

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

November, 2016



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# 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.
<b>I List of Tables</b>		
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
<b>II List of Figures</b>		
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 December, 2016	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 **November, 2016** are as under:

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

During November 2016, total electricity generation excluding generation from renewable and captive power plants in India was 93165.44 MUs (Table-1).

Of the total electricity generation, 8687.58 MUs (9.32 %) was transacted through short-term, comprising of 3708.35 MUs (3.98%) through bilateral (through traders and term-ahead contracts on power exchanges and directly between distribution companies), followed by 3397.88 MUs (3.65%) through day ahead collective transactions on power exchanges (IEX and PXIL) and 1581.36 MUs (1.70%) through DSM (Table-1 & Figure-2).

Of the total short-term transactions, bilateral constitutes 42.69% (23.86% through traders and term-ahead contracts on power exchanges and 18.83% directly between distribution companies) followed by 39.11% through day ahead collective transactions on power exchanges and 18.20% 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 November, 2016. In November 2016, 22 trading licensees were engaged in short term trading. Top 5 trading licensees had a share of 71.64% in the total volume traded by all the licensees. These are PTC India Ltd., Mittal Processors (P) Ltd., Tata Power Trading Company (P) Ltd., Manikaran Power Ltd. and Adani Enterprises 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 0.1443 for the month of November 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 3388.65 MUs and 9.23 MUs respectively. The volume of total buy bids and sell bids was 3959.26 MUs and 7336.87 MUs respectively in IEX while the same was 29.29 MUs and 71.05 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 201.20 MUs and 9.47 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, ₹5.54/kWh and ₹3.81/kWh respectively (Table-3). The weighted average sale prices were also computed for the transactions during Round

the Clock (RTC) and Off-peak periods separately, and the sale prices were ₹3.98/kWh, and ₹2.92/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 ₹0.80/kWh, ₹4.83/kWh and ₹2.48/kWh respectively in IEX and ₹1.75/kWh, ₹3.99/kWh and ₹ 2.84/kWh respectively in PXIL (Table-5).

The price of electricity transacted through IEX and PXIL in the term-ahead market was ₹2.43/kWh and ₹2.85/kWh respectively (Table-6 and Table-7).

**(iii) Price of electricity transacted through DSM:** The average deviation settlement price was ₹1.90/kWh. The minimum and maximum deviation settlement prices were ₹0.00/kWh and ₹ 8.24/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 41.02% of the volume, and these were Haryana, Punjab, Uttar Pradesh, Essar Power and Delhi. Top 5 regional entities purchased 46.78% of the volume, and these were Madhya Pradesh, Tamil Nadu, Bihar, Jammu & Kashmir and Himachal Pradesh (Table-9 & 10).

Of the total power exchange transactions, top 5 regional entities sold 34.62% of the volume, and these were Jindal India Thermal Power Ltd., Karnataka, Korba West Power, Madhya Pradesh and Jindal Power Ltd. Top 5 regional entities purchased 57.02% of the volume, and these were Rajasthan, Gujarat, Karnataka, Andhra Pradesh and Haryana (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 86.93% of the volume, and these were NTPC Stations (WR), Tamil Nadu, Madhya Pradesh, Punjab and Uttar Pradesh (Table-13). Top 5 regional entities overdrew 31.57% of the volume, and these were Karnataka, NTPC Stations (NR), Rajasthan, Uttar Pradesh 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 Madhya Pradesh, Tamil Nadu, NTPC Stations (WR), Punjab and Gujarat. Top 5 electricity purchasing regional entities were Kerala, Karnataka, Rajasthan, NTPC Stations (NR) and Jharkhand.

#### **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 November, 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 4.19% and 8.70% of the unconstrained cleared volume respectively. In terms of time, congestion occurred was 64.90% in IEX and 3.61% in PXIL (Table-16).

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

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

**(i) Duration of bilateral contracts:** During December, 2016, a total of 121 bilateral contracts (excluding banking/swap contracts) have been executed by traders for the volume of 1903.74 MUs. Figure-7 shows the percentage of contracts categorized according to the period of power supply. It can be observed from the figure that 69.4% of the bilateral contracts were executed for duration of up to one week, 25.6% of the contracts were executed for duration of more than a week and up to one month, 2.5% of the contracts were executed for duration of more than one month and up to 3 months, and 2.5% of the contracts were executed for duration of more than three months and up to 12 months.

During the month, 12 banking/swapping bilateral contracts were also executed for the volume of 103.73 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 December, 2016 to April, 2017 based on bilateral contracts<sup>4</sup> executed till December, 2016. Forward curves have been drawn for the contracts executed in November, 2016 and December, 2016 for the purpose of comparison. It is observed that the forward prices during January to April 2017 were relatively higher for the contracts executed in December, 2016 compared to the contracts executed in November, 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 November, 2016 are shown in Table-20. The market clearing volume of solar RECs transacted on IEX and PXIL were 25003 and 16826 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 150050 and 111007 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 0.011 and 0.010 for IEX and PXIL respectively. For non-solar RECs, the ratio of buy bids to sell bids was 0.018 and 0.020 for IEX and PXIL respectively.

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

## VII: Inferences:

- The percentage of short-term transactions of electricity to total electricity generation was 9.32%.
- Of the total short-term transactions of electricity, 42.69% was transacted through bilateral (through traders and term ahead contracts on power exchanges and directly by distribution companies), followed by 39.11% through power exchanges and 18.20% through DSM.
- Top 5 trading licensees had a share of 71.64% 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 0.1443, indicating non-concentration of market power.
- The weighted average price of electricity transacted through trading licensees was ₹3.81/kWh. The weighted average prices of electricity transacted through IEX and PXIL were ₹2.48/kWh and ₹2.84/kWh respectively.
- The average price of electricity transacted through DSM was ₹1.90/kWh.
- Top 5 electricity selling regional entities were Madhya Pradesh, Tamil Nadu, NTPC Stations (WR), Punjab and Gujarat. Top 5 electricity purchasing regional entities were Kerala, Karnataka, Rajasthan, NTPC Stations (NR) and Jharkhand.
- The volume of electricity that could not be cleared in IEX and PXIL due to congestion was 4.19% and 8.70% of the unconstrained cleared volume respectively. In terms of time, congestion occurred was 64.90% in IEX and 3.61% in PXIL
- In December 2016, 69.4% of the bilateral contracts were executed for duration of up to one week, 25.6% of the contracts were executed for duration of more than a week and up to one month, 2.5% of the contracts were executed for duration of more than one month and up to 3 months, and 2.5% of the contracts were executed for duration of more than three months and up to 12 months.

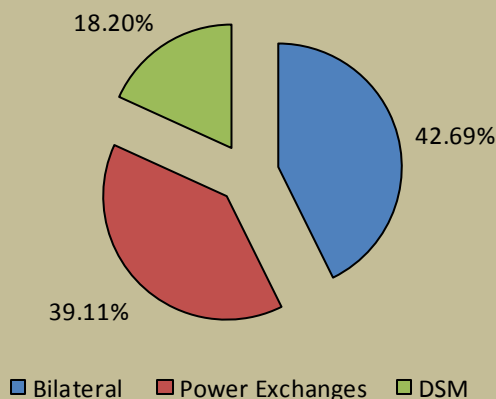
- The forward prices during January to April 2017 were relatively higher for the contracts executed in December, 2016 compared to the contracts executed in November, 2016.
- The market clearing volume of solar RECs transacted on IEX and PXIL were 25003 and 16826 respectively and the market clearing price of these RECs was ₹3500/MWh on both the power exchanges. Market clearing volume of non-solar RECs transacted on IEX and PXIL were 150050 and 111007 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), NOVEMBER 2016**

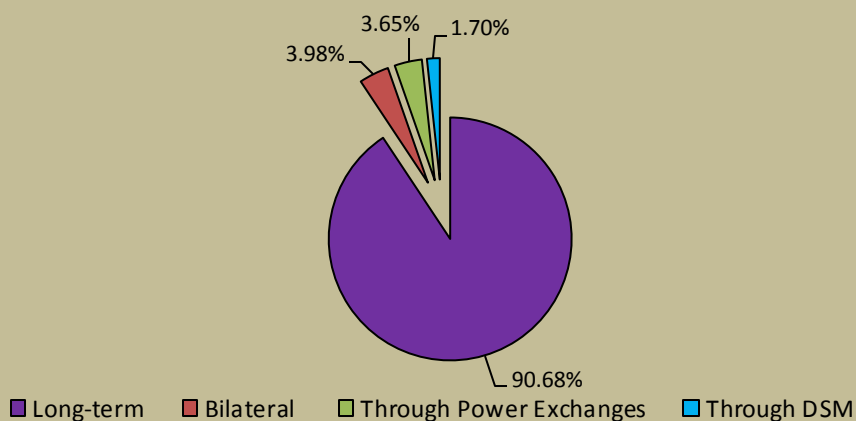
Sr.No	Short-term transactions	Volume (MUs)	% to Volume of short-term transactions	% of Total Generation
1	Bilateral	3708.35	42.69	3.98
	(i) Through Traders and PXs	2072.53	23.86	2.22
	(ii) Direct	1635.81	18.83	1.76
2	Through Power Exchanges	3397.88	39.11	3.65
	(i) IEX	3388.65	39.01	3.64
	(ii) PXIL	9.23	0.11	0.010
3	Through DSM	1581.36	18.20	1.70
	<b>Total</b>	<b>8687.58</b>	-	<b>9.32</b>
	<b>Total Generation</b>	<b>93165.44</b>	-	-

Source: NLDC

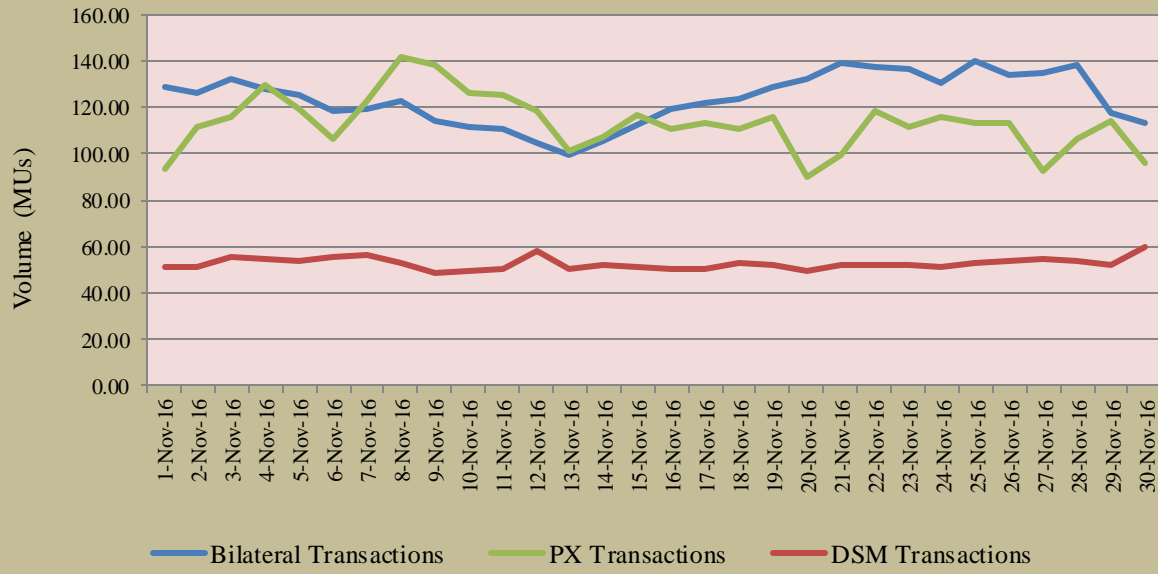
**Figure-1: Volume of Short-term Transactions of Electricity, November 2016**



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



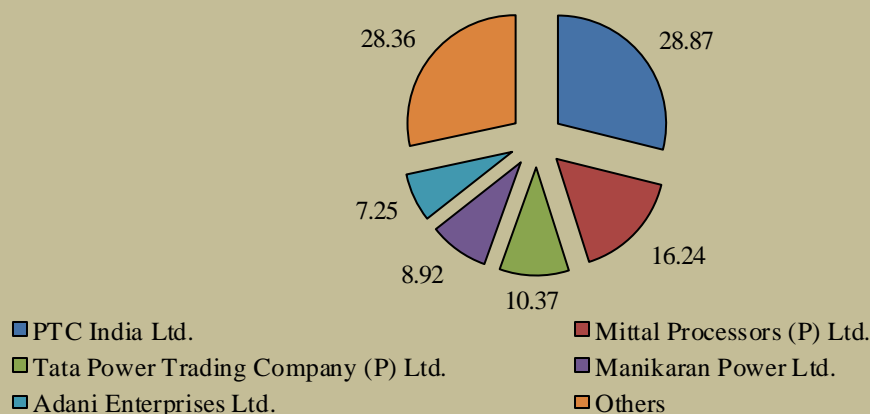
**Figure-3: Volume of Short-term Transactions of Electricity, November 2016  
(Day-wise)**



**Table-2: PERCENTAGE SHARE OF ELECTRICITY TRANSACTED BY TRADING LICENSEES, NOVEMBER 2016**

Sr. No	Name of the Trading Licensee	% Share in total Volume transacted by Trading Licensees	Herfindahl-Hirschman Index
1	PTC India Ltd.	28.87	0.0833
2	Mittal Processors (P) Ltd.	16.24	0.0264
3	Tata Power Trading Company (P) Ltd.	10.37	0.0108
4	Manikaran Power Ltd.	8.92	0.0080
5	Adani Enterprises Ltd.	7.25	0.0052
6	Jaiprakash Associates Ltd.	5.84	0.0034
7	GMR Energy Trading Ltd.	4.76	0.0023
8	NTPC Vidyut Vyapar Nigam Ltd.	4.70	0.0022
9	Arunachal Pradesh Power Corporation (P) ltd	3.92	0.0015
10	Knowledge Infrastructure Systems (P) Ltd	2.19	0.0005
11	National Energy Trading & Services Ltd.	1.61	0.0003
12	JSW Power Trading Company Ltd	1.32	0.0002
13	RPG Power Trading Company Ltd.	0.76	0.0001
14	Instinct Infra & Power Ltd.	0.72	0.0001
15	My Home Power Private Ltd.	0.71	0.0001
16	Shree Cement Ltd.	0.47	0.0001
17	SN Power Markets Pvt. Ltd.	0.42	0.0000
18	Customized Energy Solutions India (P) Ltd.	0.38	0.0000
19	Gita Power & Infrastructure Private Limited	0.16	0.0000
20	Phillip Commodities India (P) Ltd.	0.15	0.0000
21	Ambitious Power Trading Company Ltd.	0.14	0.0000
22	Essar Electric Power Development Corp. Ltd.	0.10	0.0000
<b>TOTAL</b>		<b>100.00%</b>	<b>0.1443</b>
<b>Top 5 trading licensees</b>		<b>71.64%</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>			

**Figure - 4 : Percentage Share of Electricity Transacted by Trading Licensees, November 2016**





<b>Table-3: PRICE OF ELECTRICITY TRANSACTED THROUGH TRADERS, NOVEMBER 2016</b>		
<b>Sr.No</b>	<b>Item</b>	<b>Sale Price of Traders (₹/kWh)</b>
1	Minimum	0.03
2	Maximum	5.54
3	Weighted Average	3.81

Source: Information submitted by trading licensees

<b>Table-4: PRICE OF ELECTRICITY TRANSACTED THROUGH TRADERS (TIME-WISE), NOVEMBER 2016</b>		
<b>Sr.No</b>	<b>Period of Trade</b>	<b>Sale Price of Traders (₹/kWh)</b>
1	RTC	3.98
2	PEAK	-
3	OFF PEAK	2.92

Source: Information submitted by trading licensees

<b>Table-5: PRICE OF ELECTRICITY TRANSACTED THROUGH POWER EXCHANGES, NOVEMBER 2016</b>			
<b>Sr.No</b>	<b>ACP</b>	<b>Price in IEX (₹/kWh)</b>	<b>Price in PXIL (₹/kWh)</b>
1	Minimum	0.80	1.75
2	Maximum	4.83	3.99
3	Weighted Average	2.48	2.84

Source: Information submitted by IEX and PXIL

<b>Table-6: VOLUME AND PRICE OF ELECTRICITY IN TERM AHEAD MARKET OF IEX, NOVEMBER 2016</b>			
<b>Sr.No</b>	<b>Term ahead contracts</b>	<b>Actual Scheduled Volume (MUs)</b>	<b>Weighted Average Price (₹/kWh)</b>
1	Intra-Day Contracts	27.20	2.26
2	Day Ahead Contingency Contracts	63.76	1.18
3	Daily Contracts	33.84	3.80
4	Weekly Contracts	76.40	2.93
	<b>Total</b>	<b>201.20</b>	<b>2.43</b>

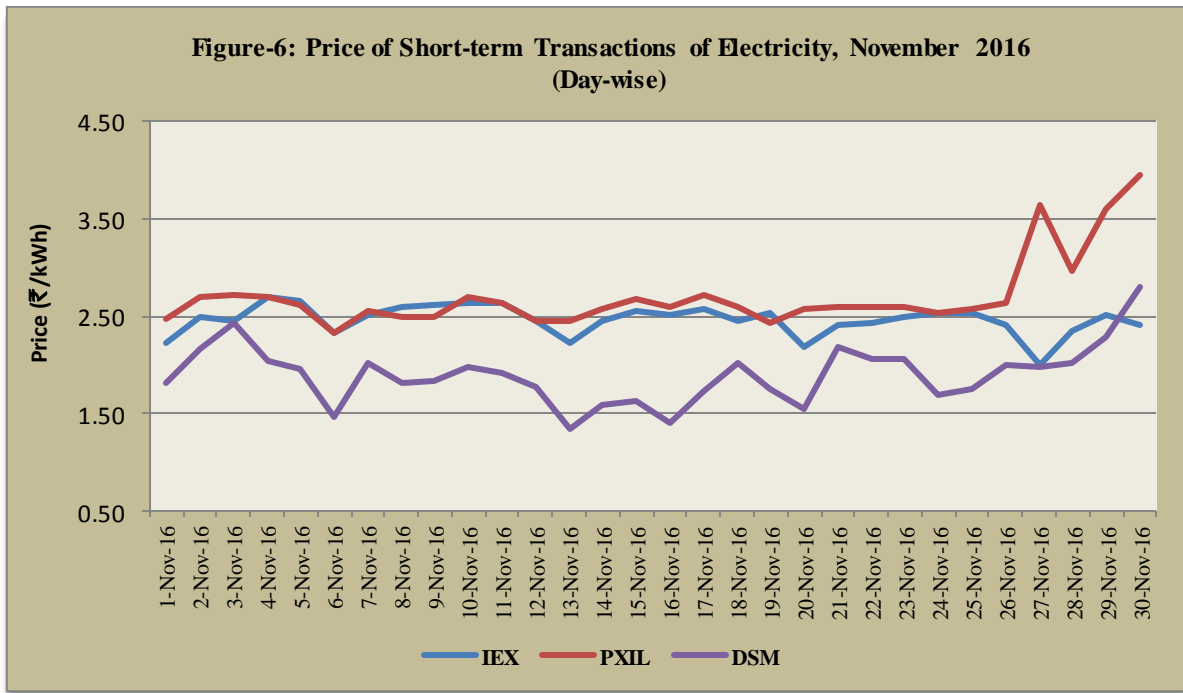
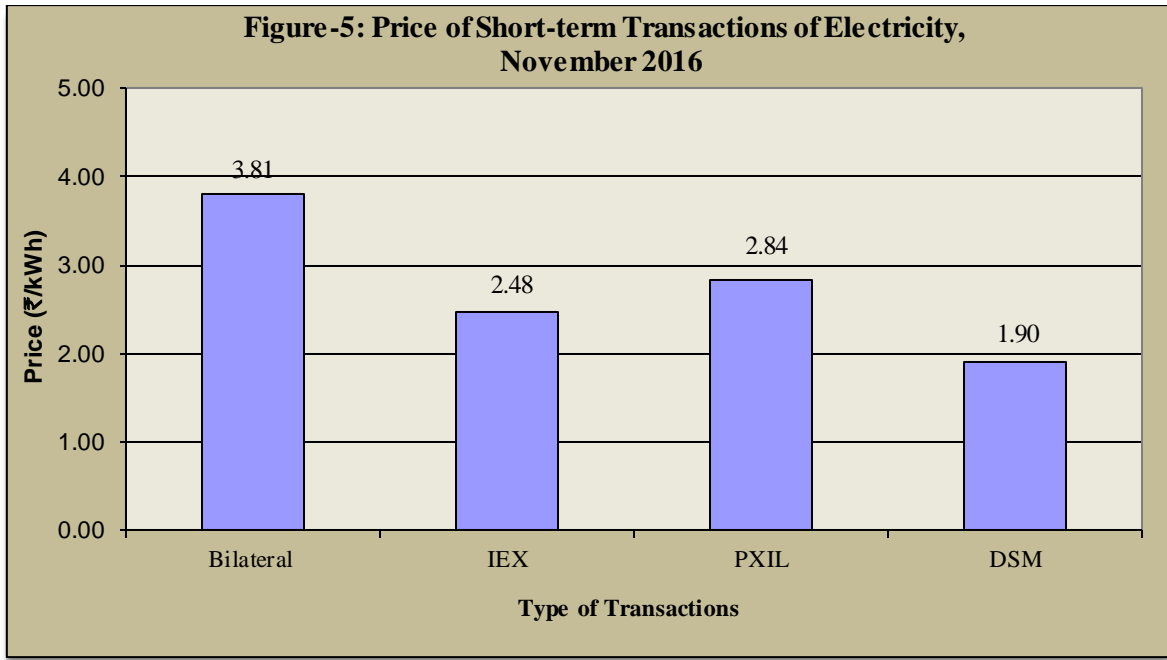
Source: IEX

<b>Table-7: VOLUME AND PRICE OF ELECTRICITY IN TERM AHEAD MARKET OF PXIL, NOVEMBER 2016</b>			
<b>Sr.No</b>	<b>Term ahead contracts</b>	<b>Actual Scheduled Volume (MUs)</b>	<b>Weighted Average Price (₹/kWh)</b>
1	Intra-Day Contracts	9.22	2.83
2	Daily Contracts	0.25	3.50
	<b>Total</b>	<b>9.47</b>	<b>2.85</b>

Source: PXIL

<b>Table-8: PRICE OF ELECTRICITY TRANSACTED THROUGH DSM, NOVEMBER 2016</b>		
<b>Sr.No</b>	<b>Item</b>	<b>Price in All India Grid (₹/kWh)</b>
1	Minimum	0.00
2	Maximum	8.24
3	Average	1.90

Source: NLDC



<b>Table-9: VOLUME OF ELECTRICITY SOLD THROUGH BILATERAL, NOVEMBER 2016</b>		
<b>Name of the Entity</b>	<b>Volume of Sale (MUs)</b>	<b>% of Volume</b>
HARYANA	384.64	10.39
PUNJAB	369.25	9.97
UTTAR PRADESH	296.06	8.00
ESSAR POWER	249.17	6.73
DELHI	219.56	5.93
GMR KAMALANGA	185.16	5.00
JITPL	178.86	4.83
DB POWER	169.82	4.59
ILF&S	151.87	4.10
WEST BENGAL	148.78	4.02
CHHATTISGARH	146.40	3.95
SEMBCORP	135.62	3.66
GUJARAT	130.56	3.53
COASTGEN	90.14	2.43
ADHUNIK POWER LTD	84.17	2.27
HIMACHAL PRADESH	79.04	2.13
BALCO	73.80	1.99
THERMAL POWERTECH	66.20	1.79
JINDAL POWER	59.69	1.61
DHARIWAL POWER	59.39	1.60
ANDHRA PRADESH	48.69	1.32
DAGACHU	36.92	1.00
SIMHAPURI	32.85	0.89
MEENAKSHI	31.17	0.84
TAMIL NADU	28.01	0.76
DVC	27.47	0.74
ODISHA	25.25	0.68
KORBA WEST POWER	24.04	0.65
JAYPEE NIGRIE	19.66	0.53
JINDAL STAGE-II	18.06	0.49
MAHARASHTRA	17.52	0.47
KARNATAKA	15.50	0.42
J & K	14.92	0.40
TELANGANA	14.09	0.38
ASSAM	13.50	0.36
CHANDIGARH	10.80	0.29
LANKO_AMK	9.27	0.25
ACBIL	8.40	0.23
LANKO KONDAPALLI	6.26	0.17
MP	5.20	0.14
RAJASTHAN	4.70	0.13
JHABUA POWER_MP	3.13	0.08
AD HYDRO	2.50	0.07
MARUTI COAL	2.45	0.07
SIKKIM	1.12	0.03
SPECTRUM	1.10	0.03
TRIPURA	0.84	0.02
<b>TOTAL</b>	<b>3702.26</b>	<b>100.00</b>
<b>Volume Sold by top 5 Regional Entities</b>	<b>1518.69</b>	<b>41.02</b>

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

<b>Name of the Entity</b>	<b>Volume of Purchase (MUs)</b>	<b>% of Volume</b>
MP	566.48	15.28
TAMIL NADU	306.93	8.28
BIHAR	304.25	8.20
J & K	286.24	7.72
HIMACHAL PRADESH	270.98	7.31
MAHARASHTRA	244.38	6.59
ESSAR STEEL	236.14	6.37
TELANGANA	220.28	5.94
RAJASTHAN	187.33	5.05
KARNATAKA	179.05	4.83
BANGLADESH	139.95	3.77
UTTAR PRADESH	113.23	3.05
UTTARAKHAND	111.54	3.01
CHHATTISGARH	98.79	2.66
HARYANA	90.78	2.45
JHARKHAND	76.28	2.06
ODISHA	62.51	1.69
NEPAL(NVVN)	54.13	1.46
MEGHALAYA	50.99	1.37
ANDHRA PRADESH	43.07	1.16
WEST BENGAL	17.05	0.46
ASSAM	16.84	0.45
GUJARAT	14.60	0.39
DELHI	4.39	0.12
KERALA	4.00	0.11
PUNJAB	3.83	0.10
DAMAN & DIU	2.22	0.06
MANIPUR	2.07	0.06
<b>TOTAL</b>	<b>3708.35</b>	<b>100.00</b>
<b>Volume Purchased by top 5 Regional Entities</b>	<b>1734.90</b>	<b>46.78</b>

<b>Table-11: VOLUME OF ELECTRICITY SOLD THROUGH POWER EXCHANGES, NOVEMBER 2016</b>		
<b>Name of the Entity</b>	<b>Volume of Sale (MUs)</b>	<b>% of Volume</b>
JITPL	245.71	7.23
KARNATAKA	245.59	7.23
KORBA WEST POWER	244.32	7.19
MP	223.82	6.59
JINDAL POWER	216.75	6.38
JAYPEE NIGRIE	198.34	5.84
DB POWER	186.35	5.48
GUJARAT	129.86	3.82
DELHI	120.07	3.53
MARUTI COAL	111.36	3.28
ODISHA	99.96	2.94
HIMACHAL PRADESH	88.02	2.59
MB POWER	86.72	2.55
KARCHAM WANGTOO	75.86	2.23
CHHATTISGARH	69.75	2.05
ASSAM	67.10	1.97
WEST BENGAL	62.07	1.83
NTPC STATIONS (WR)	61.10	1.80
HARYANA	56.92	1.68
ACBIL	48.86	1.44
TELANGANA	47.64	1.40
TRIPURA	43.20	1.27
MEENAKSHI	42.65	1.26
SIMHAPURI	42.60	1.25
TRN ENERGY	39.68	1.17
DVC	32.16	0.95
JHABUA POWER_MP	30.43	0.90
JORETHANG	28.19	0.83
UTTAR PRADESH	27.78	0.82
NEEPCO STATIONS	27.72	0.82
EMCO	27.16	0.80
ADHUNIK POWER LTD	25.75	0.76
SPECTRUM	25.23	0.74
MAHARASHTRA	24.01	0.71
MANIPUR	23.18	0.68
CHUZACHEN HEP	22.07	0.65
GMR KAMALANGA	19.95	0.59
TAMIL NADU	19.55	0.58
NSPCL	18.90	0.56
SIKKIM	18.87	0.56
AD HYDRO	15.60	0.46
ANDHRA PRADESH	15.19	0.45
UTTARAKHAND	14.49	0.43
DCPP	14.05	0.41

NLC	13.51	0.40
MIZORAM	13.02	0.38
ILF&S	12.88	0.38
GOA	11.45	0.34
BALCO	9.33	0.27
NJPC	6.34	0.19
RANGANADI HEP	5.73	0.17
PUNJAB	5.47	0.16
J & K	4.08	0.12
SEMBCORP	3.91	0.11
DHARIWAL POWER	3.88	0.11
THERMAL POWERTECH	3.54	0.10
KERALA	3.47	0.10
MEGHALAYA	2.50	0.07
NTPC STATIONS (NR)	2.08	0.06
NTPC STATIONS (SR)	1.90	0.06
DOYANG HEP	1.74	0.05
ONGC PALATANA	1.57	0.05
NAGALAND	1.53	0.04
DGEN MEGA POWER	1.32	0.04
MALANA	1.11	0.03
CHANDIGARH	1.06	0.03
LANCO BUDHIL	0.91	0.03
NTPC STATIONS (ER)	0.88	0.03
COASTGEN	0.05	0.00
MAITHON POWER LTD	0.04	0.00
RAJASTHAN	0.01	0.00
<b>Total</b>	<b>3397.88</b>	<b>100.00</b>
<b>Volume sold by top 5 Regional Entities</b>	<b>1176.19</b>	<b>34.62</b>

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

<b>Name of the Entity</b>	<b>Volume of Purchase (MUs)</b>	<b>% of Volume</b>
RAJASTHAN	570.72	16.80
GUJARAT	434.30	12.78
KARNATAKA	401.74	11.82
ANDHRA PRADESH	285.10	8.39
HARYANA	245.47	7.22
DADRA & NAGAR HAVELI	230.78	6.79
TELANGANA	178.36	5.25
KERALA	146.91	4.32
BIHAR	146.59	4.31
WEST BENGAL	143.90	4.24
UTTARAKHAND	118.21	3.48
TAMIL NADU	77.10	2.27
DELHI	56.88	1.67
HIMACHAL PRADESH	50.36	1.48
MAHARASHTRA	46.79	1.38
ASSAM	42.14	1.24
DAMAN & DIU	38.07	1.12
ODISHA	36.75	1.08
UTTAR PRADESH	35.00	1.03
MP	33.49	0.99
J & K	18.91	0.56
GOA	15.90	0.47
MEGHALAYA	8.77	0.26
CHHATTISGARH	6.67	0.20
DVC	6.23	0.18
PUNJAB	5.37	0.16
PONDICHERRY	4.25	0.13
NAGALAND	4.25	0.12
ESSAR STEEL	3.80	0.11
ARUNACHAL PRADESH	3.25	0.10
CHANDIGARH	0.95	0.03
MANIPUR	0.88	0.03
<b>TOTAL</b>	<b>3397.88</b>	<b>100.00</b>
<b>Volume purchased by top 5 Regional Entities</b>	<b>1937.34</b>	<b>57.02</b>

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

<b>Name of the Entity</b>	<b>Volume of Under Drawal (MUs)</b>	<b>% of Volume</b>
NTPC STATIONS (WR)	130.15	8.15
TAMIL NADU	106.09	6.64
MP	95.50	5.98
PUNJAB	89.34	5.60
UTTAR PRADESH	88.14	5.52
GUJARAT	87.15	5.46
MAHARASHTRA	82.75	5.18
NHPC STATIONS	59.27	3.71
HARYANA	57.69	3.61
BIHAR	51.20	3.21
CHHATTISGARH	49.61	3.11
DVC	45.25	2.83
NTPC STATIONS (NR)	39.78	2.49
ANDHRA PRADESH	39.39	2.47
SASAN UMPP	35.09	2.20
NLC	31.19	1.95
ODISHA	30.20	1.89
KARNATAKA	25.00	1.57
ESSAR STEEL	22.91	1.44
UTTARAKHAND	22.72	1.42
RAJASTHAN	22.41	1.40
TELANGANA	20.60	1.29
WEST BENGAL	20.15	1.26
NTPC STATIONS (ER)	17.59	1.10
NEEPCO STATIONS	15.59	0.98
GMR KAMALANGA	14.98	0.94
NTPC STATIONS (SR)	14.49	0.91
JITPL	14.19	0.89
GOA	13.32	0.83
DADRA & NAGAR HAVELI	12.09	0.76
JINDAL POWER	11.49	0.72
MEGHALAYA	11.35	0.71
HIMACHAL PRADESH	11.28	0.71
PONDICHERRY	10.82	0.68
NSPCL	10.19	0.64
TRIPURA	9.96	0.62
DELHI	9.63	0.60
THERMAL POWERTECH	8.85	0.55
URI-2	7.95	0.50
RGPPL(DABHOL)	7.87	0.49
JHARKHAND	7.06	0.44
DB POWER	6.93	0.43
LANKO_AMK	6.78	0.42
MAITHON POWER LTD	6.43	0.40
JINDAL STAGE-II	6.40	0.40
EMCO	6.09	0.38
NJPC	5.67	0.36



KARCHAM WANGTOO	5.66	0.35
SIKKIM	5.56	0.35
MB POWER	5.11	0.32
TEESTA HEP	5.06	0.32
CGPL(COASTAL GUJARAT POWER LTD)	5.03	0.32
JAYPEE NIGRIE	4.65	0.29
ACBIL	4.63	0.29
ARUNACHAL PRADESH	4.22	0.26
BANGLADESH	4.05	0.25
KORBA WEST POWER	3.86	0.24
COASTGEN	3.48	0.22
ADHUNIK POWER LTD	3.41	0.21
DAMAN & DIU	3.24	0.20
MANIPUR	3.12	0.20
DCPP	2.78	0.17
NAGALAND	2.72	0.17
JORETHANG	2.54	0.16
ASSAM	2.48	0.16
ILF&S	2.21	0.14
SEMBCORP	1.82	0.11
CHANDIGARH	1.80	0.11
DAGACHU	1.79	0.11
KSK MAHANADI	1.69	0.11
ESSAR POWER	1.58	0.10
MEENAKSHI	1.58	0.10
RANGIT HEP	1.53	0.10
SIMHAPURI	1.53	0.10
JHABUA POWER_MP	1.52	0.10
AD HYDRO	1.48	0.09
NEPAL(NVVN)	1.33	0.08
KERALA	1.32	0.08
BALCO	1.02	0.06
CHUZACHEN HEP	0.94	0.06
TRN ENERGY	0.78	0.05
MIZORAM	0.75	0.05
DHARIWAL POWER	0.67	0.04
LOKTAK	0.59	0.04
LANCO BUDHIL	0.33	0.02
MALANA	0.15	0.01
DGEN MEGA POWER	0.02	0.00
<b>Total</b>	<b>1596.61</b>	<b>100.00</b>
<b>Volume Exported by top 5 Regional Entities</b>	<b>1387.95</b>	<b>86.93</b>

<b>Table-14: VOLUME OF ELECTRICITY OVER DRAWAL (IMPORTED) THROUGH DSM, NOVEMBER 2016</b>		
<b>Name of the Entity</b>	<b>Volume of Over drawal (MUs)</b>	<b>% of Volume</b>
KARNATAKA	103.01	7.16
NTPC STATIONS (NR)	92.35	6.42
RAJASTHAN	88.19	6.13
UTTAR PRADESH	87.68	6.10
KERALA	82.83	5.76
NTPC STATIONS (WR)	59.87	4.16
NTPC STATIONS (ER)	52.59	3.66
ANDHRA PRADESH	49.46	3.44
MAHARASHTRA	48.10	3.34
DELHI	48.09	3.34
JHARKHAND	47.98	3.34
TELANGANA	44.33	3.08
BIHAR	40.95	2.85
WEST BENGAL	40.88	2.84
HARYANA	39.04	2.71
ASSAM	35.93	2.50
ODISHA	33.49	2.33
UTTARAKHAND	30.74	2.14
GUJARAT	30.67	2.13
TAMIL NADU	25.74	1.79
HIMACHAL PRADESH	24.44	1.70
PUNJAB	23.05	1.60
BALCO	22.08	1.54
ESSAR STEEL	20.02	1.39
DVC	16.55	1.15
CGPL	16.42	1.14
CHHATTISGARH	14.95	1.04
GOA	12.10	0.84
NTPC STATIONS (SR)	12.09	0.84
MP	10.85	0.75
CHANDIGARH	9.32	0.65
GMR KAMALANGA	8.87	0.62
ARUNACHAL PRADESH	8.40	0.58
JINDAL STAGE-II	8.40	0.58
KORBA WEST POWER	8.39	0.58
ACBIL	7.44	0.52
JITPL	7.00	0.49
EMCO	6.88	0.48
NLC	6.80	0.47
NHPC STATIONS	6.40	0.44
NJPC	5.63	0.39
MIZORAM	5.52	0.38
DCPP	4.42	0.31
NAGALAND	4.40	0.31
TRIPURA	4.24	0.29
BANGLADESH	4.00	0.28
MANIPUR	3.93	0.27
ADHUNIK POWER LTD	3.66	0.25
DAMAN & DIU	3.47	0.24
JHABUA POWER_MP	3.39	0.24
MAITHON POWER LTD	3.29	0.23
JINDAL POWER	3.22	0.22
ILF&S	3.07	0.21
JORETHANG	2.94	0.20

SEMBCORP	2.80	0.19
COASTGEN	2.79	0.19
SIKKIM	2.72	0.19
NSPCL	2.67	0.19
LANKO_AMK	2.66	0.18
TRN ENERGY	2.36	0.16
JAYPEE NIGRIE	2.28	0.16
SPECTRUM	2.27	0.16
NEPAL(NVVN)	2.26	0.16
KSK MAHANADI	2.03	0.14
MEGHALAYA	2.03	0.14
DAGACHU	1.79	0.12
DB POWER	1.75	0.12
DGEN MEGA POWER	1.70	0.12
NEEPCO STATIONS	1.61	0.11
GMR CHHATTISGARH	1.39	0.10
THERMAL POWERTECH	1.38	0.10
PONDICHERRY	1.36	0.09
ESSAR POWER	1.29	0.09
LANKO KONDAPALLI	1.25	0.09
SIMHAPURI	1.23	0.09
RGPPL(DABHOL)	1.20	0.08
KARCHAM WANGTOO	1.18	0.08
DADRA & NAGAR HAVELI	1.17	0.08
MEENAKSHI	0.97	0.07
SASAN UMPP	0.84	0.06
MB POWER	0.80	0.06
AD HYDRO	0.54	0.04
DHARIWAL POWER	0.49	0.03
URI-2	0.44	0.03
LANCO BUDHIL	0.43	0.03
MALANA	0.39	0.03
CHUZACHEN HEP	0.35	0.02
RANGIT HEP	0.19	0.01
LOKTAK	0.18	0.01
TEESTA HEP	0.05	0.00
<b>TOTAL</b>	<b>1438.41</b>	<b>100.00</b>
<b>Volume Imported by top 5 Regional Entities</b>	<b>454.07</b>	<b>31.57</b>

<b>Table-15: TOTAL VOLUME OF NET SHORT-TERM TRANSACTIONS OF ELECTRICITY (REGIONAL ENTITY-WISE), NOVEMBER 2016</b>		
<b>Sr.No.</b>	<b>Name of the Entity</b>	<b>Total volume of net short-term transactions of electricity*</b>
1	KERALA	81.52
2	KARNATAKA	78.01
3	RAJASTHAN	65.78
4	NTPC STATIONS (NR)	52.57
5	JHARKHAND	40.92
6	DELHI	38.47
7	NTPC STATIONS (ER)	35.00
8	ASSAM	33.45
9	TELANGANA	23.72
10	BALCO	21.06
11	WEST BENGAL	20.74
12	HIMACHAL PRADESH	13.16
13	CGPL	11.39
14	ANDHRA PRADESH	10.07
15	UTTARAKHAND	8.02
16	CHANDIGARH	7.52
17	MIZORAM	4.77
18	KORBA WEST POWER	4.53
19	ARUNACHAL PRADESH	4.18
20	ODISHA	3.29
21	ACBIL	2.81
22	SPECTRUM	2.27
23	JINDAL STAGE-II	2.00
24	JHABUA POWER_MP	1.87
25	DGEN MEGA POWER	1.68
26	NAGALAND	1.68
27	DCPP	1.63
28	TRN ENERGY	1.58
29	GMR CHHATTISGARH	1.39
30	LANCO KONDAPALLI	1.25
31	SEMBCORP	0.98
32	NEPAL(NV/VN)	0.93
33	ILF&S	0.85
34	MANIPUR	0.81
35	EMCO	0.79
36	JORETHANG	0.40
37	KSK MAHANADI	0.34
38	MALANA	0.24
39	ADHUNIK POWER LTD	0.24
40	DAMAN & DIU	0.23
41	LANCO BUDHIL	0.10
42	BANGLADESH	-0.05
43	NJPC	-0.05
44	DHARIWAL POWER	-0.18
45	ESSAR POWER	-0.29
46	SIMHAPURI	-0.30

47	LOKTAK	-0.41
48	UTTAR PRADESH	-0.46
49	CHUZACHEN HEP	-0.59
50	MEENAKSHI	-0.60
51	COASTGEN	-0.70
52	AD HYDRO	-0.95
53	GOA	-1.21
54	RANGIT HEP	-1.34
55	JAYPEE NIGRIE	-2.37
56	NTPC STATIONS (SR)	-2.40
57	SIKKIM	-2.83
58	ESSAR STEEL	-2.90
59	MAITHON POWER LTD	-3.14
60	LANKO_AMK	-4.12
61	MB POWER	-4.31
62	KARCHAM WANGTOO	-4.48
63	TEESTA HEP	-5.01
64	DB POWER	-5.18
65	TRIPURA	-5.72
66	GMR KAMALANGA	-6.11
67	RGPPL(DABHOL)	-6.67
68	JITPL	-7.20
69	THERMAL POWERTECH	-7.46
70	URI-2	-7.50
71	NSPCL	-7.52
72	JINDAL POWER	-8.27
73	MEGHALAYA	-9.32
74	PONDICHERRY	-9.46
75	BIHAR	-10.24
76	DADRA & NAGAR HAVELI	-10.92
77	NEEPCO STATIONS	-13.98
78	HARYANA	-18.65
79	NLC	-24.39
80	DVC	-28.71
81	SASAN UMPP	-34.26
82	MAHARASHTRA	-34.64
83	CHHATTISGARH	-34.66
84	NHPC STATIONS	-52.87
85	GUJARAT	-56.48
86	PUNJAB	-66.30
87	NTPC STATIONS (WR)	-70.27
88	TAMIL NADU	-80.34
89	MP	-84.65
* 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, NOVEMBER 2016</b>			
	<b>Details of Congestion</b>	<b>IEX</b>	<b>PXIL</b>
A	Unconstrained Cleared Volume* (MUs)	3550.34	10.11
B	Actual Cleared Volume and hence scheduled (MUs)	3401.42	9.23
C	Volume of electricity that could not be cleared and hence not scheduled because of congestion (MUs) (A-B)	148.92	0.88
D	Volume of electricity that could not be cleared as % to Unconstrained Cleared Volume	4.19%	8.70%
E	Percentage of the time congestion occurred during the month (Number of hours congestion occurred/Total number of hours in the month)	64.90%	3.61%
F	Congestion occurrence (%) time block wise		
	0.00 - 6.00 hours	17.66%	0.00%
	6.00 - 12.00 hours	32.37%	26.92%
	12.00 - 18.00 hours	33.23%	30.77%
	18.00 - 24.00 hours	16.75%	42.31%
<i>* This power would have been scheduled had there been no congestion.</i>			
<i>Source: IEX &amp; PXIL &amp; NLDC</i>			

**Table-17: VOLUME OF SHORT-TERM TRANSACTIONS OF ELECTRICITY IN INDIA (DAY-WISE)  
(MUs), NOVEMBER 2016**

Date	Bilateral		Power Exchange (Area Clearing Volume# of Day Ahead Market)		Deviation Settlement (Over Drawl+Under Generation)	Total Electricity Generation (MU) as given at CEA Website*
	Through Traders and PXs**	Direct	IEX	PXIL		
1-Nov-16	67.18	61.78	93.37	0.21	51.36	2998.55
2-Nov-16	70.18	55.87	111.06	0.53	50.98	3102.81
3-Nov-16	75.38	57.21	115.59	0.31	55.35	3153.17
4-Nov-16	70.08	58.13	129.22	0.31	54.60	3201.07
5-Nov-16	68.40	57.05	119.55	0.18	53.40	3205.25
6-Nov-16	61.11	57.39	105.97	0.15	55.81	3087.63
7-Nov-16	63.37	56.33	122.39	0.09	56.72	3160.98
8-Nov-16	64.56	58.07	140.70	0.70	52.98	3184.77
9-Nov-16	62.01	52.15	135.91	2.48	49.06	3198.78
10-Nov-16	59.82	52.11	126.49	0.11	49.89	3148.15
11-Nov-16	56.79	53.62	125.57	0.17	50.02	3172.71
12-Nov-16	52.92	51.61	118.45	0.06	58.09	3119.98
13-Nov-16	54.72	44.35	101.39	0.08	50.72	3035.42
14-Nov-16	60.85	44.94	107.25	0.06	51.66	3088.90
15-Nov-16	60.33	52.34	116.71	0.15	51.21	3145.60
16-Nov-16	64.45	54.71	110.67	0.15	50.73	3088.54
17-Nov-16	69.05	52.81	113.33	0.17	50.09	3061.55
18-Nov-16	70.43	53.37	110.54	0.08	52.68	3075.64
19-Nov-16	77.00	52.16	116.00	0.13	52.00	3092.84
20-Nov-16	79.09	53.44	90.13	0.03	49.31	2971.69
21-Nov-16	83.38	55.88	99.33	0.03	51.83	3068.65
22-Nov-16	82.19	55.50	118.55	0.03	51.79	3121.77
23-Nov-16	78.40	58.16	111.78	0.04	52.48	3114.05
24-Nov-16	75.67	54.54	115.85	0.04	51.52	3104.55
25-Nov-16	83.12	56.84	113.10	0.03	53.08	3062.75
26-Nov-16	78.63	55.73	112.73	0.51	53.82	3069.46
27-Nov-16	80.07	54.38	92.19	0.23	54.46	3002.01
28-Nov-16	81.85	56.24	105.94	0.48	53.73	3099.41
29-Nov-16	62.55	55.23	113.62	0.82	52.27	3147.38
30-Nov-16	58.96	53.89	95.27	0.93	59.72	3081.38
<b>Total</b>	2072.53	1635.81	3388.65	9.23	1581.36	93165.44

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), NOVEMBER, 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-Nov-16	1.00	3.52	2.23	2.29	2.89	2.48	0.00	3.03	1.81
2-Nov-16	1.89	4.11	2.49	2.29	2.83	2.69	0.00	3.45	2.16
3-Nov-16	1.91	4.00	2.46	2.38	2.85	2.72	0.36	5.32	2.43
4-Nov-16	2.08	4.21	2.70	2.19	3.12	2.70	0.00	5.11	2.05
5-Nov-16	2.08	4.29	2.66	2.18	2.90	2.61	0.00	3.45	1.95
6-Nov-16	2.00	3.01	2.34	2.19	2.41	2.32	0.00	2.82	1.48
7-Nov-16	1.89	4.00	2.52	2.41	2.62	2.55	0.00	5.11	2.03
8-Nov-16	2.03	3.68	2.60	2.19	2.61	2.50	0.00	3.45	1.82
9-Nov-16	2.17	3.80	2.62	2.19	2.63	2.50	0.00	3.45	1.83
10-Nov-16	2.02	3.96	2.64	2.19	2.78	2.69	0.00	4.91	1.99
11-Nov-16	1.99	4.11	2.63	2.19	2.93	2.64	0.00	3.45	1.91
12-Nov-16	1.93	4.11	2.46	2.19	3.03	2.45	0.00	5.95	1.77
13-Nov-16	1.40	3.50	2.22	2.19	3.13	2.46	0.00	3.45	1.33
14-Nov-16	1.20	4.31	2.46	2.29	3.23	2.58	0.00	3.45	1.58
15-Nov-16	1.80	4.33	2.56	2.29	3.33	2.68	0.00	3.45	1.64
16-Nov-16	1.10	4.45	2.51	2.41	2.76	2.59	0.00	3.24	1.40
17-Nov-16	1.23	4.57	2.57	2.19	3.43	2.71	0.00	3.45	1.72
18-Nov-16	1.09	4.59	2.45	2.29	3.53	2.59	0.00	4.91	2.02
19-Nov-16	1.53	4.59	2.53	2.19	2.57	2.43	0.00	3.24	1.75
20-Nov-16	1.78	4.26	2.18	2.22	3.21	2.58	0.00	3.45	1.55
21-Nov-16	1.09	4.60	2.41	2.60	2.60	2.60	0.00	5.32	2.18
22-Nov-16	1.00	4.70	2.44	2.00	3.15	2.60	0.00	5.11	2.05
23-Nov-16	1.59	4.49	2.48	1.98	2.90	2.59	0.00	5.11	2.06
24-Nov-16	1.10	4.71	2.53	1.88	2.95	2.53	0.00	5.11	1.68
25-Nov-16	0.99	4.73	2.53	2.58	2.58	2.58	0.00	5.11	1.76
26-Nov-16	1.00	4.68	2.41	2.32	2.75	2.64	0.00	5.32	2.01
27-Nov-16	1.00	3.85	2.01	2.08	3.80	3.64	0.00	3.45	1.98
28-Nov-16	0.90	4.79	2.35	2.14	3.00	2.97	0.00	4.91	2.01
29-Nov-16	1.10	4.81	2.50	1.75	3.80	3.60	0.00	5.11	2.29
30-Nov-16	0.80	4.83	2.40	1.80	3.99	3.94	0.00	8.24	2.79
	<b>0.80#</b>	<b>4.83#</b>	<b>2.48</b>	<b>1.75#</b>	<b>3.99#</b>	<b>2.84</b>	<b>0.00</b>	<b>8.24</b>	<b>1.90</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.

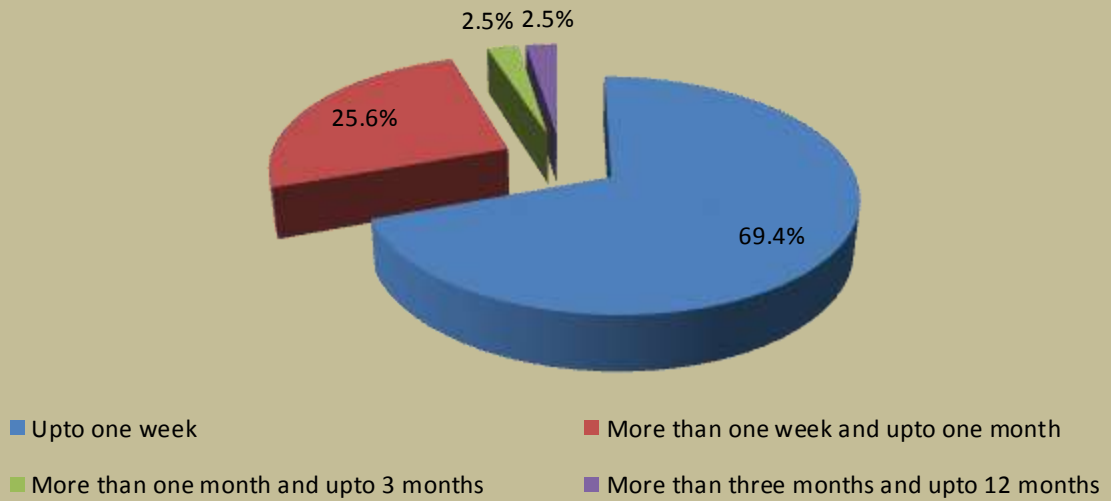
# Maximum/Minimum in the month



Table-19: VOLUME OF SHORT-TERM TRANSACTIONS OF ELECTRICITY (REGIONAL ENTITY*-WISE) (MUs), NOVEMBER 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	369.25	3.83	-365.42	5.47	5.37	-0.10	23.05	89.34	-66.30	-431.82
HARYANA	384.64	90.78	-293.86	56.92	245.47	188.55	39.04	57.69	-18.65	-123.96
RAJASTHAN	4.70	187.33	182.62	0.01	570.72	570.71	88.19	22.41	65.78	819.12
DELHI	219.56	4.39	-215.17	120.07	56.88	-63.20	48.09	9.63	38.47	-239.90
UTTAR PRADESH	296.06	113.23	-182.83	27.78	35.00	7.22	87.68	88.14	-0.46	-176.07
UTTARAKHAND	0.10	111.54	111.44	14.49	118.21	103.72	30.74	22.72	8.02	223.18
HIMACHAL PRADESH	79.04	270.98	191.94	88.02	50.36	-37.66	24.44	11.28	13.16	167.45
J & K	14.92	286.24	271.32	4.08	18.91	14.82	0.00	0.00	0.00	286.14
CHANDIGARH	10.80	0.00	-10.80	1.06	0.95	-0.11	9.32	1.80	7.52	-3.39
MP	5.20	566.48	561.28	223.82	33.49	-190.33	10.85	95.50	-84.65	286.30
MAHARASHTRA	17.52	244.38	226.85	24.01	46.79	22.78	48.10	82.75	-34.64	214.98
GUJARAT	130.56	14.60	-115.96	129.86	434.30	304.43	30.67	87.15	-56.48	131.99
CHHATTISGARH	146.40	98.79	-47.61	69.75	6.67	-63.08	14.95	49.61	-34.66	-145.35
GOA	0.00	0.00	0.00	11.45	15.90	4.45	12.10	13.32	-1.21	3.24
DAMAN & DIU	0.00	2.22	2.22	0.00	38.07	38.07	3.47	3.24	0.23	40.52
DADRA & NAGAR HAVELI	0.00	0.00	0.00	0.00	230.78	230.78	1.17	12.09	-10.92	219.86
ANDHRA PRADESH	48.69	43.07	-5.63	15.19	285.10	269.91	49.46	39.39	10.07	274.35
KARNATAKA	15.50	179.05	163.55	245.59	401.74	156.16	103.01	25.00	78.01	397.72
KERALA	0.00	4.00	4.00	3.47	146.91	143.44	82.83	1.32	81.52	228.96
TAMIL NADU	28.01	306.93	278.92	19.55	77.10	57.55	25.74	106.09	-80.34	256.13
PONDICHERRY	0.00	0.00	0.00	0.00	4.25	4.25	1.36	10.82	-9.46	-5.21
TELANGANA	14.09	220.28	206.19	47.64	178.36	130.73	44.33	20.60	23.72	360.64
WEST BENGAL	148.78	17.05	-131.73	62.07	143.90	81.83	40.88	20.15	20.74	-29.16
ODISHA	25.25	62.51	37.26	99.96	36.75	-63.21	33.49	30.20	3.29	-22.66
BIHAR	0.00	304.25	304.25	0.00	146.59	146.59	40.95	51.20	-10.24	440.60
JHARKHAND	0.00	76.28	76.28	0.00	0.00	0.00	47.98	7.06	40.92	117.21
SIKKIM	1.12	0.00	-1.12	18.87	0.00	-18.87	2.72	5.56	-2.83	-22.82
DVC	27.47	0.00	-27.47	32.16	6.23	-25.93	16.55	45.25	-28.71	-82.11
ARUNACHAL PRA	0.00	0.00	0.00	0.00	3.25	3.25	8.40	4.22	4.18	7.44
ASSAM	13.50	16.84	3.34	67.10	42.14	-24.96	35.93	2.48	33.45	11.83
MANIPUR	0.00	2.07	2.07	23.18	0.88	-22.30	3.93	3.12	0.81	-19.42
MEGHALAYA	0.50	50.99	50.48	2.50	8.77	6.27	2.03	11.35	-9.32	47.43
MIZORAM	0.00	0.00	0.00	13.02	0.00	-13.02	5.52	0.75	4.77	-8.25
NAGALAND	0.00	0.00	0.00	1.53	4.25	2.72	4.40	2.72	1.68	4.39
TRIPURA	0.84	0.00	-0.84	43.20	0.00	-43.20	4.24	9.96	-5.72	-49.76
NTPC STATIONS(NR)	0.00	0.00	0.00	2.08	0.00	-2.08	92.35	39.78	52.57	50.49
NHPC STATIONS	0.00	0.00	0.00	0.00	0.00	0.00	6.40	59.27	-52.87	-52.87
NJPC	0.00	0.00	0.00	6.34	0.00	-6.34	5.63	5.67	-0.05	-6.39
AD HYDRO	2.50	0.00	-2.50	15.60	0.00	-15.60	0.54	1.48	-0.95	-19.04
KARCHAM WANGTOO	0.00	0.00	0.00	75.86	0.00	-75.86	1.18	5.66	-4.48	-80.33
URI-2	0.00	0.00	0.00	0.00	0.00	0.00	0.44	7.95	-7.50	-7.50
NTPC STATIONS(WR)	0.00	0.00	0.00	61.10	0.00	-61.10	59.87	130.15	-70.27	-131.37

JINDAL POWER	59.69	0.00	-59.69	216.75	0.00	-216.75	3.22	11.49	-8.27	-284.71
LANKO_AMK	9.27	0.00	-9.27	0.00	0.00	0.00	2.66	6.78	-4.12	-13.39
NSPCL	0.00	0.00	0.00	18.90	0.00	-18.90	2.67	10.19	-7.52	-26.43
ACBIL	8.40	0.00	-8.40	48.86	0.00	-48.86	7.44	4.63	2.81	-54.45
BALCO	73.80	0.00	-73.80	9.33	0.00	-9.33	22.08	1.02	21.06	-62.06
RGPPL(DABHOL)	0.00	0.00	0.00	0.00	0.00	0.00	1.20	7.87	-6.67	-6.67
CGPL	0.00	0.00	0.00	0.00	0.00	0.00	16.42	5.03	11.39	11.39
DCPP	0.00	0.00	0.00	14.05	0.00	-14.05	4.42	2.78	1.63	-12.41
EMCO	0.00	0.00	0.00	27.16	0.00	-27.16	6.88	6.09	0.79	-26.37
ESSAR STEEL	0.00	236.14	236.14	0.00	3.80	3.80	20.02	22.91	-2.90	237.05
ESSAR POWER	249.17	0.00	-249.17	0.00	0.00	0.00	1.29	1.58	-0.29	-249.46
JINDAL STAGE-II	18.06	0.00	-18.06	0.00	0.00	0.00	8.40	6.40	2.00	-16.07
DB POWER	169.82	0.00	-169.82	186.35	0.00	-186.35	1.75	6.93	-5.18	-361.34
DHARWAL POWER	59.39	0.00	-59.39	3.88	0.00	-3.88	0.49	0.67	-0.18	-63.45
JAYPEE NIGRIE	19.66	0.00	-19.66	198.34	0.00	-198.34	2.28	4.65	-2.37	-220.37
WEST POWER	24.04	0.00	-24.04	244.32	0.00	-244.32	8.39	3.86	4.53	-263.83
MB POWER	0.00	0.00	0.00	86.72	0.00	-86.72	0.80	5.11	-4.31	-91.04
MARUTI COAL	2.45	0.00	-2.45	111.36	0.00	-111.36	0.00	0.00	0.00	-113.82
SPECTRUM	1.10	0.00	-1.10	25.23	0.00	-25.23	2.27	0.00	2.27	-24.06
JHABUA POWER_MP	3.13	0.00	-3.13	30.43	0.00	-30.43	3.39	1.52	1.87	-31.69
SASANUMPP	0.00	0.00	0.00	0.00	0.00	0.00	0.84	35.09	-34.26	-34.26
TRN ENERGY	0.00	0.00	0.00	39.68	0.00	-39.68	2.36	0.78	1.58	-38.10
NTPC STATIONS (SR)	0.00	0.00	0.00	1.90	0.00	-1.90	12.09	14.49	-2.40	-4.30
SIMHAPURI	32.85	0.00	-32.85	42.60	0.00	-42.60	1.23	1.53	-0.30	-75.75
MEENAKSHI	31.17	0.00	-31.17	42.65	0.00	-42.65	0.97	1.58	-0.60	-74.42
COASTGEN	90.14	0.00	-90.14	0.05	0.00	-0.05	2.79	3.48	-0.70	-90.89
THERMAL POWERTECH	66.20	0.00	-66.20	3.54	0.00	-3.54	1.38	8.85	-7.46	-77.20
ILF&S	151.87	0.00	-151.87	12.88	0.00	-12.88	3.07	2.21	0.85	-163.90
NLC	0.00	0.00	0.00	13.51	0.00	-13.51	6.80	31.19	-24.39	-37.90
SEMBCORP	135.62	0.00	-135.62	3.91	0.00	-3.91	2.80	1.82	0.98	-138.54
NTPC STATIONS (ER)	0.00	0.00	0.00	0.88	0.00	-0.88	52.59	17.59	35.00	34.12
ADHUNIK POWER	84.17	0.00	-84.17	25.75	0.00	-25.75	3.66	3.41	0.24	-109.68
CHUZACHEN HEP	0.00	0.00	0.00	22.07	0.00	-22.07	0.35	0.94	-0.59	-22.66
GMR KAMALANGA	185.16	0.00	-185.16	19.95	0.00	-19.95	8.87	14.98	-6.11	-211.22
JITPL	178.86	0.00	-178.86	245.71	0.00	-245.71	7.00	14.19	-7.20	-431.77
DAGACHU	36.92	0.00	-36.92	0.00	0.00	0.00	1.79	1.79	0.00	-36.92
JORETHANG	0.00	0.00	0.00	28.19	0.00	-28.19	2.94	2.54	0.40	-27.78
NEPAL(NVVN)	0.00	54.13	54.13	0.00	0.00	0.00	2.26	1.33	0.93	55.06
BANGLADESH	0.00	139.95	139.95	0.00	0.00	0.00	4.00	4.05	-0.05	139.90
NEEPCO STATIONS	0.00	0.00	0.00	27.72	0.00	-27.72	1.61	15.59	-13.98	-41.70
<b>Total</b>	<b>3702.26</b>	<b>3708.35</b>	<b>6.09</b>	<b>3397.88</b>	<b>3397.88</b>	<b>0.00</b>	<b>1438.41</b>	<b>1596.61</b>	<b>-158.20</b>	<b>-152.11</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 December, 2016**



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

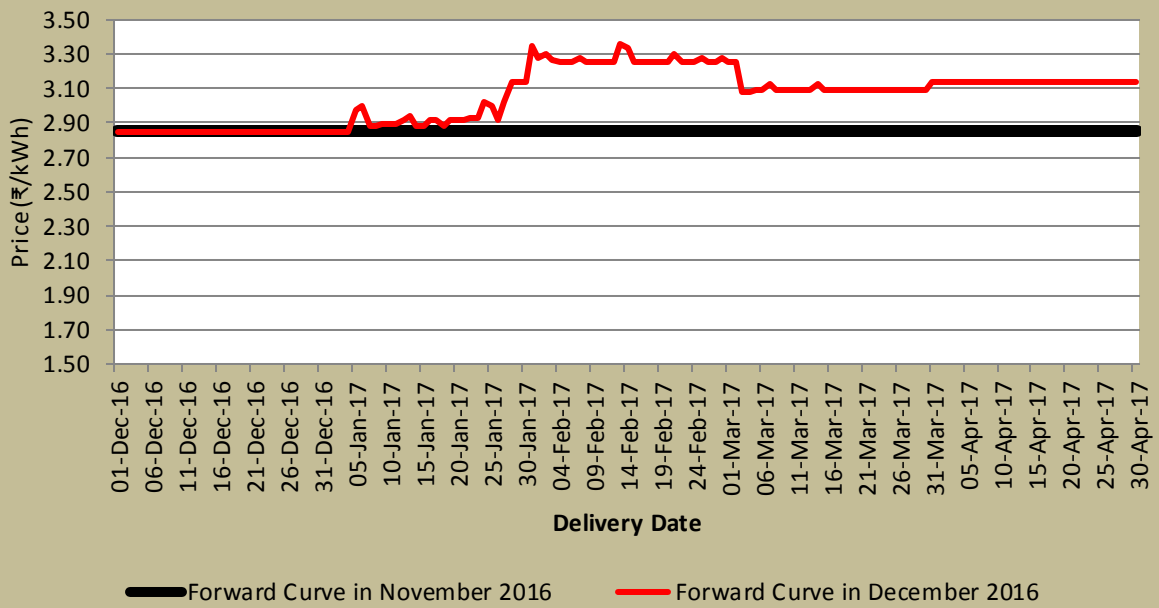


Table-20 : VOLUME AND PRICE OF RENEWABLE ENERGY CERTIFICATES (RECs) TRANSACTED THROUGH POWER EXCHANGES, NOVEMBER 2016					
Sr.No.	Details of REC Transactions	IEX		PXIL	
		Solar	Non-Solar	Solar	Non Solar
A	Volume of Buy Bid	25003	150050	16,826	111007
B	Volume of Sell Bid	2300940	8120951	1746236	5553204
C	Ratio of Buy Bid to Sell Bid Volume	0.011	0.018	0.010	0.020
D	Market Clearing Volume (MWh)	25003	150050	16826	111007
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