8.58	NA	5.82	NA	NA	NA	NA
Feb, 2023	NA	NA	NA	NA	6.82	9.93	NA	6.30	NA	NA	NA	NA
Mar, 2023	NA	4.83	NA	NA	6.10	7.26	NA	6.80	NA	NA	NA	NA
Average (2022-23)	3.10	7.75	7.25	5.10	6.62	6.15	6.04	7.15	NA	4.50	5.77	NA

NA: Not applicable

Table: 39

3. Contract-wise Final Scheduled Volume under GTAM in the Power Exchanges on Delivery date basis

(i) Intraday contract

The total volume of electricity transacted in the Power Exchanges in Intraday Contract under GTAM for solar, non-solar and hydro segments was **4.84 MU** (**3.14 MU** in IEX and **1.70 MU** in PXIL). No transaction took place in HPX under intraday contract in GTAM. In IEX, the maximum volume of **1.16 MU** was transacted in August, 2022 under the solar segment and the minimum volume of **0.03 MU** was transacted in August, 2022 under the non-solar segment. In PXIL, the maximum volume of **1.35 MU** was transacted in May, 2022 under the non-solar segment and the minimum volume of **0.35 MU** was transacted in March, 2023 under the non-solar segment.

The month wise details of electricity transacted in Intraday Contract under solar, non-solar and hydro segments in GTAM are tabulated in **Table: 40**.

Month	Final Scheduled Volume in Intraday Contract (MU)									Total
	IEX			PXIL			HPX			
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	
Apr, 2022	-	0.20	-	-	-	-	-	-	-	0.20
May, 2022	-	-	-	-	1.35	-	-	-	-	1.35
Jun, 2022	-	-	-	-	-	-	-	-	-	0.00
Jul, 2022	-	-	1.75	-	-	-	-	-	-	1.75
Aug, 2022	1.16	-	0.03	-	-	-	-	-	-	1.19
Sept, 2022	-	-	-	-	-	-	-	-	-	0.00
Oct, 2022	-	-	-	-	-	-	-	-	-	0.00
Nov, 2022	-	-	-	-	-	-	-	-	-	0.00
Dec, 2022	-	-	-	-	-	-	-	-	-	0.00

Month	Final Scheduled Volume in Intraday Contract (MU)									
	IEX			PXIL			HPX			Total
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	
Jan, 2023	-	-	-	-	-	-	-	-	-	0.00
Feb, 2023	-	-	-	-	-	-	-	-	-	0.00
Mar, 2023	-	-	-	-	0.35	-	-	-	-	0.35
Total	1.16	0.20	1.78	0.00	1.70	0.00	0.00	0.00	0.00	4.84

- : No transaction took place

Table: 40

(ii) Day Ahead Contingency (DAC) Contract

The total volume of electricity transacted in the Power Exchanges in Day Ahead Contingency Contract under GTAM for solar, non-solar and hydro segments was **2,276 MU** (**1,253 MU** in IEX, **964 MU** in PXIL and **59 MU** in HPX). In IEX, the maximum volume of **113 MU** was transacted in June, 2022 under the non-solar segment and the minimum volume of **3 MU** was transacted in March, 2023 under the hydro segment. In PXIL, the maximum volume of **164 MU** was transacted in April, 2022 under the solar segment and the minimum volume of electricity of **0.20 MU** was transacted in December, 2022 under the solar segment. In HPX, the maximum volume of **23 MU** was transacted in April, 2022 under the non-solar segment and the minimum volume of **1.13 MU** was transacted in March, 2023 under the non-solar segment.

The month wise details of electricity transacted in Day Ahead Contingency Contract under solar, non-solar and hydro segments in GTAM are tabulated in **Table: 41**.

Month	Final Scheduled Volume in Day Ahead Contingency Contract (MU)												
	IEX				PXIL				HPX				Total
	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	
Apr, 2022	20.12	68.55	-	88.67	163.52	43.9	-	207.42					296.09
May, 2022	28.11	60.24	-	91.89	92.37	163.26	-	255.63					347.52
Jun, 2022	10.93	112.56	-	168.76	25.07	35.66	-	60.73	-	-	-		229.49
Jul, 2022	24.65	49.41	66.06	140.12	11.91	39.7	-	51.61	-	-	-	0	191.73
Aug, 2022	16.66	15.23	80.57	112.46	20.29	35.61	5.45	61.35	-	-	-	0	173.81
Sept, 2022	11.71	17.4	95.90	125.01	3.93	21.55	-	25.48	-	-	-	0	150.49
Oct, 2022	6.14	4.6	77.71	88.45	3.33	29.53	-	32.86	-	-	-	0	121.31
Nov, 2022	1.35	25.52	36.26	63.13	12.57	74.45	-	87.02	-	-	-	0	150.15
Dec, 2022	6.67	104.3	25.60	136.57	0.20	66.94	-	67.14	-	16.69	-	16.69	220.40
Jan, 2023	-	41.41	14.37	55.78	-	44.84	-	44.84	-	18.41	-	18.61	119.23
Feb, 2023	-	77.24	9.53	86.77	-	39.29	-	39.29	-	22.89	-	22.89	148.95
Mar, 2023	-	92.56	2.87	95.43	-	30.45	-	30.45	-	1.13	-	1.13	127.01

Final Scheduled Volume in Day Ahead Contingency Contract (MU)													
Month	IEX				PXIL				HPX				Total
	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	
Total	126.34	669.02	457.68	1,253.04	333.19	625.18	5.45	963.82	0.20	59.12	0.00	59.32	2,276.18

- : No transaction took place

Table: 41

The month wise plot of Final Scheduled Volume (MU) in Day Ahead Contingency contract on delivery date basis under GTAM is displayed in **Figure: 30**

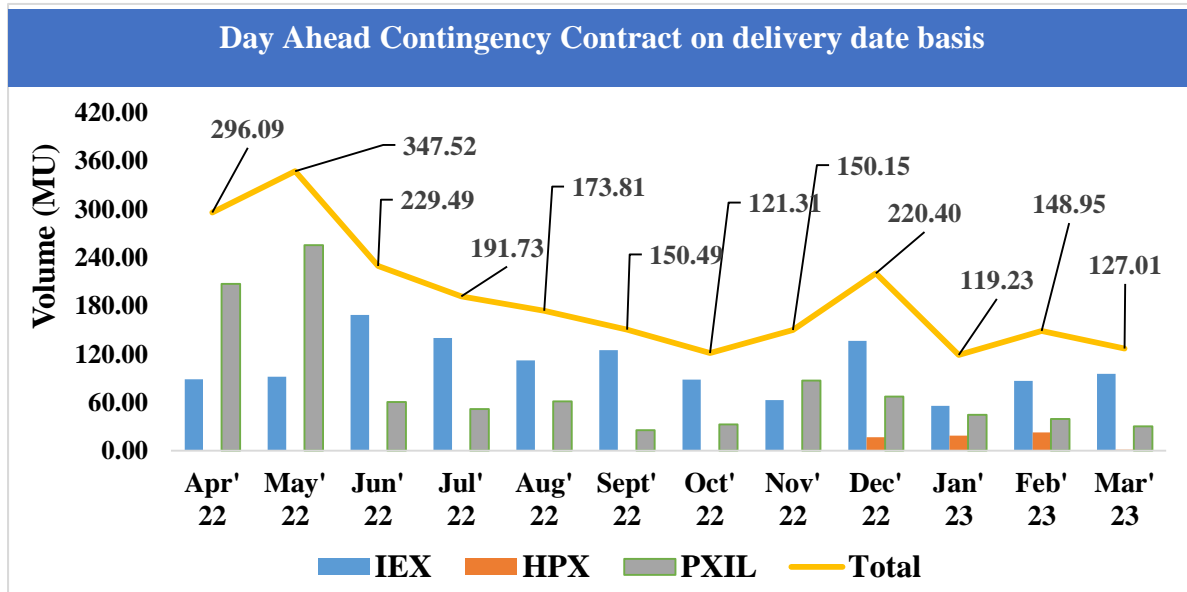


Figure: 30

(iii) Daily/Anyday Contract

The total volume of electricity transacted in the Power Exchanges in Daily/Anyday Contract under GTAM for solar, non-solar and hydro segments was **260 MU** (129 MU in IEX, **131 MU** in PXIL and no transaction took place in HPX). In IEX, the maximum volume of **54.80 MU** was transacted in May, 2022 under the non-solar segment and the minimum volume of **1.49 MU** was transacted in March, 2023 under the non-solar segment. In PXIL, the maximum volume of **114.03 MU** was transacted in May, 2022 under the non-solar segment and the minimum volume of electricity of **0.32 MU** was transacted in April, 2022 under the non-solar segment.

The month wise details of electricity transacted in Daily/Anyday Contract under solar, non-solar and hydro segments under GTAM are tabulated in **Table: 42**

Final Scheduled Volume in Day Ahead Contingency Contract (MU)													
Month	IEX				PXIL				HPX				Total
	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	
Apr, 2022	17.48	14.42	-	31.90	0.93	0.32	-	1.25	-	-	-	0.00	33.15
May, 2022	6.00	54.80	-	60.80	15.98	114.03	-	130.01	-	-	-	0.00	190.81
Jun, 2022	2.40	-	-	2.40	-	-	-	0.00	-	-	-	0.00	2.40

Final Scheduled Volume in Day Ahead Contingency Contract (MU)													
Month	IEX				PXIL				HPX				Total
	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	Solar	Non Solar	Hydro	Total	
Jul, 2022	-	-	-	0.00	-	-	-	0.00	-	-	-	0.00	0.00
Aug, 2022	-	-	-	0.00	-	-	-	0.00	-	-	-	0.00	0.00
Sept, 2022	3.90	-	-	3.90	-	-	-	0.00	-	-	-	0.00	3.90
Oct, 2022	3.90	1.80	-	5.70	-	-	-	0.00	-	-	-	0.00	5.70
Nov, 2022	10.50	2.16	-	12.66	-	-	-	0.00	-	-	-	0.00	12.66
Dec, 2022	-	-	-	0.00	-	-	-	0.00	-	-	-	0.00	0.00
Jan, 2023	-	5.57	-	5.57	-	-	-	0.00	-	-	-	0.00	5.57
Feb, 2023	-	4.20	-	4.20	-	-	-	0.00	-	-	-	0.00	4.20
Mar, 2023	-	1.49	-	1.49	-	-	-	0.00	-	-	-	0.00	1.49
Total	44.18	84.44	0.00	128.62	16.91	114.35	0.00	131.26	0.00	0.00	0.00	0.00	259.88

- : No transaction took place

Table: 42

(iv) Weekly Contract

The total volume of electricity transacted in the Power Exchanges in Weekly Contract under GTAM for solar, non-solar and hydro segments was **7.33 MU** (**7.33 MU** in IEX only). In IEX, the maximum volume of **4.20 MU** was transacted in October, 2022 under the solar segment and the minimum volume of **0.40 MU** was transacted in July, 2022 under the non-solar segment. Whereas, no transaction of electricity happened in PXIL and HPX.

The month wise details of electricity transacted in Weekly Contract under solar, non-solar and hydro segments under GTAM are tabulated in **Table: 43**

Final Scheduled Volume in Weekly Contract (MU)										
Month	IEX			PXIL			HPX			Total
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	
Apr, 2022	-	-	-	-	-	-	-	-	-	0.00
May, 2022	-	-	-	-	-	-	-	-	-	0.00
Jun, 2022	-	-	-	-	-	-	-	-	-	0.00
Jul, 2022	-	0.40	-	-	-	-	-	-	-	0.40
Aug, 2022	-	1.93	-	-	-	-	-	-	-	1.93
Sept, 2022	-	0.80	-	-	-	-	-	-	-	0.80
Oct, 2022	4.20	-	-	-	-	-	-	-	-	4.20
Nov, 2022	-	-	-	-	-	-	-	-	-	0.00
Dec, 2022	-	-	-	-	-	-	-	-	-	0.00
Jan, 2023	-	-	-	-	-	-	-	-	-	0.00
Feb, 2023	-	-	-	-	-	-	-	-	-	0.00

Month	Final Scheduled Volume in Weekly Contract (MU)									Total
	IEX			PXIL			HPX			
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	
Mar, 2023	-	-	-	-	-	-	-	-	-	0.00
Total	4.20	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.33

- : No transaction took place

Table: 43

4. Real Time Curtailment under GTAM (Solar, Non Solar & Hydro segments)

The total real time curtailment of **4.79 MU** took place under GTAM during FY 2022-23 (i.e. **4.69 MU** in Day Ahead Contingency contract in Non-Solar segment in PXIL & **0.10 MU** in Day Ahead Contingency contract in Hydro segment in IEX). No real time curtailment happened in Solar segment under GTAM in IEX, PXIL & HPX.

5. Congestion under GTAM (Solar, Non Solar & Hydro segments)

The total transmission congestion of **1.15 MU** took place under GTAM during FY 2022-23 (i.e. **0.57 MU** in Solar segment, **0.48 MU** in Non-Solar segment & **0.10 MU** in Hydro segment under Day Ahead Contingency contract in IEX). No transmission congestion took place in PXIL and HPX during FY 2022-23 under GTAM.

6. Average Market Clearing Price (MCP) of Electricity transacted in PXs under Green Term Ahead Market (GTAM) during FY 2022-23 (on Delivery date basis)

The Average Market Clearing Price of electricity on delivery date basis transacted under GTAM under Solar and Non Solar segments during FY 2022-23 is tabulated in **Table: 44**

GTAM MCP (₹./kWh)	IEX			PXIL			HPX		
	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro	Solar	Non Solar	Hydro
FY 2022-23	4.45	7.77	6.70	7.89	7.85	NA	7.28	6.54	NA

Table: 44

CHAPTER-VIII**BILATERAL TRANSACTIONS AND DEVIATIONS****1. Volume of Electricity transacted through Bilateral transactions**

The total volume of electricity transacted through Bilateral transactions during FY 2022-23 was **89,146.04 MU**. The total buy volume of electricity transacted in bilateral market through direct transactions and trader during FY 2022-23 were **29,512.35 MU** and **57,103.01 MU**, respectively. The details of Bilateral transactions of electricity during FY 2022-23 is shown in **Table: 45 & 46**.

Month	Direct (MU)	Traders (MU)	Total Bilateral Transaction (MU)
Apr, 2022	1,548.30	6,044.05	7,592.35
May, 2022	1,820.14	6,416.88	8,237.02
Jun, 2022	2,530.69	5,410.06	7,940.75
Jul, 2022	2,735.36	5,210.74	7,946.10
Aug, 2022	3,042.02	4,820.83	7,862.84
Sept, 2022	3,155.38	4,856.35	8,011.73
Oct, 2022	2,113.16	2,888.17	5,001.33
Nov, 2022	2,133.41	2,904.68	5,038.09
Dec, 2022	3,102.21	3,623.63	6,725.84
Jan, 2023	3,376.11	3,899.57	7,275.68
Feb, 2023	3,305.62	4,352.20	7,657.82
Mar, 2023	3,180.64	6,675.85	9,856.49
Total	29,512.35	57,103.01	89,146.04

Table: 45**2. Region-wise Volume (MU)**

Month	ER		WR		NR		SR		NER	
	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)
Apr, 2022	296.09	957.72	822.33	1810.2	219.57	597.88	210.31	2655.83	-	22.43
May, 2022	310.12	998.83	878.56	2159.27	538.42	1676.34	93.03	1582.21	-	0.23
Jun, 2022	326.38	884.13	687.26	1882.29	1494.26	2450.14	22.79	192.47	-	1.04
Jul, 2022	253.05	960.22	507.59	1085.62	1921.08	3088.21	53.63	51.4	-	25.3
Aug, 2022	279.53	1041.01	536.7	721.46	1954.07	2841.12	271.71	140.1	-	77.14
Sept, 2022	304.86	871.93	610.55	1123.95	1939.57	2337.94	292.23	427.76	8.17	94.78
Oct, 2022	45.99	345.47	1231.15	1312.12	723.72	821.28	112.31	112.31	-	73.65
Nov, 2022	46.21	344.50	1244.85	1317.84	726.81	827.58	115.54	340.88	-	73.88

Month	ER		WR		NR		SR		NER	
	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)	Direct (MU)	Trader (MU)
Dec, 2022	119.68	243.81	1708.18	1398.66	1141.2	1057.14	133.11	752.06	-	171.97
Jan, 2023	190.91	151.63	1769.7	1000.89	1133.38	1127.13	282.12	1448.91	-	171.01
Feb, 2023	167.39	113.74	1260.6	1097.44	915.24	856.43	962.39	2135.03	-	149.56
Mar, 2023	144.19	124.70	852.13	1641.8	711.21	1166.19	1473.1	3663.44	-	79.73
Total	2,484.40	7,037.69	12,109.60	16,551.54	13,418.53	1,8847.38	4,022.27	1,3502.40	8.17	940.72

- : No transaction took place

Table: 46

The month wise plot of Bilateral transactions (MU) during FY 2022-23 is displayed in

Figure: 31

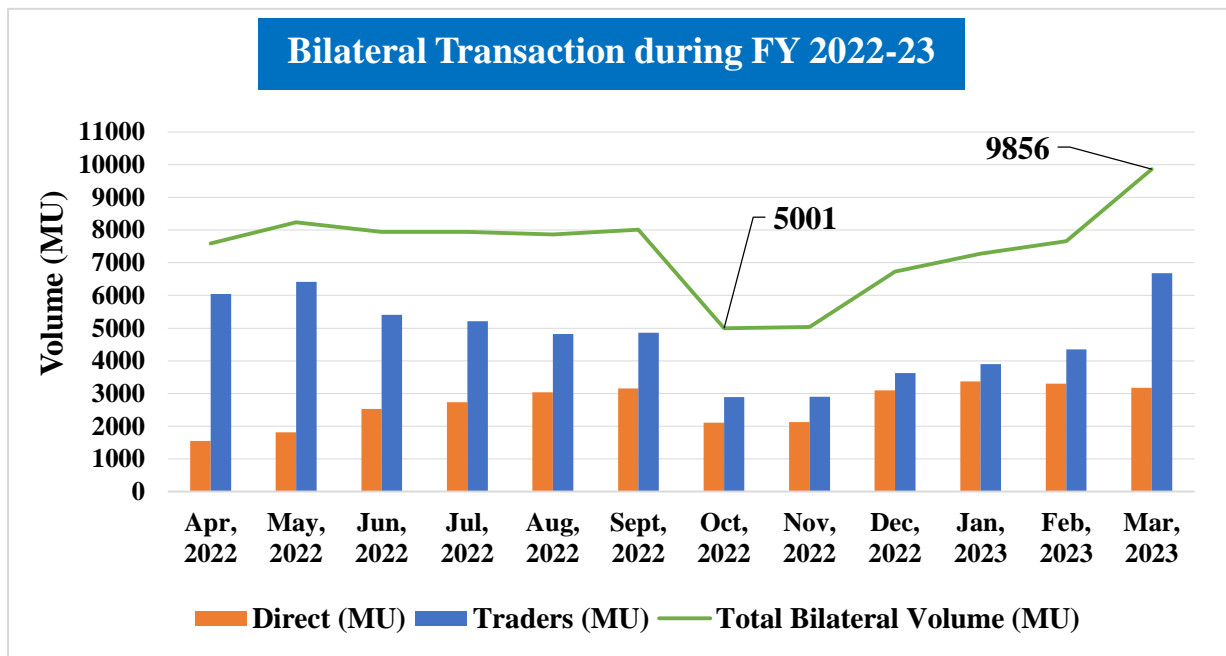


Figure: 31

3. Volume of Electricity transacted through Deviation

The volume of Deviation observed in the FY 2022-23 was **30,542 MU**. The details of Deviation volume during FY 2022-23 is shown in **Table: 47**.

Month	Deviation Volume (MU)	Import Volume (MU)	Export Volume (MU)
Apr, 2022	2,109.57	2,009.04	2,210.10
May, 2022	4,488.84	4,130.47	4,847.20
Jun, 2022	2,542.12	2,553.19	2,531.05
Jul, 2022	2,788.86	2,735.35	2,842.36
Aug, 2022	2,703.64	2,662.99	2,744.29
Sept, 2022	2,440.83	2,415.36	2,466.30

Month	Deviation Volume (MU)	Import Volume (MU)	Export Volume (MU)
Oct, 2022	2,315.20	2,189.76	2,440.64
Nov, 2022	1,912.17	1,952.22	1,872.11
Dec, 2022	1,812.51	1,770.34	1,854.69
Jan, 2023	3,740.24	3,850.16	3,630.32
Feb, 2023	1,566.57	1,624.77	1,508.38
Mar, 2023	2,121.54	1,991.79	2,251.29
Total	30,542.09	29,885.44	31,198.73

Table: 47

The month wise plot of Deviation volume (MU) during FY 2022-23 is displayed in **Figure: 32**

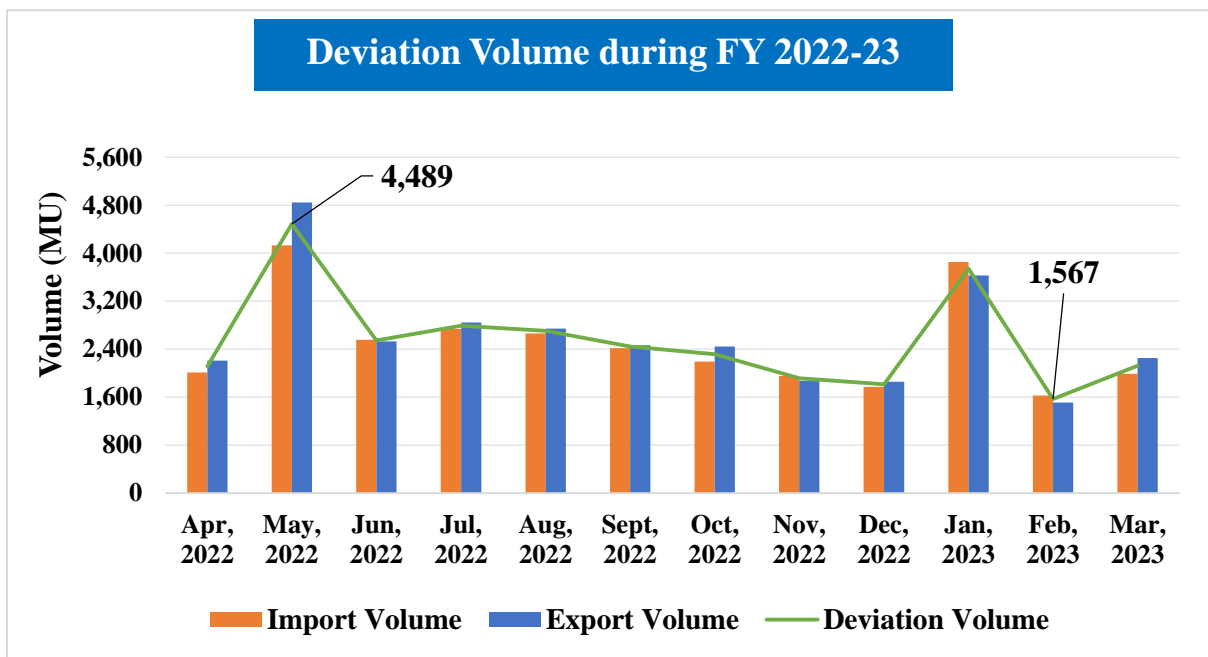


Figure: 32

CHAPTER-IX**ANALYSIS OF VARIATIONS IN FSV & AVERAGE MCP DURING FY 2022-23****1. General Observations**

(i) The demand and supply scenario in the market is the main determinant, which determines the prices discovered in the Power exchanges. The fundamental drivers of price in the Exchanges can be identified as:

- i. Demand scenario for major entities in India
- ii. Changes in Short/ Medium/ Long term contracts of buying/ selling entities and variable cost of generation.
- iii. Availability/ Outages of State Sector/ Central Sector / Private Sector Plants
- iv. Capacity available for exchange from all Independent Power Producers
- v. Expected transmission corridor availability
- vi. Peak Demand in the country
- vii. Coal, Wind, Solar and Hydro power generation in the country
- viii. Purchase and Sell Bid on power exchanges

(ii) Most of the DISCOMs have some sort of capping on the quantum and price for procuring power from the power exchange or open market, which is based on directive from the respective State Electricity Regulatory Commission (SERCs). Therefore, they are not at liberty to procure 100% power requirement from the power exchange/open market when there is a shortage scenario in the state or when electricity demand of the state has gone up. Hence, the demand of electricity in any particular time block on the power exchange also depends upon the strategic decision of the utilities to meet the entire load or to shed some load.

2. Specific Observations

(i) During most of the months of FY 2022-23, the difference in volume of total sale bid (MU) and total purchase bid (MU) during any day of the month has been found as one of the important factor which determined the increase/decrease in daily average MCP of that day during the month. It implies that when the difference between the sale bid (MU) and purchase bid (MU) is minimum, then on that day, the daily average MCP is maximum and when the difference between the two is maximum, then on that day, the daily average MCP is minimum. It was also further observed that congestion also plays a role in the relationship.

(ii) From the day-wise variation in most of the months of FY 2022-23, it is seen that the total purchase bid (MU) and the total final scheduled volume (MU) almost followed the same trend i.e. when total purchase bid (MU) increases, the total final scheduled volume (MU) increases and vice-versa.

(iii) The purchase bids and the MCP discovered in each of the 15-minute time block during all the days of almost every months of FY 2022-23 followed the same trend i.e when the volume of purchase bids is more in any time block, MCP discovered in that time block is also more and vice-versa. **This is also corroborated with the outcome of the Regression Analysis carried out for each months of FY 2022-23 using a double log function, whereby the elasticity of Daily average MCP can be read off from the coefficients of independent variables.**

3. Regression Analysis for DAM transaction

(i) The regression analysis was carried out for every month of FY 2022-23 with average MCP as dependent variable and with peak demand, total sell bid, total purchase bid, thermal generation, hydro generation, wind generation and solar generation as independent variables to find the significant variables affecting the average Market Clearing Price. The analysis have been done for transactions happening in IEX only, as the 99.63 % of transactions happening in power exchanges in Day Ahead Market occurred in IEX only. The regression analysis revealed that the most important variables, which determines daily average market clearing price is the total purchase bid and peak demand during FY 2022-23.

The month wise details of significant variables, most significant variables and its regression coefficient in IEX are tabulated in **Table: 48**

Month	Most Significant Variable	Regression Coefficient
Apr, 2022	Total Purchase Bid	0.98
May, 2022	Total Purchase Bid	0.39
Jun, 2022	Total Sell Bid	-0.82
Jul, 2022	Total Purchase Bid	0.57
Aug, 2022	Total Purchase Bid	0.72
Sept, 2022	Total Purchase Bid	0.54
Oct, 2022	Peak Demand	1.62
Nov, 2022	Total Sell Bid	0.65
Dec, 2022	Solar Generation	0.92
Jan, 2023	Peak Demand	6.43
Feb, 2023	Peak Demand	9.00
Mar, 2023	Peak Demand	3.05

Table: 48

ii) On annual regression analysis of Daily Average Market Clearing Prices w.r.t Total Purchase bid, Total Sell bid, Peak Demand, Hydro generation, Wind generation, Solar generation and Thermal generation, it is observed that the significant variables were Total Purchase and Total

Peak Demand only. Further, among these two variables, the most significant variable was **Total Purchase bid** with regression coefficient as **0.02**.

4. Regression Analysis for RTM transaction

(i) Similar to Day Ahead Market, the regression analysis for Real time Market was carried out for every month of FY 2022-23 with average MCP as dependent variable and with peak demand, total sell bid, total purchase bid, thermal generation, hydro generation, wind generation and solar generation as independent variables to find the significant variables affecting the average Market Clearing Price. The analysis have been done for transactions happening in IEX only, as the 99.95 % of transaction happening in power exchanges in Real Time Market occurred in IEX only. The regression analysis revealed that the most important variable, which determines daily average market clearing price is the total purchase bid for almost every months of FY 2022-23.

The month wise details of significant variables, most significant variables and its regression coefficient in IEX are tabulated in **Table: 49**

Month	Most Significant Variable	Regression Coefficient
Apr, 2022	Total Purchase Bid	0.35
May, 2022	Total Purchase Bid	0.73
Jun, 2022	Total Purchase Bid	0.51
Jul, 2022	Total Purchase Bid	0.81
Aug, 2022	Total Sell Bid	0.67
Sept, 2022	Total Purchase Bid	0.93
Oct, 2022	Total Purchase Bid	1.72
Nov, 2022	Total Purchase Bid	0.63
Dec, 2022	Total Sell Bid	0.99
Jan, 2023	Peak Demand	9.09
Feb, 2023	Peak Demand	13.54
Mar, 2023	Coal Generation	4.22

Table: 49

ii) On annual regression analysis of Daily Average Market Clearing Prices w.r.t Total Purchase bid, Total Sell bid, Peak Demand, Hydro generation, Wind generation, Solar generation and Thermal generation, it is observed that the most significant variable was **Total Purchase bid** with regression coefficient as **0.03**.

CHAPTER-X**1. TOP TEN SELLERS ON ALL THE POWER EXCHANGES DURING FY 2022-23 UNDER DAM**

The percentage share of top 10 sellers during FY 2022-23 in the power exchanges is **53.71%** of total volume of electricity transacted under DAM. The volume of electricity transacted by top ten sellers along with their share in total volume are provided in the **Table: 50**.

Entity Name	Sell (MU)	Percent
Uttar Pradesh	7,819.83	15.22%
Bihar	4,295.75	8.36%
West Bengal	3,220.76	6.27%
Karnataka	2,230.15	4.34%
Chhattisgarh	2,010.95	3.91%
Madhya Pradesh	2,001.04	3.90%
Telangana	1,770.40	3.45%
Raipur Energen	1,439.75	2.80%
Jindal Power Ltd. Stg-II	1,431.65	2.79%
JITPL	1,370.16	2.67%
Total	10,988.17	53.71%
Total Volume in PXs during FY 2022-23	51,366.11	

TABLE: 50**2. TOP TEN BUYERS ON ALL THE POWER EXCHANGES DURING FY 2022-23 UNDER DAM**

The percentage share of top 10 purchasers during FY 2022-23 in the power exchanges is **75.15%** of total volume of electricity transacted under DAM. The volume of electricity transacted by top ten buyers along with their share in total volume are provided in the **Table: 51**.

Entity Name	Purchase (MU)	Percent
Gujarat	9,948.07	19.37%
Andhra Pradesh	4,678.71	9.11%
Telangana	3,656.17	7.12%
Rajasthan	3,491.35	6.80%
Uttar Pradesh	3,283.44	6.39%
Punjab	3,231.52	6.29%
Maharashtra	3,118.46	6.07%
Tamil Nadu	2,670.24	5.20%
Haryana	2,303.72	4.48%
West Bengal	2,220.25	4.32%
Total	38,601.92	75.15%
Total Volume in PXs during FY 2022-23	51,366.11	

TABLE: 51

3. TOP TEN SELLERS ON ALL THE POWER EXCHANGES DURING FY 2022-23 UNDER RTM

The percentage share of top 10 sellers during FY 2022-23 in the power exchanges is **62.34** % of total volume of electricity transacted under RTM. The volume of electricity transacted by top ten sellers along with their share in total volume are provided in the **Table: 52**.

Entity Name	Sell (MU)	Percent
Madhya Pradesh	3,438.55	14.22%
Bihar	3,299.36	13.64%
West Bengal	1,420.76	5.87%
Odisha	1,220.88	5.05%
Uttar Pradesh	1,157.35	4.78%
Karnataka	1,108.21	4.58%
Delhi	1,018.87	4.21%
Telangana	868.19	3.59%
Chhattisgarh	781.52	3.23%
Rajasthan	764.32	3.16%
Total	11,972.47	62.34%
Total Volume in PXs during FY 2022-23	24,186.94	

TABLE: 52

4. TOP TEN BUYERS ON ALL THE POWER EXCHANGES DURING FY 2022-23 UNDER RTM

The percentage share of top 10 purchasers during FY 2022-23 in the power exchanges is **75.97** % of total volume of electricity transacted under RTM. The volume of electricity transacted by top ten buyers along with their share in total volume are provided in the **Table: 53**.

Entity Name	Purchase (MU)	Percent
Rajasthan	3030.30	12.53%
Telangana	2613.05	10.80%
Punjab	2475.43	10.23%
Maharashtra	2335.22	9.65%
Uttar Pradesh	1549.32	6.41%
Gujarat	1466.87	6.06%
West Bengal	1324.01	5.47%
Andhra Pradesh	1244.25	5.14%
Haryana	1178.12	4.87%
Tamil Nadu	1157.69	4.79%
Total	18,374.27	75.97%
Total Volume in PXs during FY 2022-23	24,186.94	

TABLE: 53

5. TOP TEN SELLERS ON ALL THE POWER EXCHANGES FY 2022-23 UNDER GDAM

The percentage share of top 10 sellers during FY 2022-23 in the power exchanges is **87.89** % of total volume of electricity transacted under GDAM. The volume of electricity transacted by top ten sellers along with their share in total volume are provided in the **Table: 54**.

Entity Name	Sell (MU)	Percent
Karnataka	1177.23	4.87%
Andhra Pradesh	1011.70	4.18%
Adani Hybrid Energy Jaisalmer Four Limited (Solar)	231.41	0.96%
Telangana	211.68	0.88%
Madhya Pradesh	167.13	0.69%
Adani Wind Energy Kutchh Five Limited	165.16	0.68%
J&K	124.05	0.51%
Adani Hybrid Energy Jaisalmer Three Limited (Solar)	107.50	0.44%
Adani Hybrid Energy Jaisalmer Two Limited (Solar)	84.55	0.35%
Ramagundam Floating Solar PV Station	74.29	0.31%
Total	3,354.69	87.89%
Total Volume in PXs during FY 2022-23	3,817.26	

TABLE: 54

6. TOP TEN BUYERS ON ALL THE POWER EXCHANGES FY 2022-23 UNDER GDAM

The percentage share of top 10 purchasers during FY 2022-23 in the power exchanges is **77.92** % of total volume of electricity transacted under GDAM. The volume of electricity transacted by top ten buyers along with their share in total volume are provided in the **Table: 55**.

Entity Name	Purchase (MU)	Percent
Maharashtra	687.95	2.84%
Punjab	460.43	1.90%
Gujarat	405.78	1.68%
DVC	343.28	1.42%
Delhi	272.12	1.13%
Karnataka	215.60	0.89%
Daman & Diu - Dadra & Nagar Haveli	186.82	0.77%
Assam	151.42	0.63%
Uttar Pradesh	128.63	0.53%
Madhya Pradesh	122.08	0.50%
Total	2,974.11	77.92%
Total Volume in PXs during FY 2022-23	3,817.26	

TABLE: 55

Table: 56**SELLERS UNDER DAM ON ALL POWER EXCHANGES DURING FY 2022-23.**

Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Uttar Pradesh	7819.83	Arunachal Pradesh	190.84	Simhapuri Energy Limited	29.68
Bihar	4295.75	J&K	186.46	Tashiding HEP	25.69
West Bengal	3220.76	AD Hydro	175.14	Jorethang	24.58
Karnataka	2230.15	Punjab	170.76	Sorang HEP, (Himachal Sorang Power Private Ltd)	22.18
Chhattisgarh	2010.95	Adhunik Power	163.66	IL&FS	22.00
Madhya Pradesh	2001.04	Mizoram	159.64	Bongaigaon	20.68
Telangana	1770.40	SKS Power	150.82	Ramagundam Stg-1	20.58
Raipur Energen	1439.75	Jindal Steel	146.50	Adani Hybrid Energy	
Jindal Power Ltd. Stg-	1431.65	Tripura	138.39	Jaisalmer Two Limited (Solar)	17.97
JITPL	1370.16	DVC	134.98	Jhajjar	15.78
NVVN (SNA) - NEA	1358.73	Sikkim	102.11	Neyveli New Thermal Power Project	11.91
Delhi	1347.45	Palatana	99.76	NTPC Kudgi	11.64
Sembcorp Gayatri	1341.79	Jhabua Power	98.67	BALCO 2	11.37
Himachal Pradesh	1180.70	Adani Green Energy Nineteen Limited	94.63	RGPPL	10.90
DB Power	1120.17	GMR Warora	88.66	Adani Wind Energy Kutchh Five Limited	10.31
Jaypee Nigrie	1110.25	Renew Surya Ravi Private Limited	86.78	Simhadri Stg-2	9.37
Teesta -3	1058.50	Adani Power STG3	82.22	Nathpa Jhakri	9.26
Kerala	1036.92	Shree Cement	66.98	Ostro Energy Private Limited (OEPL)	8.74
Orissa	1031.20	Costal Energen	63.29	Rihand-III	8.07
Maharashtra	911.11	Nagaland	62.39	Dhariwal	7.88
Rajasthan	773.60	Chuzachen	61.97	Koldam HEP	6.85
Jindal Power	689.59	Talcher Stg-2	56.53	Vindhyachal stg-4	6.57
Assam	643.35	Coastal Gujrat Power Limited	55.81	Ramagundam Stg-3	6.35
Tamilnadu	637.02	GMR Kamalanga	55.61	Rampur HEP	5.07
MB Power	627.14	Adani Hybrid Energy Jaisalmer Four Limited (Solar)	53.57	KSK Mahanadi	4.80
ACBIL	579.13	Meghalaya	49.96	Singrauli	4.79
Kameng HEP	492.17	NLC TPS-II	42.47	PARBATI II HE PROJECT	3.81
Andhra Pradesh	426.93	Dikchu	37.00	Ostro Kannada Power Private Limited	3.74
Mahan Energy Limited	402.89	NLC TPS-II Stg-2	35.51	Renew Solar Urja Private Limited	3.22
RKM Power	393.48	NPCIL		Renew Solar Energy (Jharkhand Three) Pvt Ltd (RSEJTPL)	3.20
Essar Power MP Ltd	380.41	KAKRAPAR		Koteshwar HEP	3.02
Sembcorp Energy India Ltd. (formerly Therma Powertech)	343.86	ATOMIC POWER STATION UNITS 3 & 4	34.82		
Haryana	336.43	Singoli Bhagwati	32.35		
Goa WR	289.30	Lanco Budhil	31.44		
Raigarh Energy Ltd.	257.44	Adani Hybrid Energy Jaisalmer Three Limited (Solar)	31.20		
Gujarat	251.43	Adani Green Solar Jaisalmer	30.25		
Jharkhand	239.02				
Sainj HEP	225.65				
Maruti Clean Coal Power	225.45				
Chandigarh	222.99				
Uttarakhand	200.06				
Karcham Wangtoo	199.02				

Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
SBSR Power		Unchahar-II	0.42	Dhauliganga Power Station	0.07
Cleantech Eleven Private Limited	3.00	Darlipalli	0.41	Kishanganga Power Station	0.05
Kahalgaon	2.43	NLC TPS-II Expn	0.41	Chamera II Power Station	0.05
NTPL	1.83	AGBPP	0.41	Vindhyachal stg-3	0.05
Talcher	1.73	Korba Stg 3	0.36	Chamera III Power Station	0.04
TRN Energy	1.43	Dadra & Nagar Haveli	0.35	NPGC Nabinagar	0.03
Goa SR	1.27	Rognichu Hydro Electric Project	0.34	Parbati III Power Station	0.02
Farakka	0.98	AGTPP	0.34	Chamera I Power Station	0.02
NTPC Simhadri 25 MW Solar Project	0.84	URI I Power Station	0.25	Continuum Power Trading (TN) Private Limited	0.02
Ramagundam Floating Solar PV Station	0.77	NTPC Sholapur	0.24	Tanakpur Power Station	0.02
Sasan UMPP	0.75	Dulhasti Power Station	0.24	Sewa II Power Station	0.01
Manipur	0.73	JSW RENEW ENERGY TWO LIMITED	0.22		
Salal Power Station	0.53	URI II Power Station	0.10		
Tehri	0.52	Simhadri FSP 15 MW Project	0.09		
Dhauliganga	0.50	Vallur	0.08		
NLC	0.50				
Torrent Power	0.44				
Rihand-II	0.43				

Table: 57**BUYERS UNDER DAM ON ALL POWER EXCHANGES DURING FY 2022-23**

Entity Name	Purchase (MU)
Gujarat	9948.07
Andhra Pradesh	4678.71
Telangana	3656.17
Rajasthan	3491.35
Uttar Pradesh	3283.44
Punjab	3231.52
Maharashtra	3118.46
Tamilnadu	2670.24
Haryana	2303.72
West Bengal	2220.25
J&K	2149.43
ArcelorMittal Nippon steel (ESIL)	1357.77
Uttarakhand	1130.64
Daman & Diu - Dadra & Nagar Haveli	1104.45
Orissa	954.29
Assam	909.33
NVVN (SNA) - NEA	835.80
Madhya Pradesh	831.47
Karnataka	538.66
Delhi	465.69
Jharkhand	354.93
Druk Green Power Corporation Limited (DGPCL-Bhutan)	318.84
Chhattisgarh	308.02
Kerala	216.20
NEA-NR	207.98
Railways	190.04
Himachal Pradesh	157.07
Bihar	132.81
DVC	122.69
Goa WR	71.43
Goa SR	62.28

Entity Name	Purchase (MU)
Meghalaya	44.98
Tripura	39.72
Jorethang	35.88
Dadra & Nagar Haveli	35.68
Chandigarh	35.35
BALCO 2	22.81
Daman & Diu	20.90
JITPL	17.36
Sikkim	15.94
Manipur	10.29
Nathpa Jhakri	9.97
Unchahar-IV	8.85
Renew Surya Ravi Private Limited	8.66
Renew Solar Urja Private Limited	6.97
Sainj HEP	5.48
Nagaland	4.49
NTPL	3.08
Talcher Stg-2	2.98
Kawas	2.75
Tehri	2.55
BHARAT ALUMINIUM COMPANY LTD (Bulk Consumer)	1.92
NLC	1.75
IL&FS	1.72
Rihand-III	1.52
Arunachal Pradesh	1.40
NLC TPS-II Stg-2	1.05
Ratnagiri Gas & Power Private Limited	0.94
Unchahar-II	0.53
Vallur	0.50
Chamera-III	0.30
Adhunik Power	0.16

Table: 58**SELLERS UNDER RTM ON ALL POWER EXCHANGES DURING FY 2022-23**

Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Madhya Pradesh	3438.55	Neyveli New		Adani Power STG3	16.93
Bihar	3299.36	Thermal Power	72.34	Kahalgaon-II	16.14
West Bengal	1420.76	Project		Jorethang	15.80
Orissa	1220.88	TRN Energy	71.90	Chandigarh	14.18
Uttar Pradesh	1157.35	Manipur	69.44	GMR Kamalanga	13.50
Karnataka	1108.21	DB Power	64.78	NLC TPS-II	12.30
Delhi	1018.87	Uttarakhand	64.35	NTPC Sholapur	12.28
Telangana	868.19	SKS Power	58.13	Raigarh Energy Ltd.	12.17
Chhattisgarh	781.52	Sembcorp Energy		Shree Cement	10.86
Rajasthan	764.32	India Ltd. (formerly	57.66	NTPC Kudgi	10.13
Himachal Pradesh	758.99	Thermal Powertech)		Khargone STPP	9.92
Andhra Pradesh	730.41	NTPL	54.48	Tashiding HEP	8.71
Kerala	653.08	Meghalaya	49.39	Kahalgaon	8.41
Kameng HEP	636.51	Jhabua Power	48.76	Ramagundam Stg-1	8.33
Assam	442.27	Jindal Power	46.56	Mouda Stg-1	6.32
J&K	435.96	GMR Warora	43.87	Renew Surya Ravi	
Tamilnadu	426.53	Arunachal Pradesh	43.52	Private Limited	6.06
Maharashtra	403.79	Dikchu	42.27	IL&FS	5.21
MB Power	258.89	Essar Power MP Ltd	41.46	Simhapuri Energy	
Haryana	245.87	ACBIL	40.39	Limited	4.85
RKM Power	216.50	JITPL	40.34	Chuzachen	4.28
Punjab	204.12	NLC	38.70	Jindal Steel	4.05
Tripura	188.67	Nagaland	37.62	Ramagundam Stg-3	3.00
Jindal Power Ltd.		Sorang HEP,		Rihand-II	2.04
Stg-II	186.29	(Himachal Sorang	33.22	AGBPP	2.04
Sembcorp Gayatri	183.65	Power Private Ltd)		Jaypee Nigrie	2.00
NTPC North		NLC TPS-II Stg-2	31.84	Talcher Stg-2	1.97
Karanpura STPS	177.70	Sainj HEP	26.61	AGTPP	1.94
Sasan UMPP	169.56	Goa WR	25.55	Darlipalli	1.63
Jharkhand	158.08	Adhunik Power	25.31	Rihand-I	1.61
NPCIL KAKRAPAR		AD Hydro	24.37	Lanco Budhil	1.61
ATOMIC POWER		Daman & Diu -		Rihand-III	1.50
STATION UNITS 3	119.24	Dadra & Nagar	23.77	Renew Solar Energy	
& 4		Haveli		(Jharkhand Three)	1.43
Palatana	113.56	BALCO 2	23.76	Pvt Ltd (RSEJTPL)	
Raipur Energen	106.82	Singoli Bhagwati	23.23	Dadra & Nagar	
DVC	105.39	NTPC Gadarwara	22.11	Haveli	1.08
Teesta -3	104.38	Karcham Wangtoo	20.02	Ramagundam	
Gujarat	94.92	Maruti Clean Coal	19.22	Floating Solar PV	1.07
Coastal Gujrat Power		Power		Station	
Limited	88.23	Bongaigaon	18.98	Adani Hybrid Energy	
Mahan Energy		NLC TPS-II Expn	17.46	Jaisalmer Four	1.00
Limited	80.99	Ostro Energy Private	17.45	Limited (Solar)	
Sikkim	75.00	Limited (OEPL)		Adani Wind Energy	1.00
		Mouda Stg-2	16.95	Kutchh Five Limited	

Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Renew Solar Urja Private Limited	0.86	Dhariwal	0.27	JSW RENEW ENERGY TWO LIMITED	0.06
NTPC BARH1 Unit 2	0.83	Tanda Stg-2	0.24	Vindhyachal stg-5	0.05
RGPPL	0.72	RGPPL_Others	0.22	Farakka	0.05
Daman & Diu	0.57	Singrauli	0.21	Continuum Power Trading (TN) Private Limited	0.05
Adani Hybrid Energy Jaisalmer Three Limited (Solar)	0.54	Adani Green Energy Nineteen Limited	0.20	Dadri Stg-2	0.05
Adani Green Solar Jaisalmer	0.45	Costal Energen	0.19	Vindhyachal stg-3	0.04
Mizoram	0.44	NSPCL Bhilai	0.15	Unchahar-III	0.04
Sipat Stg-2	0.44	Sipat Stg-1	0.13	Jhajjar	0.04
Ostro Kannada Power Private Limited	0.42	Vindhyachal stg-4	0.12	KSK Mahanadi	0.04
NTPC Lara	0.35	Korba	0.11	Unchahar-I	0.02
Maithon Power	0.32	Vindhyachal stg-1	0.10	Ayana Renewable Power One Private Limited	0.02
Simhadri Stg-2	0.31	Unchahar-II	0.09	Adani Hybrid Energy Jaisalmer Two Limited (Solar)	0.01
Unchahar-IV	0.28	Vindhyachal stg-2	0.08		
		SBSR Power Cleantech Eleven Private Limited	0.08		
		Ratnagiri Gas & Power Private Limited	0.06		

Table: 59**BUYERS UNDER RTM ON ALL POWER EXCHANGES DURING FY 2022-23**

Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Rajasthan	3030.30	Arunachal Pradesh	6.16	BALCO 2	137.68
Telangana	2613.05	Nagaland	5.03	Kerala	132.82
Punjab	2475.43	Raigarh Energy Ltd.	4.98	Bihar	129.76
Maharashtra	2335.22	Jaypee Nigrie	4.17	Jharkhand	78.39
Uttar Pradesh	1549.32	Jindal Power	4.10	Meghalaya	59.92
Gujarat	1466.87	Coastal Gujrat Power Limited	3.79	Manipur	59.02
West Bengal	1324.01	Maruti Clean Coal Power	2.99	Tripura	47.64
Andhra Pradesh	1244.25	ACBIL	2.10	Railways	46.95
Haryana	1178.12	Sainj HEP	1.88	Goa WR	25.74
Tamilnadu	1157.69	Raipur Energen	1.74	Sikkim	15.44
J&K	956.30	Jhabua Power	1.29	Jindal Power Ltd. Stg-II	14.39
Orissa	864.46	Mouda Stg-2	1.22	Dadra & Nagar Haveli	12.77
Delhi	655.52	Karcham Wangtoo	0.92	BHARAT ALUMINIUM COMPANY LTD (Bulk Consumer)	12.23
ArcelorMittal Nippon steel (ESIL)	323.35	SKS Power	0.76	Goa SR	8.49
Assam	322.39	Jindal Steel	0.22	Mahan Energy Limited	6.77
Himachal Pradesh	319.23	Ratnagiri Gas & Power Private Limited	0.19	Chandigarh	6.42
DVC	272.98	Singoli Bhagwati	0.13	Daman & Diu	6.24
Madhya Pradesh	260.20	NTPC Gadawara	0.06	Arunachal Pradesh	6.16
Karnataka	251.82	Lanco Budhil	0.02	Nagaland	5.03
Daman & Diu - Dadra & Nagar Haveli	224.56	Rajasthan	3030.30	Raigarh Energy Ltd.	4.98
Uttarakhand	195.16	Telangana	2613.05	Jaypee Nigrie	4.17
Chhattisgarh	181.42	Punjab	2475.43	Jindal Power	4.10
BALCO 2	137.68	Maharashtra	2335.22	Coastal Gujrat Power Limited	3.79
Kerala	132.82	Uttar Pradesh	1549.32	Maruti Clean Coal Power	2.99
Bihar	129.76	Gujarat	1466.87	ACBIL	2.10
Jharkhand	78.39	West Bengal	1324.01	Sainj HEP	1.88
Meghalaya	59.92	Andhra Pradesh	1244.25	Raipur Energen	1.74
Manipur	59.02	Haryana	1178.12	Jhabua Power	1.29
Tripura	47.64	Tamilnadu	1157.69	Mouda Stg-2	1.22
Railways	46.95	J&K	956.30	Karcham Wangtoo	0.92
Goa WR	25.74	Orissa	864.46	SKS Power	0.76
Sikkim	15.44	Delhi	655.52	Jindal Steel	0.22
Jindal Power Ltd. Stg-II	14.39	ArcelorMittal Nippon steel (ESIL)	323.35	Ratnagiri Gas & Power Private Limited	0.19
Dadra & Nagar	12.77	Assam	322.39	Singoli Bhagwati	0.13
BHARAT ALUMINIUM COMPANY LTD (Bulk Consumer)	12.23	Himachal Pradesh	319.23	NTPC Gadawara	0.06
Goa SR	8.49	DVC	272.98	Lanco Budhil	0.02
Mahan Energy Limited	6.77	Madhya Pradesh	260.20		
Chandigarh	6.42	Karnataka	251.82		
Daman & Diu	6.24	Daman & Diu -	224.56		
		Uttarakhand	195.16		
		Chhattisgarh	181.42		

Table: 60**SELLERS UNDER GDAM ON ALL POWER EXCHANGES DURING FY 2022-23**

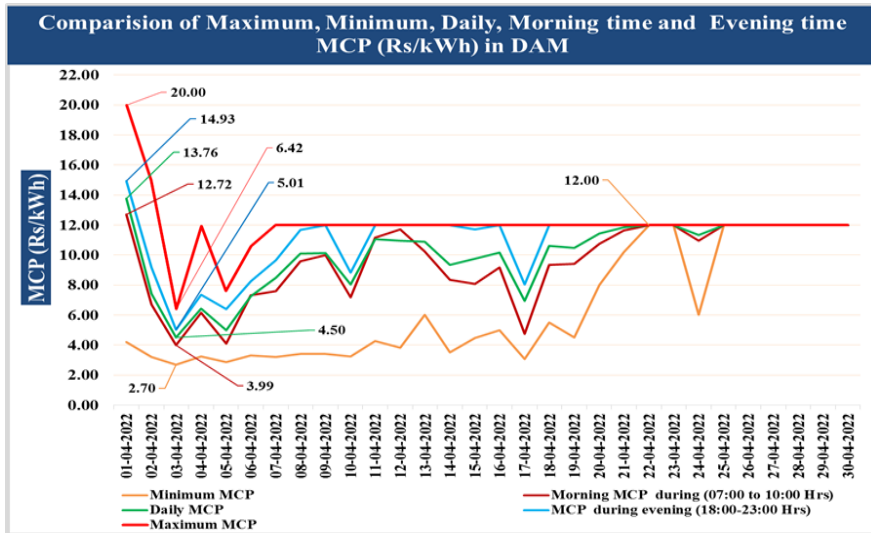
Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Karnataka	1177.23	SBSR Power		Azure Power Maple Pvt Ltd	11.19
Andhra Pradesh	1011.70	Cleantech Eleven Private Limited	30.49	Renew Solar Energy (Jharkhand Three) Pvt Ltd (RSEJTPL)	11.09
Adani Hybrid Energy Jaisalmer Four Limited (Solar)	231.41	ADANI SOLAR ENERGY		Renew Solar Urja Private Limited	8.75
Telangana	211.68	JAISALMER ONE PRIVATE LIMITED AHS	28.98	Ostro Kannada Power Private Limited	5.71
Madhya Pradesh	167.13	Adani Green Solar Jaisalmer	26.52	Delhi	3.71
Adani Wind Energy Kutchh Five Limited	165.16	Uttar Pradesh	26.49	Haryana	2.70
J&K	124.05	Kerala	24.21	Continuum Power Trading (TN) Private Limited	2.49
Adani Hybrid Energy Jaisalmer Three Limited (Solar)	107.50	Adani Green Energy Nineteen Limited	23.47	Singoli Bhagwati	1.23
Adani Hybrid Energy Jaisalmer Two Limited (Solar)	84.55	Simhadri FSP 15 MW Project	22.94	JSW RENEW ENERGY TWO LIMITED	1.02
Ramagundam Floating Solar PV Station	74.29	NTPC Simhadri 25 MW Solar Project	20.18	West Bengal	0.23
Ostro Energy Private Limited (OEPL)	66.90	ADANI SOLAR ENERGY		Tamil Nadu	0.11
Maharashtra	47.24	JAISALMER ONE PRIVATE LIMITED AHW	11.51		
Himachal Pradesh	38.25	Sikkim	11.24		
Rajasthan	32.96				

Table: 61**BUYERS IN GDAM ON ALL POWER EXCHANGES DURING FY 2022-23**

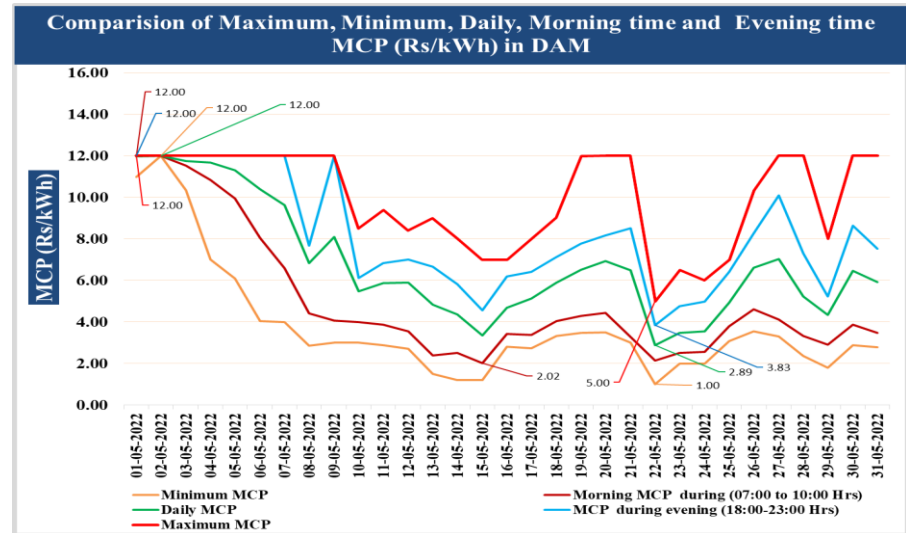
Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Maharashtra	687.95	ArcelorMittal Nippon steel (ESIL)	99.97	Telangana	13.29
Punjab	460.43	Haryana	91.36	Meghalaya	7.64
Gujarat	405.78	Railways	88.66	Andhra Pradesh	5.63
DVC	343.28	Tamil Nadu	86.83	Daman & Diu	5.60
Delhi	272.12	Kerala	68.06	Himachal Pradesh	2.58
Karnataka	215.60	West Bengal	37.49	Uttarakhand	2.53
Daman & Diu - Dadra & Nagar Haveli	186.82	Rajasthan	25.93	Bihar	0.36
Assam	151.42	BALCO 2	24.13		
Uttar Pradesh	128.63	BHARAT ALUMINIUM COMPANY LTD (Bulk Consumer)	24.12		
Madhya Pradesh	122.08	Dadra & Nagar Haveli	19.78		
Jharkhand	119.54				
Orissa	119.42				

Annexure: I

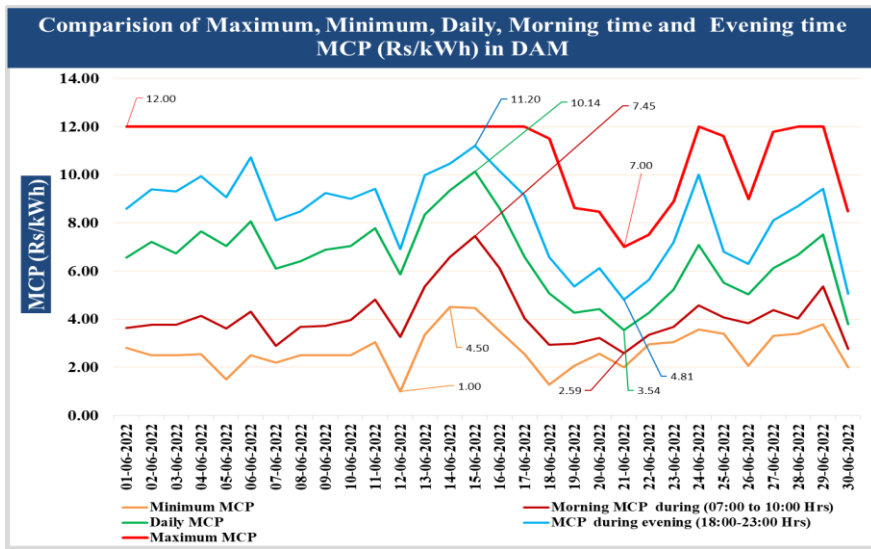
Month wise variation of Maximum, Minimum, Daily, Non Peak Time, Peak Time MCP under DAM are given below:



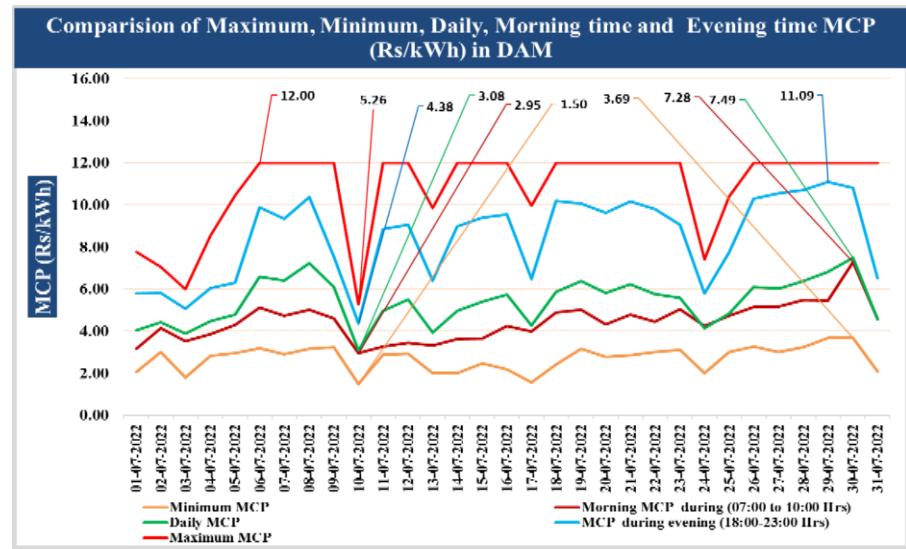
APRIL, 2022



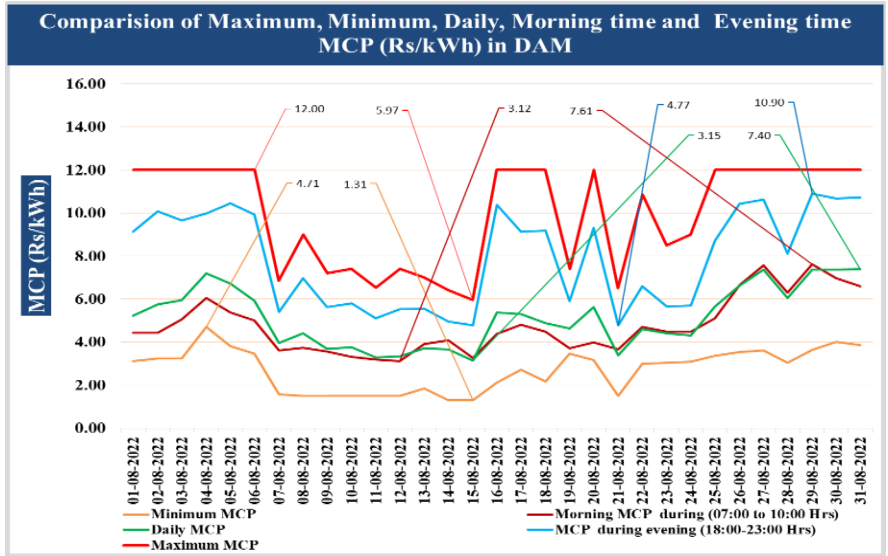
MAY, 2022



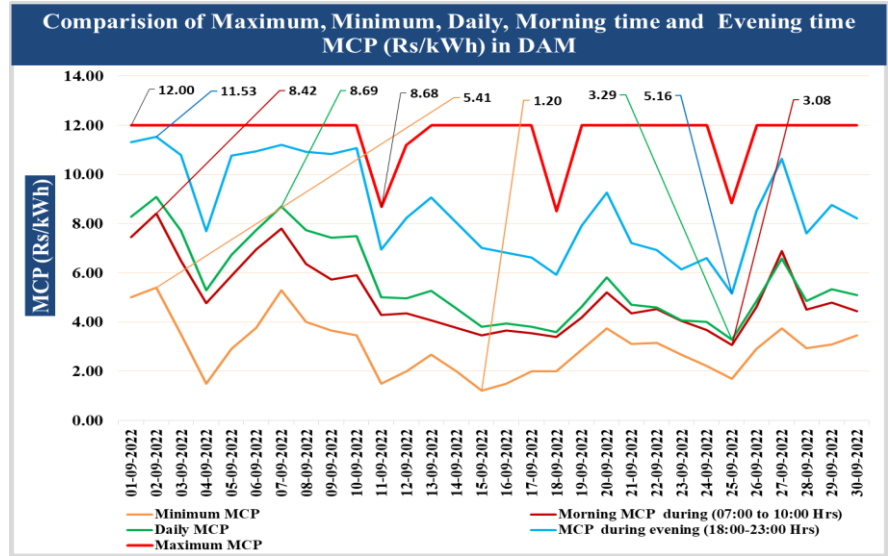
JUNE, 2022



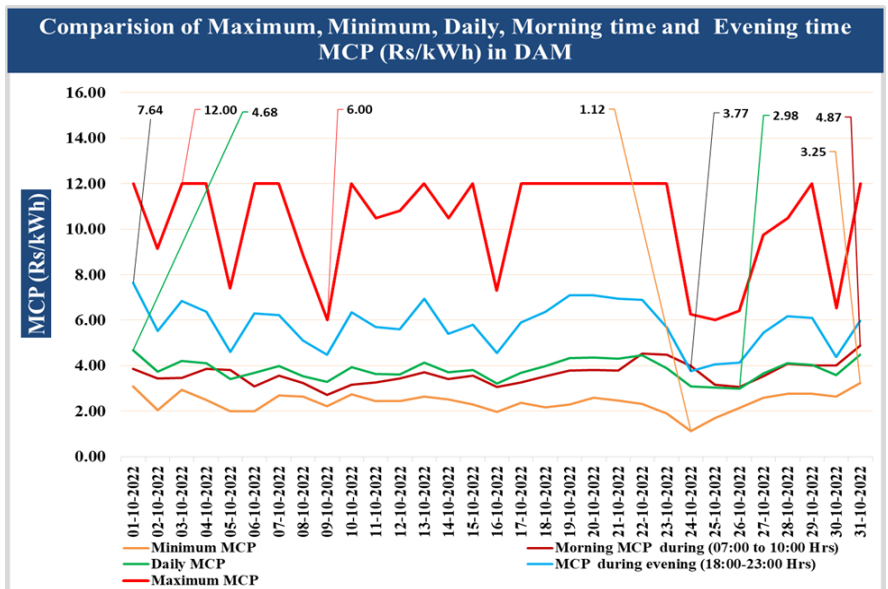
JULY, 2022



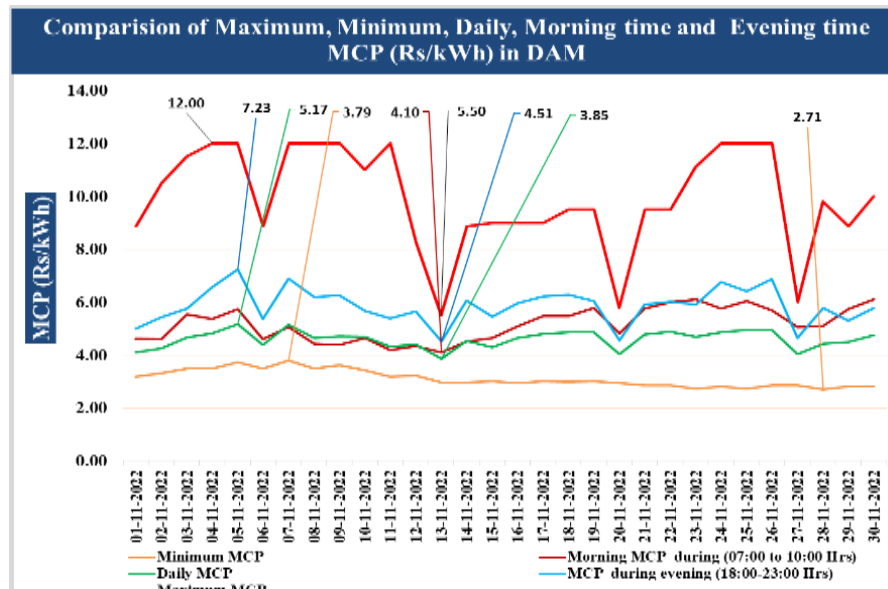
AUGUST, 2022



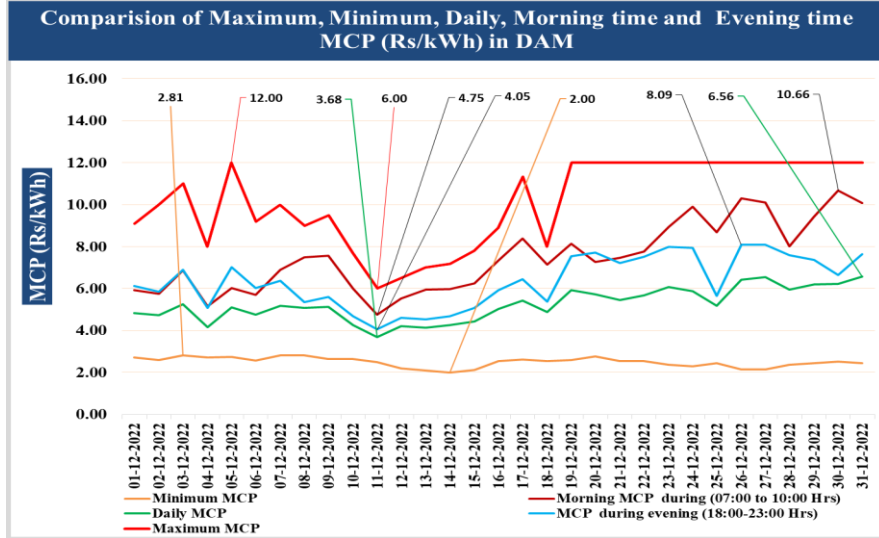
SEPTEMBER, 2022



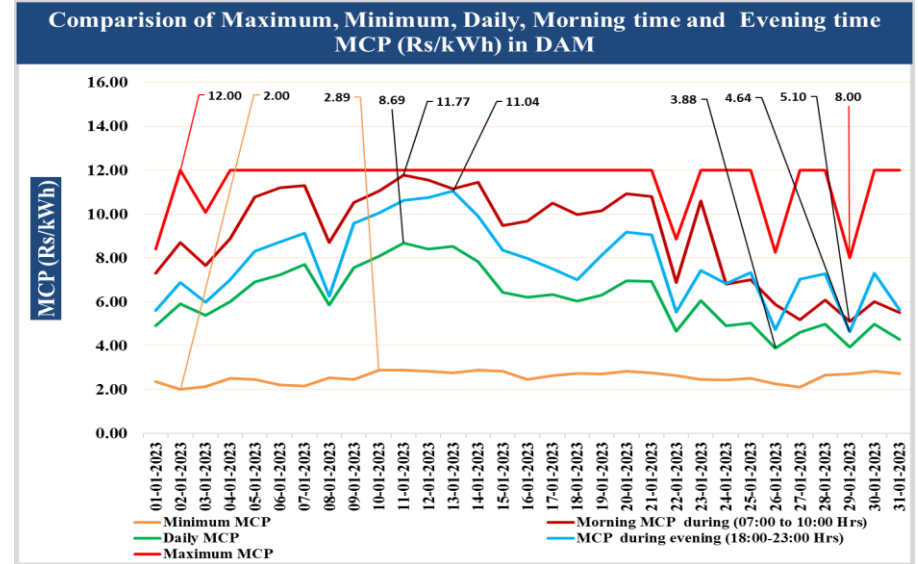
OCTOBER, 2022



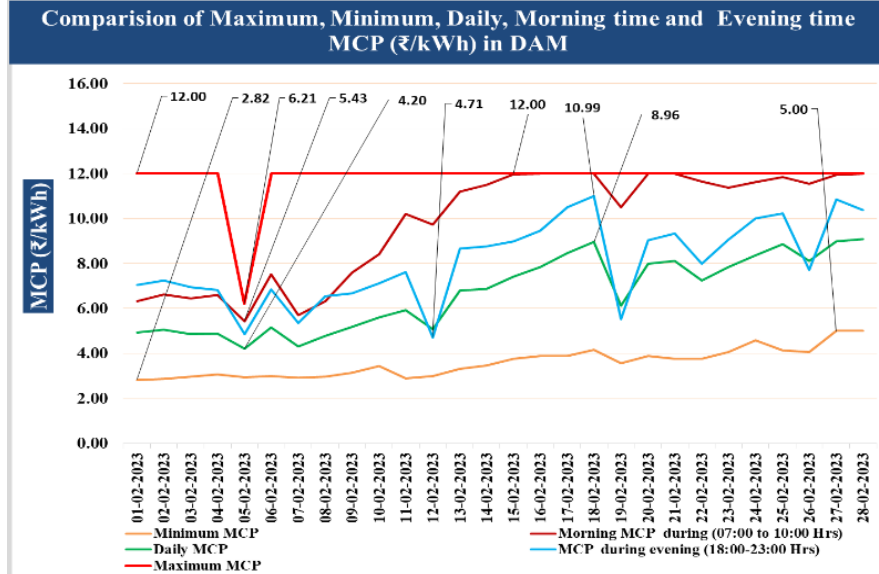
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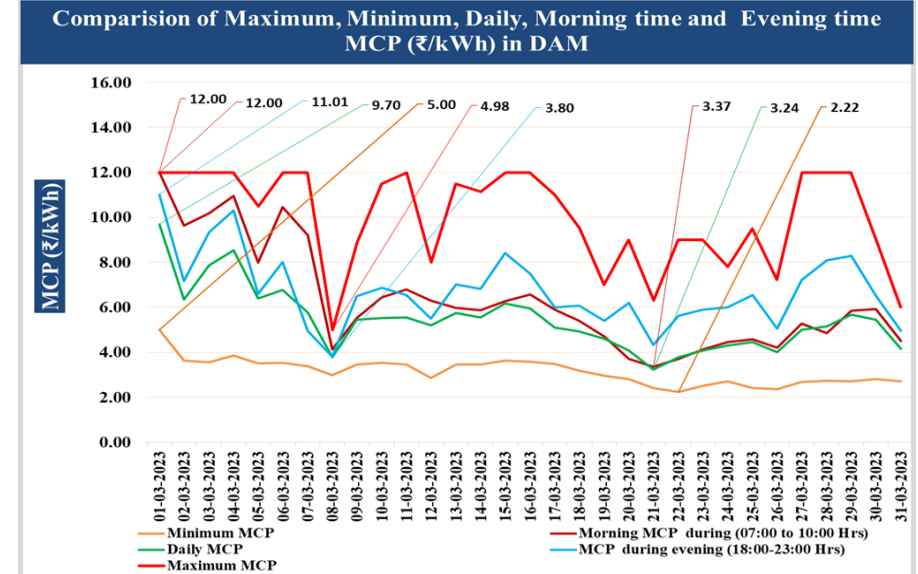
DECEMBER, 2022



JANUARY, 2023



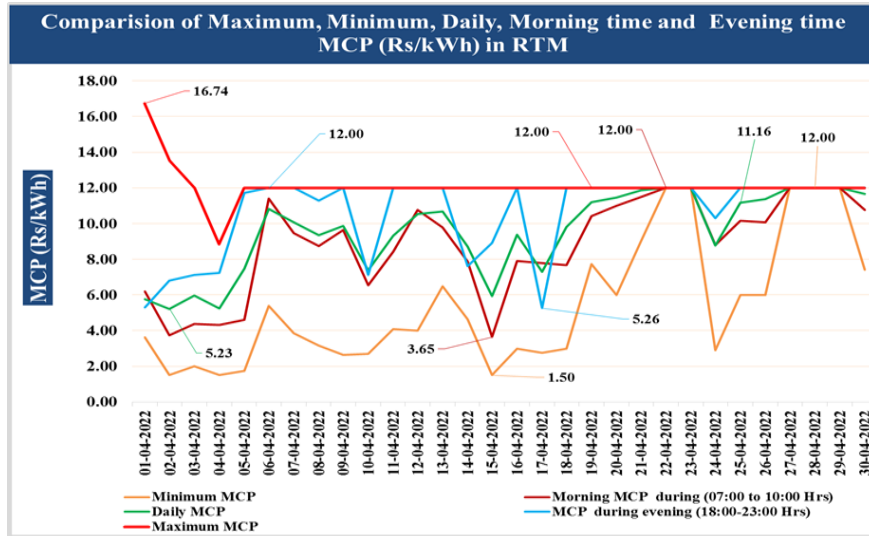
FEBRUARY, 2023



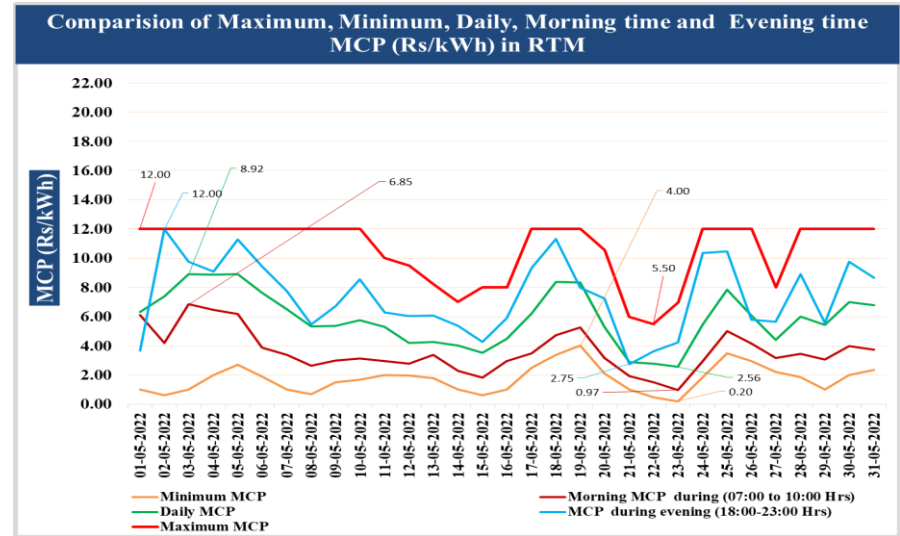
MARCH, 2023

Annexure: II

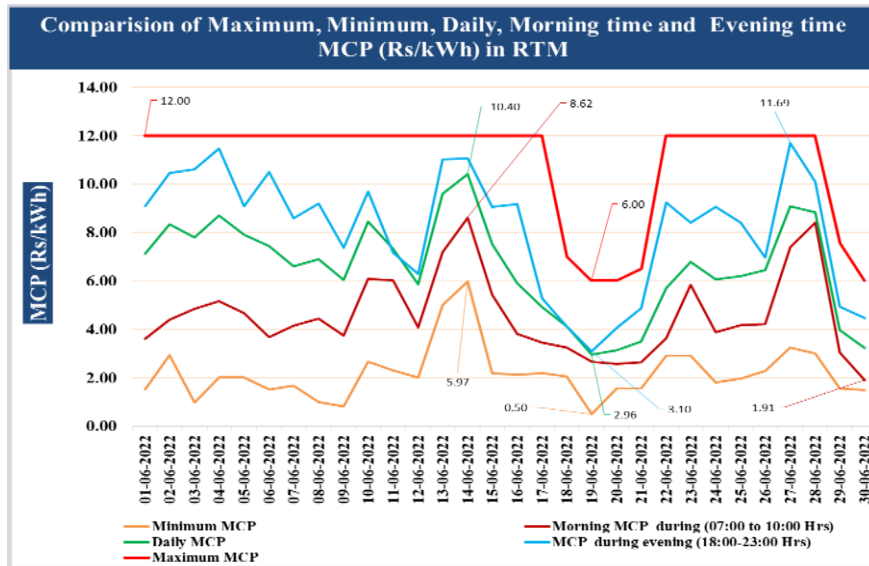
Month wise variation of Maximum, Minimum, Daily, Non Peak Time, Peak Time MCP in RTM are given below:



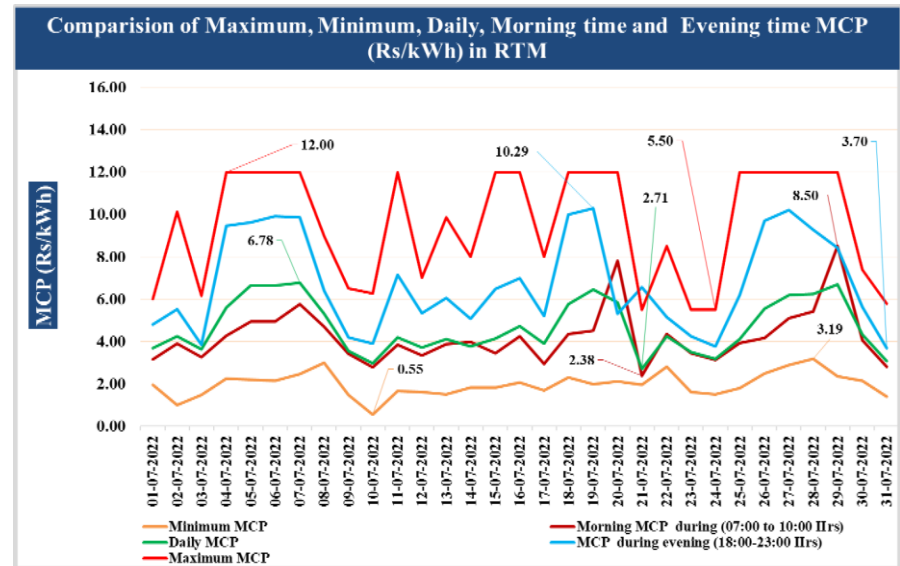
APRIL, 2022



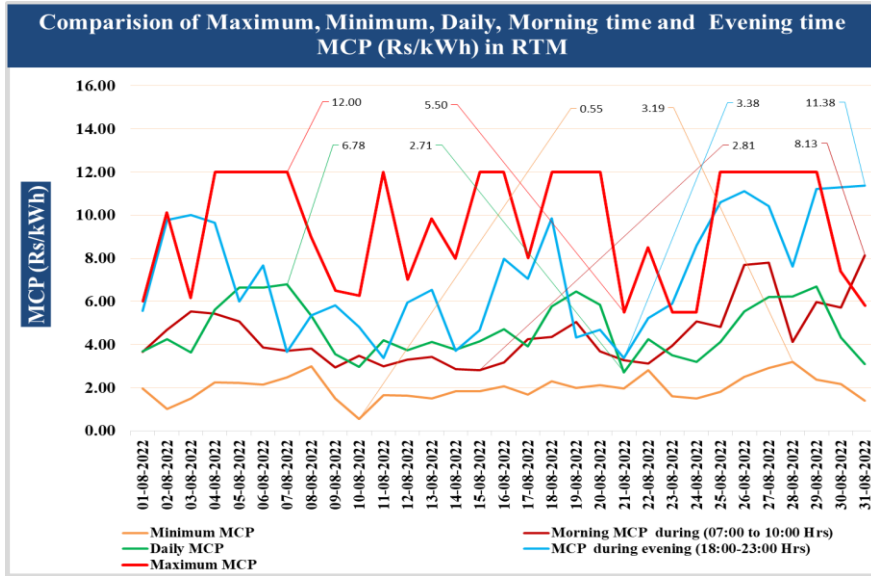
MAY, 2022



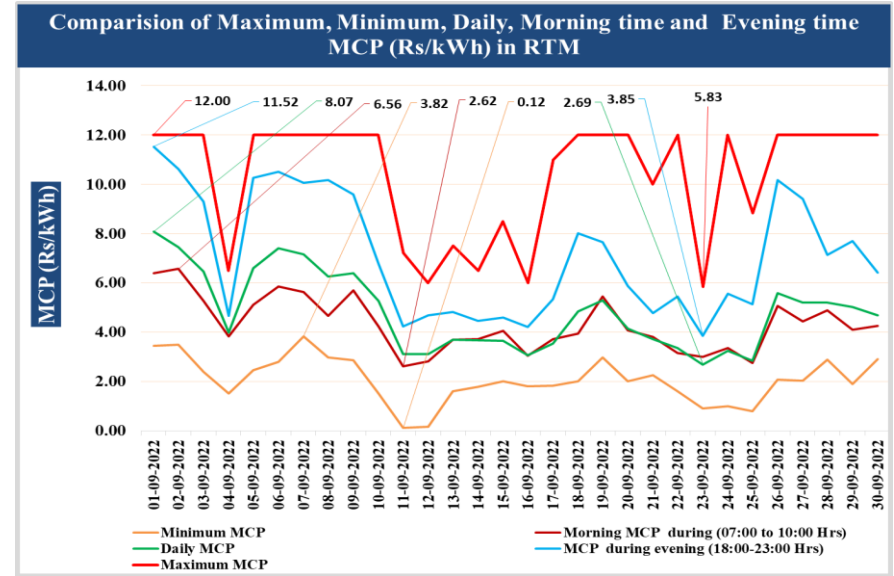
JUNE, 2022



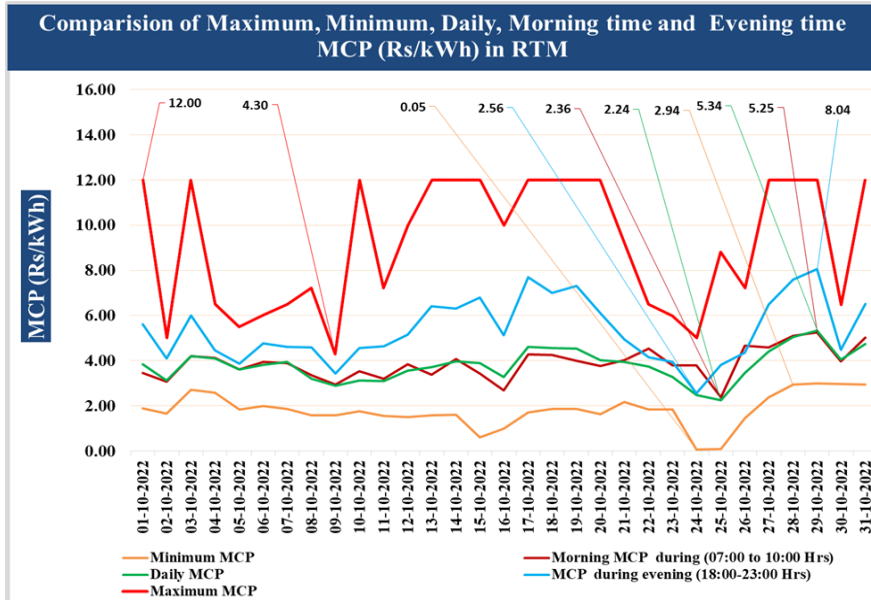
JULY, 2022



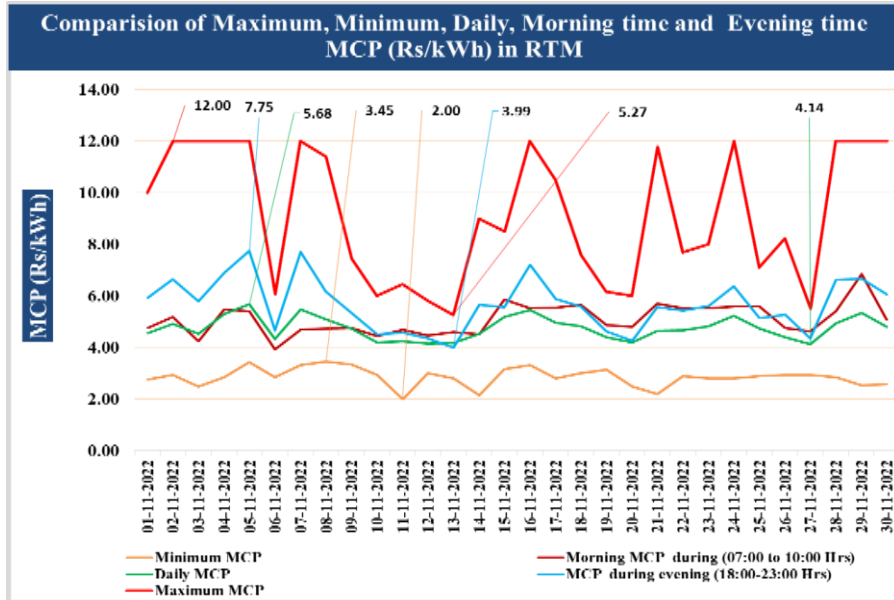
AUGUST, 2022



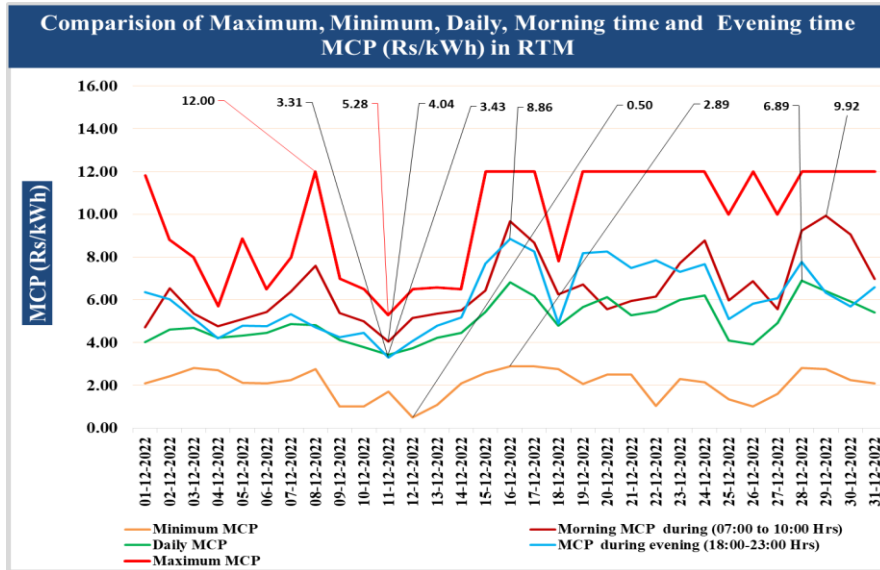
SEPTEMBER, 2022



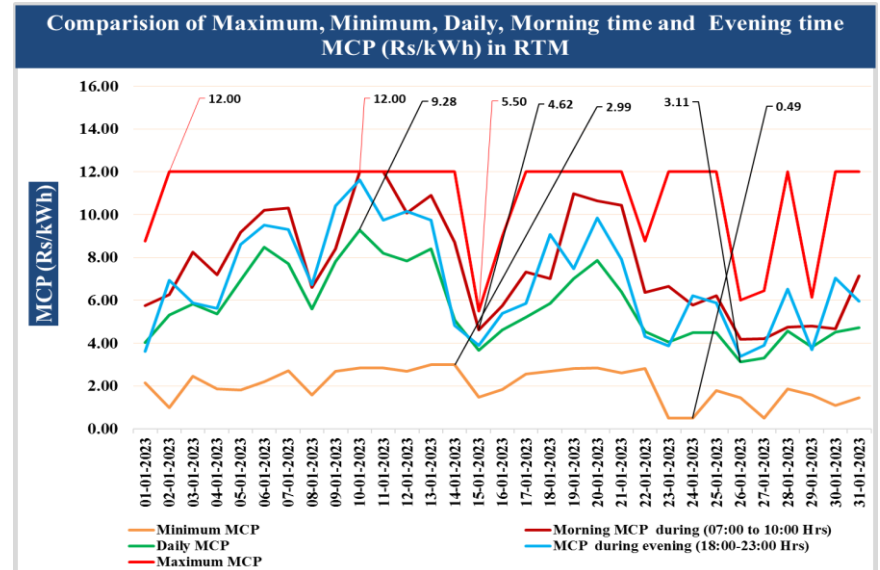
OCTOBER, 2022



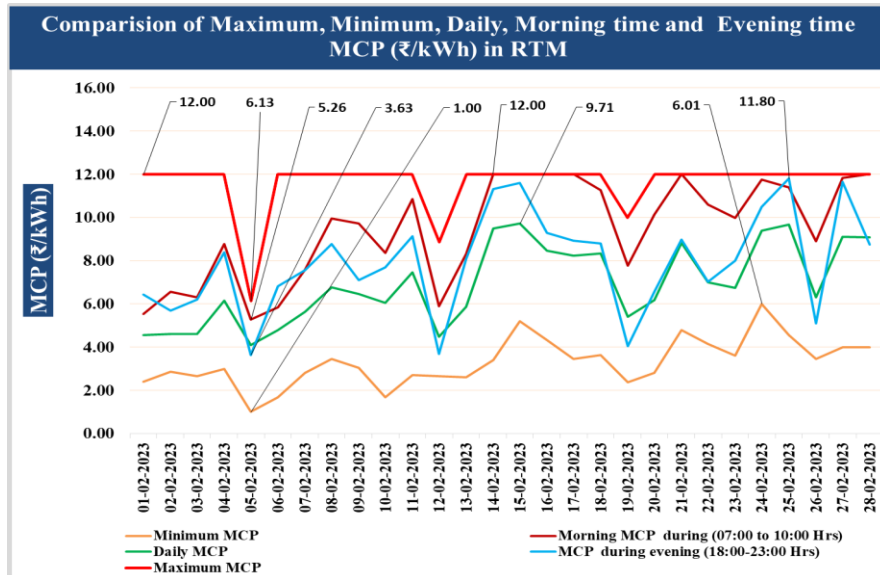
NOVEMBER, 2022



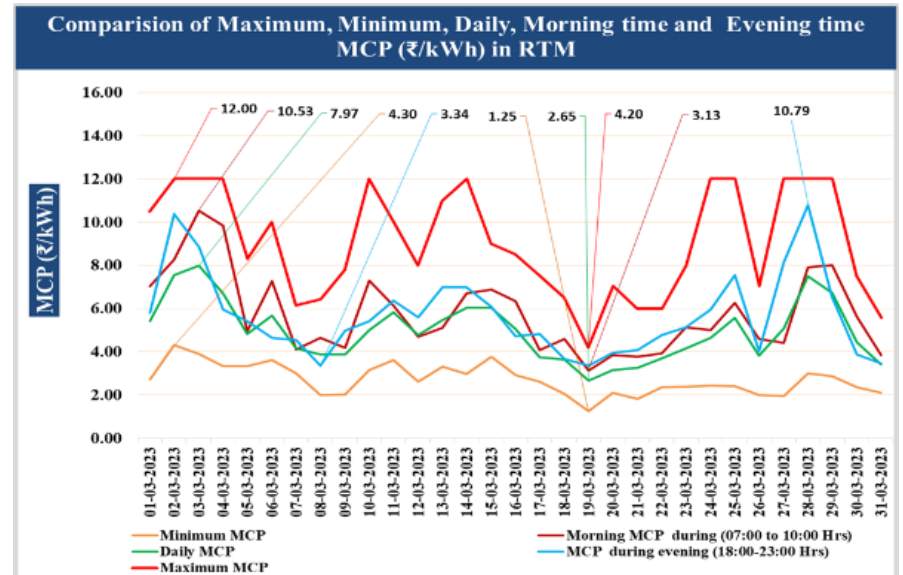
DECEMBER, 2022



JANUARY, 2023



FEBRUARY, 2023



MARCH, 2023