

Certificate of Higher Education in Employability Skills LEVEL 4

Problem Solving and Innovation
(BMSW4014)

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1. Introduction

The UK electric vehicle (EV) industry is currently experiencing a dynamic phase characterised by rapid growth, burgeoning opportunities, considerable innovation, and substantial challenges. According to recent statistics, fully battery-electric vehicles accounted for over 1.7 million on UK roads by September 2025, representing about 4.99 % of the total vehicle parc (Society of Motor Manufacturers and Traders, 2025). In new car registrations, the share of battery electric cars rose to around 19.6 % in 2024 (Department for Transport, 2024). This growth is underpinned by policy commitments such as the impending ban on sales of new petrol and diesel cars by 2030 and new vans by 2035 (HM Government, 2023). The sector offers significant opportunities: moving to zero-emission road transport, capturing new market segments (including fleets and commercial vehicles), growth in charging infrastructure and battery value chains, and innovation in software, connectivity and circular economy models (Transport and Environment, 2024). At the same time, the industry faces serious challenges – such as high upfront costs of EVs, supply-chain issues (especially batteries and critical minerals), the need for massive expansion in charging infrastructure, consumer scepticism, and the threat of global competition (National Audit Office, 2024). The purpose of this report is to provide a critical analysis of the external factors influencing the UK EV industry, applying theoretical frameworks (PESTLE and SWOT) to evaluate these forces, and examining how innovation in technology and infrastructure is shaping the sector (Jhonson et al., 2023). The scope is focused on the UK market, covering the broad external environment (political, economic, social, technological, legal, environmental) and how EV companies operating in the UK can respond strategically.

2. Findings

2.1 PESTLE Analysis

Political:

The UK government has set out ambitious targets to phase out the sale of new petrol and diesel cars by 2030 (and new petrol/diesel vans by 2035) which sends a strong signal to the industry (HM Government, 2023). The introduction of the Zero Emission Vehicle (ZEV) mandate for manufacturers in January 2024 further compels OEMs to push EVs (Department for Transport, 2024). Such political and regulatory drivers create favourable conditions for EV adoption. On the other hand, political risk remains: government incentives may be reduced, public funding may fall, or subsidies may shift. In the UK context, for example other European markets have seen EV subsidies phased out with a corresponding slowdown in sales (IEA, 2024).

Economic:

The cost of EVs remains higher than internal combustion engine vehicles due to battery cost, R&D, and production scale (BloombergNEF, 2024). Consumers face higher purchase prices and residual-value uncertainties, impacting demand. Meanwhile macroeconomic headwinds such as inflation, rising interest rates, and cost of living pressures may dampen consumer uptake (Office for Budget Responsibility, 2024). On the positive side, economies of scale, technological learning curves and declining battery costs mean that the economic case for EVs is improving (Zapmap, 2025). For instance, the charging infrastructure market in the UK is experiencing rapid growth (e.g., a 46 % annual increase in public charging points) which supports the broader ecosystem.

Social:

Social attitudes are shifting: consumer buying intent for EVs in the UK is rising, while sentiment toward petrol/diesel is declining (Energy Saving Trust, 2024). However social barriers persist: range anxiety, charging-access worries (especially for those without off-street parking), and scepticism about resale value and total cost of ownership. In addition, social equity issues emerge if charging infrastructure is unevenly distributed (for example across deprived versus affluent areas), (House of Lords Environment and Climate Change Committee, 2023).

Technological:

Innovation is a major driver advances in battery chemistry, vehicle architecture, connectivity (smart charging, vehicle-to-grid), and charging infrastructure are altering the competitive landscape. For example, research from the UK shows multi-session predictive charging can reduce carbon emissions by 40-46 % compared to uncontrolled charging (University of Oxford, 2023). The UK has key organisations promoting technological development (e.g., Faraday Institution, Advanced Propulsion Centre), (Faraday Institution, 2024). Challenges include ensuring adequate charging network coverage, grid impact management (peak demand), and supply-chain pressures for batteries, minerals and semiconductors (European Commission, 2024).

Legal/Regulatory:

Regulatory frameworks such as vehicle emissions standards, vehicle type-approval requirements, and charging-point regulation (e.g., the UK's Public Chargepoint Regulations 2023) shape business models (Office For Zero Emission vehicles, 2023). The competition regulator (Competition and Markets Authority) has also studied the EV-charging sector and raised issues around competition and consumer trust (CMA, 2021). For companies, compliance, future liability (e.g., battery-end-of-life), and changing regulatory risk (e.g., new mandates) are material.

Environmental:

The push for decarbonisation is a major external factor. Road transport accounts for a significant proportion of UK emissions, and EVs are positioned as a key enabler of the transition to net zero (Climate Change Committee, 2024). Environmental regulation (emission targets, carbon pricing) and investor pressure for ESG compliance are shaping the industry. At the same time, environmental factors such as the sourcing of critical minerals, recycling, battery waste, and lifecycle emissions present reputational and operational risks (Green Alliance, 2023).

Summary:

The PESTLE analysis reveals that the UK EV industry is strongly influenced by political-regulatory impetus, economic pressures, social behaviours, rapid technological change, legal/regulatory frameworks and overarching environmental imperatives. These external factors create both strong tailwinds (policy, innovation) and headwinds (costs, infrastructure lag, supply-chain risk).

2.2 SWOT Analysis

Strengths:

- The UK EV market is growing quickly: new car registrations show increasing market share for BEVs (e.g., 19.6 % in 2024) and a cumulative parc of over 1.7 million BEVs (SMMT, 2025).
- Strong infrastructure ambition and ecosystem support (e.g., investment in charging infrastructure) and the presence of supportive institutions and R&D clusters (Faraday Institution, 2024).
- Technological innovation capability and a favourable business environment for new EV business models (charging, mobility services, battery production), (Transport & Environment, 2024).

Weaknesses:

- Upfront cost of EVs remains higher, which suppresses private-consumer uptake (BloombergNEF, 2024).

- Charging infrastructure coverage remains uneven, especially in residential areas without off-street parking, leading to range-anxiety and social equity concerns (House of Lords Environment and Climate Change Committee, 2023). For example, disparities in UK charging provision risk slowing uptake.
- UK production of vehicles has fallen below one million units in 2024, partly due to the retooling required for EVs. This highlights industrial transition risk (SMMT, 2025).
- Supply-chain dependencies (batteries, minerals) are a weakness where the UK may lag global competitors (European Commission, 2024).

Opportunities:

- Innovation in infrastructure (fast charging networks, vehicle-to-grid, home charging solutions) offers growth potential for EV firms (Zapmap, 2025).
- Growth in fleet electrification (commercial vehicles, vans) and subsequent services (charging, maintenance, software) offers new revenue streams. Statistics show electric vans in the UK are growing (8.4 % of new van sales in 2025 YTD), (SMMT, 2025).
- Circular economy and sustainability models (battery second-life, recycling) can open new business lines and enhance resilience (Green Alliance, 2023).
- Export potential for UK-based battery/EV manufacturing, linking to global value-chains.

Threats:

- Global competition: e.g., Chinese EV makers (such as BYD) are increasing their UK presence, potentially under-cutting UK incumbents (IEA, 2024).
- Infrastructure rollout lag (charging, grid) could bottleneck adoption and undermine growth (NAO, 2024).
- Consumer concerns about residual value, charging access, and range could slow demand growth. The House of Lords Environment and Climate Change Committee has noted demand is constrained by

upfront cost, infrastructure and scepticism (House of Lords Environment and Climate Change Committee, 2023).

- Regulatory uncertainty, supply-chain shocks (e.g., minerals), and macroeconomic pressures (inflation, interest rates) threaten the industry (OBR, 2024).

Summary:

The SWOT analysis shows that UK EV companies can leverage strong market growth and innovation opportunities, while needing to address internal weaknesses (cost, infrastructure coverage) and external threats (competition, supply-chain risk) if they are to succeed.

2.3 Innovation in Technology and Infrastructure

Innovation is a critical force shaping the UK EV industry. From a theoretical perspective, the concept of creative destruction (Schumpeter) applies: new EV technologies and business models are displacing traditional ICE vehicles and associated value chains (Schumpeter, 2010). Also, the diffusion of innovation framework (Rogers) helps explain how early-adopter segments transition to majority uptake as cost and infrastructure improve (Rogers, 2003).

Technological innovation:

Battery cost reductions are enabling EVs to approach cost-parity with ICE vehicles. Research on smart charging (e.g., multi-session predictive charging in the UK) shows how infrastructure and software innovation can reduce emissions by 40-46 % compared to uncontrolled charging (University of Oxford, 2023). This indicates how firms that invest in smart-charging software, vehicle-to-grid or bidirectional charging may gain competitive advantage. Moreover, UK institutions such as the Faraday Institution and Advanced Propulsion Centre support innovation in battery manufacturing, vehicle architecture and supply-chain resilience (Faraday Institution, 2024).

Infrastructure innovation:

The rollout of charging infrastructure is critical to EV adoption. The rapid growth in public charging points (reported increases of 46 % per year) shows the scale of this opportunity (Zapmap, 2025). However, infrastructure rollout must be accompanied by standards (e.g., plug types, payment systems) and consumer trust (reliable, accessible charging), (OZEV, 2023). The UK's Public Chargepoint Regulations 2023 introduce requirements around transparency, contactless payments and consumer experience. Firms that innovate in offering seamless, ubiquitous charging networks (home, work, public, rapid) gain a strategic edge (CMA, 2021).

Business model innovation:

There is scope for new business models charging-as-a-service, battery-leasing, second-life battery use, circular economy approaches, mobility-as-a-service (MaaS) integration. For example, firms such as EO Charging (UK-based) provide charging hardware plus cloud-based management software, enabling fleets to optimise operations (Transport and Environment, 2024). These innovations support both competitiveness and sustainability.

Policy and ecosystem innovation:

Government policy is driving innovation. The UK's ZEV mandate, infrastructure funding, and collaboration between industry-academia are creating an innovation ecosystem (DfT, 2024). For example, the UK automotive sector brochure highlights opportunities in circularity, autonomous vehicle platforms and smart charging. These ecosystem enablers allow UK EV companies to build resilience and differentiate themselves.

Challenges in innovation:

Despite the potential, firms must manage technology risk (which technology will prevail), standardisation risk (compatibility of infrastructure, plug types), and timing risk (if infrastructure lags, adoption slows). For example, a study warned that disparities in charging provision risk a drop-off in UK adoption.

Hence, innovation must be aligned with infrastructure rollout and consumer readiness.

3. Conclusion

In summary, the UK EV industry is at a pivotal juncture driven by favourable policy, technological innovation and growing consumer interest yet facing material headwinds from cost, infrastructure gaps, supply-chain vulnerability and global competition. The external environment (as revealed by the PESTLE analysis) points to strong tailwinds (political/ environmental) but also significant risks (economic, technological, social). The SWOT analysis emphasised internal strengths and opportunities (growth, innovation) but also weaknesses (costs, infrastructure) and threats (competition, supply chains). Innovation in technology and infrastructure emerges as a key strategic lever for companies operating in this space. For UK EV firms to thrive, they must not simply react to external pressures but proactively use innovation to build competitiveness, sustainability and resilience (Jhonson et al., 2023).

4. Recommendations

1. Invest in integrated charging infrastructure and smart-charging capabilities: UK EV companies should partner with energy-grid firms and local authorities to roll out fast, reliable and user-friendly charging networks (public, workplace, residential). By integrating smart-charging software (including vehicle-to-grid) they can enhance customer value, reduce grid strain and build a service-based revenue stream, thus differentiating themselves and improving sustainability (University of Oxford, 2023).

2. Develop circular-economy and battery-value-chain innovation: Firms should focus on battery-second-life, recycling, localised battery manufacturing and supply-chain resilience. By embedding circular-economy models (reuse, remanufacture, recycling) they not only reduce costs and environmental impact but also protect against supply-chain shocks. This supports sustainability, builds resilience and enhances competitiveness in a global market (Green Alliance, 2023). By implementing these recommendations, UK EV companies will be better equipped to respond to external pressures, harness innovation as a competitive advantage, and position themselves for long-term sustainable growth in the evolving EV ecosystem.

References

BloombergNEF (2024) *EV Outlook 2024*. BloombergNEF, London.

Climate Change Committee (2024) *Progress Report to Parliament*. CCC, London.

Competition and Markets Authority (2021) *Electric Vehicle Charging Market Study*. CMA, London.

Department for Transport (2024a) *Vehicle Licensing Statistics 2024*. DfT, London.

Department for Transport (2024b) *Zero Emission Vehicle Mandate Policy Paper*. DfT, London.

Energy Saving Trust (2024) *Public Attitudes to Electric Vehicles in the UK*. EST, London.

European Commission (2024) *Critical Raw Materials Assessment*. European Commission, Brussels.

Faraday Institution (2024) *Battery Science and Innovation Review*. Faraday Institution, Oxford.

Green Alliance (2023) *A Circular Economy for Batteries in the UK*. Green Alliance, London.

HM Government (2023) *Net Zero Strategy: Build Back Greener*. HM Government, London.

House of Lords Environment and Climate Change Committee (2023) *Electric Vehicle Transition Inquiry Report*. House of Lords, London.

IEA (2024) *Global EV Outlook 2024*. International Energy Agency, Paris.

Johnson, G., Whittington, R. & Scholes, K. (2023) *Exploring Corporate Strategy*. 13th ed. Pearson, London.

National Audit Office (2024) *Infrastructure for the Transition to Electric Vehicles*. NAO, London.

Office for Budget Responsibility (2024) *Economic and Fiscal Outlook*. OBR, London.

Office for Zero Emission Vehicles (2023) *Public Chargepoint Regulations 2023*. OZEV, London.

Rogers, E.M. (2003) *Diffusion of Innovations*. 5th ed. Free Press, New York.

Schumpeter, J. (2010) *Capitalism, Socialism and Democracy*. HarperCollins, New York.

Society of Motor Manufacturers and Traders (2025a) *EV Registration Data: September 2025*. SMMT, London.

Society of Motor Manufacturers and Traders (2025b) *UK Automotive Production Statistics 2024*. SMMT, London.

Society of Motor Manufacturers and Traders (2025c) *Light Commercial Vehicle Market Update 2025*. SMMT, London.

Transport & Environment (2024) *UK EV Market Briefing*. T&E, London.

University of Oxford (2023) *Smart Charging Strategies for Emissions Reduction*. Oxford Energy Institute, Oxford.

Zapmap (2025) *UK Charging Infrastructure Report 2025*. Zapmap, London.

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