SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A++ Grade

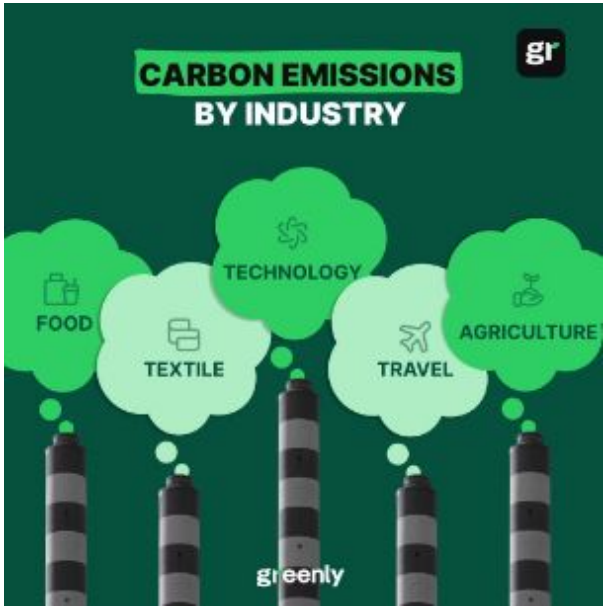
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

UNIT V: BUSINESS

TOPIC: **Case study E-mobility Indian Roadmap Perspective**

Introduction

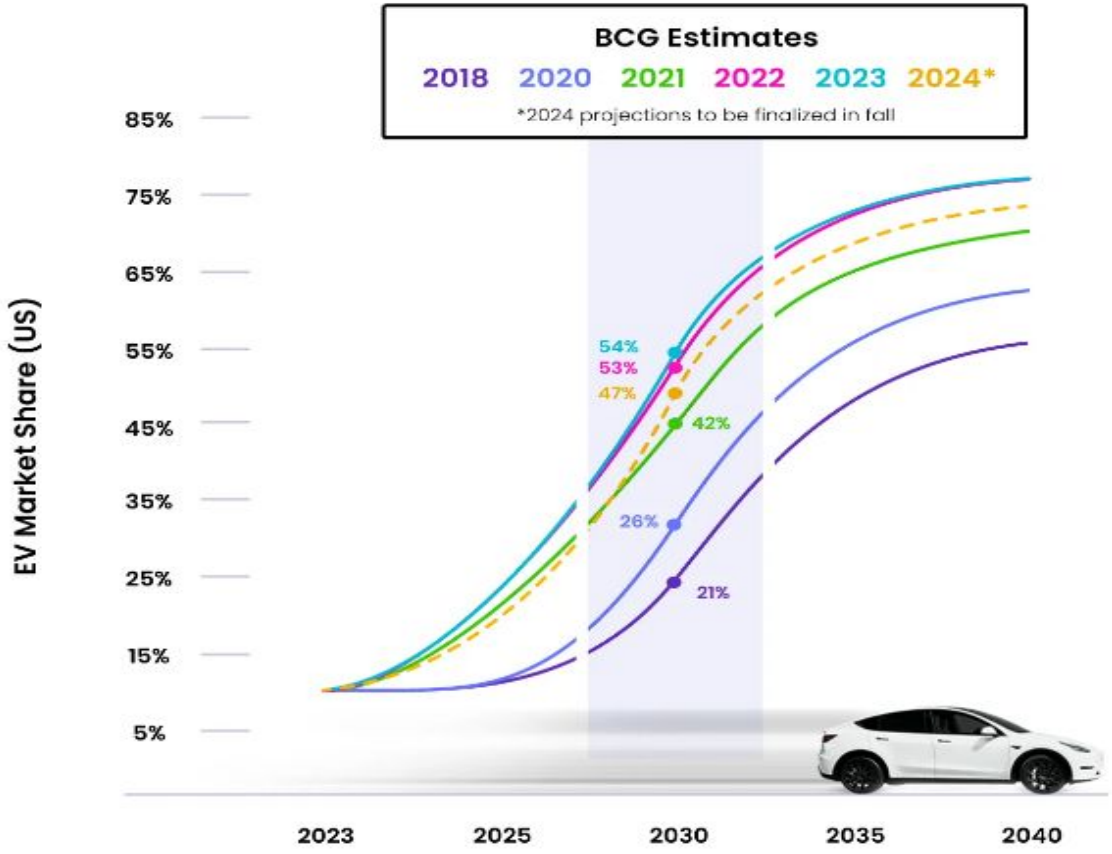
- **Key Points**:
  - Growing concerns about climate change and energy dependence.
  - India's commitment to reducing carbon emissions (COP21 & Net Zero by 2070).
  - The role of electric mobility in transforming the transportation sector.
- **Visual**: Infographic showing India’s carbon emission breakdown.



E-Mobility Overview in India

- **Current Scenario**:
  - Share of EVs in the market (~2% in 2023).
  - Types of EVs in India: Two-wheelers, three-wheelers, passenger cars, and buses.
- **Challenges**:
  - Limited charging infrastructure.
  - High initial costs of EVs.
  - Consumer awareness and trust.
- **Visual**: EV adoption trend graph from 2015 to 2023.

2030 EV Projections Converge at 50%



Policy and Incentives

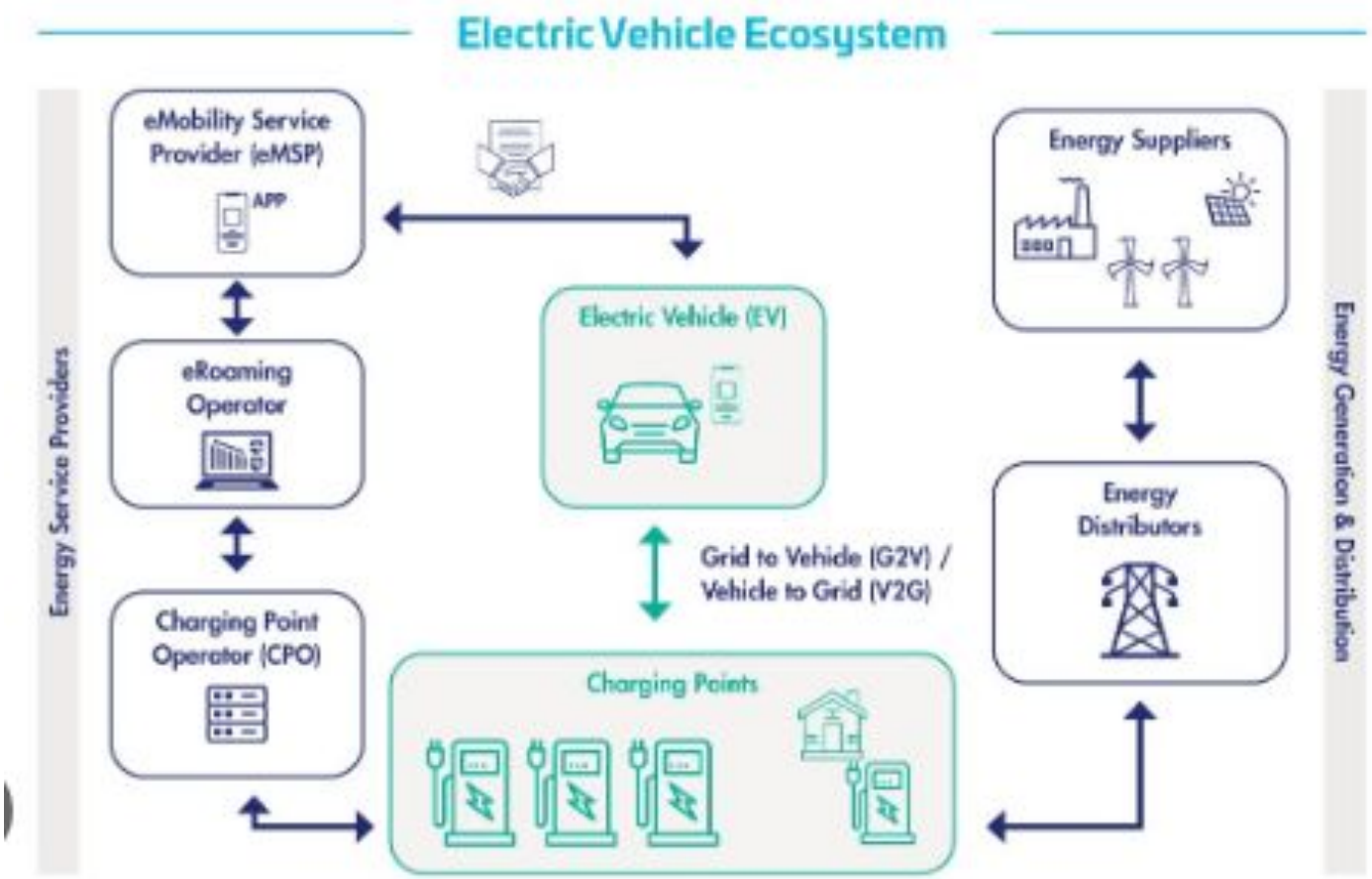
- **Government Initiatives**:
  - Faster Adoption and Manufacturing of Electric Vehicles (FAME) I & II.
  - Production Linked Incentive (PLI) scheme for battery manufacturing.
  - State-level EV policies.
- **Subsidies and Tax Benefits**: GST reduction on EVs, income tax benefits on loans for EV purchase.
- **Visual**: Map of India highlighting key states with EV incentives.

Case Study: Success Stories in India

- **Two-Wheelers**:
  - Ola Electric and Ather Energy leading the EV revolution.
- **Public Transport**:
  - Adoption of e-buses in Bengaluru (BMTC) and Delhi (DTC).
- **Fleet Electrification**:
  - Companies like Uber and BluSmart integrating EVs into their fleets.
- **Visual**: Photos of successful EVs and fleets operating in India.

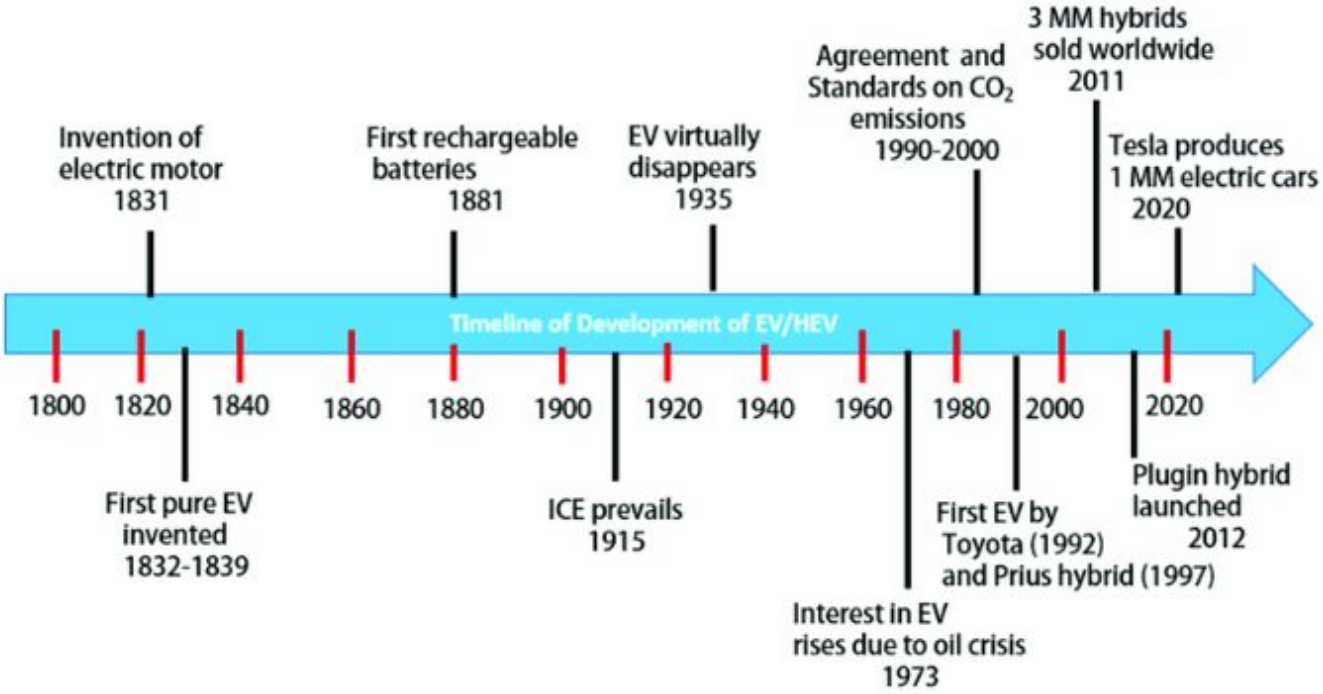
Infrastructure Development

- **Charging Infrastructure**:
  - Public-private partnerships driving growth (e.g., Tata Power, Fortum, and EESL).
  - Growth from ~1,000 charging stations in 2021 to 8,000+ in 2023.
- **Battery Swapping**:
  - Emerging models for two-wheelers and three-wheelers.
- **Renewable Integration**:
  - Linking EV charging with solar and wind energy.
- **Visual**: Diagram of an integrated EV ecosystem.


Electric Vehicle Ecosystem
eMobility Service Provider (eMSP)
APP
eRoaming Operator
Charging Point Operator (CPO)
Energy Service Providers
Electric Vehicle (EV)
Grid to Vehicle (G2V) / Vehicle to Grid (V2G)
Charging Points
Energy Suppliers
Energy Distributors
Energy Generation & Distribution

Technology & Innovation

- **Key Innovations**:
  - Battery advancements: Lithium-ion to solid-state batteries.
  - Connected cars: IoT and telematics in EVs.
  - Energy management: Smart grids and V2G (Vehicle-to-Grid) technology.
- **Visual**: Timeline of EV technology innovations.


Timeline of Development of EV/HEV
1800
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
2020
Invention of electric motor 1831
First pure EV invented 1832-1839
First rechargeable batteries 1881
ICE prevails 1915
EV virtually disappears 1935
Interest in EV rises due to oil crisis 1973
Agreement and Standards on CO_2 emissions 1990-2000
First EV by Toyota (1992) and Prius hybrid (1997)
3 MM hybrids sold worldwide 2011
Plugin hybrid launched 2012
Tesla produces 1 MM electric cars 2020

Technology & Innovation

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Opportunities and Challenges

- **Opportunities**:
  - Job creation in EV manufacturing and services.
  - Export potential of EVs and batteries.
  - Reduction in oil imports and improvement in air quality.
- **Challenges**:
  - Raw material dependency (e.g., Lithium and Cobalt).
  - High cost of EVs and batteries.
  - Consumer trust in EV reliability.
- **Visual**: SWOT analysis of the Indian EV market.

Future Projections

- **2030 Goals**:
  - EVs to constitute 30% of the total vehicle sales.
  - 50% reduction in oil dependency in transportation.
  - Creation of 5 million EV-related jobs.
- **Path to Achieve**:
  - Strengthening policies, scaling production, and improving infrastructure.

Strengths	Weaknesses
• Eco-friendly • Silent • Low cost of ownership • Cheaper to run • Energy savings—achievable from regenerative braking system • Simpler mechanism	• Needs time to recharge • Lack of recharging infrastructure • Batteries change is expensive
Opportunities	**Threats**
• Governments subsidy for ownership • No congestion charge • Lower taxes • Increasing fossil fuel costs	• Competition in form of electric hybrids, alternative fuel, hydrogen-powered cars • Rise in cost of electricity

SWOT analysis for electric vehicles.

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- **Visual**: Projection graph of EV adoption and infrastructure development.

India's EV Road To Future

Where It Is Currently Parked

Existing Market Size
$5.7 Bn

Vehicles Sold
~3 Mn

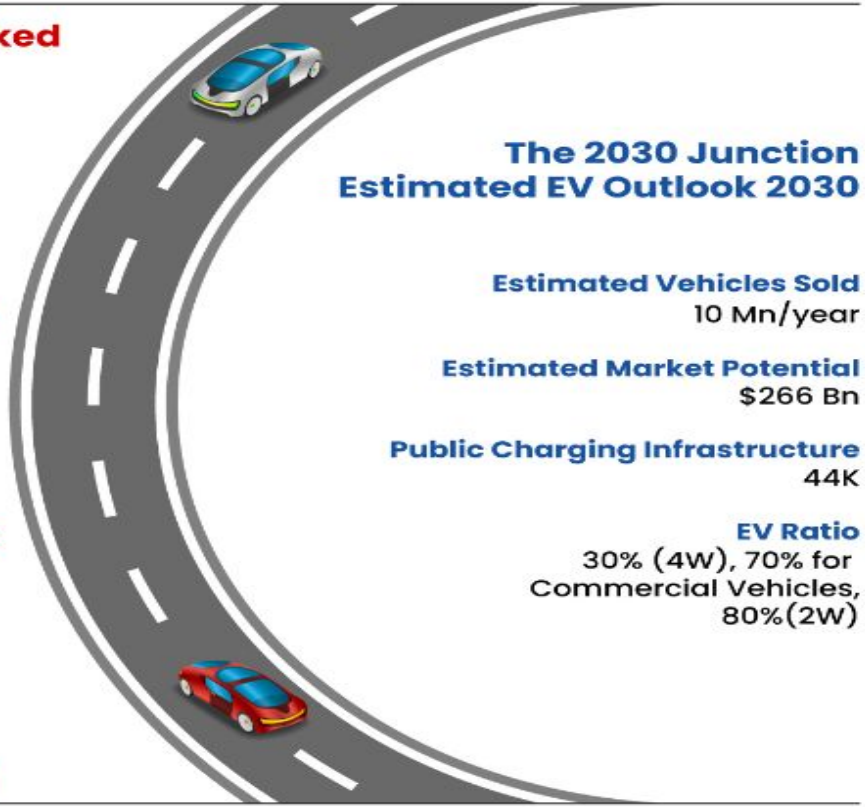
EV/ICE Ratio
6%

Public Charging Infrastructure
7721 charging stations

Key Players
TATA MOTORS, Mahindra electric, BAJAJ, ATHER, OLA, TVS

Key Charging Station Providers
BOLT.EARTH, TATA POWER-DDL, ATHER, charzer, chargepoint

Key Battery Manufacturers
AMARON, EXIDE, BATTRIXX, exicom, GRINNTECH, TOSHIBA



The 2030 Junction
Estimated EV Outlook 2030

Estimated Vehicles Sold
10 Mn/year

Estimated Market Potential
$266 Bn

Public Charging Infrastructure
44K

EV Ratio
30% (4W), 70% for Commercial Vehicles, 80%(2W)

Conclusion

- **Key Takeaways**:
  - E-mobility is crucial for India’s sustainability goals.
  - Supportive policies, innovation, and infrastructure will drive adoption.
  - Collaboration among stakeholders is essential for success.
- **Call to Action**:
  - “Invest in the future of mobility—be a part of India’s EV revolution.”
- **Visual**: Inspirational image of a bustling city with EVs dominating the roads.

…THANK YOU