



WRI INDIA
—ROSS CENTER

TREND IN EV ADOPTION IN POST COVID-19 SCENARIO

“Mobilise Your City” program by AFD & UMTCL

PARVEEN KUMAR, 23RD JULY 2020, NEW DELHI

A product of WRI Ross Center for Sustainable Cities

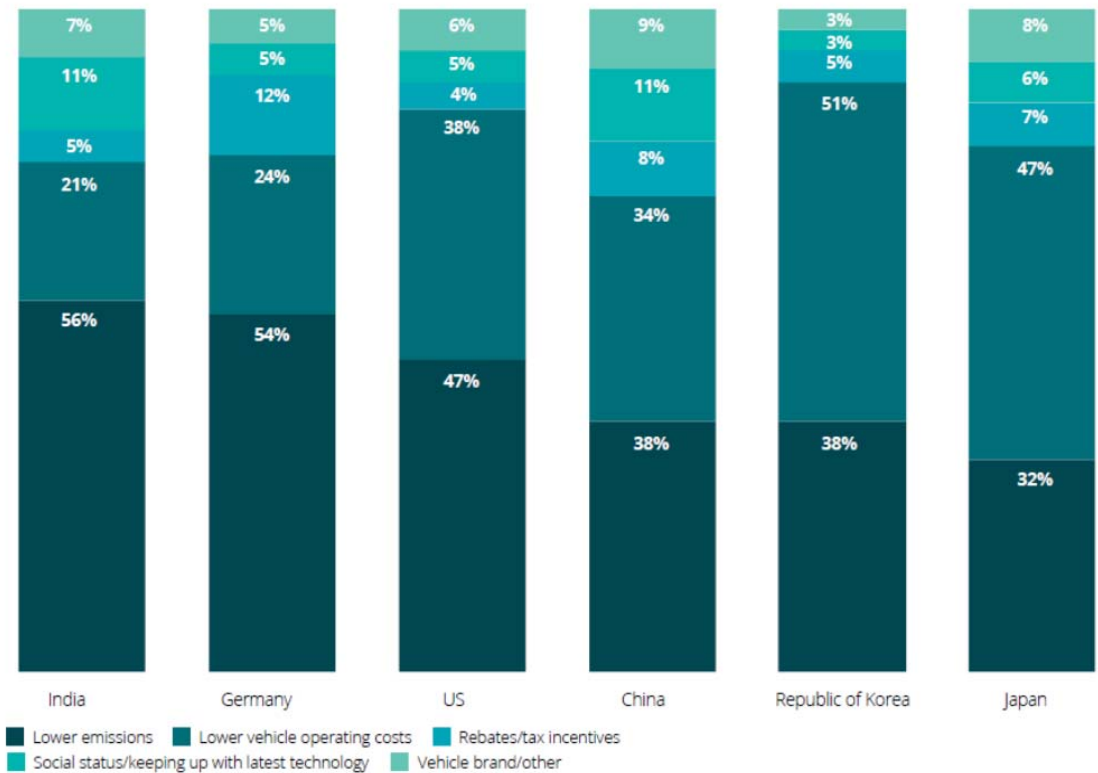
EV ADOPTION: MAJOR MOTIVATION

➤ Driving Factor

- ❖ Environmental reasons: ~47%
- ❖ Lower Operating Costs: 38%
- ❖ Tech/social status: ~5%
- ❖ Others: ~10%

➤ Major Challenges

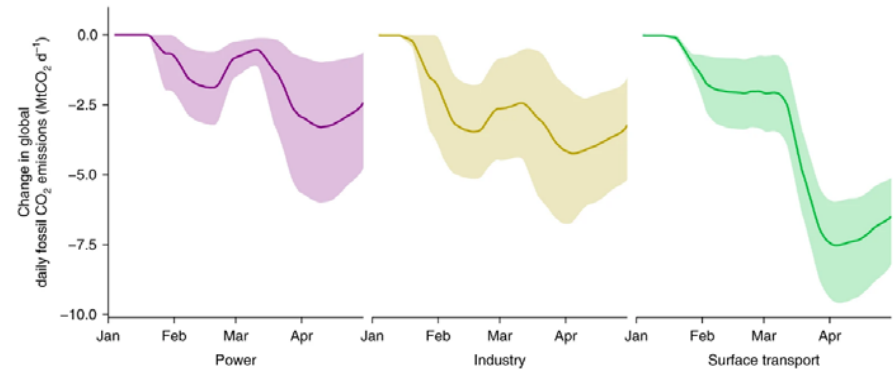
- ❖ High upfront cost
- ❖ Drive range anxiety
- ❖ Lack of charging infrastructure
- ❖ Anxiety related emerging technology



IMPACT OF COVID-19 PANDEMIC

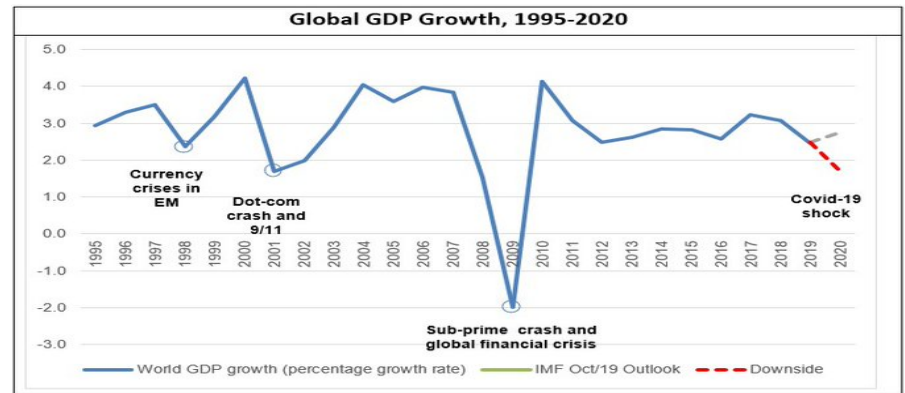
➤ Lockdown: Temporary reduction in daily global CO₂ emission

- ❖ Reduction in global emissions from surface transport is -36%
- ❖ Surface transport: largest contribution in total emission change (~43%)



➤ Economic and Financial Crisis

- ❖ Corona virus outbreak could cost the global economy up to \$2 trillion this year
- ❖ May be impact on funding to support EV adoption



<https://www.nature.com/articles/s41558-020-0797-x>

<https://www.weforum.org/agenda/2020/03/coronavirus-and-global-supply-chains/>

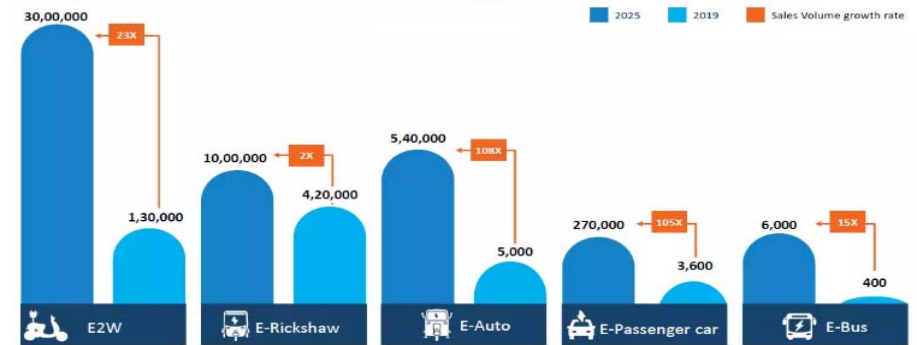
INDIAN EV MARKET: CURRENT STATUS

Trend in EV Sales:

Vehicle Segment	FY2016	FY2017	FY2018	FY2019
e-2W	20,000	23,000	54,800	1,26,000
e-3W	-	-	-	6,30,000
e-car	2000	2000	1200	3,600
Total EVs	22,000	25,000	56,000	7,59,600
e-bus	SRTUs under FAME Scheme			

MARKET FORECAST TO 2025

E-RICKSHAWS, E-AUTOS AND E-2W ARE THE MOST PROMISING SEGMENTS FOR ELECTRIFICATION IN INDIA; EXPECTED TO ACCOUNT FOR OVER 4 MILLION UNITS BY 2025



Source: Frost & Sullivan

➤ Trend to watch in India's EV Market

- ❖ Growth in e-rickshaw adoption
- ❖ Adoption of e-car via B2B model
- ❖ Aggregator model in different vehicle segment

<https://auto.economictimes.indiatimes.com/news/industry/indias-electric-story-to-continue-to-be-dominated-by-light-mobility-post-covid-19/75284206>

EV ADOPTION: FAME-I

➤ FAME-I: 2015-2019

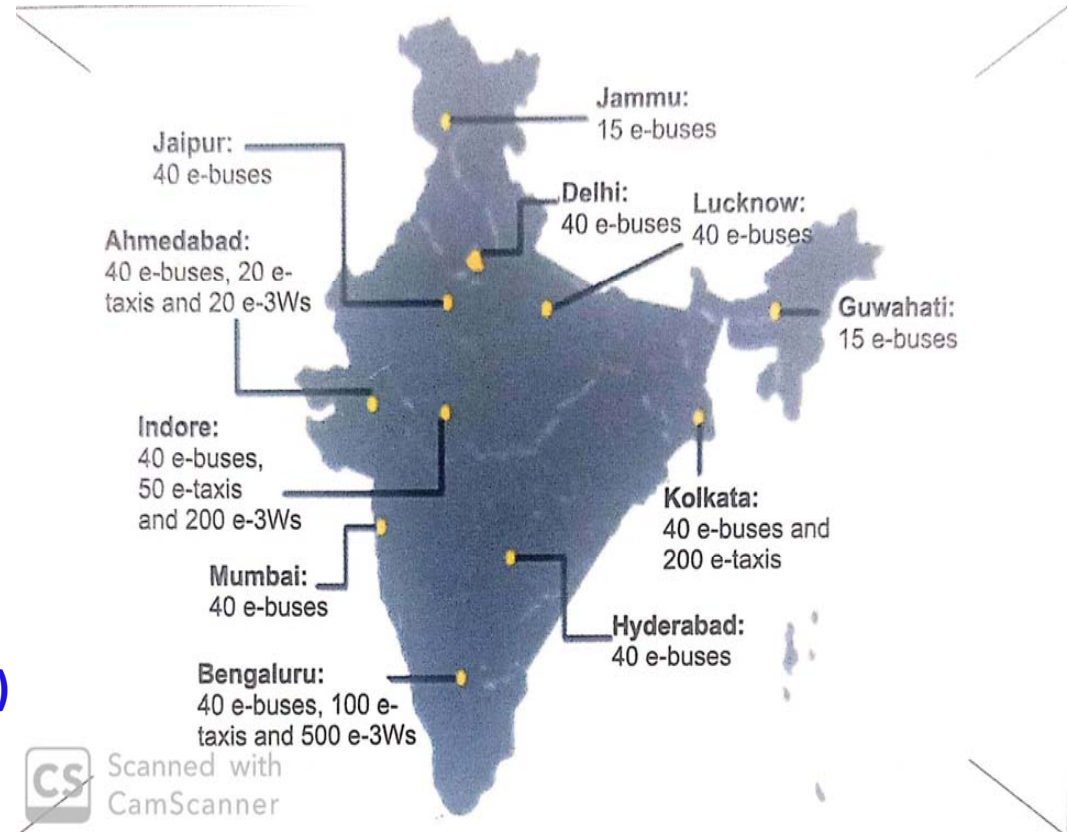
- ❖ Cities covered - **11**
- ❖ Vehicle Supported: **~2.78 lakh** electric & hybrid vehicles

➤ Subsidy Allocated

- ❖ Buses - ~60% of cost
- ❖ Taxis – 10-15% of cost
- ❖ e-3W - ~20% of cost

➤ Allowed Procurement Models (e-bus)

- ❖ **GCC Model & Outright Purchase**



CS Scanned with CamScanner

E-BUS ADOPTION: FAME II

- E-buses sanctioned in Phase 1 (5595 e-buses)
 - ❖ Cities covered - 22 states/64 Cities
 - ❖ 5095 for Intra-city
 - ❖ 400 for Inter-city
 - ❖ 100 for DMRC last mile connectivity

- Subsidy Allocated
 - ❖ Rs 20,000/kWh (e-buses/trucks)
 - ❖ Rs 10,000/kWh (all other vehicles)

- Allowed Procurement Models
 - ❖ GCC Model

- Stakeholders
 - ❖ **State Govt. Entities/STUs**



E-BUS CO-BENEFITS: REDUCTION IN EMISSIONS

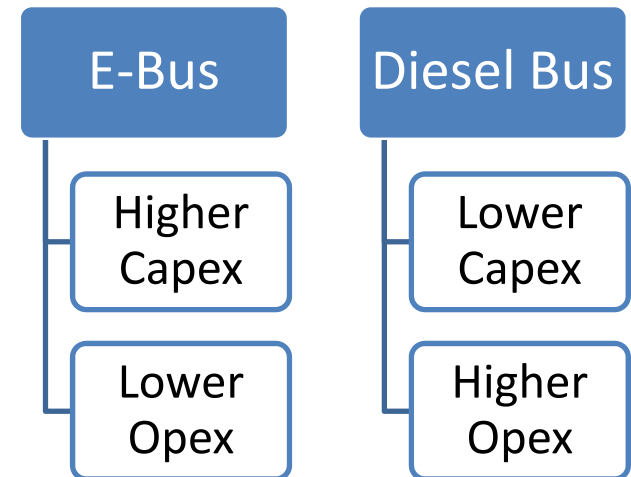
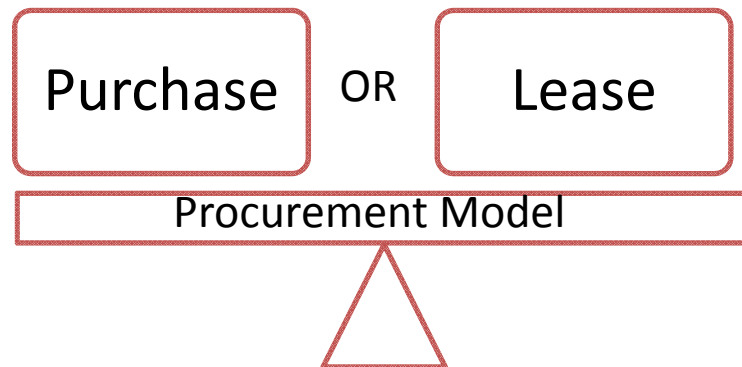
- Air pollution kills 1.2 mn Indians in a year
- 14 out of 20 most polluted cities in the world, are in India (WHO Report)
- Transport accounts for ~11% of India`s carbon emission
- Significant reduction in CO₂ emission with e-bus
- With renewable energy source of electricity, CO₂ emission will further decrease
- Zero tail pipe emissions --> Direct reduction in local air pollution

Bus/Fuel Type	GHG (g/km)		
	CO ₂ eq	NOx	PM10
Diesel Bus (Euro VI)	1000	1.1	0.03
CNG Bus	850	0.88	0.024
Electric Bus	500	0	0

DIESEL TO E-BUS TRANSITION : CHALLENGES

Major Challenges

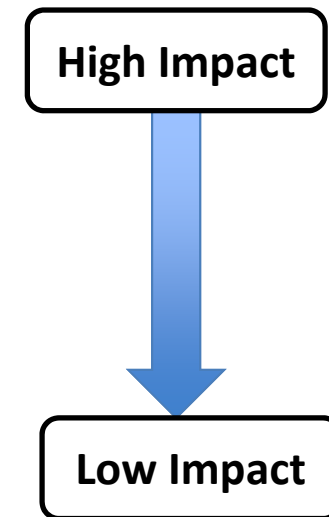
- High upfront cost
- Drive range anxiety
- Operational Challenges
- Risk associated with early technology adoption
- Lack of charging infrastructure



TCO: KEY VARIABLES

Factors Influence Total Cost of Ownership (TCO) per km

- Distance Travelled /year
- Operational year
- Investment Cost Including Battery
- Maintenance Cost /year
- Energy Cost/year
- Extra Battery Cost
- Normal Chargers Cost



TCO per km decreases with increasing vehicle utilization, and decreasing initial purchase cost.

PUBLIC TRANSPORT IN POST-COVID-19 SCENARIO

Major Issues

- Financial challenges
- Social Distancing Requirements
- Safety against infection
- Availability & Reliability of services



Image Source: WEB



OPPORTUNITY FOR E-BUSES: POST-COVID-19

- Zero tailpipe emission
- Low GHG emission
- Lower Operating Costs
- High Tech Solution
- More reliable service



Thank You

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- **Transitioning Traditional buses to E-Buses in tier 2 cities in India**