NEXT-GEN SOLUTIONS – ELECTRIC MOBILITY

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INDIA is different and so are its needs

- Largest **2W (74%) and 3W (3%)** fleet on-road in the world
- Only **22 cars per 1,000 capita** vs. 980 in USA. Still high congested and polluted cities.
- Only **1.2 buses per 1,000 capita** vs. 6 in China and 8.6 in Thailand. Weak PT leading to increased individual vehicle ownership.
- Highly price and value sensitive market
India is 4th largest AUTO market

- Total **250+ million** vehicles on road
- Total **26+ million** annual sales and net 20+ million added on-road
- High **31 million** production capacity of OEMs (15% exports)
EV is a GLOBAL phenomenon now

- **5X Efficient** over ICES (86% power to wheel vs. 17% in ICES)
- **6X Economic** in terms of fuel cost. Lower TCO. Falling Battery prices will achieve price parity with ICES by 2024.
- **Cleaner** in local air quality. Growing renewable mix will further improve its proposition.
- **Reliable** with **30X** lesser moving parts
- **Safer** as gasoline has **100X** energy mass than Lithium batteries
- **Much better connected and shared**
Why EVs are important for India?

- EV sales is growing fast globally. If India wants to safeguard its exports, its OEMs will need to build capacity faster.

- EV sales is growing slow in India*, but ~60% valued parts are imported (mostly from China). India needs to protect its industry from cheap imports.

* India EV sales share in FY2018-19: <0.1% in cars; <0.5% in 2Ws; <3% in STU Buses and >50% in 3Ws.
INR 10K cr. Incentives under FAME II Policy. 12+ States have announced State EV Policies.

De-regulated charging services. 2,636 public chargers to be deployed through incentives from DHI.

Other fiscal & non-fiscal incentives to EV buyers. Mandatory EV chargers in new buildings.

New EV models and Supply chain ramping. Phase Manufacturing Plan (PMP) to kick-off 50 GWh Integrated Cell & Battery manufacturing.
EV Opportunity for India in 2030

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<thead>
<tr>
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<th>Scenario 1</th>
<th>Scenario 2</th>
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<tbody>
<tr>
<td>% EV Sales in 2030</td>
<td>100%</td>
<td>30%</td>
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<tr>
<td>Total EVs on road</td>
<td>~ 256 million</td>
<td>~ 84 million</td>
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<tr>
<td>% EV Share of Total Vehicle Stock</td>
<td>41%</td>
<td>14%</td>
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<tr>
<td>Total Capacity Connected</td>
<td>~ 1045 GWh</td>
<td>~ 338 GWh</td>
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<tr>
<td>- Integrated LIBs</td>
<td>88%</td>
<td>88%</td>
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<tr>
<td>- Swapping + Range Extender LIBs</td>
<td>12%</td>
<td>12%</td>
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Peak power Management possible for optimizing Grid investments:

- Time-of-Use (TOU) Tariff system
- Solar add in the mornings and Wind in the nights can create favorable renewable integration and peak power reduction from EVs charging
Actively shaping Customer Choices

1. Range Anxiety

- Selection of optimum battery size to meet daily commute and keeping vehicle cost affordable
- Choosing Battery Swapping Opex model (for 2Ws and 3Ws)

<table>
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<tr>
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<th>ICEs</th>
<th>EV (Fixed Battery)</th>
<th>EV (Swap Battery)</th>
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<tbody>
<tr>
<td>2W</td>
<td>Rs. 3.5/km</td>
<td>Rs. 2.2/km (Range- 60km)</td>
<td>Rs. 2.1/km (Range- 60 km)</td>
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<tr>
<td>3W</td>
<td>Rs. 3.6/km (Petrol)</td>
<td>Rs. 2.9/km (Range- 60 km)</td>
<td>Rs. 2.2/km (Range- 60 km)</td>
</tr>
<tr>
<td>4W</td>
<td>Rs. 15.5/km (Petrol)</td>
<td>Rs. 13.20/km (Range- 100km)</td>
<td>Rs. 11.4/km (Range- 75 km)</td>
</tr>
<tr>
<td>Buses</td>
<td>Rs. 57.4/km</td>
<td>Rs. 56.2/km (Range- 100km)</td>
<td>Rs. 51.5/km (Range- 46 km)</td>
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</table>
2 Charging Time/ Charger Type

- **Slow AC charging** at home, office and public parking lots
- **Fast AC/DC charging** at public charging stations
- **Battery swapping** + Range Extension for 2Ws and 3Ws

Number of EV Charges by location distribution

- 31% Home charging
- 51% Public charging
- 9% Office/Private charging
- 9% Swapping + Range Extender

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Actively shaping Customer Choices …

3 EV end-user Financing

- Existing high penetration of ICE vehicle financing in India:
  - ~40% in 2Ws
  - ~75% in cars
  - ~90% in Commercial Vehicles

- Need for design of right EV financing products
  - Building certainty in EV resale value through **Battery reuse and recycling**

*Setting up Battery reuse and recycling plant in India will de-risk Lithium ion and other precious metal supply chain*
Actively shaping Customer Choices

4 Incentives + Disincentives

- Balancing policy incentives to drive:
  - User adoption
  - Balance Govt. deficit from EVs

- EV Incentives
  - Incentives for ICE scrap/retrofit and channelizing benefits to EV purchase
  - Lower EV interest rate and down payment. Define batteries re-sale value.
  - Subsidies on home/ work/ public parking lot slow AC chargers
  - Exemption/reduction from registration fee, toll and parking charges, road taxes, etc.

- ICE Disincentives
  - Levy pollution cess on ICE vehicles
  - Levy fuel surcharge on fuel sales towards green fund
  - Increase road tax in ICE vehicles
Emerging New EV Business models

- Battery swapping for 3Ws / 2Ws / Buses
- Retrofits in 4Ws / 3Ws/ 2Ws / Buses
- B2G and B2B demand aggregation by Govt. supplied entity EESL
- Oil companies setting up charging stations
- Discoms setting up charging stations
- Renewable tied charging stations
- GCC model in e-Buses
Most business strategies for EV fleet and charging services are catering to commercial fleet segment for its certainty in demand.
Shared EV fleet models are attractive
No one model will solve India’s diversity
Convergence of Technology and Business Models happening
Active levers to drive EV inflection point in India

De-risking raw material supply chain

Making EVs a public movement

Easy & attractive financing, insurance, VAS

Recycling

Consumer Awareness

Financing + Services

Manufacturing

Policy

Charging Infra

Pan city slow AC charging network

100% Local capacity, standards, performance & quality

Targets, ownership, alignment, execution
Biggest CITY
EV Data Platform