

ELECTRIFYING THE AUTOMOTIVE LANDSCAPE: PORTUGAL'S GLOBAL INFLUENCE



AICEP

Portugal Trade & Invest



Portugal is making a significant impact on the global automotive industry by driving the electrification of vehicles throughout Europe and beyond, with a strong emphasis on renewable energy sources.

The country has become a leader in innovative design and industrial engineering for electric vehicles (EVs). Currently, Portugal is a producer and exporter of hydrogen-powered public transport buses, Electrical trucks, commercial vehicles, and two-wheelers. It also manufactures essential components for EVs, charging infrastructure, and software solutions, all while establishing a groundbreaking electric mobility network that incorporates advanced interoperability.

According to AFIA - Portuguese Manufacturers Association for the Automotive Industry, in each 100 cars produced in Europe, 98 have components made in Portugal.

The country's industrial ecosystem is complemented by the excellence of universities, specialised technical training centres and research and technological development centres. Nowadays,

Portugal offers a combination of state-of-the-art technology, talent, flexible production capacity, research and innovation in process and product engineering.

Export oriented, the automotive sector frequently receives investment from large multinational groups for the implementation of innovative projects and new products, which demonstrates the confidence of several international manufacturers and tiers in the Portuguese automotive industry.

Pioneering Design and Development

The path to automotive electrification begins with comprehensive design interventions. This includes collaborating with clients on project specifications, generating concepts, and developing products, ultimately supporting the construction of prototypes. Almadesign has been a key player for over 25 years, focusing on creating lighter, quieter, and more environmentally friendly designs across various mobility industries.



CEiiA is another innovator, with more than 20 years of experience collaborating with industry leaders to create a new generation of products and services to be industrialized being created in 2006 with the goal of establishing the capability to develop and industrialize complete products with the Portuguese automotive industry. Since then, CEiiA has been working in mobility by introducing new mobility concepts through innovative products and services. New products and services towards a sustainable future.

INESC-TEC, INEGI and ISQ are some other good examples of excellence in the technological interface with the automotive industry, which today is focused on developing solutions dedicated to electrification, connectivity and autonomous and safe driving, including cybersecurity.

Expanding EV Manufacturing Capabilities

Among the notable electrified products emerging from Portugal is the FUSO eCanter, developed in partnership with Daimler Trucks at the Mitsubishi Fuso Truck European facility in Portugal. The Next Generation eCanter offers 42 configurations, with various wheelbases and gross vehicle weights from 4.25 to 8.55 tonnes.

Recent investments in electric vehicle production are on the rise, with Stellantis launching a new line of battery electric light commercial vehicles at its historic Mangualde factory, the longest existing in Portugal. They plan to produce popular models such as the Citroën ë-Berlingo and Peugeot e-Partner.

CaetanoBus, is a Portuguese bus OEM, dedicated to the production of modern public transportation through initiatives like the e.City Gold and Cobus, which are both zero-emission city and airport buses. The Cobus serves now over 337 airports in more than 100 countries, reinforcing sustainable urban mobility worldwide.

The H2.City Gold project showcases Portugal's commitment to hydrogen solutions, emphasizing modular designs that enhance

autonomy and comfort, while allowing for customizable interior configurations to meet diverse operator needs. Vega is another standout initiative, featuring rapid charging capabilities, zero emissions, and a focus on passenger comfort. Its sleek design combines emotional appeal with practicality, embodying a future-oriented approach to zero-emission transport.

Volkswagen Autoeuropa, another major player in the market, has the largest car producing unit in Portugal, where it manufactures the acclaimed T-Roc, an European best seller. This unit is not yet dedicated to the electric model, but the future will certainly involve models with a lower carbon footprint.

Regarding EV components, BorgWarner is making substantial investments in Portugal, focusing on developing electrified products, particularly in engines and thermal management systems for hybrid and fully electric vehicles. Other global companies, including Yazaki, Hanon Systems, and Denso, along with local firms as microelectronics firm HFA, are also advancing the production of critical components for electric vehicles.

Portugal is building a comprehensive battery value chain, with various companies collaborating from raw material sourcing to battery recycling. As the holder of Europe's largest lithium reserves, coupled with a strong capacity for renewable energy generation, Portugal is well-equipped to enhance its role in the transition to cleaner transportation.

In addition, components in composite materials and textiles for intelligent coatings stand out in the offer for the cars of the future. Electronic, electrical, metal and plastic components continue to play a major role in the total number of components manufactured in Portugal.

Smart manufacturing is another focus of Portuguese industry, with the fast growth of companies dedicated to the development of technology applied to the automotive industry. The digitalisation of the industry is showing clear results in the optimisation of vehicle and component production. The industrial metaverse and augmented reality applied to the industry are areas of specialisation which, although off the vehicle's drawing board, contribute to shaping the mobility of the future.

Leading Innovations in Electric Vehicle Charging

In the realm of sustainable transport and energy, Efacec has established itself as a pioneer in electric charger production, offering ultra-fast charging solutions (60 to 120 kW) suitable for all types of electric vehicles.

Siemens Portugal is transforming EV charging systems with its Sicharge UC family, a versatile solution designed for eBuses and eTrucks. Additionally, Porto-based company i-charging specializes in fast and ultra-fast charging technology. Since its establishment in 2019, the company has earned accolades, including the German Innovation Award 2022, for its commitment to user experience. i-charging's intelligent charging systems allow for simultaneous

connections for multiple vehicles, featuring an innovative cable management system and user-friendly interface. i-charging's dynamic technology facilitates concurrent and sequential vehicle charging, optimizing power distribution and minimizing downtime ideal for fleet operations. Soon this company will be presenting the solution related to the Megawatt Charging System: the first choice for trucks.

A Comprehensive Charging Network

Mobi.E, Portugal's national Electric Mobility Network, integrates all private charging networks, providing universal access across the country. With more than 9,000 public charging points, including fast and ultra-fast stations. Mobi.E streamlines the charging process, resembling an ATM system. Users can access charging services with a single method, either through a card or an app, simplifying transactions, especially for tourists.

Curiosities Looking Ahead

- Portugal was pioneer having a fully interoperable charging infrastructure that allows seamless universal access, as well as providing real-time updates on charging point availability.
- Charging Point Density: Portugal presents 82 outlets per 100 kilometers of roadway, with 111 outlets for every 100,000 residents. An average of 31 new posts are installed per week in the year.
- Environmental Contributions: As of August 2023, the Mobi.E network has facilitated over 91,000 MWh of energy use and has saved over 73,000 tonnes of CO₂ emissions.



- Access to Information: Users can track charging point availability and environmental impact data in real time via the Mobi.E website: mobie.pt/mobidata/data.

These are some of the reasons why Portugal has been paving the way to become one of the best places to develop, manufacture and test vehicles and technologies.

Innovative solutions developed by talented people, prepared to showcase its reliability as a partner to the Thai automotive industry.

For additional details about the Portuguese automotive sector, please reach out to AICEP: aicep.bangkok@portugalglobal.pt



OEM AUTOMOTIVE PARTS MANUFACTURING BUSINESS CASTING & MACHINING

Casting Parts and Machining Parts

AAPICO Maia, S.A. and AAPICO Águeda, S.A., large companies in Portugal, are part of AAPICO Hitech Public Company Limited Group, a Thai manufacturing conglomerate established in 1996 and listed on the Stock Exchange of Thailand since 2002. The Group's main business initially was to design, produce, and install car assembly jigs and stamping dies; and to manufacture OEM automotive parts, including floor parts, cross members, pillars, brackets, clips, and fuel tanks for leading automobile assemblers in Thailand. The Group has since progressed by adding the production of chassis frame components, forging parts, machining parts, casting parts, plastic parts and plastic fuel tanks to its manufacturing portfolio. AAPICO Maia, S.A. and AAPICO Águeda, S.A. are part of AAPICO Hitech Group since October 2019 and specialize in the production of safety critical components in nodular cast iron, serving primarily the automotive industry in the European market. Over the past years, AAPICO Maia, S.A. and AAPICO Águeda, S.A. have demonstrated technical and environmental excellence, being considered benchmark companies in the foundry industry. These companies are developing and producing lightweight casting solutions, grouped as follows: powertrain, brakes, engine, and suspension, now complemented with sport discs and shoulders and base plates for the rail track. AAPICO Maia, S.A. and AAPICO Águeda, S.A. sell about 28 million components per year.

Foundry process is a millennial process, but always actual. The most common process is the sand mold process. It consists of the usage of pattern plates (tooling) to mold the negative shape of a part to be produced in a sand mold. Liquid metal, obtained in high temperature furnaces, is then poured into the sand mold filling the entire cavity. After solidification and cooling, the part is removed from the mold, cleaned, and is ready for subsequent operation, such as machining.

AAPICO Maia, S.A. and AAPICO Águeda, S.A. currently supply ductile iron safety critical components to BMW, Daimler Trucks, Ford, Mercedes-Benz, Renault, Stellantis Group, Volkswagen, and as Tier 1 and as Tier 2 to CIE Automotive, Continental, Dana, and Linamar. France, Germany, Hungary, Italy, Slovakia, Spain, and Sweden are among the Company's primary markets in Europe. The Company also exports to worldwide markets including



America, Asia, and Africa. In Asia we export to Dana Thailand with an annual sales volume of approximately 6 million euro.

The Diversification Program enables AAPICO Maia and AAPICO Águeda to develop iron solutions to a new range of industries, where Sport, Railway, Agriculture and Heavy- Duty can be highlighted. The new 4 customers are Décathlon, Pandrol, John Deere, SAF and Jost.

Foundry process allows a high production rate with lower cost compared to other production processes. Its major applications are transport (cars, trucks, trains, and boats), machines and equipment, infrastructure, and water systems.

Additionally, foundry is an important industrial process in the circular economy, as it uses steel scrap as main raw material and reuses a considerable amount of the molding sand. Although it uses up an intensive amount of electricity, more advanced foundry companies such as AAPICO is able to obtain a significant part of their energy through renewable sources.

AAPICO advantages rely on experienced team namely at engineering level in offering new design solutions and efficiently supporting the foundry. The Company can especially highlight the absence of fettling at the finishing line, along with low level of final controls. Also, AAPICO counts on a large data base (more than 5M inputs daily), worked out with artificial intelligence offering a very precise control of the process, granted on the shop floor by the Company's operators as well as to develop and formulate special recipes offering special characteristics like welding.

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