



80,00,000
+ Lakh Operational
Kms
On Indian Roads





Olectra – Products & Operations



Leaders In Next Generation Transportation Technology

- **Listed company Part of MEIL group**
- **Pioneer in identifying and bringing new power and transportation technologies to India**
- **Largest manufacturers of Polymer Insulators in India**

Olectra – BYD Partnership

- **Crafted strong strategic partnership with BYD, World's largest EV manufacturer, to bring revolutionary electric Buses to India in 2016**
- **Partnership provides access to entire BYD Bus product line.**
- **Providing complete solution including charging infrastructure**



BYD AUTO – WORLD'S LARGEST EV MAKER



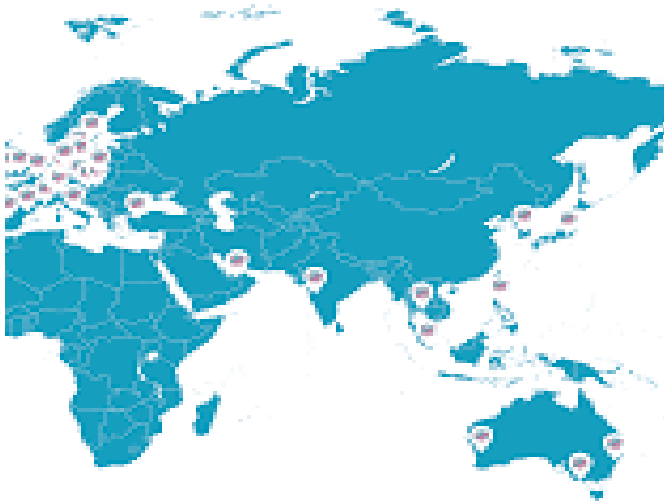
Headquartered in **Shenzhen, China**

Strategic Partnership for technology, sales & after sales support

130 Million of service bus miles worldwide

Proven Quality and Reliability worldwide

Present In
30+ COUNTRIES
&
150+ CITIES



BYD sold more than **60,000 buses** all over the world



K9 PREMIUM 12 MTR ELECTRIC BUS



Kneeling Mechanism

Differently abled
and
elderly people friendly

Front & Rear Air Suspension

Increases convenience
and
comfort

Monocoque Chassis In-wheel drive

Best-in-class features improves safety, comfort and reliability



Inter-city
&
Intra-city



Kneeling mechanism
for old & DA people



Front and rear
air suspension



Disc brake
with ABS



Range up to
250 km



4-5 hrs
charging time



39 passengers
& driver

Ebuzz K9



K7 MIDI 9 MTR ELECTRIC BUS



Air Suspension

Increases convenience and comfort

Monocoque Chassis In-wheel drive

Best-in-class features improves safety, comfort and reliability



Intra-city



Front and rear air suspension



Disc brake with ABS



Range up to 200 km



2-3 hrs charging time



31 passengers & driver

Ebuzz K7



K6 MINI 7 MTR ELECTRIC BUS



Air Suspension

Increases convenience
and
comfort

Monocoque Chassis In-wheel drive

Best-in-class features improve safety, comfort and reliability



Intra-city
&
Feeder



Front and rear
air suspension



Disc brake
with ABS



Range up to
200 km



3-4 hrs
charging time

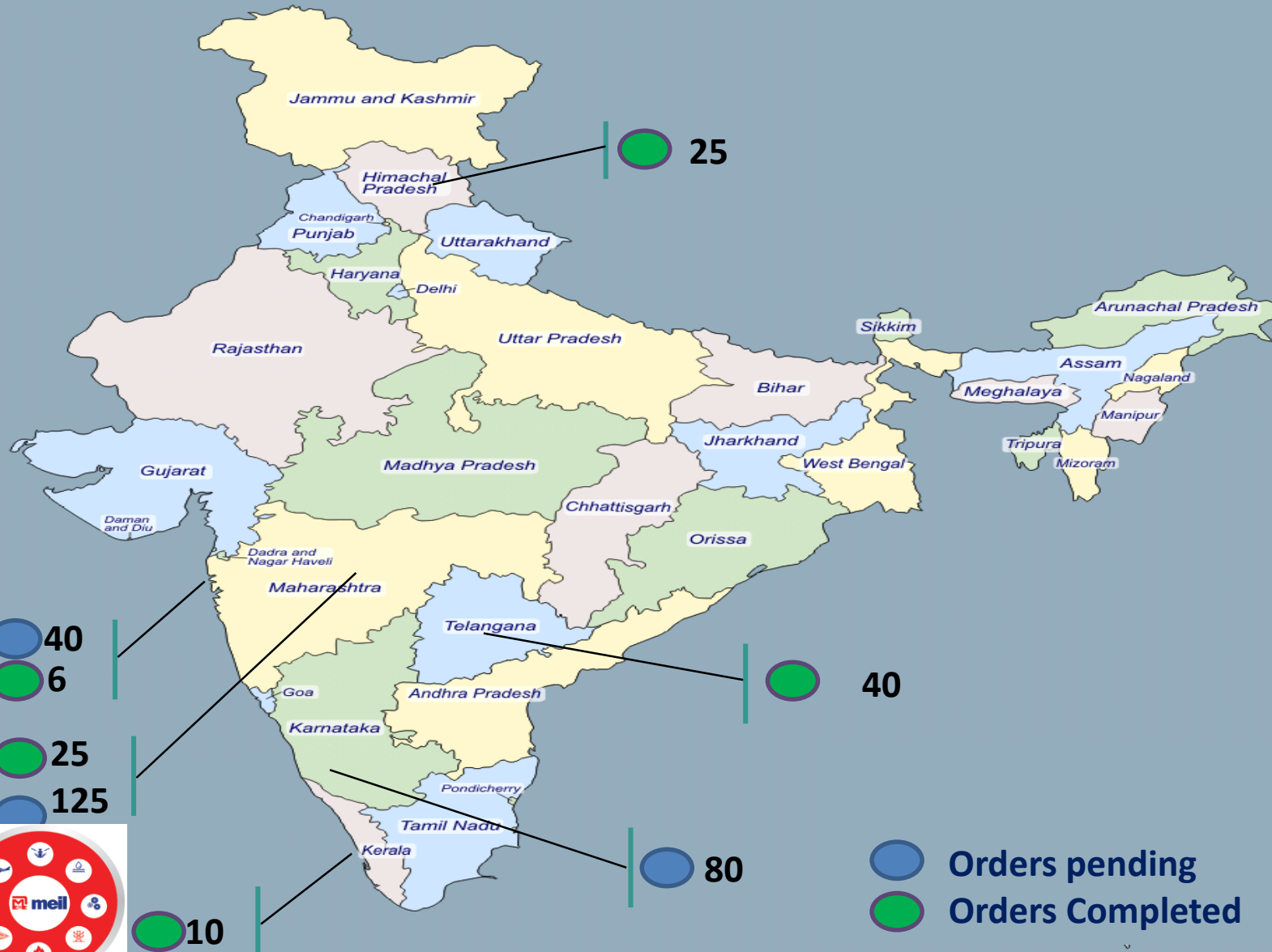


22 passengers
& driver

Ebuzz K6



OLECTRA-BYD – 1st TO DELIVER E-BUSES IN INDIA



First ever commercially operated 9 meter Electric AC bus was launched in India by Olectra

First ever 12 meter Electric AC bus was launched in India by Olectra at Hyderabad, Telangana

The largest fleet of Electric buses were deployed by Olectra in Pune, 150 12 & 9 meter buses

A total of 200+ Electric buses have been deployed in India by Olectra

Olectra will be deploying additional 150 No's 12 meter electric buses in Nasik

OLECTRA- BYD BUS TRIALS ALL ACROSS INDIA



Chandigarh

Delhi

Rajkot

Pune

Goa

Bangalore

Kolkata

Manali - Rohtang

Dehradun - Mussorie

Nainital

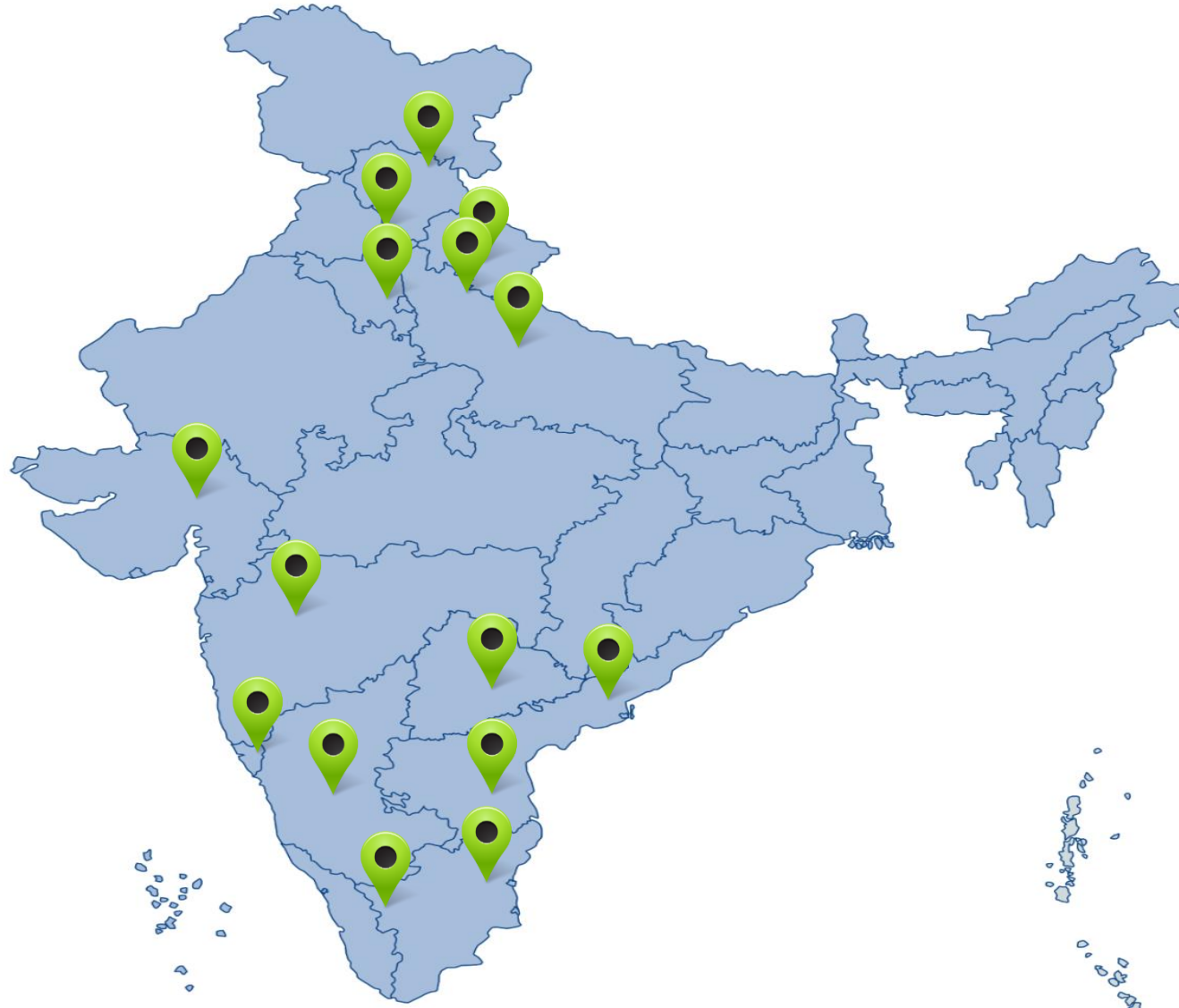
Agra – Lucknow

Hyderabad

Vijyawada

Tirupati

Puducherry



Buses Currently in Operation

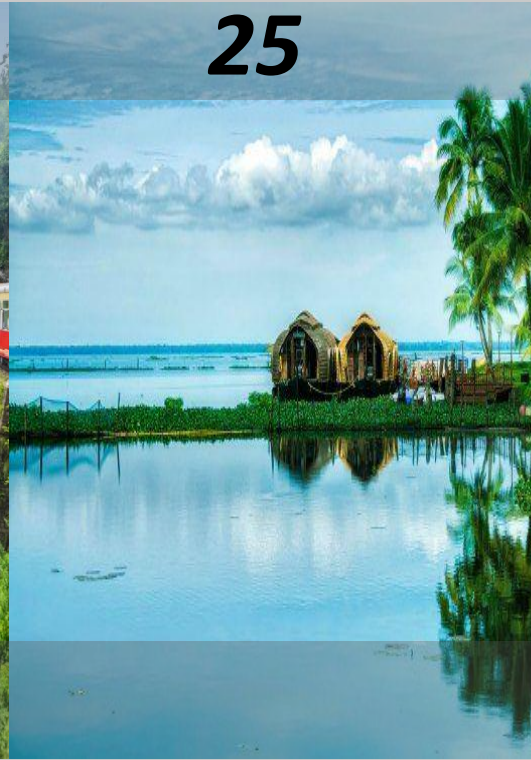
Hyderabad

40



Himachal Pradesh

25



Pune

100+



Mumbai

20



Kerala

10



Buses Under Deployment



Nasik
150



Mumbai
25



DEPOT & CHARGING INFRASTRUCTURE



DEPOT



CHARGER & PACKAGE SUB-STATION



BUS OPERATIONS IN INDIA

HRTC - Manali-Rohtang



TSRTC - Hyderabad



KSRTC - Kerala



BEST - Mumbai



PMPML - Pune



Nagpur



Details	9 Mtr	12 Mtr
<i>Number of buses</i>		
<i>Pune</i>	<i>25</i>	<i>125</i>
<i>Hyderabad</i>	<i>0</i>	<i>40</i>
<i>Himachal Pradesh</i>	<i>25</i>	<i>0</i>
<i>Kerala</i>	<i>10</i>	<i>0</i>
<i>Mumbai</i>	<i>46</i>	<i>0</i>
<i>Nagpur</i>	<i>6</i>	<i>0</i>



BUS ROUTE ALLOCATION:

ROUTE ALLOCATION: The timing of different routes mapped are in such a way that there will be bunching in depot during outshedding. Since punctuality (early or late) is also a penalty clause, there are chaos in the schedule deliveries

TRAFFIC JAM:

Traffic jam is every day problem, though it is not under penalty clause, revenue loss is incurred. The delays due this issue some times trips to be missed, which is inconvenient to public

ELECTRICAL ISSUES

The power supply : The input current is varying which is effecting the charging time. The charging time crucial in this operation, which is directly linked to the schedules. The current consistency required to deliver the schedules in proper and better way.

DRIVERS

Drivers pay key role in this operation. There is a gap in demand vs supply, in this segment. New engineers are made abundantly, but not drivers. The drivers available are not upto the mark to suit, this generation of mobility. Hence there is a need to act on making drivers, create good working atmosphere to give a safe and comfort journey, as per the bus and its passengers.

MAINTENANCE ISSUES

For Maintenance, we have observed the constraints of capacity of depot. No of buses and the area allocated are not mapped. Once parking area is congested, maintenance will effect.

In general area required:

For every 20 buses 1 acre

For every 15 buses 1 inspection pit

For every 2 pits 1 bay

In most of the depots, this demand is not being met, which effects the maintenance.



TSRTC : KMS LOST	April	May	June	July	August	September	Total
Charging Issue	0	86	172	169	0	0	427
Drivers	2352	3371	12852	3938	0	0	22513
Power Issue	0	0	0	501	0	0	501
Traffic Issue	348	0	610	0	0	0	959



- Fixed Cost of electric bus is significantly higher than comparable diesel bus while variable cost is significantly lower than diesel buses.
- Total Cost of Ownership of electric bus will be comparable with diesel buses when buses are utilized for more number of kilometers.
- To achieve higher daily run battery should be capable of running higher range in single charge.

Benefits of having higher single charge range:

- Achieve higher daily run, less incremental cost for STU's as incremental operating (variable) cost is marginal for electric buses
- Cost Savings for intermediate charging Infrastructure
- Increased available operating time for buses
- Buses can ply on high distance routes, more flexibility for STU's in deciding the routes
- Reduced battery replacement cost (Battery life is more)
- Less range anxiety in future when battery performance will degrade



- So far, in our experience, DEPOT charging is the most suitable option as it eliminates most of the unwarranted risks like;
- 1) Running out of the Charge suddenly, during peak/day time due to surge in traffic or unexpected longer waiting period or any other unexpected circumstances.
- 2) Not having Route flexibility.

Example: Our Charging infrastructure at Manali, which is meant for Manali-Rohtang Pas route during tourist season, is used to ply the buses upto Mandi during off-season.

- 3) Cost of creation & maintaining of additional infrastructure in the terminals to the STU's.
- Depot Charging is like the famous punch line, "Fill it-Shut it-Forget it".



Few Challenges before STU's

- Incentivising OEM's to go for Long-range buses (minimum 200km/single charge) to address range anxiety and to address growing needs of Public Transportation
 - DHI has addressed this, by announcing VGF based on battery capacity. It encourages to go for longer range batteries.
- Remaining technology agnostic
- Arranging level playing field between Long-range buses and shorter-range buses;
- To devise bidding parameters to have a sustainable business model for both, STU's as well as to OEM's;



Challenges in the Bidding process



- Electric Buses induction is still in the nascent stages.
- FAME-II's aim is to establish the Industry, eco-system and localization
- Any complex competitive bidding, will straightaway put the pressure on prices thus eroding the confidence on the sustainability of the industry and bankability of the project.
- This will have a cascading effect on the entire eco-system, where initial R&D & setup costs are high.
- The existing system of quoting Rs/Km is well established and less complex



Thank You

