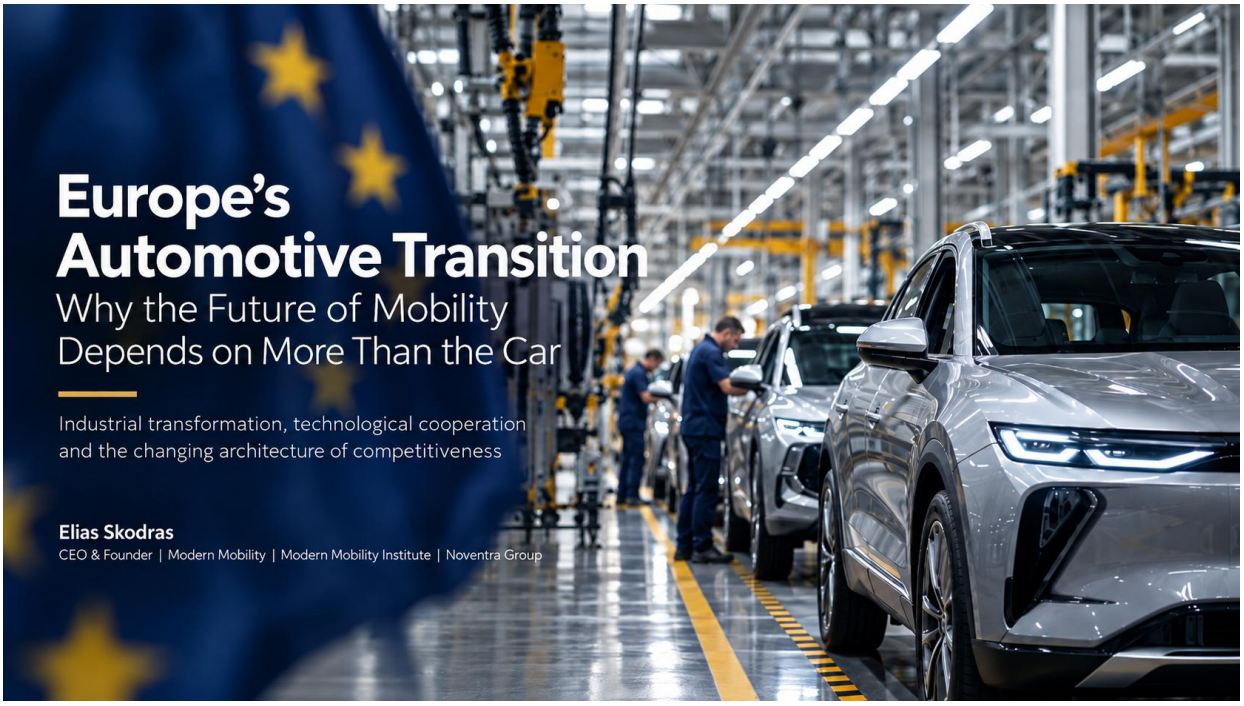
MODERN MOBILITY | RESEARCH & PERSPECTIVES

Europe's AutomotiveTransition

Why the Future of Mobility Depends on More Than the Car

Industrial transformation, technological cooperation and the changing architecture of competitiveness



Nitra, SK, September 2026 – Modern Mobility Institute

Beyond the Electric Vehicle

Europe's automotive industry is not simply facing a transition from combustion engines to electric drivetrains. It is confronting a more fundamental question: how should industrial value be created, organised and sustained when the automobile becomes part of an increasingly interconnected technological, energy and service ecosystem?

The distinction matters.

For more than a century, the automotive industry's competitive model has been built around the development, manufacture and distribution of vehicles. Engineering excellence, manufacturing efficiency, supplier relationships and brand strength have been the foundations of competitive advantage.

These capabilities remain essential. But they are no longer sufficient on their own.

Electric propulsion, software-defined vehicle architectures, advanced driver assistance, connected services, battery technologies and changing patterns of mobility are transforming both the product and the industrial relationships behind it.

At the same time, the success of electrification increasingly depends on factors beyond the vehicle itself: energy availability, charging infrastructure, electricity prices, infrastructure investment, fleet economics and the ability of different industries to coordinate implementation.

> **The central challenge is therefore not simply to manufacture better electric vehicles. It is to develop the industrial and operational systems in which these vehicles can become economically and functionally successful.**

This has important implications for European manufacturing, market adoption, employment and global competitiveness.

1. A Growing Market Does Not Automatically Mean a Successful Industrial Transition

The global electric vehicle market has undergone extraordinary growth.

According to the International Energy Agency's Global EV Outlook 2026, worldwide electric car sales exceeded 20 million in 2025, representing approximately one-quarter of new car sales. Europe recorded approximately 4.2 million electric car sales, accounting for around 28% of its market. These IEA figures include battery-electric and plug-in hybrid vehicles. [1]

Growth has continued.

Figures published by the European Automobile Manufacturers' Association (ACEA) show that battery-electric vehicles alone accounted for 21.7% of new passenger car registrations in the European Union during the first eight months of 2026, compared with 15.8% during the corresponding period in 2025. [2]

These developments demonstrate that electrification is advancing. However, growing demand does not, by itself, establish whether European manufacturers will capture a corresponding share of future industrial value.

A region may experience increasing electric vehicle registrations while remaining dependent on imported battery cells, critical materials, software components or manufacturing technologies.

Similarly, a manufacturer may sell more electric vehicles without necessarily achieving the profitability, production efficiency or technological independence required for long-term competitiveness.

This distinction between market adoption and industrial transformation is essential.

The relevant question is not only how many electric vehicles are sold, but also where their value is created, which organisations control the underlying technologies and whether the resulting industrial structures are economically sustainable.

2. Germany: When Industrial Excellence Meets Architectural Change

Germany offers a particularly important example.

Few countries possess comparable strengths in automotive engineering, precision manufacturing, industrial automation and sophisticated supplier networks.

These capabilities were not developed overnight. They are the result of decades of accumulated knowledge, industrial investment, specialised employment and continuous improvement.

It would therefore be misleading to describe Germany's current challenges as a simple failure to recognise electric mobility.

The more interesting issue is how established industries respond when the structure of competitive advantage changes.

Research on architectural innovation provides a useful conceptual perspective. Henderson and Clark demonstrated that established organisations can encounter difficulties when innovation changes the relationships between technological components, even if many of the individual components remain familiar. [3]

This distinction is particularly relevant to the automotive transition.

A traditional vehicle manufacturing organisation is highly experienced in managing complex mechanical systems, production processes, supplier hierarchies and long development cycles.

An increasingly software-defined and electrically powered mobility system requires additional capabilities and different forms of integration.

Software architectures evolve on different development cycles. Battery supply chains operate according to different industrial economics. Digital services create relationships extending beyond the initial vehicle sale. Charging and energy infrastructure introduce dependencies that conventional vehicle manufacturers cannot resolve through automotive engineering alone.

The challenge is therefore not necessarily a lack of engineering competence.

> **It is the difficulty of reorganising highly successful existing capabilities around a different industrial architecture.**

This is not unique to Germany. It is a recurring challenge in technological transitions, particularly where established business models, investment commitments and organisational structures have been optimised over several decades.

Nor does it mean that European manufacturers have remained inactive. Considerable investment and restructuring are already underway.

The question is whether the pace and organisation of change are sufficient to secure future competitiveness.

3. From Manufacturing Everything to Orchestrating Capabilities

One of the most consequential strategic questions concerns the boundaries of the automotive manufacturer itself.

For decades, control over vehicle development, production, suppliers and distribution has been central to the industrial model.

But future value creation increasingly involves technologies and services that extend well beyond traditional vehicle manufacturing.

These include software platforms, driver assistance systems, connectivity, digital services, battery management, charging, energy integration and mobility services.

No single organisational model is necessarily optimal for all these activities.

Some technologies are strategically important enough to justify direct ownership or internal development. Others may be more effectively developed through partnerships, specialised suppliers, shared platforms or industrial cooperation.

The key is to distinguish between capabilities that must be controlled and capabilities that must be coordinated.

This question has also shaped our own professional experience.

In earlier vehicle design and mobility development work, we were already considering the automobile not simply as an individual product, but as a platform connecting vehicle architecture, software, driver assistance, services and wider mobility applications.

The underlying idea was that the value of a vehicle increasingly depends on the interaction between these components.

Our experience with partners in India has also brought a related industrial question into focus.

Developing a vehicle concept and establishing a new automotive manufacturing company are fundamentally different undertakings.

The latter requires substantial capital, production infrastructure, regulatory capabilities, supplier management, distribution networks and long-term operational commitments.

Consequently, an alternative strategy is to contribute design, engineering and development capabilities through cooperation with established automotive manufacturers rather than attempting to replicate the entire manufacturing structure.

Such cooperation is not automatically the superior approach. It depends on intellectual property arrangements, bargaining power, commercial incentives and the capabilities of the partners involved.

But it illustrates a broader principle.

> **Industrial competitiveness increasingly depends on knowing what to develop independently, what to acquire and what to achieve through cooperation.**

For Europe, this raises questions extending well beyond individual companies.

Can European manufacturers, technology developers, suppliers and research institutions cooperate more effectively without surrendering strategically important capabilities?

Can smaller innovative organisations gain meaningful access to established industrial production and distribution systems?

And can such cooperation accelerate implementation rather than becoming another layer of organisational complexity?

These questions deserve as much attention as vehicle specifications or sales forecasts.

FIGURE 01 | NEW MOBILITY VALUE SYSTEM



4. Electric Vehicle Adoption Is an Economic and Operational Decision

Public discussion frequently presents the adoption of electric vehicles as a matter of consumer preference, environmental awareness or technological acceptance.

These factors matter, but they provide only a partial explanation.

In practice, vehicle adoption depends heavily on economic conditions and operational suitability.

The relevant variables include acquisition cost, financing, depreciation, residual value, energy prices, charging availability, maintenance, vehicle utilisation and the predictability of operating conditions.

For commercial fleets, the decision becomes even more operational.

A vehicle must meet defined transport requirements within the available time, energy and infrastructure constraints.

An electric vehicle may offer attractive operating costs while still being difficult to deploy if charging capacity is unavailable at the required location, if connection costs are disproportionate or if charging interferes with essential operations.

The IEA's 2026 analysis identifies affordability as a major obstacle to broader electric vehicle adoption in Europe. In 2025, fewer than 10% of available battery-electric models in Europe were priced below EUR 30,000, despite meaningful progress in reducing average prices. [1]

Infrastructure presents another challenge.

European public charging networks have expanded significantly. The IEA reports approximately 20% growth in the number of public charging points across Europe during 2025. [4]

Yet the presence of charging infrastructure does not necessarily indicate that it is located where demand occurs, provides sufficient electrical capacity or is economically suitable for every user.

> **A charging point is not equivalent to an operationally viable charging solution.**

The distinction is particularly important for commercial transport, logistics facilities and vehicle depots, where simultaneous charging requirements can create concentrated electricity demand.

Electric vehicle adoption is therefore not a purely automotive issue.

It is influenced by housing conditions, access to private charging, electricity tariffs, grid capacity, transport operations, financing conditions and infrastructure planning.

This also helps explain why adoption rates vary considerably between European markets.

A successful transition must address these differences rather than assume that one technological or financial solution will work equally well everywhere.

5. Global Competition Is Changing the Structure of Automotive Value

The international competitive environment further illustrates the scale of the transformation.

China has established a substantial position in electric vehicle production and battery manufacturing.

The IEA estimates that China accounted for nearly 75% of global electric car production in 2025. The European Union remained the world's second-largest electric car production region, with output growing approximately 30% to nearly 3.2 million vehicles. [5]

These figures reveal both the scale of China's industrial position and the continuing capabilities of European manufacturing.

Battery technology demonstrates another dimension of competition.

According to the IEA, average battery pack prices in China were approximately 35% lower than in Europe in 2025. [6]

Such differences influence vehicle affordability, manufacturing strategies and the economics of local production.

However, China's development should not be interpreted through a single explanation.

Industrial scale, domestic competition, investment, technological development, supply-chain integration and public policy have all played roles in shaping the market.

The United States presents a different industrial environment, with its own combinations of manufacturing capabilities, consumer demand, technology companies, energy conditions and policy incentives.

Europe must therefore compete in a market where the underlying industrial models are not identical.

This is why global competitiveness cannot be assessed solely through vehicle sales.

The location of battery production, access to critical materials, software capabilities, production productivity, capital requirements and the ability to introduce new models efficiently all matter.

So does the capacity to integrate technologies developed outside the traditional automotive industry.

The European Commission's Industrial Action Plan for the European Automotive Sector recognises this broader challenge, addressing innovation and digitalisation, clean mobility, supply-chain resilience, workforce skills and the conditions for industrial competitiveness. [7]

Europe's future competitive position will depend partly on how effectively these areas are translated into industrial capabilities.

Protection of existing value chains may provide some stability, but long-term resilience also requires adaptation, investment and new commercial relationships.

The objective should not be to reproduce every element of another region's industrial model.

It should be to establish a competitive European model capable of combining manufacturing excellence with technological adaptability, international cooperation and economically sustainable production.

6. The Missing Implementation Layer: Mobility and Energy Infrastructure

There is another dimension of the transition that receives considerably less attention than vehicle manufacturing or battery chemistry.

It concerns the infrastructure in which electric mobility must operate.

Transport and energy systems have historically been planned, financed and operated through largely separate institutional structures.

Vehicle manufacturers develop vehicles. Energy companies produce and supply electricity. Grid operators manage networks. Infrastructure owners maintain transport assets. Public authorities regulate and plan. Financial institutions evaluate investments.

Electrification creates new dependencies between these responsibilities.

A logistics depot transitioning to electric vehicles may require changes to electrical capacity, charging schedules, energy storage, local generation, property infrastructure and operating procedures.

An airport may need to coordinate the electrification of ground vehicles with existing energy demand and long-term infrastructure development.

A port may have to consider vehicle charging alongside terminal operations, industrial electricity consumption and future grid requirements.

In each case, the electric vehicle represents only one component of a larger investment problem.

The infrastructure must be technically suitable, economically justified and operationally compatible with the site's primary function.

This is the perspective underlying our present work on Transport Energy Infrastructure (TEI).

Rather than beginning with a preferred technology or a predefined infrastructure product, the approach begins with the conditions of a real transport location.

Five questions are particularly relevant:

1. Is there sufficient and identifiable transport activity?
2. What is the actual or foreseeable energy demand?
3. Is the physical infrastructure suitable for the proposed solution?
4. Is there an identifiable operator with responsibility for implementation?
5. Can the project be engineered, financed and operated on credible terms?

Only when these conditions are understood does it become meaningful to determine which combination of electricity supply, storage, charging, control systems or other technologies is appropriate.

This approach does not assume that every transport location requires a new energy project.

Some locations may justify investment. Others may require adaptation or further validation. Others may not justify implementation at all.

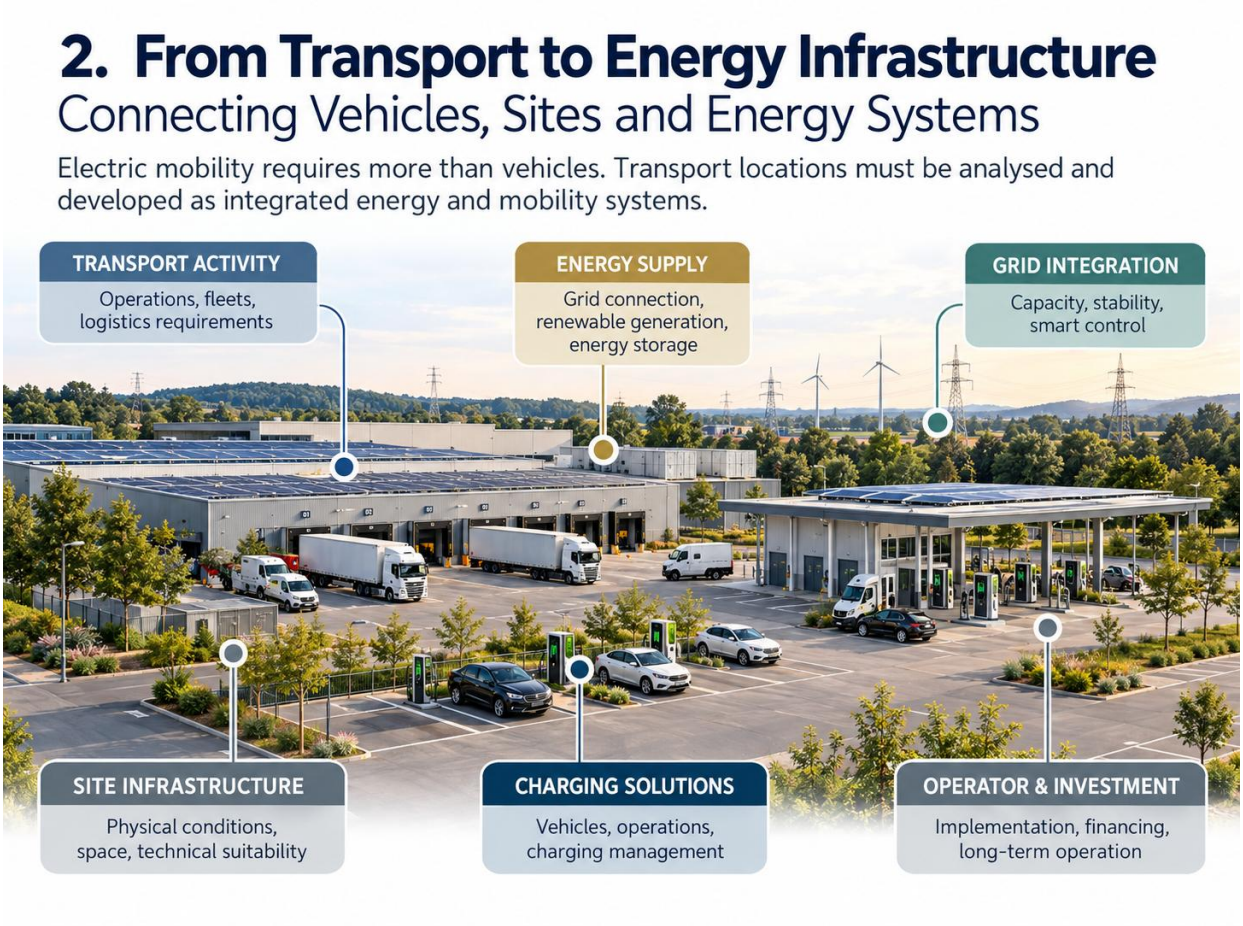
The objective is to establish the technical and economic basis for a decision before capital is committed.

The broader implication extends beyond individual infrastructure projects.

> **If electric mobility is becoming an integrated industrial and energy system, its implementation requires coordination across organisational boundaries that were not originally designed to operate together.**

This is a challenge for manufacturers, infrastructure operators, utilities, financiers and public institutions alike.

FIGURE 02 | FROM TRANSPORT ACTIVITY TO AN INVESTABLE SITE



7. What Europe Needs to Reconsider

The automotive transition is frequently discussed in terms of technological leadership.

But technological capability and industrial implementation are not interchangeable.

A successful prototype does not automatically produce a commercially viable product. A commercially viable product does not automatically create a competitive manufacturing industry. And a competitive electric vehicle does not automatically guarantee successful adoption without the necessary economic and infrastructure conditions.

Europe consequently faces several interconnected tasks.

First, it must preserve and adapt its established engineering and manufacturing capabilities, including the skills and employment structures on which they depend.

Second, it must develop or secure access to strategically important technologies, particularly in software, battery systems, electronics and industrial production.

Third, it must establish forms of cooperation that allow specialised innovators, established manufacturers and infrastructure organisations to combine capabilities without unnecessary duplication of capital-intensive structures.

Fourth, the economics of adoption must receive as much attention as technological performance. Affordability, vehicle utilisation, energy costs and operational practicality ultimately influence market outcomes.

Finally, infrastructure development needs to be integrated into the transition from the beginning rather than treated as a secondary activity after vehicle deployment decisions have already been made.

These priorities involve difficult trade-offs.

Greater vertical integration may strengthen control but increase capital requirements and organisational complexity. Wider cooperation may accelerate innovation but introduce dependencies. Domestic production may improve resilience while requiring substantial investment to achieve international cost competitiveness.

There is no universal solution.

The appropriate choices depend on the technologies involved, market conditions, industrial capabilities and the distribution of investment risks.

What is increasingly difficult to justify, however, is analysing these decisions in isolation.

Conclusion: The Future of the European Automobile Is Larger Than the Automobile

Europe's automotive industry has not lost the industrial knowledge that made it successful.

Its engineering expertise, manufacturing capabilities, supplier networks and research institutions remain substantial assets.

The challenge is that the economic architecture of mobility is changing around them.

Future competitiveness will not be determined by electric drivetrains alone. It will depend on the ability to integrate vehicle technologies, software, energy systems, infrastructure, industrial partnerships and investment decisions into viable models of production and use.

Germany's experience illustrates the complexity of this transition. A highly successful industrial model cannot simply be replaced without significant economic and organisational consequences.

But neither can past success serve as a sufficient blueprint for future competitiveness.

The transition requires preserving valuable capabilities while being prepared to reorganise how those capabilities interact.

It requires cooperation without abandoning strategic judgement, innovation without neglecting industrial economics, and investment decisions grounded in operational reality.

Above all, it requires recognising that the automobile is becoming part of a much larger system.

> **Europe does not need to relearn how to build excellent cars. It needs to reconsider how industrial excellence translates into competitiveness in a fundamentally different mobility ecosystem.**

The future of European mobility will be shaped not only by the vehicles Europe produces, but by the systems, partnerships and industrial capabilities it develops around them.

References and Source Notes

[1] International Energy Agency (2026). Global EV Outlook 2026 – Trends in Electric Cars, including sales, adoption and affordability analysis.

Open verified source ↗

[2] European Automobile Manufacturers' Association (2026). New Car Registrations: January–August 2026, published 24 September 2026.

Open verified source ↗

[3] Henderson, R. M., & Clark, K. B. (1990). “Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms.” Administrative Science Quarterly, 35(1), 9–30.

Open verified source ↗

[4] International Energy Agency (2026). Global EV Outlook 2026 – Electric Vehicle Charging.

Open verified source ↗

[5] International Energy Agency (2026). Global EV Outlook 2026 – Manufacturing and Trade.

Open verified source ↗

[6] International Energy Agency (2026). Global EV Outlook 2026 – Electric Vehicle Batteries.

Open verified source ↗

[7] European Commission (2025). Industrial Action Plan for the European Automotive Sector, COM(2025) 95 final.

Open verified source ↗

About the Author

Elias Skodras is CEO & Founder of Modern Mobility and Noventra Group, and Founder and director of the Modern Mobility Institute, with more than 25 years of professional experience spanning the automotive industry, electrification and mobility development.

His work has evolved from vehicle-related technologies and integrated mobility concepts toward the engineering, integration and implementation of transport and energy infrastructure.

Through Modern Mobility and the applied research activities of the Modern Mobility Institute, his current focus includes Transport Energy Infrastructure (TEI), technology integration and evidence-based infrastructure investment decisions.