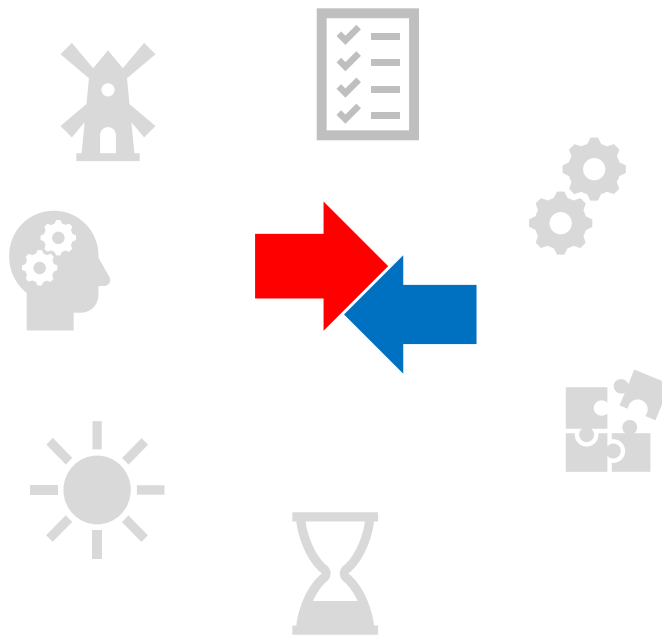


WEBINAR ON GREEN MARKET



25th August 2020

BACKGROUND

GREEN MARKETS – BUILDING INDIA AS A SUSTAINABLE ENERGY ECONOMY

- **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



SELLERS-Discom and RE Developers

- ✓ Additional avenue to sell besides structured long term agreements - near term
- ✓ Creation of merchant renewable capacity in the country - mid to long-term
- ✓ Access to pan India market
- ✓ Certainty in despatch
- ✓ RTM for imbalance settlement
- ✓ Portfolio sale by RE rich Discoms
- ✓ Payment guarantee

BUYERS-Discom and OA Consumers

- ✓ Competitive prices
- ✓ Flexible and transparent procurement
- ✓ No long term rigid commitments
- ✓ Integrated Energy + RPO fulfilment



PRODUCTS & OFFERINGS

BUNDLED



FEED IN TARIFF

COMPETITIVE BIDDING

CAPTIVE

THIRD PARTY

GTAM

GDAM & Other

UNBUNDLED



DAM

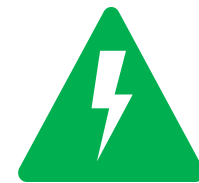
TAM

RTM

CAPTIVE

THIRD PARTY

OTHER IEX ELECTRICITY
PRODUCT



REC

Company Snapshot



95% Market Share **6000+** MW average daily trade

6000+ Participants

4100+ Industries **70+** Commercial **50+** Discoms

500+ Conventional Generators **1500+** RE Participants

Transparency

Liquidity

Competition

IEX Market Segments

 Auction

 Continuous



Day-Ahead Market since June,08	<ul style="list-style-type: none"> • <i>Delivery <u>for next day</u></i> • <i>Price discovery: Closed , Double-sided Auction</i> 	
Intraday Market & Day-Ahead Contingency Round the clock since Jul'15	<ul style="list-style-type: none"> • <i>Intraday: For Delivery <u>within the same day</u></i> • <i>Day Ahead Contingency: <u>Another window for next day</u></i> • <i>Gate closure : 3.5 hours</i> 	
Term-Ahead Contracts since Sep,09	<ul style="list-style-type: none"> • <i>For delivery <u>up to 11 days</u></i> • <i>Daily Contracts, Weekly Contracts</i> 	
Renewable Energy Certificates since Feb,11	<ul style="list-style-type: none"> • <i>Green Attributes as Certificates</i> • <i>Sellers : RE generators not under feed in tariffs</i> • <i>Buyers: Obligated entities; 1MWh equivalent to 1 REC</i> 	
Energy Saving Certificates since 27 Sep'17	<ul style="list-style-type: none"> • <i>1 Escert= 1 Mtoe(Metric Tonne Oil Equivalent)</i> • <i>Trading Session on every Tuesday of the Week</i> • <i>Trading time 1300 hrs to 1500 hrs</i> 	
Real-Time Market since 1 Jun'20	<ul style="list-style-type: none"> • <i>Delivery <u>within an hour</u></i> • <i>Price discovery: Closed , Double-sided Auction</i> 	
Green Term Ahead Market since 21 Aug ,2020	<ul style="list-style-type: none"> • <i><u>Intraday, DAC (commenced) Daily and Weekly(starting soon)</u></i> 	

BID MATCHING

Open/Closed Auction

Orders accumulated during call phase (no matching)

Orders matched after call period

Orders are used for calculation common price i.e. Equilibrium Price.

All successful orders matched at Equilibrium Price.

Continuous Trading

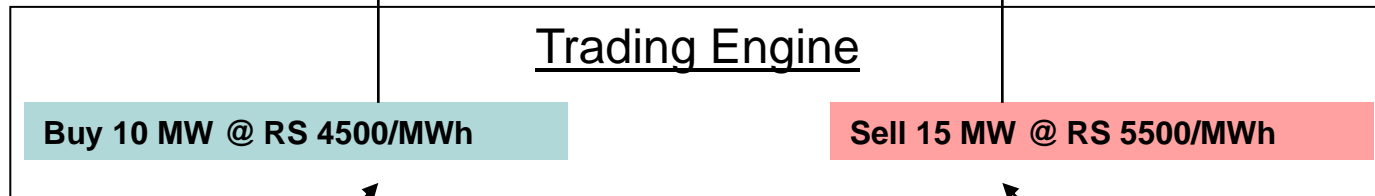
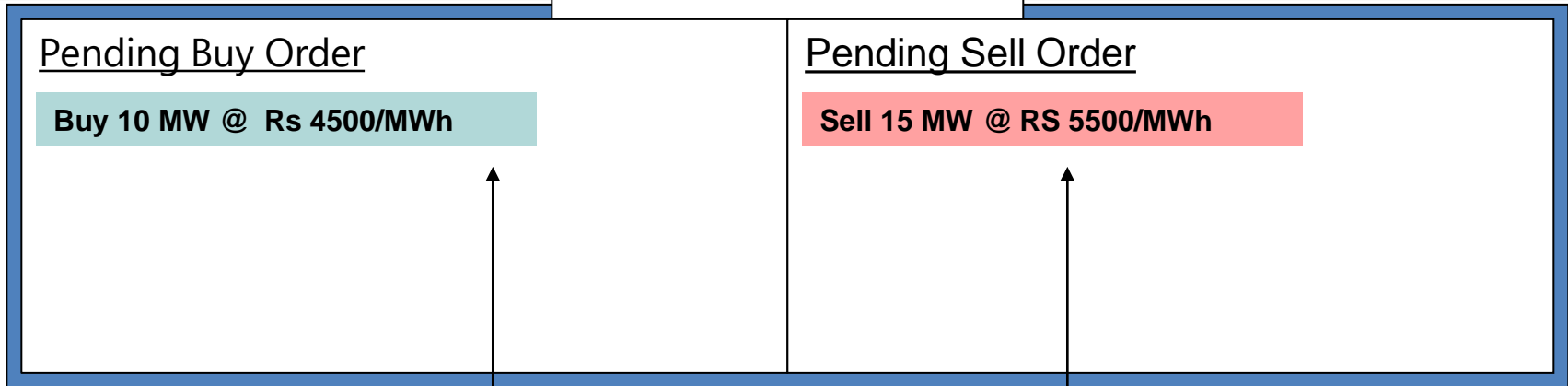
Price-time priority based continuous matching

The highest Buy order & lowest Sell order gets the priority

If the prices are same then priority is given to the time of the order received.

CONTINUOUS TRADING

TWS Screen



Buy 10 MW @ Rs 4500/MWh

Sell 15 MW @ Rs 5500/MWh



CONTINUOUS TRADING

TWS Screen

Pending Buy Order

Buy 10 MW @ RS 5000/MWh

Buy 10 MW @ RS 4500/MWh

Pending Sell Order

Sell 15 MW @ Rs 5500/MWh

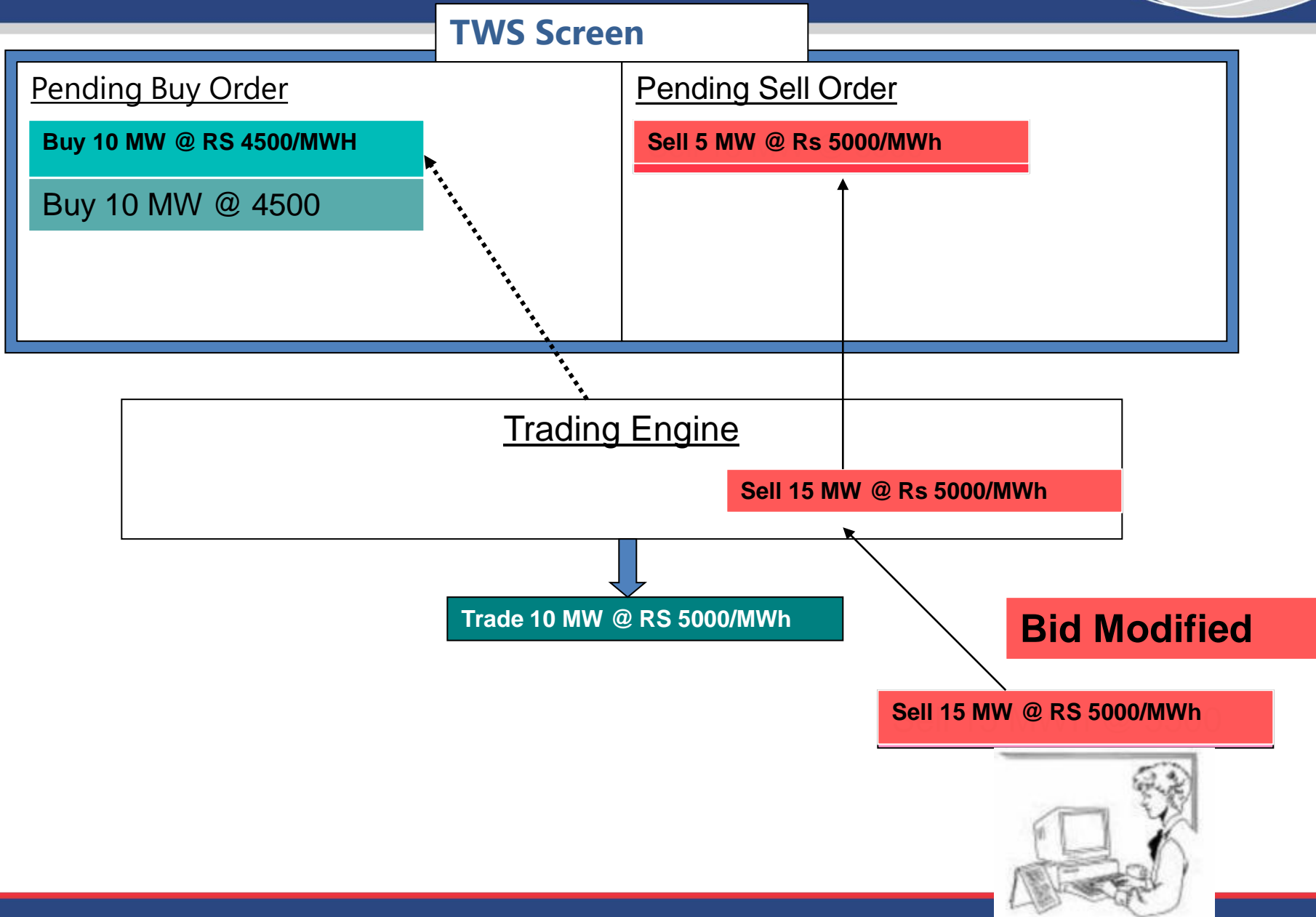
Trading Engine

Buy 10 MW @ RS 5000/MWh

Buy 10 MW @ 5000/MWh



CONTINUOUS TRADING



Contracts Snapshot

Traded in energy terms.

Traded for delivery from Monday to Sunday.

No revision in schedule.

15 min Granularity

National level contracts .

WEEKLY

Traded in energy terms.

Traded for delivery from T+2 to T+10 (9 days)* rolling basis.

No revision in schedule

15 min Granularity

National level contracts

* Subject to trading calendar

DAILY

Traded on D-1 in MW terms

No revision in schedule

15 min Granularity

National level contracts

DAC

Traded 3.5 hours before delivery in MW terms





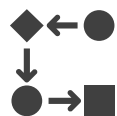
No revision in schedule

15 min Granularity





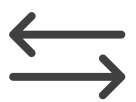
National level contracts .

INTRADAY

Contracts Specification

	INTRADAY	DAC	DAILY	WEEKLY
 CONTRACT	15 Min same day Delivery	15 Min next day Delivery	Energy traded in MWh (Profile)	
 TRADING	Continuous trading			
 TRADING DAYS	Daily		As per Trading calendar	
 TRADING HOURS	00:15 to 19:30	15:00 to 23:30	As per Trading calendar	
 DELIVERY HOURS	04:00 to 24:00	00:00 to 24:00	As per Trading calendar	

Contracts Specification

	INTRADAY	DAC	DAILY	WEEKLY
 MINIMUM VOLUME	0.22 MW			
 INITIAL MARGIN	105%		5%	
 PAY IN	T+1	D		D-1
 PAY OUT	T+1	D+1		D+1
 VOLUME VARIATION	NO			NO

Contracts Specification

INTRADAY**DAC****DAILY****WEEKLY****DELIVERY
POINT**

SELLER'S REGIONAL PERIPHERY

**DELIVERY
PERIOD**

As per schedule issued by LDC

**SLDC
CLEARANCE**

PX-1

Post Trade concurrence

**CHARGES**Seller: Till Delivery Point
Buyer: Delivery point onwards

Trading of Intra-day Contracts

Trading Hour

Trading Hours:19.15
(00:15-19:30)

00:15-00:30	00:30-01:30	1:30-2:30	2:30-3:30	3:30-4:30	4:30-5:30	5:30-6:30	6:30-7:30	7:30-8:30	8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	12:30-13:30	13:30-14:30	14:30-15:30
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15:30-16:30	16:30-17:30	17:30-18:30	18:30-19:30
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Delivery Hours:20
(04-24)

4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
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20-21	21-22	22-23	23-24
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Contracts available for delivery on the same day

Intra-day & DAC contracts with current trading system

Trading Date	Trading Time	Intra-Day contracts	Trading Time	DAC contracts
17-04-	00:15- 00:30	H5 to 24 (of 17-04)		
17-04-	01:30 – 02:30	H6 to 24 (of 17-04)		
17-04-	02:30 – 03:30	H7 to 24 (of 17-04)		
17-04-	03:30 – 04:30	H8 to 24 (of 17-04)		
17-04-	04:30 – 05:30	H9 to 24 (of 17-04)		
17-04-	05:30 – 06:30	H10 to 24 (of 17-04)		
17-04-	06:30 – 07:30	H11 to 24 (of 17-04)		
17-04-	07:30 – 08:30	H12 to 24 (of 17-04)		
17-04-	08:30 – 09:30	H13 to 24 (of 17-04)		
17-04-	09:30 – 10:30	H14 to 24 (of 17-04)		
17-04-	10 :30- 11:30	H15 to 24 (of 17-04)		
17-04-	11:30 – 12:30	H16 to 24 (of 17-04)		
17-04-	12 :30- 13:30	H17 to 24 (of 17-04)		
17-04-	13 :30- 14:30	H18 to 24 (of 17-04)	15:00 to 20:30	H1 to H24
17-04-	14 :30- 15:30	H19 to 24 (of 17-04)	15:00 to 20:30 (of 17-04)	H1 (of 18-04)
17-04-	15 :30- 16:30	H20 to 24 (of 17-04)	15:00 to 21:30 (of 17-04)	H2 (of 18-04)
17-04-	16 :30- 17:30	H21 to 24 (of 17-04)	15:00 to 22:30 (of 17-04)	H3 (of 18-04)
17-04-	17 :30- 18:30	H22 to 24 (of 17-04)	15:00 to 23:30	H4(of 18-04)
17-04-	18 :30- 19:30	H23 to 24 (of 17-04)	23:00-23:30	H4-H24

REGULATORY FRAMEWORK

- Eligibility Conditions & RPO Compliance
 - Sale of power through GTAM will not be able to claim REC (Regulation 5(1)(d) of REC Regulations)
- Specification of source in NOC
 - RE Generator or Discom selling power through GTAM contract has to provide NOC indicating source of generation (Solar/Non-Solar) (Clause 37 of CERC Order)
- Deemed RPO & Deviation Settlement for GTAM
 - Deviation Settlement of Regional Entities will be carried out by NLDC through RE DSM Pool as per DSM Regulations
 - Deviation Settlement of State Entities will be carried out in accordance with Regulations & Orders for State Commission

- Revision in the Schedule
 - No revision allowed in the GTAM Contract
 - Hon'ble Commission will examine the need for flexibility in scheduling and propose amendment in Open Access Regulations, if required
- Waiver of ISTS Charges
 - Waiver as allowed under Sharing Regulations/MoP Order
 - Waiver is presently allowed for the projects awarded through competitive bidding for RPO compliance

Deviation Settlement incase of GTAM

- ✓ Incase of Regional entities, the deviation will be carried out in accordance with CERC (Deviation and Settlement mechanism and related matters) Regulations,2014 whereas for intra-state entities, the same is carried out as per provisions in the respective State Forecasting and Scheduling Regulations.
- ✓ Wind or Solar Generators shall be paid as per schedule and the quantum scheduled shall be considered as deemed RPO fulfilment of Buyer.
- ✓ For enabling deemed RPO of buyers, all RE shortfalls and RE over-injections of regional entities to be netted off (on a monthly basis) for the entire RE DSM pool by NLDC. In case of RE shortfall, RECs to be purchased by the nodal agency (NLDC) from power exchange by using funds from DSM pool and the RECs so purchased shall stand extinguished. For Intrastate entities, the same is carried out as per provisions in the respective State Forecasting and Scheduling Regulations.
- ✓ CERC invoked power to issue directions (Regulation 13) under DSM Regulations and directed that the Fixed Rate for settlement of deviation on account of sale of power through open access by an RE generator to an obligated entity for meeting its RPO compliance shall be Average Power Purchase Cost (APPC) rate at the National level.

THANK YOU



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Charges

PoC charges

- Inter-State Transmission charges payable by the open access consumer

Transmission Charges or STU Charges

- Payable to the state transmission utility for the use of the transmission system for availing power through open access.

Wheeling charges

- Charge to the Discom for conveyance of electricity through open access as determined by the SERCs

Cross Subsidy Surcharge

- Subsidising open access consumer has to pay a cross subsidy surcharge to the Discom.

Others

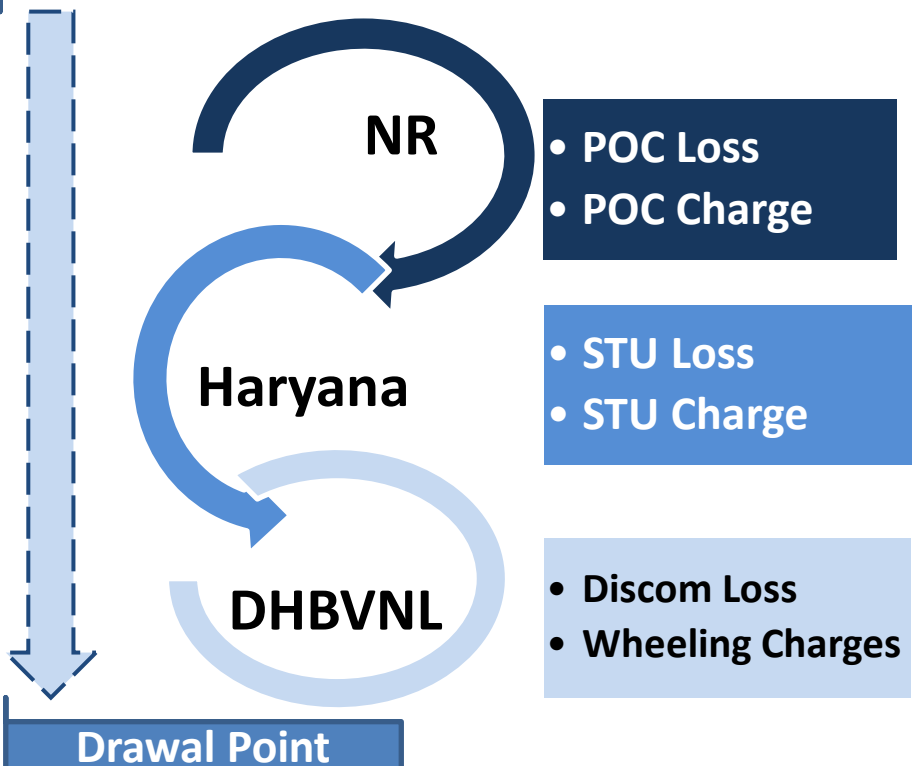
- Additional Charges, if any
- NLDC application fee, scheduling and operating charges, SLDC Charges
- IEX transaction charges/Trading Margin

Charges Settlement for Power Traded through PX

- Delivery point for Buyers & Sellers is their respective **Regional Periphery**
- **Buyer:** All losses and charges from delivery point till Drawal Point
- **Seller:** All losses and charges from Injection point till Delivery Point

Buyer Connected to Haryana Discom network

Delivery Point



Seller Connected to Gujarat State network

Delivery Point

