

Monthly Report on Short-term Transactions of Electricity in India

December, 2016



Economics Division
Central Electricity Regulatory Commission
36, Janpath, Chanderlok Building



Contents

S.No.	Contents	Page No
	Contents	i
	List of Tables and Figures	ii
	Abbreviations	iii
	Introduction	1
I	Volume of Short-term Transactions of Electricity	1
II	Price of Short-term Transactions of Electricity	2
(i)	<i>Price of electricity transacted through Traders</i>	2
(ii)	<i>Price of electricity transacted through Power Exchanges</i>	3
(iii)	<i>Price of electricity transacted through DSM</i>	3
III	Volume of Short-term Transactions of Electricity (Regional Entity-wise)	3
IV	Congestion on Inter-State Transmission Corridor for Day-Ahead Market on Power Exchanges	4
V	Bilateral Contracts executed by Traders	5
(i)	<i>Duration of bilateral contracts</i>	5
(ii)	<i>Forward Curve based on Price of bilateral contracts</i>	5
VI	Volume and Price of Renewable Energy Certificates (RECs)	6
VII	Inferences	7

List of Tables and Figures

S.No.	List of Tables and Figures	Page No.
I List of Tables		
Table-1	Volume of Short-term Transactions of Electricity in India	9
Table-2	Percentage Share of Electricity Transacted by Trading Licensees	11
Table-3	Price of Electricity Transacted through Traders	12
Table-4	Price of Electricity Transacted through Traders (Time-wise)	12
Table-5	Price of Electricity Transacted through Power Exchanges	12
Table-6	Volume and Price of Electricity in Term Ahead Market of IEX	12
Table-7	Volume and Price of Electricity in Term Ahead Market of PXIL	12
Table-8	Price of Electricity Transacted through DSM	12
Table-9	Volume of Electricity Sold through Bilateral	14
Table-10	Volume of Electricity Purchased through Bilateral	15
Table-11	Volume of Electricity Sold through Power Exchanges	16
Table-12	Volume of Electricity Purchased through Power Exchanges	18
Table-13	Volume of Electricity Under drawal through DSM	19
Table-14	Volume of Electricity Over drawal through DSM	21
Table-15	Total Volume of Net Short-term Transactions of Electricity (Regional Entity-wise)	23
Table-16	Details of Congestion in Power Exchanges	25
Table-17	Volume of Short-term Transactions of Electricity in India (Day-wise)	26
Table-18	Price of Electricity in Short-term Transactions (Day-wise)	27
Table-19	Volume of Short-term Transactions of Electricity (Regional Entity-wise)	28
Table-20	Volume and Price of Renewable Energy Certificates (RECs) Transacted through Power Exchanges	31
II List of Figures		
Figure-1	Volume of Short-term Transactions of Electricity	9
Figure-2	Volume of Various Kinds of Electricity Transactions in Total Electricity Generation	9
Figure-3	Volume of Short-term Transactions of Electricity (Day-wise)	10
Figure-4	Percentage Share of Electricity Transacted by Trading Licensees	11
Figure-5	Price of Electricity in Short-term Transactions	13
Figure-6	Price of Electricity in Short-term Transactions (Day-wise)	13
Figure-7	Bilateral Contracts Executed by Traders in January, 2017	30
Figure-8	Forward Curve based on Prices of Bilateral Contracts	30

Abbreviations

Abbreviation	Expanded Version
ACBIL	ACB (India) Limited
ACP	Area Clearing Price
ACV	Area Clearing Volume
Adani HVDC	Adani Power Limited (High Voltage Direct Line Current Line)
AD HYDRO	AD Hydro Power Limited
BALCO	Bharat Aluminum Company Limited
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CGPL	Coastal Gujarat Power Limited
CHUZACHEN HEP	Chuzachen Hydro electric power project
COASTGEN	Coastal Energen Private Limited
DAGACHU	Dagachhu Hydro Power Corporation
DB POWER	Diligent Power Pvt. Ltd.
DCPP	Donga Mahua Captive Power Plant
DGEN MEGA POWER	DGEN Mega Power Project
DHARIWAL POWER	Dhariwal Power Station
DOYANG HEP	Doyang Hydro Electric Project
DSM	Deviation Settlement Mechanism
DVC	Damodar Valley Corporation
EMCO	EMCO Energy Limited
ESSAR POWER	Essar Power Limited
ESSAR STEEL	Essar Steel Ltd
GMR CHHATTISGARH	GMR Chhattisgarh Energy Limited
GMR KAMALANGA	GMR Kamalanga Energy Ltd.
IEX	Indian Energy Exchange Limited
ILF&S	Infrastructure Leasing & Financial Services Limited
J&K	Jammu & Kashmir
JAYPEE NIGRIE	Jaypee Nigrie Super Thermal Power Project
JINDAL POWER	Jindal Power Limited
JINDAL STAGE-II	Jindal Power Ltd Stage II
JITPL	Jindal India Thermal Power Ltd.
JORETHANG	Jorethang Loop Hydroelectric Power Project
KARCHAM WANGTOO	Jaypee Karcham Hydro Corporation Limited
KORBA WEST POWER	Korba West Power Company Limited
KSK MAHANADI	KSK Mahanadi Power Ltd
LANKO BUDHIL	Lanco Budhil Hydro Power Private Limited
LANKOAMK	Lanco Amarkantak Power Private Limited
LANKOKONDAPALLY	Lanco Kondapally Power Private Limited

LOKTAK	Loktak Power Project
MALANA	Malana Hydroelectric Plant
Maruti Coal	Maruti Clean Coal and Power Limited
MB POWER	MB Power Ltd
MEENAKSHI	Meenakshi Energy Private Limited
MP	Madhya Pradesh
MUs	Million Units
NEEPCO	North Eastern Electric Power Corporation Limited
NHPC STATIONS	National Hydro Electric Power Corporation Ltd. Stations
NLC	Neyveli Lignite Corporation Limited
NTPC STATIONS	National Thermal Power Corporation Ltd. Stations
NJPC	Nathpa Jhakri Hydroelectric Power Station
NLDC	National Load Despatch Centre
NSPCL	NTPC - SAIL Power Company Private Limited
NVVN	NTPC Vidyut Vyapar Nigam Limited
ONGC Platana	ONGC Tripura Power Company
OTC	Over The Counter
PX	Power Exchange
PXIL	Power Exchange India Limited
RANGIT HEP	Rangit Hydro electric power project
REC	Renewable Energy Certificate
RGPPL	Ratnagiri Gas and Power Private Limited
RLDC	Regional Load Despatch Centre
RTC	Round The Clock
Sasan UMPP	Sasan Ultra Mega Power Project
SHREE CEMENT	Shree Cement Limited
SIMHAPURI	Simhapuri Energy Private Limited

Introduction

A well-functioning electricity market requires an effective market monitoring process. As part of the market monitoring process, the monthly report on short-term transactions of electricity, is being prepared and posted on the website of CERC since August 2008. Here, “short-term transactions of electricity” refers to the contracts of less than one year period, for electricity transacted (inter-State & intra-State) through inter-State Trading Licensees and directly by the Distribution Licensees, Power Exchanges (Indian Energy Exchange Ltd (IEX) and Power Exchange India Ltd (PXIL), and Deviation Settlement Mechanism (DSM). The objectives of the report are: (i) to observe the trends in volume and price of the short-term transactions of electricity; (ii) to analyse competition among the market players; (iii) to analyse effect of congestion on volume of electricity transacted through power exchanges; (iv) to analyse bilateral contracts executed by traders; (v) to provide information on volume and price of Renewable Energy Certificates (RECs) transacted through power exchanges; and (vi) to disclose/disseminate all relevant market information. The details of the report for the month of **December, 2016** are as under:

I: Volume of Short-term Transactions of Electricity

During December 2016, total electricity generation excluding generation from renewable and captive power plants in India was 95019.55 MUs (Table-1).

Of the total electricity generation, 8587.88 MUs (9.04 %) was transacted through short-term, comprising of 3813.21 MUs (4.01%) through bilateral (through traders and term-ahead contracts on power exchanges and directly between distribution companies), followed by 3109.51 MUs (3.27%) through day ahead collective transactions on power exchanges (IEX and PXIL) and 1665.16 MUs (1.75%) through DSM (Table-1 & Figure-2).

Of the total short-term transactions, bilateral constitutes 44.40% (22.82% through traders and term-ahead contracts on power exchanges and 21.59% directly between distribution companies) followed by 36.21% through day ahead collective transactions on power exchanges and 19.39% through DSM (Table-1& Figure-1). Daily volume of short-term transactions is shown in Table-17 & Figure-3.

The percentage share of electricity traded by each trading licensee in the total volume of electricity traded by all the trading licensees is provided in Table-2 & Figure-4. The volume of electricity transacted by the trading licensees includes bilateral transactions and the transactions undertaken through power exchanges. There were 35 trading licensees as on December, 2016. In December 2016, 22 trading licensees were engaged in short term trading. Top 5 trading licensees had a share of 69.30% in the total volume traded by all the licensees. These are PTC India Ltd., Mittal Processors (P) Ltd., Manikaran Power Ltd., GMR Energy Trading Ltd., and Tata Power Trading Company (P) Ltd.

Herfindahl-Hirschman Index (HHI) has been used for measuring the competition among the trading licensees. Increase in the HHI generally indicates decrease in competition and increase of market concentration, and vice versa. The HHI below 0.15 indicates non-concentration, HHI between 0.15 and 0.25 indicates moderate concentration and HHI above 0.25 indicates high concentration. The HHI has been computed based on the volume of electricity traded (inter-State & intra-State) by inter-State trading licensees, and it was 0.1447 for the month of December 2016, which indicates non-concentration of market power (Table-2).

The volume of electricity transacted through IEX and PXIL in the day ahead market was 3094.72 MUs and 14.78 MUs respectively. The volume of total buy bids and sell bids was 3683.94 MUs and 7096.17 MUs respectively in IEX while the same was 39.25 MUs and 56.37 MUs respectively in PXIL. The variation in the volume of buy bids and sell bids placed through power exchanges shows variation in the demand and supply position.

The volume of electricity transacted through IEX and PXIL in the term-ahead market was 56.47 MUs and 11.28 MUs respectively (Table-6 & Table-7).

II: Price of Short-term Transactions of Electricity

(i) *Price of electricity transacted through Traders:* The minimum, maximum and weighted average sale prices have been computed for the electricity transacted through traders and the sale prices were ₹0.03/kWh, ₹4.70/kWh and ₹3.43/kWh respectively (Table-3). The weighted average sale prices were also computed for the transactions during Round the Clock (RTC), Peak and Off-peak periods separately, and the sale prices were ₹3.49/kWh, ₹4.37/kWh, and ₹2.75/kWh respectively (Table-4).

(ii) Price of electricity transacted through Power Exchanges: The minimum, maximum and weighted average prices have been computed for the electricity transacted through IEX and PXIL separately. The minimum, maximum and weighted average prices were ₹0.30/kWh, ₹15.00/kWh and ₹2.37/kWh respectively in IEX and ₹0.80/kWh, ₹4.20/kWh and ₹ 3.01/kWh respectively in PXIL (Table-5).

The price of electricity transacted through IEX and PXIL in the term-ahead market was ₹3.44/kWh and ₹3.05/kWh respectively (Table-6 and Table-7).

(iii) Price of electricity transacted through DSM: The average deviation settlement price was ₹1.89/kWh. The minimum and maximum deviation settlement prices were ₹0.00/kWh and ₹ 6.36/kWh respectively (Table-8).

The prices of electricity transacted through trading licensees, power exchanges and DSM and their comparison is shown in Table-18, Figure-5 & 6.

III: Volume of Short-term Transactions of Electricity (Regional Entity¹-Wise)

Of the total bilateral transactions, top 5 regional entities sold 53.33% of the volume, and these were Haryana, Punjab, Uttar Pradesh, Jindal India Thermal Power Ltd., and Infrastructure Leasing & Financial Services Limited. Top 5 regional entities purchased 52.64% of the volume, and these were Madhya Pradesh, Jammu & Kashmir, Himachal Pradesh, Maharashtra and Tamil Nadu (Table-9 & 10).

Of the total power exchange transactions, top 5 regional entities sold 35.52% of the volume, and these were Diligent Power Pvt. Ltd., Karnataka, Jindal Power Ltd., Madhya Pradesh and Korba West Power. Top 5 regional entities purchased 52.11% of the volume, and these were Gujarat, Rajasthan, Karnataka, Haryana and Telangana (Table-11 & 12).

Of the total DSM transactions, top 5 regional entities underdrew 88.09% of the volume, and these were NTPC Stations (WR), Tamil Nadu, Punjab, Maharashtra and Madhya Pradesh

¹ In case of a state, the entities which are “selling” also include generators connected to state grid and the entities which are “buying” also include open access consumers.

(Table-13). Top 5 regional entities overdrew 31.47% of the volume, and these were Uttar Pradesh, NTPC Stations (NR), Karnataka, Rajasthan, and Kerala (Table-14).

Regional entity-wise total volume of net short-term transactions of electricity i.e. volume of net transactions through bilateral, power exchanges and DSM is shown in Table-15 & 19. Top 5 electricity selling regional entities were Tamil Nadu, NTPC Stations (WR), Madhya Pradesh, Maharashtra and NHPC Stations. Top 5 electricity purchasing regional entities were Kerala, Uttar Pradesh, Jharkhand, Karnataka and Rajasthan.

IV: Congestion² on Inter-State Transmission Corridor for Day-Ahead Market on Power Exchanges

Power Exchanges use a price discovery mechanism in which the aggregate demand and supply are matched to arrive at an unconstrained market price and volume. This step assumes that there is no congestion in the inter-State transmission system between different regions. However, in reality, the system operator (NLDC) in coordination with RLDCs limits the flow (due to congestion) in the inter-State transmission system. In such a situation, power exchanges adopt a mechanism called “Market Splitting”³.

In the month of December, congestion occurred in both the power exchanges. The details of congestion are shown in Table-16. The volume of electricity that could not be cleared due to congestion and could not be transacted through power exchanges is the difference between unconstrained cleared volume (volume of electricity that would have been scheduled, had there been no congestion) and actual cleared volume.

² “Congestion” means a situation where the demand for transmission capacity exceeds the available transfer capability

³ “Market Splitting” is a mechanism adopted by Power Exchange where the market is split in the event of transmission congestion, into predetermined (by NLDC) bid areas or zones, which are cleared individually at their respective area prices such that the energy balance in every bid area is reached based upon the demand and supply in individual bid areas and using the available transmission corridor capacity between various bid areas simultaneously”

As a result of this market splitting the price of electricity in the importing region, where demand for electricity is more than supply, becomes relatively higher than the price of electricity in the exporting region.

During the month, the volume of electricity that could not be cleared in IEX and PXIL due to congestion was 4.21% and 32.82% of the unconstrained cleared volume respectively. In terms of time, congestion occurred was 62.77% in IEX and 17.31% in PXIL (Table-16).

V: Bilateral Contracts executed by Traders

In addition to the analysis on short-term transactions of electricity in December, 2016, this section covers an analysis of bilateral contracts executed in January, 2017.

(i) Duration of bilateral contracts: During January, 2017, a total of 81 bilateral contracts (excluding banking/swap contracts) have been executed by traders for the volume of 660.24 MUs. Figure-7 shows the percentage of contracts categorized according to the period of power supply. It can be observed from the figure that 77.8% of the bilateral contracts were executed for duration of up to one week and 22.2% of the contracts were executed for duration of more than a week and up to one month.

During the month, 7 banking/swapping bilateral contracts were also executed for the volume of 210.16 MUs.

(ii) Forward Curve based on price of bilateral contracts: A forward curve reflects present day's expectation of prices for a future period. The forward curve of electricity prices are based on sale prices of bilateral contracts executed by traders. The price of each contract for each day is taken into consideration while constructing the forward curve. On the basis of these prices, the weighted average price for each day is calculated using various sale prices of contracts for delivery on that particular day.

Figure-8 represents the forward curve of electricity sale prices for the period from January, 2017 to April, 2017 based on bilateral contracts⁴ executed till January, 2017. Forward curves have been drawn for the contracts executed in December, 2016 and January, 2017 for the purpose of comparison. It is observed that the forward prices during March to April 2017 were relatively higher for the contracts executed in January, 2017 compared to the contracts executed in December, 2016.

⁴Excluding Banking/Swapping contracts

VI: Volume and Price of Renewable Energy Certificates (RECs)

The concept of Renewable Energy Certificates (RECs) seeks to address mismatch between availability of renewable energy and the requirement of the obligated entities to meet their renewable purchase obligation by purchasing green attributes of renewable energy remotely located in the form of RECs. The REC mechanism is a market based instrument, to promote renewable sources of energy and development of electricity market.

One REC is equivalent to 1 MWh electricity injected into the grid from renewable energy sources. The REC is exchanged only in the power exchanges approved by CERC within the band of a floor price and forbearance (ceiling) price as notified by CERC from time to time. The first REC trading session was held on power exchanges in March, 2011.

The details of REC transactions for the month of December, 2016 are shown in Table-20. The market clearing volume of solar RECs transacted on IEX and PXIL were 24789 and 7297 respectively and the market clearing price of these RECs was ₹3500/MWh on both the power exchanges. Market clearing volume of non-solar RECs transacted on IEX and PXIL were 226532 and 195420 respectively and the market clearing price of these RECs was ₹1500/MWh on both the power exchanges.

The gap between the volume of buy and sell bids of RECs placed through power exchanges shows about the variation in demand for both solar and non-solar RECs. For Solar RECs, the ratio of buy bids to sell bids was 0.009 and 0.005 for IEX and PXIL respectively. For non-solar RECs, the ratio of buy bids to sell bids was 0.032 and 0.028 for IEX and PXIL respectively.

VII: Inferences:

- The percentage of short-term transactions of electricity to total electricity generation was 9.04%.
- Of the total short-term transactions of electricity, 44.40% was transacted through bilateral (through traders and term ahead contracts on power exchanges and directly by distribution companies), followed by 36.21% through power exchanges and 19.39% through DSM.
- Top 5 trading licensees had a share of 69.30% in the total volume traded by all the trading licensees.
- The Herfindahl Hirschman Index computed for the volume of electricity traded by trading licensees was 0.1447, indicating non-concentration of market power.
- The weighted average price of electricity transacted through trading licensees was ₹3.43/kWh. The weighted average prices of electricity transacted through IEX and PXIL were ₹2.37/kWh and ₹3.01/kWh respectively.
- The average price of electricity transacted through DSM was ₹1.89/kWh.
- Top 5 electricity selling regional entities were Tamil Nadu, NTPC Stations (WR), Madhya Pradesh, Maharashtra and NHPC Stations. Top 5 electricity purchasing regional entities were Kerala, Uttar Pradesh, Jharkhand, Karnataka and Rajasthan.
- The volume of electricity that could not be cleared in IEX and PXIL due to congestion was 4.21% and 32.82% of the unconstrained cleared volume respectively. In terms of time, congestion occurred was 62.77% in IEX and 17.31% in PXIL
- In January 2017, 77.8% of the bilateral contracts were executed for duration of up to one week and 22.2% of the contracts were executed for duration of more than a week and up to one month.
- The forward prices during March to April 2017 were relatively higher for the contracts executed in January, 2017 compared to the contracts executed in December, 2016.

- The market clearing volume of solar RECs transacted on IEX and PXIL were 24789 and 7297 respectively and the market clearing price of these RECs was ₹3500/MWh on both the power exchanges. Market clearing volume of non-solar RECs transacted on IEX and PXIL were 226532 and 195420 respectively and the market clearing price of these RECs was ₹1500/MWh on both the power exchanges.

Table-1: VOLUME OF SHORT-TERM TRANSACTIONS OF ELECTRICITY (ALL INDIA), DECEMBER 2016

Sr.No	Short-term transactions	Volume (MUs)	% to Volume of short-term transactions	% to Total Generation
1	Bilateral	3813.21	44.40	4.01
	(i) Through Traders and PXs	1959.35	22.82	2.06
	(ii) Direct	1853.86	21.59	1.95
2	Through Power Exchanges	3109.51	36.21	3.27
	(i) IEX	3094.72	36.04	3.26
	(ii) PXIL	14.78	0.17	0.016
3	Through DSM	1665.16	19.39	1.75
	Total	8587.88	-	9.04
	Total Generation	95019.55	-	-

Source: NLDC

Figure-1: Volume of Short-term Transactions of Electricity, December 2016

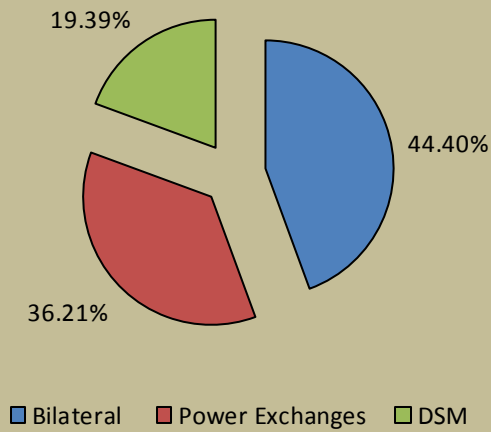


Figure-2: Volume of Various Kinds of Electricity Transactions in Total Electricity Generation, December 2016

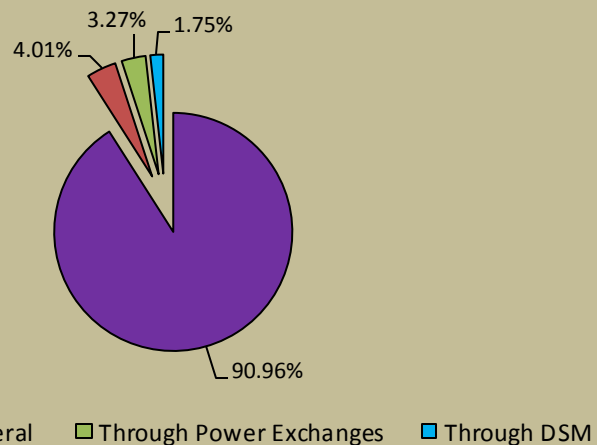


Figure-3: Volume of Short-term Transactions of Electricity, December 2016 (Day-wise)

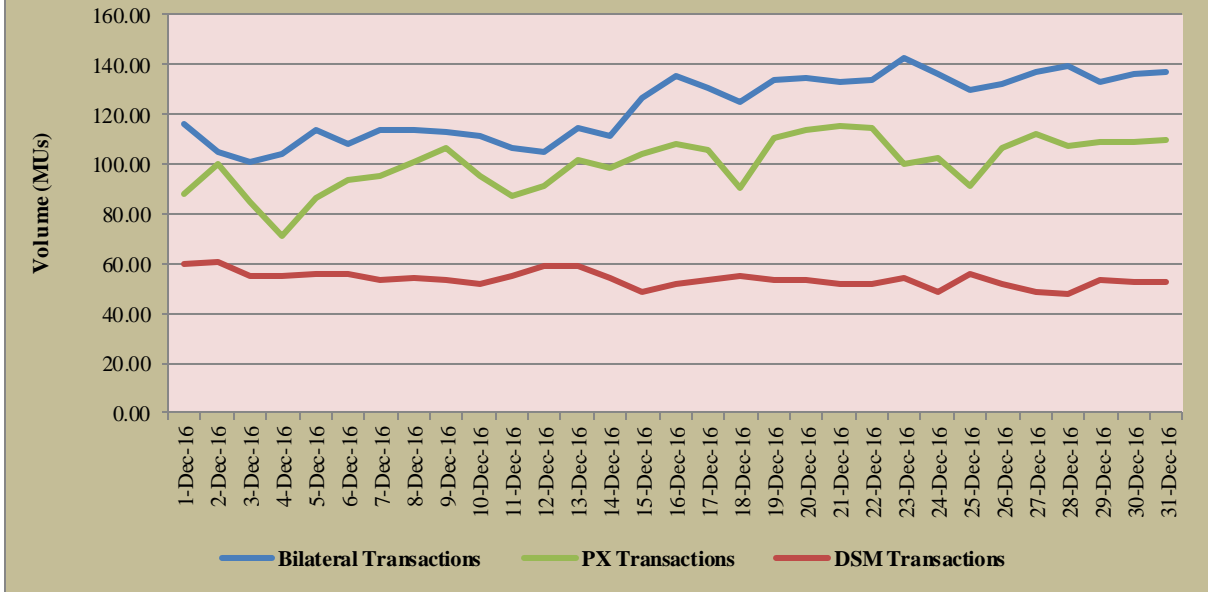


Table-2: PERCENTAGE SHARE OF ELECTRICITY TRANSACTED BY TRADING LICENSEES, DECEMBER 2016			
Sr.No	Name of the Trading Licensee	% Share in total Volume transacted by Trading Licensees	Herfindahl-Hirschman Index
1	PTC India Ltd.	28.18	0.0794
2	Mittal Processors (P) Ltd.	19.15	0.0367
3	Manikaran Power Ltd.	8.67	0.0075
4	GMR Energy Trading Ltd.	7.15	0.0051
5	Tata Power Trading Company (P) Ltd.	6.15	0.0038
6	Adani Enterprises Ltd.	5.51	0.0030
7	Jaiprakash Associates Ltd.	4.84	0.0023
8	NTPC Vidyut Vyapar Nigam Ltd.	4.78	0.0023
9	Arunachal Pradesh Power Corporation (P) Ltd	4.52	0.0020
10	Knowledge Infrastructure Systems (P) Ltd	3.43	0.0012
11	JSW Power Trading Company Ltd	2.98	0.0009
12	National Energy Trading & Services Ltd.	1.58	0.0003
13	RPG Power Trading Company Ltd.	0.83	0.0001
14	Instinct Infra & Power Ltd.	0.68	0.0001
15	My Home Power Private Ltd.	0.48	0.0000
16	Customized Energy Solutions India (P) Ltd.	0.43	0.0000
17	SN Power Markets Pvt. Ltd.	0.40	0.0000
18	Phillip Commodities India (P) Ltd.	0.11	0.0000
19	Gita Power & Infrastructure Private Limited	0.07	0.0000
20	Shree Cement Ltd.	0.02	0.0000
21	Essar Electric Power Development Corp. Ltd.	0.02	0.0000
22	Ambitious Power Trading Company Ltd.	0.01	0.0000
TOTAL		100.00%	0.1447
Top 5 trading licensees		69.30%	
<i>Note 1: Volume of electricity transacted by the trading licensees includes bilateral transactions (inter-state & intra-state) and the transactions undertaken through power exchanges.</i>			
<i>Note 2: Volume of electricity transacted by Global Energy Ltd is not included.</i>			
<i>Source: Information submitted by trading licensees</i>			

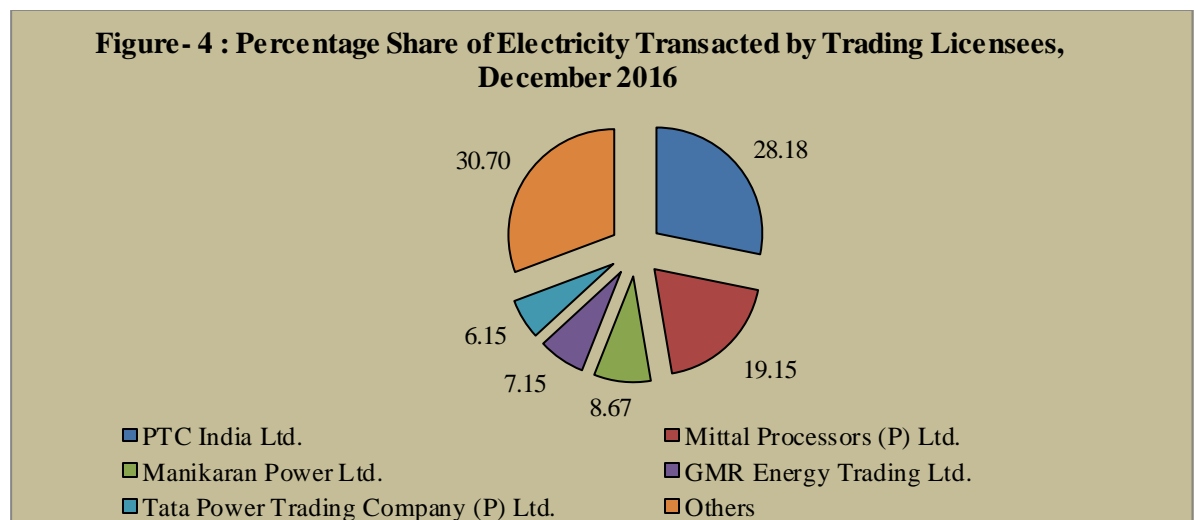


Table-3: PRICE OF ELECTRICITY TRANSACTED THROUGH TRADERS, DECEMBER 2016

Sr.No	Item	Sale Price of Traders (₹/kWh)
1	Minimum	0.03
2	Maximum	4.70
3	Weighted Average	3.43

Source: Information submitted by trading licensees

Table-4: PRICE OF ELECTRICITY TRANSACTED THROUGH TRADERS (TIME-WISE), DECEMBER 2016

Sr.No	Period of Trade	Sale Price of Traders (₹/kWh)
1	RTC	3.49
2	PEAK	4.37
3	OFF PEAK	2.75

Source: Information submitted by trading licensees

Table-5: PRICE OF ELECTRICITY TRANSACTED THROUGH POWER EXCHANGES, DECEMBER 2016

Sr.No	ACP	Price in IEX (₹/kWh)	Price in PXIL (₹/kWh)
1	Minimum	0.30	0.80
2	Maximum	15.00	4.20
3	Weighted Average	2.37	3.01

Source: Information submitted by IEX and PXIL

Table-6: VOLUME AND PRICE OF ELECTRICITY IN TERM AHEAD MARKET OF IEX, DECEMBER 2016

Sr.No	Term ahead contracts	Actual Scheduled Volume (MUs)	Weighted Average Price (₹/kWh)
1	Intra-Day Contracts	15.79	3.14
2	Day Ahead Contingency Contracts	29.02	3.45
4	Weekly Contracts	11.66	3.80
	Total	56.47	3.44

Source: IEX

Table-7: VOLUME AND PRICE OF ELECTRICITY IN TERM AHEAD MARKET OF PXIL, DECEMBER 2016

Sr.No	Term ahead contracts	Actual Scheduled Volume (MUs)	Weighted Average Price (₹/kWh)
1	Intra-Day Contracts	11.28	3.05
	Total	11.28	3.05

Source: PXIL

Table-8: PRICE OF ELECTRICITY TRANSACTED THROUGH DSM, DECEMBER 2016

Sr.No	Item	Price in All India Grid (₹/kWh)
1	Minimum	0.00
2	Maximum	6.36
3	Average	1.89

Source: NLDC

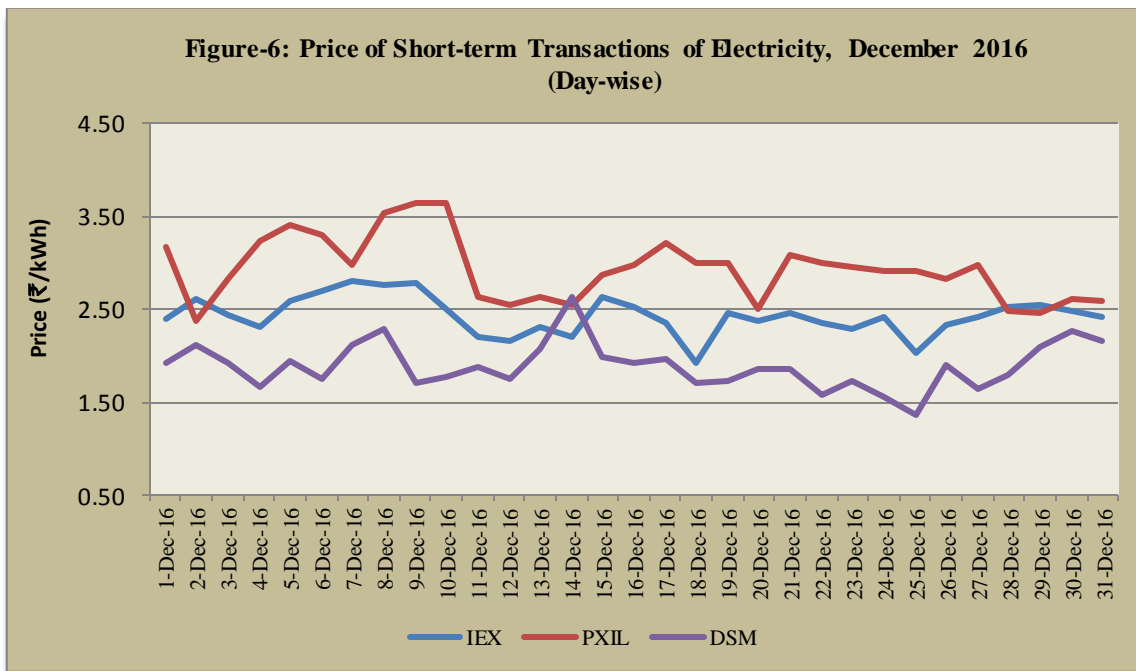
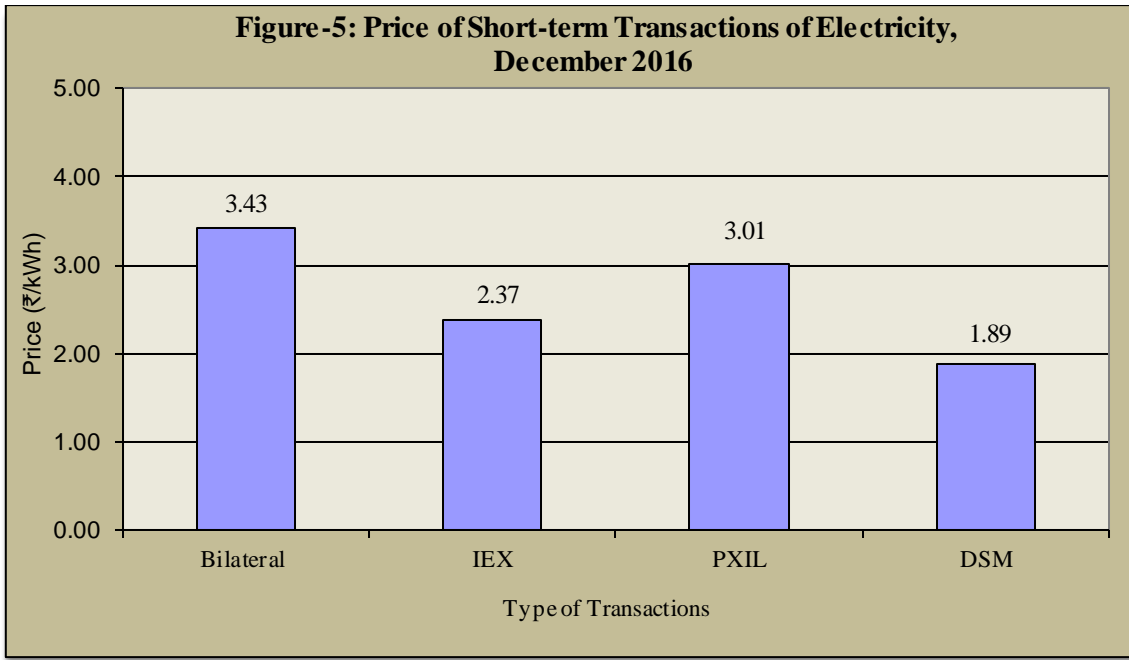


Table-9: VOLUME OF ELECTRICITY SOLD THROUGH BILATERAL, DECEMBER 2016		
Name of the Entity	Volume of Sale (MUs)	% of Volume
HARYANA	590.53	15.94
PUNJAB	516.47	13.94
UTTAR PRADESH	321.60	8.68
JITPL	297.55	8.03
ILF&S	249.62	6.74
DELHI	239.06	6.45
CHHATTISGARH	151.28	4.08
WEST BENGAL	137.59	3.71
GMR KAMALANGA	126.82	3.42
KORBA WEST POWER	125.84	3.40
ADHUNIK POWER LTD	87.18	2.35
GUJARAT	83.11	2.24
HIMACHAL PRADESH	79.98	2.16
JAYPEE NIGRIE	79.49	2.15
BALCO	67.51	1.82
ANDHRA PRADESH	59.79	1.61
JINDAL POWER	57.60	1.55
SEMBICORP	52.85	1.43
MAHARASHTRA	36.23	0.98
DB POWER	36.02	0.97
ONGC PALATANA	33.33	0.90
TAMIL NADU	31.77	0.86
SIMHAPURI	29.99	0.81
DAGACHU	28.46	0.77
THERMAL POWERTECH	25.38	0.69
DHARIWAL POWER	21.17	0.57
MEENAKSHI	19.06	0.51
JINDAL STAGE-II	18.68	0.50
ODISHA	13.69	0.37
KARNATAKA	13.44	0.36
J & K	11.21	0.30
TELANGANA	11.04	0.30
LANKO_AMK	9.89	0.27
ACBIL	9.73	0.26
MARUTI COAL	8.74	0.24
MP	6.01	0.16
RAJASTHAN	5.21	0.14
DVC	4.46	0.12
MEGHALAYA	2.70	0.07
JHABUA POWER_MP	1.21	0.03
SPECTRUM	1.14	0.03
TRIPURA	1.06	0.03
SIKKIM	0.81	0.02
TOTAL	3704.61	100.00
Volume Sold by top 5 Regional Entities	1975.77	53.33

**Table-10: VOLUME OF ELECTRICITY PURCHASED THROUGH BILATERAL,
DECEMBER 2016**

Name of the Entity	Volume of Purchase (MUs)	% of Volume
MP	505.14	12.66
J & K	478.04	11.99
HIMACHAL PRADESH	437.66	10.97
MAHARASHTRA	387.36	9.71
TAMIL NADU	291.31	7.30
ESSAR STEEL	278.78	6.99
TELANGANA	210.64	5.28
BIHAR	201.64	5.06
RAJASTHAN	181.79	4.56
UTTARAKHAND	180.89	4.54
BANGLADESH	115.97	2.91
UTTAR PRADESH	112.82	2.83
CHHATTISGARH	109.19	2.74
HARYANA	84.27	2.11
JHARKHAND	81.68	2.05
MEGHALAYA	70.80	1.78
ASSAM	60.26	1.51
NEPAL(NVVN)	58.27	1.46
ODISHA	35.34	0.89
DELHI	21.27	0.53
ANDHRA PRADESH	21.15	0.53
GUJARAT	12.71	0.32
GOA	11.84	0.30
SIKKIM	11.34	0.28
KERALA	9.56	0.24
PUNJAB	7.48	0.19
MANIPUR	7.31	0.18
WEST BENGAL	2.42	0.06
DAMAN AND DIU	1.58	0.04
TOTAL	3988.50	100.00
Volume Purchased by top 5 Regional Entities	2099.51	52.64

Table-11: VOLUME OF ELECTRICITY SOLD THROUGH POWER EXCHANGES, DECEMBER 2016		
Name of the Entity	Volume of Sale (MUs)	% of Volume
DB POWER	275.96	8.87
KARNATAKA	254.01	8.17
JINDAL POWER	235.68	7.58
MP	205.51	6.61
KORBA WEST POWER	133.19	4.28
MARUTI COAL	130.99	4.21
CHHATTISGARH	111.09	3.57
JAYPEE NIGRIE	108.77	3.50
SEMBCORP	106.69	3.43
DELHI	106.20	3.42
JITPL	71.42	2.30
HIMACHAL PRADESH	67.97	2.19
KARCHAM WANGTOO	61.19	1.97
NTPC STATIONS (WR)	61.18	1.97
ASSAM	58.34	1.88
RAJASTHAN	55.10	1.77
GUJARAT	49.87	1.60
ACBIL	48.87	1.57
TELANGANA	48.32	1.55
TRIPURA	48.24	1.55
UTTAR PRADESH	43.64	1.40
MB POWER	43.21	1.39
DCPP	41.97	1.35
WEST BENGAL	41.29	1.33
UTTARAKHAND	41.23	1.33
ODISHA	38.76	1.25
SIMHAPURI	36.30	1.17
BALCO	35.36	1.14
JHABUA POWER_MP	33.54	1.08
TRN ENERGY	33.45	1.08
DVC	32.71	1.05
ADHUNIK POWER LTD	32.07	1.03
EMCO	30.86	0.99
SPECTRUM	30.00	0.96
HARYANA	28.97	0.93
ANDHRA PRADESH	26.54	0.85
TAMIL NADU	25.99	0.84
MEENAKSHI	23.96	0.77
NLC	18.55	0.60
MAHARASHTRA	18.54	0.60
JORETHANG	17.58	0.57

NEEPCO STATIONS	15.92	0.51
J & K	13.83	0.44
AD HYDRO	13.71	0.44
CHUZACHEN HEP	13.70	0.44
MANIPUR	13.08	0.42
NSPCL	12.89	0.41
DHARIWAL POWER	12.02	0.39
GOA	10.68	0.34
SIKKIM	10.10	0.32
THERMAL POWERTECH	10.09	0.32
PUNJAB	9.71	0.31
GMR KAMALANGA	9.37	0.30
NTPC STATIONS (NR)	8.92	0.29
NTPC STATIONS (ER)	8.01	0.26
MIZORAM	6.13	0.20
MEGHALAYA	5.04	0.16
NJPC	4.96	0.16
ILF&S	4.37	0.14
KERALA	3.70	0.12
RANGANADI HEP	3.18	0.10
DGEN MEGA POWER	2.43	0.08
CHANDIGARH	1.50	0.05
LANKO KONDAPALLI	1.47	0.05
LANCO BUDHIL	0.63	0.02
DOYANG HEP	0.63	0.02
Total	3109.51	100.00
Volume sold by top 5 Regional Entities	1104.35	35.52

Table-12: VOLUME OF ELECTRICITY PURCHASED THROUGH POWER EXCHANGES, DECEMBER 2016		
Name of the Entity	Volume of Purchase (MUs)	% of Volume
GUJARAT	509.25	16.38
RAJASTHAN	406.59	13.08
KARNATAKA	268.79	8.64
HARYANA	221.01	7.11
TELANGANA	214.72	6.91
DADRA & NAGAR HAVELI	195.87	6.30
ANDHRA PRADESH	143.18	4.60
BIHAR	141.60	4.55
MAHARASHTRA	136.39	4.39
KERALA	132.44	4.26
J & K	129.05	4.15
WEST BENGAL	97.93	3.15
UTTARAKHAND	77.29	2.49
MP	60.44	1.94
DELHI	60.44	1.94
ODISHA	52.20	1.68
ASSAM	41.24	1.33
TAMIL NADU	39.80	1.28
PUNJAB	36.09	1.16
DAMAN AND DIU	35.93	1.16
HIMACHAL PRADESH	25.12	0.81
UTTAR PRADESH	17.85	0.57
ESSAR STEEL	16.28	0.52
GOA	10.29	0.33
NAGALAND	9.52	0.31
MEGHALAYA	8.27	0.27
DVC	6.90	0.22
ARUNACHAL PRADESH	5.79	0.19
PONDICHERRY	4.14	0.13
MANIPUR	2.27	0.07
CHANDIGARH	1.81	0.06
TOTAL	3109.51	100.00
Volume purchased by top 5 Regional Entities	1620.35	52.11

Table-13: VOLUME OF ELECTRICITY UNDER DRAWAL (EXPORTED) THROUGH DSM, DECEMBER 2016

Name of the Entity	Volume of Under drawal (MUs)	% of Volume
NTPC STATIONS (WR)	137.47	8.54
TAMIL NADU	120.56	7.49
PUNJAB	112.76	7.00
MAHARASHTRA	110.90	6.89
MP	86.20	5.35
GUJARAT	61.36	3.81
HARYANA	60.86	3.78
UTTAR PRADESH	51.72	3.21
NHPC STATIONS	50.94	3.16
DVC	49.96	3.10
NTPC STATIONS (NR)	49.73	3.09
ANDHRA PRADESH	48.81	3.03
BIHAR	47.94	2.98
CHHATTISGARH	45.27	2.81
ODISHA	42.85	2.66
NLC	36.85	2.29
SASAN UMPP	36.20	2.25
KARNATAKA	29.57	1.84
RAJASTHAN	27.49	1.71
NTPC STATIONS (SR)	22.02	1.37
UTTARAKHAND	20.62	1.28
NTPC STATIONS (ER)	20.00	1.24
TELANGANA	18.94	1.18
HIMACHAL PRADESH	17.21	1.07
WEST BENGAL	15.72	0.98
DELHI	13.12	0.81
JINDAL POWER	12.98	0.81
LANKO_AMK	12.85	0.80
JITPL	12.54	0.78
PONDICHERRY	11.90	0.74
NEEPCO STATIONS	11.29	0.70
NSPCL	10.93	0.68
DB POWER	10.89	0.68
THERMAL POWERTECH	10.09	0.63
DADRA & NAGAR HAVELI	9.63	0.60
MEGHALAYA	9.21	0.57
RGPPL(DABHOL)	8.63	0.54
GMR KAMALANGA	8.05	0.50
GOA	7.96	0.49
JINDAL STAGE-II	7.63	0.47
TRIPURA	7.43	0.46
EMCO	7.24	0.45
MAITHON POWER LTD	7.07	0.44

CGPL	6.84	0.42
SIKKIM	5.70	0.35
DCPP	5.54	0.34
ACBIL	5.47	0.34
NJPC	5.42	0.34
JAYPEE NIGRIE	5.33	0.33
KARCHAM WANGTOO	4.11	0.26
TEESTA HEP	3.86	0.24
KORBA WEST POWER	3.86	0.24
MANIPUR	3.69	0.23
ADHUNIK POWER LTD	3.19	0.20
JHABUA POWER_MP	3.15	0.20
MB POWER	2.77	0.17
KSK MAHANADI	2.67	0.17
ASSAM	2.67	0.17
CHANDIGARH	2.62	0.16
COASTGEN	2.61	0.16
NEPAL(NVVN)	2.52	0.16
URI-2	2.46	0.15
JORETHANG	2.31	0.14
TRN ENERGY	2.27	0.14
DAMAN AND DIU	2.20	0.14
ILF&S	2.03	0.13
BANGLADESH	2.02	0.13
ESSAR STEEL	1.91	0.12
ESSAR POWER	1.91	0.12
JHARKHAND	1.66	0.10
DAGACHU	1.63	0.10
SEMBCORP	1.62	0.10
BALCO	1.53	0.09
RANGANADI HEP	1.50	0.09
SIMHAPURI	1.41	0.09
RANGIT HEP	1.27	0.08
MIZORAM	1.11	0.07
KERALA	1.08	0.07
ARUNACHAL PRADESH	0.99	0.06
MEENAKSHI	0.99	0.06
DHARIWAL POWER	0.85	0.05
AD HYDRO	0.78	0.05
NAGALAND	0.77	0.05
LOKTAK	0.74	0.05
CHUZACHEN HEP	0.55	0.03
DOYANG HEP	0.43	0.03
LANCO BUDHIL	0.36	0.02
Total	1610.20	100.00
Volume Exported by top 5 Regional Entities	1418.46	88.09

Table-14: VOLUME OF ELECTRICITY OVER DRAWAL (IMPORTED) THROUGH DSM, DECEMBER 2016		
Name of the Entity	Volume of Over Drawal (MUs)	% of Volume
UTTAR PRADESH	127.99	8.31
NTPC STATIONS (NR)	101.78	6.61
KARNATAKA	89.88	5.84
RAJASTHAN	84.00	5.46
KERALA	80.85	5.25
JHARKHAND	64.62	4.20
BIHAR	60.76	3.95
NTPC STATIONS (WR)	57.21	3.72
TELANGANA	55.68	3.62
GUJARAT	55.08	3.58
DELHI	47.81	3.11
NTPC STATIONS (ER)	47.60	3.09
MAHARASHTRA	46.60	3.03
HARYANA	41.48	2.69
WEST BENGAL	36.94	2.40
UTTARAKHAND	35.32	2.29
ANDHRA PRADESH	31.36	2.04
ASSAM	30.23	1.96
TAMIL NADU	27.75	1.80
ESSAR STEEL	25.84	1.68
GOA	23.35	1.52
CGPL	22.55	1.46
BALCO	22.35	1.45
DVC	21.22	1.38
HIMACHAL PRADESH	20.15	1.31
ODISHA	17.87	1.16
CHHATTISGARH	16.67	1.08
MP	14.26	0.93
NLC	13.79	0.90
PUNJAB	13.29	0.86
ARUNACHAL PRADESH	12.49	0.81
NTPC STATIONS (SR)	11.60	0.75
CHANDIGARH	10.96	0.71
SEMBCORP	10.34	0.67
ILF&S	10.03	0.65
NAGALAND	8.16	0.53
DCPP PLANT)	8.06	0.52
TRIPURA	7.81	0.51
GMR KAMALANGA	7.13	0.46
NHPC STATIONS	6.62	0.43
DAGACHU	6.50	0.42
ACBIL	6.41	0.42
KORBA WEST POWER	6.01	0.39
MB POWER	5.94	0.39
MIZORAM	5.80	0.38
JINDAL STAGE-II	4.89	0.32

BANGLADESH	4.66	0.30
DAMAN AND DIU	4.26	0.28
EMCO	3.79	0.25
JITPL	3.47	0.23
JHABUA POWER_MP	3.29	0.21
JINDAL POWER	3.22	0.21
MAITHON POWER LTD	3.16	0.21
JORETHANG	2.86	0.19
NJPC	2.73	0.18
MANIPUR	2.62	0.17
DADRA & NAGAR HAVELI	2.55	0.17
NSPCL	2.38	0.15
KARCHAM WANGTOO	2.19	0.14
MEGHALAYA	2.02	0.13
THERMAL POWERTECH	1.99	0.13
ADHUNIK POWER LTD	1.98	0.13
COASTGEN	1.90	0.12
TRN ENERGY	1.83	0.12
NEEPCO STATIONS	1.79	0.12
DGEN MEGA POWER	1.72	0.11
DHARIWAL POWER	1.58	0.10
SASAN UMPP	1.52	0.10
LANKO KONDAPALLI	1.44	0.09
SIKKIM	1.42	0.09
JAYPEE NIGRIE	1.41	0.09
GMR CHHATTISGARH	1.40	0.09
RANGANADI HEP	1.37	0.09
PONDICHERRY	1.34	0.09
DB POWER	1.32	0.09
KSK MAHANADI	1.20	0.08
NEPAL(NVVN)	1.03	0.07
LANKO_AMK	0.78	0.05
RGPPPL(DABHOL)	0.75	0.05
ESSAR POWER	0.75	0.05
SHREE CEMENT	0.74	0.05
MEENAKSHI	0.67	0.04
URI-2	0.57	0.04
SIMHAPURI	0.54	0.04
AD HYDRO	0.41	0.03
DOYANG HEP	0.37	0.02
CHUZACHEN HEP	0.33	0.02
RANGIT HEP	0.32	0.02
TOTAL	1539.30	100.00
Volume Imported by top 5 Regional Entities	484.49	31.47

**Table-15: TOTAL VOLUME OF NET SHORT-TERM TRANSACTIONS OF ELECTRICITY
(REGIONAL ENTITY-WISE), DECEMBER 2016**

Sr.No.	Name of the Entity	Total volume of net short-term transactions of electricity*
1	KERALA	79.77
2	UTTAR PRADESH	76.27
3	JHARKHAND	62.96
4	KARNATAKA	60.31
5	RAJASTHAN	56.50
6	NTPC STATIONS (NR)	52.05
7	TELANGANA	36.74
8	DELHI	34.69
9	NTPC STATIONS (ER)	27.60
10	ASSAM	27.57
11	ESSAR STEEL	23.93
12	WEST BENGAL	21.21
13	BALCO	20.82
14	CGPL	15.71
15	GOA	15.39
16	UTTARAKHAND	14.70
17	BIHAR	12.82
18	ARUNACHAL PRADESH	11.50
19	SENBCORP	8.72
20	CHANDIGARH	8.34
21	ILF&S	8.00
22	NAGALAND	7.39
23	DAGACHU	4.87
24	MIZORAM	4.69
25	MB POWER	3.17
26	HIMACHAL PRADESH	2.94
27	BANGLADESH	2.65
28	DCPP	2.52
29	KORBA WEST POWER	2.15
30	DAMAN AND DIU	2.06
31	DGEN MEGA POWER	1.69
32	GMR CHHATTISGARH	1.40
33	LANKO KONDAPALLI	1.33
34	ACBIL	0.94
35	DHARIWAL POWER	0.73
36	SHREE CEMENT	0.62
37	JORETHANG	0.56
38	TRIPURA	0.38
39	JHABUA POWER_MP	0.14
40	MALANA	0.12
41	DOYANG HEP	-0.06
42	RANGANADI HEP	-0.13
43	ADANI HVDC	-0.14
44	LANCO BUDHIL	-0.19
45	CHUZACHEN HEP	-0.22
46	MEENAKSHI	-0.32
47	AD HYDRO	-0.37
48	LOKTAK	-0.53
49	COASTGEN	-0.71
50	SIMHAPURI	-0.87

51	GMR KAMALANGA	-0.93
52	RANGIT HEP	-0.95
53	MANIPUR	-1.08
54	ESSAR POWER	-1.16
55	ADHUNIK POWER LTD	-1.21
56	KSK MAHANADI	-1.47
57	NEPAL(NVVN)	-1.49
58	URI-2	-1.88
59	KARCHAM WANGTOO	-1.93
60	NJPC	-2.68
61	JINDAL STAGE-II	-2.73
62	EMCO	-3.45
63	TEESTA HEP	-3.79
64	MAITHON POWER LTD	-3.91
65	JAYPEE NIGRIE	-3.91
66	SIKKIM	-4.28
67	GUJARAT	-6.28
68	DADRA & NAGAR HAVELI	-7.08
69	MEGHALAYA	-7.18
70	RGPPPL(DABHOL)	-7.88
71	THERMAL POWERTECH	-8.10
72	NSPCL	-8.55
73	JITPL	-9.07
74	NEEPCO STATIONS	-9.50
75	DB POWER	-9.56
76	JINDAL POWER	-9.76
77	NTPC STATIONS (SR)	-10.43
78	PONDICHERRY	-10.56
79	LANKO_AMK	-12.07
80	ANDHRA PRADESH	-17.45
81	HARYANA	-19.38
82	NLC	-23.06
83	ODISHA	-24.99
84	CHHATTISGARH	-28.61
85	DVC	-28.74
86	SASAN UMPP	-34.68
87	NHPC STATIONS	-44.32
88	MAHARASHTRA	-64.30
89	MP	-71.95
90	NTPC STATIONS (WR)	-80.25
91	TAMIL NADU	-92.81
	Punjab	-99.48
* Total volume of net short-term transactions of electricity includes net of transactions of electricity through bilateral, power exchange and UI		
(-) indicates sale and (+) indicates purchase		

Table-16: DETAILS OF CONGESTION IN POWER EXCHANGES, DECEMBER 2016			
	Details of Congestion	IEX	PXIL
A	Unconstrained Cleared Volume* (MUs)	3237.49	22.00
B	Actual Cleared Volume and hence scheduled (MUs)	3101.03	14.78
C	Volume of electricity that could not be cleared and hence not scheduled because of congestion (MUs) (A-B)	136.46	7.22
D	Volume of electricity that could not be cleared as % to Unconstrained Cleared Volume	4.21%	32.82%
E	Percentage of the time congestion occurred during the month (Number of hours congestion occurred/Total number of hours in the month)	62.77%	17.31%
F	Congestion occurrence (%) time block wise		
	0.00 - 6.00 hours	13.92%	0.00%
	6.00 - 12.00 hours	28.10%	34.56%
	12.00 - 18.00 hours	27.84%	29.51%
	18.00 - 24.00 hours	30.14%	35.92%
<i>* This power would have been scheduled had there been no congestion.</i>			
<i>Source: IEX & PXIL</i>			

Table-17: VOLUME OF SHORT-TERM TRANSACTIONS OF ELECTRICITY IN INDIA (DAY-WISE) (MUs), DECEMBER 2016						
Date	Bilateral		Power Exchange (Area Clearing Volume# of Day Ahead Market)		Deviation Settlement (Over Draw+Under Generation)	Total Electricity Generation (MU) as given at CEA Website*
	Through Traders and PXs**	Direct	IEX	PXIL		
1-Dec-16	69.36	46.89	86.10	2.02	59.82	3049.95
2-Dec-16	58.74	46.22	99.63	0.56	60.35	3004.33
3-Dec-16	51.73	49.13	84.45	0.36	54.82	2975.92
4-Dec-16	53.34	50.34	70.91	0.06	54.71	2901.00
5-Dec-16	60.91	52.53	85.87	0.44	55.43	3049.35
6-Dec-16	58.06	49.88	93.59	0.39	55.62	3046.31
7-Dec-16	59.27	54.47	94.85	0.34	53.76	3073.67
8-Dec-16	61.36	52.54	100.71	0.10	54.10	3115.98
9-Dec-16	61.79	50.83	105.74	0.66	53.64	3125.70
10-Dec-16	60.07	51.49	94.87	0.64	52.10	3082.69
11-Dec-16	54.70	51.66	87.09	0.24	54.74	2992.69
12-Dec-16	53.97	50.72	91.34	0.03	58.82	2983.37
13-Dec-16	58.32	55.98	100.58	0.76	59.41	2887.43
14-Dec-16	55.50	55.45	98.25	0.03	54.13	2962.60
15-Dec-16	71.06	55.85	103.98	0.25	48.84	3013.76
16-Dec-16	67.79	67.98	107.21	0.73	51.90	3074.35
17-Dec-16	65.41	65.49	105.41	0.58	53.12	3077.79
18-Dec-16	59.65	65.05	89.29	0.83	55.13	3008.07
19-Dec-16	67.66	66.52	109.28	0.83	53.18	3090.67
20-Dec-16	68.47	66.55	113.88	0.03	53.15	3102.50
21-Dec-16	68.92	64.15	114.88	0.22	51.90	3144.62
22-Dec-16	67.68	66.17	114.04	0.83	51.94	3169.25
23-Dec-16	73.36	69.28	99.19	0.68	54.37	3184.38
24-Dec-16	68.69	67.24	101.84	0.51	48.57	3166.00
25-Dec-16	63.42	66.42	90.67	0.83	55.91	3018.18
26-Dec-16	65.99	66.07	106.51	0.06	51.48	3085.90
27-Dec-16	67.36	69.48	111.46	0.79	48.96	3115.74
28-Dec-16	68.89	70.89	107.05	0.03	47.44	3134.96
29-Dec-16	64.93	68.37	108.69	0.03	53.13	3132.63
30-Dec-16	66.84	69.07	108.83	0.08	52.30	3131.19
31-Dec-16	66.09	71.15	108.51	0.83	52.43	3118.57
Total	1959.35	1853.86	3094.72	14.78	1665.16	95019.55

Source: NLDC

* Gross Electricity Generation excluding electricity generation from renewable and captive power plants

** The volume of bilateral through PXs represents the volume through term-ahead contracts.

Area Clearing Volume represents the scheduled volume of all the bid areas.

Table-18: PRICE OF SHORT-TERM TRANSACTIONS OF ELECTRICITY (DAY-WISE)(₹/kWh), DECEMBER, 2016									
Market Segment	Day ahead market of IEX			Day ahead market of PXIL			Under Drawl/Over Drawl from the Grid (DSM)		
Date	Minimum ACP	Maximum ACP	Weighted Average Price*	Minimum ACP	Maximum ACP	Weighted Average Price*	All India Grid		
							Minimum Price	Maximum Price	Average Price**
1-Dec-16	0.60	15.00	2.40	1.65	3.85	3.16	0.00	5.32	1.92
2-Dec-16	1.78	6.00	2.61	1.65	4.17	2.37	0.00	6.36	2.11
3-Dec-16	0.40	6.50	2.44	2.10	4.20	2.83	0.00	3.45	1.92
4-Dec-16	0.80	6.50	2.31	1.90	4.18	3.23	0.00	3.45	1.66
5-Dec-16	1.78	4.69	2.59	1.62	3.55	3.40	0.00	3.45	1.95
6-Dec-16	2.00	4.96	2.69	1.48	3.95	3.29	0.00	5.32	1.74
7-Dec-16	1.35	4.99	2.80	1.38	3.95	2.98	0.00	5.11	2.12
8-Dec-16	1.10	4.90	2.76	1.70	4.16	3.53	0.00	5.32	2.28
9-Dec-16	1.69	4.95	2.78	1.00	3.96	3.65	0.00	3.45	1.71
10-Dec-16	1.60	4.47	2.50	1.00	3.90	3.65	0.00	5.11	1.77
11-Dec-16	1.15	4.36	2.21	1.95	2.80	2.64	0.00	3.45	1.87
12-Dec-16	0.80	4.00	2.16	1.95	2.80	2.55	0.00	5.11	1.76
13-Dec-16	0.81	3.70	2.31	1.88	2.80	2.64	0.00	3.45	2.06
14-Dec-16	0.80	3.50	2.20	1.96	2.88	2.55	0.00	5.32	2.63
15-Dec-16	1.10	4.00	2.62	0.87	3.21	2.86	0.00	5.32	1.98
16-Dec-16	0.80	3.89	2.51	0.86	3.50	2.97	0.00	4.91	1.91
17-Dec-16	0.80	4.07	2.35	1.10	3.30	3.21	0.00	4.91	1.97
18-Dec-16	0.74	2.56	1.93	0.87	3.21	3.00	0.00	3.45	1.72
19-Dec-16	0.80	3.50	2.45	1.15	3.20	2.99	0.00	3.45	1.73
20-Dec-16	1.05	3.80	2.38	1.90	3.00	2.51	0.00	3.45	1.85
21-Dec-16	1.56	3.73	2.45	1.10	3.50	3.09	0.00	3.45	1.87
22-Dec-16	0.90	3.40	2.36	0.82	3.20	2.99	0.00	3.45	1.59
23-Dec-16	0.70	6.11	2.28	1.10	3.20	2.95	0.00	4.91	1.72
24-Dec-16	0.80	6.50	2.42	1.20	3.10	2.92	0.00	3.45	1.56
25-Dec-16	0.30	5.71	2.03	1.20	3.10	2.90	0.00	3.24	1.36
26-Dec-16	0.80	3.99	2.34	1.80	3.22	2.82	0.00	6.16	1.89
27-Dec-16	0.95	3.80	2.41	0.80	3.21	2.98	0.00	3.45	1.63
28-Dec-16	1.10	4.08	2.51	2.47	2.71	2.47	0.00	3.24	1.79
29-Dec-16	1.10	4.51	2.55	2.45	2.71	2.46	0.00	3.45	2.09
30-Dec-16	1.05	4.75	2.49	2.10	2.70	2.61	0.00	5.74	2.27
31-Dec-16	1.21	4.50	2.41	1.96	2.82	2.58	0.00	4.91	2.16
	0.30#	15.00#	2.37	0.80#	4.20#	3.01	0.00	6.36	1.89

Source: Data on price of PX transactions from IEX and PXIL and data on DSM Price from NLDC.

* Weighted average price computed based on Area Clearing Volume (ACV) and Area Clearing Price (ACP) for each hour of the day. Here, ACV and ACP represent the scheduled volume and weighted average price of all the bid areas of power exchanges.

** Simple average price of DSM of 96 time blocks of 15 minutes each in a day. DSM price includes Ceiling DSM Rate +40% additional DSM charge.

Maximum/Minimum in the month

**Table-19: VOLUME OF SHORT-TERM TRANSACTIONS OF ELECTRICITY (REGIONAL ENTITY*-WISE) (MUs),
DECEMBER 2016**

Name of the Entity	Through Bilateral			Through Power Exchange			Through DSM with Regional Grid			Total Net***
	Sale	Pur- chase	Net**	Sale	Pur- chase	Net**	Import (Over Drawl)	Export (Under Drawl)	Net**	
PUNJAB	516.47	7.48	-508.99	9.71	36.09	26.38	13.29	112.76	-99.48	-582.09
HARYANA	590.53	84.27	-506.26	28.97	221.01	192.04	41.48	60.86	-19.38	-333.60
RAJASTHAN	5.21	181.79	176.58	55.10	406.59	351.49	84.00	27.49	56.50	584.57
DELHI	239.06	21.27	-217.78	106.20	60.44	-45.76	47.81	13.12	34.69	-228.85
UTTAR PRADESH	321.60	112.82	-208.78	43.64	17.85	-25.79	127.99	51.72	76.27	-158.31
UTTARAKHAND	0.00	180.89	180.89	41.23	77.29	36.06	35.32	20.62	14.70	231.65
HIMACHAL PRADESH	79.98	437.66	357.68	67.97	25.12	-42.85	20.15	17.21	2.94	317.77
J & K	11.21	478.04	466.83	13.83	129.05	115.22	0.00	0.00	0.00	582.06
CHANDIGARH	0.00	0.00	0.00	1.50	1.81	0.32	10.96	2.62	8.34	8.66
MP	6.01	505.14	499.14	205.51	60.44	-145.07	14.26	86.20	-71.95	282.12
MAHARASHTRA	36.23	387.36	351.13	18.54	136.39	117.85	46.60	110.90	-64.30	404.68
GUJARAT	83.11	12.71	-70.40	49.87	509.25	459.38	55.08	61.36	-6.28	382.69
CHHATTISGARH	151.28	109.19	-42.09	111.09	0.75	-110.34	16.67	45.27	-28.61	-181.04
GOA	0.00	11.84	11.84	10.68	10.29	-0.39	23.35	7.96	15.39	26.83
DAMAN AND DIU	0.00	1.58	1.58	0.00	35.93	35.93	4.26	2.20	2.06	39.57
DADRA & NAGAR HAVELI	0.00	0.00	0.00	0.00	195.87	195.87	2.55	9.63	-7.08	188.79
ANDHRA PRADESH	59.79	21.15	-38.65	26.54	143.18	116.64	31.36	48.81	-17.45	60.54
KARNATAKA	13.44	0.00	-13.44	254.01	268.79	14.78	89.88	29.57	60.31	61.65
KERALA	0.00	9.56	9.56	3.70	132.44	128.75	80.85	1.08	79.77	218.08
TAMIL NADU	31.77	291.31	259.54	25.99	39.80	13.81	27.75	120.56	-92.81	180.55
PONDICHERRY	0.00	0.00	0.00	0.00	4.14	4.14	1.34	11.90	-10.56	-6.42
TELANGANA	11.04	210.64	199.60	48.32	214.72	166.39	55.68	18.94	36.74	402.73
WEST BENGAL	137.59	2.42	-135.16	41.29	97.93	56.64	36.94	15.72	21.21	-57.31
ODISHA	13.69	35.34	21.64	38.76	52.20	13.45	17.87	42.85	-24.99	10.11
BIHAR	0.00	201.64	201.64	0.00	141.60	141.60	60.76	47.94	12.82	356.06
JHARKHAND	0.00	81.68	81.68	0.00	0.00	0.00	64.62	1.66	62.96	144.63
SIKKIM	0.81	11.34	10.53	10.10	0.00	-10.10	1.42	5.70	-4.28	-3.85
DVC	4.46	0.00	-4.46	32.71	6.90	-25.81	21.22	49.96	-28.74	-59.01
ARUNACHAL PRA	0.00	0.00	0.00	0.00	5.79	5.79	12.49	0.99	11.50	17.29
ASSAM	0.00	60.26	60.26	58.34	41.24	-17.10	30.23	2.67	27.57	70.73
MANIPUR	0.00	7.31	7.31	13.08	2.27	-10.80	2.62	3.69	-1.08	-4.57
MEGHALAYA	2.70	70.80	68.10	5.04	8.27	3.23	2.02	9.21	-7.18	64.15
MIZORAM	0.00	-1.05	-1.05	6.13	0.24	-5.89	5.80	1.11	4.69	-2.25
NAGALAND	0.00	0.00	0.00	0.00	9.52	9.52	8.16	0.77	7.39	16.91
TRIPURA	1.06	0.00	-1.06	48.24	0.00	-48.24	7.81	7.43	0.38	-48.92
NTPC STATIONS (NR)	0.00	0.00	0.00	8.92	0.00	-8.92	101.78	49.73	52.05	43.12
NHPC STATIONS	0.00	0.00	0.00	0.00	0.00	0.00	6.62	50.94	-44.32	-44.32
NJPC	0.00	0.00	0.00	4.96	0.00	-4.96	2.73	5.42	-2.68	-7.65
AD HYDRO	0.00	0.00	0.00	13.71	0.00	-13.71	0.41	0.78	-0.37	-14.09
KARCHAM WANGTOO	0.00	0.00	0.00	61.19	0.00	-61.19	2.19	4.11	-1.93	-63.12

NTPC STATIONS (WR)	0.00	0.00	0.00	61.18	0.00	-61.18	57.21	137.47	-80.25	-141.44
JINDAL POWER	57.60	0.00	-57.60	235.68	0.00	-235.68	3.22	12.98	-9.76	-303.04
LANKO_AMK	9.89	0.00	-9.89	0.00	0.00	0.00	0.78	12.85	-12.07	-21.96
NSPCL	0.00	0.00	0.00	12.89	0.00	-12.89	2.38	10.93	-8.55	-21.44
ACBIL	9.73	0.00	-9.73	48.87	0.00	-48.87	6.41	5.47	0.94	-57.66
BALCO	67.51	0.00	-67.51	35.36	0.00	-35.36	22.35	1.53	20.82	-82.05
RGPPL(DABHOL)	0.00	0.00	0.00	0.00	0.00	0.00	0.75	8.63	-7.88	-7.88
CGPL	0.00	0.00	0.00	0.00	0.00	0.00	22.55	6.84	15.71	15.71
DCPP	0.00	0.00	0.00	41.97	0.00	-41.97	8.06	5.54	2.52	-39.45
EMCO	0.00	0.00	0.00	30.86	0.00	-30.86	3.79	7.24	-3.45	-34.31
ESSAR STEEL	0.00	278.78	278.78	0.00	16.28	16.28	25.84	1.91	23.93	318.99
JINDAL STAGE-II	18.68	0.00	-18.68	0.00	0.00	0.00	4.89	7.63	-2.73	-21.41
DB POWER	36.02	0.00	-36.02	275.96	0.00	-275.96	1.32	10.89	-9.56	-321.54
DHARIWAL POWER	21.17	0.00	-21.17	12.02	0.00	-12.02	1.58	0.85	0.73	-32.46
JAYPEE NIGRIE	79.49	0.00	-79.49	108.77	0.00	-108.77	1.41	5.33	-3.91	-192.17
KORBA WEST POWER	125.84	0.00	-125.84	133.19	0.00	-133.19	6.01	3.86	2.15	-256.88
MB POWER	0.00	0.00	0.00	43.21	0.00	-43.21	5.94	2.77	3.17	-40.04
MARUTI COAL	8.74	0.00	-8.74	130.99	0.00	-130.99	0.00	0.00	0.00	-139.73
SPECTRUM	1.14	0.00	-1.14	30.00	0.00	-30.00	0.00	0.00	0.00	-31.14
JHABUA POWER_MP	1.21	0.00	-1.21	33.54	0.00	-33.54	3.29	3.15	0.14	-34.62
SASAN UMPP	0.00	0.00	0.00	0.00	0.00	0.00	1.52	36.20	-34.68	-34.68
TRN ENERGY	0.00	0.00	0.00	33.45	0.00	-33.45	1.83	2.27	0.00	-33.45
NTPC STATIONS (SR)	0.00	0.00	0.00	0.00	0.00	0.00	11.60	22.02	-10.43	-10.43
SIMHAPURI	29.99	0.00	-29.99	36.30	0.00	-36.30	0.54	1.41	-0.87	-67.16
MEENAKSHI	19.06	0.00	-19.06	23.96	0.00	-23.96	0.67	0.99	-0.32	-43.34
THERMAL POWERTECH	25.38	0.00	-25.38	10.09	0.00	-10.09	1.99	10.09	-8.10	-43.57
ILF&S	249.62	0.00	-249.62	4.37	0.00	-4.37	10.03	2.03	8.00	-245.99
NLC	0.00	0.00	0.00	18.55	0.00	-18.55	13.79	36.85	-23.06	-41.61
SEMBCORP	52.85	0.00	-52.85	106.69	0.00	-106.69	10.34	1.62	8.72	-150.82
NTPC STATIONS (ER)	0.00	0.00	0.00	8.01	0.00	-8.01	47.60	20.00	27.60	19.59
ADHUNIK POWER	87.18	0.00	-87.18	32.07	0.00	-32.07	1.98	3.19	-1.21	-120.46
CHUZACHEN HEP	0.14	0.00	-0.14	13.70	0.00	-13.70	0.33	0.55	-0.22	-14.07
GMR KAMALANGA	126.82	0.00	-126.82	9.37	0.00	-9.37	7.13	8.05	-0.93	-137.11
JITPL	297.55	0.00	-297.55	71.42	0.00	-71.42	3.47	12.54	-9.07	-378.04
DAGACHU	28.46	0.00	-28.46	0.00	0.00	0.00	6.50	1.63	4.87	-23.58
JORETHANG	0.00	0.00	0.00	17.58	0.00	-17.58	2.86	2.31	0.56	-17.03
NEPAL(NVWN)	0.00	58.27	58.27	0.00	0.00	0.00	1.03	2.52	-1.49	56.78
BANGLADESH	0.00	115.97	115.97	0.00	0.00	0.00	4.66	2.02	2.65	118.62
NEEPCO STATIONS	0.00	0.00	0.00	15.92	0.00	-15.92	1.79	11.29	-9.50	-25.41
ONGC PALATANA	33.33	0.00	-33.33	0.00	0.00	0.00	0.00	0.00	0.00	-33.33
Total	3704.61	3987.45	282.84	3109.51	3109.51	0.00	1539.30	1610.20	-34.69	212.38

Source: NLDC

* in case of a state, the entities which are "selling" also include generators connected to state grid and the entities which are "buying" also include open access consumers.

** (-) indicates sale and (+) indicates purchase,

*** Total net includes net of transactions through bilateral, power exchange and DSM

Figure 7: Bilateral Contracts executed by Traders in January, 2017

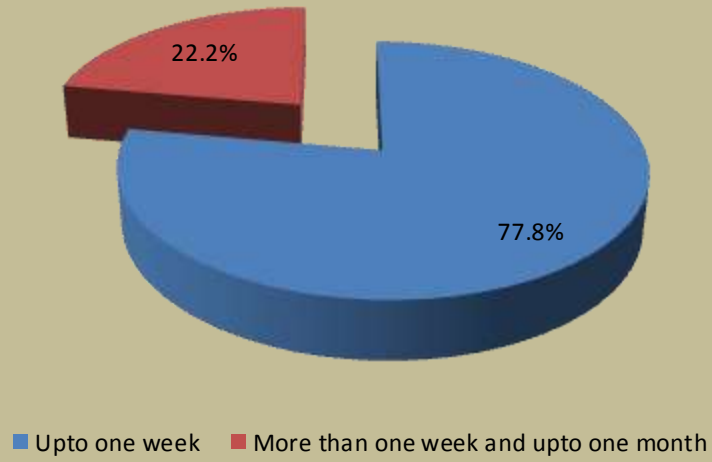


Figure-8: Forward Curve based on Prices of Bilateral Contracts

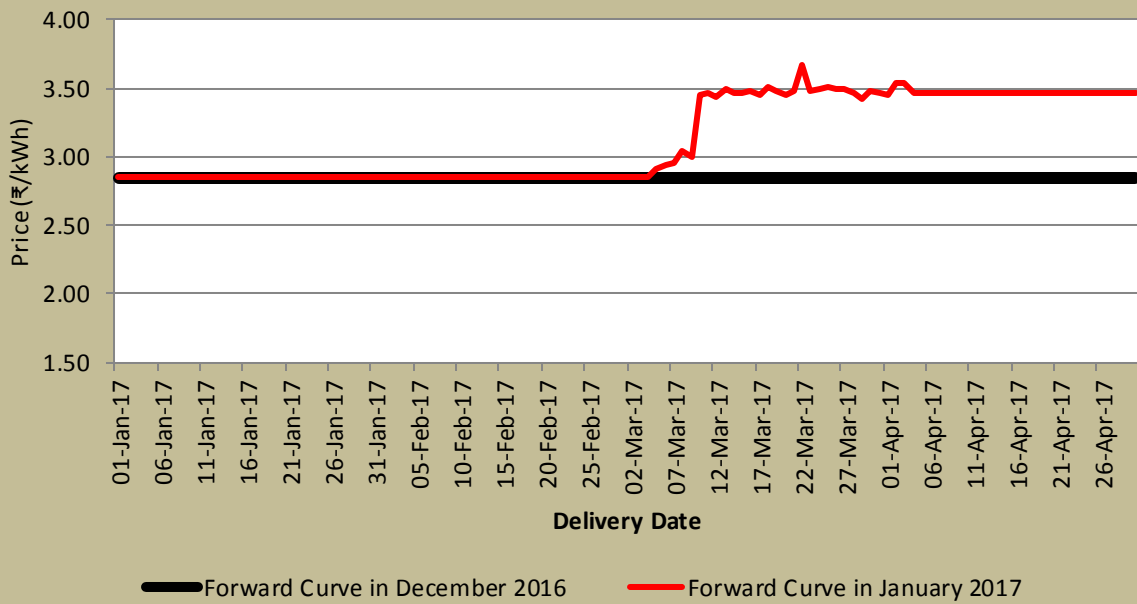


Table-20 : VOLUME AND PRICE OF RENEWABLE ENERGY CERTIFICATES (RECs) TRANSACTED THROUGH POWER EXCHANGES, DECEMBER 2016					
Sr.No.	Details of REC Transactions	IEX		PXIL	
		Solar	Non-Solar	Solar	Non Solar
A	Volume of Buy Bid	24789	226532	7297	195420
B	Volume of Sell Bid	2906174	7094753	1368286	6945036
C	Ratio of Buy Bid to Sell Bid Volume	0.009	0.032	0.005	0.028
D	Market Clearing Volume (MWh)	24789	226532	7297	195420
E	Market Clearing Price (₹/MWh)	3500	1500	3500	1500

Source: IEX and PXIL

Note 1: 1 REC = 1 MWh

Note 2:

<i>Forbearance and Floor Price w.e.f 1st March 2015</i>		
Type of REC	<i>Floor Price (₹MWh)</i>	<i>Forbearance Price (₹MWh)</i>
<i>Solar</i>	<i>3500.00</i>	<i>5800.00</i>
<i>Non-Solar</i>	<i>1500.00</i>	<i>3300.00</i>