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Deep dive in the EU automotive industry

May 2025

Creating Opportunities

Key messages

- China dominates the global automotive industry, producing and consuming over 30% of the world's vehicles. The EU ranks second in production (15%) and third in demand (13%). The auto sector contributes 3.5% of EU GVA, and 3% of EU jobs. Germany leads by far the EU automotive sector, with 60% of GVA and 35% of jobs.
- The EU sector generates a very significant external surplus (0.5% of GDP). Germany leads overwhelmingly; US, UK and China are the main clients. Exports have higher import content due to greater reliance on external suppliers (China, US), along with the shift to EVs.
- China is rapidly gaining market share in the EU for Battery Electric & Plug-In Hybrid Electric vehicles (BEVs and PHEVs), becoming the leading foreign supplier. Chinese BEVs are now cheaper than combustion vehicles in the small car segment and dominates the battery supply chain.
- The share of EVs (BEVs + PHEVs) in total EU new car sales has plateaued at ~21%. High prices, insufficient charging infrastructure, and strong income-dependence are major barriers. Sales of combustion vehicles still represent nearly half of all new registrations in 2024.
- Triple challenge ahead: European car makers must hit ever-stricter CO_2 goals even as EV demand plateaus, close the technology & battery gap with China, and re-wire supply chains in a fragmenting geo-trade landscape—all at once, with profitability and jobs on the line.
    - The EU aims to cut CO_2 emissions from new cars by 100% by 2035, but short-term targets have been eased (15% reduction now over 2025–27 instead of 2025). Absent that easing, auto makers could face sanctions, or would need to buy credits from competitors or cut non-EV sales, jeopardizing profitability and employment.
    - The EU leads in automotive R&D spending, yet China is catching up fast. Investment is shifting toward autonomous driving, connectivity, and battery innovation, but the EU's industrial ecosystem lacks the vertical integration seen in China's EV industry.
    - Geopolitical fragmentation – US-China tensions and new trade barriers oblige costly de-risking and vertical reintegration.

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01

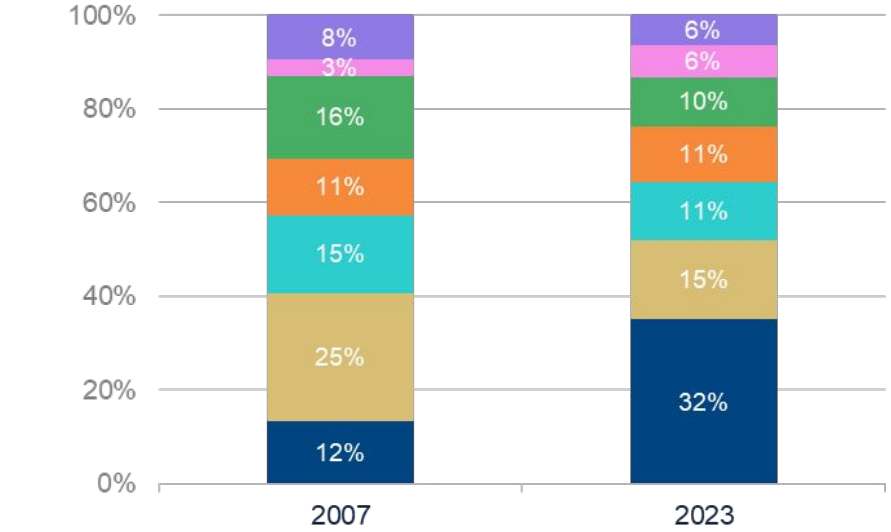
The relevance of the EU automotive sector

China leads the global auto industry, producing and consuming over 30% of all vehicles

The EU ranks second in production (15%) and third in demand (13%), half of 2007 levels

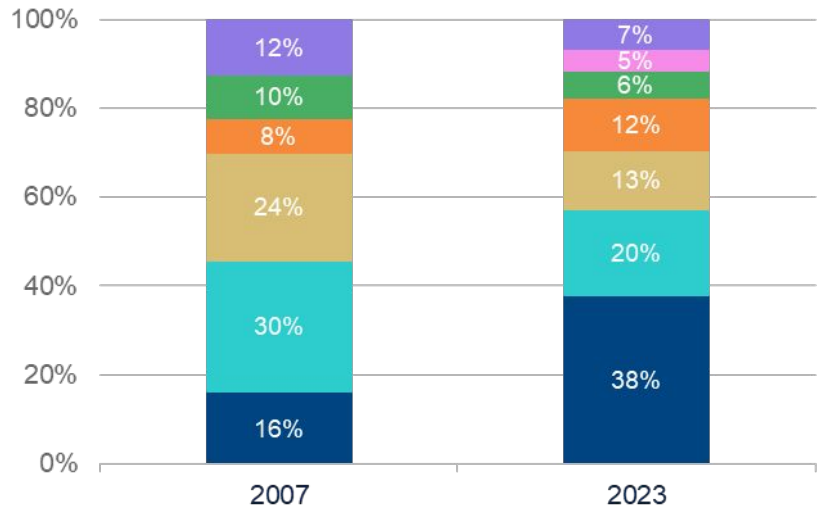
PRODUCTION OF VEHICLES (NACE 29) BY REGION

(UNIT OF CARS BY REGION AS % OF THE TOTAL VEHICLE PRODUCTION)



SALES OF NEW VEHICLES (NACE 29) BY REGION

(UNIT OF CARS BY REGION AS % OF THE TOTAL NEW VEHICLE SALES)



China EU27 United States Asia-Oceania (excluding China,India and Japan) Japan India Other (UK, South America, Africa)

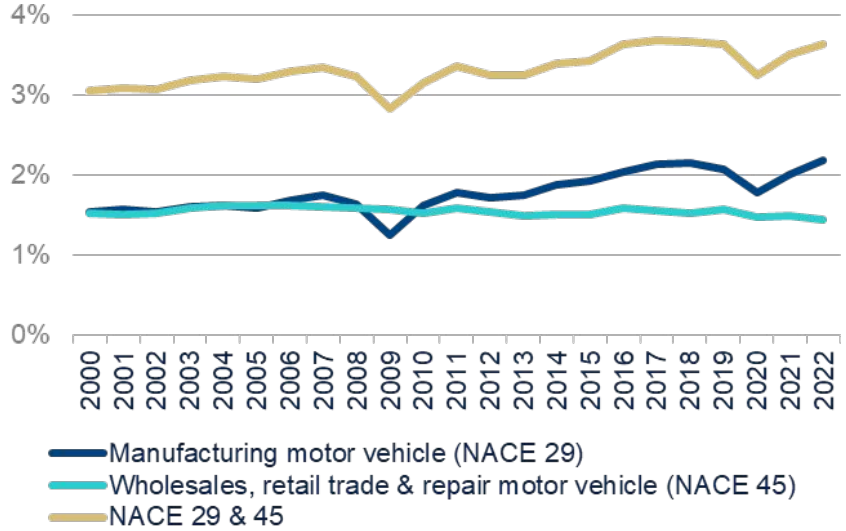
(*) Sum of Passenger Cars, Commercial Vehicle, MiniBuses, Heavy Trucks, Buses and Coaches and Light Vehicles

Source: BBVA Research from OICA.

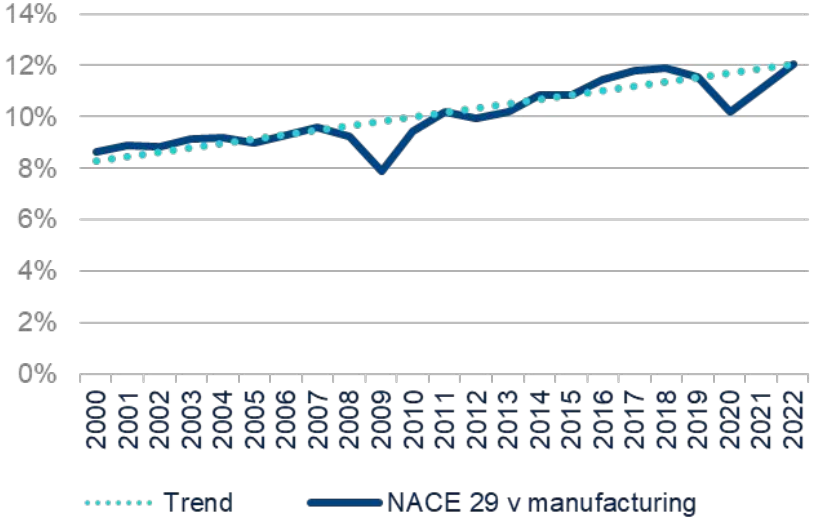
The EU industry's GVA (including trade and repair) has maintained a secular trend this century except during crises, reaching 12% of EU manufacturing

EU27 GVA MANUFACTURING AND, TRADE AND REPAIR OF MOTOR VEHICLE*

(AS % TOTAL GVA EU27, VOLUMEN PRICES 2005)



EU27 GVA MANUFACTURING AUTOMOTIVE SECTOR (NACE 29) (AS % EU27 GVA MANUFACTURING SECTOR, VOLUME PRICES 2005)



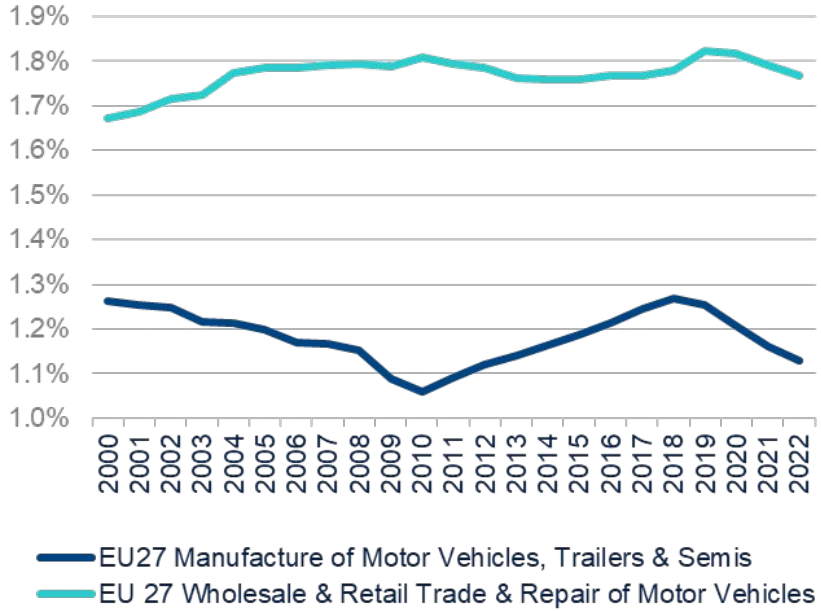
EU27: Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden.
GVA EU27 is the simple sum of GVA of EU countries
*NACE 29: Manufacture of motor vehicles, trailers and semi-trailers. NACE 45: Wholesale trade and retail trade and repair of motor vehicle and motorcycle.
Source: BBVA Research from Eurostat.

The EU automotive sector directly employs 6.5 million people (3% of EU jobs).

GVA and productivity have increased significantly, in parallel, over the past decade

EMPLOYMENT IN EU27 AUTOMOTIVE SECTOR 2000-2022 (NACE 29 AND 45)

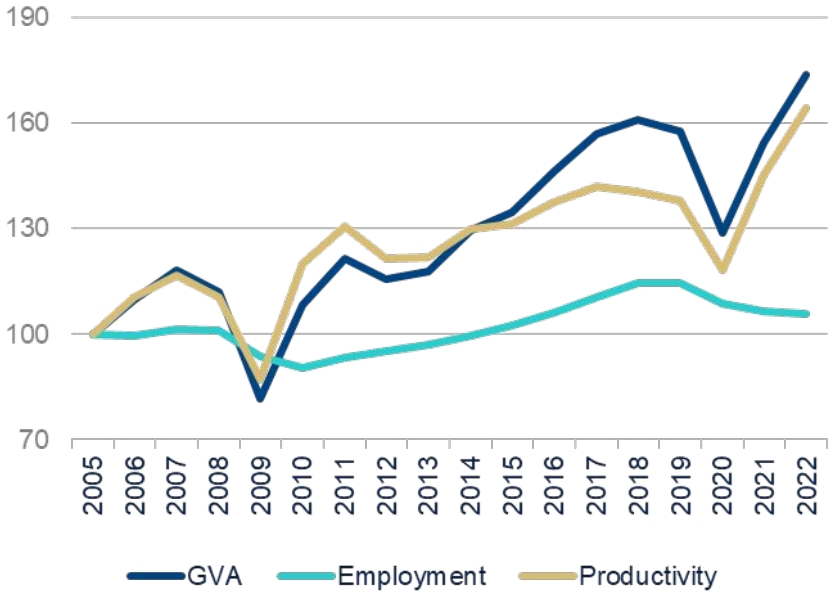
(% SHARE OF TOTAL EU EMPLOYMENT)



Source: BBVA Research from Eurostat.

GVA, EMPLOYMENT AND PRODUCTIVITY* IN EU27 MANUFACTURING AUTOMOTIVE SECTOR (NACE 29)

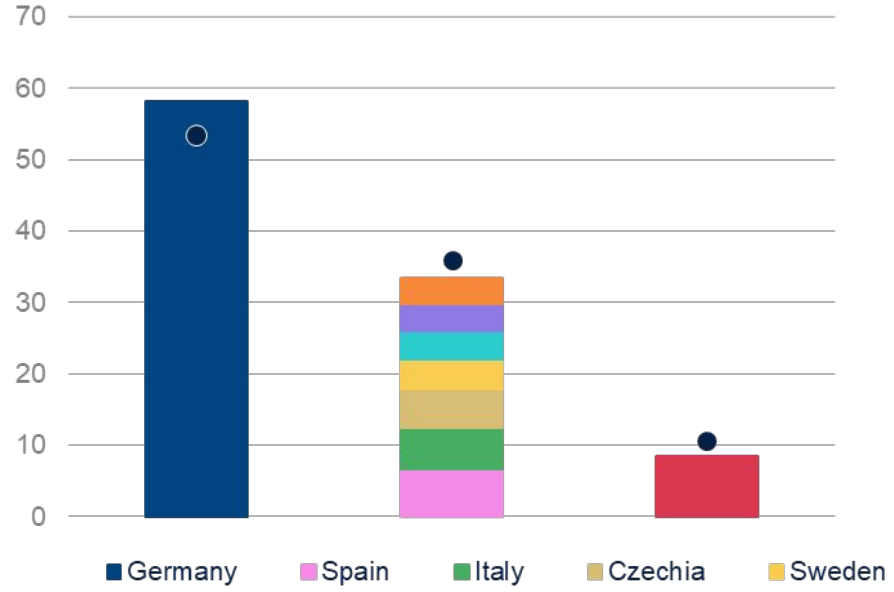
(2005=100)



Source: BBVA Research from Eurostat data. (*) Productivity is calculated as the ratio between GVA and employment.

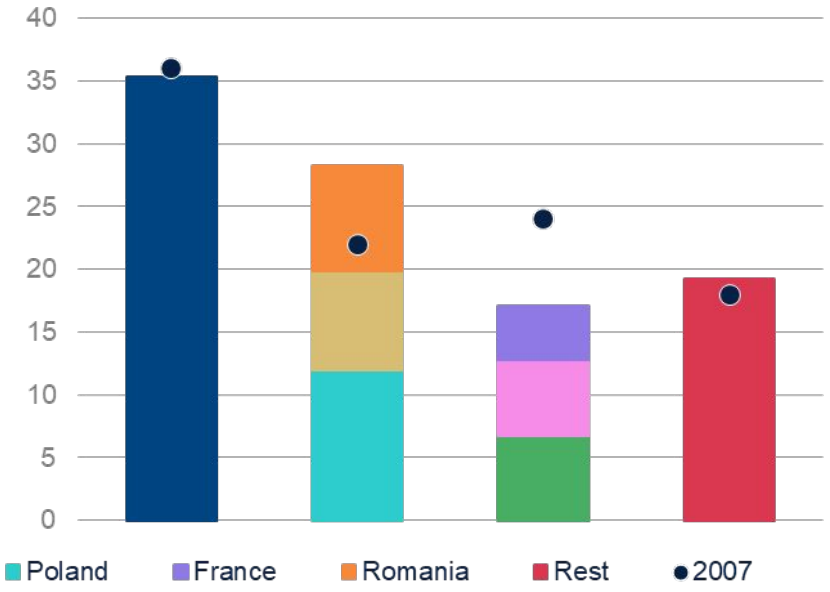
Germany leads the European automotive industry, contributing almost 60% of the sector's GVA and 35% of employment; it has also increased its share since 2007

LEADING EU COUNTRIES IN GVA FOR THE MANUFACTURING AUTOMOTIVE INDUSTRY (NACE 29) 2022 VS 2007 AUTOMOTIVE GVA BY COUNTRY / TOTAL EU27 GVA AUTOMOTIVE (VOLUME PRICES 2005) %



Source: BBVA Research based on data from Eurostat.

LEADING EU COUNTRIES IN EMPLOYMENT FOR THE MANUFACTURING AUTOMOTIVE SECTOR (NACE 29) 2022 VS 2007 AUTOMOTIVE EMPLOYMENT BY COUNTRY / TOTAL EU27 EMPLOYMENT AUTOMOTIVE %



Source: BBVA Research based on data from Eurostat.

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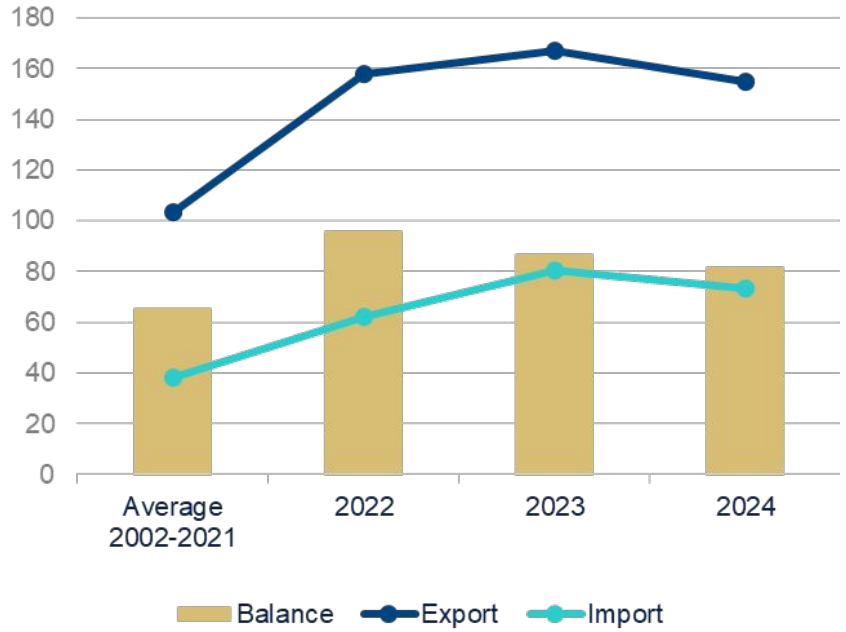
02

Exports and Global Value Chains

The EU automotive industry generates a very significant external trade surplus (approximately 0.5% of GDP)

EU VEHICLES FOREIGN TRADE: EXPORTS, IMPORTS AND BALANCE

2002-2024 (€ BILLION); % OF EU GDP

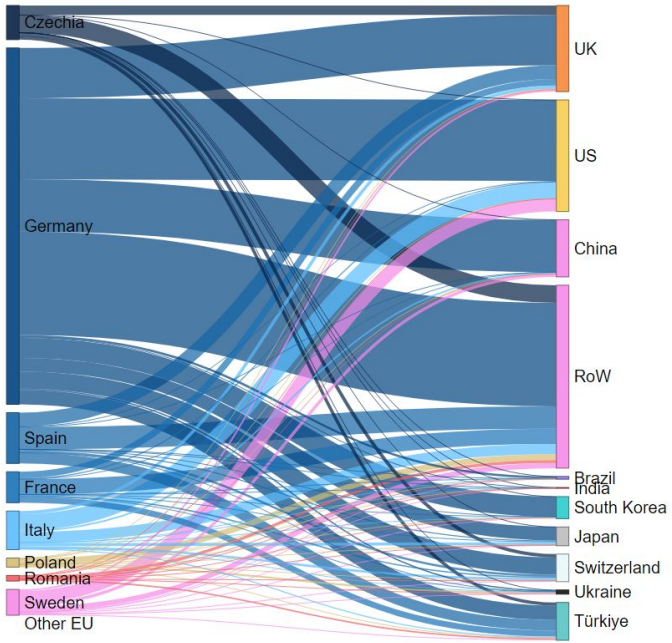


- The EU enjoys a very significant trade surplus in the vehicles sector, of around €81 billion, 0.5% of GDP (the total current account surplus is close to 2.5% of GDP).
- In 2024, the EU witnessed a notable contraction in both the import value and volume of cars, and of car exports, resulting in a slight fall of the trade surplus (5.9% decline compared to 2023).

Source: BBVA Research from Eurostat and ACEA Report 2024.

Germany leads overwhelmingly EU car exports; US, UK and China are the main customers

EU VEHICLES EXPORTS BY ORIGIN AND DESTINATION (€ THOUSANDS MILLION AND %) (2023)

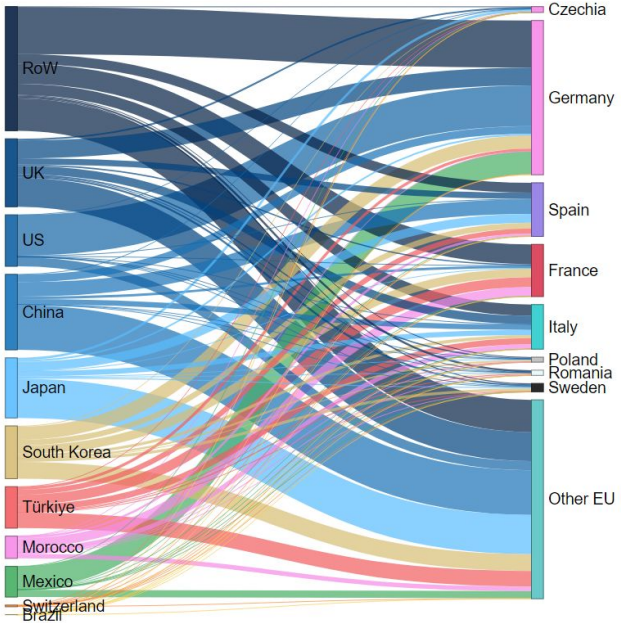


Source: BBVA Research from Eurostat.

- In 2024, the export value of EU-made cars to the US fell by 4.6% and 25.5% to China, likely due to competition from domestic vehicle manufacturers.
- Germany is by far the largest EU exporter, followed by Spain, Italy, Sweden, Czech Rep and France.
- The US is the main customer, closely followed by the UK and then China. The US buys mostly from China, but also from Italy and Sweden. China buys EU cars almost exclusively from Germany.
- Spain's exports go mainly to the UK and the rest of the world.

EU car imports are diversified, both from providers and buyers; Spain is the top destination for China's cars

EU VEHICLES IMPORT BY ORIGIN AND DESTINATION
(€ THOUSANDS MILLION AND %) (2023)

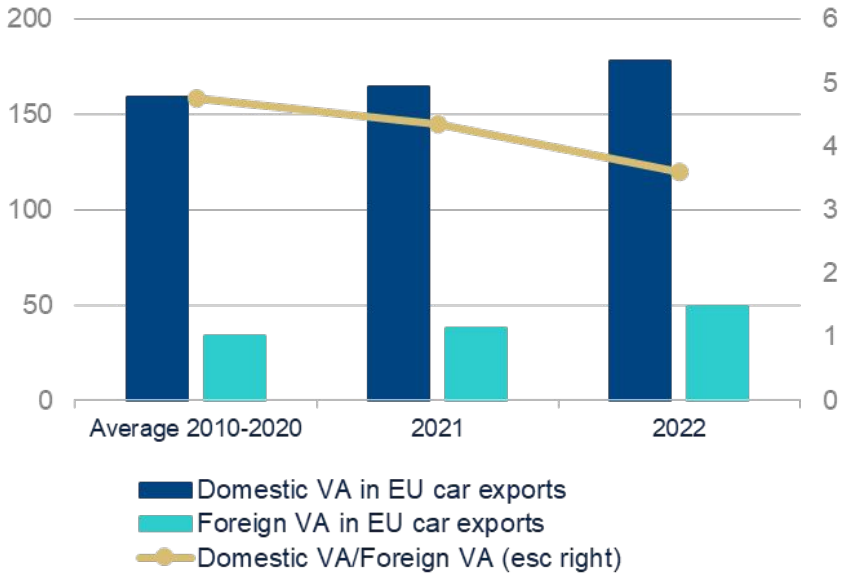


Source: BBVA Research from Eurostat.

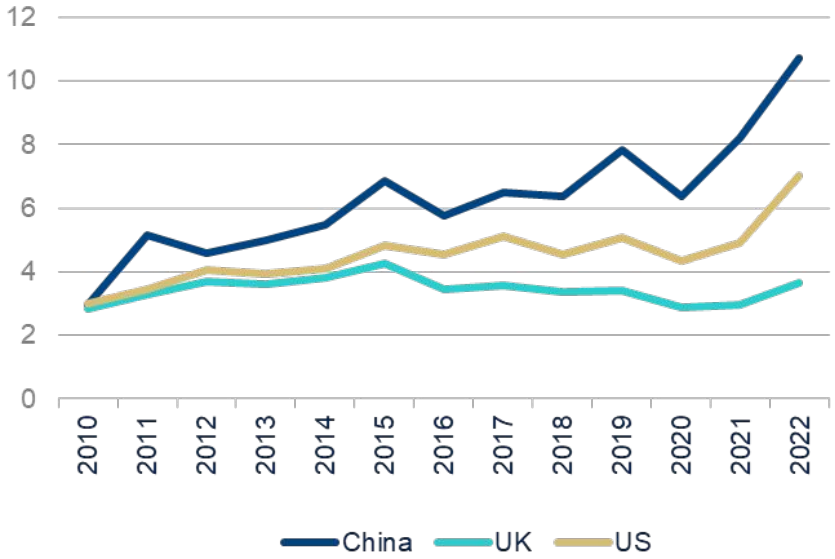
- EU car imports is very diversified across providers.
- In 2024, China maintained its position as the primary source of new EU car imports in terms of value (17%), followed by the UK, Japan, and Türkiye.

EU car exports have higher import content due to greater reliance on external suppliers like China and the US, along with the shift to EVs, which is promoting vertical integration

DOMESTIC AND FOREIGN VA EMBEDDED IN EU CAR EXPORTS (€ BILLION AND %)



FOREIGN VA EMBEDDED IN EU CAR EXPORTS BY MAIN TRADING PARTNERS (€ BILLION)



Source: BBVA Research from Eurostat data. Automotive industry refers to NACE C29 - Motor vehicles, trailers and semi-trailers (hereafter referred to as motor vehicles). Domestic and foreign value added (VA) in EU automotive exports indicators are based on the FIGARO tables – full international and global accounts for research in input-output analysis – and which use the Leontief input-output model (Miller and Blair, 2022) for the automotive industry.

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03

Looking ahead: EVs and R&D

The EU automotive industry needs to transform to address various challenges

Climate change:

- Adoption of zero-emission technologies to fill EU's climate change targets

Shift in society's demand for mobility, that point to boost EV production and demand:

- Urbanization
- Connectivity (evolution towards autonomous driving)
- Accessibility (ageing)

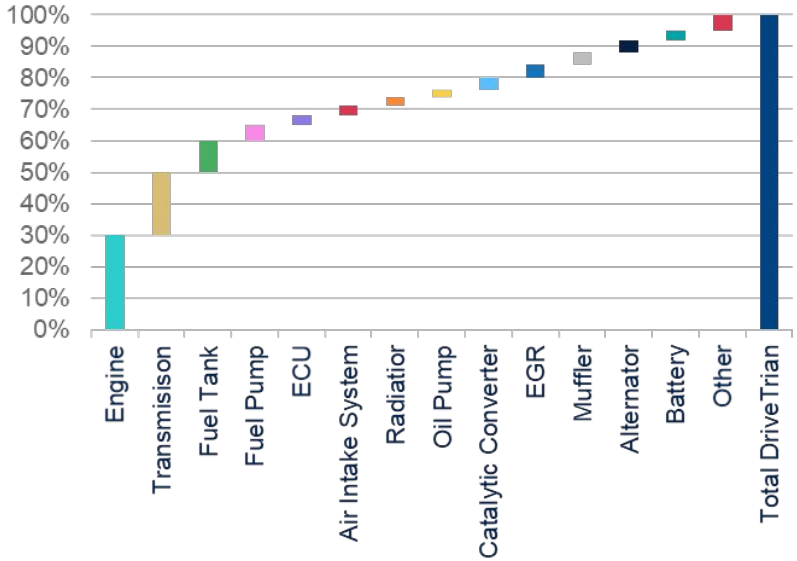
Competition from abroad:

- Battery electric Vehicle (BEV) has a lower entry barrier than conventional ones, given that it has fewer components and is cheaper to manufacture. The battery accounts for 50% of its powertrain.
- China dominates all segments of the battery production chain and can build cheaper BEV than European ones, and even cheaper than combustion engine ones for some segments.

Powertrain components (engine and transmission) in combustion vehicles account for 50% of the cost, while in EVs the battery represents 50% of the total cost

COMBUSTION POWERTRAIN COST BREAKDOWN

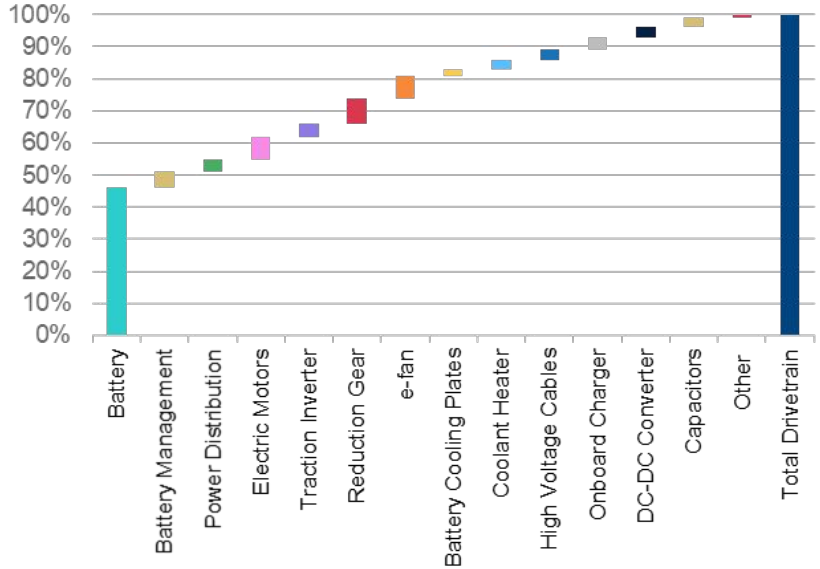
(% SHARE COST FOR EACH SUBCOMPONENT OUT OF THE TOTAL PRODUCTION COST)



Source: Thunder Said Energy.

BEV POWERTRAIN COST BREAKDOWN

(% SHARE COST FOR EACH SUBCOMPONENT OUT OF THE TOTAL PRODUCTION COST)



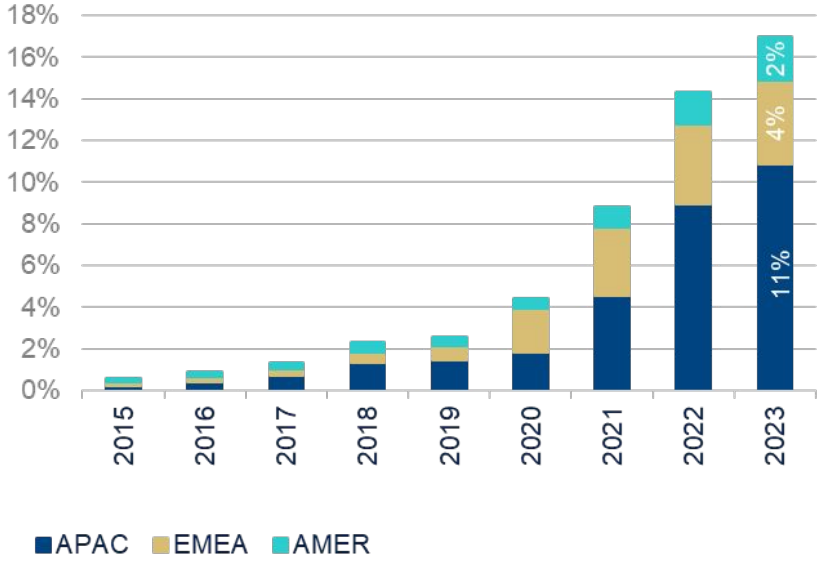
Source: Thunder Said Energy.

The green-digital transition drives EV adoption (especially in China, where they are now cheaper than conventional cars)

De-globalization and easing of ESG rules slow progress

SHARE OF NEW ELECTRIC* VEHICLE SALES

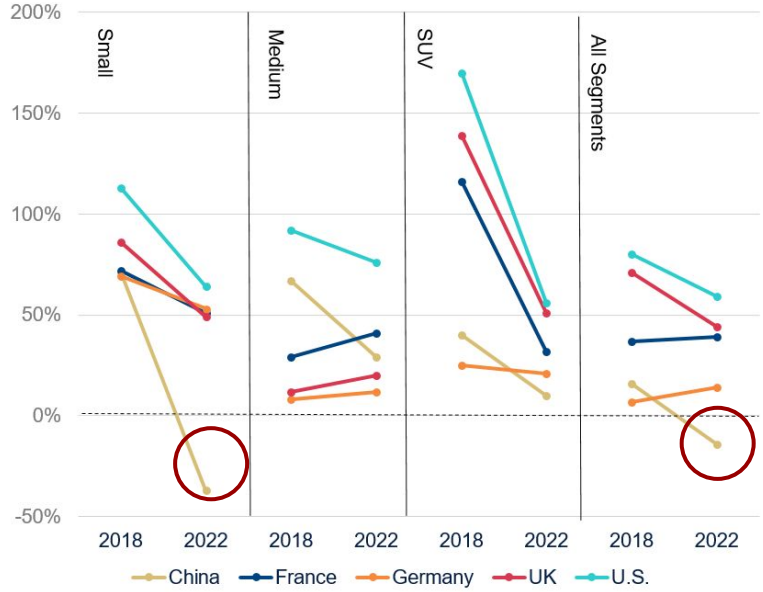
(% OF TOTAL WORLD VEHICLE SALES)



*APAC: Asian Pacific, excluding Australia and New Zealand; EMEA: Western Europe, Eastern Europe, Africa and Middle East; AMER: North America and Latin American.
*Electric car: Sum of battery electric vehicle, fuel cell vehicle and Plug-in Hybrid electric vehicle.
Source: OICA and national automobile association.

PRICE GAP BETWEEN SALES-WEIGHTED AVG-PRICE OF EV AND CONVENTIONAL CARS, BEFORE SUBSIDY

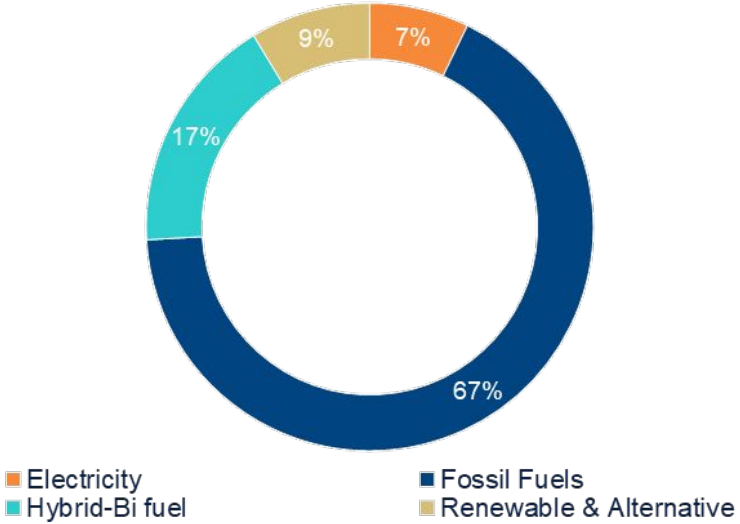
(%)



Source: IEA.

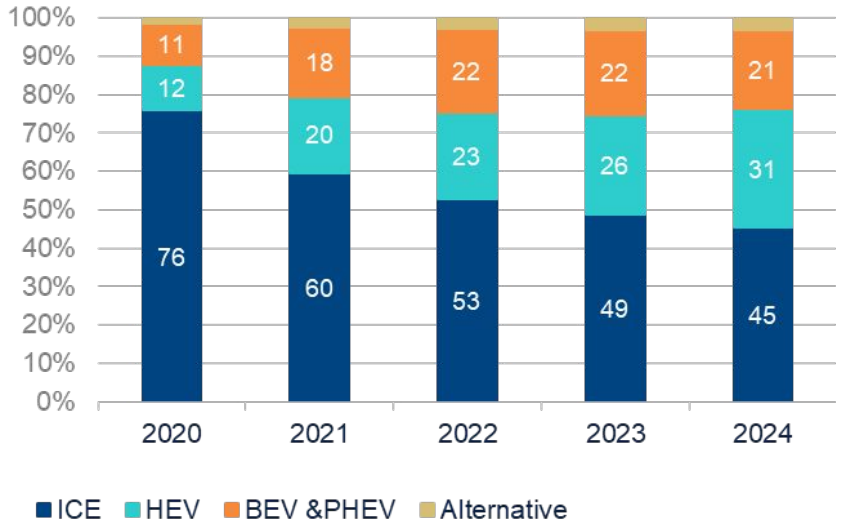
Combustion engine vehicles still represent close to half of EU sales, while the share of passenger EV sales has barely changed over the past three years (just above 20%)

EU NEW TOTAL VEHICLE* REGISTRATIONS BY POWER SOURCE (% SHARE 2023) (EUROS)



*Electricity=Battery Electric; Renewable Alternative=Alternative energy,Hydrogen and fuel cells ,Bioethanol,Biodiesel;Hybrid-Bi fuel=Hybrid electric-petrol,Plug-in hybrid petrol-electric;Fossil Fuels=Petroleum products,Liquefied petroleum gases (LPG),Diesel,Natural gas,Petrol (excluding hybrids),Diesel (excluding hybrids)
*Total Vehicles=Passenger cars, Motor Coaches and Lorries
Source: BBVA Research from Eurostat.

EU TREND OF NEW PASSENGER CAR REGISTRATION BY TYPE OF MOTOR* (% EU NEW CAR REGISTRATION)

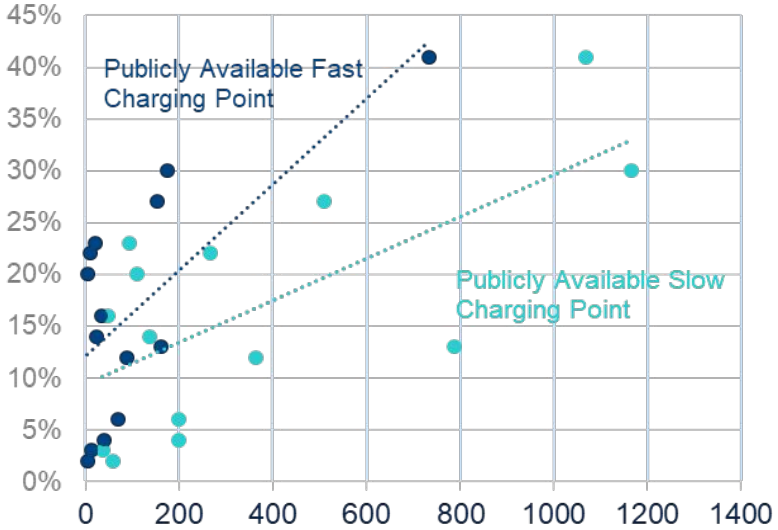


*BEV & PHEV=Battery Electric & Plug-In Hybrid Electric; HEV= Hybrid Electric; ICE=Internal combustion engine Diesel & fuel; Alternative=LPG, natural gas (LNG or CNG), alcohols, hydrogen, bio-fuels (such as biodiesel), etc.
Source: BBVA Research from Eurostat

Factors that determine EV demand include their price, the availability of charging points. The correlation between household income to EV uptake is relatively high

CORRELATION BETWEEN EV PENETRATION* CHARGING POINT DENSITY** IN EU COUNTRIES

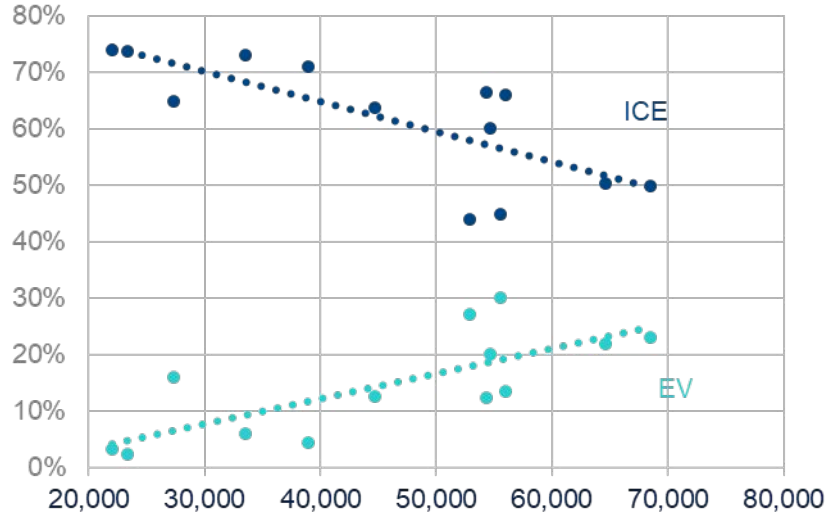
(Y AXIS EV % SHARE OF TOTAL DOMESTIC SALES) (X AXIS CHARGING POINTS / POPULATION CONCENTRATION)



*EV penetration=Domestic battery electric cars and Plug-in hybrid electric vehicle registration vs total domestic registration
**Public Charging Points per Population Concentration: Charging Points / Population Concentration.
Source: BBVA Research from World Bank,IEA,Eurostat,OICA.

CORRELATION BETWEEN GDP PER CAPITA AND EV AND ICE ENGINES PENETRATION

(Y AXIS EV AND COMBUSTION ENGINE AS % SHARE OF TOTAL DOMESTIC SALES) (X AXIS GDP PER CAPITA CURRENT $ (2023)

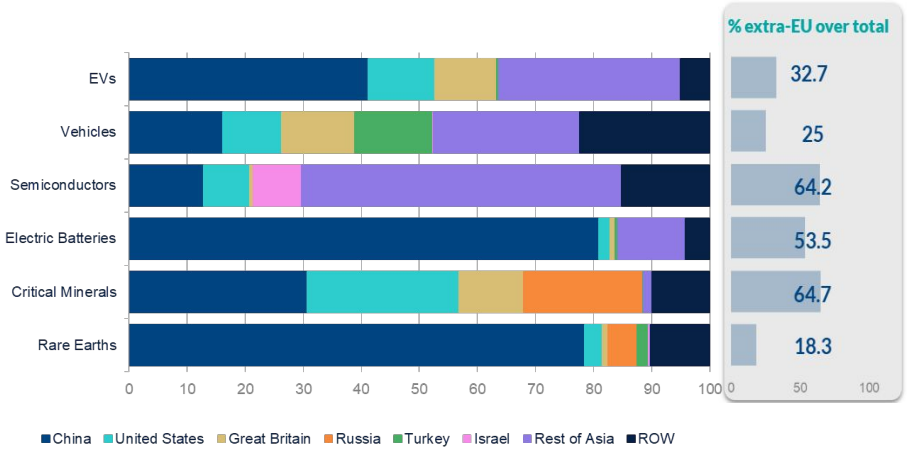


*EV=Battery electric cars and Plug-in hybrid electric vehicle.
iCE Internal combustion Engine.
Source: BBVA Research from World Bank,Eurostat,OICA.

The EU is significantly dependent on imports of EVs, batteries and rare earths from Asia

EXTRA-EU EU IMPORTS BY PARTNERS AND PRODUCT (2023)

(% OVER TOTAL EXTRA-UE PRODUCT IMPORTS OF EU)

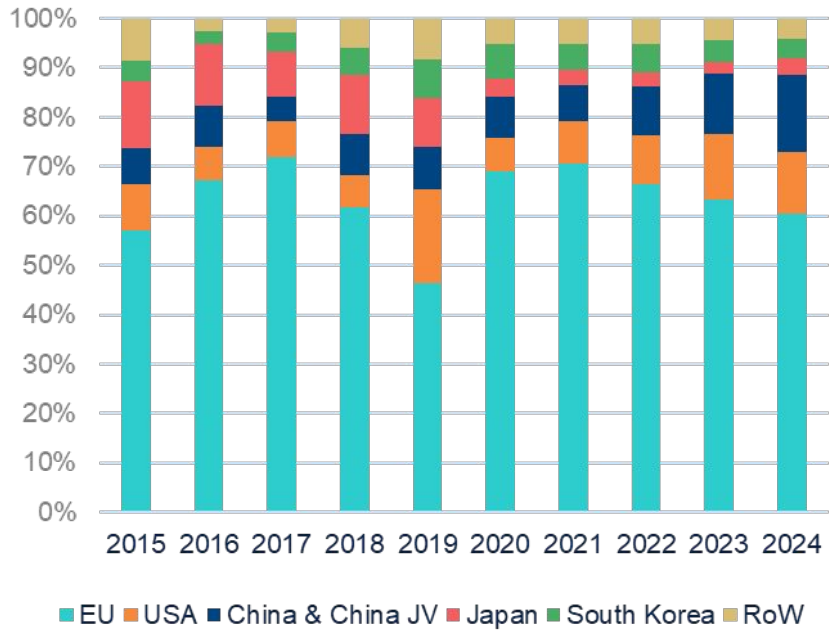


- China leads the electric car value chains as the world's largest exporter of parts, batteries and minerals.
- Carmakers are reconfiguring supply chains to make them less exposed to geopolitical concerns, with reliance on China as a growing issue.
- The rising geopolitical tensions between America and China, new trade barriers and rising protectionism, a subsidy race, the shifting of the supply change and tighter restrictions on Western technology and data-sharing hinder the optimal development of the global automotive industry.
- Data-sharing emerge as a major issue in the safe development of autonomous cars. Americans are concerned about the security of data gathered in China-made cars and have already imposed a 27.5% tariff against them.

Source: BBVA Research calculations from UN Comtrade data.

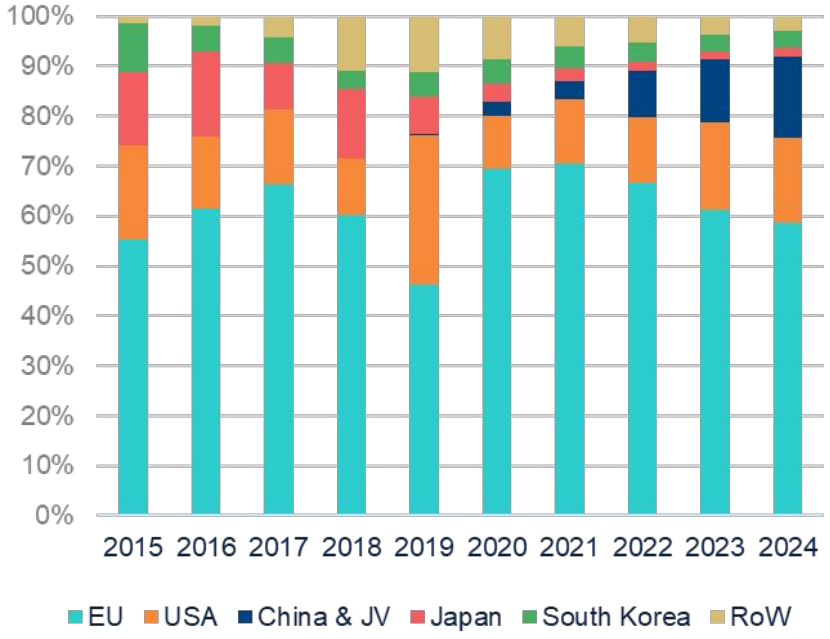
Hence, China's EV and PHEV sales penetration in EU27 is gathering pace

EU27 SALES OF BEV AND PHEV BY MANUFACTURER COUNTRY (% OF TOTAL BEV AND PHEV SOLD IN THE EU27)



Source: BBVA Research from OICA.

EU27 SALES OF BEV BY MANUFACTURER COUNTRY (% OF TOTAL BEV AND PHEV SOLD IN THE EU27)



Source: BBVA Research from OICA.

EU response: A new Action Plan (2025) to maintain the auto industry competitive

Action Plan for the EU Automotive Sector

Clean Mobility

More flexibility for meeting CO2 target* (from 2025 to 2027)

Innovation & Digitalisation

Developing new technologies for batteries

Supporting Workers

Monitoring employment trends and boosting skill training in the car industry

Competition with non-EU competitors

Attract foreign investment and protect EU car industry from unfair competition

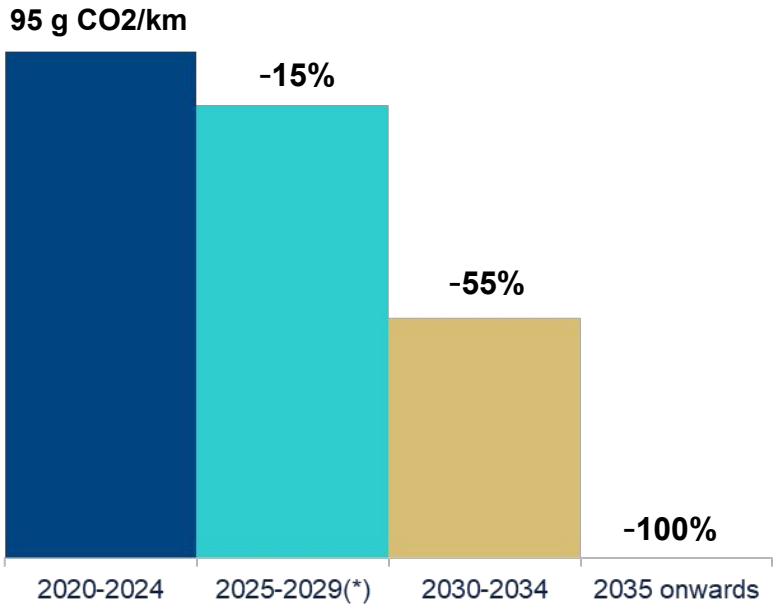
Competitiveness & Supply Chain Resilience

Supporting EU battery production and key tech for connected vehicles

* Goal: 15% reduction in CO2 emissions from 2021 levels. The EC has extended the compliance period for the 2025 emission targets until 2027.

EC set in 2023 CO_2 emission transition targets for the broad auto sector

CARS. EU CO2 EMISSION TARGETS
G CO2/KM AND % (REDUCTION FROM 2021 CO2 LEVELS)

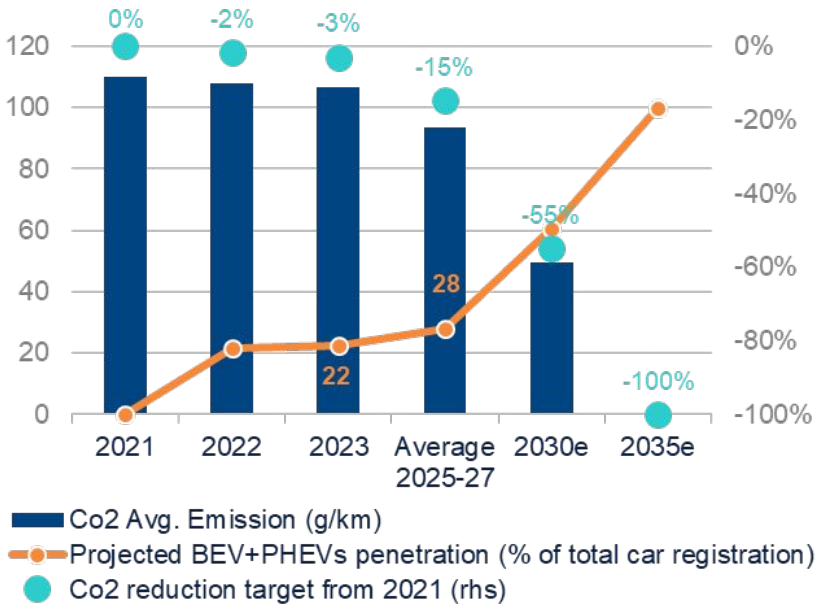


- By 2050, the fleet of passenger cars and light commercial vehicles should be free of direct emissions.
- The broad targets are associated with more specific targets for manufacturers
- Sanctions: Brands that fail to meet the benchmark will be fined €95 per gram of CO2 per kilometer emitted above the target for each non-compliant vehicle sold in the bloc.
- However, manufacturers could benefit from:
  - Vehicles equipped with advanced CO_2-reducing technologies can contribute to emission reductions.
  - Manufacturers earn credits if their share of new BEV and PHEV vehicles surpasses 25%. For every percentage point above this threshold, their CO_2 target is eased by 1%, up to a maximum of 5%.
  - Automakers can form compliance pools, allowing traditional engine manufacturers to offset emissions by purchasing credits from EV producers that exceed their targets, helping them avoid penalties.

(*) In 2025, the European Commission proposed a flexibility measure allowing car and van to meet 2025–2027 CO_2 targets over a three-year average rather than annually.
Source: BBVA Research from COM-CO_2 emission performance standards for cars and vans.

The EU has eased in April 2025 short-term targets to support manufacturers as its penetration in EV is delayed

CO2 EMISSION REDUCTION TARGETS FOR PASSENGER CARS

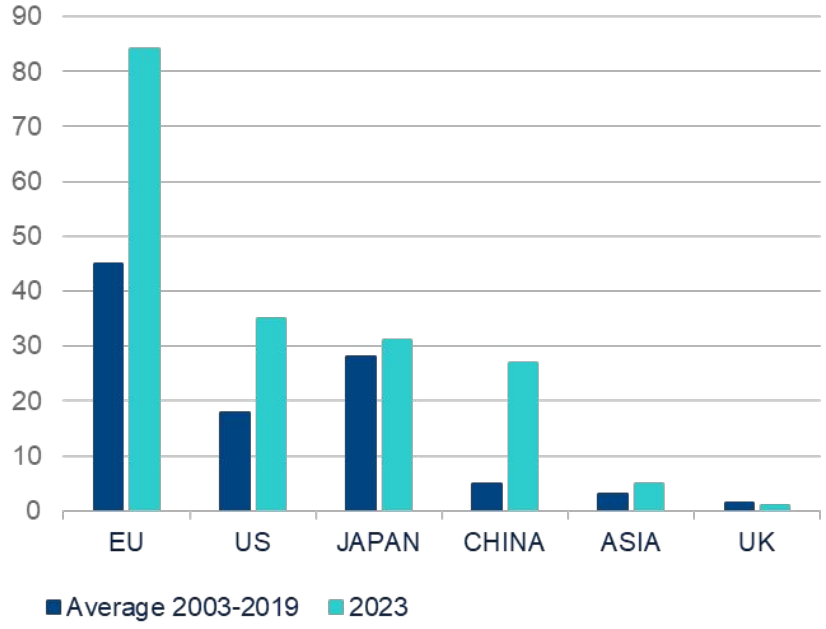


Considering car 1,609.6 kg. and assuming emission of Co2: BEV 0, PHEV 35, 7, HEV 108 and ICE 136 g/km
Source: BBVA Research, haver and European Commision.

- Slowing EV adoption in the EU risks missing 2025 CO_2 targets. Hence, the EC is extending the compliance date for the first emission target deadline (from 2025 to an average of three years 2025-27) for firms to avoid penalties. Now, new vehicle registrations must emit 15% less CO2 on average between 2025-2027 compared to 2021 levels.
- We estimate that in order to meet this target, the combined share of electric vehicles sales (BEV+PHEV) needs to increase from the current 21% to an average of 28% in 2025-27 (reaching 32% by 2027).
- However, more importantly for the EU industry is for domestic manufacturers to comply with the targets. Currently they are losing share in EV sales.

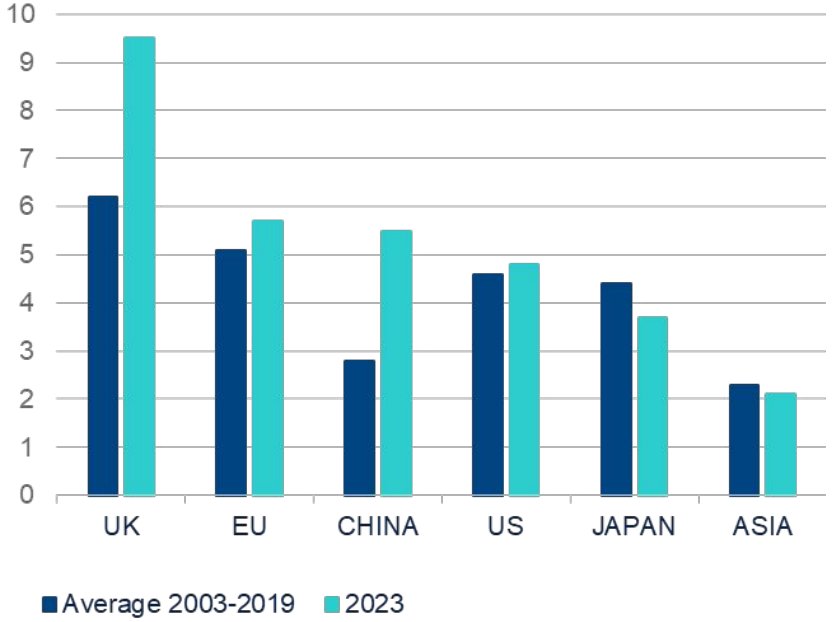
The EU leads global investment in automotive R&D, but China is rapidly catching up. R&D intensity in the sector seems higher in UK and similar in China

R&D INVESTMENT IN THE AUTOMOTIVE SECTOR
(BILLION EUROS)



Source: BBVA Research from EC Industrial R&D Investment Scoreboard (2003-2023).

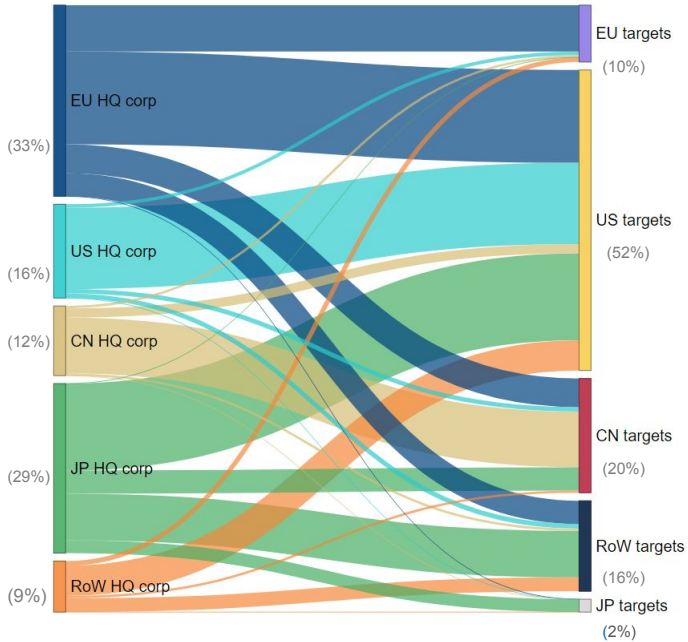
AVERAGE R&D INTENSIVE RATIO IN THE AUTOMOTIVE SECTOR PER COMPANY
(% R&D TO NET SALES)



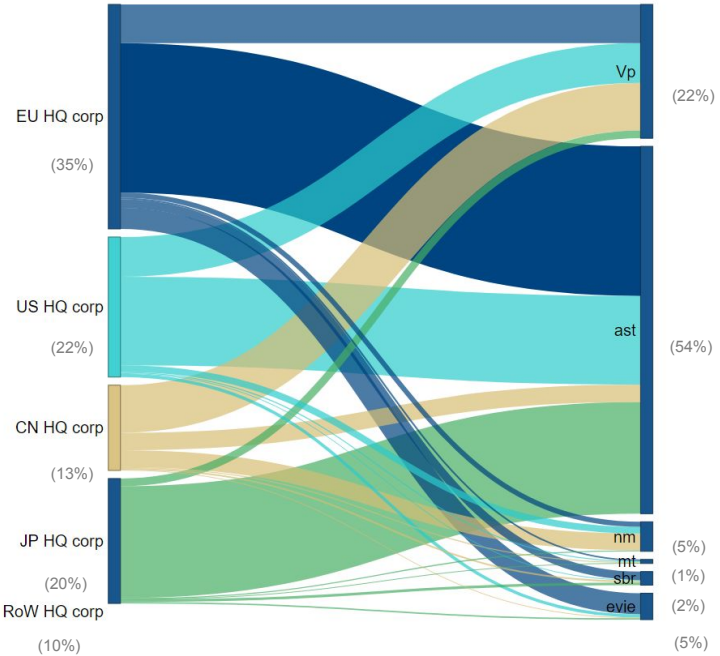
Source: BBVA Research based on EC Industrial R&D Investment Scoreboard (2003-2023).

However, repeating a pattern common to European private innovation, EU automotive start-ups are directing part of their investments towards the US

CORPORATE VENTURE CAPITAL INVESTMENT FLOW BY MAIN AUTO INVESTORS HQ (€ MILLION) (2023)



AUTO R&D INVESTMENT HQ BASED BY SUB-INDUSTRY (€ MILLION) (2023)



Source: BBVA Research from JRC Publications Repository - Corporate Venture Capital in the Automotive Sector

Key messages

- China dominates the global automotive industry, producing and consuming over 30% of the world's vehicles. The EU ranks second in production (15%) and third in demand (13%). The auto sector contributes 3.5% of EU GVA, and 3% of EU jobs. Germany leads by far the EU automotive sector, with 60% of GVA and 35% of jobs.
- The EU sector generates a very significant external surplus (0.5% of GDP). Germany leads overwhelmingly; US, UK and China are the main clients. Exports have higher import content due to greater reliance on external suppliers (China, US), along with the shift to EVs.
- China is rapidly gaining market share in the EU for Battery Electric & Plug-In Hybrid Electric vehicles (BEVs and PHEVs), becoming the leading foreign supplier. Chinese BEVs are now cheaper than combustion vehicles in the small car segment and dominates the battery supply chain.
- The share of EVs (BEVs + PHEVs) in total EU new car sales has plateaued at ~21%. High prices, insufficient charging infrastructure, and strong income-dependence are major barriers. Sales of combustion vehicles still represent nearly half of all new registrations in 2024.
- Triple challenge ahead: European car makers must hit ever-stricter CO_2 goals even as EV demand plateaus, close the technology & battery gap with China, and re-wire supply chains in a fragmenting geo-trade landscape—all at once, with profitability and jobs on the line.
    - The EU aims to cut CO_2 emissions from new cars by 100% by 2035, but short-term targets have been eased (15% reduction now over 2025–27 instead of 2025). Absent that easing, auto makers could face sanctions, or would need to buy credits from competitors or cut non-EV sales, jeopardizing profitability and employment.
    - The EU leads in automotive R&D spending, yet China is catching up fast. Investment is shifting toward autonomous driving, connectivity, and battery innovation, but the EU's industrial ecosystem lacks the vertical integration seen in China's EV industry.
    - Geopolitical fragmentation – US-China tensions and new trade barriers oblige costly de-risking and vertical reintegration.

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BBVA Research

Deep dive in the EU automotive industry

May 2025

Creating Opportunities