

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

October 22, 2024

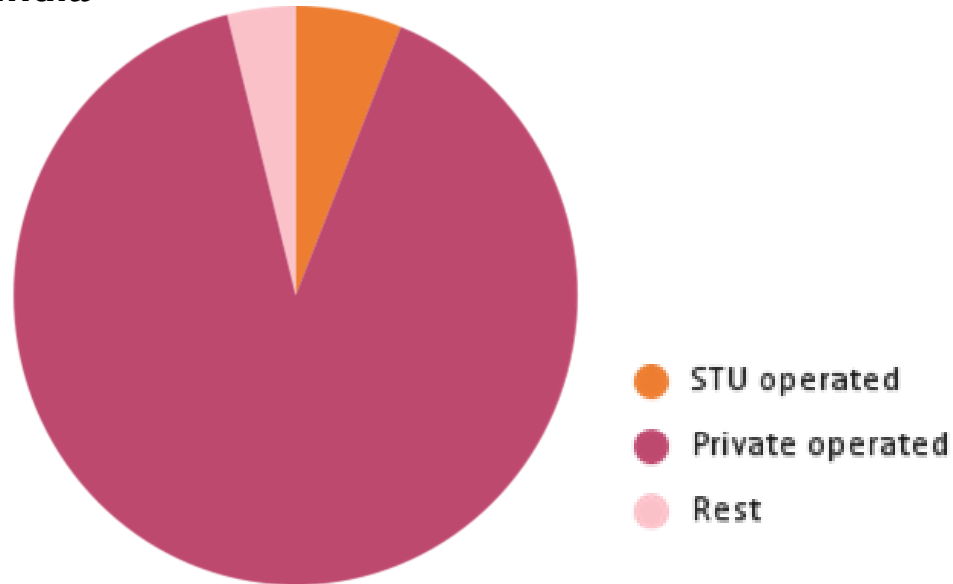
2:00PM - 3:30PM



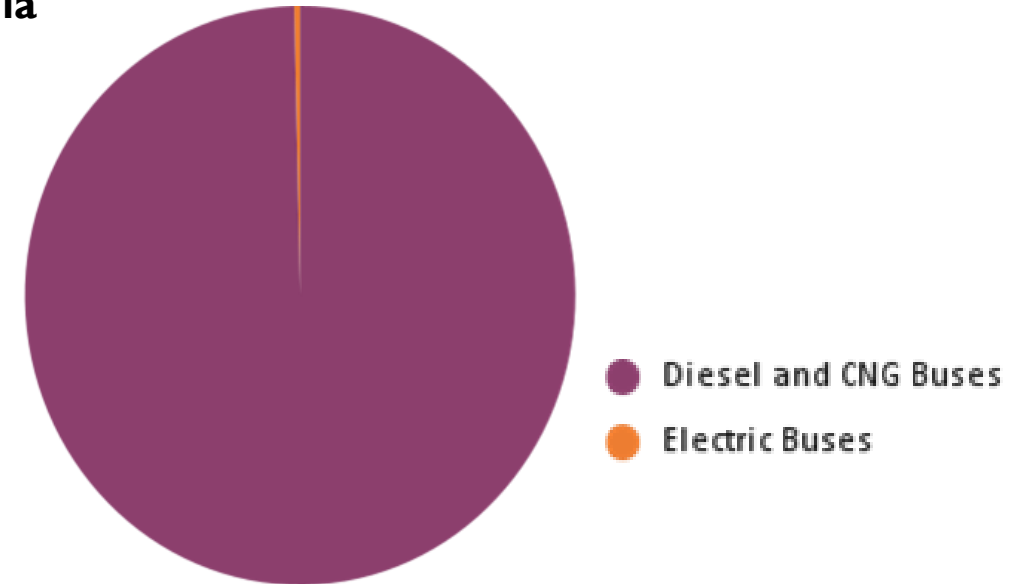
Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Current Landscape of Buses in India

Breakup of registered buses in India



Registered e-buses in India



- There are about 23 lakh registered buses in India (as of March 2024)
- Around 90% of the total bus stock is operated by private operators, whereas remaining 10% are operated by STUs/government departments.
- As per VAHAN Dashboard, there are around 8,000 e-buses* registered in India.

*<https://vahan.parivahan.gov.in/vahan4dashboard/vahan/view/reportview.xhtml>

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

E-Bus Benefits



Environmental Benefits

- Zero tailpipe emissions



Operational Benefits

- Increased energy efficiency due to regenerative braking



Health and Social Benefits

- Reduced noise, improved public healthcare



Economic Benefits

- Lowered fuel and maintenance costs

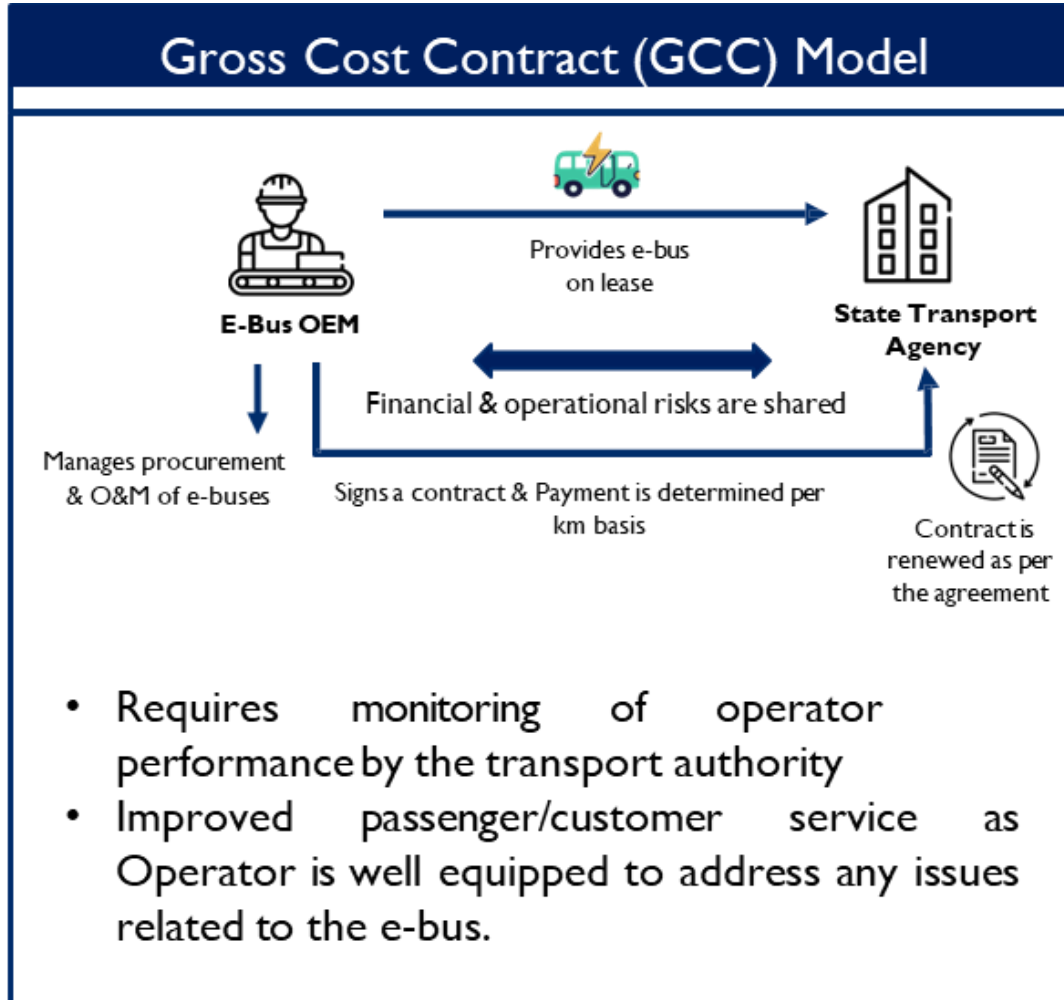
Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Government of India Initiatives to promote Electric Buses

- **FAME II Scheme** – Supported deployment of 7,210 e-buses
- **NEBP** – Announced in June 2022 to deploy 50,000 e-buses by 2027
- **PM-e-Bus Sewa** – Launched in August 2023 to deploy 10,000 e-buses in 169 Indian cities in next 10 years
- **Payment Security Mechanism** – Aims at reducing financial risk due to delayed payments, to support deployment of 38,000 ebuses
- **PM E-Drive scheme** – notified recently and plans to support deployment of 14,028 ebuses.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Gross Cost Contract (GCC) model



Key features of GCC model

- Private operator invests in the purchase of bus and charging infrastructure
- Operation and maintenance done by private operator for a tenure of 12 years
- PTAs pay a per kilometer fee for the duration of the contract
- Penalties are levied in case of deviations from predefined service levels beyond the threshold
- Rates discovered are lower due to demand aggregation

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Key Findings of Stakeholder Consultation undertaken by USAID and CESL

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

List of Stakeholder Consultations convened

Theme	Location	Date	Key Participants
New Business Models for E-Bus Procurement	Goa	8th Feb 2024	Battrixx, GreenCell, Hitachi India, Ohm Mobility, Sun Mobility, TATA Motors, Volvo-Eicher, Switch Mobility
Scaling International Footprint of Made-in-India Electric Buses	Mumbai	24th April 2024	PMI Electromobility, Pinnacle Mobility, Switch Mobility, JBM Group, Volvo-Eicher
Scaling up Financing for E-Buses Through Project Finance and Leasing Structures	Mumbai	12th June 2024	Aseem Infra Finance, HDFC Bank, ICICI Bank, IIFCL, IndusInd Bank, Marubeni, Mizuho Leasing, Rent Alpha, SMBC Group, TATA Cleantech, Vertelo
Leading Best Practices in E-Bus Operations	Mumbai	9th July 2024	BMTC, GreenCell Mobility, Jio BP, TATA Motors, Volvo-Eicher, Pinnacle Mobility, PMI Electromobility, Transvolt
Deployment of E-Buses in Areas Other Than STUs	Delhi	3rd Sep 2024	Veera Vahan, Ohm Mobility, JBM, TATA Motors, BOCI, DCBA, Prasanna Purple, Chartered Bus, GreenCell Mobility, Leafy Bus, Switch Mobility, Vaultus

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Consultation I: New Business Models for E-Bus Procurement

- 1 **Battery Swapping** is emerging as an alternative charging model for electric buses, in addition to wired charging.
- 2 **Bundled e-bus leasing packages** are gaining momentum especially for private operations.
- 3 **Specialized Battery Charging and Management Service (BCMS)** is crucial for successful implementation of BaaS model.
- 4 **Credit Enhancement Mechanisms** such as government backed loans for e-bus purchases can be game changer for E-bus adoption.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Consultation II: Scaling International Footprint of Made-in-India E-Buses

1

Recognition of Indian homologation standards by other countries can significantly enhance scale up opportunities in other countries.

3

Establishing Payment Security Mechanism in the importing countries can further strengthen e-bus exports.



2

Capacity Building and Robust After-Sales Service Network in the importing countries will support in increasing exports.

4

Setting up **Advanced Testing Facilities** and **capacity-building programs** for Indian e-bus OEMs to meet the required quality and technical specifications.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Consultation III: Scaling up financing for E-Buses through project finance and leasing structures

1

Making **Concession Agreements Bankable** by including measures such as payment security mechanisms.

3

Implementing **Differential Payment Security** amounts based on the economic progressiveness of the states can be thought at later stages of market maturity.



2

Asset risk in e-bus financing can be mitigated with the introduction of **specialized insurance products**.

4

Subsidy Restructuring can be beneficial by allocating part of the subsidy for capex and releasing the remainder for opex, based on the bus operators' performance.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Consultation IV: Leading Practices in E-Bus Operations in India

1

Standardizing Manual Operations Data into formats like GTFS and NeTEx, to capture key city route information, is essential.

3

Integrating an Intelligent Fleet Management System (ITMS) is crucial to efficiently monitor and manage each bus.



2

Effective Route Planning is crucial to ensure a steady supply of passengers and optimal e-bus utilization.

4

Effective Standardization of Terms and Conditions of e-bus tenders across states/cities can further streamline the procurement process and improve efficiency of e-bus operations.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Consultation V: Deployment of E-Buses in areas other than STUs

1

Charging and Parking space for e-buses of private bus operators should be provisioned inside the public bus depots.

3

Innovative financing mechanisms such as e-bus leasing, Battery-as-a-Service, etc. will be beneficial in securing funding by private operators.



2

Deployment of fast chargers for e-buses (both public and private) **along highways/expressways** will accelerate e-bus adoption.

4

Tier-2 and Tier-3 cities can be prioritized for e-bus deployment due to less congested roads and greater availability of land.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Key Recommendations

1	Access for Private Buses to Charge at Public Bus Depots	Increasing utilisation of installed chargers
2	Installation of Fast Chargers along Highways	Incentivize private operators to invest in e-buses for long routes and reduce the need for heavy batteries
3	Charging agnostic e-bus bids	Enables quick refueling and eliminate need for heavy batteries, thereby lowering the upfront costs
4	End use to dictate Business models for busses	Ownership models such as leasing will be beneficial for private operations, Battery-as-a-Service (BaaS) can be beneficial for e-buses with a low daily running km
5	Local Manufacturing and Battery Recycling	Reduce imports reliance for components, especially cells for quality and cost. Encourage Battery recycling
6	Standardised Homologation and Export Readiness	Accommodate Indian homologation standards in Countries' own standards.

Decarbonizing Public Transportation in South Asia - Accelerating transition through E-buses

Thank You!