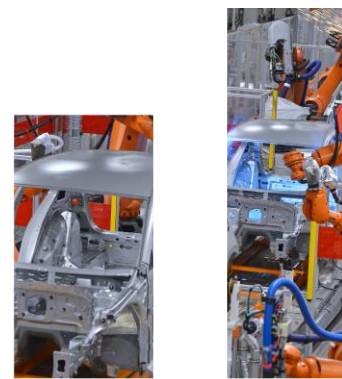


The future of the Italian automotive value chain: how to stay competitive?



Key Messages

This document has been prepared as part of the activities of the Sectoral Strategies and Impact Directorate, with the coordination of Andrea Montanino and Simona Camerano. The authors are: Alberto Carriero, Livio Romano, Sofia Torreggiani. The opinions expressed and conclusions are solely attributable to the authors and do not in any way reflect the views of CDP. The data reported refer to the information available as of August 30, 2024. All rights reserved.

- The European automotive supply chain is going through two transformative phenomena that **call into question its development prospects**:
 - i. transition to **electric mobility**, with the EU setting itself a zero-emission target for new vehicles from 2035;
 - ii. digital **transformation**, with the emergence of connectivity technologies and autonomous driving systems, which has prompted major IT companies to enter the sector.
- These transformations make the control of the supply of **batteries, critical minerals** and **software** for the generation of added value increasingly important. In these areas, however, the EU is **lagging behind** compared to:
 - **China**, which holds the record in the supply of batteries and many critical minerals;
 - **United States**, which is still the leading country in terms of digital technologies.
- In this context of growing difficulties for the European automotive industry, Italy dropped to the **sixth place in the EU ranking of motor vehicles' manufacturers** (nineteenth globally), with volumes **halved** compared to the early 2000s.
- However, it retains an important role in **components' manufacturing**, an area in which it consolidated an important **international leadership**.
- However, Italian suppliers are on average small in **size** and therefore have less investment capacity than international peers; **they still depend** significantly on a few major manufacturers and are **specialized**, in 40% of cases, in **traditional engines**.
- Despite the difficulties, the **extended supply chain** is still the **third largest contributor to national employment** and the **fourth in terms of GDP's share**, with values estimated in both cases at around 6%.
- The **repositioning of the supply chain** is therefore **strategic for the entire Italian economy**. It requires:
 - i. **attraction of new investments** by car manufacturers, linked to guarantees in terms of employment and value added activation in Italy;
 - ii. support for **innovation along the supply chain**, focusing on components, services and infrastructures for **electrification** and **digitalisation**;
 - iii. **diversification** towards **other sectors** and **new geographies**;
 - iv. support for the **dimensional growth** of suppliers, also through alliances and **aggregation operations**.
 - v. development of new **training plans** to cope with emerging technological trends and new business models.

1. Main challenges for the European automotive industry

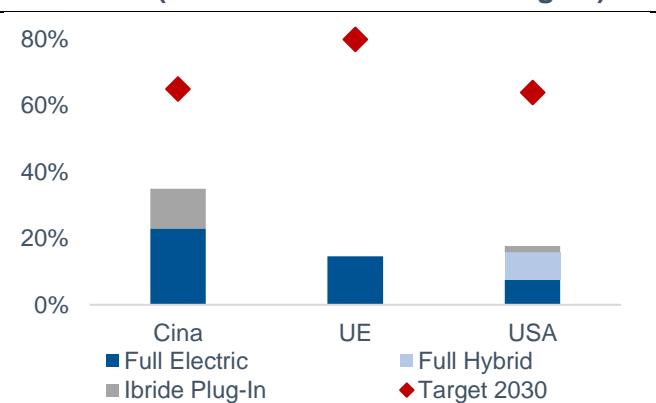
- ▶ The **automotive supply chain** is a **strategic asset for the European industry**. It represents **8% of the continent's GDP** (€1,000 billion in revenues in 2023) and employs, directly or indirectly, almost **14 million people** (7% of employment in the EU).
- ▶ **Five out of the ten** of the largest capitalisation **car brands** in the world are **European** and contribute significantly to the **EU trade surplus in the sector, which stood at around €90 billion in 2023¹**.
- ▶ The automotive sector also accounts for a **third of all R&D investments** made by Europe's top 1000 innovative companies² and **a fifth of EU tax revenues³**.
- ▶ The medium- to long-term competitiveness of the European automotive industry, however, is **being challenged by two major transformations**: the transition to **electric mobility** and the **digital transition**.

1. Transition to electric motors

- ▶ In the last seven years, the **global share of electric and plug-in hybrid cars in total sales has risen from 1% to 13%**.
- ▶ In the EU, this percentage reaches 22%, although with great disparities between member states⁴. This **rapid electrification** of the European market is due to **EU regulatory obligations on environmental protection**.
- ▶ In fact, the **Commission** approved in 2023 the **obligation for new passenger cars and light commercial vehicles not to generate any CO2 emissions "at the tailpipe" from 2035⁵**.

- ▶ From that date – unless there is a change of mind by the new European executive that will take office in the coming months – **new cars with internal combustion engines⁶**, which today power more than 90% of the Italian, German or French circulating fleet, **will no longer be sold**.
- ▶ The EU target is much **more ambitious than** the one envisaged by the **United States or China** (figure 1).

Fig. 1 – Share of electric and hybrid vehicles in new sales (2023 vs estimated 2030 targets)



N.B. Only the main technologies covered by the respective strategies towards decarbonisation should be indicated, excluding propulsion that is still marginal such as e-fuel or hydrogen.

Source: CDP elaboration on data from ACEA, China Association of Automobile Manufacturers, EIA, OIES.

- ▶ However, this higher ambition on the part of the EU **does not correspond to an industrial primacy in the electric mobility sector**. In fact, **China** is the world's **leading economy in terms of production, adoption and export of electric cars⁷**.

¹ Data source: Eurostat, referring to 2023.

² Data source: EU Industrial Research & Development (R&D) Investment Scoreboard, referring to 2022.

³ "Letter to Europe. Call for a sustainable, inclusive and competitive automotive industry", De Meo, 2024.

⁴ They range from 56% in Sweden to 4% in Eastern European countries. ACEA data, 2022.

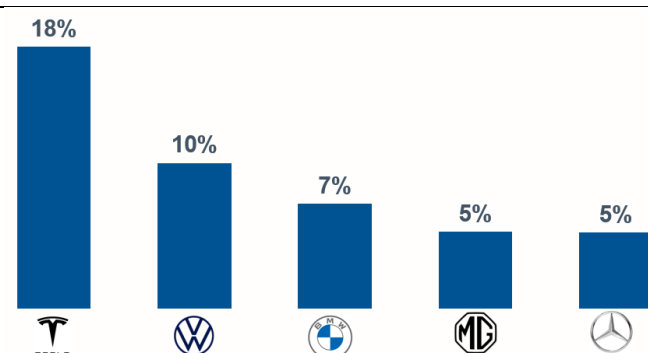
⁵ This target assumes an 80% penetration of electric cars by 2030 in order to be realistically achieved.

⁶ With the sole exception of cars that use e-fuels, which, according to T&E estimates, will represent a maximum of 2% of the European car fleet by 2035.

⁷ In 2023, more than a third of all electric vehicles exported to the world came from China, International Energy Agency, Global EV Outlook 2023.

- ▶ Among electric vehicle manufacturers, **only the American Tesla manages to compete with the main Chinese brand, BYD**, in terms of global sales numbers.
- ▶ Also in the European market, **the two best-selling electric models in 2023 and early 2024 were from Tesla**, which has a total share of 18%.
- ▶ The most popular **Sino-British brand in Europe, MG, sells the same number of electric cars as Mercedes** (figure 2).

Fig. 2 – Top 5 European market shares of Full Electric (as % of sales 2023)



Source: CDP elaboration on JATO data

- ▶ Overall, it is estimated that the **penetration of Chinese brands in the European full electric market will be 11% this year**, and it is expected to double by 2027⁸.
- ▶ The **loss of competitiveness of European producers does not only affect the continental market, but also the Chinese market**, which is the largest in the world.
- ▶ Emblematic in this sense is the **case of Volkswagen**, which makes half of its profits in China and whose market share in the country has fallen from 20% in 2020 to 14% in 2023.

In the **electric car segment**, the German manufacturer's share is **only 3%**.⁹

2. Digital transformation of vehicles

- ▶ To date, **50% of new vehicles sold worldwide have their own internet connection**, to exchange data wirelessly with other vehicles and infrastructures, with the vehicle manufacturer or with third-party service providers. It is estimated that this percentage will reach **90% by 2030**¹⁰.
- ▶ This trend will increasingly allow car manufacturers to profile driving habits, **sell additional services and features**, and improve the customer experience through **remote updates**.
- ▶ **Connectivity will also be essential** for the spread of advanced **autonomous driving systems**, which are expected to be present on almost 40% of vehicles by 2035¹¹.
- ▶ In the wake of these technological transformations, the **business model of car manufacturers is changing drastically**: it no longer focuses only on mechanical efficiency, but also, and above all, on transforming the vehicle into a state-of-the-art digital system.
- ▶ As a result, **product development timelines** are increasingly **influenced by the world of digitech** and its **industrial players increasingly central to the automotive industry**, both as strategic software suppliers (Apple, Intel and Google), and as vehicle manufacturers (as happened recently with Xiaomi¹²).

⁸ Data source: T&E, "One in four EVs sold in Europe this year will be made in China – analysis", 2024.

⁹ Data source: UBS, 2024.

¹⁰ McKinsey, "Car connectivity: What consumers want and are willing to pay", 2024.

¹¹ McKinsey, "The future of autonomous vehicles", 2023.

¹² CNN, "China's Xiaomi joins the crowded EV race with 'dream car' to take on Tesla", 2024.

2. Positioning of the European automotive industry

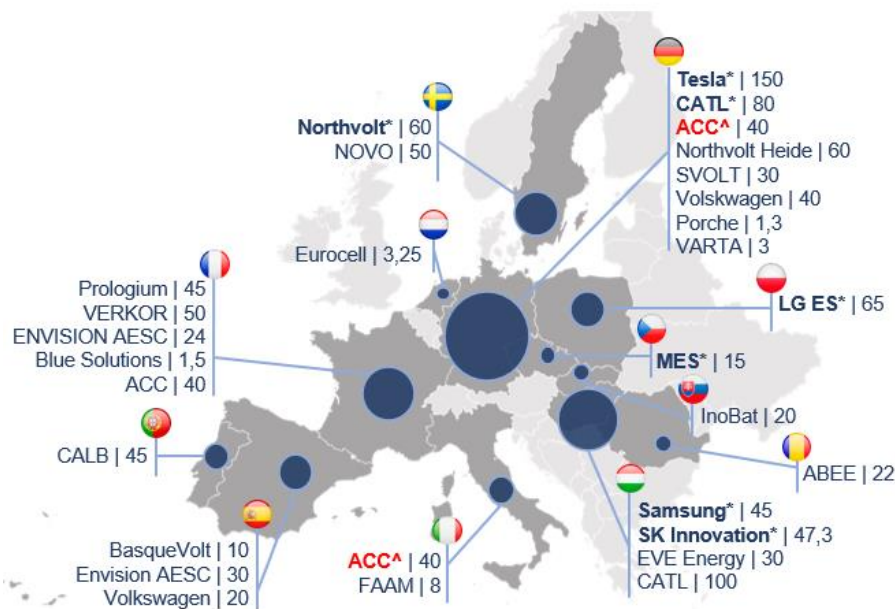
► **The electrification and digitalisation of mobility are revolutionising the automotive sector both upstream and downstream of the value chain:**

- up to **a third of the value of an electric car is concentrated in the battery alone**,¹³ a new central element in the competition between countries and manufacturers;
- an **electric car contains six times the amount of minerals used for a**

traditional one¹⁴. As a result, the availability of critical raw materials becomes a key competitive factor, so much so that an increasing number of automakers are investing in mining assets related to electrification¹⁵;

- The **value of the software** in the total cost of a car – currently 20% – could **double** by the end of the decade¹⁶.

Fig. 3 – EU battery production capacity by 2030 (announced, Company | GWh/a)



**Operational for a portion of the indicated capacity; ^projects currently on hold*

Source: CDP elaboration on European Battery Alliance data (2023) and desk analysis on company reports

► In this context, **Europe presents clear critical issues, especially in the upstream phases of the value chain:**

- looking at battery production, **the EU share of global capacity is around 6%**

(as in the US) compared to 75% in China¹⁷;

- **equally critical is the dependence on the extraction and refining of key raw materials** for the production of batteries

¹³ T&E, "Hitting the EV Inflection Point," 2021.

¹⁴ SRM, "Med & Italian Energy Report", 2023.

¹⁵ The mining industry today ranks fourth in terms of the number of acquisitions completed by automotive companies, CDP elaboration on Refinitiv data, referring to deals completed between 2018 and 2023.

¹⁶ De Meo (2024), ibidem.

¹⁷ JRC, "Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU – A foresight study", 2023.

and electric motors, with **Beijing again holding a strong competitive advantage**¹⁸;

- the **dependence, instead, is on the US regarding software** for autonomous driving, cloud services and infotainment systems¹⁹. Europe's leading manufacturers²⁰ rely on Big Tech technologies while relinquishing full control of the data generated while driving.
- ▶ **For each of these critical issues, however, there are positive signs:**
 - the policy impulse²¹ is giving impetus to battery production: by 2030, the current 233 GWh could exceed 1,000 GWh, more than **adequate to meet future European demand**²² (figure 3);
 - the entry into force of the **Critical Raw Material Act** in March 2024, setting precise objectives for strengthening the EU's domestic supplies of critical raw materials, should help reduce its dependence on foreign countries;
 - finally, there is increasing investment in Europe to build **autonomous software development capacity**²³.
- ▶ The strengthening of European industrial capacity will help generate **economies of scale in production, reducing the current cost differential** with Chinese electric cars sold in Europe, which for small cars is worth up to 25% of the total price.
- ▶ There are **only 6 electric car models sold in Europe for less than 30 thousand euros**, 3 of which are Chinese²⁴.
- ▶ In addition to the limited scale of production, **the high costs of European electric cars are also affected by the incidence of the energy bill** – double in the EU compared to China – which has a significant impact in the upstream stages of the supply chain.
- ▶ Added to this are the **direct incentives that the Beijing government has been granting since 2009 to Chinese electric car manufacturers**²⁵, under investigation by the European Commission since last October, **because they are considered detrimental to international competition**. Following findings of unfair trade practices, the EU has provisionally imposed **higher tariffs** on imports of battery electric vehicles from China since July²⁶.
- ▶ In addition, European manufacturers, which are traditionally export-oriented, are further penalised by the **protectionist policies of the United States and China**²⁷ which, unlike the EU, have conditioned the granting of incentives for the purchase of electric cars to local content requirements²⁸.

¹⁸ China has between 60 and 70% of the world's lithium, cobalt and synthetic graphite processing capacity. IEA data, 2023.

¹⁹ European Parliament, 'The future of the EU automotive sector', 2021.

²⁰ For example, Renault is integrating the Android Automotive system into numerous models, BMW bases its voice assistant on Alexa, VW is betting on Microsoft for the development of a cloud platform functional to the development of automated driving functions.

²¹ For example: the European Battery Alliance launched in 2017, the Strategic Action Plan on Batteries published in 2018, the two IPCEIs on batteries approved in 2019 and 2021.

²² European Commission, Progress on competitiveness of clean energy technologies, COM/2023/652 final. The actual implementation of the announced development plans is, however, weighed down by factors of uncertainty: some investments are currently on hold, as in the case of the ACC plants planned in Italy and Germany.

²³ The VW group will invest 27 billion euros by 2025 with the aim of increasing the percentage of internal development of the car's software to 60% from the current 10%.

²⁴ European Commission, 'Dashboard towards zero emission vehicles', 2024.

²⁵ IFW, "China's Massive Subsidies for Green Technologies", 2024.

²⁶ In mid-June, the European Commission announced that it will provisionally apply additional tariffs, between 17% and 38%, on imported Chinese electric vehicles from July. Source: Financial Times, *EU to hit Chinese electric cars with tariffs of up to 48%*, 2024.

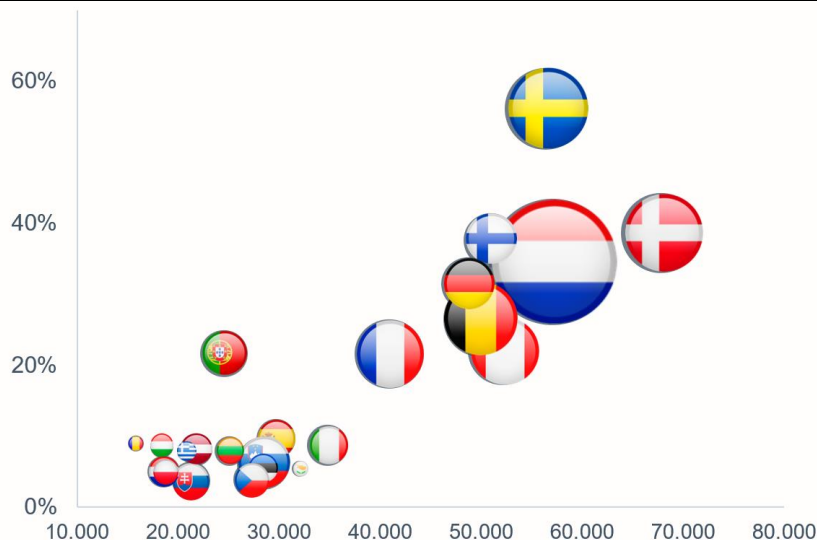
²⁷ The US Inflation Reduction Act, passed in August 2022, provides for tax credits of up to \$7500 for the purchase of electric cars with domestically produced batteries, similar to what China did until 2019.

²⁸ At the national level, however, we are proceeding in this direction. To be eligible for the French *écologique bonus*, a vehicle must obtain

- ▶ While the **high prices** of electric cars produced in Europe are one of the main factors hindering their uptake, the same can be said of the

current **shortage of charging infrastructure** (figure 4).

Fig. 4 – Electric cars' registrations (y-axis), GDP per capita (x-axis) and charging points per 100 thousand inhabitants (bubble size)



Note: They are considered full-electric and plug-in hybrids.

Source: CDP elaboration on Eurostat data, & ChargeUp

- ▶ In more than half of the EU countries, the share of **100 charging points per 100 thousand inhabitants is not reached**. In China, this figure is almost double²⁹.

EU, a **drastic increase in the number of charging points installed** per week will be necessary from the current 2 thousand to 14 thousand³⁰.

- ▶ o incentivise the use of electric vehicles and achieve its environmental goals by 2030 in the

3. Italian automotive supply chain between strengths and weaknesses

- ▶ With an added value of over 100 billion euros produced by about 1.5 million employees, the **extended automotive supply chain** is the **third in terms of contribution to national employment** (6%) – after the agri-food and construction sectors – and **fourth in terms of incidence on GDP** (6%)³¹.

- ▶ It is **among the most articulated** in terms of number of sectors involved, with high organizational and technological complexity.
- ▶ **17% of the total added value of the supply chain** is produced by the main sector, i.e. the **manufacture of vehicles and their**

a minimum green score, calculated on the entire supply chain, including transport, penalizing manufacturers without factories in France.

²⁹ Data source: China Electric Vehicle Charging Infrastructure Promotion, 2023.

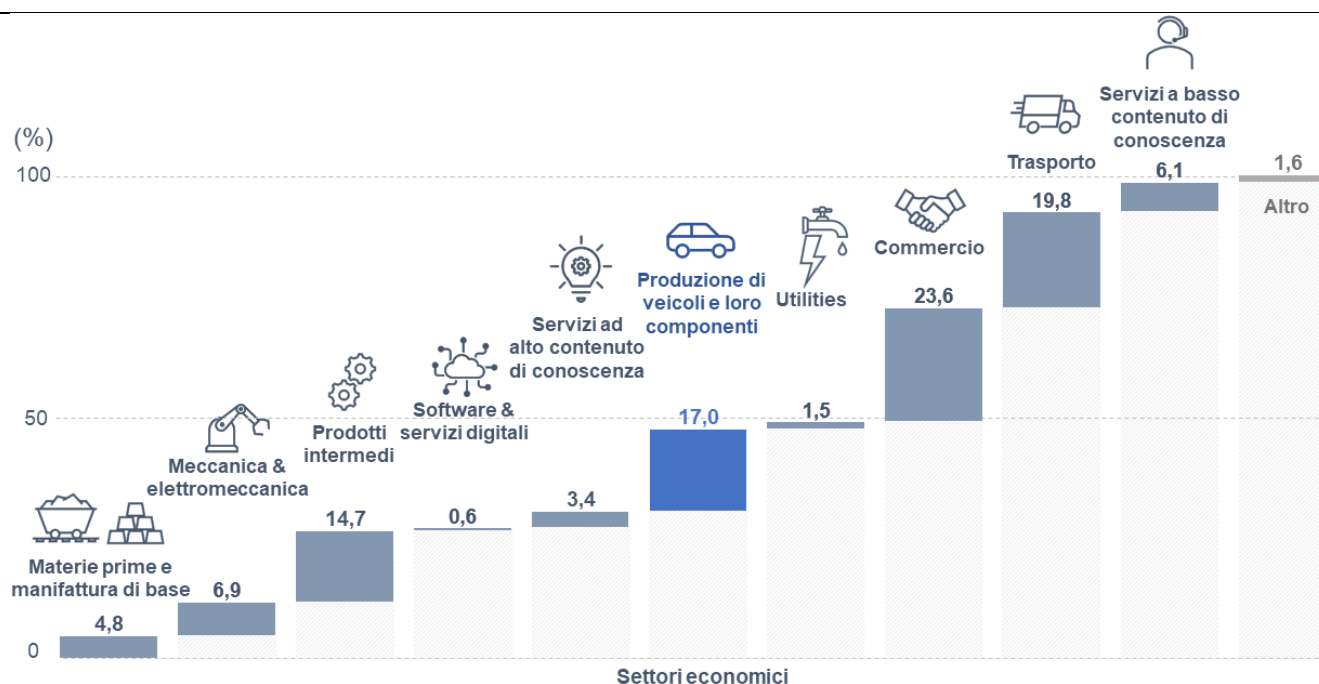
³⁰ Ibid. note 1.

³¹ CDP calculations based on Istat data (Permanent Business Census, 2023). The agri-food and finance sectors have been statistically reworked to take into account the contribution provided by the agricultural sector and banking, insurance and financial activities, which are excluded from the reference universe of the census survey.

components³². **Upstream processing**³³ and **digital and knowledge-intensive services** (software development, R&D, consulting services, engineering, technical testing) account for about **30% of total added value**.

- ▶ The other half of the added value of the supply chain is instead concentrated in the **sales** (24%) and **transport** (20%) phases, and in the **services with less intensity of technical knowledge**, such as rental and leasing (figure 5).

Fig. 1 – Breakdown of the added value of the Italian automotive supply chain (% , 2022)



Source: CDP elaboration on Istat data (Permanent Census of Companies, 2023)

- ▶ Italy is the **sixth largest European manufacturer of motor vehicles**. In 2023, **852 thousand units were produced nationwide**, including cars (520 thousand) and commercial vehicles (332 thousand).³⁴
- ▶ This represents a higher figure than that of the previous three years, characterized by the pandemic and supply disruptions, but **down 17% compared to 2018** when the units produced exceeded one million.
- ▶ The **other major European countries have maintained higher volumes despite the**

years of crisis: France produces 1.5 million motor vehicles (of which over 1 million cars), Spain 2.4 million (2 million cars) and Germany 4.4 million (4.1 million cars).

- ▶ Even smaller economies such as the **Czech Republic and Slovakia** - strongly integrated into the European automotive supply chain thanks to attractive labour costs and proximity to Western Europe - outnumber Italy with over one million units produced (figure 6).

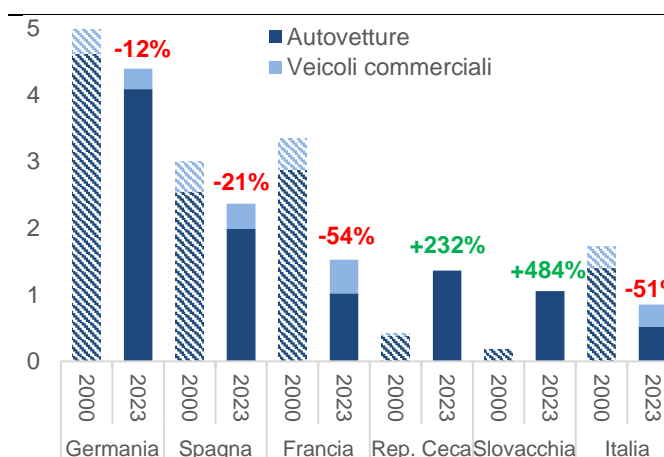
³² Bodies, engines, electronic parts, and seats.

³³ They include the phases ranging from the transformation of raw materials to intermediate products used in the production process of vehicles (semi-finished metal, plastics' parts and tires), basic processes in the metallurgical and chemical fields, the use of

mechanical and electromechanical machinery, electric components such as batteries and electronic parts as microchips.

³⁴ Data source: Oxford Economics.

Fig.6 – Top EU motor vehicles' manufacturers (in mln units)



Source: CDP elaboration on Oxford Economics data, 2023

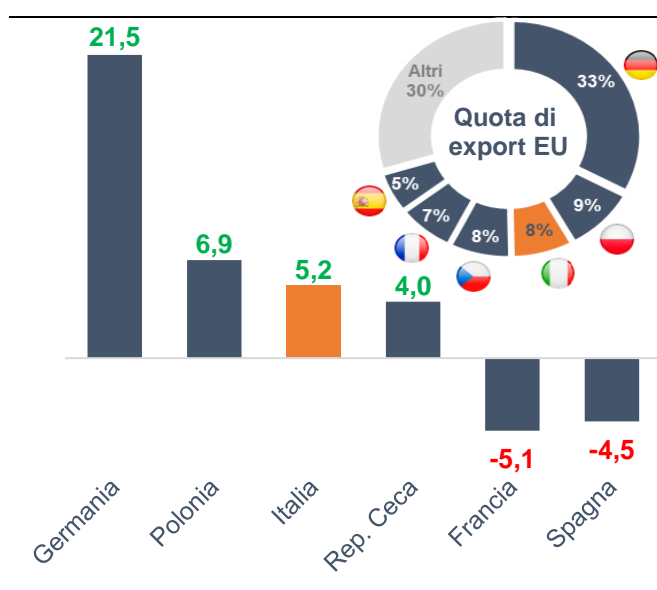
- Data on Italy's car production should be read in the context of a **30-year downward trend** that has seen the country **gradually lose ground as a motor vehicle production hub**:
 - national production has **halved since 2000**, when national plants produced 1.7 million vehicles, with a drop that, in the case of cars, was almost two-thirds (from 1.4 million to 520 thousand);
 - the number of employed people has **fallen** by 17% (about 35 thousand fewer between 2000 and 2021).³⁵
- However, despite this contraction in volumes, **Italy maintains a key role** in terms of **added value** generated by **vehicle production**³⁶, ranking third in Europe after France and Germany, thanks also to excellence in the high-end and sports car segment.

³⁵ Data source: Istat, National Economic Accounts.

³⁶ Despite being the second country for vehicle production in Europe, Spain follows France and Italy in terms of added value generated by the sector. This result is the result of a precise industrial policy design that since the 80s has seen the Spanish automotive industry – today less focused on research, product development and engineering – move into the lower value-added assembly segment – with a series of measures aimed at attracting factories of foreign manufacturers such as Volkswagen, Ford and Stellantis.

- Furthermore, in the last twenty years, **component** companies specialised in the various areas of production upstream of final assembly³⁷ have shown an excellent ability to adapt and have managed to sustain their competitiveness by **focusing on exports and internationalisation** to overcome the decline in production volumes in the domestic market.
- Despite the downsizing of its motor vehicle production capacity, Italy has built and consolidated an **international leadership** in this context, with a **share of 8% of total European exports** in 2023 (third behind Germany and Poland, with and a trade surplus of 5 billion euros)³⁸ (figure 7).

Fig. 7 – Trade balance (€ billion) and % exports of topEU component manufacturers



Source: CDP elaboration on Eurostat data, 2023

- In the context of the strong transformation of the automotive industry, **three structural**

³⁷ Among the most representative production areas are: design and engineering services, modules and systems, lighting and signalling components, electrical and electronic components, bodywork and passenger compartment parts, engine and transmission, steering components, suspension and braking. The main technological excellences of the supply chain concern methane and LPG fuel systems, propulsion systems, connected and autonomous driving technologies and engineering and car design services. Source: ANFIA, Observatory on Components, 2023.

³⁸ Data source: Eurostat, 2023.

weaknesses could **hinder the technological and market repositioning** of the Italian value chain:

- despite the presence of companies active in the most emerging segments (alternative powertrains, new technologies), **40% of the more than 2 thousand companies** in the sector are mainly **specialised** in the production of parts for **internal combustion engines**³⁹;
- Italian suppliers are **on average small** (on average, they employ 46 employees compared to over 100 for Czech, Polish and German companies),⁴⁰ thus suffering from greater **difficulty in putting in place the huge investments necessary** for product innovation, industrial conversion, and adaptation to the standards of manufacturers' modular platforms⁴¹;
- Finally, the Italian automotive system is **exposed to the choices of a few, but important players**. In fact, despite the growing diversification of the customer portfolio and outlet markets, the supply

chain remains **highly dependent on**:

- a. the **orders of Stellantis**, the only manufacturer operating in Italy⁴², which accounts for **over 50% of turnover of a third of suppliers**⁴³;
 - b. the **sales to German** and, to a lesser extent, French **manufacturers** (22% and 12% in 2023),⁴⁴ in a context in which car production in Germany and France is contracting⁴⁵.
- ▶ These structural fragilities are accompanied by the tendency, on the part of many car manufacturers, to **directly control the production of components and services with greater added value** (e.g., batteries, semiconductors, software), often creating joint-ventures with the main international players in these markets⁴⁶.
 - ▶ The internalisation of these phases of the supply chain by manufacturers could **preclude Italian component manufacturers from entering the most emerging and attractive technological segments**.

4. What policy options?

- ▶ Despite the critical issues highlighted, the automotive industry represents **one of the pillars of the Italian economy** and has consolidated international **leadership** in various areas of component production.
- ▶ **In order not to lose this centrality**, in a context of strong transformation of the supply chain at a global level, a mix of interventions is necessary to **accompany Italian companies**

³⁹ 11.9% of companies are active in electrification, 6.8% in LPG and methane fuel systems and 4.5% in hydrogen systems. Technologies in terms of connectivity and autonomous driving and those related to mobility services concern 6.0% and 3.4% of companies respectively. Data source: Anfia, Observatory on components, 2023.

⁴⁰ Data source: Eurostat, Structural Business Statistics, referring to 2022.

⁴¹ The platform is the technical element around which a vehicle is developed: it includes the general characteristics of a model and the mechanical elements it can contain. Modular platforms are universal matrices that allow you to make model development as flexible as possible.

⁴² However, there are two manufacturers of luxury and sports cars, such as Ferrari, which produces more than 13 thousand and 500 units and Lamborghini, part of the Volkswagen Group since 1998, which in 2023 for the first time exceeded 10 thousand units produced. Finally, DR Automobiles is operating on the national territory which assembles, in Isernia, cars produced in China, employing 500 workers. In the light commercial vehicle segment, on the other hand, companies such as Iveco and Piaggio operate.

⁴³ Data source: Anfia, Observatory on components, 2022 and 2023.

⁴⁴ Data source: Istat, Coeweb, 2023.

⁴⁵ In the last seven years, it has shrunk by 26% and 40%, respectively. Data source: Oxford Economics, 2017-2023.

⁴⁶ IEA, Global EV Outlook 2023, Chapter 8, Corporate Strategy.

in the path of **technological and market** repositioning.

- ▶ First of all, it is necessary **to encourage the increase in car production volumes**, through a greater involvement of the main manufacturer present in the country and the **attraction of investments** by other manufacturers, verifying the potential positive impact on employment and innovation (e.g., with guarantees of activation of the allied industries and R&D activities on electric motorisation and new technologies).
- ▶ Secondly, it is essential to support the **R&D and industrial innovation** activities of companies that operate and invest in components, services and infrastructures related to **electrification** and **digitalisation**, including through the development of **new platforms** and **technological hubs** in Italy.
- ▶ It is also important to accompany the **diversification** of suppliers along two lines:
 - **new sectors**, especially those that insist on **industrial areas characterized by strong contiguity with the automotive sector** (aeronautics, aerospace, railways, agricultural machinery, medical devices). Companies that already operate to a large extent in other sectors (with a turnover achieved in the automotive sector up to 25% of the total) show better revenue trends⁴⁷;
 - **new non-EU geographies**, where the

phase-out of endothermic vehicles will be more gradual (e.g., the United States) or where it is not yet at the core of the political agenda (e.g., Turkey, North Africa). Italian companies that boast production excellence in the endothermic engine sector will thus be able to continue to apply these capabilities, while **ensuring resources to invest in new technologies and alternative fuel systems**.

- ▶ Support for the **dimensional growth** of companies in the supply chain will be essential to boost their competitiveness and the acquisition of new technical-productive skills. Particularly relevant will be the **strategic alliances** and **aggregation operations** aimed at the **creation and consolidation of players capable of interfacing directly with manufacturers**, integrating sub-systems for the automotive sector (so-called tier 1 suppliers), to act as a driving force for the reconversion of smaller companies, promoting investments in innovation, entry into new markets, formation of qualified professionals.
- ▶ Speaking of human capital, it is necessary to promote **new training plans** consistent with the new needs of the supply chain and increasingly oriented towards developing digital skills (starting with data analysis, related to sensors and remote diagnostics) and mechatronics.

⁴⁷ Anfia, Observatory on components, 2023.

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