



**SAARC
ENERGY
CENTRE**

Energy for Peace & Prosperity

On-line Training of SAARC Professionals on Power Purchase Agreements of Renewable Energy Projects



Green Markets – Renewable Trading through Exchange

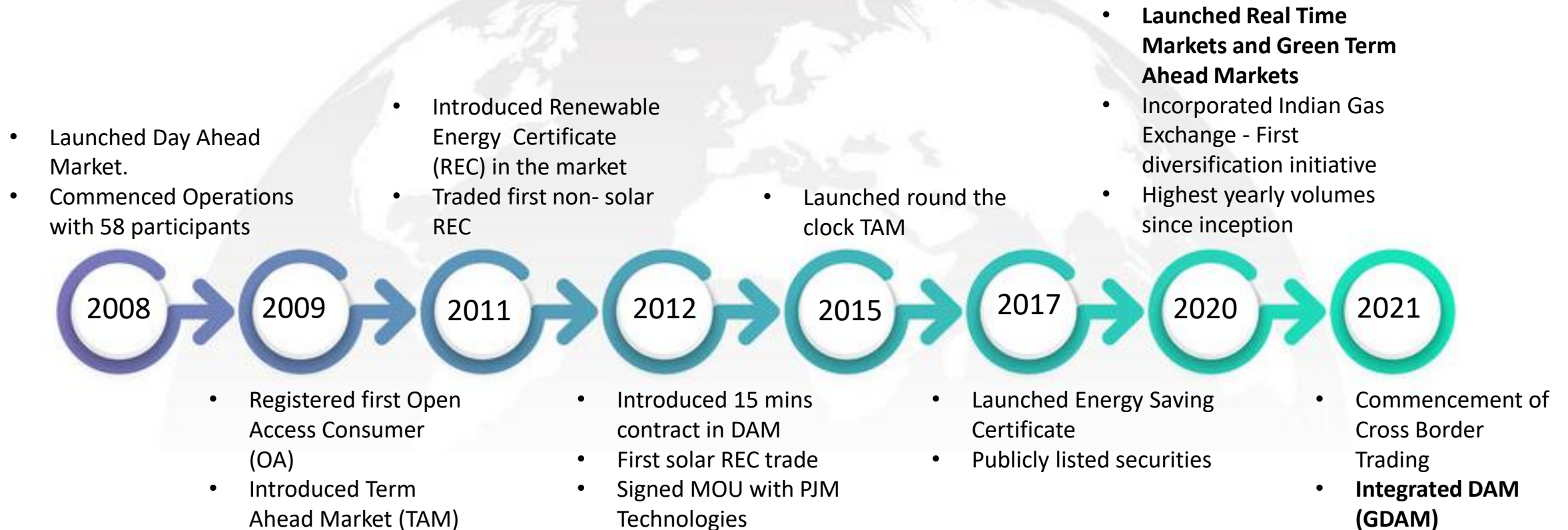
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IEX completes 13 years of successful operations. Endeavors to support a sustainable energy economy



Since its inception in 2008, Power Exchanges have been benefitting the entire power sector

- ✓ Helps **match demand and supply** of energy
- ✓ Provides **benchmark prices** for all electricity transactions
- ✓ **Transparent** Mechanism for Price Discovery
- ✓ High liquidity ensures **lowest prices**
- ✓ **Transparent process** and price discovery
- ✓ **Payment Security**



Generation

▶ **Signals for Generating Capacity addition (~35 GW Merchant plants)**



Transmission

▶ **Investments in transmission-congestion free – One Grid One Price**
Non-discriminatory access to transmission grid



Distribution

- ▶ **Lower power prices** for consumers.
- ▶ **Avoids buying under take-or-pay**
- ▶ **Flexibility** on quantum and duration(15-min basis)

Value Proposition



24X7 Power



Transparency



Flexibility in Power Procurement



Competitive Price



Payment Security



Cost Saving

Market Segment

Integrated Day-Ahead Market[^]

Conventional Since June, 08 **GDAM since 26 Oct 21**

- **Delivery** : any/some/all 15- minute time blocks in 24 hours of the next day
- **prices & quantum discovery**: double-sided closed auction
- Separate bids for green and conventional with option to carry forward for bidders in green segment

Term-Ahead Contracts

▪ Products & Delivery:

Since Sep., 09 :

Daily Contracts* -T+2 to T+11

Weekly Contracts# - Next Week

Since Jul., 15 (RTC) :

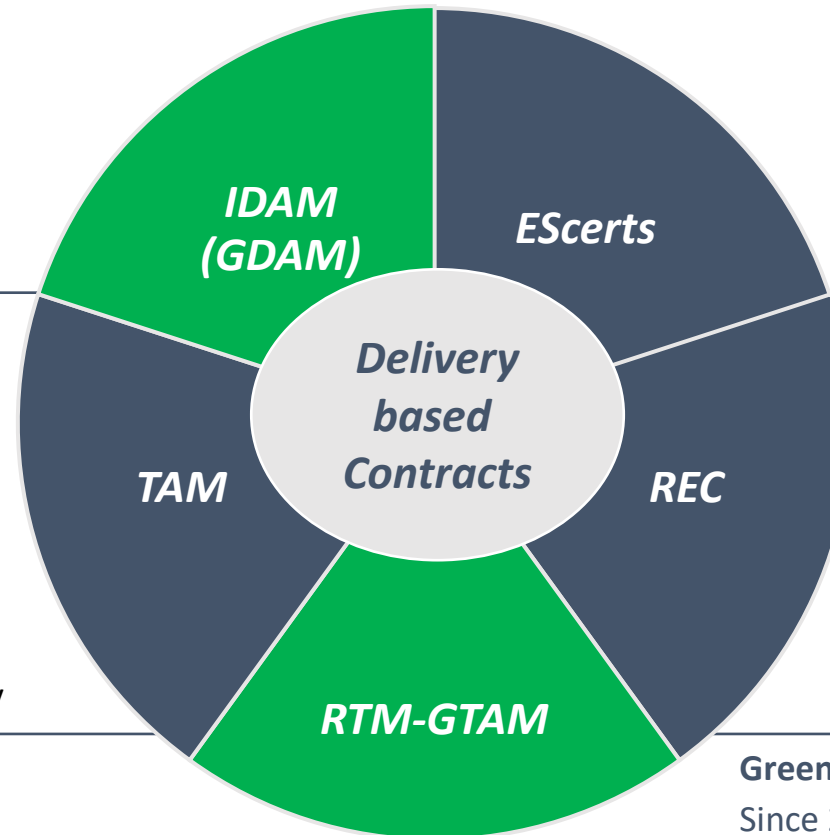
Intraday * -04:00 to 24:00 hrs same day

Day-Ahead Contingency* - all hrs following day

Real Time Market[^]

Since 01 Jun'20

- **Bid sessions** Half Hourly market; 48 times per day
- **Delivery**: 30 minutes in two time blocks of 15 minutes each
- **prices and quantum discovery**: Double sided closed auction.



Energy Saving Certificates[^]

Since Sep., 17

- 1 Escert = 1 Mtoe (Metric Tonne Oil Equivalent)
- **Trading Frequency** : Once a week (every Tuesday)
- **Price Determination** : Double-sided closed auction

Renewable Energy Certificates[^]

Since Feb., 11

- 1 MWh = 1 Certificate
- attributes of electricity generated from renewable resources
- **Sellers**: RE generators not under feed in tariffs
- **Buyers**: Obligated entities; 1MWh equivalent to 1 REC

Green Term Ahead Market

Since 21 Aug' 20

Products & Delivery :

- Intraday * -04:00 to 24:00 hrs same day
- Day-Ahead Contingency* - 00:00 to 24:00
- Daily Contracts* - T+2 to T+11; 10 rolling contracts
- Weekly Contracts# - Next Week

RE options



BUNDLED

FEED IN TARIFF

COMPETITIVE BIDDING

CAPTIVE

THIRD PARTY

GTAM

GDAM



UNBUNDLED

DAM

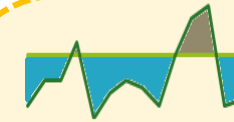
TAM

RTM

CAPTIVE

THIRD PARTY

REC



CFD

GAURANTEED PRICE

BILATERAL

POOL BASED

To be introduced

Robust Participation

- **>100 participants**
 - >25 Gencos
 - > 25 Discoms
 - > 40 industrial and commercial participants
- Total volumes traded - more than 3.3BU
- Average price for Green Power - INR 3.87/unit

Value Proposition

Buyers

- Competitive prices
- Flexible and transparent procurement
- No long-term commitment
- Integrated Energy + RPO fulfilment

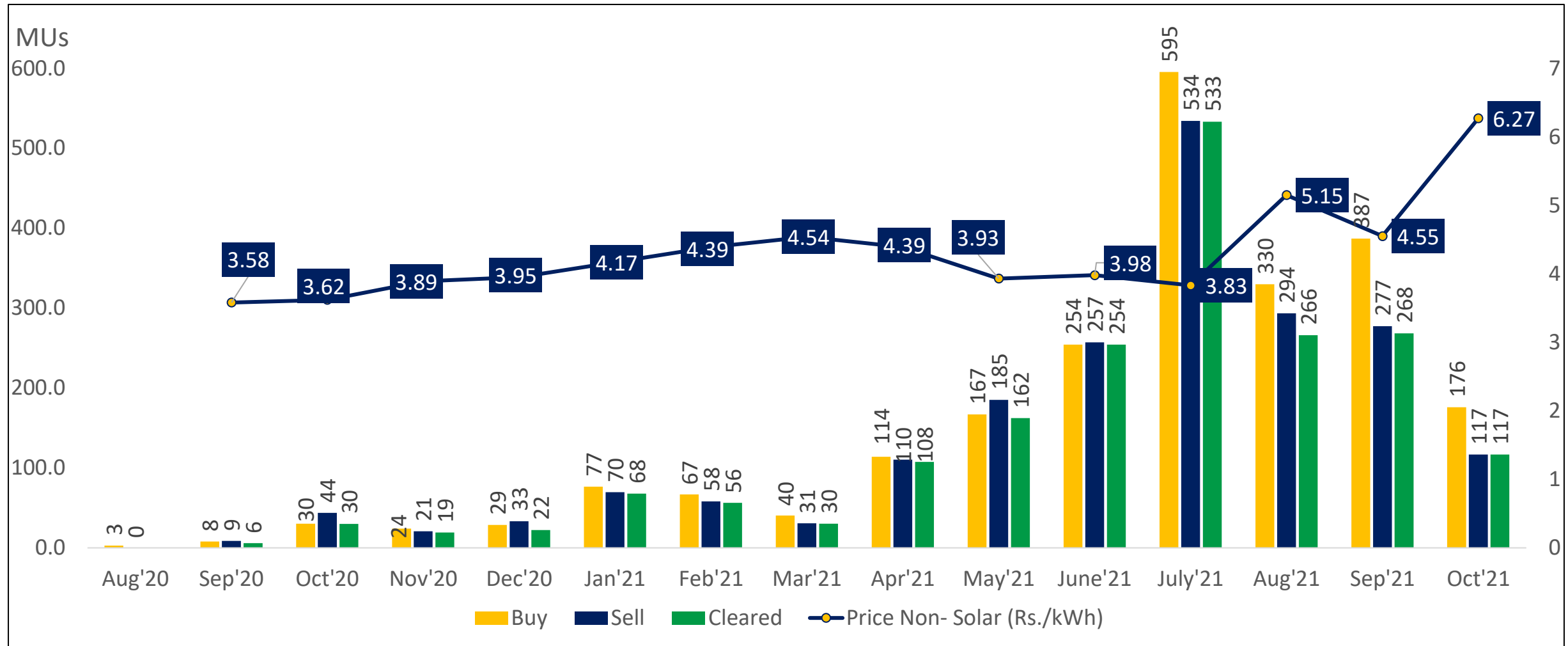
Sellers

- Payment guarantee
- Dispatch certainty
- Additional avenue to sell besides PPA
- Competitive rate for merchant sell
- Pan India market access
- Portfolio sale by RE rich DISCOMs

Price discovered in GTAM is higher than price discovered for renewable through competitive route, creating a case for capacity addition through market mechanism

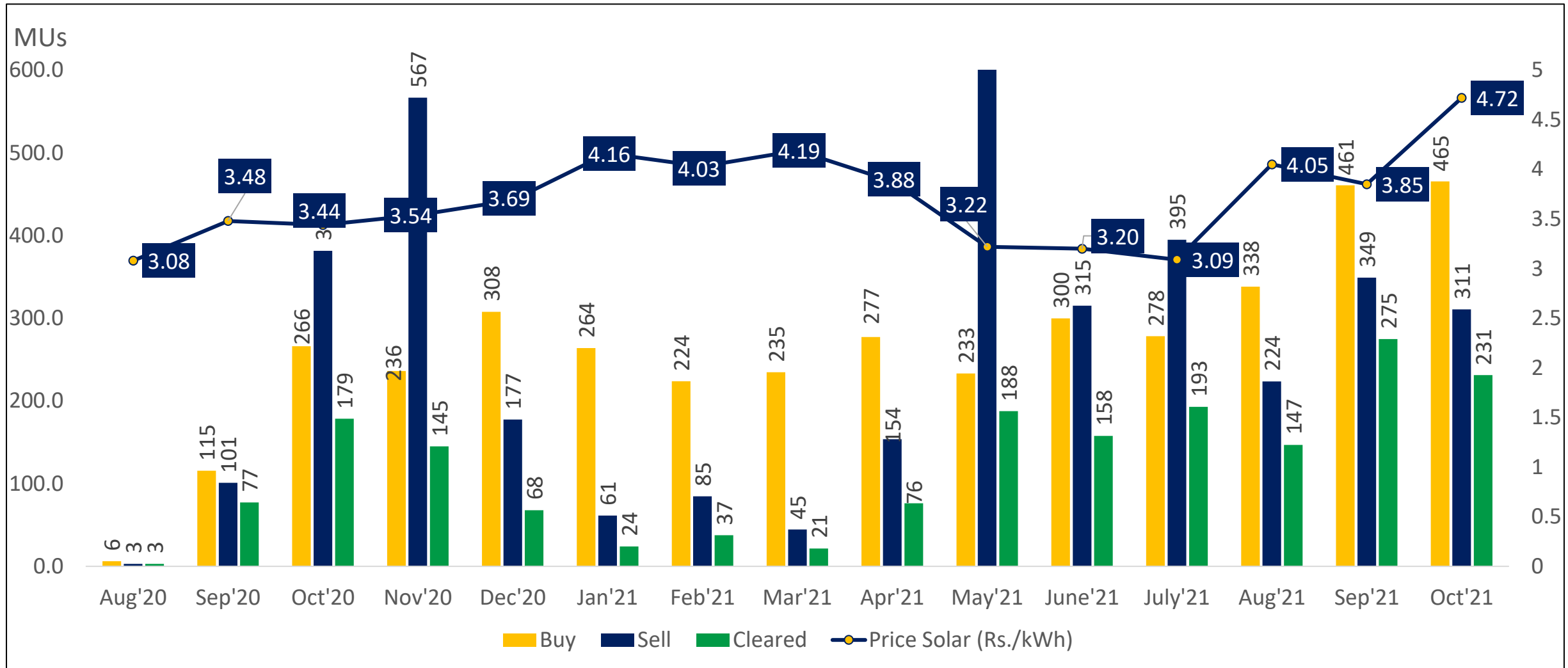
Journey So far

Market Snapshot-Non Solar



Journey So far

Market Snapshot-Solar

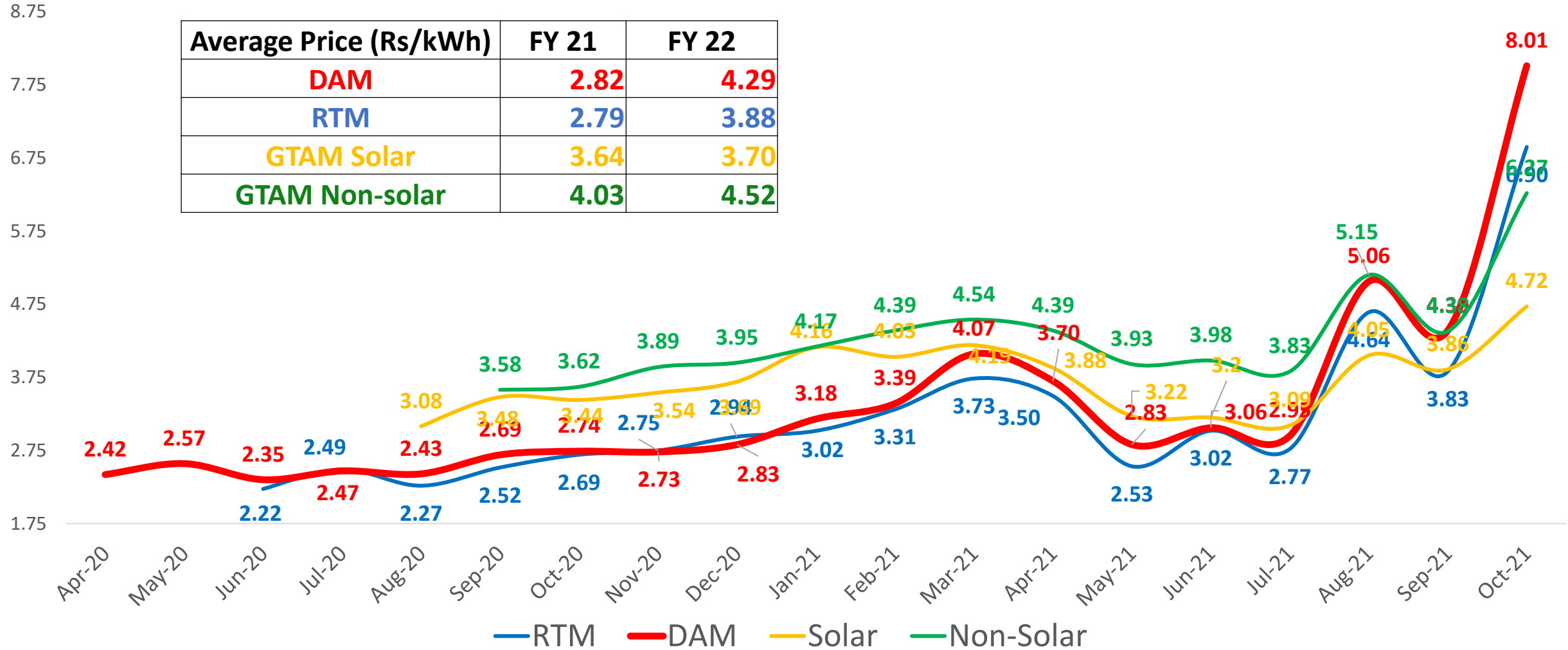


Synchronised Markets

DAM – RTM – GTAM Price Trends



Average Price (Rs/kWh)	FY 21	FY 22
DAM	2.82	4.29
RTM	2.79	3.88
GTAM Solar	3.64	3.70
GTAM Non-solar	4.03	4.52



Till 31st Oct'21

Integrated DAM with separate price formation for RE & Conventional

CERC Approved GDAC Highlights

- RE & conventional bidders to participate in existing DAM
- Bids to be submitted in two parts: RE and/or conventional
- Uncleared RE bids may opt to shift to conventional segment
- Different prices can be given for RE & conventional bids
- RE bids to be cleared first followed by conventional.
- RE bids have priority over conventional in transmission allocation
- **Inline with GTAM, Participation in GDAC is restricted to only those RE Generators that are not registered under REC mechanism and sale of power by such RE generator in GDAC(unselected bids) would not be eligible for issuance of RECs.**
- **Portfolio RE sale by Discom is permitted.**

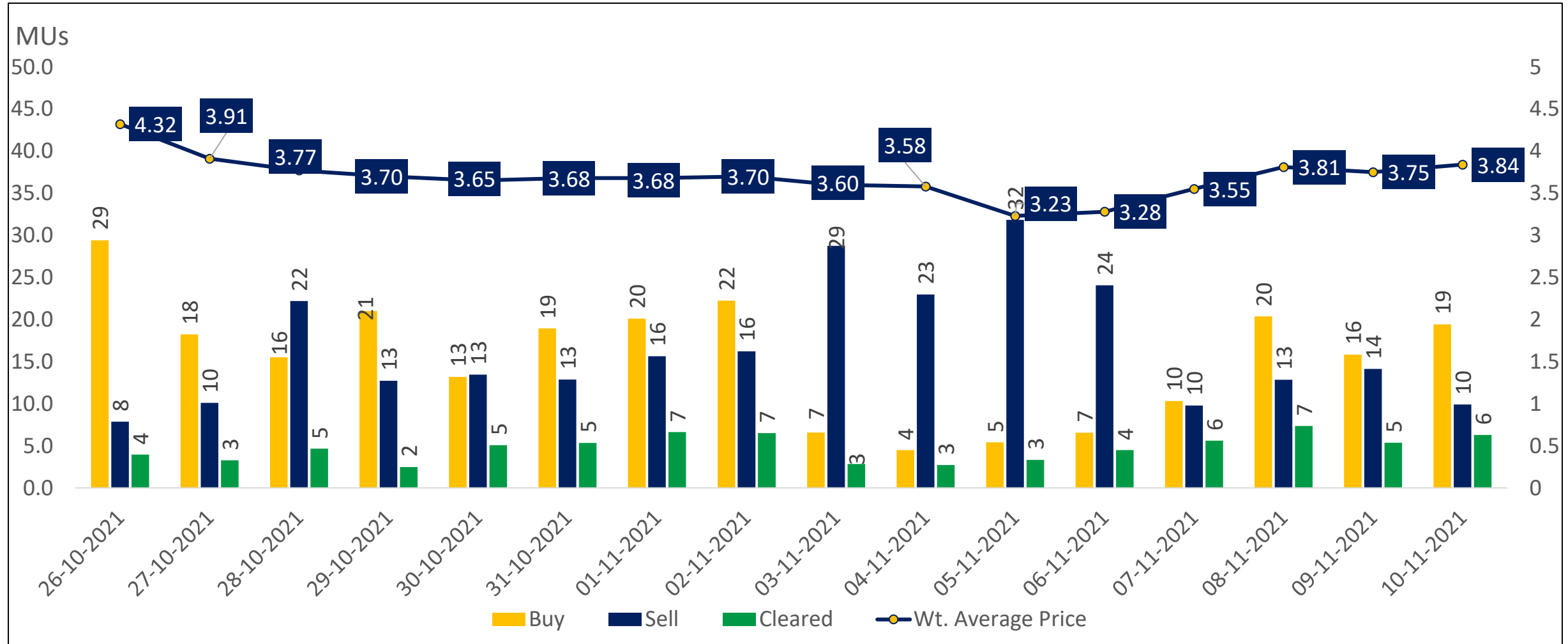
Benefits

- Investment Signal for RE sector
- Ensuring payment to the generator
- Unlocking untapped RE potential
- Options to meet the RPO anytime from the market
- Reduction in curtailment of the power
- Mitigating the price risk of Discoms in purchasing through Long Term PPAs

Enablers

- Variation management through RTM
- Waiver of ISTS charge in GDAC.

Journey So far : GDAM Market Snapshot



Thank You



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Daily SMS



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Mobile App (IEXApp)
Available on Android and IOS