



Ajuntament de
Barcelona



The most in- demand jobs in Automotive Sector

REPORT

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01. Introduction to the sector

The automotive sector includes activities from manufacturing of new vehicles, trucks and motorcycles, to activities such as production of spare parts. We can then identify two big areas:

- **Engineering and R+D:** Processes related to new facilities, assemblies, investigation, innovation, etc.
- **Operations:** Processes linked to production activities in factories, for example, automated lines of production, continuous progress processes, tasks of maintenance, etc.

The automotive sector constitutes one of the most important sectors of the world economy. Nevertheless, in a situation of suspense such as the current one and, attending to its sensibility to consumption evolution and to the industrial and commercial activity, the sector is suffering a transformation and it focuses on reinventing itself in order to increase the future viability of its productive plants. In order to improve its competitiveness, car companies are facing, especially, towards a progress of quality and productivity improvement.

02. Current environment

Global Trends:

The activity of automotive sector has improved over the course of 2015 due mainly to the increase in vehicle sales, production and exports globally. During the first quarter of 2015, 17,9 million cars were sold, 2,3% more than in the same period last year. Also, China has remained the leading exporter and marketer of automobiles during the first quarter of 2015, followed by the European Union and the United States. However, emerging countries such as India, Russia and Brazil have gained greater economic weight in the global automotive industry also in the first quarter of 2015. Industry experts suggest that in the coming years, China and India, together with Europe, Japan, Korea and the United States, will become the design and manufacture center of vehicles, components and other products and services in the automotive industry.

In Europe, the automotive sector, has also become a key sector for the economy due to its industrial activity and its ability to create direct and indirect jobs (market components, research, transport, etc.), with a total of 12,1 million workers in 2014. Moreover, this sector is the main contributor to investment in R&D in Europe, with 41.500 million euros per year, according to the European Automobile Manufacturer Association (ACEA). On the other hand, car sales grew by 8.6% during the first quarter of 2015, with 3,5 million vehicles sold. Car production was near 4,1 million, what represents a rise of 5,1% over the same period of 2014.

The main automotive markets in the European Union, such as Germany, Spain and the east countries have outlined an increase in car production and sales, contributing to the gradual recovery of the European auto market. Likewise, the European Union, aware of the importance of the sector, has promoted new initiatives within the European Horizon 2020 program to foster improvement and development.. Thus, they have launched projects to encourage the production of alternative energy vehicles, as well as to develop new technologies that can be used in the manufacture of component and pieces.

Trends in Spain:

The automotive sector in Spain is in line with the situation of the global and European markets in 2015. Therefore, during the first half of the year there is an increase in consumption, exports and, consequently, production and manufacture of both vehicles and components. This growth trend continued during the first seven months of 2015, registering 1,7 million vehicles manufactured and a value of 27,455 million euros in exports of vehicles and components. This is due mainly to increased exports to countries like the US and South Korea, among others, as well as increased demand for vehicles in the Spanish market. Moreover, in 2014 Spain was ranked as the ninth largest car producer and the second in the EU.

With regard to the sector employment, 31.700 new direct jobs were created, increasing employment in 209.800 people employed in 2014 according to the Economically Active Population Survey (EAPS) provided by the *Tribuna de Automoci3n*.

Experts of the sector consider that part of the slight improvement in the economical and commercial activity owing to the positive impact of *PIVE* plans as well as the improving economic environment and access to credit, for enterprises and consumers.

Trends in Catalonia:

The automotive sector has grown in 2015 due to automobiles exports improvement (registered growth of 18,2% in the first half of 2015) and the increased levels of private investment in the sector. In this regard, investment in production and research (R&D) by multinational and other companies has increased by 20,3% comparing to the previous year. Likewise, Catalonia was named as the first vehicle production center in Spain in 2014, reaching 23,73% of the market and with 553.000 manufactured cars approximately.

Furthermore, exports from the automotive sector grew by 14.3% during the first five months of 2015 (January-May) over the same period in 2014, so that the automotive sector was the second sector in terms of export volume during that time.

In regards with the employment, 38.455 people was employed in 2014 (including sales activities, repair and distribution of vehicles), according to the Statistics Department of the *Ajuntament de Barcelona*. In this context, the Catalan government launched in 2015 a new automotive training center in Martorell to boost youth employment in this sector. This training is in line with the needs of companies in the automotive sector in Catalonia.

The sector is one of the most strategic ones for the economic recovery in Catalonia, both the activity it generates and the impact that has on the indirect job creation in other sectors. Thus, Barcelona plays an important role because most vehicles and components production centers are concentrated in Catalonia.

Automotive Indicators	Sector contribution to GDP in Spain ⁽¹⁾	Employed population in Catalonia ⁽²⁾	Number of companies in Catalonia ⁽³⁾
	7,3% (2014)	38.455 (4th 2014)	400 (2014)

(1) Data extracted from the annual report ANFAC 2014.
 (2) Data extracted from the Statistical Department Barcelona Council.
 (3) Data available in National Institute of Social Security, (INSS).

03. Key sectorial trends

	<p>International Market</p>	<p>As global competition has continued to grow during 2015, automotive companies are improving their production and marketing processes to introduce new technologies and to adapt to changing needs and preferences of customers. In addition, companies put special emphasis on research and development, focusing on the environmental impact of vehicles produced, and on the launch of new initiatives. Conversely, there are differences in business models among the countries with low labor costs (China, India) and countries with high investment in R+D+i (Spain and the United States). The manufacturers increasingly opt for internationalization to access financing, to investments in other markets and to reduce costs in production processes and thus increase competitiveness. Moreover, components companies tend to locate in different countries in order to become manufacturers global suppliers and increase their specialization in production models.</p> <p>Finally, the training of professionals has become essential for the competitiveness of the automotive industry worldwide.</p>
	<p>New Consumer Trends</p>	<p>The automotive companies are facing the need to orient and adapt to changing needs and preferences of customers due to changes in lifestyle and new consumption habits. These challenges involve investments in innovation, technology and improvement quality of products and services offered by companies. Also, the following are considered as key elements in buying a vehicle: price, integrated technology, safety systems and energy efficiency systems. In this concern, consumers tend increasingly to get hybrid or electric vehicles. Regarding the purchasing process, companies have adapted to the digital environment of consumers. For instance, manufacturing companies allow their customers to customize their vehicle through the website.</p> <p>Globally, there are differences between Western and emerging countries. On the one hand, consumer preferences are changing as young people increasingly tend to use new ways to travel and plan the trips , such as carpooling, digital platforms and apps. On the other hand, emerging countries are expected to increasingly buy more vehicles. For this reason, companies are beginning to diversify their services and increase their online presence.</p>
	<p>Sustainability and Environment</p>	<p>The new consumer preferences together with the regulation on sustainability are factors that are leading more and more companies in the sector to implement improvements in products, processes and services. The main objective is to reduce greenhouse gas emissions and increase energy efficiency in vehicles. On the one hand, companies incorporate lighter and stronger materials, including recycled products, to reduce vehicle weight and further improve fuel efficiency. On the other hand, the electric vehicle with new electric batteries is still promoted.</p> <p>Public administrations encourage the use of sustainable transport in cities and encourage the purchase of fuel-efficient cars through schemes such as the <i>Plan Pive</i> and <i>Plan Movele</i>. For example, there is a fleet of about 4.000 electric vehicles in Catalonia.</p>

	<p>Innovation and New Technologies</p>	<p>Technological advances are one of the key trends in the industry in 2015. Companies and public Institutions have increased their investment in innovation, in order to attract new customers and increase competitiveness in the sector. Thus, car prototype has been adapted to consumer trends; more and more vehicles combine functionality and hyper-connectivity-through digital services and mobile devices. Consequently, companies are beginning to incorporate new technological advances in vehicles like the big data, new software and electronics as well as the “internet of things”, among others. Production companies are working to improve security and facilitate the use of the vehicle systems. Also it is expected that the built-in car technology will be a key purchasing factor in the coming years.</p> <p>Regarding big data technology, it plays an important role in the sector, both for businesses and consumers. On the one hand, provides data in real time and calculate risks. Consequently, it improves flexibility and better adapt to consumer preferences, providing information on traffic, weather and other useful information. In addition, manufacturers can accelerate the production time reducing costs and streamlining processes. On the other hand, it is expected that the incorporation of 3D printing technology in the sector will increase in the coming years due to mass production of pieces, components and prototypes. According to industry experts, this technology will allow more flexible and streamline manufacturing process and reduce material costs, time and gas emissions.</p>
	<p>Modularity</p>	<p>Sector companies increasingly tend toward flexibility in the manufacturing process using modular platforms to reduce time costs and share parts of the production line both between partner companies and suppliers and among component companies. Thus, they can adapt their manufacturing processes and new products with the requirements of the automotive market.</p>
	<p>Quality</p>	<p>The increasing competitiveness of the sector and increased investment are forcing companies to improve the quality of products they offer. The end-product manufacturers not only offer the product but are also specialized in the design of pieces and components, marketing and after-sales service. Also, the improvement in products quality, processes and customer service, has become a key tool to compete in the international market.</p>

04. Employment in the Automotive Industry

The demand for professionals in the automotive sector has increased during 2015, mainly due to the significant increase in production of vehicles and components, and the increased investment in R+D+i by the auto companies. This is leading to increased demand for experts both for highly-qualified and less-qualified professionals, but especially for the more technical profiles. It is also expected that employment in the sector will continue to grow in the coming years driven mainly by increased vehicle sales.

Moreover, the impact of the automotive industry in other sectors of the economy points to a trend in the diversification of jobs and a growing need for greater expertise in the sector areas.

Analysis of employment in the Automotive Industry	Current Trend	Forecast Growth
	↑	↑

↑ Recovery / Growth; ⇌ Maintenance; ↓ Decrease

4.1. THE MOST REQUIRED HIGHLY-QUALIFIED JOBS DEMANDADAS

	Job Position	Description	Requirements valued (Education, experiences and skills)	Additional Considerations
1	Process Engineer	The processes engineer is the professional who defines and establishes manufacturing processes with corresponding parameters, taking into account the production means of the company. His/her missions include reaching optimum quality levels, costs and delivery periods in the manufacturing process.	<ul style="list-style-type: none"> Education: it is necessary to have a degree in engineering. Experience: a minimum of three years of experience in the production systems of metalworking factories is desirable. 	Skills as the following are highly valued: orientation towards achievement , planning and organization and people management .
2	Production Planning Manager	The production planning manager is the professional who is charge of planning company production and implementing and executing its quality control, environmental and safety policies.	<ul style="list-style-type: none"> Education: it is necessary to have a degree in engineering, specially in industrial engineering. Experience: between three and five years of experience in production planning with a company operating in the mechanical industry or similar is required. 	It is essential to have a high level of English. For other positions it is necessary to speak other languages such as German.

	Job Position	Description	Requirements valued (Education, experiences and skills)	Additional Considerations
3	Automotive R&D+i engineer	The R&D&I engineer in the automotive industry is the professional who is in charge of the product search, development and innovation processes at companies of the automotive sector, both vehicle and part manufacturers. This is the person responsible for the design, execution, coordination and carrying out of projects that should lead to new products in the future.	<ul style="list-style-type: none"> • Education: an industrial engineering degree is required. • Experience: a minimum of five years of experience in managing a R&D+i department in the automotive industry is advisable. 	<p>Both integrative capacity of different types of technology, and capacity to manage innovation projects are highly valued.</p> <p>Skills such as commitment to the organization are valued.</p>
4	Electronic engineer (electric vehicles)	Electronic engineer is the professional who works on the electric vehicle manufacture process, since these types of vehicles are driven by electric energy generated by electrical and electronic elements. Their tasks involve scouting, as well as designing, the product.	<ul style="list-style-type: none"> • Education: it is necessary to have a degree in either engineering or architecture. Moreover, advanced courses in industrial electronics or in new technologies related to electric vehicles are desirable. • Experience: a minimum of three years of experience in product development for companies in the automotive industry is required. 	<p>To carry out these activities, the application of technical knowledge (laws of physics, calculations and mathematical formulas, properties of materials) is required. Creativity is also necessary to provide optimal solutions for the functional requirements of products design.</p>
5	Automotive Project Manager	This professional is responsible for planning the production lines and work equipment, from the design to their start-up.	<ul style="list-style-type: none"> • Education: it is necessary to have a degree in engineering. • Experience: it is desirable to have between four and five years of experience in technological project management within the automotive sector. 	

	Job Position	Description	Requirements valued (Education, experiences and skills)	Additional Considerations
6	Tester for Automotive Industry	The automotive tester in the automobile sector is the professional who carries out visual monitoring of the quality of production, including checking that manufactured products are satisfactory, taking samples of critical components and supervising work areas. He/she also manages quality documentation and records of problems arising.	<ul style="list-style-type: none"> • Education: it is necessary to have a degree in engineering. • Experience: a minimum of two years of experience performing testing in the automotive sector or metalworking industry is desirable. 	<p>Skills such as: orientation towards achievement, planning and organization, leadership, flexibility and change management are required.</p> <p>It is advisable to have knowledge on the industry which the work is performed in.</p>
7	Continuous Improvement Manager	The person responsible for ongoing improvement is required to plan and manage human and technical resources to ensure that clients' specifications are met. He/she therefore sets targets and establishes the strategies to be followed so that a culture of total quality is created and improvements can constantly be made.	<ul style="list-style-type: none"> • Education: it is necessary to have a degree in either engineering or business field. • Experience: A minimum of three years of experience in the field of continuous improvement in the automotive industry is desirable. 	

4.2. THE MOST REQUIRED LESS-QUALIFIED JOBS

	Job Position	Description	Requirements valued (Education, experiences and skills)	Additional Considerations
1	Production Worker	The production worker is the professional responsible for various functions such as screwing, handling parts, among others, in the assembly or production line.	<ul style="list-style-type: none"> • Education: it is necessary to have a professional training course in a technical field such as industrial technician. • Experience: it is valued to have minimal previous experience in the industry as well as in mounting and assembly of components. 	Professionals used to work under pressure and with manual dexterity are required.
2	Maintenance Manager	The maintenance manager is the professional in charge of managing overall maintenance in the company, coordinating a group of qualified individuals in various tasks (mechanics, electricity, electronics, IT...). This person is in charge of covering the preventative and predictive maintenance plan of all company facilities (production or other), ensuring these operate properly and trying to prevent unforeseen interruptions.	<ul style="list-style-type: none"> • Education: it is necessary to have a professional training course in either electronic, production or maintenance field. • Experience: minimum experience of between four and five years in a position of responsibility in maintenance, human resource management, analytical skills, management duties and others involving multi-skills. 	<p>Key skills associated to the degree of responsibility are: concern for order and quality, safety oriented and regulatory compliance.</p> <p>The sector is committed to increasing the training of professionals and that is why almost all auto companies are investing in training and internal development.</p>
3	Commercial	The commercial is the professional directly responsible for maintaining the customer portfolio as well as performing market research to attract new accounts for the company.	<ul style="list-style-type: none"> • Education: basic education is required. It is recommended to have a course in sales field. • Experience: three years of previous experience in sales in the automotive sector is required. 	The sector is committed to increasing the training of professionals and that is why almost all auto companies are investing in training and internal development.

	Job Position	Description	Requirements valued (Education, experiences and skills)	Additional Considerations
4	Automation-robotics Technician	Automation-robotics technician is the professional in charge of ensuring the rightful operation of the production process and its different phases using these production resources. They must ensure the minimisation of any interruptions due to technical incidents and the maximisation of automated-robotised processes.	<ul style="list-style-type: none"> • Education: it is required to have a professional training course in the field of mechanical production. • Experience: it is required to have a minimum of three years of experience in automated and robotized production lines. 	The companies value knowledge and proven experience in automation lines, robotics and informatics.
5	Electronic Equipment and Automation Systems Repair Mechanic	The electronic equipment and automation systems repair mechanic is the professional who assembles, repairs and starts up the electrical, electronic, pneumatic and hydraulic systems of capital equipment and industrial machinery, based on technical assembly plans and instructions, using the required utensils and tools, etc.	<ul style="list-style-type: none"> • Education: it is required to have a professional training course in either electricity and electronics or maintenance. • Experience: previous experience of two years in the electronic equipment sector in installation, maintenance and/or repair task is recommended. 	<p>Completing an automation, robotics or computer science course is a plus</p> <p>These professionals must have skills such team work and cooperation, orientation towards achievement and concern for order and quality.</p>
6	Forklift Truck Operator	The forklift truck operator carries out maintenance, storage, product re-issue and store assembly line tasks. As stores atomize, professionals have to work in an increasingly more dynamic environment, managed by means of technological systems.	<ul style="list-style-type: none"> • Education: no single specialized qualification is required because companies offer training in security and warehouse management. • Experience: it is not necessary. Truck driving license is required. 	

5. Conclusions and future prospects

New opportunities



- Due to environmental regulations and new product preferences of consumers it is expected that future vehicle production will be increasingly focused on the production of electric vehicles. In this context, the development of electric cars is an opportunity in terms of industrial production, improving energy efficiency and reducing greenhouse gas emissions.
- The applied technology and the innovation in processes, products and services are crucial for the development of new infrastructure, vehicles and equipment factors. Also, manufacturers of both vehicles and components, tend to the standardization of processes and the use of platforms that allow them to reduce time and costs, as these are the key factors to improve efficiency aspects.
- The orientation of the sector towards innovation and sustainability is foreseen to create new and interesting job opportunities for professionals. Besides, providing businesses is an important added value and increased competitiveness.
- It is anticipated that new trends in mobility and consumption will favor the development of a modern automotive industry characterized by the quality and range of flexible services and products according to the needs and preferences of consumers.

The professionals in the Automotive Sector



- The most demanded careers in the sector include those related to quality control processes, attention to suppliers and customers, technology and innovation. Moreover, companies require professionals with training and experience related to the sector and able to adapt to change and innovation, both technological and business.
- Growing international competition among companies in the industry offers new opportunities for professionals with languages (as English), especially for those who would like to be promoted and progress both domestically and internationally.
- Companies seek to differentiate themselves from the competition, enhancing their professional qualification through specific training on the current trends. These trainings are related to innovation in production and sale processes as well as the quality and personalization of services and products. Thus, the expertise of professionals in the sector and the acquisition of new skills will be key aspects.

Alerts



- Increasing international competition, particularly in Europe (Eastern countries) has led to the emergence of more competitive new companies and plants in terms of production costs. Sector companies located in Spain will have to deal with this context and seek strategies to remain competitive.
- The measures to improve the situation of the sector that both automotive companies and public administrations are implementing should be designed with a long-term vision. Strategies to stabilize the growth of the sector in the coming years should be implemented. This growth depends heavily on the evolution of consumption, economic recovery and industrial activity itself. Therefore, companies in the automotive sector will have to face with the constant changes in energy and raw material prices.
- Another challenge that companies are expected to face in the future, will be the global competition to recruit the best talent in the field of engineering, technology and science.

Strengths



- Spain is the second country in vehicle manufacturing in Europe and the first European producer of industrial vehicles according to the Ministry of Industry, Energy and Tourism of Spain.
- Public administrations are committed to the automotive sector with the aim of increasing both employment and competitiveness in the industry. Hence, they have launched various initiatives and programs to encourage consumption and improve companies efficiency. A good example of this is the PIVE plan, a financial aid to buy a new vehicle.
- The automotive sector has an important supportive role in the Spanish and Catalan economy as its growth causes a positive impact on other industries, such as machinery and metal, creating new job opportunities.
- Catalonia is the first vehicles and components producer in Spain. There is also an important business network (large concentration of components companies and vehicle plants) that promotes the development of business and investment in the sector.
- Labour flexibility in the sector has become an important factor to compete in the international market with countries where labor costs are lower. Thus, multinationals invest and increase production in factories across the country.

The automotive sector has become one of the strategic sectors of the economy, both the activity it generates, and the impact it has on creating direct and indirect employment.

06. Articles and reports consulted

Sources: Latest data available: INE; IDESCAT; Ministry of Industry, Energy and Tourism Spain; Government of *Generalitat de Catalunya*; Automotive industry cluster of Catalonia.

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07. Sectorial complementary Webography

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<http://ciac.cat/en>

✓ Asociación Española de Fabricantes de Automóviles y Camiones.

<http://www.anfac.com/portada.action>

✓ Asociación Europea de Fabricantes de Automóviles.

<http://www.acea.be>

✓ Asociación Española de Fabricantes de Equipos y Componentes para la Automoción.

<http://www.sernauto.es/>

✓ Asociación de Profesionales de la Automoción.

<http://www.asepa.es/>

✓ Federación de Asociaciones de Concesionarios de la Automoción.

<http://www.faconauto.com/presentacion>

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