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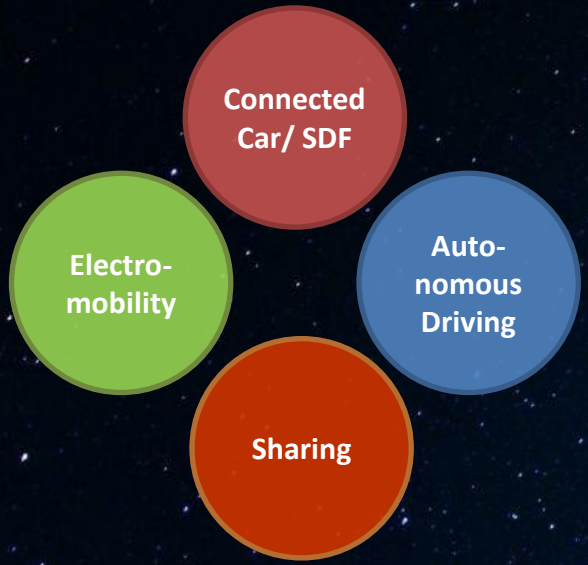
E-Mobility Stage

# Global Crossroads: Challenges and Missed Opportunities for OEMs and Suppliers

Prof. Dr. Stefan Bratzel

Founder/Director Center of Automotive Management (CAM)

# Transformation of the Automobile Industry




## New Challenges

Co Co C O

- Competencies
- Cooperations
- Culture of the Company
- Organisational structures

# Innovation as a Forward-Looking Indicator: A Comparison of OEMs by Country Group

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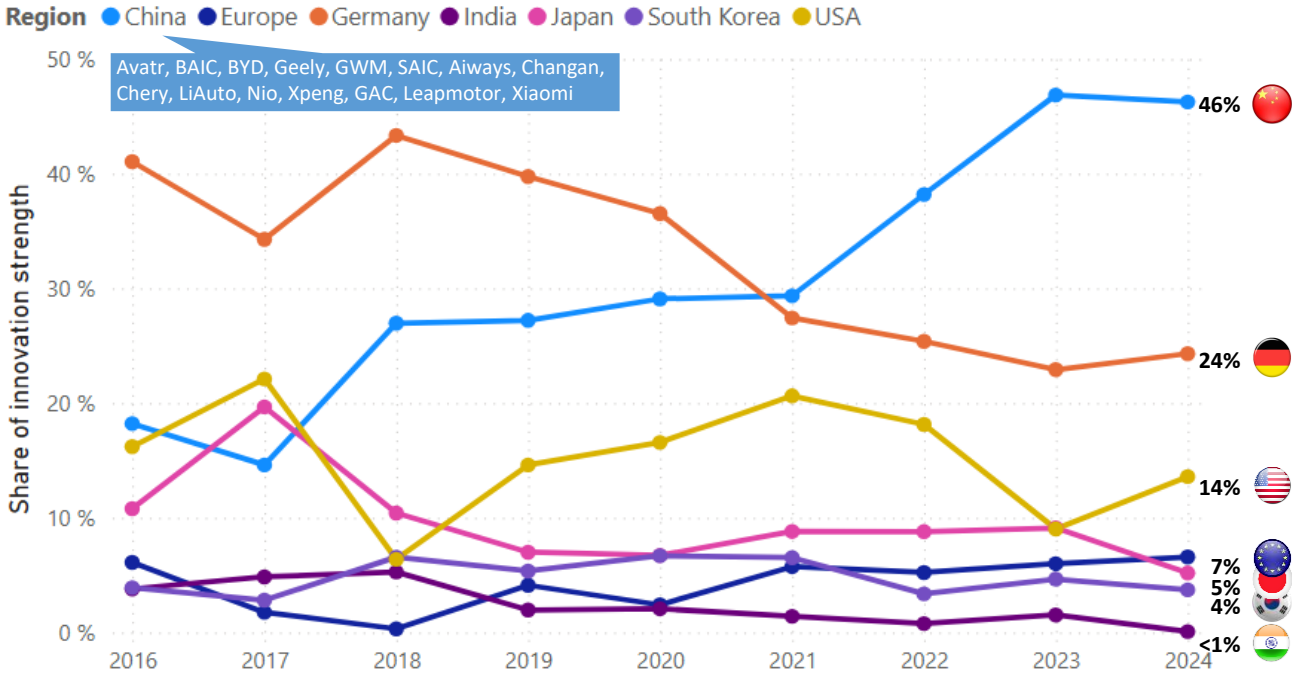
**German car manufacturers must be at least as innovative and superior as they are expensive. However, in recent years, there has been a tectonic shift in innovation power in favor of Chinese automakers.**


**Share of Series Innovation Strength by Country/Region 2016–2024 (in %)**




Source: CAM/ AutomotiveINNOVATIONS Report 2024

# Automotive Production in Germany: Medium- and Long-Term Decline?

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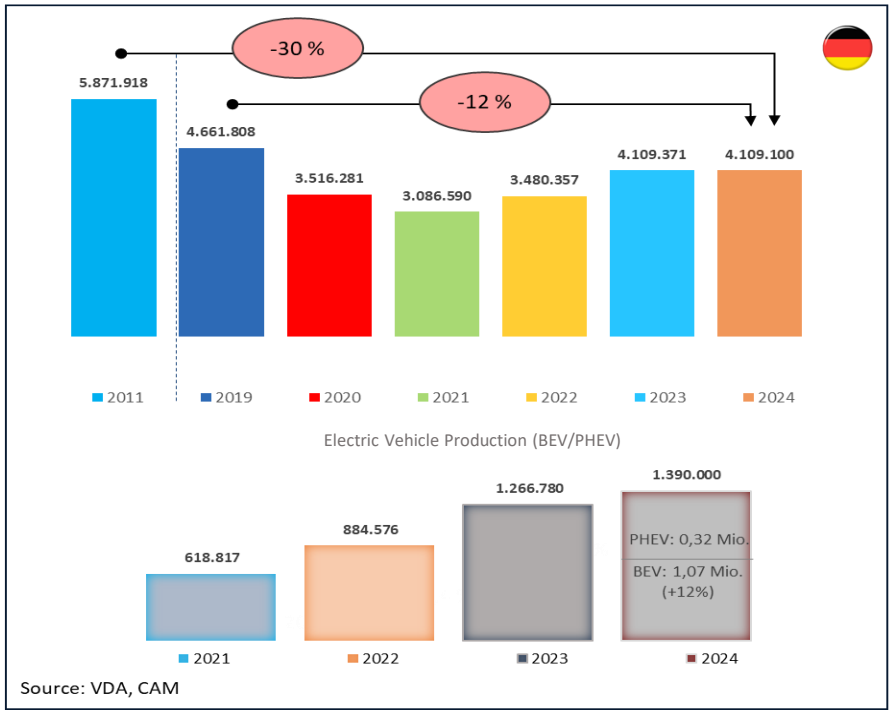
**Structural Competitive Disadvantages of Germany as a Production Location. With a capacity utilization of around 65%, long-term competitiveness is increasingly at risk.**

**AUTOMOTIVE PRODUCTION IN GERMANY (TOTAL PASSENGER CARS)**




Source: VDA, CAM

**Capacity Utilization of Passenger Car Production in Germany (2024)**

| | *Maximum Capacity* | *Production (Units)* | *Utilization* |
|---|---|---|---|
| **Gesamt** | **6.330.000** | **4.109.371** | 64,9 % |
| ***Plants (Selection)*** | | | |
| BMW, Regensburg | 400.000 | 390.700 | 98% |
| Audi, Ingolstadt | 450.000 | 419.906 | 93 % |
| VW, Wolfsburg | 800.000 | 564.584 | 71 % |
| BMW, Leipzig | 400.000 | 260.600 | 65 % |
| Mercedes, Sindelf. | 400.000 | 200.159 | 50 % |
| Tesla, Grünheide | 375.000 | 216.409 | 58 % |
| VW, Zwickau | 360.000 | 318.518 | 88 % |
| Audi, Neckarsulm | 225.000 | 86.116 | 38 % |
| Opel, Eisenach | 100.000 | 59.875 | 60 % |
| Ford, Saarlouis | 400.000 | 114.171 | 29 % |
| Ford, Köln | 400.000 | 19.974 | 5 % |

# Decline in Automotive Industrial Jobs Due to Transformation and High Costs

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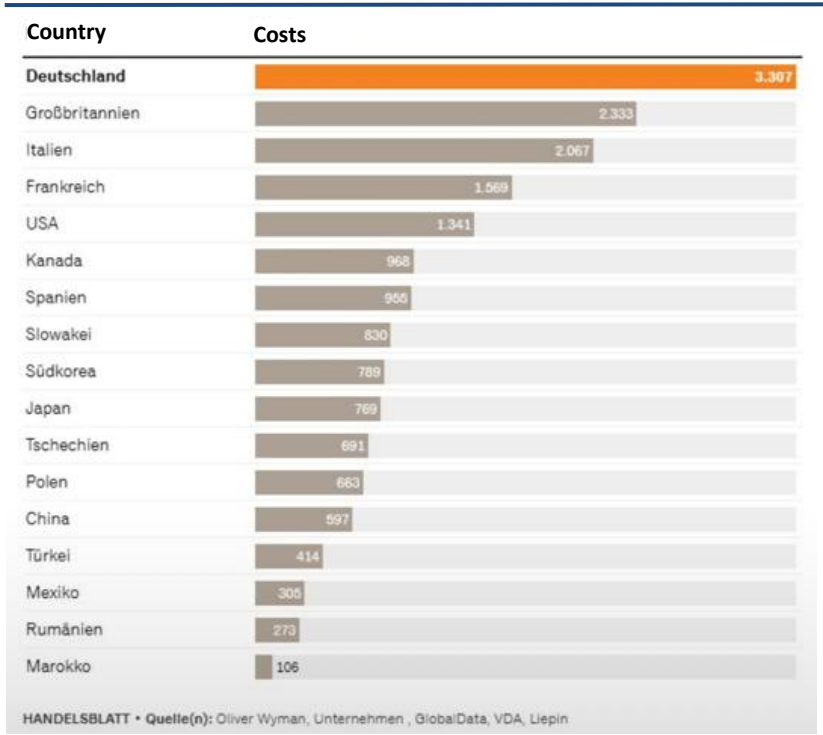
**Electrification and automation in automotive manufacturing are driving a significant decline in industrial employment—not only among carmakers but also in the machinery and supplier industries. One key reason: electric vehicles require less manufacturing depth.**

**Labor Costs per Vehicle in 2024 (by Country, in US Dollars)**




Quelle: Handelsblatt, 7.5.2025

**Planned Job Cuts by Selected Suppliers and OEMs**

| OEMs/Supplier | Job Cuts / Measures | Reason |
|---|---|---|
| ZF | **-14.000** (by the end of 2028) | Delayed ramp-up of e-mobility, high costs, and resulting lower margins in the traditional transmission business |
| BOSCH | Up to 60,000 worldwide (by 2030) | Stagnating vehicle production, overcapacity in the automotive industry, and intensified competitive pressure |
| Continental | Already cut in Germany: **approx. 5,400 jobs** Planned additional cuts: **2,110 jobs** | Adjustment to changing market demands, as demand for traditional products such as rubber moldings, hoses, and combustion engine components is declining |
| SCHAEFFLER | Reduction of **4,700** jobs by **2027**; closure of two sites | Revenue below market expectations; adjustment to market conditions and consolidation (including merger with Vitesco) |
| VW | **35,000 jobs** in Germany by **2030** | Overcapacity, high labor costs, efficiency improvements, competitive pressure |
| Mercedes | **10% cost reduction** in production by 2027 | Profit slump, cost reduction, market shift, competitive pressure |
| Porsche | Around **1,900** jobs will be cut by **2029** | Declining sales (especially in China); cost control and efficiency improvements |
| Audi | Reduction of **7,500** jobs by **2029** | Declining sales, especially in China and the US; efficiency improvements and cost reductions |

# Market Trends for Electric Passenger Cars in Key Global Regions (2024)

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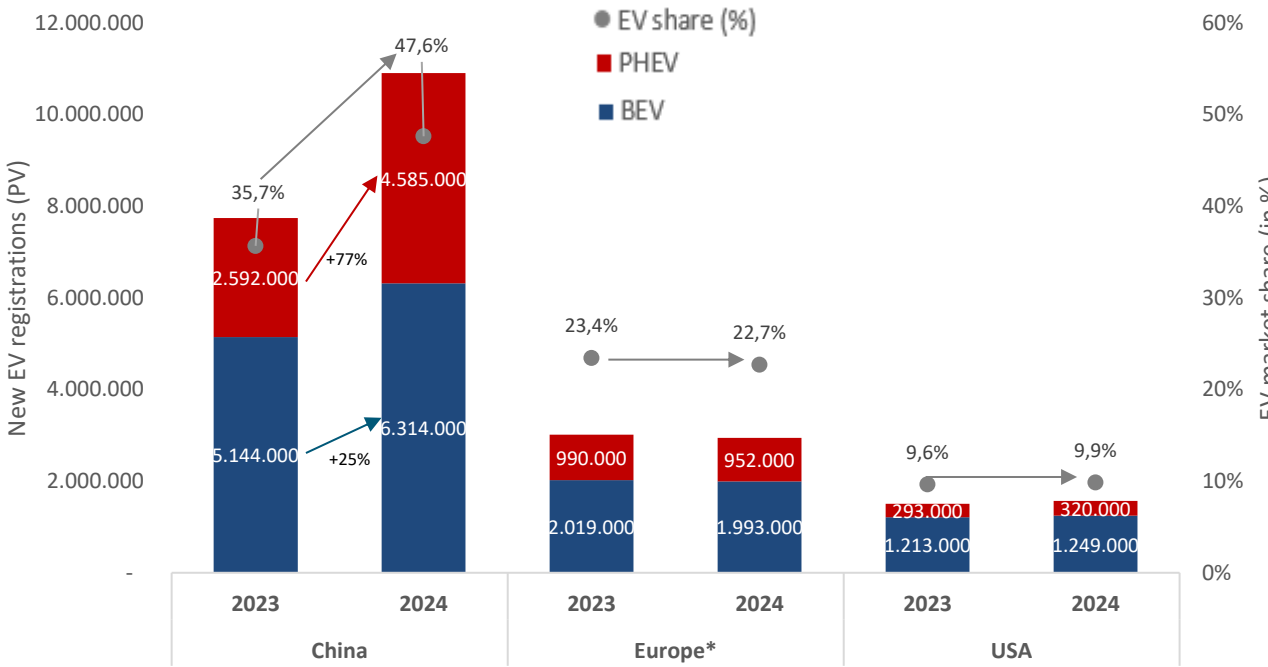
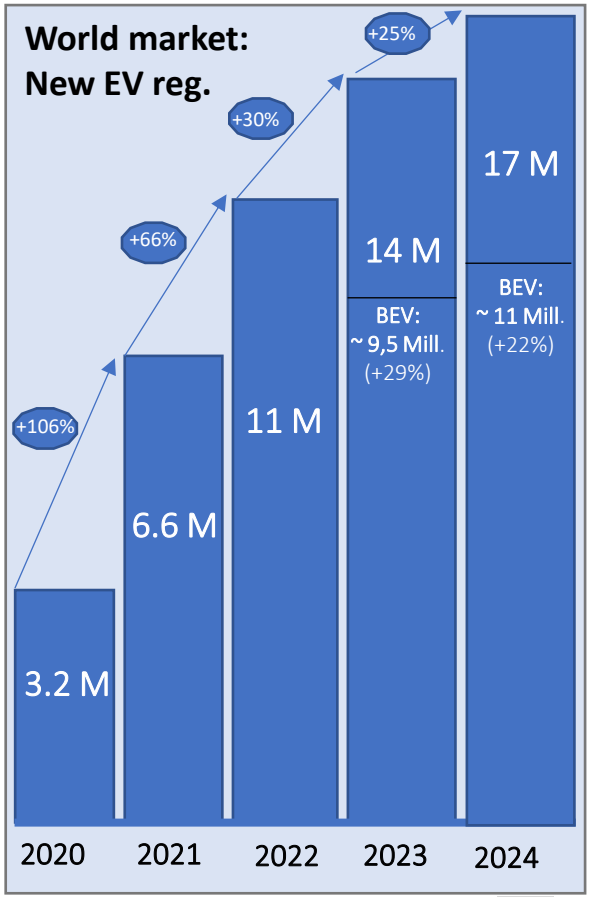
**China is the lead market with around 50% electric vehicle share (BEV/PHEV) in new registrations – stagnation in Europe and the US.**

## New EV registrations / market shares in the core regions 2023/24




Source: CAM

Figure MW003c Source: CAM Ann.: * EU+EFTA+UK

# Electromobility in Key European Countries – Q1 2025

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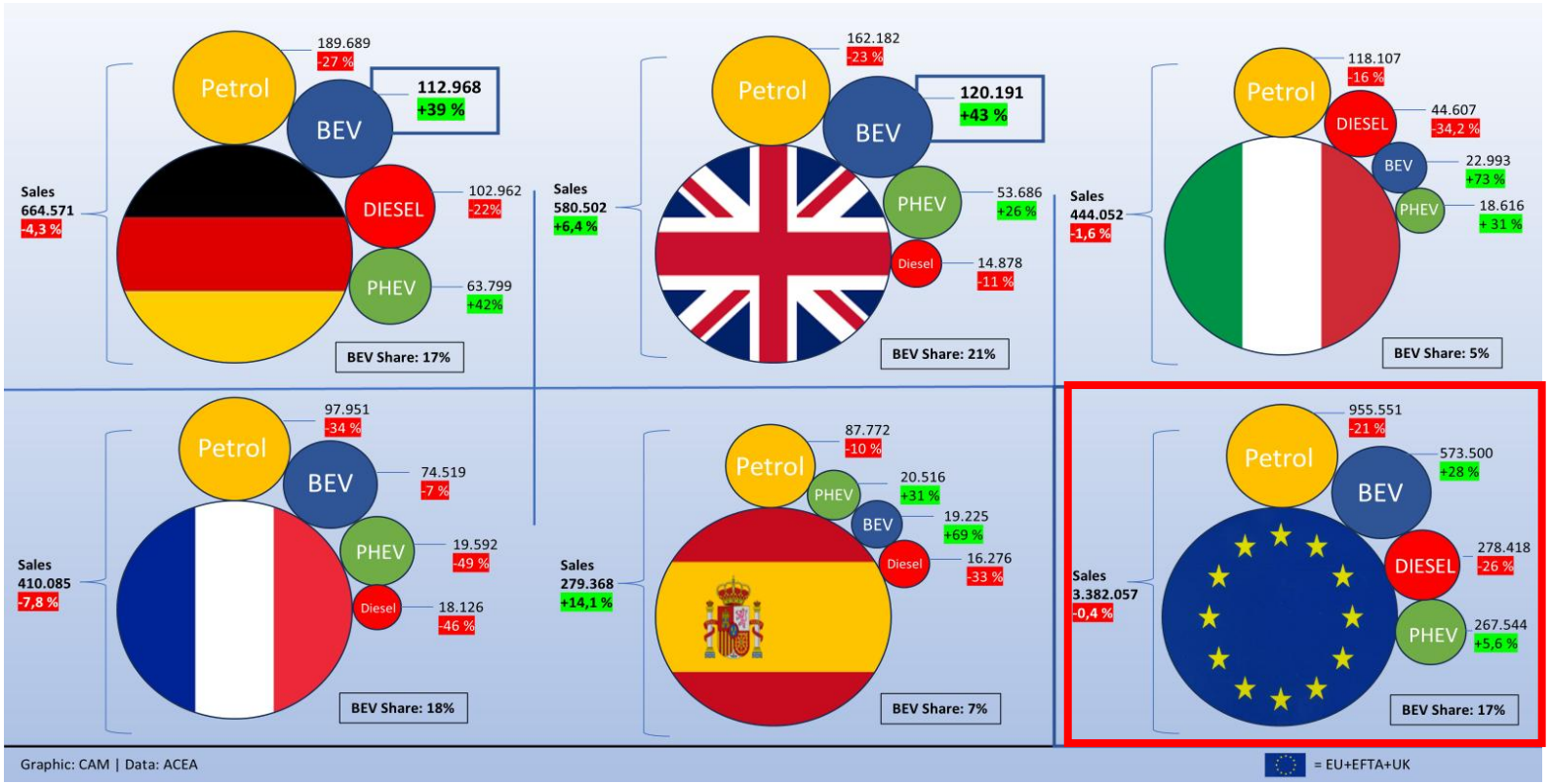
**E-mobility in Europe picks up strongly in 2025: BEV registrations rise by 28% in Q1.**



# BEV registrations in GERMANY by selected groups/countries (Jan - Apr 2025/2024)

BEV

Total BEV registrations in GER: 158.503 (+42,8 %) | BEV Share 17,5 %

**75.195**
+ 135 %

VOLKSWAGEN GROUP

35.118 +140%
13.474 +150%
12.024 +53%
11.259 +261%
3.320 +221%

BEV Share: 19,3 %

**17.896**
+ 43 %

BMW GROUP

14.466 +26%
3.430 +233%

BEV Share: 20,8 %

**13.264**
- 19 %

3.464 -29%
3.225 -19%
2.028 +252%
1.281 -76%

BEV Share: 36,3 %

**12.476**
+ 35 %

7.787 +45 %
4.571 +22 %

BEV Share: 25,2 %

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**10.165**
+ 36 %

STELLANTIS

5.160 +70 %
2.374 +2 %
1.328 +131 %

BEV Share: 10,3 %

**9.777**
-38%

5.820 -60 %
3.916 +298 %

BEV Share: 23,7 %

**9.716**
-11 %

9.716 -11%

BEV Share: 11,7 %

**5.488**
+ 38 %

Renault Group

3.557 +99 %
1.931 -12 %

BEV Share: 13,5 %

**3.115**
+ 67 %

2.261 +173 %
664 +65 %
102 +252 %

BEV Share: 5,6 %

Graphic: CAM | Data: KBA

**China**: Volvo, MG Roewe, BYD, Smart, Polestar, Leapmotor, GWM, Xpeng, Lotus, Nio, Lynk&Co, Maxus, Chery

# China's Automotive Market: "The Party Is Over"

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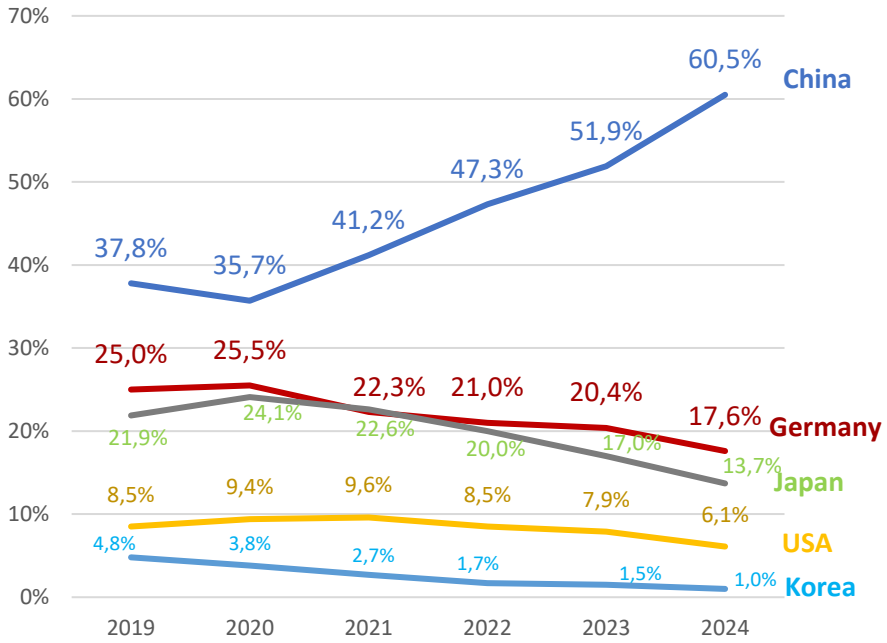
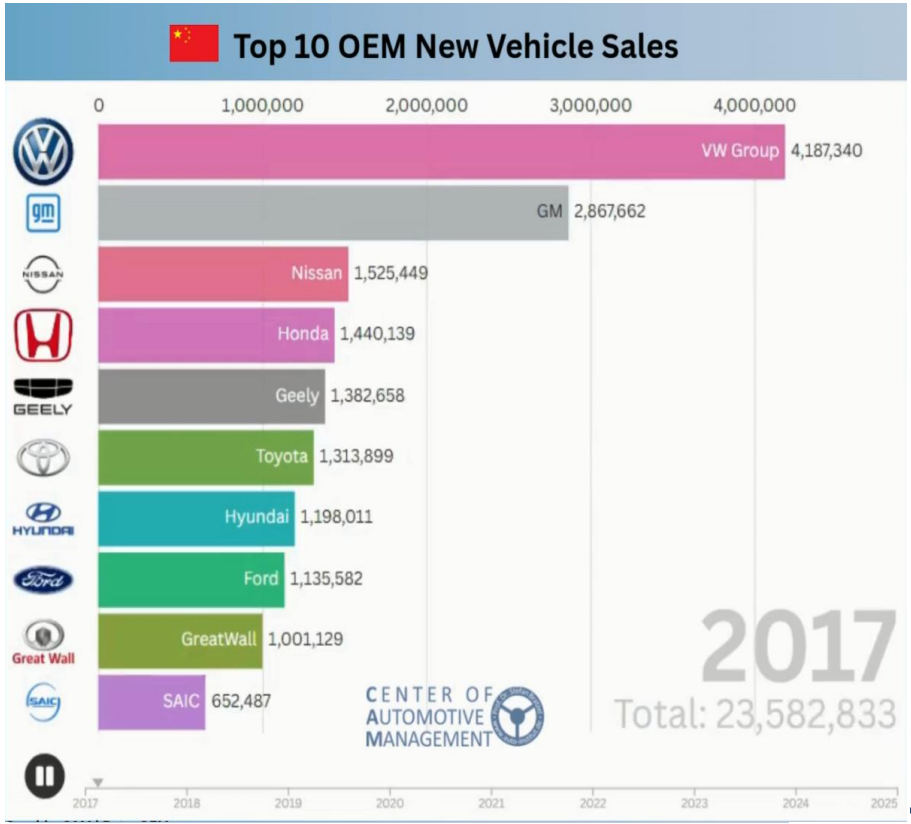
**Chinese manufacturers are increasingly dominating their home market, pushing out foreign OEMs.**

## Market Shares of Car Manufacturers in China by Country of Origin (in %) (2019–2024)




Grafic: CAM | Source: CPCA



# Worldwide BEV Sales and Innovation Performance of Automotive Manufacturers (by Group)

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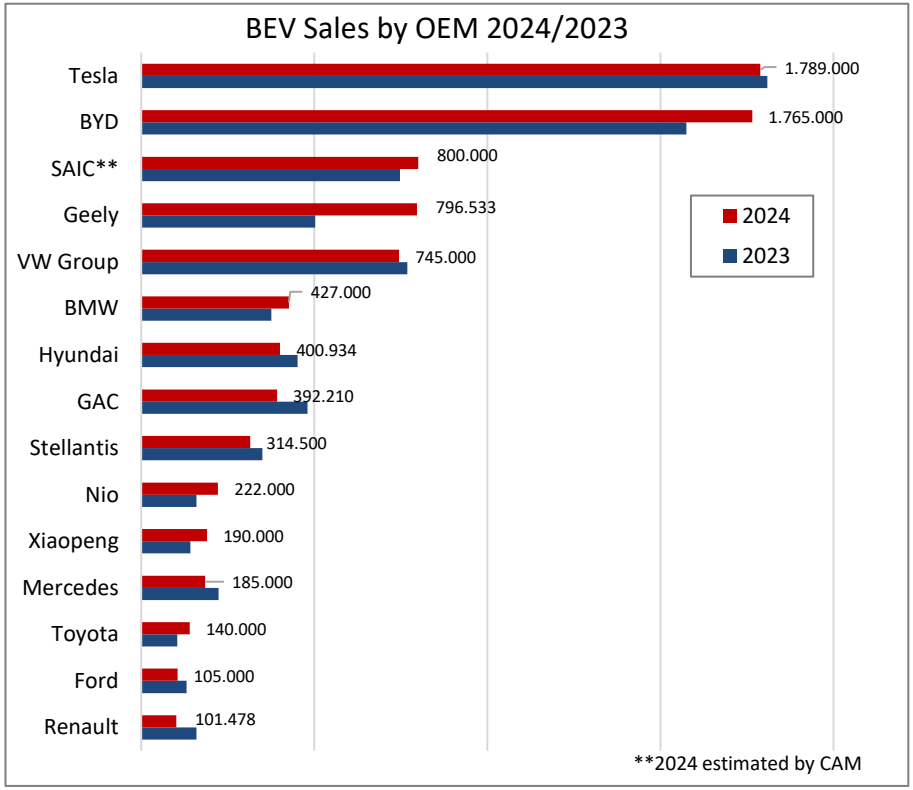
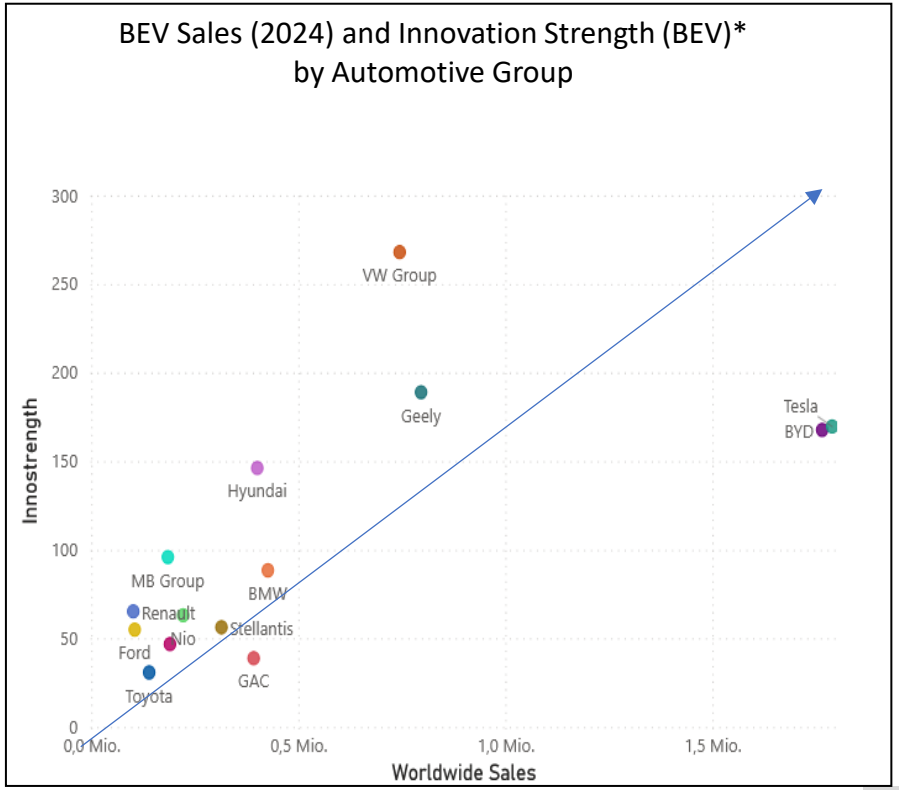
**Strong correlation between innovation strength and sales success among automotive manufacturers**




Source: CAM; *BEV Innovation Strenght 2018-2024

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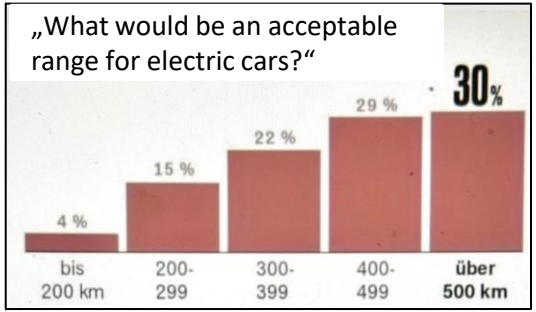
## R.I.P - Issues of the Electromobility


# Range

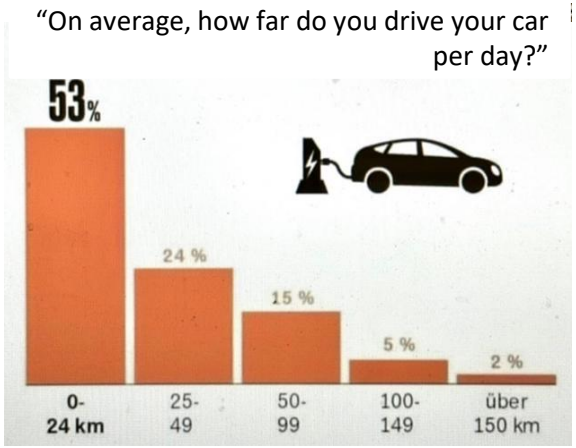
„What would be an acceptable range for electric cars?“




Source: EON/Handelsblatt 2022

# Infrastructure

“On average, how far do you drive your car per day?”




Source: EON/Handelsblatt 2022

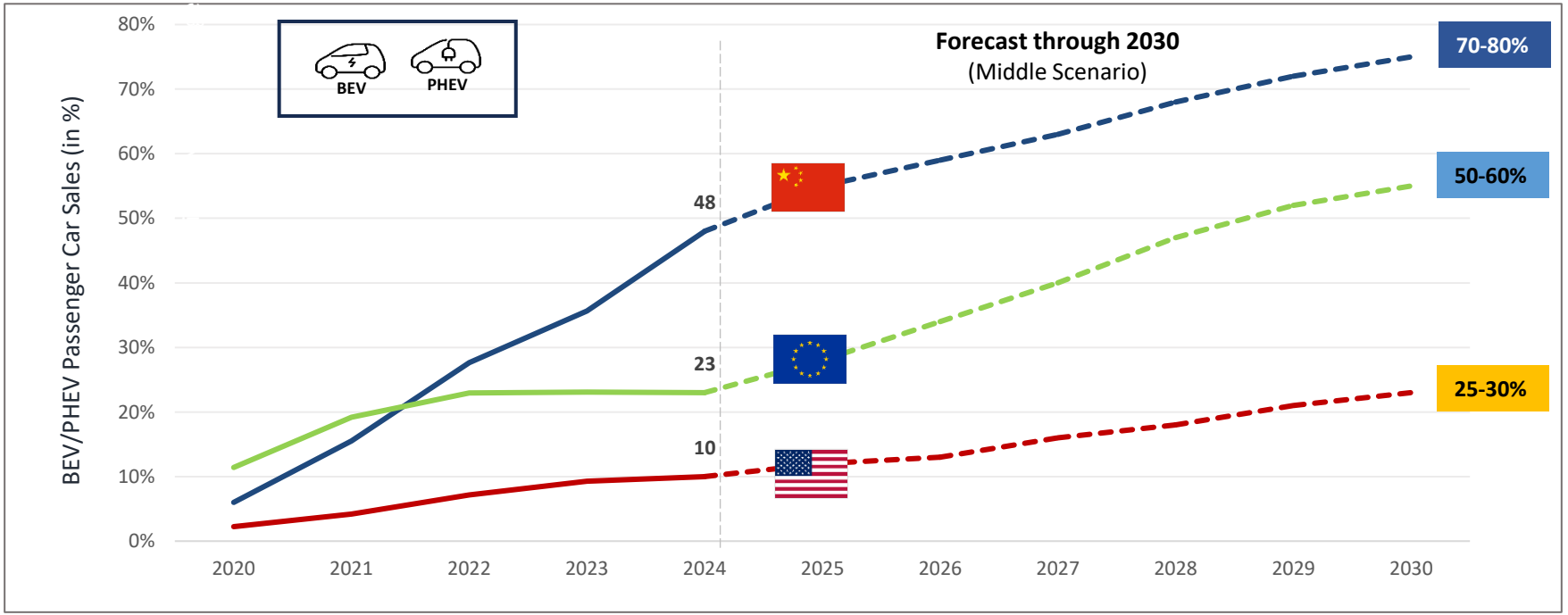
# Price


Quelle: CAM

# CAM Forecast: Ramp-up of E-Mobility in Core Automotive Regions by 2030

**By 2030, the EV share of new registrations in China is expected to rise to 80%, while Europe could reach up to 60%. In the US, the EV share will likely increase to only around 30%.**

**Development and Forecast (Base Case) of Electric Vehicle Registrations in Core Markets – China, Europe, and the USA (2020–2030)**




Source: CAM (Jan. 2025) Ann.: * EU+EFTA+UK

# Paradigm shift from ICE towards an “Electric Vehicle Ecosystem”

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**To achieve strong customer acceptance—and above all, enthusiasm—for battery electric vehicles (BEVs), the focus must shift to new dimensions of customer value: benefits that internal combustion engine (ICE) vehicles simply cannot offer.**

*Paradigm Shift:*

- The development of electric vehicles is still predominantly guided by the internal combustion engine (ICE) paradigm, aiming to make EVs at least equal to ICE vehicles in performance and usability.
- However, the real challenge is to create innovations that unlock new, EV-specific customer benefits.

*Focus on new value propositions, e.g.:*

- Smart charging: lower electricity costs, greater sustainability
- V2H (Vehicle-to-Home): energy autonomy and sustainability
- V2G (Vehicle-to-Grid): grid stabilization (sustainability), additional revenue streams
- Charging benefits: enhanced (fast) charging experience
  - “Personalized” stops: increased driving safety, tailored rest experiences
  - Infotainment / e-commerce / meeting & socializing options…
- Autonomous-Charging (charging robots) / inductive charging…

**Electric Vehicle Ecosystem Use Cases (Examples)**

| | Vehicle-to-Load (V2L) | Vehicle-to-Vehicle Charging (V2VC) | Vehicle-to-Home (V2H) | Vehicle-to-Grid (V2G) |
|---|---|---|---|---|
| |  |  |  |  |
| *Beschreibung* | E-Fahrzeug als mobile Steckdose für elektronische Geräte | E-Fahrzeug als mobile Stromtankstelle für andere Fahrzeuge | E-Fahrzeug als Zwischenspeicher für das lokale Hausnetz | E-Fahrzeug als Zwischenspeicher für das öffentliche Stromnetz |
| *Kundennutzen* | Aufladen von anderen Gegenständen (z.B. Laptop, E-Bike, Elektrogrill) | Unterstützung von Liegenbleibern; neue Verdienstmöglichkeiten („mobile Ladesäule“) | Steigerung des Autarkiegrads, z.B. bei Stromausfällen; Geringere Stromkosten | Stabilisierung der Stromnetze; Zusätzliche Verdienstmöglichkeiten |
| *Zeithorizont* | State-of-the-Art | State-of-the-Art | 2025+ | 2030+ |
| *Komplexität* | Gering | Gering | Mittel bis hoch | Hoch bis sehr hoch |

Source: CAM

Focus on innovation areas that create new, EV-specific customer value—features that internal combustion engine (ICE) vehicles cannot offer. Examples include charging experience, V2G, V2L, and the broader Electric Vehicle Ecosystem.


AI

# Innovation Strength: ADAS / Autonomous Driving

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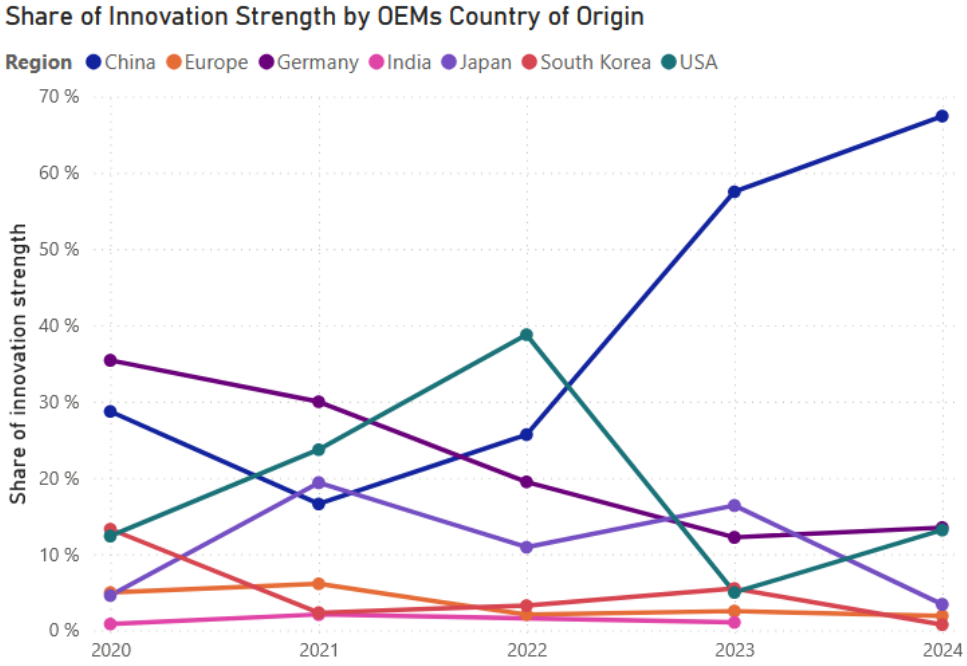
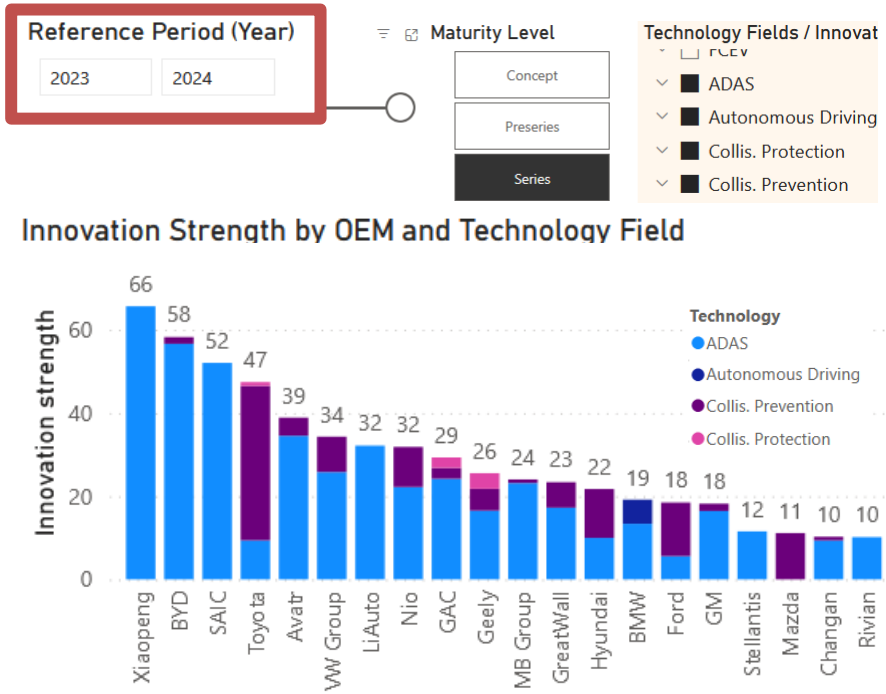
**Very high innovation dynamics in the field of ADAS/AD have been observable among Chinese OEMs since 2021/2022.**

## ADAS / AD / Safety Systems




## OEM Innovation Strength



# Sharing Model: Robotaxis – Automated Driving L4 in the USA

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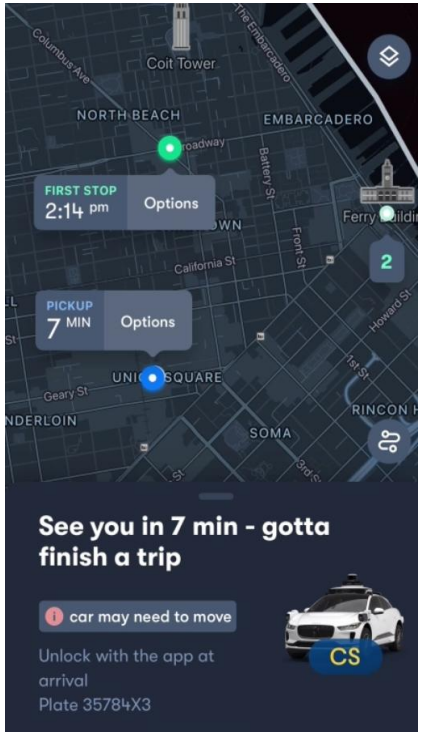
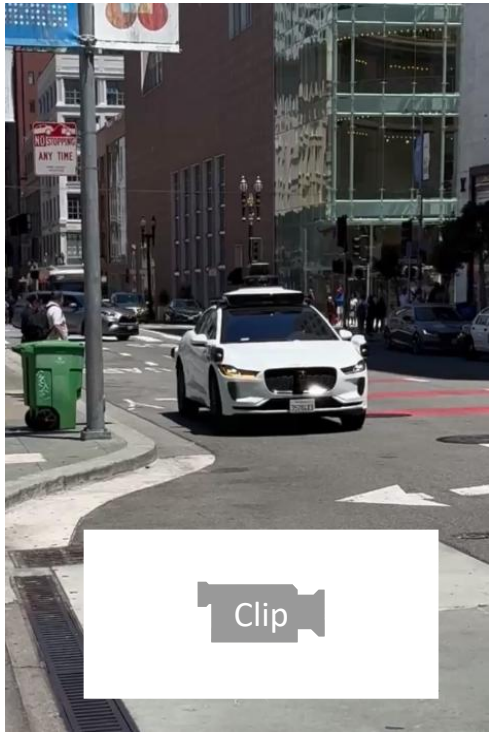
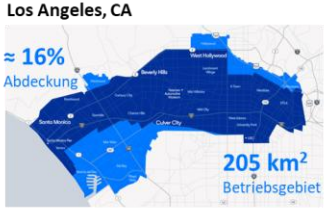
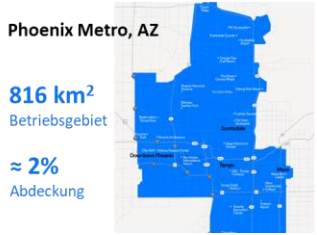
**Market leader Waymo (Alphabet): Commercial autonomous taxi services (without safety driver) in the USA with currently around 250,000 rides per week.**

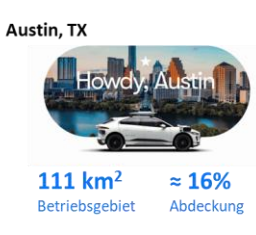








**Future model?**
*Zeekr M-Vision Concept (BEV) (2023)*

Sensor set:
- 4 Lidar-sensors (360°)
- 6 Radar-sensors (360°)
- 13 cameras (360 °, Short/ Mid Range)
- plus. Ultrasonic sensors (Front/ Rear)

„It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.”

**Thank you for your attention!**
**Questions?**

# Imprint


**Firma**

Dr. Bratzel Center of Automotive Management GmbH & Co. KG (CAM)
Director: Prof. Dr. Stefan Bratzel
Responsible for the contents: Prof. Dr. Stefan Bratzel
Authors: Prof. Dr. Stefan Bratzel

Rommerscheider Str. 103
51465 Bergisch Gladbach
Germany

**Büroadresse**

Center of Automotive Management
An der Gohrsmühle 25
51465 Bergisch Gladbach
Germany

Phone: +49 (0) 22 02 / 2 85 77 - 0
Fax: +49 (0) 22 02 / 2 85 77 - 28
E-Mail: info@auto-institut.de