



Roadmap for Scaling Up E-Buses: Vision 2030



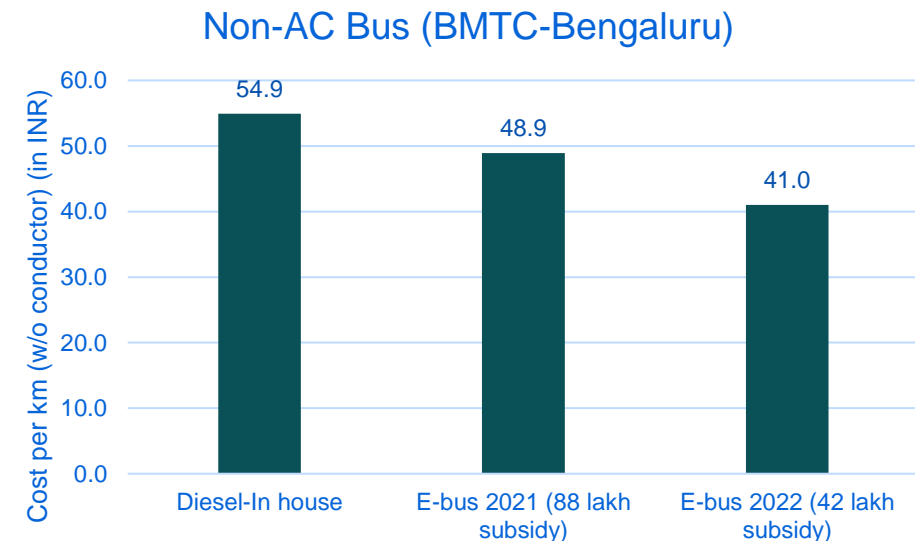
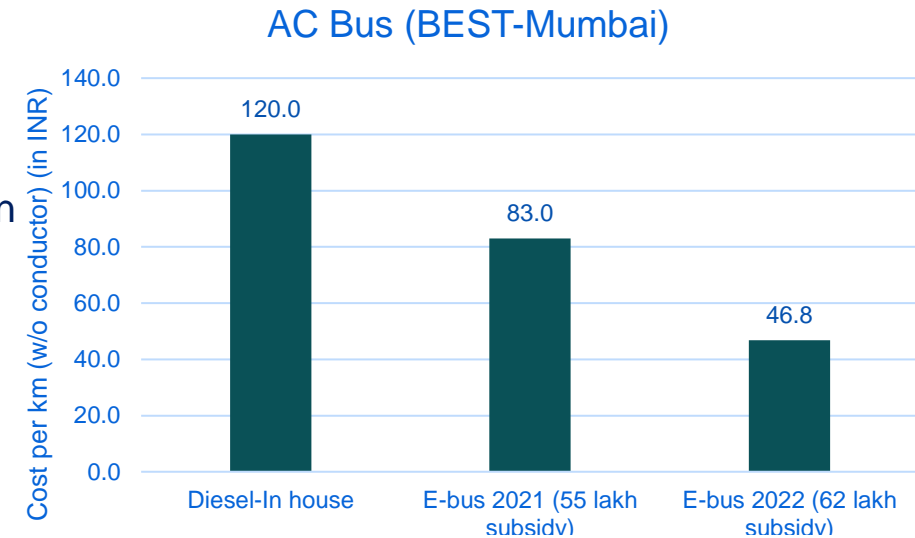
SETTING THE STAGE

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THE WORLD BANK



ELECTRIC BUSES IN INDIA: SCALING THE MARKET TO 300,000 E-BUSES BY 2030

- India made several advancement towards e-bus adoption
 - ~8,000 e-buses procured through FAME and State-level programs
 - E-buses are now ~24-26% cheaper than diesel/ CNG buses due to transition to Gross Cost Contracts, aggregation and standardisation of procurement
 - National Electric Bus Program (NEBP) launched with a target of 50,000 e-buses
 - 6,465 e-buses already procured through NEBP-Phase 1
 - PM eBus Sewa for 10,000 e-buses announced
 - Payment Security Mechanism (PSM) being launched to improve bankability
- India could now aim to deploy 3,00,000 e-buses by 2030**
 - Requires INR 4.5 lakh Cr of investment, including INR 3.6 lakh Cr financing
 - Can mitigate GHG emissions of 180-300 mtCO₂e through technology transition, green energy adoption and mode shift



LEVERS TO UNLOCK 300,000 E-BUSES ACROSS MARKET SEGMENTS

- Public and private buses have varied approaches to achieve large-scale e-bus adoption
- The policy, financing and infrastructure needs require market specific approach for

Public buses: 8% market share [~150,000 buses]

- Key market segments
 - 35,000 urban buses (23%)
 - 110,000 rural and intercity buses (77%)
- Need to focus on fleet renewal and addressing service gaps
- Driven by policy and financial viability
- Dedicated infrastructure available
- Concentrated buyers
- Government support exists-even if it is inconsistent

Private buses: 92% market share [~2.15 million]

- Key market segments
 - 625,000 Intercity buses (stage and contract carriage)
 - 730,000 school buses
 - 430,000 employee transport
- Driven by profitability/competitiveness
- Limited infrastructure
- Fragmented (only 13% operators own more than 50 buses)
- No direct Government support

CHALLENGES IN SCALING: RECOVER UPFRONT INVESTMENTS OVER TIME

- Electric buses are capital intensive but deliver operational cost benefits over time.
- The following are the key challenges in financing such models

Functional Fit Challenge	Financing Challenge for Public buses	Financing Challenge for Private buses
<ul style="list-style-type: none">▪ Uncertainty on performance over time (range/reliability/spares)▪ Unavailability of charging (availability/compatibility)▪ Low capabilities in EV tech [planning, maintenance, operations, risk management)▪ Unknown in life cycle Management	<ul style="list-style-type: none">▪ Weak financial position of STUs▪ Limited bankability of contracts [lack of VGF/timely payments/dispute resolution]▪ Legacy preference for costlier in-house delivery	<ul style="list-style-type: none">▪ Challenge converting economics into ROI▪ High upfront cost/uncertain resale value<ul style="list-style-type: none">• No subsidy• Small scale purchases▪ Risk of competitive obsolescence▪ Uncertain savings (cost of power/taxes)▪ Limited financial solutions▪ Unclear scalability (OEMs and availability)▪ Brand image (e.g fires)

WHAT COULD A SYNERGISTIC ROADMAP LOOK LIKE?

1. **Policy Framework and Regulations** fostering stability in incentives, disincentive to diesel/CNG buses, mandate for transition (in cities first)
2. **Bankable STU contracts:** standardized contracts, VGF, Payment security, dispute resolution
3. **Shared Charging infrastructure:**
 - a. State plans to cover all large vehicles (bus/trucks) in metropolitan areas/along corridors\
 - b. Standardized charging
 - c. Integration of green charging
4. **Financial innovation**
 - a. Pools to achieve economies of scale
 - b. Access to green bonds
 - c. Support to first 10% of private e-bus with incentives (tax rebates/subsidies) collected from ICE personal vehicles
 - d. Stimulation of business models reducing upfront costs (CaaS/BaaS/Operating leases)
5. **Learning ecosystem**
 - a. Capacity building and training-National training program in collaboration with institutes
 - b. R and D for improved products for India
 - c. Monitor, learn and share program on e-buses put in operations

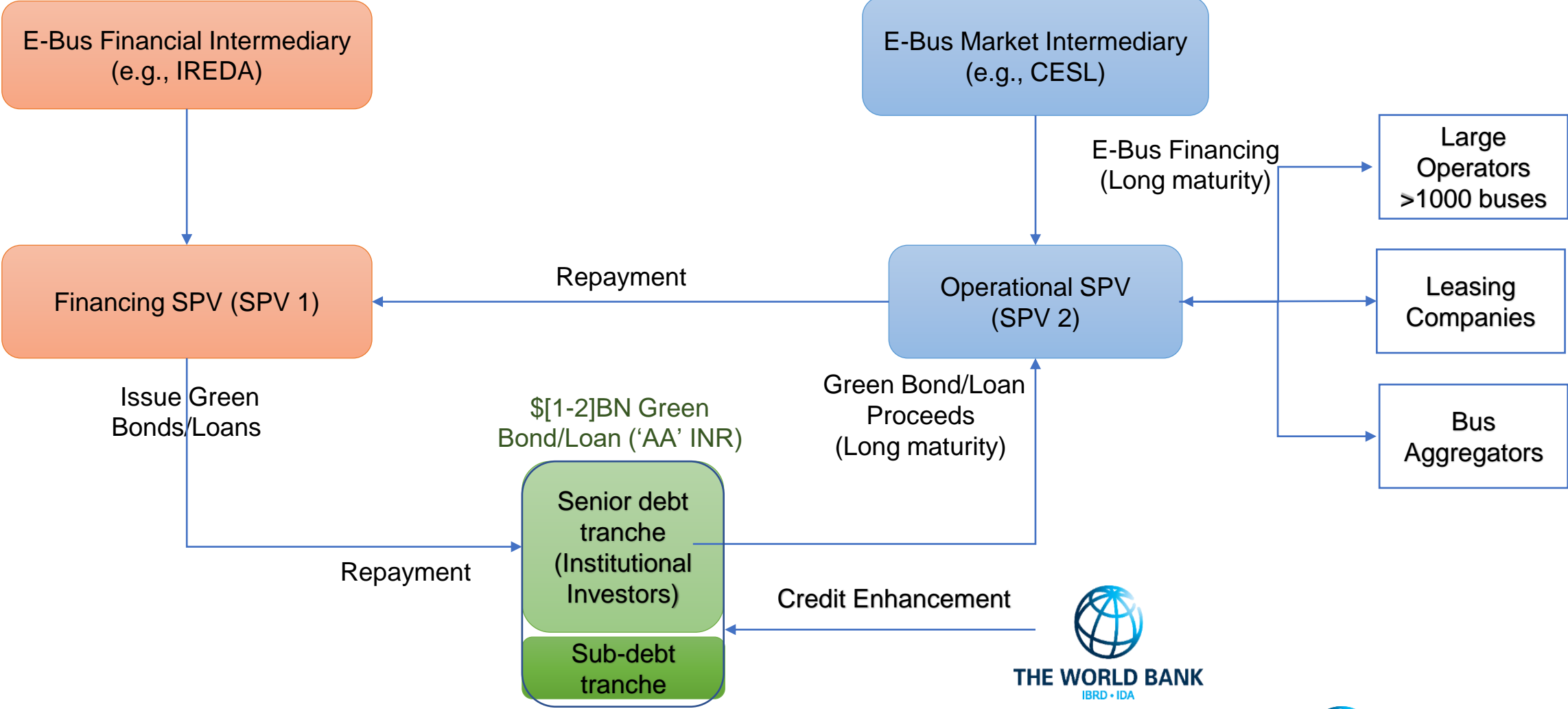
ADDITIONAL SLIDES

PRIVATE BUSES UNDER STUS: BUSINESS MODELS AND GREEN BONDS

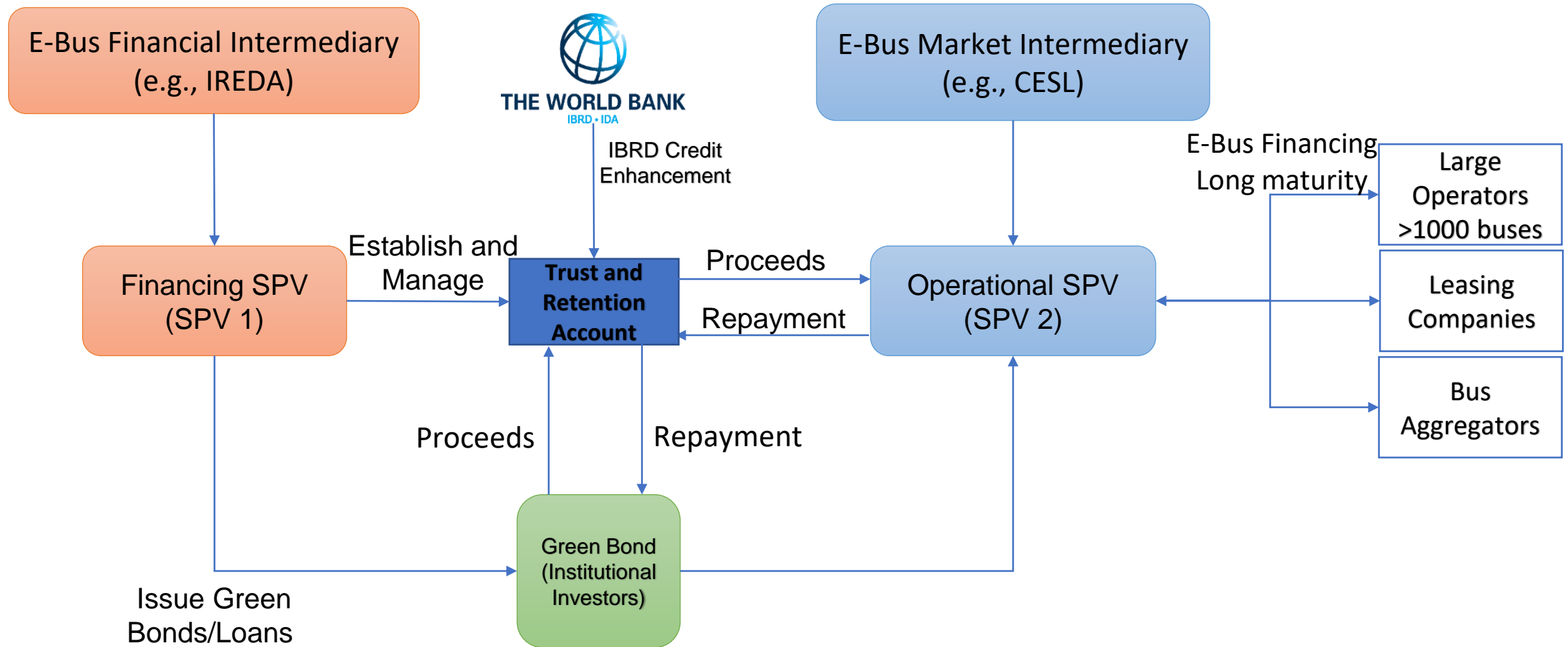
- Private buses offer significant financial and emission savings through electrification, but are constrained by lack of access to finance to purchase new e-buses along with inadequate infrastructure for parking, charging and maintenance
- A combination of Green bonds to improve access to finance combined with encouraging lease modes which protect small-time operators from capital risk
- Other business models for fleet and energy provision outlined in the table below can also be explored
- Establishing 'Bus ports' for parking, charging and maintenance through PPP is also a key enabler for e-bus transition

Business model	Fleet			Energy		Financing Instruments		
	Operations	Maintenance	Provision	Charging Infra	Depot & power connection	Leasing	Loan	Equity
GCC/ wet-lease (FAME-II, NEBP Phase-1)	OEM + Private Operator				STU	NA	FI	OEM
Dry-lease (NEBP Phase-2)	STU	OEM			STU	OEM	FI	OEM
Financial lease (FI led) (Bogota, Santiago etc.)	STU/ Private Operator		OEM			STU	FI	NA

MOBILIZING LONG-TERM GREEN FINANCE FOR PRIVATE ELECTRIC BUSES – OPTION 1



MOBILIZING LONG-TERM GREEN FINANCE FOR PRIVATE ELECTRIC BUSES – OPTION 2



[\$1-2]BN Green Bond/Loan ('AA' INR)