What awaits the Automotive Industry in the Future?

2021

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Global Overview of the Automotive In

Global Overview of the Automotive Industry

Introduction

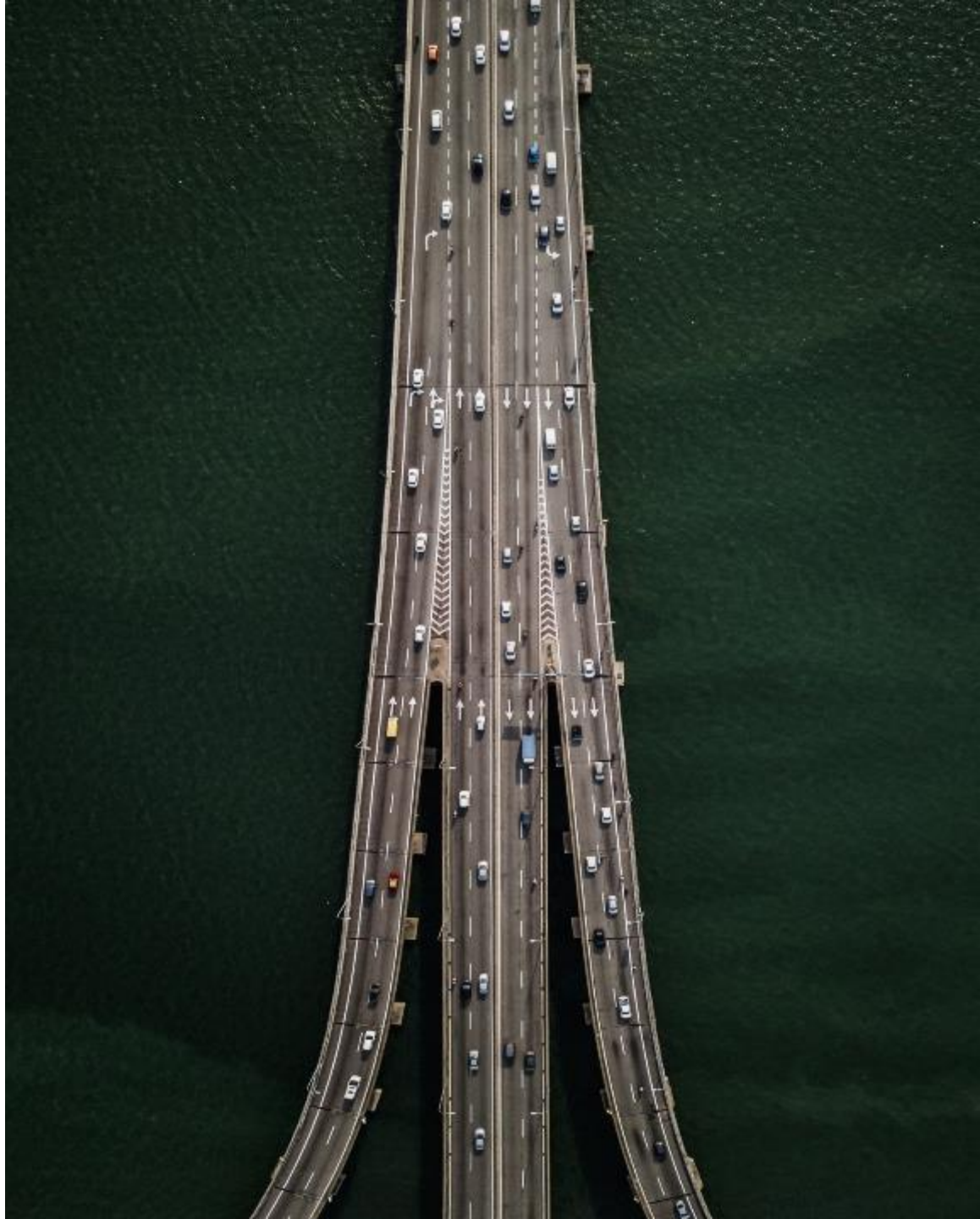
The automotive sector is one of the sectors where the largest investments are made in the world. Global production in the world automotive industry is generally classified as automobiles and light commercial vehicles. Automobile production accounts for approximately 71% of total automotive production. Light commercial vehicle production also accounts for about 27%.

Due to Covid-19in 2020, there have been serious disruptions in global automotive production. Total automotive production in 2020 is 77,621,582 units. Of this, 55,834,456 are automobiles and 27,787,126 are light commercial vehicles. These figures were as follows for the year 2019. While the total production is 91,786.86 units, automobile production is recorded as 67,149,196 units and light commercial vehicle production as 24,637,665 units.

When we look at the foreign trade of the global automotive sector, we can see that there is a trade volume of approximately $3 trillion. The automotive sector, which operates in a highly dynamic environment, is expected to make significant progress in the coming years, especially in areas such as digital integration, autonomous vehicles, shared mobility and electrification.

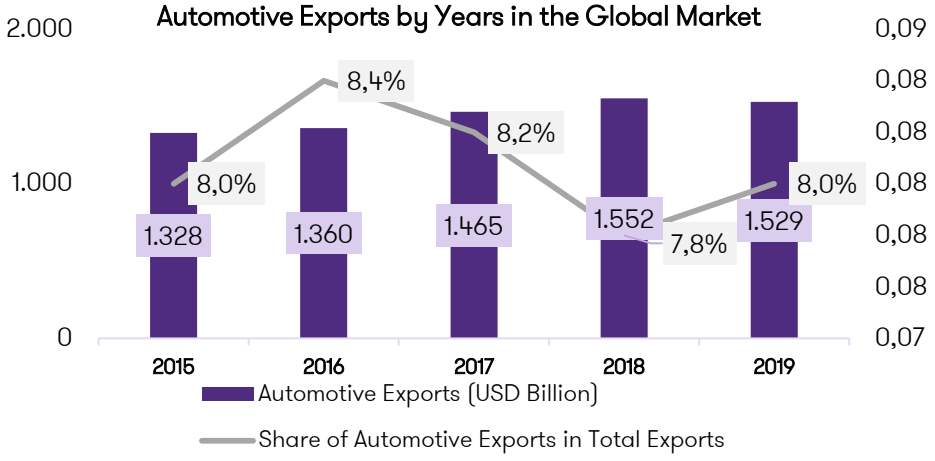
In this context, electric vehicles will be the most important agenda item in the coming years. According to EV-volumes.com and the International Energy Agency (IEA), although global electric vehicle sales declined in the first half of last year due to Covid-19 compared to the same period of 2019, there was an explosion in electric vehicle sales as of July 2020. Especially in October, November and December 2020, global electric vehicle sales increased by more than 100% on a monthly basis compared to the same period of 2019. Thus, last year, electric vehicle sales rose by 43% to 3.2 million units compared to 2.1 million vehicles sold in 2019.

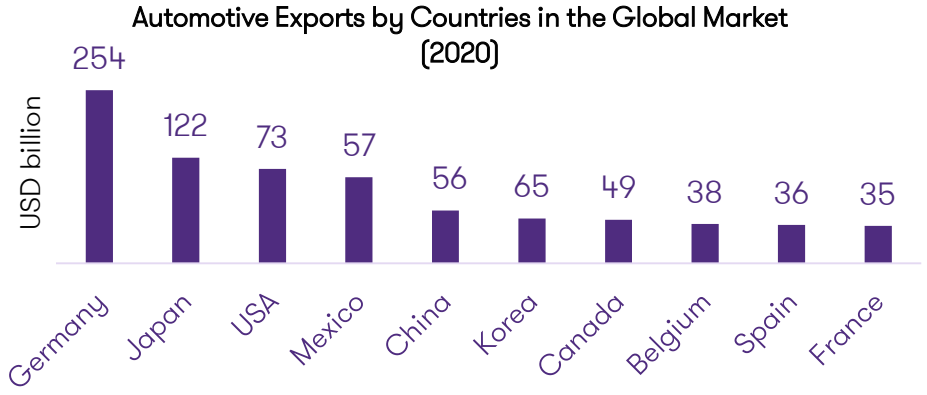
With this increase, the total number of electric vehicles in the world exceeded 10 million. The share of electric vehicles in the total vehicle market increased from 2.5% in 2019 to 4.2% in 2020.

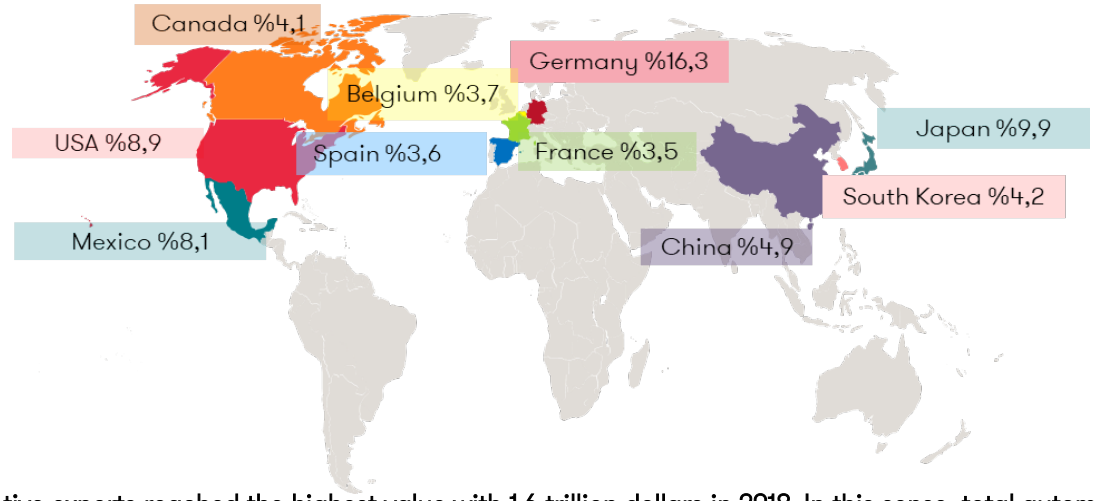


Global Overview of the Automotive Industry

Automotive Foreign Trade by Years







Global automotive exports reached the highest value with 1.6 trillion dollars in 2018. In this sense, total automotive exports in the global market experienced an uninterrupted growth until 2019. In 2019, it decreased by 1.5% compared to the previous year and decreased to 1.5 trillion dollars. The share of automotive exports in total world exports was 8% in 2019.

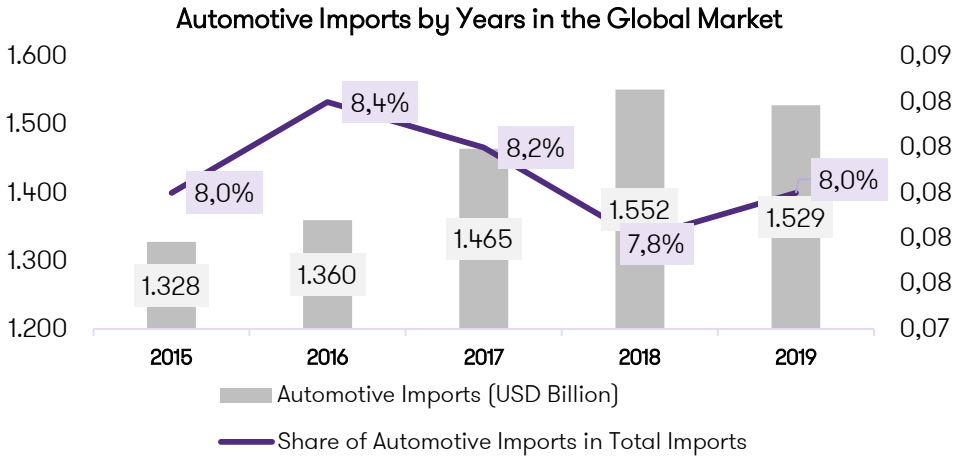
When we look at the export figures of the automotive sector in 2020, Germany has the highest automotive exports in the global market with a share of 16.3% and an export volume of 211 billion dollars. After Germany, Japan comes second with 122 billion dollars. Due to the pandemic, production capacities decreased and supply chain networks were disrupted. Considering these reasons, it was inevitable to see the decreases in exports. US exports in 2019 decreased from 133 billion dollars to 105 billion dollars in 2020 and Japan's exports in 2019 decreased from 149 million dollars to 122 billion dollars.

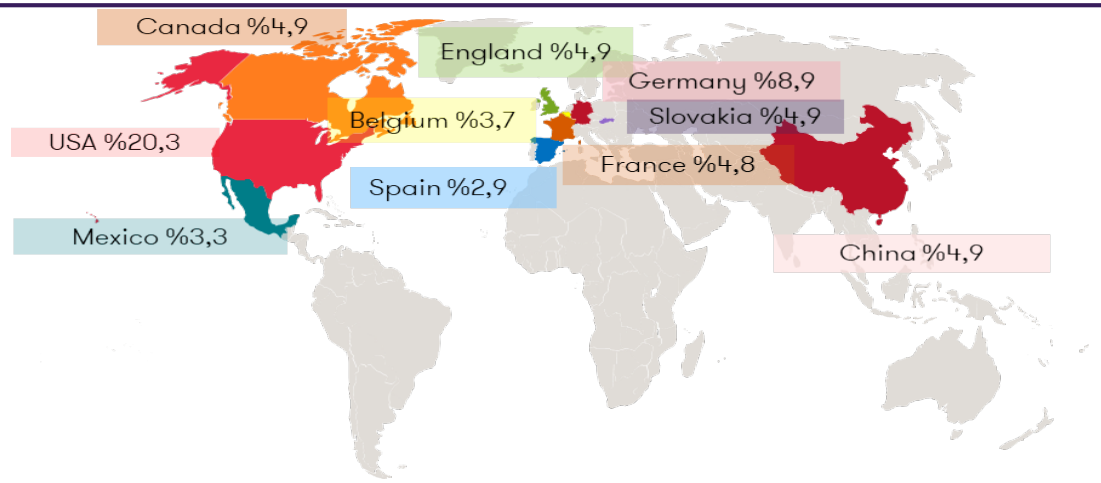
Note: Foreign trade data within the scope of 87 GTIP were used.

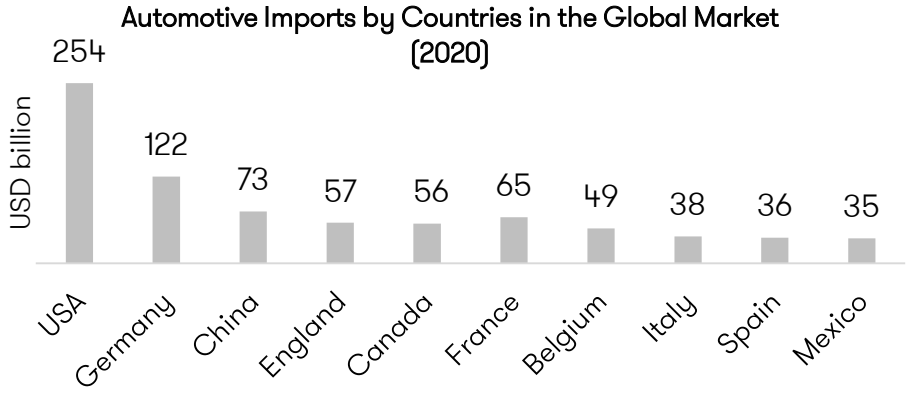
Source: ITC Trademap (International Trade Center)

Global Overview of the Automotive Industry

Automotive Foreign Trade by Years







Automotive imports, which were 1.3 trillion dollars in 2015, reached 1.4 trillion dollars in 2016 and 1.5 trillion dollars in 2017. Total automotive imports in the global market reached their historical level in 2018, reaching approximately 1.6 trillion dollars. However, in 2019, it decreased by 1.5% compared to the previous year and imports decreased to 1.5 trillion dollars. The share of automotive imports in total imports is 8% in 2019.

In 2020, the country with the highest automobile imports in the global market is the United States with a 22% share and $254 billion imports. France's imports fell from around 73 billion dollars in 2019 to 65 billion dollars in 2020. When we look at the import figures in 2020, we see a decrease of about 20%.

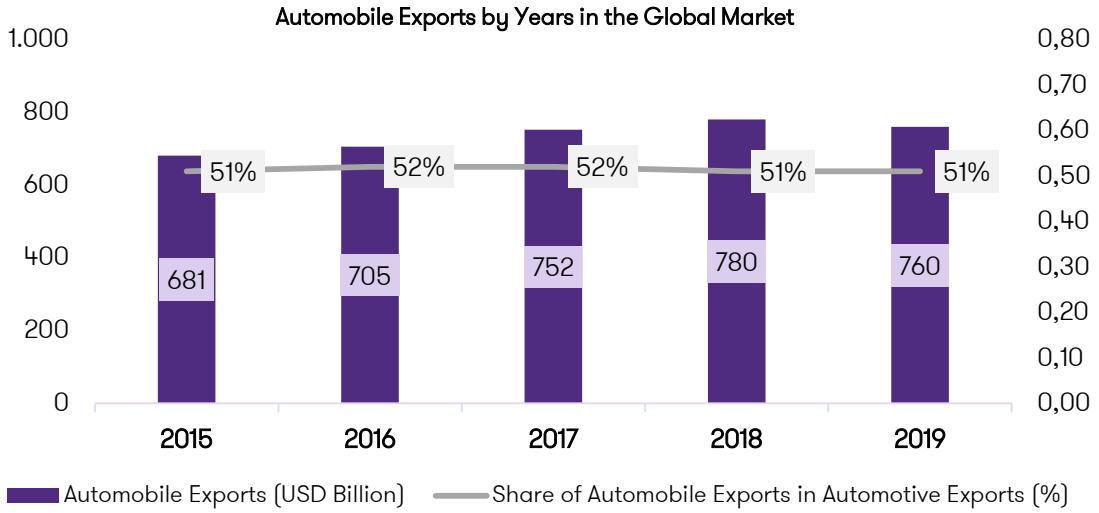
However, Turkey differs negatively from this situation. Turkey's automotive imports rose from 9.6 billion dollars in 2019 to 15.2 billion dollars in 2020.

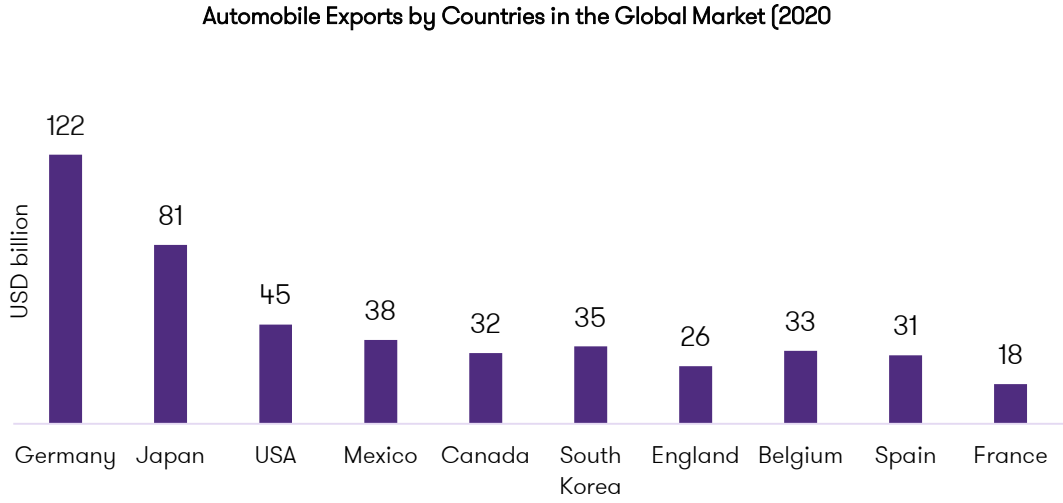
Note: Foreign trade data within the scope of 87 GTIP were used.

Source: ITC Trademap (International Trade Center)

Global Overview of the Automotive Industry

Automotive Foreign Trade by Years





Global automobile exports, which were $ 681 billion in 2015, were $ 760 billion in 2019. This represents a 3% decrease compared to exports, which was 780 billion dollars in the previous year. The share of automobile exports in automotive exports is 51% in 2020. Germany ranks first in automobile exports with $122 billion.

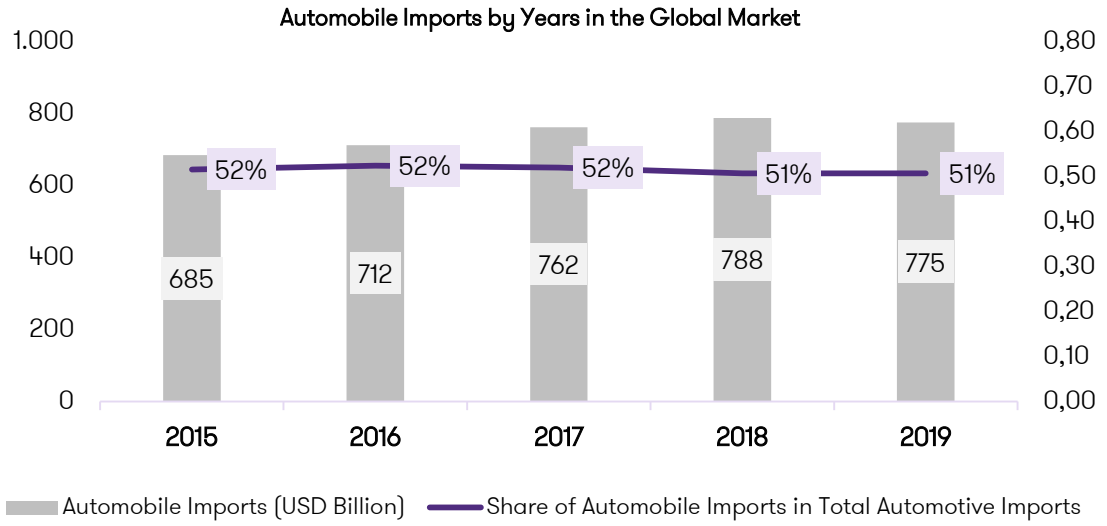
Due to Covid-19, world automobile exports fell by about 15% in 2020. In 2020, Japan's exports were $81 billion, the United States $45 billion, and South Korea $35 billion.

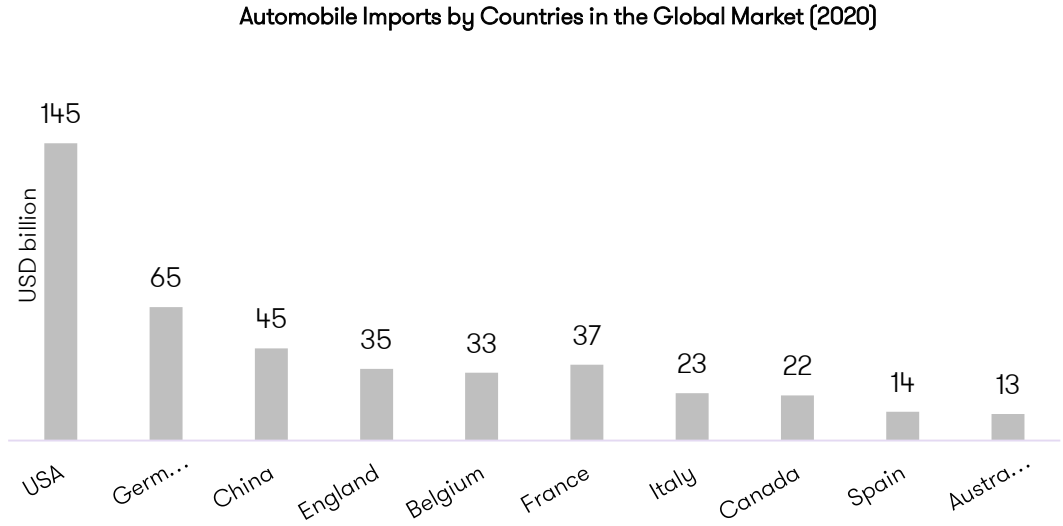
Note: Foreign trade data within the scope of 8703 GTIP were used.

Source: ITC Trademap (International Trade Center)

Global Overview of the Automotive Industry

Automotive Foreign Trade by Years





Total automobile imports in the global market amounted to 685 billion dollars in 2015 and reached 775 billion dollars in 2019. In 2018, the previous year, car imports broke a record with 788 billion dollars. The share of automotive imports in automotive imports was 51% in 2020. The United States ranks first in total automobile imports with 145 billion dollars.

With Covid-19 in 2020, import figures dropped significantly, Germany's car imports fell to $65 billion and France to $37 billion.

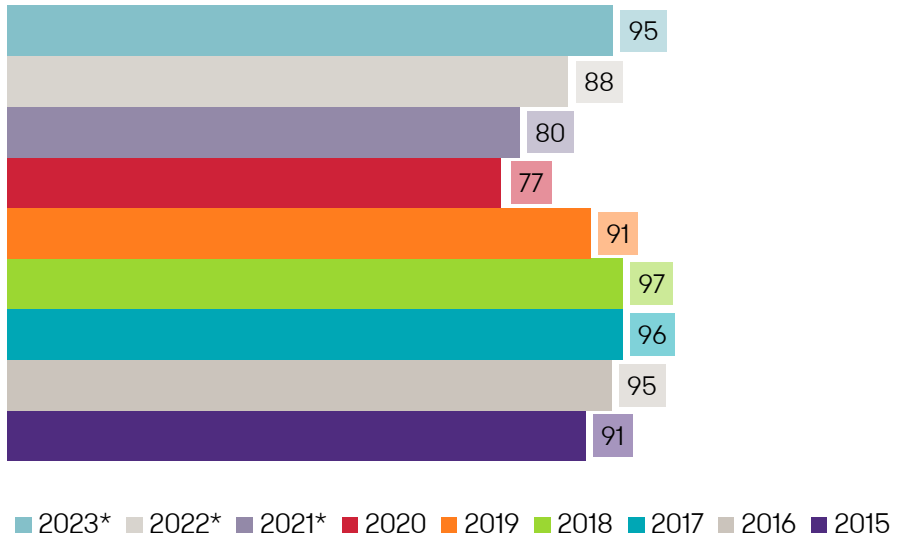
Note: Foreign trade data within the scope of 8703 GTIP were used.

Source: ITC Trademap (International Trade Center)

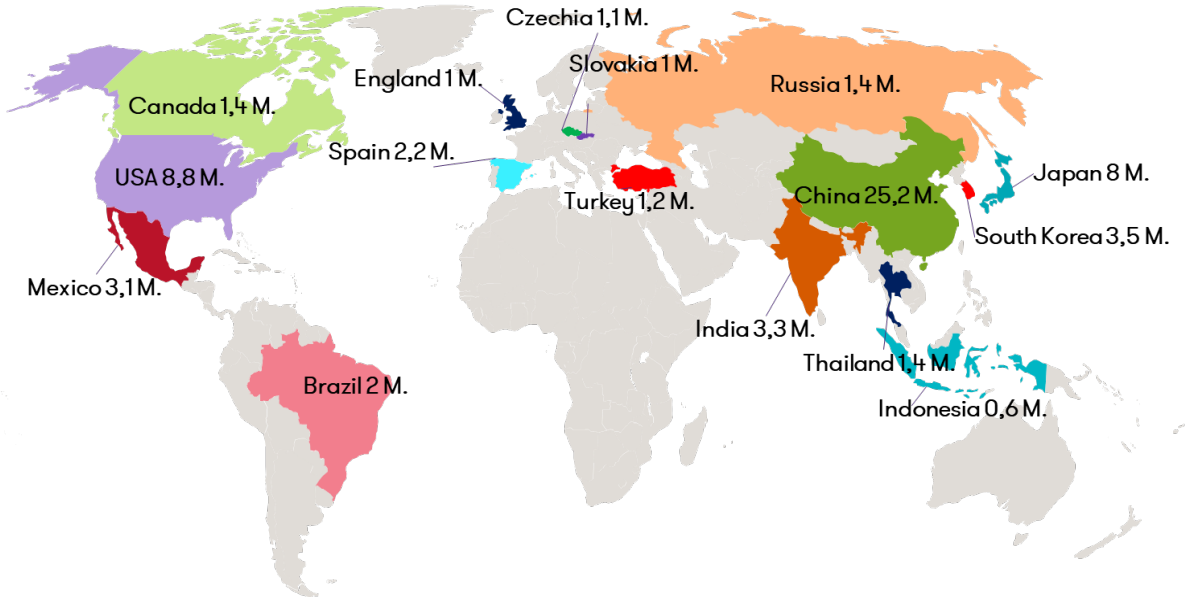
Global Overview of the Automotive Industry

Global Production and Projections

Global Motor Vehicle Production (Including Tractors) Million Units



Leading Countries in Motor Vehicle Manufacturing (2020)



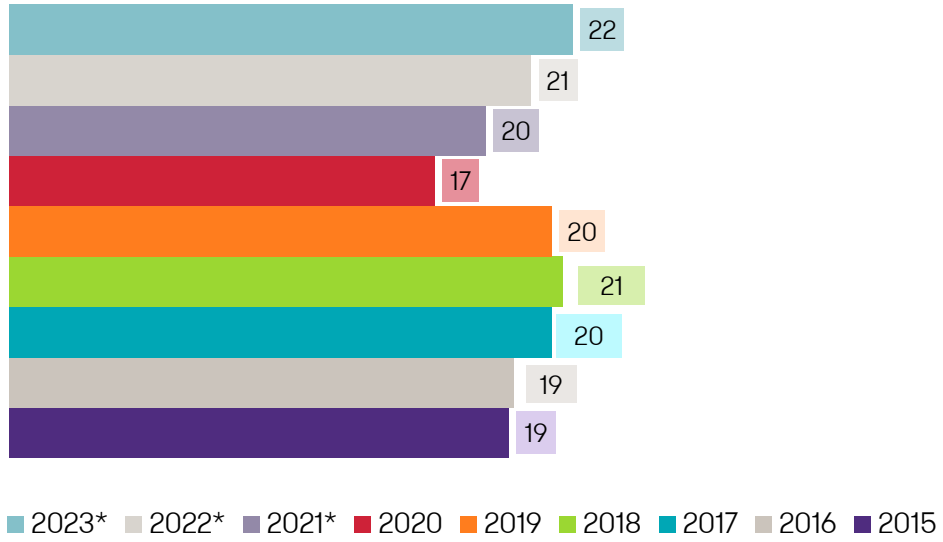
The highest number of production in the world motor vehicle production was reached with 97 million units in 2018. The number of production in the sector, which experienced a slight decrease in 2019, was 92 million. China ranked first with a share of 28% and 25.2 million production in total motor vehicle production in 2019. The leading countries in motor vehicle production after China are the USA, Japan, India, Mexico, South Korea and Brazil, respectively. We see that the motor vehicle production, which decreased due to Covid-19 in 2020, was 77 million units. We foresee 97 million production in the sector in 2023.

Source: GT Global Resources, LMC Automotive, OICA (International Organization of Motor Vehicle Manufacturers)

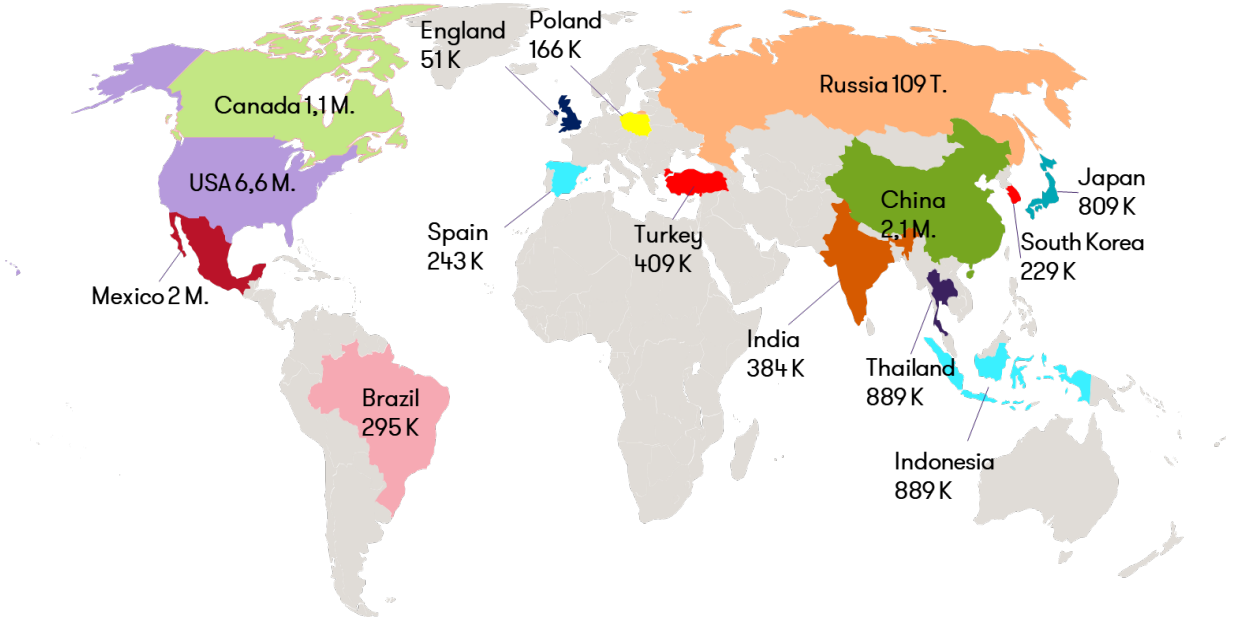
Global Overview of the Automotive Industry

Global Production and Projections

Global Light Commercial Vehicle Production



Leading Countries in Light Commercial Vehicle Production (2020)



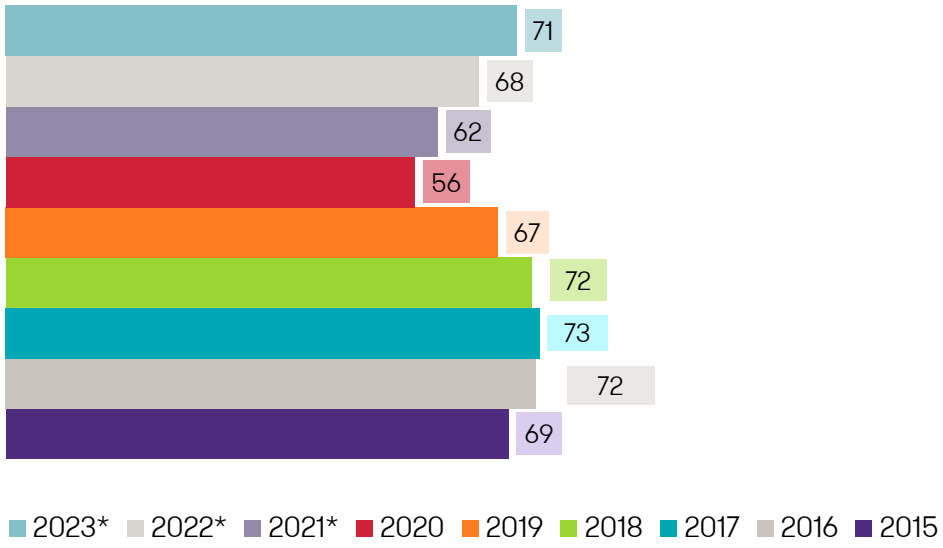
World light commercial vehicle production in 2018 is approximately 21 million units. However, there has been a decline in the production of light commercial vehicles in the world since 2019. With a 40% share in the production of light commercial vehicles and a production number of 8 million, the United States ranked first. In 2020, the production of light commercial vehicles in the world was 17 million units. The leading countries in light commercial vehicle production after the US are Mexico, China, Russia, Canada and Thailand. In 2020, the US produced 6.6 million light commercial vehicles, China 2.1 million, Mexico 2 million, Turkey 409 thousand light commercial vehicles. We anticipate that the production of light commercial vehicles, which decreased due to Covid-19 in 2020, will be 21 million in 2023.

Source: GT Global Resources, LMC Automotive, OICA (International Organization of Motor Vehicle Manufacturers)

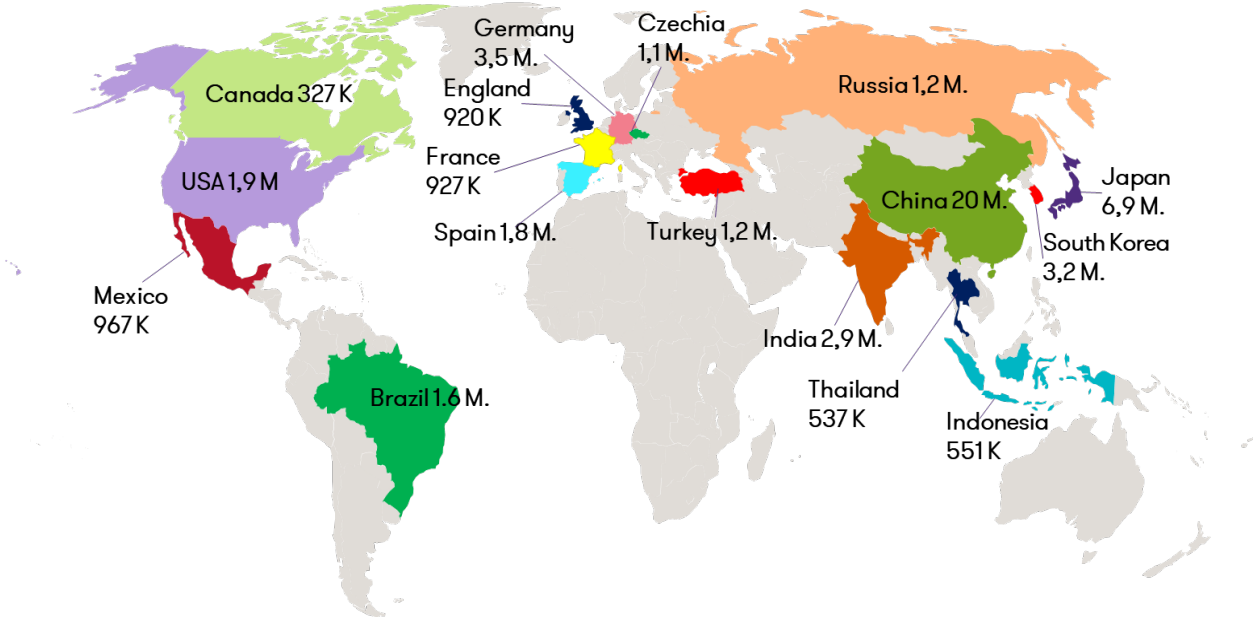
Global Overview of the Automotive Industry

Global Production and Projections

Global Automobile Production



Leading Countries in Global Automobile Production (2020)

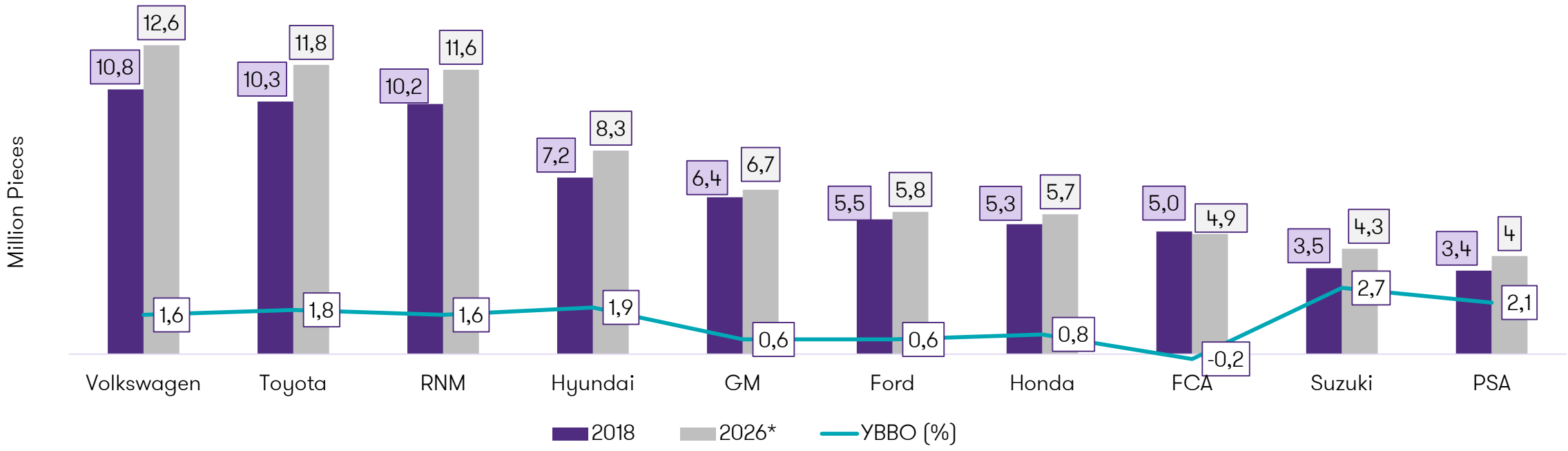


It reached the highest level in global car (passenger car) production with 72.8 million units in 2017. Due to Covid-19, production is 55.8 million units for 2020. This indicates a drop of about 23%. China has the largest share in car production with 20 million units. Developments in China directly affect the global automobile market. Other leading countries in automobile production are Japan, Germany, India, South Korea and the United States, with an estimated car production projection of 69.7 million units in 2023.

Source: GT Global Resources, LMC Automotive, OICA (International Organization of Motor Vehicle Manufacturers)

Global Overview of the Automotive Industry

OEM Productions and future goals



When we look at the global market automotive production, the leading brand is Volkswagen. Its production in 2018 is 10.8 million units. It is expected to reach 12.6 million with 1.6% CAGR in 2026.

Toyota is the biggest competitor to Volkswagen in global markets. Toyota's production in 2018 is 10.3 million units. It is expected to reach 11.8 million units in 2026. Also among the global biggest players are RNM, Hyundai, GM, Ford, Honda, FCA, Suzuki and PSA.

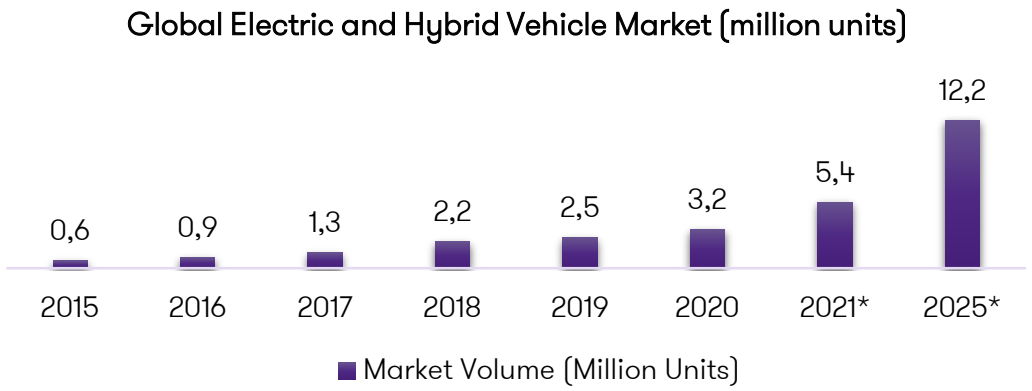
Due to Covid-19, production is expected to lose about 20% in 2020. The sector is expected to fully recover in 2023.

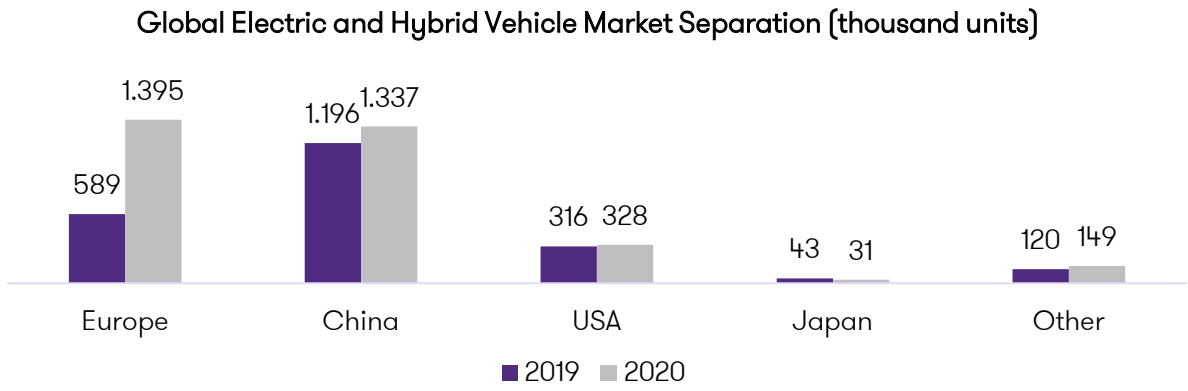
Note: The line here does not express a trend. It is just a representation.

Source: IHS

Global Overview of the Automotive Industry

Global Electric and Hybrid Vehicle Market and Future Projection





Electric and hybrid vehicle sales rose from 600,000 units in 2015 to 3.2 million units in 2020. CAGR increased by 40% in 2015-2020. We estimate the growth in CAGR to be 31% in 2020-2025. The share of electric and hybrid vehicles in the global market will gradually increase. The production volume of global electric and hybrid vehicles is projected to increase by 70% to 5.4 million units in 2021 and to increase the market share of electric and hybrid vehicles to 12.2 million units in 2025.

According to the report of the International Renewable Energy Agency (IRENA), there are 6 million electric vehicles in the world as of the end of 2019. The number of electric vehicles worldwide is projected to reach 1.1 billion by 2050.

In most countries, Covid-19 electric and hybrid vehicles were generally more resilient than automobile markets. In terms of volume, global electric vehicles increased by 28% in 2020 compared to the previous year, while the global car market decreased by 15%. Global market shares increased from 2.5% in 2019 to 4.2% in 2020.

In Europe, the automotive sector contracted by 20% in 2020, while sales of electric and hybrid vehicles increased by 137% to 1.4 million units. Thus, it surpassed China, the market leader, and reached its peak in market share.

While the Chinese electric vehicle market increased by 12%, the automotive market contracted by 4%. The automotive sector, which contracted by 15% in the United States, increased by 4% in the sales of electric vehicles. In Japan, both the electric vehicle market and the automotive market have narrowed. Electric and hybrid vehicle market contracted by 28% and automotive market contracted by 11%.

Source: EV-volumes, IHS Markit, IRENA

General Status of the Sector: Turkey

- Introduction
- Automotive Foreign Trade by Years
- Current Status of Production
- Production Projection
- Market development
- The Future of Automotive, Electric Vehicles

General Status of the Sector: Turkey

Introduction

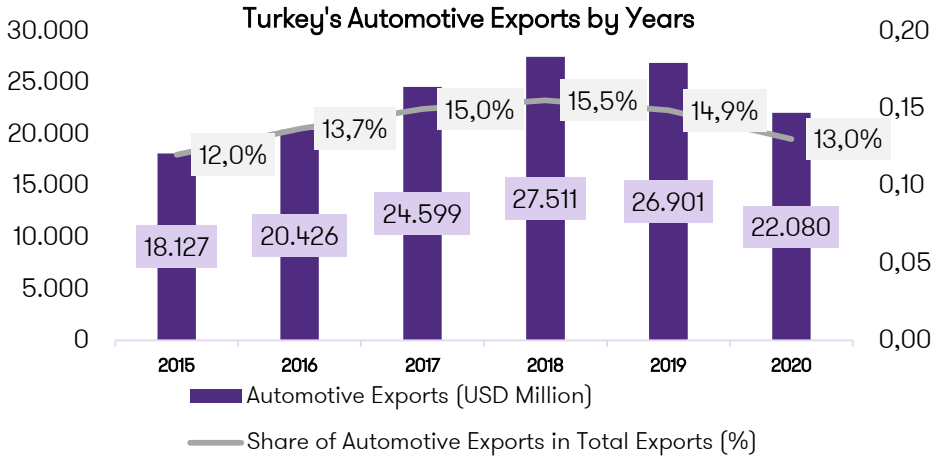
With its impact on the sectors such as plastic, glass, petro-chemical and iron-steel to which it is connected through supply chains in Turkey and its weight in the foreign trade of the country, automotive stands out as one of Turkey's locomotive industries. Automotive, which is currently Turkey's most exported product, has a 15% export share. It increased by 49% compared to 17.5 billion dollars in 2015 and reached 26 billion dollars in 2019. A Pandemic was declared by the World Health Organization on March 11, 2020. Covid-19, which spread all over the world in 2020, also affected Turkey's automotive sector badly. Factories closed in China and Europe disrupted the supply chain, increased foreign exchange rate automotive costs, and production contracted by 10%. Total automotive production fell from 1.5 million units to 1.3 million units. Automotive exports in 2020 compared to 2019 in 2020 experienced a contraction of 18% and amounted to 22 billion dollars.

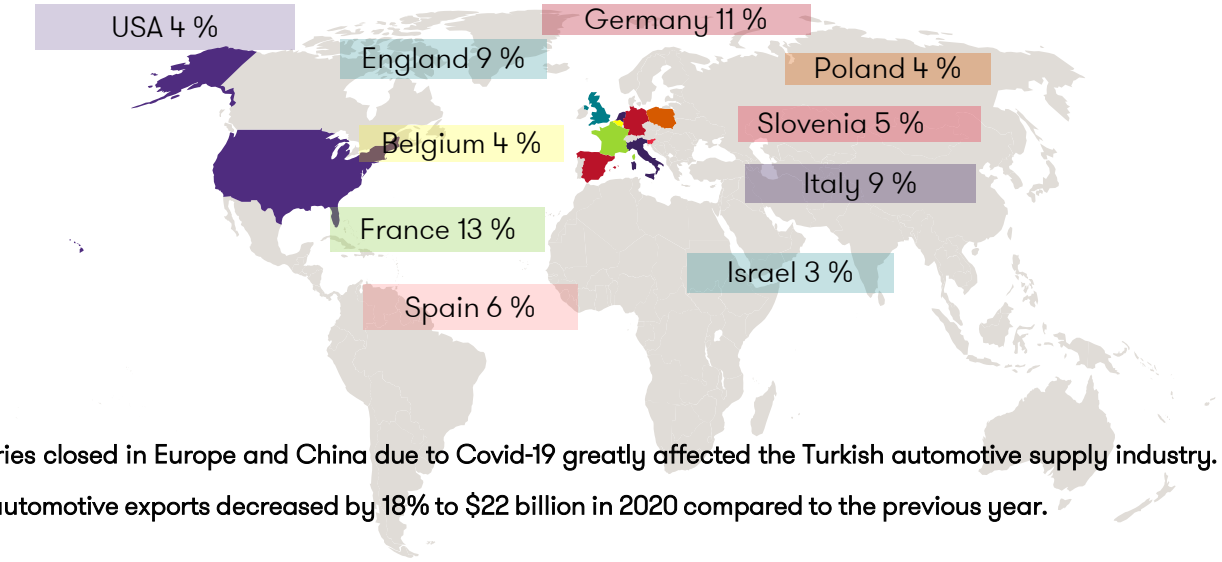
However, the decrease in the exports of the automotive sector did not apply to imports either. Automotive imports, which amounted to $10 billion in 2019, increased by 52% and closed with $15 billion in 2020. The decline in loan interest rates in Turkey has increased the demand for vehicles. Automobile imports increased from $3.5 billion to $8 billion, increasing the share of automobiles in total automotive imports from 35% to 52%.

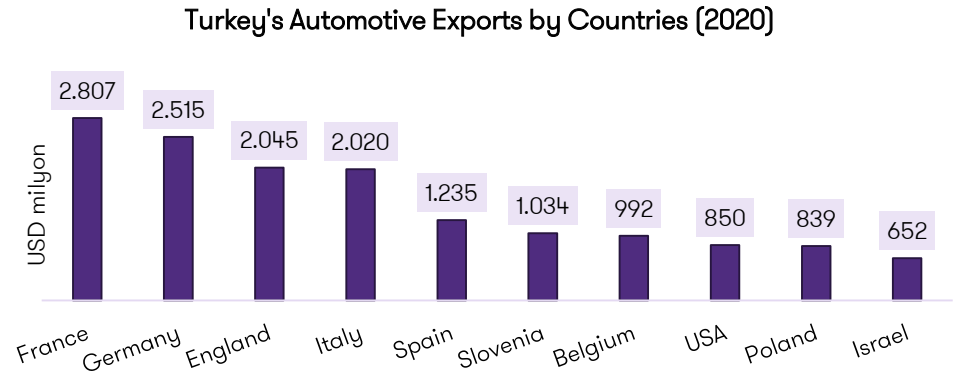
The impact of exchange rates and loan interest rates on the automotive sector is significant. The increases in the exchange rate after 2017 reached the highest level with 985,000 units in 2016. The sales of cars and light commercial vehicles decreased to 479,000 units in 2019. However, in 2020, delayed demands were realized with private loan programs for the ownership of vehicles by public banks. With subsidised vehicle loans, vehicle sales increased significantly and automobile-light commercial vehicle sales increased by 61.3% in 2020 compared to the previous year. However, the temporary cessation of production by factories and SCT (special consumption tax) increases have brought about significant increases in vehicle prices. This is expected to adversely affect commercial vehicle sales in the medium term.

General Status of the Sector: Turkey

Automotive Foreign Trade by Years







Factories closed in Europe and China due to Covid-19 greatly affected the Turkish automotive supply industry. Turkey's total automotive exports decreased by 18% to $22 billion in 2020 compared to the previous year.

Turkey accounts for 68% of its total automotive exports to the top 10 countries. The density of automotive exports in the top 10 countries is to European countries with a share of 60%. In Turkey, 4 out of every 5 automotive products are exported to Europe. France comes first in automotive exports with 2.8 billion dollars of exports and 13% share. After European countries, the intensity of exports is to African countries and Middle Eastern countries.

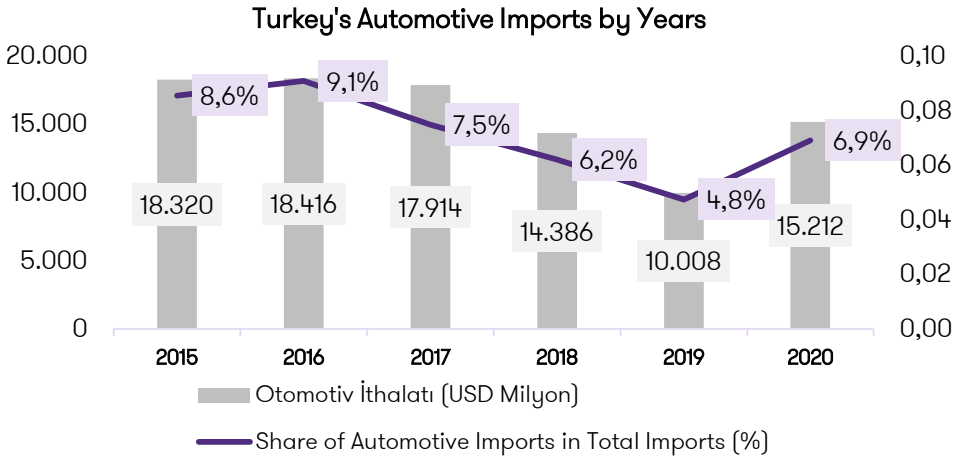
Turkey's share in total exports of the product numbered 87 GTIP, which ranked first in the main products exported in 2020, was 13%.

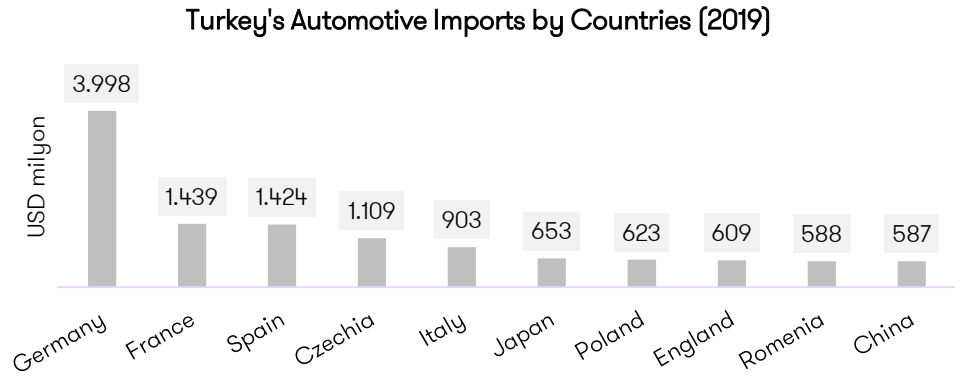
Note: Foreign trade data within the scope of 87 GTIP were used.

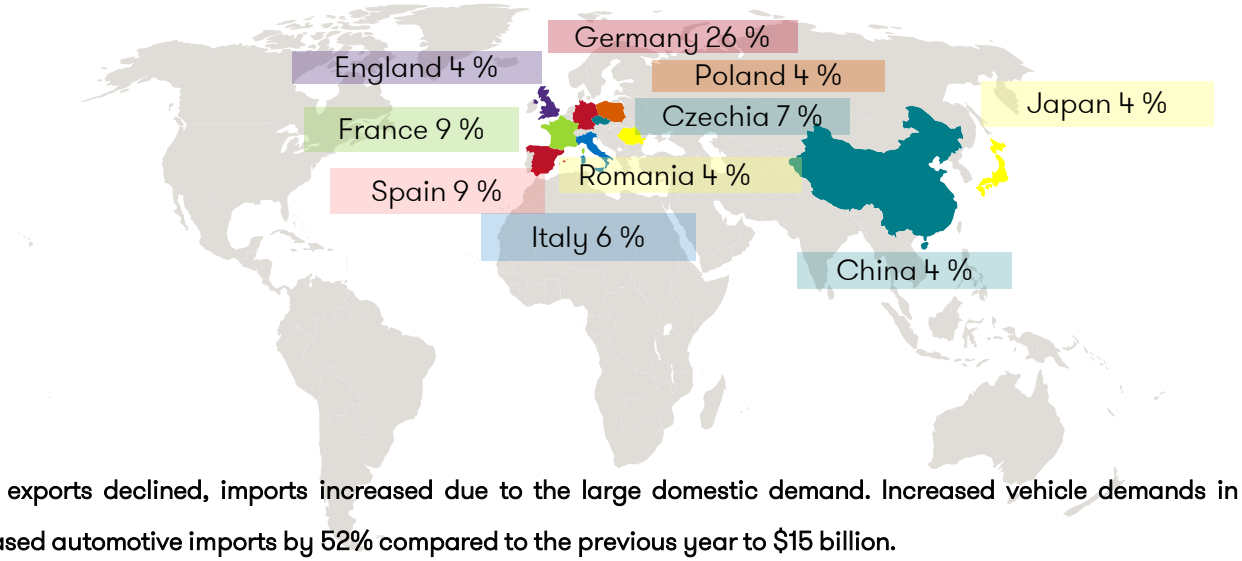
Source: ITC Trademap (International Trade Center), TurkStat (Turkish Statistical Institute)

General Status of the Sector: Turkey

Automotive Foreign Trade by Years







While exports declined, imports increased due to the large domestic demand. Increased vehicle demands in 2020 increased automotive imports by 52% compared to the previous year to $15 billion.

Turkey realizes 78% of its total automotive imports from the first 10 countries. The intensity of automotive imports is in Europe as in exports. The share of European countries in the top 10 countries is 70%.

The share of the product numbered 87 GTIP, which ranks 5th in the main imported products, in total imports is 6.9%.

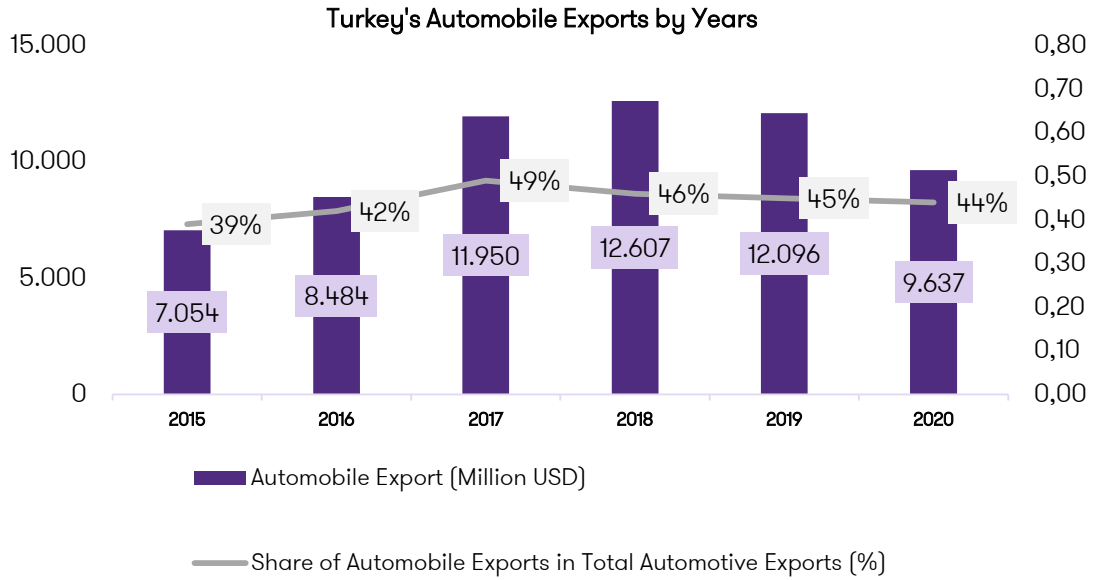
Turkey has a comparative advantage in the automotive sector trade and gives a foreign trade surplus of 6.9 billion dollars.

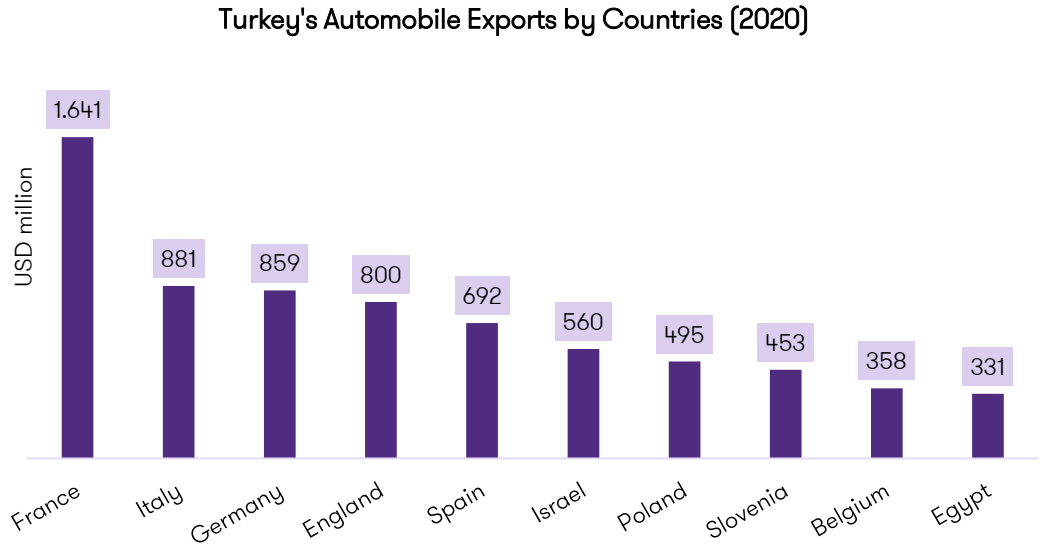
Note: Foreign trade data within the scope of 87 GTIP were used.

Source: ITC Trademap (International Trade Center), TurkStat (Turkish Statistical Institute)

General Status of the Sector: Turkey

Automotive Foreign Trade by Years





The 13% decrease in car production in 2020 also significantly affected car exports. Total automobile exports decreased by 20% to 9.6 billion dollars in 2020 compared to the previous year. Due to Covid-19, the share of the car in total automotive imports varied due to vehicle demand, but did not cause a significant change in exports. The share of the car in total exports fell from 45% to 44%.

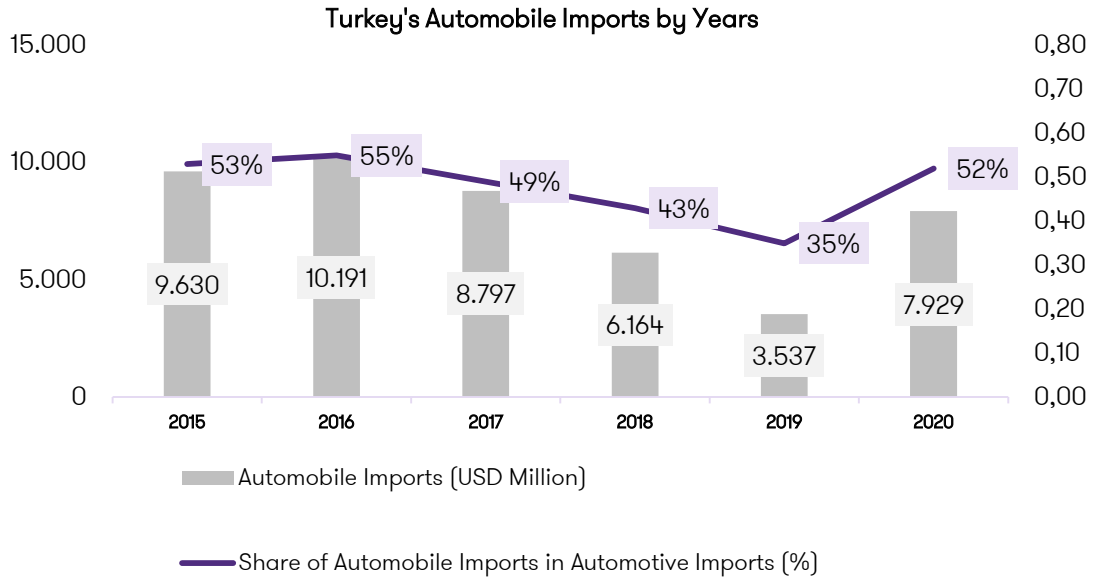
France comes first in Turkey's automobile exports with 1.6 billion dollars. The share of the top 10 countries in total car exports, where the density is in Europe, was 73%. France is followed by Italy with 881 million dollars and Germany with 859 million dollars.

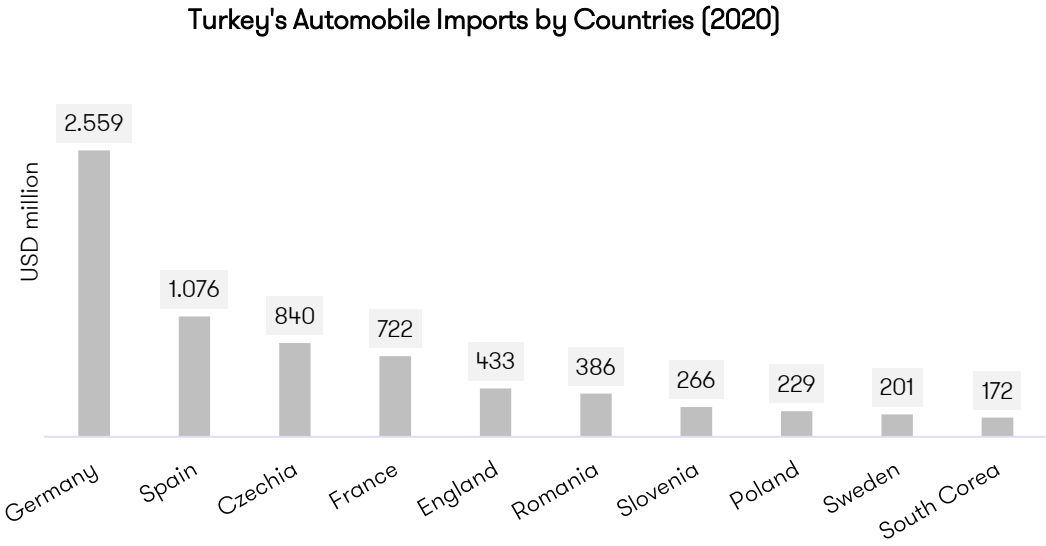
Note: Foreign trade data within the scope of 8703 GTIP were used.

Source: ITC Trademap (International Trade Center), TurkStat (Turkish Statistical Institute)

General Status of the Sector: Turkey

Automotive Foreign Trade by Years





Vehicle loans subsidised in Turkey in 2020 increased vehicle sales and increased car imports by 124% to $8 billion. In 2019, the share of the car in total automotive imports was 35%. This rate increased to 52% in 2020 with increasing demand.

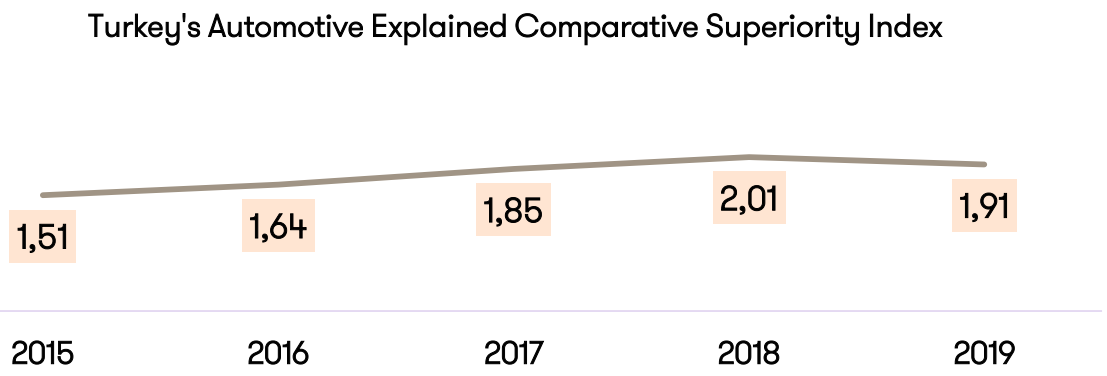
Germany comes first with 32% share in automobile imports and 2.6 billion dollars in imports. The share of the top 10 countries in total car imports, where the density is in Europe, was 87%. The share of European countries is 82%. Germany is followed by Spain with $1 billion and Czech Republic with $840 million.
Turkey is superior compared to automobile foreign trade in 2020 and has given a foreign trade surplus of $ 1.7 billion.

Note: Foreign trade data within the scope of 8703 GTIP were used.

Source: ITC Trademap (International Trade Center), TurkStat (Turkish Statistical Institute)

General Status of the Sector: Turkey

Automotive Foreign Trade by Years



Turkey's comparative advantage announced in the automotive sector increased every year, reaching 1.83 in 2018. This figure was 1.58 in 2013. In the sector, Turkey gives foreign trade surplus every year and has an advantageous position.

$$RCA\ ij = (x\ ij / X\ j) / (x\ iw / X\ w)$$

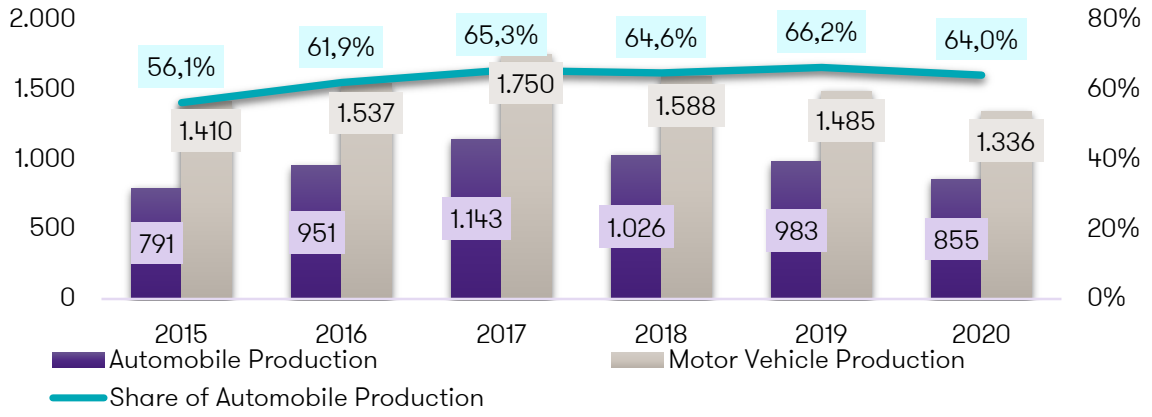
Here "RCAij" shows the index of comparative advantages explained for goods "i" of country j. "xij", "Xj" , "xiw" and "Xw" respectively show goods exports "i" of country "j", total exports of country "j", world exports "i" and total world exports. The fact that the index has a greater value than one indicates that country j has a comparative advantage in goods i.

Source: World Integrated Trade Solution (WITS)

General Status of the Sector: Turkey

Current Status of Production

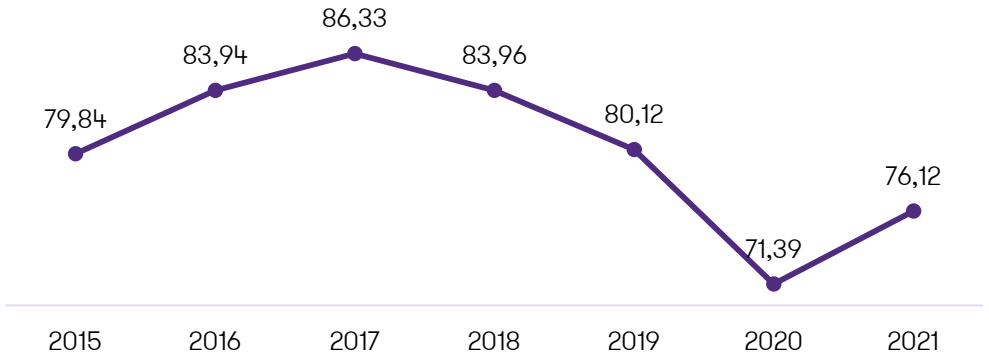
Turkey's Car Production by Years (Thousands)



Both the increase in the exchange rate and the effects of the Covid-19 outbreak affected motor vehicle production in 2020. Automobile production decreased by 13% to 855,000 units in 2020 compared to the previous year. The share of total automobile production in motor vehicle production was 64%. Automobile production increased by 2% in 2015-2020.

Turkey's brightest year in motor vehicle production took place in 2017. Motor vehicle production was 1.8 million and automobile production was 1.1 million units. The decrease in the number of production after 2017 was due to the decrease in capacity utilization rate, the decrease in domestic vehicle demand due to increasing prices and the increase in the exchange rate after 2017.

Motor Vehicle Manufacturing Industry Capacity Utilization Rate



After 2015, the capacity utilization rate of motor vehicle manufacturing industry started to increase in Turkey. This increase continued until 2017, when it reached the highest capacity utilization rate in the last 10 years. However, the increase in the exchange rate after 2017 increased the costs and decreased the capacity utilization rate in the following years.

With the increase in the exchange rate after 2017, vehicle prices increased and brought about a decrease in domestic demand by 2020.

The reason for the increase in demand in 2020 is that public banks subsidized vehicle loans with special loan programs for vehicle ownership. In the first months of 2021, the market continued to maintain its vitality and the capacity utilization rate increased to 76%.

Note: Motor vehicles consist of automobiles, commercial vehicles and tractors. Automotive Manufacturing Industry Capacity Utilization Ratio 2021 value is the first 2 months data.
Source: ODD (Automotive Distributors Association), EVDS (Electronic Data Distribution System)

General Status of the Sector: Turkey

Current Status of Production

2020			2015			Exchange
OEM	Number Of Car Production (Thousand)	Share in Total Production	OEM	Number Of Car Production (Thousand)	Share in Total Production	2015-2020 %
FORD OTOSAN	11	1%	FORD OTOSAN	21	3%	-47,14%
HONDA TURKEY	26	3%	HONDA TURKEY	13	2%	104,22%
HYUNDAI ASSAN	137	16%	HYUNDAI ASSAN	227	29%	-39,50%
OYAK RENAULT	309	36%	OYAK RENAULT	339	43%	-9,04%
TOFAŞ	153	18%	TOFAŞ	76	10%	102,31%
TOYOTA	219	26%	TOYOTA	116	15%	89,30%
Total	855	100%	Total	791	100%	

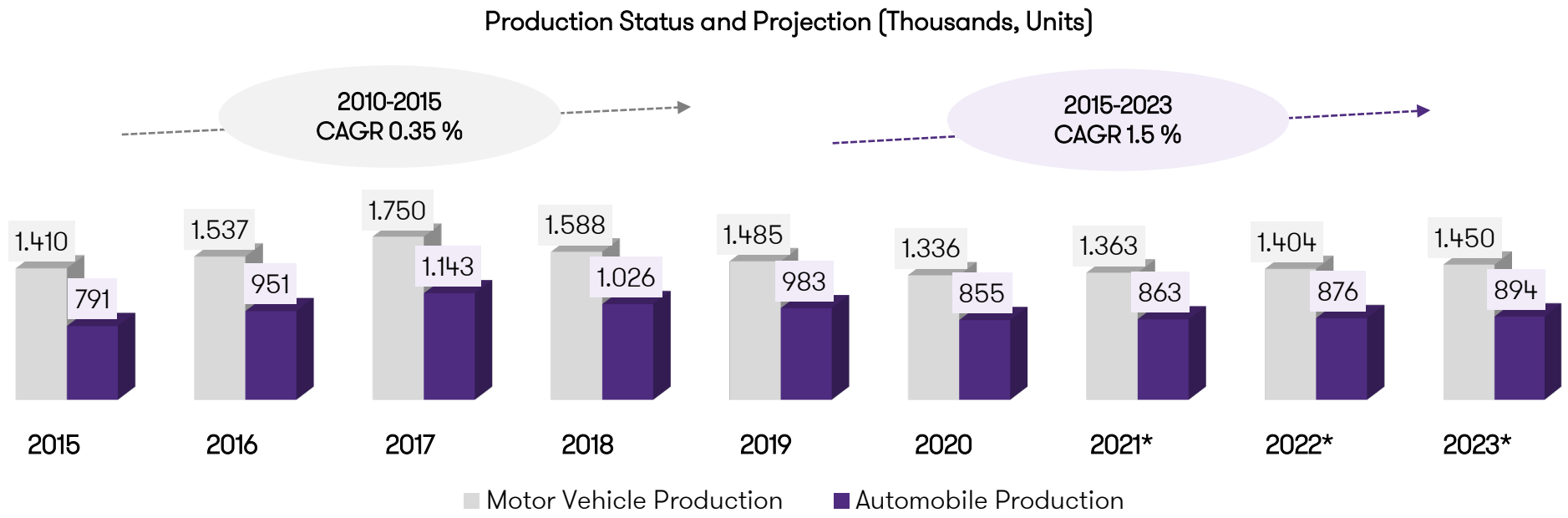
Oyak Renault has the largest share among OEMs producing cars in Turkey with 36%. Oyak Renault produced 309,000 cars in 2020, but its market share decreased by 9% from 339,000 to 309,000 compared to 2015. Oyak Renault's market share in 2015 was 43%.

The biggest production decrease in OEMs occurred in Ford Otosan with 47%. While Ford Otosan produced 21,000 cars in 2015, it produced 11,000 cars in 2020 and its market share decreased from 3% to 1%. Subsequently, Hyundai Assan's market share fell from 29% to 16% and car production fell from 227,000 to 137,000. Honda Turkey, Tofaş and Toyota have almost doubled their production and increased their market share. Toyota, which ranks second in market share in Turkey, continues to increase its market share rapidly in Europe and Turkey. Honda Turkey officially announced that it stopped production in 2021 because its factory capacity was below 30-35%. Withdrawn from Turkey and the UK, Honda announced that it withdrew from the Turkish and UK markets in order to adapt to rapidly changing technological developments and market dynamics. However, low sales in Turkey and Europe and Europe's failure to fully meet environmental standards were a separate factor in its withdrawal from the markets.

Source: OSD (Automotive Industry Association)

General Status of the Sector: Turkey

Production Projection



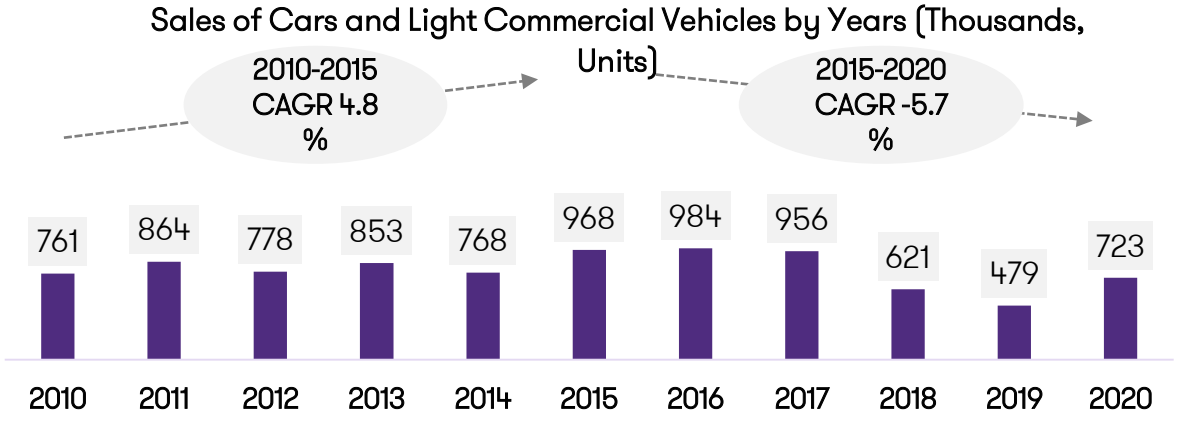
Turkey's motor vehicle production was 1.3 million units in 2020. CAGR decreased by 1% in motor vehicle production in 2015-2020. However, in the last 3 years, CAGR decreased by 8% in the2017-2020 period. Given the factors that reduce production and the year of the pandemic, it is estimated that production will return to its former capacity only after3-4 years. Especially due to Covid-19 in 2020, the automotive sector is expected to reach the 2019 figures only in 2023.

Automobile production was 855,000 units in 2020. Automobile production increased by 2% in CAGR in 2015-2020. However, when we look at the years 2017-2020, CAGR decreased by 9.2%. Since automobiles were the biggest share in the motor vehicle manufacturing industry, car production was the most affected by the negativities in the sector.

Source: GT Data, OSD (Automotive Industry Association)

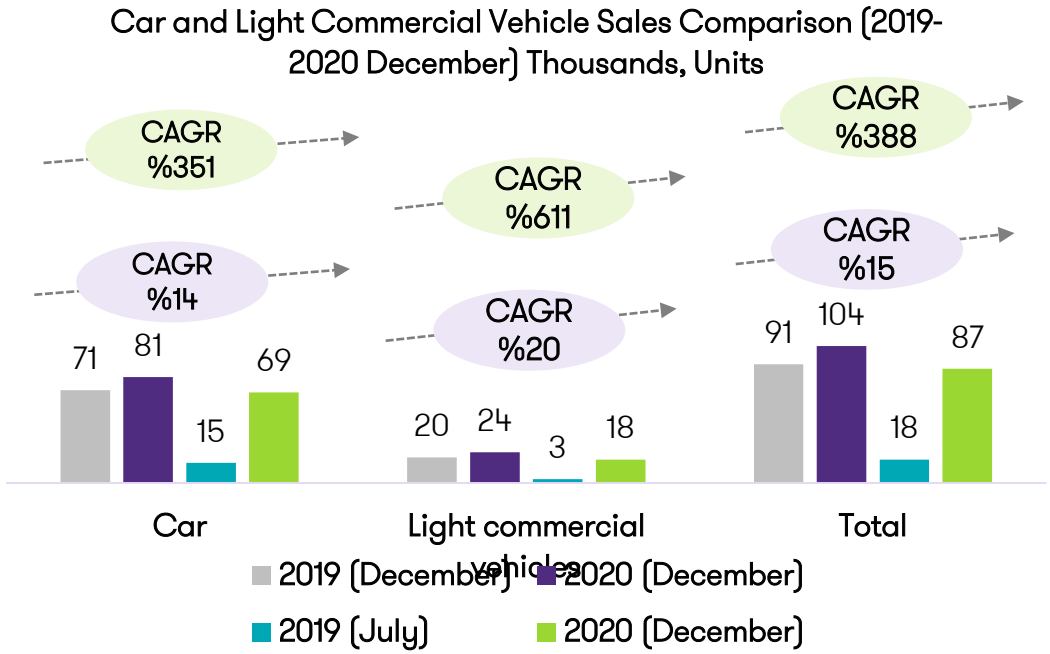
General Status of the Sector: Turkey

Market development



Turkey's average automobile and light vehicle market in 2010-2019 was 803,000 units. Vehicle sales grew by 1.6% in 2016, reaching a record 984,000 units. However, after 2016, vehicle sales started to decline due to increases in the exchange rate and there was a significant decrease of 35% in 2018 compared to the previous year. CAGR realized 4.8% in vehicle sales in 2010-2015. CAGR decreased by 5.7% in 2015-2020 due to the exchange rate increase directly affecting the high SCT and vehicle market.

With the vehicle loans subsidized in 2020, delayed demand occurred and vehicle sales increased 1.5 times to 723,000 units.



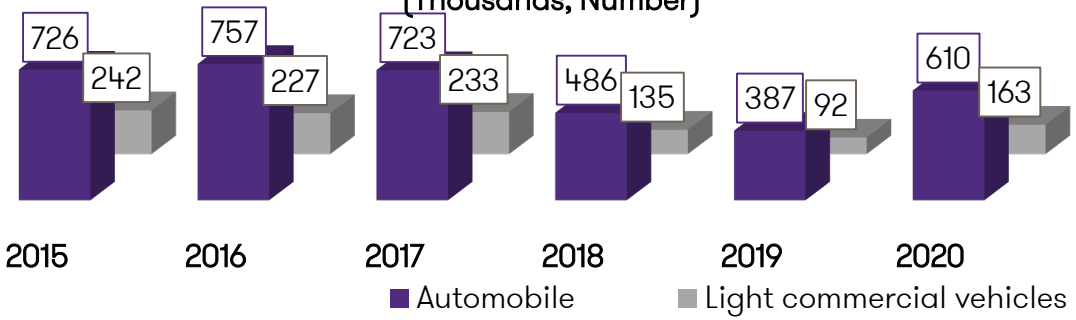
Although the increase in the exchange rate in 2020 increased vehicle prices, the decrease in vehicle loan interest rates significantly increased sales compared to 2019. With the decline in loan interest rates in June, total vehicle sales rose by 388% in July 2020 compared to the previous year. In December 2020, total vehicle sales increased by 15% compared to the previous year and reached 104,000 units.

Source: ODD (Automotive Distributors Association)

General Status of the Sector: Turkey

Market development

Separation of Car and Light Commercial Vehicle Sales by Years (Thousands, Number)



Turkey's automobile and light commercial vehicle market increased by 61.3% in 2020 compared to the previous year. Sales of 387,000 cars in 2019 increased by 58% compared to the previous year to 610,000 in 2020. The light commercial vehicle market increased by 77% in 2020 compared to the previous year, from 92,000 units to 163,000 units.

Analysis of Sales (Domestic/Imported)

In the domestic market, 65% of the total sales are imported and 35% are domestic. Fiat ranks first with 137,000 sales and Renault ranks second with 102,000. Domestic production accounts for 96% of Fiat sales and 88% of Ford sales. Domestic OEM share of light commercial vehicle sales is 64%. Ford and Fiat cover most of this share. In car sales, the weight is 59% in imported vehicles and the highest sales in imported vehicles is Volkswagen with 53 thousand.

2020 OEM Sales Analysis (Qty)

OEM	AUTOMOBILE			LIGHT COMMERCIAL			TOTAL		
	LOCAL	IMPORTED	TOTAL	LOCAL	IMPORTED	TOTAL	LOCAL	IMPORTED	TOTAL
FIAT	91.066	1.298	**92.364**	41.100	3.861	**44.961**	132,166	5.159	**137,325**
RENAULT	89.561	9.339	**98.900**	0	2.634	**2.634**	89.561	11.973	**101,534**
FORD	3.699	23.897	**27.596**	61.857	3.034	**64.891**	65.556	26.931	**92.487**
VOLKSWAGEN	0	52.740	**52.740**	0	12.036	**12.036**	0	64.776	**64.776**
PEUGEOT	0	36.589	**36.589**	0	7.085	**7.085**	0	43.674	**43.674**
TOYOTA	36.942	2.016	**38.958**	0	1.417	**1.417**	36.942	3.433	**40.375**
OPEL	0	31.229	**31.229**	0	3.067	**3.067**	0	34.296	**34.296**
DACIA	0	25.910	**25.910**	0	4.890	**4.890**	0	30.800	**30.800**
HYUNDAI	8.506	19.035	**27.541**	0	990	**990**	8.506	20.025	**28.531**
CITROEN	0	22.254	**22.254**	0	5.226	**5.226**	0	27.480	**27.480**
SKODA	0	24.175	**24.175**	0	0	**0**	0	24.175	**24.175**
HONDA	19.885	2.337	**22.222**	0	0	**0**	19.885	2.337	**22.222**
TOTAL	**249,659**	**250,819**	**500,478**	**102,957**	**44.240**	**147,197**	**352,616**	**295,059**	**647,675**

Note: The total figures in the OEM sales analysis table belong only to the OEMs included in the list.

Source: ODD (Automotive Distributors Association)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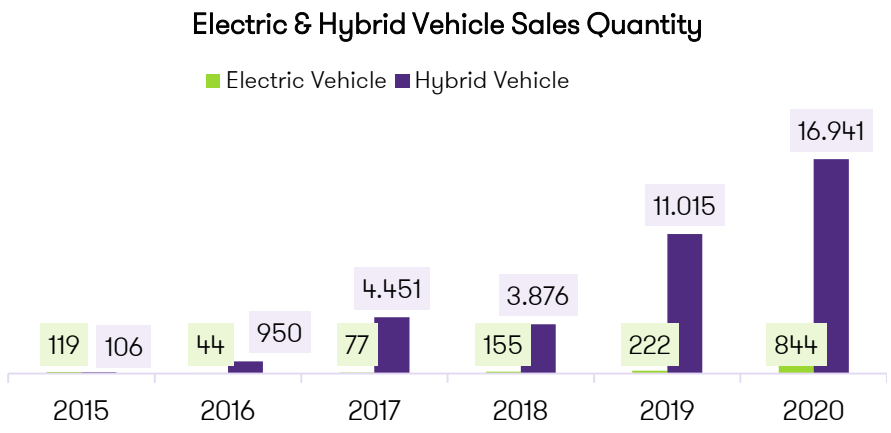
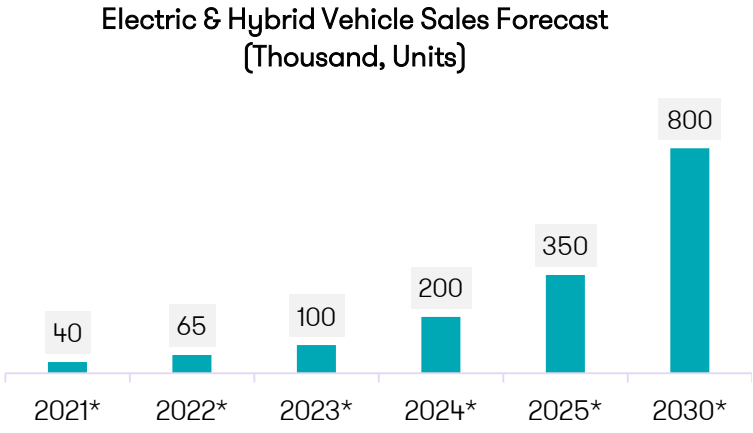
General Status of the Sector: Turkey

Electric&Hybrid Vehicle Market and Future Projection





Electric and hybrid vehicle market in Turkey has increased significantly in recent years. The number of electric vehicle sales, which was 119 in 2015, increased by 48% in CAGR in 2015-2020. Electric vehicle sales increased by 280% in 2020 compared to the previous year and reached 844 units. Hybrid vehicle sales increased by 54% in 2020 compared to the previous year. The number of hybrid vehicles sold in 2020, which was 106 units in 2015, approached 17,000. CAGR in 2015-2020 was 176%.

Despite the acceleration in the number of electric & hybrid vehicle sales, Turkey is still behind the sector compared to developed countries. In the market, which has gained a great momentum in recent years, the increase of SCT from 15% to 60% in February 2021 did not reduce the growth of the market. There were 3.6 thousand sales in the January-March period of 2020. This figure was 12.7 thousand in the January-March period of 2021. According to the report of Shura Energy Transformation Center on the Effects of Electric Vehicles on Turkey's Distribution Network, this figure will reach 800,000 units in 2030. It is envisaged that 2.5 million electric vehicles will be on the market in Turkey in 2030 and 1 million charging stations will be established. Currently, there are 800 charging stations in 61 provinces in Turkey. The electric vehicle market is expected to accelerate with charging infrastructure.

The reason why the sector lags behind the developed countries is the lack of electric & hybrid vehicle production and battery infrastructure in the domestic market. Although the prices of all imported electric & hybrid vehicles are higher than other engine types, the fact that charging stations are not common in Turkey creates a reservation for the consumer in terms of purchasing decision. TOGG, Turkey's first domestic and national electric car, aims to complete the factory in 2021 and launch an SUV in segment C in 2022. It envisages completing the product range to 5 models by 2030. Ford Otosan, one of the leading companies in the Turkish automotive industry, started to invest in Battery Assembly in Kocaeli factory, which is the largest supplier in Europe for Ford E-Transit production, and Ford Otosan aims to be the only and integrated electric vehicle production facility in Turkey in 2022.

Source: Marketline, SHURA Energy Transformation Center, TEHAD (Turkish Electrical and Hybrid Vehicles Association),

Transformation In The Automotive Industry

- Digital Integration
- Autonomous Vehicles
- Shared Mobility
- Electrification

Future Transformation In The Automotive Industry

Developments in 4 main areas of the value chain are expected to come to the forefront in the Automotive Industry in the coming period.

1. Digital Integration

In 2020, internet-connected vehicles are expected to develop further and offer users customization options from their smartphones.

Internet-connected vehicles are now available as standard equipment in upper- and middle-class cars.

2. Autonomous Vehicles

Autonomous driving service It is provided by the combination of certain technological services that perceive its environment without human support and have the ability to navigate and guide.

3. Shared Mobility

In the future, there will be evolution towards autonomous vehicles picking you up and dropping you off at your destination via mobile phone apps. Vehicle sharing will become widespread in many countries of the world.

Shared mobility (This means that users have the advantage of offering their personal vehicles to others when they wish, and leasing the vehicles of others when they wish, with the use of a mobile application.) is expected to continue the growth trend with convenience and cost advantages because it is economical compared to owning vehicles.

4. Electrification

It is the general name given to the process of restructuring the automotive eco-system to produce and serve electric cars and other electrical components in terms of products, services and processes. The aim is to allow minimum impact on the environment, minimum maintenance cost, lower noise engine and longer term part replacement. Accordingly, a lot of investments will be made in electrification in the coming years.

Source: Counterpointresearch

Future Transformation In The Automotive Industry

1. Digital Integration

With the increasing digitalization in the world, the digital integration of tools will have an important place in the future of the sector. Telematic applications (telecommunications, vehicle technologies, road transport, road safety, electrical engineering, sensors, instrumentation, wireless communication, computer science, multimedia, internet) have radically changed the automotive industry.

Connection and communication greatly improve with smart apps and offer drivers and passengers information, entertainment, safety and vehicle management. Digital integration and connectivity systems in vehicles are now available as standard in most vehicles.

The integration of computer solutions for information and entertainment improves the customer experience of passengers. With cloud access, drivers can manage all updates to operating systems, software, and apps from the real-time cloud. Cloud system based development and life cycle management can be done and automation of these systems is expected to develop further in the future.

Advances in digitalization encompass more than just the circulation of information. With the development of in-vehicle sensors, the built-in internal detection in the vehicle improves the passenger experience in the car and stands out as a system that increases safety in the car. Car interior sensors increase comfort and safety.

Future Transformation In The Automotive Industry

2. Autonomous Vehicles

Autonomous Driving technology is another technology that will play an important role in the future of the automotive sector. Many leading companies in the automotive sector carry out many researches and developments related to autonomous driving technology.

Many technologies such as automatic brake sensors, adaptive speed stabilizer, highway lane tracking sensors, automatic parking technology are already in use as driver support technologies.

As autonomous technologies in vehicles increasingly assume driver-controlled functions, each automation level requires additional sensor layers.

The most important element for autonomous vehicles is the existence of dynamic software and sensor systems for vehicles. With the help of advanced sensors, the artificial intelligence and learning capabilities of the tool are increased and the tool adapts to changes in the environment and internal inputs. In this way, a vehicle with the highest level 5 autonomous driving ability can adapt to the traffic flow without requiring any driver.

So far, improvements in autonomous vehicles have been achieved up to level 4. Different companies are working on autonomous vehicles. For example, Google is developing the Waymo autonomous driving capsule. The American motor vehicle manufacturing company Local Motors is working on an autonomous vehicle. Ford plans to further boost its efficiency in the industry in 2021. The most important issue for autonomous vehicles is the elimination of safety concerns. Although there are serious restrictions and regulatory pressure on firms in this regard, significant improvements will be made in the automotive industry in the coming years for autonomous vehicles.

Future Transformation In The Automotive Industry

3. Shared Mobility

Shared Mobility entered our lives as a vehicle sharing service in large metropolitan areas. Shared mobility services in many metropolitan areas of the world stand out as a highly developed sector.

Shared mobility has become a service used by many people in recent years with ease and cost advantages. However, with the developments in autonomous vehicles, shared mobility services are expected to develop in different directions.

Users of mobility services shared with autonomous vehicles are expected to provide transportation through autonomous vehicles that do not require drivers. Autonomous driving is a very important option that can reduce costs for companies providing shared mobility services. For this reason, there are investments of many automotive and technology companies related to autonomous and shared mobility. However, the spread of this service is expected to last until 2025 with the completion of the necessary regulations.

The use and advancement of "Artificial Intelligence" and "Big Data" technologies will play a crucial role in completing the driverless development of shared mobility services.

By integrating autonomous tools and different technological features with shared mobility, human life will be in safe hands when going from place to place.

Future Transformation In The Automotive Industry

4. Electrification

Electric Vehicles and Hybrid Vehicles have been a very important issue for many automotive and technology companies in recent years. Electric and hybrid vehicle sales have made significant progress, especially in developed economies, and this trend is expected to be in this direction in developing countries.

In the future, technologies related to the development of new batteries, the establishment of charging infrastructure, products and regulations for new electric vehicles will focus on electrification so that electric vehicles will be adopted worldwide. Innovation breakthroughs in the sector are also increasing significantly among consumers. They are very positive developments for electric cars with longer charging times and increased number of charging points.

Mass production of once-dreamy electric cars is now carried out by many car companies. Tesla, the decline in the use of diesel and petrol vehicles in Europe is forcing OEMs to move faster in their efforts to meet tougher emission targets.

As the cost of developing electric vehicles decreases, electric vehicles compete effectively in many markets around the world. In the future, electrification and electric vehicles are expected to be at the heart of the automotive sector.

Covid-19 Impact: Automotive Sector

- New Trends in the Automotive Industry under The Effect of Covid-19
- Automotive Sector Crises
- Possible Incentive and Climate Sensitivity Scenarios under the Covid-19 Impact
- Covid-19 Observations - Actions taken in the Automotive Sector

Automotive Sector under the Effect of Covid-19

The temporary cessation of operations of the factories experienced due to Covid-19 put the entire automotive sector in a difficult situation. Car sales declined by up to 80% in China in February. The recession following this initial shock significantly reduced global car demand by the end of 2020. In this case, it is predicted that reaching 2019 level can only take place in 2023.
However, it is known that this process will trigger very important developments in the sector. During this 2-3 years period, there will be gradual improvements in the sector and significant advances in the automobile industry will emerge in this process. For example, the digitalization of vehicles and the development of electric power transmission organs will be an achievement for the sector. Therefore, this crisis environment also offers very important opportunities for companies that can position themselves correctly for the future.

In the period of 24-36 months, the automobile industry will undergo a huge change and transformation.

- Indicators show that a period of 24-36 months will be needed to catch up with the pre-crisis period. However, this period differs from other past crises. The most important issues of this period are:

- Electrification of powertrain,
- Digitalization of automotive sales services,
- Change in vehicle ownership,
- Reduced use of diesel and petrol vehicles

Source: Arthur D Little, Global GT Resources

Covid-19 Impact: Automotive Sector

New Trends in the Automotive Industry under the Effect of Covid-19

Shared Mobility	• People's hesitant approaches to public transport and shared vehicles • Affecting short and medium term strategies of OEMs in mobility solutions
Green Agenda	• Companies will invest more in the production of electric vehicles with the transition to clean air space. • Challenges for OEMs to continue with pre-Covid-19 strategies introduced by CAFE* Legislation
Industrial Structure	• Covid-19 has accelerated the change in the automotive industry. • Negatives in procurement due to cash and liquidity pressure
E-Commerce	• Requirement of digital sales infrastructure compatible with retail and wholesale • Suppliers and consumers who previously used digital sales have become advantageous.
Procurement	• Demand will increase especially in the small segment, and supply surplus will be experienced in the upper segment • Market comparison will be made not only according to market volume but also according to retail prices
Demand	• Online sales will come to the forefront to adapt to new processes • The imbalance between supply and demand will lead to price uncertainties
Study and Interaction	• The way they work together with social distancing will also change • The overall trend will be in the form of remote operation

*Note: CAFE :Corporate Average Fuel Economy

Source: Cox Automotive, Global GT Resources

Automotive Sector under the Effect of Covid-19

Some Global Automotive Sector Crises:

U.S.A. Economic and Automotive Industry Crises

	GDP	CAR SALES
1) **Narrowing in the Early 1980s** • The FED's rise in interest rates has made it difficult to access vehicle loans.	-%2 1 year of recovery	-%20 2 years of recovery
2) **Savings and Credit Crisis+ Gulf War** • Banks collapse, limited access to consumer loans, rising oil prices.	-%0,1 1 year of recovery	-%11 2 years of recovery
3) **Financial Crisis** • The collapse of the consumer credit market negatively affected the middle class in particular. The average year of vehicle ownership has increased from 4 to 6 years.	-%3 2 years of recovery	-%35 3 years of recovery
4) **Covid-19 Crisis** • The shock of supply and demand affected the lower and middle. But financial institutions are now stronger than in 2008.	-5% to -10% Recovery 1-1.5 years	- 15% to-30% Recovery 2-3 years

Looking at past crises in the United States, we see that the recovery in the automobile industry takes twice as long as the recovery in GDP.

Source: Arthur D Little, Global GT Resources

Automotive Sector under the Effect of Covid-19

Some Global Automotive Sector Crises:

EU Economic and Automotive Industry Crises

	GDP	CAR SALES
1) **European Monetary Crisis+ Gulf War** • The European money crisis has limited consumer loans. The Gulf War pushed up oil prices.	%-6 1 year of recovery	%-13 3 years of recovery
2) **Financial Crisis** • The collapse of the consumer credit market affected the middle class negatively.	%-10 3 years of recovery	%-5 (%-10) 3 years of recovery
3) **Eurozone Crisis** • Some European countries that use the Euro currency have fallen short in debt repayment or debt restructuring.	%-4 1 year of recovery	%-6 2,5 years of recovery
4) **Covid-19 Crisis** • The shock of supply and demand affected the middle and lower classes. It hit the new car market, which is already stagnant.	%-5 - %-10 1 -1.5 years recovery	%-10 - %-20 Recovery 2-3 years

As can be seen from the European Monetary Crisis, the Financial Crisis and the Eurozone Crisis, European markets have returned to the pre-crisis situation over a three-year period with the support of government interventions such as procurement incentives and beneficial taxation. In the crises, car sales suffered more than the general economy.

Source: Arthur D Little, Global GT Resources

Automotive Sector under the Effect of Covid-19

Some Global Automotive Sector Crises:

EU Economic and Automotive Industry Crises

	GDP	CAR SALES
1) SARS 2002/2005 • It has affected tourism and the Chinese economy.	%9,6 Not affected	%20 Car sales boomed
2) 2008 Financial Crisis • The financial crisis in Western countries has reduced China's growth by 9%.	%9,5 Not affected	%3,6 Growth fell but quickly caught up
3) Decline Of Vehicle Market (2018-2019) • New car sales have fallen due to regulations imposing special restrictions on new car sales.	%6,5 Growth rate decreased	%-8 Car market plummeted for 2 years
4) Covid-19 Crisis • The shock of supply and demand is expected to be shorter than in Europe and the United States. However, it has largely affected exports.	%3 - %5	%-5 - %-10

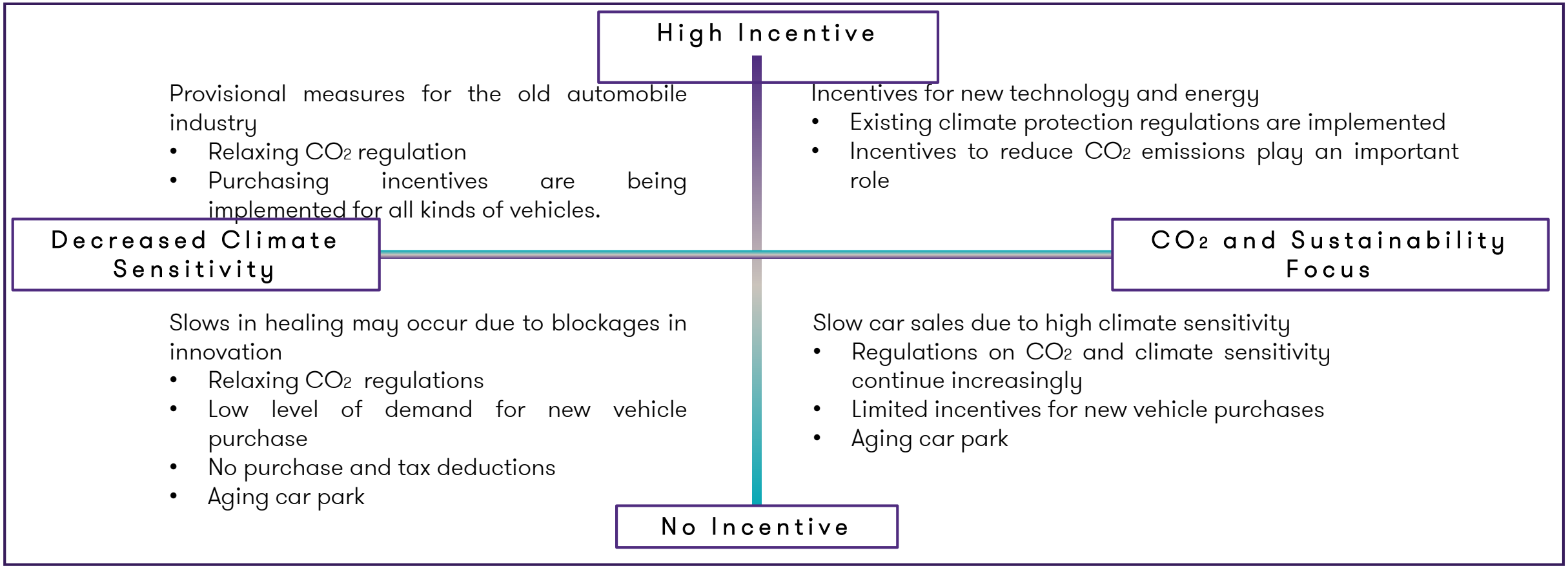
Unlike the US and Europe, GDP and car sales in China have not experienced a serious recession in the last 20 years, but growth has declined in some periods. For example, there was a significant slowdown in the automobile market during the 2008 global financial crisis. This also happened in 2018 and 2019. The most important factors of this slowdown are the saturated car internal market, restrictions on vehicle purchase and challenges in the financial incentive system.

Source: Arthur D Little, Global GT Resources

Automotive Sector under the Effect of Covid-19

Possible Incentive and Climate Sensitivity Scenarios under the Covid-19 Impact

After COVID-19, the automotive market will be reshaped by regulations and government interventions and will differ across the United States, Europe and China. OEMs will need to implement different production and sales strategies. Issues such as CO_2 and climate policy will also play an important role in consumers' decision making. Therefore, it is important to develop a strategic perspective with different scenarios comparing the scope of procurement incentives, climate and environmental focus. The matrix below reflects some CO_2 and climate scenarios.



Source: Arthur D Little, Global GT Resources

Covid-19 Impact: Automotive Sector

Covid-19 Observations - Actions in the Automotive Sector

OBSERVATIONS	ACTIONS
• Sales of new cars and commercial vehicles are projected to decline significantly in 2020.	• Due to difficulties in production and supply, demand for second-hand cars and commercial vehicles will increase in the short and medium term.
• Unusual situations occur in second-hand vehicle prices due to supply and demand imbalances.	• It will be important to use existing data and insights to support pricing strategies.
• New market dynamics are emerging that have never been seen before.	• Understanding emerging behaviour and marketing trends will be important (public transport, home delivery services, online sales, etc.).
• Commercial vehicles in Turkey and in the world will also be important to be electric.	• New strategies will be implemented to adapt to the supply and demand market.
• Among the bottlenecks of the automotive sector are issues such as cash flow, debt, lack of demand, productivity.	• From OEMs to dealers, industry providers and supply chains, an industry-wide consolidation plan will be needed.
• The automotive sector is adversely affected by social distancing restrictions and slowdowns in the supply chain. The recovery process is expected to take a long time.	• When leveraging and investing in digital solutions, it will be important to redesign inefficient physical procedures and activities
• Emergence of financial risks	• It will be important to find alternative financing solutions to be least affected by financial risks.

Source: Cox Automotive, Global GT Resources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What awaits the Automotive Industry in the Future?

Result

Due to the Covid-19 outbreak in 2020, the automotive sector is experiencing a decline in both production and foreign trade. Breaks in international supply chains appear to have a negative impact on the automotive sector. It is predicted that the sector will return to its pre-pandemic position only in 2023.

Although automotive sales, which are tried to be increased by government incentives, increase periodically, it is clear that this situation is not sustainable for the sector in the long term. The motor vehicle manufacturing industry needs to increase current capacity utilization in the short term and support the sector with new investments and incentives in the medium term.

With Covid-19, there have been changes in vehicle sales processes, especially the purchase and sales of first-hand and second-hand vehicles on the internet have increased considerably. This situation is expected to remain effective in the coming period. Automotive companies are expected to give more weight to the internet side when marketing, on the grounds that it provides both cost reduction and access to a wider audience.

Variable exchange rates are also the leading factors affecting Turkey's automotive sector in this period. Exchange rates, which have been highly volatile since 2017, cause a significant increase in imported vehicle prices and a decrease in demand in the domestic market.

In addition, this makes it difficult for manufacturers to plan in the short and long term and causes serious fluctuations in vehicle purchases and sales by reducing the purchasing power of consumers.

Increases in SCT rates also negatively affect domestic market growth. Low-interest loans provided by banks in June, July and August 2020 only provided temporary growth in the domestic market and we anticipate that demand will shrink in the long term with the effect of SCT.

2020 yılında elektrikli ve hibrit araçlar otomotiv sektörünün en önemli gündem maddelerindendir. This situation will increase even more in the coming years, especially with many car manufacturers starting to manufacture such vehicles. In the next 10 years, we estimate that the share of electric and hybrid vehicles that have become more common, especially in the European Economic Area, will reach 10% of all vehicle sales. According to the European Automobile Manufacturers Association (ACEA), national incentive policies also have a significant impact behind the recently increasing popularity of electric vehicles.

In Turkey, we expect that electric vehicles will become widespread in our country in the coming period as a result of the production of our domestic electric vehicle TOGG, the development of the necessary infrastructures for electric charging stations and appropriate pricing and incentives in electric vehicles.

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