

SMART MOBILITY EXPORTER RESOURCE GUIDE



Best Prospects

Enter New Markets

Trade Events

Foreign & Domestic

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AUSTRIA P. 8

FRANCE P. 52

NETHERLANDS P. 102

SLOVAKIA P. 138

BULGARIA P. 16

GERMANY P. 64

NORDIC REGION P. 108

SPAIN P. 146

CZECH REPUBLIC P. 26

GREECE P. 72

POLAND P. 116

TURKEY P. 154

CROATIA P. 32

HUNGARY P. 79

PORTUGAL P. 122

UKRAINE P. 160

EUROPEAN UNION P. 36

ITALY P. 82

ROMANIA P. 130

UNITED KINGDOM P. 170

FINLAND P. 44

KAZAKHSTAN P. 92



About the U.S. Commercial Service

What Can the U.S. Commercial Service Do for You?

The U.S. Commercial Service is the trade promotion arm of the U.S. Department of Commerce's International Trade Administration. Through its network of trade experts and policy professionals in 78 markets, and all 50 states, the U.S. Commercial Service assists U.S. firms in selling their "Made in the USA" products around the world, advises them on how to use trade deals to their advantage, and helps them overcome obstacles and barriers to international expansion.

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- Customized reports analyzing your market potential, alongside your foreign competitors
- Briefing materials on export financing, laws, and cultural issues
- Background checks on potential buyers and distributors

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- Meetings with pre-screened, vetted potential overseas partners
- Introductions for your product or service to prospective buyers at trade events worldwide
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- Government-to-government engagement to protect your company's interests
- Advocacy support from the U.S. government for your foreign government procurement bids

As Director of the Global Auto & Smart Mobility Team, I'd like to welcome you to our new Smart Mobility Exporter Digital Resource Guide: A Reference for U.S. Exporters. The Auto & Smart Mobility Team of the U.S. Commercial Service is dedicated to enhancing the global competitiveness of the U.S. automotive industry, expanding market access for our more than 14,000 clients across all sectors of the industry, as well as ensuring our core mission is met: increasing the exports of small and medium-sized enterprises.

Our dedicated team is comprised of more than 225 automotive trade specialists both in the U.S. and overseas at more than 70 U.S. Embassies and Consulates. The bottom line is this: the Smart Mobility and Intelligent Transportation Systems industries are essential to U.S. innovation and our economy. We are looking to approach and support an untapped bloodline of U.S. exporters and help them achieve global expansion from inception.

Overall, this industry is extremely unique and you don't have to look too far to see that more than 20 foreign markets in Europe and Eurasia are interested in purchasing your products today! If you are not already working with your local U.S. Commercial Service Smart Mobility Trade Specialist, click [here](#) to find your nearest office where an international trade specialist is ready to work with you! Our team members will work with you and your company to develop market entry strategies, while recognizing country specific barriers, and help connect you to our global industry experts. After reading through your markets of interest, our trade specialists can coordinate a free conference call with our overseas colleagues to hone-in and promote your product's unique offering.

I strongly believe our digital resource guide will exceed your expectations! For more than 40 years, we have assisted U.S. businesses with their visions of global expansion and we look forward to providing you the same, exceptional service.

If you're already a client working with the U.S. Commercial Service, we thank you for the opportunity to serve your exporting and international trade needs. If you're seeing this guide for the first time, we hope you consider our Auto & Smart Mobility Team as a true resource to you and your business development.

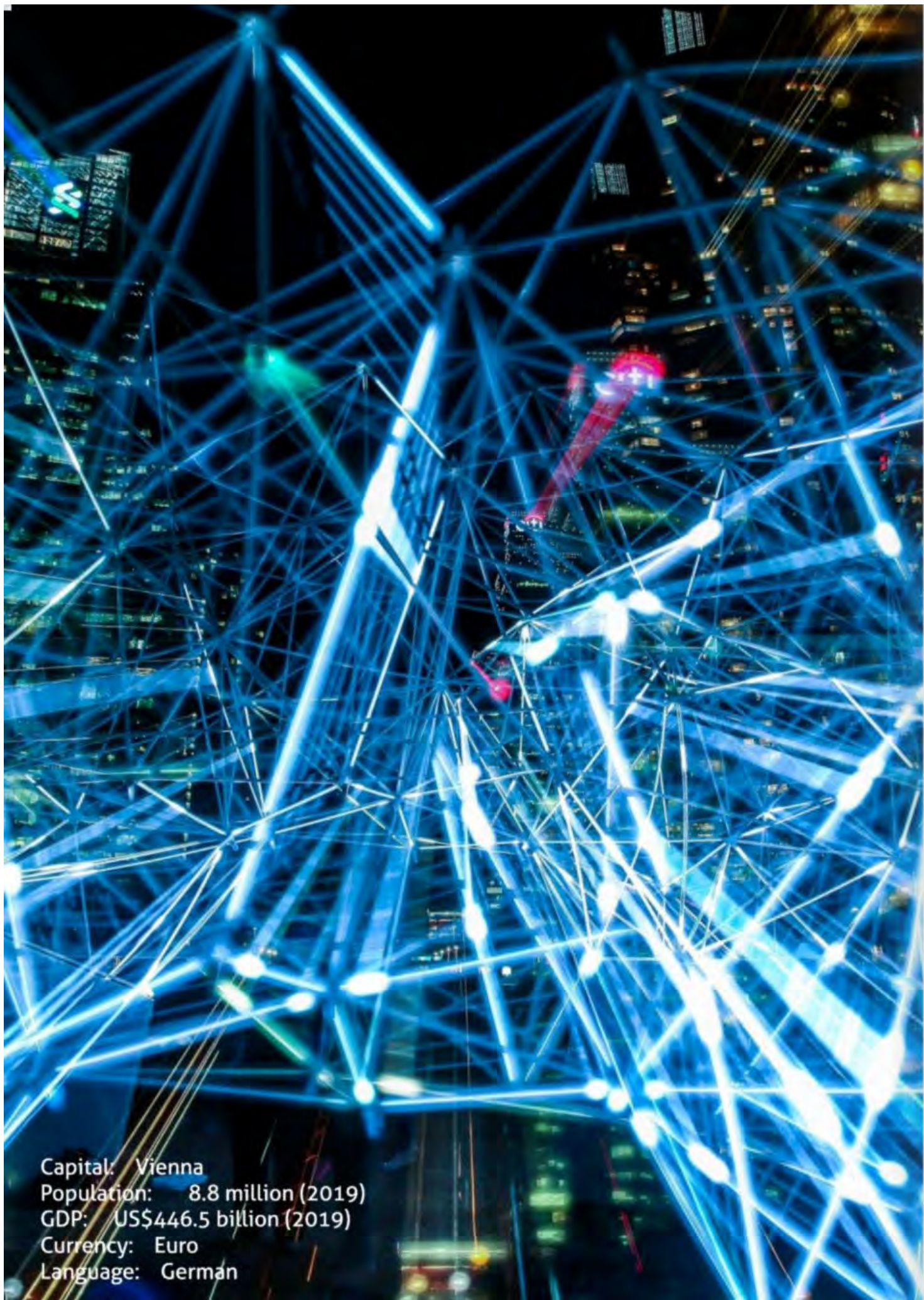


All the best,

Michael Rosales

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A U S T R I A

Summary

Austria's highly developed and innovative mobility market is deeply interlinked with German OEMs. In the automotive industry alone, most vehicles produced worldwide contain Austrian components. In total, 800 automotive companies, including 80+ specialized start-ups, a variety of research facilities, clusters, and competence centers, are helping to shape the future of mobility in Austria and the world.

Technological progress, the decarbonization of the transport system, urbanization, an influential younger generation, and the global COVID-19 pandemic, are driving increased Austrian requirements for smart mobility and transport systems of the future. These trends offer significant export and collaboration opportunities for innovative U.S. companies in the areas of clean mobility, increasing connectivity, the spread of automation, and the shared use of transportation.

Trends & Best Prospects for U.S. Exporters

Austria's outlook for mobility solutions is strong on the medium-term as accelerating digital transformation is increasing demand for shared and connected mobility services. However, the COVID-19 pandemic with social distancing and telework regulations has dampened short-term demand for mobility solutions. According to a Technical University Vienna survey, during Austria's March – May 2020 lockdown, usership for mobility decreased significantly (-50% cars, -80% public transport), and will continue at a low level potentially until 2021 Q3. Post-pandemic mobility in Austria is expected to be more environmentally friendly, more convenient, faster and cheaper, mainly driven by four trends:

1. Clean Mobility

The greatest changes in the Austrian mobility sector can be expected in the areas of energy and the environment. Driven by the Austrian Climate Change Act (enacted in 2011) and supported by the Green party that joined the governing coalition in 2019, CO₂ emissions in the transport sector are mandated to be drastically reduced by 2030 with Austria's transport system to become CO₂-neutral by 2050. These ambitious plans will require a comprehensive reduction of greenhouse gas emissions, supported by a strong focus on e-Mobility.

Capital: Vienna
Population: 8.8 million (2019)
GDP: US\$446.5 billion (2019)
Currency: Euro
Language: German



To encourage electric vehicle purchases, during 2021, the Austrian government is subsidizing individual consumers (\$6,000 per vehicle) and businesses (\$4,800 per vehicle) and has already invested in electric charging infrastructure nationwide. While petrol-driven vehicles are still the most popular choice, electric vehicles are catching up. According to the government's mobility agency Austria Tech, the number of new electric and plug-in hybrid passenger car registrations grew significantly from a 3.5% market share in 2019 to 9.5% in 2020. Furthermore, the number of charging points has doubled in the last 2 years to reach 8,395 locations as of the end of 2020.

Austrian automotive component manufacturers heavily focus on emission-optimized and energy-efficient solutions, typically in close collaboration with their OEM clients. Examples include the further development of conventional combustion engines, lighter vehicle construction, the development of new drive and assistance systems. These developments offer great opportunities around eco-drive trains and eco-materials as well as smart manufacturing.

Looking ahead, Austrian government and industry are also increasingly focused on hydrogen mobility. For example, Postbus (Austria's largest bus company) and Wiener Linien (Vienna's public transport company) are leading efforts to shift to hydrogen buses in the future. The Austrian headquartered oil and gas company OMV is expanding its infrastructure of hydrogen pumps at its filling stations. Furthermore, the world's first hydrogen-powered narrow-gauge railroad will begin operations in Austria's western province Tyrol starting in 2022.

2. Shared Mobility

According to a 2018 survey by the VCÖ (a public-benefit organization specializing in mobility and transport), around 900,000 Austrian households were completely car-free, 1.2 million people rarely drove, and more than 100,000 used car-sharing services. The study projected that one shared car has the potential to replace between 4 and 16 private cars in the future.

Shared mobility is particularly popular in Austria's capital Vienna where a growing number of young people in the city do not want to own a car due to high cost or lack of necessity, and instead prefer sharing concepts in combination with public transport. In 2019 the two leading providers in Vienna, Daimler's car2go and BMW's DriveNow; merged their services to form the new car-sharing company Share Now. Together they offer customers a pool of 1,500 BMW, Mercedes, MINI and Smart cars.

Other sharing services that available mainly in Vienna include:

- Wiener Linien: Vienna's public transport organization provides a complementary range of vehicles at selected locations. These may include car-sharing, mopeds, cargo bikes and EV charging stations.
- Getaround: An Austrian-wide platform for private individuals offering their vehicles for sharing.
- Uber: The U.S. company has been active in Vienna since 2014 and has strong collaborations with local rental car companies and a pool of 2,000 drivers.
- Bolt: The Estonian company offers a range of transportation services, including car and motorcycle ride-hailing, as well as scooter sharing.
- Bicycle hire: The largest provider is Citybike. Users can rent bicycles at over 120 stations in Vienna. More than 10 million rides have been completed since its launch in 2003.
- Electro scooters: In recent years, Vienna has seen a strong upswing in the rental of e-scooters. The reason for this is the almost simultaneous launch of the three providers Bird, Lime and Tie in 2018. Since then, KiwiRide and Wheels have also started to operate in Vienna. The Vienna city government restricts providers to a maximum number of 1,500 e-scooters per company.

The pandemic slowed demand for ride sharing and public transport in Austria with users opting instead for individual mobility with social distance. Providers promote frequent disinfection and vinyl separators in vehicles to win back consumers. In the future, the line between traditional car sales and leasing or alternative ownership with rental, subscription, sharing, and hailing continues to blur.

3. Connected Mobility

Austrian industry and start-ups are active in the Connected Mobility space propelled in part by the country's advanced digital infrastructure combined with high levels of innovation.

Apps and platforms that allow the combination of different offerings in the sense of multimodal mobility or "Mobility as a Service" (MaaS) are widely used in Austria. Connected Intelligent Transport Systems (C-ITS) industry leaders in Austria such as Kapsch Traffic are active worldwide including in the U.S.

Digital advancement is a priority of the Austrian government across the economy. In Vienna, as part of the country's Open Government Data (OGD) initiative, the city government makes numerous data sets and web services available to the public, which also can be accessed by U.S. solutions providers. In the field of mobility, examples include the locations of bus stops, speed 30 zones and the route planning service of Wiener Linien.

While useful in advancing connected mobility solutions, increasing digitization and data collection are also accompanied by risks and new challenges related to cyberattacks, data theft, data misuse and the protection of privacy. For U.S. companies offering mobility services or solutions to digital vulnerabilities, compliance with the General Data Protection Regulation (GDPR) is the most important requirement for a successful expansion within the EU.

4. Autonomous Mobility

Autonomous driving will increasingly play a vital role in Austria's mobility future. The Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) is investing around \$80 million between 2019-22 in an "Automated Mobility Action Package". This government's program aims to further strengthen the country's role as a leading location for research, development and production in the following areas:

- close government cooperation with the automotive industry and transport companies in the development of a legal framework for autonomous mobility
- safer testing and the creation of versatile test tracks
- strong funding of research projects
- public promotion of autonomous technology

Most Austrian vehicles are currently classified as Level 0 or Level 1 (max = Level 5) of autonomous driving. According to a recent study by PWC, the first vehicles classified at least as Level 4 could come onto the market in 2022 and reach 17% of EU market share by 2035. Most fully automated cars are anticipated to be used by car sharing providers. Several major Austrian automotive companies are heavily involved in advance R&D and prototyping of drive trains for autonomous vehicles manufacturers, often working in close collaboration with Austrian universities.

Market Entry

U.S. exporters interested in the Austrian market can either position themselves by building a direct relationship with larger clients or by selling through an established, qualified partner such as a wholesaler, value-added distributor or systems integrator. Some U.S. software companies may choose to partner with U.S. or other international integrators already established in Austria or work with an existing partner in Germany, that can also cover the Austrian market.

U.S. companies pursuing long-term cooperation with OEMs, Tier 1 and Tier 2 companies or that are interested in national projects with the Austrian government and larger professional integrators should consider a direct business presence in Austria.

Particularly in the field of automotive R&D collaboration, Austria offers a range of highly innovative players that are shaping the future of automotive sector, most with U.S. presence. Leading companies include AVL List, TTTech, Kressel, Miba, BMW Steyr, Magna Steyr and KTM Industries. The Austrian government offers grant funding also available to international companies pursuing R&D efforts in Austria.

Key considerations by Austrian clients include a supplier's full compliance with EU and industry-specific quality, safety, technical and environmental standards/regulations. Conformity with the EU's General Data Protection Regulation (GDPR) is also essential for U.S. providers, particularly of software. Increasingly, clients also request that software providers use secure data centers within the EU region. Most Austrian business partners are fluent in English, but most local trade shows, conferences and industry publications are in German. Therefore, U.S. companies should adapt marketing materials accordingly for the Austrian market.

2021 In-Person or Virtual Events

Event Name: Applied Artificial Intelligence Conference
 Date & Location: 27-28 May 2021, Austria hosted - virtual
 Website: www.wko.at/service/Veranstaltung.html?id=4bcf6f0e-6cdf-47b4-a24a-30d0c9636b4e
 Sector: Artificial Intelligence

Event Name: IAA – International Automotive Exhibition
 Date & Location: in person, 7-12 September 2021, in-person, Munich Germany
 Website: www.iaa.de/en/mobility
 Sector: Automotive

Event Name: eMove360° Europe
 Date & Location: 16-18 November, 2021, in-person, Munich – Germany
 Website: www.emove360.com/events/trade-fairs/emove360-europe-2021
 Sector: eMobility

Event Name: International Mobility Days
 Date & Location: 17-18 November 2021, in-person, Vienna - Austria
 Website: www.wko.at/service/Veranstaltung.html?id=6caf18b7-e120-41eb-a28e-ecf3cd14697e
 Sector: Automotive, Rail, Aerospace

Resources

Cluster & Associations

- ACStyria Mobility Cluster: www.acstyria.com/en
- AI Austria: www.aiaustria.com
- Association of the Austrian Automotive Industry: www.fahrzeugindustrie.at (German only)
- AustriaTech: www.austriatech.at/en
- Automotive Cluster (AC) Business Upper Austria: www.automobil-cluster.at/en
- A2LT Austrian Advanced Lightweight Technology: www.a2lt.at/en
- BieM - Federal Initiative for eMobility in Austria: www.biem.at (German only)
- VCÖ – Traffic Club Austria: www.vcoe.at/en

University Research & Competence Centers

- AIT - Austrian Institute of Technology: www.ait.ac.at/en
- COMET - Competence Centers for Excellent Technologies:
www.ffg.at/en/comet-competence-centers-excellent-technologies
- JKU – Johannes Kepler University: www.jku.at/en
- Joanneum Research: www.fh-joanneum.at/en
- Johannes Kepler University: www.jku.at/en
- Virtual Vehicle Research Center: www.v2c2.at

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BULGARIA

Summary

Bulgaria's automotive sector employs some 40,000 citizens, has more than 130 company members and generates about 4.5 percent of Bulgaria's GDP (as per 2019). It is one of the fastest growing sectors of the Bulgarian economy and has received significant attention and support from the government of Bulgaria. The sector manufactures components and spare parts for over 100 foreign automotive brands. Bulgaria produces components for such brands as Tesla, Lamborghini and Porsche; 90 percent of the bag sensors in European cars are manufactured in Bulgaria and Bulgaria also makes sensors for air conditioning systems, aluminum parts, disc-based brake system, SoCs, water and oil pumps. Bulgaria follows the latest trends in the automotive sector and many electrical vehicles/spare parts will be manufactured in the future years. The country has an ambition plan to develop the smart mobility infrastructure in many cities and regions – including building new e-charging stations and infrastructure, developing the next level of the e-toll system on the national roads, introducing 5G in most of the biggest cities, replacing the public transport with more eco-friendly and e-based vehicles and launching various smart services in the public transport systems.

In addition, the leading e-car manufacturer Tesla plans to open its first charging station in the town of Plovdiv, Bulgaria's second largest city, located in Southcentral Bulgaria. Tesla is also developing its distributorship network in Central and Eastern Europe with show rooms in Warsaw and Bucharest (scheduled for 2021).

Bulgaria is one of the few Southeast European countries that does not have a car manufacturing facility, despite the government's efforts in the last two years to attract leading car manufacturers (including Volkswagen Group).

The Bulgarian market is generally very receptive to U.S. goods and services, including the vast Automotive sector and innovative smart mobility technologies. The developed IT sector, startups and automotive supply channels make the Bulgarian companies good partners for joint foreign projects.



Capital: Sofia
Population: 6.9 million
GDP: US\$68,955 million
Currency: Bulgarian LEV (BGN)
Language: Bulgarian

Market Entry

The Bulgarian market is traditionally well receptive to well-established U.S. goods and services, as well as new and smart technologies. Bulgarian governments introduced a number of investment incentive programs, created and developed several new industrial zones and Tech parks and provided significant assistance corresponding to the level of investment. Bulgaria is known as having one of the lowest corporate taxes in the EU.

Finding a good local representative or partner is a key strategy to a successful market entry but conducting a due diligence report before selecting an agent or representative is crucial as it provides a detailed market overview and report from a trusted source. Bulgaria's official statistics on the automotive and ICT sectors are very reliable.

For years Bulgaria has aimed to optimization its investment climate by offering investors a 10 percent flat corporate tax rate and improving the registration process for new business. The Government is recently focusing on introducing various programs on promoting hybrid and e-vehicles for personal and public cars and developing the corresponding infrastructure.

Current Market Trends & Demand

Around 75 percent of Bulgarian families own one or two cars; almost 80 percent of Bulgarian companies with business activities have motor pools consisting of cars, vans, minibuses, SUVs and light trucks.

The percentage of the hybrid and e-cars in the country was constantly increasing until the pandemic in 2020. The smart mobility infrastructure is constantly developing in Bulgaria with many new tenders opened by the Ministry of Regional Development and Public Works and Ministry of Transportation, as well as local municipalities and authorities.

Opportunities

Best sales prospects for US companies in the automotive sector will include:

- accessories such as wheel covers, car/truck bed covers,
- aftermarket consumables-oil and air filters,
- auto security products such as alarms,
- car body parts, engine parts, brake parts, exhaust system parts,
- exterior accessory lights,
- quick repair kits, tools, paints and auto cosmetics.
- service equipment for electronic diagnosis, monitoring, testing and analyzing,
- steering wheel locks, wheel balancing, tire changing, oil changing.

The shared services are slowly and carefully penetrating the Bulgarian market. Companies like Spark and UAB Ride share are offering shared e-cars for the biggest cities starting with the capital Sofia. The vehicles that are available so far are: VW e-up!, Nissan Leaf AC only, Nissan Leaf 24, Nissan Leaf 40, Hyundai Kona 40, Hyundai IONIQ 30, BMW i3, Nissan eNV 200 Cargo, Nissan eNV 200 Passenger, VW e-up! 36, Skoda CITIGO e iV. As of 2020 there are 158 charging stations in Sofia. Eldrive charging stations are free for all Spark users who have the opportunity to recharge their electric car in about three hours. The stations are strategically located around Sofia near business offices, hotels and shopping centers. Each of the charging stations has a minimum of two charging points to provide continuous location and access for the electric cars. So far Spark has around 350 vehicles in the capital.

Shared e-motorbikes are also expected to be operational in the capital, Sofia, very soon. Shared bicycle services with related infrastructure and software support has also been introduced to some Bulgarian cities in the last years.

The American company Lime came to Bulgaria in the summer of 2019 and so far are available only in Sofia. It launched with 150 scooters and the legislation limit, at least for now, is 300 e-scooters per provider. A driver's license is not needed but if one wants to register to use the app they have to be at least 18 years old. Since 2019 other sharing e-scooter company opened their activities in Bulgaria – such as Bird, and others.

In the Government strategy Bulgaria 2030 the stated long-term goal is by 2030 the country to have a full electro mobility infrastructure completed, focus on LNG more widely as a standard fuel and take hydrogen technology beyond the R&D stage. For public transport the plan is by the end of 2021, 20% of all city buses to be electric. So far in Sofia there are 6 charging stations for the public transport. Bulgaria has a significant lack of public charging stations at the moment and the aim is to complete 15,000 new e-charging stations in the next 3 years.

e-Cars

Bulgaria's e-car market constitutes the smallest part of automotive sector, but there is an increase in the past several years. Electronic Vehicles Industrial Cluster (EMIC) notes that electronic vehicles must begin in the business sector, the government sector and then - Bulgarian citizens will see the benefit of e-Cars. (Sources: www.emic-bg.org; Bulgarian Traffic Police Department, Ministry of Interior). The price range varies from USD 15,700 to USD 81,468. The owners of e-cars or personal use do not pay taxes for the car, as well as product charge. The eco tax is paid only one time, when the car is purchased.

For 2019 Bulgaria was ranked relatively low in the sales of electric cars with 181 units sold (-6.7% decrease from previous year). Hybrid models across the EU have seen an increase of nearly 50 per cent to 465,026 units sold, and in Bulgaria their number has increased by 7.7 per cent to 237.

For 2020 Bulgaria was ranked 20 out of 28 EU member states for Market share of electric passenger vehicles and 24/28 for electric vehicle charging points.

A study by the Association of European Automobile Manufacturers (ACEA) shows that only seven of all countries in the European Union (EU) do not offer subsidies for the purchase of an electric vehicle, including Bulgaria.

e-Buses

In 2020 the Bulgarian capital Sofia has completed the tender for 30 electric buses and ten charging stations. The procurement winner was announced to be the Bulgarian-Chinese bidding consortium of Chariot Motors and Higer Bus. The second place took the Polish Solaris company. Technology from German company Siemens is also be used in the vehicles marketed as the Chariot bus - fully electric zero emission non-polluting bus. In 2021 in the capital Sofia is expected to have in operation a total of 45 ultra capacitor electric buses. The master transportation plan of the capital aims to turn most or all of the urban bus fleet into zero emission. E-buses were tested in the last six years. Some used traditional battery charging and others had fast charging ultracapacitors. Fast charging is practical in cities with relatively short bus routes and easy power access from tram, trolleybus, or subway networks.

e-Charging stations

There are currently 204 charging stations in Bulgaria.

Dieselor is the first Bulgarian chain of gas stations to install a charging station for electric cars at its site. Dieselor currently has only five gas stations in the country. With this Diesel joins the infrastructure for electric cars of www.Elektromobili.bg. Users of such vehicles can quickly and easily find charging locations using the convenient online locator and mobile application – www.vsichkorok.bg

e-toll system

In the beginning of 2019 Bulgaria introduced the e-toll system for heavy vehicles and trucks (over 3.5 t). Revenues from electronic vignettes and toll fees from the introduction of the electronic system on January 1, 2019 to December 8, 2020 are a total of USD 467,258,970.

Currently, the Road Infrastructure Agency fulfills its legally defined role to collect tolls through the electronic toll system, which was designed, built and put into operation in implementation of the 2018 contract between RIA and the leading contractor – the Austrian company Kapsch Traffic Solutions consortium.

The Bulgarian toll system unites all known law enforcement models - automated through the densest network of stationary control points in Europe and through three parallel bodies - the Road Infrastructure Agency, the Ministry of Interior and the Customs Agency in the border areas. This guarantees effective law enforcement for transit traffic and an effective collection mechanism through an electronic form for individuals and legal entities with a permanent address in Bulgaria.

Another essential functionality is the maintenance of its own area (domain) for processing card payments (including payments with fuel cards) without the mediation of a commercial bank. As a result, the Bulgarian electronic toll system is evaluated by international experts as a modern technological solution in Europe.

The Bulgarian toll system uses GNSS (Global Navigation Satellite System) technology and is based on the "free flow" principle. This means that if the driver has chosen to use a GNSS on-board device, the reading is done automatically and drivers do not have to stop somewhere to pay.

There are several companies involved in the project – "Intelligent Traffic Systems", "Concord Smart Infrastructure", "Teletol", "Viasat Technology" (Ikom), "Tol Bulgaria".

A map of the toll system range

https://cdn.tollpass.bg/static/media/cms/ywbh7jbn/tollpass-road-map_.pdf

e-tickets in public transport

In May 2021 the capital Sofia will start with the smart electronic ticket system for the integrated public city transport vehicles, including the underground system. The e-ticketing system was financed by the Center for Urban Mobility for around USD 62 million and got already one year delay. Currently, the application ticky.me is used as testing software for 3 public bus lines and 3 metro lines. When the systems gets fully operational the city will be equipped with 1,350 vehicles with 7,500 electronic ticket validation devices. The e-tickets will be stored on mobile phones or bank cards and it will be possible to purchase them online, thus avoiding queues and delays. The main contractor for this project is Bulgarian company CNC ticketing system Sofia in a partnership with another Bulgarian and Turkish companies.

5G and smart mobility in Bulgaria – the city of Burgas

Burgas is among the top performing cities in Bulgaria when it comes to the length of the municipal optical network. An indicator which enables the seaside city to become the first 5G city in the country with full network coverage.

Over the past years, Burgas has introduced a series of smart management systems for a number of urban assets. The city boasts a large number of sensors and smart devices which communicate with one another in a common infrastructure. Burgas was found to be the perfect "test stand" as regards the attainment of the goals of the Innovation Strategy of Bulgaria for Intelligent Specialization. To this end, the city is developing an "urban dashboard" based on the existing digital infrastructure which will monitor, assess and optimize public investment plans and service delivery.

Quite a few cities in Bulgaria have monitoring systems for air quality and traffic as well as a network of video surveillance cameras. A number of Bulgarian cities can also boast interactive maps to present historical and natural landmarks. Burgas, however, offers all of this in an integrated system which summarizes the enormous volume of data in a convenient user interface. The platform smartburgas.eu (launched in November 2019) is an easy-to-use tool which offers smart solutions to the people living in the city.

The portal provides access to smart management systems for key urban assets such as: Mobility – traffic control, checks for vacant parking lots, bikers and pedestrians data, urban transport; Waste management – effective separate waste collection; Environmental monitoring – monitoring the levels of chemicals in water and air; - Video streaming to avoid risks from undesired events through video surveillance of public spaces and key urban sites.

With the integration of a unified system to the benefit of citizens and visitors, Burgas is on its way to implementing the smart city model following the example of a number of successful European cities.

Source: www.clustercollaboration.eu/profile-articles/burgas-way-becoming-first-5g-city-bulgaria

Trade Events

AUTOTECH - Plovdiv - 2021 part of the International Tech Fair
September 27 – October 2, 2021 • Plovdiv, Bulgaria • www.fair.bg
The International Specialized Exhibitions AUTOTECH and AUTOWORLD Plovdiv.
AUTOWORLD shows many premiers and offers customers attractive financial instruments.

AUTOMOTIVE EXPO SOFIA - Inter Expo Center - 2019
June 3-6, 2021 • Sofia, Bulgaria • <http://automotive-expo.bg/index.php/en/>
AUTOMOTIVE EXPO SOFIA is a trade show, which focuses on the fast-growing automotive industry and after-sales service in Bulgaria. AUTOMOTIVE EXPO SOFIA is an exhibition for new technologies and components, parts and accessories, workshops equipment.

SOFIA MOTOR SHOW – Inter Expo Center - Sofia
Scheduled for October • www.aap.bg; <https://sofiamotorshow.bg/>
Bulgaria's largest motor show organized by the Association of Car Manufacturers and their



Local Resources / Contacts

Automotive Cluster Bulgaria

The Automotive Cluster Bulgaria (ACB), founded in 2012, is one of the best developed cluster structures in the Bulgarian economy. As an NGO it represents the interests of automotive manufacturers, suppliers and organizations providing services for the automotive industry - <http://automotive.bg/>

Electrical Vehicles Industrial Cluster Bulgaria

EVIC was registered in 2009 in Sofia, as an organization of cluster type, established by seven Bulgarian companies and is the first Industrial Association for electric mobility in Bulgaria. Currently the EVIC has 63 members and 73 recognized partner organizations. <http://www.emic-bg.org/news>

Ministry of Interior – Traffic police

Traffic Police within the Bulgarian Ministry of the Interior is the body that monitors the registration of any vehicles and all matters related to the road safety and everything related to road safety, as well as ensure that laws are properly enforced on the roads - <https://www.mvr.bg/opp>

Ministry of Regional Development and Public Works

The Bulgarian Road Infrastructure Agency is part of the Ministry of Regional Development and Public Works - <https://www.mrrb.bg/en/>; <http://www.api.bg/index.php/en>

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Capital: Prague
Population: 10.5 million
GDP: US\$205 billion
Currency: Czech Crown
Language: Czech

CZECH REPUBLIC

Summary

Smart Mobility brings new opportunities almost everywhere. Many new programs and technologies need to be combined to achieve the complexity and functionality needed for the systems. A functional traffic infrastructure is the most important part. Intelligent Traffic Systems are to enhance functionality of such a traffic infrastructure, and a key market opportunity. Autonomous cars are expected to be a final answer to smart mobility requirements, but deployment is many years away, while autonomous public transport solutions could be deployed sooner. All these technologies and structures cannot work in isolation and all require significant investments. Therefore, besides a way how to achieve a sustainability, Smart Mobility is also a long-term business opportunity for all developed countries. The EU and the Czech Republic as a member state are no exceptions.

Automotive Industry in the Czech Republic

There are the three major car manufacturers in the Czech Republic - Volkswagen / Skoda Auto, Toyota Motor Corporation and Hyundai. In addition, there are also manufacturing facilities for more than half of the world's 50 leading suppliers located in the country. In 2019, the Czech automotive market created 10 percent of the national GDP and contributed 24 percent to Czech total exports. The Czech Automotive Industry Association announced an annual production of 1,427 million new passenger cars in the Czech Republic, which represented roughly CZK 1,100 billion (\$54 billion). Production of exported automotive parts and accessories was responsible for about 60 percent of total output. The remaining 40 percent represented production of new vehicles for export. Final data for 2020 is not yet available, but the automotive market has been hit by the pandemic and the numbers are anticipated to be significantly lower.

Market Entry

The Czech market fully complies with EU market entry regulations. Manufacturers must comply with numerous European Commission Directives, a scope of which is beyond a size of this report. A comprehensive market entry strategy is described in the Country Commercial Guide Czech Republic at www.export.gov/ccg/. Parts of that report have been included in the following paragraphs but not the entire report.

Success in this market requires an in-country presence such as an agent, distributor, or representative office. Local distributors generally take responsibility for handling customs clearance, dealing with established wholesalers/retailers, marketing the product directly to major corporations or the government, and handling after-sales service. Price remains the most critical factor when positioning a product or service for sale.

The Czech Republic is a small market and each sector has a few key decision makers and opinion leaders. One way to quickly reach these leaders is to hold an innovative in-country promotion. Examples of good programs include technical seminars or small receptions at industry trade shows; media promotions and press conferences related to events such as launching new lines or opening new offices; or annual holiday receptions for key clients and potential clients. The U.S. Commercial Service in Prague can help organize such events and target key decision makers. On the retail side, in-store promotions are extensively utilized.

Current Market Trends and Demand

Traffic Infrastructure

The Czech Republic has not finished a basic network of highways and speed railways yet. All needed bypasses of cities to take traffic away from the residential parts of municipalities has not been finished either. There are a lot of major traffic infrastructure projects in the pipeline and with significant EU funds available for co-financing these projects. Nevertheless, due to bureaucratic and regulatory delays, getting these projects done will take decades.

Public Municipal Transportation (PMT)

Electric trams and trolley buses and other alternate propulsion vehicles create a skeleton of public municipal transportation in almost every larger Czech city. Traditional Czech tram and bus manufacturers capitalize on demand for less polluting transportation and have been successful in the most competitive markets. For example, Skoda Transportation <https://www.skoda.cz/> won a tender for 26 trams in Bonn, Germany in 2019 and its total contracts for trams and trolley busses reached \$2 billion in 2019. These manufacturers are asked to implement Intelligent Traffic System requirements in their vehicles and therefore they are always searching for new technologies.

Intelligent Traffic Systems (ITS)

ITS are a combination of electronic, detection, transport telematics and a management systems, which request advanced and diversified technologies. These technologies are not available in the Czech market. For example, Prague's traffic violation detection system consists of 108 cameras, of which 58 were delivered by American Dynamics Company. Delivering the most advanced parts of ITS is a great opportunity for technologically advanced exporters.

Major ITS projects are to be implemented on municipal, national or regional levels. Information on these projects can be found at relevant institutions. On the EU level, these are ERTICO-ITS Europe <https://ertico.com/> or EUREKA www.eurekanetwork.org. Czech equivalents of these institutions are CDV / Transport Research Centre established by the Czech Ministry of Transport, Association for Transport Telematics or Centre of Vehicles for Sustainable Mobility, a part of the Czech Technical University focused on R&D in alternative propulsions (see their web pages below).

An example of one of the latest and the most advanced ITS projects is being realized in Austria. Siemens Mobility supplies a connected vehicles system for Austrian highways to allow an exchange of information between vehicles and the road. Austrian ASFiNAG will be the first infrastructure provider in Europe to install this system. There is a good chance of replications throughout the EU and any references from the US would be commercially viable.

Electromobility

Electromobility is often considered both a challenge and an opportunity. It is expected that electric engines will replace combustion within this generation. If so, electric cars need sophisticated batteries but they need less parts, less maintenance and generally are less difficult to manufacture. That might be a challenge for traditional car manufacturing companies in the Czech Republic. The automotive industry represents the backbone of the national economy and any slowdown would be heavily reflected. In addition, with more than 90 percent of Czech automotive companies foreign owned, there is a risk that foreign investors cancel local production or move to other destinations. Therefore, the Czech Government pays high attention to Electromobility and its impacts on local manufacturers.

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e-Vehicles (EVs)

The total number of EV registrations in the Czech Republic is only about 10,000 but there is a significantly growing trend. In 2020, a number of newly registered EVs was 3,261 (+ 332 percent compared to 2019) and plug-in hybrids 1,978 (+321 percent), while registrations for traditional combustion registrations went down. Though the EU has imposed high taxes on fossil propulsion cars, Czech buyers still consider e-vehicles impractical, too expensive and are waiting for further developments.

Charging Infrastructure

There are approximately 500 public charging stations with 1,000 charging points in the Czech Republic (+ 50 percent jump compared to 2019). Both municipality and private businesses invest or plan to invest

heavily in the recharging infrastructure. Prague is considering building a number of charging points from columns of street lighting and to support zero- emission zones in many other ways.

Industry Associations

- Association of Automotive Industry of the Czech Republic <https://autosap.cz/>
- CDV / Transport Research Centre www.cdv.cz
- Association for Transport Telematics www.sdt.cz
- Centre of Vehicles for Sustainable Mobility www.cvum.eu/,
- eMobility <https://www.elektromobilita.cz/>

2021 In-Person or Virtual Events

Due to the difficult Covid situation, most of the regular events have been canceled or postponed. New dates need to be established. Just to name two events focusing on Smart Mobility issues:

Event: e-SALON: A CLEAN MOBILITY EXHIBITION

Date: November 12-15, 2021

Website: <https://e-salon.cz/en>

Sector: Automotive/Intelligent Transportation Systems/ICT/etc.

Event: THE FUTURE OF AUTOMOTIVE INNOVATION

Dates: September, 2021

Web: <https://futureofautomotive.com/>

Sector: Automotive /ICT/, electric cars, autonomous cars, etc.

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CROATIA

[Rimac Automobili](#), the manufacturer of the world fastest electric racing car, is the only Croatian car brand and has recently started a serial production, after several years of struggling to find a strategic investor. The company has also received European Union (EU) funding for development of car batteries. '

The traditional automobile industry in Croatia consists of automotive part manufacturing companies supplying almost all well-known automobile brands. For example, AD Plastik manufactures plastic automotive parts while Boxmark Leather manufactures leather seats, and Lipik Glas wind shields. Metal production, welding, plastics manufacturing, and engineering are the most common sectors related to automotive manufacturing in Croatia. In 2020, the German Porsche Digital and the Croatian software company Infinum established a [digital innovation hub for smart mobility](#).

Consumers in Croatia are following global trends in smart mobility. They increasingly tend to purchase hybrid and electric cars, cars with autonomous driving software, electrical scooters, etc. They prefer using transportation providing apps as an alternative to car ownership. Smart mobility solutions are in demand in large cities and in touristic places across the coastline in order to provide better experience for citizens and to protect local culture and environment.

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Market Entry

Croatia is an EU member, with fully harmonized regulatory system. Exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products & accessories to the EU and its member states must undergo a thorough assessment of, and ensure compliance with, existing European Commission Directives, i.e. regulatory requirements regarding technical specifications, product safety, as well as environmental impact & requirements. In principle, type-approval granted for vehicles or vehicle parts in one EU member state should be accepted by all member states across the EU. The institution responsible for automotive registration in [Croatia is the Center for Vehicles of Croatia](#).



Capital: Zagreb
Population: 4.06 million (2020)
GDP: US\$60.4 million
Currency: Croatian Kuna
Language: Croatian

Current Market Trends and Demand

Croatian market for new vehicles is not saturated and it is growing year over year, presenting a positive outlook for the future. In 2019, a total of 73,707 new vehicles were sold in Croatia, a 4.7% growth compared to 2018. This represents 15 new vehicles per 1,000 inhabitants, well under the EU average of 30 vehicles. In 2019, Croatia counted a total of 451 registered vehicles per 1,000 inhabitants and the average vehicle age was 12 years. German Volkswagen (VW) is the leading car brand. A total of 297 road fatalities in 2019 put Croatia above the EU average and make the road security as one of the priorities for the government.

In 2020, 8,080 hybrid and 1,343 electrical vehicles were sold, compared to 5,547 hybrid and 452 electric vehicles in 2019. According to Business Monitor International, this segment is expected to grow and more than quadruple in size until 2029. Government subsidies up to 40% of the purchase cost of a new electrical vehicles are driving the market. According to July 2020 local media reports, the most recent round of \$3.4 million in funding was exhausted within two minutes, with 546 applications received online for the co-financing of energy-efficient vehicles. The country's charging infrastructure is also growing. In September 2020, state-owned electric utility company Hrvatska Elektroprivreda (HEP) installed its 200th EV charging station. Car sharing services and mobile platforms for transportation are increasingly popular in Croatia, starting the trend of the Mobility-as-a-Service.

COVID-19 pandemic has cut the new automobile demand in Croatia in 2020 for 43%. It is expected that control of the pandemic and later economic recovery will eventually boost the market. An increase in inbound tourism after the pandemic should also lead to a rise in demand for new vehicles from the hospitality and car rental sectors. Tourism is also boosting demand for smart mobility, to help better organize transportation for over 17 million foreign tourists who visited the country in 2019 (Croatia's population is four million). EU funds are available for environmental protection and smart mobility projects in Croatia, giving additional support to cities and municipalities to implement smart solutions.

Resources

ACEA – European Automobile Manufacturers Association: <http://www.acea.be/>

CLEPA – European Association of Automotive Suppliers: <http://clepa.eu/>

European Commission – DG for Mobility & Transport:

https://ec.europa.eu/transport/about-us_en

Strujni krug – Association of Electric Car Drivers in Croatia: <https://www.strujnikrug.hr/>

Opportunities / Best Prospects for U.S. Exports

1) Intelligent Transportation Systems (ITS)

- o 5G Technologies
- o Connected and Automated Technology
- o Cybersecurity
- o Internet of Things (IoT)
- o Transit Technology & Sensors
- o Vehicle-to-Everything (V2X) Communication
- o Vehicle-to-Infrastructure (V2I) Communication
- o Vehicle-to-Pedestrian (V2P) Communication
- o Vehicle-to-Vehicle (V2V) Communication

2) Automotive Technology


- o Autonomous Vehicles
- o Diagnostics & Testing
- o Electric Vehicles
- o Hybrid / Electric / Alternative Fuel
- o Vehicle Technology

3) Robotics / Machine Intelligence

- o Artificial Intelligence
- o Robotics / Drones

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Capital:	Brussels
Population:	445 million (2020)
GDP:	US\$18.292 trillion
Currency:	Euro

EUROPEAN UNION

Overview: Trends & Opportunities

The European Commission's Sustainable and Smart Mobility strategy will create new opportunities in European markets but will also impact U.S. smart transportation products and services companies' ability to access these markets. The purpose of this report is to give U.S. exporters a general awareness of EU trends and policies affecting smart mobility in all Member States. However, the U.S. Commercial Service located in each Member State would be the best resource to provide company-relevant assistance to U.S. exporters interested in selling into those respective markets.

EU goals for smart mobility:

By 2030:

- at least 30 million zero-emission cars will be in operation on European roads.
- 100 European cities will be climate neutral.
- high-speed rail traffic will double across Europe.
- scheduled collective travel for journeys under 500 km should be carbon neutral.
- automated mobility will be deployed at large scale.
- zero-emission marine vessels will be market-ready.

By 2035:

- zero-emission large aircraft will be market-ready.

By 2050:

- nearly all cars, vans, buses as well as new heavy-duty vehicles will be zero-emission.
- rail freight traffic will double.
- a fully operational, multimodal Trans-European Transport Network (TEN-T) for sustainable and smart transport with high-speed connectivity.

The ecosystem for intelligent transportation system (ITS) can be viewed through the lens of systems interacting with each other, also known as systems of systems. At the broader level, the ecosystem within which smart mobility exist includes cloud computing, data centers, access to telecommunication resources and infrastructure. Within this ecosystem are other systems that manage products, services, and customers: Advanced Traveler Information Systems (ATIS), Advanced Transportation Management Systems (ATMS), Advanced Public Transportation

Systems (APTS), Connected and Cooperative Automated Vehicle Systems, Fleet Management and Asset Monitoring, Automotive Telematics, etc. Specific modes of transportation ranging from rail/tram/metro to drones, vehicles, and buses increasingly rely on artificial intelligence (AI) to manage outcomes such as improved performance and safety in areas such as traffic/congestion, collision avoidance, passenger information, intermodal switches within one journey, carbon emission, etc. All these systems and ecosystems will be guided and governed by standards and regulations, some of which are being developed and some that will be developed at the national and international levels. Market access for U.S. companies into the EU market for the smart mobility ecosystem will be determined by how seamlessly the U.S. products and services can be incorporated into this complex ecosystem at different stages of the product development cycle. It is very important for U.S. companies to be aware of the different EU strategies and directives that have impact, either directly or indirectly, on the smart mobility ecosystem.

The EU's Sustainable and Smart Mobility Strategy

The European Commission's strategy for sustainable and smart mobility will lead to many commercial opportunities for companies and technologies that can transform transportation to be smarter and greener. The European Parliament and the Council have reached a political agreement on strong rules to decarbonize and modernize the mobility sector. They provisionally agreed on new CO₂ emission standards for cars and light vans in the EU for the period after 2020. Emissions from new cars will have to be 37.5% lower in 2030 compared to 2021 and emissions from new vans will have to be 31% lower. The Commission aims by 2030 to have at least 30 million zero-emission cars on European roads with 100 cities being climate neutral and that all road vehicles in the EU should have zero emission by 2050. By 2025, the EU aims to produce enough battery cells to meet the needs of the European automotive industry, powering at least 6 million electric vehicles via at least 15 new battery giga-factories being built in Italy, France, Germany, Hungary, Poland, Slovakia, and Sweden.

Alternative fuels, such as hydrogen, would play a key role in this transformation. The Commission's Hydrogen Strategy envisions that hydrogen refueling stations will be needed for the uptake of hydrogen fuel-cell buses and trucks. Hydrogen is expected to provide at least 13% of the energy demand by 2050 in Europe. Hydrogen as a fuel source is also envisioned for all modes of transportation – including ships, drones, aircrafts – in other words, an ecosystem of hydrogen producers, manufacturers, ports, and airports. The EU aims to achieve this goal through a variety of means such as a proposal to revise its criteria for selecting and supporting Trans-European

Networks for Energy (TEN-E) projects to prioritize clean energy such as hydrogen infrastructure -- including transport and certain types of electrolyzers. 56 out of the 300+ applications for EU funding of clean tech from the Innovation Fund in 2020 were for hydrogen-related projects. The EU's Innovation Fund aims to create the right financial incentives for companies and public authorities to invest now in the next generation of low-carbon technologies and give EU companies a first-mover advantage to become global technology leaders. For the period 2020-2030, the Fund may amount to about EUR 10 billion, depending on the carbon price. The EU's Emission Trading System (ETS) provides the revenues for the Fund and also provides the main long-term incentive for these technologies to be deployed in the EU. The EU ETS works on the 'cap and trade' principle.

Besides the Innovation Fund's focus on low-carbon technologies, the EU also have the Horizon 2020 and the upcoming Horizon Europe that support innovation and research. These programs have supported and will continue to support a variety of smart mobility projects. These early-stage collaborations, such as the Horizon 2020-funded project to develop a prototype hydrogen-fueled train or the ENSEMBLE project for platooning connected-automated trucks, also aim to inform the development of standards and regulations. For example, the ENSEMBLE project helped to identify and establish pre-standard requirements regarding interoperability among the vehicles and with logistics solution providers, to speed up commercialization of the practice, and to harmonize legal frameworks among the Member States. A general safety regulation has been adopted in 2019/2144 which addresses cooperative and connected automated mobility (CCAM), automation, cyber and platooning communication (V2V). One single V2V standard is now adopted throughout the ENSEMBLE project. It is equally important for U.S. companies to be able to participate in these projects or, at the very least, be able to provide input into the resulting standards and regulations to ensure that U.S. products and services will be inter-operable within the EU ecosystem for smart mobility. The U.S. Department of State is leading an interagency effort to discuss with the European Commission how to address challenges to U.S. participation in these projects.

The EU's Digital Single Market Strategy also plays an important role in the implementation of the EU's smart mobility strategy. The European Commission aims to make more use of ITS solutions to achieve a more efficient management of the transport network for passengers and business. ITS will be used to improve journeys and operations on specific and combined modes of transport. The European Commission will also work to set the ground for the next generation of ITS solutions, through the deployment of Cooperative-ITS, paving the way for automation in the transport sector.

Besides passenger mobility, the EU's smart mobility strategy also includes intermodal and intelligent cargo, meaning that goods become self-, context- and location-aware as well as connected to a wide range of information logistics services incorporating navigation systems, digital tachographs and tolling systems. The European Commission's Horizon 2020 program recently funded a swappable container marine transport battery called Current Direct. This program plans to revolutionize the marine transport of cargo. Current Direct will also provide an opportunity for energy companies, institutional investors, and even government stakeholders from across Europe's marine electrification value chain to join in the green transformation of Europe's merchant and passenger fleet. The fact that the United Kingdom, while no longer a part of the EU, is investing in nine new 5G test beds to support ports logistics illustrates the overall government trends and funding commitments towards this segment of the smart mobility transformation in Europe.

The EU Action Plan for the Smart Mobility Strategy

The EU action plan for the smart mobility strategy listed 80+ new areas of regulations and standards development that will be part of the work plan for the next 3-4 years. These activities are grouped under 10 different "Flagship" headings covering almost all aspects of the smart mobility ecosystem. Among the action plan items is setting up a high-level group ('New Mobility Tech Group') as a first step toward the development of a coherent EU approach and a set of recommendations on facilitating testing and trials of emerging mobility technologies and solutions in the EU ('European Mobility Test Beds'). The hyperloop was mentioned as an example of a new technology that would need regulatory actions to ensure safety and security. The ability of U.S. companies to provide input into this process would be very important to ensure that U.S. technologies are not inadvertently locked out of the EU market. U.S. companies see any potential market access barriers arising through this forum or any area of smart mobility in the EU can request the assistance of the Commercial Service in the International Trade Administration.

Recognizing the role of data to smart mobility, the European Commission included in its strategy the planned creation of a "European Common Mobility Data Space", which will also encourage the development of Artificial Intelligence (AI) within the mobility sector. Connectivity for smart mobility relies on adequate access to telecommuting resources and infrastructure. In 2012, the European Union established a Radio Spectrum Policy Program (RSPP) to define key policy objectives and set up general principles for managing radio spectrum in the internal market.

In December 2020, EU Member States presented a report that compiles their proposed best practices for cutting the cost of network rollout and for providing timely access to radio spectrum for 5G. This report marked the first step towards developing the toolbox of best practices. The report identified main trends and provided examples for improving connectivity.

The Commission has set up a special group for Member States to cooperate with one another and with the Commission to develop by end of March 2021 the Toolbox of best practices for an efficient and timely rollout of very high-capacity networks, including fiber and 5G, across the EU.

While the focus of this market insight is on the EU's strategy for smart mobility, there are several other EU strategies and action plans that will also have an impact on the ecosystem and some of them have been mentioned herein as examples when appropriate, but the list is not meant to be exhaustive. Depending on the U.S. product and service a company exports, there may be other relevant EU initiatives, regulations, and activities that would be important to monitor. Beside EU regulations, U.S. exporters must also be mindful of U.S. export licensing requirements. U.S. exporters are encouraged to work closely with the U.S. Commercial Service for tailored assistance regarding export and market access to the EU.

The Role of Member States in Smart Mobility

The implementation of the EU's Sustainable and Smart Mobility Strategy will happen mostly at the level of Member States where many procurement opportunities and pilot projects will occur. The Member States also participate in the various working groups that coordinate on supporting regulations and funding for innovations within the smart mobility ecosystem. As each Member State takes over the rotating presidency of the European Council, such state will in its turn will highlighting or emphasize a different aspect of the strategy. For example, Portugal holds the current presidency of the Council of the European Union and will launch the European Year of Rail in Lisbon in March 2021 to further debate measures enabling both rail infrastructure and rolling stock to contribute to decarbonization, intermodal modernization and the safety of transport. Together with the European Commission, Portugal will also host the Trans-European Transport Network (TEN-T) Days 2021 in Lisbon in June, focusing on sustainable and smart transport with high-speed connectivity.

References

A fundamental transport transformation: Commission presents its plan for green, smart and affordable mobility https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2329

Speech by Vice-President Šefčovič at the European Conference on Batteries, November 2020. https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_20_2202

A hydrogen strategy for a climate-neutral Europe https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf

Commission proposes revised rules for cross-border energy infrastructure in line with the European Green Deal https://ec.europa.eu/commission/presscorner/detail/en/IP_20_2394

First Innovation Fund call for large-scale projects: [311 applications for the EUR 1 billion EU funding for clean tech projects.](#)

[Innovation Fund](#)

[EU Emission Trading System](#)

[Horizon 2020 Smart, Green and Integrated Transport](#)

[Developing Horizon Europe](#)

[Hydrogen fuel cell train to be developed with EU funding](#)

[ENSEMBLE: ENabling Safe Multi-Brand platooning for Europe](#)

[Making multibrand, cross border Platooning a reality](#)

There are some problems facing U.S. stakeholders wishing to participate in these EU-funded research and innovation programs, as noted in this article: "[Tale of two cities: Brussels and Washington struggle to cooperate in science 'Devil in the details' when US and European researchers try to work together under Horizon 2020.](#)" The U.S. Department of State is coordinating with other interagency partners, including the U.S. Department of Commerce, to resolve issues related to the EU's framework programs for research and innovation (presently Horizon Europe) at the earliest possible opportunity.

In the meantime, there are two smart mobility collaborative projects led by the U. S. Department of Transportation on the U.S. side that companies might want to engage with: [CARMA](#) and [VOICES](#).

The [CARMA Program](#) is developing research tracks that explore traffic, reliability, and freight operations scenarios. The research tracks will encourage stakeholder collaboration to accelerate the development, testing, and deployment of cooperative driving automation (CDA). The VOICES program, Virtual Open Innovation Collaborative Environment for Safety ([VOICES](#)) is a joint effort of the U.S. Department of Transportation and the U.S. Department of Defense. Through the VOICES project, the USDOT intends to seed a platform designed to facilitate collaborative research, development, and testing, while protecting intellectual property (IP), among diverse stakeholders engaged in the design, build, test, and evaluation of the safety, performance, and interoperability of transportation automation and connectivity technologies that could significantly improve the safety,

mobility, efficiency, and environmental impacts of transportation in the United States. The VOICES PoC will be accessible to Federal, State, and local governments; transportation infrastructure and automotive industries; manufacturers; technology developers; research institutions; and academia.

Intelligent transport systems: [Innovating for the transport of the future](#)

C-ITS are systems that allow effective data exchange through wireless technologies so that vehicles can connect with each other, with the road infrastructure and with other road users.

Intelligent transport systems: [Freight and logistics](#)

[Swappable Container Waterborne Transport Battery](#)

[Ports, warehouses, construction sites - UK lines up £28m for nine new 5G testbeds](#)

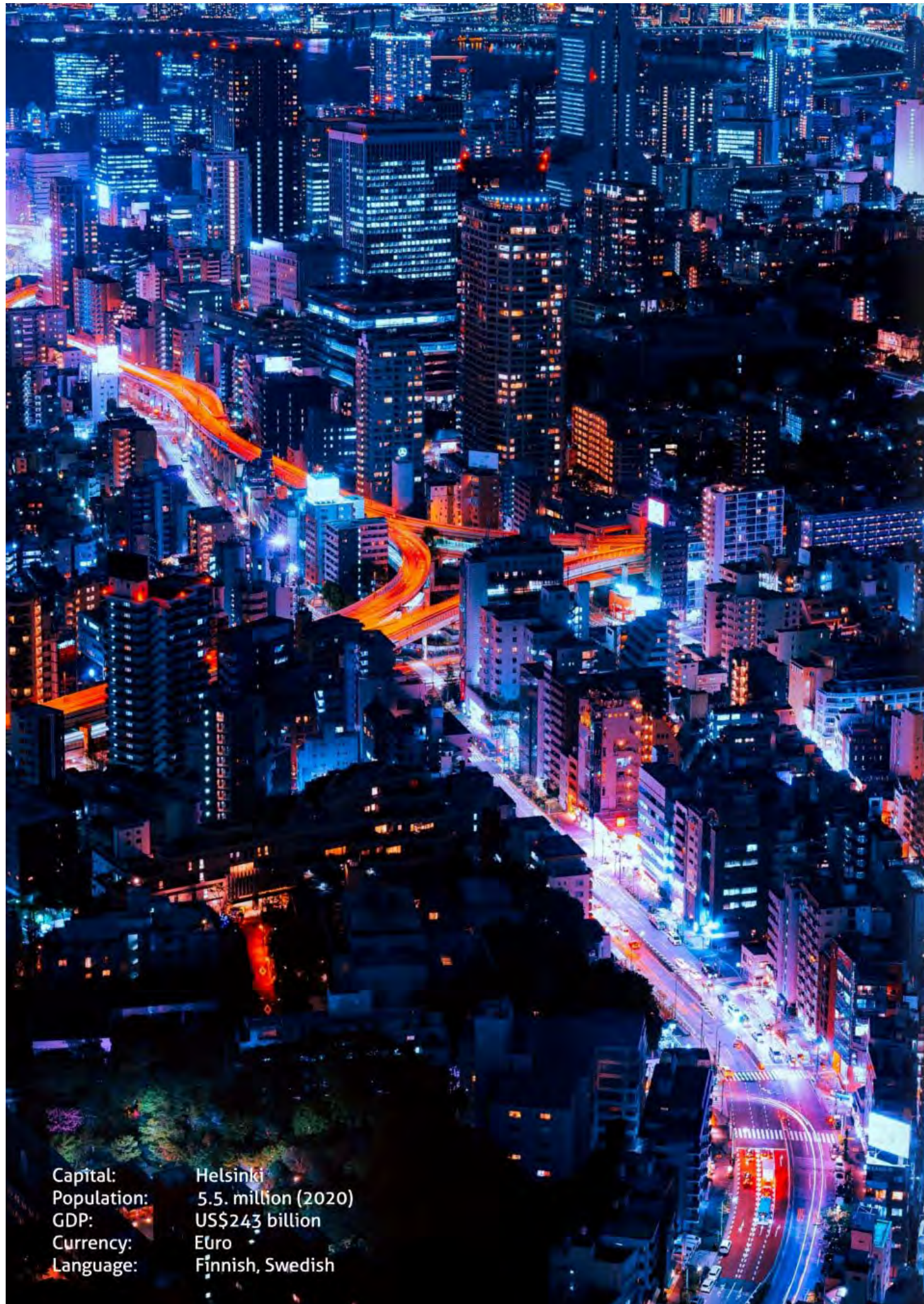
[Sustainable and Smart Mobility Strategy - putting European transport on track for the Future](#)

[Radio Spectrum Policy Programme: the roadmap for a wireless Europe](#)

[EU Member States present report of best practices on fast network rollout, a first step towards the Connectivity Toolbox](#)

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Capital: Helsinki
Population: 5.5 million (2020)
GDP: US\$243 billion
Currency: Euro
Language: Finnish, Swedish

FINLAND

Summary

Finland has a strong vision on how to create a smarter mobility for the future. Key aspects to reach the goal consist of the following elements and steers decision making in the smart mobility field:

- 1) Carbon neutrality and resource efficiency: Finland is aiming to become carbon-neutral by 2035. Public sector, industry and research are committed to reaching this goal in tight collaboration. The Ministry of Transport and Communications is preparing [Finland's roadmap for fossil-free transport](#), which should be finished in 2021.
- 2) Mobility as a Service (MaaS): A MaaS service provider brokers and integrates the services of several transport modes according to the customer's needs and sells the entire travel chain needed by the customer. It combines public transport, taxis, on-demand ridesharing, and the use of private cars in a single digital service.
- 3) Seamless intermodality and connectivity: The Finnish Act on Transport Services allows combining different modes of transport and use of data in mobility services. Finland's high-quality mobile network (5G) enables smooth data transfers.
- 4) High automation: Progressive legislation and smart tech allow for smart automation. Finland's laws for testing autonomous vehicles are seen as rather progressive and conducive to enabling automation pilots of different kinds.

Market Entry

The new [Road Traffic Act](#) entered into force in 1 June 2020. It promotes traffic safety and traffic flow, and has created a favorable environment for digitalization and safe automation of traffic while reducing regulatory burdens. The Act is seen as being rather progressive and conducive to enabling smart mobility solutions to enter the Finnish market. In smart mobility the role of the public sector is to enable the change and provide favorable operating conditions. The responsibility for innovations and service development lies with the private sector.

Railway traffic of private persons will open for competition in 2024. Finnish Railways, VR, has the monopoly for person traffic until end of 2024. Competition will be based on the Open Access model, meaning that each player comes to the market with their own rolling stock and is responsible for workforce and other expenses. Freight transport has been open for competition since 2007. To be able to operate on the Finnish railways an undertaking must apply for a license from the Ministry of Transport and Communication.

The provision of professional passenger transport services in return for payment is subject to license in all transport modes.

A good way to enter the market is through partnerships with either private companies or through public/private organizations by participating in testbeds or other smart mobility projects. Test permits can be obtained effortlessly and interaction with authorities is easy. Several bigger cities have opened their data for others to use. Helsinki was one of the first capital cities in the world to do this.

Other market entry models include the use of Memoranda of Understanding. As an example, an MoU to enhance cooperation between clusters and businesses in smart mobility was signed between [Finland and the State of Michigan](#) in March 2020. The focus will be on R&D, but the goal is also to create partnerships in support of market access and bilateral investment opportunities especially in the automotive industry, battery technology, smart mobility, and energy storage. The common need for this MoU was to mitigate climate change and advance green sustainable growth.

Current Market Trends & Demand

Bigger cities in Finland have development programs where they list individual goals in creating smarter cities. The following measures appear most frequently: developing gathering of traffic information and traffic light systems, pricing of parking, continuing automation testing, creating better infrastructure for automated vehicles. Among the popular goals is to create diverse and affordable mobility services without the need for owning a car and to create effective, safe and emission free traffic systems. The concept of Mobility as a Service (MaaS) is increasingly popular and the present legislation seeks to enable a better integration and use of MaaS in the coming years.

Automotive

The Finnish automotive sector, the Ministry of Transport and Communications and the Ministry of the Environment concluded a [Green Deal](#) on 22 November 2018, where emissions from transport should be cut by half by 2030. This deal is in force until the end of 2025 and it has several targets. Companies are using alternative fuel vehicles as demonstrator cars and loner cars during repair and maintenance and installing charging points for electric vehicles at their premises. The Government of Finland promotes low-emission vehicles through financial steering instruments such as aid for the acquisition of fully electric cars, public procurement, and campaigns, and by developing advisory services and materials. The Government of Finland also aims to reform the taxation of the transport sector to support the acquisition of low and zero emission cars. Finnish industry is eager to cooperate with international companies on smart automotive/transport solutions like [Sensible 4](#) and [Vinka Oy](#)

Heavy Duty Vehicles

Finland covers a large north-to-south geographical area and heavy-duty transport distances are long. Demand in this area lies in developing smart technologies for safety and surveillance of drivers and in solutions that are cost-saving and environmentally friendly. Finland is a testbed for such technologies, with past pilot projects such as Smart Arctic Trucks, and ongoing projects like [NewPerception](#) (funded by the EU) paving the way for further development and deployment of technologies in Finland and in other markets.

Rail Traffic

In rail traffic there is demand for new access control systems like radio-based control systems. Currently installed trackside control systems in Finland will near the end of their life cycles toward the end of the 2020s. EU regulations require Finland to transition towards the requirements of the Single European Railway Area Convention with regard to the TEN-T Core Network and to equip railway sections with European Rail Traffic Management Systems (ERTMS). The use of ERTMS are key requirements in projects like [Finland Railway](#) and [One-Hour Train Turku-Helsinki](#).

In July 2019 [Finest Bay Area Development](#) signed an MOU with a consortium of three Chinese companies, China Railway International Group, China Railway Engineering Company, and China Communications Construction Company, with financial backing of Touchstone Capital Partners, to build an undersea train tunnel between Helsinki, Finland and Tallinn, Estonia. This project has faced delays due to a number of factors, including a vote by the Helsinki-Uusimaa Regional Council's Assembly to adjust the route of the project, which would make the cost estimates much higher than originally estimated. Private investors say that nevertheless planning is still ongoing. Opening up this route would connect Finland to standard-gauge [Rail-Baltica Project](#) connecting three Baltic states with Poland and the Western Europe standard-gauge network.

Artificial Intelligence

The Government of Finland has taken a proactive role in nurturing artificial intelligence (AI) development in Finland, and aims to make the country a leading economy in artificial intelligence and platform economy development and utilization. To support this goal, a four-year (2018-2022) \$226 million program "[AI Business](#)" was developed to fund Finnish start-up, SME, mid-cap, and large companies in all fields developing and utilizing AI and platforms in business including mobility services. The program offers international networks and export services, such as matching selected companies with large global firms.

Testbeds

Finnish legislation allows the type of development and trial projects currently being carried out in Europe and the United States to be implemented on Finnish public roads. This has led to the creation of several testbed ecosystems around Finland, which are available for both domestic and international companies piloting smart mobility solutions. Some bigger cities offer free data for companies to use in these testbeds, such as the City of Tampere through its [Data.Tampere.fi-portal](#) and the capital region with the cities of Helsinki, Espoo, Vantaa and Kauniainen with the Helsinki Region Infoshare portal.

Finland has been a testbed between 2015 and 2019 for multiple self-driving car projects, including an EU funded minibus shuttle service project in 2018 in Helsinki. The project has since expanded to multiple other projects, including piloting the same shuttle service in the Baltics, and initiating new tests in Helsinki.

VTT Technical Research Center has conducted testing and research with autonomous cars since 2015. Adoption of such cars is expected to be limited until changes are made in EU wide legislation, which still holds drivers liable for accidents.

Present testbeds: Smart Mobility Helsinki, which offers testing in an urban environment concentrating in digital solutions and smart services; OuluZone+, which offers 8 test zones from autonomous vehicles to tires in arctic conditions and offering a high speed 5G network; Smart Mobility Finland Project 2018-2022 by Business Finland, which focuses on transport supply chains, emission reduction and big data.

Opportunities / Best Prospects for U.S. Exporters

Automotive Technology

- Autonomous Vehicles
- Diagnostics & Testing
- Electric Vehicles
- Hybrid / Electric / Alternative Fuel Vehicle Technology

Intelligent Transportation Systems (ITS)

- Connected and Automated Technology
- Cybersecurity
- MaaS
- Rail/Tram/Track/Metro
- Testbeds
- Transit Technology & Sensors

Robotics / Machine Intelligence

- Artificial Intelligence
- Robotics / Drones

Opportunities / Best Prospects for U.S. Exporters

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Robotics / Machine Intelligence

- Artificial Intelligence
- Robotics / Drones

2021 In-Person or Virtual Events

Event Name: Tampere Smart City Week
 Date: 22-29 January 2021 (annual event)
 Website: <https://tscw.fi/en/welcome/>
 Sector: (Smart Mobility, ICT)

Resources

- [Ministry of Transport and Communications](#)
- [TrafiCom-Finnish Transport and Communications Agency](#)
- [Finnish Transport Infrastructure Agency](#)
- [The Finnish Information Centre of Automobile Sector](#)
- [Association of Automobile Industry in Finland](#)
- [VTT Technical Research Centre of Finland](#)
- [Helsinki Business Hub](#)
- [Smart Tampere](#)
- [Business Finland](#)
- [ITS Finland](#)

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FRANCE

Summary

The European Commission just released its Sustainable and [Smart Mobility Strategy Action plan](#) with a series of initiatives that will guide the work of European countries for the next four years. The priority is to reach the climate target emissions for the transportation sector in the next thirty years. As outlined in the [European Green Deal report](#), 90% of emissions must be cut by 2050.

France is a European leader in the fight against climate change. The French government just released its "[France Revival Plan 2030](#)", which focuses on the ecological transition of the French economy and its production tools. France will invest in new technologies with the goal of becoming the first European country to reach carbon neutrality in 2050.

This goal will be achieved by increasing the number of zero-emission vehicles (cars, buses, trains, heavy-duty, aircraft, and marine vessels). Priority will be given to renewable and low-carbon fuels, to developing climate neutral cities through the installation of more charging stations, to zero-emission airports and ports, and to expanding high-speed rail traffic in order to reach a fully operational multimodal Trans-European Transport Network (TEN-T). This will be achieved through the use of autonomous vehicles, scooters, e-bikes, and multimodal transportation means and infrastructure.

France will follow the path of Europe by betting on smart mobility solutions as they can contribute to a 5 to 8% reduction of greenhouse gas emissions. The focus will be on technologies related to intelligent transportation systems (ITS), as well as electric and alternative fuel vehicles, autonomous vehicles, artificial intelligence, and machine intelligence.

[The French mobility orientation law](#), voted in December 2019, will encourage the development of MaaS (Mobility as a Service), open data and ticketing, autonomous vehicles, carpooling, car-sharing, free-floating and electric fleets and charging stations.

The French association [ITS Atec France](#) has been promoting the French Mobility 3.0 initiative [Livre_Vert_Mobilite_3-0_-_ATEC_ITS_France-2.pdf \(mobilite-intelligente.com\)](#), since 2016. ITS France and its institutional partners such as [CEREMA](#), [IFSTTAR](#), and [ADEME](#), are building a collective strategic steering framework in order to achieve and deploy in France and

Capital:	Paris
Population:	67 million (2020)
GDP:	US \$2.4 trillion
Currency:	Euro (€)
Language:	French



internationally new mobility solutions that meet users' expectations, while still maintaining road safety objectives, improving traffic conditions, respecting environmental protection and fighting against climate change. The estimated budget over 5 years is 8.5 million Euros. The French government will contribute up to 6 million Euros and the private sector up to 2.5 million Euros.

Another initiative of the French Ministry for Ecological Transition is [France Mobilités – French Mobility](#). This collaborative platform aims to support regional experimentation, development, and dissemination of national solutions to improve sustainable mobility in everyday life. It is open to players located in France, such as mobility companies, startups, local authorities, incubators, investment funds, training organizations, R&D centers, and associations. The French government, as well as its French agency for ecological transition [ADEME](#), are co-financing projects to boost the development of multimodal and green mobility solutions.

Market Entry

In France, the smart mobility market turnover reaches 4.5 billion Euros per year, accounting for more than 45,000 direct jobs in the public sector. It also represents thousands of jobs in more than 1,000 companies in traditional sectors such as construction, transport infrastructure, automobile manufacturing, and logistics.

France is a major player in this field thanks to a network of qualified and recognized companies (large and small) in the transportation of people and goods, in digital technologies, and industries related to energy and environmental technologies. It is a closed environment, where projects are developed by consortiums. It requires enhanced cooperation between public actors in charge of mobility and transport policies, private actors, research entities and startups organizations (i.e.: [Cleantech Open France](#); [Via ID](#)) and clusters (i.e.: [NextMove](#); [Advancity Systematic](#); [Images & Réseaux](#); [iD4Car](#); [CARA](#), [Minalogic](#), [Véhicule du Futur](#), [IFP Énergies nouvelles](#)).

Most smart mobility projects are carried out in close collaboration with European institutions, in particular for standardization and co-financing, and are intended to support national industrial players in order to strengthen their leadership on international markets. Consequently, to be involved in projects and to benefit from European, national and regional funding, it is often necessary to be a member of those organizations listed above. This provides easier access to

information (especially for project tenders), a maximum of visibility, and eases interaction with OEMs and public authorities.

To enter the French market and become an actor of the French smart mobility environment, it is necessary for U.S. manufacturers of smart transportation solutions to either:

- Establish a presence in France or Europe
- Partner with a local company/agent that proposes a complementary technology
- Set up a joint venture with an integrator of smart mobility solutions

Current Market Trends & Demand

France has identified several themes within its smart mobility action plan:

- Backing the development of more efficient and less polluting cars
- Multimodal passenger information, ticketing and electronic banking, electronic tolls
- Public transport and optimization of road traffic
- Shared mobility
- Urban, public transportation, and roads logistics
- Mobility for all
- Knowledge of mobility (identification of travel needs, practices and modes)
- Planning of public spaces
- Optimization of travels

ITS, which include 5G technologies, connected and automated technology, cybersecurity, Internet of Things (IoT), transit technology & sensors, vehicle-to-everything (V2X) communication, vehicle-to-infrastructure (V2I) communication, vehicle-to-pedestrian (V2P) communication, vehicle-to-vehicle (V2V) communication, have a predominant role to play to respond to user demands focusing on services rather than infrastructure.

National players in the automotive, digital, public transport, and infrastructure industries are involved in working groups. They are solution providers, infrastructure builders or operators, vehicle and rolling stock manufacturers, electronics or information systems manufacturers, service operators or startups active in the ICT field.

- An example of projects is [Renault Software Labs](#). It is composed of two entities, one for embedded software and another for offboard software, who work together and for each other to develop end-to-end connected platform software services and extended vehicle platform software [Renault Software Factory | LinkedIn](#)
- [SCOOP](#) is a pilot project for the deployment of cooperative intelligent transport systems, i.e., systems based on the exchange of information between vehicles and between vehicles and roads.

France is betting on electric and hydrogen vehicles

The French government has incentivized the purchasing of hybrid and electric vehicles, both two and four-wheeled. There are more than 250,000 electric passenger vehicles on French roads (mainly Renault Zoe; Volkswagen ID.3; Dacia Spring; Fiat 500E; Renault Twingo ZE; Peugeot E-208; Tesla Model3; Kia E-Niro; Volkswagen E-UP; Hyundai Kona and Nissan Leaf) and around 70,300 plug-in-hybrid electric passenger vehicles (mainly Toyota with 4 models and Peugeot 3008).

The market for electric bicycles is booming with brands such as Moustache, Kalkhoff Cannondale, VanMoof and Nakamura (electric bikes represent 45% of total bike sales in France in 2020). Buses in large French cities have already moved from 100 percent diesel to hybrid engines (mainly Iveco, Heuliez, Man, Mercedes, Solaris, Safra, Van Hool and Volvo brands).

To support the electric vehicle initiative, France plans to install seven million charging points for hybrid and electric vehicles by 2030 through partnerships with OEMs, energy suppliers and charging station infrastructure providers. The pan-European IPCEI project has recently launched to develop fuel cells, tanks and materials to enable the development of hydrogen vehicles.



- An example of a project is the joint-venture between [Renault and Plug Power](#) to develop a fuel cell-powered light commercial vehicle for the European market.
- Another example is the joint venture between PSA (now Stellantis since the merger with Fiat/FCA) and Saft. The project, called ACC, has the goal to reach a cumulative production capacity of 48 gigawatt hours by 2030.
- Another example is the joint venture between Renault and LG Chem to set up an electric battery factory in France.
- The European Commission has just approved, under EU State aid rules, a second Important Project of Common European Interest ("IPCEI") to support research and innovation in the battery value chain. The project, called "[European Battery Innovation](#)" was jointly prepared and notified by Austria, Belgium, Croatia, Finland, France, Germany, Greece, Italy, Poland, Slovakia, Spain and Sweden. The project will cover the entire battery value chain from extraction of raw materials, design and manufacturing of battery cells and packs, and finally the recycling and disposal in a circular economy, with a strong focus on sustainability.

The French government announced a financial package in July 2020 to bolster its aerospace industry. Within the larger package, 1.5 billion Euros will be made available between now and the end of 2022 to accelerate development of a new "green" aircraft powered by hybrid propulsion. The funds will be allocated to French primes contractors and their supply chains through the government aero research entity [CORAC](#). The emphasis will be twofold: saving up to 30 percent in fuel, with a possibility of burning 100 percent biofuels, and then moving to hydrogen as the primary fuel. Entry in service date is planned for 2035, an extremely ambitious goal. Access to this funding is restricted to local industry or foreign firms with production and/or R&D facilities in France.

Additionally, it will be essential to establish hydrogen delivery and refueling infrastructure. A technological development agreement was signed last September between [Engie](#) and [Ariane Group](#) to develop an installation to liquefy hydrogen, for use in the aviation and maritime sectors. ArianeGroup's Vernon site, which develops the propellant for Ariane 5 and 6 rockets, masters the components and materials that can withstand the very high pressures and temperatures essential for the development of systems capable of producing liquid hydrogen at - 252.87 ° C, transport it

and inject it into mobile reservoirs. ArianeGroup, in partnership with CMA CGM and Engie, plans to install a demonstrator in a port from 2025 and market in 2030.

The French have also been looking at urban air mobility closely (ex: air taxis, integration into urban airspace, maintenance, charging etc); the French greater Paris region airport rail transportation and investment authorities recently held a competition revolving around urban air technologies. Categories included vehicles, infrastructure, operations, air space integration and acceptability.

About 30 international companies were selected and will join the competition's first laureate, Velecopter, to show demonstrators and begin testing at the Pontoise airfield starting next June. The idea is to work with French and European safety and regulatory authorities and to test some of the technologies (like the [Volocopter Volocity](#) air taxi) during the 2024 Paris Olympics.

France wants to ensure its autonomy with hydrogen production

Two large French companies, [Total and Engie](#), join forces to produce renewable hydrogen on a large scale. Powered by solar farms with an aggregate capacity of over 100 MW, the 40 MW electrolyzer will produce five tons of green hydrogen per day.

The two energy companies signed a cooperation agreement to design, build and operate the largest renewable hydrogen production site in France, in the PACA region. Construction and installation will start in 2022 and production in 2024. This project is subsidized by the French and European authorities.

France is pushing the development of autonomous vehicles

About thirty actions are planned over the next two years to strengthen the autonomous vehicle ecosystem in France and for the deployment of automated road mobility services. It requires the precision of the regulatory framework set by the French Mobility Orientation law (LOM), the establishment of cybersecurity criteria, and the establishment of benchmarks to allow the circulation of autonomous vehicles without an operator from 2021. These vehicles will be able to welcome the public from 2022.

The legislative framework for use cases concerning freight and logistics must also be established by the end of 2022. Beyond the autonomous driving system itself, the government will also look at the criteria to be set for the definition of HD cards and certification standards on the cybersecurity side. With a budget of 120 million Euros (public and private funding), a series of experiments for automated and connected road mobility systems and services" are under development. The autonomous vehicle is used as part of a shared mobility service. Pilots are also done on autonomous transport of goods on logistic sites as well as on autonomous delivery of the last mile in city centers.

- Example of projects: [EasyMile](#) or [Tornado project](#)

France wants to develop 5G and quantum technologies

5G and quantum technologies will be critical to the development of connected and autonomous vehicles. and, in particular, the development of connected and autonomous vehicles. There will also be a push for digital developments for mobility 3.0, such as sensor technology, wireless communications, computing, real-time and localization technologies, electronic payment, traffic management, flow and security, and fleet and freight management. A funding plan of 1.8 billion Euros over the next 5 years has been unveiled for the development of quantum computers, partially quantum simulators and machines and full-fledged quantum computers. In detail, an envelope of nearly 800 million Euros is devoted to quantum computers alone: 350 million Euros are dedicated to partially quantum simulators and machines and 430 million Euros to full-fledged quantum computers.

- Example of [ATOS](#) is working on the development of a quantum accelerator connected to a supercomputer for 2023 but also on post-quantum cryptography.
- Example of [Pasqal](#) which manufactures Quantum Information Processors that tackle complex issues.
- Example of [Alice & Bob](#), which builds powerful quantum computer to solve complex problems
- Example of [Thales Group](#), which is working on quantum sensors.

France wants to develop an alternative to road transportation

Investment will prioritize technologies and products for the modernization of rail networks for passengers (train, metro, tramway and bus), and for haulage, as well as technologies related to rail network security.

France is also substantially developing cycling lanes in large cities to encourage the use of bicycles.

France wants to develop new mobility services to respond to users' new needs, to people with disabilities and reduced mobility, while respecting carbon neutrality.

- An example of project is [Mobilize](#) by Renault. It brings together mobility and energy management services, financial services and data management services. Mobilize aims to increase the rate of car use by at least 20%.

France wants to ramp-up advanced manufacturing equipment in its automotive industry

The implementation of industry 4.0 solutions is far from homogeneous, depending on the size of the companies and on the industry. Most of the multinationals have been engaged in digital transformation for a long time, and several large companies have opened a digital factory to accelerate their digital transformation. On the contrary, we can estimate that only 20% of smaller companies have implemented, or plan to implement, in the short term their industry 4.0 transformation.

The French automotive industry has a lot of experience in robotics for tooling and in augmented reality technology. Big data predictive software and artificial intelligence technologies are widely tested in the automotive sector.

France has an urgent need to grow and modernize its industry to bring it to the level of its main partners and competitors. This need has even been reinforced since the recent sanitary crisis as it is more important than ever to be able to manage supply chain risk and disruption and to remain competitive in the global economy.

Overview

Automotive Technology

- o Autonomous Vehicles
- o Charging station software
- o EV software systems
- o EV battery technologies
- o EVs
- o Hybrid / Electric / Alternative Fuel
- o Vehicle Technology
- o Vehicle-to-Infrastructure (V2I) Communication
- o Vehicle-to-Pedestrian (V2P) Communication
- o Vehicle-to-Vehicle (V2V) Communication

Intelligent Transportation Systems (ITS)

- o 5G Technologies
- o Connected and Automated Technology
- o Cybersecurity
- o Internet of Things (IoT)
- o Traffic Management Systems & Sensors
- o Vehicle-to-Everything (V2X) Communication
- o Vehicle-to-Infrastructure (V2I) Communication
- o Vehicle-to-Pedestrian (V2P) Communication
- o Vehicle-to-Vehicle (V2V) Communication

Robotics / Machine Intelligence

- o Artificial Intelligence
- o Robotics / Drones



Opportunities exist for U.S. companies with innovative technology and a significant reputation on the European scene. It is preferable to have business in other European markets before entering the French market. The fact that a U.S. technology succeeds in other European markets is an important pledge of guarantee for French companies. It is important to understand that because of the small size of the majority of businesses in France, the level of financial risk that those companies can take is low. Therefore, the decision making is slow and complicated.

- Example: Few French companies produce new real-time traffic data sensors, a market dominated by North American and Asian companies. French players are lagging behind in real-time traffic management despite a historical presence in the sector and are absent from mobility simulation tools, coming mainly from Germany and Spain.
- Example: There is a need for route planner solutions. Major foreign competitors are breaking into the French market with public transport information to travelers' solutions; the SNCF route planner is provided by a German company.
- Example: In the field of ticketing, France is behind its European competitors. New opportunities exist with more efficient and less expensive solutions than the French one.

2021 In-Person or Virtual Events

[Autonomy Paris](#) – France – May 19/21, 2021

[ITS France Congress Paris](#) – France – June 14-16, 2021

[Hub Cities Summit](#), Paris – France – September 14, 2021. It is a conference mainly attended by

French companies. The largest show in Europe about smart cities is SCEWC <https://www.smartcityexpo.com/next-edition-2021/>, located in Barcelona, Spain.

Resources

European Commission – Mobility Strategy:
https://ec.europa.eu/transport/themes/mobilitystrategy_en

Autonomy white paper: [AUTONOMY-Whitepaper-latest.pdf](#) (autonomychain.com)

ITS France - [Mobilité 3.0: Livre_Vert_Mobilite_3-0_-_ATEC_ITS_France-2.pdf](#)
([mobilite-intelligente.com](#))

French mobility orientation law guide: [French Mobility Orientation Law Guide.pdf](#) (hubspot.net)

France Mobilités: France Mobilités : [Innovation, expérimentation et actions de transports et mobilité durables dans les territoires](#) (francemobilites.fr)

Ministry of Ecology: [Accueil Ministère de la Transition écologique](#) (ecologie.gouv.fr)


Transport Intelligent magazine: Magazine des transports : [Voitures, avions, trains, bateaux, motos...](#) (transport-intelligent.net)

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Capital: Berlin
Population: 81.3 million (2020)
GDP: EUR 3,329 billion
Currency: Euro
Language: German

GERMANY

Automotive Overview

The automotive industry in Germany is the nation's largest industry sector, accounting for nearly 20% of total German industry revenue and directly supporting 833,000 jobs. Germany is Europe's #1 automotive market in terms of both global automotive sales (2019: EUR 436 billion) & production (2019: 4.66 million vehicles=ca. 25% of EU capacity). The automotive industry is considered the backbone industry in Germany, which is home to many global industry leaders. Germany has the highest concentration of OEM plants in Europe (43 in total) and 18 of the world's TOP 100 automotive suppliers are German companies.

Germany is recognized as a leading global market when it comes to the engineering of automotive components, systems, and vehicles. In 2018, the German auto industry invested as much as EUR 27 billion in R&D and more than 40 percent of all patent registrations in Germany originate from the automotive industry. Competition for U.S. exporters of vehicles and components comes mostly from European companies across all industry segments, as well as foreign manufacturers, many of which maintain R&D, design, manufacturing, distribution and sales networks in Germany and Europe. The German automotive market is considered highly competitive and saturated. However, the market remains open and opportunities exist for new-to-market, competitive and especially for innovative products and services.

Trends & Opportunities - Mobility & Transport:

A combination of technological innovations and socio-economic trends are significantly challenging the status quo of today's mobility sectors and its related stakeholders. Several relevant trends can be observed: (a) emergence of new, often data-centric and increasingly digital business models; (b) rise of new contestants challenging traditional automakers & suppliers; (c) industry convergence & sector coupling; (d) shifting demand and new mobility paradigm that include shared, sustainable, flexible (use vs. own), and multi-modal mobility; and (e) strong implications due to socio-economic trends, especially in growing urban centers.

Germany's Federal Government has identified the transition to a clean and sustainable future of mobility and transportation as a fundamental objective and core element of the country's future-oriented roadmap. Several strategic (sub-)sectors and measures were identified across modes, industries and geographies, including individual, public, and commercial transport.

Applicable recent measures taken by Germany's Federal Government include legislative adaptation as well as publication of white papers on future frameworks and directives (non-comprehensive selection):

- Electric vehicle charging infrastructure: German Federal government is actively supporting and investing in the expansion of a comprehensive national EV charging network
- Rail infrastructure - Significant rail infrastructure investment announced (2020): <https://tinyurl.com/RailGermany>
- National Hydrogen Strategy (2020): <https://tinyurl.com/HydrogenStrategy>
- 5G: deployment of advanced communication and 5G as an enabler of future connected and autonomous vehicle technology: (1) <https://tinyurl.com/AutonomousConnectedDriving>; (2) <https://www.bmvi.de/EN/Topics/Digital-Matters/5G/5g.html>
- Intelligent Transport Systems - National ITS Action Plan: <https://tinyurl.com/ITSActionPlan>
- Rail & Public Transport – 2021 “European Year of Rail”: <https://tinyurl.com/Rail2021Europe>
- Smart Deal for Mobility (“Passau Declaration”, 10/2020) - outlines the future of mobility in Germany and the EU: <https://tinyurl.com/PAssauDeclaration2021>

Robotics & Automation

Germany is the fifth largest robotics market in the world with 20,473 industrial robots utilized across various industries in 2019, a 23% decrease over 2018. The main industries for robotics integration are automotive, electrical and electronics, metal working, chemical rubber and plastics, logistics, medical, and the food industry.

The German Robotics + Automation Association represents three industry segments: Robotics, Machine Vision and Integrated Assembly Solutions with a combined annual turnover of EUR 15 billion in 2019. Fiscal years 2020/2021 are expected to be affected by the recovery from the impact of the most recent pandemic. Industry experts predict an average increase of 12 percent annually from 2022 onward.

In 2019, the two single most important markets for German exporters of robotic units were China (140,500) and the United States (33,339). Overall, China remains the world's largest importer of robotics and automation solutions and a key market and destination for German exporters. In terms of robot density (robots' utilization per 10,000 worker), Germany ranks 4th in the world with a value of 346 units per 10,000 workers in 2019, after Singapore (918), Korea (855) and, Japan (364). The USA ranks 9th with 228, China is 15th (187).

Trends include the utilization of artificial intelligence, human-robot collaboration, digital transformation in production, service robotics in the commercial and health industry, collaborative robots and mobile platforms, and robot leasing incl. Robot as a Service – RaaS. According to industry experts the future of manufacturing will become more resilient through a higher degree and integration of industrial automation and robotics usage. For further information on Robotics & Automation, please contact Klaus Jonas, Trade Specialist, U.S. Commercial Service Dusseldorf, Email: Klaus.Jonas@trade.gov.

Market Access

U.S. Exporters seeking to sell products in the European Union and its member states must undergo a thorough assessment of, and ensure compliance with, existing European Commission Directives, i.e. regulatory requirements regarding technical specifications, product safety, as well as environmental impact & footprint. In addition to compliance with the legal requirements of an EU member state as well as relevant EC/UNECE directives and regulations, U.S. exporters are advised to assess and obtain evidence of compliance with relevant technical norms and standards via an accredited testing & (technical) consulting service provider. Please contact the U.S. Commercial Service in Europe for further information and assistance on compliance with European Directives and industry standards: <http://2016.export.gov/europeanunion>

Overall, Germany remains open for new products and suppliers. Business opportunities exist for innovative products, services and business models, especially in high-tech sectors. Overall, Germany is a highly sophisticated and competitive market with many German manufacturers and suppliers as world leaders in their respective sectors. New-to-market (NTM) companies must be prepared to face competition from locally established and globally operating companies with a local presence and established market shares. Successful market access strategies for NTM companies in most cases involve a local market presence which may involve one (or a

- Strategic industry partnership with an established, local company: e.g. strategic Joint Venture and/or distribution partner, system integrator etc.
- Technical sales representative / business development agency with an established network of local customers and contacts within the German & EU auto industry.
- Official legal subsidiary: including marketing, (technical) sales & business development staff & engineering support.

US Exporters interested in business opportunities in industries such as public transportation & infrastructure (e.g. road, rail), Intelligent Transportation Systems (ITS), etc. need to address additional specific requirements as most relevant public transport & infrastructure projects in Germany are procured as public tenders. For related projects, US exporters should carefully assess the specific terms, requirements and overall eligibility to participate in relevant public procurement/tenders.

While international companies may be eligible to qualify for public tenders, in many cases a direct presence or EU partner is mandated. Further information and a database of EU tenders can be accessed online: <https://ted.europa.eu>. For additional information on EU Tenders and assistance for US companies please contact our EU office in Brussels:

<https://2016.export.gov/europeanunion>.

Opportunities / Best Prospects for U.S. Exporters

Germany remains very open for technology innovation from the US. Exporters with products and/or services in related categories have a high export potential as the US is still regarded as a main driver and source of innovative and disruptive ideas, technology, products and new business models.

The German government is actively supporting the transition to a clean and sustainable future of transport. Measures taken include various direct and indirect subsidies, supportive legislation, funding of R&D & localization, deployment of low- and zero emission vehicles, re-fueling and charging infrastructure, as well as the integration of new and public transport modes.

Opportunities exist for suppliers of battery- and fuel cell-electric technology, charging and refueling technology and infrastructure, connected and autonomous vehicle technology & related services, new and lightweight materials, software & digital and data-driven services (e.g. shared mobility services, remote diagnostics and service & maintenance), cyber security as well as digital solutions for user experience, sales & marketing, personal health, etc.



The automotive industry is further one of the drivers in the deployment of innovation in advanced manufacturing technology. New development in automation, robotics, new manufacturing methods (e.g. additive manufacturing), logistics, as well as everything that makes a factory “smarter”, more sustainable, and more efficient is of great interest to the German manufacturing industry.

Challenges

Today's global automotive leaders are increasingly challenged by a combination of global developments & trends, including: demographic change, urbanization, climate change, digitalization, socio-economic trends, and disrupted global supply and value chains – and further impacted by imminent risks such as pandemics, natural disasters, geopolitics, migration, and regulatory changes and requirements. Many transport systems around the globe are further reaching their limitations as we are increasingly facing transport infrastructure challenges (age, quality, cost, scarcity of space) due global trends such as urbanization.

Germany remains a highly sophisticated, competitive and in many sectors also saturated market with many local manufacturers and suppliers as world leaders in their respective sectors. New-to-market (NTM) companies must compete with locally established and globally operating competitors in terms of quality, price, and availability. Regulatory compliance with EU and national directives as well as industry norms are mandatory. Brand recognition and a local presence are often a requirement for a successful market entry for NTM companies and investments in marketing, business development, and partner development should be considered.

2021 In-Person or Virtual Events

Upcoming Events (Mobility)

IAA Mobility 2021, September 7-12, 2021, Munich: <https://www.iaa.de>

IAA changed its concept from a traditional automotive trade show and aims to become one of the leading international platform for future mobility. IAA Mobility 2021 will exhibit automobiles as well as the entire mobility chain, from physical products to new digital worlds. It will feature start-ups and established groups and combine intelligent transport solutions with visionary thinking.

ITS World Congress Hamburg, October 11-15, 2021, Hamburg: <https://itsworldcongress.com/>

ITS World Congress & exhibition is the world's largest and most prominent event focused on smart mobility and the digitalisation of transportation.

Hypermotion (alongside Automechanika Frankfurt), September 14-16, 2021, Frankfurt:

<https://hypermotion-frankfurt.messefrankfurt.com/frankfurt/en.html>:

Digitalization, disruption and decarbonisation are megatrends that are the focal point of Hypermotion. Hypermotion is designed as an independent platform to address the digital transformation of transport, mobility and logistics. In 2021, Hypermotion will be held alongside Automechanika Frankfurt, the leading international trade fair for the automotive aftermarket.

InnoTrans, September 20-23, 2021, Berlin: <https://www.innotrans.com>

InnoTrans is a leading trade fair for (rail) transport technology. InnoTrans takes places every two years in Berlin and is sub-divided into the five trade fair segments: Railway Technology, Railway Infrastructure, Public Transport, Interiors and Tunnel Construction.

PARKEN, June 23-24, 2021, Wiesbaden: <https://parken.mesago.com>

PARKEN is Germany's only exhibition held in tandem with a conference that covers the entire spectrum of the parking industry. The exhibition covers the entire spectrum of the parking industry, from car park refurbishment and cashless payment systems to smart mobility apps. Patron of the event is the German Parking Association.

Upcoming Events (Robotics & Automation)

automatica sprint, June 22-24, 2021, Munich: <https://automatica-munich.com/en/>

The automatica is the largest international trade fair for robotics and automation including the International Symposium on Robotics (ISR). This year former automatica has changed to automatica sprint – an agile and compact event format that will go live in June 2021.

Hannover Fair/Industrial Automation, April 12-16, 2021, Hannover:

<https://www.hannovermesse.de/en/>

For the first time a virtual trade fair. Industrial Automation is part of the Hannover Messe and the international trade fair for process automation, production automation, integrated industrial and building automation systems. Together with other simultaneously ongoing trade fairs the Hannover Fair is the largest horizontal trade fair in the world.

Motek, August 5-8, 2021, Stuttgart: <https://www.motek-messe.de/en>

The international trade fair Motek is the world's leading event in the fields of production and assembly automation, feed technology and material flow, streamlining through handling technology, and industrial handling

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G R E E C E

Summary

Greece introduced e-mobility legislation in July 2020. The new law offers tax breaks, subsidies and other incentives while also setting the framework for installing charging stations. Together with a progressive pro-environment campaign related to renewable energy, energy conservation, recycling and combatting climate change, the current government has made digitization and modernization of the economy a priority. The mayor of Athens, Greece's largest city known for its traffic congestion, has acted over the past year to implement ecologically friendly and smart transport solutions. Greece has a well-educated and talented workforce that has been attracting much attention due to the growth of innovation and technology hubs in Athens and Thessaloniki.

Market Entry

Following on the success of the United States as the Honored Country at the 2018 Thessaloniki International Fair, American companies are viewed favorably in Greece for entrepreneurship, innovation, and advanced technology. U.S. companies have had success finding opportunities to invest and partner with Greek companies in R&D, battery storage, e-vehicle charging networks and traffic management software. Under the leadership of current Prime Minister Kyriakos Mitsotakis and other U.S. educated technocrats, Greece is encouraging a transformation of the economy to promote innovation.

Exporters of vehicles, OEM parts & components, EV chargers, as well as aftermarket products & accessories should be aware that Greece is part of the European Union and subject to EU standards and regulations. While a pan-European business strategy is critical, individual market entry plans must be developed on a country-by-country and industry-by-industry basis. In principal, approval granted for vehicles or vehicle parts in one EU member state should be accepted by all member states across the EU. However, individual member states may enforce more stringent or additional regulatory requirements for certain product groups and/or applications.

In addition to compliance with the legal requirements of an EU member state as well as relevant EC and UNECE directives and regulations, U.S. exporters of automotive parts are advised to obtain evidence of compliance with relevant technical norms and standards.

Capital: Athens
Population: 10.6 million (2020)
GDP: US\$43.03 billion
Currency: Euro
Language: Greek

Current Market Trends & Demands

Greece passed e-mobility legislation in 2020. The new law offers tax breaks, subsidies and other incentives while encouraging the installation of charging stations. Government targets aim for 15% of all new vehicle registration by 2025 and 30% by 2030 being electric. The push for vehicle fleets, rental cars and taxis to migrate to electric vehicles may present new opportunities in this sector.

The Information and Communications Technology sector is the driving force behind the undergoing digital transformation that the Government of Greece has initiated in order to reduce bureaucracy, simplify procedures, and help the country converge with the [EU average Digital Economy and Society Index \(DESI\)](#). This effort has been accelerated during the pandemic and has become an immediate priority for the [Ministry of Digital Governance](#), as the demand for automation and digitalization in both the public and private sectors has increased.

The continuing development of fast internet in Greece will contribute to the increased demand for digital services that has already triggered a significant growth of technology clusters, incubators and accelerators that will enhance the competitiveness of the country and support employment.

As Greece is committed in reducing its CO₂ emissions and achieve a smooth transition towards climate neutral economy by 2050, Greece announced its new National Plan for E-mobility in June 2020. This new initiative for cleaner mobility is in line with the EU Green Deal growth strategy and part of a ten-year climate protection plan. The goal is for 1 in 3 vehicles to be electric by 2030.

For the promotion of e-mobility in Greece, the National Plan has 3 main pillars:

1. a series of economic and other incentives, subsidizing the e-vehicle acquisition by 100 million euros for 18 months (e-taxis, e-scooters, e-bicycles included); Buyers of electric cars and light commercial vehicles will get 15% of the purchase price while the state will provide 25% for electric taxis.
2. regulation of the market of EV charging services and operation of charging infrastructures. Every new building should have the infrastructure to charge electric vehicles. Together with tax breaks, and other subsidies offered by the Greek government, electric vehicles are to become up to EUR 10,000 cheaper. Electric cars will also be exempt from parking fees for two years. The e-mobility measures are part of a ten-year climate protection plan, and
3. incentives for the installation of new e-mobility production units in decarbonization areas.

Additionally, in September 2020, the Greek Government announced a Special Development Program for Greek Municipalities that includes the following Mobility objectives

- Intelligent traffic and public transportation management systems/applications.
- Integration of mild transportation resources, new technologies to inform citizens about public transportation.
- Applications/actions of “sharing mobility”, and
- Electric vehicles for all municipal vehicles and the respective EV chargers.

According to data published by [ACEA](#), the share of battery-electric vehicles in Greece’s new-car market in 2019 was just 0.2%, compared to an EU-wide share of 1.9%. Thus, the Greek government aggressively promotes its e-Mobility program covering electric cars, motorcycles and bicycles, and on 24 August 2020 launched an online platform where subsidies were offered and provided incentives for purchasing battery-electric vehicles. As per the press release from the Ministry of Energy, the number of applications within the first 15 days covered 10% of the allocated funds.

As the National plan provides for the establishment of charging stations throughout the country, Greece's main energy supplier, Public Power Corporation (PPC), announced its plan to install 1,000 charging stations throughout Greece in the next two to three years, and in the medium term another 10,000 charging stations. Apart from PPC, other European companies have begun to offer charging stations and/or networks, i.e., the multi-national ABB, the German firms Efasec (subsidiary of Siemens), Geyer, Wallbox, the Norwegian EV Box, and the US firm Blink Charging. Blink Charging formed a joint venture with the Greek firm Eunice Group

Finally, Greek Prime Minister Mitsotakis announced Astypalea island is to become a pioneer in a model project to run exclusively with electric vehicles.

Best Prospects for U.S. Exports / Opportunities

Intelligent Transportation Systems (ITS) Opportunities

- 5G Technologies
- Connected and Automated Technology
- Cybersecurity
- Internet of Things (IoT)
- Transit Technology & Sensors

Automotive Technology Opportunities

- Autonomous Vehicles
- Diagnostics & Testing
- Electric Vehicles
- Hybrid / Electric / Alternative Fuel
- Vehicle Technology
- E-mobility charging programs/platforms
- EV chargers and maintenance services

Resources

Country Economy: <https://countryeconomy.com/gdp/greece>

ACEA – European Automobile Manufacturers Association: <http://www.acea.be/>

Greek Ministry of Energy and Environment: <https://ypen.gov.gr/>

Developments in Greece's e-Mobility Market:

<https://www.wfw.com/articles/recent-developments-in-greeces-e-mobility-market/>

Devops Competences for Smart Cities: <https://devops.uth.gr/dev/antonis-tritsis-programme/>

Association of Information Technology and Communications Companies in Greece (SEPE)
<http://www.sepe.gr/>

EU average Digital Economy and Society Index (DESI).
<https://ec.europa.eu/digital-single-market/en/scoreboard/greece>

Ministry of Digital Governance <https://mindigital.gr/>

NSRF 2021-2027 <https://www.espa.gr/en/pages/default.aspx>

"ESPA" 2014-2020 <https://www.espa.gr/en/pages/default.aspx>


European Union Agency for Cybersecurity ('ENISA') <https://www.enisa.europa.eu/>

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Capital: Budapest
Population: 9.66 million (2020)
GDP: US\$161 billion
Currency: Forint (HUF)
Language: Hungarian

HUNGARY

Summary

In 2020 three million fewer cars were sold in the European Union when compared to 2019, a decrease 23.7%. A total of 9 942 509 new cars were placed on the market in the European Union in 2020 and 13 028 948 in 2019. A decrease was recorded in all 27 Member States. Sales fell by 27.9 percent in Italy, 25.5 percent in France and 19.1 percent in Germany. In line with the overall trend, the number of new cars sold in Hungary in 2020 decreased by 18.9 percent.

According to forecasts, Hungary's car industry will hit pre-COVID 19 production levels in 2023. Analyst averages show a declining trend from month to month, and economic forecasts are based on a health forecast, which also includes a sense of optimism. According to initial forecasts, production was expected to drop by 28% by the end of 2020 (i.e. that is before adjusting for pandemic conditions).

Innovations and changes such as the CO2 standard, as well as alternative propulsion, self-driving, industry 4.0, digitalization and automation, are all revolutionizing the industry. In an effort to protect workers and to adjust to pandemic challenges, there have been many changes in the supply chain. Looking at the macro-processes, Hungary is focusing on restarting.

A global recession is expected, with the eurozone shrinking by 7%, according to median forecasts, it is anticipated that Hungary will be unable to avoid the crisis. According to central bank forecasts, a 4.1% decline in GDP is expected, and a less optimistic forecast could lead to a decline of almost 7%.

Market Entry

Entering the Hungarian market, U.S. companies need to use distribution, franchising and/or agency arrangements to guarantee procedures are in line with the laws of Hungary (and the European Union).

Market Trends & Demands

Steel

Commodity market in the steel market is dominated by China, of which the automotive sector is one of the largest steel consumers, but the epidemic also affected steel production (further exacerbated by the US-China steel market conflict).

Aluminum

Aluminum production is also dominated by China, which led to an oversupply in the market even before the epidemic. As a result, market consolidation is anticipated, and demand is expected to fall by 6%.

Plastic

The role of plastic has been increased over the years. As an example, a car now contains five times as much plastic as it did in the 1970s. Recent analyzes show a decline in demand, which is linked to a decline in car purchases. At the same time, production of medical equipment has increased due to the pandemic.

E-Mobility

E-mobility vehicles usage showed a 68% growth in 2019, with 672 registered electric charging stations in Hungary.

Electromobility

Although there are still some uncertainties and shortages in new regulations, overall, the new regulation follows more closely actual European and domestic market developments.



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ITALY

Summary

The automotive sector is one of Italy's major industries. According to July 2020 data, there were more than 5,500 companies operating in the sector, employing over 274,000 people, more than 7% of the Italian manufacturing workforce. In 2019, turnover was almost 106 billion euro (about \$128 billion), which represents 11% of Italy's manufacturing turnover and 6.2% of Italy's GDP.

In 2019, the number of cars produced reached a total of 542,000 units (19.5% less than in 2018). Italy also had a sizable production of light commercial vehicles (312,000 units in 2019, 4% less than in 2018). The total (cars + light commercial vehicles) was 854,000 units. The production of trucks was about 60,000 units both in 2019 and 2018. The production of buses was in the last year almost negligible (about 500 units). Vehicle production in 2020 fell sharply in the first months of the year and grew in the final months. Provisional data highlight about 720,000 vehicles (cars + light commercial vehicles) produced in 2020.

https://www.repubblica.it/economia/2021/01/05/news/la_produzione_di_auto_in_italia_e_scesa_del_12_4_nel_2020-281229491/

The Italian auto components sector had a turnover of 49.2 billion euro (about \$59 billion) in 2019, 4% less than in 2018. There were about 2,200 companies in the sector, which employed over 160,000 workers. Piedmont is the heart of the Italian automotive industry (companies in this area account for about 40% of national production).

The current production evolution from thermal engines to electromobility (hybrid and electric) is reshaping the sector and may offer opportunities to U.S. manufacturers of vehicle components, charging infrastructures and diagnostic equipment for maintaining new hybrid and electric vehicles. There are also opportunities for car tuning, but Italian regulations are stricter than European ones, especially as concerns mechanical alterations to vehicles. Most alterations need to be approved by the car manufacturer and highlighted in the documentation that travels with the vehicle.

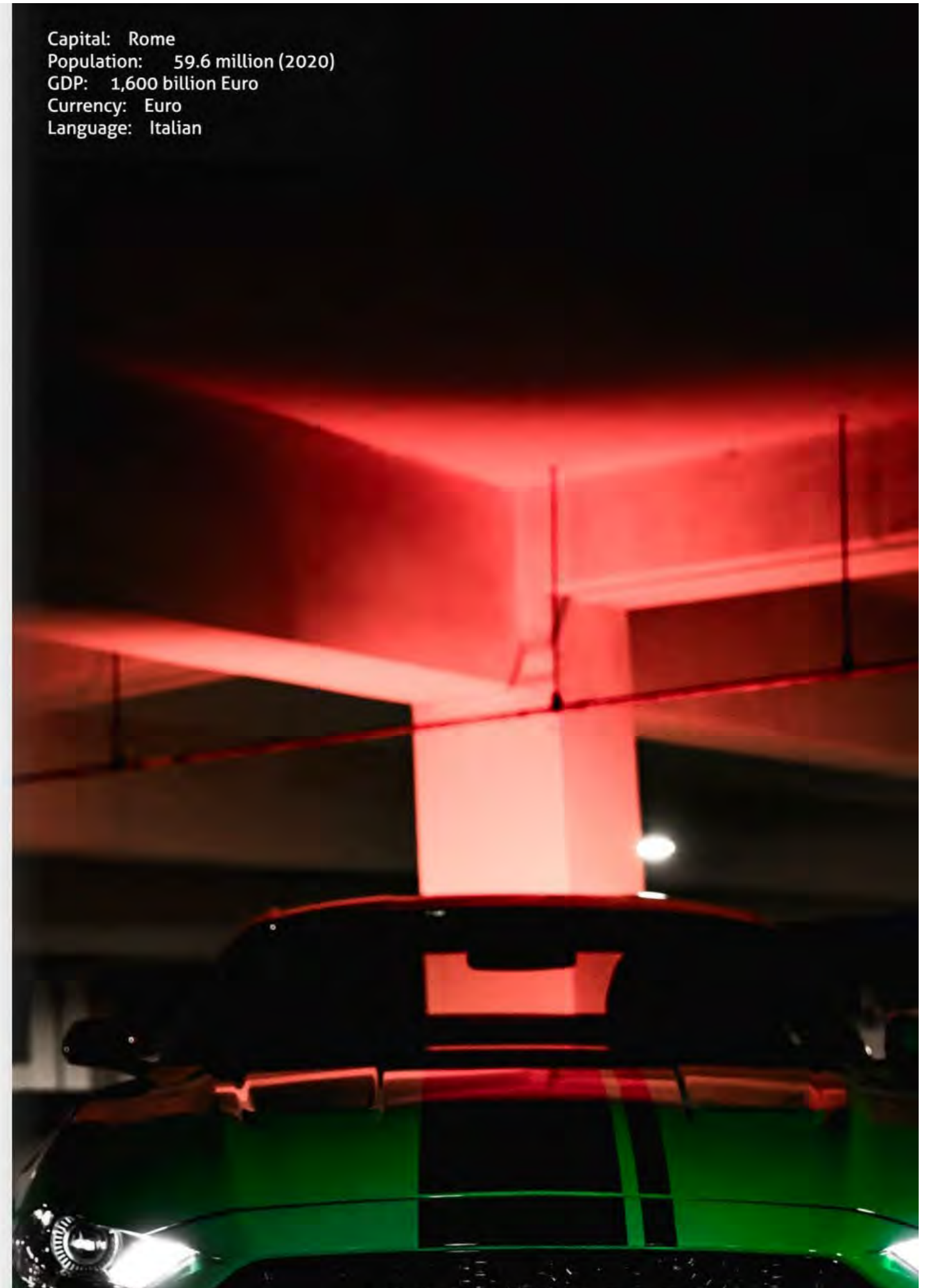
The Italian Market

In 2020 new vehicle registrations in Italy were 1,381,496, compared to 1,916,949 in 2019, a reduction of 28%. Market leaders included:

Leading Brands:

- o Fiat Chrysler Automobiles (FCA) Group: 332,983 units in 2020, i.e. 24.1% of total registrations (454,684, i.e. 23.72%, in 2019)

Capital: Rome
Population: 59.6 million (2020)
GDP: 1,600 billion Euro
Currency: Euro
Language: Italian



- o Volkswagen Group: 225,052 units in 2020, i.e. 16.29% of total (295,096, i.e. 15.39%, in 2019)
- o Peugeot SA (PSA) Group: 204,502 units in 2020, i.e. 14.8% of total (297,572, i.e. 15.52%, in 2019).

U.S. Brands:

- o Ford Motor Company sold 89,558 units in 2020, i.e. 6.48% of total (122,567, i.e. 6.39%, in 2019)
- o Tesla sold 3,804 units in 2020, i.e. 0.28% of total (2,453, i.e. 0.13%, in 2019)
- o Chevrolet sold only 6 vehicles in 2020 (38 in 2019).

<https://www.ilsole24ore.com/art/il-2020-dell-auto-si-chiude-volumi-calo-279percento-nell-anno-covid-ADOx5YBB>

The market for used vehicles is very important in Italy. In 2020 it also shrank by 28% to slightly more than 3 million used vehicles sold,

https://www.anfia.it/data/portale-anfia/comunicazione_eventi/comunicati_stampa/2021/Nota_stamp_a_ANFIA_Struttura_mercato_Vetture_Italia_DIC_2020.pdf

The Birth of Stellantis

In January 2021, Fiat Chrysler Automobiles (FCA) and Peugeot SA (PSA) sealed their long-awaited merger to create Stellantis, the world's fourth-largest automotive group with an intention to shift to electric vehicles and to take on larger rivals such as Toyota, Volkswagen, and Renault-Nissan. The Stellantis Group currently owns 14 brands: Abarth, Alfa Romeo, Fiat, Jeep, Lancia, Maserati, Chrysler, Citroen, Dodge, DS, Fiat, Jeep, Lancia, Maserati, Opel, Peugeot, Ram and Vauxhall. Some of these brands, such as Alfa Romeo, Lancia and Vauxhall, are found in smaller regional markets. For example, Alfa Romeo and Lancia are mainly sold in Italy or nearby countries, while Vauxhall is sold in the UK and some other countries with a left-hand drive. Not all these brands are expected to survive in the medium-long term if keeping them proves to be extremely costly. Altogether, FCA and PSA sold in Italy 537,485 units in 2020, i.e. 38.9% of total (752,253, i.e. 39.24%, in 2019), a significant portion of the local market.

Stellantis is expected to cut annual costs by over 5 billion euros (about \$6.05 billion) without plant closures. Like all global automakers, Stellantis needs to invest billions in the years ahead to transform its vehicle range for the electric era. Other pressing tasks loom, including reviving the group's lagging fortunes in China, rationalizing its huge global footprint and addressing massive overcapacity.

FCA CEO Mike Manley - who will head Stellantis' key North American operations - said 40% of the carmaker's expected synergies would come from convergence of platforms and powertrains and from optimizing R&D investments, 35% will come from savings on purchases, and another 7% from savings on sales operations and general expenses.

<https://www.reuters.com/article/us-stellantis-deal/after-long-journey-fiat-chrysler-and-psa-seal-merger-to-become-stellantis-idUSKBN29L001>. Most component manufacturers located in the Piedmont region are positively disposed towards the agreement between FCA and PSA.

Market Break-Down by Type of Fuel

Car fuel use in the Italian market:

1. Gasoline vehicle sales were 522,694 units, i.e. 37.8% of the total, in 2020 (852,799, i.e. 44.5% of the total, in 2019). In December 2020 their share of the market shrank to 33.4%.
2. Diesel vehicle sales were 452,061, i.e. 32.7% of the total, in 2020 (763,100, i.e. 39.8%, in 2019). In December 2020 their share of the market shrank to 25.1%.
3. Alternative fuels vehicle sales were 406,866, i.e. 29.4% of the total, in 2020 (301,216, i.e. 15.7%, in 2019). In December 2020 their share of the market increased to 41.4%.

In particular:

LPG vehicle sales were 93,464, i.e. 6.8% of the total, in 2020 (135,495, i.e. 7.1%, in 2019). In December 2020 their share of the market shrank to 6%.

Methane vehicle sales were 31,615 i.e. 2.3% of the total, in 2020 (38,622, i.e. 2%, in 2019). In December 2020 their share of the market increased to 2.5%.

Hydrogen vehicle sales were just 2 units in 2020 (17 in 2019).

Electric vehicle sales were 32,485, i.e. 2.4% of the total, in 2020 (10,668, i.e. 0.6%, in 2019). In December 2020 their share of the market increased to 2.5%. Tesla sales in Italy were 3,804 units in 2020, i.e. 0.28% of the market, up from 2,453 units, i.e. 0.13%, in 2019). In short, Tesla sales increased by 55% in one year. Besides 20 Tesla Superchargers available in Italy, drivers can charge their vehicles at hundreds of so-called 'destination charging' locations at shopping malls, hotels, restaurants, etc.

Hybrid vehicle sales were 249,300, i.e. 18% of the total, in 2020 (116,414, i.e. 6.1%, in 2019). In December 2020 their share of the market increased to 26.8%. In detail:

- gasoline-electric hybrid vehicle sales were 191,906, i.e. 13.9% of the total, in 2020 (90,789, i.e. 4.7%, in 2019). In December 2020 their share of the market increased to 19.2%.
- diesel-electric hybrid vehicle sales were 29,987, i.e. 2.2% of the total, in 2020 (19,140, i.e. 1% in 2019). In December 2020 their share of the market shrank to 2.3%.
- plug-in hybrid vehicle sales were 27,407, i.e. 2% of the total, in 2020 (6,484, i.e. 0.3% in 2019). In December 2020 their share of the market increased to 5.3%.

<https://www.anfia.it/it/component/jdownloads/send/2-mercato-autovetture/237-122020-italia-focus-mercato-auto> and

http://www.unrae.it/files/01%20Analisi%20UNRAE%20struttura%20del%20mercato_Dicembre%202020_5ff34fe7bdd21.pdf

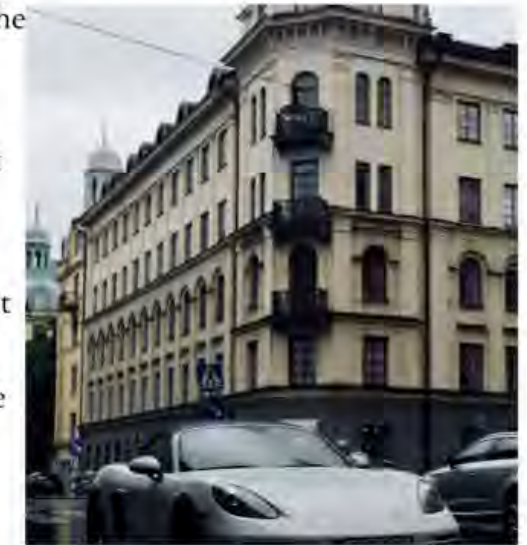
If the sale of hybrid and electric vehicles continues to increase, it is expected that the market share of these vehicles will grow well over 30% in the next years.

Incentives and limitations to accessing city centers (e.g. ban on old diesel vehicles) have helped promote the popularity of hybrid and electric vehicle sales. Recently, the Covid pandemic created a need for 'emergency' use of individual vehicles (often older vehicles) in order to reduce the use of public transportation. Therefore, for the time being, Italy is allowing older vehicles to continue to circulate to ensure social distancing among commuters.

National laws in summer 2020 and December 2020 supported through an incentives program the scrapping of 10+years old vehicles and replacement with new vehicles with low CO₂ emissions. This is valid for both cars and light commercial vehicles. These measures are expected to increase sustainable mobility, the automotive market, and local production. The December 2020 legislation provided new car sales incentives until June 2021 worth 420 million euros (about \$508 million) and light commercial vehicle sales with 70 million euros (about \$85 million). Incentives vary according to the polluting footprint of the new vehicle. They can be worth up to 10,000 euros (or \$12,100) for a vehicle emitting less than 60 g/km CO₂. Scrapping old vehicles is clearly positive as it reduces the pollution footprint and increases the safety of the circulating automotive stock. On average Italy's stock is more than ten years old.

Rechargeable vehicles are obviously still a very small share of the total market (about 60,000 units in 2020).

Incentives to buy electrified vehicles are not enough to support this change in mobility: a suitable charging infrastructure is needed to allow people to charge their vehicles quickly and safely. Recent data (August 2020) estimates that there are about 16,000 public and private, but publicly accessible, charging stations in Italy - there are private charging stations that can be accessed also by public users - for example inside shopping malls. Their distribution is uneven throughout the different areas of the country. Public and private but publicly accessible charging stations are mostly AC (91%); only 9% of them are DC. This is probably because AC charging, while slower, is by far cheaper than DC charging.



Charging stations are mostly located in cities (60-70%), installed along streets or in public parking lots. The others are located at commercial locations such as hotels, restaurants, shopping areas, car dealerships, etc., while 5% of them are in non-urban areas. There are still few ultra-fast charging stations. Private charging stations are mostly residential (about 70%), while the other 30% are in companies' private areas. There are fiscal incentives specifically targeted to residential vehicle charging, https://www.energystrategy.it/assets/files/SMR_20_webdef29_10.pdf.

Major initiatives exist at the local level. For example, the Milan municipality is mandating that all fuel service stations operating in its metro area have at least one charging station for electric vehicles beginning in 2023,

https://www.ansa.it/canale_motori/notizie/eco_mobilita/2020/11/20/milano-dal-2023-ricarica-elettrica-in-tutti-i-distributori_42f997d4-551d-4426-ab65-bb92eac73459.html

The development of electrified models is resulting in changes in the investments of component manufacturers. A recent survey by Anfia, the Italian Association of the Automotive Industry (which has 350 associates), discovered that almost 30% of component manufacturers had electric and/or hybrid vehicles as their main production focus,

https://www.ansa.it/canale_motori/notizie/industria/2020/11/24/auto-295-impresecomponentistica-investe-nellelettrico_67ea3949-5854-4c7d-8e95-342f00826b18.html.

Market Entry

The most effective way to enter the Italian market is to partner with a local company that can act as a local representative as well as provide insights about the local market environment and trends. Exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products & accessories to the European Union and its member states must undergo a thorough assessment of, and ensure compliance with, existing European Commission Directives, i.e. regulatory requirements regarding technical specifications, product safety, as well as environmental impact & requirements.

European Community Whole Vehicle Type Approval (ECWVTA) is the process used to ensure that motor vehicles intended to be placed on the market for consumers meet relevant environmental, safety and security standards.

Type approval is imperative, given the large body of requirements that motor vehicles are subject to. During the process sample motor vehicles, which are taken to be representative of a 'type', are physically tested to check their conformity with these standards, hence the name.

These vehicle regulations are set by European Union law, and in many cases refer to Regulations developed by the United Nations Economic Commission for Europe (UN-ECE) Working Party 29, under the '1958 Agreement'. These regulations and directives cover virtually all aspects of vehicle design for most types of self-propelled road-based vehicles, as well as trailers. This includes requirements for vehicle systems such as braking, lighting, crash performance, and of tail/non tailpipe and noise emissions. Type approval tests are carried out under the control of the type approval authority or an authorized technical service.

To ensure a consistent approach, the methodology is outlined in EU Directive 2007/46/EC, also known as the 'Framework Directive on the type-approval of motor vehicles. The Directive outlines and classifies the various applicable vehicle types and defines the relationship between EU Directives and UN-ECE Regulations.

Component & System Type Approvals

A 'whole vehicle' is made up of large numbers of components and systems, each of which must conform to corresponding requirements. Vehicle manufacturers and suppliers of relevant parts to automobile manufacturers must ensure that their products meet those requirements.

Type approval makes a distinction between 'components' for vehicles - such as lighting components, glazing, rear view mirrors, etc. - and 'systems' for vehicles, which determine compliance of many components together, such as for braking, steering, crash performance and emissions.

Whole Vehicle Type Approval (WVTA)

Once all components and systems have been approved, a manufacturer can request approval of the Whole Vehicle Type. Upon submission of the relevant manufacturer's information document, including reference to the separate type approvals of all systems and components, a European WVTA Certificate will be issued by a type approval authority. The manufacturer shall produce a Certificate of Conformity (CoC) for each vehicle manufactured in conformity with an approved type. A 'type' can best be described as a 'range' of vehicle models that share fundamental characteristics.

The type approval system also allows for a multi-stage approval procedure that applies when the vehicle is built up in more than one step (e.g. by a chassis manufacturer and a body builder).

The European WVTA certificate of a vehicle type issued by the approval authority of one-member state must be accepted by all other European member states and allows for the registration of a new

Conformity of Production

Conformity of Production (CoP) is a vital part of the approval process. The manufacturer must bring evidence of its capacity to maintain compliance with the approved type for each new vehicle manufactured during serial production. This ensures that quality standards are upheld when the vehicle is being produced in large numbers.

A type approval authority or an authorized technical service conducts the necessary tests and authors a test report. It can use the manufacturer's test facilities if it is satisfied that the equipment and processes applied meet the necessary quality standards. Finally, the approval authority issues a European WVTA approval certificate. The manufacturer is then responsible for ensuring ongoing Conformity of Production (CoP). By issuing and signing the Certificate of Conformity (CoC) the manufacturer takes full responsibility that all separate regulatory acts are met.

<https://www.acea.be/industry-topics/tag/category/type-approval>. The mandatory European legal requirements and certification process can be challenging for U.S. vehicles and parts when exporting to Italy. The Italian regulations on car tuning are more restrictive than the European ones, especially as concerns the mechanical alterations to the vehicle. Most alterations need to be approved by the car manufacturer and highlighted in the documentation that travels with the vehicle. Esthetic alterations are easier but, in many cases, the products used (e.g. to screen the windows, etc.) need to be homologated. There are no customs duties on imports from European Union (EU) countries. The VAT in Italy is 22 percent. The VAT is applied to all imports, including European and local suppliers. https://www.quattroruote.it/news/curiosita/2019/05/09/personalizzazioni_tuning_tutto_quello_che_c_e_da_sapere_sulle_modifiche_alle_auto.html.

Motorcycles

The two and three-wheelers sector in Italy produces 300,000 units and is the leader at the European level. Italy is one of the most important European markets for motorcycles. Unlike in other sectors, 2020 was not a bad year for motorcycles sales in Italy with 218,626 vehicles sold, a reduction of 5.76% over 2019. The need for individual mobility, also determined by the pandemic, and the lower purchase and operating costs when compared to cars, helped avoid a sharp reduction in this market.

In 2020, sales of electric motorbikes exceeded 10,000 units (an increase of over 84% on 2019.) National level incentives will be in place until 2026 (a total of 150 million euros, about \$181 million), http://www.ancma.it/media/2269/comunicato-stampa_mercato_elettrico_20.pdf.

Aftermarket Accessories

Distribution channels in the market for automotive accessories and specialty equipment in Italy still largely consist of small importers. Acceptance of U.S. products and new technology in Italy is quite high and well received by local companies. Products with cutting-edge technology can be placed into the Italian market. As a rule, Italians are ready to take into consideration new products and pay extra money for something that is, or seems to be, new and innovative.

The evolution of the aftermarket sector in Italy will probably be driven by major changes in the circulating stock. Some experts believe that the different features of hybrid (and especially electric) vehicles will impact the sector and need for quality diagnostic and testing tools.

2021 In-Person Shows

Event Name: Motor Bike Expo

Date: April 2-5, 2021

Website: <https://www.motorbikeexpo.it/en/>

Sector: Motorcycles

Event Name: EICMA Cycles and Motorcycles Show

Date: November 23-28, 2021

Website: <https://www.eicma.it/en/>

Sector: Bicycles and motorcycles

Event Name: Autopromotec

Date: May 25-28, 2022

Website: <https://www.autopromotec.com/en/>

Sector: Automotive aftermarket

Best Prospects for U.S. Exports / Opportunities



Automotive Technology Opportunities

- o EV software systems, including charging station software
- o EV battery technologies
- o EVs
- o Electric Vehicles
- o Electric Bicycles
- o Electric Scooters
- o Hybrid / Electric / Alternative Fuel
- o Vehicle Technology
- o Vehicle-to-Infrastructure (V2I) Communication
- o Vehicle-to-Pedestrian (V2P) Communication
- o Vehicle-to-Vehicle (V2V) Communication
- o Diagnostics & Testing

Resources

ACI, <http://www.aci.it/>

ANCMA, <http://www.ancma.it/>

ANFIA, <https://www.anfia.it/en/>

AUTOPROMOTEC, <https://www.autopromotec.com/en/>

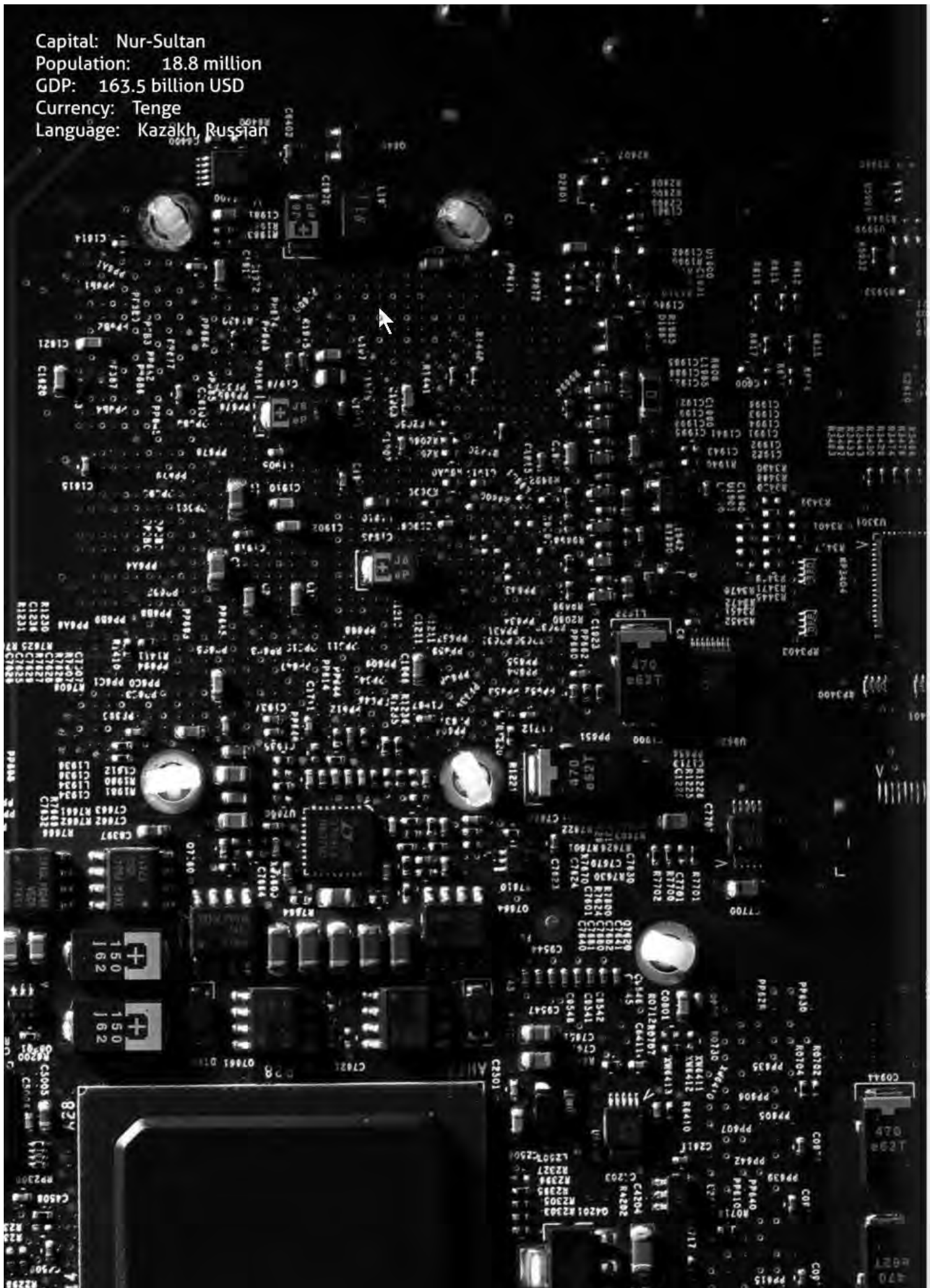
ENERGY STRATEGY REPORT,

https://www.energystrategy.it/assets/files/SMR_20_webdef29_10.pdf

For Information about exporting to Hungary contact:

Andrea Rosa
American Consulate, Milan, Italy
Automotive Commercial Specialist
Andrea.Rosa@trade.gov

Capital: Nur-Sultan
Population: 18.8 million
GDP: 163.5 billion USD
Currency: Tenge
Language: Kazakh, Russian



KAZAKHSTAN

Summary

Kazakhstan is the second-largest republic of the former Soviet Union, after Russia, and the ninth-largest country in the world in territory. The country has an abundance of natural resources - including oil, gas, coal, uranium and other mineral deposits - and has exploited these resources to build Central Asia's leading economy. The country is emerging as a major transport and logistics hub in the region, linking the large and fast-growing markets of China and South Asia to those of Russia and Western Europe by road, rail and a port on the Caspian Sea. Kazakhstan presents a trade gateway to a market of about 150 million consumers in Caspian Sea countries, 50 million in Central Asia, and 300 million in Western China.

Kazakhstan's transport infrastructure is inadequate and urban transit is increasingly dominated by automobiles. The Economist Intelligent Unit estimates that the number of cars on the road reached nearly 5 million in 2019 and forecast that it will surpass 6 million by 2025. The car ownership rate, estimated at 279 vehicles per 1,000 people in 2020, is fairly high compared with other post-Soviet republics, and is comparable to the rate of car penetration in Russia. It is expected to reach 322 per 1,000 people by 2025, reflecting growing sales, a low scrappage rate and slowing population growth.

The Kazakhstan automotive sector is small but growing. Despite economic fallout from the COVID-19 pandemic, in 2020 car sales in Kazakhstan increased 25.8 percent over the same time last year. Dealers sold 79,374 cars totaling \$1.7 billion. Of those, 71.6 percent were cars produced or assembled in Kazakhstan. Last year Kazakhstanis bought 80,800 new cars, including 22,527 imported vehicles and 56,867 locally produced vehicles. The government will continue to stimulate domestic vehicle assembly and production, which will expand rapidly from a low base. The Association of Kazakhstan Auto Business reported a 53.2% jump in domestic vehicle production in January-October 2020, to nearly 60,000 units.

Market Entry

A growing middle class and a rise in real incomes have increased demand for quality products in Kazakhstan. Inexpensive Russian and Chinese goods flow readily across Kazakhstan's borders, but Western goods and expertise are also in demand. In some cases, consumers are willing to pay more for imported goods and services that offer higher quality and innovation. Customer service in Kazakhstan lags; providing customers with after-sales service could give companies advantage in the market. Most exporters into Kazakhstan find using local distributors or product representatives an easy first step for entering the market. It is not uncommon to partner with a firm that is involved

in several unrelated sectors. Companies are advised to be cautious of exclusive distribution agreements with local partners. Keep in mind that Kazakhstan has a small population spread over a large landmass, and your distribution channels should be able to represent your needs countrywide. U.S. firms with experience doing business in Eastern Europe, the Caucasus, Russia or Ukraine will be well positioned for success in Kazakhstan.

Current Market Trends & Demands

Intelligent Transportation Systems: With around 4 million residents and 2 million vehicles on the streets daily, road congestion has frustrated commuters and threatened economic growth in Kazakhstan's largest cities (Almaty, Shymkent, Nur-Sultan). In 2018 the government launched Digital Kazakhstan, a five-year program focused on digitization of energy, transportation, agriculture, e-commerce, and smart city infrastructure as well as development of high speed and secure communication networks and IT infrastructure across the country. Development of an Intelligent Transport System envisioned under the program includes components for automating road toll collection, developing points for non-stop dynamic weighing of vehicles along road transport corridors, and traffic control systems among others.

Ridesharing Services: The ride sharing market in Kazakhstan is actively developing. Over the past few years rideshare service providers such as Yandex Taxi, Bolt, inDriver and others have entered the market. In addition to the growth of taxi aggregators, the promotion of mobile applications and development of related services has had a positive impact on the market. Traditional taxi service providers are on the decline in Kazakhstan due to the expansion of rideshare service providers. Thanks to the "uberization" of taxis in Kazakhstan, the market is expected to grow over the next few years, with total trips increasing by 13% and the average cost per ride by 12%. This growth will be driven by consumer demand and growing competition between service providers.

Robotics/Machine Intelligence: The Government of Kazakhstan has identified the development of artificial intelligence, Internet of Things (IoT) technologies and big data analysis as priorities in its bid to improve efficiency of key industries and diversify the economy. In partnership with the World Bank, the Institute of Smart Systems and Artificial Intelligence (AI) was established in 2019 at Nazarbayev University in Nur-Sultan to support creation of a national AI cluster to include a laboratory, a data processing research center and AI development science park. In 2020 as a part of the 50th annual World Economic Forum (WEF) meeting in Davos, the Kazakhstani government, the Astana International

Financial Centre and the WEF signed a letter of intent to establish a Fourth Industrial Revolution Affiliation Center aimed to help create the policy and regulatory framework to encourage innovations in areas of AI, machine learning, robotics, data policies, as well as IoT and Smart City development. Kazakhstani large companies are in the initial phase of introducing robotic technologies into manufacturing processes. According to available statistics, less than 2% of 130 thousand enterprises surveyed use robotics in production. In the regional context, Almaty is a leader where 62% of surveyed robotic enterprises are located and 16% in Nur-Sultan.

UAV Industry: Kazakhstan is the world's ninth largest country by landmass with 45% of its 18 million population living in rural areas. The current market for unmanned aerial vehicles (UAV) and associated services is characterized by experts as small but developing. Market participants are divided into three groups including companies engaged in assembly of UAVs, service companies providing monitoring and data collection, and distributors. The second group includes 10-15 small- and medium-sized companies that have purchased drones abroad and provide aerial surveillance and imaging services. In a separate category are large oil & gas and mineral resources companies that can afford the purchase of expensive drones, provide training of pilots and specialists for analyzing the data collected. Local experts predict that weakened revenue flows related to the COVID-19 pandemic could become a key driver for development of the UAV market as companies look to reduce human capital costs. The use of UAV in geodetic surveys, cadastral works, agricultural monitoring, transportation sector, protection and environmental monitoring of oil and gas transmission lines, monitoring of power lines and surveillance of state borders has strong potential for growth over the near term. As of June 2020, 277 UAVs were registered in Kazakhstan.

5G Technologies: According to the Ministry of Digital Development, Innovation & Aerospace Industry, the transition to 5G in Kazakhstan will be phased. A government procurement for a 5G integrated radio access network is expected to be launched in April, 2021. In 2022, residents of megacities are planned to switch to the new standard, then regional centers will come online by 2025. The development of cutting-edge technologies such as 5G, Smart City, IoT, OpenAPI and Big Data will be enabled by the rollout of 5G technologies. In support of 5G deployment in Kazakhstan, Transtelecom and Azertelecom companies are working on a project to lay a 400 km high-speed fiber-optic communication line at a speed of 4-6 terabits per second across the bottom of the Caspian Sea between Kazakhstan and Azerbaijan. The start of the project is scheduled for the spring of 2021 and is planned to be completed in 2022.

Best Prospects for U.S. Exports / Opportunities

Intelligent Transportation Systems (ITS) Opportunities

5G Technologies, Internet of Things (IoT), Cybersecurity

Connected and Automated Technology

Fleet Management Technology, Vehicle-to-Infrastructure (V2I) Communication

Transit Technology & Sensors

Robotics / Machine Intelligence

Artificial Intelligence, Robotics, Drones (UAV)

2021 In-Person or Virtual Events

TransLogistica Kazakhstan | Date: October 13-15, 2021

Website: <https://translogistica.kz/en/>

Sector: Transportation/Logistics, Fleet Management

Automechanika Astana | Date: April 15-17, 2021

Website: <http://automechanika.kz/en/>

Sector: Automotive, Mobility as a Service & Autonomous Driving

MachExpo | Date: May 19-21, 2011

Website: <https://www.machexpo.kz/en>

Sector: Machine Building, Industrial Automation, Robotics



Resources

Doing Business in Kazakhstan Guide: <https://www.trade.gov/kazakhstan-country-commercial-guide>

Research Institute of Transport and Communications: <https://niitk.kz/en/index.php>

Digital Kazakhstan Initiative: <https://digitalkz.kz/en/>

Kazakhstan Association of Automation and Robotics: <https://en.kaar.kz/about/>

Ministry of Industry & Infrastructure Development:

<https://www.gov.kz/memleket/entities/miid?lang=en>

The MOST Business Incubator: <http://most.com.kz/eng>

Institute of Smart Systems and Artificial Intelligence: <https://issai.nu.edu.kz/home/>

Astana International Financial Center (AIFC): <https://www.aifc.kz/>

Kazakhstan Automobile Industry Association: <https://akab.kz/>

The Union of Kazakhstan's Automotive Industry: <http://kazautoprom.kz/>

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Capital: Amsterdam
Population: 17.4 million (2020)
GDP (2019): \$909 billion
Currency: Euro
Language: Dutch

THE NETHERLANDS

Summary

The Netherlands had 11.7 million registered vehicles in 2020, an increase of 1.8 percent compared to 2019. The Dutch government enforces strict environmental policies and safety regulations and encourages the use of electric mobility. U.S. companies taking these measures into account will find opportunities on the Dutch market, which is receptive to U.S. products.

Market Entry

Exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products and accessories to the European Union and its member states must undergo a thorough assessment of, and ensure compliance with, existing European Commission Directives, i.e. regulatory requirements regarding technical specifications, product safety, as well as environmental impact & requirements. In principal, type-approval granted for vehicles or vehicle parts in one EU member state should be accepted by all member states across the EU. However, individual member states may enforce more stringent or additional regulatory requirements for certain product groups and/or applications.

In addition to compliance with the legal requirements of an EU member state as well as relevant EC and UNECE directives and regulations, U.S. exporters of automotive parts are advised to assess and obtain evidence of compliance with relevant technical norms and standards. A certified management system is required for access to new markets and customers in the Netherlands and Europe. One of the automotive industry's most widely used international standards for quality management is ISO/TS 16949 (under revision, transition to IATF 16949 is in progress), which defines the quality management system requirements for the design and development, production and, when relevant, installation and service of automotive-related products.

Products that sell well in the United States will generally have market potential in the Netherlands, providing pricing is competitive. The key to successfully enter the Dutch market is to work closely with a local partner. An experienced representative will be able to advise on adapting a product to local technical requirements and consumer preferences, logistics, and marketing. Due to the size, accessibility, and competitive nature of the Dutch market, local importers and distributors usually insist on an exclusive distributorship. Although the European Union is considered a single market, marketing strategies and consumer preferences vary greatly from country to country. As a member of the European Union, both EU and national legislation applies.

Current Market Trends

The market for electric and hybrid cars is experiencing a rapid increase in popularity. According to the Dutch Census Bureau, there were 402,000 electric and hybrid vehicles in the Netherlands at the start of 2020. This is an increase of 28 percent compared to the year before. As a result, the number of charging points grew by more than 93 percent from 32,875 in 2017 to more than 63,586 public and 169,000 private charging points in 2020. One out of 20 passenger vehicles is either electric or hybrid. One of the newest developments is autonomous driving. According to research conducted by KPMG, the Netherlands is the most suitable country in Europe for autonomous driving. Cars with completely autonomous driving systems are currently being tested on the Dutch roads. The Netherlands is one of the best testing grounds for these vehicles because it has a large charging network for electrical cars and the roads are well maintained.

Other driver assistance growth areas include: remote control parking, forward/reverse collision warning with autonomous brakes, lane departure warning, and blind-spot monitoring. Additional technologies in high demand include 360 degree cameras, keyless-go-systems, and automatic transmissions.

According to Roland Berger (2017), four megatrends have emerged in recent years that are poised to disrupt and significantly reshape the automotive industry: (1) Mobility (as-a-Service); (2) Automated driving; (3) Digitized culture; and (4) Electric vehicles. The disruptive potential of new technology, business models and market actors are putting significant pressure on the traditional auto industry to adapt and innovate. This is not only limited to the integration of new vehicle technology or digital services, but also requires innovation with regards to existing and new business models – e.g. shared mobility.

Current Market Demand

Electric mobility remains the largest growth market with opportunities in charging points and electric engines. Even though the fiscal stimulus offered by the Dutch government is reduced annually, the demand for electric cars continues to increase with a rise of 20.3 percent in market share from 2019 to 2020. Electric cars also benefit from a lower additional tax rate compared to cars with a combustion engine. The lower rate will be raised each year until 2026 when the additional tax rate is the same for all cars. Other eco friendly cars, including hybrids, no longer benefit from a lower additional tax.

Best Prospects for U.S. Exporters / Opportunities

- 1) Intelligent Transportation Systems (ITS) Opportunities
 - o 5G Technologies
 - o Cybersecurity
 - o Transit Technology & Sensors
 - o Vehicle-to-Everything (V2X) Communication
 - o Vehicle-to-Infrastructure (V2I) Communication
 - o Vehicle-to-Pedestrian (V2P) Communication
 - o Vehicle-to-Vehicle (V2V) Communication
- 2) Automotive Technology Opportunities
 - o Autonomous Vehicles
 - o Electric Vehicles
 - o Hybrid / Electric / Alternative Fuel
 - o Vehicle Technology
- 3) Robotics / Machine Intelligence
 - o Artificial Intelligence
 - o Robotics / Drones

In Person or Virtual Events

ReMaTec

June 14-16, 2022 | Amsterdam, the Netherlands | <https://www.rematec.com>

ReMaTec is an international trade show for the remanufacturing market. The trade show attracts specialists from the automotive and heavy-duty markets, and has a strong focus on innovation, education and development.



Resources

ACEA – European Automobile Manufacturers Association: <http://www.acea.be/>

CLEPA – European Association of Automotive Suppliers: <http://clepa.eu/>

European Commission – DG for Mobility & Transport: https://ec.europa.eu/transport/about-us_en

The EU Electric Cars Market Report

https://www.transportenvironment.org/sites/te/files/publications/2020_10_TE_Car_CO2_report_final.pdf

Report on the Automotive Aftermarket in the Netherlands

<https://www.marketresearch.com/MarketLine-v3883/Automotive-Aftermarket-Netherlands-12128971/>

IPR Law Firms

The Legal 500 maintain a list of top law firms in the Netherlands here:

<https://www.legal500.com/c/netherlands/intellectual-property-trade-marks-copyrights-and-design-rights/>

List of Dutch IPR firms: <https://www.hg.org/law-firms/intellectual-property/netherlands.html>

Logistics

Holland International Distribution Council (HIDC) is a private, non-profit, member-based organization providing free advisory and matchmaking services for supply chain operations in Europe. Their website also contains a lot of information about logistics in the Netherlands.

<https://hollandinternationaldistributioncouncil.com/en/>

Dutch Government article on Dutch smart logistics:

<https://investinholland.com/doing-business-here/business-operations/smart-logistics/>

Service Providers

The Netherlands has been a trading nation for over 400 years and has a wide range of service providers to assist with import and export. If you are looking for a specific type service provider, please reach out to the U.S. Foreign Commercial Service.

Accelerators, incubators, and investors

Techleap.nl - The Netherlands official Startup Envoy: <https://www.techleap.nl/tools>

List of Dutch accelerators: <https://www.crunchbase.com/hub/the-netherlands-accelerators>

List of Dutch incubators: <https://www.dutchincubator.nl/incubator/lijt-business-incubators/>

List of Dutch venture capital investors:

<https://www.crunchbase.com/hub/the-netherlands-venture-capital-investors>

Dutch Government

The Dutch Government has several programs to assist foreign companies in the Netherlands :

<https://business.gov.nl>. The Netherlands Foreign Investment Agency assists U.S. companies wanting to

expand to the Netherlands: <https://investinholland.com/>

Import Associations

Dutch Ministry of Economic Affairs at <https://www.rvo.nl>

Industry Association

Connekt/ITS Netherlands: Connekt is a Dutch-based independent network for smart and sustainable mobility. With more than 500 partners across the globe they develop and implement tangible solutions that make the world a better place – ecologically and economically.

Nico Anten, Managing Director - nico.anten@connekt.nl

Phone: + 31 15 251 65 65 office , + 31 6 53 38 03 74 cell

<http://www.connekt.nl/>

Membership list of 116 Dutch companies:

<https://www.connekt.nl/en/leden/>

One of their initiatives is Smart Mobility Embassy, where they offer their expertise with the aim of encouraging international parties to carry out testing in the Netherlands. The Smart Mobility Embassy functions as an intermediary, bringing parties who need Dutch expertise and capabilities in the area of Smart Mobility together with Dutch parties who can offer these services. The Smart Mobility Embassy is a public-private network within which national and local authorities, knowledge institutions and companies make their knowledge, experience and testing capabilities available. The Smart Mobility Embassy the gateway to knowledge and experience in the Netherlands; acts as an intermediary between the Netherlands and the rest of the world: government-to-government, business-to-government, government-to-business and business-to-business.

<https://www.smartmobilityembassy.nl/>

Universities

Eindhoven: <https://www.tue.nl/en/research/research-areas/smart-mobility/>

Delft:

<https://www.tudelft.nl/en/ceg/about-faculty/departments/transport-planning/research/labs/smart-mobility-lab/>

List of Dutch universities: <https://www.study.eu/best-universities/netherlands>

For Information about exporting to the Netherlands contact:

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THE NORDIC REGION

Summary


The Nordic countries of Denmark, Finland, Norway and Sweden have long enjoyed a reputation for being among the most business-friendly locations for innovation-oriented enterprises. This holds true for mature global companies as well as SMEs and startups. The Nordic Region is often seen as playing a unique, innovative role as a frontrunner and a testbed for the industries and circular economy clusters of the future. According to the [Regional Innovation Scoreboard](#), which indicates regional performance and growth, the Nordic regions show a strong overall performance compared to other parts of Europe, and lead in terms of innovation.

In January 2019, the Nordic prime ministers [signed a declaration](#) on a common Nordic vision for carbon neutrality and particularly committed their countries to strengthening mutual co-operation in order to achieve carbon neutrality in the transport sector. The Nordic countries have a strong focus on developing smart and sustainable cities and there is a great growth potential in the entire region for all sectors associated with smart mobility and intelligent transportation. The Nordic countries have strong skills within several associated technologies and areas, not least in relation to the energy and digital industries and key future topics such as Smart Grid and Smart Integration, but everything in the intersection between mobility, energy, digital infrastructure and online solutions.

COVID-19: Transportation is among the most affected sectors during COVID-19. All the modes of transportation such as trains, buses, flights, cars are kept to a minimum until the pandemic subsides. The impact of the pandemic will be felt for years, in both predictable and unpredictable ways, but COVID-19 has underscored the need for ubiquitous connectivity as a backbone for a productive, sustainable, and resilient society. As the Nordic region has a strong focus on developing smart and livable cities and has gained a high level of digitalization, the countries are well poised to deal with the long-term changes that will arise in a post-COVID society. [The current crisis might even speed up the smart mobility transition](#) across the region as it could be seen as an opportunity to transform the entire ecosystem towards more modern and sustainable solutions.

Market Entry

U.S. Exporters seeking to sell products in the European Union and its member states must undergo a thorough assessment of, and ensure compliance with, existing [European Commission Directives](#), i.e. regulatory requirements regarding technical specifications, product safety, as well as environmental impact & footprint. In addition to compliance with the legal requirements of an EU member state as well as relevant EC/UNECE directives and regulations, U.S. exporters are advised to assess and obtain evidence of compliance with relevant technical norms and standards via an accredited testing &



Population: 27 million (2020)
DK: 5.8m - FI: 5.5m - NO: 5.3m - SW 10.2m

GDP: US\$1.564 trillion (combined)
DK: \$347.17 billion - FI: \$269.65 billion -
NO: \$417.12 billion - SW: \$530.83 billion

(technical) consulting service provider. Please contact the U.S. Commercial Service in Europe for further information and assistance on compliance with European Directives and industry standards.

As the Smart Mobility industry covers a [wide area of products and services](#), it is recommended to seek general export information and assistance, or country-specific commercial information at their nearest Export Assistance Center or the U.S. Department of Commerce's [website](#). Overall, the Nordic region remains open for new products and suppliers. Business opportunities exist for innovative products, services and business models, especially in high-tech sectors. The region is a highly sophisticated and competitive market with many manufacturers and suppliers as world leaders in their respective sectors. New-to-market (NTM) companies must be prepared to face competition from locally established and globally operating companies with a local presence and established market shares. Successful market access strategies for NTM companies in most cases involve a local market presence which may involve one (or a combination) of below options:

Strategic industry partnership with an established, local company: e.g. strategic Joint Venture and/or distribution partner, system integrator etc.

Technical sales representative / business development agency with an established network of local customers and contacts within the German & EU auto industry.

Official legal subsidiary: including marketing, (technical) sales & business development staff & engineering support.

U.S. exporters interested in business opportunities in industries such as public transportation & infrastructure (e.g. road, rail), Intelligent Transportation Systems (ITS), etc. need to address additional specific requirements as most relevant public transport & infrastructure projects in the Nordic region are procured as public tenders. For related projects, US exporters should carefully assess the specific terms, requirements and overall eligibility to participate in relevant public procurement/tenders.

Current Market Trends & Demand

Tech savvy population with a focus on sustainability: The population in the Nordic region loves technology. The consumers are seen as early adopters, with the Nordics boasting the highest internet and mobile phone penetration in Europe. Thanks to the Nordics' high GDP per capita, the average person has more money in their pocket to spend on technology than most. The Nordic region is also very focused on sustainable development and green initiatives that reduce the overall climate footprint and negative impact on society.

Most traditional businesses in the Nordic region are [moving toward digital transformation](#). They are striving towards consumerization of services using mobile apps, data and analytics, coupled with business process transformation to remain relevant and competitive in the region. There is a huge demand for digital services in the Nordics. However, there is a small number of local vendors, and the consolidation of these vendors has been increasing. The landscape is highly competitive among local and global service providers. Those who demonstrate the ability to scale and partner with their clients to realize the benefits of digital transformation are preferred by enterprises in the region.

Public transportation: In the Nordic Region, implementation of smart services in public transport fleets has been ongoing [since the early 2000s](#). A majority of the vehicles across the region are already equipped with one or more connected solutions. The public transport market is worth around USD 1 billion, with an estimated annual growth of around 10 percent.

Passenger information is the largest segment with approx. 25 percent of the market. This includes smart screens and trip planners such as the RuterReise and Entur apps in Oslo or Rejseplanen in Copenhagen, allowing passengers to plan their trips using both bus and local trains, operated by different parties. The second largest segment is ticketing systems at around USD 100 million. Driven by an increasing need for real time analysis of traffic data, cloud and analytics services is the fastest growing segment at around 20 percent, expected to reach a size of almost USD 100 million in 2021.

Technology and digitalization as a key driver: The rapid expansion of [IoT in the Nordics](#) has also driven the development of smarter and more intelligent transportation. An increasing share of vehicles and infrastructure have become connected. Roadside sensors and positioning technologies have increased the amount of traffic information that is gathered. Improvements in software services such as cloud and analytics tools have enabled better analysis of data. Combined with increasing connectivity, such as [4G/5G](#) and the widespread prevalence of smartphones, this has enabled a fast development of new transportation services. Advancements in tracking and counting passengers has helped both operators and authorities to more efficient route planning, and enabled volume-based contracts. Driver information application helps operators to lower fuel costs and gives the passengers a smoother ride. Fleet management systems has allowed operators to handle their fleets more efficiently.

Globally, most smart public transportation services are still operated in "silos", meaning that integration of smart services is very limited or non-existing. This needs to change in order to unlock the full potential of digital technology and drive public transport from individually connected vehicles to Intelligent Transport Systems (ITS). Characterized by integration of multiple modes of

transportation along with physical and digital infrastructure, ITS will redefine public transport as well as enable it to become more passenger centric, autonomous and integrated. The Nordic countries lead the way in this integration.

Self-driving cars and other autonomous vehicles may help to cut emissions while improving road safety. The U.S., together with the Nordics spearhead this development, all ranking top 10 in the 2020 KPMG *Autonomous Vehicle Readiness Index*.

A transparent and efficient regulatory framework is critical when vehicle and driver is physically separated. Norwegian authorities started early, by developing a detailed framework specifically adapted for autonomous vehicles. This means that there are few hurdles to begin testing autonomous solutions in cities and towns across the country. Tesla joins the well-established ecosystem. In November 2020, CEO Elon Musk tweeted "Canada and Norway are next after we get US out of early beta!".

Public Transportation and Traffic Management Systems: Traffic management and control systems is the third largest segment at close to USD 80 million. Investments in this segment have enabled operators to increase punctuality, for example through driver information and connected traffic lights giving priority to buses. An important driver of this development is changing customer behavior and expectations. Customers expect connectivity in public transport to improve at the same rate as in their homes and offices. When purchasing tickets, customers expect flexible and smooth transactions and are increasingly becoming customized to user friendly apps and intelligent solutions. Commuters expect to be able to work from the train or bus traveling to and back from work. As the time spent traveling continues to increase, being able to utilize this time for, e.g. working or shopping, becomes more important.

Another key driving force is public policy to increase the share of public transport. *Authorities in the Nordic Region realize the importance of digitalization* as a means to increase the attractiveness of public transport. An increasing share of contracts are volume based, which incentivizes operators to invest in digitalization as this improves customer satisfaction and contributes to growth. More and more contracts now also include specific clauses regarding customer satisfaction and safety, such as Wi-Fi and surveillance cameras onboard. Following successful examples from the Swedish market, the Danish Public Transport Authorities formalized new goals, predominantly focused on increased connectivity, availability and eco driving. Also, the city of Helsinki has set a goal, to provide a mobility-as-a-service concept in the future, aiming to make car ownership unnecessary.

As for passenger centricity, a platform economy approach will enable passengers to travel on the same ticket or subscription, whether they travel by bus, bike, electric scooter, or taxi. Newer and more integrated ticketing systems will enable a pay-as-you-go system, as opposed to the subscription-type model of many public transport systems today.

Electrical vehicles: Countries in the Nordic region have always been pioneers and leaders in Electric Vehicle (EV) adoption and the stock of Electric Vehicles has been expanding steadily since 2010. Despite an uneven penetration of electric cars across each of the Nordic countries, the Nordic region as a whole is at the forefront of the global growth of electric mobility.

Norway has long been the world EV leader. Thanks to long-standing and ambitious policies and incentives, Norway reached an EV milestone in 2020, where more than half of new passenger vehicles sold were EVs. In December 2020, 87% of new cars sold in were rechargeable and two-thirds all-electric, with Tesla Model 3 being the most sold model.

Taken together, Nordic countries have a ratio of electric cars per capita among the highest globally and the Nordic countries are set to become the third-largest electric car market by sales volume in the world, after China and United States. It is estimated that in 2030 there will be four million electric cars in this region with Norway and Sweden leading this growth. Finland is lacking behind due to low amount of incentives from the government side to encourage the use of electric vehicles.

Charging infrastructure: In the future, additional publicly accessible charging infrastructure will be needed as electric car adoption reaches all car owner categories, including those living in dense urban centers in apartment buildings with no private charging options. It is expected that if the Nordic region as a whole advanced its EVSE (electric vehicle supply equipment) deployment such that each country converged to a ratio of one charger for ten electric cars, more than 380,000 chargers would be installed over the next 10 years.



As the share of electric cars grows and the market matures, the deployment of publicly accessible chargers will need to target high utilization rates and close the gap with full cost recovery. Full cost recovery can be facilitated by the availability of additional revenue streams that can be effectively recovered, such as parking fees or the income derived from attracting customers to commercial facilities that offer EV charging. Business models that enable the installation, operation and maintenance of EVSE to make it viable without subsidies are essential to ensure that electrification can be economically sustainable in the long term.

Current Market Trends & Demand

1) Intelligent Transportation Systems (ITS) Opportunities

5G Technologies

Connected and Automated Technology

Cybersecurity

Internet of Things (IoT)

Transit Technology & Sensors

Vehicle-to-Everything (V2X) Communication

Vehicle-to-Infrastructure (V2I) Communication

Vehicle-to-Pedestrian (V2P) Communication

Vehicle-to-Vehicle (V2V) Communication

Testbeds

AI and Machine Learning Systems

Federated Learning and Swarm Intelligence Systems

2) Automotive Technology Opportunities

AI and Machine Learning Systems

Federated Learning and Swarm Intelligence Systems

Autonomous Vehicles R&D and testing

Autonomous vessels and marine operations

Diagnostics & Testing

Electric Vehicles/ Battery Technology

Hydrogen value chain (storage, electrolysis, fuel cells, infrastructure etc)

Hybrid / Alternative Fuels

Vehicle Technology

3) Robotics / Machine Intelligence

Artificial Intelligence

Robotics / Drones

2021/2022 In-Person or Virtual Events

Event Name: Zero Emissions Conference, Norway

Date: TBD, tentatively November 2021 (2020 was hosted virtually)

Website: <https://zerokonferansen.no/about-the-zero-emission-conference/>

Sector: (Automotive/Intelligent Transportation Systems/ICT/etc.) Zero emission technologies

Event Name: Electric Vehicle Symposium and Exhibition (EVS35)

Date: June 2022

Website:

<https://www.averse.org/averse-awards-35th-international-electric-vehicle-symposium-and-exhibition-evs35-to-oslo-and-norway-in-2022/>

Sector: Electric vehicles

Resources

- Nordic Council – Focus on Smart Mobility
 - Danish Transport Ministry
- Danish Electrical Vehicle Association
 - State of Green - Denmark
 - Copenhagen Capacity
 - Smart City Sweden
 - Swedish Institute
- Sweden Electrical Vehicle Association
 - Innovation Norway
- Norway Electrical Vehicle Association
 - Smart Cities Norway

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Capital: Warsaw
Population: 38.35 million (2020)
GDP: US\$607 billion
Currency: Polisy zloty (PLN)
Language: Polish

P O L A N D

Summary

The automotive industry is the second largest industry sector in Poland, accounting for nearly 10,1% of total Poland industry revenue and directly supporting 202,700 jobs. The country size, regional diversity, and access to human resources are special advantages of Poland in the Central Europe region contributing to further development of automotive industry. There are over 660 first and second-tier subcontracted companies in Poland and five vehicle manufacturing plants (2 x VW, FCA and PSA Group including the Opel plant and Daimler plant), 6 bus factories (Solaris, MAN, Scania, Volvo, Autosan, URSUS/AMZ) and one MAN truck factory. Poland specializes in the production of car engines, e.g., Volkswagen, Toyota (two plants), FCA engine plants, Opel and the Daimler plants.

The automotive sector is one of the key sectors for the Polish government. The principal forms of support for investors in the automotive sector include:

- income-tax exemptions for investments in the Special Economic Zones.
- real-estate tax exemptions granted under relevant local government regulations applicable for the investment location; various forms of support for the employment of registered unemployed persons, offered by local Employment Agencies (at the level of poviats),
- aid offered under co-financed EU programs aimed at supporting R&D activities (e.g., Innomoto),
- tax credit for R&D activities.

The electromobility sector is an official priority for the country. There are special programs created by the Polish government, which may amount to 19.4 billion PLN over the next ten years providing financial support for development of electromobility industry in Poland. In 2016, the Ministry of Energy adopted the Electromobility Development Plan, which is to contribute to strengthening Poland's economic growth, and assumes that by 2025 there will be a million electric cars on Polish roads. Unfortunately, due to pandemic situation the implementation of these programs is delayed.

Nevertheless, the number of electric vehicles has doubled and the number of electric vehicles charging stations has also increased. Poland has become a basin for factories building for electric vehicles batteries or their components. Daimler is constructing a second production branch dedicated to production of electric batteries, which should start operates this year. LG Chem, one of the largest producers of e-car batteries has a factory in Kobierzyce near Wrocław. SK Innovation, Foosung, KET and Euchem will open their plants of batteries in Poland. Also, the British company Johnson Matthey will build a plant in Konin producing advanced materials for batteries for electric cars.

Next year the ElectroMobility Poland will build a factory producing the first Polish electric vehicle and the Industrial Development Agency (ARP) group in Solec Kujawski started the production of electric buses.

Market Entry

As a member of the European Union, both EU and national legislation apply. Exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products & accessories to the European Union and its member states must undergo a thorough assessment of, and ensure compliance with, existing European Commission Directives, i.e., regulatory requirements regarding technical specifications, product safety, as well as environmental impact & requirements. In principle, type-approval granted for vehicles or vehicle parts in one EU member state should be accepted by all member states across the EU. However, individual member states may enforce more stringent or additional regulatory requirements for certain product groups and/or applications.

In addition to compliance with the legal requirements of an EU member state as well as relevant EC and UNECE directives and regulations, U.S. exporters of automotive parts are advised to assess and obtain evidence of compliance with relevant technical norms and standards. A certified management system is required for access to new markets and customers in Poland and Europe. One of the automotive industry's most widely used international standards for quality management is ISO/TS 16949 (under revision, transition to IATF 16949 is in progress), which defines the quality management system requirements for the design and development, production and, when relevant, installation and service of automotive-related products.

Current Market Trends & Demand

Poland is a developing country and, unlike developed countries, the number of cars per capita is growing up. Most of the Polish families own one, two or even three cars. Almost a million of passenger cars were sold in 2019. The great majority of cars are older than 10 years, which gives a constant demand for automotive parts and services. There is a large competition on the Polish market regarding above, but just like with vehicle purchase, the most important factor for Poles is price and good quality of products and services. Only competitive producers, distributors and services are able to exist on this market.

2020 was a very difficult year for the automotive industry. The automotive market ends in December with a decline of almost 30%. However, the situation of the electromobility market is different. The difficult year 2020 was for this segment a year of a turnover jump by about 80 percent. The Polish Alternative Fuels Association predicts that such a large annual growth will be the norm for the electromobility market for the next few years. At the end of 2020 there were 20 181 e-cars registered including 9,751 purely electric models (48.3% of the park), and 10,430 plug-in hybrids (51.7% share) - this is more than twice as many as in 2019. The fleets of Polish companies will be more and more electrified. Today, electric vehicles are used by 3% companies, and in three years it will be 18 percent, i.e. - according to the latest Arval Mobility Observatory Fleet Barometer.

The increase number of electric vehicles requires the need for infrastructure development. According to the "Electric Mobility Meter" run by PSPA (Polish Alternative Fuels Association) and the Polish Automotive Industry Association, at the end of November 2020 there were 1,324 public electric vehicle charging stations in Poland, with a total of 2,532 points. The network of charging stations in Poland increases by over 30% year to year. Recently, the Polish government announced a program of subsidies to charging points for electric cars, which may translate into the creation of 48,000 by 2025 public EV charging points.

Poland devotes sizeable resources to the development of its intelligent transportation systems (ITS) infrastructure. Poland's [Ministry of Infrastructure](#), the policy maker, and The National Directorate for Roads and Highways (GDDKiA), are responsible for developing its infrastructure and are the key contacts for Poland's nation-wide projects, most of which are eligible for EU funding. In May 2020, GDDKiA signed a contract for National Traffic Management system, with a value of \$53 million, and is in the process of investing in a real time monitoring of highways and expressways, including additional radar and speed control systems.

Smart City infrastructure development, including ITS, is the responsibility of local municipal and city authorities. Most Smart City plans include investments in intelligent public transportation systems, parking systems and intelligent mobility systems.

The Green Deal and the regulatory and financial support proposed by the European Commission are to help, especially small and medium-sized enterprises, prepare for the perspective of the EU climate goals for 2030. It is very important from the Polish perspective. The Polish sector producing car parts, specializing in components for internal combustion engines, is slowly getting ready for changes, as there is a growing belief that electromobility is a trend that will remain dominant in the European automotive industry.

Hydrogen should be mentioned as a technology that will develop in parallel with battery technologies in the coming years, especially in heavy and public transport. In its recently presented Hydrogen Strategy until 2030 with the perspective until 2040 the Polish government targets having 500 Polish-manufactured hydrogen fuel-cell buses on the country's streets by 2025 and 2,000 by 2030, together with 32 refueling stations. The first activities in the hydrogen area are undertaken by the state-controlled oil and gas company, PGNiG that has started working on projects for the use of hydrogen in the energy and automotive sectors. The company will investigate the possibilities of hydrogen storage and transport through the gas network. The first and the most advanced is PGNiG's Hydra Tank project, a hydrogen

refueling research station. PGNiG has signed a contract with a Polish-British consortium for its design and construction. The station is scheduled to be launched in Warsaw in 2021.

In January 2021 National Fund for Environmental Protection and Water Management started recruitment under the "Green Public Transport" program, under which company can receive support for the purchase of electric buses. The ARP e-Vehicles, a company from the Industrial Development Agency (ARP) group started the production of electric buses. At the end of November 2020, the electric bus park in Poland had 418 units.

Polish government encourages companies to implement innovative technologies in manufacturing. The government plans implementing a tax relief for manufacturing companies that invested in automation and robotics. The new law should come into force in 2021.

According to the International Federation of Robotics, the use of robots in Polish factories reached its record in 2018, during which, the number of robots grew by 40% compared to the previous year. In 2018, the total number of robots in the Poland reached 13,600, ranking Poland as the 16th most dense robotics country in the world, as published by the International Federation of Robotics. Moreover, Poland's potential for increased robotics growth is high. Poland has only 42 robots per 10,000 workers, leaving the country far behind other European economies (e.g., Germany has 338 robots per 10000 workers). Today, only 6% of Polish SMEs and 22% of its large companies use robots, compared to the EU where robot use is higher, at 7% and 25% respectively, according to the Polish Economic Institute analysis. Poland's robot density is expected to increase in the coming years, as the International Federation of Robotics states. The Polish Economic Institute noted that industrial robots are used mainly in manufacturing industries (81.5%) and are most commonly used in the automotive (38.6%), chemical (18.9%) and metallurgy sectors (12.8%).

2021 In-Person or Virtual Events

Event Name: Poznan Motor Show

Date: 8 – 11.04, 2021

Website: <https://www.motorshow.pl/en/>

Sector: (Electromobility/Autonomous vehicles/car sharing/connectivity/cybersecurity)

Event Name: Polish ITS Congress

Date: May 17-18, 2021, Warsaw

Website: <http://www.itspolska.pl/>

Best Prospects for U.S. Exports / Opportunities

- 1) Intelligent Transportation Systems (ITS) Opportunities
 - o 5G Technologies
 - o Connected and Automated Technology
 - o Cybersecurity
 - o Internet of Things (IoT)
 - o Transit Technology & Sensors
 - o Vehicle-to-Everything (V2X) Communication
 - o Vehicle-to-Infrastructure (V2I) Communication
 - o Vehicle-to-Pedestrian (V2P) Communication
 - o Vehicle-to-Vehicle (V2V) Communication
- 2) Automotive Technology Opportunities
 - o Autonomous Vehicles
 - o Diagnostics & Testing
 - o Electric Vehicles
 - o Hybrid / Electric / Alternative Fuel
 - o Vehicle Technology
- 3) Robotics / Machine Intelligence
 - o Artificial Intelligence
 - o Robotics / Drones

Resources

PZPM (Polish Association of Automotive Industry): <https://www.pzpm.org.pl/en>

Polish Investments & Trade Agency PFR Group: <https://www.paih.gov.pl/en>

WNP.PL - <https://www.wnp.pl/>

ITS Polska - <http://www.itspolska.pl/>

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PORTUGAL

Summary

In recent years, the automotive sector has become increasingly important in the Portuguese economy in terms of GDP. The automotive sector is responsible for almost 8.5% of Portugal's production industry and represents 2.1% of the Portuguese economy. It employs 0.7% of the population and accounts for a total of 4.8% of the employment in the manufacturing industry. According to ACAP- Associação Automóvel de Portugal (Automobile Association of Portugal), the automotive sector in Portugal is responsible for 11% of total Portuguese exports. In 2019, the number of vehicles produced reached a total of 345 thousand, a 17.4% increase compared with the previous year, and out of which 97.3% were exported, mainly to Europe.

There are about 5.8 million registered vehicles in Portugal. In 2019, 267,828 vehicles were sold in Portugal. Most of those vehicles are passenger vehicles with a growth of 20.5% compared to 2018. Portugal has over 220 automotive supplier companies and 4 major car manufacturers—Toyota/Salvador Caetano, PSA Peugeot Citroen, Mitsubishi Trucks and Volkswagen AutoEuropa.

Since 2016 Portugal has focused on creating integrated and sustainable mobility systems in major urban areas to reduce Co2 emissions. In January 2016, Lisbon became a pilot city, jointly with Milan and London for the Sharing Cities Project, with the aim to implement replicable urban digital solutions and collaboration models. The project objectives in Lisbon downtown included, among many others, introducing new modes of electric mobility services and an urban sharing platform directed to citizens. This initiated the engagement and total commitment of municipality and public and private entities, across various sectors as well as universities. Improvements and adjustments made under the program led Lisbon to be nominated in European Green Capital 2020.

In 2018 Lisbon launched a number of programs to reduce the CO2 emissions in the city and implemented the car and micro mobility sharing programs. Traffic lights became 100% LED (translating to a reduction of CO2 emissions by 1521 tons per year). In 2018 Lisbon had more than 600 electric bicycles, 81 charging stations and 90 Km of bike lanes, these numbers have more than doubled in the past two years. The municipality of Lisbon created the [MOBI.E](#) program that links all users, operators and manufacturers across all mobility segments.

Capital: Lisbon
Population: 10.1 million (2020)
GDP: US\$175 billion
Currency: Euro
Language: Portuguese



In Portugal all e-mobility and smart city projects are planned and executed by local municipalities – presently we have 25 municipalities with smart city programs, most of which used EU funds to upgrade city infrastructure. As an example, the Lisbon municipality car fleet is 91% electric. The [Mobi Cascais](#), of the Municipality of Cascais is the only program with an autonomous vehicle in Portugal, and the first to have all public transportation within the municipality free to its residents.

Market Entry

The most effective way to enter the Portuguese market is to partner with a local company that can act as a local representative as well as provide insights about local market environment and trends. Exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products & accessories to the European Union and its member states must undergo a thorough assessment of, and ensure compliance with, existing European Commission Directives, i.e., regulatory requirements regarding technical specifications, product safety, as well as environmental impact & requirements. In principle, type-approval granted for vehicles or vehicle parts in one EU member state should be accepted by all member states across the EU. However, individual member states may enforce more stringent or additional regulatory requirements for certain product groups and/or applications.

The mandatory European legal requirements and certification process can be challenging for U.S. vehicles and parts when exporting to Portugal. There are no customs duties on imports from European Union (EU) countries if the car is new. However, Portugal faced a discriminatory legislation on car registration tax amendment in 2019 for heavily taxing EU imported used cars purchased in the Portuguese market (https://ec.europa.eu/commission/presscorner/detail/EN/INF_19_6304). The VAT in Portugal is 23 percent. The VAT is applied to all imports, including European vehicles. More taxes apply, depending on if the car is used for personal use or if it is a company fleet car. In the latter case if the car is a plug-in hybrid, taxes vary between 5% and 17.5%; and if it is LPG or CNG vehicle, between 7.5% and 27.5%. Diesel and gasoline have the highest tax rates, between 10% and 35%.

Current Market Trends & Demand

Electric Vehicles and Hybrid Vehicles: Zero emissions vehicles (ZEV) and hybrid vehicles continue to gain market share. These vehicles include Tesla, Toyota Prius, Honda Civic Hybrid, Lexus LS, GS and RX Hybrid, Segway among others. Portugal benefits from the first nationwide, fully interoperable electric mobility system (MOBIE), where any user can charge any vehicle at any of the more than 1,250 charging points. An emerging cluster around new mobility concepts and services in Portugal is attracting the partnership of large corporations. Portugal is also one of the top lithium producers in

Europe with an estimate reserve of 2–10 million tons of lithium to be explored soon. A perfect example of that is Tesla, which started Model 3 deliveries in February 2019, selling 1979 cars that first year, giving Tesla a 27.8% market share.

Electric Bicycles: The Portuguese municipalities are building more bicycle lanes with the aim of fulfilling all requirements for the smart city title position. Under the program [Mobi-e](#) (<https://www.mobie.pt/>), the Lisbon Municipality is facilitating the acquisition of e-bikes to all Lisbon residents by refunding partial amounts of bicycles acquired, to citizens and students, in order to contribute to sustainable mobility in Lisbon. By the end March 2021, Lisbon will have over 200 Km of bicycle lanes. Bike and e-bike sharing is now part of Lisbon city life, and other municipalities, namely Cascais, follow the same path. Cascais alone has 120 stations and 1200 bicycles in the municipality.

Electric Scooters: The city of Lisbon has adopted a dock-less electric scooters sharing system and several providers emerged immediately, namely Bungo, Flash, Hive, Lime, Tier, Voi and Wind. This type of micro mobility transportation is popular amongst citizens and tourists in many cities across the country.



Aftermarket Accessories: The market for automotive accessories and specialty equipment in Portugal and distribution channels largely consist of small importers. Although it is a fairly small market when compared to neighboring Spain, it is an ideal market for product acceptance studies, serving as a gateway to enter other European markets as well as other Portuguese-speaking markets.

Acceptance of U.S. products and new technology in Portugal is very high and well received by local companies. Portuguese over the past years have become fans of a wide range of products such as, passive and active security systems, automotive eco-friendly solutions, diagnostic and testing tools, as well as car entertainment systems.

In general, all products with cutting-edge technology can be placed into the Portuguese market. As a rule, Portuguese are ready to take into consideration new products and pay extra money for something that is, or seems to be, new and innovative.

Smaller Engines: Europe's best-selling car models can be equipped with 3-cylinder engines of 1000cc or less. This is the measure taken by brands to meet emission limits for pollution gases and also to contain the production and sales costs of the latest cars, thus providing more technology while maintaining similar prices.

Gasoline engine VS Diesel Engine: Diesel cars are rapidly losing market share. According to ACAP of the 223,799 light passengers bought in 2019, 49.2% have a gasoline engine and 40% have a diesel engine. Despite that, in the commercial vehicles the presence of diesel engine is still overwhelming: 99.1% of the 38,454 cars in this market are diesel and only 0.2% (90 vehicles) have a gasoline engine.

In alternative engines to fossil fuels, sales of electric and plug-in hybrids are also noteworthy. There was an increase of 3.3% in electric/petrol hybrids to 8545 units and almost zero growth in electric/diesel hybrids (+0.3% for 883 cars sold). On other hand plug-in/gasoline grew 1.8% to 4653 cars bought; and plug-in/diesel grew 0.4% to 1145 units. All in all, in the field of trams, pure plug-in or hybrids, the market share rose to 8.5%.

Smart Mobility: As mentioned in the summary of this report, new trends indicate a migration to a more sustainable and environment-oriented type of mobility. Socio-economic smart city trends include increased urbanization with an increased adoption of electric mobility and digital solutions. These new demands in growing Portuguese urban centers suggest best prospects in the smart mobility sector.

Best Prospects for U.S. Exports / Opportunities

1) Intelligent Transportation Systems (ITS) Opportunities

5G Technologies

Connected and Automated Technology

Cybersecurity

Internet of Things (IoT)

Traffic Management Systems & Sensors

Vehicle-to-Everything (V2X) Communication

Vehicle-to-Infrastructure (V2I) Communication

Vehicle-to-Pedestrian (V2P) Communication

Vehicle-to-Vehicle (V2V) Communication

2) Automotive Technology Opportunities

Autonomous Vehicles

EV software systems, including charging station software

EV battery technologies

EVs

Hybrid / Electric / Alternative Fuel

Vehicle Technology

Vehicle-to-Infrastructure (V2I) Communication

Vehicle-to-Pedestrian (V2P) Communication

Vehicle-to-Vehicle (V2V) Communication

3) Automotive Technology Opportunities

Autonomous Vehicles

Diagnostics & Testing

Electric Vehicles

Electric Bicycles

Electric Scooters

Hybrid / Electric / Alternative Fuel

Vehicle Technology

4) Robotics / Machine Intelligence

Artificial Intelligence

Robotics / Drones

2021 In-Person or Virtual Events

Event Name: Velo City 2021 Conference

Date: June 1-4, 2021

Website: <https://www.velo-city2021.com/>

Sector: E-bicycles and bicycles

Event Name: Smart Mobility Summit (SMS Lisbon)

Date: April 20-21, 2021

Website: <http://www.smartmobilitysummit.com/>

Sector: Smart mobility

Resources

- IMT-Institute for Mobility and Transport

<http://www.imt-ip.pt/sites/IMTT/English/Pages/IMTnew.aspx>

- ITS Portugal <https://www.its-portugal.com/its>

- CEiiA <https://www.ceiia.com/>

- Mobi Cascais <https://mobi.cascais.pt/> and

<https://www.techdays.pt/application/files/2315/7141/0878/2-RuiRei.pdf>

- Mobi.e <https://www.mobie.pt/>

- European Green Capital

<https://ec.europa.eu/environment/europeangreencapital/winning-cities/2020-lisbon/>

- EU Smart Cities Information System

<https://smartcities-infosystem.eu/scis-projects/demo-sites/sharing-cities-site-lisbon>

- Infraestruturas de Portugal <https://www.infraestruturasdeportugal.pt/>

- Mobinov <https://www.mobinov.pt/index.php/en/>

- Automobile Association of Portugal <http://www.acap.pt>

- Portuguese Association of Automotive Suppliers <http://www.afia.pt>

- Automotive Cluster MOBINOVA <http://www.mobinov.pt/index.php/en/>

- Car registration tax in Portugal https://ec.europa.eu/commission/presscorner/detail/en/ip_20_210

- Autonomous Company Vehicle Taxation

<https://essencial-portugal.com/en/news-portugal/taxation-company-cars-portugal/#:~:text=Portugues e%20company%20cars%20are%20taxed,companies%20making%20profits%20or%20losses.>



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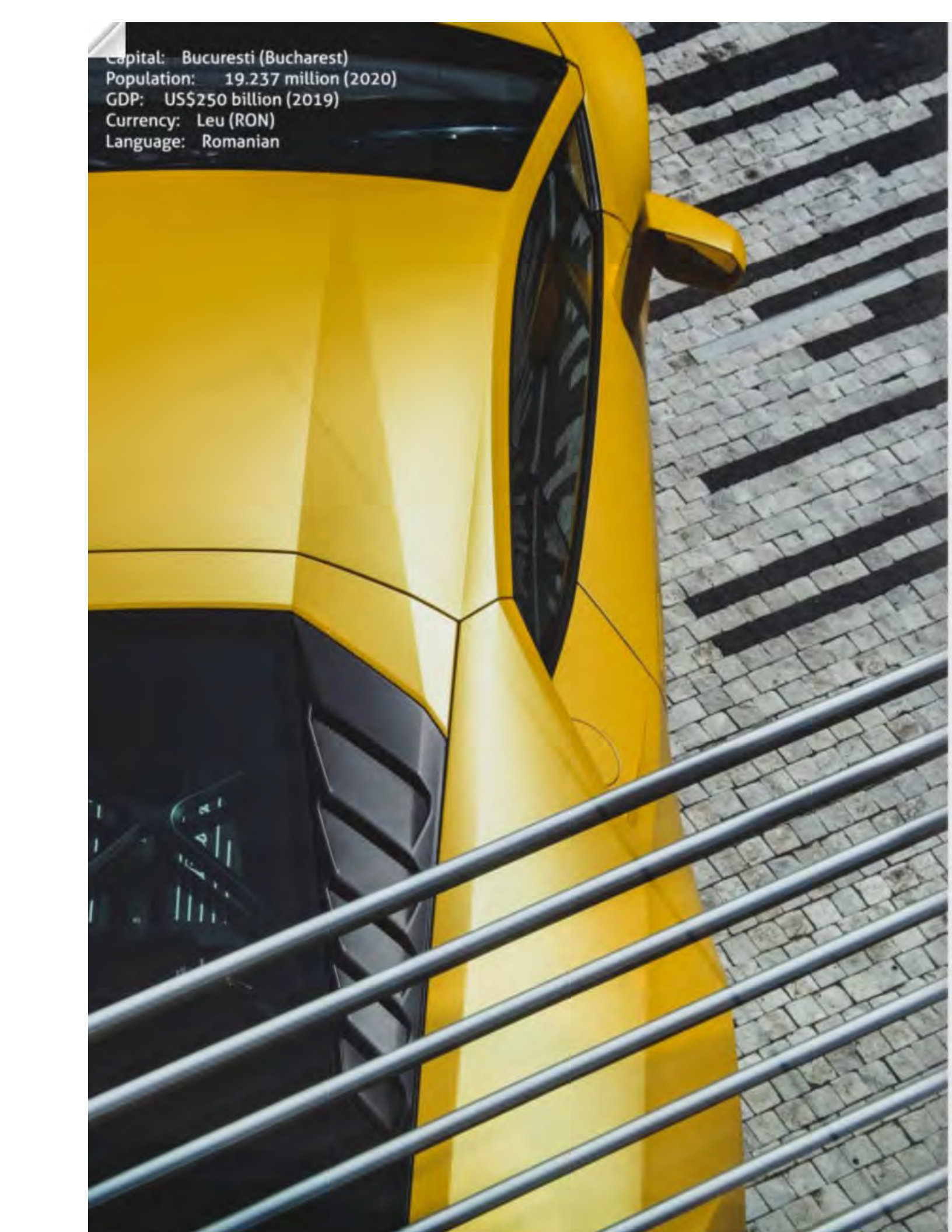
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Capital: Bucuresti (Bucharest)
Population: 19.237 million (2020)
GDP: US\$250 billion (2019)
Currency: Leu (RON)
Language: Romanian

ROMANIA

Summary

According to industry associations, the automotive industry in Romania generates approx. 14% of the GDP and stands for more than 25% of the total exports. The over 600 companies in the sector employ over 230,000 people with a turnover of approx. 35 billion USD.

With a production of approximately 4 million vehicles, Central and Eastern Europe region is the 2nd largest automotive producer in the EU after Germany. Almost every 4th new car manufactured in the EU has been made in the Central and Eastern Europe (CEE) region.

For the first 11 months in 2020 the Romanian production of Ford and Dacia Renault vehicles was 404,699 units, down almost 10% from the same period in 2019. Ford Craiova (Puma and EcoSport) counted for 164,404 units, or 40.64% of total automotive production.

Globally, it is estimated that, despite the decline in the car market (-17%), purchases of electric vehicles will register a significant increase (+11%), according to an Association of Automotive Producers and Importers (APIA) study. In the European Union too, an upward trend in purchases of electric vehicles witnessed an increase of 122% (570,000 units in 2020 vs. 257,000 units in 2019). The market share of electric cars increased to 10% in Q3 2020.

Although the total passenger car market decreased in Romania (2020 - 11 months) by 25.3%, the acquisitions of electric cars (BEV & PHEV) increased by 74.2%, reaching a market share of 2.7% for same period. It is expected that for 2020 (12 months) approximately. 3,500 BEV & PHEV vehicles will be registered in Romania (+84% vs. 2019), with a new record of EVs registrations in December 2020.

In 2020, 2,111 units of BEV (Battery Electric Vehicles) were registered in Romania, a 59.7% increase from 2019. In the same year, 796 Plug-in Hybrid units were registered - a 229.4% increase from 2019. (3)

Smart Ridesharing/ Rental services (e-Bikes, e-Kick Scooters)

A trend toward lesser-polluting bicycles and kick-scooters as a means of transport within urban areas is evident in Europe.

Switzerland and the United Kingdom are the main destinations for EU exports of electric bicycles (33% and 29% of total extra-EU electric bicycle exports respectively), followed by Norway (15%) and the United States (13%).

Under current pandemic conditions one of the alternatives to public transportation is ride-sharing, or electrical bikes and scooters. Investors all over the world bet on electric bikes and scooters, and millions of USD flowed to start-ups developing in this niche. Some companies sell, others rent electric bikes. In Romania, the cost for renting an electric bike starts at 37 USD per day. Electric bikes sell for 620 - 2,400 USD. (6). All signs point to a significant increase in electric bike usage.

Some electric bike rental services present in Romania (July 2020) are: [Bolt](#) (former Taxify) (EE), [Wolf-e](#) (Ro), [Flow](#) (Ro), [Lime](#) (USA) (in Bucharest, Constanta, Brasov), [MELC](#) (Ro), [Splash](#) (Ro), and [Bird](#) (USA).(8)

Within the EU more than 3 million electric bikes were sold in 2019, a substantial increase of 23% compared to 2018 - 17% of the total e-bikes market. (9). As of 2019, Romania had only 5500 km of bike lanes. While bikes sales are booming, bike lane infrastructure growth has been slow in Romania. The bike market has grown 10 times over the last decade. (10).

Smart Infrastructure

The first smart street in Romania has been constructed in Cluj-Napoca following a EUR 6 million investment from EU funds. It has charging stations for electric cars, bicycles and scooters, USB plugs, free Wi-Fi and smart lighting system. (1) The street has 551 square meters of green area, a smart irrigation system, 4 electric car charging stations, 15 parking lots for cars and 30 electric bike and scooter-charging stations. It also has a smart, energy-efficient lighting system and a smart rainwater collection system.

Market Entry

Exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products & accessories to the European Union and its member states (MS) must ensure compliance with existing European Commission Directives (i.e. technical specifications, product safety, environmental impact & requirements). The licenses granted for vehicles (or parts) in one EU MS should be accepted automatically by all MS across the EU. However, individual MS may enforce stricter and/or additional regulatory requirements for certain product groups and/or applications. This is why communication with the Commercial Teams at posts is crucial.

In addition to compliance with the legal requirements of an EU MS, as well as relevant EC and UNECE directives and regulations, U.S. exporters of automotive parts are advised to assess and obtain evidence of compliance with relevant technical norms and standards. A certified quality management

system is required for access to new markets and customers in Romania and the EU / Europe. One of the automotive industry's most widely used international standards for quality management is the cornerstone EPD standard, EN 15804, which has been broadly adopted worldwide. In July 2019, a major amendment, EN15804+A2, was approved which changes EPDs significantly and will become mandatory in July 2022. It provides the updated quality management system requirements for the design and development, production, installation and service of automotive-related products.

Current Market Trends & Demands - Electric Cars

In Romania, APIA (the Association of Automobile Manufacturers and Importers - www.apia.ro) proposed ambitious objectives for the coming years to the authorities, respectively about 50,000 EVs in 2025 and about 300,000 units in 2030. It is estimated that the global demand for electric cars will increase strongly in the coming years, reaching approximately 5 million units per year in 2026 and a market share of about 25% - (3). The proposal was based on the EU Green Deal requirements of a 55% reduction of CO2 emissions by 2030 and on the Clean Vehicle Directive for the procurement of "green" vehicles by public authorities. The proposal was also based on relevant national legislation calling for the acquisition of at least 50 million Euros of green vehicles in 2020. (3).

However, considering the 2020 trend, and the EU and Romanian acquisitions incentive programs for "green" vehicles, it is expected that these objectives will be exceeded. Thus, based on currently available data, an increase of approximately 70% - 80% is expected for electric vehicles purchases in 2021 (6,000 units) and 2022 (9,000 units). The total number of electric cars existing in Romania will reach approximately 20,000 units at the end of 2022.

The installation of approximately 1,500-2,000 public and private recharging stations in the next 2-3 years is supported by government incentive programs. The number of private (residential) charging stations will also increase (some manufacturers provide, in addition to the electric car, a recharging station - wall box). (3)

In the European Union we can see an increasing trend toward the purchases of electric vehicles (ACEA source), which witnessed an increase of +122% (570,000 units in 2020 vs. 257,000 units in 2019). The market share of electric cars reached 10% in Q3 2020.

Although the total passenger car market in Romania decreased by 25.3%, the acquisitions of electric cars (BEV & PHEV) increased by 74.2%, to a market share of 2.7%. It is expected that 3,500 BEV & PHEV vehicles (+84% vs. 2019) will be registered in Romania in 2020.

Current Market Trends & Demands – Artificial Intelligence, Robotics & Drones

Artificial Intelligence and robotics are hot subjects in the local start-up ecosystem. Although small, the local start-ups have been quite dynamic with some notable successes such as UiPath.

In Romania, Artificial Intelligence (AI) is well represented among start-ups. Romania is currently drafting its national AI strategy as part of a program launched at European level where each country has to draft a local AI strategy on line with the European directives.

At the national level, at the end of 2020, based on government policies, the AI4RO association was established, which aims to promote national research and development programs in AI. These policies will have the role of creating the legislative framework for the realization of academic-industry partnerships in the field of AI and the promotion of Artificial Intelligence applications developed in the economic academic environment.

Most of the AI developments are located in Bucharest. Notable initiatives also exist in Cluj-Napoca, Timisoara, Iasi, and Oradea.

The academic AI developments are concentrated around Romania's major Universities (Bucharest, Cluj-Napoca, Iasi and Timisoara) which have developed different start-up companies, and in the industry.

In the area of robotics, Romania's champion is the Bucharest founded UiPath which is one of the Eastern Europe's unicorn companies. Many other start-ups are coming with interesting solutions. In Artificial Intelligence the local ecosystem comprises of many promising start-up companies such as: TypingDNA, CODA Intelligence (cybersecurity) and nextlab.tech (EdTech).

AI is also part of the smart specializations promoted by the soon to be created European Digital Innovation Hubs. The European Union will fund a number of Innovation Hubs that are supposed to be created around Romania; major universities. In the Bucharest area, the two innovation hubs that were pre-approved are promoted the Department of Computer Science and Cybernetics of the Bucharest University of Economy Studies. The two hubs focus on smart skills and cybersecurity.

An Integrated Center for Autonomous and Robotic Technology - CITARO is to be opened (2022) within the Polytechnic University of Bucharest (UPB). The Integrated Center for Autonomous Technology and Robotics - CITARO - aims to bring together all the experts of the Polytechnic University of Bucharest in

the field of autonomous devices and robots. The center aims to carry out multidisciplinary activities of research, design, development, testing and approval of autonomous devices and robots.

The center will have laboratories for: industrial robotics; micro robotics; medical robotics; drones; autonomous vehicles; autonomous software.

For the development of drones, in Romania, there are a few manufacturers of UAVs dedicated to the protection of Critical Infrastructures (1.8-meter wingspan, multi-copter and fixed wing - developed in partnership with the academic environment), otherwise American-made drones are used, especially DJI, for monitoring agricultural crops, installations with photovoltaic panels and topography.

Best Prospects for U.S. Exports / Opportunities

1) Intelligent Transportation Systems (ITS) Opportunities

- o 5G Technologies
- o Connected and Automated Technology
- o Cybersecurity
- o Internet of Things (IoT)
- o Transit Technology & Sensors
- o Vehicle-to-Everything (V2X) Communication
- o Vehicle-to-Infrastructure (V2I) Communication
- o Vehicle-to-Pedestrian (V2P) Communication
- o Vehicle-to-Vehicle (V2V) Communication

2) Automotive Technology Opportunities

- o Autonomous Vehicles
- o Diagnostics & Testing
- o Electric Vehicles
- o Hybrid / Electric / Alternative Fuel
- o Vehicle Technology

3) Robotics / Machine Intelligence

- o Artificial Intelligence
- o Robotics / Drones

2021 In-Person or Virtual Events

Event Name: Smart Mobility Cluj 2021 (In—person / Virtual)

Date: October 2021, TBC

Website: <https://www.clujlife.com/eveniment/smart-mobility-cluj-2020/>

Sector: (Intelligent Transportation Systems)

Event Name: SHOW 2nd Ideathon – Help us decide the best possible automated urban mobility solutions! (Virtual)

Date: January 2022, TBC

Website:

<https://ertico.com/event/show-1st-ideathon-help-us-decide-the-best-possible-automated-urban-mobility-solutions/>

Sector: (Intelligent Transportation Systems)

Event Name: Transforming Transportation 2021: Reimagining Safe and Resilient Mobility for Recovery (Virtual)

Date: February 3—5, 2021

Website: <https://www.transformingtransportation.org/>

Sector: (Intelligent Transportation Systems)

Event Name: Auto & Accessories Bucharest Show (In—person / Virtual)

Date: TBC 2021

Website: <https://www.sab.ro/>

Sector: (Intelligent Transportation Systems)

Event Name: SIAB International Auto Show Bucharest (In—person / Virtual)

Date: TBC March 2022

Website: <https://siab.ro/>

Sector: (Intelligent Transportation Systems)

Event Name: Smart City Industry Awards Bucharest (In—person / Virtual)

Date: TBC December 2021

Website: <https://scia.ro/>

Sector: (Smart cities & Intelligent Transportation Systems)

Resources

CLEPA – European Association of Automotive Suppliers: <http://clepa.eu/>

European Commission – DG for Mobility & Transport: https://ec.europa.eu/transport/about-us_en
<https://www.romaniajournal.ro/society-people/the-first-smart-street-in-romania-completed-in-cluj-napoca/> July 17, 2020

<https://economie.hotnews.ro/stiri-auto-24477109-productia-auto-depasit-400-000-unitati-romania.htm>
 APIA (Romanian Association of Automotive Producers and Importers) “Possible evolutions of the green cars acquisitions (2020-2022) in Romania”

APIA <http://www.apia.ro/>

(Aug 2020) <https://www.romania-insider.com/eurostat-bike-production-ro-aug-2020>

(July 2020) <https://www.mediafax.ro/economic/o-noua-piata-devine-atractiva-in-pandemie-19444097>

ACEA European Automobile Manufacturers Association: <http://www.acea.be/>

<https://www.romania-insider.com/lime-enters-romania>

<https://ecf.com/news-and-events/news/european-e-bike-market-booming-latest-industry-figures-show-%E2%80%93-and-there>

<https://www.newmoney.ro/piata-bicicletelor-este-in-crestere-infrastructura-ramane-deficitara/>

<https://www.forbes.ro/un-grup-de-experti-romani-lanseaza-o-initiativa-pentru-sprijinirea-inteligentei-artificiale-romania-197171>

https://adevarul.ro/tech/stiinta/5-companii-dezvolta-inteligentaartificiala-romania-1_5cdab4ac445219c57e9d3319/index.html

<https://www.caleaeuropeana.ro/drone-militare-produse-in-romania-compania-israeliana-elbit-systems-avioane-craiova-si-romaero-au-semnat-un-memorandum-de-intelegere/>

<https://www.caleaeuropeana.ro/compania-israeliana-elbit-systems-a-castigat-un-contract-de-27-de-milioane-de-dolari-pentru-modernizarea-avioanelor-iar-99-ale-fortelor-aeriene-romane/>
<https://www.aero-drone.ro/inspectia-infrastructurii/>

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SLOVAKIA

Summary

With four car manufacturers and 1.15 million cars produced in Slovakia in 2019, Slovakia was the world leader in per capita auto production for the sixth year in a row. In 2019, automotive production represented about 13.9 percent of Slovakia's GDP, 49.5 percent of Slovakia's industrial production and 46.6 percent of country's industrial exports. Over 340 Tier 1 and Tier 2 auto suppliers, providing parts and subassemblies to clients throughout Europe and beyond directly employed 177,000 people, while the total number of people employed in the automotive industry was 275,000. Though the 2020 statistical data is not publicly known yet, it is expected that due to COVID-19 crisis the industry production dropped by 10% and that the whole industry dropped by 20%.

Market Entry

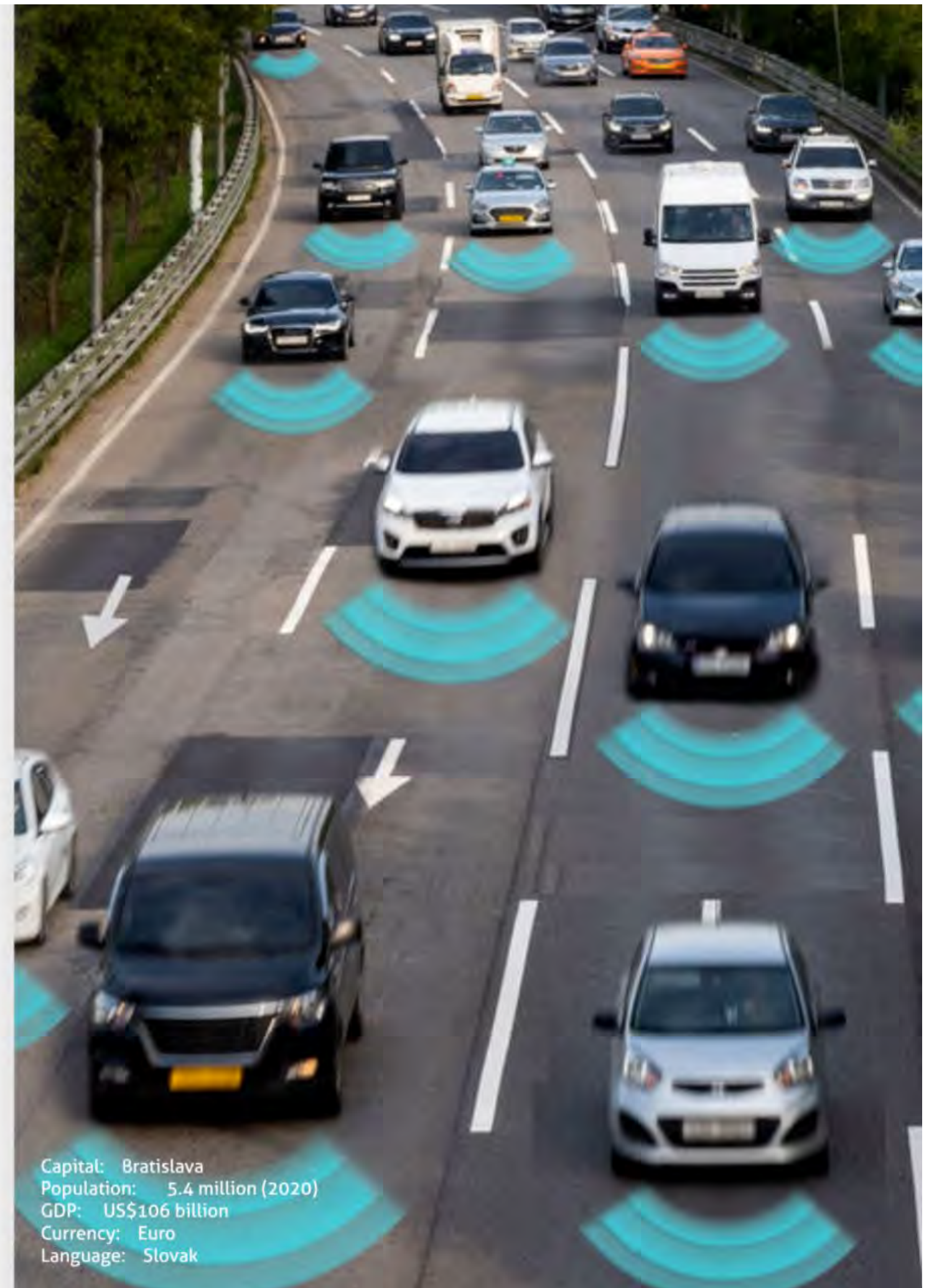
Market success depends on in-country presence (such as an agent, importer, distributor, franchisee) and price. U.S. companies wishing to use distribution, franchising and agency arrangements need to ensure that the agreements they put into place are in accordance with European Union (EU) and Slovak national laws. The Slovak Commercial Code closely follows EU legislation and recognizes agents, commissioned merchants, and brokers not bound by contract.

American exporters of vehicles, original equipment parts & components, aftermarket products & accessories to EU are subject to certification for quality and safety (i.e. regulatory requirements on technical norms and standards, environmental impact) conformity with existing European Commission Directives by a notified body in any EU member State. Once approval is granted, it should be accepted by all member states across the EU. Yet, individual member states may enforce more strict or additional regulatory requirements for specific product groups. In general, there are no other trade/import restrictions other than import duties. Since these may be subject to change, please see [TARIC, the integrated Tariff of the European Union](#) for relevant information. A certified management system is required for access to new markets and customers in Slovakia and Europe.

Current Market Trends & Demands

2020 car sales dropped by 31% on average. As of December 31, 2020, there are 2,373,264 M1 cars (3,357,777 vehicles) registered at the Slovak Ministry of Interior. Slovaks own less cars per 1,000 inhabitants compared to other EU nations. While in the past this trend was determined by weak purchase power, nowadays it is caused by changing consumer behavior and shared economy.

Based on the approved [EU's Mobility Strategy](#) Slovakia through Slovak Ministry of Economy implements "The National Policy Framework for Alternative Fuels Market Development" which indicates the target to have 35,000 E- vehicles and plug-in hybrids by 2030 on the Slovak roads and 1,500 racks for medium-fast charging (up to 22 kW) and fast charging (above 22 kW) by 2025.



Capital: Bratislava
Population: 5.4 million (2020)
GDP: US\$106 billion
Currency: Euro
Language: Slovak

The Slovak Electromobility Development Action Plan which also follows up on the conclusions and recommendations of the GEAR 2030 from October 18, 2017 as well as on three already adopted packages from the "Clean Mobility Package" was approved by the government on March 13, 2011 and contains the following 15 measures:

1. Inclusion of the topic of electromobility in all relevant strategies and policies of the state
2. Continuity of direct support for the use of low-emission vehicles
3. Long - term financial mechanism to support the development of charging infrastructure
4. Support for R&D and production of batteries
5. Information campaign
6. Implementation of the legal, technical and business environment for electromobility in Slovakia
7. Accelerated depreciation of E- cars and charging stations for E- vehicles
8. Application of green public procurement principles when purchasing motor vehicles
9. Distinctive marking of E- vehicles (green plates)
10. Use of designated lanes for E- vehicles
11. Low emission zone
12. Simplified administrative process when constructing charging infrastructure
13. Legal obligation to build charging infrastructure in newly built parking spaces
14. Installation of charging station in parking lots of State institutions
15. Adaptation of E-al qualification for production and service of E- vehicles

The initial government financial support for green cars purchase was divided into two rounds. In the future The Slovak Ministry of Economy considers lowering the subsidy of EUR 8,000 for an E-car and EUR 5,000 for a plug-in hybrid car from category M1 and N1 with maximum purchase price of EUR 50,000 in favor of hydrogen vehicles as there is no hydrogen passenger car and no public hydrogen filling station available on the Slovak market.

E- cars: In the first eight months of 2020, a record 503 of E-cars were registered in Slovakia (162 in FY 2019) still making up a negligible percentage of all car registrations. Similar to plug-in hybrids, which also hit a record with 470 pieces, this number is lower compared to numbers from 2019.

Registered E- vehicles in Slovakia as of June 30, 2020 totals 2,603 e-cars. Note, 2,603 E-cars = 1,582 battery E- cars + 1,021 plug-in hybrid cars .

Before the COVID-19 crises, the Slovak car manufacturing industry produced about 6,000 E- and hybrid cars annually. E- models of seven brands produced in Slovakia are:

BEV	PHEV	MHEV
VW e-UP	VW Touareg	Kia XCeed
Seat e-Mii	Porsche Cayenne	Kia Ceed Sportswagon
Skoda e-Citigo	Porsche Cayenne Coupe	Kia Sportage
Peugeot e-208	Kia XCeed	Kia Ceed
	Kia Ceed Sportswagon	Kia Ceed GT
		Kia Ceed PRO
		Audi Q7
		Audi Q8

E-bikes, E-scooters, E-motor scooters: Within the past twelve months the interest in green car taxi with car sharing (UBER, HOPIN, BOLT, Blablacar, LIFTAGO, Go4, Up!City, Share'ngo in big Slovak cities has been replaced by the interest in E-bikes, E-scooters, E-motor scooters sharing provided by e.g. Slovnaft, Bolt, Up!City, Blinkcity, Antik, Arriva and Rekola. In order to contribute to sustainable mobility Slovak cities need primarily build more bike lanes (the most are in Bratislava, only 128.9km) and expand the charging infrastructure.

Charging infrastructure: Slovakia is on the tail of Europe in the number of charging stations. The goal of the Slovak Ministry of Economy is to have 1,500 E- pumps by 2025. According to European Alternative Fuels Observatory (EAFO) Slovakia currently has 924 E- charging stations with three plug-in E- vehicles per public charging point (59% growth compared to FY 2019). 56 are fast public charging points (>= 22 kW) per 100 km highway.

The two biggest players in the charging infrastructure market are Greenway with 456 charging stations in Slovakia and Poland and ZSE with 142 charging stations (160 planned by 2021, 200 projected by 2023). Other players like Tesla, Slovnaft, Ionity, Ejoin, Delta Electronics, Elexim, Seak Energetics, SCAME, Polyfazer may face growing retail chain own infrastructure by Lidl, Billa, Tesco, Kaufland, Alza, McDonald's and others. Slovak companies Innogy Slovensko and AgeVolt have introduced innovative charging systems ensuring versatile, intelligent, efficient and economical E-car charging.

EUR 350,000 from the EUR 500,000 first round grant program will support the charging station network for self- governing regions with approximately 400 new AC charging points in 73 Slovak cities and municipalities. Municipalities can build additional charging stations also thanks to EUR 650,000 second round grant program if they submitted request to The Slovak Ministry of Economy by December 31, 2020.



Electromobility: The Automotive Industry Association of the Slovak Republic considers political ambitions to reduce emissions and their constant and fundamental changes to be the greatest threats to future development, as Slovak education and the sufficiency of a qualified workforce are also perceived as a risk factor.

There are about 340 Tier 1 and Tier 2 suppliers in the Slovak automotive market. Their respond to E-production trend is sequential and OEM dependent. Recent activities worth highlighting include Intercable (EUR 23million investment into production's expansion of high voltage cables for E-cars), Schaeffler (new R&D center to develop and test new powertrain modules for hybrids and E-cars), U.S. Steel (EUR 130 million/investment of the decade into production upgrade of electro-technical steel used in generators, transformers and E-cars), Panasonic Industrial Devices Slovakia (EUR 70 million investment to build in five years a factory with expanded accessories production for E-car batteries with 450 employees), Sygic (first comprehensive electro-mobility solution as part of Sygic GPS Navigation developed with Plugsurfing company), MSM Group (new factory for the production of E-car charging stations with the goal to produce 2,500 units by 2022.) and Electroad (startup developing intelligent algorithm providing reliable prediction of range, consumption and route parameters to E-drivers).

Local pioneers of electromobility - InoBat, IPM, A.En. Slovensko, MSM E-mobility Division, GreenWay Infrastructure, SLOVNAFT, MATADOR Holding, Centrum pre využitie pokročilých materiálov SAV, Technická univerzita v Košiciach (Hydrogen R&D), Univerzita Pavla Jozefa Šafárika v Košiciach, RepaNet, Žilinská univerzita v Žiline, Slovenská technická univerzita and Slovenská poľnohospodárska univerzita Nitra are members of the Slovak Battery Alliance, an independent advocacy group composed of legal entities operating as an industry cluster. This executive cooperation platform is a member of European Battery Alliance and connects public & private sectors, innovators, academic community with financial institutions. Other market players within E-motors & components include BSH Drives and Pupms, Eiben, Sisme, Slovres, TRW Automotive, VEM, Elektrokarbon; within Battery & Charging Components include Intercable, Van Doren Engineers, NES, Voltia Automotive, Panasonic; Machinery & equipment components include Transmisie Engineering, Hornlein, U.S. Steel Kosice.

New mobility trends emerged at Slovak universities:

- Autonomous - CEIT: Spin-off of the University of Zilina mass implementing autonomous guided vehicles
- Electric: Green Team electrical race car developed as a student project in Slovak Technical University Bratislava
- Efficient ICU: The energy efficient car B&S developed by Faculty of Mechanical Engineering in Kosice
- Hydrogen: car powered by hydrogen - the first car of its kind in Slovakia developed by Faculty of Mechanical Engineering in Kosice.

Traffic Infrastructure: Electrification of fleet by transport and logistic companies is usually an advertising move rather than a trend owed to discouraging higher initial costs. Due to the network of trams and trolleybuses Slovakia ranks among countries with relatively sufficient resources for public E-transport expansion.

5G: The development of fifth generation networks in Slovakia is considered to be one of the prerequisites for further development and a competitiveness strengthening factor, especially when it comes to future of autonomous vehicle technology implementation. In November 2020, 5G network frequencies were granted to Orange Slovensko, Slovak Telekom, Swan and O2. Operators are bound to start using the frequencies within two years and cover 95% of each regional city's population by 2025.

Best Prospects for U.S. Exports / Opportunities

IT (software and applications prolonging battery life span, software and applications for charging stations, 5G technologies, cybersecurity, IoT, diagnostics), installation of energy storage solutions (especially for energy gained from fluctuating solar and wind energies), battery ecosystem from research, to production and zero environmental damage recycling, charging station network infrastructure including E-bike & E-scooter & E-motor scooter charging, E-education (requalification), electrification of public transport, E-taxi/Car sharing applications, Robotics/Cobotics.

2021 In-Person or Virtual Events

Event Name: Smart Cities 2021

Date: February 10, 2021

Website: <https://konferencie.hnonline.sk/event/smart-cities>

Sector: (Smart City/Smart mobility)

Event Name: Climate Smart Mobility - ONLINE kooperačné podujatie

Date: April 21-24, 2021

Website: <https://www.npc.sk/sk/aktuality/climate-smart-mobility-online-kooperacne-podujatie/>

Sector: (Automotive/Intelligent Transportation Systems/Smart Mobility)

Event Name: Smart Transport in Smart City

Date: TBD Spring 2021

Website: <https://www.smart-transport.sk/>

Sector: (Automotive/Intelligent Transportation Systems/Smart Mobility)

Please check these link for any added conferences [Hospodarske Noviny](#) and [TREND](#)

Resources

ZAP - Automotive Industry Association of the Slovak Republic <https://www.zapsr.sk>

Electromobility Slovakia <https://e-mobility.sk/>

Tesla Magazine <https://www.teslamagazin.sk/>

Slovak Ministry of Economy <https://www.mhsr.sk/> or

<https://e-mobility.sk/wp-content/uploads/2020/08/Elektromobilita-v-%C4%8D%C3%ADslach-Q2-2020.pdf>

Slovak Ministry of Interior <https://www.minv.sk/>

Greenway Slovensko <https://greenway.sk>

European Alternative Fuels Observatory <https://www.eafo.eu/countries/slovakia/1751/summary>



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Capital: Madrid
Population: 46 million
GDP: 1.393 Trillion Euros
Currency: Euro
Language: Spanish

SPAIN

Electric Drive Vehicles Market Summary (includes hybrid electric, plug-in hybrid and electric, and fuel cell)

As a member of the European Union, Spain has committed to reducing its greenhouse gas emissions by 26 percent in 2030, and by 80 to 95 percent before 2050. Among other measures, the country will need to change the composition of its gasoline/diesel-powered vehicles and, above all, expand its electric charging infrastructure. Aside from electric vehicle prices and autonomy, extending the charging network is one of the most significant changes necessary for electric mobility to become a reality in the coming years. Spain is already far behind EU targets. For example, to comply with the EU's objectives, some 300,000 electric cars were needed by 2020, as well as 11,000 fast or semi-fast charging stations, as reported by the consultancy firm Deloitte. However, while production of cars in Spain for sale in Spain grew 80% in 2020 over that of 2019, it has been reported that there is only a total of 27,689 units of electric vehicles in use in Spain. As will be reference later, the majority of Spain's production is being sold outside of Spain.

A greater offer from manufacturers, aided, in the case of electric vehicles, by the possibility of subscribing to (few) plans with subsidies for purchasing vehicles, has pushed new vehicle registrations up. The number of electric vehicles currently on the road is in line with this market's annual volume of new vehicle registrations with strong growth over the last 3 years.

Further growth will be exponential: estimates show that by 2030, there should be close to six million electric vehicles and 50,000 charging points.

There has been very little competition in the Spanish market as there are few companies fully dedicated to the adaptability of vehicles. Since the enforcement of new European laws in 2018, there has been a great number of new companies dedicated exclusively to the manufacture of specialty vehicles in Spain, and in Europe in general. Others have only dedicated part of their work to this and have recently decided to have full dedication to the adaptation of all types of vehicles. Reports for the first quarter of 2020 estimate that USD 3,700,000 worth of Spanish medium and heavy-duty hybrid vehicles have been exported to the U.S.

While the numbers of electric/hybrid vehicles on the road in Spain are currently lagging, the popularity of hybrid vehicles (those that combine two sources of energy) and electric vehicles is on the rise. Sales of hybrid/electric cars went up in Spain, where the market share increased from 1.8% in 2018 to 4.5% in 2019. Spain is one of the leading EU member states in the "Eco-Electromobility" market. 74 Spanish automotive companies and technology centers have contributed to over 60% of European

Eco-Electromobility projects. Renault, Mercedes, Nissan, and Peugeot-Citroen are already producing full electric powered and hybrid vehicles in the country, and Comarth, a Spanish manufacturer, produces 100% full electric vehicles. For a list of private and public charging point locations in Spain:

<http://www.electromaps.com/puntos-de-recarga/mapa>

Current production of electric vehicle models in Spain for worldwide distribution include the following models (1 hybrid & 5 electric):

- Renault Twizy (45 & 85)
- Citroen Berlingo Eléctrica
- Peugeot Partner Eléctrica
- Nissan e-Nv 200
- Nissan EVALIA
- Ford Mondeo Hybrid

<http://www.ejinsight.com/20181203-plugging-spain-into-electric-cars/>

1. Local Resources/Contacts

- ACEM (Association des Constructeurs Européens de Motocycles), acem.eu
- ANFAC (National Association of Automobile and Truck Manufacturers), anfacs.es
 - SERNAUTO (Spanish Association of Equipment Manufacturers for the Automotive Industry), www.sernauto.es
- SEMA (Specialty Equipment Market Association), sema.org
- Cámaras (Spanish Foreign Trade Statistics), customs.camaras.org

Intelligent Transport Systems- Cybersecurity Opportunities in Spain

Cybersecurity should be incorporated into solutions and processes from their design stage, especially in critical sectors like transportation and mobility, alongside the physical safety features. However, given the challenges posed by the integration of Intelligent Transportation Systems (ITS) into larger complex environments like those related to Smart Cities, sharing economy business models, and legal requirements there are specific opportunities for US cybersecurity companies focusing in IT/OT environments. For example:

- Digital Customer Onboarding / Identity Verification Solutions, driven by sharing economy business models and fraud prevention.
- Compliance and risk assessment solutions, driven by legal requirements and risks posed by integration of networks in larger environments required by effective Intelligent Transportation Systems.

See the following reference on ITS in Spain (Foro de Nuevas Tecnologías del Transporte): www.itsspain.es

High Speed Rail

High-speed rail in Spain is currently made up of four main high-speed corridors along which various services run, as well as numerous lines under construction or in the pipeline. With approximately 3,400 km in service, it is the most extensive high-speed network in Europe and the second most extensive in the world, behind only China.

This network is served by a multitude of services by the operator Renfe, mainly AVE, Alvia and Avant; and since 2010, TGV of the French SNCF. Of all these, the best known are the AVE services. For this reason, high-speed trains in Spain and the railway lines on which they run are popularly referred to as 'AVE'.

The development of infrastructures and trains manufactured in Spain has allowed the acquisition of experience in the design, planning, execution and operation of projects that have made the United States want to use the Spanish high-speed rail network as an example to develop its own. Renfe recently won a private contract in Texas to develop the Dallas-Houston corridor.

Notably, in recent years there has been much doubt as to its profitability, with AIReF carrying out a study which states that the AVE is not profitable on any line, not even the Madrid-Barcelona line, and proposes diverting the money to other more necessary services such as the Cercanías and Regionales. This, together with the fact that the Minister of Transport, José Luis Ábalos, has stressed that AIReF's recommendations be listened to, casts doubt on the future expansion of the Spanish high-speed rail network.

Robotics

Spain launched the industrial digitalization initiative in 2016 called, Connected Industry 4.0, intended to provide a strategy to support companies in their digital transformation. The main objectives of the initiative include increasing industrial added value and qualified employment in the sector, favoring the Spanish model for future industries and the local supply of digital solutions.

As a government priority, the Spanish market provides good opportunities in the robotic and automation sub sectors where US exporters can be competitive. The new installation of robots in Spain reached 5,266 units in 2018 and is expected to increase in coming years. Spanish companies employ 160 robots per 100,000 workers, while 53% of companies in Spain are currently adopting robotic automation implementation processes.

The main industries using robots are the automotive industry followed by food and beverage, metal working, chemical, rubber, and plastics. In the automotive sector, which leads the use of industrial robotics, the most widely used are collaborative robots (cobots) and automatic guided vehicles (AGV), since they allow companies to optimize processes, achieve high productivity levels and increase competitiveness.

In the International context, Industrial Robotics will be a fundamental part of the 4th industrial revolution in Spain. The International Federation of Robotics forecasts that between 2019 and 2022, investments in industrial robotics in Spain will increase by around 10% on average every year.

Energy

Whether through renewable energy, alternate green fuel, and/or green transportation, Spain has committed itself to a clean energy transition, which will contribute to fulfilling the goals of the Paris Agreement on climate change and provide clean energy. The Spanish National Energy and Climate Plan (NECP) lays the foundation for a carbon neutral economy by 2050.

Under the NECP, by 2030, the Spanish government aims to reduce greenhouse gas emission by 23% compared to the 1990 level and be a carbon neutral economy by 2050. The plan focuses on achieving an ambitious goal of obtaining 42% of energy from renewable sources in gross final energy consumption and to generate 74% of its electricity from renewables in 2030. The proposed renewable energy share in the transport sector is above EU average at 22%.

Regarding needed investments, the plan quantifies a total of USD 274 billion during 2021-2030, annually around 2% of GDP, of which 20% would come from public sources. The figure covers key sectors, notably renewables, energy efficiency, grids and non-energy sectors, (i.e., transportation).

The Spanish government has also developed the county's "Hydrogen Roadmap: a commitment to renewable hydrogen" plan to contribute to achieving climate neutrality and a 100% renewable electricity system by 2050.

The European strategy contemplates three phases of renewable hydrogen development. The first phase, (2020-2024), is planned to have at least 6 GW of electrolyzers installed in the EU, plus up to one million tons of renewable hydrogen produced. Spain is planning to have electrolyzers - the system to obtain renewable hydrogen using water and electricity of renewable origin as raw materials - installed that produce at least 4 GW by 2030.

These measures outline the needed regulatory framework and sets goals for the next decade. As part of the plan to achieve installed capacity of electrolyzers of at least 4 GW includes renewable hydrogen powered transportation vehicles: a fleet of at least 150 buses; 5,000 light and heavy vehicles; and, two commercial train lines. It also implements a network with a minimum of 100 renewable hydrogen stations and machinery for handling propelled-with-hydrogen in the main five ports and airports.

Spanish companies are already beginning to invest in renewable hydrogen projects. Enagás, the Spanish energy company and transmission system operator that owns and operates the nation's gas grid, is planning the largest hydrogen plant in Spain. This installation would involve an investment of USD 309 million. The project consists of a 32 MW electrolyzer, powered by a 150 MW photovoltaic plant. There will also be a warehouse for daily production of 12 tons of green hydrogen and other associated infrastructure. To reach the ambitious objectives of the Spanish Hydrogen Roadmap, an estimated investment of over USD 10 billion will be required during the period 2020-2030.

Drone Technologies

UAVs or Remotely Piloted Aircraft System (RPAS) have been the subject of great growth in recent years; hence, the need for legal framework to enable further security developments. For this reason, a new regulation has been approved for drone usage that opens new operational scenarios, establishes the conditions that must be met by design, manufacturing and maintenance of aircraft organizations, as well as training requirements for piloting. Spain has been one of the pioneer countries in the development of drone regulations in Europe.

It has set the standard and introduced a broader and more comprehensive regulation with the entry of Royal Decree 1036/2017 of December 15, 2018 by AESA (State Aviation Safety Agency), under the Ministry of Public Works (Ministerio de Fomento).

Following the adoption of the final drone regulations, the Spanish Ministry of Public Works presented the "Strategic Plan for the Development of Drones 2018-2021", with the aim of stimulating the unmanned aviation industry in the years to come. The European Union adopted it in May 2019.

Spain currently ranks third in Europe in terms of unmanned aviation activity (16%), following behind France and Poland. One of the uses Spain found for drones is for city traffic control. The National Traffic Department (Dirección General de Tráfico-DGT) started using eleven drones in 2019, to fine those who violate traffic and road safety regulations. According to the DGT, "drones will be mostly intended for traffic surveillance in those places most at risk of accidents, on roads where there is increased traffic of vulnerable users (cyclists, motorcyclists and pedestrians), or for supervision of distractions while driving. The DGT is in the process of acquiring another twenty units that will be incorporated to the traffic surveillance and control systems. These devices are equipped with high-definition cameras that have a view range of seven kilometers and the capacity to run for approximately 20 minutes. The field of application of these types of devices is extensive and can help to improve safety and efficiency in many areas.

To guard against harmful/wrongful use, Spain has joined the AESA RPAS Advisory Commission, which includes representatives of the security sector to include companies, pilots, schools, customers and other relevant stakeholders and society representatives. The Commission aims to work for the safe development of this promising sector. For more reference please access the below links:

European Aviation Safety Agency Federal Aviation Administration - [Civil drones \(Unmanned aircraft\) | EASA \(europa.eu\)](#)

Drone Advisory Committee RTCA - [Drone Advisory Committee \(faa.gov\)](#)

Technical Aviation Advancements Association - Drone Advisory Committee
www.rtca.org/about/

Ebikes

72.2% of the companies in the sector are located in four communities: País Vasco (8%), Comunidad de Valenciana (9%), Comunidad de Madrid (16%) and Catalonia (39%).

Of the 1,104 brands in the sector marketed in Spain, 210 are national and are dedicated to maintenance (3.2%), road (5%), nutrition (7.5%), electronics (7.7%), helmets (10%), textiles (23.8%), bicycles (28.2%), accessories (37.3%) and components (42%).

Complete bicycles, with 43.79% of total sales, continue to be the leading category in the sell-in market. It is followed by bicycle components, which account for 32.01% of the total value. Textiles are slowly gaining traction with 8.39% of the sell-in volume and are the third largest category, followed by helmets with 4.55%, ahead of footwear with 4.10%.

For the first time since AMBE (bikes trade association) began keeping statistics (2014), the total sales of bicycles in units has decreased, specifically by 6%. However, the total volume of business with the Tecosystem (bicycles, components, accessories, textile, helmets, etc.) has continued to grow. Growth in 2020 was greater than 5%, motivated mainly by the increase in the average price of bicycles (17%), due in large part to the upward drag effect of pedal-assist bicycles.

In bicycle sales, three very relevant data stand out: 1) Mountain bike sales continue to decline (-11%); 2) Kids bikes have decreased 15%; 3) The only segment that is growing at a more remarkable rate is pedal-assisted bicycles (54%), which now exceed the number of units sold of road bicycles and are very close to city bicycles.

In sales value by type of bicycle measured, the rise in sales of electric bicycles is very notable, with a growth in value of 116.7% in the period 2015-2020.

Finally, although the number of stores and retail employment decreased, 2% and 1%, respectively, the average surface area of the stores increased by 10%. In the manufacturing and importing/distributing sectors, companies net employment has increased nearly 6%, which translates into an increase in employment in the sector as a whole (+1.72%).

Resources

www.hibridosyelectricos.com

[Las ventas de bicicletas eléctricas se disparan un 54% en España - Bicicletas eléctricas - Híbridos y Eléctricos | Coches eléctricos, híbridos enchufables \(hibridosyelectricos.com\)](#)

www.Hibridosyelectricos.com

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TURKEY

Summary

Turkey's geographic location at the crossroads of Europe and Asia and Turkey's Customs Union agreement with the EU make it an ideal hub to penetrate markets in Central Asia, the CIS and the Caucasus for automotive manufacturers. The automotive sector plays an important role in the manufacturing sector of the Turkish economy. Turkey is the 15th largest Automotive manufacturer in the world and 5th largest in Europe. The automotive industry employs more than 500,000 people, and it is the production, export, and engineering hub of global brands for international markets.

Most international vehicle producers manufacture in Turkey. Currently, there are 16 automotive manufacturing companies; including foreign investors such as Ford, Fiat, Honda, Hyundai, Renault and Toyota, Mercedes-Benz and M.A.N, manufacturing various types of vehicles, through joint venture partnerships with local firms, direct investment, or license agreements. In addition, Turkey's Automobile Joint Venture Group (TOGG), is seeking to become the first Turkish automaker. TOGG plans to launch an electric C- segment SUV by the end of 2022. The construction of TOGG's facility started in 2020 and it is expected to be completed in 2021. The factory is expected to have the capacity to produce up to 175,000 vehicles per year. The facility will include R&D centers and a customer experience park. In addition, according to the latest announcement of TOGG, battery cells will be provided by Farasis and the battery modules and packs will be jointly developed and produced in Turkey. The company is expected to employ more than 4,000 staff.

Given Turkey's increasing population – now over 80 million – and inward migration to larger cities from rural areas, traffic has become a crucial issue, compelling local municipalities to invest heavily in Intelligent Transportation Systems (ITS). As a result, Turkey has doubled its transportation industry investment budget from 20% to 40% and invested more than \$60 billion over the last decade. This sector is dependent on critical foreign technologies such as ITS, thus providing opportunities for U.S. firms. Some of the implementations of ITS in metropolitan areas are the following: speed detection systems, red light violation detection, bus route control, traffic density tracking, automatic license plate recognition and scanning systems, passenger information systems, electronic payment systems, smart intersections, smart stop, and smart parking.

Some major metropolitan cities have invested in mobile software to support ITS. These include the EGO Cepte application of the Ankara Metropolitan Municipality, the IMM CepTrafik and MOBİETT applications of the Istanbul Metropolitan Municipality, Mobile Application of the Izmir Metropolitan Municipality, and BURULAŞ application of the Bursa Metropolitan Municipality.



Capital: Ankara
Population: 83 million (2020)
GDP: US\$650 billion
Currency: Turkish Lira
Language: Turkish

Market Entry

American products compete with European products that maintain price advantages because of lower transportation and logistics expenses, and zero customs duties. Turkey is also a member of the EU Customs Union. In addition, American companies compete with cheap Asian products. In some segments of the industry, such as automotive chemicals and lubricants, the easiest way for an American supplier to overcome the freight disadvantage is to ship its products in bulk and have the products repackaged for retail in the local market. They may also bring products in a concentrated form, add ingredients and then package them in Turkey. This is how most American companies are successful in the market.

Major procurements are realized by private business. However, large fleets of vehicles owned by the municipalities and the central government are also important to the sector. Suppliers' agents play an essential role in marketing and sales. In fact, because of the complicated import procedures, it is almost impossible to sell without a competent agent in the country. In Turkey, agency/representation/distributor agreements are private contracts between agents and their foreign suppliers. There are no unusual regulations which govern commission rates or termination. However, in the automotive aftermarket sector, a commission rate of 5-10 percent is most common. Representatives provide proforma invoices to the importers, including their commission in the price, and expect the foreign supplier to reimburse the commission amount to their account after the sale is realized.

According to the Under Secretariat of Foreign Trade of the General Directorate of Imports, the importation of used or reconditioned parts for automobiles and/or vehicles is prohibited in Turkey. The Turkish Government only permits limited importation of used equipment or machinery. Items permitted for importation are listed and published in the official Gazette. Used or reconditioned parts for automobiles and/or vehicles are noticeably absent from this list.

Current Market Trends & Demand

There is a wide variety of vehicle models available in Turkey, however the market is dominated with European brands, also increasing the need for European parts. In addition to the large number of models manufactured in Turkey, a significant large number of models are imported. Almost all the models from every brand and any technology related to the EVs have a good market in Turkey.

Electric vehicles: Electric Vehicles (EV's) and hybrid vehicle market is growing in Turkey. According to the Turkey Electric and Hybrid Vehicles Association, TEHAD, data, 4,031 hybrid and electrical vehicle sold in 2018. In 2019, new brands and models entered the market and electrical vehicles

sales tripled to 11,237 units, of which 222 were 100% electric and the rest were hybrid. According to the ODD, first nine months EV sales in 2020 are totaled 12,011 of which 261 were 100% electric. When the first nine months of 2019 and 2020 are compared, EV sales increased up to 53.7% and hybrid vehicle sales increased by 103.9%. There are more than 1,600 electric vehicles on the roads and approximately 800 charging stations located in Turkey.

Electric Bikes: Some cities like Eskisehir, Antakya, Hatay, Ankara, Istanbul, Izmir and others are extending their bicycle routes in Turkey. For instance, Izmir was the first city to initiate the Bicycle Master Plan in Turkey and extended its bicycle route from 39 km to 52 km and plans to further extend the route to 90 km. Citizens can rent one of 550 bicycles that present in 40 bicycle stations around Izmir. E-Bikes is small but a developing sector in Turkey. E-bike manufacturers focus on exporting to the EU markets believing that they will have a price advantage after the EU's Anti-Dumping Duties implemented on E-Bikes imported from China. In general, Turkey imports e-bike motors and batteries from Bosch-Germany, Shimano-Japan and Bafang-China. Some of the E-bike brands that are being used in Turkey are; Benelli, Peugeot, GeoTech, Carraro, Kron, Salcano and Bianchi.

Intelligent Transportation Systems (ITS): ITS are being installed in many cities in Turkey. However, except the major cities, such as Istanbul, Izmir, and Ankara, the majority are only in initial phases. Some of the implementations of ITS in Turkey are the following: traffic management systems, smart bus stops, on-line traffic density map, e-payment cards, shared bicycle and electric scooter systems. The Ministry of Transportation & Infrastructure stated in its 2013-2023 Action Plan that all cities will implement smart traffic light systems. In August 2020, the Turkish Presidency issued a decree for the implementation of a smart transportation system across the country. The decree lays out an action plan by the Ministry of Transportation & Infrastructure with the goal to improve traffic safety and travel comfort with widespread intelligent transportation systems applications, maintain uninterrupted traffic flow conditions, and to create a sustainable system integrated with all modes of transportation including the development of a nationwide payment system that will allow passengers to travel in all types of mass transit. Additionally, the Ministry plans to establish provincial traffic control centers where traffic will be monitored from a single point and data will be gathered for reducing traffic jams. According to the decree, Turkey also plans to establish smart parking lots and add charging stations for EV's in parking lots.

Currently, all smart transportation projects are planned and executed by local municipalities; however, while some use their own resources, others use local and foreign funding resources. Since there is no central ITS institution, it is not possible to obtain the total amount of spending or planned spending for all projects in Turkey.

Best Prospects for U.S. Exports / Opportunities

- 1) Intelligent Transportation Systems (ITS) Opportunities
 - o 5G Technologies
 - o Connected and Automated Technology
 - o Cybersecurity
 - o Internet of Things (IoT)
 - o Traffic Management Systems & Sensors
 - o Vehicle-to-Everything (V2X) Communication
 - o Vehicle-to-Infrastructure (V2I) Communication
 - o Vehicle-to-Pedestrian (V2P) Communication
 - o Vehicle-to-Vehicle (V2V) Communication

- 2) Automotive Technology Opportunities
 - o Autonomous Vehicles
 - o EV software systems, including charging station software
 - o EV battery technologies
 - o EVs
 - o Hybrid / Electric / Alternative Fuel
 - o Vehicle Technology

In-Person or Virtual Events

Event Name: Automechanica Istanbul (In-Person)

Date: April 8-11, 2021

Website: <https://automechanika-istanbul.tr.messefrankfurt.com/istanbul/en.html>

Sector: (Automotive/Intelligent Transportation Systems/ICT/etc.)

Event Name: International Automotive Industry, Spare Parts, Accessories and Service Equipment Exhibition (In-Person)

Date: May 27-29, 2021

Website: <http://cnrotomotivfuari.com/index.aspx?ln=2>

Sector: (Automotive/Spare Parts/Accessories/etc.)

Resources

ODD – Automotive Distributors Association: http://www.odd.org.tr/web_2837_1/index.aspx

OSD – Automotive Manufacturers Association: <http://www.osd.org.tr/>

TEHAD - Turkey Electric and Hybrid Vehicles Association: <http://tehad.org/>

KPMG Turkey - <https://home.kpmg/tr/tr/home.html>

TAYSAD- Automotive Suppliers Association of Turkey: <https://www.taysad.org.tr/en>

Turkey, Ministry of Transport and Infrastructure, National ITS Strategy Document: <https://www.uab.gov.tr/uploads/announcements/ulusal-akilli-ulasim-sistemleri-strateji-belgesi-v/ulusal-akilli-ulas-im-sistemleri-strateji-belgesi-ve-2020-2023-eylem-plani-eng.pdf>



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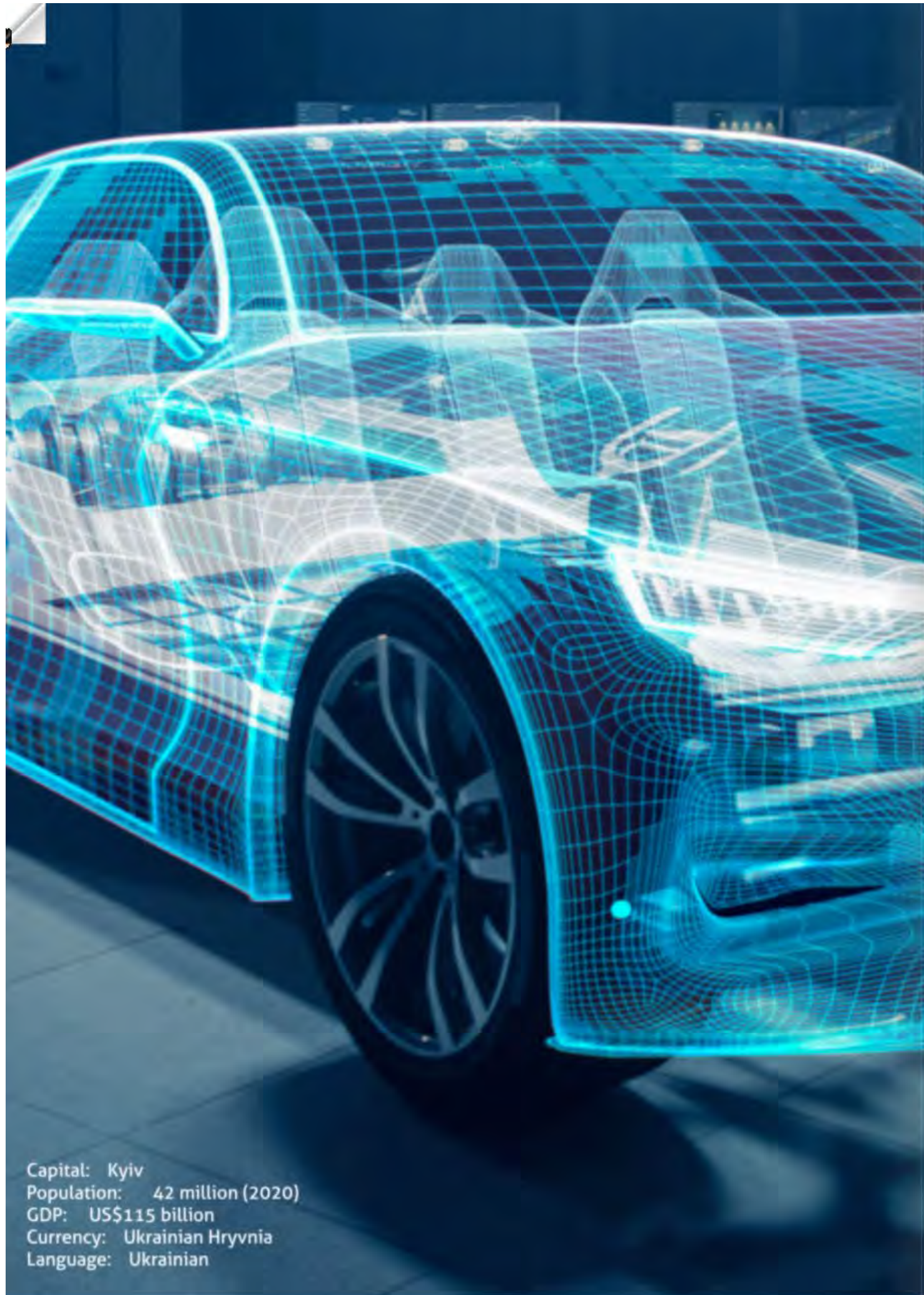
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Capital: Kyiv
Population: 42 million (2020)
GDP: US\$115 billion
Currency: Ukrainian Hryvnia
Language: Ukrainian

UKRAINE

Summary

Ukraine, with a population of more than 40 million, used to be one of the largest automotive markets in Central and Eastern Europe. However, since 2008, the global financial crisis and conflict with Russia have taken a toll on the economy and the car market. In 2020, only 85,500 new passenger cars were registered in Ukraine, which is 3% less than in 2019, according to the Ukrainian Motor Vehicle Manufacturers Association (Ukrautoprom). Today Ukraine is one of the smallest European car markets, with annual sales below those of Slovakia. It is especially remarkable considering Ukraine's large population. Poland, which has a population of comparable size, has annual car sales that are 5.5 times larger than those of Ukraine. Ukraine's car penetration, at 185 per 1,000 people in 2020, is well below that of Poland (530 per 1,000), and much lower than in its other Eastern European neighbors, Hungary and Slovakia. Ukrainians prefer imported used cars to new cars (the ratio is approximately 4:1). In 2020, the most popular imported used cars were Volkswagen Passat, Renault Megane, Skoda Octavia, Volkswagen Golf, and Ford Focus.

Ukraine's car market is small, turbulent and fragmented, and market shares are volatile. Previously, the market was dominated by Russian and Ukrainian brands, but domestic production has collapsed because of fighting in the east, while the Ukrainian government has worked to sever economic ties with Russia. In early 2020, Ukraine's domestic motor-vehicle industry shows little sign of a sustained rebound. The country produced 423,127 vehicles at a peak in 2008, but this figure has plunged by over 95%. Any recovery in demand is likely to benefit imports more than domestic manufacturing. Still Ukraine has a strong industrial base, an inexpensive, skilled workforce and a large, underserved market that could remain attractive for investors.

In the era of digitalization and Industry 4.0, Ukraine is growing a reputation as an important center of innovation and Research & Development, with a number of its renowned IT companies serving the leading global OEMs and Tier 1 suppliers. Today new investment opportunities are being explored, such as electric vehicles and batteries, with Ukraine possessing the world's largest reserves in lithium.

Market Entry

Buying and importing a car from the United States is quickly becoming a popular option for buyers in Ukraine. U.S. companies interested in expanding to the Ukrainian market should identify a local partner for effective marketing and sales distribution. This can be done via an established distributor with complementary product lines or a joint venture partner for joint distribution. In any case, due diligence on a potential local partner is highly recommended.

There are no restrictions on the import of passenger cars and parts from the United States. Due to Ukraine's Deep and Comprehensive Free Trade Agreement (DCFTA) with the European Union (EU), U.S. exporters will need to meet EU regulations and be certified accordingly.

In 2019, the Verkhovna Rada (parliament) proposed cancelling the excise tax on new automobiles, arguing that high taxes in addition to import duties make even the cheapest car unaffordable for local consumers. However, the fiscal constraints caused by the coronavirus make such a step less likely now. Customs duties for automotive parts and accessories imported from abroad are ten percent. The value added tax (VAT) for automobiles in Ukraine is 20 percent and is applied to all imports. Also, there is an excise tax based on a car's engine capacity and age, as well as a base tariff. Trade restrictions or other non-tariff barriers (such as quotas) do not exist. Shipping costs to Ukraine from the United States start at \$2,400 for basic cars and go up to \$5,200 for larger vehicles and premium services. There are additional costs that apply once the car arrives, both for import taxes and registration fees. For temporary stays in the country, vehicles are granted two months in Ukraine before they must be registered with the Ministry of Internal Affairs. Vehicles that are shipped to Ukraine must have been manufactured in the past five years.

Current Market Trends & Demand

There is a wide variety of vehicle models available in Ukraine, however the market is dominated by European brands, also increasing the need for European parts. Imported global marques have come to dominate the market over the past few years, especially since Ukraine lies just east of the major production hub comprised of the Czech Republic, Slovakia and Hungary. Renault (France), one of AvtoVAZ's owners, has been scoring spectacular gains over the past year and is now vying with Toyota (Japan) for first place. Both hold more than 15% of the Ukrainian market. No other brand has a double-digit share of the market. Several are closely bunched up, including Nissan (Japan, Renault's alliance partner), Skoda (Czech Republic, part of Germany's Volkswagen Group) and Kia (South Korea).

Although small, the market is open and has a large number of players with annual sales of only a handful of units. Ukrainians are also discovering cheaper brands, such as Suzuki (Japan) which is manufactured in Hungary. Ukraine may prove a fertile ground for Chinese proprietary brands, of which Chery has been the most successful. However, Ukrainian buyers continue to prefer large cars. In 2020, three sports utility vehicles (SUVs) or crossovers, the Renault Duster, the Kia Sportage and the Toyota RAV4, remained the top sellers in the Ukrainian market. This reflects the poor quality of roads and great distances. Safety is also a consideration, as highway fatalities per 100,000 vehicles in Ukraine are more than twice as high as the European average.

For a country with such a low disposable personal income per capita (measuring just over US\$2,000 in 2019), the premium segment is fairly large, which points to enduring corruption. In 2019 the three German premium brands, Mercedes, BMW and Audi, controlled 6.8% of the market, with Lexus and Infinity (both Japanese), Jaguar and Land Rover (UK), Porsche (Germany) and Volvo (Sweden) adding another 5.7%.

Best Prospects for U.S. Exports / Opportunities

Electric vehicles : Ukraine's electric car market has shown significant growth in recent years. In 2020 the number of electric cars registered in Ukraine has grown by 375% since 2018. . As of August 2020, 43,882 electric vehicles were registered in Ukraine (together with hybrids). Half of them – only electric cars (21,836). An interesting trend has emerged in connection with the pandemic - people have become more interested in hybrids. Ukrautoprom attributes this to the fact that people who are afraid of electric vehicles because of the dependence on charging network, consider hybrid technology more secure because these vehicles can also be filled with regular fuel. Therefore, consumers see fewer risks in purchasing such equipment. However, Ukraine has the biggest number of public charging points compared to its nearest EU neighbors – over 8,500 (a 57% increase in 2020 compared to the same period in 2019). It is estimated that by 2025 there will be over 50,000 EVs registered in Ukraine.

As for Ukrainians' preferences, they mainly prefer used cars. The average age of electric vehicles imported into Ukraine is about 5 years old. Cars under 1-year-old are only 1% of all imported cars in the last year.

Unlike in other European countries, Ukraine's government doesn't provide any subsidies to stimulate electric vehicle sales. The only incentives offered are VAT excise and customs duties exemptions for imported electric vehicles, which will remain in effect until 2022.

In 2019, the President of Ukraine signed the Law of Ukraine No. 2754-VIII which simplifies the rules pertaining to electric vehicles (EV) on Ukrainian roads. The Law, which entered into force in 2020, establishes fines (from EUR 11 to 17) for owners of regular vehicles for parking in, or blocking, parking spaces dedicated for EVs, including the right to tow-away the vehicle to a police compound. Furthermore, according to the Law, parking spaces for EVs are marked with new special signs and EVs receive distinct license plates. These rules are aimed at preventing regular cars from congesting or blocking EV parking lots, including charging stations.

These changes bring Ukraine closer to compliance with international standards in EV infrastructure.

Intelligent Transportation System: On June 1, 2020, the Ministry of Internal Affairs of Ukraine introduced the first 50 video cameras in Kyiv and the region to monitor traffic speeding cases. On January 1, 2021, three more cameras were installed on the M-06, Kyiv - Chop route. The system detects road incidents and issues electronic speeding tickets.

In January 2021, the State Road Agency of Ukraine "Ukravtodor" launched the first three sites for the Weigh-in-Motion (WiM) system. The system will detect overloaded cargo vehicles and issue fines in cases where violations occur. The Ministry of Infrastructure of Ukraine plans to implement 150 WiM sites throughout Ukraine by the end of the year.

Smart Ticket: Several Ukrainian cities including Kyiv, Kharkiv, Dnypro, Ivano-Frankivsk, Vinnytsa and Chernyiv have tested and implemented a public transportation e-ticket system. Public transport in Kyiv is equipped with GPS technology that allows citizens to monitor transport movement via an application called EasyWay. Bus stops are equipped with displays indicating the wait time for various routes.

In September 2020, Ukraine introduced a single ticket system that allows one to plan a trip using various types of transportation and have a single QR code ticket. The system analyzes and offers the best route and finds tickets up to an hour before departure. The system integrates rail, air, and public transportation within the country. Over time, it will include international travel options.

Aftermarket Sales: The aftermarket in Ukraine has been actively developing, particularly in online sales. Most of the spare parts in Ukraine are imported (88 percent). In 2020 the total sales of imported spare parts reached \$450 million. The top five exporters were China, Germany, Russia, Belarus, and Turkey.



Most spare parts are imported by distributors and trading companies. The top four sales segments are suspension parts, oils, filters, and tires. As the number of used cars has grown in Ukraine, owners of these cars prefer to purchase low-cost products, increasing the average order size by 10-15%. Experts predict that aftermarket online sales will continue to grow in 2021, reshaping the market in the coming years.

E-Scooter Rental in Ukraine: E-Scooter Rental introduced by Bolt taxi service emerged in Ukraine in 2020. According to Bolt, 93% of Ukrainian users gave the rental service an excellent rating. Bolt is planning to launch the service in other cities of Ukraine and is looking forward to the opening of the new season in spring 2021. Bolt management intends to improve the quality and availability of electric scooter rental service in Kyiv and increase the number of such micro-vehicles. Previous successful experience indicates that users willingly support the development trend of environmentally friendly transport infrastructure. According to the service, in 2020, the average ride time on a Bolt scooter was 21 minutes, and the average distance was 9 km per ride.

The rental of electric scooters is one step toward fulfilling Bolt's long-term environmental strategy. Bolt plans to offset at least 5 million tons of carbon emissions by 2025 through the Green Plan program. In Ukraine, Bolt's taxi services are available in Kyiv, Kharkiv, Odesa, Dnipro, Zaporizhia, Vinnytsia, Poltava, Ivano-Frankivsk, Kryvyi Rih and Lviv. According to the Bolt app, it costs UAH 29 (\$1) to unlock the scooter, followed by a UAH 4.9 (\$0.2) per minute fee.

Kiwi Scooter Rental in Ukraine: Dutch startup Kiwi announced on its Instagram page that it has rolled out the rental of electric scooters in Kyiv on September 13, 2020, only a month after the Estonian transportation company Bolt began to offer analogous services to Kyiv's commuters. Kiwi's headquarters are located in Odesa, but the company itself belongs to Dutch innovative technology startup developer Extra Watts. So far, Kiwi operates only in Ukraine and their projects are mostly based on the rental of scooters. Kiwi says that it plans to enter more cities with more types of vehicles, according to its website. As with most other rental vehicles, to start their ride a user has to open the Kiwi mobile app, available for Android and IOS devices, and scan the QR code located on the scooter. Similarly to Bolt, a map appears in order to help locate available scooters. The map is divided into three zones: green, yellow and a deadzone. Customers can drive the scooters in green and yellow zones but are obliged to park them only in the green zone. The app also introduces the Kiwi Wallet, or a balance account, where the users have to purchase a payment plan before their ride. The available packages vary from UAH 200 (app. USD 7) to UAH 1,000 (app.\$36).

Although from a distance one can't really tell the difference between the two lime green scooters of Kiwi and Bolt, Kiwi's services are cheaper than Bolt's. According to the Kiwi app, it costs UAH 15 (\$0.5) to unlock the scooter, followed by a UAH 2.5 (\$0.1) per minute fee.

Scroll Scooter Rental in Ukraine: Scroll, an electric scooter rental service, was launched in Kyiv in October 2020. According to Scroll, this service comes from Georgia. Besides Kyiv, it already operates in Tbilisi and Batumi. The partner of the company, indicated on the website, as well as on each scooter, is the American company Bird. For a ride, you need to download and sign up in the Bird application (available for iOS and Android).

Car-sharing in Ukraine: Electric Nissan Leaf or a small Ravon R2 are spread across central Kyiv and Odesa and can be rented by the minute, and simply unlocked with a mobile app. The service is called free-floating car-sharing, and its customers can pick up and return the vehicle anywhere within a certain area. Free floating cars are mainly used for short one-way trips (shopping) or other (leisure) in city areas. And while foreign free-floating providers are mostly big enterprises like German BMW or Russian Yandex, which view their investment in such services as a channel to promote their brands and not to reap a profit, Ukraine's car-sharing businesses are run by two entrepreneurs. These two local pioneers are already up and running in Odesa and Kyiv, and despite difficulties, they are happy to be the first to fill this niche in Ukraine.

MobileCar in Odesa was the first to try out the car-sharing business model in Ukraine. The company bought 40 electric Nissan Leafs and parked them around Odesa. MobileCar's users can pick up cars whenever they find them, drive around the town, and leave the cars in the downtown area. To use the car-sharing service, users have to download the MobileCar mobile application and register, uploading photos of the user's passport (or a residence permit) and a driver's license. As soon as it's done, all newcomers receive a call from an instructor, who makes an appointment to teach them how to use the cars and brings a contract to sign. That's the last offline experience for the client, as the company provides the rest of its services exclusively via its app. In the app, car-renters find a car on the map and reserve it. Booking a car is free for the first 20 minutes, followed by a \$1 fee for every 20 minutes thereafter. Clients then go to the car, unlock it through the app, and start using it. It costs \$7 per hour to drive the car. It can also be rented for a day (\$35) or even a week (\$22). The iOS or Android app is linked to the client's bank card and automatically charges the fee. MobileCar maintains its electric cars itself, charging and washing them. No deposit is needed, and anyone with three years of driving experience can use the service. Those who rent cars for long periods will have to charge them themselves, however. Charging stations can be found in the app. The first charge is free, but all subsequent charges cost \$4. A Nissan Leaf can run for up to 135 kilometers, or 85 miles, on a single charge. The cars are insured, but users have to pay the first \$300 of repair costs if they are involved in a road accident. MobileCar business is thriving in Odesa and is planning to expand its fleet of electric cars and encourage more people to use them.



Getman car-sharing in Kyiv. Six months after MobileCar launched in Odesa, in January 2018 Getman came up with Getmancar, investing in 100 small hatchback Ravon R2 cars. These are light vehicles with automatic transmissions, designed for cities, with four airbags, and petrol engines. The service in Kyiv works in a similar way to MobileCar, via an app, but has different tariffs and has a further limit – only adults older than 25 years old can use the service. Getmancar has three tariff plans: \$2 for 70 minutes and then 25 cents per kilometer; \$7 for three hours and then 18 cents per kilometer; \$22 for a day and 16 cents per kilometer. Getmancar pays for the petrol, but users have to fill up the car. Ukraine's OKKO gas stations will provide gas for free, while to fill up at other chains drivers will have to take a photo of the receipt and send it to Getmancar support to get a reimbursement.

Getman believes that Kyiv, with its population of 3 million potentially has the demand for 3,000 ready-for-sharing cars. According to Getman, 10,000 people have already downloaded and installed the Getmancar mobile app since the service's launch in January. Getman car-sharing service is for middle class people who are looking for alternatives to three things: taxis, traditional car rentals, and car ownership. The company next plans to introduce dynamic tariffs that change in accordance with how long the car is used; paid parking for the cars so that they are not just used in the city center; and add luxury cars to the service.

2021 In-Person or Virtual Events

- Kyiv Smart City Forum <https://forum.kyivsmartcity.com/en>
- Kyiv Smart Mobility <https://www.kyivsmartcity.com/en/kyiv-smart-mobility-2/>
- AutoTechService <http://ats-expo.com.ua/>
- KyivCar Expo 2021 <https://www.facebook.com/kyivcarexpo>

Resources

- UkrAutoProm Association: <https://ukrautoprom.com.ua/en>
- UkraineInvest: <https://ukraineinvest.gov.ua/industries/automotive/>
- The Economist Intelligence Unit:
http://industry.eiu.com/handlers/filehandler.ashx?issue_id=1119363095&mode=pdf
- Emerging Europe:
<https://emerging-europe.com/business/electric-cars-see-big-increase-in-popularity-in-ukraine/>
- Kyiv Post:
<https://www.kyivpost.com/ukraine-politics/new-passenger-car-market-in-ukraine-starts-2020-year-with-33-growth.html>
- Global Legal Monitor:
<https://www.loc.gov/law/foreign-news/article/ukraine-new-law-makes-charging-stations-more-accessible-and-requires-designated-lanes-for-electric-vehicles/>
- The Economist: <https://www.eiu.com/industry/automotive/europe/ukraine>
- Ukrinform: Ukrainians purchase over 7,500 electric vehicles in 2019 (ukrinform.net)

- Kyiv Post: Bolt ends e-scooter rental season, plans to expand service geography in Ukraine in 2021 | [KyivPost - Ukraine's Global Voice](https://www.kyivpost.com/technology/car-sharing-industry-could-make-significant-inroads.html?cn-reloaded=1)

• Kyiv Post:
<https://www.kyivpost.com/technology/car-sharing-industry-could-make-significant-inroads.html?cn-reloaded=1>

• Kyiv Post:
<https://www.kyivpost.com/business/another-electric-scooter-rental-enters-kyiv.html#:~:text=Kiwi's%20headquarters%20are%20located%20in,on%20the%20rental%20of%20scooters.>

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UNITED KINGDOM

Summary

The automotive industry in the United Kingdom is one of the nation's largest manufacturing sectors. In 2019 the sector generated more than \$136 billion in total trade for the third consecutive year, comprising approximately 0.8% of the UK's whole economic output, and 8.5% of its manufacturing output.

Exporting vehicles, engines and components to more than 150 countries worldwide across all continents, the automotive industry holds the lead as Britain's largest exporter of goods by a considerable margin and supports 823,000 jobs in the UK.

The UK automotive industry welcomed the post-Brexit trade agreement reached between the UK and the European Union, which will avoid the introduction of tariffs on cars and car parts. The automotive industry repeatedly pushed for a tariff-free trade deal, which was vital given the frequent movement of both car parts and completed vehicles across the UK-EU border. The majority of UK-produced automotive goods that are exported are destined for the EU, and 7 out of 10 vehicles bought by UK consumers come from the EU.

The UK is a major center for engine manufacturing and in 2019 over 2.5 million engines were produced in the country. In 2019, over 1.3 million cars were manufactured in the UK, of which 85% were exported. The UK automotive industry is best known for premium and sports car brands including Aston Martin, Bentley, Jaguar, Lagonda, Land Rover, Lotus, McLaren and Rolls-Royce. Volume car manufacturers with a major presence in the UK include Ford, Honda, BMW Mini, Nissan, Toyota and Vauxhall Motors.

Market Entry

The UK has no significant trade or investment barriers and no restrictions on the transfer of capital or repatriation of profits. Partnering with an experienced and well-established UK distributor or manufacturer is the most effective method for U.S. companies to enter the UK market. It is advisable to demonstrate a clear value proposition and competitive advantage (i.e. price, quality, branding). U.S. exporters of vehicles, Original Equipment (OE) parts & components, as well as aftermarket products & accessories to the UK and to the EU must undergo a thorough assessment of, and ensure compliance with, existing UK regulations (which, it is anticipated, will mirror the EU directives for the foreseeable future).

In addition to compliance with the legal requirements, U.S. exporters of automotive parts are advised to assess and obtain evidence of compliance with relevant technical norms and standards. A certified management system is required for access to new markets and customers in the UK and Europe. One of the automotive industry's most widely used international standards for quality management is ISO/TS 16949 (under revision, transition to IATF 16949 is in progress), which defines the quality management system requirements for the design and development, production and, when relevant, installation and service of automotive-related products.

Current Market Trends & Demand

New car and commercial vehicle sales will not return to any version of pre-Coronavirus normality in 2021. The UK automotive sector is under heavy pressure through cash flow, debt, unemployment, and productivity issues. The entire automotive supply chain is running slower or inactive due to social distancing, and a restart to pre-Coronavirus operations will be more complex than shutdown.

One silver lining for the automotive sector in a post-Coronavirus world could come from a recent survey by Ipsos MORI that suggests that the automotive market may not be as depressed as had been feared. The survey showed that one in three consumers in Europe's top five markets are willing to buy a new vehicle, and the main reason for continued vehicle demand is the safety and protection a personal vehicle can provide, rather than travelling via public transport. Before the pandemic, consumers showed greatest interest in crash prevention (e.g., ADAS, warnings, alerts, etc.) and personal security (connectivity, cybersecurity, etc.) features, enhancing standard crash protection features. Now, consumers want their vehicle also to provide a 'safe environment' that is as hygienic as possible and includes: air filtration, antibacterial surfaces and methods to disinfect the interior. This enables the consumer to be in control of the vehicle to make the interior 'clean and safe.'

The UK Government has a very ambitious Green agenda, and in November 2020 the Government's Road to Zero strategy set the "ambition" that by 2050 almost every car and van will be zero emission. The Government has brought forward its planned date for ending the sale of petrol and diesel vehicles from 2040 to 2030 and for hybrid vehicles to 2035.

The UK's shift towards electric vehicles has been slower than that of some countries, but with the advent of more advanced technology increasing the range and efficiency of EVs, and with UK government policy pushing a green agenda, the UK has seen a dramatic increase in consumers purchasing EVs. In 2020, Battery Electric vehicles saw a 165% increase over 2019 sales and this trend will most likely continue. Strong research industry within the UK has allowed the British automotive sector to stay relevant with fast-changing technology. Big manufacturers in the UK, such as Nissan, Jaguar Land Rover and BMW produce EVs at UK facilities. Batteries make up roughly 40 percent of the total cost of a new EV and they will play a pivotal role in the UK automotive sector in the future. While some manufacturers already produce or source batteries produced in the UK, the UK automotive industry must scale up its efforts in order to compete on the global stage. Even though EVs have been available in the UK for decades, the take up on this form of travel combined with autonomous driving technology presents robust business opportunities across a wide variety of technologies that support EVs and autonomous driving solutions.

Best Prospects for U.S. Exports / Opportunities

In promoting innovation in urban mobility for freight, passengers and services, the UK Government's Industrial Strategy for Mobility urges industry to provide:

- Mobility innovation that reduces congestion.
- Mobility services designed to operate as part of an integrated transport system.
- Mobility services that lead the transition to zero emissions.
- Mobility services that ensure active travel remain the best options for short urban journeys.
- Data from mobility services that is shared to improve choice and operation of the transport system.

In November 2020 the British Government announced that it would invest \$1.6 billion in charging infrastructure and consumer incentives. Specifically, funding will be provided for:

- Rapid EV charging hubs at every service station on England's motorways and major roads.
- Plug-in car, van, taxi, and motorcycle grants
- Charge point installation at homes, workplaces and on-street locations.
- EV charging infrastructure to support on-street charging programs and rapid charging hubs.

Accordingly, the best prospects for U.S. companies seeking to take advantage of opportunities offered in the UK automotive sector lie with providing novel solutions for:

- Journey planning
- Home charging
- On-street charging
- Destination and journey charging
- Payment of charging
- Vehicle sharing programs
- Batteries (high capacity, rapid charging, sustainable)
- Electricity usage arrangements with power companies
- Data connectivity
- Cyber security
- Automation and autonomous solutions
- Artificial intelligence

2021 In-Person or Virtual Events

Event Name: Automotive Management Live

Date: 20-21 January 2021

Website: <https://www.automotivemanagementlive.co.uk>

Sector: Automotive retail

Event Name: The Commercial Vehicle Show

Date: 8-10 June 2021

Website: <https://cvshow.com>

Sector: Commercial vehicle transport

Event Name: Smart City Summit

Date: 16-17 March 2021

Website: <https://smartcitysummit.co.uk>

Sector: All aspects of smart city applications

Event Name: Intelligent Mobility (TBD)

Website: <https://www.intelligentmobilityevent.com>

Sector: All aspects of intelligent mobility

Event Name: Smart Transport Conference (TBD)

Website: <https://conference.smarttransport.org.uk>

Sector: Comprehensive industry engagement discussing smart transportations and smart cities

Event Name: Smart Cities UK (TBD)

Website: <https://www.smartcityuk.com>

Sector: All aspects of smart city applications

Event Name: automechanika Birmingham

Date: June 2022

Website: <https://www.automechanika-birmingham.com>

Sector: All segments of the automotive/intelligent transportation industry

Resources

Society of Motor Manufacturers and Traders (SMMT) – Trade association and events organizer

<https://www.smmt.co.uk>

Electric Drive Transportation Association (EDTA) – Trade association and events organizer

<https://electricdrive.org>

Engineering Industries Association – Supports the engineering manufacturing sector

<http://www.eia.co.uk>

Renewable Energy Association – Represents the renewable energy and clean tech industry

<https://www.r-e-a.net>

Automotive Council UK – Coordinates automotive industry engagement

<https://www.automotivecouncil.co.uk>

CLEPA – European Association of Automotive Suppliers <http://clepa.eu>

Advanced Propulsion Centre – Supports transition to net-zero emissions <http://www.apcuk.co.uk>

Office for Zero Emission Vehicles – Government team working to support transition to zero emission vehicles <https://www.gov.uk/government/organisations/office-for-zero-emission-vehicles>

HM Revenue & Customs - Classifying vehicles, parts and accessories

<https://www.gov.uk/guidance/classifying-vehicles>

Smart Transport – Policy think tank and industry engagement <https://www.smarttransport.org.uk>

Innovate UK – Technology accelerator and events organizer

<https://www.gov.uk/government/organisations/innovate-uk>

techUK – Technology accelerator <https://www.techuk.org>

Transport Systems Catapult – Innovation center for Intelligent Mobility <https://ts.catapult.org.uk>

SmartCitiesWorld – Platform for sharing ideas to solve urban challenges

<https://www.smartcitiesworld.net>

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