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ANALYSIS



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Waking Up from the Electric Vehicle Dream: From Big Brother to Budget Shortfalls

Jan Rovenský

Abstract

Electromobility is about more than simply changing how cars are powered. As the number of electric vehicles grows, the way road transport is taxed is also gradually changing, with governments losing some of the revenue traditionally collected through excise duties on petrol and diesel. One possible alternative is charging drivers according to the distance they travel. However, this raises questions about what data governments would need to collect and how drivers' privacy would be protected. At the same time, modern cars are becoming increasingly sophisticated digital devices capable of collecting data and allowing certain functions to be controlled remotely. A third dimension is the industrial and geopolitical shift. Electromobility is strengthening China's position in the global automotive and battery industries, putting pressure on European manufacturers. The transformation of transport is therefore not simply an environmental issue, but also a matter of public finances, privacy and European competitiveness.

Key Takeaways

- The revenue gap: The expansion of electromobility is eroding the traditional tax base for road transport, forcing governments to find new ways of financing road infrastructure. One option is a charge based on distance travelled.
- The car sees everything: Connected vehicles generate vast amounts of data and allow certain functions to be modified remotely. Minimising the amount of data collected is therefore essential.
- China and European industry: Electrification is reshaping the global automotive industry, strengthening Chinese manufacturers and their supply chains. Europe must therefore address not only emissions, but also manufacturing, technology, batteries, software and data.

Introduction

For a long time, the electric car was presented primarily as a symbol of technological progress and the green transformation of transport. Its rise, however, is gradually revealing problems that do not sit comfortably with the original narrative of cleaner and cheaper mobility.

One of these problems is fiscal. Governments currently collect a substantial share of transport-related revenue through excise duties on petrol and diesel. As internal combustion engines begin to disappear, part of this tax base will disappear with them. The second problem is technological. A modern car is no longer simply a mechanical means of travelling from A to B. It is a connected digital device capable of generating and transmitting information about its operation, location and the behaviour of its driver.

Electromobility therefore creates a paradox. A technology intended to provide greater freedom of movement without exhaust emissions also makes it possible to monitor that movement with far greater precision. Meanwhile, governments facing declining fuel tax revenues will have a natural incentive to seek new ways of charging motorists for road use. One of the most logical options is a charge based on the number of miles or kilometres travelled. Such a system, however, requires a reliable way of measuring that distance.

This brings together two questions that were previously treated separately: who will pay for roads in the age of electromobility, and who will have access to information about where and how people drive? This is not a hypothetical debate. California is testing a road charging system based on distance travelled, while the United Kingdom is preparing to introduce a per-mile charge for electric vehicles from 2028. At the same time, the European Union is already addressing the legal framework governing data generated by connected cars.

The purpose of this analysis is to highlight the other side of the transport transition: electrification is changing not only how cars are powered, but also how they are taxed, regulated and controlled.

When Fuel Tax Revenue Disappears

The expansion of electric vehicles is no longer a marginal technological trend. According to the International Energy Agency (IEA), global electric car sales reached approximately 21 million vehicles in 2025, accounting for roughly a quarter of all new cars sold. For 2026, the IEA expects sales of around 23 million electric vehicles, equivalent to 28 per cent of global passenger car sales (IEA 2026). Yet this development has a consequence that receives considerably less attention in discussions about electromobility: it is changing the tax base for road transport.

The current system is largely based on drivers paying for road use through taxes on fuel. The more miles a driver covers in a petrol or diesel car, the more fuel they consume and the more revenue the government collects through excise duties and other charges. Electric vehicles break this link. Their drivers use the same roads but do not pay petrol or diesel excise duty when driving.

In the Czech Republic, the sums involved are far from insignificant. According to official figures, excise duties on mineral oils generated CZK 93.6 billion in public revenue in 2025, while motorway vignettes brought in a further CZK 8.7 billion. Together, these amounted to more than CZK 102 billion in revenue associated with road transport and the use of internal combustion engine vehicles (Krýžová 2026).

For now, electric vehicles still account for a relatively small proportion of the Czech vehicle fleet. According to the Transport Research Centre, there were approximately 58,000 electric vehicles in the country at the end of 2025, representing just 0.85 per cent of passenger cars. However, one scenario suggests that their number could reach approximately one million by 2035.

This is where the fiscal problem emerges. According to estimates by KPMG, a substantial increase in electric vehicle adoption could result in a shortfall of 10 to 15 per cent of current fuel tax revenues by around 2035. The Ministry of Finance has also acknowledged that changes to the tax mix may become necessary in the future (Krýžová 2026).

The question, then, is not so much whether the government will seek new sources of revenue, but how it will do so. One possibility is an annual registration or vehicle ownership charge. Another is to tax the electricity used to charge electric cars. A third, and perhaps the most technologically interesting, is to charge motorists according to the distance they actually travel.

This model is no longer merely theoretical. The United Kingdom, for example, plans to introduce a road charge of three pence per mile for electric vehicles and 1.5 pence per mile for plug-in hybrids from April 2028. The British government expects the scheme to generate approximately £1.1 billion in its first year (UK Government 2026).

California has been testing a similar approach for some time. Its Road Charge Program is based on a straightforward principle: as cars become more fuel-efficient and an increasing number no longer use taxed liquid fuels, road infrastructure can no longer be financed solely through fuel taxes. The proposed solution is to charge drivers according to their actual use of the roads.

California's pilot programme is testing various methods of collecting mileage data, ranging from odometer readings to vehicle telematics. A study by California's Legislative Analyst's Office explicitly identifies devices connected to vehicles and onboard telematics as potential sources of this information (Caltrans 2024; 2026).

This brings us to the heart of the issue. A mileage-based tax is not simply a fiscal instrument. It is also an information system. The more precise the system is intended to be, the more accurate the information about the distance travelled must become. And if it moves beyond simple odometer readings towards telematics, it becomes possible to record considerably more than just mileage.

Convenience, Data and Surveillance

Modern cars are fundamentally different from those of previous generations. Their operation increasingly depends on software, sensors, cloud services and continuous data communication.

The European Data Protection Board (EDPB) has warned that connected vehicles may process a wide range of personal data, including information about driving habits, location and biometric characteristics. Such data may remain within the vehicle, be transferred to the driver's phone or be transmitted to manufacturers, insurers, repair services and other parties (EDPB 2021).

This is not some distant future. In 2025, the European Commission issued specific guidance on the application of the EU Data Act to automotive data. The document explicitly identifies services associated with vehicles, including remote locking and unlocking, starting and stopping the engine, pre-conditioning the cabin and managing electric vehicle charging (European Commission 2025).

In other words, a manufacturer or digital service provider no longer needs to be physically present beside a car to influence some of its functions.

There are legitimate benefits to this technology. Remote unlocking, software updates, pre-setting the cabin temperature and managing charging can all offer drivers convenience and safety. However, the same technological infrastructure also creates a new form of dependency: some vehicle functions are no longer determined solely by the hardware, but also depend on software permissions.

The case of Toyota in Germany provides a telling example. In December 2025, the carmaker disabled the remote heating function accessed through mobile applications for certain Toyota and Lexus models with internal combustion engines in Germany. The decision was prompted by German legislation

concerning unnecessary emissions from idling engines. Owners were notified of the change through the app, while the manufacturer stated that the function would remain available for electric vehicles and plug-in hybrids (Echo24 2026). However, Toyota reactivated the function in February 2026.

This example matters because it demonstrates that a feature purchased as part of a vehicle can subsequently be modified or disabled through software in response to changes in the legal environment.

Who decides what information a car shares about its users, with whom it is shared, and what the vehicle is permitted to do? Today, this may concern something relatively minor, such as remote heating or charging. In the future, however, an increasing number of functions will be controlled by software.

As cars become permanently connected devices, it may become technically possible to change their behaviour not only through physical repairs but also through remote software modifications. Clear boundaries must therefore be established between safety, environmental protection, legitimate regulation and the autonomy of vehicle owners.

This represents a fundamental departure from the traditional car. In conventional vehicles, the relationship between the state, the manufacturer and the owner was relatively straightforward. The car had a particular technical configuration, while the state established the rules governing its use.

Connected vehicles introduce an additional digital layer between the owner and the car. It is precisely here that questions of privacy arise.

If a government introduces a mileage-based charge, it must have some way of determining how far a vehicle has travelled. There are several technical options. Mileage could be checked periodically using the odometer, measured through a device installed in the vehicle or recorded automatically by an electronic system capable of tracking journeys.

From a privacy perspective, however, there is a fundamental difference between knowing that “a car has travelled 20,000 kilometres” and knowing that “a car has travelled those 20,000 kilometres through particular locations at particular times”.

Calculating a straightforward mileage-based charge does not require a complete record of a vehicle’s movements. If the government relied solely on total mileage, the intrusion into privacy would be relatively limited. If, however, the system used GPS and stored travel histories, it would create a far more sensitive database.

Electromobility does not in itself mean the emergence of a system of mass surveillance of drivers. Nevertheless, the technical capability exists, and modern vehicles are creating an infrastructure that is better suited to such purposes than ever before.

The EDPB has pointed out that, from a privacy perspective, a connected vehicle is comparable to a computer or smartphone, generating data that can be linked to an identifiable individual. It therefore recommends, among other measures, prioritising local data processing within the vehicle over transmission to cloud-based systems wherever possible (EDPB 2021).

This is also an important principle for future transport policy: the state does not need to know where someone is driving in order to determine how much they should pay for using the roads. If the charge can be calculated from the difference between two odometer readings, there is no reason to create a system that stores a complete history of the vehicle’s movements.

Industrial and Geopolitical Upheaval

The third challenge concerns the economic foundations of electromobility itself. Electrifying transport is not simply a matter of replacing an internal combustion engine with an electric motor. It is transforming the entire automotive supply chain and increasing the importance of batteries, semiconductors, software and other technological components.

The pace of change is considerable. According to global statistics for 2025, worldwide electric car sales exceeded 21 million vehicles. Electric cars therefore accounted for approximately a quarter of global passenger car sales, with China representing around 60 per cent of worldwide electric vehicle sales (IEA 2026).

This fundamentally changes the European narrative. The question is no longer simply whether Europe can replace petrol and diesel cars with electric vehicles. It is also about who will manufacture those vehicles.

China has established a significant competitive advantage in this field. It has a vast domestic market, extensive manufacturing capacity and a strong position in the battery supply chain. Chinese manufacturers are therefore making increasingly substantial inroads into the European market, competing directly with established European carmakers.

Even more significant is the fact that Chinese automotive companies are beginning to make use of manufacturing infrastructure within Europe itself. Rather than building entirely new factories, they can move into existing or underused production facilities. This trend represents another stage in the international expansion of China's automotive industry (ZeroHedge 2026a).

For Europe, this presents two challenges. The first is technological competitiveness. Traditional European carmakers must move from producing mechanically complex internal combustion engine vehicles towards cars whose competitiveness increasingly depends on batteries, electronics, software and production costs.

The second challenge concerns industrial policy. Europe is creating a regulatory environment that encourages the rapid electrification of its car market, while a substantial share of electric vehicle manufacturing capacity is being developed outside Europe.

Europe must therefore consider not only how many electric vehicles it wants on its roads, but also where they will be manufactured, who will produce their batteries, who will own the key technologies, who will control the software and data, and how electric vehicles and their batteries will ultimately be disposed of.

Electromobility is thus redistributing economic power within one of the world's most important industries. This is precisely why the debate about electric vehicles should not end with the question of emissions.

It must also ask: who manufactures the batteries, who builds the cars, who owns the software, who controls the data, and who will ultimately pay for the infrastructure needed to keep these vehicles on the road?

Conclusion

The electrification of transport is undoubtedly one of the most significant technological transformations in the automotive industry. Its consequences, however, extend far beyond the question of exhaust emissions. As electric vehicles come to represent a substantial share of the vehicle fleet, the question of how to replace fuel tax revenues will become increasingly urgent.

California’s experience and the planned British system demonstrate that one possible solution is to charge drivers according to the distance they travel.

Such a system may make economic sense. However, it should not automatically entail the creation of infrastructure capable of monitoring people’s movements. A mileage-based tax does not require a database of every journey made by every driver. Equally, the technical ability to control a vehicle remotely does not mean that this capability should be used to interfere with ownership rights and privacy without clear legal safeguards.

The central question, therefore, is not whether we should embrace or reject electric vehicles. Rather, it is this: what kind of mobility system do we want to create when a car becomes, simultaneously, a means of transport, a computer, a sensor and a source of government revenue?

If the electric car is to symbolise modern transport, its environmental transformation must not become a pretext for the unchecked expansion of digital surveillance and the introduction of new charges.

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Author



JAN ROVENSKÝ

Analyst

He graduated from the Faculty of Arts of Charles University, majoring in English and Political Science, and in 2008 he received his PhD in Political Theory from the LUISS Guido Carli University in Rome. For fifteen years he worked at the daily Právo, where he first worked in the foreign editorial office. Since 2009 he has worked in the political department, from 2018 to January 2021 as deputy editor-in-chief. Since February 2021, he has been the media advisor to the chairman of the ANO movement.

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Martinská 2, 110 00 Praha 1

+420 602 502 674

www.politikaspolecnost.cz

office@politikaspolecnost.cz