

# Monthly Report on Short-term Transactions of Electricity in India

October, 2016



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## 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 **October, 2016** are as under:

### I: Volume of Short-term Transactions of Electricity

During October 2016, total electricity generation excluding generation from renewable and captive power plants in India was 99706.83 MUs (Table-1).

Of the total electricity generation, 9542.51 MUs (9.57 %) was transacted through short-term, comprising of 4115.68 MUs (4.13%) through bilateral (through traders and term-ahead contracts on power exchanges and directly between distribution companies), followed by 3640.06 MUs (3.65%) through day ahead collective transactions on power exchanges (IEX and PXIL) and 1786.77 MUs (1.79%) through DSM (Table-1 & Figure-2).

Of the total short-term transactions, bilateral constitutes 43.13% (24.32% through traders and term-ahead contracts on power exchanges and 18.81% directly between distribution companies) followed by 38.15% through day ahead collective transactions on power exchanges and 18.72% 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 October, 2016. In October 2016, 22 trading licensees were engaged in short term trading. Top 5 trading licensees had a share of 70.98% in the total volume traded by all the licensees. These are PTC India Ltd., Tata Power Trading Company (P) Ltd., Mittal Processors (P) Ltd., Manikaran Power Ltd. and Arunachal Pradesh Power Corporation Ltd.

Herfindahl-Hirschman Index (HHI) has been used for measuring the competition among the trading licensees. Increase in the HHI generally indicates a decrease in competition and an 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 0.1541 for the month of October 2016, which indicates moderate concentration of market power (Table-2).

The volume of electricity transacted through IEX and PXIL in the day ahead market was 3609.46 MUs and 30.59 MUs respectively. The volume of total buy bids and sell bids was 4294.18 MUs and 7270.01 MUs respectively in IEX while the same was 62.46 MUs and 112.55 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 93.18 MUs and 18.30 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 ₹0.02/kWh, ₹5.59/kWh and ₹3.48/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 ₹3.64/kWh, ₹3.15/kWh and ₹3.05/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 ₹1.10/kWh, ₹4.35/kWh and ₹2.43/kWh respectively in IEX and ₹0.75/kWh, ₹4.85/kWh and ₹ 1.97/kWh respectively in PXIL (Table-5).

The price of electricity transacted through IEX and PXIL in the term-ahead market was ₹3.08/kWh and ₹3.08/kWh respectively (Table-6 and Table-7).

(iii) *Price of electricity transacted through DSM:* The average deviation settlement price was ₹1.81/kWh. The minimum and maximum deviation settlement prices were ₹0.00/kWh and ₹ 5.32/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 Entity<sup>1</sup>-Wise)**

Of the total bilateral transactions, top 5 regional entities sold 39.78% of the volume, and these were Chhattisgarh, Infrastructure Leasing & Financial Services Limited, Diligent Power Private Ltd. Haryana and Jaypee Nigrie Super Thermal Power Project. Top 5 regional entities purchased 56.05% of the volume, and these were Chhattisgarh, Tamil Nadu, Maharashtra, Haryana and Bihar (Table-9 & 10).

Of the total power exchange transactions, top 5 regional entities sold 40.75% of the volume, and these were Madhya Pradesh, Jindal India Thermal Power Ltd., Gujarat Jindal Power Ltd. and Himachal Pradesh. Top 5 regional entities purchased 47.34% of the volume, and these were Gujarat, Rajasthan, Karnataka, Telangana and Uttar Pradesh (Table-11 & 12).

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<sup>1</sup> 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.



Of the total DSM transactions, top 5 regional entities underdrew 87.86% of the volume, and these were NTPC Stations (WR), Uttar Pradesh, Gujarat, Madhya Pradesh and Tamil Nadu, (Table-13). Top 5 regional entities overdrew 30.76% of the volume, and these were Karnataka, NTPC Stations (NR), Uttar Pradesh, Rajasthan and Andhra Pradesh (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 Jindal India Thermal Power Ltd., Madhya Pradesh, Diligent Power Private Ltd, Infrastructure Leasing & Financial Services Limited and Jindal Power Ltd. Top 5 electricity purchasing regional entities were Bihar, Rajasthan, Telangana, Tamil Nadu and Uttar Pradesh.

#### **IV: Congestion<sup>2</sup> 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”<sup>3</sup>.

In the month of October, 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

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

<sup>3</sup> “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.

difference between unconstrained cleared volume (volume of electricity that would have been scheduled, had there been no congestion) and actual cleared volume.

During the month, the volume of electricity that could not be cleared in IEX and PXIL due to congestion was 3.03% and (-)1.86% of the unconstrained cleared volume respectively. In terms of time, congestion occurred was 52.72% in IEX and 5.38% in PXIL (Table-16).

## **V: Bilateral Contracts executed by Traders**

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

**(i) Duration of bilateral contracts:** During November, 2016, a total of 138 bilateral contracts (excluding banking/swap contracts) have been executed by traders for the volume of 732.86 MUs. Figure-7 shows the percentage of contracts categorized according to the period of power supply. It can be observed from the figure that 77.54% of the bilateral contracts were executed for duration of up to one week, 21.74% of the contracts were executed for duration of more than a week and up to one month, and 0.72% of the contracts were executed for more than three months and upto 12 months.

During the month, 21 banking/swapping bilateral contracts were also executed for the volume of 182.71 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 November, 2016 to March, 2017 based on bilateral contracts<sup>4</sup> executed till November, 2016. Forward curves have been drawn for the contracts executed in October, 2016 and November,

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<sup>4</sup>Excluding Banking/Swapping contracts

2016 for the purpose of comparison. It is observed that the forward prices for the period from 15<sup>th</sup> November to 31<sup>st</sup> December, 2016 are relatively higher for the contracts executed in November, 2016 compared to the contracts executed in October, 2016.

## **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 October, 2016 are shown in Table-20. The market clearing volume of solar RECs transacted on IEX and PXIL were 19932 and 15676 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 157273 and 98048 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 0.012 for IEX and PXIL respectively. For non-solar RECs, the ratio of buy bids to sell bids was 0.019 and 0.021 for IEX and PXIL respectively.

## VII: Inferences:

- The percentage of short-term transactions of electricity to total electricity generation was 9.57%.
- Of the total short-term transactions of electricity, 43.13% was transacted through bilateral (through traders and term ahead contracts on power exchanges and directly by distribution companies), followed by 38.15% through power exchanges and 18.72% through DSM.
- Top 5 trading licensees had a share of 70.98% 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 0.1541, indicating moderate concentration of market power.
- The weighted average price of electricity transacted through trading licensees was ₹3.48/kWh. The weighted average prices of electricity transacted through IEX and PXIL were ₹2.43/kWh and ₹1.97/kWh respectively.
- The average price of electricity transacted through DSM was ₹1.81/kWh.
- Top 5 electricity selling regional entities were Jindal India Thermal Power Ltd., Madhya Pradesh, Diligent Power Private Ltd, Infrastructure Leasing & Financial Services Limited and Jindal Power Ltd. Top 5 electricity purchasing regional entities were Bihar, Rajasthan, Telangana, Tamil Nadu and Uttar Pradesh.
- The volume of electricity that could not be cleared in IEX and PXIL due to congestion was 3.03% and (-)1.86% of the unconstrained cleared volume respectively. In terms of time, congestion occurred was 52.72% in IEX and 5.38% in PXIL.
- In November 2016, 77.54% of the bilateral contracts were executed for duration of up to one week, 21.74% of the contracts were executed for duration of more than a week and up to one month, and 0.72% of the contracts were executed for more than three months and upto 12 months.

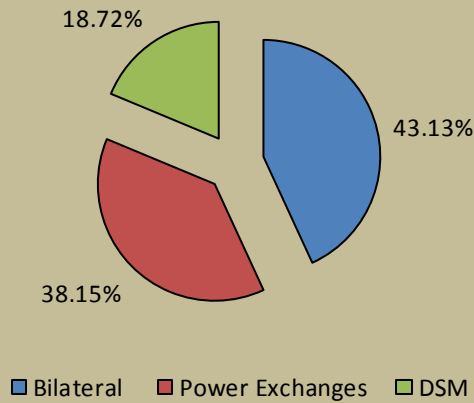
- The forward prices for the period from 15<sup>th</sup> November to 31<sup>st</sup> December, 2016 are relatively higher for the contracts executed in November, 2016 compared to the contracts executed in October, 2016.
- The market clearing volume of solar RECs transacted on IEX and PXIL were 19932 and 15676 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 157273 and 98048 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), OCTOBER 2016**

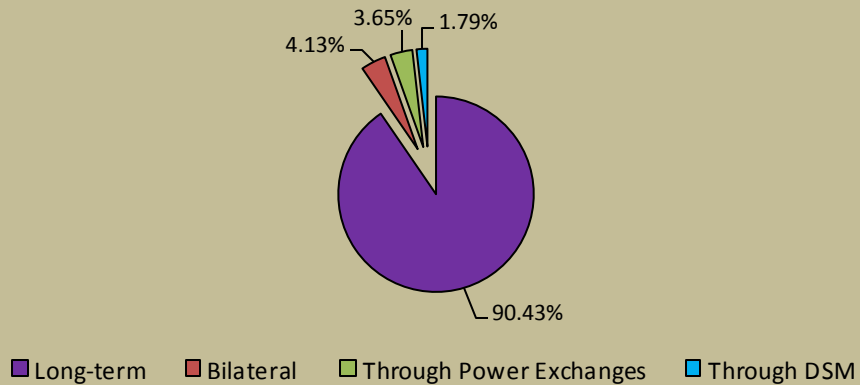
Sr.No	Short-term transactions	Volume (MUs)	% to Volume of short-term transactions	% to Total Generation
1	Bilateral	4115.68	43.13	4.13
	(i) Through Traders and PXs	2320.37	24.32	2.33
	(ii) Direct	1795.31	18.81	1.80
2	Through Power Exchanges	3640.06	38.15	3.65
	(i) IEX	3609.46	37.83	3.62
	(ii) PXIL	30.59	0.32	0.031
3	Through DSM	1786.77	18.72	1.79
	<b>Total</b>	<b>9542.51</b>	-	<b>9.57</b>
	<b>Total Generation</b>	<b>99706.83</b>	-	-

Source: NLDC

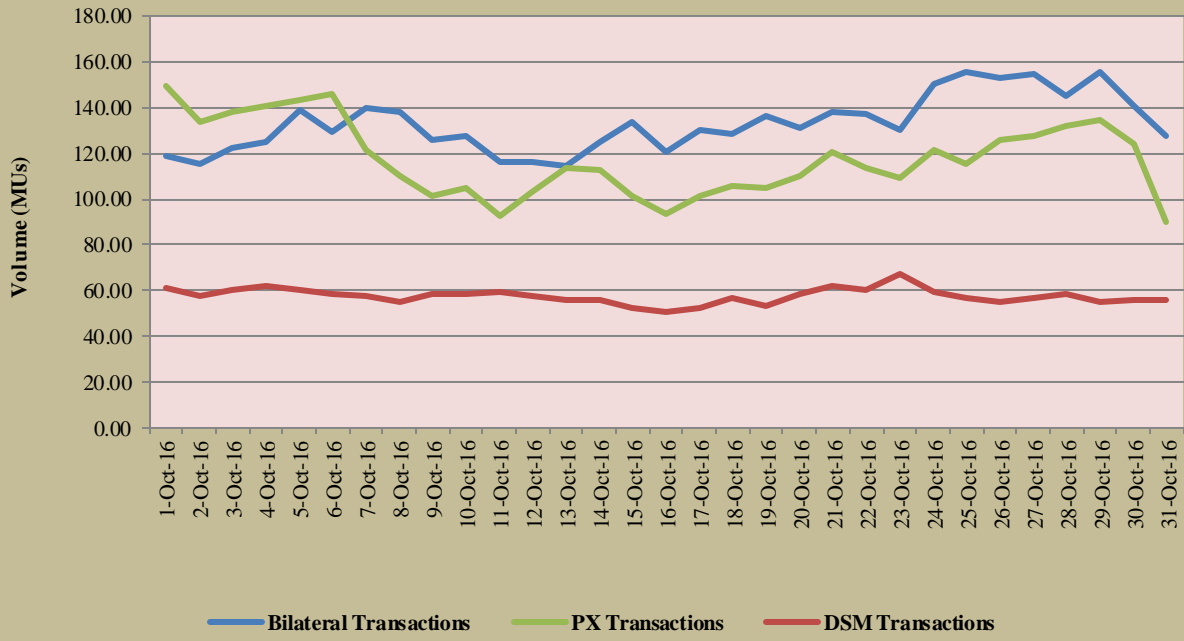
**Figure-1: Volume of Short-term Transactions of Electricity, October 2016**



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



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



<b>Table-2: PERCENTAGE SHARE OF ELECTRICITY TRANSACTED BY TRADING LICENSEES, OCTOBER 2016</b>			
<b>Sr.No</b>	<b>Name of the Trading Licensee</b>	<b>% Share in total Volume transacted by Trading Licensees</b>	<b>Herfindahl-Hirschman Index</b>
1	PTC India Ltd.	32.15	0.1034
2	Tata Power Trading Company (P) Ltd.	12.06	0.0145
3	Mittal Processors (P) Ltd.	10.94	0.0120
4	Manikaran Power Ltd.	8.71	0.0076
5	Arunachal Pradesh Power Corporation(P) ltd	7.12	0.0051
6	Adani Enterprises Ltd.	6.41	0.0041
7	JSW Power Trading Company Ltd	5.60	0.0031
8	NTPC Vidyut Vyapar Nigam Ltd.	4.21	0.0018
9	GMR Energy Trading Ltd.	3.89	0.0015
10	Knowledge Infrastructure Systems (P) Ltd	1.62	0.0003
11	Jaiprakash Associates Ltd.	1.60	0.0003
12	National Energy Trading & Services Ltd.	1.32	0.0002
13	RPG Power Trading Company Ltd.	1.08	0.0001
14	Instinct Infra & Power Ltd.	0.70	0.0001
15	SN Power Markets Pvt. Ltd.	0.69	0.0000
16	Shree Cement Ltd.	0.40	0.0000
17	Gita Power & Infrastructure Private Limited	0.39	0.0000
18	Customized Energy Solutions India (P) Ltd.	0.32	0.0000
19	Essar Electric Power Development Corp. Ltd.	0.30	0.0000
20	My Home Power Private Ltd.	0.25	0.0000
21	Ambitious Power Trading Company Ltd.	0.13	0.0000
22	Phillip Commodities India (P) Ltd.	0.12	0.0000
<b>TOTAL</b>		<b>100.00%</b>	<b>0.1541</b>
<b>Top 5 trading licensees</b>		<b>70.98%</b>	
<i>Note 1: Volume of electricity transacted by the trading licensees includes bilateral transactions (inter-state &amp; 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>			

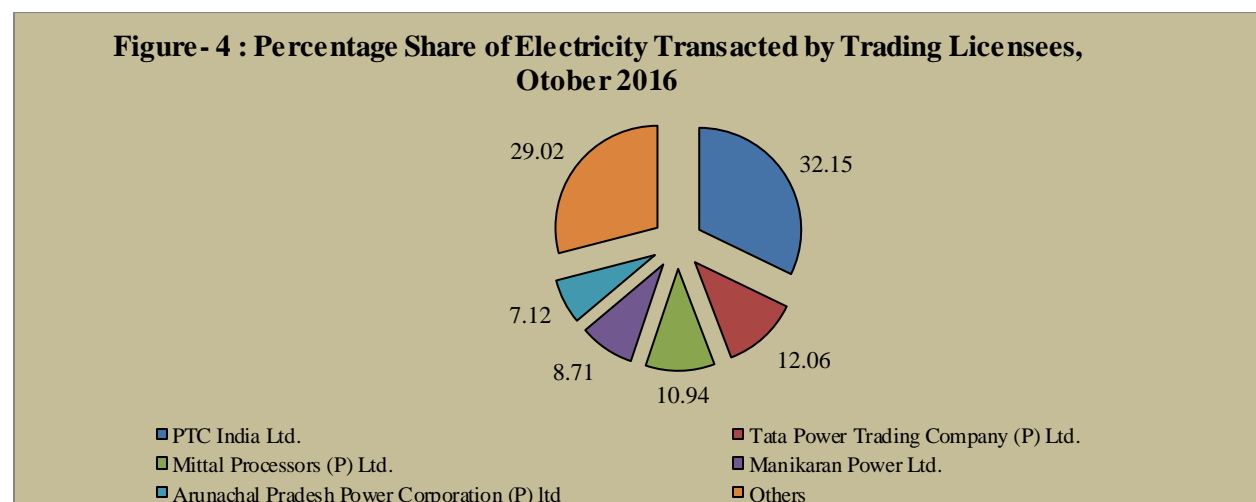




Table-3: PRICE OF ELECTRICITY TRANSACTED THROUGH TRADERS, OCTOBER 2016		
Sr.No	Item	Sale Price of Traders (₹/kWh)
1	Minimum	0.02
2	Maximum	5.59
3	Weighted Average	3.48

Source: Information submitted by trading licensees

Table-4: PRICE OF ELECTRICITY TRANSACTED THROUGH TRADERS (TIME-WISE), OCTOBER 2016		
Sr.No	Period of Trade	Sale Price of Traders (₹/kWh)
1	RTC	3.64
2	PEAK	3.15
3	OFF PEAK	3.05

Source: Information submitted by trading licensees

Table-5: PRICE OF ELECTRICITY TRANSACTED THROUGH POWER EXCHANGES, OCTOBER 2016			
Sr.No	ACP	Price in IEX (₹/kWh)	Price in PXIL (₹/kWh)
1	Minimum	1.10	0.75
2	Maximum	4.35	4.85
3	Weighted Average	2.43	1.97

Source: Information submitted by IEX and PXIL

Table-6: VOLUME AND PRICE OF ELECTRICITY IN TERM AHEAD MARKET OF IEX, OCTOBER 2016			
Sr.No	Term ahead contracts	Actual Scheduled Volume (MUs)	Weighted Average Price (₹/kWh)
1	Intra-Day Contracts	18.85	3.16
2	Day Ahead Contingency Contracts	20.81	3.06
3	Daily Contracts	4.80	1.58
4	Weekly Contracts	48.72	3.21
	<b>Total</b>	<b>93.18</b>	<b>3.08</b>

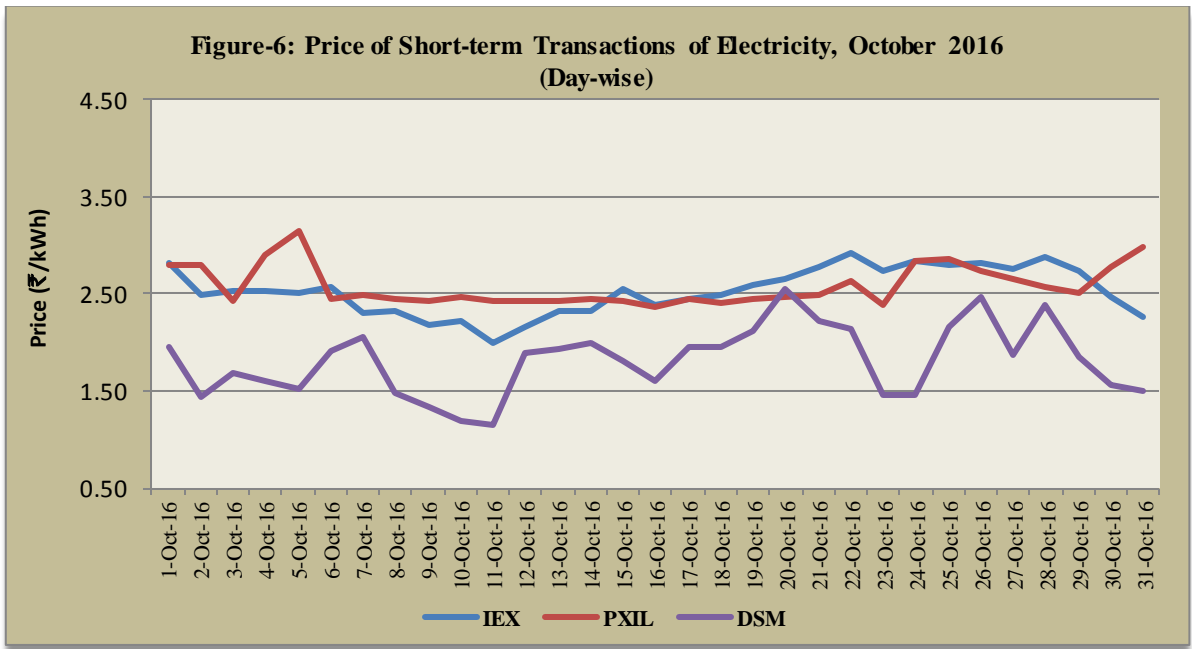
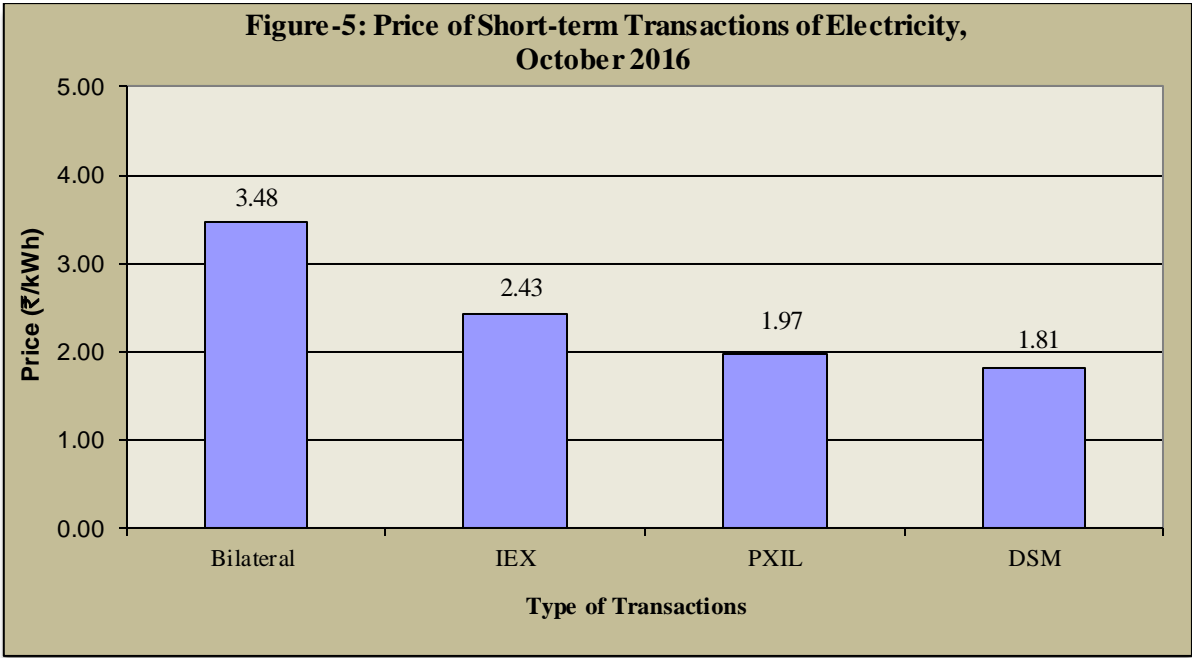
Source: IEX

Table-7: VOLUME AND PRICE OF ELECTRICITY IN TERM AHEAD MARKET OF PXIL, OCTOBER 2016			
Sr.No	Term ahead contracts	Actual Scheduled Volume (MUs)	Weighted Average Price (₹/kWh)
1	Intra-Day Contracts	15.09	3.12
2	Daily Contracts	3.09	2.91
3	Weekly Contracts	0.12	3.00
	<b>Total</b>	<b>18.30</b>	<b>3.08</b>

Source: PXIL

Table-8: PRICE OF ELECTRICITY TRANSACTED THROUGH DSM, OCTOBER 2016		
Sr.No	Item	Price in All India Grid (₹/kWh)
1	Minimum	0.00
2	Maximum	5.32
3	Average	1.81

Source: NLDC



**Table-9: VOLUME OF ELECTRICITY SOLD THROUGH BILATERAL,  
OCTOBER 2016**

<b>Name of the Entity</b>	<b>Volume of Sale (MUs)</b>	<b>% of Volume</b>
CHHATTISGARH	409.04	9.68
ILF&S	406.47	9.62
DB POWER	331.32	7.84
HARYANA	294.53	6.97
JAYPEE NIGRIE	239.75	5.67
JITPL	224.93	5.32
GMR KAMALANGA	219.01	5.18
ESSAR POWER	197.15	4.67
WEST BENGAL	195.29	4.62
GUJARAT	187.40	4.43
COASTGEN	185.96	4.40
JINDAL POWER	145.81	3.45
UTTAR PRADESH	114.79	2.72
HIMACHAL PRADESH	104.88	2.48
MP	88.76	2.10
ODISHA	83.93	1.99
ADHUNIK POWER LTD	78.04	1.85
LANKO KONDAPALLI	74.96	1.77
MARUTI COAL	61.67	1.46
DVC	58.04	1.37
MEENAKSHI	42.43	1.00
BALCO	40.95	0.97
PUNJAB	39.57	0.94
MEGHALAYA	36.36	0.86
ACBIL	34.82	0.82
SIMHAPURI	31.00	0.73
ANDHRA PRADESH	29.67	0.70
J & K	26.67	0.63
RAJASTHAN	25.12	0.59
DHARIWAL POWER	24.51	0.58
THERMAL POWERTECH	21.42	0.51
TAMIL NADU	20.54	0.49
SHREE CEMENT	20.32	0.48
DELHI	17.00	0.40
JINDAL STAGE-II	15.29	0.36
SPECTRUM	15.28	0.36
KARNATAKA	14.20	0.34
MAHARASHTRA	10.68	0.25
LANKO_AMK	9.10	0.22
TELANGANA	8.51	0.20
GMR CHATTISGARH	8.21	0.19
MANIPUR	7.23	0.17
SIKKIM	6.20	0.15
TRN ENERGY	4.63	0.11
AD HYDRO	3.21	0.08
UTTARAKHAND	2.59	0.06
NAGALAND	2.50	0.06
ASSAM	2.13	0.05
GOA	1.52	0.04
DAGACHU	0.86	0.02
TRIPURA	0.84	0.02
<b>TOTAL</b>	<b>4226.00</b>	<b>100.00</b>
<b>Volume Sold by top 5 Regional Entities</b>	<b>1681.11</b>	<b>39.78</b>

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

<b>Name of the Entity</b>	<b>Volume of Purchase (MUs)</b>	<b>% of Volume</b>
CHHATTISGARH	615.22	14.95
TAMIL NADU	449.27	10.92
MAHARASHTRA	447.69	10.88
HARYANA	443.22	10.77
BIHAR	351.46	8.54
UTTAR PRADESH	325.31	7.90
TELANGANA	240.57	5.85
ESSAR STEEL	186.50	4.53
BANGLADESH	171.02	4.16
PUNJAB	125.36	3.05
MP	106.59	2.59
HIMACHAL PRADESH	105.60	2.57
J & K	97.53	2.37
GUJARAT	78.24	1.90
JHARKHAND	71.74	1.74
ODISHA	68.60	1.67
DELHI	61.07	1.48
ANDHRA PRADESH	58.55	1.42
WEST BENGAL	47.24	1.15
UTTARAKHAND	18.90	0.46
ASSAM	16.58	0.40
DAMAN AND DIU	12.40	0.30
GOA	5.46	0.13
MANIPUR	3.51	0.09
KERALA	2.95	0.07
NEPAL(NVVN)	1.83	0.04
RAJASTHAN	1.31	0.03
TRIPURA	0.95	0.02
MEGHALAYA	0.69	0.02
KARNATAKA	0.25	0.01
ARUNACHAL PRADESH	0.07	0.00
<b>TOTAL</b>	<b>4115.68</b>	<b>100.00</b>
<b>Volume Purchased by top 5 Regional Entities</b>	<b>2306.86</b>	<b>56.05</b>

<b>Table-11: VOLUME OF ELECTRICITY SOLD THROUGH POWER EXCHANGES, OCTOBER 2016</b>		
<b>Name of the Entity</b>	<b>Volume of Sale (MUs)</b>	<b>% of Volume</b>
MP	471.56	12.96
JITPL	352.23	9.68
GUJARAT	311.87	8.57
JINDAL POWER	186.26	5.12
HIMACHAL PRADESH	161.29	4.43
KARCHAM WANGTOO	134.00	3.68
TRN ENERGY	133.03	3.65
DB POWER	115.77	3.18
HARYANA	115.67	3.18
ODISHA	107.30	2.95
MAHARASHTRA	103.05	2.83
SIMHAPURI	102.89	2.83
KARNATAKA	101.64	2.79
JAYPEE NIGRIE	91.30	2.51
ASSAM	74.83	2.06
MARUTI COAL	65.26	1.79
JORETHANG	60.58	1.66
DELHI	59.91	1.65
CHUZACHEN HEP	57.00	1.57
NTPC STATIONS(WR)	55.65	1.53
NEEPCO STATIONS	52.86	1.45
TELANGANA	46.04	1.26
SIKKIM	43.41	1.19
UTTAR PRADESH	40.98	1.13
CHHATTISGARH	35.15	0.97
MEENAKSHI	30.86	0.85
MANIPUR	30.36	0.83
DCPP	29.96	0.82
DVC	29.23	0.80
TRIPURA	29.03	0.80
AD HYDRO	27.80	0.76
DHARIWAL POWER	25.65	0.70
PUNJAB	24.57	0.67
ACBIL	24.00	0.66
ILF&S	22.79	0.63
THERMAL POWERTECH	21.13	0.58
RAJASTHAN	20.91	0.57
WEST BENGAL	20.20	0.55
KORBA WEST POWER	19.25	0.53
TAMIL NADU	17.32	0.48
MIZORAM	15.44	0.42
NLC	14.95	0.41

EMCO	14.29	0.39
SHREE CEMENT	13.86	0.38
NSPCL	13.27	0.36
SPECTRUM	12.94	0.36
ANDHRA PRADESH	11.88	0.33
ADHUNIK POWER LTD	11.80	0.32
NJPC	11.03	0.30
J & K	8.98	0.25
GOA	8.40	0.23
MB POWER	6.72	0.18
BALCO	6.05	0.17
GMR KAMALANGA	4.79	0.13
NAGALAND	4.23	0.12
KERALA	3.83	0.11
NTPC STATIONS(NR)	3.77	0.10
NTPC STATIONS(ER)	3.50	0.10
ONGC PALATANA	2.73	0.08
MALANA	2.61	0.07
UTTARAKHAND	2.41	0.07
COASTGEN	2.29	0.06
ARUNACHAL PRADESH	1.97	0.05
LANCO BUDHIL	1.89	0.05
JINDAL STAGE-II	1.40	0.04
CHANDIGARH	1.24	0.03
NTPC STATIONS (SR)	0.58	0.02
ESSAR POWER	0.45	0.01
<b>TOTAL</b>	<b>3639.85</b>	<b>100.00</b>
<b>Volume sold by top 5 Regional Entities</b>	<b>1483.21</b>	<b>40.75</b>

**Table-12: VOLUME OF ELECTRICITY PURCHASED THROUGH POWER EXCHANGES,  
OCTOBER 2016**

<b>Name of the Entity</b>	<b>Volume of Purchase (MUs)</b>	<b>% of Volume</b>
GUJARAT	462.08	12.69
RAJASTHAN	455.07	12.50
KARNATAKA	299.21	8.22
TELANGANA	255.79	7.03
UTTAR PRADESH	250.99	6.90
DADRA & NAGAR HAVELI	243.37	6.69
HARYANA	241.44	6.63
WEST BENGAL	232.36	6.38
UTTARAKHAND	219.51	6.03
ANDHRA PRADESH	218.72	6.01
BIHAR	147.77	4.06
KERALA	102.00	2.80
DELHI	85.92	2.36
J & K	63.75	1.75
ESSAR STEEL	58.33	1.60
DAMAN AND DIU	42.38	1.16
ASSAM	41.17	1.13
MP	38.24	1.05
ODISHA	34.48	0.95
HIMACHAL PRADESH	33.68	0.93
MAHARASHTRA	30.83	0.85
TAMIL NADU	18.64	0.51
PUNJAB	18.28	0.50
GOA	12.61	0.35
MEGHALAYA	9.21	0.25
CHANDIGARH	8.62	0.24
DVC	6.28	0.17
PONDICHERRY	4.88	0.13
TRIPURA	2.17	0.06
NAGALAND	1.85	0.05
CHHATTISGARH	0.44	0.01
<b>TOTAL</b>	<b>3640.06</b>	<b>100.00</b>
<b>Volume purchased by top 5 Regional Entities</b>	<b>1723.14</b>	<b>47.34</b>

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

<b>Name of the Entity</b>	<b>Volume of Under drawal (MUs)</b>	<b>% of Volume</b>
NTPC STATIONS(WR)	152.26	8.84
UTTAR PRADESH	148.66	8.63
GUJARAT	113.85	6.61
MP	109.15	6.34
TAMIL NADU	98.69	5.73
PUNJAB	79.70	4.63
MAHARASHTRA	75.45	4.38
BIHAR	71.22	4.13
HARYANA	67.27	3.91
NHPC STATIONS(NR)	66.55	3.86
CHHATTISGARH	61.72	3.58
SASAN UMPP	45.11	2.62
NTPC STATIONS (NR)	35.52	2.06
ODISHA	34.20	1.99
RAJASTHAN	30.88	1.79
TELANGANA	30.10	1.75
WEST BENGAL	28.20	1.64
NLC	24.96	1.45
DVC	24.11	1.40
DELHI	22.42	1.30
UTTARAKHAND	20.12	1.17
NEEPCO STATIONS	19.53	1.13
NTPC STATIONS(ER)	18.77	1.09
ESSAR STEEL	18.35	1.07
KARNATAKA	17.13	0.99
HIMACHAL PRADESH	16.75	0.97
JITPL	15.97	0.93
GMR KAMALANGA	11.76	0.68
JINDAL STAGE-II	11.53	0.67
JINDAL POWER	11.19	0.65
ANDHRA PRADESH	10.93	0.63
LANKO_AMK	10.90	0.63
DADRA & NAGAR HAVELI	10.59	0.61
NSPCL	10.17	0.59
SIKKIM	10.01	0.58
JHARKHAND	9.94	0.58
NTPC STATIONS (SR)	9.06	0.53
MANIPUR	8.51	0.49
THERMAL POWERTECH	7.63	0.44
GOA	7.42	0.43
TEESTA HEP	6.94	0.40
MAITHON POWER LTD	6.90	0.40
PONDICHERRY	6.75	0.39
NJPC	6.70	0.39
BANGLADESH	6.67	0.39
ARUNACHAL PRADESH	6.60	0.38
DB POWER	6.14	0.36
EMCO	5.76	0.33
JAYPEE NIGRIE	5.62	0.33
RGPPL(DABHOL)	5.40	0.31
ASSAM	5.06	0.29



ACBIL	4.82	0.28
KARCHAM WANGTOO	4.71	0.27
CGPL(COASTAL GUJARAT POWER LTD)	4.62	0.27
NAGALAND	3.81	0.22
ILF&S	3.70	0.21
GOA	3.55	0.21
MEGHALAYA	3.50	0.20
CHUZACHEN HEP	3.47	0.20
KSK MAHANADI	3.20	0.19
JORETHANG	3.09	0.18
URI-2	3.06	0.18
DCPP	2.86	0.17
DAMAN AND DIU	2.78	0.16
AD HYDRO	2.75	0.16
KERALA	2.59	0.15
RANGIT HEP	2.27	0.13
MB POWER	2.17	0.13
COASTGEN	2.07	0.12
TRN ENERGY	2.06	0.12
CHANDIGARH	1.99	0.12
ADHUNIK POWER LTD	1.90	0.11
SIMHAPURI	1.71	0.10
SHREE CEMENT	1.68	0.10
MIZORAM	1.50	0.09
TRIPURA	1.27	0.07
ESSAR POWER	1.18	0.07
DAGACHU	1.08	0.06
BALCO	1.02	0.06
DHARIWAL POWER	0.97	0.06
LANCO BUDHIL	0.85	0.05
MEENAKSHI	0.84	0.05
LOKTAK	0.68	0.04
<b>Total</b>	<b>1722.57</b>	<b>100.00</b>
<b>Volume Exported by top 5 Regional Entities</b>	<b>1513.54</b>	<b>87.86</b>

<b>Table-14: VOLUME OF ELECTRICITY OVER DRAWAL (IMPORTED) THROUGH DSM, OCTOBER 2016</b>		
<b>Name of the Entity</b>	<b>Volume of Over drawal (MUs)</b>	<b>% of Volume</b>
KARNATAKA	139.21	8.25
NTPC STATIONS(NR)	116.86	6.93
UTTAR PRADESH	102.67	6.09
RAJASTHAN	81.37	4.82
ANDHRA PRADESH	78.73	4.67
NTPC STATIONS(WR)	75.56	4.48
KERALA	70.33	4.17
ASSAM	59.33	3.52
NTPC STATIONS(ER)	58.57	3.47
MAHARASHTRA	52.26	3.10
TAMIL NADU	50.30	2.98
WEST BENGAL	39.86	2.36
HARYANA	39.03	2.31
UTTARAKHAND	35.78	2.12
BIHAR	35.09	2.08
TELANGANA	34.17	2.03
JHARKHAND	33.80	2.00
PUNJAB	33.44	1.98
DVC	32.54	1.93
HIMACHAL PRADESH	32.42	1.92
DELHI	32.22	1.91
NTPC STATIONS (SR)	31.47	1.87
TRIPURA	28.92	1.71
ESSAR STEEL	26.66	1.58
ODISHA	22.65	1.34
CGPL	20.71	1.23
GUJARAT	20.28	1.20
BALCO	18.71	1.11
NLC	17.45	1.03
GOA	15.92	0.94
MEGHALAYA	15.61	0.93
CHHATTISGARH	14.10	0.84
CHANDIGARH	11.50	0.68
GOA	11.45	0.68
TRN ENERGY	11.33	0.67
MP	11.17	0.66
EMCO	10.87	0.64
GMR KAMALANGA	10.66	0.63
ACBIL	8.55	0.51
JITPL	8.52	0.50
DAMAN AND DIU	7.65	0.45
ESSAR POWER	7.56	0.45
NHPC STATIONS(NR)	7.36	0.44
JINDAL STAGE-II	5.84	0.35
ARUNACHAL PRADESH	5.18	0.31
COASTGEN	5.12	0.30

STERLITE	4.93	0.29
NEEPCO STATIONS	4.92	0.29
NJPC	4.74	0.28
JORETHANG	4.49	0.27
MIZORAM	4.46	0.26
ILF&S	4.05	0.24
NAGALAND	3.89	0.23
DAGACHU	3.79	0.22
JINDAL POWER	3.31	0.20
MB POWER	3.29	0.19
DCPP	3.18	0.19
SHREE CEMENT	3.03	0.18
MAITHON POWER LTD	3.02	0.18
KORBA WEST POWER	2.97	0.18
NSPCL	2.92	0.17
LANCO BUDHIL	2.86	0.17
PONDICHERRY	2.82	0.17
BANGLADESH	2.82	0.17
ADHUNIK POWER LTD	2.69	0.16
JAYPEE NIGRIE	2.65	0.16
MANIPUR	2.29	0.14
DADRA & NAGAR HAVELI	1.96	0.12
SASAN UMPP	1.93	0.11
JHABUA POWER_MP	1.91	0.11
DB POWER	1.66	0.10
LANKO KONDAPALLI	1.66	0.10
KARCHAM WANGTOO	1.55	0.09
GMR CHATTISGARH	1.48	0.09
RGPPPL(DABHOL)	1.43	0.08
SIKKIM	1.33	0.08
THERMAL POWERTECH	1.23	0.07
SPECTRUM	1.21	0.07
URI-2	1.12	0.07
DGEN MEGA POWER	1.04	0.06
CHUZACHEN HEP	1.01	0.06
MEENAKSHI	0.85	0.05
MALANA	0.67	0.04
AD HYDRO	0.62	0.04
KSK MAHANADI	0.59	0.04
LANKO_AMK	0.55	0.03
DHARIWAL POWER	0.48	0.03
LOKTAK	0.41	0.02
<b>TOTAL</b>	<b>1686.97</b>	<b>100.00</b>
<b>Volume Imported by top 5 Regional Entities</b>	<b>518.84</b>	<b>30.76</b>

<b>Table-15: TOTAL VOLUME OF NET SHORT-TERM TRANSACTIONS OF ELECTRICITY (REGIONAL ENTITY-WISE), OCTOBER 2016</b>		
<b>Sr.No.</b>	<b>Name of the Entity</b>	<b>Total volume of net short-term transactions of electricity*</b>
1	BIHAR	463.10
2	RAJASTHAN	460.85
3	TELANGANA	445.89
4	TAMIL NADU	381.65
5	UTTAR PRADESH	374.54
6	MAHARASHTRA	341.59
7	KARNATAKA	305.69
8	ANDHRA PRADESH	303.51
9	ESSAR STEEL	253.13
10	UTTARAKHAND	249.07
11	HARYANA	246.23
12	DADRA & NAGAR HAVELI	234.74
13	KERALA	168.86
14	BANGLADESH	167.17
15	J & K	125.63
16	CHHATTISGARH	123.83
17	JHARKHAND	95.60
18	DELHI	79.89
19	NTPC STATIONS(NR)	77.57
20	WEST BENGAL	75.78
21	DAMAN AND DIU	59.66
22	NTPC STATIONS(ER)	36.30
23	ASSAM	35.05
24	PUNJAB	33.25
25	NTPC STATIONS (SR)	21.83
26	CHANDIGARH	16.88
27	GOA	16.64
28	CGPL	16.09
29	GOA	7.90
30	STERLITE	4.82
31	NEPAL(NVVN)	1.91
32	JHABUA POWER_MP	1.91
33	DAGACHU	1.85
34	DGEN MEGA POWER	1.04
35	PONDICHERRY	0.96
36	TRIPURA	0.90
37	URI-2	-1.95
38	RANGIT HEP	-2.08
39	MALANA	-2.24
40	KSK MAHANADI	-2.61
41	ONGC PALATANA	-2.73
42	ARUNACHAL PRADESH	-3.38
43	MAITHON POWER LTD	-3.88
44	RGPPPL(DABHOL)	-3.98
45	NAGALAND	-4.79

46	MB POWER	-5.60
47	GMR CHATTISGARH	-6.73
48	TEESTA HEP	-6.92
49	EMCO	-9.19
50	MIZORAM	-12.48
51	NJPC	-12.99
52	MEGHALAYA	-14.35
53	KORBA WEST POWER	-16.92
54	LANKO_AMK	-19.45
55	NSPCL	-20.52
56	JINDAL STAGE-II	-22.38
57	NLC	-22.46
58	SPECTRUM	-27.01
59	BALCO	-29.30
60	DCPP	-29.65
61	SHREE CEMENT	-32.83
62	AD HYDRO	-33.14
63	MANIPUR	-40.29
64	SASAN UMPP	-43.18
65	THERMAL POWERTECH	-48.95
66	DHARIWAL POWER	-50.65
67	GUJARAT	-52.50
68	ACBIL	-55.09
69	SIKKIM	-58.29
70	JORETHANG	-59.18
71	NHPC STATIONS(NR)	-59.18
72	CHUZACHEN HEP	-59.45
73	NEEPCO STATIONS	-67.48
74	DVC	-72.56
75	MEENAKSHI	-73.28
76	LANKO KONDAPALLI	-73.40
77	ADHUNIK POWER LTD	-89.05
78	ODISHA	-99.69
79	HIMACHAL PRADESH	-111.22
80	MARUTI COAL	-126.93
81	TRN ENERGY	-128.39
82	NTPC STATIONS(WR)	-132.35
83	SIMHAPURI	-135.21
84	KARCHAM WANGTOO	-137.47
85	COASTGEN	-185.20
86	ESSAR POWER	-191.22
87	GMR KAMALANGA	-224.89
88	JAYPEE NIGRIE	-334.02
89	JINDAL POWER	-339.96
90	ILF&S	-428.91
91	DB POWER	-451.57
92	MP	-513.46
93	JITPL	-584.62

\* 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

<b>Table-16: DETAILS OF CONGESTION IN POWER EXCHANGES, OCTOBER 2016</b>			
	<b>Details of Congestion</b>	<b>IEX</b>	<b>PXIL</b>
A	Unconstrained Cleared Volume* (MUs)	3722.30	30.03
B	Actual Cleared Volume and hence scheduled # (MUs)	3609.46	30.59
C	Volume of electricity that could not be cleared and hence not scheduled because of congestion (MUs) (A-B)	112.84	-0.56
D	Volume of electricity that could not be cleared as % to Unconstrained Cleared Volume	3.03%	-1.86%
E	Percentage of the time congestion occurred during the month (Number of hours congestion occurred/Total number of hours in the month)	52.72%	5.38%
F	Congestion occurrence (%) time block wise		
	0.00 - 6.00 hours	20.28%	15.00%
	6.00 - 12.00 hours	28.81%	21.88%
	12.00 - 18.00 hours	29.48%	36.88%
	18.00 - 24.00 hours	21.42%	26.25%
<i>* This power would have been scheduled had there been no congestion.</i>			
<i># In some instances, after market splitting the Actual Cleared Volume can be greater than the Unconstrained Cleared Volume.</i>			
<i>Source: IEX &amp; PXIL &amp; NLDC</i>			

<b>Table-17: VOLUME OF SHORT-TERM TRANSACTIONS OF ELECTRICITY IN INDIA (DAY-WISE) (MUs), OCTOBER 2016</b>						
<b>Date</b>	<b>Bilateral</b>		<b>Power Exchange (Area Clearing Volume# of Day Ahead Market)</b>		<b>Deviation Settlement (Over Drawl+Under Generation)</b>	<b>Total Electricity Generation (MU) as given at CEA Website*</b>
	<b>Through Traders and PXs**</b>	<b>Direct</b>	<b>IEX</b>	<b>PXIL</b>		
1-Oct-16	67.91	51.04	141.97	7.43	61.52	3233.31
2-Oct-16	66.96	48.18	132.35	1.23	57.79	3150.85
3-Oct-16	75.51	46.74	137.63	0.26	60.60	3302.65
4-Oct-16	76.00	48.74	139.59	0.71	61.78	3309.48
5-Oct-16	78.14	60.25	142.73	0.73	60.11	3242.70
6-Oct-16	69.07	60.48	144.65	0.71	58.47	3230.65
7-Oct-16	76.71	62.84	120.34	0.78	57.85	3269.18
8-Oct-16	78.23	59.28	109.89	0.47	54.95	3175.93
9-Oct-16	68.71	56.96	101.06	0.18	59.04	3045.37
10-Oct-16	70.65	56.96	104.42	0.62	58.21	3054.10
11-Oct-16	64.87	51.10	92.17	0.44	59.10	2938.78
12-Oct-16	59.96	55.91	102.59	0.42	58.04	3068.74
13-Oct-16	65.71	49.00	113.44	0.45	55.74	3173.92
14-Oct-16	68.14	56.71	112.02	0.49	55.63	3220.09
15-Oct-16	71.72	61.90	100.59	0.48	52.70	3259.04
16-Oct-16	69.12	51.26	93.67	0.12	50.74	3165.80
17-Oct-16	74.60	55.53	101.21	0.33	52.20	3289.40
18-Oct-16	71.54	57.11	104.18	1.38	57.19	3307.37
19-Oct-16	78.22	57.72	104.53	0.34	53.61	3334.32
20-Oct-16	80.02	51.04	109.87	0.31	58.34	3327.09
21-Oct-16	78.08	59.49	117.57	2.70	61.71	3339.94
22-Oct-16	77.32	60.18	110.98	2.56	60.40	3292.42
23-Oct-16	69.18	60.73	109.44	0.12	67.35	3203.86
24-Oct-16	83.16	66.62	120.21	1.03	59.74	3288.13
25-Oct-16	92.59	62.89	114.91	0.37	56.53	3339.95
26-Oct-16	86.37	65.96	125.23	0.45	54.74	3364.02
27-Oct-16	85.68	68.42	126.32	1.56	56.94	3321.15
28-Oct-16	77.62	67.00	130.48	1.46	58.51	3281.90
29-Oct-16	86.89	68.12	132.80	1.37	55.10	3185.60
30-Oct-16	79.99	60.92	123.56	0.56	56.25	3032.31
31-Oct-16	71.69	56.21	89.07	0.54	55.88	2958.78
<b>Total</b>	<b>2320.37</b>	<b>1795.31</b>	<b>3609.46</b>	<b>30.59</b>	<b>1786.77</b>	<b>99706.83</b>

Source: NLDC

\* Gross Electricity Generation excluding electricity generation from renewables 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),  
OCTOBER, 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-Oct-16	2.35	4.00	2.81	2.27	4.85	2.80	0.00	3.45	1.96
2-Oct-16	1.84	3.56	2.49	1.80	4.00	2.79	0.00	3.03	1.45
3-Oct-16	2.21	3.80	2.54	0.75	3.93	2.43	0.00	3.45	1.69
4-Oct-16	2.12	3.56	2.54	2.70	3.92	2.89	0.00	3.45	1.61
5-Oct-16	2.03	3.65	2.50	2.82	3.16	3.15	0.00	3.45	1.52
6-Oct-16	2.06	4.00	2.57	2.45	2.45	2.45	0.00	3.45	1.92
7-Oct-16	2.06	2.97	2.30	2.45	3.02	2.49	0.00	3.45	2.05
8-Oct-16	1.89	2.70	2.32	2.45	2.45	2.45	0.00	3.03	1.48
9-Oct-16	1.89	2.59	2.18	2.29	2.45	2.42	0.00	3.24	1.33
10-Oct-16	1.92	2.90	2.21	2.19	2.82	2.46	0.00	3.45	1.20
11-Oct-16	1.86	3.15	2.00	2.12	2.49	2.43	0.00	2.82	1.15
12-Oct-16	1.89	3.00	2.16	2.22	2.45	2.43	0.00	3.45	1.90
13-Oct-16	1.93	2.67	2.31	2.22	2.45	2.42	0.00	3.45	1.93
14-Oct-16	1.99	3.15	2.33	2.22	2.45	2.45	0.00	3.45	1.99
15-Oct-16	2.20	3.30	2.54	2.22	2.45	2.43	0.00	3.45	1.81
16-Oct-16	2.10	2.88	2.38	2.09	2.48	2.37	0.00	2.82	1.61
17-Oct-16	2.04	3.54	2.44	2.19	2.48	2.44	0.00	4.91	1.96
18-Oct-16	2.20	3.80	2.49	2.18	2.91	2.41	0.00	3.45	1.96
19-Oct-16	2.15	3.52	2.60	2.19	2.48	2.45	0.00	3.45	2.12
20-Oct-16	2.15	4.21	2.66	2.29	2.50	2.46	1.07	5.32	2.55
21-Oct-16	2.29	3.72	2.78	2.18	3.15	2.49	0.00	5.32	2.22
22-Oct-16	2.24	4.20	2.92	2.19	3.01	2.63	0.00	3.45	2.13
23-Oct-16	2.20	4.30	2.74	2.22	3.01	2.39	0.00	3.24	1.45
24-Oct-16	2.30	4.10	2.83	2.29	3.01	2.84	0.00	3.45	1.45
25-Oct-16	2.08	4.20	2.79	2.25	3.01	2.85	0.00	4.91	2.17
26-Oct-16	2.17	4.21	2.82	2.22	3.50	2.73	0.00	5.32	2.48
27-Oct-16	2.11	4.31	2.76	1.97	3.10	2.65	0.00	3.45	1.87
28-Oct-16	2.02	4.35	2.87	2.28	2.89	2.58	0.71	4.91	2.39
29-Oct-16	1.90	3.99	2.73	2.28	3.01	2.50	0.00	3.45	1.86
30-Oct-16	1.90	4.11	2.48	2.25	3.00	2.77	0.00	3.24	1.56
31-Oct-16	1.10	4.31	2.26	2.67	3.00	2.98	0.00	3.24	1.49
	<b>1.10#</b>	<b>4.35#</b>	<b>2.43</b>	<b>0.75#</b>	<b>4.85#</b>	<b>1.97</b>	<b>0.00#</b>	<b>5.32#</b>	<b>1.81</b>

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), OCTOBER 2016**

Name of the Entity	Through Bilateral			Through Power Exchange			Through DSM with Regional Grid			Total Net***
	Sale	Purchase	Net**	Sale	Purchase	Net**	Import (Over Drawl)	Export (Under Drawl)	Net**	
PUNJAB	39.57	125.36	85.80	24.57	18.28	-6.28	33.44	79.70	-46.27	33.25
HARYANA	294.53	443.22	148.69	115.67	241.44	125.77	39.03	67.27	-28.24	246.23
RAJASTHAN	25.12	1.31	-23.81	20.91	455.07	434.16	81.37	30.88	50.49	460.85
DELHI	17.00	61.07	44.07	59.91	85.92	26.02	32.22	22.42	9.80	79.89
UTTAR PRADESH	114.79	325.31	210.52	40.98	250.99	210.01	102.67	148.66	-45.99	374.54
UTTARAKHAND	2.59	18.90	16.31	2.41	219.51	217.10	35.78	20.12	15.66	249.07
HIMACHAL PRADESH	104.88	105.60	0.73	161.29	33.68	-127.61	32.42	16.75	15.67	-111.22
J & K	26.67	97.53	70.86	8.98	63.75	54.77	0.00	0.00	0.00	125.63
CHANDIGARH	0.00	0.00	0.00	1.24	8.62	7.38	11.50	1.99	9.51	16.88
MP	88.76	106.59	17.84	471.56	38.24	-433.32	11.17	109.15	-97.98	-513.46
MAHARASHTRA	10.68	447.69	437.00	103.05	30.83	-72.23	52.26	75.45	-23.19	341.59
GUJARAT	187.40	78.24	-109.16	311.87	462.08	150.22	20.28	113.85	-93.56	-52.50
CHHATTISGARH	409.04	615.22	206.18	35.15	0.44	-34.72	14.10	61.72	-47.63	123.83
GOA	1.52	5.46	3.93	8.40	12.61	4.21	15.92	7.42	8.50	16.64
DAMAN AND DIU	0.00	12.40	12.40	0.00	42.38	42.38	7.65	2.78	4.87	59.66
DADRA & NAGAR HAVE	0.00	0.00	0.00	0.00	243.37	243.37	1.96	10.59	-8.63	234.74
ANDHRA PRADESH	29.67	58.55	28.87	11.88	218.72	206.84	78.73	10.93	67.80	303.51
KARNATAKA	14.20	0.25	-13.95	101.64	299.21	197.57	139.21	17.13	122.07	305.69
KERALA	0.00	2.95	2.95	3.83	102.00	98.17	70.33	2.59	67.74	168.86
TAMIL NADU	20.54	449.27	428.72	17.32	18.64	1.32	50.30	98.69	-48.39	381.65
PONDICHERRY	0.00	0.00	0.00	0.00	4.88	4.88	2.82	6.75	-3.92	0.96
GOA	0.00	0.00	0.00	0.00	0.00	0.00	11.45	3.55	7.90	7.90
TELANGANA	8.51	240.57	232.06	46.04	255.79	209.76	34.17	30.10	4.07	445.89
WEST BENGAL	195.29	47.24	-148.05	20.20	232.36	212.17	39.86	28.20	11.66	75.78
ODISHA	83.93	68.60	-15.33	107.30	34.48	-72.82	22.65	34.20	-11.54	-99.69
BIHAR	0.00	351.46	351.46	0.00	147.77	147.77	35.09	71.22	-36.13	463.10
JHARKHAND	0.00	71.74	71.74	0.00	0.00	0.00	33.80	9.94	23.86	95.60
SIKKIM	6.20	0.00	-6.20	43.41	0.00	-43.41	1.33	10.01	-8.68	-58.29
DVC	58.04	0.00	-58.04	29.23	6.28	-22.96	32.54	24.11	8.43	-72.56
ARUNACHAL PRADESH	0.07	0.07	0.00	1.97	0.00	-1.97	5.18	6.60	-1.41	-3.38
ASSAM	2.13	16.58	14.45	74.83	41.17	-33.66	59.33	5.06	54.26	35.05
MANIPUR	7.23	3.51	-3.72	30.36	0.00	-30.36	2.29	8.51	-6.21	-40.29
MEGHALAYA	36.36	0.69	-35.67	0.00	9.21	9.21	15.61	3.50	12.11	-14.35
MIZORAM	0.00	0.00	0.00	15.44	0.00	-15.44	4.46	1.50	2.96	-12.48
NAGALAND	2.50	0.00	-2.50	4.23	1.85	-2.37	3.89	3.81	0.08	-4.79
TRIPURA	0.84	0.95	0.11	29.03	2.17	-26.86	28.92	1.27	27.65	0.90
NTPC STATIONS(NR)	0.00	0.00	0.00	3.77	0.00	-3.77	116.86	35.52	81.34	77.57
NHPC STATIONS(NR)	0.00	0.00	0.00	0.00	0.00	0.00	7.36	66.55	-59.18	-59.18
NJPC	0.00	0.00	0.00	11.03	0.00	-11.03	4.74	6.70	-1.96	-12.99
AD HYDRO	3.21	0.00	-3.21	27.80	0.00	-27.80	0.62	2.75	-2.13	-33.14
KARCHAM WANGTOO	0.32	0.00	-0.32	134.00	0.00	-134.00	1.55	4.71	-3.15	-137.47
SHREE CEMENT	20.32	0.00	-20.32	13.86	0.00	-13.86	3.03	1.68	1.35	-32.83
LANCO BUDHIL	0.00	0.00	0.00	1.89	0.00	-1.89	2.86	0.85	2.01	0.12
MALANA	0.00	0.00	0.00	2.61	0.00	-2.61	0.67	0.29	0.37	-2.24
URI-2	0.00	0.00	0.00	0.00	0.00	0.00	1.12	3.06	-1.95	-1.95

NTPC STATIONS(WR)	0.00	0.00	0.00	55.65	0.00	-55.65	75.56	152.26	-76.71	-132.35
JINDAL POWER	145.81	0.00	-145.81	186.26	0.00	-186.26	3.31	11.19	-7.88	-339.96
LANKO_AMK	9.10	0.00	-9.10	0.00	0.00	0.00	0.55	10.90	-10.34	-19.45
NSPCL	0.00	0.00	0.00	13.27	0.00	-13.27	2.92	10.17	-7.26	-20.52
ACBIL	34.82	0.00	-34.82	24.00	0.00	-24.00	8.55	4.82	3.73	-55.09
BALCO	40.95	0.00	-40.95	6.05	0.00	-6.05	18.71	1.02	17.69	-29.30
RGPPL(DABHOL)	0.00	0.00	0.00	0.00	0.00	0.00	1.43	5.40	-3.98	-3.98
CGPL	0.00	0.00	0.00	0.00	0.00	0.00	20.71	4.62	16.09	16.09
DCPP	0.00	0.00	0.00	29.96	0.00	-29.96	3.18	2.86	0.32	-29.65
EMCO	0.00	0.00	0.00	14.29	0.00	-14.29	10.87	5.76	5.10	-9.19
ESSAR STEEL	0.00	186.50	186.50	0.00	58.33	58.33	26.66	18.35	8.31	253.13
KSK MAHANADI	0.00	0.00	0.00	0.00	0.00	0.00	0.59	3.20	-2.61	-2.61
ESSAR POWER	197.15	0.00	-197.15	0.45	0.00	-0.45	7.56	1.18	6.38	-191.22
JINDAL STAGE-II	15.29	0.00	-15.29	1.40	0.00	-1.40	5.84	11.53	-5.69	-22.38
DB POWER	331.32	0.00	-331.32	115.77	0.00	-115.77	1.66	6.14	-4.49	-451.57
DHARIWAL POWER	24.51	0.00	-24.51	25.65	0.00	-25.65	0.48	0.97	-0.49	-50.65
JAYPEE NIGRIE	239.75	0.00	-239.75	91.30	0.00	-91.30	2.65	5.62	-2.98	-334.02
DGEN MEGA POWER	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	1.04	1.04
GMR CHATTISGARH	8.21	0.00	-8.21	0.00	0.00	0.00	1.48	0.00	1.48	-6.73
KORBA WEST POWER	0.53	0.00	-0.53	19.25	0.00	-19.25	2.97	0.12	2.86	-16.92
MB POWER	0.00	0.00	0.00	6.72	0.00	-6.72	3.29	2.17	1.12	-5.60
MARUTI COAL	61.67	0.00	-61.67	65.26	0.00	-65.26	0.00	0.00	0.00	-126.93
SPECTRUM	15.28	0.00	-15.28	12.94	0.00	-12.94	1.21	0.00	1.21	-27.01
JHABUA POWER_MP	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.00	1.91	1.91
SASAN UMPP	0.00	0.00	0.00	0.00	0.00	0.00	1.93	45.11	-43.18	-43.18
TRN ENERGY	4.63	0.00	-4.63	133.03	0.00	-133.03	11.33	2.06	9.27	-128.39
NTPC STATIONS (SR)	0.00	0.00	0.00	0.58	0.00	-0.58	31.47	9.06	22.41	21.83
LANKO KONDAPALLI	74.96	0.00	-74.96	0.00	0.00	0.00	1.66	0.10	1.56	-73.40
SIMHAPURI	31.00	0.00	-31.00	102.89	0.00	-102.89	0.38	1.71	-1.33	-135.21
MEENAKSHI	42.43	0.00	-42.43	30.86	0.00	-30.86	0.85	0.84	0.01	-73.28
COASTGEN	185.96	0.00	-185.96	2.29	0.00	-2.29	5.12	2.07	3.05	-185.20
THERMAL POWERTECH	21.42	0.00	-21.42	21.13	0.00	-21.13	1.23	7.63	-6.40	-48.95
ILF&S	406.47	0.00	-406.47	22.79	0.00	-22.79	4.05	3.70	0.35	-428.91
NLC	0.00	0.00	0.00	14.95	0.00	-14.95	17.45	24.96	-7.51	-22.46
NTPC STATIONS(ER)	0.00	0.00	0.00	3.50	0.00	-3.50	58.57	18.77	39.80	36.30
STERLITE	0.00	0.00	0.00	0.00	0.00	0.00	4.93	0.11	4.82	4.82
MAITHON POWER LTD	0.00	0.00	0.00	0.00	0.00	0.00	3.02	6.90	-3.88	-3.88
ADHUNIK POWER LTD	78.04	0.00	-78.04	11.80	0.00	-11.80	2.69	1.90	0.79	-89.05
CHUZACHEN HEP	0.00	0.00	0.00	57.00	0.00	-57.00	1.01	3.47	-2.45	-59.45
RANGIT HEP	0.00	0.00	0.00	0.00	0.00	0.00	0.19	2.27	-2.08	-2.08
GMR KAMALANGA	219.01	0.00	-219.01	4.79	0.00	-4.79	10.66	11.76	-1.10	-224.89
JITPL	224.93	0.00	-224.93	352.23	0.00	-352.23	8.52	15.97	-7.46	-584.62
TEESTA HEP	0.00	0.00	0.00	0.00	0.00	0.00	0.02	6.94	-6.92	-6.92
DAGACHU	0.86	0.00	-0.86	0.00	0.00	0.00	3.79	1.08	2.71	1.85
JORETHANG	0.00	0.00	0.00	60.58	0.00	-60.58	4.49	3.09	1.40	-59.18
NEPAL(NVVN)	0.00	1.83	1.83	0.00	0.00	0.00	0.26	0.17	0.08	1.91
BANGLADESH	0.00	171.02	171.02	0.00	0.00	0.00	2.82	6.67	-3.85	167.17
NEEPCO STATIONS	0.00	0.00	0.00	52.86	0.00	-52.86	4.92	19.53	-14.61	-67.48
ONGC PALATANA	0.00	0.00	0.00	2.73	0.00	-2.73	0.00	0.00	0.00	-2.73
<b>TOTAL</b>	<b>4226.00</b>	<b>4115.68</b>	<b>-110.32</b>	<b>3639.85</b>	<b>3640.06</b>	<b>0.21</b>	<b>1687.49</b>	<b>1723.40</b>	<b>-35.92</b>	<b>-146.03</b>

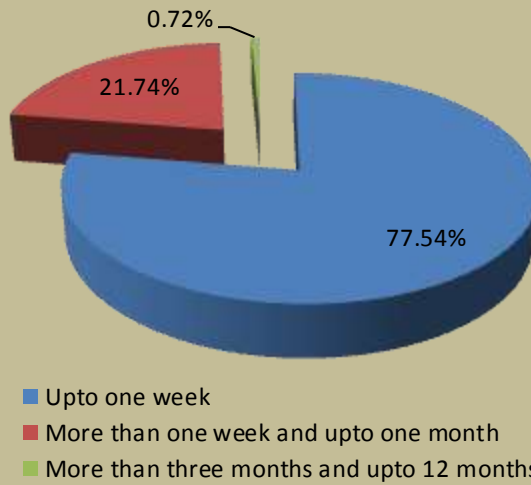
Source: NLDC

\* 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 November, 2016**



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

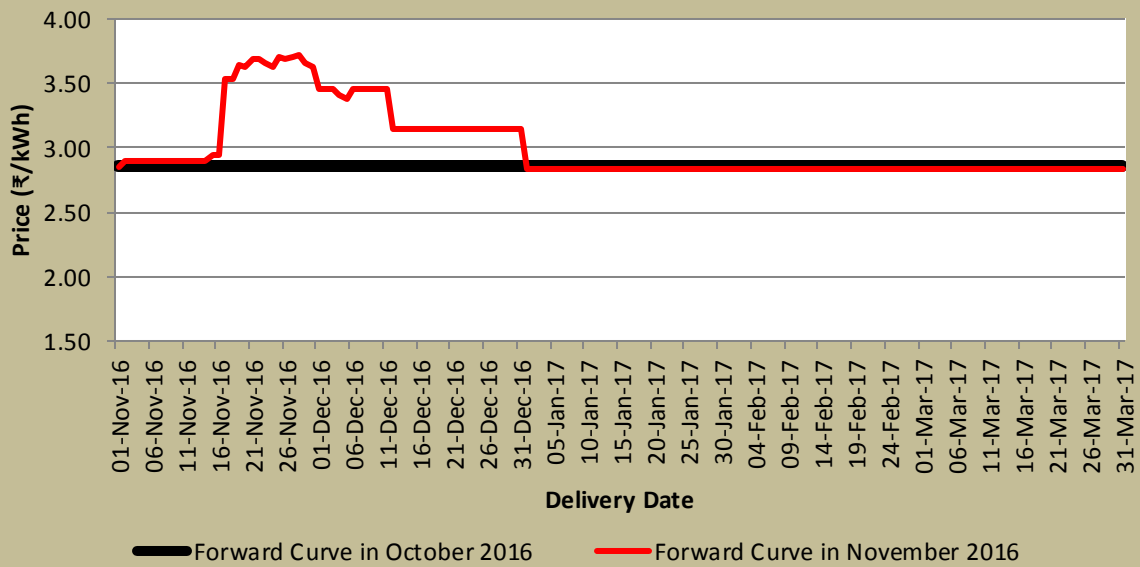


Table-20 : VOLUME AND PRICE OF RENEWABLE ENERGY CERTIFICATES (RECs) TRANSACTIONED THROUGH POWER EXCHANGES, OCTOBER 2016					
Sr.No.	Details of REC Transactions	IEX		PXIL	
		Solar	Non-Solar	Solar	Non Solar
A	Volume of Buy Bid	19932	157273	15676	98048
B	Volume of Sell Bid	2300940	8269834	1347938	4743346
C	Ratio of Buy Bid to Sell Bid Volume	0.009	0.019	0.012	0.021
D	Market Clearing Volume (MWh)	19932	157273	15676	98048
E	Market Clearing Price (₹/MWh)	3500	1500	3500	1500

Source: IEX and PXIL

Note 1: 1 REC = 1 MWh

Note 2:

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