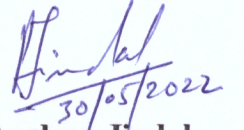


भारत सरकार/ **Government of India**
विद्युत मंत्रालय/ **Ministry of Power**
केन्द्रीय विद्युत प्राधिकरण/ **Central Electricity Authority**
आर. ए. प्रभाग/ **Regulatory Affairs Division**

Subject: Annual Market Monitoring Report for the FY 2021-22-reg.

In the FY 2021-22, a total of **1,374 BU** of electricity was transacted in the country out of which a total of **202.10 BU** was transacted under Short Term Market. The total volume of electricity transacted in both the power exchanges (IEX & PXIL) during FY 2021-22 was **101.46 BU**, which includes transactions through DAM, GDAM, RTM, TAM and GTAM contracts. The total transactions through bilateral trading and through deviations were **75.46 MU** and **25.18 BU**, respectively. Thus, the total short term trade in FY 2021-22 was 14.71 % of total volume of electricity traded in FY 2021-22 and 7.38 % was transacted through Power Exchanges.

The Annual market monitoring report for the FY 2021-22 giving details of electricity transaction happened in the power exchanges is annexed below for reference.


30/05/2022

Pardeep Jindal

Chief Engineer (RA)

To

All Stake holders



सत्यमेव जयते

वार्षिक रिपोर्ट 2021-22

ANNUAL REPORT 2021-22



भारत सरकार/ Government of India

विद्युत मंत्रालय/ Ministry of Power

केन्द्रीय विद्युत प्राधिकरण/ Central Electricity Authority

आर. ए. प्रभाग/ Regulatory Affairs Division



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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 2021-22 provides a snapshot of the short-term transactions of electricity through both the power exchanges in India viz. Indian Energy Exchange (IEX) and Power Exchange of India Ltd. (PXIL) 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 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 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 (Rs/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
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 2021-22 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 2021-22.

The report also provides details of month-wise Minimum, Maximum daily volumes and Final scheduled volume in the month for electricity transacted in both the Power exchanges viz. IEX and PXIL in Day Ahead Market (DAM), Real Time Market (RTM) and Green Day Ahead Market (GDAM) during FY 2021-22. Similarly, the report provides details of the month-wise and also contract-wise Final Scheduled Volume and Price for electricity transacted in both the Power exchanges viz. IEX and PXIL in Term Ahead Market (TAM) and Green Term Ahead Market (GTAM) during FY 2021-22.

The report further provides details of the minimum, maximum and average of daily Market Clearing Price (MCP) of every month during FY 2021-22 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 2021-22 in DAM, RTM and GDAM.

The salient features of Annual Market Monitoring Report of CEA for FY 2021-22 are as under:

The total volume of electricity transacted on both the power exchanges in the DAM, RTM, GDAM, TAM and GTAM on delivery date basis during the FY 2021-22 were **65186 MU, 19909 MU, 921 MU, 9988 MU and 5453 MU** respectively, whereas the total volume in TAM and GTAM on trade date basis were **10,138 MU and 5,432 MU**, respectively. The total energy supplied in the country during the FY 2021-22 was **1,374 BU**. The volume of electricity transacted on the power exchanges on delivery date basis was **101.46 BU**, which is **7.38 %** of the total energy supplied in the country. Out of this DAM, RTM, GDAM, TAM and GTAM represents **4.74%, 1.45%, 0.07%, 0.73% and 0.40%** of the total energy supplied in the country respectively.

In DAM, the total volume of electricity transacted in IEX during FY 2021-22 was **65,143 MU** with an average MCP of **Rs 4.39/kWh**. Similarly, in PXIL, the total volume of electricity transacted in DAM during FY 2021-22 was **42.62 MU** with Average MCP of **Rs 4.42/kWh**. In the RTM, the total volume of electricity transacted in IEX during FY 2021-22 was **19,908 MU** with an average MCP of **Rs 8.46/kWh**. Whereas, in PXIL, there was no transaction of electricity during FY 2021-22 under RTM. In GDAM, the total volume of electricity transacted in IEX

during FY 2021-22 was **921 MU** with an average MCP of **Rs 5.29/kWh** and no transaction happened in PXIL in GDAM.

In the TAM, the total volume of electricity transacted in IEX and PXIL during FY 2021-22 on delivery date basis were **5,561 MU** and **4,427 MU**, respectively. These were **5,596 MU** and **4,542 MU**, respectively on trade date basis. Whereas in the GTAM, the total volume of electricity transacted in IEX and PXIL during FY 2021-22 on delivery date basis were **4,018 MU** and **1,435 MU**, respectively. These were **4,024 MU** and **1,408 MU**, respectively on trade date basis.

During the FY 2021-22, the average price of electricity transacted in TAM in IEX and PXIL on the delivery date basis were **Rs. 4.98/kWh** and **Rs. 4.39/kWh**. The same were **Rs. 4.94/kWh** and **Rs. 5.13/kWh** on trade date basis, respectively. Whereas in GTAM, the average price of electricity transacted in GTAM in IEX and PXIL on the delivery date basis were **Rs. 4.36/kWh** and **Rs. 4.35/kWh**, respectively. For trade date basis also, the price were same at **Rs. 4.47/kWh** and **Rs. 4.43/kWh** on trade date basis, respectively.

During FY 2021-22, congestion in DAM on IEX was observed only on **3 days** and **no** congestion happened in PXIL during FY 2021-22.

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 both 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 happening in IEX only, as the transaction happened in IEX in Day Ahead Market and Real Time Market were **99.93 %** and **100 %** of total transactions in both the power exchanges. The regression analysis's results of each month of FY 2021-22 revealed that the most important variable, which determined the Daily Market Clearing Price was the **Total Purchase Bids** and second important variable was **Total Sell Bids** (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 2021-22.

Note: The data /information used for Annual Market Monitoring Report of CEA for the FY 2021-22 have been obtained from both the Power Exchanges (IEX & PXIL), 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, as well as, to renewable sources such as wind, solar, and bio-mass.

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, 2022 was **3,99,497 MW** out of which Thermal Capacity was **2,36,109 MW (59.10 %)**, Hydro Capacity was **46,723 MW (11.70 %)**, Nuclear capacity was **6,780 MW (1.70 %)** and RES Capacity was **109,885 MW (27.51 %)**. The total electrical energy supplied in the country during the FY 2021-22 was **1,374 BU**.

2. Development of Electricity Market

2.1 Legal and Regulatory framework

Section 66 of Electricity Act, 2003 and Power Market Regulations, 2010 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 provide 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.

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

The transactions of electricity was initially started in 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 both the PXs from FY 2008-09 to FY 2021-22, 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 **101.46 BU** in FY 2021-22.

4. Contracts executed in Power Exchanges in India during FY 2021-22

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 sessions of 15 minutes duration. The trading takes place during even time blocks of the hour with delivery to be commenced 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.

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. Similar to TAM, the GTAM on the power exchanges is the market for trading renewable energy (Solar and Non Solar) 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,
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
8.	W3	West Region	Chhattisgarh
9.	S1	South Region	Andhra Pradesh, Telangana, Karnataka, Pondicherry
10.	S2	South Region	Tamil Nadu, Puducherry, Puducherry (Karaikal),
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

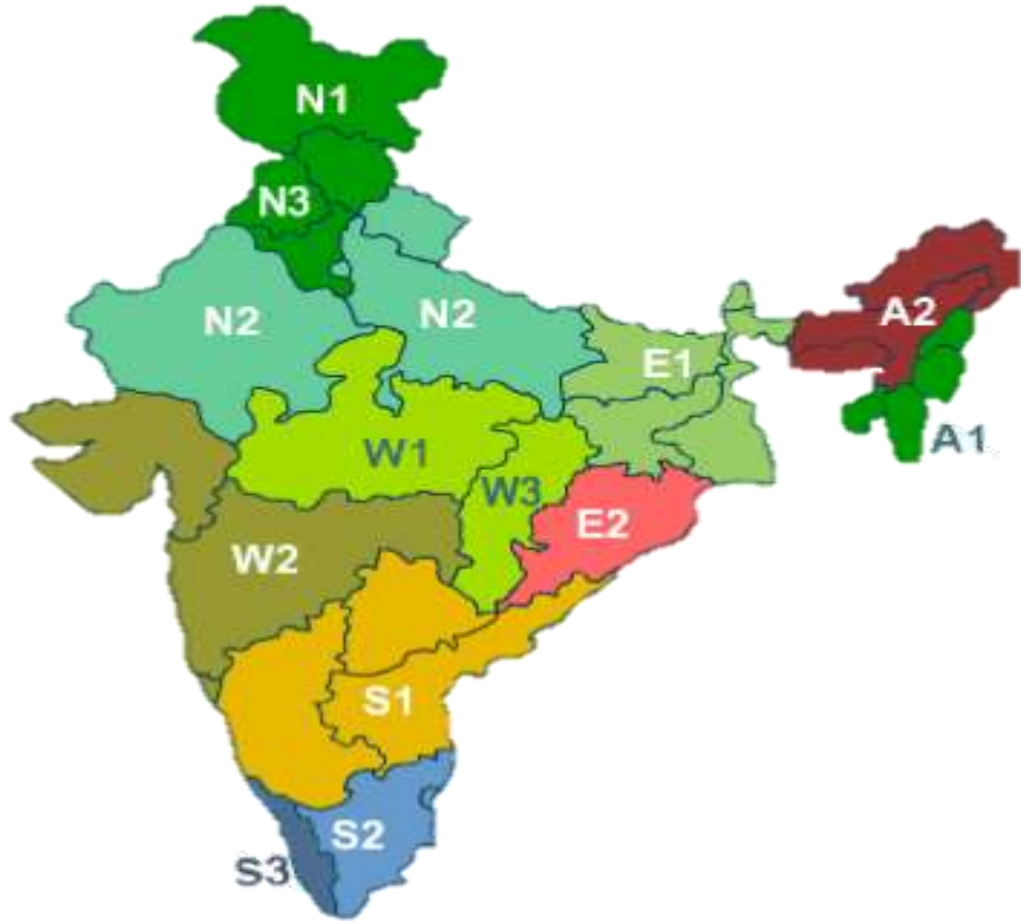


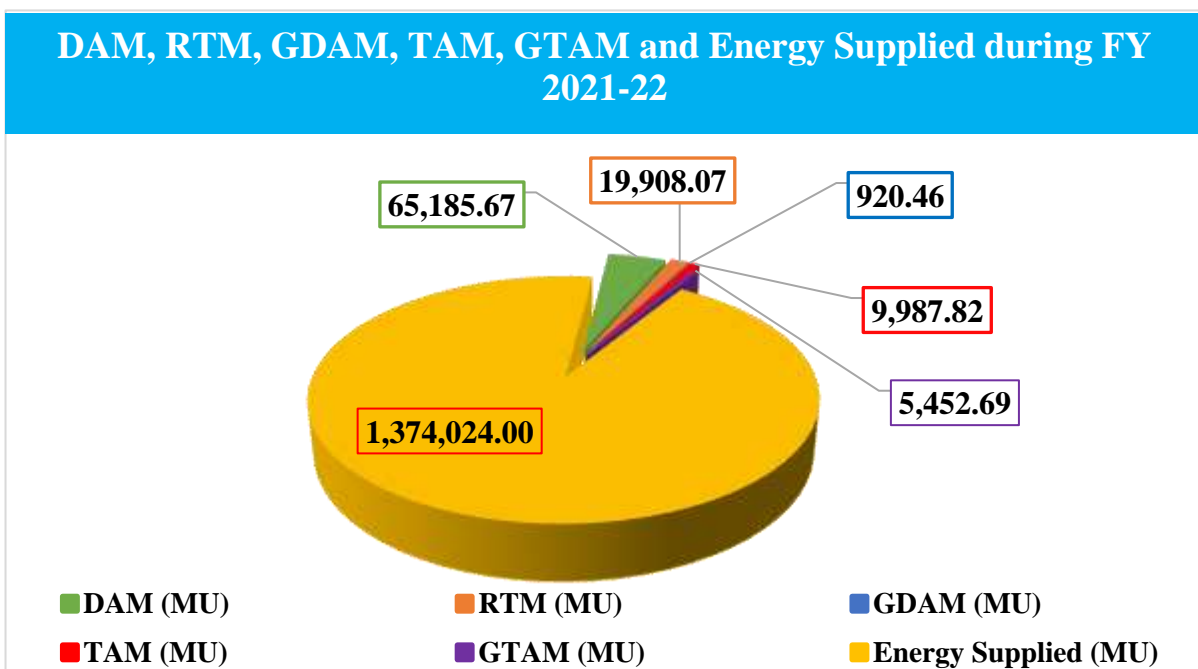
Figure: 1 Demarcation of Bid Areas in the country for Power Exchanges

CHAPTER-II**OVERVIEW OF POWER MARKET IN INDIA****1. Total Short Term Trade (Bilateral + Exchanges + Deviation)**

During, 2021-22, a total of **1,374 BU** of electricity was supplied out of which **75.46 BU** was transacted through Bilateral trade, **101.46 BU** through Power Exchanges and **25.18 BU** through Deviations. Thus the short term trade (**202.10 BU**) constitutes 14.71 % of total energy supplied in the country during FY 2021-22, out of which bilateral trade constituted 5.49 %, trade through exchange constituted 7.38 % and remaining i.e. 1.83 % 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 2021-22

The total volume of electricity transacted on both the power exchanges, viz., IEX and PXIL on delivery date basis during the FY 2021-22 was **101,455 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 **65,186 MU**, **19,909 MU**, **921 MU**, **9,988 MU** and **5,453 MU** respectively. The total energy supplied in the country during the FY 2021-22 was **1,374,024 MU**. The volume of electricity transacted on the power exchanges represents 7.38 % of the total energy supplied in the country, out of which DAM, RTM, GDAM, TAM and GTAM represents 4.74 %, 1.45 %, 0.07 %, 0.73 % and 0.40 % respectively.

**Figure: 2**

3. Transactions in Power Exchanges w.r.t. total Energy Supplied in the country during FY 2021-22

The total volume of electricity transacted through both the power exchanges in DAM, RTM, GDAM, TAM and GTAM together on delivery date basis during FY 2021-22 was **101,455 MU (95,550 MU in IEX and 5,905 MU in PXIL)**. The total energy supplied during the FY 2021-22 was **1,374 BU**. The total volume transacted in power exchanges was **7.38 %** of total electrical energy supplied during FY 2021-22 respectively. The maximum volume of transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in both the Power Exchanges happened in the month of March, 2022, whereas the minimum transaction happened in November, 2021.

The maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in IEX happened in the month of August, 2021, whereas the minimum transaction happened in June, 2021. The maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in PXIL happened in the month of February, 2022, whereas the minimum transaction happened in August, 2021.

The month-wise transactions in PXs (on delivery date basis) and total energy supplied in the country during FY 2021-22 are shown in Table 2:

Month	IEX	PXIL	Total (MU)	Total Energy Supplied (MU)
	DAM+RTM+GDAM+ TAM+GTAM (MU)	DAM+RTM+GDAM+ TAM+GTAM (MU)		
Apr, 2021	7,699.50	587.19	8,286.69	117,080
May, 2021	6,527.75	423.28	6,951.03	108,809
Jun, 2021	7,094.58	362.07	7,456.65	114,483
Jul, 2021	7,274.91	352.25	7,627.16	123,720
Aug, 2021	9,591.10	276.55	9,867.65	127,881
Sept, 2021	8,996.87	306.80	9,303.67	112,435
Oct, 2021	9,156.94	294.64	9,451.58	112,797
Nov, 2021	6,789.82	409.03	7,198.85	99,324
Dec, 2021	7,656.20	502.45	8,158.65	109,177
Jan, 2022	7,524.27	424.32	7,948.59	111,808
Feb, 2022	8,143.80	1,125.09	9,268.89	108,032
Mar, 2022	9,094.11	841.19	9,935.30	128,478
Total	95,549.85	5,904.86	101,454.71	1,374,024

Table: 2

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

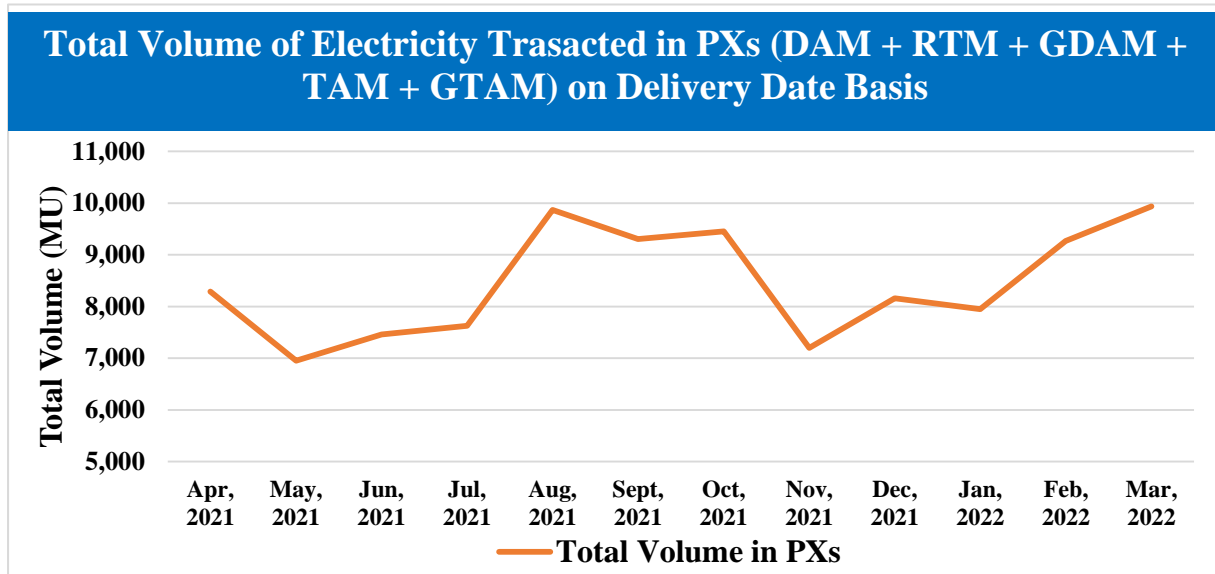


Figure: 3

The total volume of electricity transacted through both the power exchanges in DAM, RTM, GDAM, TAM and GTAM together on trade date basis during FY 2021-22 was **101,584 MU (95,592 MU in IEX and 5,992 MU in PXIL)**. The total energy supplied during the FY 2021-22 was **1,374 BU**. The total volume transacted in power exchanges was **7.39%** of the total electrical energy supplied during FY 2021-22 respectively. The maximum volume of transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in both the Power Exchanges happened in the month of March, 2022, whereas the minimum transaction happened in November, 2021.

The maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in IEX happened in the month of August, 2021, whereas the minimum transaction happened in June, 2021. The maximum transaction of electricity (DAM+RTM+GDAM+TAM+GTAM) in PXIL happened in the month of February, 2022, whereas the minimum transaction happened in September, 2021.

The month-wise transactions in PXs (on trade date basis) and total energy supplied in the country during FY 2021-22 are shown in Table 3:

Month	IEX	PXIL	Total (MU)	Total Energy Supplied (MU)
	DAM+RTM+GDAM+TAM+GTAM	DAM+RTM+GDAM+TAM+GTAM		
Apr, 2021	7,684.31	661.62	8,345.93	117,080
May, 2021	6,582.93	347.95	6,930.88	108,809
Jun, 2021	7,074.13	398.38	7,472.51	114,483
Jul, 2021	7,392.07	286.10	7,678.17	123,720

Month	IEX	PXIL	Total (MU)	Total Energy Supplied (MU)
	DAM+RTM+ GDAM+ TAM+GTAM	DAM+RTM+ GDAM+ TAM+GTAM		
Aug, 2021	9,404.35	321.96	9,726.31	127,881
Sept, 2021	9,001.01	270.30	9,271.31	112,435
Oct, 2021	9,232.72	279.53	9,512.25	112,797
Nov, 2021	6,773.46	402.79	7,176.25	99,324
Dec, 2021	7,722.30	540.74	8,263.04	109,177
Jan, 2022	7,498.70	394.46	7,893.16	111,808
Feb, 2022	8,238.36	1,177.36	9,415.72	108,032
Mar, 2022	8,987.70	911.02	9,898.72	128,478
Total	95,592.04	5,992.21	101,584.25	1,374,024

Table: 3

The graphical representation of total volume of electricity transacted in DAM, RTM, GDAM, TAM and GTAM in PXs on trade date basis is given in **figure: 4**

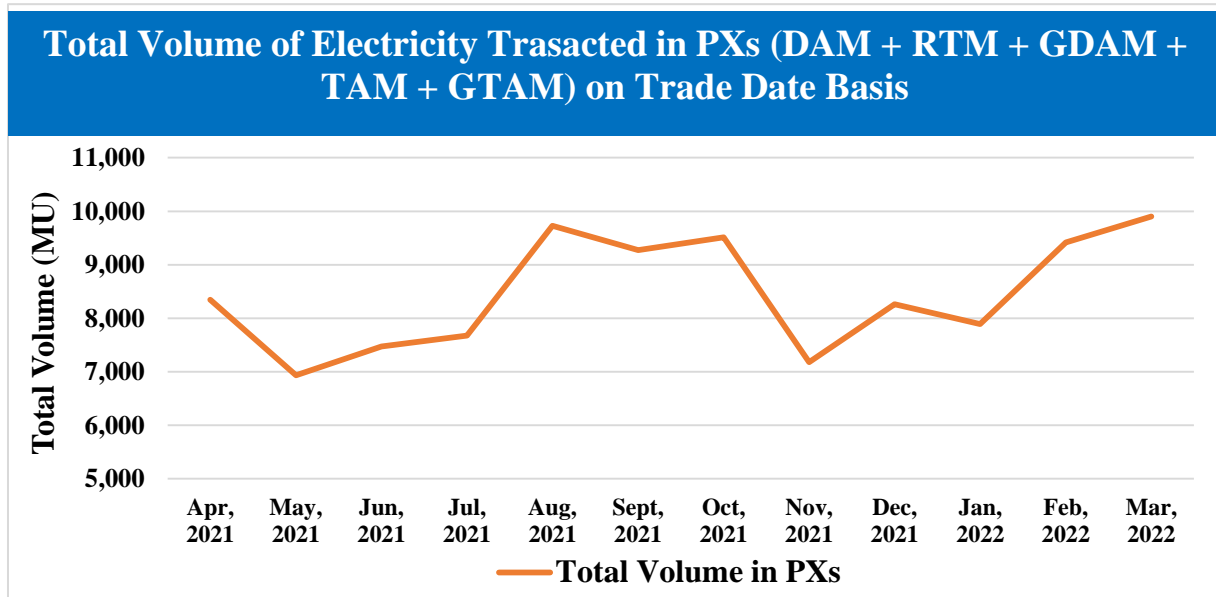


Figure: 4

4. Volume of electricity transaction in power exchanges on delivery date basis as percentage (%) of total electrical energy supplied in the country during FY 2021-22

The total volume of electricity transacted in power exchanges on delivery date basis as percentage (%) of total electricity generated and the total electrical energy supplied in the country during FY 2021-22 are given in **Table: 4**.

Month	% of IEX w.r.t. Total Energy Supplied	% of PXIL w.r.t. Total Energy Supplied	% of Total Volume in PXs w.r.t. Total Energy Supplied
Apr, 2021	6.58%	0.50%	7.08%
May, 2021	6.00%	0.39%	6.39%
Jun, 2021	6.20%	0.32%	6.51%
Jul, 2021	5.88%	0.28%	6.16%
Aug, 2021	7.50%	0.22%	7.72%
Sept, 2021	8.00%	0.27%	8.27%
Oct, 2021	8.12%	0.26%	8.38%
Nov, 2021	6.84%	0.41%	7.25%
Dec, 2021	7.01%	0.46%	7.47%
Jan, 2022	6.73%	0.38%	7.11%
Feb, 2022	7.54%	1.04%	8.58%
Mar, 2022	7.08%	0.65%	7.73%
FY 2021-22	6.95%	0.43%	7.38%

Table: 4

The graphical representation of the total volume of electricity transacted on delivery date basis in power exchanges as percentage of the total electrical energy supplied in the country during FY 2021-22 is displayed in **Figure: 5**.

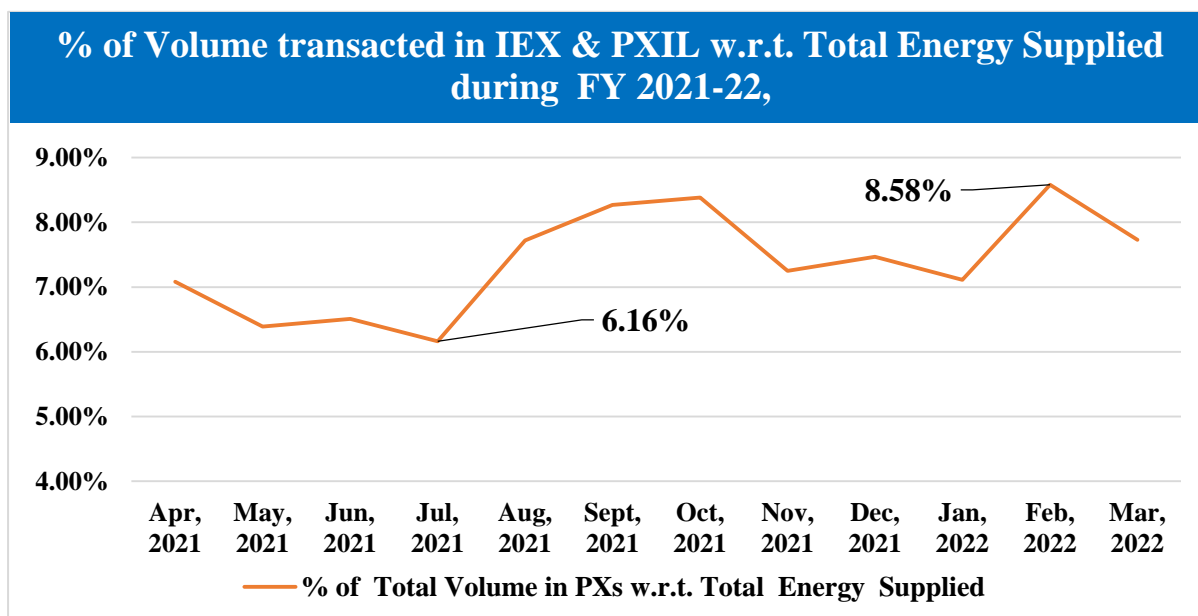


Figure: 5

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

The total volume of electricity transacted in IEX in DAM on delivery date basis during FY 2021-22 was **65,186 MU** with an average MCP of **Rs 4.58 /kWh**. In IEX, the maximum transaction of electricity happened in the month of August, 2021 which was **6,649 MU** with an average MCP of **Rs 5.06 /kWh**. The minimum volume of electricity happened in the month of July, 2021, which was **4,238 MU** with average MCP of **Rs 2.95 /kWh**.

The total volume of electricity transacted on IEX in DAM was **99.94 %** of the total volume on the power exchanges.

2. Volume and Price of Electricity transacted in PXIL

The total volume of electricity transacted in PXIL in DAM on delivery date basis during FY 2021-22 was **42.62 MU** with Average MCP of **Rs 4.37/kWh**. In PXIL, the maximum volume of transaction of electricity happened in the month of June, 2021, which was **21.91 MU** with average MCP of **Rs 3.35 /kWh** and the minimum volume of transaction of electricity happened in the month of March, 2022, which was **0.20 MU** with average MCP of **Rs 3.49 /kWh**.

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

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

Month	Final Scheduled Volume MU)			Average MCP (Rs/kWh)		
	IEX	PXIL	Total	IEX	PXIL	Wt. Avg.
Apr, 2021	5,699.22	4.73	5,703.95	3.70	3.69	3.70
May, 2021	4,363.88	3.32	4,367.20	2.83	3.06	2.83
Jun, 2021	4,314.17	21.91	4,336.08	3.06	3.35	3.07
Jul, 2021	4,238.25	2.76	4,241.01	2.95	3.02	2.95
Aug, 2021	6,648.76	5.12	6,653.88	5.06	4.72	5.06
Sept, 2021	6,418.27	1.27	6,419.54	4.40	6.52	4.40
Oct, 2021	6,568.31	0.37	6,568.68	8.01	7.71	8.00
Nov, 2021	4,718.76	0.74	4,719.50	3.08	3.71	3.08
Dec, 2021	5,423.27	0.88	5,424.15	3.54	4.23	3.54
Jan, 2022	5,279.70	0.56	5,280.26	3.39	4.38	3.39
Feb, 2022	5,612.07	0.76	5,612.83	4.44	5.14	4.44
Mar, 2022	5,858.39	0.20	5,858.59	8.23	3.49	8.22
Total	65,143.05	42.62	65,185.67			
Average FY 2021-22	5,428.59	3.55	5,432.14	4.39	4.42	4.58

No transaction happened

NA- Not applicable

Table: 5

The graphical representation of month wise total FSV in DAM is displayed in **Figure: 6**.

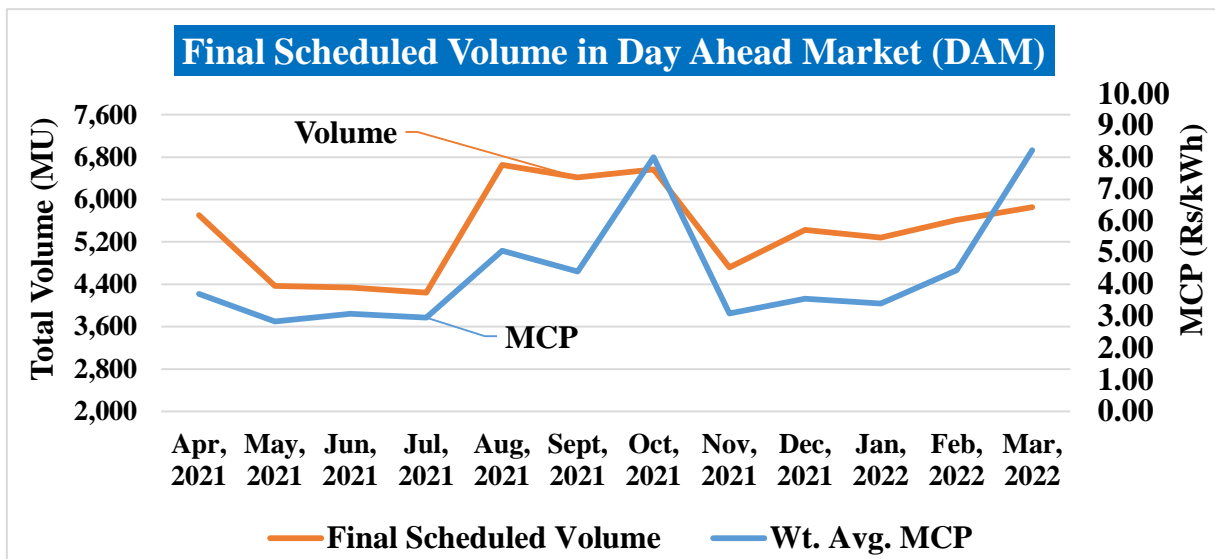


Figure: 6

4. Maximum/ Minimum Final scheduled Volume (FSV) for a Day in DAM during FY 2021-22

The maximum Final Scheduled Volume (FSV) for transaction of electricity for a day in IEX in Day Ahead Market was observed in the month of February, 2022 during the FY 2021-22, whereas, in PXIL the maximum FSV was observed in the month of August, 2021. Similarly, the minimum FSV in any particular day in IEX was observed in May, 2021, while in PXIL, the minimum FSV was observed in May, 2021, January, 2022 & February, 2022.

The month- wise Maximum/Minimum FSV for a day during various months of FY 2021-22 are shown in **Table 6**:

Months	Minimum FSV (MU)		Maximum FSV (MU)	
	IEX	PXIL	IEX	PXIL
Apr, 2021	143.55	0.14	238.26	0.84
May, 2021	102.60	0.01	167.32	0.79
Jun, 2021	111.91	0.05	172.97	0.73
Jul, 2021	103.00	0.11	176.31	2.07
Aug, 2021	114.52	0.84	296.64	3.94
Sept, 2021	154.11	0.03	294.18	0.38
Oct, 2021	115.18	0.03	181.82	0.16
Nov, 2021	108.16	0.02	180.05	0.20
Dec, 2021	155.60	0.01	209.33	0.28
Jan, 2022	136.74	0.01	196.08	0.10
Feb, 2022	172.17	0.01	226.72	0.10
Mar, 2022	148.13	0.04	245.05	0.16

- No transaction happened

Table: 6

The graphical representation of month wise maximum & minimum FSV in DAM is displayed in **Figure: 7 & 8**

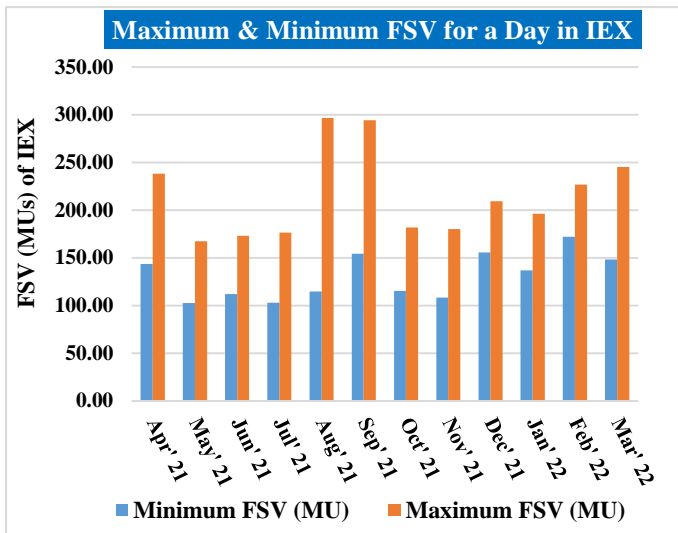


Figure: 7

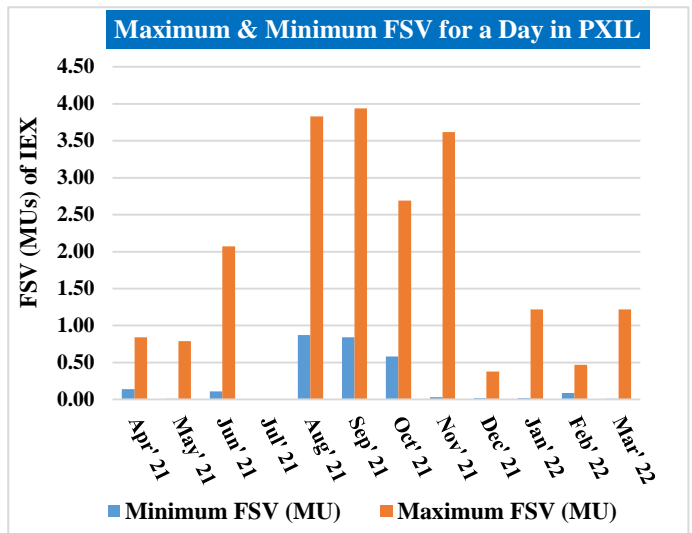


Figure: 8

5. Maximum, Minimum & Average of Daily Average MCP in DAM during FY 2021-22

The maximum daily average MCP for transaction of electricity in IEX was observed in the month of March, 2022 (**Rs. 18.67 /kWh**) during the FY 2021-22, whereas, in PXIL it was **Rs. 9.99 /kWh, which** was observed in the month of October, 2021. Similarly, the minimum daily average MCP of **Rs. 1.79 /kWh** in IEX was observed in July, 2021, while in PXIL, the minimum MCP of **Rs. 2.00 /kWh** was also observed in March, 2022. The month-wise Maximum, Minimum and Average MCP are shown in **Table 7**:

Months	Maximum Daily Average MCP (Rs/kWh)		Minimum Daily Average MCP (Rs/kWh)		Monthly Average MCP (Rs/kWh)	
	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2021	4.94	4.57	2.96	3.28	3.70	3.69
May, 2021	3.29	3.63	2.26	2.53	2.83	3.06
Jun, 2021	4.65	4.77	2.00	2.36	3.06	3.35
Jul, 2021	5.08	3.72	1.79	2.32	2.95	3.02
Aug, 2021	9.81	8.16	1.90	2.88	5.06	4.72
Sept, 2021	7.04	8.09	2.35	5.00	4.40	6.52
Oct, 2021	16.42	9.99	2.37	4.59	8.01	7.71
Nov, 2021	3.83	4.99	1.96	2.99	3.08	3.71
Dec, 2021	4.41	5.58	2.69	2.16	3.54	4.23
Jan, 2022	4.45	4.99	2.63	3.99	3.39	4.38
Feb, 2022	6.94	5.86	3.29	4.99	4.44	5.14
Mar, 2022	18.67	4.99	3.76	2.00	8.23	3.49

- No transaction happened

Table: 7

The graphical representation of month wise maximum, minimum & average of daily average MCP is displayed in **Figure: 9 & 10**

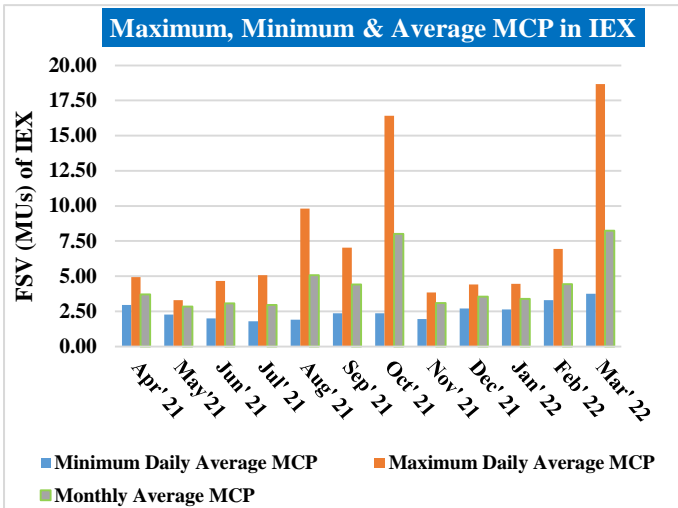


Figure: 9

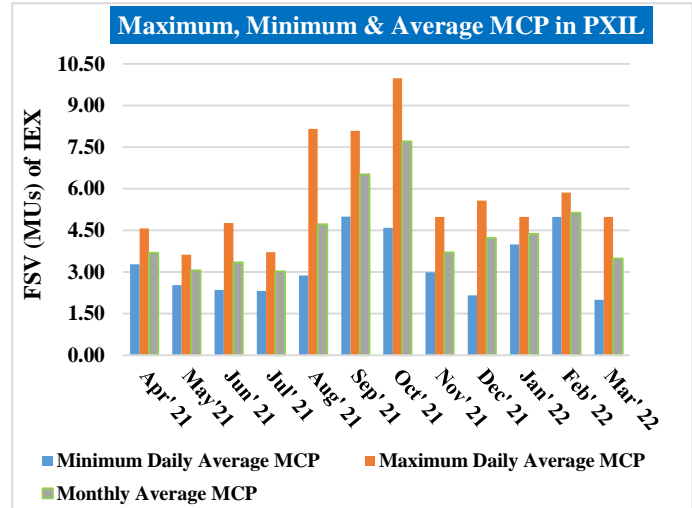


Figure: 10

6. Maximum/ Minimum Area Clearing Price (ACP) in DAM during FY 2021-22

The maximum ACP of **Rs. 20.00 /kWh** in IEX during the FY 2021-22 was observed during the months August, 2021 to December, 2021, February, 2022 & March, 2022, whereas, the minimum ACP of **Rs. 0.60 /kWh** in IEX was observed in June, 2021. Similarly, the maximum ACP of **Rs. 19.50 /kWh** in PXIL during the FY 2021-22 was observed October, 2021 during FY 2021-22, whereas, the minimum ACP of **Rs. 1.85 /kWh** in PXIL was observed in December, 2021.

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

Months	IEX		PXIL	
	Min. ACP (Rs/kWh)	Max. ACP (Rs/kWh)	Min. ACP (Rs/kWh)	Max. ACP (Rs/kWh)
Apr, 2021	2.30	7.55	3.09	7.10
May, 2021	1.50	7.10	2.53	4.41
Jun, 2021	0.60	9.67	2.00	6.99
Jul, 2021	1.00	10.90	2.32	6.99
Aug, 2021	1.10	20.00	2.41	8.99
Sept, 2021	1.50	20.00	3.33	15.90
Oct, 2021	1.00	20.00	3.65	19.50
Nov, 2021	1.37	20.00	2.99	5.99
Dec, 2021	1.47	20.00	1.85	5.50
Jan, 2022	1.58	11.27	3.99	4.99
Feb, 2022	2.00	20.00	3.99	5.99
Mar, 2022	2.42	20.00	2.00	4.99

- No Transaction happened

Table: 8

7. Congestion in Day Ahead Market in IEX and PXIL

From the table, it may be seen that in DAM, the total transmission congestion of **11.26 MU** happened in IEX, whereas, **no** transmission congestion happened in PXIL during FY

2021-22. The congestion was only 0.017 % of the total volume of electricity transacted in DAM.

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

Months	IEX		PXIL		Total	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	11.26	3 days	00	00	11.26	3 days
May, 2021	0.00	00	00	00	0.00	00
Jun, 2021	0.00	00	00	00	0.00	00
Jul, 2021	0.00	00	00	00	0.00	00
Aug, 2021	0.00	00	00	00	0.00	00
Sept, 2021	0.00	00	00	00	0.00	00
Oct, 2021	0.00	00	00	00	0.00	00
Nov, 2021	0.00	00	00	00	0.00	00
Dec, 2021	0.00	00	00	00	0.00	00
Jan, 2022	0.00	00	00	00	0.00	00
Feb, 2022	0.00	00	00	00	0.00	00
Mar, 2022	0.00	00	00	00	0.00	00
Total	11.26	3 days	0.00	0.00	11.26	3 days

- No transaction happened

NA: Not Applicable

Table: 9

8. Real Time Curtailment in Day Ahead Market

The total volume of real time curtailment of **7.89 MU** happened in DAM in IEX during FY 2021-22, whereas no real time curtailment happened in PXIL during same period. As a result, 7.89 MU could not be transacted due to real time curtailment in the power exchanges. This is only 0.012 % of the total volume of electricity transacted in DAM.

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

Months	IEX	PXIL	Total (MU)
	Curtailment (MU)	Curtailment (MU)	
Apr, 2021	0.00	0.00	0.00
May, 2021	0.00	0.00	0.00
Jun, 2021	2.35	0.00	2.35
Jul, 2021	0.00	0.00	0.00
Aug, 2021	5.13	0.00	5.13
Sept, 2021	0.00	0.00	0.00
Oct, 2021	0.00	0.00	0.00
Nov, 2021	0.41	0.00	0.41
Dec, 2021	0.00	0.00	0.00
Jan, 2022	0.00	0.00	0.00
Feb, 2022	0.00	0.00	0.00
Mar, 2022	0.00	0.00	0.00
Total	7.89	0.00	7.89

Table: 10

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

The total volume of electricity transacted in IEX in RTM on delivery date basis during FY 2021-22 was **19,908 MU** with an average MCP of **Rs 8.46 /kWh**. In IEX, the maximum transaction of electricity happened in the month of March, 2022 which was **2,021 MU** with an average MCP of **Rs 8.17 /kWh**. The minimum volume of electricity happened in the month of November, 2021, which was **1,311 MU** with average MCP of **Rs 3.48 /kWh**.

No transaction of electricity happened in PXIL in RTM, so the total volume of electricity transacted on IEX in RTM was **100 %** of the total volume on the power exchanges.

2. 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 in RTM are shown in **Table 11**

Month	Final Scheduled Volume (MU)			Average MCP (Rs/kWh)		
	IEX	PXIL	Total	IEX	PXIL	Wt. Avg.
Apr, 2021	1,473.36	-	1,473.36	3.50	NA	3.50
May, 2021	1,436.28	-	1,436.28	2.53	NA	2.53
Jun, 2021	1,725.70	-	1,725.70	3.02	NA	3.02
Jul, 2021	1,596.00	-	1,596.00	2.77	NA	2.77
Aug, 2021	1,859.46	-	1,859.46	4.64	NA	4.64
Sept, 2021	1,842.59	-	1,842.59	3.84	NA	3.84
Oct, 2021	1,999.17	-	1,999.17	6.91	NA	6.91
Nov, 2021	1,311.35	-	1,311.35	3.48	NA	3.48
Dec, 2021	1,512.39	-	1,512.39	3.61	NA	3.61
Jan, 2022	1,575.13	-	1,575.13	3.45	NA	3.45
Feb, 2022	1,555.78	-	1,555.78	4.35	NA	4.35
Mar, 2022	2,020.86	-	2,020.86	8.17	NA	8.17
Total	19,908.07	-	19,908.07			
Average FY 2021-22	1,659.01	-	1,659.01	8.46	NA	8.46

- No transaction happened

NA- Not applicable

Table: 11

The graphical representation of month wise total FSV in RTM is displayed in **Figure: 11**.

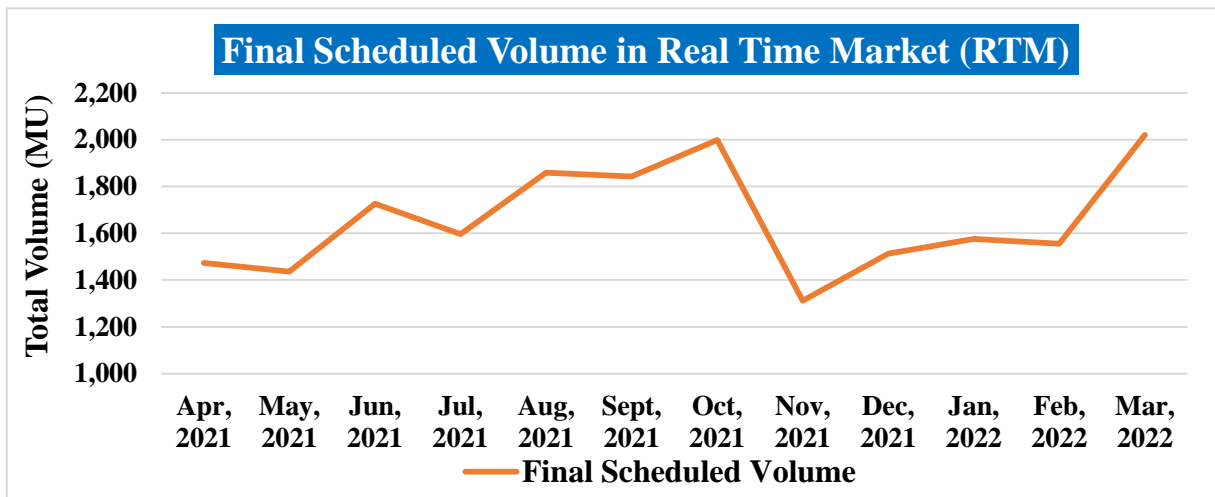


Figure: 11

3. Maximum / Minimum Final Scheduled Volume (FSV) for a Day in RTM during FY 2021-22

The maximum Final Scheduled Volume (FSV) for transaction of electricity in any particular day in IEX in Real Time Market was observed in the month of August, 2021, whereas, the minimum FSV in any particular day was observed in the month of May, 2021 during the FY 2021-22. In PXIL, no transaction of electricity happened during FY 2021-22. The month-wise Maximum/Minimum FSV for a day during various months of FY 2021-22 are shown in **Table 12**:

Months	Minimum FSV (MU)		Maximum FSV (MU)	
	IEX	PXIL	IEX	PXIL
Apr, 2021	35.56	-	68.36	-
May, 2021	26.62	-	74.33	-
Jun, 2021	44.84	-	79.96	-
Jul, 2021	33.33	-	81.61	-
Aug, 2021	40.08	-	98.33	-
Sept, 2021	40.58	-	88.03	-
Oct, 2021	28.16	-	96.91	-
Nov, 2021	31.36	-	56.17	-
Dec, 2021	33.95	-	67.45	-
Jan, 2022	37.21	-	75.04	-
Feb, 2022	38.02	-	88.64	-
Mar, 2022	47.92	-	96.60	-

- No transaction happened

Table: 12

The graphical representation of month wise maximum & minimum FSV in IEX in RTM is displayed in **Figure: 12**

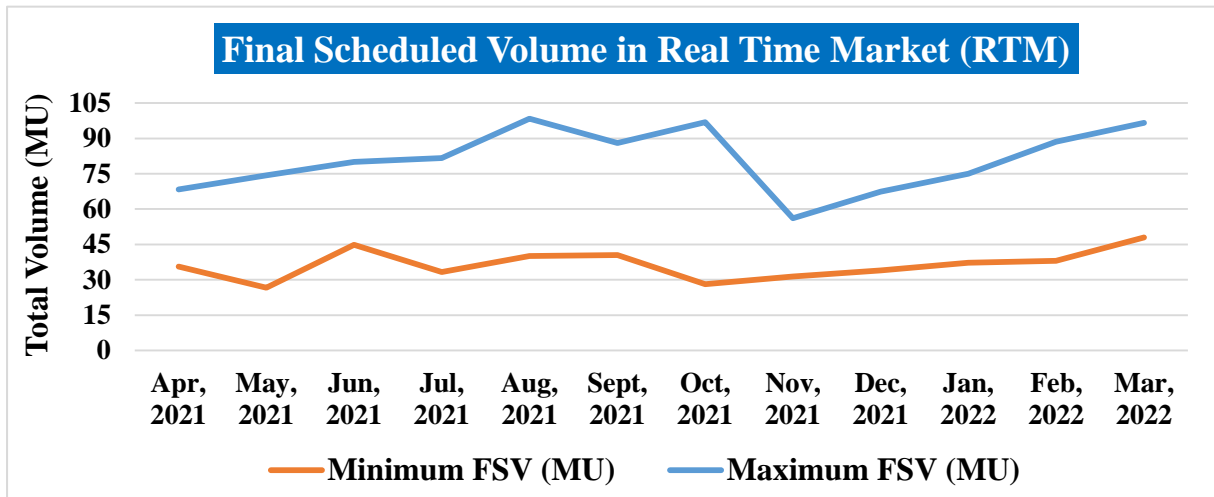


Figure: 12

4. Maximum, Minimum & Average of Daily Average MCP in RTM during FY 2021-22

The maximum MCP for transaction of electricity in IEX was observed in the month of March, 2022 (**Rs. 17.49 /kWh**) during the FY 2021-22. Whereas, the minimum MCP of **Rs. 1.60 /kWh** in IEX was observed in June, 2021. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in RTM.

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

Months	Maximum MCP (Rs/kWh)		Min. MCP (Rs/kWh)		Average MCP (Rs/kWh)	
	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2021	5.60	NA	2.77	NA	3.50	NA
May, 2021	3.56	NA	1.71	NA	2.53	NA
Jun, 2021	5.85	NA	1.60	NA	3.02	NA
Jul, 2021	6.47	NA	1.62	NA	2.77	NA
Aug, 2021	11.98	NA	2.18	NA	4.64	NA
Sept, 2021	6.89	NA	1.66	NA	3.84	NA
Oct, 2021	15.81	NA	2.53	NA	6.91	NA
Nov, 2021	5.43	NA	2.08	NA	3.48	NA
Dec, 2021	5.12	NA	2.51	NA	3.61	NA
Jan, 2022	4.92	NA	2.53	NA	3.45	NA
Feb, 2022	7.08	NA	3.13	NA	4.35	NA
Mar, 2022	17.49	NA	3.43	NA	8.17	NA

NA: Not Applicable as no transaction happened

Table: 13

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

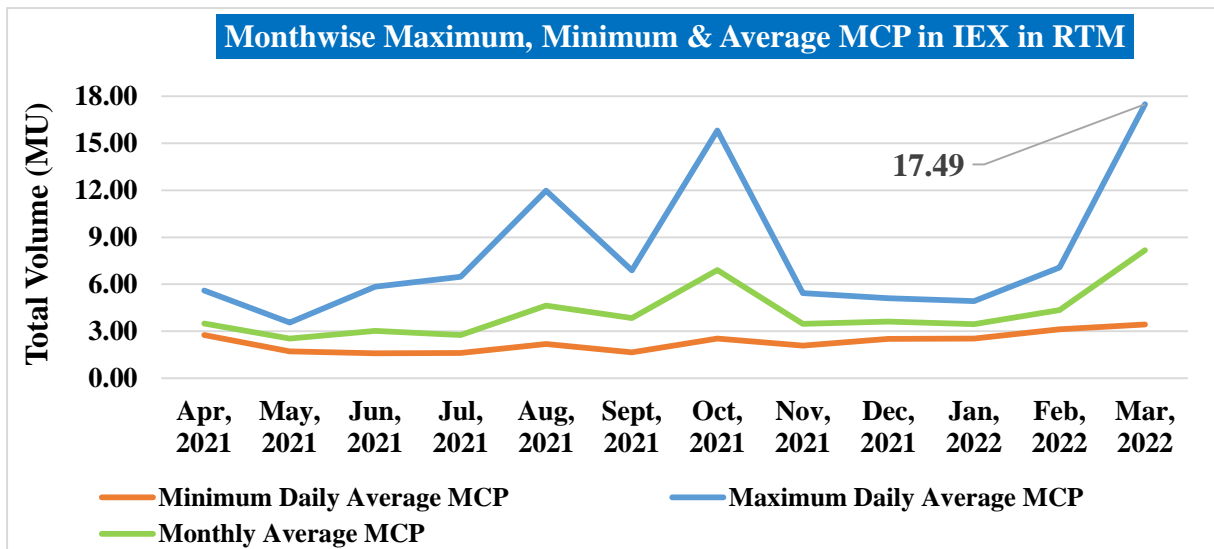


Figure: 13

5. Maximum / Minimum Area Clearing Price (ACP) in RTM during FY 2021-22

The maximum ACP of **Rs. 20.00 /kWh** in the month in IEX during the FY 2021-22 was observed from August, 2021 to March, 2022, whereas, the minimum ACP of **Rs. 0.50 /kWh** in IEX was observed in May, 2021, September, 2021 to November, 2021 and January, 2022. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in RTM.

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

Months	IEX		PXIL	
	Max. ACP (Rs/kWh)	Min. ACP (Rs/kWh)	Max. ACP (Rs/kWh)	Min. ACP (Rs/kWh)
Apr, 2021	10.50	1.00	NA	NA
May, 2021	6.01	0.50	NA	NA
Jun, 2021	13.00	0.49	NA	NA
Jul, 2021	16.85	0.20	NA	NA
Aug, 2021	20.00	0.80	NA	NA
Sept, 2021	20.00	0.50	NA	NA
Oct, 2021	20.00	0.50	NA	NA
Nov, 2021	20.00	0.50	NA	NA
Dec, 2021	20.00	0.95	NA	NA
Jan, 2022	20.00	0.50	NA	NA
Feb, 2022	20.00	1.64	NA	NA
Mar, 2022	20.00	1.00	NA	NA

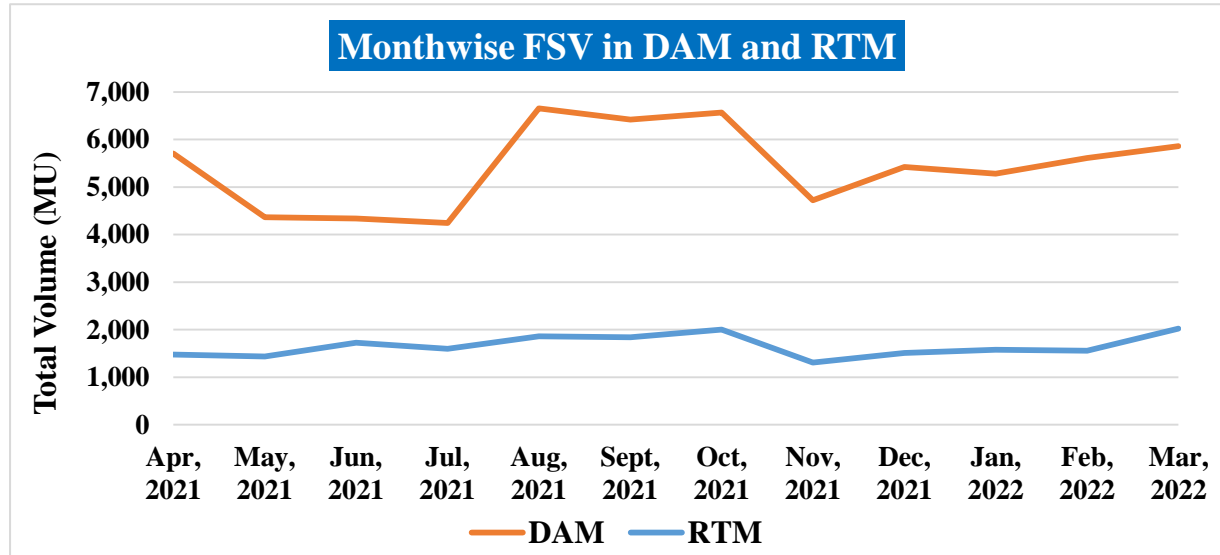
NA: Not Applicable as no transaction happened

Table: 14

6. Comparison of Final Scheduled volume & Monthly average MCP of Day Ahead Market and Real Time Market during FY 2021-22

During the FY 2021-22, the volume of electricity transacted in Day Ahead Market and Real Time Market were **65,186 MU** & **19,908 MU**, respectively. Whereas, the average MCP's for DAM & RTM during FY 2021-22 were **Rs. 4.58/kWh** & **Rs. 8.46/kWh**, respectively.

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



*Transaction of electricity in RTM started from 1st June, 2020 onwards.

Figure: 14

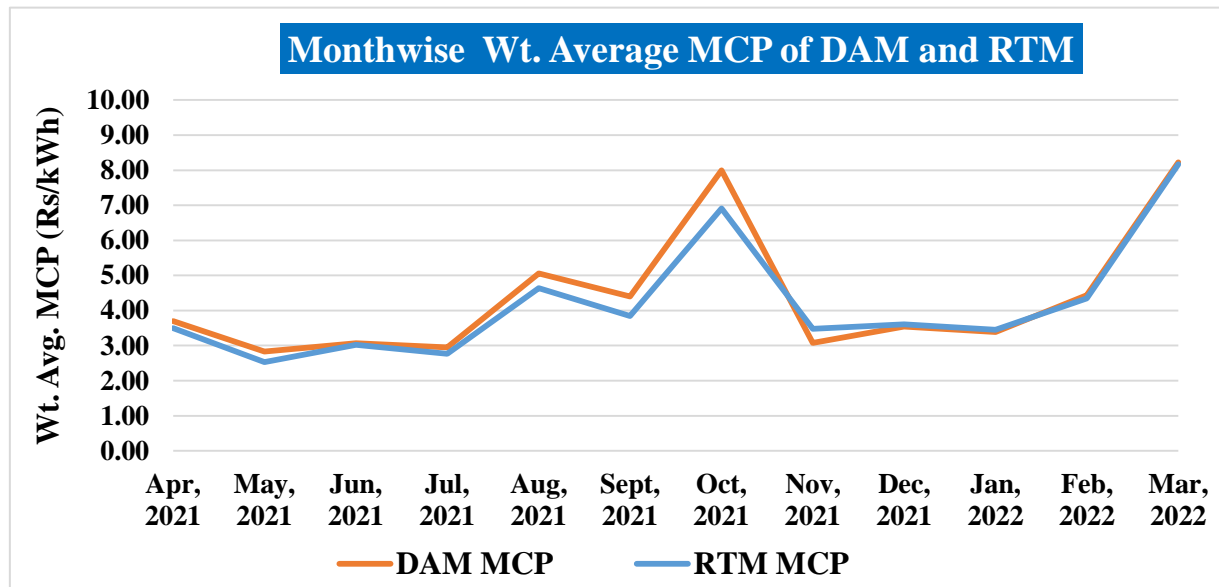


Figure: 15

7. Congestion in Real Time Market in IEX and PXIL

From the table, it may be seen that in RTM, the total transmission congestion of **46.46 MU** happened in IEX during FY 2021-22. Whereas, **no** transaction of electricity happened in PXIL in RTM during FY 2021-22.

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

Months	IEX		PXIL		Total	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2020	0.64	6 days			0.64	6 days
May, 2020	0.00	0			0.00	0
Jun, 2020	3.97	9 days	-	NA	3.97	9 days
Jul, 2020	26.01	27 days	-	NA	26.01	27 days
Aug, 2020	9.35	17 days	-	NA	9.35	17 days
Sept, 2020	2.11	10 days	-	NA	2.11	10 days
Oct, 2020	1.14	5 days	-	NA	1.14	5 days
Nov, 2020	0.00	0	-	NA	0.00	0
Dec, 2020	0.06	1 day	-	NA	0.06	1 day
Jan, 2021	0.005	1 day	-	NA	0.005	1 day
Feb, 2021	0.05	2 days	-	NA	0.05	2 days
Mar, 2021	3.13	9 days	-	NA	3.13	9 days
Total	46.46	87 days	-	NA	46.46	87 days

- No transaction happened

NA: Not Applicable

Table: 15

8. Real Time Curtailment in Real Time Market

There was **no** real time curtailment happened in Real Time Market in IEX during FY 2021-22. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in RTM.

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

The transaction of electricity in Green Day Ahead market (GDAM) started from 27th October, 2021 in IEX. The total volume of electricity transacted in IEX in GDAM on delivery date basis during FY 2021-22 was **920 MU** (**419.70 MU** under Solar and **500.76 MU** under Non Solar) with an average MCP of **Rs 5.29 /kWh** for both Solar & Non Solar. In IEX, the maximum transaction of electricity happened in the month of March, 2022 which was **205 MU** with an average MCP of **Rs 8.09 /kWh**. The minimum volume of electricity happened in the month of October, 2021, which was **19 MU** with average MCP of **Rs 5.36 /kWh**.

No transaction of electricity happened in PXIL in GDAM, so the total volume of electricity transacted on IEX in RTM was **100 %** of the total volume on the power exchanges.

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

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

Month	Final Scheduled Volume (MU)			Average MCP (Rs/kWh)
	Solar	Non Solar	Total	
Apr, 2021	Transaction of electricity in GDAM started from 27 th October, 2021 in IEX			
May, 2021				
Jun, 2021				
Jul, 2021				
Aug, 2021				
Sept, 2021				
Oct, 2021	17.19	2.22	19.41	5.36
Nov, 2021	129.25	20.22	149.47	4.48
Dec, 2021	102.67	54.53	157.20	4.72
Jan, 2022	56.63	141.72	198.35	4.20
Feb, 2022	46.09	145.12	191.21	4.91
Mar, 2022	67.87	136.95	204.82	8.09
Total	419.70	500.76	920.46	
Average FY 2021-22	69.95	83.46	153.41	5.29

Table: 16

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

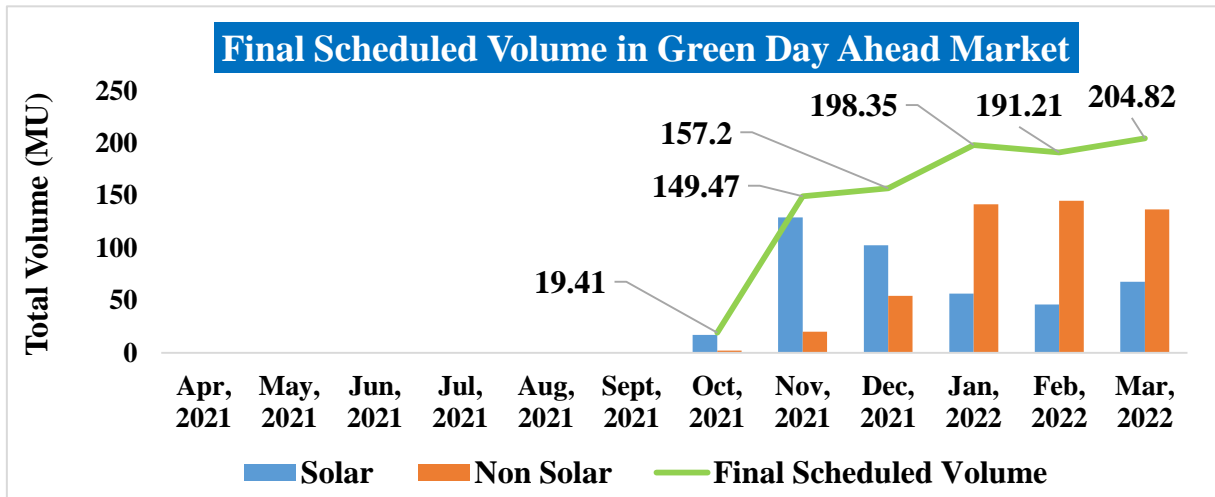


Figure: 16

3. Maximum / Minimum Final Scheduled Volume (FSV) for a Day in GDAM during FY 2021-22

The maximum Final Scheduled Volume (FSV) for transaction of electricity in any particular day in IEX in Green Day Ahead Market was observed in the month of January, 2022, whereas, the minimum FSV in any particular day was observed in the month of October, 2021 during the FY 2021-22. In PXIL, no transaction of electricity happened during FY 2021-22.

The month-wise Maximum/Minimum FSV for a day during various months of FY 2021-22 are shown in **Table 17**:

Months	Minimum FSV (MU)		Maximum FSV (MU)	
	Solar	Non Solar	Solar	Non Solar
Apr, 2021	Transaction of electricity in GDAM started from 27 th October, 2021 in IEX			
May, 2021				
Jun, 2021				
Jul, 2021				
Aug, 2021				
Sept, 2021				
Oct, 2021				
Nov, 2021	1.06	0.18	7.16	1.44
Dec, 2021	1.45	1.12	5.70	2.17
Jan, 2022	0.33	1.37	3.64	6.61
Feb, 2022	0.32	3.99	3.38	6.16
Mar, 2022	0.47	2.64	6.10	6.38

Table: 17

4. Maximum, Minimum & Average of Daily Average MCP in GDAM during FY 2021-22

The maximum MCP for transaction of electricity in IEX was observed in the month of March, 2022 (**Rs. 17.34 /kWh**) during the FY 2021-22. Whereas, the minimum MCP of Rs.

3.00 /kWh in IEX was observed in January, 2022. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in GDAM.

The month-wise Maximum, Minimum and Average MCP are shown in **Table 18**:

Months	Minimum MCP (Rs/kWh)	Maximum MCP (Rs/kWh)	Average MCP (Rs/kWh)
	IEX	IEX	IEX
Apr, 2021	Transaction of electricity in GDAM started from 27 th October, 2021 in IEX		
May, 2021			
Jun, 2021			
Jul, 2021			
Aug, 2021			
Sept, 2021			
Oct, 2021	4.37	8.35	5.36
Nov, 2021	3.85	5.04	4.48
Dec, 2021	4.24	5.36	4.72
Jan, 2022	3.00	4.98	4.20
Feb, 2022	3.55	6.68	4.91
Mar, 2022	4.01	17.34	8.09

Table: 18

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

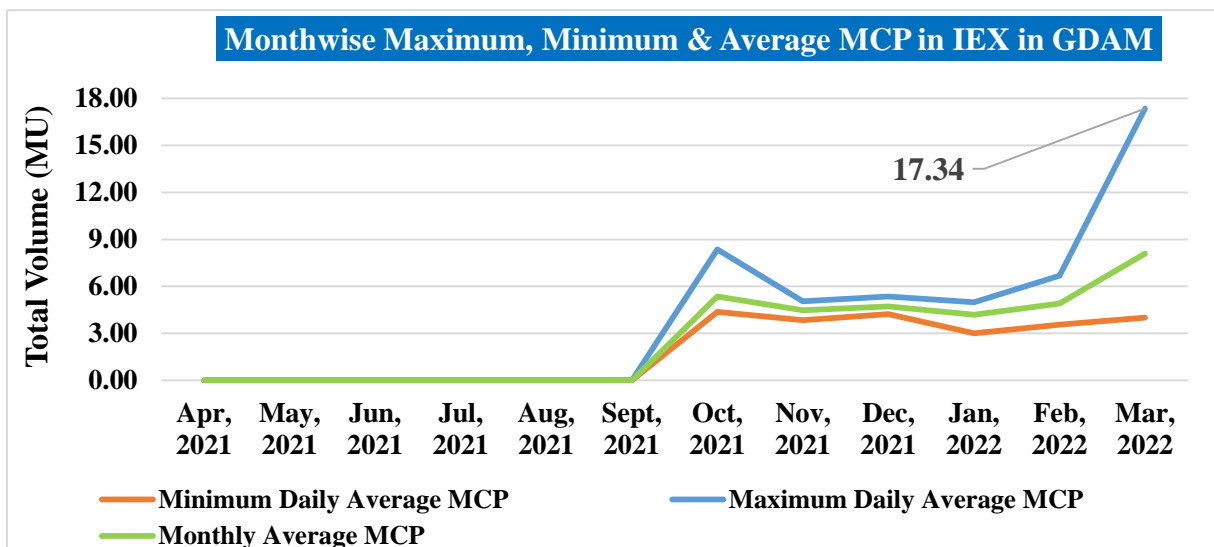


Figure: 17

5. Maximum / Minimum Area Clearing Price (ACP) in GDAM during FY 2021-22

The maximum ACP of **Rs. 20.00 /kWh** in the month in IEX during the FY 2021-22 was observed from March, 2022, whereas, the minimum ACP of **Rs. 0.80 /kWh** in IEX was observed in November, 2021. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in GDAM.

The month wise Maximum/Minimum ACP are shown in **Table 19**:

Months	IEX	
	Min. ACP (Rs/kWh)	Max. ACP (Rs/kWh)
Apr, 2021	Transaction of electricity in GDAM started from 27 th October, 2021 in IEX	
May, 2021		
Jun, 2021		
Jul, 2021		
Aug, 2021		
Sept, 2021		
Oct, 2021	3.40	18.70
Nov, 2021	0.80	13.30
Dec, 2021	3.04	13.90
Jan, 2022	1.00	8.00
Feb, 2022	2.50	18.00
Mar, 2022	3.25	20.00

NA: Not Applicable as no transaction happened

Table: 19

6. Congestion in Green Day Ahead Market in IEX and PXIL

There was **no** transmission congestion happened in Green Day Ahead Market in IEX during FY 2021-22. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in GDAM

7. Real Time Curtailment in in Green Day Ahead Market

There was **no** real time curtailment happened in Green Day Ahead Market in IEX during FY 2021-22. Whereas, no transaction of electricity happened in PXIL during FY 2021-22 in GDAM.

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

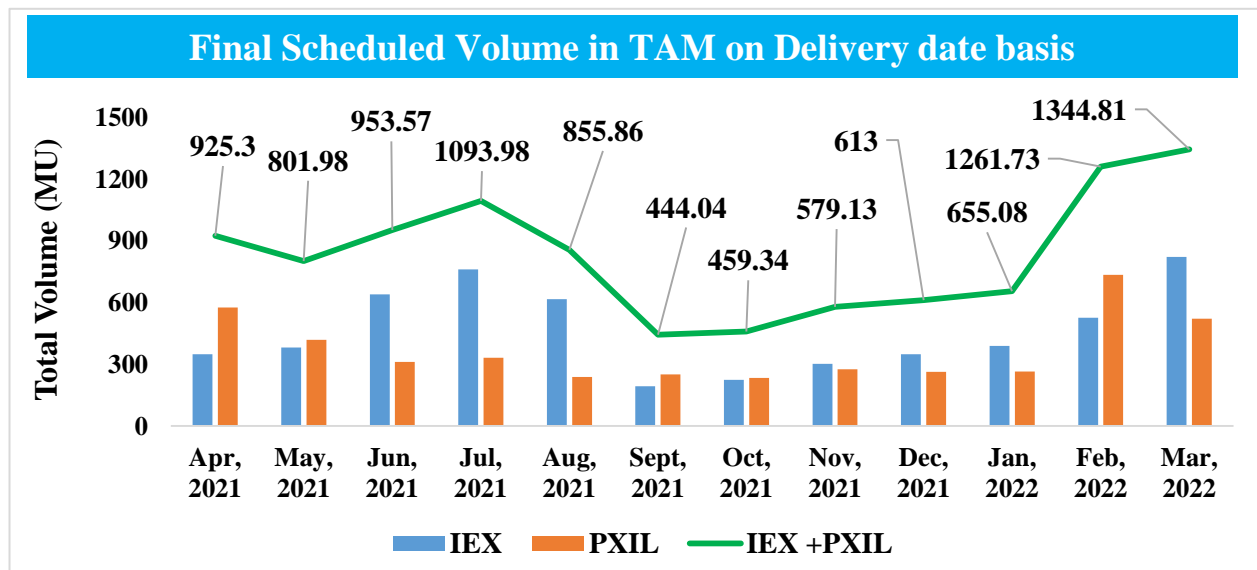
The total volume of electricity transacted in Power Exchanges in TAM on delivery date basis was **9,988 MU** (**5,561 MU** in IEX and **4,427 MU** in PXIL). In IEX, the maximum volume of **823 MU** was transacted in the month of March, 2022, whereas, the minimum volume of **193 MU** was transacted in the month of September, 2021.

Similarly, in PXIL the maximum volume of **735 MU** was transacted in the month of February, 2022, and the minimum volume of **235 MU** was transacted in the month of October, 2021. The month wise TAM transaction details are given in **Table 20** below:

Months	Final Scheduled Volume (MU)		
	IEX	PXIL	Total
Apr, 2021	348.58	576.72	925.30
May, 2021	382.62	419.36	801.98
Jun, 2021	640.91	312.66	953.57
Jul, 2021	761.26	332.72	1093.98
Aug, 2021	617.23	238.63	855.86
Sept, 2021	192.87	251.17	444.04
Oct, 2021	224.78	234.56	459.34
Nov, 2021	302.75	276.38	579.13
Dec, 2021	349.77	263.23	613.00
Jan, 2022	390.27	264.81	655.08
Feb, 2022	526.80	734.93	1,261.73
Mar, 2022	822.71	522.10	1,344.81
Total	5,560.55	4,427.27	9,987.82

Table: 20

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

**Figure: 18**

2. Contract-wise Final Scheduled Volume and Weighted Average MCP in TAM in both 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 21**:

Months	Final Scheduled Volume (MU)				
	Intraday	Day Ahead Contingency	Daily/ Anyday	Weekly	Total
Apr, 2021	101.67	63.07	760.56	-	925.30
May, 2021	71.83	122.9	607.25	-	801.98
Jun, 2021	88.03	316.43	549.11	-	953.57
Jul, 2021	131.98	263.75	698.25	-	1093.98
Aug, 2021	22.41	211.68	621.77	-	855.86
Sept, 2021	3.82	211.97	228.25	-	444.04
Oct, 2021	5.45	384.29	69.6	-	459.34
Nov, 2021	1.81	348.36	228.96	-	579.13
Dec, 2021	6.92	326.48	279.6	-	613.00
Jan, 2022	0.43	308.06	346.59	-	655.08
Feb, 2022	1.41	689.84	570.48	-	1,261.73
Mar, 2022	3.95	765.06	575.8	-	1,344.81
Total	439.71	4,011.89	5,536.22	-	9,987.82

- : No transaction happened

Table: 21

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: 22**

Months	Weighted Average MCP (Rs/kWh) for TAM in PXs				
	Intraday	Day Ahead Contingency	Daily/ Anyday	Weekly	Wt. Average
Apr, 2021	4.48	3.92	3.71	NA	3.81
May, 2021	3.92	3.10	3.01	NA	3.10
Jun, 2021	4.27	3.37	3.02	NA	3.25
Jul, 2021	4.67	3.22	3.22	NA	3.39
Aug, 2021	6.72	5.88	3.22	NA	3.97
Sept, 2021	7.51	4.54	3.92	NA	4.24
Oct, 2021	8.82	7.63	7.58	NA	7.63
Nov, 2021	7.87	3.30	3.30	NA	3.31
Dec, 2021	4.39	4.26	3.43	NA	3.88
Jan, 2022	5.75	3.85	3.31	NA	3.57
Feb, 2022	5.30	5.18	4.09	NA	4.69
Mar, 2022	12.77	9.01	6.48	NA	7.93

NA: Not Applicable

Table: 22

3. Contract-wise Final Scheduled Volume in TAM in both 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 **440 MU** (**53 MU** in IEX and **387 MU** in PXIL). In IEX, the maximum volume of electricity of **16 MU** was transacted in the month of June, 2021, and the minimum volume of **0.15 MU** was transacted in the month of November, 2021. Similarly, in PXIL the maximum volume of **119 MU** was transacted in the month of July, 2021, and the minimum volume of **0.26 MU** was transacted in the month of January, 2022. No transaction happened in the month of February, 2022 in IEX.

The month wise details of electricity transacted in Intraday Contract under TAM are tabulated in **Table: 23**.

Months	Final Scheduled Volume in Intraday Contract (MU)		
	IEX	PXIL	Total
Apr, 2021	7.50	94.17	101.67
May, 2021	2.65	69.18	71.83
Jun, 2021	16.00	72.03	88.03
Jul, 2021	12.88	119.10	131.98
Aug, 2021	8.47	13.94	22.41
Sept, 2021	0.42	3.40	3.82
Oct, 2021	1.28	4.17	5.45
Nov, 2021	0.15	1.66	1.81
Dec, 2021	0.87	6.05	6.92
Jan, 2022	0.17	0.26	0.43
Feb, 2022	-	1.41	1.41
Mar, 2022	2.61	1.34	3.95
Total	53.00	386.71	439.71

Table: 23

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

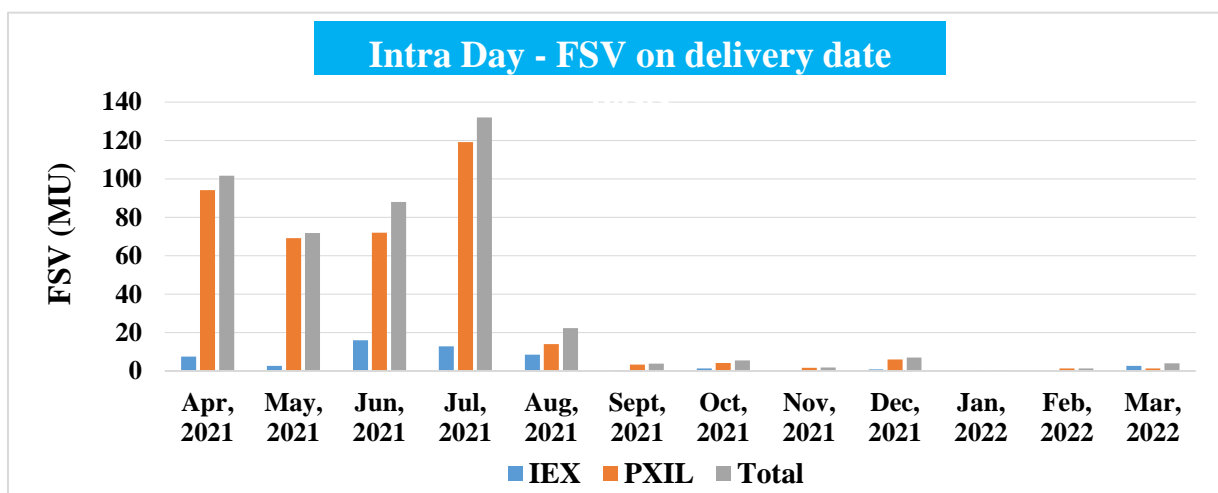


Figure: 19

(ii) Day Ahead Contingency (DAC) Contract

The total volume of electricity transacted in Power Exchanges in **Day Ahead Contingency Contract** was **4,012 MU** (1,932 MU in IEX and 2,080 MU in PXIL). In IEX, the maximum volume of **388 MU** was transacted in the month of March, 2022 and the minimum volume of **63 MU** was transacted in the month of April, 2021. Whereas, in PXIL, the maximum volume of electricity was transacted in the month of March, 2022 at **377 MU** and the minimum volume of electricity was transacted in the month of August, 2021 at **102 MU**. No transaction happened in PXIL during the period April, 2021 to July, 2021.

The month wise details of electricity transacted in Day Ahead Contingency Contract under TAM are tabulated in **Table: 24**.

Months	Final Scheduled Volume in Day Ahead Contingency Contract (MU)		
	IEX	PXIL	Total
Apr, 2021	63.07	-	63.07
May, 2021	122.90	-	122.90
Jun, 2021	316.43	-	316.43
Jul, 2021	263.75	-	263.75
Aug, 2021	110.10	101.58	211.68
Sept, 2021	68.36	143.61	211.97
Oct, 2021	153.90	230.39	384.29
Nov, 2021	107.24	241.12	348.36
Dec, 2021	72.90	253.58	326.48
Jan, 2022	102.31	205.75	308.06
Feb, 2022	163.00	526.84	689.84
Mar, 2022	387.89	377.17	765.06
Total	1,931.85	2,080.04	4,011.89

- No transaction happened

Table: 24

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

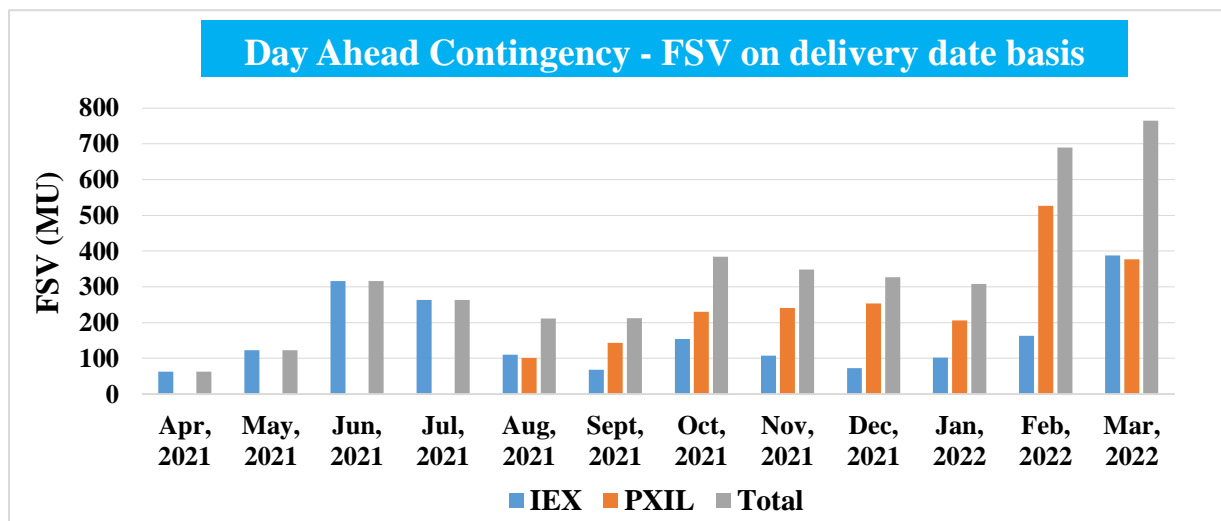


Figure: 20

(iii) Daily/Anyday Contract

The total volume of electricity transacted in Power Exchanges in Any day/Daily Contract was **5,536 MU** (**3,576 MU** in IEX and **1,960 MU** in PXIL). In IEX, the maximum volume of **499 MU** was transacted in the month of August, 2021 and the minimum volume of **70 MU** was transacted in the month of October, 2021. Similarly, in PXIL the maximum volume of **483 MU** was transacted in the month of April, 2021, and the minimum volume of **4 MU** was transacted in the month of December, 2021. No transaction happened in PXIL in the month of October, 2021.

The month wise details of electricity transacted in Daily/Anyday Contract under TAM are tabulated in **Table: 25**

Months	Transactions in Daily/ Anyday Contract (MU)		
	IEX	PXIL	Total
Apr, 2021	278.01	482.55	760.56
May, 2021	257.07	350.18	607.25
Jun, 2021	308.48	240.63	549.11
Jul, 2021	484.63	213.62	698.25
Aug, 2021	498.66	123.11	621.77
Sept, 2021	124.09	104.16	228.25
Oct, 2021	69.60	-	69.60
Nov, 2021	195.36	33.60	228.96
Dec, 2021	276.00	3.60	279.60
Jan, 2022	287.79	58.80	346.59
Feb, 2022	363.80	206.68	570.48
Mar, 2022	432.21	143.59	575.80
Total	3,575.70	1,960.52	5,536.22

- No transaction happened

Table: 25

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

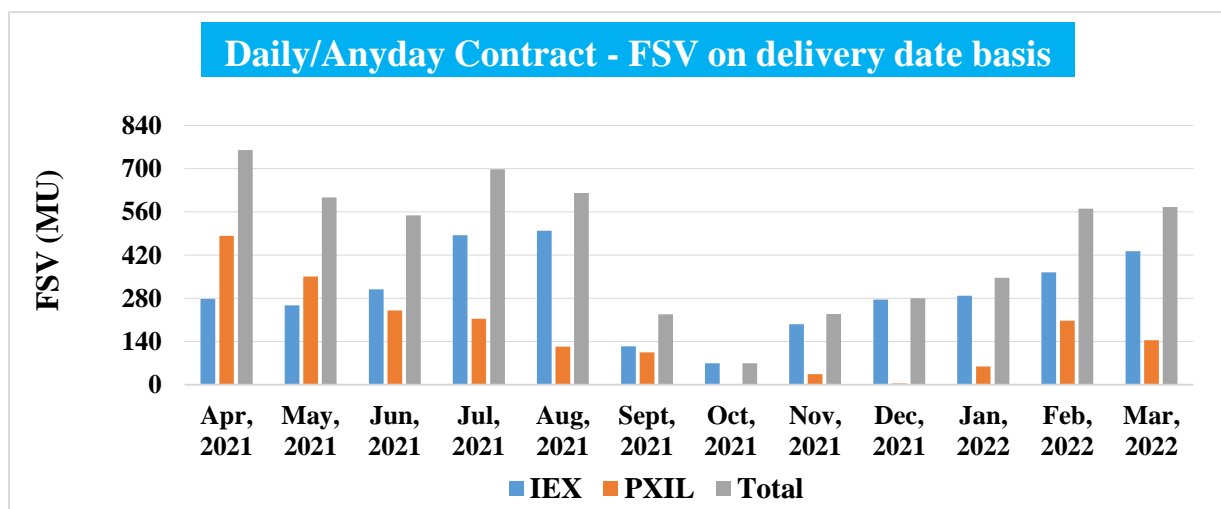


Figure: 21

(iv) Weekly Contract

During the period April, 2021 to March, 2022, no transaction of electricity happened in Weekly contract in TAM on delivery date basis on both the power exchanges.

4. Real Time Curtailment in Term Ahead Market

The total real time curtailment of **180.18 MU** happened in IEX and PXIL during FY 2021-22 (on delivery date basis transaction data). The total real time curtailment of **104.66 MU** (Intraday-0.00 MU, Daily/Any day- 83.43 MU, DAC-21.23 MU and Weekly-0.00 MU) happened in IEX during FY 2021-22. The same was **75.52 MU** in PXIL (Intraday- 3.44 MU, Daily/ Any day – 64.13 MU, DAC-7.95 MU and Weekly- 0.00 MU).

The month wise and contract wise details of real time curtailment in TAM are tabulated in **Table: 26**

Months	IEX Curtailment (MU)				PXIL Curtailment (MU)				Total Curtailment (MU)
	Intraday	Daily	DAC	Weekly	Intraday	Daily	DAC	Weekly	Total
Apr, 2021	0.00	6.75	0.00	NA	0.00	0.00	0.00	NA	6.75
May, 2021	0.00	5.01	0.04	NA	0.29	16.5	0.00	NA	21.89
Jun, 2021	0.00	5.62	0.00	NA	1.63	9.63	0.00	NA	16.88
Jul, 2021	0.00	0.00	0.00	NA	1.44	5.12	0.00	NA	6.56
Aug, 2021	0.00	28.16	0.31	NA	0.08	8.41	0.32	NA	37.28
Sept, 2021	0.00	23.03	0.00	NA	0.00	20.98	0.00	NA	44.01
Oct, 2021	0.00	0.00	0.00	NA	0.00	0.00	1.57	NA	1.57
Nov, 2021	0.00	0.00	1.99	NA	0.00	0.00	3.23	NA	5.22
Dec, 2021	0.00	0.00	0.00	NA	0.00	0.00	0.77	NA	0.77
Jan, 2022	0.00	0.00	17.88	NA	0.00	0.00	0.00	NA	17.88
Feb, 2022	0.00	7.14	0.91	NA	0.00	3.44	1.05	NA	12.54
Mar, 2022	0.00	7.72	0.00	NA	0.00	0.00	1.01	NA	8.73
Total	0.00	83.43	21.23	NA	3.44	64.13	7.95	NA	180.18

Table: 26

The month wise details of real time curtailment in Daily/Anyday Contract is displayed in **Figure: 22**

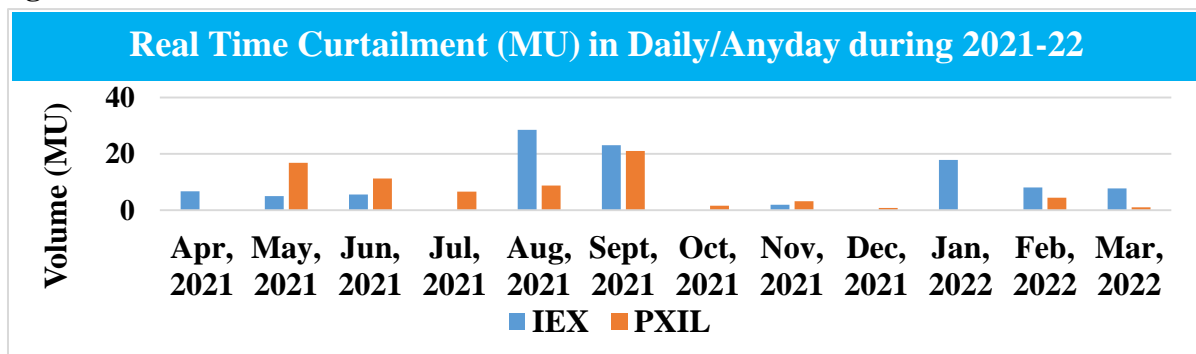


Figure: 22

5. Volume of Electricity transacted in IEX & PXIL on Trade date basis

The total volume of electricity transacted in Power Exchanges in Term Ahead Market was **10,138 MU** (5,596 MU in IEX and 4,542 MU in PXIL). In IEX, the maximum volume of **832 MU** was transacted in the month of July, 2021 and the minimum volume of **197 MU** was transacted in the month of September, 2021.

Similarly, in PXIL the maximum volume of **782 MU** was transacted in the month of February, 2021, and the minimum volume of **209 MU** was transacted in the month of September, 2021.

The month wise transaction details are given in **Table: 27**

Months	Traded Volume (MU)		
	IEX	PXIL	Total
Apr, 2021	325.78	651.35	977.13
May, 2021	425.63	344.03	769.66
Jun, 2021	622.42	358.74	981.16
Jul, 2021	832.44	267.10	1,099.54
Aug, 2021	483.31	284.40	767.71
Sept, 2021	197.18	209.46	406.64
Oct, 2021	298.11	223.78	521.89
Nov, 2021	291.20	282.24	573.44
Dec, 2021	421.34	300.08	721.42
Jan, 2022	364.09	237.67	601.76
Feb, 2022	617.84	782.52	1,400.36
Mar, 2022	716.62	600.37	1,316.99
Total	5,595.96	4,541.74	10,137.70

Table: 27

The month wise plot of total traded volume during FY 2021-22 in TAM is displayed in **Figure: 23**.

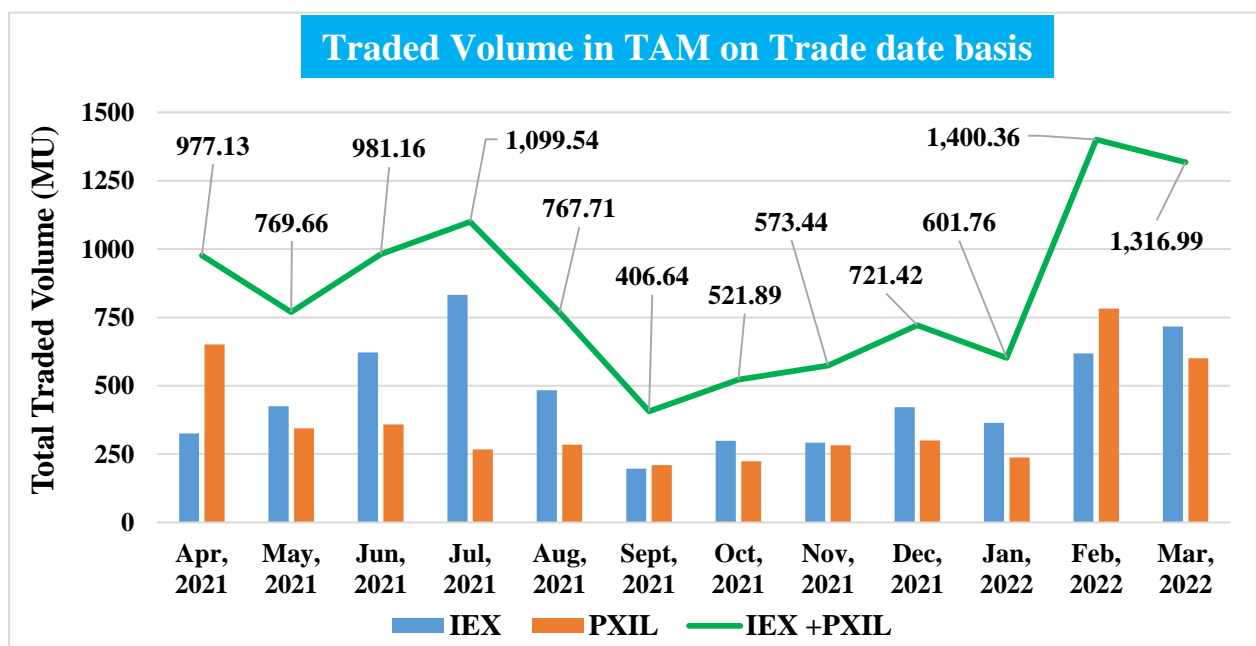


Figure: 23

6. Contract-wise Final Scheduled Volume and Weighted Average MCP in TAM in both the Power Exchanges on Trade date basis

Out of the total volume of **10,138 MU** transacted in TAM on trade date basis, the majority of transaction i.e. 55.71 % & 39.95 % happened under Daily/ Anyday & Day Ahead Contingency contract. Whereas, no transaction happened in Weekly contract in TAM on trade date basis during FY 2021-22. The month wise transaction of electricity on PXs in all 4 contracts under term ahead market on trade date basis is shown below in **Table: 28**

Months	Final Scheduled Volume (MU)				
	Intraday	Day Ahead Contingency	Daily/ Anyday	Weekly	Total
Apr, 2021	103.37	64.77	808.99	-	977.13
May, 2021	71.33	129.41	568.92	-	769.66
Jun, 2021	96.00	325.92	559.24	-	981.16
Jul, 2021	122.81	249.01	727.72	-	1099.54
Aug, 2021	22.41	222.59	522.71	-	767.71
Sept, 2021	3.82	212.54	190.28	-	406.64
Oct, 2021	5.45	376.28	140.16	-	521.89
Nov, 2021	1.81	353.23	218.40	-	573.44
Dec, 2021	6.92	331.70	382.80	-	721.42
Jan, 2022	0.43	305.99	295.34	-	601.76
Feb, 2022	1.41	703.26	695.69	-	1,400.36
Mar, 2022	3.95	775.08	537.96	-	1,316.99
Total	439.71	4,049.78	5,648.21	-	10,137.70

Table: 28

The month wise weighted average MCP for transactions in all 4 contracts under term ahead market on PXs (trade date basis) are shown below in **Table: 29**

Months	Weighted Average MCP (Rs/kWh) for TAM in PXs				
	Intraday	Day Ahead Contingency	Daily/ Anyday	Weekly	Wt. Average
Apr, 2021	4.40	3.91	3.60	NA	3.70
May, 2021	3.91	3.10	2.93	NA	3.05
Jun, 2021	4.25	3.38	3.17	NA	3.34
Jul, 2021	4.66	3.16	3.17	NA	3.33
Aug, 2021	6.72	5.90	3.54	NA	4.31
Sept, 2021	6.46	4.62	3.92	NA	4.30
Oct, 2021	8.82	7.49	5.49	NA	6.97
Nov, 2021	7.87	3.30	3.31	NA	3.32
Dec, 2021	4.39	4.41	3.19	NA	3.76
Jan, 2022	4.46	4.10	3.25	NA	3.68
Feb, 2022	5.75	3.87	3.40	NA	3.64
Mar, 2022	12.77	9.34	8.15	NA	8.86

NA: Not Applicable

Table: 29

7. Contract-wise Traded Volume in TAM in both the Power Exchanges on Trade Date Basis

7.1. Intraday contract

The total volume of electricity transacted in Power Exchanges in Intraday Contract was **440 MU** (**53 MU** in IEX and **387 MU** in PXIL). In IEX, the maximum volume of **16 MU** was transacted in the month of June, 2021, and the minimum volume of **0.15 MU** was transacted in the month of November, 2021. Similarly, in PXIL the maximum volume of **110 MU** was transacted in the month of July, 2021 and the minimum volume of **0.26 MU** was transacted in the month of January, 2022. No transaction happened in IEX in the month of February, 2022. The month wise details of electricity transacted in Intraday Contract under TAM are tabulated in **Table: 30**

Months	Traded Volume in Intraday Contract (MU)		
	IEX	PXIL	Total
Apr, 2021	7.50	95.87	103.37
May, 2021	2.65	68.68	71.33
Jun, 2021	16.00	80.00	96.00
Jul, 2021	12.88	109.93	122.81
Aug, 2021	8.47	13.94	22.41
Sept, 2021	0.42	3.40	3.82
Oct, 2021	1.28	4.17	5.45
Nov, 2021	0.15	1.66	1.81
Dec, 2021	0.87	6.05	6.92
Jan, 2022	0.17	0.26	0.43
Feb, 2022	-	1.41	1.41
Mar, 2022	2.61	1.34	3.95
Total	53.00	386.71	439.71

Table: 30

The month wise plot of Traded Volume (MU) in Intraday Contract in TAM is displayed in **Figure: 24**

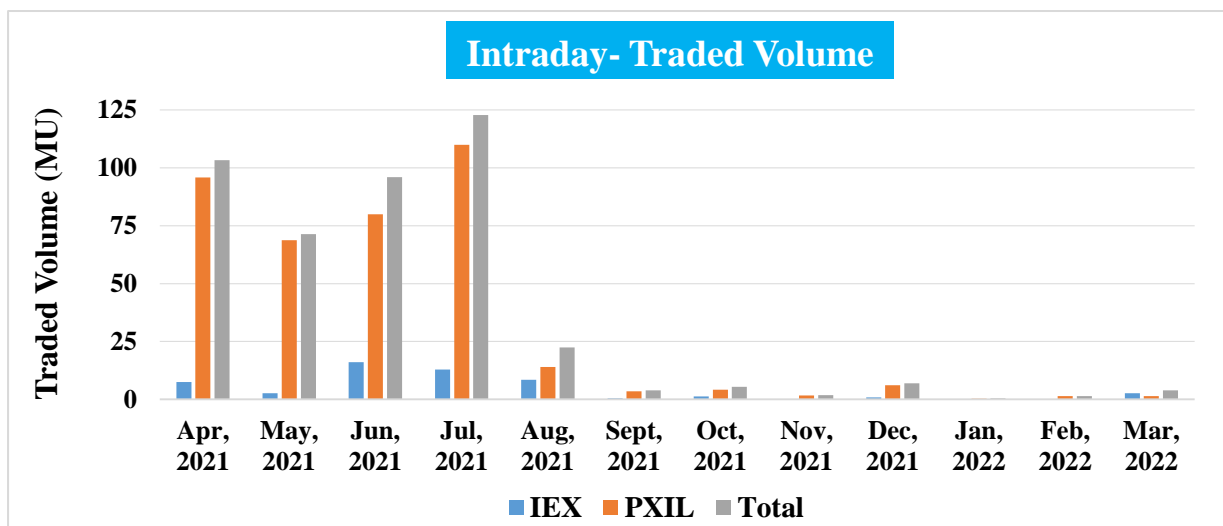


Figure: 24

7.2. Day Ahead Contingency (DAC) Contract

The total volume of electricity transacted in Power Exchanges in **Day Ahead Contingency Contract** was **4,050 MU** (**1961 MU** in IEX and **2,088 MU** in PXIL). In IEX, the maximum volume of electricity was transacted in the month of March, 2022 at **408 MU** and the minimum volume of electricity was transacted in the month of April, 2021 at **65 MU**. Whereas, in PXIL, the maximum volume of electricity was transacted in the month of February, 2022 at **535 MU** and the minimum volume of electricity was transacted in the month of August, 2021 at **115 MU**. No transaction happened in PXIL during the period April, 2021 to July, 2021.

The month wise details of electricity transacted in Day Ahead Contingency Contract under TAM are tabulated in **Table: 31**

Months	Traded Volume in Day Ahead Contingency Contract (MU)		
	IEX	PXIL	Total
Apr, 2021	64.77	-	64.77
May, 2021	129.41	-	129.41
Jun, 2021	325.92	-	325.92
Jul, 2021	249.01	-	249.01
Aug, 2021	108.11	114.48	222.59
Sept, 2021	68.64	143.90	212.54
Oct, 2021	156.67	219.61	376.28
Nov, 2021	106.25	246.98	353.23
Dec, 2021	73.67	258.03	331.70
Jan, 2022	102.18	203.81	305.99
Feb, 2022	168.27	534.99	703.26
Mar, 2022	408.44	366.64	775.08
Total	1,961.34	2,088.44	4,049.78

- No transaction happened

Table: 31

The month wise plot of Traded Volume (MU) in Day Ahead Contingency on Contract in TAM is displayed in **Figure: 25**

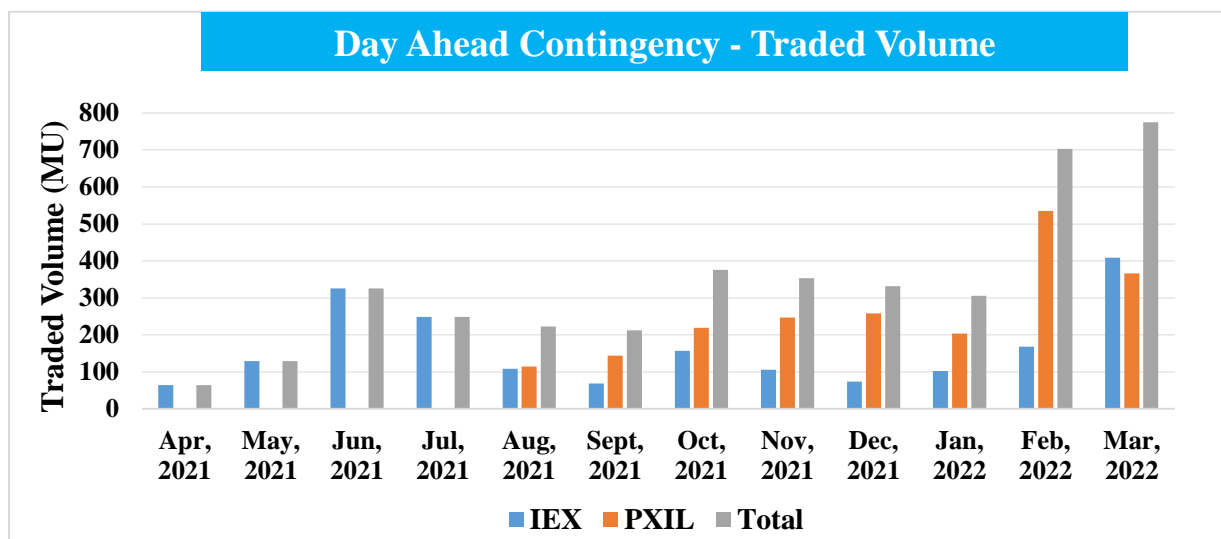


Figure: 25

7.3. Daily/ Anyday Contract

The total volume of electricity transacted in Power Exchanges in Any day/Daily Contract was **5,648 MU** (**3,582 MU** in IEX and **2,067 MU** in PXIL). In IEX, the maximum volume of **571 MU** was transacted in the month of July, 2021 and the minimum volume of **128 MU** was transacted in the month of September, 2021. Similarly, in PXIL the maximum volume of **556 MU** was transacted in the month of April, 2021, and the minimum volume of **34 MU** was transacted in the month of November, 2021 & January, 2022. No transaction happened in PXIL in the month of October, 2021.

The month wise details of electricity transacted in Daily/Anyday on Contract under TAM is tabulated in **Table: 32**

Months	Traded Volume in Daily/ Anyday Contract (MU)		
	IEX	PXIL	Total
Apr, 2021	253.51	555.48	808.99
May, 2021	293.57	275.35	568.92
Jun, 2021	280.50	278.74	559.24
Jul, 2021	570.55	157.17	727.72
Aug, 2021	366.73	155.98	522.71
Sept, 2021	128.12	62.16	190.28
Oct, 2021	140.16	-	140.16
Nov, 2021	184.80	33.60	218.40
Dec, 2021	346.80	36.00	382.80
Jan, 2022	261.74	33.60	295.34
Feb, 2022	449.57	246.12	695.69
Mar, 2022	305.57	232.39	537.96
Total	3,581.62	2,066.59	5,648.21

- No transaction happened

Table: 32

The month wise plot of Traded Volume (MU) in Daily/Anyday on Contract in TAM is displayed in **Figure: 26**

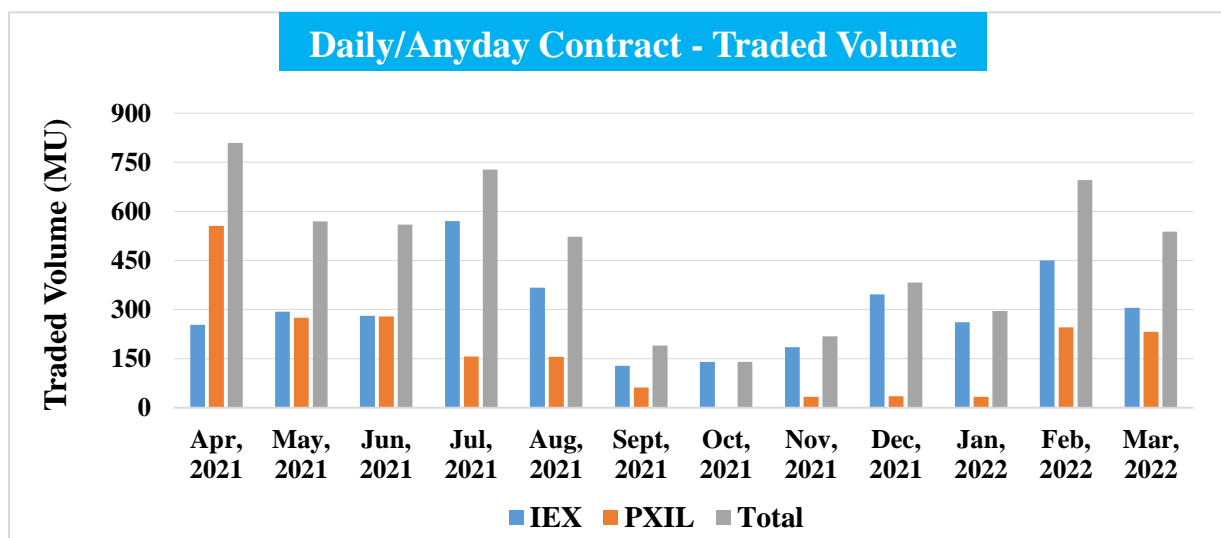


Figure: 26

7.4. Weekly Contract

During the period April, 2021 to March, 2022, no transaction of electricity happened in Weekly contract in TAM on trade date basis on both the power exchanges.

8. Congestion in Term Ahead Market in IEX

From the table, it may be seen that in IEX, the total transmission congestion of **194.41** MU happened in TAM.

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

Months	IEX							
	Intraday		DAC		Any Day/ Daily		Weekly	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	0.00	NA	0.00	NA	0.00	NA	NA	NA
May, 2021	0.04	1 day	2.03	6.00	0.00	NA	NA	NA
Jun, 2021	1.25	1 day	3.01	7.00	7.5	1.00	NA	NA
Jul, 2021	0.20	1 day	17.54	15.00	77.09	7.00	NA	NA
Aug, 2021	0.50	2 days	0.00	NA	14.46	3.00	NA	NA
Sept, 2021	0.11	1 day	0.06	1.00	0.00	NA	NA	NA
Oct, 2021	0.00	NA	0.00	NA	0.00	NA	NA	NA
Nov, 2021	0.00	NA	0.91	2.00	0.00	NA	NA	NA
Dec, 2021	0.00	NA	0.00	NA	0.00	NA	NA	NA
Jan, 2022	0.00	NA	0.19	1.00	14.4	1.00	NA	NA
Feb, 2022	0.00	NA	1.5	2.00	0.00	NA	NA	NA
Mar, 2022	0.00	NA	0.15	2.00	53.47	5.00	NA	NA
Total	2.10	6 days	25.39	36 days	166.92	17 days	NA	NA

NA: Not Applicable as no transaction happened

Table: 33

The month wise plot of Congestion in IEX in TAM is displayed in **Figure: 27**

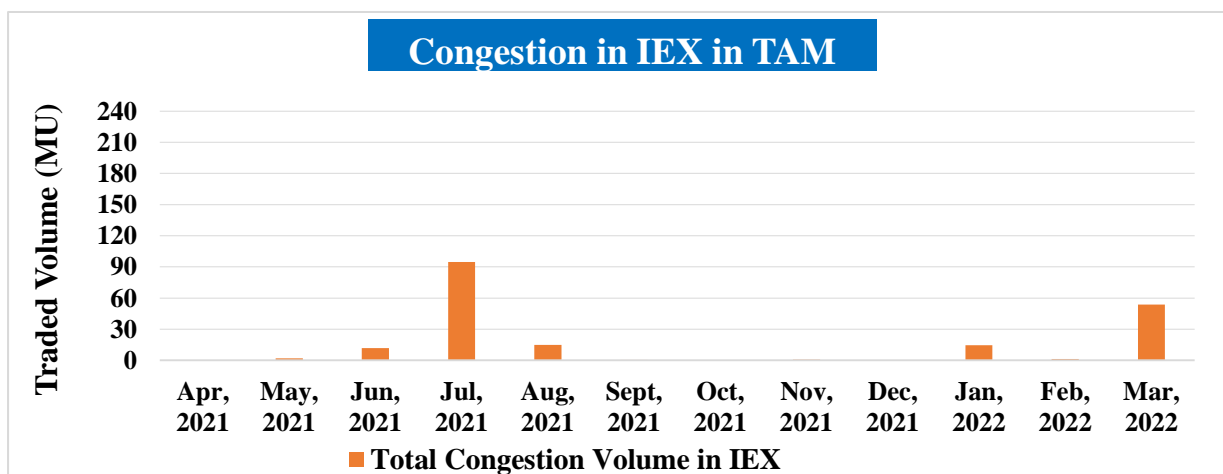


Figure: 27

9. Congestion in Term Ahead Market in PXIL

From the table, it may be seen that in PXIL, the total transmission congestion of **74.15 MU** happened in TAM.

The month wise details of transmission congestion in PXIL in TAM are tabulated in **Table: 34**

Months	PXIL							
	Intraday		DAC		Any Day/ Daily		Weekly	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	0.00	NA	0.00	NA	14.46	4 days	NA	NA
May, 2021	0.29	2 days	0.00	NA	1.72	3 days	NA	NA
Jun, 2021	1.63	7 days	0.00	NA	10.45	2 days	NA	NA
Jul, 2021	1.44	5 days	0.00	NA	2.8	3 days	NA	NA
Aug, 2021	0.08	1 day	0.32	1 day	20.98	3 days	NA	NA
Sept, 2021	0.00	NA	13.2	1 day	0.00	NA	NA	NA
Oct, 2021	0.00	NA	1.57	2 days	0.00	NA	NA	NA
Nov, 2021	0.00	NA	0.00	NA	0.00	NA	NA	NA
Dec, 2021	0.00	NA	0.00	NA	0.00	NA	NA	NA
Jan, 2022	0.00	NA	0.00	NA	0.00	NA	NA	NA
Feb, 2022	0.00	NA	0.00	NA	0.00	NA	NA	NA
Mar, 2022	0.00	NA	0.00	NA	5.21	1 day	NA	NA
Total	3.44	15 days	15.09	4 days	55.62	16 days	NA	NA

NA: Not Applicable as no transaction happened

Table: 34

The month wise plot of Congestion in PXIL in TAM is displayed in **Figure: 28**

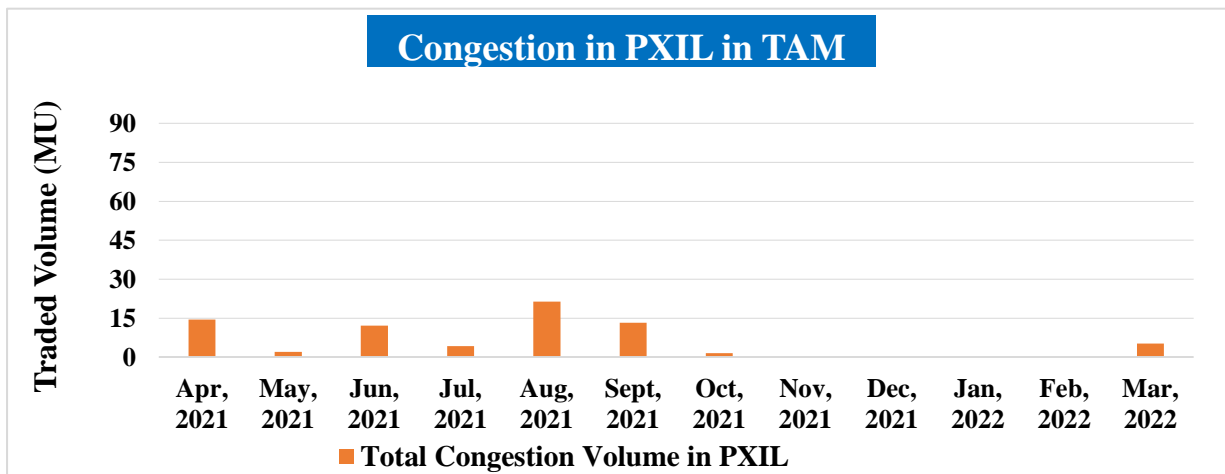


Figure: 28

10. Contract-wise Prices (Rs. /kWh) on Delivery date basis in TAM during FY 2021-22

The month wise and contract wise prices of electricity transacted in TAM during FY 2021-22 on delivery date basis are tabulated in **Table: 35**.

Months	Intraday		Day Ahead Contingency		Daily/ Anyday Contract		Weekly Contract	
	IEX	PXIL	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2021	4.72	4.23	3.92	0.00	3.67	3.75	NA	NA
May, 2021	4.57	3.27	3.10	0.00	3.02	2.99	NA	NA
Jun, 2021	5.06	3.48	3.37	0.00	2.88	3.16	NA	NA
Jul, 2021	5.86	3.47	3.22	0.00	3.17	3.27	NA	NA
Aug, 2021	7.91	5.53	5.41	6.35	3.06	3.37	NA	NA
Sept, 2021	8.72	6.30	4.55	4.53	3.80	4.03	NA	NA
Oct, 2021	6.25	11.38	7.01	8.24	7.58	0.00	NA	NA
Nov, 2021	11.15	4.58	3.37	3.22	3.19	3.40	NA	NA
Dec, 2021	3.36	5.42	4.66	3.85	3.36	3.50	NA	NA
Jan, 2022	3.50	8.00	4.05	3.65	3.37	3.25	NA	NA
Feb, 2022	0.00	5.30	5.88	4.48	4.10	4.08	NA	NA
Mar, 2022	13.07	12.47	9.31	8.70	6.11	6.85	NA	NA
Average (2021-22)	6.18	6.12	4.82	3.59	3.94	3.47	NA	NA

Table: 35

The month wise movement of prices in Intraday, Day Ahead Contingency, Daily/Anyday and Weekly Contracts on delivery date basis is displayed in Figures: 29, 30 & 31

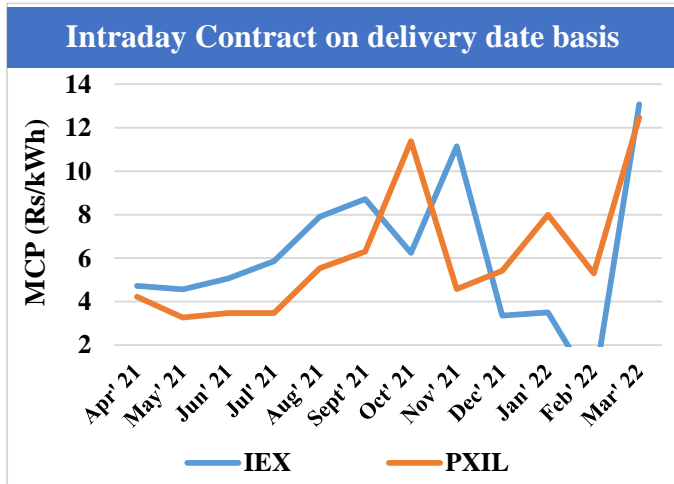


Figure 29

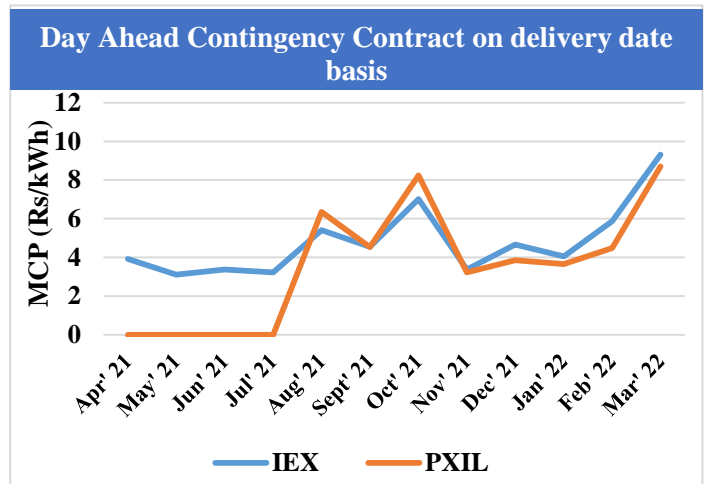


Figure 30

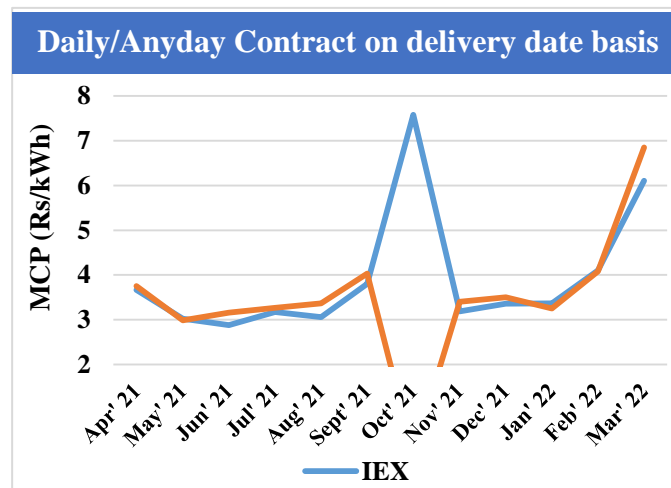


Figure: 31

11. Contract-wise Price (Rs. /kWh) of Electricity transacted on Trade date basis in IEX & PXIL in TAM during FY 2021-22

The month wise and contract wise prices of electricity transacted in TAM during FY 2021-22 on Trade date basis are tabulated in **Table: 36**

Months	Intraday		Day Ahead Contingency		Daily/ Anyday Contract		Weekly Contract	
	IEX	PXIL	IEX	PXIL	IEX	PXIL	IEX	PXIL
Apr, 2021	4.72	4.07	3.91	NA	3.48	3.72	NA	NA
May, 2021	4.57	3.24	3.1	NA	2.84	3.01	NA	NA
Jun, 2021	5.06	3.43	3.38	NA	3.04	3.3	NA	NA
Jul, 2021	5.86	3.45	3.16	NA	3.02	3.31	NA	NA
Aug, 2021	7.91	5.53	5.52	6.27	3.28	3.79	NA	NA
Sept, 2021	6.61	6.3	4.63	4.6	3.65	4.18	NA	NA
Oct, 2021	6.25	11.38	6.86	8.12	5.49	NA	NA	NA
Nov, 2021	11.15	4.58	3.37	3.22	3.22	3.4	NA	NA
Dec, 2021	3.36	5.42	4.69	4.12	3.28	3.1	NA	NA
Jan, 2022	3.5	5.42	4.08	4.12	3.39	3.1	NA	NA
Feb, 2022	3.5	8	4.08	3.66	3.39	3.41	NA	NA
Mar, 2022	13.07	12.47	9.63	9.05	7.72	8.58	NA	NA
Average (2021-22)	6.30	6.11	4.70	5.40	3.82	3.90	NA	NA

- No transaction happened

NA- Not applicable

Table: 36

The month wise movement of prices in Intraday, Day Ahead Contingency, Daily/Anyday and Weekly Contracts on trade date basis is displayed in **Figures: 32, 33 & 34**

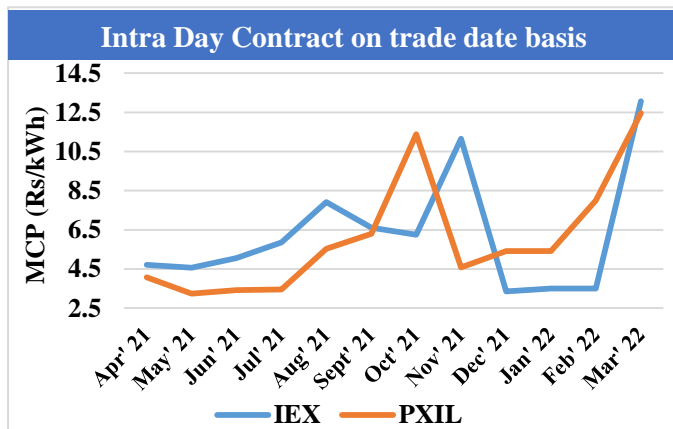


Figure: 32

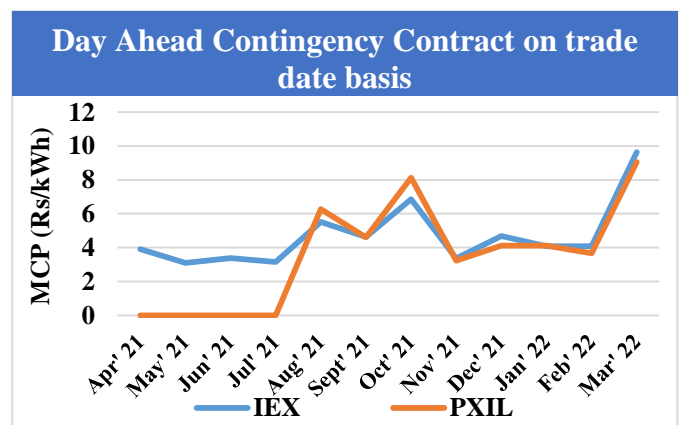


Figure: 33

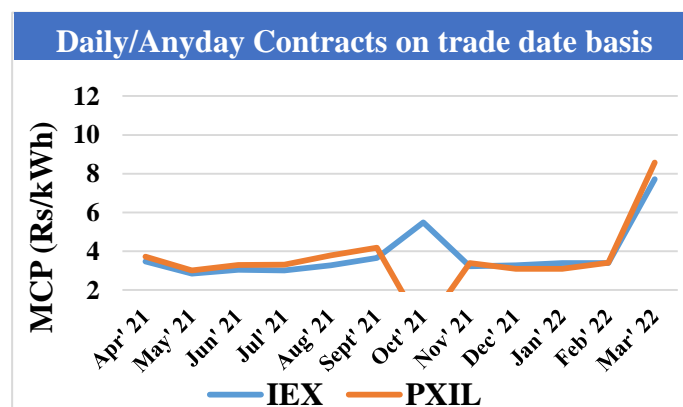


Figure: 34

12. Average Market Clearing Price (MCP) of Electricity transacted in IEX & PXIL in Term Ahead Market (TAM) during FY 2021-22 (on Delivery date basis)

The Average Market Clearing Price of electricity on delivery date basis transacted in TAM during FY 2021-22 is tabulated in **Table: 37**.

TAM MCP (Rs./kWh)	IEX	PXIL
FY 2021-22	4.98	4.39

Table: 37

13. Average Market Clearing Price (MCP) of Electricity transacted in IEX & PXIL in Term Ahead Market (TAM) during FY 2021-22 (on Trade date basis)

The Average Market Clearing Price of electricity on trade date basis transacted in TAM during FY 2021-22 is tabulated in **Table: 38**.

TAM MCP (Rs./kWh)	IEX	PXIL
FY 2021-22	4.94	5.13

Table: 38

CHAPTER- VII
GREEN TERM AHEAD MARKET (GTAM)

1. Volume of Electricity transacted in GTAM on Delivery date basis

The total volume of electricity transacted in both the Power Exchanges in GTAM under Solar and Non Solar segments was **5,453 MU** (**2,278 MU** in Solar and **3,175 MU** in Non Solar). Under the GTAM (Solar) segment the maximum volume of **293 MU** was transacted in the month of November, 2021, whereas, the minimum volume of **75 MU** was transacted in the month of April, 2021. Similarly, under the GTAM (Non-Solar) segment the maximum volume of **497 MU** was transacted in the month of July, 2021, whereas, the minimum volume of electricity of **109 MU** was transacted in the month of April, 2021. The majority of transactions in GTAM happened under Day Ahead Contingency Contract (**86.32 %**) on delivery date basis.

The month wise GTAM transaction details under solar and non-solar segments on delivery date basis are given in **Table: 39**

Months	Final Scheduled Volume (MU)		
	GTAM (Solar)	GTAM (Non Solar)	Total
Apr, 2021	75.39	108.69	184.08
May, 2021	184.52	161.05	345.57
Jun, 2021	171.86	269.44	441.30
Jul, 2021	199.12	497.05	696.17
Aug, 2021	145.70	352.75	498.45
Sept, 2021	281.36	316.14	597.50
Oct, 2021	251.37	153.61	404.98
Nov, 2021	292.59	146.81	439.40
Dec, 2021	181.89	270.02	451.91
Jan, 2022	119.26	120.51	239.77
Feb, 2022	183.22	464.12	647.34
Mar, 2022	191.59	314.63	506.22
Total	2,277.87	3,174.82	5,452.69

Table: 39

The graphical representation of GTAM transaction details under solar and non-solar segments on delivery date basis is displayed below in **Figure: 35**

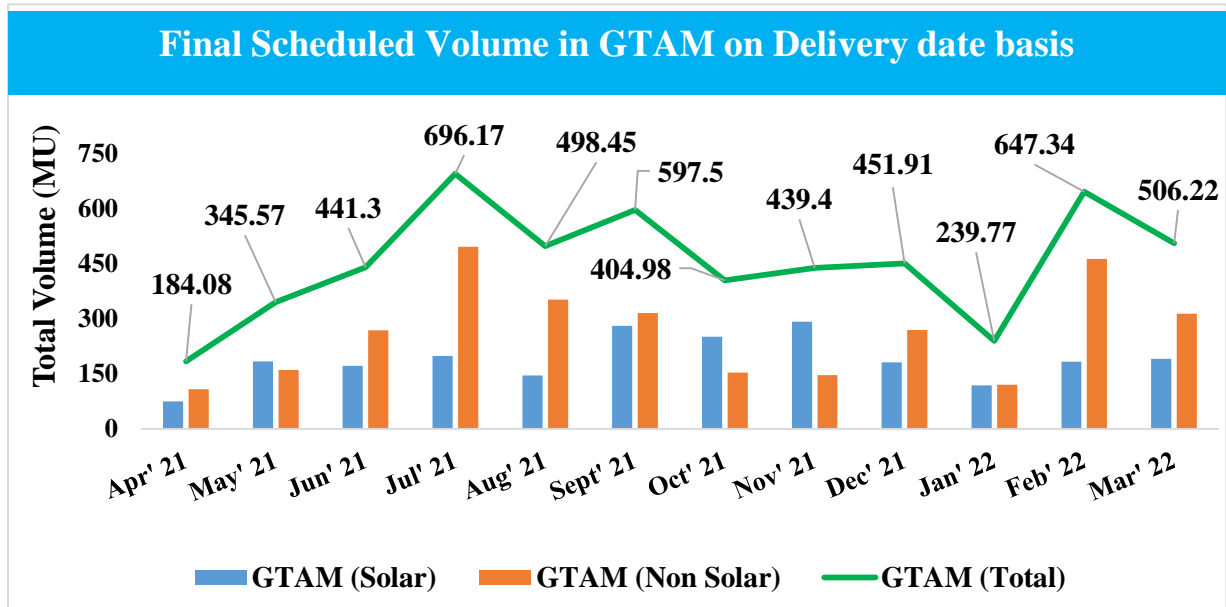


Figure: 35

2. Volume (MU) and Prices (Rs. /kWh) for Solar and Non Solar transactions in GTAM on Delivery date basis during FY 2021-22

The month wise GTAM transaction details for IEX and PXIL under solar and non-solar segments on delivery date basis are given in **Table -40** below:

Months	Final Scheduled Volume (MU)				Total
	IEX		PXIL		
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	75.39	102.95	0.00	5.74	184.08
May, 2021	184.52	160.45	0.00	0.60	345.57
Jun, 2021	159.30	254.50	12.56	14.94	441.30
Jul, 2021	199.12	480.28	0.00	16.77	696.17
Aug, 2021	145.70	319.95	0.00	32.80	498.45
Sept, 2021	275.83	267.31	5.53	48.83	597.50
Oct, 2021	225.63	119.64	25.74	33.97	404.98
Nov, 2021	178.72	128.77	113.87	18.04	439.40
Dec, 2021	70.78	142.79	111.11	127.23	451.91
Jan, 2022	21.05	59.77	98.21	60.74	239.77
Feb, 2022	37.83	220.11	145.39	244.01	647.34
Mar, 2022	47.33	140.00	144.26	174.63	506.22
Total	1,621.20	2,396.52	656.67	778.30	5452.69
	4,017.72		1,434.97		

- No transaction happened

Table: 40

The month wise and contract wise prices of solar and non-solar transaction of electricity in GTAM during FY 2021-22 on delivery date basis are tabulated in **Table: 41**.

Months	Intraday		Day Ahead Contingency		Daily/Anyday Contract		Weekly Contract	
	Solar	Non Solar	Solar	Non Solar	Solar	Non Solar	Solar	Non Solar
Apr, 2021	4.00	4.63	3.91	4.38	4.38	4.45	NA	NA
May, 2021	3.43	4.44	3.24	3.88	3.44	3.59	3.53	3.43
Jun, 2021	3.06	4.48	3.24	4.17	3.26	3.80	3.37	4.22
Jul, 2021	3.21	4.25	3.07	3.92	3.47	4.01	3.93	4.05
Aug, 2021	3.35	4.69	4.20	4.99	3.22	4.25	3.40	4.26
Sept, 2021	3.51	5.29	3.95	4.72	4.60	4.79	4.15	NA
Oct, 2021	3.67	17.35	4.33	7.97	NA	6.82	NA	4.70
Nov, 2021	3.50	3.65	3.70	4.06	3.53	4.65	NA	4.65
Dec, 2021	3.42	7.00	3.76	3.94	3.50	4.65	NA	4.65
Jan, 2022	3.52	NA	3.69	3.98	NA	4.48	NA	NA
Feb, 2022	3.60	5.00	4.46	4.72	3.96	4.66	3.97	NA
Mar, 2022	NA	9.51	4.86	8.35	4.75	4.76	NA	NA
Average (2021-22)	3.48	6.39	3.87	4.92	3.81	4.58	3.73	4.28

NA: Not applicable as no transaction happened

Table: 41

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

(i) Intraday contract

The total volume of electricity transacted in both the Power Exchanges in Intraday Contract under GTAM for solar and non-solar segments was **71 MU** (**64 MU** in IEX and **7 MU** in PXIL). In IEX, the maximum volume of **10 MU** was transacted in the month of May, 2021 under the non-solar segment, whereas, the minimum volume of **0.02 MU** was transacted in the month of February, 2022 under the non-solar segment. Similarly, in PXIL, the maximum volume of **3 MU** was transacted in the month of March, 2022 under the non-solar segment, whereas, the minimum volume of electricity of **0.15 MU** was transacted in the month of December, 2021 under the solar segment.

The month wise details of electricity transacted in Intraday Contract under solar and non-solar segments in GTAM are tabulated in **Table: 42**.

Months	Final Scheduled Volume in Intraday Contract (MU)				
	IEX		PXIL		Total
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	0.42	3.01	-	0.03	3.46
May, 2021	2.18	9.92	-	-	12.1
Jun, 2021	1.87	8.30	1.86	0.40	12.43
Jul, 2021	0.45	8.46	-	-	8.91
Aug, 2021	2.86	6.44	-	0.42	9.72
Sept, 2021	3.37	2.89	-	-	6.26
Oct, 2021	3.26	1.42	-	-	4.68
Nov, 2021	1.52	0.43	-	-	1.95
Dec, 2021	4.33	-	0.15	1.40	5.88
Jan, 2022	1.23	-	-	-	1.23
Feb, 2022	1.39	0.02	-	-	1.41
Mar, 2022	-	-	-	2.83	2.83
Total	22.88	40.89	2.01	5.08	70.86
	63.77		7.09		

- No transaction happened

Table: 42

(ii) Day Ahead Contingency (DAC) Contract

The total volume of electricity transacted in both the Power Exchanges in Intraday Contract under GTAM for solar and non-solar segments was **4,707 MU** (**3,428 MU** in IEX and **1,279 MU** in PXIL). In IEX, the maximum volume of **269 MU** was transacted in the month of July, 2021 under the non-solar segment, whereas, the minimum volume of **20 MU** was transacted in the month of January, 2022 under the solar segment. Similarly, in PXIL, the maximum volume of **244 MU** was transacted in the month of February, 2022 under the non-solar segment, whereas, the minimum volume of electricity of **5 MU** was transacted in the month of September, 2021 under the solar segment.

The month wise details of electricity transacted in Day Ahead Contingency Contract under solar and non-solar segments in GTAM are tabulated in **Table: 43**.

Months	Final Scheduled Volume in Day Ahead Contingency Contract (MU)						
	IEX			PXIL			Total
	Solar	Non Solar	Total	Solar	Non Solar	Total	
Apr, 2021	72.07	99.94	172.01	-	-	-	172.01

May, 2021	155.78	148.76	304.54	-	-	-	304.54
Jun, 2021	141.42	227.99	369.41	-	-	-	369.41
Jul, 2021	176.54	269.29	445.83	-	-	-	445.83
Aug, 2021	132.77	226.27	359.04	-	12.68	12.68	371.72
Sept, 2021	230.74	205.28	436.02	5.53	47.53	53.06	489.08
Oct, 2021	222.37	114.4	336.77	25.74	30.31	56.05	392.82
Nov, 2021	177.20	127.57	304.77	48.61	18.04	66.65	371.42
Dec, 2021	66.45	141.83	208.28	103.96	125.83	229.79	438.07
Jan, 2022	19.82	52.75	72.57	98.21	57.96	156.17	228.74
Feb, 2022	22.43	213.81	236.24	145.39	244.01	389.40	625.64
Mar, 2022	43.64	138.79	182.43	143.23	171.80	315.03	497.46
Total	1,461.23	1,966.68	3,427.91	570.67	708.16	1,278.83	4,706.74

- No transaction happened

Table: 43

The month wise plot of FSV (MU) in Day Ahead Contingency contract on delivery date basis under GTAM is displayed in **Figure: 35**

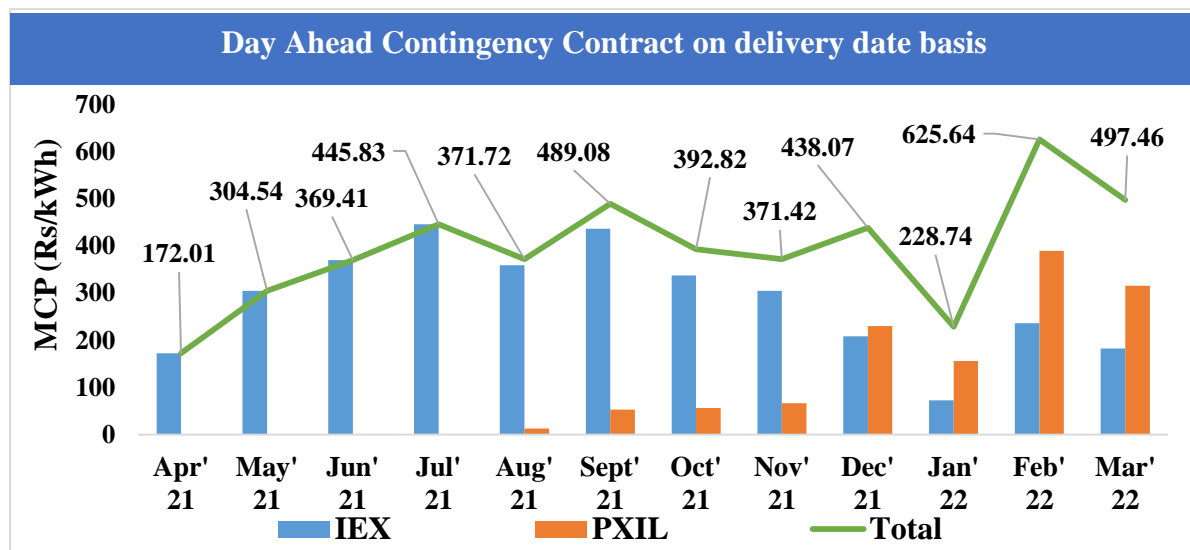


Figure: 35

(iii) Daily/Anyday Contract

The total volume of electricity transacted in both the Power Exchanges in Daily/Anyday Contract under GTAM for solar and non-solar segments was **590 MU** (**441 MU** in IEX and **149 MU** in PXIL). In IEX, the maximum volume of **189 MU** was transacted in the month of July, 2021 under the non-solar segment, whereas, the minimum volume of **0.26 MU** was transacted in the month of May, 2021 under the non-solar segment. Similarly, in PXIL, the maximum volume of **65 MU** was transacted in the month of November, 2021 under the solar segment, whereas, the minimum volume of electricity of **0.60 MU** was transacted in the month of May, 2021 under the solar segment.

The month wise details of electricity transacted in Daily/Anyday Contract under solar and non-solar segments in GTAM are tabulated in **Table: 44**

Months	Final Scheduled Volume in Daily/ Anyday Contract (MU)				
	IEX		PXIL		Total
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	2.90	-	-	5.71	8.61
May, 2021	10.82	0.26	-	0.60	11.68
Jun, 2021	2.59	9.36	10.70	14.54	37.19
Jul, 2021	18.88	188.95	-	16.77	224.60
Aug, 2021	6.22	76.80	-	19.70	102.72
Sept, 2021	36.12	59.14	-	1.3	96.56
Oct, 2021	-	2.98	-	3.66	6.64
Nov, 2021	-	0.43	65.26	-	65.69
Dec, 2021	-	0.31	7.00	-	7.31
Jan, 2022	-	7.02	-	2.78	9.80
Feb, 2022	7.49	6.28	-	-	13.77
Mar, 2022	3.69	1.21	1.03	-	5.93
Total	88.71	352.74	83.99	65.06	590.50
	441.45		149.05		

- No transaction happened

Table: 44

(iv) Weekly Contract

The total volume of electricity transacted in both the Power Exchanges in Weekly Contract under GTAM for solar and non-solar segments was **85 MU (85 MU in IEX and no transaction happened in PXIL)**. In IEX, the maximum volume of **16 MU** was transacted in the month of May, 2021 under the solar segment, whereas, the minimum volume of **0.34 MU** was transacted in the month of November, 2021 under the non-solar segment. Whereas, no transaction of electricity happened in PXIL.

The month wise details of electricity transacted in Weekly Contract under solar and non-solar segments in GTAM are tabulated in **Table: 45**

Months	Final Scheduled Volume in Weekly Contract (MU)				
	IEX		PXIL		Total
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	-	-	-	-	-
May, 2021	15.74	1.51	-	-	17.25
Jun, 2021	13.42	8.85	-	-	22.27
Jul, 2021	3.25	13.58	-	-	16.83
Aug, 2021	3.85	10.44	-	-	14.29
Sept, 2021	5.60	-	-	-	5.60
Oct, 2021	-	0.84	-	-	0.84

Nov, 2021	-	0.34	-	-	0.34
Dec, 2021	-	0.65	-	-	0.65
Jan, 2022	-	-	-	-	-
Feb, 2022	6.52	-	-	-	6.52
Mar, 2022	-	-	-	-	-
Total	48.38	36.21	-	-	84.59
	84.59		-		

- No transaction happened

Table: 45

4. Real Time Curtailment in Green Term Ahead Market

The total real time curtailment of **1.48 MU** happened under Solar segment in GTAM during FY 2021-22 (i.e. **0.78 MU** in Day Ahead Contingency contract & **0.70 MU** Daily/Anyday contract). No real time curtailment happened in Intraday and weekly contracts under solar segment, respectively.

The month wise details of real time curtailment in Solar segment in GTAM are tabulated in **Table: 46:**

Months	GTAM (Solar)							
	Intraday		DAC		Any Day/ Daily		Weekly	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
May,	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jun, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jul, 2021	0.00	NA	0.78	8 days	0.00	NA	0.00	NA
Aug, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Sept, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Oct, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Nov, 2021	0.00	NA	0.00	NA	0.70	6 days	0.00	NA
Dec, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jan, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Feb, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Mar, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Total	0.00	NA	0.78	8 days	0.70	6 days	0.00	NA

Table 46

Similarly, the total real time curtailment of **0.16 MU** happened under Non Solar segment in GTAM during FY 2021-22 (i.e. **0.13 MU** in Day Ahead Contingency contract, **0.02 MU** in Daily/ Anyday contract and **0.01 MU** in Intraday contract). No real time curtailment happened in weekly contract under solar non solar segment, respectively.

The month wise details of real time curtailment in Non-Solar segment in GTAM are tabulated in **Table: 47.**

Months	GTAM (Non Solar)							
	Intraday		DAC		Any Day/ Daily		Weekly	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	0.00	NA	0.00	NA	0.02	1 day	0.00	NA
May, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jun, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jul, 2021	0.00	NA	0.13	1 day	0.00	NA	0.00	NA
Aug, 2021	0.01	1 day	0.00	NA	0.00	NA	0.00	NA
Sept, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Oct, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Nov, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Dec, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jan, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Feb, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Mar, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Total	0.01	1 day	0.13	1 day	0.02	1 day	0.00	NA

NA: Not Applicable as no transaction happened

Table 47

5. Volume of Electricity transacted in GTAM on Trade date basis

The total volume of electricity transacted in Power Exchanges in Green Term Ahead Market was **5,432 MU** (**2,253 MU** in IEX and **3,179 MU** in PXIL). Under the GTAM (Solar) segment the maximum volume of **280 MU** was transacted in the month of September, 2021, whereas, the minimum volume of **78 MU** was transacted in the month of April, 2021. Similarly, under the GTAM (Non-Solar) segment the maximum volume of **549 MU** was transacted in the month of July, 2021, whereas, the minimum volume of electricity of **113 MU** was transacted in the month of April, 2021. The majority of transactions in GTAM happened under Day Ahead Contingency Contract (**86.79 %**) on trade date basis.

The month wise GTAM transaction details under solar and non-solar segments on trade date basis are given in **Table-48** below:

Months	Final Scheduled Volume (MU)		
	GTAM (Solar)	GTAM (Non Solar)	Total
Apr, 2021	78.33	113.16	191.49
May, 2021	193.60	164.14	357.74
Jun, 2021	159.63	269.94	429.57
Jul, 2021	192.27	549.35	741.62
Aug, 2021	146.73	298.53	445.26
Sept, 2021	280.33	322.21	602.54
Oct, 2021	256.88	146.22	403.10

Nov, 2021	277.71	144.78	422.49
Dec, 2021	170.91	276.97	447.88
Jan, 2022	122.11	115.55	237.66
Feb, 2022	185.45	470.09	655.54
Mar, 2022	189.30	308.16	497.46
Total	2,253.25	3,179.10	5,432.35

Table: 48

The graphical representation of GTAM transaction details under solar and non-solar segments on trade date basis is displayed below in **Figure: 37**

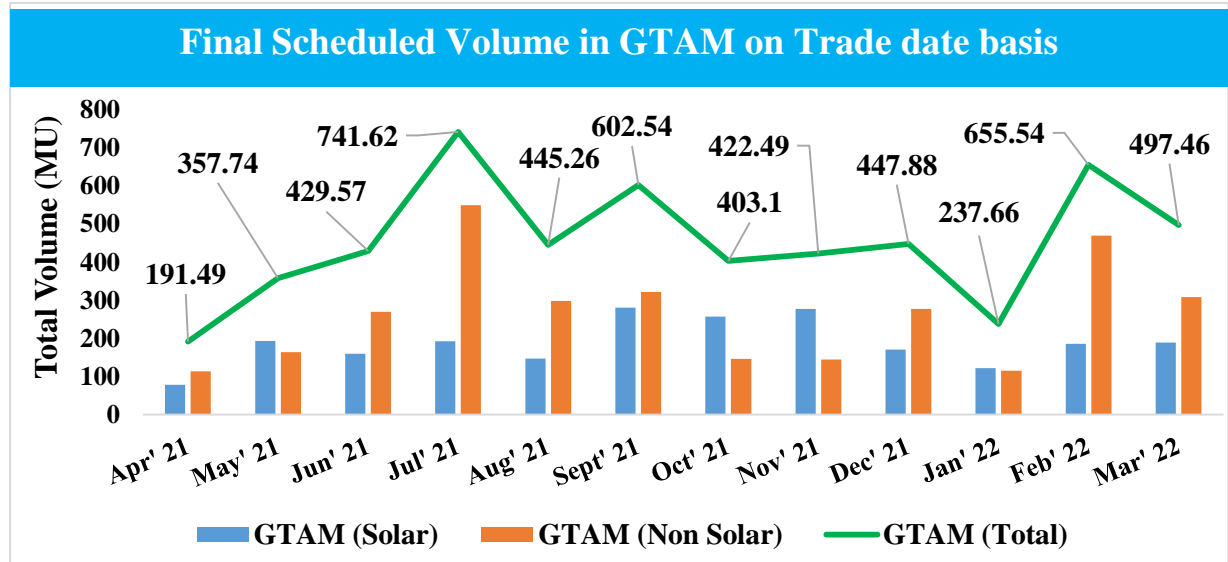


Figure: 37

6. Volume (MU) and Prices (Rs. /kWh) for Solar and Non Solar transactions in GTAM on Trade date basis during FY 2021-22

The month wise GTAM transaction details for IEX and PXIL under solar and non-solar segments on trade date are given in **Table-49** below:

Months	Final Scheduled Volume (MU)				Total
	IEX		PXIL		
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	78.33	107.62	0.00	5.54	191.49
May, 2021	193.60	163.54	0.00	0.60	357.74
Jun, 2021	157.73	254.11	1.90	15.83	429.57
Jul, 2021	192.27	533.11	0.00	16.24	741.62
Aug, 2021	146.73	266.09	0.00	32.44	445.26
Sept, 2021	274.80	268.17	5.53	54.04	602.54
Oct, 2021	231.10	116.62	25.78	29.60	403.10
Nov, 2021	175.40	127.28	102.31	17.50	422.49
Dec, 2021	65.16	142.94	105.75	134.03	447.88
Jan, 2022	20.62	60.81	101.49	54.74	237.66

Feb, 2022	39.80	221.66	145.65	248.43	655.54
Mar, 2022	48.55	138.46	140.75	169.70	497.46
Total	1,624.09	2,400.41	629.16	609.38	5,432.35
	4,024.50		1,407.85		

Table: 49

The month wise and contract wise prices of solar and non-solar transaction of electricity in GTAM in during FY 2021-22 on trade date basis are tabulated in **Table: 50**

	Intraday		Day Ahead Contingency		Daily/ Anyday Contract		Weekly Contract	
	Solar	Non Solar	Solar	Non Solar	Solar	Non Solar	Solar	Non Solar
Apr, 2021	4.00	4.63	3.90	4.39	4.38	4.20	4.00	NA
May, 2021	3.43	4.44	3.24	3.88	3.28	3.66	3.34	3.43
Jun, 2021	3.06	4.48	3.24	4.17	3.32	3.84	3.43	4.22
Jul, 2021	3.21	4.25	3.05	3.88	3.35	3.92	4.00	3.94
Aug, 2021	3.35	4.69	4.24	5.02	3.35	4.40	3.40	3.94
Sept, 2021	3.51	5.14	3.96	4.79	4.60	4.76	NA	4.70
Oct, 2021	3.67	17.35	4.32	7.87	3.50	9.55	NA	NA
Nov, 2021	3.50	3.65	3.69	4.08	3.53	4.65	NA	4.65
Dec, 2021	3.42	7.00	3.76	3.92	NA	4.53	NA	4.65
Jan, 2022	3.52	NA	3.84	4.00	NA	4.46	NA	NA
Feb, 2022	3.60	5.00	4.45	4.29	4.23	4.66	NA	NA
Mar, 2022	4.00	9.51	6.33	8.66	4.38	5.23	3.97	NA
Average (2021-22)	3.52	6.38	4.00	4.91	3.79	4.82	3.69	4.22

NA: Not applicable as no transaction happened

Table: 51

7. Contract-wise Traded Volume in GTAM in both the Power Exchanges on Trade Date Basis

7.1. Intraday contract

The total volume of electricity transacted in both the Power Exchanges in Intraday Contract under GTAM for solar and non-solar segments was **70 MU** (**64 MU** in IEX and **6 MU** in PXIL). In IEX, the maximum volume of **10 MU** was transacted in the month of May, 2021 under the non-solar segment, whereas, the minimum volume of **0.02 MU** was transacted in the month of February, 2022 under the non-solar segment. Similarly, in PXIL, the maximum volume of **3 MU** was transacted in the month of March, 2022 under the non-solar segment, whereas, the minimum volume of electricity of **0.15 MU** was transacted in the month of December, 2021 under the solar segment.

The month wise details of electricity transacted in Intraday Contract under Solar and Non Solar segments in GTAM are tabulated in **Table: 52**

Months	Final Scheduled Volume in Intraday Contract (MU)				
	IEX		PXIL		Total
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	0.42	3.01	-	0.03	3.46
May, 2021	2.18	9.92	-	-	12.1
Jun, 2021	1.87	8.30	0.93	0.40	11.5
Jul, 2021	0.45	8.46	-	-	8.91
Aug, 2021	2.86	6.44	-	0.42	9.72
Sept, 2021	3.37	2.89	-	-	6.26
Oct, 2021	3.26	1.42	-	-	4.68
Nov, 2021	1.52	0.43	-	-	1.95
Dec, 2021	4.33	-	0.15	1.40	5.88
Jan, 2022	1.23	-	-	-	1.23
Feb, 2022	1.39	0.02	-	-	1.41
Mar, 2022	-	-	-	2.83	2.83
Total	22.88	40.89	1.08	5.08	69.93
	63.77		6.16		

- : No transaction happened

Table: 52

7.2. Day Ahead Contingency (DAC) Contract

The total volume of electricity transacted in both the Power Exchanges in Intraday Contract under GTAM for solar and non-solar segments was **4,715 MU** (**3,433 MU** in IEX and **1,282 MU** in PXIL). In IEX, the maximum volume of **272 MU** was transacted in the month of July, 2021 under the non-solar segment, whereas, the minimum volume of **19 MU** was transacted in the month of January, 2022 under the solar segment. Similarly, in PXIL, the maximum volume of **248 MU** was transacted in the month of February, 2022 under the non-solar segment, whereas, the minimum volume of electricity of **5 MU** was transacted in the month of September, 2021 under the solar segment.

The month wise details of electricity transacted in Day Ahead Contingency Contract under Solar and Non Solar segments in GTAM are tabulated in **Table: 53**

Months	Final Scheduled Volume in Day Ahead Contingency Contract (MU)						
	IEX			PXIL			Total
	Solar	Non Solar	Total	Solar	Non Solar	Total	
Apr, 2021	72.73	104.61	177.34	-	-	-	177.34
May, 2021	160.75	147.89	308.64	-	-	-	308.64

Jun, 2021	138.39	231.37	369.76	-	-	-	369.76
Jul, 2021	174.26	272.32	446.58	-	-	-	446.58
Aug, 2021	137.07	220.82	357.89	-	12.68	12.68	370.57
Sept, 2021	229.71	205.93	435.64	5.53	50.34	55.87	491.51
Oct, 2021	227.84	113.18	341.02	25.74	28.34	54.08	395.1
Nov, 2021	173.88	125.92	299.8	49.56	17.50	67.06	366.86
Dec, 2021	60.83	142.14	202.97	105.60	131.67	237.27	440.24
Jan, 2022	19.39	52.29	71.68	101.49	52.92	154.41	226.09
Feb, 2022	24.40	216.42	240.82	145.06	248.43	393.49	634.31
Mar, 2022	43.37	137.03	180.4	140.31	166.87	307.18	487.58
Total	1,462.62	1,969.92	3,432.54	573.29	708.75	1,282.04	4,714.58

- No transaction happened

Table: 53

The month wise plot of FSV (MU) in Day Ahead Contingency contract on trade date basis under GTAM is displayed in **Figure: 38**

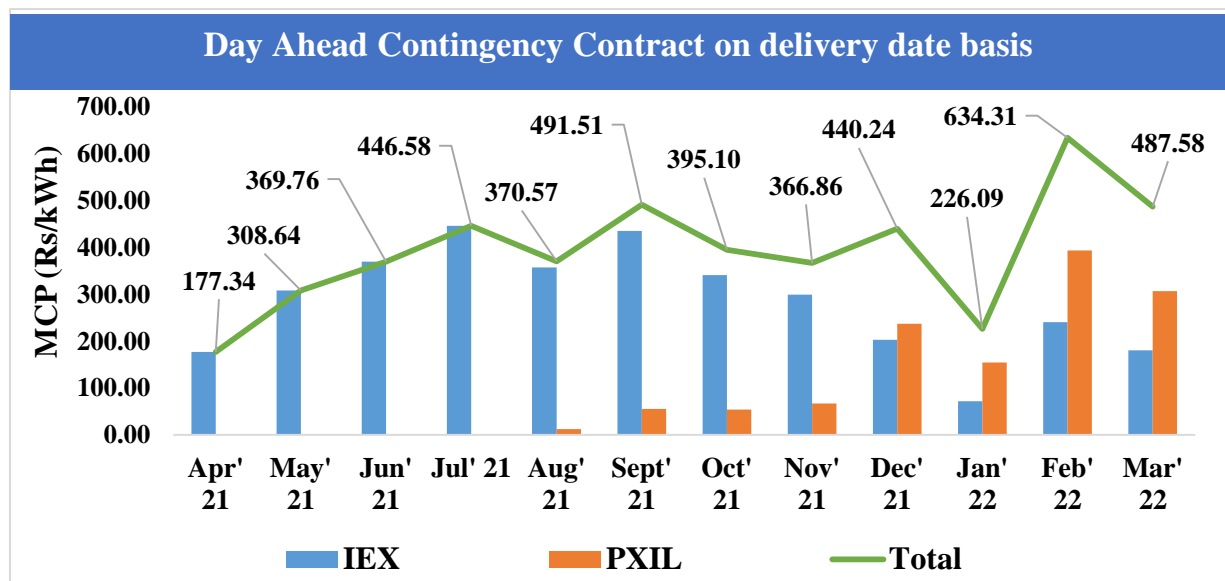


Figure: 38

7.3. Daily/ Anyday Contract

The total volume of electricity transacted in both the Power Exchanges in Daily/Anyday Contract under GTAM for solar and non-solar segments was **564 MU** (**444 MU** in IEX and **120 MU** in PXIL). In IEX, the maximum volume of **231 MU** was transacted in the month of July, 2021 under the non-solar segment, whereas, the minimum volume of **0.15 MU** was transacted in the month of December, 2021 under the non-solar segment. Similarly, in PXIL, the maximum volume of **53 MU** was transacted in the month of November, 2021 under the solar segment, whereas, the minimum volume of electricity of **0.04 MU** was transacted in the month of October, 2021 under the solar segment.

The month wise details of electricity transacted in Daily/Anyday under Solar and Non Solar segments in GTAM is tabulated in **Table: 53**

Months	Final Scheduled Volume in Daily/ Anyday Contract (MU)				
	IEX		PXIL		Total
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	3.50	-	-	5.51	9.01
May, 2021	10.70	4.22	-	0.60	15.52
Jun, 2021	8.80	5.59	0.97	15.43	30.79
Jul, 2021	15.46	231.33	-	16.24	263.03
Aug, 2021	2.95	35.81	-	19.34	58.1
Sept, 2021	36.12	58.51	-	3.70	98.33
Oct, 2021	-	2.02	0.04	1.26	3.32
Nov, 2021	-	0.59	52.75	-	53.34
Dec, 2021	-	0.15	-	0.96	1.11
Jan, 2022	-	8.52	-	1.82	10.34
Feb, 2022	7.49	5.22	0.59	-	13.3
Mar, 2022	5.18	1.43	0.44	-	7.05
Total	90.2	353.39	54.79	64.86	563.24
	443.59		119.65		

- No transaction happened

Table: 53

7.4. Weekly Contract

The total total volume of electricity transacted in both the Power Exchanges in Weekly Contract under GTAM for solar and non-solar segments was **85 MU** (**85 MU** in IEX and no transaction happened in PXIL). In IEX, the maximum volume of **21 MU** was transacted in the month of July, 2021 under the solar segment, whereas, the minimum volume of **0.34 MU** was transacted in the month of November, 2021 under the non-solar segment. Whereas, no transaction of electricity happened in PXIL.

The month wise details of electricity transacted in Weekly Contract under Solar and Non Solar segments in GTAM are tabulated in **Table: 54**

Months	Final Scheduled Volume in Weekly Contract (MU)				
	IEX		PXIL		Total
	Solar	Non Solar	Solar	Non Solar	
Apr, 2021	1.68	-	-	-	1.68
May, 2021	19.97	1.51	-	-	21.48
Jun, 2021	8.67	8.85	-	-	17.52
Jul, 2021	2.10	21.00	-	-	23.10
Aug, 2021	3.85	3.02	-	-	6.87
Sept, 2021	5.60	0.84	-	-	6.44
Oct, 2021	-	-	-	-	-

Nov, 2021	-	0.34	-	-	0.34
Dec, 2021	-	0.65	-	-	0.65
Jan, 2022	-	-	-	-	-
Feb, 2022	6.52	-	-	-	6.52
Mar, 2022	-	-	-	-	-
Total	48.39	36.21	-	-	84.60
	84.60		-		

- No transaction happened

Table: 54

8. Congestion in GTAM (Solar) & GTAM (Non Solar) segments

The total transmission congestion of **0.47 MU** happened in Day Ahead Contingency contract under Solar segment in GTAM during FY 2021-22. No transmission congestion happened in Intraday, Daily/Anyday and weekly contracts under solar segment, respectively.

The month wise details of transmission congestion in GTAM (Solar) segment are tabulated in

Table: 55:

Months	GTAM (Solar)							
	Intraday		DAC		Any Day/ Daily		Weekly	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
May,	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jun, 2021	0.00	NA	0.07	1 day	0.00	NA	0.00	NA
Jul, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Aug, 2021	0.00	NA	0.12	2 days	0.00	NA	0.00	NA
Sept, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Oct, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Nov, 2021	0.00	NA	NA	NA	0.00	NA	0.00	NA
Dec, 2021	0.00	NA	NA	NA	0.00	NA	0.00	NA
Jan, 2022	0.00	NA	0.28	1 day	0.00	NA	0.00	NA
Feb, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Mar, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Total	0.00	NA	0.47	4 days	0.00	NA	0.00	NA

Table 55

Similarly, the total transmission congestion of **6.27 MU** happened under Non Solar segment in GTAM during FY 2021-22 (i.e. **3.52 MU** in Day Ahead Contingency contract, **2.51 MU** in Daily/ Anyday contract and **0.24 MU** in Intraday contract). No transmission congestion happened in weekly contract under solar non solar segment, respectively.

The month wise details of transmission congestion in GTAM (Non-Solar) segment are tabulated in **Table: 56**.

Months	GTAM (Non Solar)							
	Intraday		DAC		Any Day/ Daily		Weekly	
	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days	Volume (MU)	No. of days
Apr, 2021	0.00	NA	0.17	1 day	0.02	1 day	0.00	NA
May, 2021	0.00	NA	0.12	1 day	0.00	NA	0.00	NA
Jun, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jul, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Aug, 2021	0.01	1 day	0.03	1 day	0.00	NA	0.00	NA
Sept, 2021	0.23	1 day	2.81	1 day	2.40	1 day	0.00	NA
Oct, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Nov, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Dec, 2021	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Jan, 2022	0.00	NA	0.17	1 day	0.00	NA	0.00	NA
Feb, 2022	0.00	NA	0.00	NA	0.00	NA	0.00	NA
Mar, 2022	0.00	NA	0.22	1 day	0.09	1 day	0.00	NA
Total	0.24	2 days	3.52	6 days	2.51	3 days	0.00	NA

NA: Not Applicable as no transaction happened

Table 56

9. Average Market Clearing Price (MCP) of Electricity transacted in IEX & PXIL in Green Term Ahead Market (GTAM) during FY 2021-22 (on Delivery date basis)

The Average Market Clearing Price of electricity on delivery date basis transacted in GTAM under Solar and Non Solar segments during FY 2021-22 is tabulated in **Table: 57**

GTAM MCP (Rs./kWh)	IEX		PXIL	
	Solar	Non Solar	Solar	Non Solar
FY 2021-22	3.68	5.05	3.61	5.09

Table: 57

10. Average Market Clearing Price (MCP) of Electricity transacted in IEX & PXIL in Green Term Ahead Market (GTAM) during FY 2021-22 (on Trade date basis)

The Average Market Clearing Price of electricity on trade date basis transacted in GTAM under Solar and Non Solar segments during FY 2021-22 is tabulated in **Table: 58**.

GTAM MCP (Rs./kWh)	IEX		PXIL	
	Solar	Non Solar	Solar	Non Solar
FY 2021-22	3.77	5.17	3.80	5.07

Table: 58

CHAPTER-VIII**ANALYSIS OF VARIATIONS IN FSV & AVERAGE MCP DURING FY 2021-22****1. General Observations**

(i) The demand and supply scenario in the market is the main determinant, which determines the prices discovered in the Power exchange. The fundamental drivers of price in the Exchange 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 2021-22, 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 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 MCP is maximum and when the difference between the two is maximum, then on that day, the daily 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 2021-22, 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 2021-22 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 2021-22 using a double log function, whereby the elasticity of Daily 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 2021-22 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 99.99 % of transaction happening in power exchanges in Day Ahead Market occurred in IEX only. The regression analysis revealed that the most important variable, which determines daily market clearing price is the total purchase bid for almost every months of FY 2021-22.

The month wise details of significant variables, most significant variables and its regression coefficient in IEX are tabulated in **Table: 59**

Month	Significant Variables	Most Significant Variables and its Regression Coefficient	2 nd Most Significant Variable and its Regression Coefficient
April, 2021	Total Purchase bid and Total Sell bid	Total Purchase bid (0.42)	Total Sell bid (- 0.26)
May, 2021	Total Purchase bid, Total Sell bid and Coal generation	Total Purchase bid (0.25)	Total Sell bid (- 0.32)
June, 2021	Total Purchase bid and Total Sell bid	Total Purchase bid (0.47)	Total Sell bid (-0.47)
July, 2021	Total Purchase bid, Total Sell bid and Coal generation	Total Purchase bid (0.54)	Total Sell bid (- 0.58)
Aug, 2021	Total Purchase bid and Total Sell bid	Total Purchase Bid (1.53)	Total Sell bid (- 0.53)
Sept, 2021	Total Purchase bid, Total Sell bid and Coal generation	Total Purchase Bid (0.98)	Total Sell bid (- 0.43)
Oct, 2021	Total Purchase bid	Total Purchase Bid (1.72)	Total Sell bid (- 0.46)
Nov, 2021	Total Purchase bid, Total Sell bid and Hydro generation	Total Purchase Bid (0.63)	Total Sell bid (- 0.32)
Dec, 2021	Total Purchase bid, Total Sell bid and Wind generation	Total Purchase Bid (0.52)	Total Sell bid (- 0.38)

Jan, 2022	Total Purchase bid and Total Sell bid	Total Purchase bid (0.52)	Total Sell bid (- 0.32)
Feb, 2022	Total Purchase bid	Total Purchase bid (1.20)	Total Sell bid (- 0.92)
March, 2022	Total Purchase bid and Total Sell bid	Total Purchase bid (1.01)	Total Sell bid (- 0.97)

Table: 59

ii) On annual regression analysis of Daily Market Clearing Prices w.r.t Total Purchase bid, Total Sell bid, Peak Demand, Hydro generation, Solar generation and Thermal generation, it is observed that the significant variables were Total Purchase, Total Sell Bid and Coal Generation only. Further, among these three variables, the most significant variable was **Total Purchase bid** with regression coefficient as **1.10**.

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 2021-22 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 99.99 % 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 market clearing price is the total purchase bid for almost every months of FY 2021-22.

The month wise details of significant variables, most significant variables and its regression coefficient in IEX are tabulated in **Table: 60**

Month	Significant Variables	Most Significant Variables and its Regression Coefficient	2 nd Most Significant Variable and its Regression Coefficient
April, 2021	Total Purchase bid and Total Sell bid	Total Purchase bid (0.65)	Total Sell bid (- 0.38)
May, 2021	Total Purchase bid, Total Sell bid and Coal generation	Total Purchase bid (0.35)	Total Sell bid (- 0.42)
June, 2021	Total Purchase bid and Total Sell bid	Total Purchase bid (0.69)	Total Sell bid (- 0.26)
July, 2021	Total Purchase bid, Total Sell bid and Coal generation	Total Purchase bid (0.66)	Total Sell bid (- 0.56)
Aug, 2021	Total Purchase bid and Total Sell bid	Total Purchase Bid (0.61)	Total Sell bid (- 0.55)
Sept, 2021	Total Purchase bid, Total Sell bid, Coal generation and Wind generation	Total Purchase Bid (0.70)	Total Sell bid (-0.48)

Oct, 2021	Total Purchase bid and Total Sell bid	Total Purchase Bid (1.23)	Total Sell bid (- 0.59)
Nov, 2021	Total Purchase bid , Total Sell bid and Hydro generation	Total Purchase Bid (0.72)	Total Sell bid (- 0.47)
Dec, 2021	Total Purchase bid , Total Sell bid and Wind generation	Total Purchase Bid (0.62)	Total Sell bid (- 0.75)
Jan, 2022	Total Purchase bid and Total Sell bid	Total Purchase Bid (0.79)	Total Sell bid (- 0.43)
Feb, 2022	Total Purchase	Total Purchase Bid (0.95)	Total Sell bid (- 0.91)
March, 2022	Total Purchase bid , Total Sell bid and Hydro generation	Total Purchase Bid (1.03)	Total Sell bid (- 0.94)

Table: 60

ii) On annual regression analysis of Daily Market Clearing Prices w.r.t Total Purchase bid, Total Sell bid, Peak Demand, Hydro generation, Solar generation and Thermal generation, it is observed that the significant variables were Total Purchase, Total Sell Bid and Coal Generation only. Further, among these three variables, the most significant variable was **Total Purchase bid** with regression coefficient as **0.43**.

CHAPTER-IX**1. TOP TEN SELLERS ON THE POWER EXCHANGES (IEX & PXIL) DURING FY 2021-22 IN DAM**

The percentage share of top 10 sellers during FY 2021-22 in the power exchanges is **48.89%** of total volume of electricity transacted in DAM. The volume of electricity transacted by top ten sellers along with their share in total volume are provided in the **Table: 61**.

Entity Name	Sell (MU)	Percent
Uttar Pradesh	5,631.47	8.64%
West Bengal	5,427.69	8.33%
Teesta -3	2,899.84	4.45%
Bihar	2,831.74	4.34%
Karnataka	2,815.68	4.32%
Orissa	2,774.86	4.26%
Himachal Pradesh	2,564.70	3.93%
Sembcorp Gayatri	2,317.70	3.56%
Chhattisgarh	2,310.26	3.54%
Rajasthan	2,294.32	3.52%
Total	31,868.28	48.89%
Total Volume in PXs during FY 2021-22	65,185.67	

TABLE: 61**2. TOP TEN BUYERS ON THE POWER EXCHANGES (IEX & PXIL) DURING FY 2021-22 IN DAM**

The percentage share of top 10 purchasers during FY 2021-22 in the power exchanges is **78.32%** of total volume of electricity transacted in DAM. The volume of electricity transacted by top ten buyers along with their share in total volume are provided in the **Table: 62**.

Entity Name	Purchase (MU)	Percent
Gujarat	13,582.83	20.84%
Andhra Pradesh	8,410.21	12.90%
Maharashtra	5,601.77	8.59%
Punjab	5,226.29	8.02%
Tamil Nadu	5,058.74	7.76%
Telangana	3,770.33	5.78%
Haryana	2,996.36	4.60%
Rajasthan	2,391.08	3.67%
Uttar Pradesh	2,090.24	3.21%
J&K	1,927.53	2.96%
Total	51,055.38	78.32%
Total Volume in PXs during FY 2021-22	65,185.67	

TABLE: 62

3. TOP TEN SELLERS ON THE POWER EXCHANGES (IEX & PXIL) DURING FY 2021-22 IN RTM

The percentage share of top 10 sellers during FY 2021-22 in the power exchanges is **60.14** % of total volume of electricity transacted in RTM. The volume of electricity transacted by top ten sellers along with their share in total volume are provided in the **Table: 63**.

Entity Name	Sell (MU)	Percent
West Bengal	1,712.66	89.72%
Madhya Pradesh	1,652.46	86.56%
Orissa	1,233.45	64.61%
Uttar Pradesh	1,183.00	61.97%
Rajasthan	1,171.47	61.37%
J&K	1,153.09	60.40%
Telangana	1,116.73	58.50%
Bihar	989.96	51.86%
Karnataka	933.19	48.88%
Delhi	826.46	43.29%
Total	11,972.47	60.14%
Total Volume in PXs during FY 2021-22	19,908.07	

TABLE: 63

4. TOP TEN BUYERS ON THE POWER EXCHANGES (IEX & PXIL) DURING FY 2021-22 IN RTM

The percentage share of top 10 purchasers during FY 2021-22 in the power exchanges is **78.50** % of total volume of electricity transacted in RTM. The volume of electricity transacted by top ten buyers along with their share in total volume are provided in the **Table: 64**.

Entity Name	Purchase (MU)	Percent
J&K	2,422.50	126.90%
Andhra Pradesh	2,121.61	111.14%
Telangana	1,940.90	101.67%
Rajasthan	1,780.23	93.25%
Maharashtra	1,557.99	81.61%
Gujarat	1,480.95	77.58%
Tamil Nadu	1,335.16	69.94%
Uttar Pradesh	1,148.17	60.14%
Haryana	1,112.25	58.26%
West Bengal	727.92	38.13%
Total	15,627.68	78.50%
Total Volume in PXs during FY 2021-22	19,908.07	

TABLE: 64

5. TOP TEN SELLERS ON IEX DURING FY 2021-22 IN GDAM

The percentage share of top 10 sellers during FY 2021-22 in the power exchanges is **92.61** % of total volume of electricity transacted in GDAM. The volume of electricity transacted by top ten sellers along with their share in total volume are provided in the **Table: 65**.

Entity Name	Sell (MU)	Percent
Karnataka	497.69	54.04%
Telangana	121.57	13.20%
Mouda Stg-2	47.04	5.11%
Adani Green Solar Jaisalmer	36.90	4.01%
Adani Hybrid Energy Jaisalmer Three Limited (Solar)	36.42	3.95%
Renew Solar Energy (Jharkhand Three) Pvt Ltd (RSEJTPL)	29.15	3.17%
Andhra Pradesh	27.98	3.04%
J&K	25.96	2.82%
Azure Power Forty Three Private Limited	15.22	1.65%
Renew Solar Urja Private Limited	14.45	1.57%
Total	852.40	92.61%
Total Volume in PXs during FY 2021-22	920.46	

TABLE: 65

6. TOP TEN BUYERS ON IEX DURING FY 2021-22 IN GDAM

The percentage share of top 10 purchasers during FY 2021-22 in the power exchanges is **85.37** % of total volume of electricity transacted in GDAM. The volume of electricity transacted by top ten buyers along with their share in total volume are provided in the **Table: 66**.

Entity Name	Purchase (MU)	Percent
DGEN Mega Power	202.27	21.96%
Orissa	106.63	11.58%
Arunachal Pradesh	100.33	10.89%
Delhi	98.69	10.72%
West Bengal	72.74	7.90%
Assam	61.11	6.64%
Madhya Pradesh	53.05	5.76%
Dadra & Nagar Haveli	32.31	3.51%
Kerala	29.48	3.20%
Maharashtra	29.21	3.17%
Total	785.84	85.37%
Total Volume in PXs during FY 2021-22	920.46	

TABLE: 66

Table: 67**SELLERS IN DAM ON POWER EXCHANGES (IEX & PXIL) DURING FY 2021-22.**

Entity Name	Sell (MU)				
Uttar Pradesh	5631.47	Tamilnadu	222.95	Manipur	16.78
West Bengal	5427.69	Raigarh Energy Ltd.	221.38	NLC	15.94
Teesta -3	2899.84	NTPC Kudgi	215.65	TRN Energy	13.19
Bihar	2831.74	Andhra Pradesh	211.80	Renew Solar Energy (Jharkhand Three) Pvt Ltd (RSEJTPL)	11.40
Karnataka	2815.68	Adani Power STG2	211.38	SKS Power	10.91
Orissa	2774.86	Jharkhand	207.47	Neyveli New Thermal Power Project	10.61
Himachal Pradesh	2564.70	Dikchu	207.22	Dhariwal	8.46
Sembcorp Gayatri	2317.70	Chandigarh	178.89	Uttarakhand	8.16
Chhattisgarh	2310.26	Palatana	172.96	NLC TPS-II Expn	7.92
Rajasthan	2294.32	Jhabua Power	168.59	Adani Hybrid Energy Jaisalmer Four Limited (Solar)	7.15
Telangana	2279.62	Spectrum Coal	154.38	Adani Hybrid Energy Jaisalmer Two Limited (Solar)	6.98
Madhya Pradesh	2215.00	Jindal Steel	147.41	Dadra & Nagar Haveli	6.79
Jindal Power	1912.07	Bongaigaon	146.38	Rihand-III	6.19
Delhi	1820.20	Arunachal Pradesh	140.07	Adani Green Energy Nineteen Limited	5.54
Kerala	1485.37	GMR Warora	139.98	Adani Wind Energy Kutchh Five Limited	5.24
Essar Power MP Ltd	1169.50	Tripura	125.43	Sasan UMPP	3.92
Jindal Power Ltd. Stg-II	1168.60	Gujarat	122.92	Renew Solar Urja Private Limited	2.97
MB Power	1069.05	Meghalaya	117.51	Azure Power Forty Three Private Limited	1.52
Jaypee Nigrie	993.54	Sikkim	102.74	Dadri TPS	1.40
JITPL	972.33	Simhadri Stg-2	86.16	Talcher	1.16
RKM Power	834.36	Ramagundam Stg-3	82.91	Meenakshi Energy	0.90
Assam	686.15	Torrent Power	82.40	Ostro Energy Private Limited (OEPL)	0.83
Sembcorp Energy India Ltd. (formerly Thermal Powertech)	626.22	Adani Power STG3	82.04	Adani Green Hybrid Wind Jaisalmer	0.68
Maharashtra	605.38	IL&FS	69.54	Ayana Renewable Power One Private Limited	0.64
ACBIL	518.71	Chuzachen	64.40	RGPPL_Others	0.59
DB Power	515.33	Mizoram	62.86	Farakka	0.58
Raipur Energen	485.91	NLC TPS-II	62.86	Kahalgaoon	0.54
J&K	447.45	RGPPL	44.54	Koldam HEP	0.32
Kameng HEP	445.09	NLC TPS-II Stg-2	41.51	Continuum Power Trading (TN) Private Limited	0.31
Maruti Clean Coal Powe	413.18	Costal Energen	32.65	Dhauliganga	0.30
Haryana	345.46	NVVN (SNA) - NEA	32.04	AGTPP	0.27
Singoli Bhagwati	342.56	Lanco Budhil	28.92		
Tashiding HEP	331.04	Punjab	28.14		
Jorethang	328.39	Renew Surya Ravi Private Limited	25.97		
GMR Kamalanga	328.25	Adani Green Solar Jaisalmer	22.51		
Sainj HEP	327.16	NTPL	22.04		
AD Hydro	324.16	BALCO 2	20.64		
Talcher Stg-2	317.22	DGEN Mega Power	20.09		
Karcham Wangtoo	316.54	Nagaland	19.55		
Ramagundam Stg-1	278.91	Sorang HEP, (Himachal Sorang Power Private Ltd)	18.69		
Adhunik Power	265.16	Adani Hybrid Energy Jaisalmer Three Limited (Solar)	18.05		
Shree Cement	251.03	KSK Mahanadi	17.70		
Goa WR	248.11				
DVC	239.90				

Table: 68**BUYERS IN DAM ON POWER EXCHANGES DURING FY 2021-22**

Entity Name	Purchase (MU)		
Gujarat	13,582.83	Chhattisgarh	148.76
Andhra Pradesh	8,410.21	DGPCL Bhutan	135.41
Maharashtra	5,601.77	Daman & Diu	110.27
Punjab	5,226.29	Meghalaya	93.78
Tamilnadu	5,058.74	Goa WR	77.97
Telangana	3,770.33	DVC	63.59
Haryana	2,996.36	BALCO 2	33.07
Rajasthan	2,391.08	NEA-NR	29.47
Uttar Pradesh	2,090.24	Nagaland	21.54
J&K	1,927.53	Railways	20.45
Uttarakhand	1,505.82	Arunachal Pradesh	16.07
Assam	967.73	Chandigarh	15.60
Madhya Pradesh	946.89	Goa SR	13.93
Bihar	941.37	Manipur	8.48
Delhi	817.74	Tripura	6.82
ArcelorMittal Nippon steel (ESIL)	770.26	Sikkim	3.38
Orissa	600.02	E0XNP0	1.04
NVVN (SNA) - NEA	598.01	Mizoram	0.93
Karnataka	530.33	Maruti Clean Coal Power	0.77
Dadra & Nagar Haveli	420.04	Gandhar_RLNG Fuel	0.46
West Bengal	419.09	NTPL	0.44
Himachal Pradesh	335.09	Gandhar_NAPM	0.30
Kerala	220.66	Jindal Power Ltd. Stg-II	0.29
Jharkhand	204.11	Gandhar_Combined RLNG Fuel	0.26
		Palatana	0.01

Table: 69**SELLERS IN RTM ON POWER EXCHANGES (IEX & PXIL) DURING FY 2021-22**

Entity Name	Sell (MU)				
West Bengal	1712.66	Khargone STPP	49.41	Sorang HEP,	7.43
Madhya Pradesh	1652.46	NTPC Gadarwara	49.20	Adhunik Power	7.03
Orissa	1233.45	Gujarat	37.33	Shree Cement	6.99
Uttar Pradesh	1183.00	Ramagundam Stg-3	37.00	KBUNL(MTPS-II)	6.66
Rajasthan	1171.47	Rihand-III	36.47	Auraiya_RLNG Fuel	5.71
J&K	1153.09	GMR Kamalanga	34.63	Barh STPS Stg - I	5.27
Telangana	1116.73	Barh Stg-2	32.84	Dadri GPP	5.03
Bihar	989.96	Mouda Stg-2	32.80	Auraiya	4.27
Karnataka	933.19	NTPC Sholapur	31.35	Dadri TPS	4.16
Delhi	826.46	Singoli Bhagwati	30.56	Jhajjar	4.16
Kameng HEP	696.06	Talcher Stg-2	29.53	Dadra & Nagar Haveli	3.81
Chhattisgarh	601.95	Palatana	29.51	Chuzachen	3.77
Kerala	538.26	Adani Power STG2	29.28	Darlipalli	3.76
Himachal Pradesh	420.54	Mouda Stg-1	28.52	Kawas_RLNG Fuel	3.45
RKM Power	365.47	Meghalaya	28.00	Dadri_RLNG Fuel	3.44
MB Power	346.62	Punjab	27.57	RGPPL_Others	3.41
NLC TPS-II Stg-2	312.84	Simhadri Stg-2	27.37	Goa WR	3.34
NLC TPS-II	295.62	Jorethang	27.33	DGEN Mega Power	3.19
Tripura	272.19	BALCO 2	26.78	RGPPL	3.10
Sasan UMPP	231.89	JITPL	26.08	Renew Solar Urja Private Limited	2.95
Assam	225.94	Raigarh Energy Ltd.	24.14	Anta_RLNG Fuel	2.64
Jindal Power Ltd.Stg-II	220.30	Tashiding HEP	23.47	Chandigarh	2.14
NLC	173.75	Dikchu	22.60	Dadri Stg-2	2.02
Semcorp Gayatri	150.13	Sainj HEP	20.58	Uttarakhand	1.97
Maharashtra	137.63	Essar Power MP Ltd	20.20	Dadri_Combined RLNG Fuel	1.94
Ramagundam Stg-1	135.72	Tanda Stg-2	19.27	Ostro Energy Private Limited (OEPL)	1.80
Jindal Power	133.28	Maruti Clean Coal Power	19.00	BRBCL	1.72
Neyveli New TPP	130.11	Farakka	18.81	Singrauli	1.50
DVC	118.31	Adani Power STG3	18.12	Nagaland	1.41
Manipur	116.82	ACBIL	16.21	NSPCL Bhilai	1.33
Jharkhand	116.30	AD Hydro	16.17	Azure Power Forty Three Private Ltd.	1.01
GMR Warora	105.77	Karcham Wangtoo	16.11	Coastal Gujrat Power	0.96
Haryana	103.21	Arunachal Pradesh	15.36	TRN Energy	0.92
Bongaigaon	99.63	Torrent Power	14.94	Lanco Budhil	0.90
Jhabua Power	93.68	KSK Mahanadi	13.12	NTPC Lara	0.88
Teesta -3	82.32	Jindal Steel	12.76	Dhariwal	0.85
Sikkim	78.30	RGPPL_IR	12.13	Adani Hybrid Energy Jaisalmer Three Limited (Solar)	0.82
NTPC Kudgi	74.22	AGTPP	11.76	Rihand-II	0.81
NLC TPS-II Expn	70.51	AGBPP	11.22	Kahalgaon	0.69
Raipur Energen	68.16	IL&FS	10.06	Gandhar_NAPM	0.68
Andhra Pradesh	62.54	NTPL	10.02		
DB Power	57.06	SKS Power	9.76		
Semcorp Energy India Ltd.	52.80	NPGC Nabinagar	8.68		
Tamilnadu	52.62	Farakka Stg 3	8.31		
		Simhadri Stg-1	7.80		

Table: 70**BUYERS IN RTM ON POWER EXCHANGES DURING FY 2021-22**

Entity Name	Sell (MU)				
J&K	2422.50	Arunachal Pradesh	4.08	Jharkhand	98.63
Andhra Pradesh	2121.61	Jindal Power Ltd.		Uttarakhand	84.96
Telangana	1940.90	Stg-II	3.84	Manipur	82.09
Rajasthan	1780.23	Jorethang	3.84	Kerala	75.22
Maharashtra	1557.99	Tashiding HEP	3.83	Tripura	56.55
Gujarat	1480.95	Nagaland	3.35	ArcelorMittal	
Tamilnadu	1335.16	Unchahar-IV	3.16	Nippon steel (ESIL)	55.82
Uttar Pradesh	1148.17	Goa SR	2.91	Meghalaya	45.29
Haryana	1112.25	Railways	2.52	Dadra & Nagar	
West Bengal	727.92	Jindal Steel	2.02	Haveli	31.16
Bihar	624.51	Rihand-III	1.60	BALCO 2	20.95
Orissa	614.63	Adani Power STG2	1.08	Daman & Diu	16.22
Punjab	594.85	Mizoram	0.52	Sikkim	14.79
Delhi	580.49	SKS Power	0.49	Goa WR	9.58
Assam	327.75	Jhabua Power	0.46	Jindal Power	6.06
Madhya Pradesh	240.75	Sainj HEP	0.46	Teesta -3	5.47
DVC	223.54	Jhajjar	0.32	MB Power	5.01
Himachal Pradesh	173.14	Karcham Wangtoo	0.28	Essar Power MP Ltd	4.88
Chhattisgarh	117.01	Chandigarh	0.27	Maruti Clean Coal	
Karnataka	100.46	Spectrum Coal	0.17	Power	4.71
Jharkhand	98.63	ACBIL	0.05	Arunachal Pradesh	4.08
Uttarakhand	84.96	DGEN Mega Power	0.01	Jindal Power Ltd.	
Manipur	82.09	J&K	2422.50	Stg-II	3.84
Kerala	75.22	Andhra Pradesh	2121.61	Jorethang	3.84
Tripura	56.55	Telangana	1940.90	Tashiding HEP	3.83
ArcelorMittal		Rajasthan	1780.23	Nagaland	3.35
Nippon steel (ESIL)	55.82	Maharashtra	1557.99	Unchahar-IV	3.16
Meghalaya	45.29	Gujarat	1480.95	Goa SR	2.91
Dadra & Nagar		Tamilnadu	1335.16	Railways	2.52
Haveli	31.16	Uttar Pradesh	1148.17	Jindal Steel	2.02
BALCO 2	20.95	Haryana	1112.25	Rihand-III	1.60
Daman & Diu	16.22	West Bengal	727.92	Adani Power STG2	1.08
Sikkim	14.79	Bihar	624.51	Mizoram	0.52
Goa WR	9.58	Orissa	614.63	SKS Power	0.49
Jindal Power	6.06	Punjab	594.85	Jhabua Power	0.46
Teesta -3	5.47	Delhi	580.49	Sainj HEP	0.46
MB Power	5.01	Assam	327.75	Jhajjar	0.32
Essar Power MP Ltd	4.88	Madhya Pradesh	240.75	Karcham Wangtoo	0.28
Maruti Clean Coal		DVC	223.54	Chandigarh	0.27
Power	4.71	Himachal Pradesh	173.14	Spectrum Coal	0.17
		Chhattisgarh	117.01	ACBIL	0.05
		Karnataka	100.46	DGEN Mega Power	0.01

Table: 71**SELLERS IN GDAM ON IEX DURING FY 2021-22**

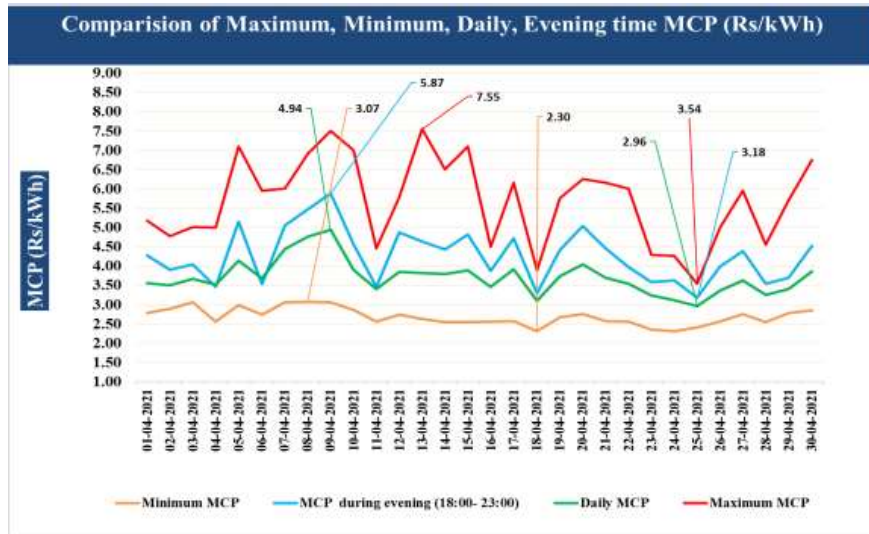
Entity Name	Sell (MU)	Entity Name	Sell (MU)	Entity Name	Sell (MU)
Karnataka	497.69	Adani Hybrid Energy Jaisalmer Two Limited (Solar)	13.66	Adani Hybrid Energy Jaisalmer Four Limited (Solar)	1.32
Telangana	121.57	Madhya Pradesh	9.57	Renew Surya Ravi Private Limited (Solar)	1.26
Mouda Stg-2	47.04	NTPC Simhadri 25 MW Solar Project	8.36	Uttarakhand	1.12
Adani Green Solar Jaisalmer	36.90	Vandana vidyut	7.51	Ramagundam Floating Solar PV Station	1.07
Adani Hybrid Energy Jaisalmer Three Limited (Solar)	36.42	Azure Power Maple Pvt Ltd	6.92	Ayana Renewable Power One Private Limited	1.06
Renew Solar Energy (Jharkhand Three) Pvt Ltd (RSEJTPL)	29.15	Rajasthan	5.51	Maharashtra	0.84
Andhra Pradesh	27.98	Ostro Energy Private Limited (OEPL)	2.71	Kerala	0.73
J&K	25.96	Himachal Pradesh	2.31	Adani Green Energy Nineteen Limited	0.32
Azure Power Forty Three Private Limited	15.22	Continuum Power Trading (TN) Private Limited	2.18	Haryana	0.08
Renew Solar Urja Private Limited	14.45	Adani Wind Energy Kutchh Five Limited	1.50	Uttar Pradesh	0.01

Table: 72**BUYERS IN GDAM ON IEX DURING FY 2021-22**

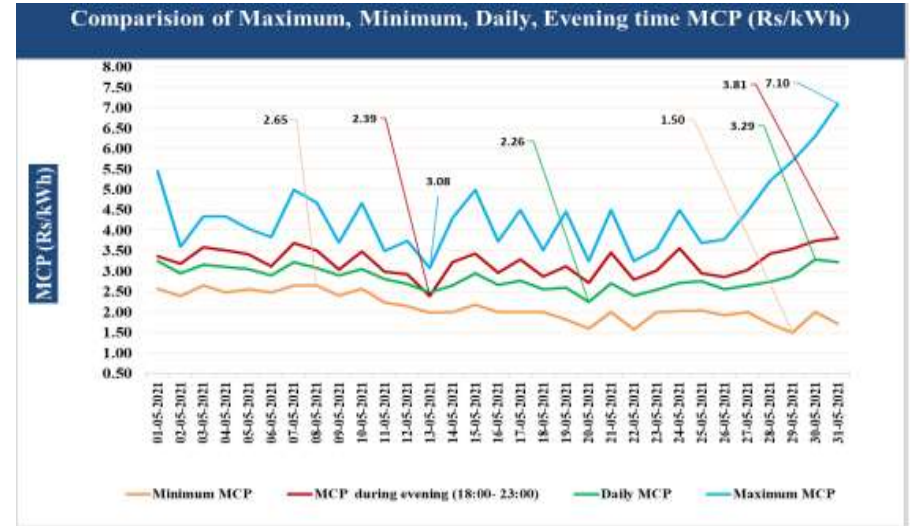
Entity Name	Sell (MU)	Entity Name	Sell (MU)
DGEN Mega Power	202.27	DB Power	6.30
Orissa	106.63	Uttarakhand	3.04
Arunachal Pradesh	100.33	Meghalaya	2.91
Delhi	98.69	Himachal Pradesh	2.47
West Bengal	72.74	Gujarat	2.10
Assam	61.11	Bihar	2.05
Madhya Pradesh	53.05	Loktak	1.99
Dadra & Nagar Haveli	32.31	ArcelorMittal Nippon steel (ESIL)	1.75
Kerala	29.48	Goa WR	0.91
Maharashtra	29.21	Railways	0.47
Haryana	28.25	Rajasthan	0.30
Punjab	24.68	Andhra Pradesh	0.30
Karnataka	14.15	DVC	0.16
Tamilnadu	13.10	Mizoram	0.09
Uttar Pradesh	12.00	Daman & Diu	0.05
Telangana	10.23	Mouda Stg-2	0.01
Jharkhand	7.28	NTPC Gadarwara	0.01
		BALCO 2	0.01

Annexure: I

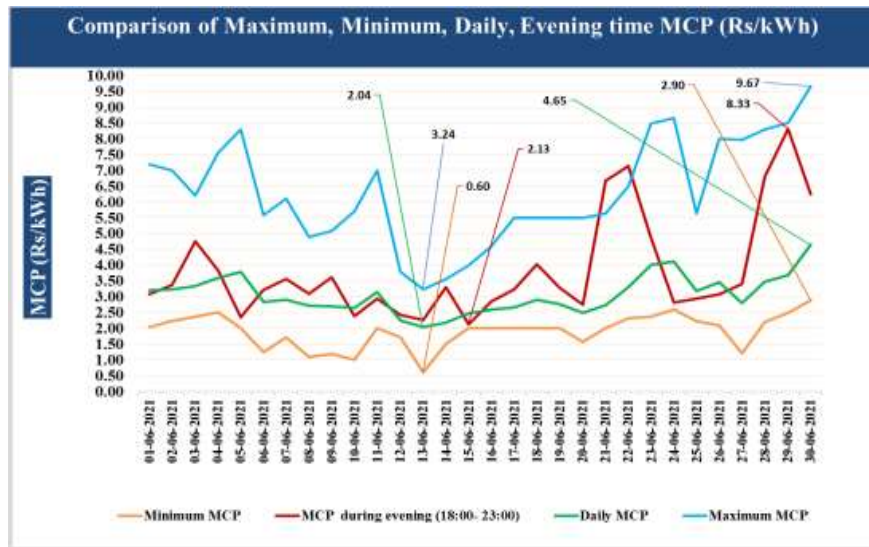
Month wise variation of Maximum, Minimum, Daily, Non Peak Time, Peak Time MCP in DAM are given below:



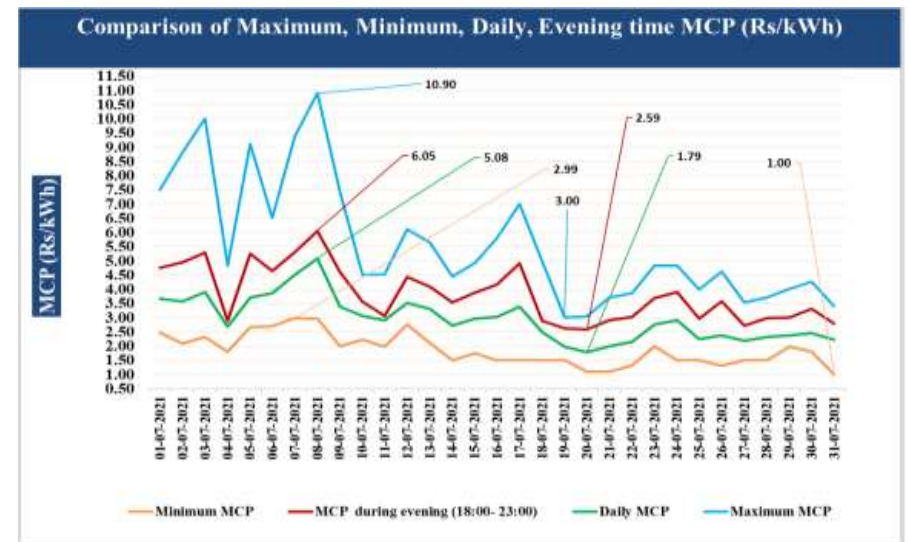
APRIL, 2021



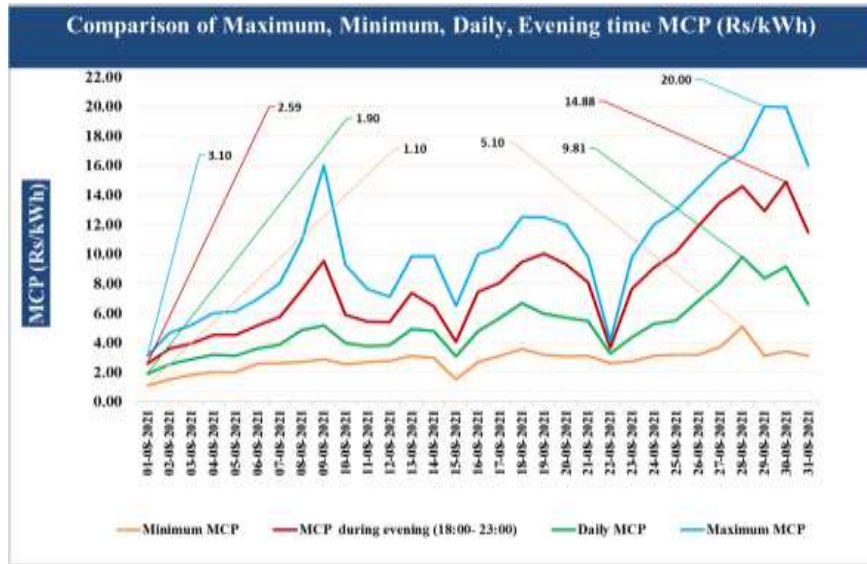
MAY, 2021



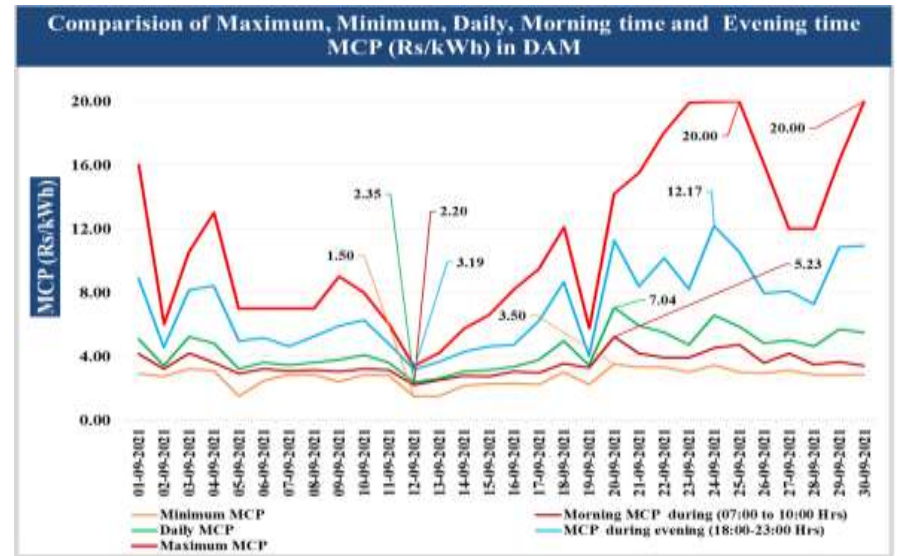
JUNE, 2021



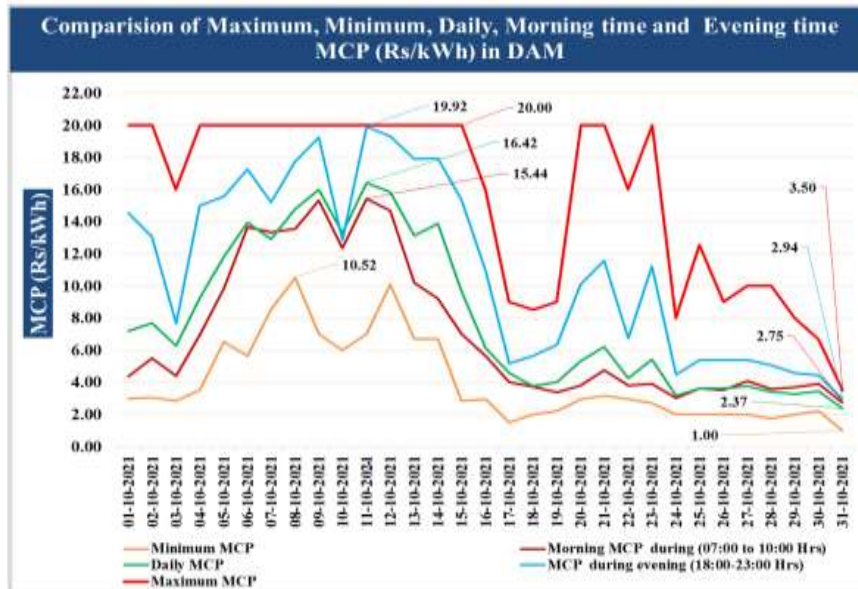
JULY, 2021



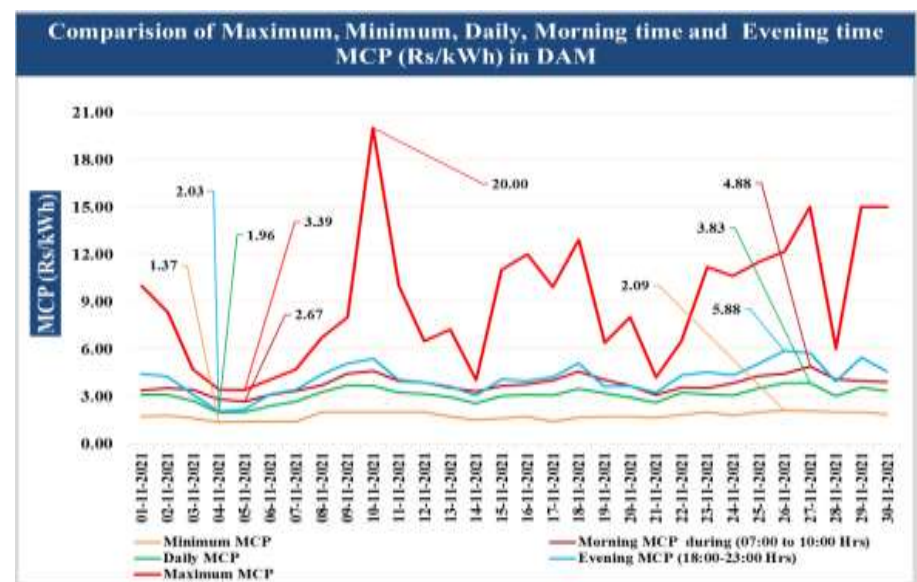
AUGUST, 2021



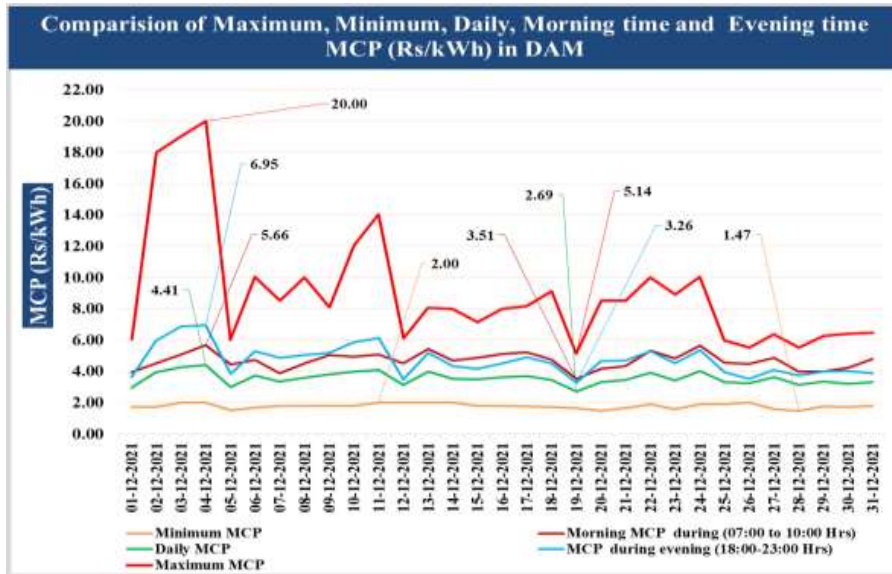
SEPTEMBER, 2021



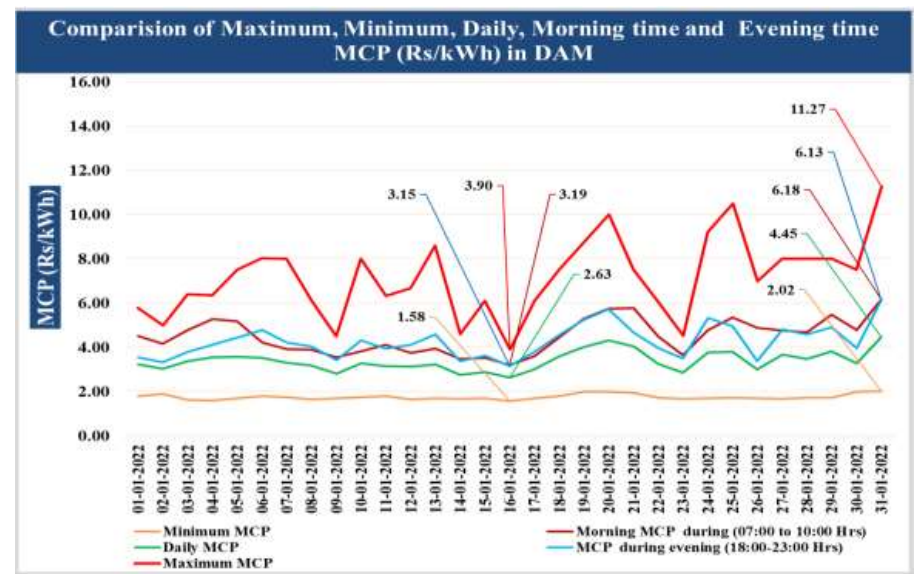
OCTOBER, 2021



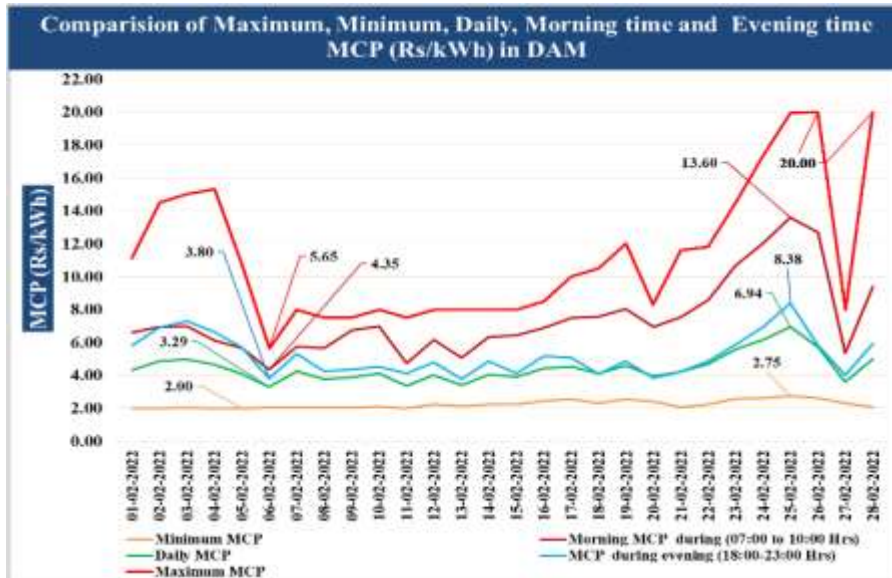
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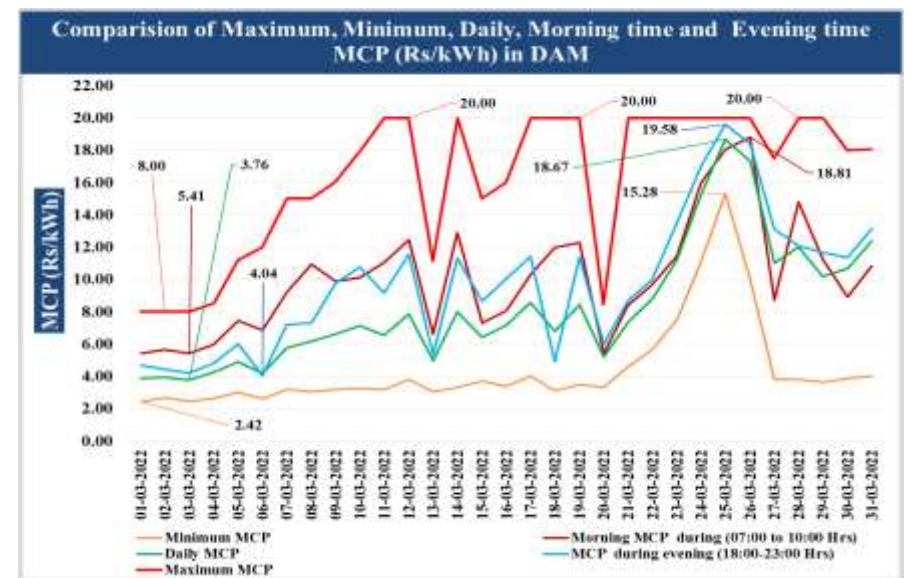
DECEMBER, 2021



JANUARY, 2022



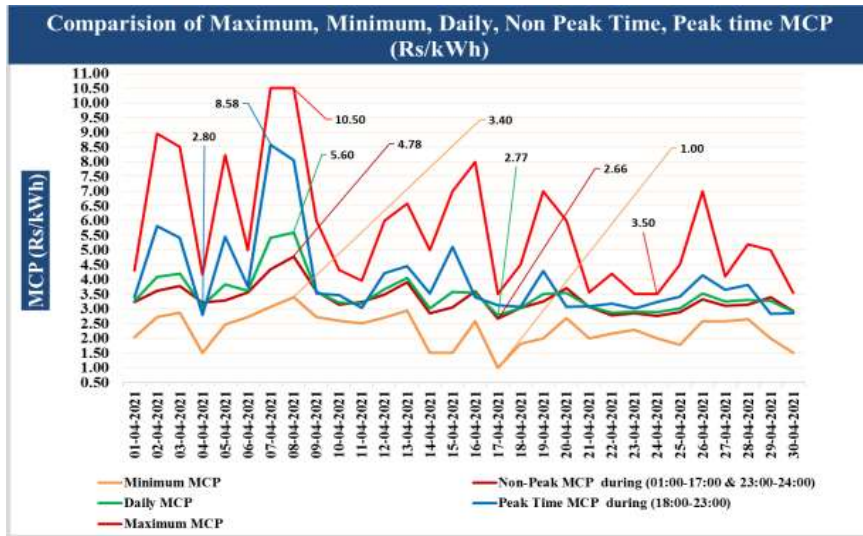
FEBRUARY, 2022



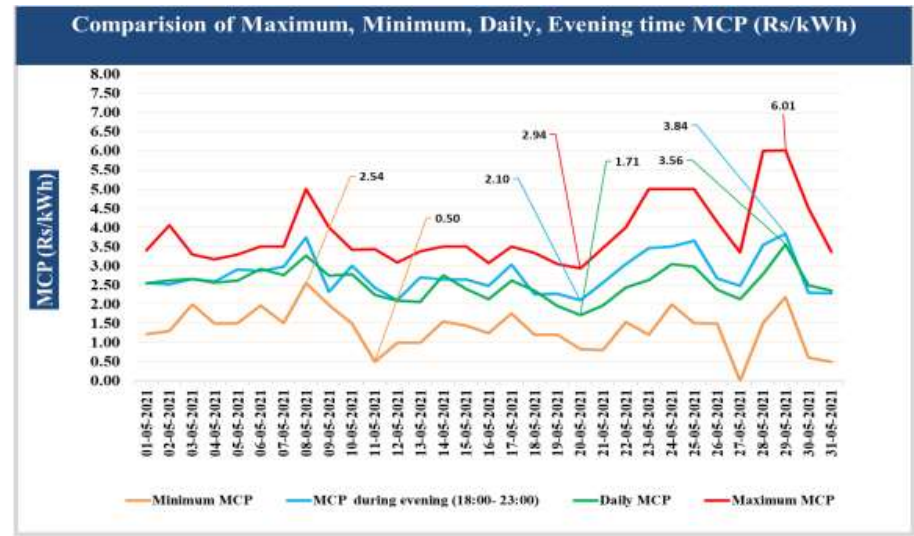
MARCH, 2022

Annexure: II

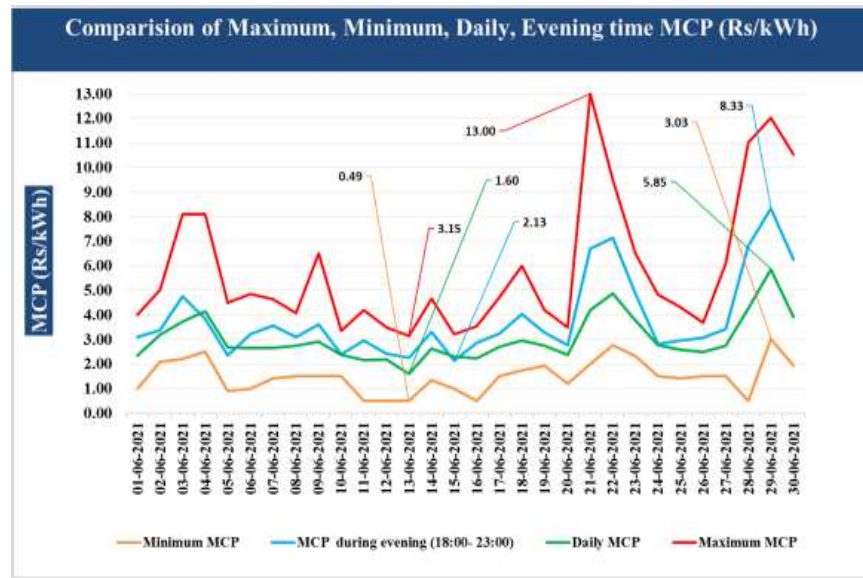
Month wise variation of Maximum, Minimum, Daily, Non Peak Time, Peak Time MCP in RTM are given below:



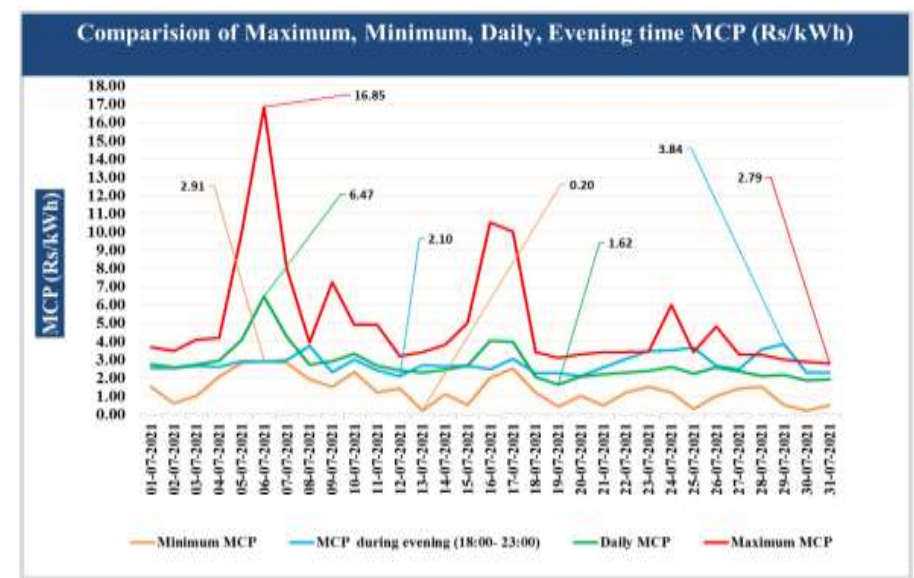
APRIL, 2021



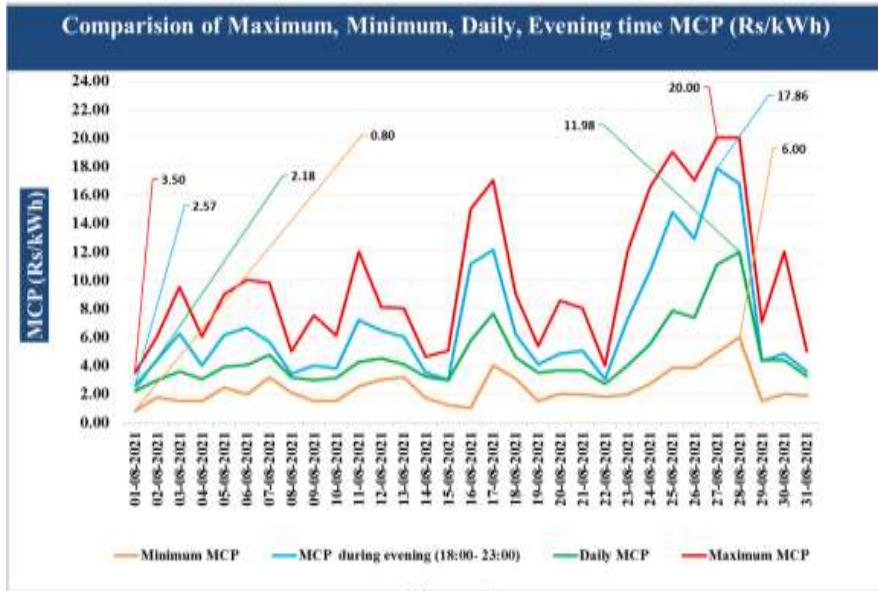
MAY, 2021



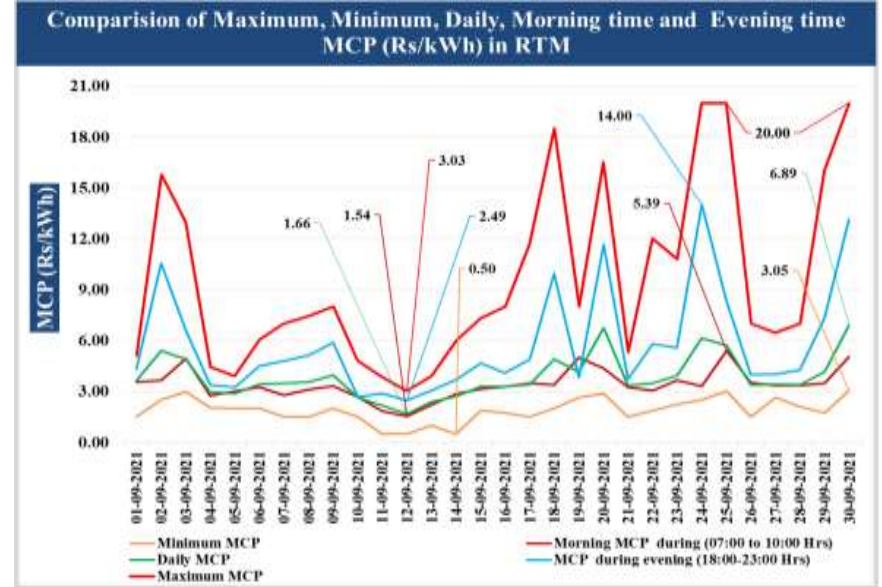
JUNE, 2021



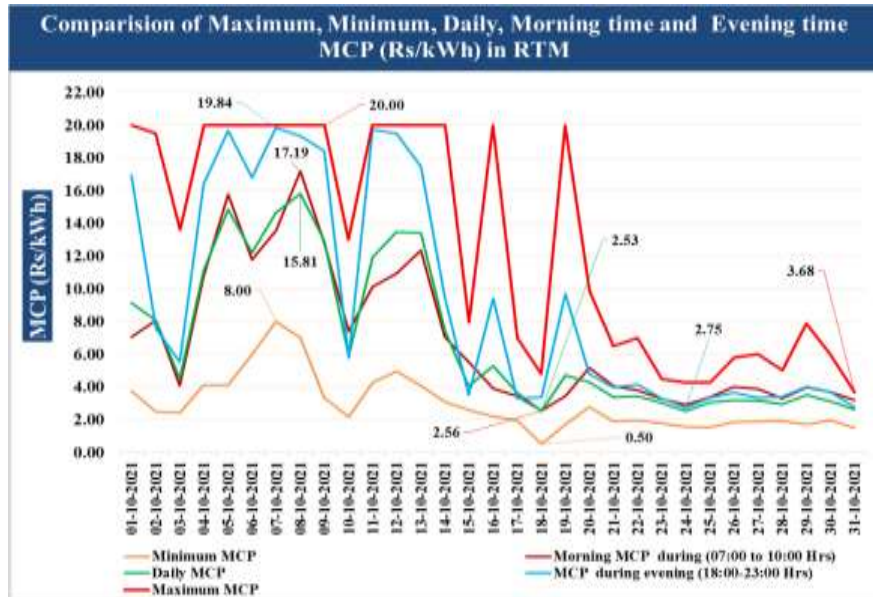
JULY, 2021



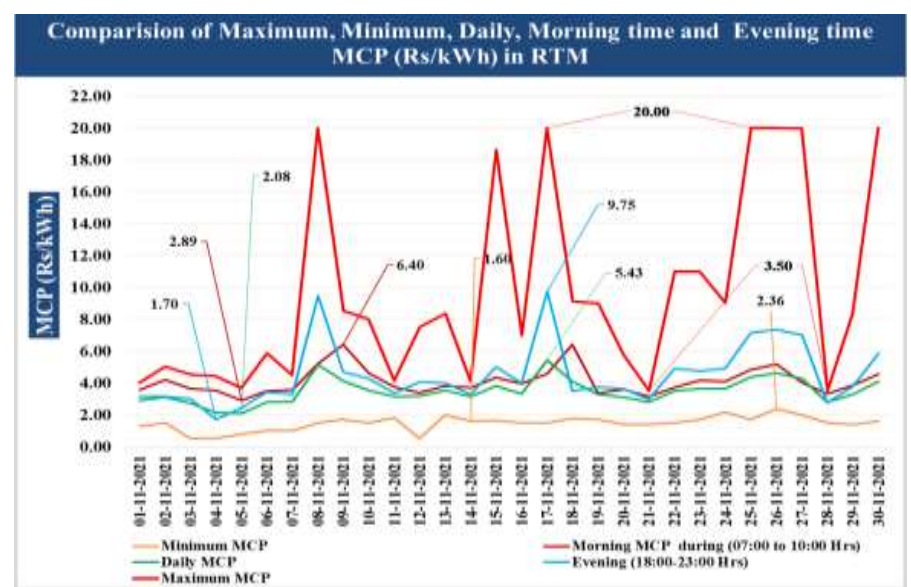
AUGUST, 2021



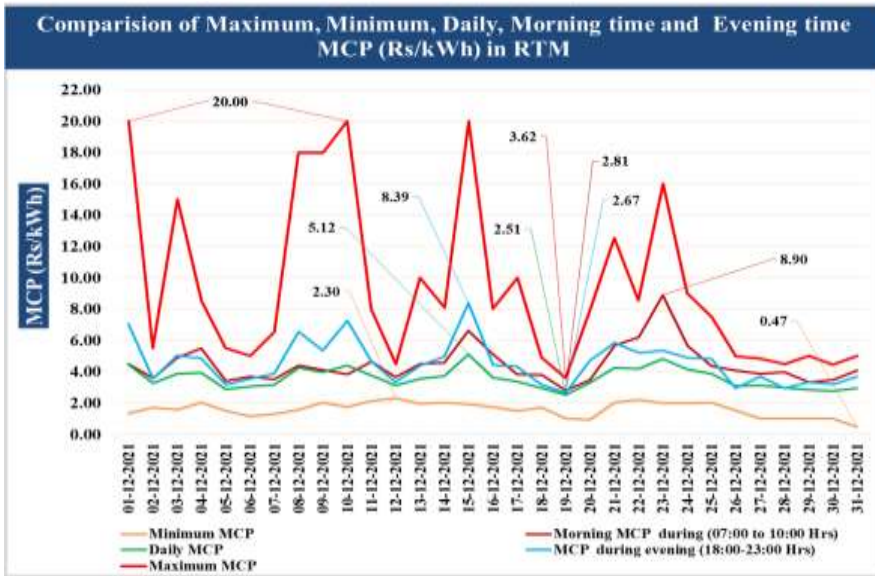
SEPTEMBER, 2021



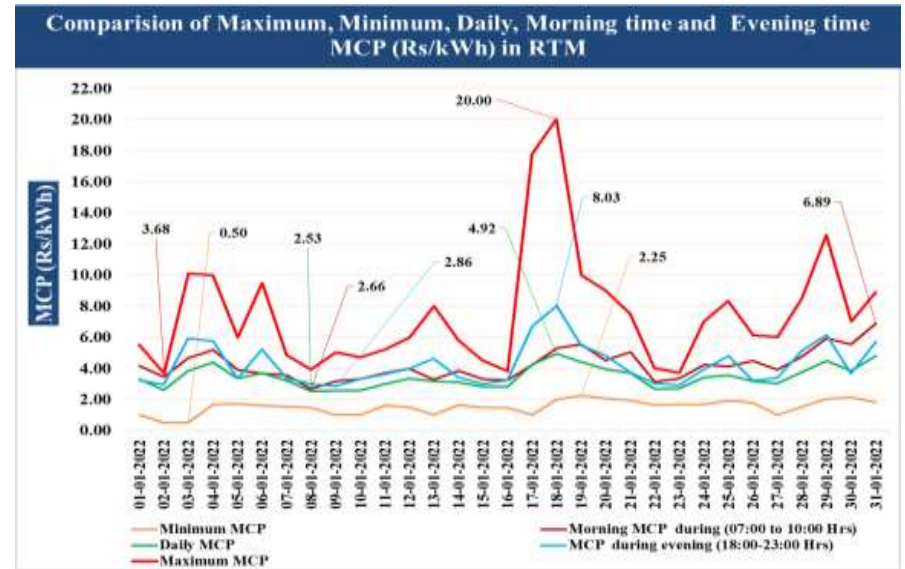
OCTOBER, 2021



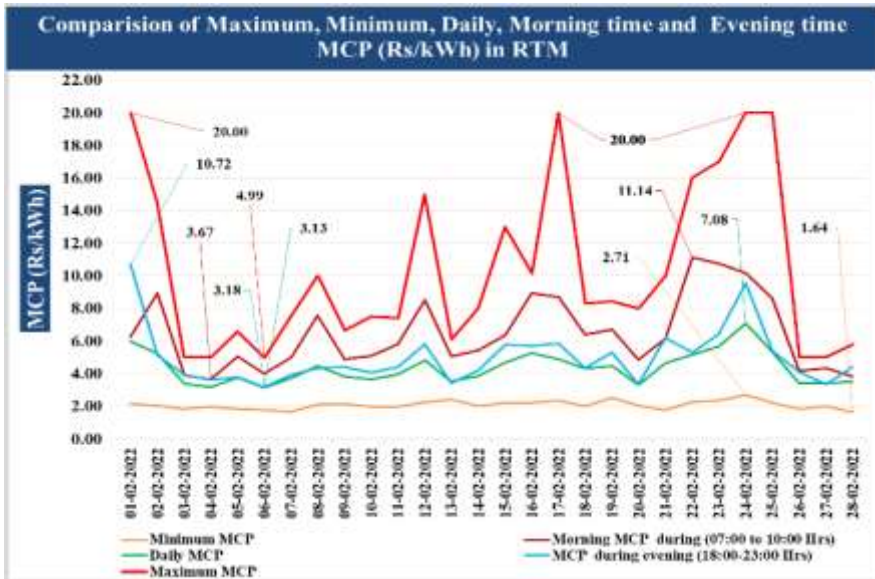
NOVEMBER, 2021



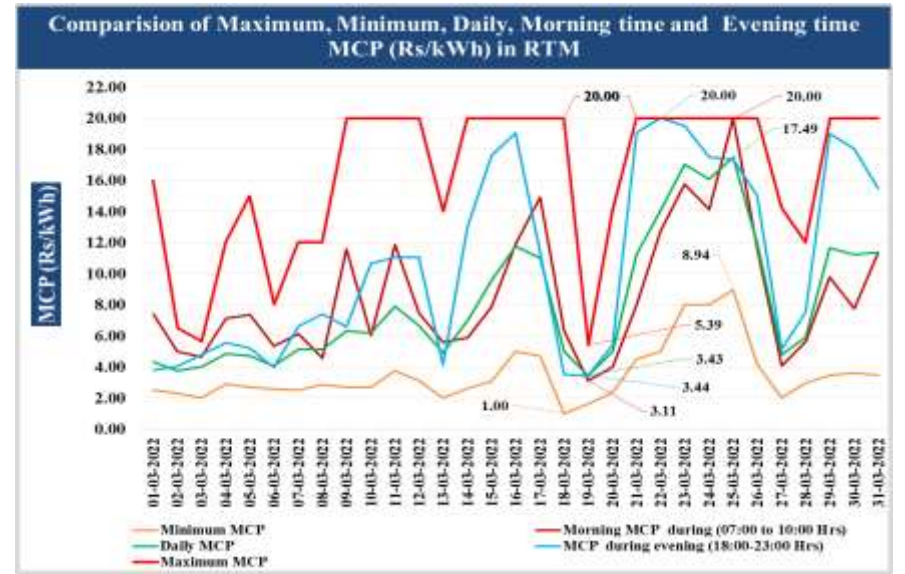
DECEMBER, 2021



JANUARY, 2022



FEBRUARY, 2022



MARCH, 2022