

DOI: 10.58168/STR2026_233-238

УДК`629.331

ЭЛЕКТРОМОБИЛИ: ЗАПАС ХОДА, ЗАРЯДКА И ЭКОНОМИКА В РОССИИ

ELECTRIC VEHICLES: RANGE, CHARGING, AND ECONOMICS IN RUSSIA

Сиделев А.А., студент ФГБОУ ВО «Воронежский государственный лесотехнический университет имени Г.Ф. Морозова», Воронеж, Россия, Воронеж, Россия.

Sidelev A.A., student of Voronezh State University of Forestry and Technologies named after G.F. Morozov, Voronezh, Russia.

Рабееах С.К.Б., к.филол.н., доцент кафедры иностранных языков ФГБОУ ВО «Воронежский лесотехнический университет имени Г.Ф. Морозова», Воронеж, Россия

Rabeeah S.K.B., PhD in philology Associate Professor of the Department of Foreign Languages, of Voronezh State University of Forestry and Technologies named after Morozov, Voronezh, Russia.

Abstract: This article examines the process of adapting international electric vehicle technologies to the requirements of the Russian market, focusing on critical aspects such as range, charging infrastructure, and economic feasibility. A key focus is the contrast between the ambitious capabilities advertised by foreign manufacturers and the real conditions prevailing in Russia, including its climate, geography, and the insufficient number of charging stations means that Russia has developed its own distinct understanding of what makes an electric vehicle practical and—one that tries to align the expectations of international engineering with the constraints of local infrastructure and current state support.

Keywords: Electric vehicles, Driving range, Charging infrastructure, Ownership economy, Electric vehicles in Russia.

Аннотация В данной статье рассматривается процесс адаптации международных технологий электромобилей к требованиям российского рынка, с акцентом на такие важные аспекты, как запас хода, зарядная инфраструктура и экономическая целесообразность. Ключевым моментом является сравнение амбициозных возможностей, рекламируемых зарубежными производителями, с реальными условиями, преобладающими в России, включая климат, географию и недостаточное количество зарядных станций означает, что в России сформировалось собственное, уникальное понимание того, что делает электромобиль практичным и доступным — понимание, которое пытается согласовать ожидания международных инженеров с ограничениями местной инфраструктуры и существующей государственной поддержки.

Ключевые слова: Электромобили, Запас хода, Зарядная инфраструктура, Экономика собственности, Электромобили в России.

An electric vehicle is a vehicle propelled by one or more electric motors powered by an independent energy source. It should not be confused with vehicles equipped with an internal combustion engine and an electric transmission.

In fact, electric transport is not a modern invention. Henry Ford and Thomas Edison were the first to introduce it to the world. Later, Nikola Tesla created his legendary miracle car, the secret of which remained undisclosed, leaving only a mysterious mark on history. Over time, this electric car has become surrounded by myths, but the mystery of its supposedly recharge-free energy source remains unsolved.

It's clear today that electric vehicles are becoming the mainstream of global transportation. However, infrastructural and climate barriers are slowing the process, forcing progress to proceed at a measured pace. Meanwhile, the traditional auto industry is losing out technologically: batteries, electric motors, and charging systems are improving much faster than traditional internal combustion engines. [1]

Electric vehicles are becoming increasingly popular in the Russian market, attracting widespread attention and strengthening their position. The Russian electric vehicle market is expected to demonstrate impressive growth dynamics in 2026, despite the overall cooling of the automotive market. Over the past two years, the electric vehicle fleet has grown by

240%, reaching over 192,000 units by the beginning of 2026. [2]

Electric vehicles have many problems, such as: purchase price, limited mobility, an underdeveloped network of charging stations, reliability, and liquidity when reselling.

Such a high price is due to: high development costs, expensive battery components, small production volumes, high customs duties and shipping costs, limited choice.[3] Some measures have already been adopted, such as: purchase subsidies, tax breaks, free parking, free travel.

Purchase subsidies - a program was in place that provided compensation for up to 25% of the cost of an electric vehicle, but no more than 700,000 rubles, provided the vehicle was manufactured in the Russian Federation.

Tax incentives - in 2025, the complete abolition of the transport tax for electric vehicles was in effect in 25 constituent entities of the Russian Federation, including Moscow and the Moscow region, St. Petersburg and the Leningrad region, the Republic of Tatarstan, Krasnodar Krai, and other regions.

Free parking - most large cities offer free parking, for example, in Moscow - in all municipal parking lots.

Free travel on toll roads - until the end of 2025, free travel will remain possible on major federal highways (M-1, M-4, M-11), the Central Ring Road (TsKAD) and other ring roads, and across some bridge crossings. [4]

A critical step is developing domestic production and technological capabilities for electric vehicles. This will significantly reduce the cost of these vehicles and, consequently, significantly increase their popularity among Russian consumers.

Limited mobility is a deterrent for electric vehicle owners on long trips, caused by the short driving range and the lack of charging infrastructure.

This problem is caused by limited range, insufficient charging infrastructure, charging time, and grid dependence.

Limited range - The battery in modern electric vehicles is designed for approximately 300-500 km. The range claimed by automakers often does not match the real-world performance. There are several factors that reduce range.

Insufficient charging station infrastructure – the number of charging stations is limited,

especially in the regions. Stations also vary by charging class, connector type, current type (DC or AC), and power. Finding a charging station isn't enough; you also need to ensure it's suitable for your specific electric vehicle.

Charging time – it takes longer for an electric vehicle's batteries to charge than for the fuel tank to fill. Even the most powerful charging stations (50 kWh and above) refill the car's charge in about an hour.

Grid dependence - Electric vehicles rely on a reliable electrical grid, and in the event of a power outage or blackout, charging the vehicle may be difficult. [5]

Mandatory measures:

1. Develop a network of charging stations. For example, create networks of fast charging points, charging stations in parking lots and shopping centers.
2. Consider operating conditions. For example, use the economy mode, which optimizes system energy consumption, and avoid extreme charge states and aggressive driving.
3. Recycle batteries. This reduces the need for new materials and saves energy resources.

Electric vehicle reliability in Russia is under pressure from a combination of factors: inadequate infrastructure, difficult repairs, software instability, and insurance issues. Taken together, these issues not only complicate daily operation, especially in harsh climates, but also negatively impact the liquidity of electric vehicles on the used market.

Repair:

1. The refusal of many auto repair shops to service electric vehicles is due to two factors: the presence of high-voltage equipment and the insufficient qualifications of their personnel. Only employees who have undergone special training and hold the appropriate authorization may work with high-voltage equipment.
2. Unqualified repairs. An unqualified service center, unable to conduct a thorough diagnosis, will prefer to replace an expensive component entirely rather than repair it. This is especially critical in the case of a traction battery: replacing the entire unit will cost you dearly, while a specialized center can only replace the faulty components.
3. Electric vehicle manufacturers may deny warranty coverage if repairs were performed at an unauthorized service center.

Software:

1. Due to the need for frequent software updates, complex electric vehicle control systems are susceptible to failures that can lead to complete or partial loss of control over the vehicle's functions.
2. Owners of parallel-imported cars often encounter software-related issues. For example, electric vehicles from China often lack localization, and some built-in services function intermittently or are completely unavailable.
3. Electric vehicle owners in Russia periodically encounter charging issues. For example, the car may stop recognizing the connected battery, and a warning appears on the dashboard: "Charging not possible, maximum limit reached." The source of the problem is often either a malfunctioning battery module or incorrect voltage and current readings.

Before fully entering the Russian market and truly competing with internal combustion engines, electric vehicles still need to significantly improve many aspects. The good news is that many of these challenges are relatively easy to overcome if you have the right goals.

Conclusion

In summary, it can be concluded that the electric vehicle market in Russia is demonstrating robust growth despite a number of significant obstacles. Analysis shows that the key barriers remain high cost of ownership, underdeveloped charging infrastructure, climate-specific operating conditions, and a shortage of qualified service personnel. These factors shape the unique "Russian experience" of electric vehicle use, which often diverges from manufacturers' marketing promises.

Nevertheless, most of the identified problems have clear solutions. Further development of government support programs, expansion of the charging station network, localization of production, and training of technical specialists could radically change the situation. Electric vehicles face a long road to fully competing with internal combustion engines, but the current momentum and awareness of existing limitations allow us to look to the future with cautious optimism. The successful integration of electric transport into Russia will depend less on global technological trends than on the ability to adapt them to local conditions.

REFERENCES

1. Trushchalova O. Electric Vehicles as Future Transport: Innovations, Market, Benefits, and Limitations. – URL: <https://rg.ru/2025/12/17/elektromobili-i-transport-budushchego-innovacii-rynok-vygoda-i-ogranicheniia.html> (Accessed 29.03.2026).
2. PUNKT E “Transport infrastructure”. – URL: <https://companies.rbc.ru/news/Ubp4VeLFA/ekspert-punkt-e-vyistupil-na-kruglom-stole/> (Accessed 29.03.2026).
3. Belyakov A. Prices for electric vehicles in Russia: what factors affect the cost and where is the best place to buy a car. – URL: <https://atomobility.ru/ceny-na-elektromobili-v-rossii> (Accessed 31.03.2026).
4. Benefits of electric vehicles in Russia. – URL: <https://moscowteslaclub.ru/article/podderzhka-elektromobiley-v-rossii-kakie-est-lgoty-i-kakie-planiruyutsya/> (Accessed 01.04.2026).
5. KP.RU “How much can be saved and what problems await the driver?”. – URL: <https://www.kp.ru/daily/27722.5/5148627/> (Accessed 01.04.2026).

СПИСОК ЛИТЕРАТУРЫ

1. Трущалова, О. Электромобили транспорт будущего: инновации, рынок, выгода и ограничения / О. Трущалова. – URL: <https://rg.ru/2025/12/17/elektromobili-i-transport-budushchego-innovacii-rynok-vygoda-i-ogranicheniia.html> (Дата обращения 29.03.2026).
2. PUNKT E “Транспортная инфраструктура”. – URL: <https://companies.rbc.ru/news/Ubp4VeLFA/ekspert-punkt-e-vyistupil-na-kruglom-stole/> (Дата обращения 29.03.2026).
3. Беляков, А. Цены на электромобили в России: какие факторы влияют на стоимость и где лучше всего приобрести автомобиль / А. Беляков. – URL: <https://atomobility.ru/ceny-na-elektromobili-v-rossii> (Дата обращения 31.03.2026).
4. Льготы электромобилей в России. – URL: <https://moscowteslaclub.ru/article/podderzhka-elektromobiley-v-rossii-kakie-est-lgoty-i-kakie-planiruyutsya/> (Дата обращения 01.04.2026).
5. KP.RU “Сколько можно сэкономить и какие проблемы ждут водителя”. – URL: <https://www.kp.ru/daily/27722.5/5148627/> (Дата обращения 01.04.2026).