Power Trade to support RE integration
19th Jan. 2021
**IEX Market Segments**

**Day-Ahead Market**
Since June, 08
- Delivery for next day
- Price discovery: Closed, Double-sided Auction
- 15 min. contracts
- Daily trade

**Term-Ahead Contracts**
Since Sep’09 - Daily, Weekly, DAC; RTC based contracts since Jul’15
- Hourly contracts
- For delivery from 3.5 hrs. in advance up to 11 days
- Price discovery - Continuous Trade in all except Weekly.
  - In Weekly it is open auction

**Real Time Market**
Since 01 Jun’20
- Half Hourly market (48 times per day)
- Delivery for 30 minutes in two time blocks of 15 minutes each
- Double sided closed auction with uniform price

**Energy Saving Certificates**
Since Sep., 17
- 1 Escert = 1 Mtoe (Metric Tonne Oil Equivalent)

**Renewable Energy Certificates**
since Feb., 11
- Green Attributes as Certificates
- **Sellers:** RE generators not under feed in tariffs
- **Buyers:** Obligated entities; 1MWh equivalent to 1 REC

**Green Term Ahead Market**
21 Aug’20 – ITD, DAC.; 4 Dec’20 - Daily, Weekly
- 15-min quote of quantity (MW) and price (Rs/MWh)
- Delivery for 30 minutes
- Price discovery - Continuous Trade in all except Weekly.
  - In Weekly it is open auction
  - Revision in schedule not allowed
Green Market
• **India is seeing rapid transformation of energy ecosystem**
  – Signatory to Paris Climate Agreement 2016
  – 40% of RE energy by 2030
  – 450 GW installed RE Capacity
  – Consumer preference shifting towards green energy

• **Green Markets to facilitate:**
  – National green aspirations
  – Pan India green markets
  – Integrated approach to energy + RPO
  – Most competitive prices
  – G-TAM + RTM to support RE integration

• **Green term-ahead Market: Solar & Non-Solar Contracts:**
  – Intraday
  – Day ahead Contingency
  – Daily Contracts
  – Weekly contracts
GTAM: Performance Snapshot

**VOLUME** (MU/GWh)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy (MU)</td>
<td>1221</td>
<td>8.14</td>
</tr>
<tr>
<td>Sell (MU)</td>
<td>1412</td>
<td>9.4</td>
</tr>
<tr>
<td>Cleared (MU)</td>
<td>603</td>
<td>4.02</td>
</tr>
</tbody>
</table>

Max. Cleared Volume in a day: 22.11 MUs

**Price** (Rs/Unit)

- Average: 3.75
- Min: 2.82
- Max: 6.00

**Participants**

**Buyers:**
- 15 Discoms (BRPL, CESC, DNH, Haryana, TPCL, DVC etc.) and 15 consumers (Vedanta, Jindal, Grasim etc)

**Sellers:**
- 2 Discoms (PCKL & Telangana) and 12 generator

**Days**

- Intraday and DAC since 21st Aug’20.
- Daily and Weekly since 4th Dec’20.
- Trading on all Days since Inception.

- **Max Buy Volume in a day**: 29 MUs
- **Major Discoms**: Haryana, CESC, TPCL, DVC, BRPL
- **Major OA**: Grasim, Vedanta Limited, Jindal Stainless Steel, and Tata Steel
- **Top 5 discoms trade almost 78% of the total cleared Volume.**

- **Max Sell Volume in a day**: 31 MUs
- **Major Discoms**: Telangana and PCKL
- **Major RE Generators**: Choudhary Power, Narmada Sugar, Amplus
- **Telangana trades almost 88% of the total cleared Volume.**

There is low liquidity in GTAM as of now; sufficient demand available at buy side.

*Till 17th Jan’20*
• Waiver of ISTS Losses & Charges for transactions in exchange green contracts
• Allow RE Generators to purchase power from Market to manage intermittency
  • RTM market to be used for managing forecasting deviation
• Uniform Regulatory & Policy framework across the States
• Flexibility in existing REC market allowing dynamic/ interchangeability status as compared to existing rigid structure.
Need for RTM:

- Large scale RE integration (175 GW by 2022)
  - Effective integration is crucial for smooth operations of electrical systems
  - Adequate framework for RE integration in the system is required
  - Few steps have been taken – regulatory framework for forecasting scheduling and deviation settlement for RE, Ancillary Services mechanism

- Need was felt in terms of improvement in market operations closer to real time not only to compliment RE integration but for optimal utilization of resources in intra daytime horizon

- Already a continuous trading option in Intraday was available and an auction-based mechanism could be added

- Intent: To provide market players an organized platform for energy trade closer to real time
IEX MARKET SNAPSHOT

- **BUY**
  - DISCOM: 53
  - INDUSTRY: 344
  - GENCO: 22
- **SELL**
  - DISCOM: 39
  - Thermal: 140
  - HYDRO: 26

**PARTICIPATION**

- **Top 5 (MU)**
  - JKPCL: 1111
  - TSSPDCL: 843
  - RUVNL: 640
  - APSPDCL: 503
  - WBSEDCL: 278

**IEX MARKET SNAPSHOT**

- **Buy Bid**
  - Avg: 35 MU 1453 MW
- **Sell Bid**
  - Avg: 77 MU 3200 MW
- **Cleared Bid**
  - Avg: 28 MU 1148 MW
- **RTM MCP**
  - Avg: 2.57 Min: 0.015 Max: 7.65
- **DAM MCP**
  - Avg: 2.66 Min: 0.68 Max: 6.90

**DISCOM**

- **IEX Share**
  - Buy
  - Sell
  - Cleared

- **Top 5 (MU)**
  - NLC: 745 MU
  - J&K: 519 MU
  - GRIDCO: 469 MU
  - NTPC: 367 MU
  - PCKL: 340 MU

**Highest Daily Cleared**
- 53 MU

**Highest Daily Buy**
- 68 MU

**Highest Daily Sell**
- 114 MU

**Max Buy**
- 5,595 MW

**Max Sell**
- 7,552 MW

**Max Cleared**
- 4,203 MW

- **Avoid OD**
- **Demand Increase**
- **Gen Outage**
- **DSM Sign Change**
- **Optimization- URS**
- **Avoid UD**
- **High Hydro**
- **Surplus RE**
- **Low Demand**
- **Sign Change**

- **Risk Factors**
  - **Avoid Spillage**
  - **Surplus**

- **Volume Highlight**
  - **Highest Daily Cleared**
  - **Highest Daily Buy**
  - **Highest Daily Sell**

*Till 17th Jan’ 20*
## Benefits of RTM

<table>
<thead>
<tr>
<th>BUYER</th>
<th>SELLER</th>
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<tbody>
<tr>
<td>DISCOM</td>
<td>Avoid under drawal/ sign change penalty</td>
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<tr>
<td></td>
<td>Manage demand drop</td>
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<tr>
<td></td>
<td>Manage increase in RE generation</td>
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<tr>
<td></td>
<td>Immediate payment</td>
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<tr>
<td>INDUSTRY</td>
<td>Uncleared DAM volume</td>
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<tr>
<td></td>
<td>Thermal</td>
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<td></td>
<td>URS Sell - improve PLF</td>
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<tr>
<td></td>
<td>Hydro</td>
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<td></td>
<td>Must Sell- Spillage</td>
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<td>Immediate Payment</td>
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<tr>
<td>GENCO</td>
<td>Despatch close to Real Time</td>
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<td></td>
<td>Optimize number of revision</td>
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<td></td>
<td>Avoid DSM</td>
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<td>Immediate Payment</td>
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<tr>
<td>RENEWABLE</td>
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- Reduce overdrawl/sign change penalty
- Manage variation in RE generation
- Handle sudden demand increase
- Better response to generation Outage
- Optimization- SGS/URS
- Uncleared DAM Vol
- Cost Optimization
- Manage demand variation
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- Uncl
All Power Market Segments Volume (FY21)

*Till 17th January 2021*
Thank You

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