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Shifting gears:
VISEGRAD ICE DEPENDENCY AND THE ROAD TO ELECTROMOBILITY

SUPPORTED BY
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About

This paper aims to contribute to the strategic discourse and communication surrounding the transition to electromobility in Poland, Czechia and Slovakia. It is a collaborative effort between the national electromobility associations from each country — the Slovak Electric Vehicle Association (SEVA), Czech E-mobility Platform, and the Polish New Mobility Association (PSNM) - which are partners for the Central and Eastern Europe Green Transportation Initiative (CEE GTI).

Central and Eastern Europe (CEE), particularly the Visegrad countries, is the most dependent on passenger cars and light-duty vehicles in Europe by almost any metric, from per capita production and gross domestic product (GDP) to employment. Compounding this structural economic dependence is their low position in the value chain hierarchy, primarily as Tier 2 and 3 vehicle and component manufacturers. For the most part, value-added and strategic decisions take place abroad in the research centers and boardrooms of foreign original equipment manufacturers (OEMs). At the same time, the "diesel leakage" — the unmitigated flow of secondhand fossil cars from Western to Central and Southeast Europe — has flooded their car markets over the past two decades, locking in older, polluting vehicles for years to come.

Altogether, this leaves the region highly vulnerable to the transition away from internal combustion vehicles (ICE), which is happening more rapidly around the world and in Northwestern Europe, and much less so in the region itself. Slow adoption is one thing, but these represent declining export markets, especially the one they most depend on, Europe.

The primacy of automotive manufacturing is both a blessing and a curse. It has delivered economic growth and a sizable share of stable, mid-level jobs over the past two decades, but largely at the expense of knowledge spillovers and small- and medium-sized enterprise (SME) dynamism. Now this path dependency is impeding their willingness and ability to harness the emerging technology that will replace it.

On the one hand, electromobility presents new opportunities to move up the value chain. On the other hand, it is a similar story of dependence on foreign expertise and technology, with the engine and transmission replaced by the battery and electric powertrain. Electromobility has vastly more innovation potential than traditional petrol or diesel combustion vehicles, from the chips, batteries, and software used in the cars to the charging points, the grids they connect to, and the relevant services. However, for the most part, these countries have not prioritized research, development, and innovation activities outside the traditional ICE business, which are inherently limited by the small markets and state budgets that characterize the region (Czechia might be the exception, with its semiconductor R&D). This limits their ability to be globally competitive. At the same time, the foreign direct investment (FDI) model must continue in some form so that battery production can replace some of the output and jobs that will be lost in the ICEV engine and transmission component divisions.

With so much at stake for Poland, Czechia, and Slovakia, it is no wonder they have been the subject of several related automotive transformation studies over recent years, providing a deep repository of analysis and informed recommendations that remain just as applicable and poignant today. The messaging is clear: if these countries cannot attract sufficient battery manufacturing investments, grow the R&D ecosystem, and stimulate a more robust domestic market for e-mobility, they risk a 'hard landing' of unrecoverable economic loss over the next decade.

The findings herein indicate that positive signs are emerging in the Visegrad countries, including progress in electric vehicle (EV) and/or battery manufacturing and gradual growth in EV registrations, but these remain only a small share relative to ICE and the rest of Europe; broader public acceptance and sustained growth still need to be fostered and demonstrated. This report can only add urgency and justification to the core messaging, in the hope that it resonates with political leadership and motorists alike.

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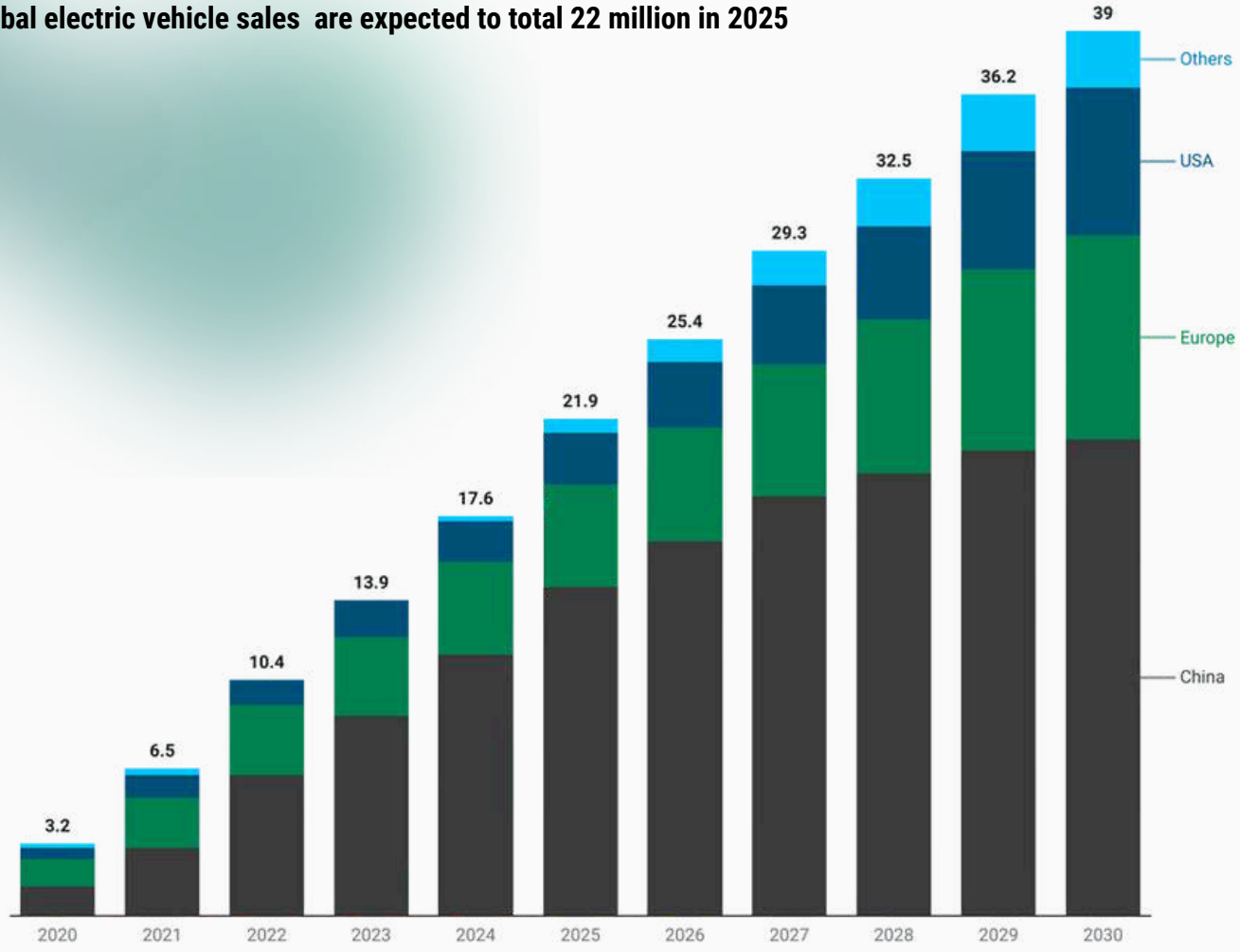
Introduction:

Europe’s slow start to the e-mobility race

History is replete with, if not defined by, game-changing technological innovations that usher in improved processes, better quality of life, and new growth opportunities. However, they are also highly disruptive, creating redistribution of winners and losers.

Electromobility represents this technological breakthrough for road transportation, poised to shatter the longstanding model of fossil vehicle ownership and operation.
The mass adoption of shared autonomous vehicles might be further away, but EVs have arrived. Globally, they grew by 25% from 2023 to 2024 and will account for **one in every four** cars sold in 2025 (22 million), projected to surpass 40% of the global car market by 2030.

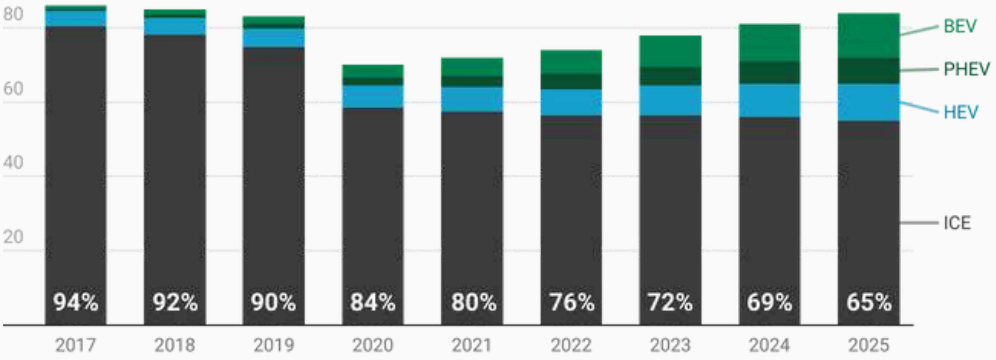
Global electric vehicle sales are expected to total 22 million in 2025



Europe includes EU, UK, and EFTA.
Electric vehicles include battery and plug-in hybrid vehicles.
Source of data: Bloomberg NEF

These trends make the inevitability of BEVs clear.
In fact, global sales of ICE vehicles already peaked in 2017.

Global passenger vehicle sales by powertrain category (mil. of vehicles)



Source of data: Bloomberg NEF

Nonetheless, European OEMs have been resistant and slow to adapt over this period, prioritizing ICE over battery R&D and pouring significant resources into lobbying in Brussels to weaken EU vehicle emissions standards and avoid hefty penalties. In one sense, this is understandable given the built-in competitive advantage and higher profitability of fossil vehicles. Furthermore, the traditional automotive industry is the lifeblood of many EU national economies, and governments have an interest in preserving the status quo for as long as possible.

However, this strategy may be dangerously shortsighted, already setting Europe back by several years in the global electromobility race and putting many economies at risk of a hard landing.

China, unburdened by the weight of an industrial legacy and a complex regulatory environment, took the opportunity to leapfrog.

It made electromobility a key pillar of its industrial strategy before the Paris Agreement, meaning it had nothing to do with climate or environmental policy and everything to do with technological superiority.

As a result, for now and the foreseeable future, European EVs will rely almost entirely on Asian lithium-ion batteries, the highest-value-added component. This, in some respects, presents an existential challenge to Europe's energy security and competitiveness, which is why the EU has responded with its own industrial strategy to boost EV and battery manufacturing capabilities, more than ten years after China. Hopefully, it is not too late, but there is no other option except to move forward.

Chapter 1:

Automotive dependency in Visegrad countries

Economic dependency

Slovakia, Czechia, and Hungary are first, second, and third in vehicle production per capita worldwide, while Poland is seventh. Annual car production in Czechia and Slovakia surpassed pre-Covid levels in 2024 and 2025, respectively, while it has declined by 15% in Poland and 10% in Hungary from 2019 to 2024.

The automotive industry accounts for around 10% of GDP in Poland, Czechia, and Slovakia. It represents almost half of industrial production in Slovakia, by far the highest share, a third in Czechia, and only 15% in Poland, which is the most diversified economy of the three.

EV production is only just beginning in these countries and will continue to grow. For now, Czechia is leading the way, jumping from around 10% of total car production in 2024 to over 20% in Q1–Q3 2025. Slovakia is near 10% and is expected to become the leading producer in the next two years. The four manufacturers currently operating in the country (Volkswagen, Stellantis, JLR, and KIA) produce plug-in hybrid electric vehicles (PHEVs) and fully electric vehicles (BEVs) alongside internal-combustion models, and will be joined by Volvo with its new EV production facility, set to launch early 2027. By comparison, Poland is more of an EV manufacturing hub than a production hub, and data is not available.

It is also important to note that ICE provides the greatest value-added and profit to European OEMs, which is why it is in their interest to keep selling and for Visegrad countries to keep producing them for as long as possible, especially in the CEE region, where familiarity and preference still strongly resonate with consumers.

Economic automotive industry dependency (approximate values, 2024 reference year)

			
Annual vehicle production	1,459,000	993,000	555,000
Annual EV production	153,000	150,000	N/A
Total employment (direct + indirect)	500,000	170,000	400,000
% GDP	9%	11%	8%
Share of automotive industry from industrial production	34%	49%	15%

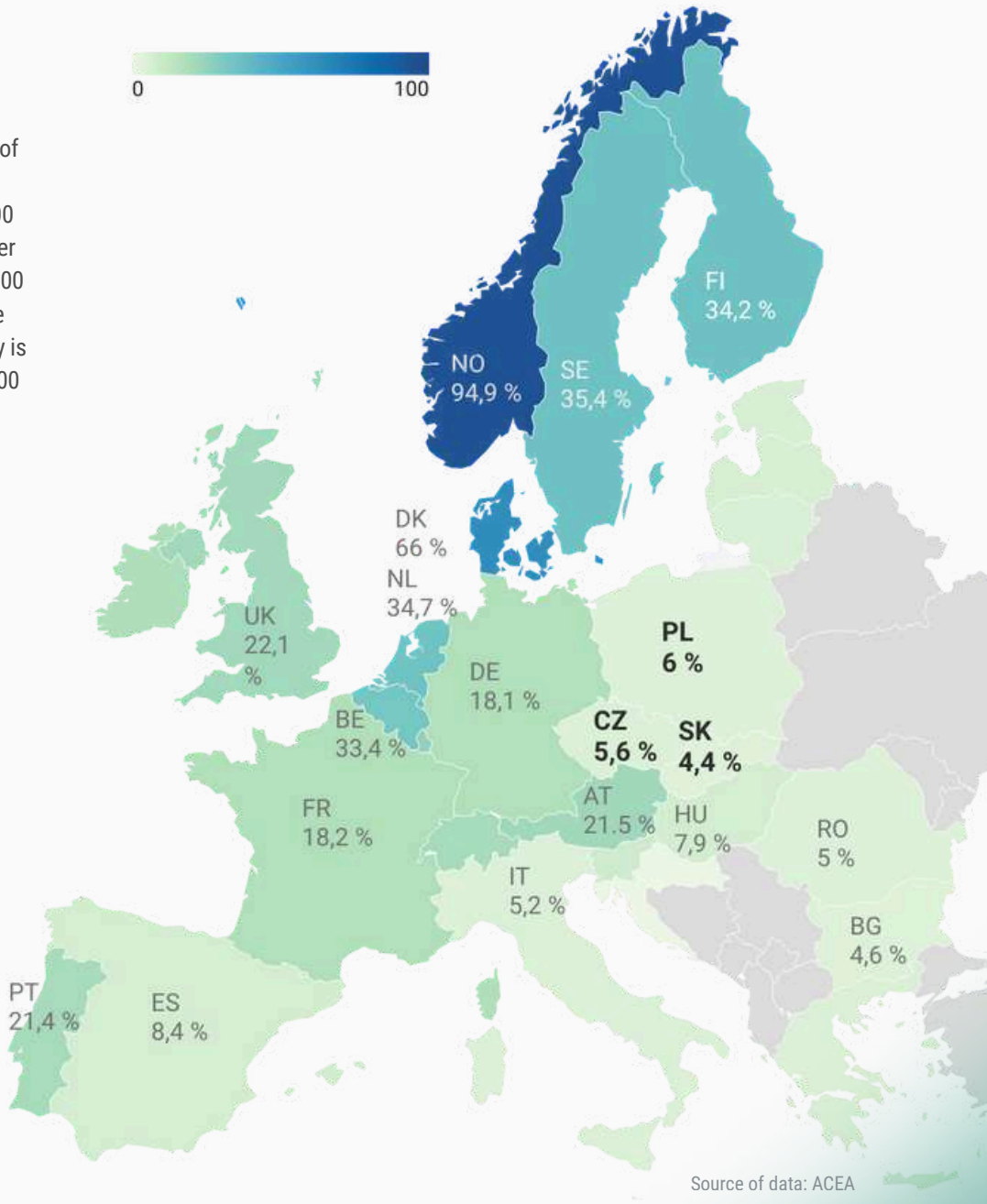
Share of BEVs in new car registrations

Starting with an indication of the prevalence of cars as the primary mode of transportation, Poland has the highest motorization rate in the EU (703 per 1,000 inhabitants), while Czechia is 7th (611 per 1,000 inhabitants). Slovakia (501 per 1,000 inhabitants) is just below the EU average (574 per 1,000 inhabitants), and Hungary is among the lowest in the EU (422 per 1,000 inhabitants).

At the end of Q3 of 2025, Slovakia had the second-lowest share of zero-emission vehicle (ZEV) registrations in the EU (4,4%), with Poland and Czechia just above it (5 to 6%), and Hungary almost 8%.

Lacking demand

Nonetheless, there are signs of growth among them. In Poland, BEV registrations increased by more than 60% year over year in the first half of 2025. In March 2025, Hungary set a new record for registered BEVs, more than half of which were used.



Source of data: ACEA

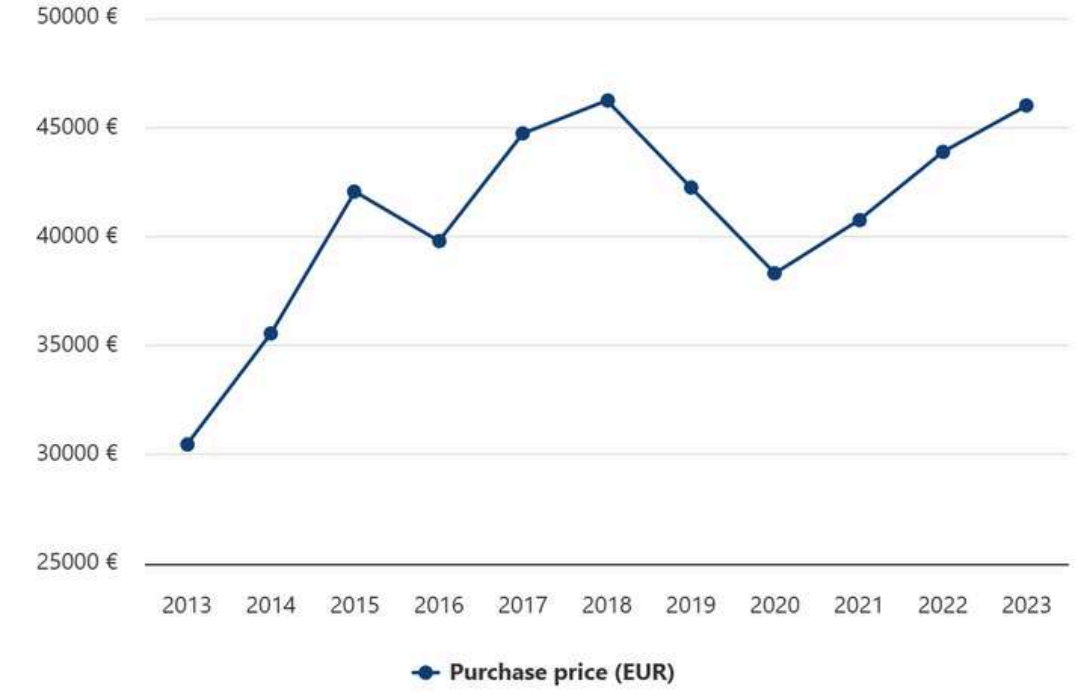
Barriers to EV adoption

Affordability and (lack of) experience

The low BEV penetration is attributable to a confluence of factors, none more significant than affordability. This is largely driven by the slightly higher upfront sticker price compared with ICE, even though the total cost of ownership (TCO) is more meaningful and favorable to BEVs, with private charging (at home or on corporate premises) always cheaper than gasoline and with lower maintenance costs.

The fact is that vehicle retail prices in Europe have been rising over the past three years, and almost all BEV models are now more expensive than their ICE equivalents. This is especially problematic in the small- and medium-sized car segments, where consumers are more price-sensitive.

Average EU retail price of BEV models per year



Source: European Alternative Fuels Observatory (EAFO)

The latest available EAFO consumer survey from 2023 found that Europeans are willing to pay around EUR 20,000 for a used or new BEV, yet only 13% of purchases were made at this price. For lower-earning CEE consumers, a new car is already expensive, and an electric one is prohibitively so. This is fueled by a false belief, for example in Czechia, that owning an EV is financially demanding, often associated with the unfounded fear that EV batteries are prone to faults and need replacing.

As a result, prospective buyers are less likely to test-drive and experience an EV. Nonetheless, they tend to harbor and express negative opinions typical of something new and unfamiliar, especially when it is perceived as unattainable.

Used vehicle markets

For the past decade, Central and Eastern European (CEE) secondhand vehicle registrations have been on the rise, fueled by cheap, name-brand ICEV imports from the West, known as “diesel/petrol leakage,” aging what are already the oldest vehicle fleets in the EU, and widening the West-East clean mobility gap.

There is far less reliable and consistent data in this field because it is inherently fragmented and volatile, and national agencies prioritize tracking new registrations for emissions compliance and taxation purposes. Based on the limited data available for Visegrad countries, it is clear that a significant share of car registrations are secondhand, and the vast majority of these are ICE vehicles.

The most data is available for Poland, where almost two-thirds of total registrations in 2024 were 2nd hand, after used car imports jumped 20% from the previous year.

Only 2% were BEVs, while about 55% were more than ten years old. The share of 2nd hand registrations is lower in Czechia and Slovakia, estimated at close to 40%. In Czechia, used vehicle registrations dropped almost 10% from 2023 to 2024, reaching the lowest level in nearly a decade, but 2nd hand EV registrations have risen recently. In Hungary, meanwhile, more than half (13,500) of the record 22,000 EVs registered in 2024 were 2nd hand.

The first generation of EVs is just beginning to enter the secondhand market, which will change the composition of imported cars and be a game changer for affordability. In CEE, corporate fleets dominate BEV registrations and will serve as the primary feedstock for domestic secondhand BEVs, which is why it is paramount that companies are incentivized to go electric. For example, in 2024, company cars represented 88% of BEV registrations in Poland.

Financial incentives

Financial incentives are crucial for closing the price gap with ICE vehicles and for providing an operational advantage throughout the lifetime of the car. The most impactful is the upfront purchase subsidy, which Poland and Hungary provide but Czechia and Slovakia do not.

Among the Visegrad countries, Poland offers the most comprehensive suite of financial support. Purchase subsidies are available under the newly launched (February 2025) “NaszEauto” program, funded with PLN 1.6 billion from the National Reconstruction Plan. In addition to the base subsidy, a scrappage bonus is available, along with additional provisions for low-income households, families, and sole proprietorships. In addition, BEVs are exempt from registration tax and excise duty through the end of 2029, and businesses can claim the full 23% VAT on the purchase of BEVs used for commercial purposes.

In Hungary, only companies are eligible for subsidies. They are also exempt from the company car tax, and costs related to charging infrastructure are tax deductible. The green plate system exempts BEVs from annual registration and property transfer taxes. PHEVs will no longer qualify from November 2026.
In Czechia, BEVs are exempt from registration and road and toll taxes (except for heavy-duty vehicles, which are subject to reduced tolls), and a EUR 1,200 subsidy is available for home chargers, supporting almost 40,000 private wallboxes.

Slovakia offers lower registration taxes for BEVs and exempts them from road tax. The government has expressed interest in future subsidies, but nothing has been announced.

Operation and performance

After price, the next most important factors are operational and performance-related: availability of public and private charging points, charging time, and battery range.

Beyond the baseline EU Alternative Fuels Infrastructure Regulation (AFIR), which all EU Member States comply with, the IEA recommends about ten EVs per charging point to avoid queuing, while acknowledging that the ratio of charging capacity per EV is a more accurate metric because it takes into account charging speeds.

Among the Visegrad countries, Hungary and Poland have the highest (worst) ratio of EVs to charging points, while Czechia and Slovakia are right around the IEA threshold of ten.

Year over year in 2025, Hungary and Poland improved, while Czechia and Slovakia regressed slightly. For countries with very small shares of EVs, such as Czechia and Slovakia, the ratio is typically inflated because public charging develops faster than EV sales to keep up with regulations.

Visegrad EVs and charging points, as of Q3 2025

	Recharging points (AC/DC)	BEV / PHEV	Total EVs to charging points
Czechia	7,143 (4,925/2,218)	54,864 / 32,163	12.1
Slovakia	3964 (2,554/1,408)	18,786 / 13,809	8.2
Poland	13,743 (8,139/5,604)	112,155 / 100,278	15.4
Hungary	4902 (3,552/1,350)	88,063 / 14,589	20.9

Source of data: European Alternative Fuels Observatory (EAFO)

Charging density is another important metric for measuring regional infrastructure gaps. Extrapolating from the AFIR requirement, the target indicator would be around 200 charging points per 100,000 inhabitants, slightly lower in rural areas and higher in urban areas. Not surprisingly, Visegrad countries have very low national density and extreme disparities between the capital and all other regions. For example, in Czechia, Prague has 95 public chargers per 100,000 inhabitants, compared with 17 in the Zlín region.

According to one McKinsey survey, a large share of 'skeptical' EV buyers (42%) would consider buying an EV only if public charging availability were at least as widespread as gas stations. Currently, Poland and Czechia have among the largest gaps between petrol stations and EV charging stations in the EU, while the gaps are less pronounced in Hungary and Slovakia, on the order of two-to-one.

While public charging is important not only for utilization but also for consumer confidence, most charging is done at home overnight in a garage or at workplace charging during office hours.

According to the aforementioned EAFO survey, European BEV drivers use a recharging station or wallbox at home a majority of the time (55%), compared with public slow (18%) and fast (10%) charging points.

For those living in urban apartment buildings, a lack of access to private charging is a major barrier. Beyond convenience, the cost disparity between public and private charging is substantial across Europe, especially in CEE countries — notably Hungary, Poland and Czechia. This is significant because in these countries, with home charging, BEVs are considerably cheaper to operate than ICEVs, but public charging costs erase this advantage. In fact, Poland is tied for the third most expensive average DC charging rate in Europe, behind only the UK and Luxembourg.

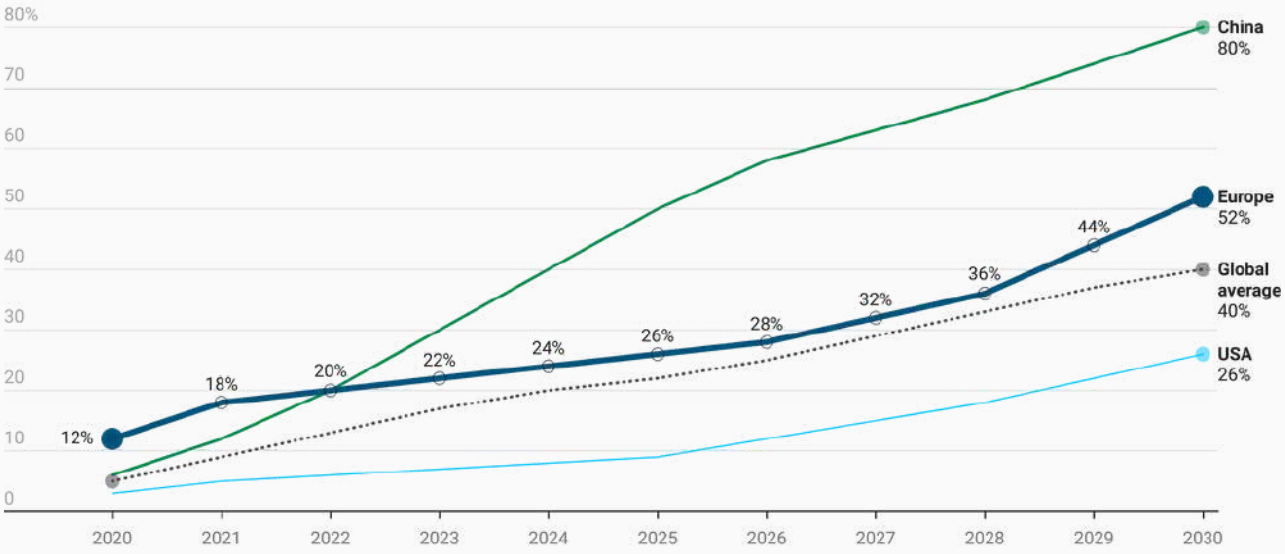
According to another McKinsey survey, most respondents needed a range of 437 km to switch from an ICEV to an EV. On average, SUVs have a range of about 350 km, compared with 150 km for the small segment. Of the 24 available BEV models under EUR 30,000, the lowest is 135 km (Fiat 500e Hatchback), and the highest is 352 km (Leapmotor B10).

Chapter 2:

China is dominating global electromobility

China has by far the highest share of EVs and steepest growth trajectory to 2030, while European EV are expected to double from the current 25% share to more than 50% by 2030. Meanwhile, the US will see the slowest growth of the three under the regressive Trump administration policies.

Past and forecast share of electric vehicle sales by region



Europe includes EU, UK, and EFTA. Electric vehicles include battery and plug-in hybrid vehicles.
Source of data: Bloomberg NEF

Industry leader

From 2019–2024, China's car production rose 22% while Europe's fell by 19%. China is also the dominant player in battery cell production and upstream stages of the value chain in the supply of raw and refined materials like cobalt, lithium, nickel and natural graphite.

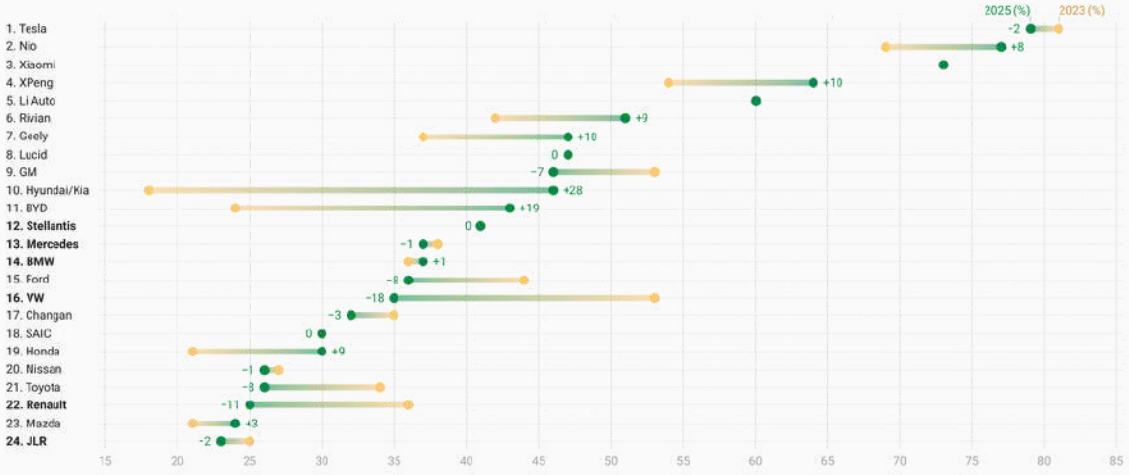
The competitive edge of China's electric car and battery industry is presenting major challenges to Europe.

With European battery production costs **50%** higher than in China, producers have been postponing or cancelling expansion plans owing to uncertainty about future profitability (e.g. Northvolt bankruptcy), while the supply chain ecosystem remains weak with skilled labor shortage. Industrial leaders might agree on the need to transition to electromobility, where they are investing heavily, but the aggressive competition from Asia is raising concerns about short-term losses.

On top of this, Chinese carmakers are ahead of traditional European OEMs in digitalizing their products and processes. The Gartner Digital Automaker Index is an annual benchmarking tool that assesses the "digital maturity" of leading automakers using a consistent methodology, reflecting how effectively each manufacturer integrates digital technologies across processes, strategy, and organizational structure relative to peers.

Data from 2023 and its comparison with the current year provide an insightful picture of the status and direction of individual automakers. While traditional European manufacturers tend to rank in the lower half, the leaders of digital transformation are newer players from China and the United States.

Gartner Index, digitalization of carmakers, 2023 vs 2025



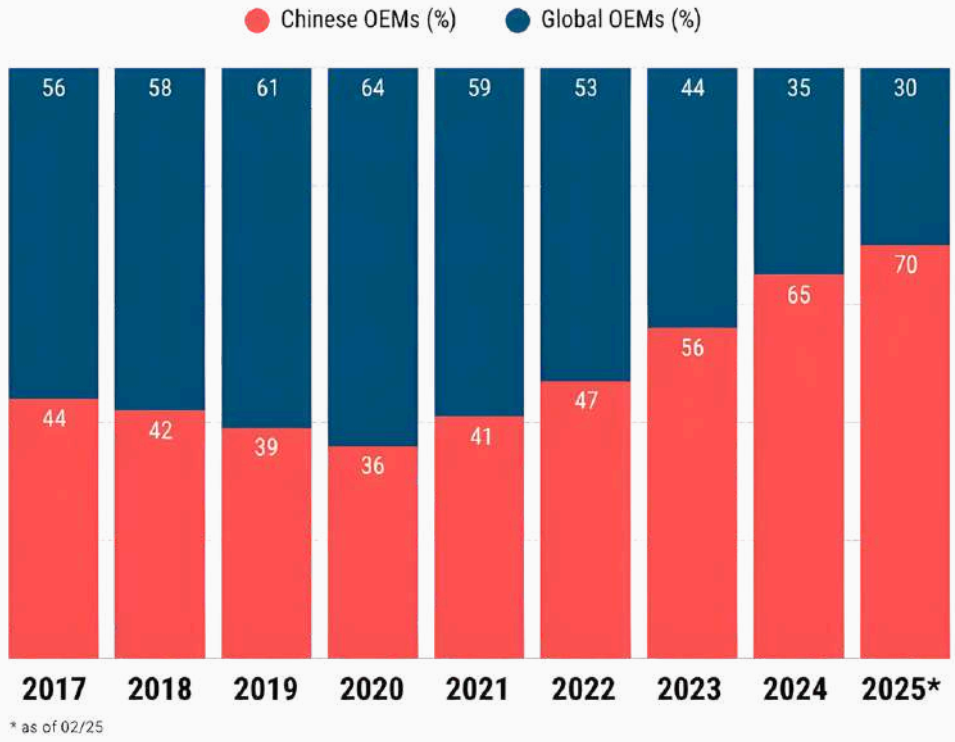
Source of data: Gartner Digital Automaker Index, 2025

Chinese Market going domestic

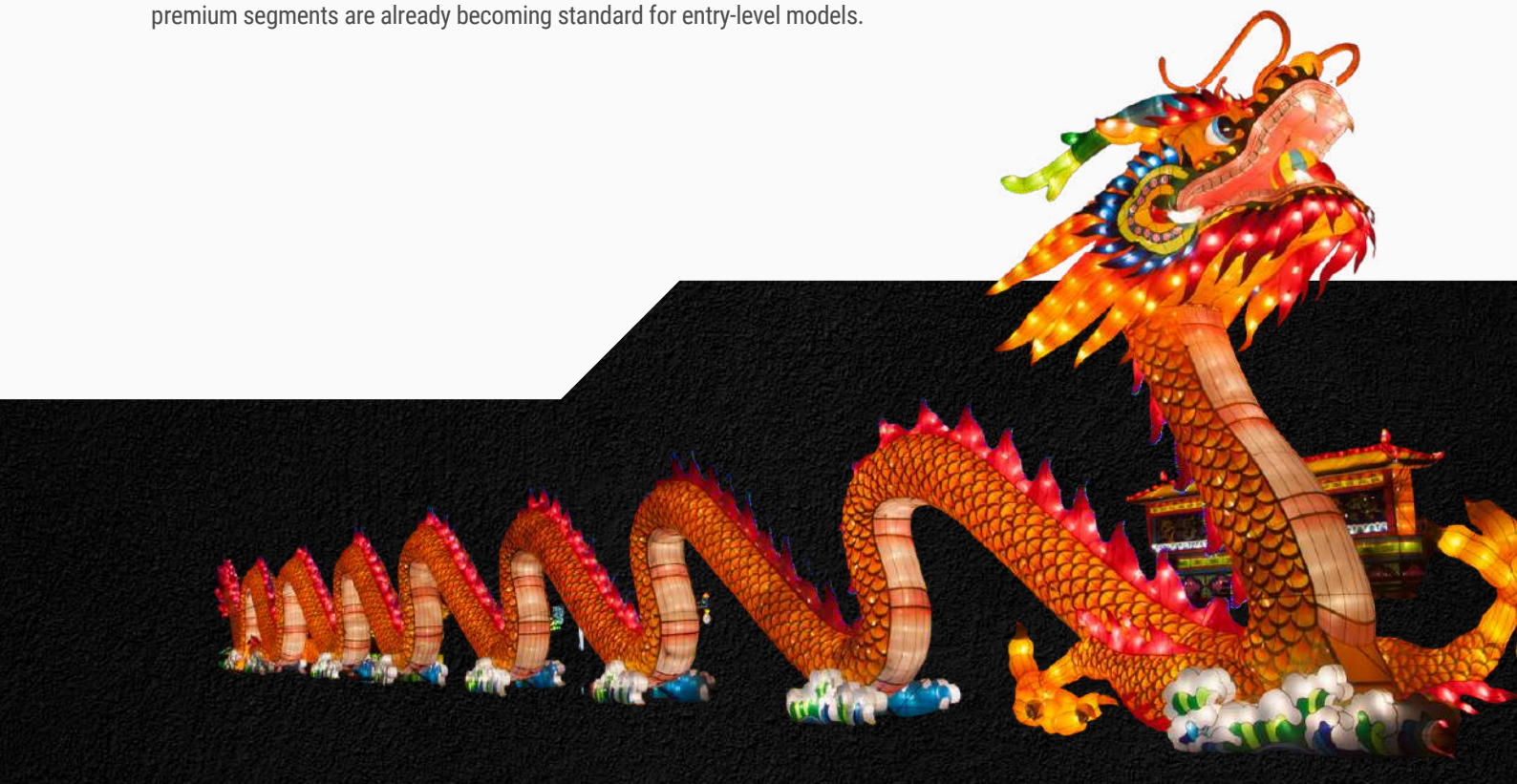
China's automotive market has undergone a structural shift. Foreign automakers, especially Europe's traditional manufacturers, are losing ground as their market shares decline and their product offerings lag behind local expectations. German OEMs face the heaviest pressure: Volkswagen sells over one million fewer vehicles than four years ago, while Mercedes, Audi, BMW and Porsche are also experiencing significant drops. Porsche's sales in China fell by 33% in 2024 alone.

Chinese consumers now buy a majority of domestic EVs, which have grown from a 36% share in 2020 to 65% in 2024.

Market Share of Carmakers in China (%): Western Carmakers Losing Ground



In China, concerns for battery capacity and range are diminishing and customers are now focusing on completely different parameters like Advanced Driver Assistance Systems (ADAS) systems and advanced vehicle autonomy. Cars are increasingly becoming a computer on wheels with 100% connectivity. The software designed vehicle is becoming a staple with the goal of making hardware costs cheaper and regular updates easier. Traditional car companies are falling behind in this regard, measured by digitalization and digitization of products and processes. Brands are working to embed supercomputers to leverage more powerful chips, for example car interiors are focused on digitization and user experience. Voice control with AI assistance, ADAS features, 'infotainment' and displays previously reserved for premium segments are already becoming standard for entry-level models.



Chapter 3:

EU vehicle emissions regulation having impact

Automakers put profits first

Despite a dramatic decline in Li-ion battery pack prices, this has not translated to lower EV prices in Europe as it has in China. This is mostly attributable to European OEM pricing strategies, which have focused on high-profit premium models (SUVs make up 60% of EV sales), while postponing the release of affordable small segment models that are less profitable. This explains why, in Europe, the premium, large-car segment is the most electrified, and the small-car segment the least.

As a result, in 2024, about 5% of BEV models (compared to 25% of ICE vehicle models) were priced below EUR 30,000, and only 3% below EUR 25,000 — widely regarded as a tipping point for mass adoption. In **Germany**, the average BEV price was 20% higher than its conventional equivalent, with small-segment BEVs pricing out at around 50% higher than their conventional equivalents.

Comparatively, in China, 2/3rds of BEVs sold — and nearly all small BEVs (representing 10% of sales) — were priced below the conventional ICE equivalent.

Vehicle emissions regulation impact on affordability

It is well known that the transportation sector — and road transportation in particular — presents the greatest challenge to EU decarbonization efforts. It is the only sector where greenhouse gas emissions have **risen** since 1990. By 2022, global CO2 emissions from transport had already rebounded to near pre-Covid levels. Around **70%** comes from road transportation and about **60%** of this from cars and vans.

The European Union has responded with two key legislative instruments aimed at reducing emissions from new passenger cars and vans. Regulation (EU) 2019/631 sets fleet-wide carbon dioxide targets, while the Euro 7 framework introduces stricter limits for exhaust emissions as well as non-exhaust emissions from tyre abrasion and brake particles.

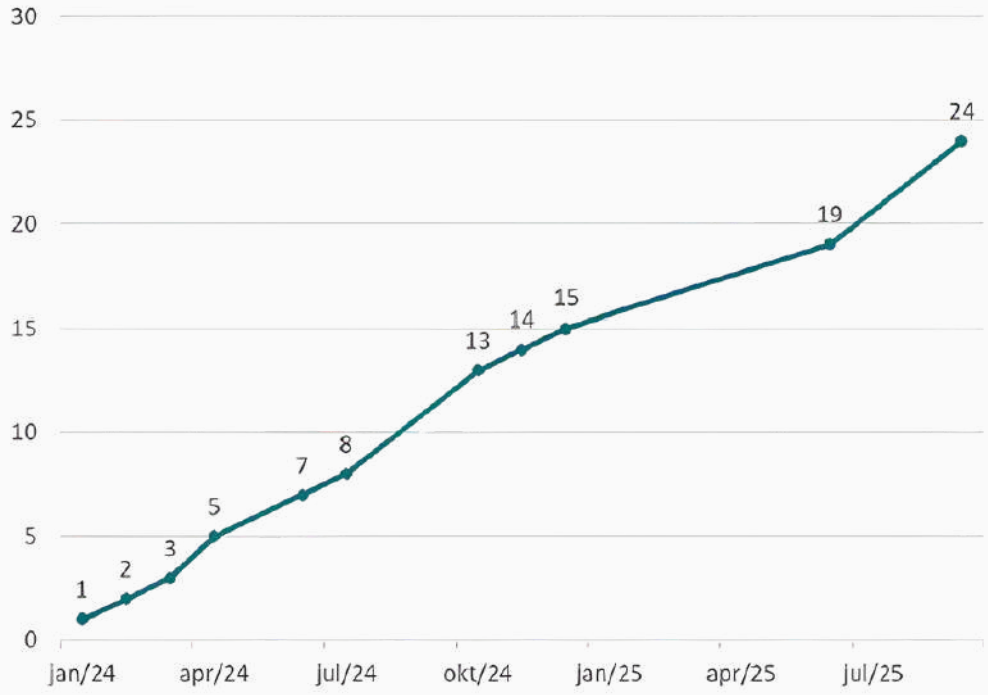
Under the current legally binding rules focused on CO2 emissions, new passenger cars and vans registered from 2035 are expected to achieve a 100% reduction in tailpipe carbon dioxide emissions compared with the baseline. However, following months of debate and sustained lobbying by various stakeholders, the EC formally proposed revisiting this target.

In December 2025, the Commission's Automotive Package proposed a 90% reduction from 2035, coupled with a 10% flexibility mechanism that could allow limited registrations of internal combustion engine vehicles, subject to additional decarbonisation conditions and offsets.

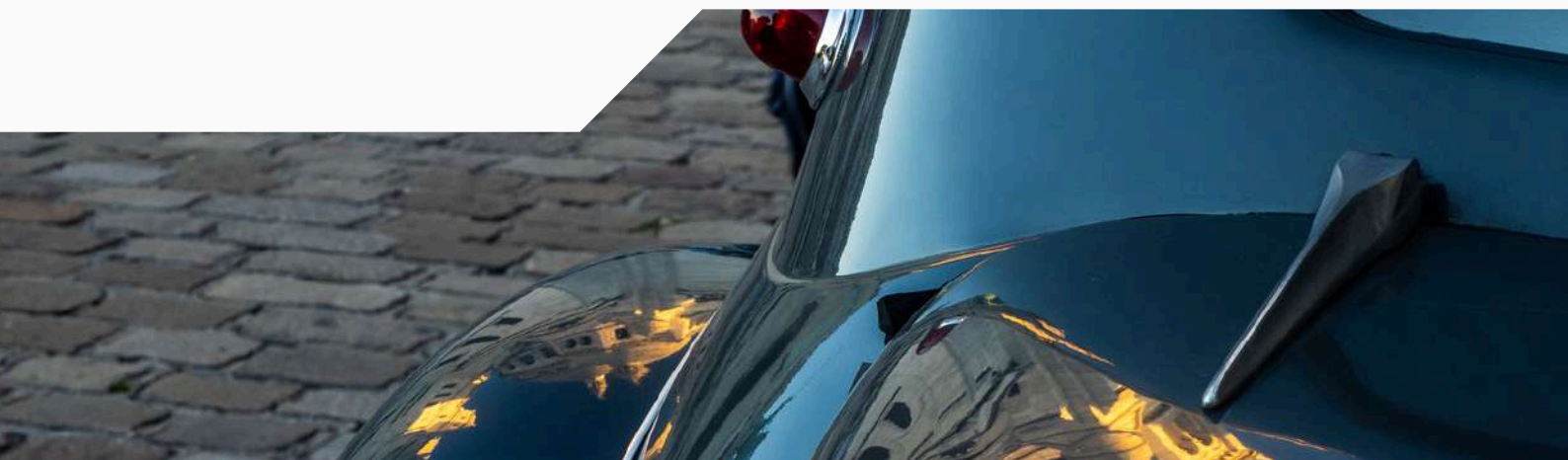
The strengthened emissions target regime beginning in 2025 is a crucial intermediary step towards the 90% tailpipe emissions reduction goal for 2035. Unfortunately many European OEMs fell short, blaming insufficient demand for BEVs and the discontinuation of subsidy programs in key markets for flagging sales. However, their profit maximizing strategy also shares responsibility for the low volume of BEV sales. In order to avoid steep penalties, the European automotive industry successfully lobbied for a one-time flexibility measure.

Nonetheless, there can be no doubt that the legislation is having its intended, if delayed, effect by bringing more affordable small segment vehicles to the market. In 2025 Stellantis and Volvo introduced new small segment vehicles at price parity with ICE, in the EUR 20-25,000 range, that will allow them to comply with the EU target, and VW will release similar models in 2026 and 2027. In all,10 BEV models priced under EUR 25,000 are expected by the end of 2026. Models under EUR 30,000 have risen sharply since January 2024. As a result, after stagnating in 2024 EU BEV sales increased by 24% across the first three quarters of 2025.

BEV passenger cars with retail price under EUR 30,000



Source: Transport and Mobility Leuven



Chapter 4:

ICE decoupling and electromobility adapting in Visegrad countries

The state plays a crucial role in the electromobility transformation, going a long way towards determining whether economies and societies will adapt and transform or be left behind over the next decade.

A successful transformation requires stable and predictable policies that encourage electromobility investment and consumer spending, creating a domestic market to grow local SMEs and attract FDI.

Industrial strategy

The industrial strategy needs to strike a delicate balance between appeasing large foreign multinationals and allowing innovative SMEs to flourish, for example in the manufacturing and deployment of charging infrastructure, vehicle software and data analytics space. The FDI model that brought the automotive industry to the region should be instructive for batteries. It created an environment of low knowledge transfer, innovation spillover and value-added, making it difficult for local SMEs to match productivity.

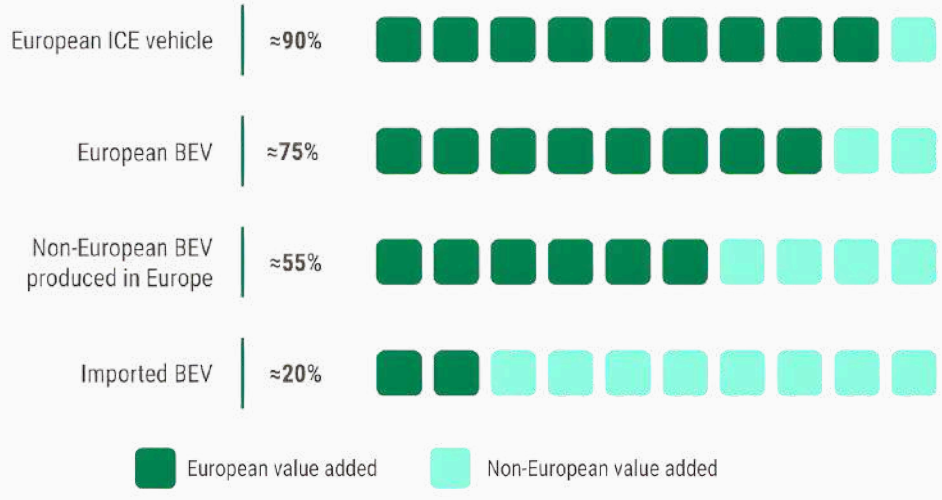
Gigafactories are a pre-requisite

While there are several niche specializations from within the diverse battery supply chain, such as upstream industry mineral extraction, refining and chemical treatment of metals, and end-of-life management of battery materials, battery gigafactories are the most natural fit for well-established automotive manufacturing hubs like the Visegrad countries. The compact CEE and Visegrad geography enables efficient logistics for the automotive and rapidly emerging battery value chain which accounts for over 30% of the value added in automotive.

CEE automotive and and battery ecosystem map

More than fit, gigafactories are absolutely essential for these countries to mitigate sizable GDP and job losses associated with ICE powertrain production (motors and transmission). It is also an opportunity to participate in the highest value added component of EVs they are producing.

European value added as % Manufacturer's Suggested Retail Price (MSRP)



Source of data: McKinsey, 2025

Thus, Visegrad 4 (V4) governments are each pursuing battery production FDI using different tactics and to varying degrees of success, competing against one another and other Member States, namely Spain and Portugal, in four key areas prioritized by multinationals:

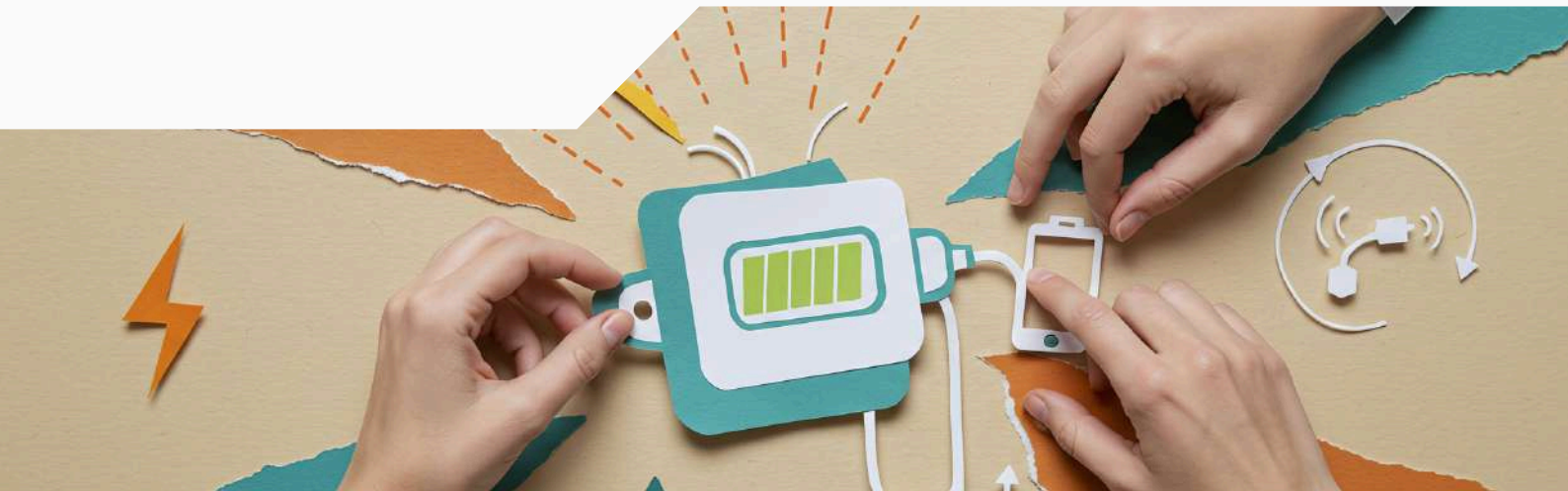
- **State subsidies:** The new, looser EU state aid framework encourages more state aid spending, which puts V4 countries at disadvantage to wealthier Western Member States that have more financial firepower.
- **Skilled labor:** V4 countries are struggling to deliver needed labor market reforms and have a shortage of skilled workers that must be supplemented by foreign workers.
- **Power price:** V4 industry electricity prices are above the EU average, with Hungary and Slovakia among the highest in the EU.
- **Electromobility adoption:** V4 countries are among the lowest in EV penetration, but there are positive signs of growth.

Hungary and Poland have each pursued classical, wholly owned FDI models (with CATL and LG respectively), reminiscent of the previous arrangement with foreign automakers, that are dependent on imported foreign technology with little spillover effect. Poland incorporates a more robust labor upskilling programme featuring Tier 1 operated internal academies and migration of engineers and technicians to domestic SMEs, while Hungary mostly imports high-level engineers and benefits from labor spillover at the operational and manufacturing levels.

Slovakia, alternatively, has pursued a joint-venture FDI model (between domestic SME InoBat and Gotion) that provides a degree of co-development and potential for high quality technology and labor spillover by way of a research and development center.

Czechia, meanwhile, has not defined a national industrial strategy for batteries, and its pursuit of green field battery FDI has struggled with delays stemming from disagreements between national and local governments.

Within the Visegrad countries, Hungary is currently the largest producer (around 90 GWh, goal of 200 GWh by 2030), just ahead of Poland (around 65 GWh of listed/planned 106 GWh). Slovakia plans to produce 20 GWh by 2026/2027, while Czechia has not announced any firm projects.



Beyond batteries

The future of mobility and transportation stretches far beyond batteries, to chips and semiconductors, smart grids, data processing and AI automation, the very components underpinning the electrification of the economy. This broader linkage between the transportation and energy sectors (so-called sector coupling) offers a range of specializations.

As such, EVs will create a multi-billion euro market opportunity for EU industry in distribution grid development, including the digitalization of the grid, along with manufacturing, installation and maintenance of public charging. Through vehicle-to-grid (V2G) technology, EVs become household batteries that can be aggregated with other distributed energy sources (DES) using software to participate in energy markets.

Automakers are already pointing to the **lagging** pace of energy and charging infrastructure development that is hindering new and digitalized technologies.

Furthermore, software will become a more distinguishable and important feature of the car than the hardware itself. The software integrates a complex system of independent components into a singular operating platform, effectively turning the car into a computer on wheels. By one estimate, in **15 years** more than half of the value of a new vehicle will be in software and digital services.

Public information and communication

With the longstanding barriers to EV adoption eroding - especially the rise of affordable new and used models coming to market - the importance of providing foundational EV knowledge and experience to CEE consumers and training for sales representatives takes on even more significance.

Targeted communication strategies need to explain and justify the electromobility transformation rather than dictate it. A segment of the public opposes electromobility due to a feeling that Brussels is pushing too forcefully and thus limits their right to choice and endangers their affordable mobility. The language of a 'ban' – even ten years from now — for something so deeply ingrained in daily life as the ICE triggered anxiety particularly among the elderly population and rural communities, providing an opening for politicians to take up the cause to 'save' the combustion engine and attack electromobility. Therefore, it is important to take back control of the narrative using data and facts.

Conclusion

It has been abundantly clear for years now that electromobility is the future of road transportation. The late start in Europe has left its automotive industry battered, divided and scrambling to catch-up, with more questions than answers. It faces enormous pressure from low cost and technologically advanced Asian competitors in the EV market and is years behind in battery development, but there is no choice other than to press forward.

The Visegrad countries have long been aligned with automotive powerhouses Germany and Italy in resisting stricter EU vehicle emission legislation and seeking carveouts to preserve combustion technology beyond 2035, when it will be an obsolete uncompetitive technology. Political and corporate leadership will need to accept the inevitable scaling-down and job losses for least performing companies in the fading ICE segments (motor powertrain and transmission) and shift their attention to developing a new regional battery production supply chain for EVs, while also prioritizing a more open innovation ecosystem for domestic SMEs.

The only way for local companies to grow from R&D to product deployment is to foster public acceptance and incentivize demand for electromobility. 2025 marks a major turning point in Europe for affordability, the biggest barrier to mass EV adoption, with the introduction of new small segment EVs at ICEV price parity in the EUR 20–25,000 price range, alongside the first wave of 2nd hand EVs. It is paramount that these models are made available in CEE markets and are properly promoted as part of a wider information and educational campaign explaining not only the benefits of electromobility but its inevitability.

Main data sources

European Alternative Fuel Observatory:
https://alternative-fuels-observatory.ec.europa.eu/transport-mode/road

Transport & Mobility Leuven:
https://www.tmleuven.be/en/project/Monitoring-the-shift-to-zero-emission-vehicles-in-Europe

E-MOBILITY PLATFORM.cz

psnm POLSKIE STOWARZYSZENIE NOWEJ MOBILNOŚCI

SEVA Slovak Electric Vehicle Association