SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

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

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UNIT V: BUSINESS

TOPIC: **E-mobility business, electrification challenges**

Introduction to E-Mobility

- **Definition**: E-mobility refers to the use of electric-powered vehicles, including cars, buses, bikes, and scooters, as a means of transportation.
- **Significance**: Emphasize the role of e-mobility in reducing greenhouse gas emissions and promoting sustainable urban development.

Electrification in transportation is a transformative trend aiming to replace fossil-fuel-based vehicles with electric vehicles (EVs), which include cars, buses, scooters, and bicycles. While the e-mobility sector is growing rapidly, it faces several opportunities and challenges.

Global Market Overview

- **Market Growth**: The global electric mobility market is projected to grow from $318.03 billion in 2023 to $402.05 billion in 2024, at a compound annual growth rate (CAGR) of 26.4%.
  The Business Research Company
- **Sales Data**: In 2023, nearly one in five cars sold worldwide was electric, with sales nearing 14 million units.

Regional Adoption Rates

- **China**: Leading the market with approximately 60% of global electric car sales in 2023.
- **Europe**: Accounts for about 25% of global sales, with significant growth in EV adoption.
- **United States**: Holds around 10% of the market share, with increasing consumer interest.

Key Trends in E-Mobility for 2024

1. **Regulatory Support**: Governments worldwide are implementing policies and subsidies to promote EV adoption. Scania
2. **Cost Competitiveness**: The total cost of ownership for electric vehicles is becoming more favorable compared to traditional internal combustion engine vehicles. Scania
3. **Infrastructure Expansion**: Continuous development of charging infrastructure is facilitating longer-distance travel and addressing range anxiety. Scania
4. **Battery Innovations**: Advancements in battery technology are leading to higher performance and longer lifespans. Powy Energy
5. **Integration with Renewable Energy**: There's a growing synergy between EVs and renewable energy sources, enhancing sustainability. Powy Energy

Challenges in Electrification

1. **High Purchase Costs**: Despite decreasing over time, the initial cost of EVs remains a barrier for many consumers. Forbes
2. **Limited Charging Infrastructure**: Insufficient charging stations, especially in rural areas, hinder widespread adoption. Automotive Technology
3. **Range Anxiety**: Concerns about the distance EVs can travel on a single charge continue to affect consumer confidence. Automotive Technology
4. **Environmental Impact of Battery Production**: The production process of EV batteries raises environmental concerns due to resource extraction and energy consumption. Automotive Technology
5. **Regulatory and Political Uncertainties**: Shifts in government policies can impact the momentum of EV infrastructure development. Wired

Case Study - UK EV Market

- **Policy Review**: The UK government has initiated a consultation to review its zero-emission vehicle targets, responding to concerns from car manufacturers about job losses attributed to stalled demand for EVs.
  Financial Times
- **Sales Data**: Electric vehicle sales constituted just 18% of the UK market from January to November 2024, falling short of the 22% target for that year.
  Financial Times

Industry Response

- **Mergers and Partnerships**: Companies like Honda and Nissan are planning mergers to strengthen their position in the EV market.
  The Verge
- **Product Launch Delays**: Manufacturers such as Lamborghini are postponing the release of electric models due to market readiness concerns.
  The Times

Future Outlook

- **Market Projections**: Global electric light-duty vehicle sales are set to reach 40% in 2030 and almost 55% in 2035 based on current policy settings.
  International Energy Agency
- **Technological Advancements**: Ongoing research and development are expected to address current challenges, making EVs more accessible and efficient.

Future Outlook

Technological Innovations

- Solid-state batteries offering higher energy density and safety.
- Advances in wireless charging and vehicle-to-grid (V2G) technology.

Policy and Industry Collaboration

- Governments working with private firms to expand infrastructure and harmonize standards.
- Development of circular economies for battery recycling.

Consumer Awareness and Education

- Addressing misconceptions and increasing awareness of total cost of ownership (TCO).

Emerging Markets

- Growth opportunities in developing nations with untapped potential for e-mobility adoption.

Strategies to Overcome Challenges

- **Investment in R&D**: Focus on sustainable battery technologies and affordable manufacturing methods.
- **Infrastructure Expansion**: Public-private partnerships to deploy more charging stations.
- **Regulatory Frameworks**: Clear policies to support long-term EV adoption goals.
- **Global Supply Chain Improvements**: Ethical sourcing and robust recycling programs.
- **Education Campaigns**: Building consumer confidence in EV reliability and benefits.

Electrification Challenges

- Infrastructure Development
- High Initial Costs
- Range Anxiety
- Battery Supply Chain
- Energy Grid Challenges
- Environmental Concerns

Conclusion

- **Summary**: The e-mobility sector is experiencing significant growth, driven by technological innovations and supportive policies.
- **Call to Action**: Stakeholders must collaborate to overcome existing challenges and promote sustainable transportation solutions.

…THANK YOU