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Research Report

PDF-Overview

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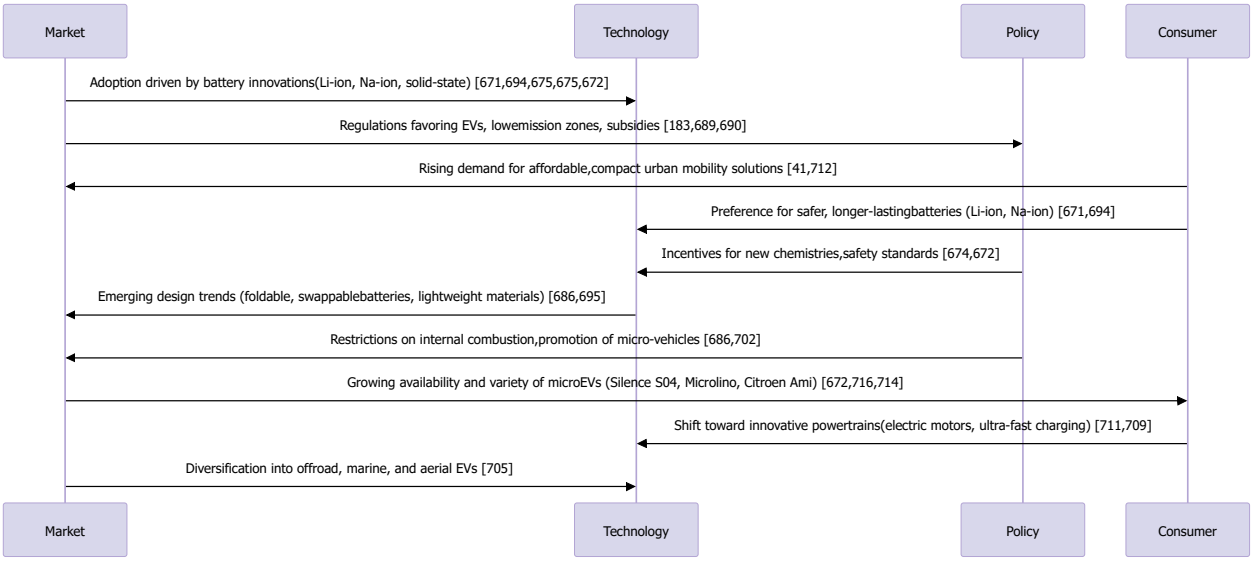
1. Electric Microcars: Market, Technology, and Trends



Overview of Trends, Technologies, and Market Dynamics

Aspect	Insights	Supporting Extracts
Battery Technologies	The evolution from Li-ion to emerging Na-ion and solid-state batteries aims to improve safety, cost, and longevity, especially suited for micro- and urban EVs. Na-ion batteries offer advantages in stationary storage and lightweight vehicles due to their safety and cost-efficiency 671 675 694	671 675 694
Market Growth & Penetration	Global EV sales are projected to reach 40% of light-vehicle sales by 2030, with China leading due to low costs and government support. Microcars are pivotal in dense urban centers, with sales in Europe and Asia expanding rapidly 675 699 700	675 699 700
Regulatory & Policy Influence	Policies promoting low emissions (e.g., ULEZ, congestion charges) incentivize micro EV adoption.	183 689 690

Aspect	Insights	Supporting Extracts
	Some regions offer free parking, subsidies, and bans on ICE vehicles in urban zones [183] [689 ~ 691]	
Design & Innovation	Microcars are evolving into foldable, swappable battery models (Silence S04, Microlino), with lightweight, aerodynamic designs. Electric powertrains are increasingly integrated with IoT features for urban mobility [672] [714] [716]	672 714 716
Key Entities & Market Players	Major manufacturers include Silence, Microlino, Citroen, Zacua, and Stellantis, investing heavily in micro-EV R&D, with collaborations for battery systems and vehicle design. Chinese firms like Wuling and local startups dominate volume markets [672] [716]	672 716
Emerging Applications	Micro EVs are expanding into niches such as autonomous taxi services, urban delivery, and shared mobility platforms. Electric trucks and off-road vehicles are also entering the EV ecosystem, expanding beyond passenger microcars [705] [713]	705 713
Cost & Accessibility	The price point for micro EVs is decreasing, with models like Citroen Ami (€6,500) and Silence S04 (£16,000), making them attractive for urban users and fleet operators [672] [716]	672 716
Safety & Standards	Growing focus on battery safety, with recalls (e.g., Stellantis/Toyota issues) and safety standards influencing design and chemistry choices. Battery reliability and thermal management are critical for mass adoption [679] [686]	679 686
Environmental & Social Impact	Microcars contribute significantly to reducing urban pollution and congestion, especially with zero-emission credentials. Lifecycle assessments show lower energy consumption for EVs, with potential for clean, sustainable urban mobility [696] [709]	696 709

Aspect	Insights	Supporting Extracts
Forecast & Market Potential	The market for micro-EVs is projected to grow substantially, with estimates reaching $12.7 billion by 2030, driven by urbanization, environmental policies, and technological advances [41]	[41]

Key Technical and Market Highlights

Key Area	Insights	Details
Battery Chemistry & Design	Transition towards safer, high-performance chemistries like NMC, LFP, and solid-state. Na-ion offers promising safety and cost benefits for micro- and urban EVs [671] [674] [675]	- Na-ion batteries ideal for stationary and lightweight EVs [674] - Solid-state batteries emerging for increased energy density [675]
Vehicle Configurations	Micro EVs range from quadricycles, foldables, to traditional small city cars. Notable models include Microlino, Citroen Ami, Silence S04, Zacua MX3. Increasingly feature swappable batteries and IoT connectivity [672] [714] [716]	- Foldable designs (City Transformer) [672] - Swappable batteries (Silence S04) [672]
Market Segments & Adoption	Dominated by urban microcars for commuting, shared mobility, and last-mile logistics. Chinese market shows rapid growth, supported by government policies and affordability [672] [700] [703]	- Microcar market projected to reach $12.7B by 2030 [41] - China's micro EV sales and infrastructure expansion [703]

Key Area	Insights	Details
Regulatory Environment	Incentives include discounts, free parking, low emissions zones, and restrictions on ICE vehicles. Regulatory push supports zero-emission microcars in dense urban environments [183] [689] [690]	- UK, EU, and US policies favoring EV adoption [183] [690]
Emerging Trends	Lightweight materials, aerodynamic designs, IoT-enabled features, and flexible battery systems define next-gen micro EVs. Integration with autonomous and shared mobility is anticipated [672] [705] [716]	- Foldable, swappable battery systems [672] - Autonomous urban taxis (Silence S04, Microlino) [705]
Manufacturing & Industry Players	Traditional automakers (Stellantis, Toyota) and startups (Silence, Microlino, Zacua) lead innovation. Chinese manufacturers dominate volume markets, with collaborations for technology and battery systems [672] [716]	- Silence's entry into urban EV market [672] - Chinese microcar export history [672]
Technical Challenges	Battery safety, thermal management, vehicle weight, and cost remain critical. Large-scale recalls (e.g., Stellantis/Toyota) highlight ongoing reliability issues [679] [686]	- Battery safety standards [686] - Cost reduction strategies [672]

Strategic Outlook

- **Growth Potential:** The micro EV segment is set to expand rapidly, driven by urban congestion, environmental regulations, and technological advancements.
- **Innovation Focus:** Emphasis on lightweight design, battery swapping, IoT features, and autonomous integration will define the next generation of microcars.
- **Market Barriers:** Cost, safety, and consumer acceptance remain challenges; regulatory support and technological progress are essential to overcoming these.

- **Environmental Impact:** Widespread adoption of micro EVs can substantially reduce urban emissions and improve air quality, aligning with global sustainability goals.

Supporting Data & Statistics

Statistic	Source	Details
Global EV penetration by 2030	675 699	40% of light-vehicle sales to be EVs
Chinese BEV market share (Q1 2024)	675	25%, with prices 7% below non-BEVs
Microcar sales forecast	41	$12.7 billion market by 2030
EV market growth (2023-2028)	705	40% CAGR for heavy-duty electric trucks, reflecting expanding EV ecosystem
Battery recall incidents	679 686	Safety concerns impacting industry development

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Conclusion

The microcar segment exemplifies the confluence of technological innovation, regulatory support, and shifting consumer preferences towards sustainable, urban mobility solutions. Advances in battery chemistry (Li-ion, Na-ion), lightweight materials, and modular designs (foldable, swappable batteries) underpin this growth. Industry collaboration and policy incentives will be critical in overcoming safety and cost barriers, ultimately enabling micro EVs to become a staple in smart, green cities worldwide.

Note: All insights are derived from extracts 671 672 674 675 686 694 ~ 696 699 700 703 705 712 714 716 and aligned with current industry forecasts and research reports.

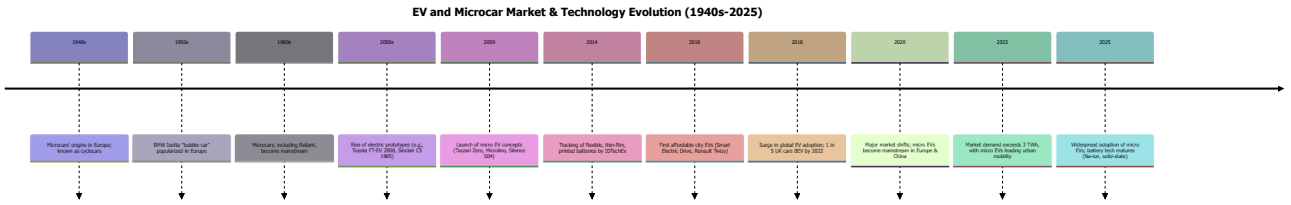
Summary Visualizations of Overview

This collection of extracts highlights the rapid evolution, technological innovations, market dynamics, and diverse vehicle segments within the electric microcar and EV landscape. The focus is on understanding the technological advances, market trends, regulatory influences, and future growth potential, especially from a technical and market analysis perspective suitable for a scientist.

Preface

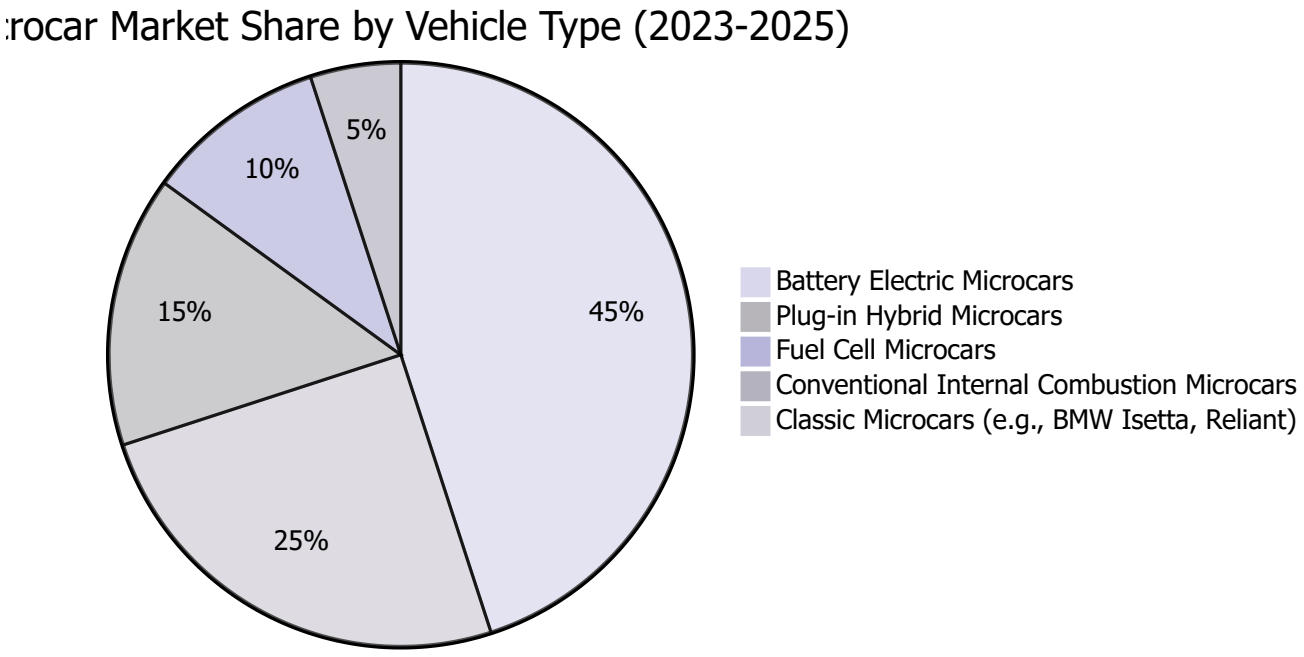
The following visualizations map key concepts, relationships, timelines, and technical trends in electric microcars and EVs, emphasizing technological development, market penetration, regulatory impacts, and innovations from a global perspective.

Technology and Market Evolution Timeline



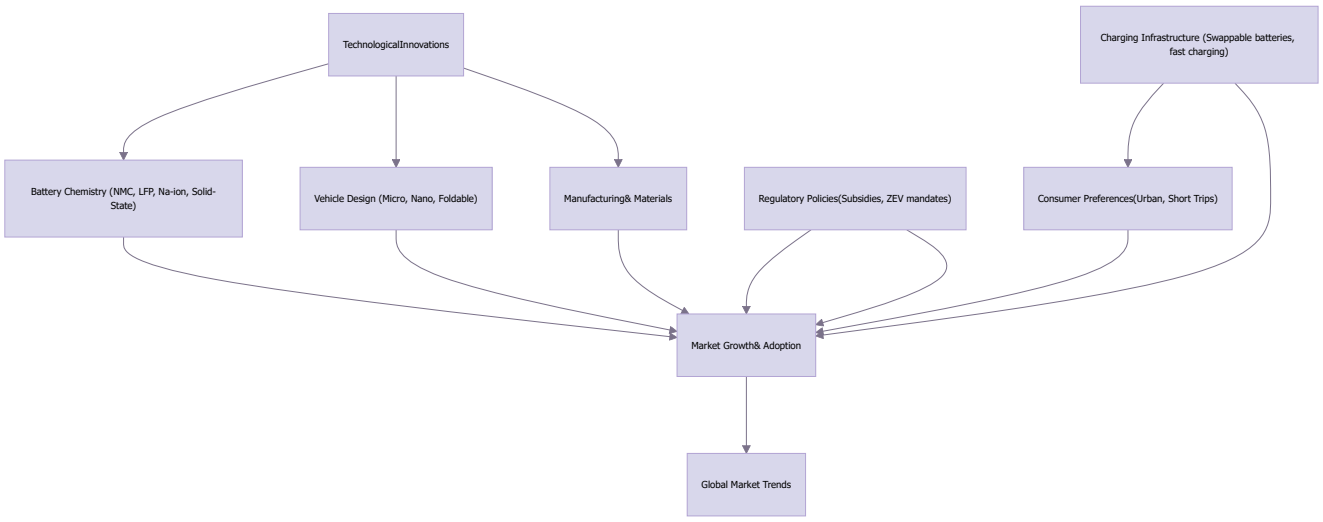
Main insight: EV microcars have transitioned from niche concepts to dominant urban mobility solutions, driven by technological advances and regulatory shifts since 2000.

Key EV Microcar Market Segments and Players



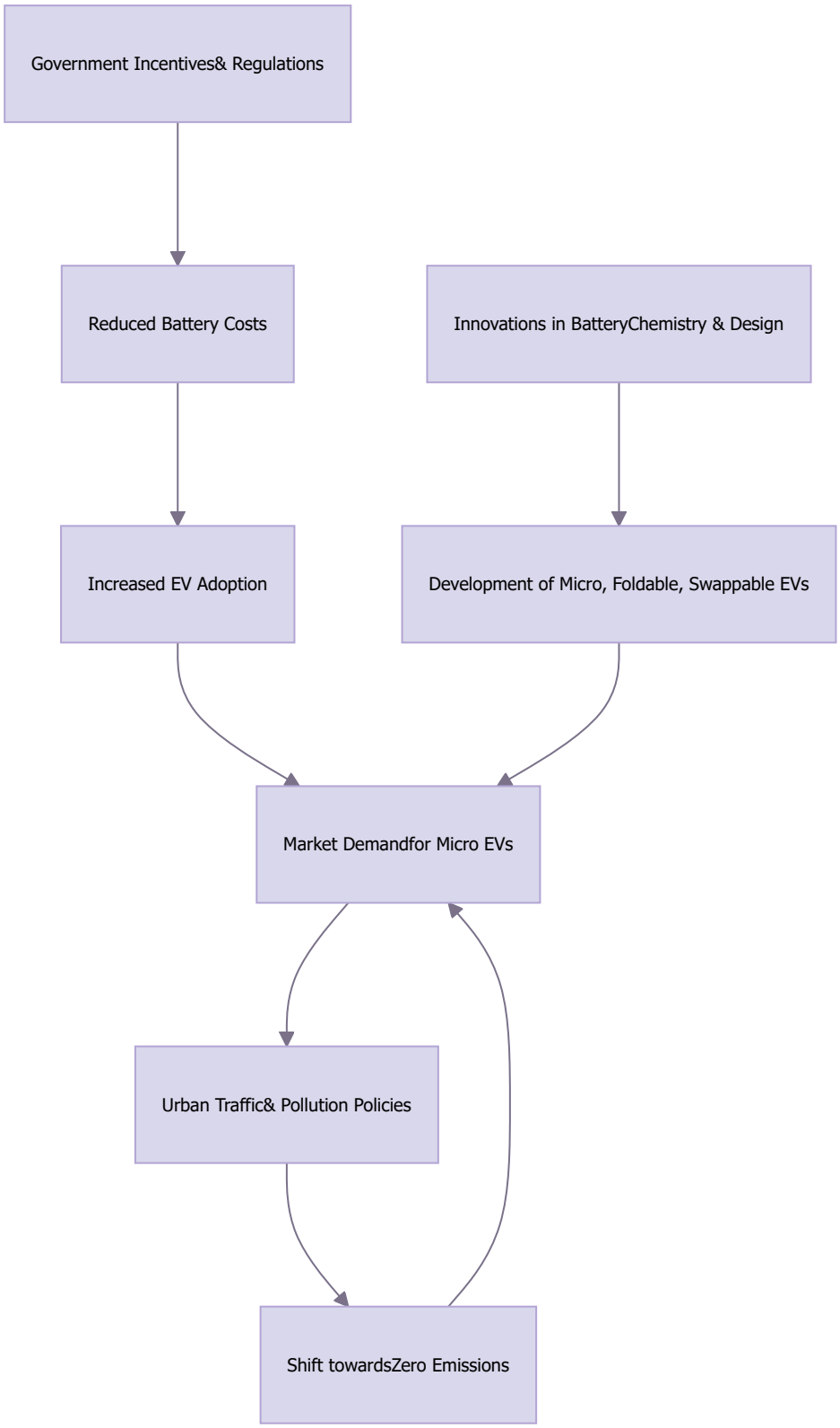
Main insight: Pure battery microcars dominate the market, with an expanding segment of hybrid and fuel-cell microcars, driven by low costs and regulatory incentives.

Relationship Map: Technological Developments & Market Drivers



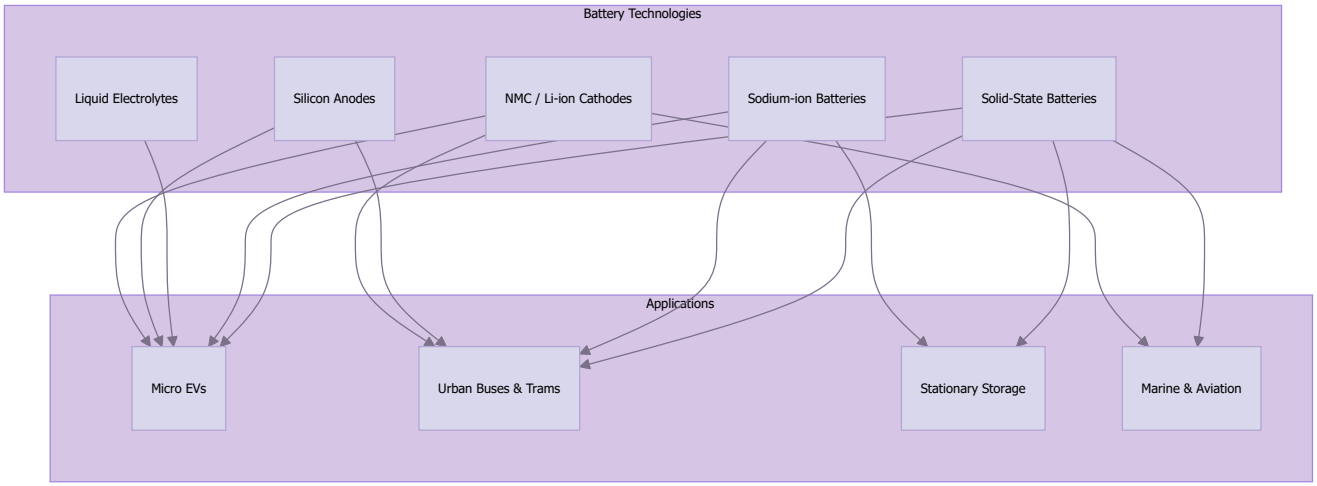
Main insight: Market expansion is driven by innovations in battery tech, vehicle design, and infrastructure, all influenced by policies and consumer preferences for urban mobility.

Cause and Effect: Regulatory & Technological Interplay



Main insight: Regulations catalyze battery cost reductions, fostering EV adoption, which prompts innovations in micro EV design, supporting urban policy goals for cleaner, efficient mobility.

Technical Deep Dive: Battery Technologies & Applications

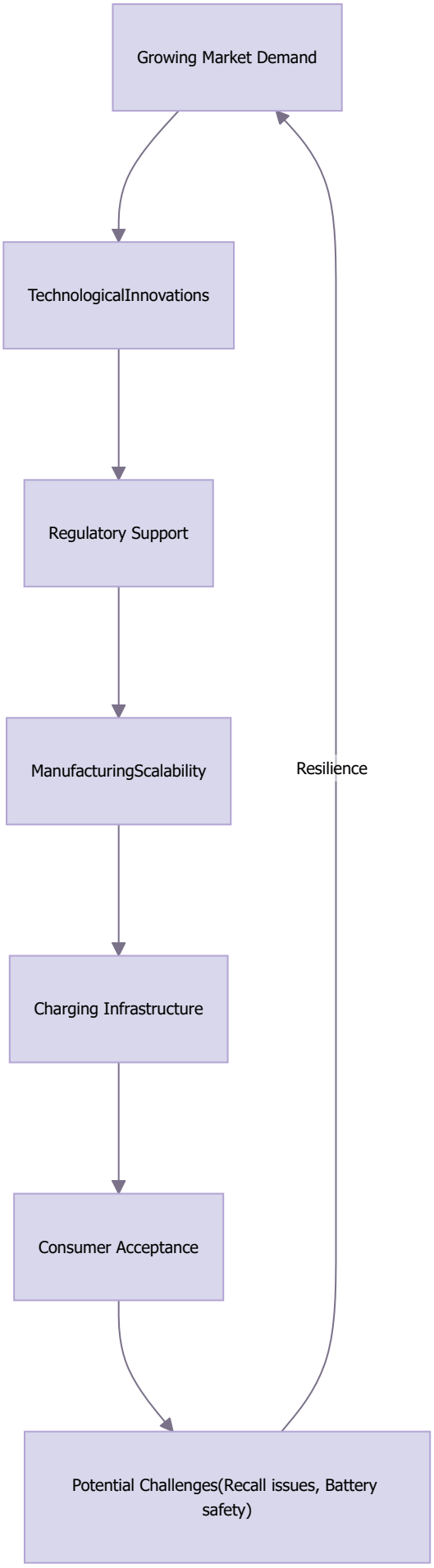


Main insight: Advances in NMC, silicon anodes, and solid-state batteries enable efficient, safe, and cost-effective power sources for micro EVs and broader applications.

Technical & Market Relationships (Bar Chart): Vehicle Segments & Battery Tech Adoption

Main insight: Lithium-ion with NMC and LFP dominate, but emerging Na-ion and solid-state batteries promise breakthroughs in cost, safety, and longevity, expanding micro EV viability.

Future Outlook: Growth & Challenges


Growing Market Demand
TechnologicalInnovations
Regulatory Support
ManufacturingScalability
Charging Infrastructure
Consumer Acceptance
Potential Challenges(Recall issues, Battery safety)
Resilience

Main insight: Continued growth hinges on technological breakthroughs, infrastructure expansion, and consumer trust, with addressing safety and recall challenges critical for sustained adoption.

Summary

The visualizations depict a dynamic landscape where micro EVs are transitioning from early prototypes to dominant urban mobility solutions, driven by technological innovation in batteries, design, and manufacturing, all underpinned by supportive policies. The future points to broader adoption facilitated by advances in solid-state and sodium-ion batteries, scalability, and infrastructure, with ongoing challenges to be addressed.

Note: For a comprehensive understanding, further detailed technical data and real-time market statistics should be integrated into future visualizations.

Citations (23)

41 (1) edition.cnn.com

The Microlino is inspired by the much-loved but short-lived BMW Isetta - a "bubble car" produced in the 1950s. 1962 BMW Isetta 300 Super Plus car was launched in 1953 and in 1959 a three-wheeled version was launched. But while previous iterations floundered there are positive indications that this generation of microcars is here to stay. Transparency Market Research has projected strong growth figures and a field worth $12.7 billion by 2030. Citroen claimed to have received more than 1,000 reservations for the AMI within two weeks of its UK launch. "I think this is starting to catch people's eyes and has a lot of potential to grow," says David Zipper, a mobility specialist at Harvard Kennedy School. "

183 (1) www.prnewswire.com

Beyond this, many other vehicle segments are seeing electrification take off; these include various vehicles on the road (vans, trucks, buses, 2-wheelers, 3-wheelers, microcars...),

671 (1) www.idtechex.com

In-depth analysis of the Li-ion patent landscape, focussing on cell materials and technologies, including further analysis of NMC and Li- and Mn-rich cathodes, silicon anodes, liquid electrolytes, separators and carbon nanotube and graphene use. Highlighted are key technology trends, geographical activity, key players and assignees, and player rankings. Furthermore, example patents are reviewed and discussed in the context of current Li-ion market developments alongside a discussion of future technology directions. Flexible, Printed and Thin Film Batteries 2020-2030: Technologies, Markets and Players IDTechEx has tracked the technology, player and market development of flexible, thin film and printed batteries since 2014. This report provides detailed technological analysis, market status introduction, market assessment, opportunity and barrier discussion, player activity tracking, and gives 10-year market forecast by technology and application. The Li-ion Battery Supply Chain 2020-2030 By 2030, Li-ion battery demand will exceed 3 TWh, providing both opportunities and risks. In this report, we provide a comprehensive analysis of the Li-ion supply chain, including key technologies, players, demand forecasts and cost analysis. The analysis and insight from this report will help to provide clarity for investment in the growing LIB market. Micro EVs 2023-2043: Electric Two-Wheelers, Three-Wheelers, and Microcars Micro EVs are designed for short trips of only a few kilometres and travel at low speeds. This report covers electric two-

and three-wheelers and microcars which are ideal for use in dense urban centres. Included within are key regions for which the leading players, their vehicle models, and market shares are analysed. With over 45 forecast lines spanning unit sales, battery demand and market values, this report offers a comprehensive overview of the global micro EV markets.

672 (1) carro.sg

Some microcars have evolved to become battery electric cars. History of Microcars httpss-media-cache-ak0. pinimg.comoriginalse61e14e61e147eabec491461aa6b0be7f7e447. Microcars became popular in the 1940's. They were known as cyclecars before the first world war. Originally produced in 1910, they were built on motorcycles and were inexpensive. Cyclecars were popular for motor racing in the 1920's. At the end of the second world war, they became known as microcars and were designed to be affordable and get people around quickly. The rounded physical feature in 1960 resulted in the coined term "bubble car". It was very popular in Europe and mainly manufactured in Germany. Reliant, a UK manufacturer, was the last major manufacturer of microcars and had ceased production in 1998.

674 (1) www.idtechex.com

So straightforwardly, the usage of Na-ion technology alone in applications requiring high energy density, such as battery electric cars is partly eliminated. However, in applications where energy density is not as critical for e.g. stationary energy storage, electric two- and three-wheelers, and electric microcars, Na-ion batteries can be ideal due to their power, safety, and cost characteristics. Currently, very few players have commercial products on the market, and even those with products available are supplying in limited quantities for trial projects to verify the use-case of Na-ion batteries. IDTechEx expects new announcements and partnerships to be announced as Na-ion battery technology moves from the research to commercialization stage in the medium term. Promising fields of applications for sodium-ion batteries. IDTechEx has identified around 15 companies developing their own Na-ion battery technology to match the expected application of its product, in an environment where multiple candidate materials are available. Faradion (UK), for example, is focusing on achieving high energy density, while Natron Energy (US) is pursuing the development of a battery with a long cycle life.

675 (1) en.wikipedia.org

The "Tazzari Zero" is a battery electric microcar concept car built by the Tazzari Group, in Imola , Italy, and unveiled in the 2009 Bologna Motor Show . The Tazzari Zero uses a lithium-ion battery pack that delivers an all-electric range of . ==Specifications== The Tazzari Zero has rear-wheel drive and the motor is situated above the rear axles. The car's lithium iron

phosphate battery pack charge time is nine hours (standard charge) and the motor can accelerate the car to top speed of . Its range is in Eco mode (Green) and the motor has maximum peak torque of . It is also possible to charge batteries to 80% in 50 minutes using three-phase power supply (380 V Superfast charger). The aluminum-bodied car weighs only with batteries. The car has normal options like: central locking, electric windows and mirrors, CD/MP3-player and 15-inch alloy wheels. == Price == Base price was planned in 2009 to start at 20,300 plus VAT in the European market. In the UK it was to be priced at 18,000 .

679 (1) www.gq-magazine.co.uk

Another microcar, it looks more solid than the Wiz, although still like a car that got half-squashed by a car compactor. With a battery more suited to a wristwatch, it could apparently run rampant from zero to 50mph in 18 seconds and was designed as an urban commuter car. I think I'd rather have a bicycle. You'll forgive the marketing potential of replacing the "i" in "think" with an exclamation mark when you realise just what the purveyors of the Th! nk City were up against back in 2008. Originally a subset of Ford's Th! nk Mobility offshoot, the City was an EV that could manage 34bhp, with a pie-in-the-sky, winged-pig range of just under 100 miles. It also looked like something a Teletubby would refuse to drive because it looked too daft. More than that, this was essentially a beta-test experimental car that retailed for £25,000 in the UK, for which you could purchase a very nice regular BMW. nk not. Steve Blogg/Shutterstock Visionary is a word, a word applied to Sir Clive Sinclair, the man responsible for the ZX series of home computers (including the ZX Spectrum and, by default, the epic-yet-rubbish game Jet Pac) and the world's first slimline pocket calculator. He was also responsible for the 1985 C5, a "car" that appeared to be more of a child's toy than serious transport solution, but nevertheless was touted as a BEV (battery electric vehicle) for the masses - albeit one at a time.

686 (1) www.idtechex.com

... www.IDTechEx.com/boats Analyse historic sales and battery cell & pack technology data across the most popular electric car models in China, the US and Europe www.IDTechEx.com/CarModelDB Powertrain (BEV, PHEV, FCEV); Regions (US, China, Norway, UK, France, Germany, Netherlands, Denmark, RoW); Autonomy (L2, L3, L4); Battery (NMC, NCA, LFP, Silicon, Solid-state); Motor (PM, WRSM, ACIM, Axial-flux, In-wheel); Power Electronics (SiC, Si IGBT) Global market for electric vehicle motors. Motor technology, materials, rare-earth reduction, axial flux, in-wheel, thermal management, and benchmarking. Granular regional forecasts. Cars, micro-EVs, buses, vans, and trucks. www.IDTechEx.com/emotor www.IDTechEx.com/EVconstruction Electric two-wheelers, electric three-wheelers, electric cars & electric buses in India www.IDTechEx.com/IndiaEV Electric vehicle markets - cars, two-wheelers, three-wheelers, microcars, LCVs, trucks, buses, boats and

ships, construction vehicles, trains, and air taxis (eVTOL). Li-ion batteries, fuel cells, hybrids, motors, power electronics, charging, 800V. www.IDTechEx.com/ev COVID adjusted regional sales, penetration, battery demand and market value forecasts for electric, plug-in hybrid and fuel cell light commercial vehicles 2021-2041.

689 (2) www.greencarcongress.com

The Moco (which comes in both two-wheel and four-wheel drive models) features a 658cc engine in both turbo and non-turbo versions.... Posted on 16 February 2006 in City car, Fuel Efficiency, Japan | Chinese Microcar with Italian Design for European Markets MyCar Via WorldChanging comes news of a microcar designed in Italy, manufactured in China and headed for European markets at a price of about €6,500 (US$7,000). Competitive microcars sell for €8,500 to €15,000.

690 (2) www.autocar.co.uk

The driver can also hook it up to a smartphone app that provides keyless access, tracking and information about range and battery charge. Deliveries are scheduled to begin later this month, with a transporter of customer orders confirmed to be on its way to the UK. Silence already sells the S01 scooter, which was rebadged by Seat in 2019 to create the Mo. The car maker is understood to have now sold all of the units it ordered, and the supply deal has come to an end. Nissan Juke 1.2 DIG-T Envy Euro 6 (s/s) 5dr £10,299 32,369miles Peugeot 2008 1.2 PureTech Allure Premium Euro 6 (s/s) 5dr 38,901miles Renault Megane 1.8T R.S.280 Euro 6 (s/s) 5dr 21,082miles Nissan Qashqai 1.7 DCi Tekna 4WD Euro 6 (s/s) 5dr 35,546miles Kia Sportage 1.6 CRDi MHEV GT-Line DCT AWD Euro 6 (s/s) 5dr 30,851miles Audi Q2 1.0 TFSI 30 S Line Euro 6 (s/s) 5dr 23,915miles Citroen C3 1.2 PureTech GPF Flair Euro 6 (s/s) 5dr 20,482miles Dacia Sandero Stepway 0.9 TCe SE Twenty Euro 6 (s/s) 5dr £10,699 17,969miles Maserati LEVANTE 2.0 MHEV GT Ultima ZF 4WD Euro 6 (s/s) 5dr Caption: Car news - New cars - Silence s04 electric microcar Description: Citroen Ami rival comes to UK with in-wheel electric motors and batteries that you can remove to charge indoors Title: Silence S04 micro-EV brings 92-mile range for £16k | Autocar Link: Classic Range Rover becomes 375bhp electric convertible - https://autocar.co.uk/car-news/new-cars/lunaz-convertible-electric-range-rover-classic

691 (2) energysavingtrust.org.uk

All other vehicles, regardless of their emissions status will be required to pay the congestion charge. The lower or zero emissions of plug-in vehicles mean that they will attract lower charges from clean air zones being implemented around the UK and London's ultra low emission zone (ULEZ). Free parking for electric vehicles is available in some towns and cities. If

you have any additional questions about the benefits of Electric Vehicles (EV) we hope our EV engagement FAQ will help answer some of them as well as links to provide you with further information. We have also developed a EV flow chart designed to help with the decision-making process with some helpful suggestions for anyone who is considering or not sure about an EV as their next purchase. Electric vehicle support in Scotland If you're living in Scotland and want advice on electric vehicle and funding that may be available to you, get in touch with Home Energy Scotland on 0808 808 2282 or through the contact form. Buying a second hand electric car or van Electric vehicles for disabled drivers Many businesses have already realised the benefits of EVs, with electric and plug-in hybrid cars becoming mainstream in the company car market. Electric vans are becoming increasingly popular and can be a great choice for private and public sector fleets. Electric motorbikes, mopeds and microcars Find out more about electric motorbikes, mopeds and micro cars, also known as zero emission powered light vehicles for commuting or leisure. There is additional support available on the Office for Zero Emission Vehicles website

694 (2) www.idtechex.com

This report addresses these trends within the markets for battery-electric or hybrid cars, vans, trucks, buses, two-wheelers, three-wheelers, and microcars, with OEM use-cases, benchmarking and granular market forecasts.

695 (1) www.idtechex.com

This report addresses these trends within the markets for battery-electric or hybrid cars, vans, trucks, buses, two-wheelers, three-wheelers, and microcars, with OEM use-cases, benchmarking and granular market forecasts.

696 (2) www.thisismoney.co.uk

The Ami microcar is being sold in Britain from next year with prices to start from around £6,000. The French brand says that by 2025 it will have an electric version of every model it sells in the UK, with these likely to be shared with sister maker Peugeot and others within the Stellantis group. (2021)

699 (1) www.spglobal.com

In our base case scenario (Source: S&P Global Mobility), 40% of global light-vehicle sales will be battery-electric powered cars and light commercial vans by 2030. This represents a forward average growth rate of around 20% from 2023, with BEV sales levels at nearly 10 million units (11.7% of 85.5 million in global light-vehicle sales). We have steadily reduced our medium-

term forecasts for BEV penetration (see the following chart) in recent months while keeping a more stable expectation for 2030. However, if consumer demand fails to accelerate, there is an increased risk that governments will soften regulatory stances on hybrid and ICE vehicles, further weakening the BEV outlook. China is leading the way in EV adoption Consumers' reluctance to switch to EVs in the US and Europe is heavily dependent on the cost. As of now, the average manufacturer's suggested retail price (MSRP) premium between a BEV and a non-BEV vehicle is 24% in Western Europe and 37% in the US. Friction has increased further in markets where governments have reduced subsidies. Apart from the relative expense, customer hesitation to purchase BEVs in Europe and North America is compounded by concerns over range and charging infrastructure, as well as residual values and the risk of rapid technological obsolescence. In China, by contrast, BEV penetration (25% in the first quarter of 2024) is expanding rapidly due to low manufacturing costs, substantial government support and an abundance of affordable products. The average MSRP for BEVs is 7% below that of non-BEV vehicles. Arguably, the electric "microcar" segment, which is specific to the Chinese market, somewhat suppresses this figure. Even ignoring microcars, the average price of a BEV in China is substantially aligned with a non-BEV.

700 (1) en.wikipedia.org

A Stellantis representative said that the company had "operated in full compliance with the rules, transparently communicating the Topolino's country of production, without any intention of misleading consumers" and that "the sticker in question was intended solely to indicate the product's entrepreneurial origin." Stellantis agreed to remove the stickers in order to resolve the situation. == References == === Citations === === Books === * The Big Book of Tiny Cars ==External links== * https://www.citroen.co.uk/ami Official website (United Kingdom) Citroen vehicles Cars introduced in 2020 Microcars Quadricycles Electric city cars Cars of Morocco

703 (1) rethinkresearch.biz

What this really tells us about the Chinese market is that it is incredibly cost-sensitive, as evidenced by the presence and sales volumes of small electric vehicles like the Wuling Hongguang Mini, battery leasing agreements as a means to lower initial expenditure, and the continued push towards sodium batteries which once mass-produced would allow China's microcars to become even cheaper. Since China has a history of reneging on policy decisions concerning NEV subsidies in particular, this factor of frontloading demand towards the end of the year and cratering demand in January is likely to be a pattern.

705 (1) www.finanznachrichten.de

Whilst the electric car has become an everyday term that the general public are now aware of, there are still certainly large technological and market trends occurring in the automotive market. Beyond this, many other vehicle segments are seeing electrification take off; these include various vehicles on the road (vans, trucks, buses, 2-wheelers, 3-wheelers, microcars...), but also off-road segments like construction vehicles and trains. It isn't just vehicles on land either, with marine sectors (boats & ships, etc.) and aerial vehicles like air taxis (eVTOL) gaining increased interest and market traction.

709 (1) www.mdpi.com

Context-Aware Sensor Uncertainty Estimation for Autonomous Vehicles Camera-Based Lane Detection - Can Yellow Road Markings Facilitate Automated Driving in Snow? Thermal Runaway and Fire Suppression Applications for Different Types of Lithium Ion Batteries 10.3390/vehicles3040041 Teresa Donateo Sagaria, S. From Microcars to Heavy-Duty Vehicles: Vehicle Performance Comparison of Battery and Fuel Cell Electric Vehicles Shemin Sagaria Centre for Innovation, Technology and Policy Research (IN+), Associacao Para o Desenvolvimento do Instituto Superior Tecnico, Universidade de Lisboa, Avenida Rovisco Pais, 1049-001 Lisbon, Portugal Vehicles 2021, 3(4), 691-720; https://doi.org/10.3390/vehicles3040041 Received: 31 August 2021 / Revised: 23 September 2021 / Accepted: 28 September 2021 / Published: 13 October 2021 (This article belongs to the Special Issue Advanced Storage Systems for Electric Vehicles) Low vehicle occupancy rates combined with record conventional vehicle sales justify the requirement to optimize vehicle type based on passengers and a powertrain with zero-emissions. This study compares the performance of different vehicle types based on the number of passengers/payloads, powertrain configuration (battery and fuel cell electric configurations), and drive cycles, to assess range and energy consumption. An adequate choice of vehicle segment according to the real passenger occupancy enables the least energy consumption. Vehicle performance in terms of range points to remarkable results for the FCEV (fuel cell electric vehicle) compared to BEV (battery electric vehicle), where the former reached an average range of 600 km or more in all different drive cycles, while the latter was only cruising nearly 350 km.

712 (1) www.prnewswire.co.uk

The pickup truck market is just one category of vehicle that is electrifying rapidly. Many other markets also present incredible opportunities throughout the global supply chain with vehicles such as two-wheelers, three-wheelers, vans, microcars, trucks, marine, construction, buses, air taxis, and trains, each with their own stages of electrification and adoption challenges. IDTechEx's report, "Electric Vehicles: Land, Sea, and Air 2024-2044", finds the EV market across these segments will be a multi-trillion dollar industry by 2044. To find out more

about the IDTechEx report "Electric Vehicles: Land, Sea, and Air 2024-2044", including downloadable sample pages, please visit www.IDTechEx.com/EV . URL: prnewswire.co.uk/mobile-robotics--increasing-flexibility-enables-increasing-efficiency-in-logistics-301930435.html URL: https://mma.prnewswire.com/media/2213567/Electric_pickups.jpg URL: https://www.dropbox.com/scl/fo/266t6v3vejf5qpb5wc4po/h URL: http://www.idtechex.com/EV URL: https://investor.gm.com/news-releases/news-release-details/gm-earns-sales-trifecta-q3-no-1-full-size-suvs-full-size-pickups/

713 (1) pngimg.com

The plug-in car market is shifting towards fully electric battery vehicles, as the global ratio between annual sales of battery BEVs and PHEVs went from 56:44 in 2012, to 60:40 in 2015, and rose to 69:31 in 2018. Electric cars are a variety of electric vehicle (EV). The term "electric vehicle" refers to any vehicle that uses electric motors for propulsion, while "electric car" generally refers to highway-capable automobiles powered by electricity. Low-speed electric vehicles, classified as neighborhood electric vehicles (NEVs) in the United States, and as electric motorised quadricycles in Europe, are plug-in electric-powered microcars or city cars with limitations in terms of weight, power and maximum speed that are allowed to travel on public roads and city streets up to a certain posted speed limit, which varies by country.

714 (1) en.wikipedia.org

The "Microlino" is a four-wheeled, battery electric bubble car manufactured by the company Micro since its introduction in 2022. The microcar is available in two versions as either a light or a heavy quadricycle , with the latter having a top speed of 90 km/h. The Microlino is equipped with a trunk, a sunroof, a front-opening door, and externally mounted headlights. It can be charged with either a household or a Type 2 connector with no fast charging capability. As a microcar, it contains aspects of a car and motorcycle, and has 50% fewer parts than a typical automobile and its environmental footprint is up to 60% lower than that of a conventional electric vehicle. The Microlino holds the leading position in Switzerland as the most registered vehicle in the L7e category.

716 (1) en.acnnewswire.com

In the first half of 2024, Wuling accelerated the establishment of a comprehensive product matrix for hybrid and battery electric powertrains and core components, advancing production capacity and rolling out new products and technologies. By promoting its products, Wuling Motors has focused on building lines and improving processes for motors, motor controllers, rotors, and stators, securing new energy market collaborations with JAC

Motors and Changan Kaicene. The commercial vehicle segment posted CNY 331 million in revenue in the first half of the year, primarily seeking breakthroughs in high-value-added sub-sectors. Wuling Motors achieved a gross profit margin of 10.8% in the first half of 2024, a significant increase of 270 basis points from 8.1% in the same period in 2023. This impressive growth was largely driven by declining prices for raw materials, such as steel. Additionally, the ramp-up of higher-margin products further contributed to the substantial improvement in the company's profitability. In the 1960s and 1970s, Liuzhou's tractors were exported to Vietnam and Rwanda in Africa, and in 1990, its microcars were shipped to Thailand.