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INDIA'S TRANSITION TO E-BUSES: CHALLENGES AND WAY FORWARD

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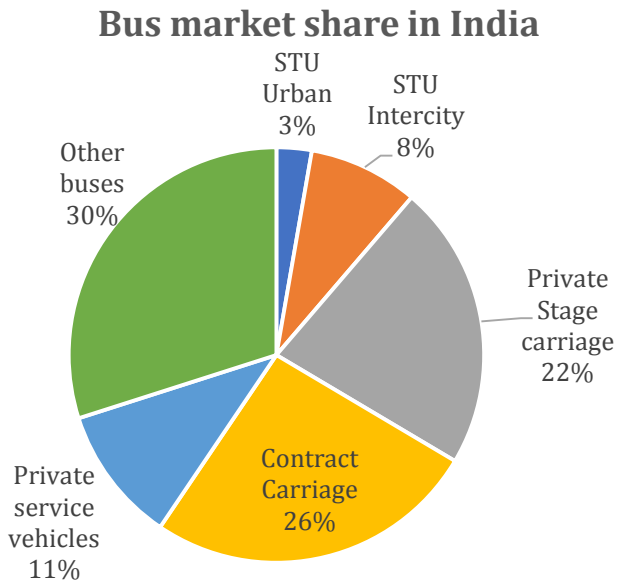
MARKET ASSESSMENT FOR E-BUSES IN INDIA

- Bus market in India
  - State Transport Undertakings (STUs) and Special Purpose Vehicles (SPVs) constitute ~11% of the total buses in India, including city buses (3%), rural and intercity buses (11%)
  - City bus services need to improve their overall level of service to meet Indian urban mobility needs sustainably

- Ongoing e-bus deployment in India
  - India has ~600 operational electric buses (e-buses) through subsidies from FAME I or other State and City level incentives
  - Another 3,500 buses being deployed under FAME II
  - Together, these constitute 0.3% of India's 1.5 million strong total bus fleet
  - The current e-bus deployment is being led by STUs



Source: MoRTH Year Book, 2016-17

India needs to deploy ~30,000 urban and ~750,000 total e-buses to improve overall bus service levels and electrify 30% of the bus market by 2030

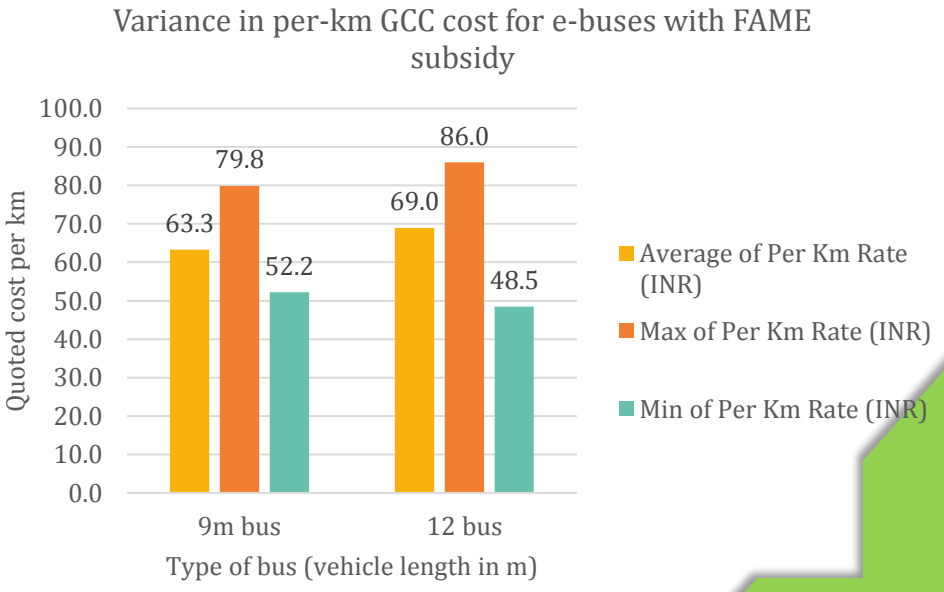
This requires efforts beyond the FAME II target of deploying 7,000 e-buses

KEY BARRIERS: TOTAL COST OF OWNERSHIP

- Total Cost of Ownership (TCO) includes capital and operational expenses over the lifecycle of the buses
- TCO from FAME II Gross Cost Contracts (GCC) procurement revealed the following:
  - FAME II subsidy covers up to 10% of the TCO of e-buses
  - e-buses cost 20-30% higher compared to equivalent diesel buses-despite subsidy
  - TCO is 50-75% higher when compared with non-AC, high floor buses used currently
  - TCO varies significantly based on city and operating characterististics

- Key TCO components of FAME II buses
  - Capital expenditure (~25-30%)
    - Bus, Charging infra, Battery replacement
  - Staff: Driver and maintenance (~25-30%)
  - Cost of financing (~10%)
  - Cost of penalties and untimely payments (~10-20%)
  - Others: Energy, Admin, Insurance etc.

Reducing vehicle costs, access to financing and transparent payment mechanisms are key to reducing the TCO for e-buses



Source: UITP estimates based on FAME II quotes

KNOWLEDGE GAPS IN PLANNING & PROCUREMENT

- Current planning practices for e-buses
  - Lack of planning beyond FAME allocated fleet
  - Depots and routes for e-buses not identified in tenders
  - Power infrastructure needs and availability
  - TCO can increase up to 100% based on efficiency in planning
- Gaps in procurement
  - STUs managing twin transitions from in-house & diesel/ CNG to outsourced & electric buses
  - Lack of clarity on key procurement specifications like
    - Vehicle and charging technology specifications
    - Financial specs like bank guarantees, termination clauses and insurance
    - Obligations of authority and operator
    - Inadequate engagement with bidders and short timelines for bidding
- Gaps in implementation
  - Lack of trust and a partnership approach in delivering e-bus services

Cities need to adopt a long-range planning approach to identify route, depot and fleet level TCO to identify the least cost path to electrification.

Standardising procurement helps, but partnership approach in implementation crucial

ADDRESSING THE FINANCING BARRIERS

- Financial constraints of contracting authorities
  - Poor financial health of STUs and SPVs is affecting timely payments to GCC operators
  - Government support for bus services is inconsistent

- Financing constraints of service providers
  - Original Equipment Manufacturers (OEMs) partnering with operators in most tenders
  - Achieving financial closure are significant due to upfront investment needs for fleet induction, infrastructure development, Bank guarantees and equity investments
  - Bankability risks associated with tenders constraining commercial financing

- Role of alternative business models
  - Outright purchase and GCC are the predominant modes of bus procurement in India
  - E-buses warrant a different outlook towards procurement due to their unique needs
  - Bulk procurement of buses, separating asset ownership and operations, leasing etc. are being explored

Proactive support from commercial banks and city Governments is crucial to ensure faster scale-up of e-bus deployment in India

PRIVATE BUSES AND IMPACT OF COVID-19

- Impact of Covid-19 on e-buses under FAME II
  - The Coronavirus pandemic crippled the financial situation of all bus operators- STUs and SPVs, Public and private, Urban and intercity
  - Only agencies with assured Government support proceeding with bus procurement
  - Supply-chains of Original Equipment Manufacturers (OEMs) disrupted due to import restrictions
  - Phased Manufacturing Program (PMP) mandates indigenous manufacturing of many components from April 2020. This is likely to increase the cost of e-buses in the short-term

- E-bus outlook for private buses
  - FAME II excluded private buses, constituting 90% of the market, from subsidies
  - Intercity private buses with daily range needs of 250-350km are likely to achieve TCO parity-even without subsidy
  - Cities need to develop bus terminals with charging facilities for private bus operators. Currently no formal bus-terminals exist for private buses
  - Limited intercity travel demand due to Covid-19 combined with poor financial health of operators likely to delay the timeline for electrification further

Financial and infrastructure support to operators combined with incentives to develop supply chain for components crucial to overcome Covid-19 impacts

WAY FORWARD

- States and Cities need to adopt a more ambitious approach to improve bus services and their transition to electrification to meet India's developmental and environmental targets

- Avenues for reducing Total Cost of Ownership (TCO) are key to accelerate the procurement preference for e-buses
  - Long-range planning approach to identify route, depot and fleet level TCO will help identify the least cost path to electrification.
  - Incentives on capital intensive expenditure like fleet and infrastructure are crucial
  - Access to financing and transparent payment mechanisms are key to attracting competitive bids during procurement

- Financial and infrastructure support to operators combined with incentives to develop supply chain for components crucial to overcome Covid-19 impacts

- Active efforts are needed to address knowledge gaps in planning, procurement, financing and performance evaluation of e-buses

THANK YOU

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