

Electric Vehicle Evolution in the United Kingdom and India: A Comparative Case Analysis for Stakeholders

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Abstract

This comparative case study explores the strategic challenges of electric vehicle (EV) adoption in India and the United Kingdom, representing contrasting economic contexts. While the United Kingdom grapples with issues like second-hand EV affordability, technician shortages, and charging infrastructure reliability, India's EV market is fueled by policy incentives and local innovation but hindered by high costs, subsidy inconsistencies, and fragmented infrastructure. Drawing on the International Energy Agency's Global EV Outlook 2024, the case highlights that global EV sales are expected to reach 17 million units in 2024, accounting for over 20% of new car sales. Adopting a raw case method, the study places learners in a dynamic, non-linear decision-making environment, encouraging critical thinking and strategic exploration. By contrasting the experiences of a developed and a developing economy, the case deepens understanding of how institutional, economic, and market dynamics shape sustainable innovation. It is highly relevant for courses in strategy, entrepreneurship, and sustainable business practices.

Categories: International entrepreneurship in youth, Social systems (economies, governments, industry), Marketing and Market Issues in Business

Keywords: comparative case study, entrepreneurial ecosystems, planning premises, sustainable mobility, strategic leadership

Introduction

The global shift toward sustainable mobility has pushed electric vehicles (EVs) to the forefront of transportation innovation (Agaton et al., 2020). As climate commitments strengthen and environmental regulations tighten, EVs have become a viable alternative to traditional internal combustion engine (ICE) vehicles, attracting significant interest from consumers, businesses, and policymakers alike (Mo et al., 2022). However, this transition is anything but uniform. While countries like the United Kingdom are rapidly advancing toward widespread EV adoption with robust infrastructure and institutional support, developing economies such as India face persistent financial, infrastructural, and policy-related challenges that slow down the EV revolution (Joseph and Elangovan, 2018).

Alongside environmental shifts, the role of digital transformation has become central in reshaping how EVs are designed, marketed, and experienced. Companies such as Tesla, NIO, Ola Electric, Tata Motors, and Mahindra Electric have introduced advanced IT-enabled ecosystems. These include over-the-air updates, predictive diagnostics, app-based service management, and cloud-based vehicle intelligence - tools that blur the boundaries between mobility and smart technology. India's Ola and Mahindra have mirrored global players by embedding intelligent telematics and fleet monitoring systems, thereby participating in a global race of tech-driven mobility.

This case study explores the contrasting institutional and digital landscapes of the UK and India, highlighting how national contexts shape the evolution of electric mobility. More than a tale of two markets, this case illustrates the operational, financial, and strategic barriers faced by entrepreneurs and managers navigating the EV industry across divergent institutional settings. It brings forward the strategic questions facing new entrants and incumbents alike: How can businesses align their innovation capabilities with local infrastructure and policy realities? How should entrepreneurs approach forward or backward integration in a fragmented yet rapidly evolving ecosystem?

Designed for business management students and emerging entrepreneurs and utilized the raw case method (Morris, 2017), this study immerses learners in a dynamic and non-linear decision-making context, promoting critical thinking and strategic inquiry within the comparative ecosystems of developed and developing nations. The study aims to stimulate critical thinking around technological adaptation, institutional interdependencies, and sustainable business strategy. By reflecting on the evolving nature of the EV industry, it urges future leaders to understand not just what innovations are needed, but where and

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how they can be implemented for impact.

Case Description

The UK market challenges of EV adoption

The UK EV market, while heralded as a beacon of sustainable progress, unfolds as a complex ecosystem teeming with ambiguities and contradictions. By 2023, EVs accounted for 16.5% of new car sales, a figure that suggests momentum but also masks underlying tensions (EV Market Statistics, 2024). A nascent second-hand market for EVs has begun to take shape, mirroring the established trajectory of ICE vehicles (IEA, 2024). ICE vehicles refer to Internal Combustion Engine vehicles, which are powered by traditional engines that burn fossil fuels like gasoline, diesel, or natural gas to produce energy. These vehicles have dominated the automotive industry for over a century. Unlike EVs, ICE vehicles rely on combustion processes to generate power, emitting pollutants such as carbon dioxide (CO₂) and nitrogen oxides (NO_x). With increasing environmental concerns and stricter emission regulations, ICE vehicles are gradually replaced by cleaner alternatives, like hybrid and fully electric cars.

As newer models flood the market (Tables 1 and 2) early adopters look to upgrade, these second-hand options are expected to play a determining role in democratizing EV ownership. Yet, the question lingers, can this emerging market truly bridge the affordability gap, or will it merely replicate the price barriers seen with new EVs?

S. No.	Brand and Model	Sales 2024	Sales 2023
1.	Tesla Model Y	32,862	35,899
2.	Audi Q4 e-tron	17,622	16,757
3.	Tesla Model 3	17,425	13,536
4.	MG 4	15,651	21,715
5.	BMW i4	12,953	8,940
6.	Mercedes-Benz EQA	11,617	NA
7.	Skoda Enyaq	11,516	8,136
8.	Hyundai Kona	10,858	NA
9.	Volvo EX30	9,931	NA
10.	Volkswagen ID4	8,927	8,495

TABLE 1: UK electric vehicle market leaders and sales insights: 2024

Created by authors

Source: (Electrifying.com, 2024)

NA, Not Available

Model Name	Brand	Notable Features
CPx	Vmoto/Super Soco	UK's best-selling e-scooter, practical step-through
Stash	Vmoto	Stylish commuter bike, practical design
RM1S	Maeving	British-made, retro styling, removable battery
Ninja e-1/Z e-1	Kawasaki	First e-motorcycles from Kawasaki
CE-02	BMW	Fun, urban-focused, unique design
G5S/C1S	Yadea/Lexmoto	Budget-friendly, removable dual battery
EK3	Horwin	Urban design, European popularity
EM1e	Honda	Honda's UK electric debut
FXE	Zero Motorcycles	Lightweight, fun ride, good for daily use
S/DS	Zero Motorcycles	Versatile city and trail performance

TABLE 2: Two-wheeler electric vehicles available in the UK: 2025

Created by authors

Source: (Bennetts, 2025)

The resale value of electric cars, particularly battery electric vehicles (BEVs), has been steadily climbing. Despite all advancements in battery technology, such as the adoption of lithium nickel manganese cobalt oxide batteries, the financial strain persists. Lithium nickel manganese cobalt (NMC) oxide is a type of battery chemistry used in EVs known for its high energy density and stability, contributing to longer driving ranges and improved safety. Other common EV battery types include lithium iron phosphate, lithium nickel cobalt aluminum oxide, and solid-state batteries. NMC batteries are widely used today due to their balanced performance, cost, and safety.

In Europe, BEVs outpaced other powertrains in retaining value, with resale values surpassing 70% after 12 months and closing in on 55% after 36 months by mid-2022 (Global EV Outlook, 2021). On the one hand, this trend seems to validate the long-term viability of EVs, but on the other hand, it complicates the accessibility of used EVs for consumers who are priced out of new models. The high resale values benefit new car buyers and leasing companies but raise questions about whether the second-hand market can serve as a genuine alternative for the broader population.

Leasing companies, with their significant influence on the market, add another layer of complexity. Their practice of reselling vehicles within a few years could either flood the market with affordable used EVs or, conversely, keep prices elevated by maintaining demand for newer models. The impact of this dynamic on the broader market remains uncertain and could tip the scales in either direction.

The UK's charging infrastructure, while expanding, remains a critical bottleneck. Despite government targets to install 300,000 public charging points by 2030, only about 42,000 had been operational by 2023 (Table 3). The disparity between these goals and the current state of infrastructure leaves a significant gap, exacerbated by frequent reports of faulty chargers and long wait times. The infrastructure challenge is not just about numbers but reliability and accessibility, raising whether the market can sustain the projected growth in EV ownership.

Year	EV Cars (approx.)	EV Chargers (approx.)
2024	300,000	50,000
2025	375,000	60,000
2026	450,000	70,000
2027	510,000	80,000
2028	570,000	90,000
2029	620,000	95,000
2030	660,000	100,000

TABLE 3: Gap between EV and EV charging in UK

Created by authors

Source: (EV-Charging, 2024)

EV, Electric Vehicle

The labor market, too, presents a formidable challenge. With the Institute of the Motor Industry (IMI) projecting a need for 90,000 new EV technicians by 2030 (TechSafe, 2024), the current shortage is already being felt. This shortfall threatens to stymie the market's growth, as high repair costs and long service times become the norm. The dilemma here is whether the labor market can catch up with the technological advancements, or if it will act as a drag on the sector's progress.

Pricing trends further muddy the waters. For instance, the cheapest EV in UK, The Dacia Spring, is priced at £14,995 (Autocar Professional, 2025). The cheapest small ICE option is The Vauxhall Corsa, priced at £19,200 (Carwow, 2025). The price gap between ICE and EV has been narrowed from 2018 to 2022, with the price premium for electric SUVs over their ICE counterparts in the UK decreasing significantly. In 2018, electric SUVs were on average 139% more expensive than ICE SUVs. By 2022, this premium had dropped to 51%, indicating substantial progress in closing the price gap, though EVs remained costlier overall (IEA, 2024). Some forecasts suggest that by 2025 or 2026, the upfront cost of an average electric car will be on par with a comparable ICE vehicle. For smaller, mass-market models, this price parity could arrive sooner, while larger vehicles like SUVs may not reach this milestone until the late 2020s (Tyson Cooper, 2024). However, will these predictions hold, or will unforeseen factors keep EV prices out of reach for many? As the market for used EVs grows, it does so in the shadow of the far larger second-hand ICE market. While used EV sales in the United States were expected to rise by 40% in 2024, these numbers are still dwarfed by the sheer volume of second-hand ICE vehicle transactions (Global EV Outlook, 2025).

By 2029, the electric vehicle market in the United Kingdom is projected to generate £43.9 billion in revenue, marking an increase of £12.3 billion from 2024. BEVs, which have led the sector since 2020, are expected to account for 72% of the total revenue by 2029 (Statista, 2023). The potential for the used EV market to scale to comparable levels exists, but it remains an open question whether it will materialize in a way that truly supports the transition to electrified road transport (Figure 1). These interwoven factors, second-hand markets, charging infrastructure, labor shortages, and pricing trends create a tapestry of challenges and opportunities that defy easy solutions. The UK EV market stands at a crossroads, with each decision point laden with potential repercussions. The questions of affordability, infrastructure reliability, and workforce readiness all hang in the balance, leaving the future of the UK's EV ecosystem open to interpretation and debate.

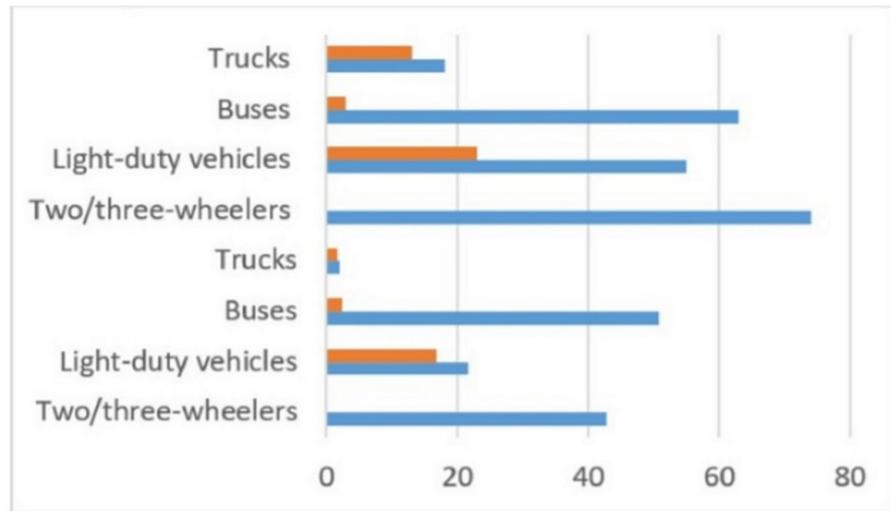


FIGURE 1: Electric vehicle sales share in Europe by 2030

Created by authors

Source: (IEA, 2021)

Red - Plug-in hybrid electric vehicle on the y-axis

Blue - Battery electric vehicle on the y-axis

Sales share (%) is shown on the x-axis

Will the market’s growth be sustained, or will these unresolved dilemmas prove to be insurmountable obstacles? The answers are anything but clear, inviting multiple perspectives and pathways forward.

Global leaders in EV adoption

Norway’s adoption of EVs is a global benchmark, driven by a mix of ambitious national targets and strong fiscal incentives. Key measures have included exemptions from purchase/import taxes (1990-2022) and value-added tax (2001-2022), reduced road and company car taxes, toll and ferry discounts, access to bus lanes, and free municipal parking. These policies have been supported by infrastructure development and a 2017 mandate requiring all new cars sold by 2025 to be zero-emission. Public procurement rules require all government cars to be zero-emission from 2022, and city buses by 2025. In 2023, the target expanded to include all heavy-duty vehicles by 2030. As a result, Norway is on track to have nearly all new cars sold by 2025 be electric, supported by 10,000 fast chargers and over 800,000 EVs on the road - offering a model of effective EV transition for other nations (Norwegian EV Policy, 2025). Norway leads in the share of EVs sold compared to total car sales, with Iceland showing strong adoption despite its smaller overall market, and China demonstrating significant EV growth (Table 4).

Country	EV Share of Passenger Vehicle Sales (2022)	Remarks
Norway	80%	Highest EV adoption rate
Iceland	41%	Strong adoption, small market
Sweden	32%	Leading in Scandinavia after Norway and Iceland
Netherlands	24%	Among EU leaders in the EV transition
China	22%	Largest car market globally, significant EV growth
European Union	12%	Overall average across member countries
United States	6%	Growth accelerating, but still behind EU and China

TABLE 4: Global leaders in EV adoption

Created by authors

Source: (Jaeger, 2023)

EV, Electric Vehicle

Comparing the contrast

In Germany, the overall growth of EV sales slowed significantly. The phase-out of plug-in hybrid vehicle (PHEV) subsidies at the beginning of 2023 led to a decline in PHEV sales compared to 2022, and the complete termination of EV subsidies in December 2023 - following a ruling on the Climate and Transformation Fund - further impacted the market. Consequently, the share of electric cars in Germany dropped from 30% in 2022 to 25% in 2023, affecting the region's overall EV sales performance. In contrast, other parts of Europe saw continued growth in electric car adoption. EVs accounted for approximately 25% of total car sales in France and the United Kingdom, 30% in the Netherlands, and 60% in Sweden. Norway, despite a contracting overall market, saw a slight increase in EV sales share, maintaining the highest rate in Europe at nearly 95% (Global EV Outlook, 2024).

By examining Norway and Germany alongside the UK, this study contextualizes the UK's EV progress within broader European trends, offering insights into how regulatory autonomy, policy choices, and industrial capabilities can either accelerate or constrain electrification in a competitive, low-carbon future.

The Indian market challenges of EV adoption

In 2023, the Indian EV market experienced remarkable growth, with electric car registrations surging by 70% year-on-year to reach 80,000 units (Global EV Outlook, 2024). However, despite this impressive growth, EVs still account for only around 2% of all cars sold, reflecting a paradox within the market. This growth has been largely driven by government incentives and policies (Table 5), such as the Faster Adoption and Manufacturing of Electric Vehicles (FAME II) scheme. The FAME scheme in India has been a significant initiative aimed at promoting the adoption of electric and hybrid vehicles in the country. Launched by the Indian government, FAME provides financial incentives for the purchase of electric vehicles and supports the development of charging infrastructure. This program plays a crucial role in reducing the cost barriers associated with EV adoption and enhancing the overall feasibility of electric mobility in India. By addressing both demand and supply-side challenges, FAME has contributed to the growth of the EV market and the development of a sustainable transportation ecosystem.

The National Electric Mobility Mission Plan (NEMMP) aims for 30% EV market penetration by 2030, creating a favorable environment for EV growth, supply-side support through the Production Linked Incentive (PLI) scheme, tax benefits, and initiatives like the Go Electric campaign (Figure 2). NEMMP is an initiative launched by the Indian government to promote electric mobility and reduce the country's dependence on fossil fuels. NEMMP aims to achieve national fuel security by promoting hybrid and EVs through a combination of policies that support research and development, manufacturing, and infrastructure development. The plan targets the deployment of millions of electric vehicles and supports the creation of a sustainable and eco-friendly transportation system. Through financial incentives, regulatory measures, and public-private partnerships, NEMMP plays a vital role in accelerating the adoption of electric vehicles in India and contributing to environmental sustainability.

PLIs are government schemes designed to boost domestic manufacturing by providing financial incentives

to companies that achieve certain production targets. In India, the PLI scheme was introduced in 2020 and supports the EV sector by encouraging increased local production of EV components and batteries, reducing costs and reliance on imports. Similar incentive schemes are also implemented in countries like China and the United States to strengthen their manufacturing sectors and promote technological advancements.

Go Electric campaign, initiated by the Bureau of Energy Efficiency (BEE) on February 19, 2021, by Bharat Sarkar, aims to promote the adoption of EVs and electric cooking. As the Central Nodal Agency, BEE is responsible for facilitating the deployment of EV charging infrastructure across India. It collaborates with State Designated Agencies, State Nodal Agencies, industry stakeholders, and government bodies to create mass awareness of the benefits of EVs and clean energy solutions.

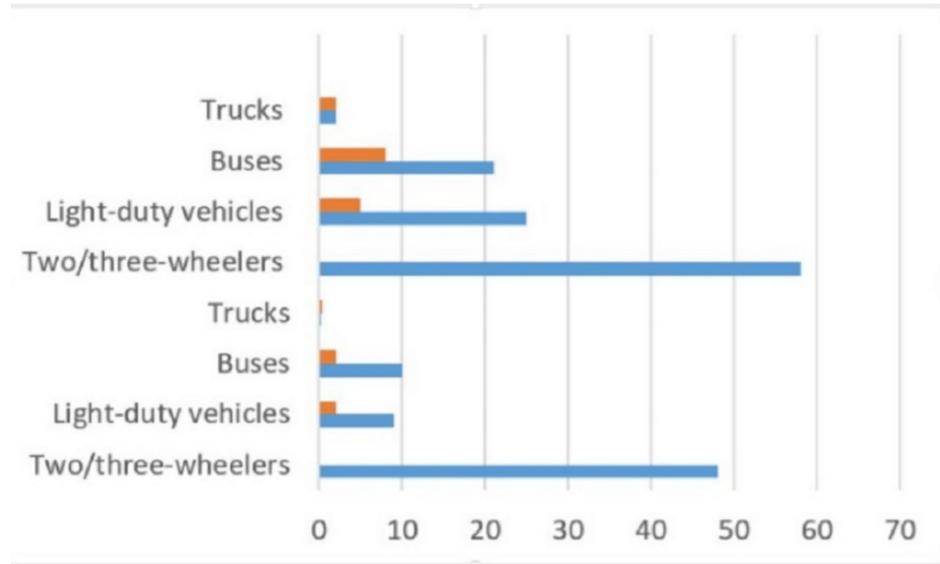


FIGURE 2: Electric vehicle sales share in India by 2030

Created by authors

Source: (EV in India, 2021)

Red - Plug-in hybrid electric vehicle

Blue - Battery electric vehicle

X-axis represents the percentage of plug-in hybrid and battery electric vehicles

Y-axis represents vehicle type

New models, including Mahindra’s XUV400, Hyundai’s Ioniq 5 and, Citroën’s e-C3, have further fueled the market’s expansion, offering more options to consumers (Global EV Outlook, 2024). Yet, beneath this momentum lies a complex and uncertain future for India’s EV market. Tata Motors currently dominates with a 72% market share, while Mahindra holds around 9% (India Briefing, 2024).

Indian EV market is supported by favorable import tariffs that encourage local manufacturing. However, the upcoming FAME III scheme, anticipated to bring reductions in subsidies, poses a significant challenge. As these subsidies potentially decline, the market could face a slowdown, particularly given the high prices of electric vehicles (The New Indian Express, 2024).

The pricing dilemma is particularly stark. Tata’s Tiago and Tigor models, priced between USD 10,000 and USD 15,000, represent about 20% of total EV sales (Reuters, 2022). However, the average price of best-selling small ICE cars in India is around USD 7,000, highlighting a substantial price gap that continues to limit wider adoption (MarketsandMarkets, 2024). The increasing transition to e-mobility in the passenger vehicle segment is becoming visible on our roads through green-number-plated SUVs, sedans, and hatchbacks. As of 2024, electric SUVs account for approximately 73% of the electric passenger car market, with sales reaching 129,124 units (India Electric Car Market, 2025).

The popularity of electric SUVs is further bolstered by a range of models across various price points. For instance, the Tata Nexon EV, a compact SUV, starts at around ₹14.74 lakh (approximately \$17,700 USD) and offers a range of up to 465 km on a single charge, similarly, the Citroën eC3 is priced from ₹11.50 lakh (around \$13,800 USD) and provides a range of approximately 320 km, on the premium end, Mahindra's BE 6e and XEV 9e electric SUVs are priced starting at approximately \$22,500 and \$26,000 USD, respectively, offering ranges exceeding 500 km (Cardekho, 2023). Chinese automaker BYD is targeting a significant share of India's EV market, aiming for 30% of the passenger EV segment by 2030. To achieve this, BYD is focusing on the premium EV category, specifically vehicles priced above ₹30 lakh (approximately USD 36,000), and the company has launched models like the Atto 3 SUV, starting at ₹33.99 lakh (around USD 41,000), and the Seal sedan, priced between ₹41 lakh and ₹53 lakh (approximately USD 49,000 to USD 63,000) (BusinessToday, 2022). This trend is not unique to India; similar patterns are observed across emerging markets like Thailand, Indonesia, Malaysia, and Vietnam, where larger, high-priced models dominate EV sales.

The BYD Seal, set for release in 2024, is an electric sedan. It features BYD's advanced Blade Battery technology, known for its safety and extended range. The Blade Battery uses lithium iron phosphate chemistry, which offers higher thermal stability and reduces fire risk compared to traditional lithium-ion batteries. Its unique design involves longer, thinner battery cells, allowing for more efficient use of space, enhancing energy density, and providing longer driving ranges. Additionally, Blade Batteries are highly durable, offering extended lifespan and improved performance, making them ideal for the growing demands of the EV market.

An additional layer of complexity comes from the international trade of used electric cars. To ensure the responsible trade of used vehicles, it is essential to strengthen the traceability of internationally traded used cars. At the same time, care should be taken not to create unintended barriers that could hinder the export of used electric vehicles to emerging economies, where they can play a role in accelerating clean mobility transitions. Exported vehicles must meet clearly defined roadworthiness criteria, including standards for emissions performance, to prevent the transfer of polluting or unsafe vehicles. Additionally, emerging economies should be supported in developing sustainable transport strategies that reduce over-dependence on private car ownership and promote alternatives such as public transit, cycling, and walking (OECD, 2023).

The future of India's EV market is intertwined with several unresolved questions (Tables 5 and 6). The potential reduction in subsidies raises concerns about affordability, especially when considering the price gap between EVs and ICE vehicles.

The dominance of local manufacturers like Tata Motors, while promising, faces pressure to deliver lower-cost options that appeal to middle-income consumers. Furthermore, the Indian government acknowledges the importance of sustainable transportation and is actively promoting EVs.

However, the widespread adoption of EVs faces several obstacles, particularly in the development of charging infrastructure. Key challenges include a shortage of charging stations, limited grid capacity, technological constraints, regulatory hurdles, and low public awareness (The Impact of EV Charging Infrastructure on Mobility in India, 2023). As global trade in used EVs grows, ensuring compatibility with local infrastructure and setting appropriate regulatory standards will be crucial. The Indian EV market, despite its rapid growth, remains at a crossroads. The interplay of incentives, pricing, infrastructure, and policy decisions will ultimately determine the trajectory of EV adoption.

Company	Key Issues	Market Share	Observation
Ola electric	More than 10,000 consumer complaints, poor after-sales service, delayed refunds, declining trust	50% → ~30%	Lost leadership due to service issues despite tech and branding strength
Ather Energy	Limited rural reach, high upfront pricing	~13%	Strong city presence, expanding cautiously
TVS Motor (iQube)	Slower product updates, traditional service model	~19%	Gaining trust through reliability and network
Bajaj (Chetak)	Limited variants, slow network expansion	~29%	Leveraging legacy brand, needs product agility
Hero Electric	Tech lag, fragmented supply chain, limited innovation	~6%	Declining share despite early mover advantage

TABLE 5: Key issues and sales performance of leading Indian electric vehicle two-wheeler players

Created by Authors

Sources: (Dalvi, 2024), (Ola Electric, 2024), (TVS iQube, 2024), (Tata Motors, 2025) and (Sorabjee and Lidhoo, 2025)

Company	Issues	Market Position	Observation
Tata Motors (Nexon EV, Tiago EV)	Supply-demand imbalance, charging infrastructure gaps	~70% of EV 4 W market	Strong first-mover in 4 W EV, but infrastructure and delivery challenges
Mahindra Electric (XUV400)	Slow launch cadence, limited EV portfolio	Emerging player	Focused on SUV EVs; facing stiff competition from Tata
MG Motor India (ZS EV, Comet)	High price tags, reliance on imports	Premium segment leader	Digital features strong; service availability still growing
BYD India (Atto 3, e6)	Low brand awareness, fleet-focused approach	Niche but growing	Technologically advanced, yet lacks mass market appeal
Hyundai India (Kona, Ioniq 5)	High cost, luxury segment competition	Urban-centric buyer base	Competes with international standards, limited reach

TABLE 6: Key issues and sales performance of leading Indian EV four-wheeler players (2023–2024)

Created by authors

Sources: (Tata EV, 2025), (Tata Nexon EV, 2024), (MG Motor India, 2024), (BYD, 2025), and (Hyundai Ioniq, 2024)

EV, Electric Vehicle; SUV, Sports Utility Vehicle

How stakeholders navigate the evolving dilemmas of electric mobility, balancing government incentives, market forces, and technological readiness, will fundamentally shape the future of EV adoption not just in India, but across other emerging economies.

The Indian EV market, in particular, stands at a critical inflection point, surrounded by multiple uncertainties. Will the gradual withdrawal of subsidies undermine affordability and slow down mass adoption? Can domestic players such as Tata Motors maintain market leadership while bridging the cost disparity with ICE vehicles? To what extent can infrastructure development especially in terms of charging stations and grid capacity catalyze or constrain adoption? Furthermore, how might the import and resale of used EVs from advanced markets impact demand dynamics and sustainability practices in developing nations?

Addressing these multifaceted and interlinked challenges requires a nuanced and coordinated response from policymakers, industry leaders, entrepreneurs, and consumers. The case of India exemplifies the broader institutional complexities faced by emerging markets, where the interplay of incentives, affordability, infrastructure readiness, and policy coherence will determine the direction and inclusiveness of the EV transition. Understanding these dynamics is crucial for business professionals and entrepreneurs exploring backward and forward integration opportunities within the evolving electric mobility ecosystem.

Comparative industry insight

To contextualize the case within a broader landscape, we present comparative industry insights by drawing on the strategic choices and institutional influences shaping leading EV players across diverse markets. These examples help illustrate how companies navigate operational, financial, and regulatory dilemmas while responding to evolving consumer expectations and infrastructure readiness. By examining major players representing distinct regional dynamics - Tesla in the United States, NIO in China, and Ola Electric in India - we uncover how institutional maturity, market expectations, and government support affect the trajectory of EV adoption.

Tesla's rise in the US and other developed markets highlights the significance of robust service infrastructure and charging networks. Tesla has strategically invested in dedicated service centers and mobile service units, ensuring timely maintenance and building customer trust. Its widespread Supercharger network has also been instrumental in reducing range anxiety, enabling long-distance travel, and addressing one of the primary concerns surrounding EV ownership. This service-led model demonstrates how early and strategic infrastructure investments in developed markets can accelerate adoption and solidify brand leadership.

In contrast, NIO's success in China offers a compelling model for emerging economies like India. Facing the challenge of limited charging infrastructure, as of May 2025, NIO has established over 3,300 battery swap stations across China, including 988 located along highways. This extensive network enables NIO drivers to replace depleted batteries with fully charged ones in under 5 minutes, significantly reducing downtime compared to traditional charging methods. The company has also expanded its charging infrastructure, operating 2,816 supercharging stations with 12,976 charging piles and 1,738 destination charging stations with 13,274 charging piles throughout the country (Mandayam, 2024) and (CNEV, 2025). This not only reduces charging time but also decouples battery costs from vehicle prices, making EVs more affordable. NIO's investment in local manufacturing also exemplifies how supply chain localization can support cost efficiencies and scale-up in cost-sensitive markets.

However, the story of Ola Electric in India serves as a cautionary tale, reflecting the pitfalls of rapid expansion without adequate operational readiness. In April 2024, Ola Electric led India's electric two-wheeler market with a commanding 52% market share, registering 34,000 units that month (Dubey, 2024). Ola's aggressive innovation strategies, extensive marketing campaigns, and the establishment of its large-scale Future Factory in Tamil Nadu have been pivotal in achieving this market position (Autocar Professional, 2024). In 2024, Ola Electric faced significant scrutiny due to a surge in customer complaints. Between September 1, 2023, and August 31, 2024, the National Consumer Helpline recorded 10,644 complaints related to Ola's electric scooters. These grievances encompassed issues such as delayed services, delivery delays, unmet service promises, manufacturing defects, and refund challenges. In response, the Central Consumer Protection Authority issued a show-cause notice to Ola Electric, highlighting potential violations of consumer rights and deficiencies in service (India Today, 2024). The Ola case highlights that successful EV adoption in a country like India requires more than innovation; it demands a balance of supportive policies, entrepreneurial efficiency, long-term operational resilience, and consideration of broader economic constraints such as consumer payment capacity.

On a broader level, market trends further shape these dynamics. The UK emerged as Europe's largest EV market in 2024, with over 382,000 electric cars sold - a 21.4% increase over the previous year - reflecting strong policy support and consumer readiness (European Commission, 2025). Meanwhile, in 2024, India sold nearly 100,000 electric vehicles, marking a 20% increase over the previous year, while total light vehicle sales reached approximately 4.9 million units. Despite the passenger car market slowing to its lowest year-over-year growth in four years - just 4% in 2024 - EV sales continued to grow steadily (Electric Vehicle Industry in India Shows Promising Growth, 2025). Electric passenger vehicle production in India is projected to rise sharply to around 1.33 million units by 2030, representing roughly 20% of the country's total passenger vehicle production (Amir, 2025).

Together, these comparative insights (Table 7) emphasized that the road to EV adoption is shaped by a complex interplay of institutional support, infrastructural readiness, market preferences, and operational strategy (Table 10). Understanding these contrasts is essential for policymakers, entrepreneurs, and corporate leaders seeking to scale solutions across regions while adapting to local challenges.

Comparative EV Scenario
Charging stations exist, but they are sparsely located, making long-distance travel impractical. – UK Market Analysis
The higher cost of insurance is a major reason why consumer still hesitate to switch to an EV. – UK EV
Subsidies are available, but they don't fully offset the cost difference with traditional vehicles. – India Policy Review
Battery swapping makes owning an EV more viable, especially when charging times are unpredictable. – NIO Business Strategy

TABLE 7: EV comparative challenges based on the case discussions

Created by Authors

EV, Electric Vehicle

Issues and strategic responses from EV manufacturers

The UK's stringent zero-emission vehicle (ZEV) mandate requires automakers to ensure that a specified percentage of their annual sales are EVs, supporting policies that promote cleaner energy and increased EV use on the road. The Society of Motor Manufacturers and Traders estimates that complying with the 2024 mandate will cost the industry nearly £6 billion (\$7.5 billion) in discounts and compliance expenses. Stellantis, the parent company of Vauxhall, announced the closure of its van factory in southern England. Similarly, Nissan has urged the government to reconsider the mandate's targets, highlighting challenges posed by lower-than-expected EV demand. In light of these developments, the UK government has initiated a consultation to review the ZEV mandate, aiming to balance environmental objectives with the economic realities faced by the automotive industry (Reuters, 2024). These strategic initiatives by automakers highlight the importance of coordinated efforts between private-sector firms and institutional actors in overcoming systemic challenges and fostering sustainable EV adoption.

However, in India, domestic automakers are also struggling to capture a significant share of the EV market while strategizing for growth in the sector. Tata Motors, the country's leading EV manufacturer, is expanding its portfolio with premium electric SUVs like the Harrier.ev and Sierra.ev, aiming to capture a broader market segment and maintain its leadership position. The company is also developing a comprehensive EV ecosystem, including the deployment of "MegaChargers" to address charging infrastructure concerns (Tata Motors, 2025) and (ET Bureau, 2025). Mahindra & Mahindra plans to have 20% to 30% of its product portfolio electric by 2030, with recent launches such as the BE 6e and XUV 9e targeting the premium SUV segment to boost market share (Mandayam, 2024).

Sustainable Development Goals and EV adoption

The EV revolution has played a transformative role in aligning the transportation industry with the United Nations' Sustainable Development Goals, particularly SDG 7 (Affordable and Clean Energy) and SDG 9 (Industry, Innovation, and Infrastructure). By shifting away from ICEs and investing in clean mobility, the industry has contributed to increasing energy efficiency, expanding access to renewable-powered transport, and supporting innovation-driven infrastructure growth. Governments, businesses, and entrepreneurs have been instrumental in accelerating this transition. According to the International Energy Agency's 2024 report, over 14 million EVs were sold globally in 2023 - a 35% increase from 2022 - indicating the rapid diffusion of cleaner mobility technologies. Meanwhile, entrepreneurs in both developed and emerging markets have experimented with localized battery-swapping models and solar-integrated EV stations, aligning industry practices with inclusive innovation. These collective efforts have fostered a more resilient and low-carbon transport ecosystem, reinforcing the objectives of SDG 7 and SDG 9 through scalable and sustainable business-led solutions.

Discussion

EV market divergence: India and UK

The Indian and UK EV markets reflect contrasting yet complementary trajectories shaped by their respective economic, infrastructural, and policy landscapes. Both countries have set ambitious electrification goals and offer government incentives to encourage EV adoption. However, while the UK's EV market is more mature, with a strong focus on electric cars supported by a growing charging network and established policy frameworks, India's EV growth is led by two- and three-wheelers, driven by affordability, last-mile mobility needs, and urban congestion challenges. The UK faces hurdles like grid readiness and charging access in rural areas, whereas India contends with infrastructure gaps and pricing sensitivities. Entrepreneurially, India's ecosystem is characterized by frugal innovation and agile startups targeting localized mobility solutions (Bhagavatula et al., 2019), while the UK ecosystem is driven by

established automakers, R&D investments, and policy-aligned infrastructure development (Berkeley, 2018) and (Küfeoğlu and Hong, 2020). Despite these differences, both markets are navigating similar challenges in consumer awareness, battery sourcing, and policy implementation, offering useful grounds for comparative learning.

The challenges

EV sales in India have grown more slowly than anticipated but are steadily gaining momentum, with projections suggesting they could account for up to 29% of the market by 2030 (Report, 2024). In 2024, EV sales in the UK reached a record high of 381,970 units. BEVs accounted for 19.6% of the market - still falling short of the mandated 22% target. Overall, new car registrations rose by 2.6% compared to the previous year. Meanwhile, the UK government has launched a consultation on plans to phase out internal combustion engine car sales by 2030 (UK Data, 2025).

The case provides comparative insight into the EV industries of the UK and India, highlighting the real-world challenges faced by entrepreneurs and managers attempting to scale EV ventures in these structurally different yet demand-driven markets. Despite both nations advancing ambitious policy mandates and fostering technological innovation, several obstacles ranging from service infrastructure gaps to regulatory ambiguity make EV adoption a complex and often uncertain landscape for business leaders.

In India, although government policies such as the Production Linked Incentive scheme (Table 8) and generous two-wheeler subsidies have sparked initial interest in EV entrepreneurship, the execution landscape remains fragmented. Entrepreneurs launching EV startups often face a critical dilemma: scaling up rapidly to seize market share versus focusing on operational sustainability. Ola Electric’s decline in market share from 50% to around 30% due to over 10,000 unresolved customer complaints and service deficiencies exemplifies this trade-off (Table 5). For founders, this poses a managerial challenge of aligning aggressive growth with customer experience, particularly when funding cycles prioritize quick expansion over ecosystem maturity.

Key Policy Measures and Targets	Year Announced	Category
Funding for charging infrastructure.	2023	EVSE
Production Linked Incentive (PLI) Scheme for EV and EV component manufacturing.	2021	Manufacturing
PLI Scheme for advanced cell chemistry manufacturing in India.	2021	Manufacturing
Passenger vehicles older than 20 years and commercial vehicles older than 15 years must pass a “fitness and emissions test” to retain their registration; incentives to scrap old vehicles, including discounts on the purchase of new vehicles against a scrap page certificate.	2021	LDV
Per kWh subsidy for electric two-wheeler increased to INR 15,000/kWh from earlier subsidy of INR 10,000/kWh, with a 50% local content requirement.	2019	2/3W

TABLE 8: Policy legislation to promote EV in India

Created by authors

Source: (Global EV Policy Explorer, 2025)

EV, Electric Vehicle; EVSE, Electric Vehicle Supply Equipment; LDV, Light Duty Vehicle

Similarly, established players like Tata Motors dominate India’s four-wheeler EV space but struggle with delivery bottlenecks and inconsistent charging infrastructure (Table 6). Although policy incentives for manufacturing and emissions compliance exist, the lack of a synchronized public-private charging infrastructure network leads to a paradox: vehicles are produced, but their usability remains constrained, limiting consumer confidence and adoption. For new entrants, this raises the strategic question, how does one create a scalable and viable EV venture when the enabling ecosystem is still catching up?

Across the UK, despite mature regulations such as the ZEV mandate and consistent R&D support through the advanced manufacturing plan (Table 9), entrepreneurs and fleet managers face a different but equally pressing challenge. The gap between the number of EVs and available charging stations is widening significantly - from 300,000 EVs and 50,000 chargers in 2024 to a projected 660,000 EVs with only 100,000 chargers by 2030 (Table 3). This service gap puts pressure on managers to coordinate charging logistics,

especially for last-mile delivery businesses, rental platforms, and intercity mobility services. Even established electric motorcycle players like Maeving face production and regulatory uncertainties due to limited charging points and high upfront costs.

Furthermore, the UK's move to eliminate vehicle tax exemptions for EVs from 2025 onward (Table 9) introduces financial ambiguity for consumers and small fleet operators. Entrepreneurs must now navigate shifting cost dynamics and predict how new taxation models may influence EV demand elasticity, pricing strategies, and leasing models. These financial uncertainties, coupled with high competition from international brands and regulatory constraints on electric scooters, create a volatile operational environment that demands constant adaptability.

Key Policy Measures and Targets	Year Announced	Category
ZEV mandate: 80% of new cars and 70% of new vans sold in Great Britain will be zero emission by 2030, increasing to 100% by 2035.	2024	LDV
As part of the Advanced Manufacturing Plan, the government announced USD 2.4 billion of new capital and R&D funding to 2030, boosting the United Kingdom's competitiveness and unlocking strategic investments in the UK automotive industry.	2023	Manufacturing
From April 2025, EVs will begin to pay excise duty, initially at the lowest rates; exemption from the "Expensive Car Supplement" will also end in April 2025.	2022	Taxation, Multiple
Grants towards the purchase of LCVs and taxis.	2021	LDV
A grant of 20% available for vehicles with at least 50% fewer emissions than a conventional Euro VI vehicle and 96 km zero emission range.	2021	M/HDV
Grant schemes for EV charging infrastructure include the EV chargepoint grant, Workplace Charging Scheme, and EV Homecharge Scheme, among others.	2016	EVSE

TABLE 9: Policy legislation to promote EV in the UK

Created by authors

Source: (Global EV Policy Explorer, 2025)

EV, Electric Vehicle; EVSE, Electric Vehicle Supply Equipment; LCVs, Light Commercial Vehicles; LDV, Light Duty Vehicle; M/HDV, Medium- and Heavy-Duty Vehicle; ZEV, Zero Emission Vehicle

In both contexts, the common thread is a mismatch between product innovation and infrastructural or regulatory preparedness. For instance, while NIO in China could overcome charging challenges via battery swapping, Indian and UK-based startups lack similar systemic support, highlighting institutional limitations (Table 7). This forces entrepreneurs to shoulder the dual burden of innovating both the product and the ecosystem something often beyond the capacity of early-stage ventures.

Thus, the challenges faced by EV players, whether in scaling service networks, managing consumer trust, ensuring after-sales delivery, or anticipating policy shifts, underscore the importance of adaptive managerial strategies. These dilemmas also highlight the need for entrepreneurs to go beyond product development and engage actively with institutional stakeholders to co-create an enabling ecosystem. In the absence of such collaboration, even the most promising EV ventures risk stalling midway - caught between policy aspirations and operational constraints.

Table 10 illustrates the dynamic interplay shaping EV adoption. Institutional Forces (e.g., government policies, regulations, infrastructure investment, and societal pressures) set the broader environment in which firms operate. These forces give rise to Market Constraints such as high upfront costs, limited charging infrastructure, consumer inertia, and technological uncertainties. In response, firms engage in Strategic Firm Responses - ranging from innovation in business models and partnerships to targeted marketing and pricing strategies. These responses collectively influence the EV Adoption Outcome, determining the pace, scale, and nature of market penetration. The model emphasizes that successful EV adoption is not solely a function of policy or market readiness but is shaped by the strategic adaptability of firms within the institutional context.

EV Adoption Process

Institutional Forces → Market Constraints → Strategic Firm Responses → EV Adoption

TABLE 10: Suggestive framework of EV adoption

EV, Electric Vehicle

Conclusions

The evolution of EV adoption across India and the UK reveals a layered interplay of institutional forces, market constraints, and strategic firm responses in EV adoption outcomes. While policy intent appears strong in both regions, market development remains uneven, creating a strategic puzzle for firms navigating infrastructure gaps, supply chain limitations, regulatory shifts, and consumer inertia. Rather than offering a clear path forward, this case invites readers who are in entrepreneurial and managerial roles to reflect on the multiple and conflicting decision points at hand. Should firms prioritize scale or service quality? Push innovation or wait for policy clarity? Collaborate or compete? The answers, as this case suggests, may lie not in choosing a single path, but in adapting wisely to evolving conditions while anticipating the next curve in the road.

This case provides valuable insights into the entrepreneurial ecosystems of India and the UK. While Indian EV entrepreneurs face challenges of fragmented infrastructure and scaling pressures, UK stakeholders contend with service network gaps and shifting policy frameworks. The analysis highlights that successful EV adoption depends not just on innovation, but on strong collaboration between private firms and institutional actors to build a supportive and scalable ecosystem. Ultimately, the success of EV adoption in both countries depends on firms' ability to collaborate effectively with institutions to co-create an enabling ecosystem, one that synchronizes vehicle rollout with charging infrastructure, policy clarity, and financial incentives. This interdependence between firm strategies and institutional support is essential for overcoming systemic constraints and developing scalable, sustainable EV ventures.

Additional Information

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All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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