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# SESSION-11: EVOLVING TRENDS IN ELECTRIC MOBILITY

## ELECTRIFICATION FOR MW-SCALE CHARGING SYSTEMS

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- Metros are embracing EV rapidly
- Speedy and Cost effective electrification of EV stations are key for MW size of charging stations
- Delhi is leading the race and pushing hard to convert DTC fleets into E-Bus in next 2-3 years
- Over 50 MW E-Bus load already operational and 500 MW E-Bus load in next 2 years

- Delhi is converting over 50 Major Bus depots to E-Bus depots with load ranging 2 MVA to 20 MVA
- For electrification of Bus depots, DTC approached Discoms
- Discoms (Utilities) are best placed to support the cause
  - Lower overall cost due to optimisation and economy of scale of purchase
  - Discoms charges only ~2.5% of project cost for end to end project
  - Minimum time (9-18 months including tender)

- Facilitate DTC / DIMTS in electrification of depots for e-Bus charging infrastructure
- Cluster based planning approach to optimise cost & space - minimizing switching s/stn, Sharing cost,
- Space acquisition for establishment of new Grids - establishing Grids at load centers
- Two type of requirement and processing of schemes
  - DTC – Electrification upto BRPL metering point only.
  - DIMTS - Upto LT, irrespective of metering point / voltage level as per requirement.



- Upto 4 MVA applied load – supply on 11 kV (HT)
  - Metering at 11 kV
  - One Feeder per 3 MVA load for ensuring N-1 reliability
  - Cost sharing 50:50 between Utility and Developer
  - RCP cost: 100% by developer
  - EHT Charges: Rs 1.25 Crs / MVA
- More than 4 MVA applied load – supply on 33, 66 kV
  - Selection of 33 or 66 kV based on infeed availability
  - Metering at 33 or 66 kV (as the case may be)
  - Cost 100% chargeable to developers

## Supply of HT

- Scope of work for utility
  - 11 kV infeed from existing network
  - 11 kV switching, metering cubical
- Scope of work for DTC / Operator
  - 11/0.4 kV Sub Station
  - LT network
  - Chargers

## Supply of 33, 66 kV

- Scope of work for utility
  - 33 or 66 kV infeed 33 or 66 Switching station
- Scope of work for DTC / Operator
  - 66/11 or 33/11 Grid Sub Station
  - 33/0.4 kV or 11/0.4 kV DT Sub station
  - LT network
  - Chargers

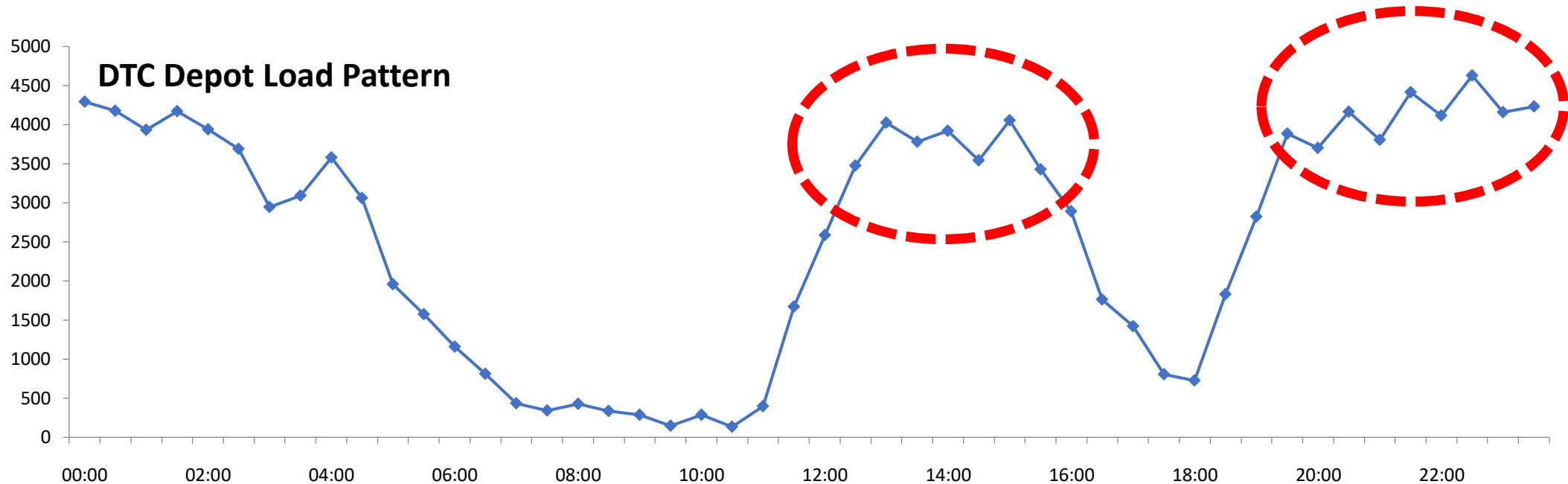
- DTC Okhla, Delhi – 3 locations with load > 4MVA, Total: 25 MVA
- As per normal electrification approach
  - Install 66 kV Switching station at each location
  - Cost about Rs 15 Crs / location
  - Space 300 sqm / location
  - Metering at 66 kV as per regulation
  - Additional cost of 66/11 kV Grid cost about Rs 45 Crs /location, space 1500 sqm /location
  - Total cost Rs about Rs 180 Crs, space 5400 sqm

- What BRPL has conceived
  - Install 66/11 kV Grid station Central location
  - Extended 11 kV Feeder to other two locations
  - Metering at 11 kV for all 3 locations
  - Supply from other BRPL Grids at 11 kV to provide additional supply reliability
  - Total cost Rs about Rs 85 Crs, space 2000 sqm
  - Saving of about Rs 95 Crs, Space of about 3400 sqm
  - Perpetual saving of O&M cost to DTC



## Charging pattern coincides with Discom peak

- Higher losses in upstream network
- Maximum bus charging happens coincides with the DISCOM peak hours (3 PM & 11 PM).
- Cost of supply is also high during peak
- With 20% peak TOD surcharge – Rs 4.80 / unit much less than cost of supply during peak





- Utility – Corporation – Operator to work in sync for ensuring Optimal cost of electrification
- Cluster wise planning for scalability and improved supply reliability
- Better to involve utilities for operation and maintenance
- Design of per km tariff inclusive of electricity bill - Low cost of power – for utility as well as Corporation

# THANK YOU

*For discussions/suggestions/queries email: **isuw@isuw.in***

*visit: [www.isuw.in](http://www.isuw.in)*

*Links/References (If any)*