

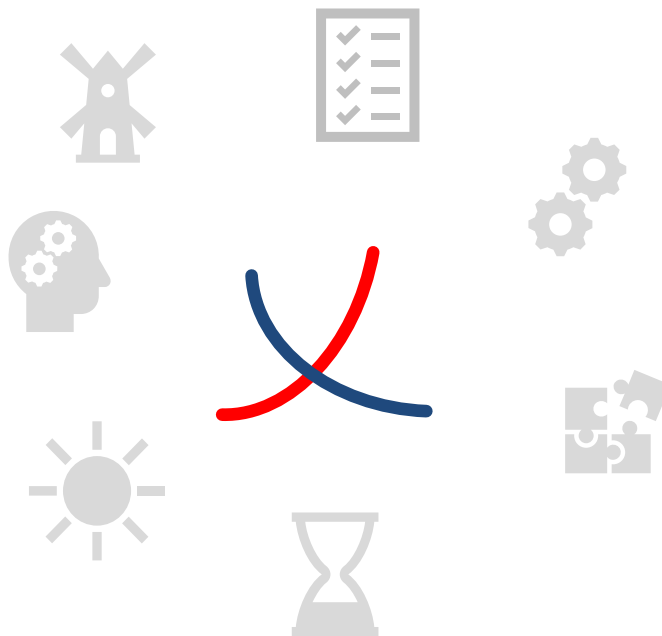
INTRODUCTION TO REAL TIME MARKET



WEBINAR

24th April 2020

1500-1615 Hrs



IN THIS PRESENTATION

WHY

WHAT

WHO

WHEN

HOW

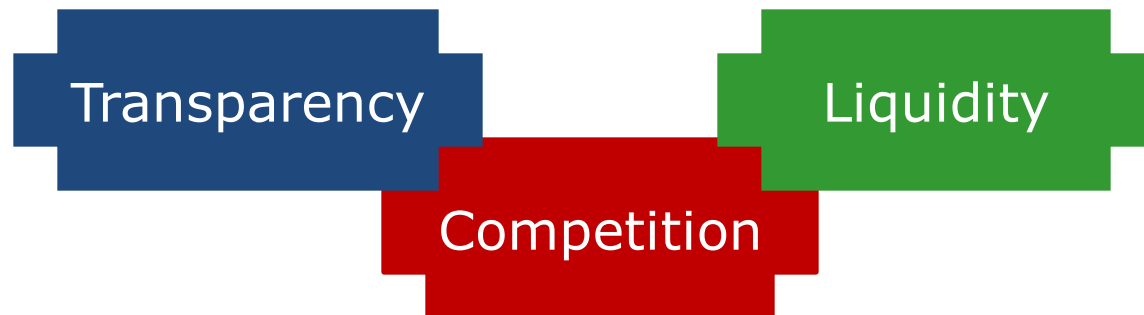
Company Snapshot



- ✓ Market Share: **97%**
- ✓ Average daily trade: **6000 MW+**
- ✓ High Participation: **6200+**
- ✓ Record Daily Volume : 308 Mus (12,900MW)

4000+ Industries | **55** Discoms (all) | **100+** ESCert Entities

400+ Generators | **1500+** RE Generators & Obligated entities



IEX Market Segments

Day-Ahead Market

since June,08

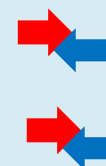
- *Delivery for next day*
- *Price discovery: Closed , Double-sided Auction*



Intraday Market & Day-Ahead Contingency

Round the clock since Jul'15

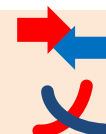
- *Intraday: For Delivery within the same day*
- *Day Ahead Contingency: Another window for next day*
- *Gate closure : 2.5 hours*



Term-Ahead Contracts

since Sep'09

- *For delivery up to 11 days*
- *Daily Contracts, Weekly Contracts*



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***



Energy Saving Certificates

since 27th Sept'17

- ***1 ESCert = 1 mtoe (metric Tonne of Oil Equivalent)***
- *Trading Session on every Tuesday of the Week*
- *Trading time 1300 hrs to 1500 hrs*



Auction



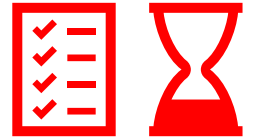
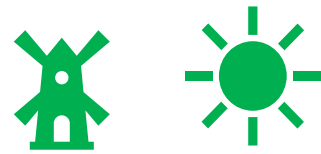
Continuous

WHY DO WE NEED RTM?



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 is 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 day time horizon
- ✓ Intent: To provide market players an organized platform for energy trade closer to real time
- ✓ Already a continuous trading option in Intraday and a auction based mechanism can be added



Real Time Energy Imbalance Management at Present:

✓ **DSM:**

Meant to manage last mile system imbalances and shouldn't be used as an avenue for sale or purchase of power at real time. The Commission has over the period been taking measures to discourage the market participants from using DSM as a trading platform

✓ **Existing resources/Right to Recall:**

Inherent right of utilities but leads to suboptimal utilization of generating resources and also limits liquidity for Intra day market

✓ **Intra Day Market:**

Not very liquid , mainly due to absence of gate closure closer to realtime , price discovery methodology and absence of delegation of decision making power at operator level



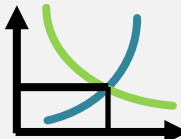

✓ **Ancillary Services:**

Instances are there when AS have been used for very long period, passive dependence of the discom on this mechanism. AS costs are not directly incident on the utilities

WHAT IS RTM?



Real Time Market- Highlights

- ✓ An organized platform for energy trade closer to real time 1st June 2020
- ✓ Half Hourly market
 - ❖ To be conducted every half an hour (48 times per day)
 - ❖ Delivery for 30 minutes in two time blocks of 15 minutes each
- ✓ Price discovery Mechanism
 - ❖ Double sided closed auction with uniform price
 - ❖ MCP/ACP and MCV/ACV will be discovered for each 15 minute block
- ✓ Allocation of transmission corridor between the power exchanges
 - ❖ In the ratio of shares in the cleared volumes in the day ahead collective market subject to a minimum of 10%
- ✓ NLDC to inform available transmission margin before the gate closure of each session
- ✓ RTM would be financially and physically binding.
- ✓ Bidding and scheduling at Regional periphery.
- ✓ Any entity will be able to participate in the Real Time Market.
- ✓ Once NOAR is in place, RTM to be brought closer to delivery.

WHO CAN PARTICIPATE?

VALUE PROPOSITION?



What it means for Generators

- The generators with un-requisitioned capacity can participate in RTM
- The generators having long term contract and participating in this market will be required to share the net gains in the ration of 50:50 subject to ceiling of 7 paise/kWh for generators.
- Gain to be calculated as difference between Selling price and fuel charges including incidental expenses.
- No sharing of losses between ISGS and beneficiary.
- All the Generators are expected to bid considering ramping and other technical capabilities.

What it means for Discoms

- ✓ Real Time Market would provide an alternate mechanism to access larger market at competitive price.
- ✓ Market discovered prices are likely to be more efficient than the power procurement cost under the bilateral arrangement
- ✓ URS from suppliers of other Discoms is available (National pool v/s regional pool)
- ✓ Discoms can recall and sell in RTM.
- ✓ Discoms can manage variation in schedule due to RE power.
- ✓ Discoms can let the suppliers to sell in RTM and share the gain. No sharing of losses
- ✓ Discoms can manage sign change requirement under DSM through RTM

VALUE PROPOSITION

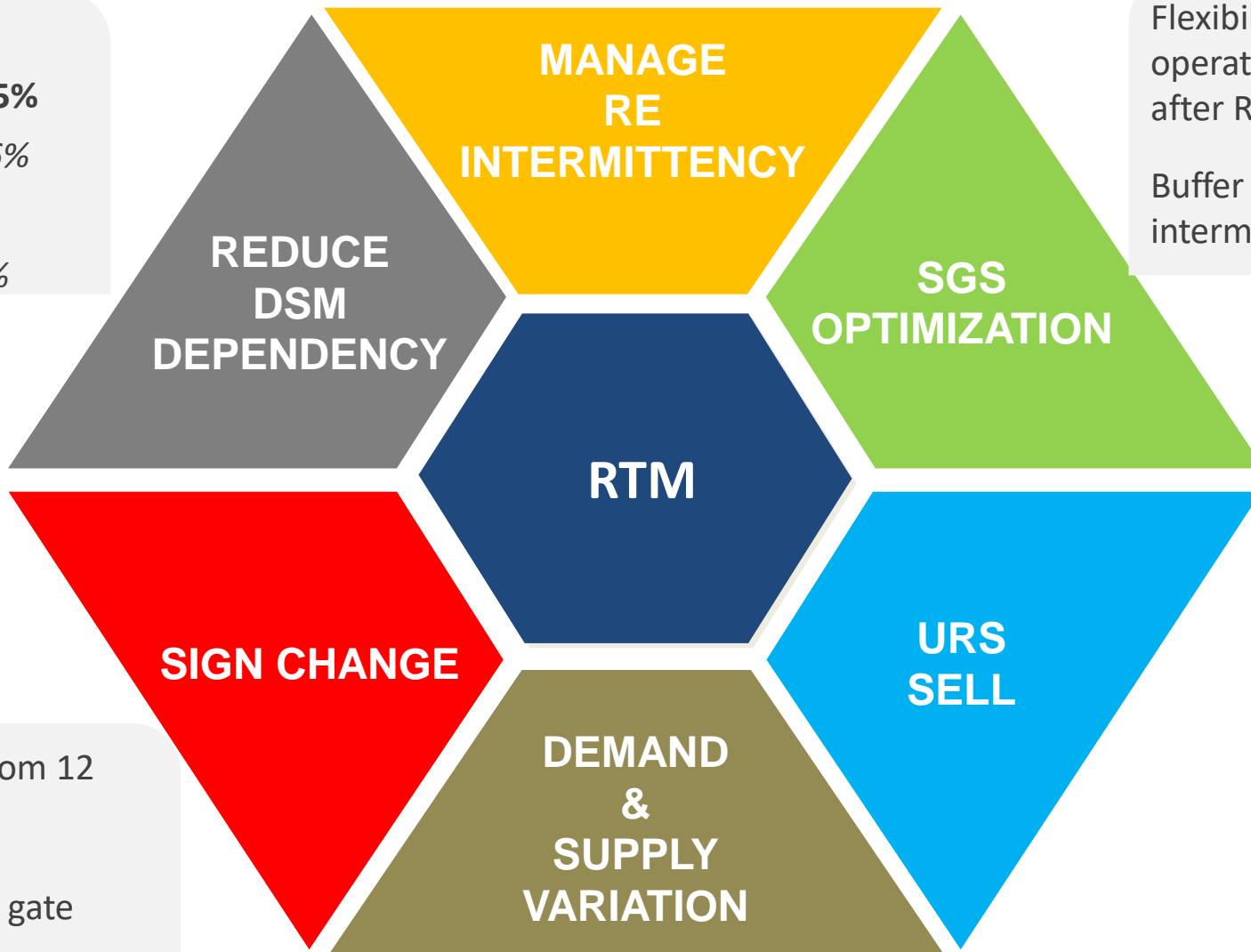
Normal: ~75%

Additional: ~25%

12-15%: ~6%

15-20%: ~7

>20%: ~12%



Flexibility to operate / recall after RTM

Buffer for RE intermittency

Reduced to 6 from 12 time block

NOAR: reduced gate closure

HOW IT WORKS?



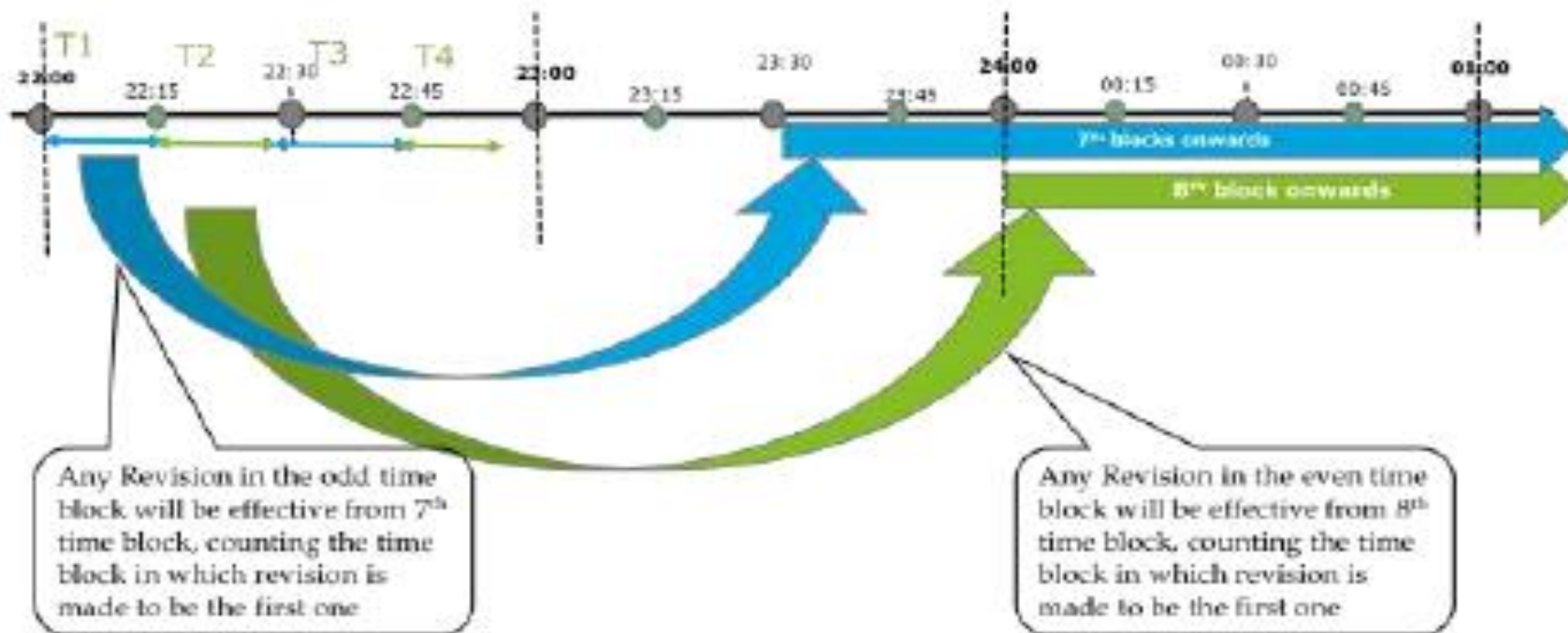
Regulatory Changes – Indian Electricity Grid Code

1. Right to recall: Changed from 4th time block to 7th (odd) and 8th (even) time block, other than Wind and Solar
2. Provision for revision of estimated time of restoration per day of a generation unit in case of unit tripping – Deleted
3. Power sell by ISGS from the share of original beneficiary in RTM:
 - a) Without the consent of the beneficiary.
 - b) Share gain with beneficiary in the ratio of 50:50
 - c) Gain of ISGS restricted to 7 paisa/ Kwh
 - d) Gain computed as difference of selling price and fuel charge including incidental expenses.
 - e) No sharing of loss, if any.
 - f) Original beneficiary shall continue to pay the fixed charge.
4. In case of curtailment day ahead collective transactions shall be curtailed first followed by real time transactions.

Right to Revision:

- Once the real time market commences for any specific half-hour delivery period, the revision in schedule for that half hour (two time blocks) shall not be permitted.
- 4 time blocks in between Gate closure and Start of delivery period.
- The right to revision of schedule for the remaining time blocks of the day for which the RTM is yet to commence, would still be available with the Discom and the generator.
- Revision of schedule in 4 Time blocks available to : Wind and Solar Generator; And System Operator.

Right to Recall/Concept of Gate Closure:

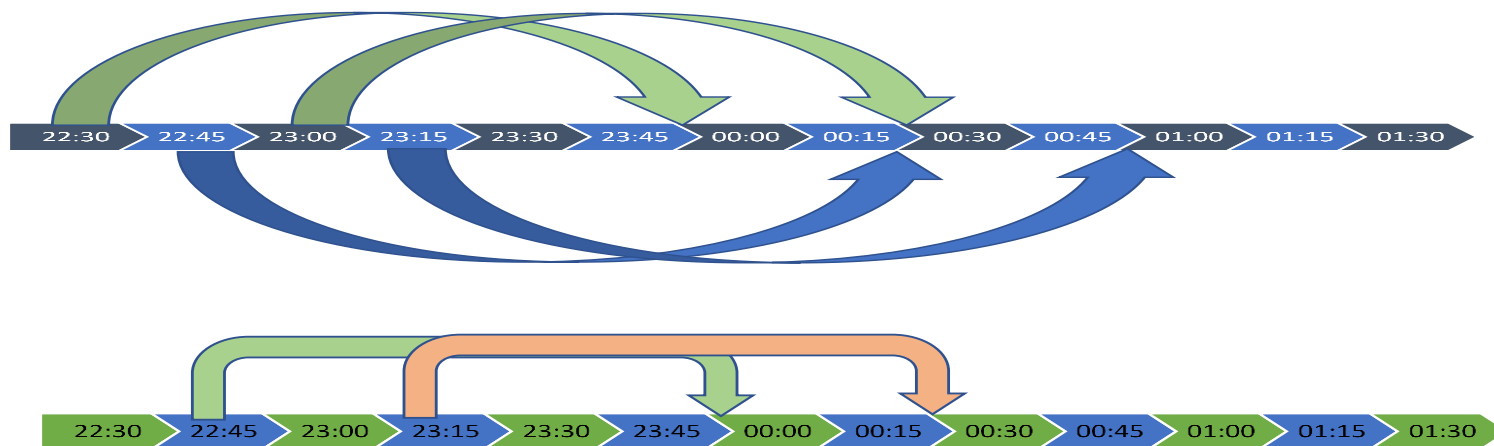


Revision request made in odd time blocks shall become effective from 7th time block onwards

Revision request made in even time blocks shall become effective from 8th time block onwards

RTM Feature-Buyback by Generators

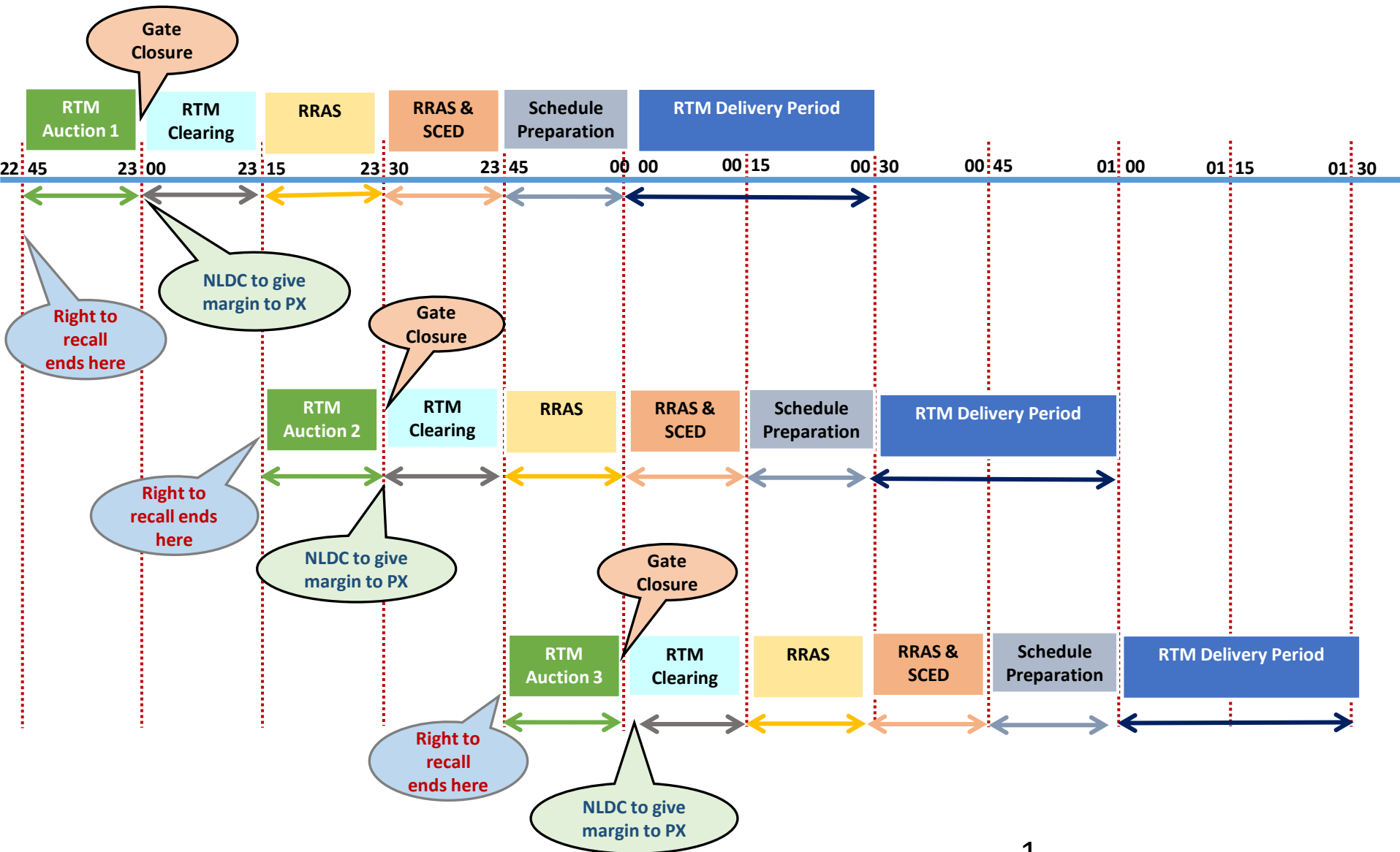
- Buyback by Generators allowed in case of Forced outage.



In case forced outage is happening in time block 22:30 to 22:45, plant would be able to revise the schedule from 7th time block onwards i.e. 00:00 Hr of next day. However no RTM auction session is open for delivery prior to 00:00 Hr. In case forced outage is happening in time block 22:45 to 23:00, plant would be able to revise the schedule from 8th time block onwards i.e. 00:30 Hr of next day. In this scenario, RTM auction session for delivery from 00:00 Hr to 00:30Hr is open and plant is allowed to buyback upto 1000 MW for 00:00 Hr to 00:30 Hr.

- Generators will be allowed based on undertaking.(Draft procedure)**

Operational Timelines for RTM

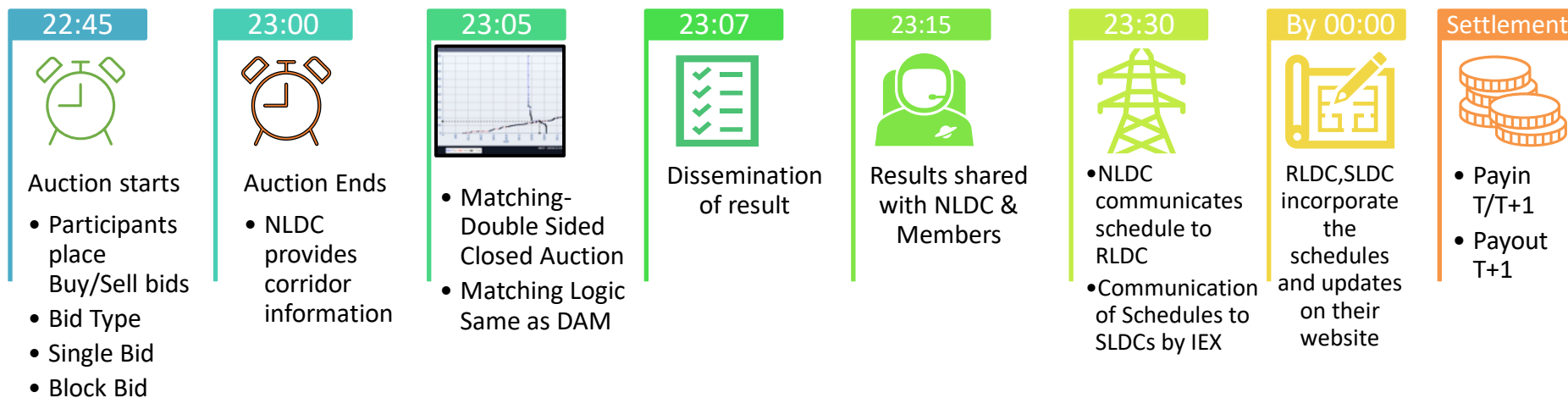


RTM Product Specification

Product Name	Real Time Market with 48 separate session in a given day. Where in each session will have two time block.
Trading System	Power Exchange
Quotation method	Double sided close bid auction with uniform Market Clearing Price for all buyers and sellers.
Auction Timings	15-minute time blocks of each hour of the day commencing at 22:45 hrs of D-1.
Minimum Volume	0.1 MW
Minimum Quotation step	Rs. 1 per MWh
Delivery Point	Periphery of Regional Transmission System in which the grid-connected entity is located
Transmission charges	ISTS: Central Electricity Regulatory Commission (Open Access in inter-State Transmission (Collective Transaction)) Regulations, 2008 and STS: As per the concerned State Electricity Regulatory Commission's
Transmission Losses	Payable in kind from delivery point to its grid connection point.
Settlement	Daily settlement at ACP x volume traded in MWh (by the Client or Member as the case may be). Final settlement adjusted for any force majeure deviations
Pay in and Pay out	Pay-In is collected on T day i.e. trade day * (Trade day) and Pay-Out is done on T+1*

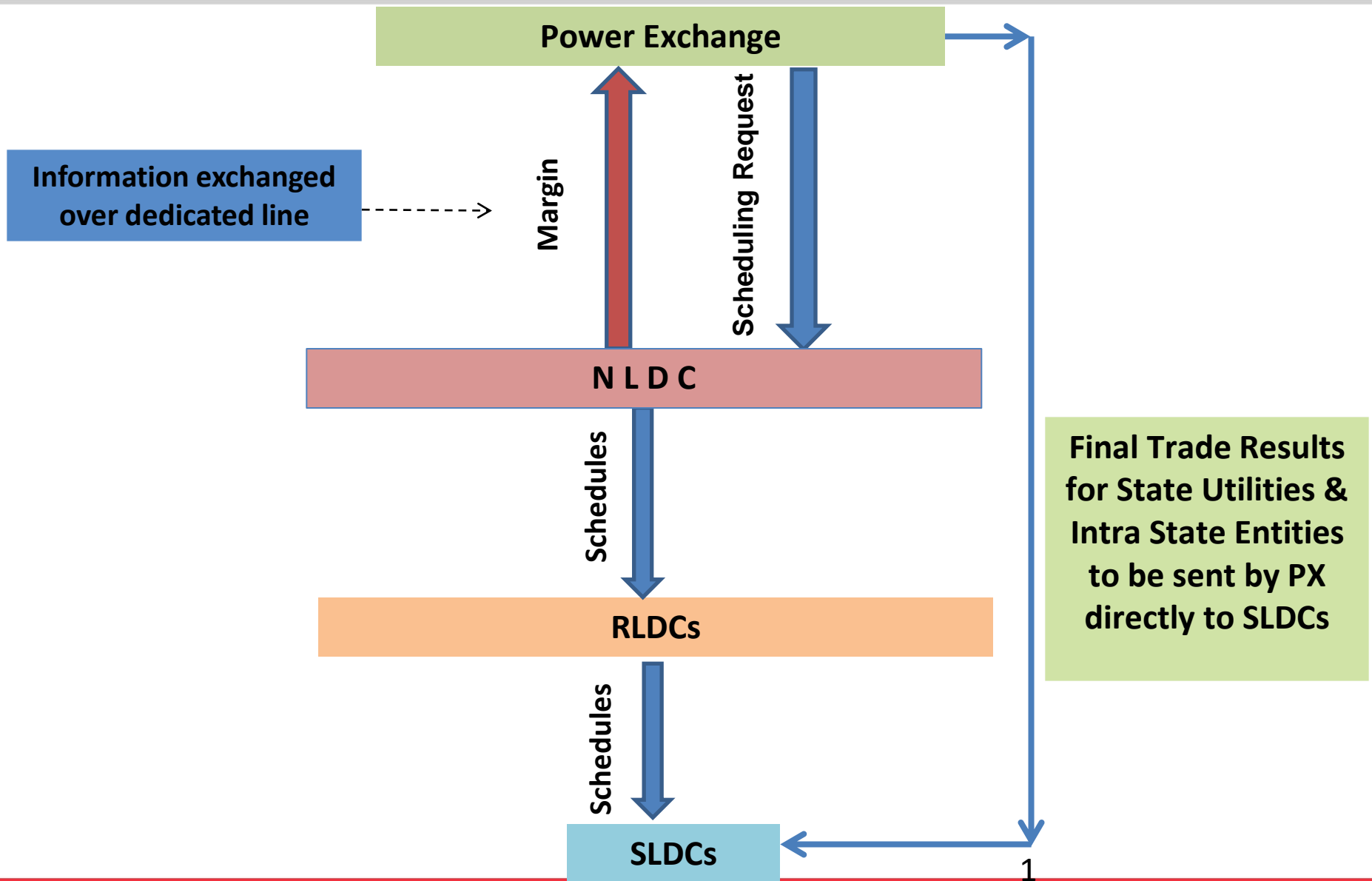
RTM Timeline-IEX-Auction 1

RTM Session For Delivery Period 00:00-00:30



Similar process is followed for all the sessions

Information Exchange



NOC and Congestion Management

- Existing NOC for collective transaction to be used for RTM.
- ***NOC for Maximum Power that can be scheduled through all types of Transaction. (Draft procedure)***
- ***To be reviewed quarterly.***

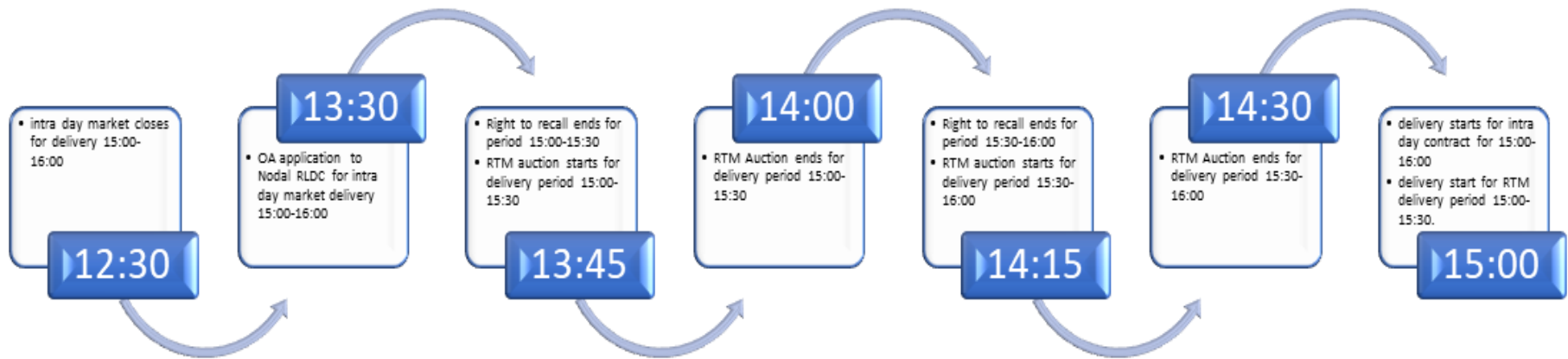
- In case of curtailment in collective transactions, DAM would be curtailed followed by RTM.
- Priority while allocating the transmission corridor
 - LTA>MTOA>STOA Bilateral (Advance &FCFS)> DAM> STOA Dayahead>STOA contingency > RTM

- Priority while curtailing the transmission corridor
 - LTA<MTOA<RTM<DAM<STOA Bilateral (Advance, FCFS, DayAhead, Contingency)

Commercial Condition- Draft Procedure

- Non refundable fee of Rs5000/- per day irrespective of quantum of RTM trade.
- Transmission charges as per CERC (Sharing of Inter State Transmission Charges and Losses) Regulation 2010 and relevant CERC order.
- NLDC operating charges of Rs 1/MWh on the basis of scheduled energy at regional periphery. Maximum ceiling of Rs 200 per day for each entity.
- Open Access charges for use of intra state transmission system shall be payable directly to SLDC by Power Exchanges. These charges will be as decided by State Commission.
- In case State commission has not determined the charges, transmission charges will be paid at the rate of Rs 80/MWh and Operating charges will be paid at the rate of Rs 1000/- per day.

Scheduling- Example (Intra Day and RTM):

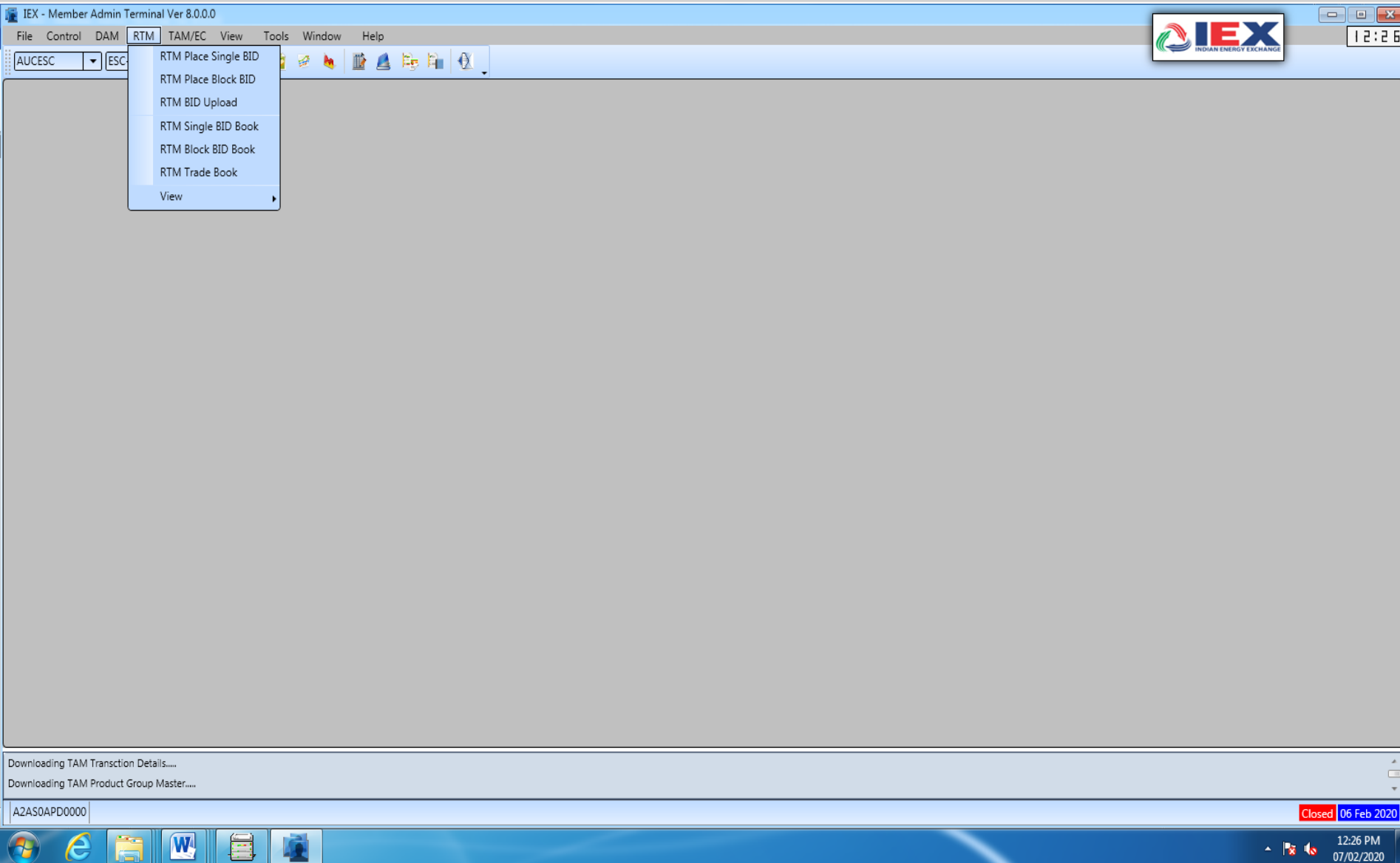


Existing intra-day segment of power exchange would continue to clear the continuous transactions except for the time blocks for which the real-time market operates.

HOW TO BID?



Under Section RTM, options available is shown as below:



The screenshot displays the IEX Member Admin Terminal interface. The title bar reads "IEX - Member Admin Terminal Ver 8.0.0.0". The menu bar includes "File", "Control", "DAM", "RTM", "TAM/EC", "View", "Tools", "Window", and "Help". The "RTM" menu is open, showing the following options:

- RTM Place Single BID
- RTM Place Block BID
- RTM BID Upload
- RTM Single BID Book
- RTM Block BID Book
- RTM Trade Book
- View

The main workspace is currently blank. The status bar at the bottom shows "A2AS0APD0000" and a "Closed 06 Feb 2020" notification. The system tray displays the time "12:26 PM" and the date "07/02/2020".

RTM Single Bid Window:

IEX - Member Admin Terminal Ver 8.0.0.0

File Control DAM RTM TAM/EC View Tools Window Help

AUCESC ESC-12-15

RTM Single BID

Delivery Date: 06 Jan 2020 Asset: INDIA User: PTC01 Auto BID

BID Area: A1 Portfolio: AITROPTC0001 TSECL Live Session

Fetch Clear Submit

Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14
01:30 - 01:45														
01:45 - 02:00														
02:00 - 02:15														
02:15 - 02:30														
02:30 - 02:45														
02:45 - 03:00														
03:00 - 03:15														
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06:15 - 06:30														
06:30 - 06:45														
SUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DPR : INR 0 - 20000

Downloading TAM Transaction Details.....

Downloading TAM Product Group Master.....

N2DL0PTC0000

Closed 05 Jan 2020

9:46 AM 06/01/2020

Can Bid for all 48 Sessions at one GO

RTM Block Bid Window:

IEX - Member Admin Terminal Ver 8.0.0.0

File Control DAM RTM TAM/EC View Tools Window Help

AUCESC ESC-12-15



12:33

RTM Block BID

Delivery Date : 06 Feb 2020 Asset : INDIA User : *

BID Area : * Portfolio : * Live Session

BID Reference	From Period	To Period	Price	Quantity	Quantity (MWh)	Linked To
SUM						0.0

DPR : INR 0 - 20000

Downloading TAM Transaction Details.....

Downloading TAM Product Group Master.....

A2AS0APD0000

Closed 06 Feb 2020



12:33 PM
07/02/2020

WAY FORWARD



Way Forward

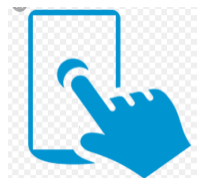
- ✓ 48 sessions with small time window for response for each session.
- ✓ Manpower and trading desk setup.
- ✓ Discoms require a tool which can
 - Take real time demand forecast and supply as input
 - Use MOD, DSM, historical RTM and DAM prices etc as parameters
 - Take decision for bidding on RTM including pricing decision
 - Submit the RTM bid on IEX platform
- ✓ Ensure DSM as last resort
- ✓ System to be in balance after RTM session

**MOCK SESSIONS to start
from 1st week of May 2020**

THANK YOU



@IEXLtd



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available on
IOS & Android



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