

IEX REC Market: An Overview

May, 2019

In this presentation



Renewable Energy in India



Introduction to REC Mechanism



Market snapshot



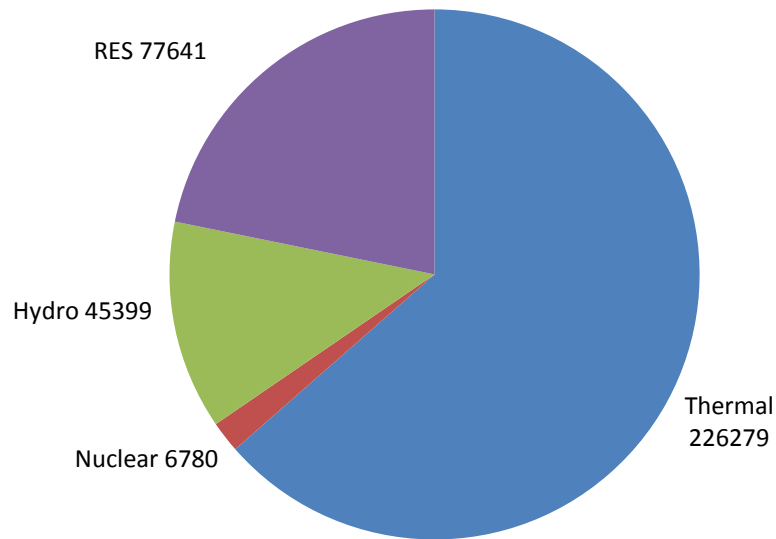
Voluntary REC Market



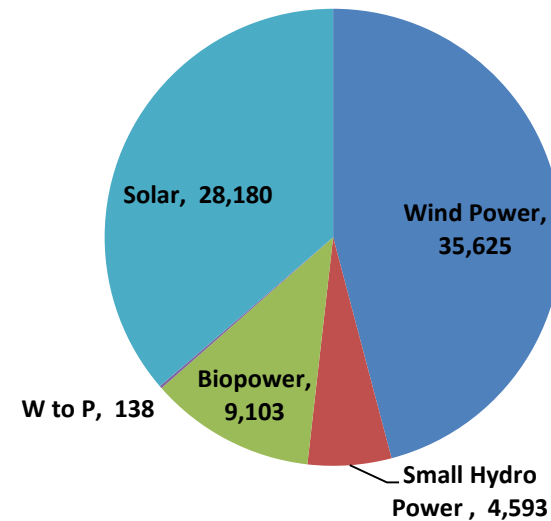
Trading @ IEX

Installed RE Capacity

Total Installed Capacity



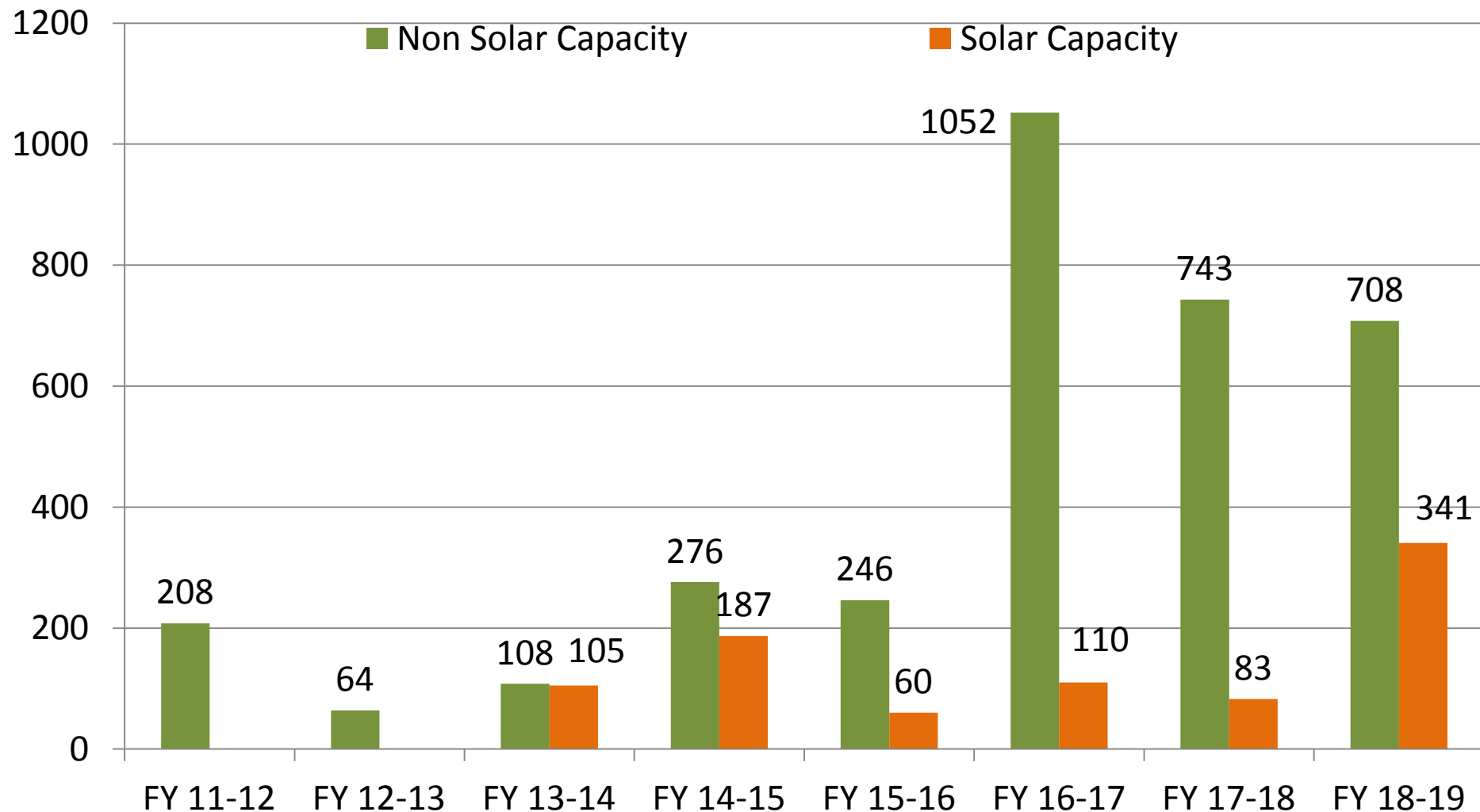
Renewable Installed Capacity



356,100 MW Total Installed Capacity as on 30th April'19

77,641 MW Renewable Installed Capacity as on 30th April'19

New REC Projects : Registration Trend





Introduction to REC Mechanism

Schemes to promote RE

Accelerated
Depreciation Scheme

Mid 1990s
Focused on
capacity addition

Generation Based
Incentive Scheme

2009
Shifted focus
from capacity
addition to
generation

Renewable Purchase
obligation

Electricity Act, 2003, National Tariff
Policy, 2006 and National Action
Plan on Climate Change, 2008
provided impetus to further RE
growth

REC Genesis: Separating green attribute from electricity

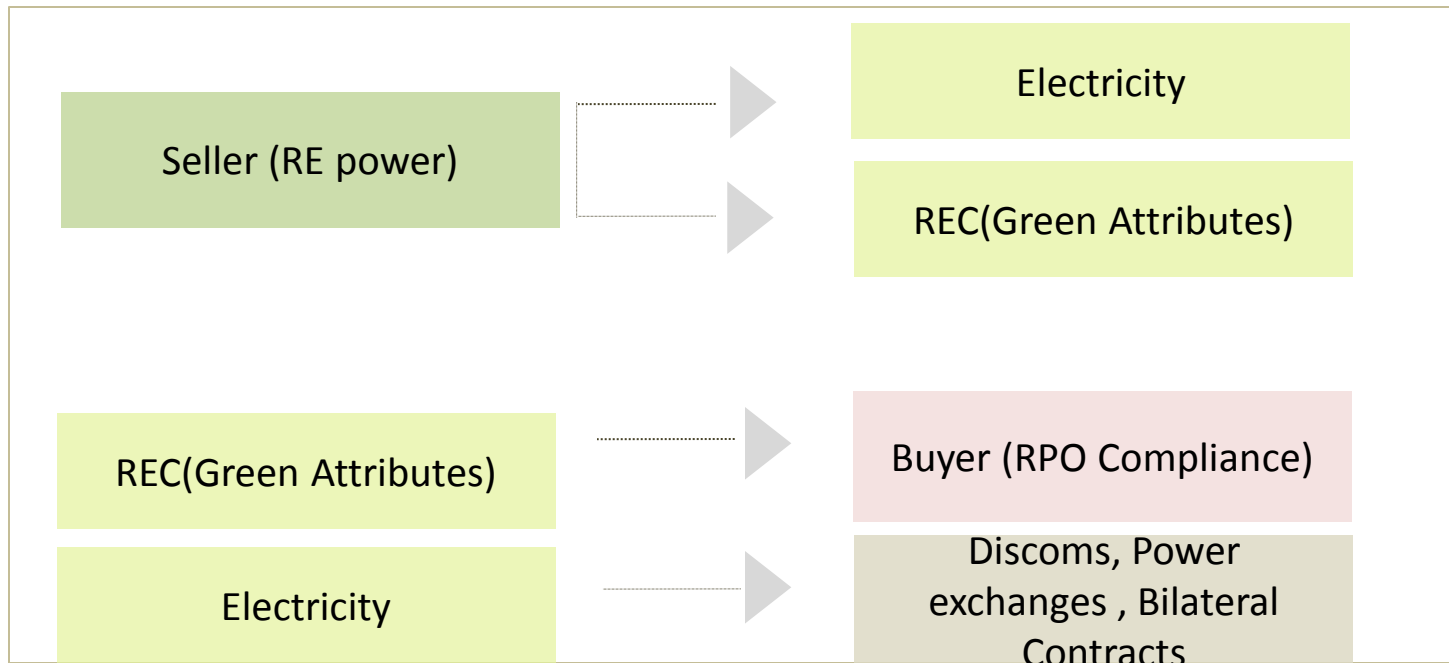
Bundled Green Power



Issues

- Schedulability
- Uncertainty
- Transmission Loss & Charge

Un-bundled Green Power



Solution

- No geographic barriers
- Reduced transaction cost
- Flexibility in meeting the RPO

Compliance Market: Overview of Legal Framework

2008 : National Action Plan on Climate Change (NAPCC)

- RPO at 5% in year 2010, increasing 1% every year for 10 years.
- Authorities may issue tradable certificates and penalties for shortfall

Jan'10 : CERC issued REC Regulation

- CERC designated National Load Despatch Centre (NLDC) as Central Agency: Notification dated 29.01.2010

June'10 : CERC approved Procedures for Accreditation, Registration & Issuance

Sep'10: First amendment of REC Regulation

July'13: Second amendment to REC Regulation

- Amendment in eligibility, Self consumption and Validity period

Dec'14 : Third Amendment to REC Regulations

- A distribution licensee shall be eligible for issuance of RECs
- Vintage Multiplier , Validity of RECs for 1095 Days , Revision in price band of Solar RECs

Mar'16 : Fourth Amendment to REC Regulations

- Terms and Conditions for recognition & issuance of Renewable Energy Certificate for Renewable Energy Generation

REC Participants: Sellers/Eligible Entity Identified Sources for RE



Wind

Solar

**Small
Hydro**

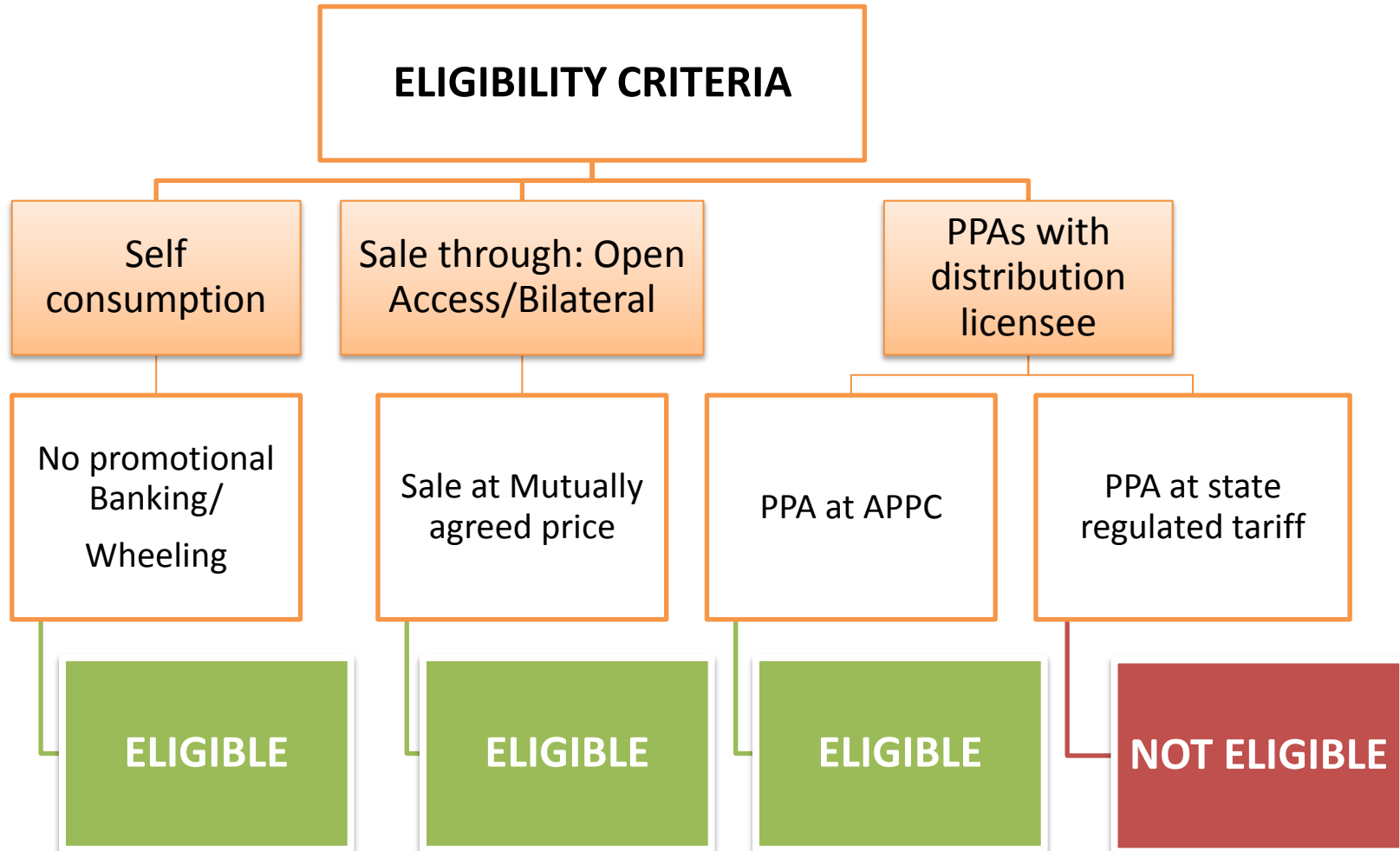
**Biomass,
Biofuel,
Cogeneration**

**Municipal
Waste**

**Black
Liquor**

**Source
approved
by
MNRE**

REC Market Participants: Sellers/Eligible Entity



REC Market Participants : Buyers

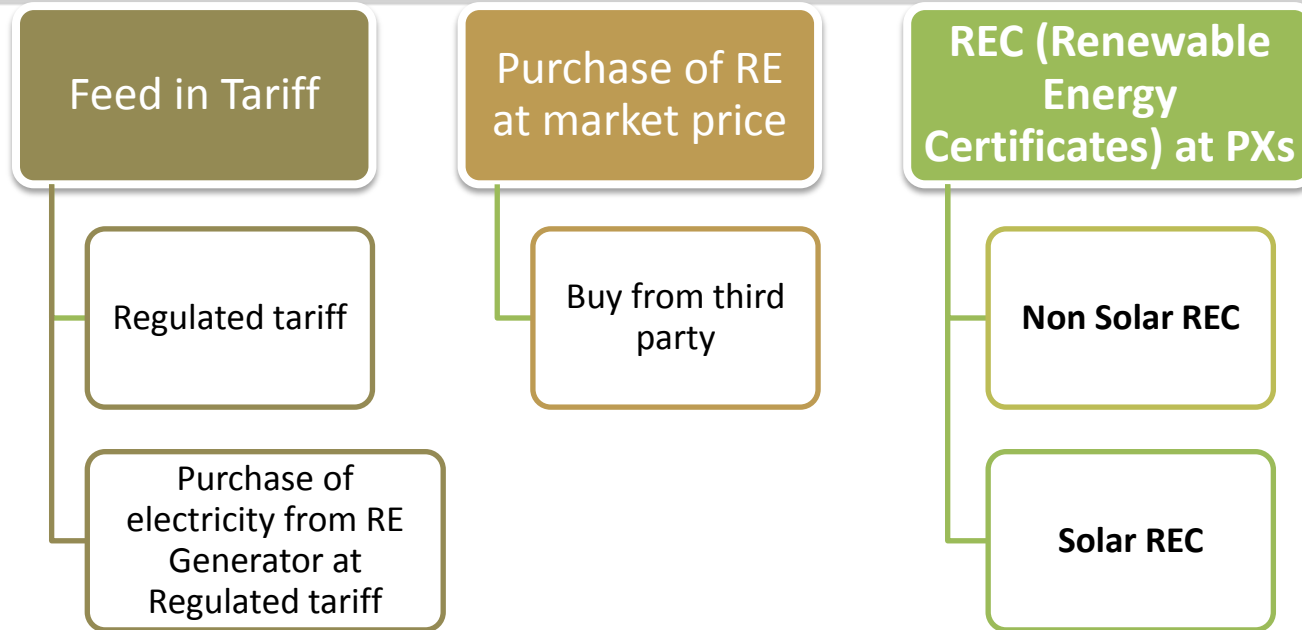
Obligated Entities

- Distribution Companies
- Open Access Consumers
- Industries consuming Captive Power

Voluntary Entities

- Corporates under CSR
- Individuals

Mechanisms to fulfill compliance



Penalty for non compliance in the provisions

- If an obligated entity fails to comply with the RPO, it shall also be liable for **penalty as may be decided by the commission under section 142 of Electricity Act, 2003**:
- The Commission may direct the entity to deposit penal charges equivalent to the **forbearance price of REC multiplied by shortfall in units of RPO**

Salient Features of REC Mechanism



Participation	Voluntary
REC Denomination	1 REC = 1 MWh
Validity	1095 Days after issuance*
Categories	1. Solar REC 2. Non-Solar REC
Trading Platform	Power Exchanges only
Banking/Borrowing	Not Allowed
Transfer Type	Single transfer only , repeated trade of the same certificate is not possible
Solar RECs	Floor Price: Rs 1000/MWh Forbearance Price: Rs 2400/MWh
Non Solar RECs(After 01.04.2017)	Floor Price: Rs 1,000/MWh Forbearance Price: Rs 3,000/MWh
Non Solar RECs(before 01.04.2017)	Floor Price: Rs 1500/MWh Forbearance Price: Rs 3,300/MWh
Penalty for Non-compliance	'Forbearance' Price (Maximum Price)
Price Guarantee	Through 'Floor' Price (Minimum Price)

REC Mechanism

Procedure for ACCREDITATION (Through State nodal Agency)

Procedure for REGISTRATION (Through Central Agency NLDC)

Procedure for ISSUANCE (Through Central Agency NLDC)

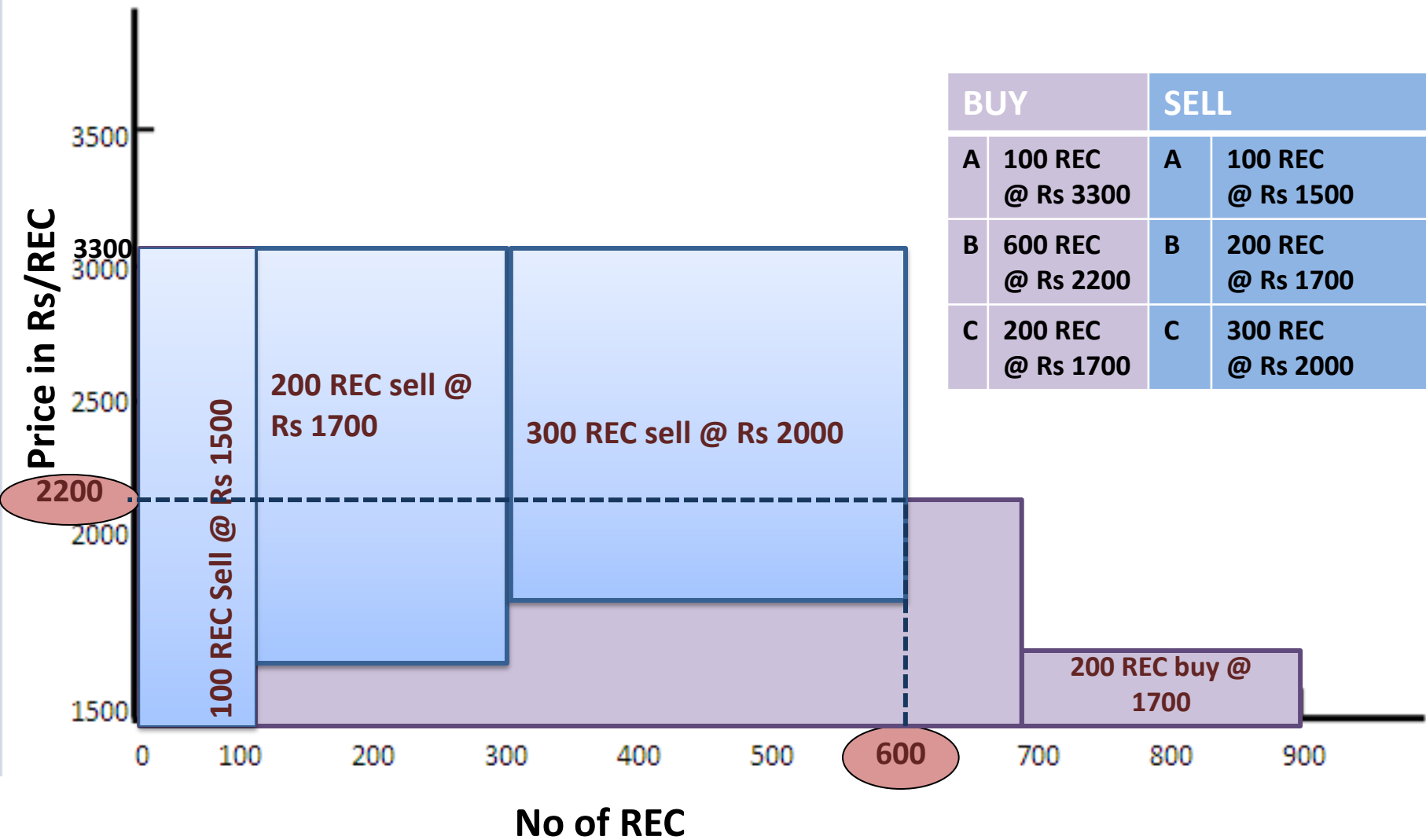
Procedure for TRADING & REDEMPTION (Through PXs)

Trading at IEX

Trading Day	Last Wednesday of every Month
Market Clearing	Closed Double sided auction
Trading Time	1300-1500 Hrs
By 1530 Hrs	Verification by Central agency for Valid REC by cleared seller at IEX
By 1600 Hrs	Central agency confirms REC
By 1630 Hrs	IEX finalizes trade
By 1700 Hrs	Buyer & Sellers informed to Central Agency
By 1800 Hrs	Invoice raised (<i>proof of REC trade</i>)

Cleared volume : 600 RECs

MCP: Rs 2200/REC



REC: Fee & Charges

State Nodal Agency

Accreditation	Fee & Charges
Application Processing Fee	Rs. 5000
Accreditation Charges (One Time – for 5 Years)	Rs. 30,000
Annual Charges	Rs. 10,000
Re-Validation Fees (After 5 Years)	Rs. 15000

Central Agency

Issuance	Fee & Charges
Fees Per REC issued	Rs. 4.0

Central Agency

Registration	Fee & Charges
Application Processing Fee	Rs. 1000
Registration Charges (One Time – for 5 Years)	Rs. 5000
Annual Charges	Rs. 1000
Re-Validation FEES (After 5 Years)	Rs. 5000

IEX

Redemption	Fee & Charges
Fees Per REC traded	Rs. 20

REC - Fee & Charges Impact

Cost Impact of Fee and charges in First Year

Assumptions:

- Project of Capacity = 1 MW
- Capacity Utilisation Factor = 22%
- No. of Units Generated = 1.927 MU
- No. of REC Issued = 1927

Cost Head	REC @ 1500	REC @ 2600	REC @ 3300
Accreditation	45,000	45,000	45,000
Registration	7,000	7,000	7,000
Issuance	7,708	7,708	7,708
TOTAL COST	59,708	59,708	59,708
Revenue from REC	28,90,800	50,10,720	63,59,760
% Cost Incurred	2.07%	1.19%	0.94%
Paise Impact Per Unit (kWh)	3.09	3.09	3.09

Similarly the cost impact (in Paise / Unit) for:

TWO Year	THREE Year	FOUR Year
2.03 Paise	1.68 Paise	1.5 Paise



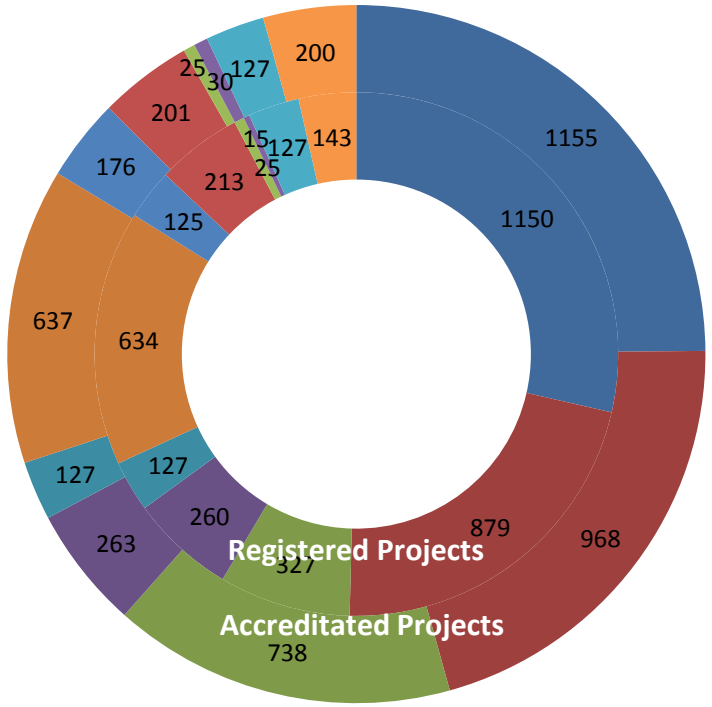
Market Snapshot

An update on RECs

	Accredited Capacity (MW)	Registered Capacity (MW)	No. of Projects Registered	No of RECs (in Cr)			
				Issued	Traded	Self Retained	Inventory
Non -Solar	3910	3248	562	4.51	4.10	0.19	0.21
Solar	759	753	371	0.94	0.89	0.01	0.3
Total	4669	4001	933	5.45	5.00	0.20	0.24

Projects under REC Mechanism

State-wise RE Capacity (MW)

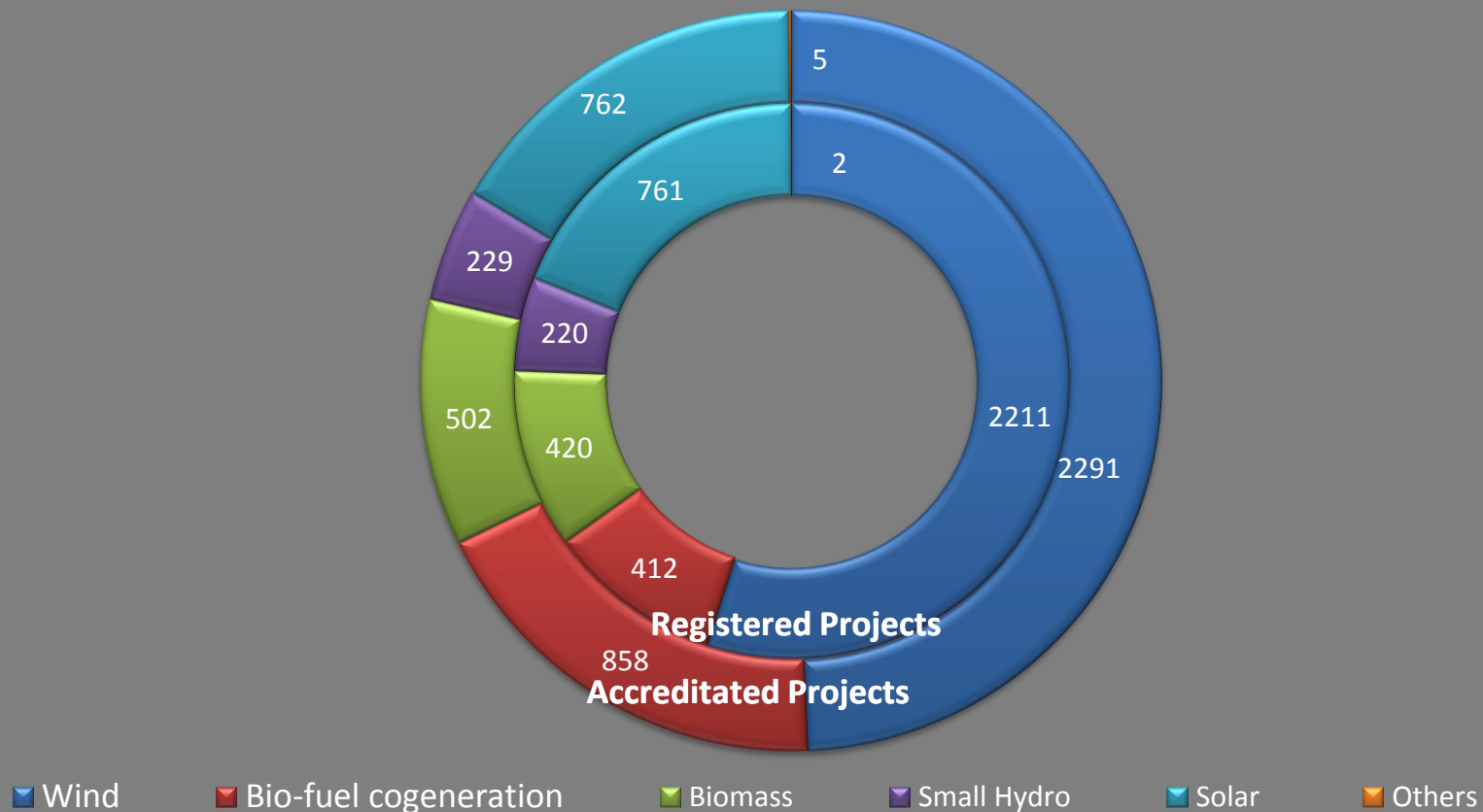


- Tamil Nadu
- Maharashtra
- Uttar Pradesh
- Gujarat
- Karnataka
- Rajasthan
- Andhra Pradesh
- Madhya Pradesh
- Chhattisgarh
- Punjab
- Himanchal Pradesh
- Others

Data as on 21st May, 2019

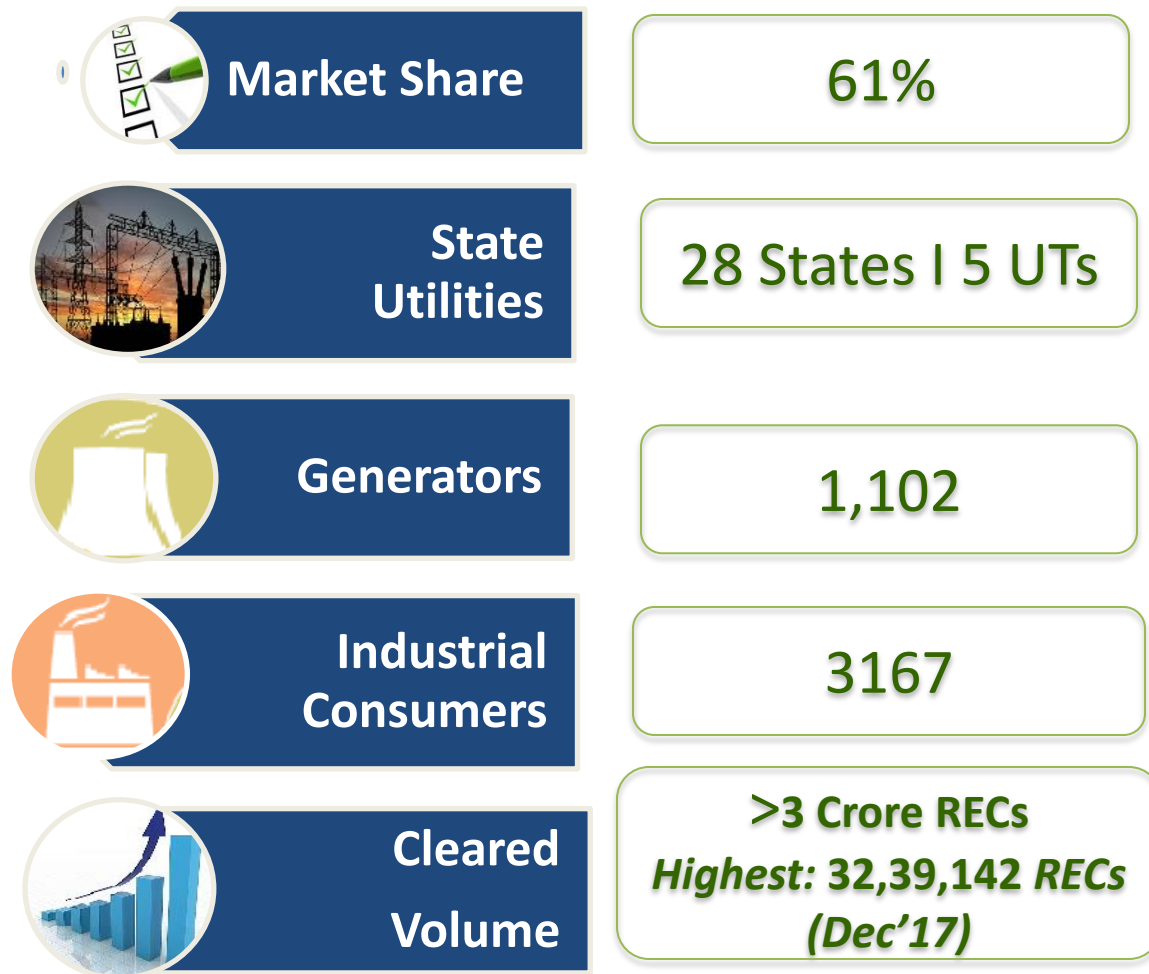
Projects under REC Mechanism

Source wise RE capacity (MW)



Data as on 21st May ,2019

Key statistics: REC Market at IEX



IEX Data as on May , 2019

Participation Details at IEX

Registered Participants	4,295
Obligated Entity	3,167
DISCOMs	35
OA consumers	2,887
Captive Consumer	195
OA + Captive	49
Discom + Captive	1
Voluntary	26
Eligible Entity (Sellers)	1,102

Why REC a better option than 'buying renewable power' ?

Schedulability

- Less predictable
- Less controllable
- Require better prediction tools over one-day
- Scheduling changes till one-hour before

High Overheads

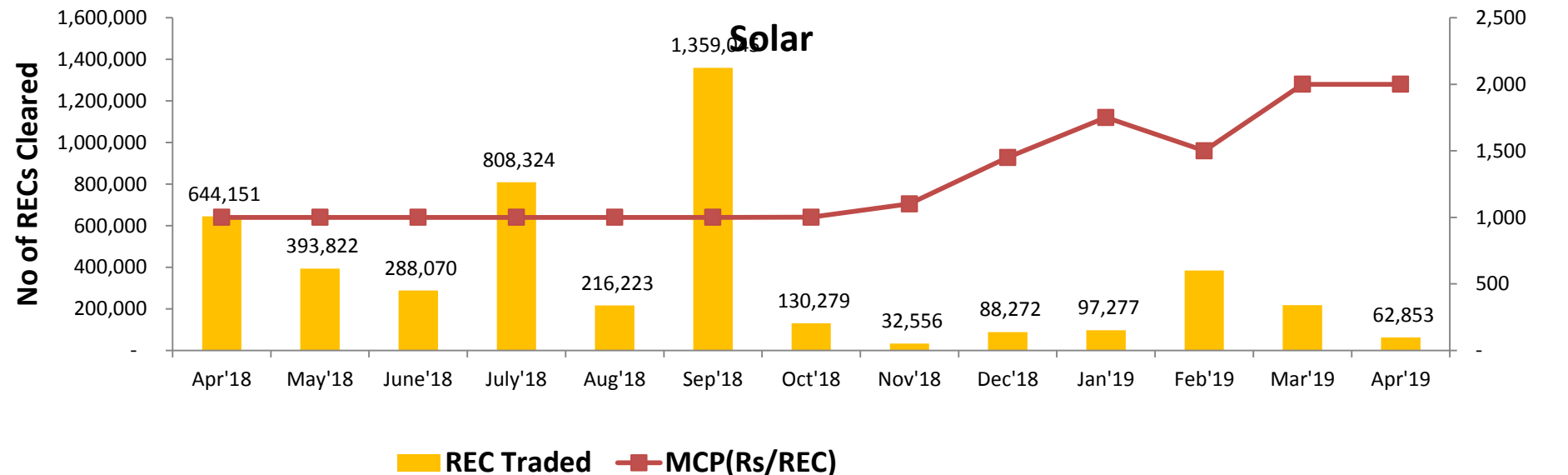
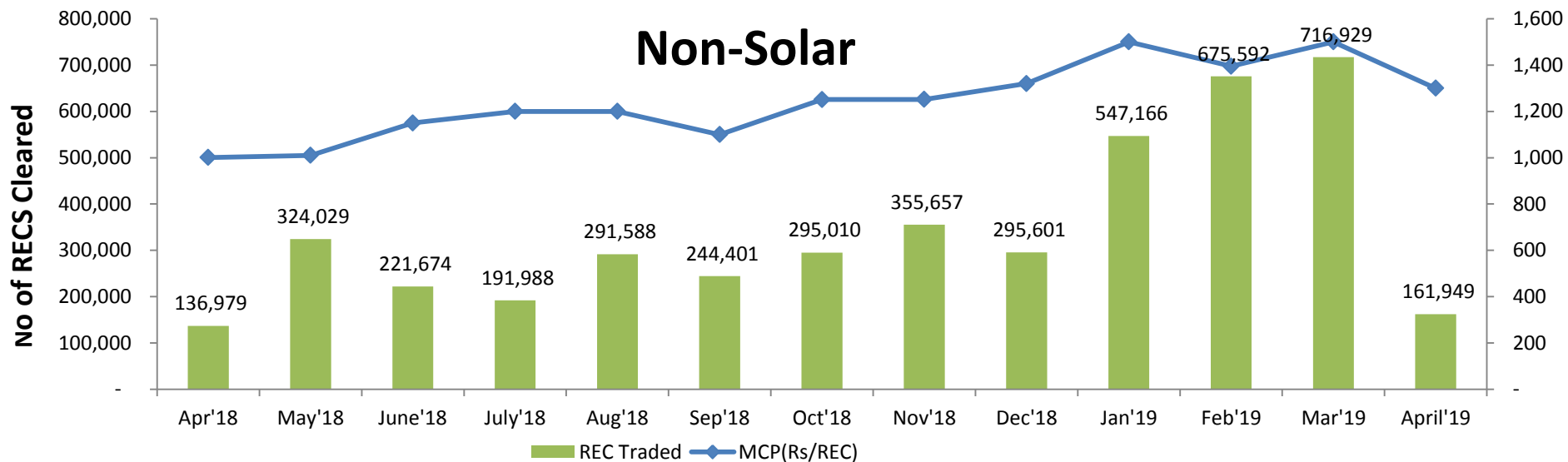
- More System imbalances
- Discoms to spend on more reserves to avoid UI
- More reserves required to balance

Open Access costly

- Payment of Transmission, Wheeling Charges, Losses and Scheduling Charges is higher than purchase of RECs

RECs are better way to transfer green premium than green energy

REC Trade Details at IEX





Trade @IEX

How to Start

Two step Process

- **Registration**

- Become Member with IEX
- Become Client through any of IEX members

- **Start Trading**

- Last Wednesday of every Month

Key Recent Developments & their likely impact REC Market

- Supreme Court Judgment on Renewable Purchase Obligations Applicability in Rajasthan
- Gujarat High Court judgment in the case of Hindalco (Birla Copper), and others
- Recent APTEL Judgments related to RPO / REC's
 - Case 1: IWEA, IWTMA, VS All SERCS
 - Case 2: IWPA VS GERC & all Gujarat discoms

Company Snapshot

98% Market Share

6400+ Participants

4000+ Industries **50+** Discoms

500+ Conventional Generators **1,650+** RE Participants

Transparency

Liquidity

Competition

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App (IEXApp)
available on
Android and Apple



Indian Energy Exchange Limited



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Indian Energy Exchange Limited



IEX Monthly Bulletin

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