

Techno commercial options for public institutions to accelerate electrification of e-Buses in Indian public transport

@ The Regional EST Forum, Asia



busworld.
academy

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Content

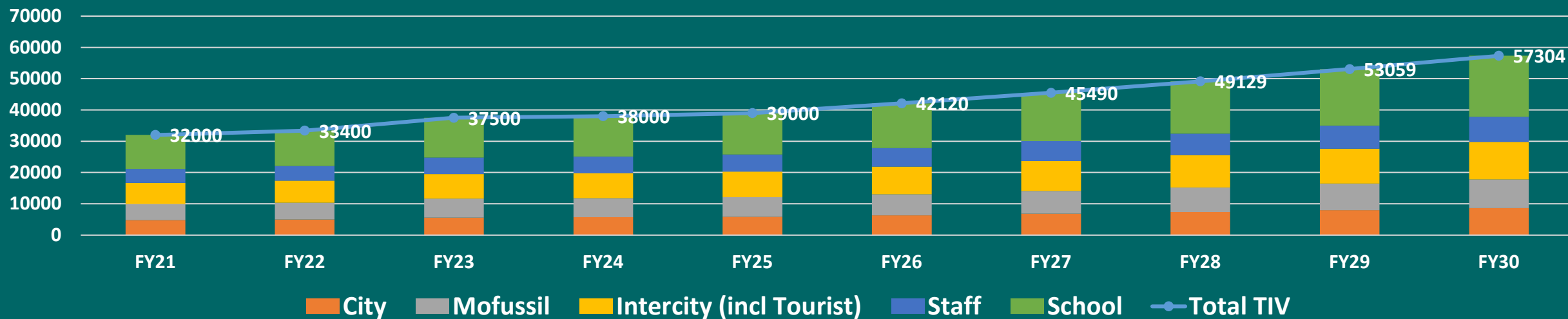


1. India Bus nos.- & expected eBus penetration.
2. Public Safety & First Responders
3. Tools for reducing Govt. grant/ support.
4. Tech-neutral tenders for Services and Solutions.
5. Financing and Business Models.

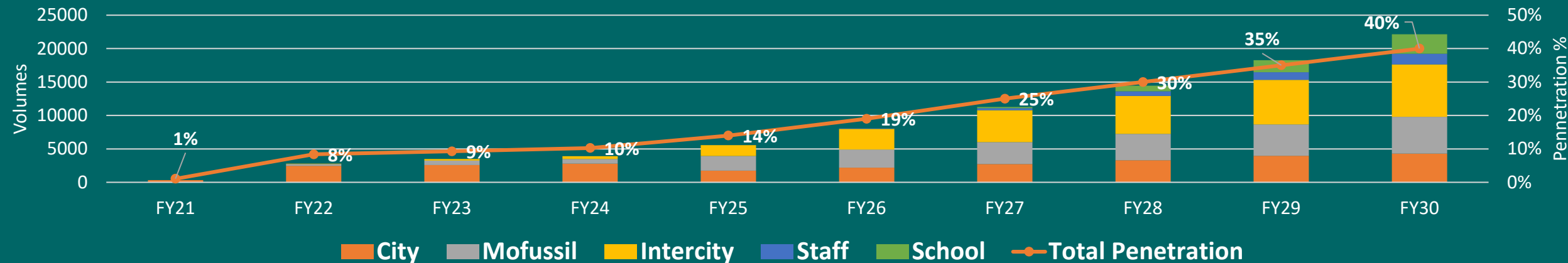


India- Bus TIV & eBus Penetration over the years

ALL BUSES- DIESEL + CNG + EV



eBuses





A quick & small diversion for a very important matter...

Public Safety & First Responders...

PUBLIC SAFETY:

1. First responders- Fire Stations, Police, Emergency Wards, etc.
2. Public awareness.
3. Passenger safety.

PRODUCT SAFETY:

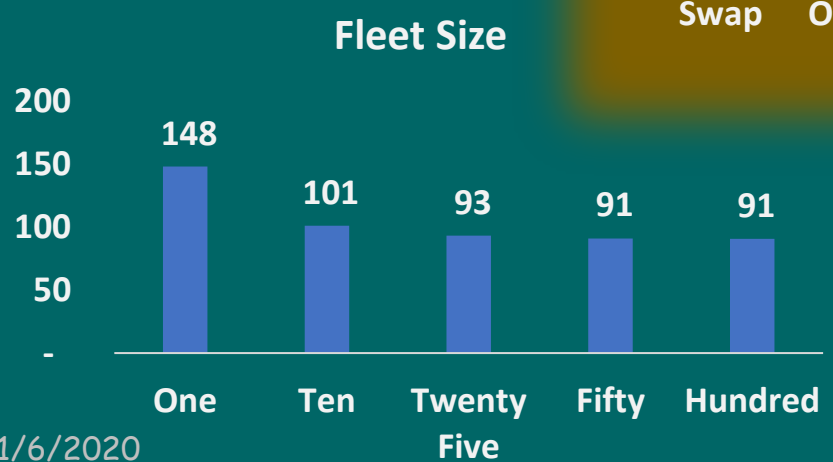
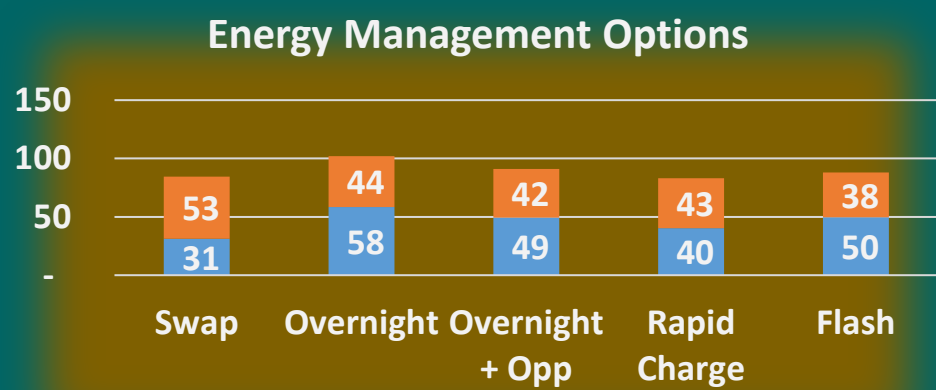
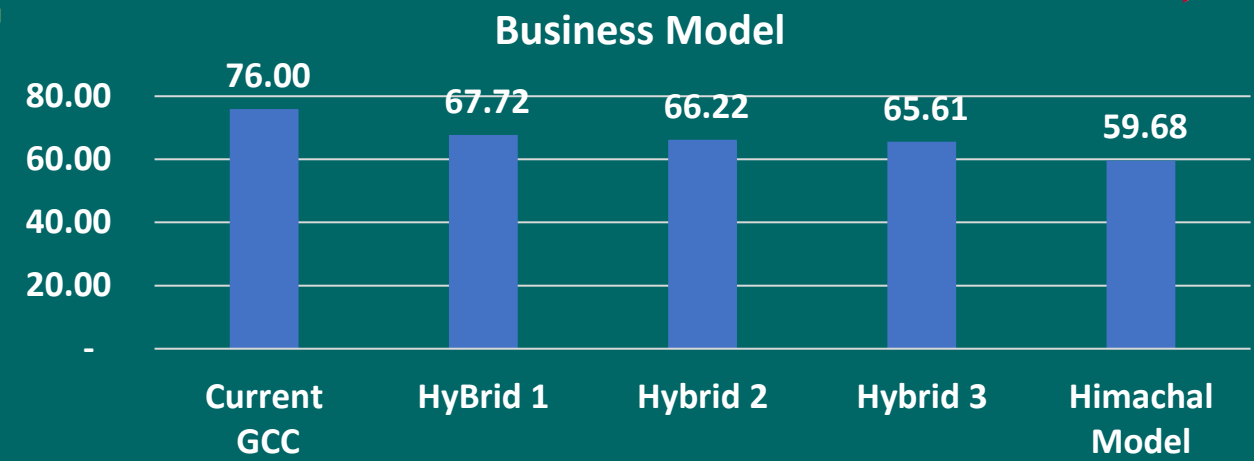
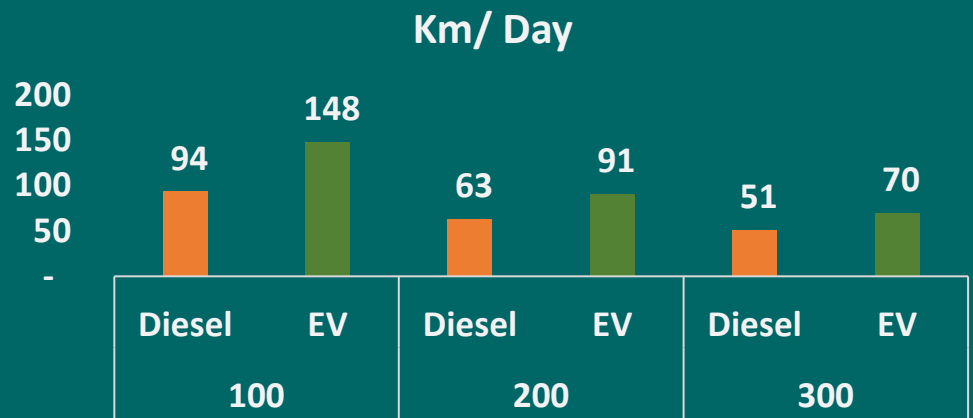
1. Emergency cut-off.
2. High Voltage wiring and aggregates.
3. Battery fires- detection and suppression systems.
4. Layouts and “terminations”.

PERSONNEL SAFETY:

1. During assembly of vehicles.
2. While maintaining the vehicles.
3. While driving the vehicle.



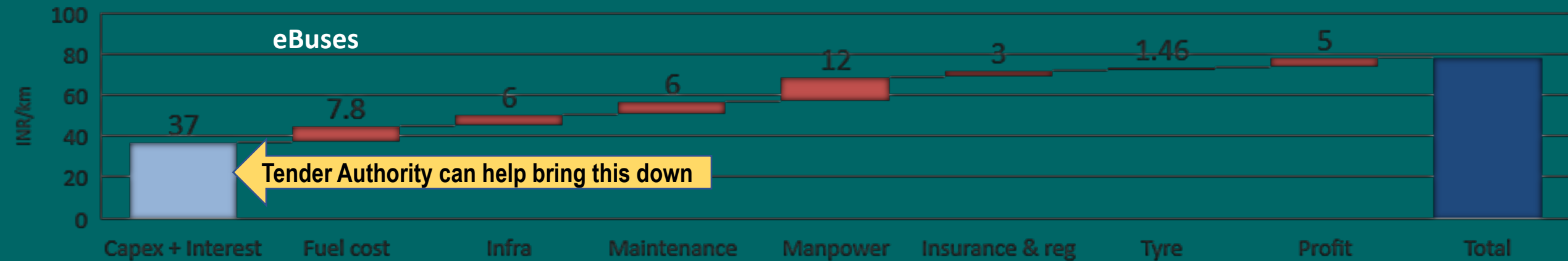
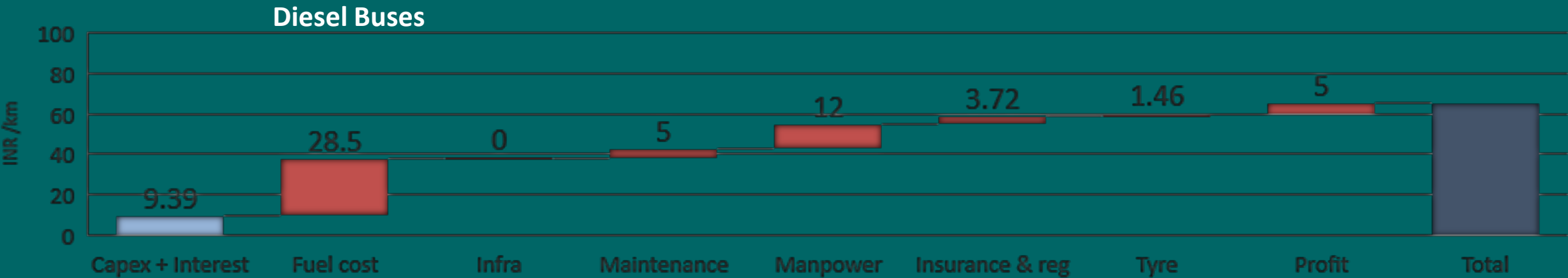
Sensitivity of TCO to variables...



	GCC	H1	H2	H3	HM
Depot Space	STU	STU	STU	STU	STU
Power Infra	AL	STU	STU	STU	STU
Vehicle Ownership	AL	STU	STU	STU	STU
Vehicle Insurance	AL	STU	STU	STU	STU
Battery Ownership	AL	AL	STU	STU	STU
Spare Battery	AL	AL	STU	STU	STU
Charger infra	AL	AL	AL	STU	STU
Driver & Operation manpower	AL	AL	AL	AL	STU
Power Cost	AL	AL	AL	AL	STU
AMC Manpower	AL	AL	AL	AL	AL
AMC Parts	AL	AL	AL	AL	AL
Battery Maintenance & Replacement	AL	AL	AL	AL	AL
Tyre Replacement	AL	AL	AL	AL	AL



Understanding the cost per km...



To reduce the costs... and thereby Govt. support



OPERATIONAL LEVERS

1. Start with routes that have high km/ day.
2. Technology & specifications- keep them open.
3. Find solutions to suit the Real Estate in the Depot.

TENDER/ CONTRACT LEVERS:

1. Place a large contract over a period of time- say, 10,000 eBuses over 7 years.
2. Tender for Solutions- not for products and specifications.
3. Tender for Services- and limit specifications to User experience.
4. Avoid “#” of eBuses- instead, ask for route-schedule-Depot compliance.

FINANCING & BUSINESS LEVERS:

1. Make it **BANKABLE** & Tie up with long-term green funds to ease Debt Service Ratios.
2. Move all technical & battery life risks to one point- as an AMC contract with the OEM.
3. Offer Hybrid tender models- upto three tenders separating:
 - a. Rolling stock & chargers.
 - b. Battery leasing/ Battery as a Service.
 - c. Operations contract

To conclude...



- 1. Close to 80% of success is now in the hands of the Tendering Authority in India.**
- 2. Very marginal influence from the Supply Chain- OEM/ Charger/ Service Providers/ Operators.**
- 3. Make sure that the Project is a Bankable contract for the suppliers- remove/ compensate for Authority Credit Risk.**
- 4. Ensure Route Planning, Depot Planning, Power Line planning are done thoroughly before tendering.**
- 5. Make it a large contract for numbers and deep contract for time-**
- 6. Keep it technology neutral- and ask for Routes, Schedules, Depot Utilisation and Service Quality.- avoid “Range per Charge”, etc.**



THANK YOU

