

# ELECTRIC BUSES: Moving forward

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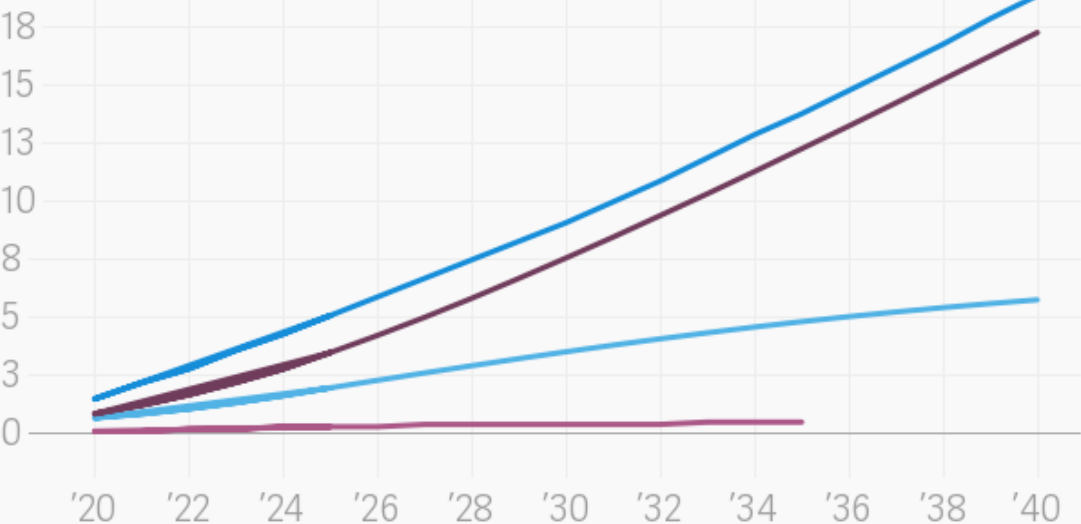
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# Growth in Electric Vehicle Growth Projections

The US EIA forecasts very low adoption of electric cars

■ 2011 ■ 2016 ■ 2018 ■ 2019

20 million cars

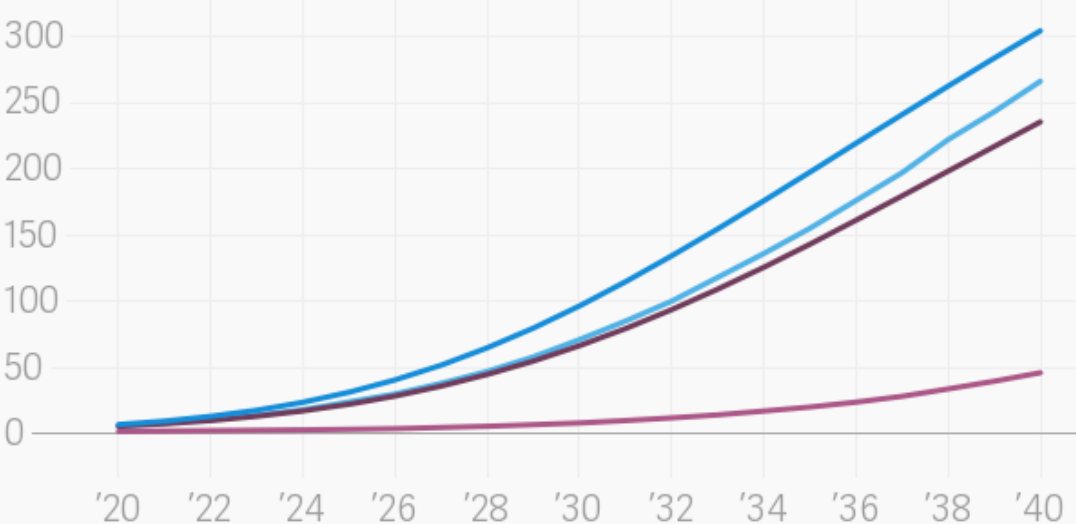


Δ T L Δ S | Data: US Energy Information Administration

OPEC projections for global electric car stocks

■ 2015 ■ 2016 ■ 2017 ■ 2018

350 million

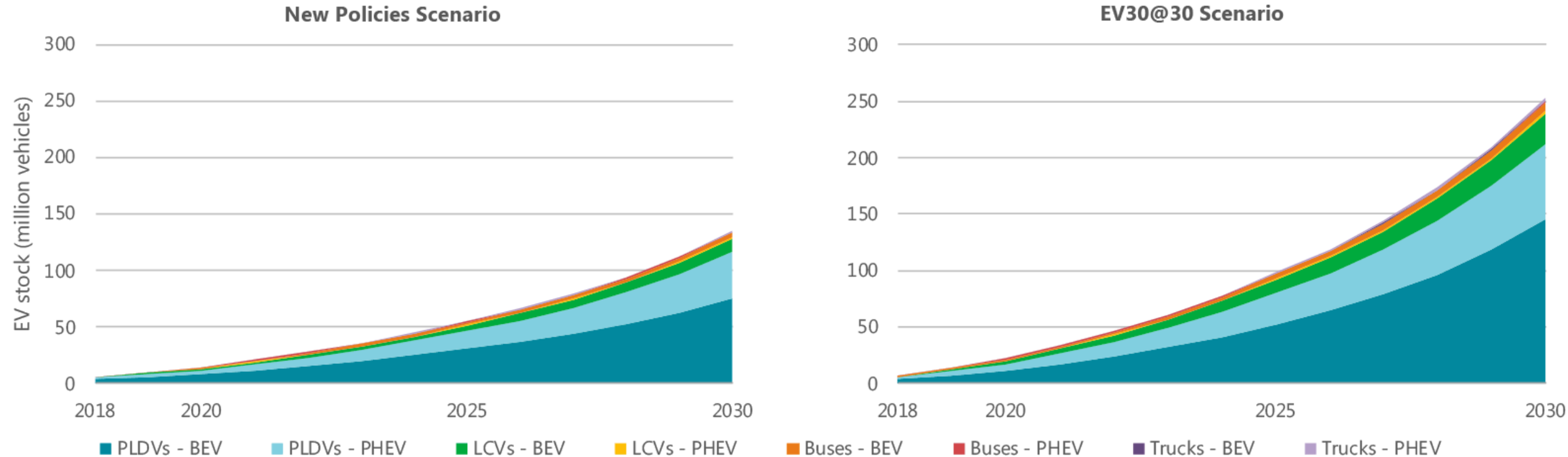


Δ T L Δ S | Data: BloombergNEF

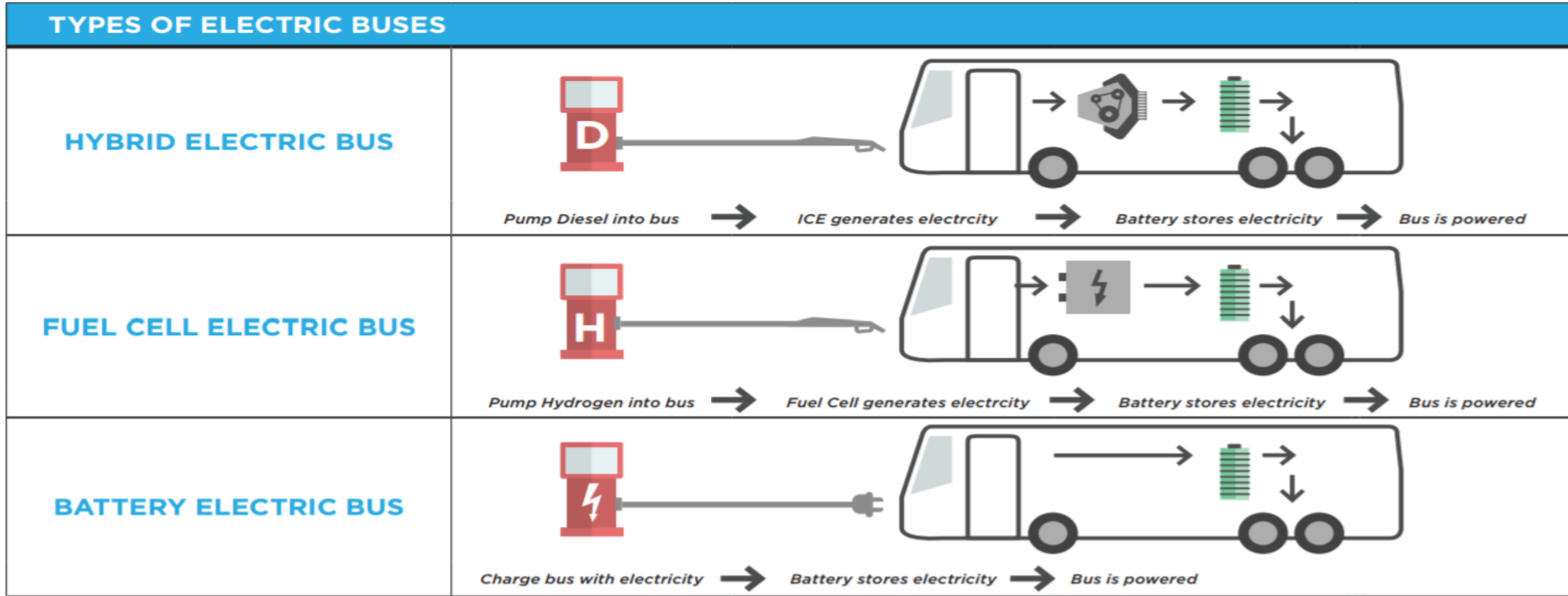
# Electric Vehicle Growth Projections

- Most Conservative Estimate: 130 million EVs by 2030
- Least Conservative Estimate: 250 million EVs by 2030

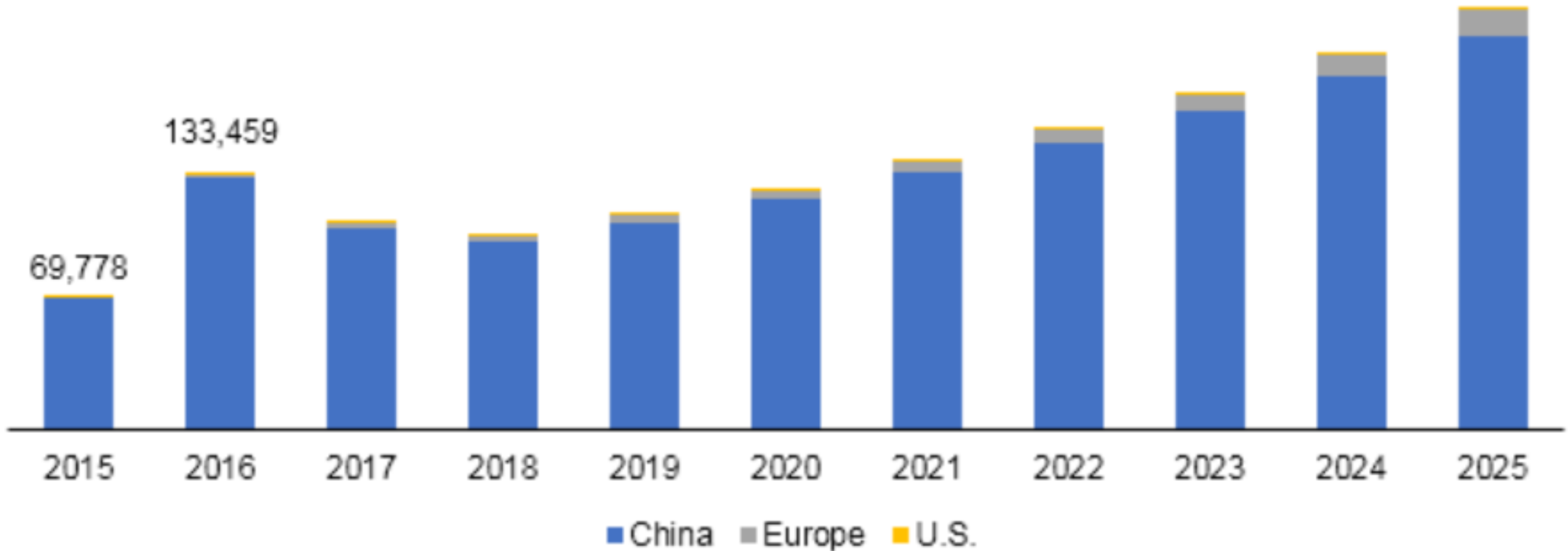
## Global Electric Vehicle Growth



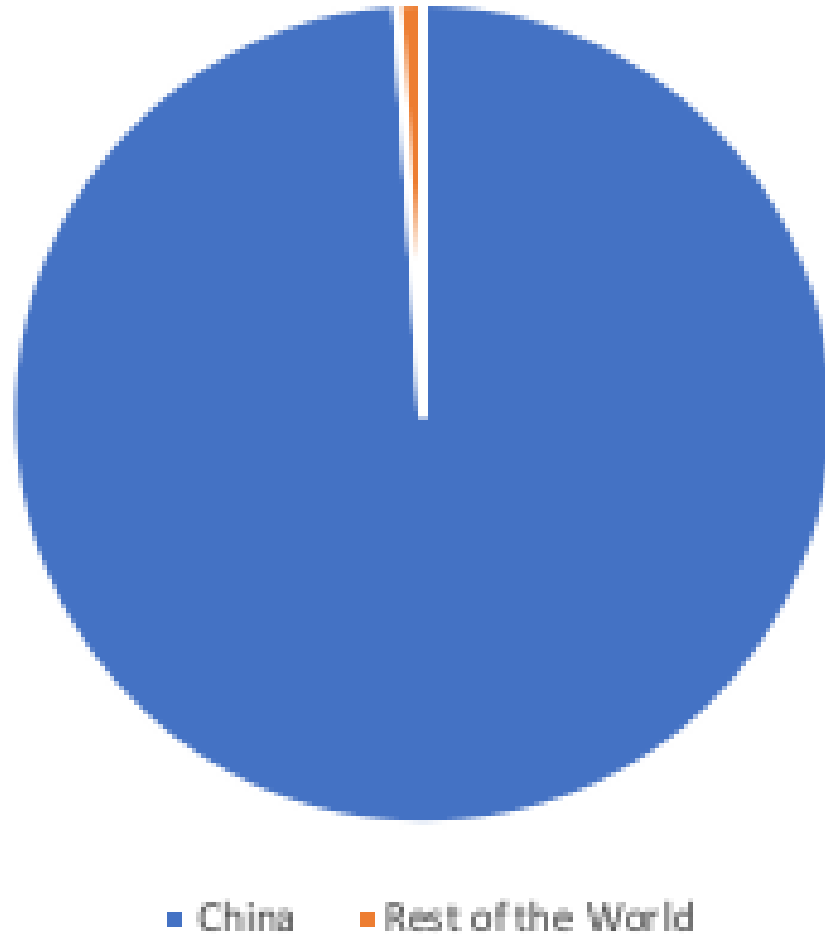
# Types of Electric Buses



## Global electric bus market demand, by region, 2015 - 2025 (Units)



# ELECTRIC BUS MARKET WORLDWIDE



- Electric bus market is valued over USD 35 billion in 2018
- There are around 425,000 electric buses in the world
- 99% of the them are in China

# WHY ARE ELECTRIC BUSES THE BEST OPTION?

**Low OpEx**



**Renewable power opportunity**



**Zero Tail Pipe Emission**



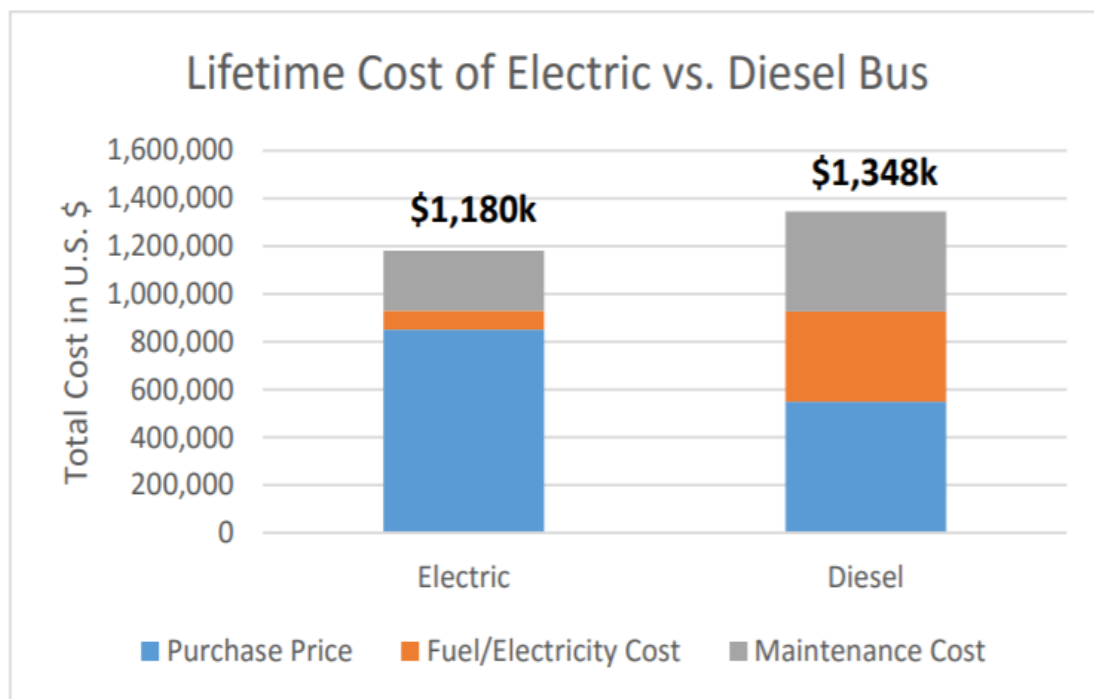
**Low or Noise**



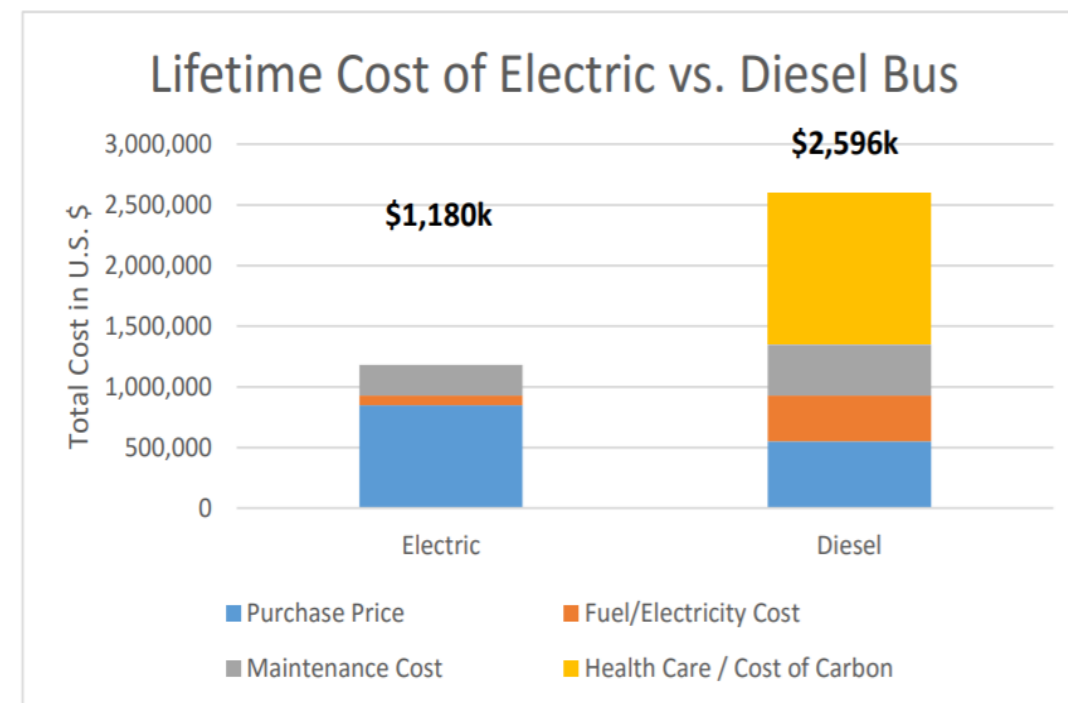
*And many more reasons.....*

# Electric buses are cost effective

**Lifetime Cost of Electric Buses vs. Diesel Buses in U.S. \$  
Excluding Cost Savings Associated with Health Benefits**



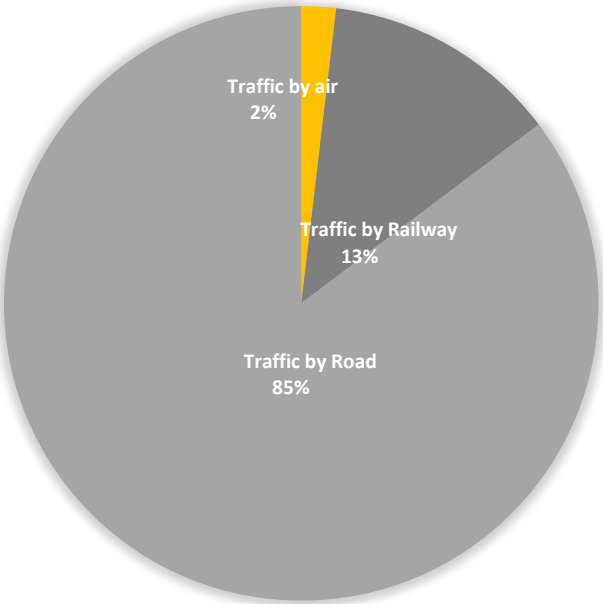
**Lifetime Cost of Electric Buses vs. Diesel Buses in U.S. \$  
Including Cost Savings Associated with Health Benefits**





# SNAPSHOT OF SHARE OF TRANSPORT BY MODE IN INDIA

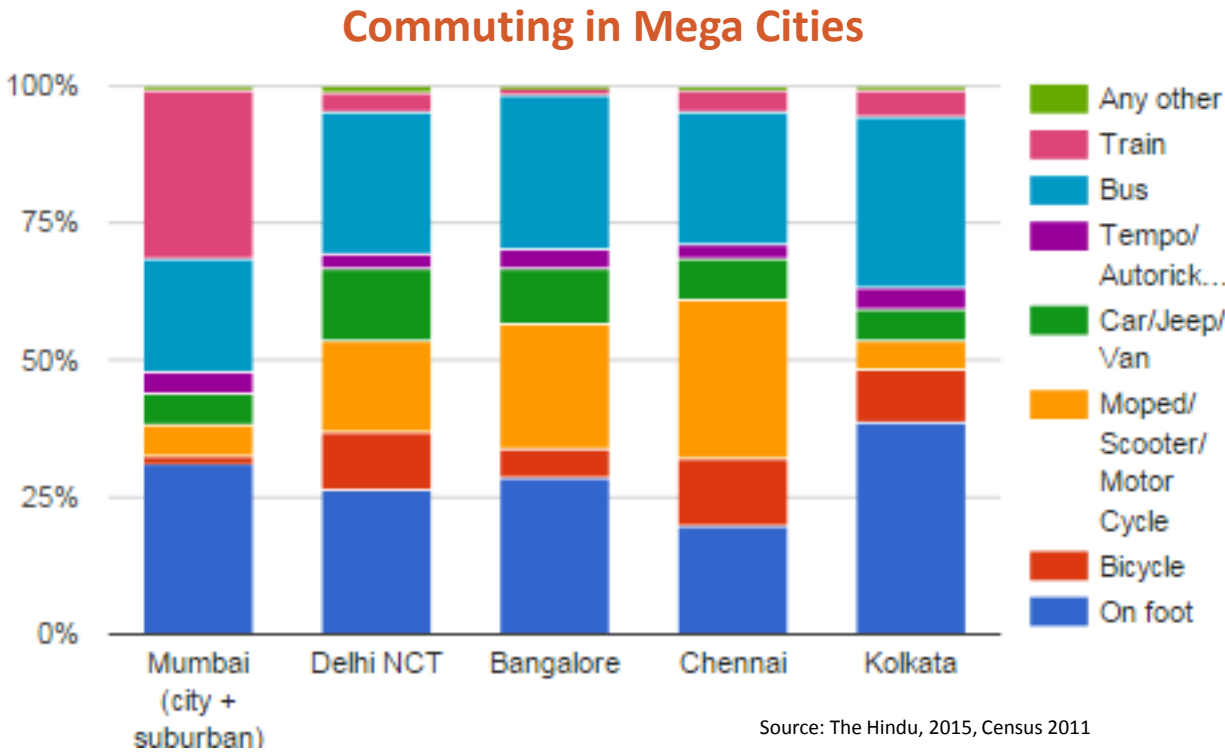
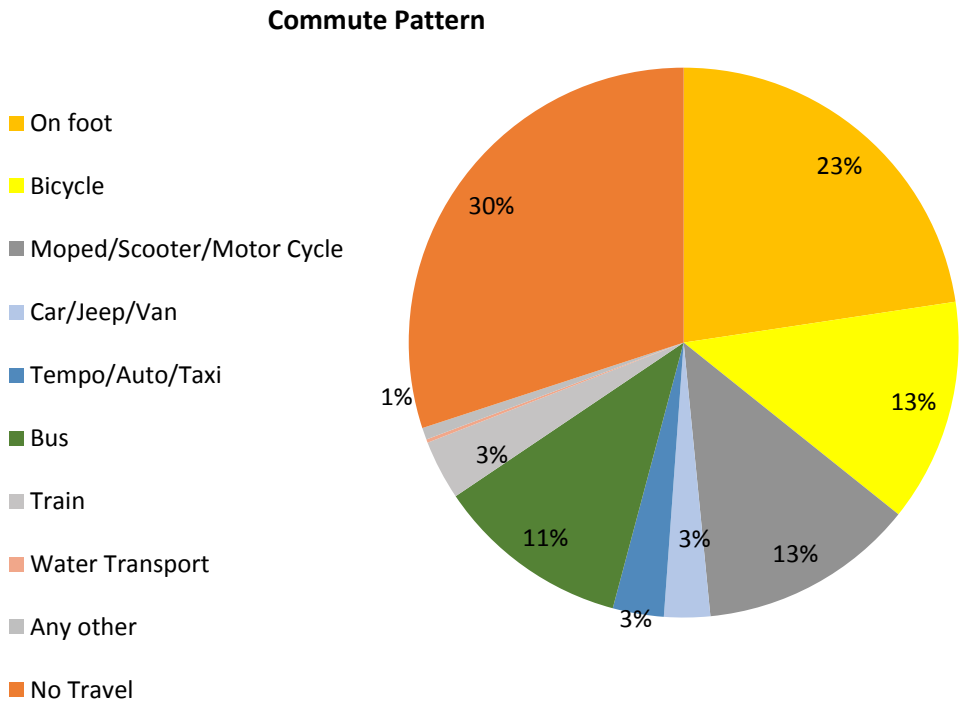
Share of passengers by mode



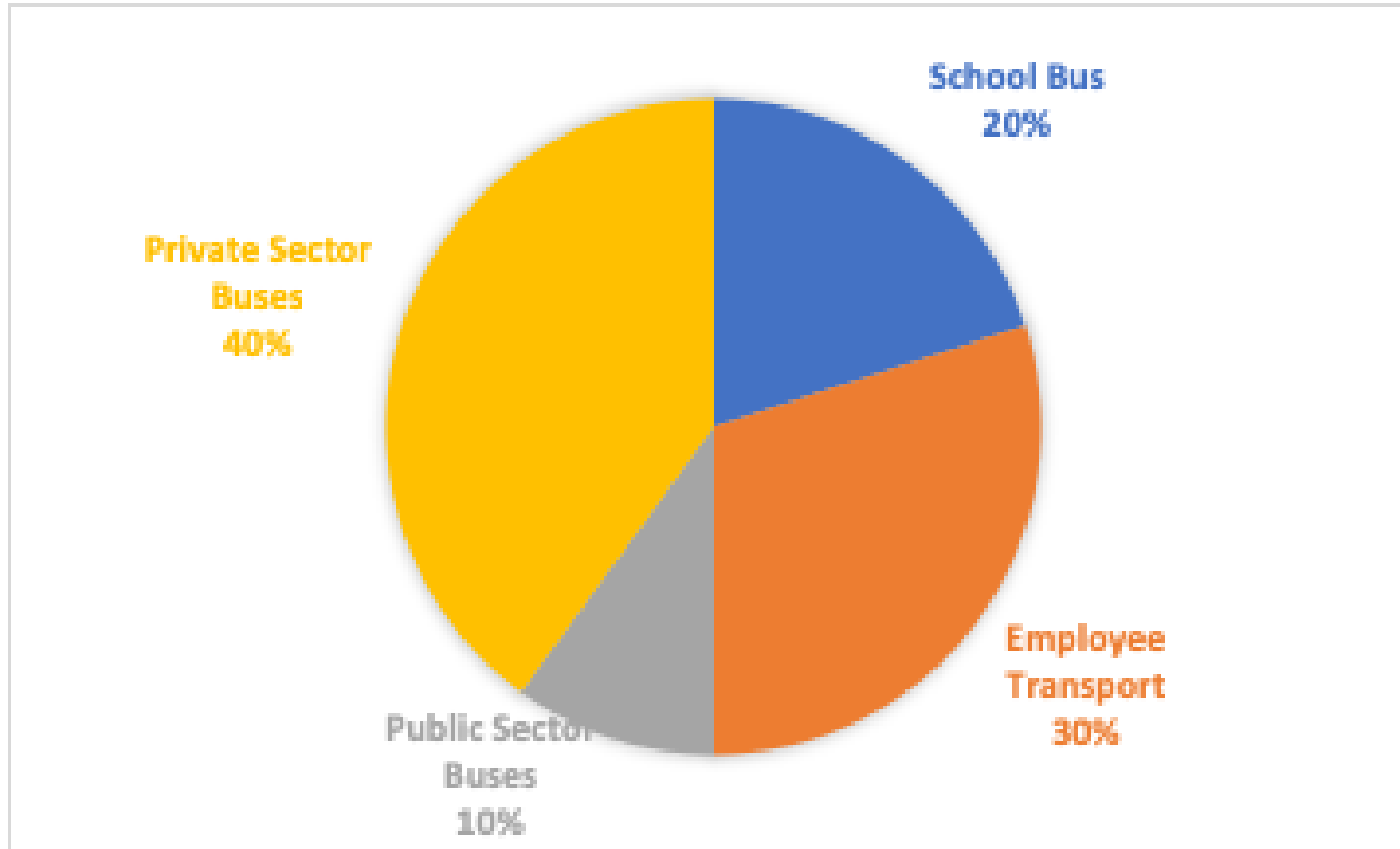
2/3<sup>rd</sup> of which is Bus Transport

Year	2012-13 Passenger KM in Billion
Passenger By Public Transport	5756
Traffic by air	108
Traffic by Railway	740
Traffic by Road	4908
% share of Road Transport	85%
Traffic by Buses	4173
% share of Bus	74%
Traffic by State transport buses	485
% share of STU buses	8%
Traffic by Private operated buses	3688
% share of Private buses	64%

# HOW INDIA COMMUTES TO WORK: CENSUS 2011



# Bus Sector in India

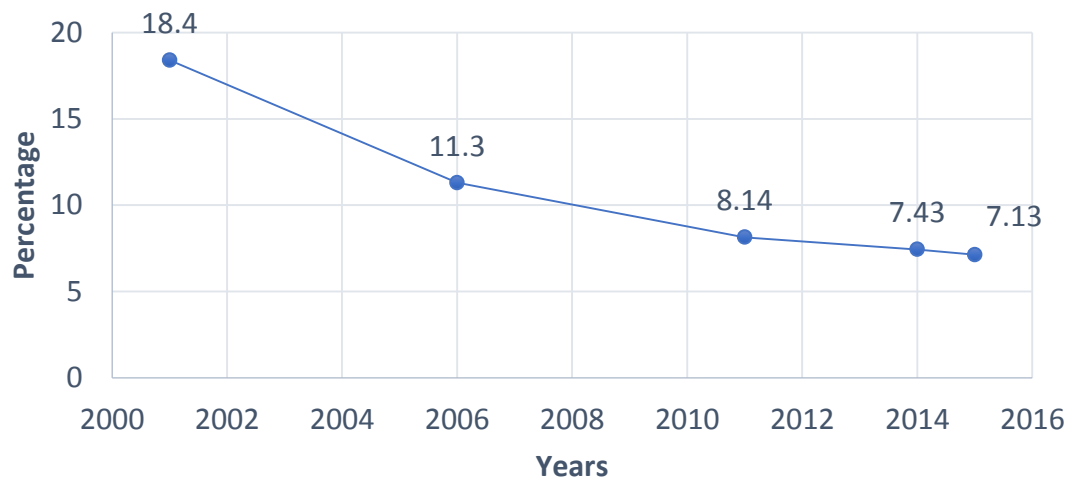


- 1,700,000 buses in India
- 170,000 operated by the public sector
- 30,000 are in urban areas

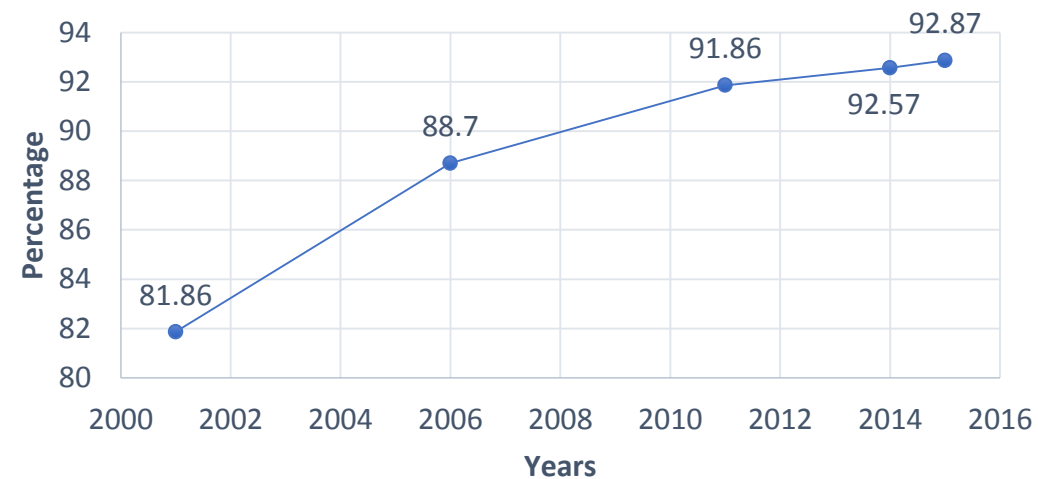
**In addition, the country has around 1 million micro buses (Mini Buses, Tata Magic, Mahindra Maximo, App based buses)**

# Bus registration in India

## Public Buses in India



## Private Buses in India



<https://community.data.gov.in/buses-owned-by-the-public-sector-in-india-from-2001-to-2015/>

<https://community.data.gov.in/buses-owned-by-the-private-sector-in-india-from-2001-to-2015/>

# BUSES PER 1000 POPULATION IN SELECT COUNTRIES

Country	Buses per 1000 population
Australia	4
Bangladesh	1
Brazil	4
China	2
France	1
Germany	1
<b>India</b>	<b>1</b>
Japan	2
Malaysia	3
Mexico	3
Russian Federation	0.5
South Africa	6
Thailand	8
UK	3
USA	2

- India has less than one bus for every 1000 citizens
- India typically has 0.5-1 buses per 1000 population
- Countries like Mexico, Brazil, China boast of more than 2 buses per 1000 population
- This has an effect on waiting time, number of citizens catered to and headway
- Less connectivity by buses gives rise to innovative and often unsafe IPT options

# INITIAL CATALYST: FAME 1

## Buses under FAME 1

- Delhi
- Ahmedabad
- Bangalore
- Jaipur
- Mumbai
- Lucknow
- Hyderabad
- Indore
- Kolkata
- Jammu
- Guwahati

**FAME 2 will look at another 7000+ electric buses**



# KEY ISSUES IN SCALING E-BUSES

- Planning of operations
- Business model and financing
- Charging infrastructure & technology
- Integration
- Skilling and capacity building