

POWER EXCHANGE TRANSACTION INCREASES DESPITE LOW DEMAND

Prepared by : Asokan K (Director, InSDES, Shoranur)

&

Subhash P (InSDES, Shoranur)

Volume of electricity transacted through Power Exchanges in India during the period from April to July 2020 registered an increase of 8.4% compared to the same period in 2019. On analysing the details available in the Monthly Market Monitoring Reports published by CEA it is observed that this increase has occurred despite 13% decrease in total electrical energy supplied in the country during this period. The monthly transactions from April to July in 2019 and 2020 are give in table below.

TABLE-1

POWER EXCHANGE TRANSACTIONS					
MONTH	DAM	TAM	RTM	TOTAL	TOTAL ENERGY SUPPLIED IN THE COUNTRY
Apr-19	4036.84	627.6		4664.44	110112
Apr-20	3692.04	587.18		4279.22	84550
May-19	3773.64	448.82		4222.46	120020
May-20	5595.97	671.8		6267.77	102089
Jun-19	4207.1	508.06		4715.16	117988
Jun-20	4189.37	148.88	516.328	4854.578	105086
Jul-19	4800.72	747.94		5548.66	116485
Jul-20	4486.71	89.04	785.39	5361.14	112244
TOTAL-2019	16818.3	2332.42	0	19150.72	464605
TOTAL2020	17964.09	1496.9	1301.718	20762.708	403969
% Difference Between 2019 to 2020				8.4	-13.1

Source : InSDES compilation of data available at <http://www.cea.nic.in/ra>

Peak demand during this period was 170545 MW (on 02-07-2020) which is 6.6% lower compared to 182610 MW (on 30-05-2019) during the same period in the previous year. Day Ahead Market (DAM) registered an increase of 6.8% in the volume of electricity transacted during this period compared to same period last year and Term Ahead Market (TAM) showed a decrease of 35.8%.

Real Time Market (RTM), a new market segment, was commenced on 1st June 2020. In this segment the auction will be conducted every half an hour and power will be

delivered after 4 time blocks (1 hour). The volume of electricity transacted in RTM through Power Exchanges is 516.328 MU and 785.39 MU during June and July 2020 respectively.

A comparison of the Average Market Clearing Price in Day Ahead Market of Power Exchanges in India during April to July period of 2019 and 2020 are shown in the Table below.

TABLE-2

DAM & RTM PRICE APRIL TO JULY 2019 & 2020					
Month	IEX		PXIL		Monthly Weighted Average
	DAM Volume	Average MCP	DAM Volume	Average MCP	
APR 2019	4005.41	3.22	31.43	3.73	3.22
MAY 2019	3772.47	3.34	1.17	3.48	3.34
JUN 2019	4206.68	3.32	0.42	3.48	3.32
JUL 2019	4800.37	3.38	0.35	3.21	3.38
Total	16784.93		33.37		
Weighted Average April to July -2019					3.32
APR 2020	3692.04	2.42	0	0	2.42
MAY 2020	5573.73	2.57	22.24	2.58	2.57
JUN 2020	4174.34	2.35	15.03	2.56	2.35
JUL 2020	4486.71	2.47	0	0	2.47
Total	17926.82		37.27		
Weighted Average April to July -2020					2.46
Month	IEX		PXIL		
	RTM Volume	Average MCP	RTM Volume	Average MCP	
JUN 2020	515.465	2.22	1.863	2.59	2.22
JUL 2020	784.96	2.49	0.43	2.61	2.49
Total	1300.425		2.293		
Weighted Average June to July -2020					2.38

Source : InSDES compilation of data available at <http://www.cea.nic.in/ra>

The weighted average price during April - July 2020 in the Day Ahead Market is Rs. 2.46/kWh which shows a 25.9% decline when compared to the Average MCP of Rs. 3.32/kWh during the same period last year. The Weighted Average price during the period June – July 2020 in Real Time Market (RTM) is Rs. 2.38/kWh.

The reason for the decline in price in Power Exchanges is the fact that the Volume of Sell bids are 2.07 times the Volume of Buy bids in the market during this period (see table below).

TABLE-3

DAY AHEAD MARKET						
MONTH	BUY BIDS			SELL BIDS		
	IEX	PXIL	TOTAL	IEX	PXIL	TOTAL
Apr-19	5208.15	34.24	5242.39	8042.62	67.28	8109.9
May-19	4785.17	1.29	4786.46	7573.59	8.00	7581.59
Jun-19	5257.81	0.42	5258.23	7982.65	7.65	7990.3
			15287.08			23681.79
Apr-20	3916.7	0	3916.7	9294.24	0	9294.24
May-20	6136.57	37.49	6174.06	10579.69	71.41	10651.1
Jun-20	4661.78	27.37	4689.15	10164.25	185.55	10349.8
			14779.91			30295.14
REAL TIME MARKET						
Jun-20	742.14	3.23	745.37	1809.56	16.92	1826.48
Volume of Total Buy Bids Apri-June 2020 (DAM+RTM)						15525.28
Volume of Total Sell Bids April-June 2020 (DAM+RTM)						32121.62
Ratio of Volume of Sell bids to Buy Bids						2.07

Source : InSDES compilation of data available at http://www.cercind.gov.in/market_monitoring

Due to the low demand for Power, the Power Producers shifted to the Power Exchanges for selling in the Short Term Market. This has resulted in the increase of Sell bids. The Distribution Utilities, who are in critical financial position due to reduced revenue income in the lock down period, took advantage of the low price and purchased power from Power Exchanges. This has resulted in the increase in traded volume.

Details of Short term Transactions including Power Exchange Transactions since 2008-09 are given in the **Annexures**.

Some of the highlights are noted below.

1. Power Exchanges in India started functioning since 2008. At present there are two Power Exchanges in India viz. Indian Energy Exchange (IEX) and Power Exchange India Ltd. (PXIL). Central Electricity Regulatory Commission has accorded sanction for the third Power Exchange in India on 31st July 2020 which will be operationalised from next Financial Year onwards.

(Source: The Hindu Business Line 04-08-20 www.thehindubusinessline.com>article32267083)

2. The Volume of Power transacted through Power Exchanges increased from 2.77BU in 2008-09 to 56.52BU in 2019-20 (**see Annexure-1**)
3. The share of Power Exchange transactions in total Short Term Transactions increased from 10.9% in 2009-10 to 41.2% in 2019-20 (**see Annexure-1**).
4. During the period April – June 2020 the share of Power Exchange transactions increased to 50% in total Short Term Transactions (**see Annexure-2A**)

5. The share of Various Short Term Transactions from 2009-10 to 2019-20 are shown in Annexure-3. During 2019-20 the share of various categories are (i) Bilateral through traders : 21.83% (ii) Bilateral through Discoms : 20.53% (iii) Power Exchanges : 41.18% (iv) Deviation Settlement Mechanism : 16.46% (**see Annexure-3**)
6. Weighted average price of electricity transacted through short term market during 2019-20 are Traders : Rs. 4.45/unit, Power Exchanges : 3.24/unit, DSM : 2.85/unit (**see Annexure-4**)
7. Weighted average price of electricity transacted through short term market during April – June 2020 are :Traders Rs. 3.77/unit, Power Exchanges : Rs. 2.55/unit, DSM : Rs. 2.44/unit (**see Annexure-2B**)
8. Price of electricity transacted through Traders was relatively high when compared with the power exchange prices. Power exchange rates are relatively high compared to DSM rates.
9. The volume of electricity transacted through Power Exchanges are sometimes constrained due to Transmission Congestion. Details of effects of Transmission Congestion are given in Annexure-5. The percentage of electricity not cleared due to congestion was 12% in 2009-10 and gone upto 17% in 2012-13. After commissioning of the 765kV RAICHUR – SHOLAPUR transmission line in December 2013, integrating NEW GRID with Southern Region, the effect of congestion started decreasing and now it has reduced considerably. The percentage of electricity not cleared due to congestion in 2019-20 is 0.4% only and that during the period April – June (1st quarter of 2020-21) is 0.04% which shows that congestion is insignificant now (**see Annexure-5**)
10. Market splitting due to Transmission Congestion had resulted in different market prices in different regions of the country. The country is divided in to 13 Bid Areas for the purpose of calculating prices in Power Exchanges.

The bid areas are :

TABLE-4

LIST OF BID AREAS	
N1	JAMMU & KASHMIR, HIMACHAL PRADESH, CHANDIGARH, HARYANA
N2	UTTAR PRADESH, UTTARANCHAL, RAJASTAHAN, DELHI
N3	PUNJAB
E1	WEST BENGAL, SIKKIM, BIHAR, JHARKHAND
E2	ODISHA
W1	MADHYA PRADESH,
W2	MAHARASHTRA, GUJRAT, DAMAN & DIU, DADAR & NAGAR HAVELI, NORTH GOA
W3	CHATTISGARH
S1	ANDHRA PRADESH, TELENGANA, KARNATAKA, PONDICHERRY (YANAM), SOUTH GOA
S2	TAMIL NADU, PONDICHERRY (PUDUCHERRY), PONDICHERRY (KARAICKAL), PONDICHERRY (MAHE)
S3	KERALA
A1	TRIPURA, MANIPUR, MIZORAM, NAGALAND
A2	ASSAM, ARUNACHAL PRADESH, MEGHALAYA

The price of electricity in each time block (Total 96 time blocks in a day) in each of the 13 bid areas is called Area Clearing Price (ACP). Daily MCP is the average of Market Clearing Prices of all 96 time blocks of the day during which transactions happened and Average MCP is average of daily MCP of the days during the month on which transactions happened. The minimum and Maximum ACP for the Financial Year 2019-20 and April – July 2020 in Power Exchanges are given in the **Annexure-6**.

The Average MCP in Day Ahead Market of IEX during July 2020 is Rs. 2.47 per unit and Maximum ACP is Rs. 5.17 per unit and Minimum ACP is Rs 0 .88 per unit. The Area Clearing Price had gone up to Rs. 11.84 per unit in April 2019 due to Congestion of Transmission System.

The maximum Area Clearing Price in the Real Time Market of IEX during June 2020 was Rs. 10 per unit and Minimum ACP was Rs. 0.015 per unit. The Average

MCP during June 2020 was Rs. 2.22 per unit. During July 2020 Maximum ACP was Rs. 5.65, Minimum ACP Rs. 0.19 and Average MCP Rs. 2.49 per unit in IEX.

11. *Volume and Price of Electricity transacted through Traders and Power Exchanges vary according to Time of the Day. During 2018-19, 88.5% of the transacted volume was Round the Clock and 1.9% during Peak period. Balance 9.6% was during OTP (other than RTC & Peak period). Weighted average price during Peak period is Rs. 5.39 per unit. Prices during RTC and OTP are Rs. 4.15 per unit and Rs. 4.39 per unit respectively. Weighted average price of electricity in Power Exchanges are higher during Peak period (between 18:00 Hrs to 23:00 Hrs.) when compared to weighted average price in rest of the period.

12. *During 2018-19, the Price of Electricity in Southern Region (S1, S2 and S3 regions) was marginally higher compared with the price in Other Regions in Indian Energy Exchange (IEX). This was mainly due to high demand for electricity in Southern Region. The prices were high due to Congestion between Southern Region and Other regions.

13. *Major Sellers of Electricity through IEX are IPPs and State Utilities (ISGS / CGS) and major Buyers are State Utilities, Private Distribution Licencees and Open Access Consumers.

14. *During 2018-19, about 4362 Open Access Consumers procured a total of 11219 MU of Electricity for meeting their power requirement through IEX. The weighted average price of electricity bought by Open Access consumers is Rs. 3.48 / kWh. This is lower compared to Rs. 4.22 / kWh the weighted average price of total electricity transacted through IEX.

15. *37% of the total power generation in the Country during 2018-19 was from Central Government owned Generating Companies. This electricity is fully procured by various Distribution Companies through Long Term Power Purchase Agreements. The Rate paid by the Distribution Companies for the power procurements on an average is as follows:

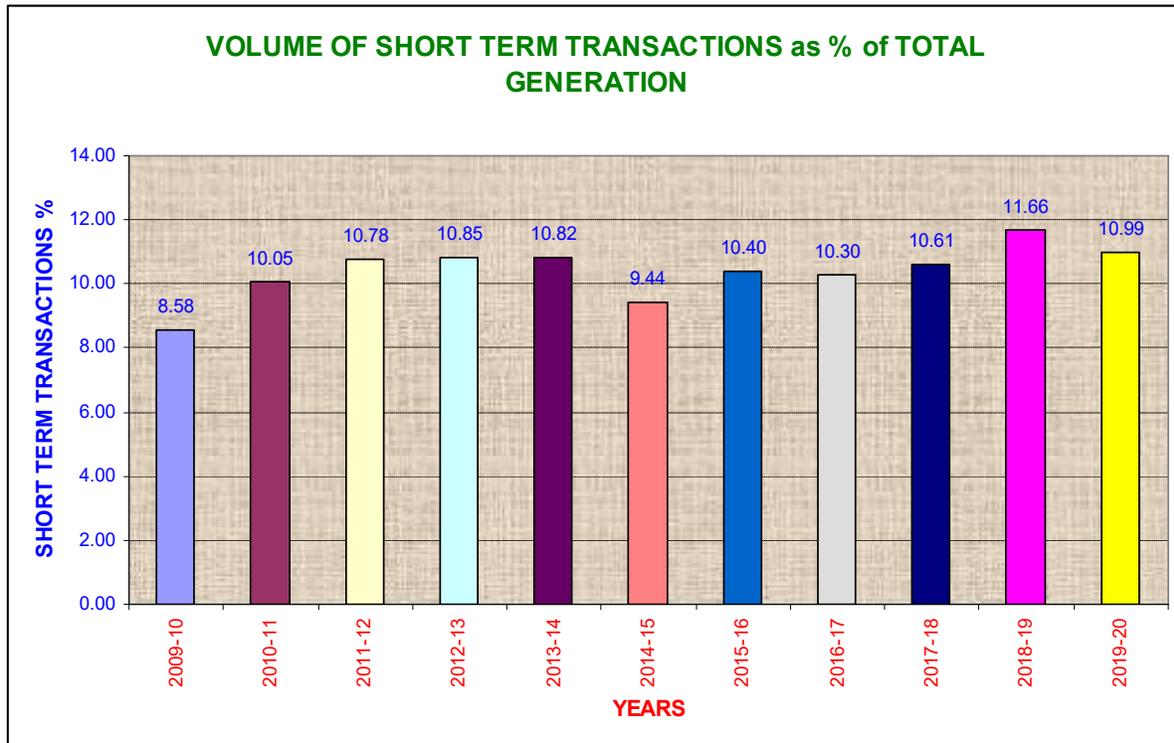
Power from Coal Based Stations	: Rs. 1.97 to Rs. 5.73 per unit
Power from Gas based Stations	: Rs. 3.70 to Rs. 6.65 per unit
Power from Hydro based Stations	: Rs. 1.16 to Rs. 8.46 per unit.

*Source : CERC Report on Short Term Power Market in India : 2018-19

ANNEXURE-1

VOLUME OF SHORT TERM TRANSACTIONS FROM 2009-10 TO 2019-20 (in BU)								
Year	Bilateral through Traders	Bilateral between DISCOMS	Power Exchange Transactions (DAM+TAM)	Transactions through DSM	Total Short Term Transactions	Total Electricity Generation	Total Short Term Transactions in % over Total Electricity Generation	Power Exchange Transactions (DAM+TAM) in % over Total Short Term Transactions
2008-09	21.92		2.77					
2009-10	26.72	6.19	7.19	25.81	65.90	768.43	8.58	10.91
2010-11	27.70	10.25	15.52	28.08	81.56	811.14	10.05	19.03
2011-12	35.84	15.37	15.54	27.76	94.51	876.89	10.78	16.44
2012-13	36.12	14.52	23.54	24.76	98.94	912.06	10.85	23.79
2013-14	35.11	17.38	30.67	21.47	104.64	967.15	10.82	29.31
2014-15	34.56	15.58	29.40	19.45	98.99	1048.67	9.44	29.70
2015-16	35.43	24.04	35.01	20.75	115.23	1107.82	10.40	30.38
2016-17	33.51	21.38	41.12	23.22	119.23	1157.94	10.30	34.49
2017-18	38.94	16.77	47.70	24.21	127.62	1202.97	10.61	37.38
2018-19	47.32	19.23	53.52	25.13	145.20	1245.32	11.66	36.86
2019-20	29.952	28.17	56.52	22.59	137.22	1248.17	10.99	41.18

Source : InSDES compilation of data available at http://www.cercind.gov.in/market_monitoring



ANNEXURE-2A

VOLUME OF SHORT TERM TRANSACTIONS 2020-21 (in MU)								
MONTH	Bilateral through Traders	Bilateral between DISCOMS	Power Exchange Transactions (DAM+TAM)	Transactions through DSM	Total Short Term Transactions	Total Electricity Generation	Total Short Term Transactions in % over Total Electricity Generation	Power Exchange Transactions (DAM+TAM) in % over Total Short Term Transactions
APR 2020	1417.68	1042.83	4279.23	1618.48	8322.27	81045.22	10.27	51.42
MAY 2020	1634.42	1167.59	6267.77	1961.39	11075.12	96501.42	11.48	56.59
JUN 2020	3175.96	1222.3	4855.578	2079.78	11359.97	99499.76	11.42	42.74
Total	6228.06	3432.72	15402.578	5659.65	30757.36	277046.4	11.10	50.08

ANNEXURE-2B

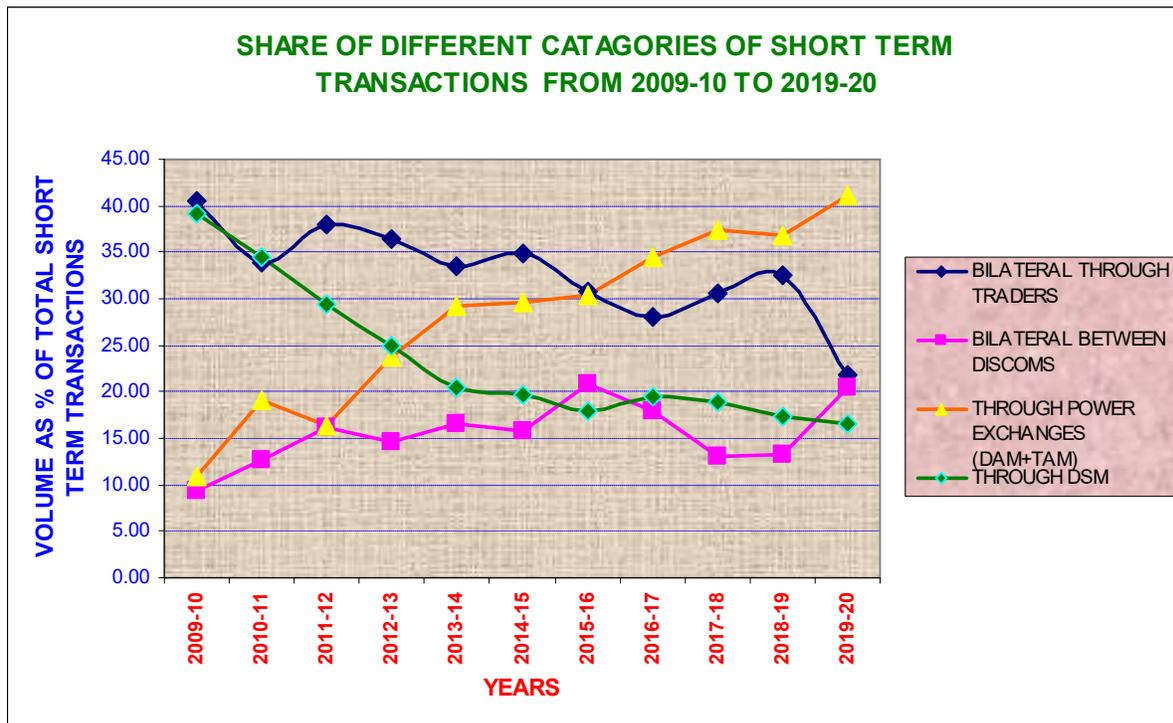
Weighted Average Price for Apr-Jun 2020			
Month	Bilateral	Power Exchanges	DSM
Apr-20	3.99	2.53	2.42
May-20	4.1	2.64	2.47
Jun-20	3.5	2.44	2.43
Weighted Average for Apr-Jun	3.77	2.55	2.44

Source : InSDES compilation of data available at http://www.cercind.gov.in/market_monitoring

ANNEXURE-3

SHARE OF DIFFERENT CATAGORIES OF SHORT TERM TRANSACTIONS FOR 2009-10 TO 2019-20				
Year	Bilateral through Traders in %	Bilateral between DISCOMS in %	Power Exchange Transactions (DAM+TAM) in %	Transactions through DSM in %
2009-10	40.55	9.39	10.91	39.17
2010-11	33.96	12.57	19.03	34.43
2011-12	37.92	16.26	16.44	29.37
2012-13	36.51	14.68	23.79	25.03
2013-14	33.55	16.61	29.31	20.52
2014-15	34.91	15.74	29.70	19.65
2015-16	30.75	20.86	30.38	18.01
2016-17	28.11	17.93	34.49	19.47
2017-18	30.51	13.14	37.38	18.97
2018-19	32.59	13.24	36.86	17.31
2019-20	21.83	20.53	41.18	16.46

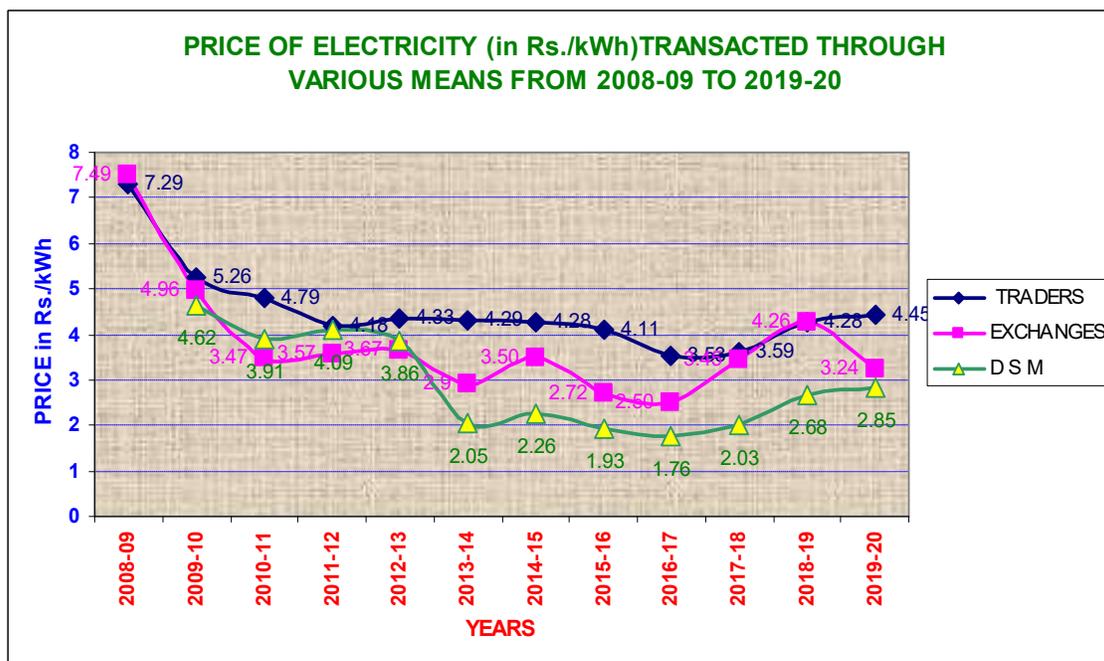
Source : InSDES compilation of data available at http://www.cercind.gov.in/market_monitoring



ANNEXURE-4

Price of Short-term Transactions of Electricity (Rs./KWh), from 2008 – 09 to 2019-20			
Year	Price of Electricity Transacted through Traders (RS./kWh)	Price of Electricity Transacted through Power Exchanges(DAM +TAM) (RS./kWh)	DSM ALL INDIA GRID
2008-09	7.29	7.49	
2009-10	5.26	4.96	4.62
2010-11	4.79	3.47	3.91
2011-12	4.18	3.57	4.09
2012-13	4.33	3.67	3.86
2013-14	4.29	2.9	2.05
2014-15	4.28	3.50	2.26
2015-16	4.11	2.72	1.93
2016-17	3.53	2.50	1.76
2017-18	3.59	3.45	2.03
2018-19	4.28	4.26	2.68
2019-20	4.45	3.24	2.85

Source : InSDES compilation of data available at http://www.cercind.gov.in/market_monitoring

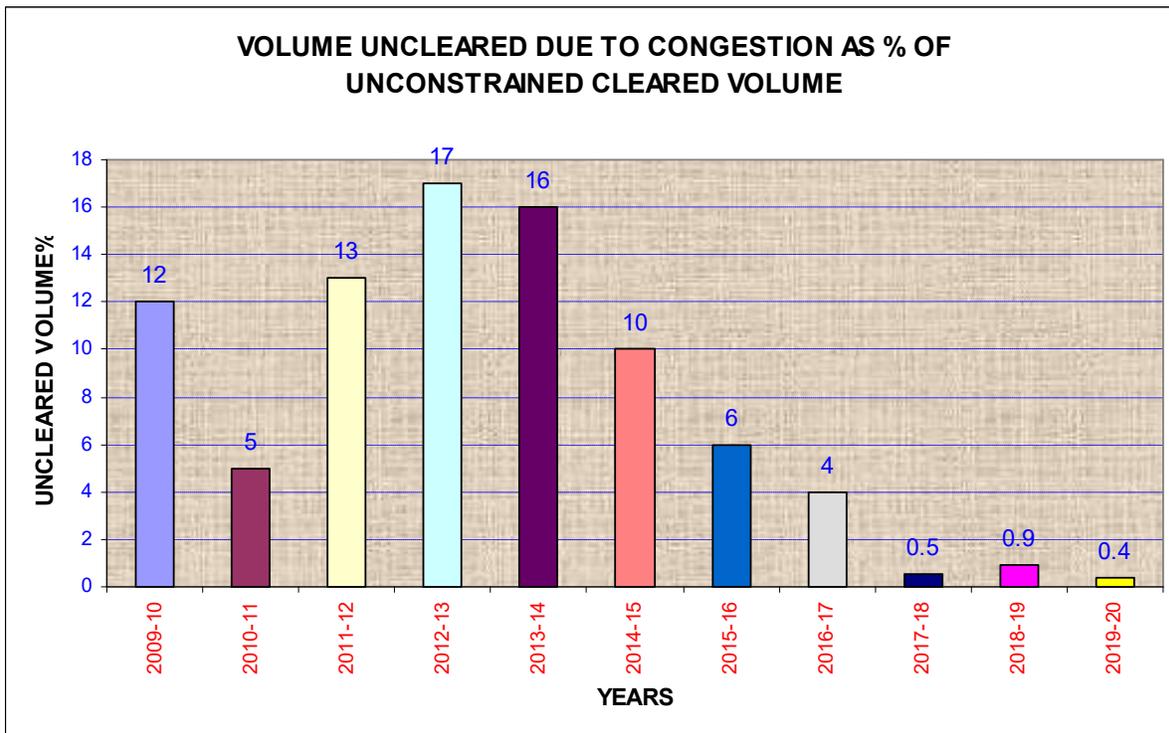


ANNEXURE-5

EFFECT OF CONGESTION ON THE VOLUME OF ELECTRICITY TRANSACTED THROUGH POWER EXCHANGES FORM 2009-10 TO 2019-20					
YEAR	Unconstrained Cleared Volume* (BU)	Actual Cleared Volume (Scheduled) BU	Volume that could not be cleared because of congestion (BU)	Volume that could not be cleared as % of Unconstrained Cleared Volume	Remarks
2009-10	8.1	7.09	1.01	12	
2010-11	14.26	13.54	0.72	5	
2011-12	17.08	14.83	2.26	13	
2012-13	27.67	23.02	4.65	17	
2013-14	35.62	30.03	5.59	16	
2014-15	31.61	28.46	3.14	10	
2015-16	36.36	34.2	2.16	6	
2016-17	41.6	40.08	1.52	4	
2017-18	45.86	45.62	0.21	0.5	
2018-19	50.69	50.22	0.47	0.9	
2019-20	49.36	49.16	0.20	0.40	
2020-21	14.00053	13.99470	0.00583	0.04	1st Qtr. only, includes RTM also

*This power would have been scheduled had there been no congestion

Source : InSDES compilation of data available at http://www.cercind.gov.in/market_monitoring



ANNEXURE-6

COMPARISON OF AREA CLEARING PRICE & DAILY MARKET CLEARING PRICE			
MONTH	AREA CLEARING PRICE at IEX		AVERAGE DAILY MARKET CLEARING PRICE at IEX
	MINIMUM	MAXIMUM	
2019-20			
APR 2019	1.80	11.84	3.22
MAY 2019	1.25	7.50	3.34
JUN 2019	1.00	9.00	3.32
JUL 2019	1.05	9.29	3.38
AUG 2019	1.00	8.95	3.32
SEP 2019	1.00	6.73	2.77
OCT 2019	0.884	8.025	2.71
NOV 2019	1.80	7.93	2.85
DEC 2019	1.70	6.12	2.93
JAN 2020	0.99	5.00	2.86
FEB 2020	0.99	5.00	2.91
MAR 2020	0.60	4.99	2.46
2020-21			
APR 2020	0.70	3.87	2.42
MAY 2020	1.10	5.00	2.57
JUN 2020	1.00	4.11	2.35
JUL 2020	0.88	5.17	2.47

Source : InSDES compilation of data available at <http://www.cea.nic.in/ra>