The future of EVs: Trends and insights on deployment, sales and consumer behaviour in Europe

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Abstract

The transition to electric vehicles (EVs) is a cornerstone of the European Union's (EU) strategy for achieving sustainable mobility and climate neutrality, yet adoption rates remain uneven across member states. This report synthesizes recent data on EV deployment, sales, infrastructure development, policy initiatives, and consumer behaviour, employing a secondary analysis methodology enriched by a thematic analysis approach. The study explores four interconnected thematic areas: consumer preferences, infrastructure development, policy measures, and economic factors. Findings reveal that EV adoption is shaped by a dynamic interplay of drivers and barriers, with the availability of accessible public charging infrastructure, financial affordability, and supportive regulatory frameworks emerging as critical enablers. Technological advances such as smart charging and vehicle-to-grid (V2G) integration further enhance the value proposition of EVs, offering economic and energy system benefits. However, persistent gaps in infrastructure accessibility, affordability, and labour market adaptation present ongoing challenges. By providing a comprehensive and interconnected analysis, the report delivers actionable insights to support a more inclusive, resilient, and accelerated transition to electric mobility across Europe.

Introduction and Motivation

Significant progress has been made toward large-scale EV adoption, yet critical research gaps persist. Key challenges include the complexity of the EV ecosystem (Wang et al., 2021), a lack of long-term data (Jones et al., 2020), limited interdisciplinary collaboration, resource and regional variability (Rubens et al., 2020), and the rapid pace of technological change (Nguyen et al. 2022). This analysis is part of the EU-funded DRIVE2X project, which seeks to address some of these challenges by establishing a robust scientific foundation and enhancing stakeholder awareness for V2X-based EV deployment. In this context, this paper offers a valuable starting point for understanding the intricate interdependencies within the EV ecosystem.

Applied Method

This study employs a secondary analysis approach with thematic insights, integrating and evaluating existing data and research from market reports and academic literature to address its objectives. The data were organized into four key themes: consumer preferences, infrastructure development, policy

measures, and economic factors. By analysing patterns and interdependencies within these themes, the study aims to uncover their collective impact on the mass deployment of EVs.

Results

The findings reveal that consumer adoption of EVs in the EU is shaped by a complex and dynamic interplay of barriers and drivers. A pivotal determinant is the availability of reliable and accessible charging infrastructure, which directly addresses practical concerns such as range anxiety and the overall convenience of EV ownership. Equally critical are supportive government policies, notably financial incentives like subsidies, tax benefits, and rebates, which reduce the upfront cost and enhance the total cost of ownership advantages of EVs. Moreover, factors such as environmental consciousness, evolving consumer lifestyles, technological innovations like smart charging and V2G integration, and economic affordability trends are increasingly influencing adoption patterns. However, disparities in infrastructure distribution, affordability challenges for low- and middle-income groups, and uncertainties regarding insurance costs and battery longevity continue to hinder wider uptake. These interconnected elements not only shape consumer behaviour but also significantly affect broader market projections, reinforcing the need for a holistic and inclusive approach to EV deployment across Europe.

Conclusions

Reliable charging infrastructure and coherent, inclusive policy frameworks are fundamental to accelerating the transition to EVs across the European Union. Their presence not only enhances consumer confidence and addresses key adoption barriers—such as range anxiety and high upfront costs—but also stimulates private investment, supports innovation, and facilitates the development of resilient supply chains. In contrast, infrastructure gaps and fragmented policy efforts risk deepening socio-economic divides and slowing the momentum of electrification. As this report highlights, the most effective path forward requires a coordinated strategy that integrates infrastructure planning, equitable policy design, and technological integration—particularly through smart charging and vehicle-to-grid systems. Together, these pillars form the backbone of a sustainable, inclusive, and future-ready EV ecosystem capable of delivering on the EU's climate and mobility goals..

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