

Opportunities for Taiwanese Manufacturers:

A Look at the European Auto Industry's Transformation (Part 2)

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01 Taiwan's Exports of Automotive Components to Major European Countries

a. Product Certification — E/e-mark Certification

Similar to certification requirements in the North American market, countries worldwide require imported automotive components to comply with local regulations before they can be sold domestically. Although certification requirements vary by country, the overall framework is broadly consistent, typically covering product validation, quality management system certification, and pre-shipment inspections. The following provides a brief overview of the European product certification system.

According to the EU Framework Directive 2007/46/EC, automotive components (components or separate technical units) that comply with relevant regulations and are properly labeled or marked must be accepted for sale within EU member states. The directive covers vehicles, systems, and components (or separate technical units), and specifies individual directives or regulations applicable to road vehicles and special-purpose vehicles. These regulations are divided into two main categories: (1) EU Directives (EC Directives) and (2) Corresponding United Nations Economic Commission for Europe regulations (ECE Regulations). **Certification based on EU Directives is commonly referred to as EC certification or e-mark certification, while certification based on ECE Regulations is known as ECE certification or E-mark certification.**

Under both EU Directives and ECE Regulations, all motor vehicles and their components imported into EU member states must comply with applicable requirements to meet fundamental safety and environmental standards. **Products bearing the E/e-mark indicate compliance with the regulations of the issuing country.** Each member state is required to incorporate these regulatory standards into its national legislation to ensure that both manufacturers and end users comply with essential safety and environmental requirements. For products covered by existing regulations, testing must be conducted, certification must be obtained, and appropriate labeling or marking must be applied. **Products without the required E/e-mark are prohibited from being sold or used within EU member markets.**

b. Procedures and Requirements for E/e-mark Certification



Initial Assessment of Manufacturer Quality System:

At the initial application stage, EU transportation authorities assess the manufacturer's quality system to ensure that mass-produced products maintain consistent quality with the tested samples. This is typically verified through:

Certification under ISO 9001 or IATF 16949 (formerly TS 16949), or factory audits to evaluate the effectiveness of the quality management system



Type Testing:

Certification testing is conducted in accordance with the specific regulations applicable to the product for which approval is sought.



Conformity of Production (COP):

Ongoing quality control measures are implemented to ensure that mass-produced items remain consistent with the approved specifications, as required by relevant regulations.



c. Taiwan’s Exports of Automotive Components to Major European Countries

According to statistics from the Taiwan Transportation Vehicle Manufacturers Association (TTVMA), Taiwan’s automotive component exports have shown steady growth over the past 5 years. The U.S. remains the largest export destination, followed by Japan, China, European countries (including the UK, Germany, the Netherlands, and Italy), and Australia. Segmented by market type, Taiwan’s automotive component industry is primarily oriented toward the aftermarket (AM), rather than the OEM market. Due to the limited scale of Taiwan’s domestic OEM market, the development of OEM components has been relatively constrained. However, with the rapid economic growth of China in recent years—alongside a significant increase in its domestic demand for vehicles and automotive components—many Taiwanese manufacturers have expanded into the Chinese market and established close partnerships with Chinese automakers. Meanwhile, influenced by global economic conditions and cost considerations, European and American automakers have gradually shifted OEM production to Asian countries. Such outsourced production is still largely focused on non-critical components.

Taiwan possesses a well-integrated automotive component supply chain across upstream, midstream, and downstream sectors. Most manufacturers benefit from flexible production capabilities, enabling them to efficiently meet diverse, small-volume orders compared to traditional mass production models. Additionally, with the advancement of production automation and Industry 4.0, along with the implementation of refined production management practices such as lean manufacturing and the Toyota Production System, Taiwan’s manufacturing quality has reached international standards. Meanwhile, as smart vehicles and active safety systems gain global traction, Advanced Driver Assistance Systems (ADAS) are becoming standard automotive features. Many Taiwanese electronics manufacturers have already invested in ADAS development. Leveraging their established R&D capabilities and a comprehensive industrial supply chain, ADAS is poised to become a key growth driver for Taiwan’s automotive component industry.

▽ Figure 1. Comparison of Taiwan’s Automotive Component Export Value to Major European Countries in 2025

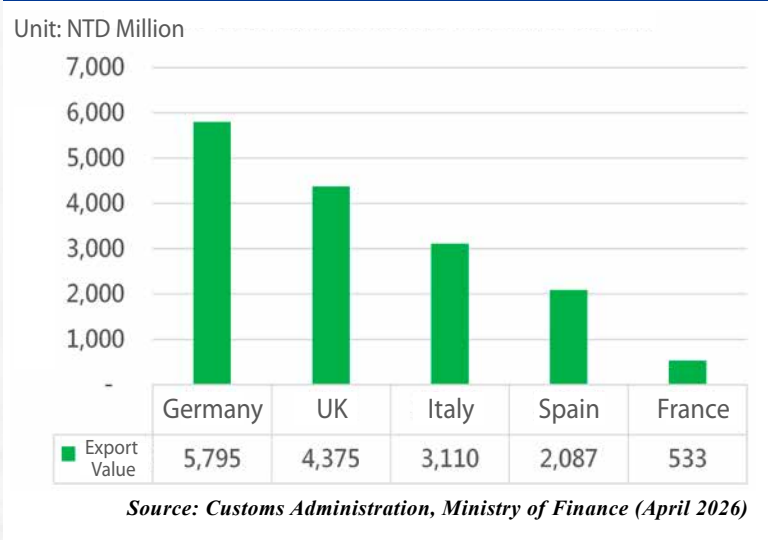


Figure 1 compares the export value of Taiwan’s automotive components to major European countries in 2025. Ranked by export value, the leading destinations are Germany, the UK, Italy, Spain, and France. A brief overview of key export destinations and product categories is provided as follows. **Taiwan is an important supplier of automotive components to Germany, particularly in fasteners, EV components, and the aftermarket sector.** Production demand from major German automakers such as Volkswagen, BMW, and Mercedes-Benz directly influences the revenue of Taiwanese suppliers. Exports to Germany are largely concentrated in the aftermarket, where Taiwan’s strengths in flexible manufacturing and high-mix, low-volume production are evident. Automotive lighting systems account for approximately half of the total export value, followed by electrical components, including automotive electronic systems. Mechanical and body components—such as transmission systems, tires, and collision parts (e.g., bumpers and sheet metal parts)—also represent key export items.



UK

The UK is Taiwan’s 4th-largest export destination for automotive components. Major export items include wheels, bolts and nuts, and EV-related components, with a strong focus on the aftermarket. Taiwanese manufacturers typically collaborate with local distributors in the UK, leveraging competitive pricing and mature supply chain capabilities, while complying with EU or UK product safety certification standards, particularly for electronic and safety-related components. Key products include wheels (with export value reaching NTD2.25 billion in 2025) and automotive fasteners such as bolts and nuts, which are highly competitive in the UK market. The aftermarket segment focuses on automotive lighting, collision parts, transmission systems, and electronic components. As the UK automotive industry undergoes transformation, demand for EV-related components is also increasing.



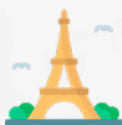
Italy

Taiwan’s exports of automotive components to Italy are primarily concentrated in the aftermarket, including automotive lighting, electrical components, tires, and transmission systems. Italy is one of Taiwan’s key automotive component trading partners in Europe, with close bilateral cooperation. Taiwan is not only Italy’s 8th-largest importer of machine tools, but its automotive fasteners are also highly recognized for their quality in the Italian market. Other export items include lighting assemblies, electrical components, tires, transmission systems, and collision parts.



Spain

Taiwan's automotive component exports to Spain show strong growth potential, largely driven by the complementary nature of the two countries' industries. Spain is the 2nd-largest automobile producer in Europe and is actively advancing its EV transition under the PERTE program. Taiwanese components are competitive in areas such as metal fasteners (e.g., screws and nuts), transmission systems, and drive shafts, creating opportunities for collaboration in both the aftermarket and EV component sectors. **Among export products, parts and accessories (HS Code 8714) are the most significant category.** Traditional automotive components, including iron and steel fasteners such as nails, screws, bolts, and nuts (HS Code 7318), remain Taiwan's export strengths and enjoy stable demand in Spain's aftermarket. As Spain accelerates its EV transition and aims to increase the automotive sector's contribution to GDP to 15% by 2030, emerging opportunities are expected in EV-related components such as electric drive motors, battery management systems, and charging infrastructure.



France

Taiwan's exports of automotive components to France are mainly focused on the aftermarket and specific electronic components. While not a primary trade segment between the two countries, there is strong potential for technological collaboration. Driven by the transformation of France's automotive industry—particularly toward electrification—and EU regulatory requirements, Taiwan is seeking to expand cooperation with French companies in areas such as lightweight materials, automotive electronics, and EV components to help optimize French supply chains. The French automotive components industry is undergoing rapid transformation, emphasizing supply chain digitalization and green transition. This creates opportunities for Taiwanese manufacturers with competitive technological capabilities in electronics and components. Major French automotive electronics companies, such as Valeo, have previously established operations or engaged in investment partnerships in Taiwan, laying the groundwork for deeper collaboration in smart vehicle and electrification technologies.

To expand exports to France, Taiwanese automotive component suppliers must comply with the EU's stringent E-mark certification requirements to enter the supply chains of French automakers such as Renault and PSA Group. As France faces a widening automotive trade deficit and increased competition from Chinese automotive brands, the **French industry is placing greater emphasis on supply chain resilience. Taiwanese companies can leverage their strengths in high-quality, technologically advanced components to gain market entry.**

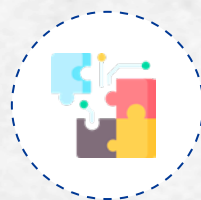
02 Entering the European Automotive Supply Chain: Opportunities for Taiwanese Firms

Europe has become one of the fastest-growing EV markets in the world and a major production hub for EVs. To achieve “zero-carbon” transportation and carbon neutrality goals, the EU has announced the implementation of the Euro 7 emissions standards in 2026, which will impose stricter limits on nitrogen oxide (NOx) emissions from new vehicles. This is prompting automakers to accelerate investment in EV development and manufacturing. Building on Taiwan's successful integration into the supply chains of major U.S. EV manufacturers, Taiwanese companies are also well-positioned to become key partners in the future EU electric vehicle supply chain. The following briefly outlines Taiwanese firms' current participation and strategic opportunities in entering the European EV supply chain.

Taiwan's Auto Component Strengths



After-service

Telematics
SystemAutonomous
Driving SystemCritical Component
DevelopmentVertical
IntegrationCertification
Alignment

a. Taiwan's Existing Pathways into Leading Automakers' Supply Chains

With the rapid growth of the EV industry, the share of automotive electronic systems continues to rise. Taiwanese automotive electronics and component manufacturers benefit from strengths such as reliable delivery schedules and high product quality, providing a solid foundation for industry development. Currently, Taiwan's ICT and electronics manufacturing service providers are expanding into the automotive electronics sector, entering international markets with products such as in-vehicle cameras, automotive displays, onboard computers, and telematics systems. These efforts are gradually strengthening Taiwan's role within the global automotive supply chain. **Taiwanese telematics**



infotainment systems hold approximately 50% market share in Europe, while automotive cameras have obtained certification from leading European automakers. In addition, Taiwanese automotive displays and navigation systems offer strong price-performance advantages in both European and American markets, enhancing their competitiveness in entering the European market.

In the areas of powertrain and charging systems, Taiwanese manufacturers are recognized by customers for their quality and delivery reliability, while actively participating in new product development. They have already established partnerships with European EV manufacturers and achieved successful implementation. Leading power supply companies are collaborating with European automakers to develop powertrain systems and charging infrastructure.

Taiwanese firms also supply components to Infineon, thereby entering the supply chains of BMW and Mercedes-Benz, or collaborating with Audi on charging station development. Leading fastener manufacturers have already supplied components to European automakers such as Volkswagen. Through referrals within established supply networks, Taiwanese firms have gained increased acceptance among European automakers and their supply chains, effectively shortening the time required to enter OEM supply systems and improving their chances of being included in procurement lists. Although Taiwanese battery manufacturers face challenges in competing with China in terms of raw material access and economies of scale, they have demonstrated success in niche and customized applications.

b. Platform Integration and Joint Certification



Volkswagen is advancing both connected vehicle technologies and autonomous driving in parallel, accelerating the development of autonomous EVs. Through collaboration with Microsoft, VW is building cloud platform capabilities, applying Microsoft's cloud technologies to connected vehicles to enhance digital mobility services such as ride-sharing and leasing. This also enables more efficient deployment of over-the-air (OTA) updates. VW is moving toward a vertically integrated model, including in-house design of autonomous driving chips. To remain competitive, automakers must define clear strategies for autonomous system development. Given the demanding operating environment for automotive semiconductors, manufacturers must establish integrated platforms combining both hardware and software capabilities to maintain a competitive edge.

In terms of cybersecurity, the EU's General Data Protection Regulation (GDPR) addresses the vast amount of data generated by connected and autonomous vehicles—including mobility data,

maintenance records, insurance information, and personal preferences. These issues involve data ownership, usage rights, privacy protection, and antitrust considerations. GDPR requires that data collected, processed, and utilized through automated means must ensure user privacy while enabling effective use of transportation and vehicle data.

Regarding automotive standards and certification, international standards such as ISO 26262 and IATF 16949 serve as basic entry requirements. However, control over automotive electronics reliability standards and certification processes largely rests with Tier 1 suppliers and automakers. Taiwan's certification systems for automotive electronics reliability are increasingly aligning with EU standards, with progress toward mutual recognition. Products validated in Taiwan can undergo additional certification in destination markets, facilitating expansion into European business opportunities.

c. Supporting Startups in Developing Key Components and Modules

European governments actively support startups in innovative development. Participating in the development of key components and modules for emerging automakers provides Taiwanese firms with opportunities to enter the European market. For example, the German startup Sono Motors targets a niche market for solar-powered EVs. Its Sion model features a body made of solar-integrated polymer materials, combining solar energy concepts with vehicle design, while relying on external supply chains for most components to reduce costs. Such companies tend to focus on business model innovation and often face limited funding in their early stages, creating opportunities for Taiwanese firms to supply systems such as powertrains, energy management solutions, charging systems, and EV chassis. Another example is Germany-based Electric Brands, which introduced the modular eBussy vehicle. This model emphasizes customization through modular design, allowing the same chassis to be adapted for passenger transport, cargo use, or camper applications. The development of distinctive modules, shorter development cycles, and cost-effective customization align well with the core strengths of Taiwanese manufacturers.



d. Replicating the Tesla Supply Chain Entry Model

Tesla has reshaped the traditional automotive supply model with an ICT-driven approach. Taiwan's strengths in vertical integration, flexibility, and responsiveness align well with Tesla's fast-paced and innovation-driven requirements, enabling Taiwanese firms to successfully enter Tesla's supply chain.

This success has also served as a springboard for entering other automakers' supply systems. For instance, as Mercedes-Benz adopts certain Tesla-related technologies, Taiwanese suppliers within Tesla's supply chain—providing components such as motors and transmission-related parts—have also gained opportunities to supply Mercedes-Benz, opening new pathways for Taiwan's automotive supply chain. Given that Europe remains dominated by traditional automakers and that EV platform development entails high costs, Taiwanese firms can leverage their strengths in the aftermarket and proven track records in component supply to pursue collaboration opportunities.



Manufacturers can also engage with emerging automakers during their early development stages, replicating the approach used during Tesla's early phase when Taiwanese companies participated in prototype development. Subsequently, many continued supplying mass-produced powertrain components (such as motors and electronic control units) and charging equipment. Their familiarity with Tesla's product validation and testing standards can be leveraged to pursue further collaboration with European automakers.

e. Learning from the Foxconn–Stellantis Joint Venture Model



The collaboration between Foxconn and Stellantis offers a potential model for Taiwanese firms entering international markets. Foxconn, under Hon Hai Technology Group, signed a memorandum of understanding with Stellantis—the world's 4th-largest automaker—to establish a joint venture, Mobile Drive. This venture focuses on providing advanced smart cockpit and connected vehicle solutions. Key development areas include in-vehicle infotainment systems, in-vehicle communication solutions, and cloud service platforms. Software development spans smart cockpit applications, AI-powered in-vehicle systems, 5G communications, and e-commerce integration. By leveraging smart cockpit technologies and related capabilities, the partnership integrates industry resources to deliver system and subsystem solutions.

Traditional supply chain structures among leading European automakers typically require suppliers to pass through multiple tiers (Tier 2, Tier 1) before reaching OEMs, making direct engagement difficult and extending development and validation

timelines. **To enter the European market, Taiwanese firms may consider strategies such as alliances, joint development, and acquisitions.** Drawing on the MIH Alliance model initiated by Hon Hai Technology, joint development with local universities or companies can provide indirect access to European vehicle specifications and future assembly or sales opportunities. Acquisitions, on the other hand, can offer more immediate access to local orders and facilitate entry into contracts with German automakers.

In the field of battery materials, participation in multinational alliances such as MIH can help position Taiwanese firms within opportunities. Battery manufacturers within the MIH ecosystem include companies such as CATL and Samsung SDI. Compared to smart cockpit and connected vehicle solutions—where Taiwan's strengths lie in ICT competitiveness and rapid development—battery material suppliers can leverage the platform to attract collaboration with automakers.

03 Strategic Opportunities for Industry Deployment

Europe, as a major economic bloc comprising 27 EU member states, supports the production, sales, and market growth of the automotive industry. Automotive manufacturing relies on an extensive network of satellite factories to form a comprehensive supply chain. Currently, major European countries are undergoing a transition toward vehicle electrification, facing multiple challenges such as high production costs, supply and allocation of key components, adjustments to national purchase subsidy policies, and the influx of low-priced electric vehicles from China. These factors have contributed to declining sales in traditional automotive segments and workforce reductions. The rapidly evolving automotive landscape presents strategic opportunities for Taiwan's automotive component industry.

Taiwan's automotive sector demonstrates high precision in stamping dies and fastener manufacturing, with advanced precision manufacturing technologies that complement those of European countries. Automotive components such as electrical systems, braking system components, aluminum alloy wheels, wiring harnesses, brake pads, and automotive lighting benefit from Taiwan's manufacturing expertise, high quality, and cost competitiveness. These strengths position Taiwanese firms to potentially fill supply chain gaps in the European automotive components market. ■

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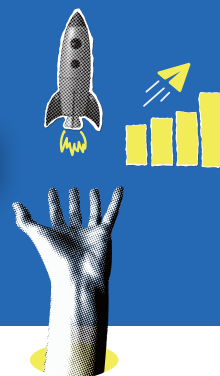


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