

STRATEGY PAPER
for KONYA
FEASIBILITY STUDY AUTOMOTIVE
Version 13.1



Konya, 2016

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I. List of Abbreviations

BRICS	Brazil, Russia, India, China and South Africa
CAGR	Compound Annual Growth Rate
e.g.	for example
etc.	and so on
EU	European Union
FDI	Foreign Direct Investment
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
IASP	International Association of Science Parks
ICE	Internal combustion engine
KOP	Konya Ovası Projesi (Plain-Project)
KOS	Konya Organize Sanayi (Organized Industry Area)
KPMG	Klynveld, Peat, Marwick and Goerdeler
MHP	Milliyetçi Hareket Partisi (National Movement Party)
MVT	Multiprogramming with a Variable number of Tasks
NATO	North Atlantic Treaty Organization
OECD	Organization for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
OIC	Organization of Islamic Cooperation
OIZ	Organized Industrial Zone
OSB	Turkish abbreviation for Organized Industrial Zone
OSCE	Organization for Security and Co-operation in Europe
R&D	Research and Development
SME	Small and Medium Entrepreneurs
SSP Support	Social Security Premium Support
SUV	Sports Utility Vehicles
TIP	tactical Implementation Plan
TL	Turkish Lira
TSR	Turkish State Railways
TÜBİTAK	Türkiye Bilimsel ve Teknolojik Araştırma Kurumu in English it's Scientific and Technological Research Council of Turkey
UN	United Nations
USA	United States of America
USD	United States Dollar
VAT	Value-Added Tax
VW	Volkswagen; German car manufacturer

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IV. Justification of Study

Since a year, the media is reporting that Turkey wants to produce its own domestic car based on the technical specifics of Saab 9-3.

In 2012 Saab was acquired by the Chinese consortium “National Electric Vehicle Sweden” (NEVS).

The cooperation between the “new” Swedish Saab and TÜBİTAK started in June 2015. Together they want to build the new Turkish car based on the Saab 9-3, which should be launched in 2020. The drive will be a combination of an electric motor and a small combustion engine for range improvement. Students from Istanbul University have already developed the electric car “T-1” in the Yerel project during 18 months in April 2015. This car is able to reach a distance of about 500 km with a high speed of 120 km/h. The students have been honored with a price by TÜBİTAK due to the outstanding result of the project and now supporting the new domestic car project with their knowledge and experience.

TÜBİTAK’s intention is to support Turkey with the set-up and development of the automotive industry. Also the Turkish Minister of National Defense, Fikri Işık stated that the electric car project does not only aim to produce an own car, but also to bring new technology and knowledge to Turkey. There are already negotiations with a big manufacturer for the supply of battery technology. Additionally, they cooperate with the German company BOSCH.

Therefore, the aim of this study is to analyze if Konya is the right location for this automotive production plant. This will be done by analyzing first of all the global automotive market with future forecast of production and potential to show that there is an increasing demand for cars worldwide. Afterwards, a closer look into the economy of Turkey and the current and future situation of the automotive sector will give insights about the automotive market and the need of a domestic car. Later on different provinces are analyzed to show the advantages and disadvantages of the regions with regard to different factors which have an importance for car manufacturers. Then a closer look into Konya will reveal the current situation in Konya. Factors like labor market and qualification of human capital, transportation and resources and different locations, like the Organized Industrial Zone,

are analyzed in detail. In addition, different plant structures worldwide are stated to prognosticate a possible layout for the automotive manufacturing plant and afterwards matched to the different location possibilities in Konya.

At the end of the report, different success factors are stated for the province Konya which is derived from automotive success factors worldwide. And the last chapter will give different fields of action to implement these factors and increase the attractiveness of Konya as an investment area for the automotive production plant.

V. Executive summary

The Automotive Industry is an increasing global industry, with complex supply chains and changing consumer demands from markets worldwide.

New technologies are revolutionizing how consumers interact inside and outside their vehicles, as well as how supply chains perform in a complex, global economy.

The first chapter **1 Automotive Sector Global** analyzes the global automotive market by stating the status quo, afterwards giving an outlook of the future sales figures and customer demands.

The key market players are still the United States, China and Germany. While analyzing the global automotive sector some strengths and weaknesses are crystallized (see Table 1 Strengths and Weaknesses of Global Automotive Market”). The global sales growth is stable at +3% and to stay competitive with the key player’s, car manufacturer need to adapt their offerings to each market and customers. An important factor for a successful automotive industry is the automotive supply Industry. The top automotive suppliers worldwide are Bosch, Continental, Denso, etc. (see Illustration 4 Top Automotive Suppliers in 2015, Based on Worldwide Revenue in Million Euros”). Not only the automotive supply industry influences the automotive market, also the mega-trends like urbanization, SMART Cities, the next game changers, global power generation in 2020, E-Mobility and infrastructure development will influence the automotive market in future.

The challenges of the global automotive market are listed at the end of chapter 1. The main challenges - climate change, emissions reduction and the competition of existing market players - will lead to a transformation and new players will enter the market. As a result we can expect a change to the structure of the entire automotive industry. Today's players, as well as potential new entrants, will need to adapt to the new framework to achieve sustainable success.

The Turkish automotive sector will be analyzed in chapter **2 Automotive Sector Turkey**, in terms of total capacity of the current car production, giving an overview of current car segments. Afterwards factors for future growth and possible trends

are identified. This chapter will be summed up by challenges and opportunities of the Turkish automotive market.

Turkey is located in the cross road between Europe, Asia and Middle East. The main factors Turkey has to face on the way to an innovation driven nation are tax rates, access to financing and inadequately educated workforce.

The annual growth rate of passenger cars in Turkey is going through an annual change of up and downs. In 2015 Turkey reached again a positive growth with +24%, but the growth rate of ownership is rising steadily by an average of 6% per year, although the young buyers under the age of 30 are more likely to rent and not buy cars.

There are already many automotive factories located, e.g. Ford with a capacity of 415,000 vehicles per year, Hyundai with 245,000 vehicles per year, Renault with 360,000 vehicles per year and Tofas with a capacity of 400,000 vehicles per year. Moreover 35 out of the top 100 global automotive suppliers are present in Turkey.

The most promising car types, according to sales rates are the sedan type in the compact and medium segment.

The main challenges for automotive manufacturers are pricing and sales and the focus on R&D as well as product development activities.

Due to the significant growing Turkish automotive market, different provinces are analyzed in chapter **3 Regional Overview** in regard to finding the most suitable location for a domestic car plant. The 8 provinces Aksaray, Bursa, Istanbul, Izmir, Kocaeli, Konya, Manisa and Sakarya are compared by standardized factors (area, population, education, human resources and infrastructure).

Aksaray already has located car manufacturers with automotive knowledge. Bursa offers very good access to qualified manpower. 38% of Turkey's industrial output is generated in Istanbul. Most of the OEMs already in Turkey are located in Kocaeli. Konya is very advantageous location in terms of road and railway transportation opportunities. Manisa offers low labor costs and Sakarya is very well connected on the Ankara-Istanbul highway.

The most available area offers Konya (38,873 km²) with 2,200 TL/m² (average of the regions is 3,402 TL/m²). 35% of investments were done in the north west of

Turkey. The region's average age is 32.7 years and the well-being index reaches from 0.51 (Aksaray) to 0.67 (Sakarya). The leader of each parameter of the well-being index varies significantly. The region's unemployment rate is 8.5% and the labor costs are 12.9 TL/h.

One of these provinces has been mentioned by the Turkish media as particularly suitable location for domestic car plant. For this reason chapter **4 Analyzing Konya** focuses on Konya in terms of population and land, education, employment and human resources, transportation, technology, R&D and innovation infrastructure, Organized Industrial Zone and automotive industry.

Konya offers a lot of strengths, like the location in the center of Turkey, the vast and for industry available land, the young, highly educated and qualified population, the high level of social security standard, innovation drivers (InnoPark, universities and vocational training centers), well-developed diverse industrial branches in Konya, availability of automotive industry knowledge, the most important engine valve, engine piston, cylinder liner, crank, gear and gasket factories, cheap and easy transportation, the strongest logistics infrastructure in Turkey convenient to freight and passenger. Supported vocational training enables company and branch specific education in the automotive sector. Konya already started projects to extend their advantages in infrastructure, the high speed railway between Antalya-Kayseri and Konya-Mersin and the logistics center near OIZ.

There are opportunities in increasing renewal energy resources, as the lack of passenger car aftermarket infrastructure poses a threat.

Konya offers a lot of economic (rich natural resources, strong industrial infrastructure, etc.), social (young and qualified human capital, qualified living spaces, etc.) and technological (strong regional innovation center, support by various national foundations and ministries) factors.

The best practice of plant design and structuring depends first of all from the product structure and from the vertical range of manufacturing. Chapter **5 Analyzing Different Plant Structures** illustrates different real built plants.

Konya offers approximately 6,700 ha area in the north east of Konya to be made available for industry and additional area in the south. Chapter **6 Choice Plant Location** shows possible locations and integration in the available infrastructure

(links are to be built). The integration of a supplier park onto the plant site is optional and an important strategy factor to the choice of the plant location.

Chapter **7 Plant Layout** shows different possibilities of plant layouts, illustrating the typical facilities (such as body shop, assembly, logistics, etc.). A detailed layout is not part of this study. The end of chapter 7 shows major milestones and an exemplary roadmap for market integration in 2020.

The prerequisites and factors for a successful domestic automotive industry are identified in chapter **8 Factors to Success**. It is important to clarify the market strategy, develop the car specifications as well as clarify the supplier and investment strategy before developing concepts about functions, infrastructure and a detailed roadmap. Also the human resources need to be further educated and qualified.

Derived from the Factors to Success are recommendations for the further activities (general and automotive specific) in Chapter **9 Recommendation for Action**. One important field of action is the quick realization of transport and logistic projects. Konya has to invest and expand their railways and roads. The attractiveness of the area of Konya for suppliers to settle could be increased by reducing land costs. The already located suppliers should be evaluated in regard to their qualification to produce parts for the passenger car industry. To increase the availability of highly qualified personnel, close partnerships with universities with governmental aid should be established. Qualified human capital could be attracted by benefits like lower housing rents and creation of more recreational areas. A marketing strategy should be developed, to show, that Konya is a hidden champion in Turkey. The prestige of Konya could be further increased by investment in green technologies.

Konya is very ambitious and an area of innovation in the automotive industry, which meets the best prerequisites to establish a successful automotive production plant in Turkey.

1 Automotive Sector Global

The Automotive Industry is an increasing global industry, with complex supply chains and changing consumer demands from markets worldwide. Being one of the world's largest industries, the industry is experiencing rapid change due to changing demands, technology and business models.

New technologies are revolutionizing how consumers interact inside and outside their vehicles, as well as how supply chains perform in a complex, global economy. Rising wages in emerging markets, energy prices and other variables pose further challenges.

1.1 General Market Insights

A global presence is a must for all car manufacturers for benefiting from global growth and globalization. However, global presence also increases global risks and challenges. As a result of the shared economy, disruptive business models or technologies and the diesel scandal are only some examples to be named.

The automotive market remains an important sector for industrial and developing countries and industries.

The key market players, due to their import and export rate, are the United States, Germany and China. The sector risk for these markets is almost zero.

Country	Role	Sector Risk
United States	#1 importer #2 exporter	●
Germany	#1 exporter #3 importer	●
China	#1 producer #2 importer	●

Illustration 1 Sector Risk of Key Market Players

When analyzing the global automotive market, there are some strengths and weaknesses which need to be named:

Strengths	Weaknesses
<ul style="list-style-type: none">▪ Steady global growth despite challenges▪ High level of profitability in the United States and China▪ Recovery in Europe after several years of decline	<ul style="list-style-type: none">▪ High overcapacity and competition in Europe▪ Major difficulties in some emerging countries, principally Brazil and Russia▪ Stringent environmental requirements (pollution, CO₂ emissions)

Table 1 Strengths and Weaknesses of Global Automotive Market

For new market players the first point will be the hardest one to overcome. However, due to recent consumer insight new technologies are gaining more and more importance in a purchasing decision. And due to the fact, that the electric car segment is not as a red ocean as the traditional automotive market, new technologies might be an opportunity to enter the market.

To capture future growth and find profit from these weaknesses - OEMs need to review and adjust their strategic priorities, deploy the appropriate investments and resources, and develop new skills to execute these strategic objectives.

Therefore, for staying in the game and maintaining global presence, collaboration with car manufacturers will lead to higher pricing power and level of profitability.

Furthermore, the “new deal” is to be present in all markets. Sales volumes are key strategy to cope with high level of investment and spending on R&D.

1.2 Market Size

Increased sales in the three main markets –China, the United States and Europe – should remain steady in 2016 after a yearly increase of respectively +7% (21 million units), +6% (17.8 million units) and +9% (14.1 million units) in 2015. India’s sales dynamism will also keep momentum with again +10% increases this year. In Japan sales is expected to rebound after a -9% decrease in 2015 due to the VAT increase in April 2014¹.

Conversely two important emerging markets will continue to face major difficulties in line with macroeconomic turmoil: (I) in Brazil sales are expected to decline fur-

¹ <http://www.eulerhermes.com/mediacenter/Lists/mediacenter-documents/Automotive-Global-Report.pdf>

ther by -7% this year after -24% in 2015; (ii) in Russia automotive sales are forecasted to fall by -11% in 2016 after a -32% drop to 1.6 million units in 2015.

Car manufacturers need to adapt their offerings to each market and customers to stay competitive. Notably, low cost models should be rolled out for India, larger Sports Utility Vehicles (SUVs) for the United States of America, and medium and premium models for all markets.

But overall and despite all challenges, global sales growth is stable at +3%.

The following graphs show the sales and prices of the OEMs. The remarkable point is that in almost all regions premium cars are at the top. However, the diesel scandal of the VW concern in the USA shows the importance of image, because after the scandal the VW brand dropped significantly in the North American market.

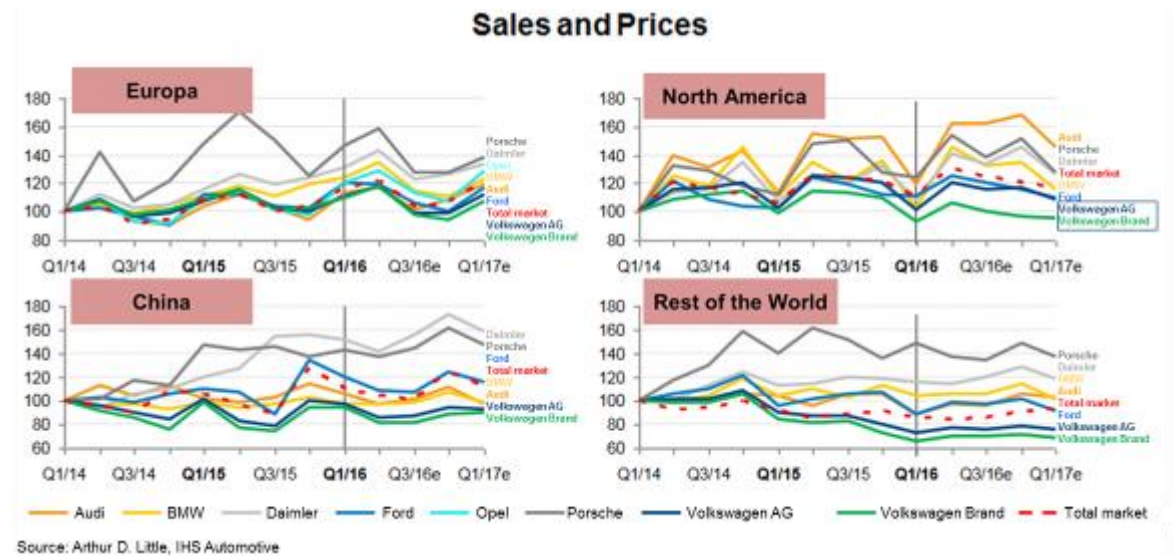


Illustration 2 Sales Passenger Cars of German OEMs and Ford by Regions

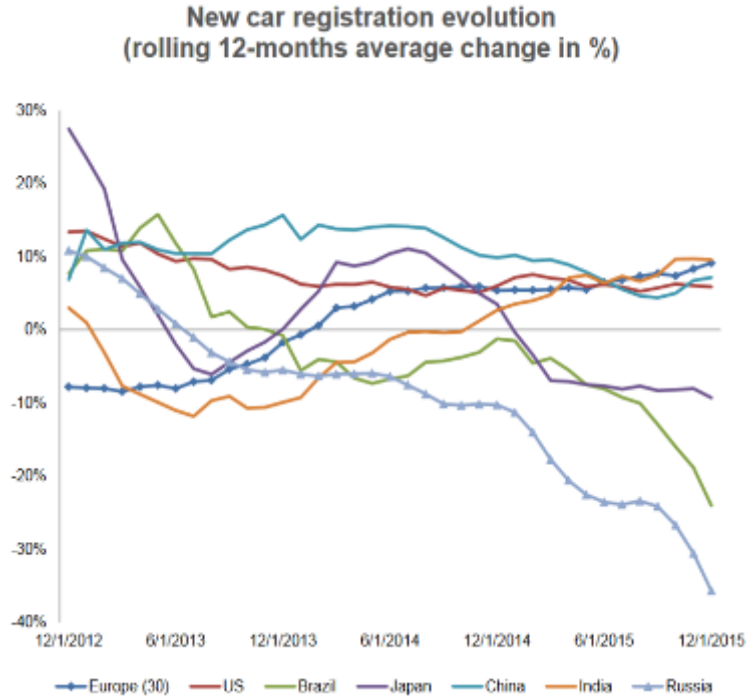


Illustration 3 New Car Registration Evolution

The automotive sector is slowly recovering from its crisis. As shown in Illustration 3, the new car registration in Europe is increasing again. But, markets like Russia and Brazil are facing significant drops. Therefore, the outlook for the global car sales underlines the current market. China will still increase, but not as much as in the last years.

International Car Sales Outlook						
(millions of units)						
	1990-99	2000-12	2013	2014	2015	2016
TOTAL SALES	39,20	52,57	68,65	71,17	72,35	74,38
North America	16,36	17,67	18,33	19,42	20,64	21,06
Canada	1,27	1,59	1,74	1,85	1,90	1,90
United States	14,55	14,12	15,53	16,44	17,39	17,70
Mexico	0,54	0,97	1,06	1,13	1,35	1,46
Western Europe	13,11	13,96	11,55	12,10	13,18	13,71
Germany	3,57	3,27	2,95	3,04	3,21	3,30
Eastern Europe	1,18	2,95	4,04	3,81	2,91	2,80
Russia	0,78	1,75	2,78	2,49	1,60	1,44
Asia	6,91	15,01	29,98	31,69	32,29	33,64
China	0,45	5,77	16,30	18,37	20,01	21,41
India	0,31	1,13	1,83	1,88	2,06	2,20
South America	1,64	2,97	4,75	4,15	3,33	3,17
Brazil	0,94	1,84	2,76	2,50	1,82	1,60

Table 2 International Car Sales Outlook

1.3 Top global Automotive Suppliers

Although motor vehicles are typically sold under a brand name, virtually all automotive manufacturing companies restrict themselves to designing and assembling automotive parts or component groups, most of which are provided by external suppliers. The car parts that are likely to be manufactured by automotive supplier firms include exteriors, interiors and air conditioning components, electrical and electronic equipment, vehicle chassis and powertrains.

In light of growing environmental awareness and an increasing desire to connect vehicles to the internet, automotive suppliers are faced with a variety of new challenges. Market trends such as the shift to lighter materials, as well as the trend towards electric vehicles and alternative fuel powertrains are set to shake up the automotive industry. It is expected that automotive suppliers will respond to changing market trends by increased spending on research and development activities.

The statistic below shows the top automotive suppliers in 2015, based on worldwide revenue. Bosch ranked first in top automotive suppliers in 2015, with automotive segment revenue of roughly 41.7 billion euros.²

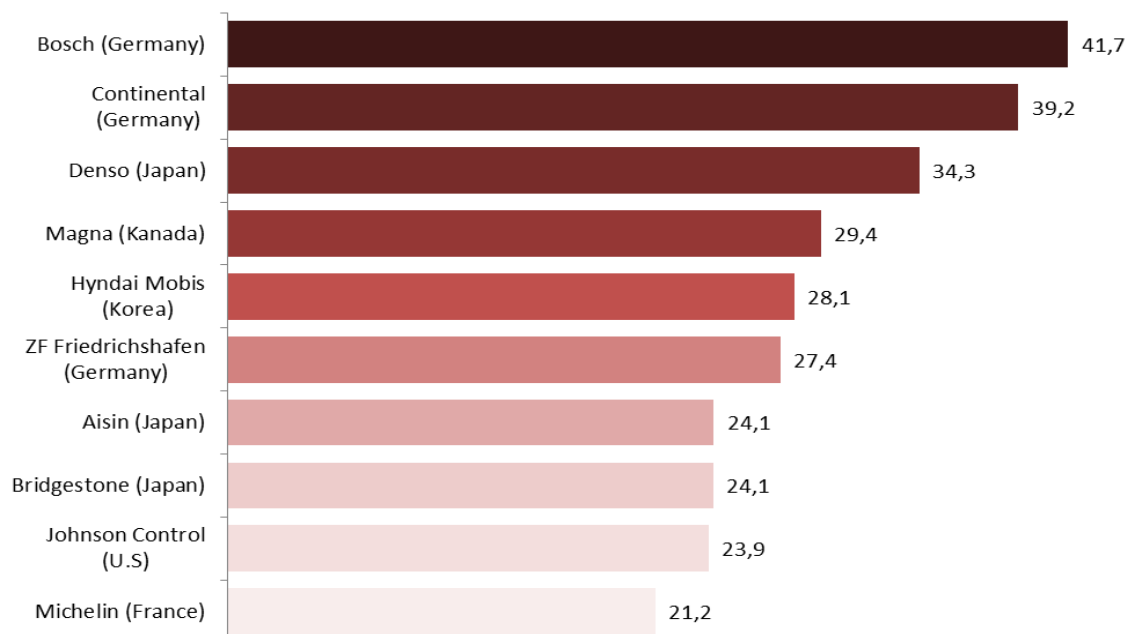


Illustration 4 Top Automotive Suppliers in 2015, Based on Worldwide Revenue in Million Euros

² <http://www.statista.com/statistics/199703/10-leading-global-automotive-original-equipment-suppliers/>

1.4 Forecast of Sales

The good news for the industry is that all segments are predicted to increase in volume. Within the next two years, global vehicle sales will pass the magical 100 million units mark and continue to rise until the end of this decade (see Illustration 5). This rise develops on the back of increasing demand in emerging markets like China.

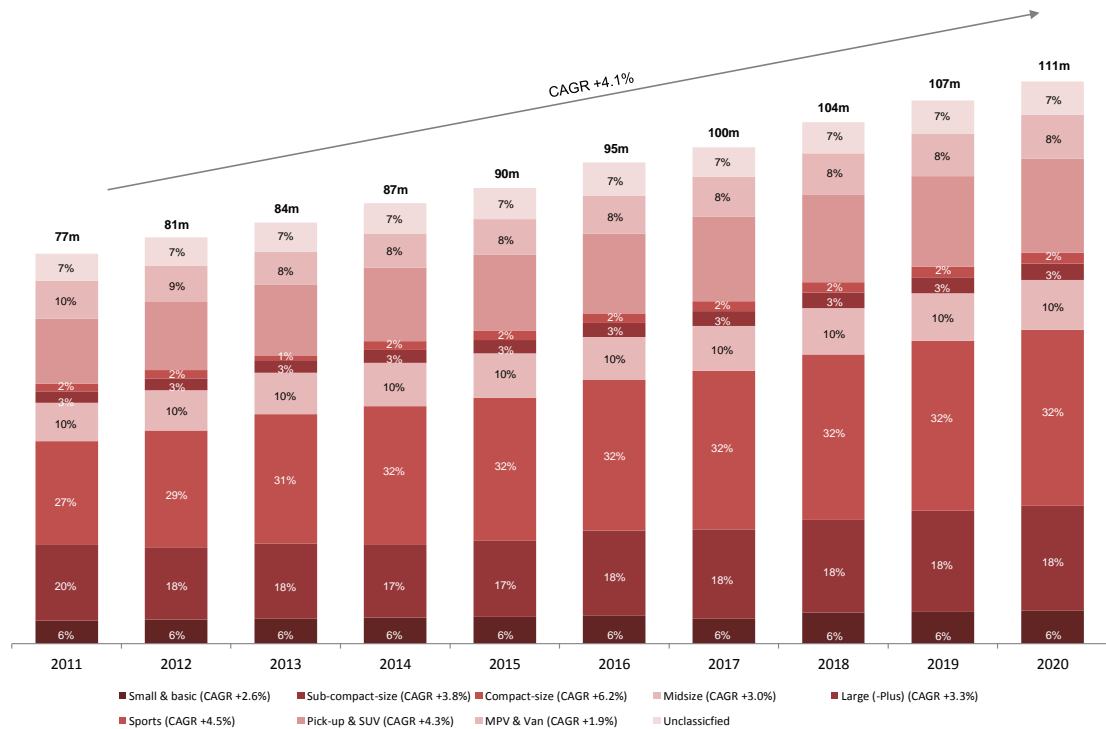


Illustration 5 Vehicle Sales Forecast by Models Market Share (2011-2020)

Conversely, the compact-sized, pick-up & SUV and sports models are forecasted to outpace overall market growth rates up to 2020, with compact-sized being the real success story. Almost one-third of all vehicles sold worldwide are expected to come from this segment in 2020. This puts the spotlight on recent efforts by global OEMs to invest in small budget cars in the BRIC countries and other high-growth territories, with an uncertain long-term sales volume and margin potential for these models.

1.5 Mega-Trends

Mega trends are global, sustained and macroeconomic forces of development that impact business, economy, society, culture and personal life. They are defining our future world and its increasing pace of change.³

The following will give a brief example of major mega-trends which will influence the global automotive market:

- **Urbanization:** Increasing pace of urbanization will lead to integration of the core city with daughter suburbs resulting in expanding city limits. This will have massive impact on the future of mobility, working life and societies. Three concepts of urbanization will emerge:
 - Mega Cities, Mega Regions and Mega Corridors
 - Mega Cities: Integration of core city with suburbs and housing over 5 million people
 - Mega Regions: Integration of two or more Mega Cities to form Mega Regions housing over 12 million people
 - Mega Corridor: Transport corridors connecting two or more Mega Cities or Mega Regions converging to form Mega Corridors
- **SMART City:** With the advent of technology and infrastructure development, there will be a shift from GREEN to SMART concept. Some of the SMART initiatives will find its way into elements of energy, technology, grids, cars, buildings, utilities and infrastructure. These will define the future of personal lives, mobility and business.
- **N11 – The Next Game Changers:** The next big emerging markets coined as the Next 11, will be the future economic engines of growth – signaling a shift in economic power in 2020 from BRIC countries to nations of Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, South Korea, Turkey, Vietnam.
- **Global Power Generation in 2020:** By 2020, nearly half of world electricity will be produced in emerging regions like China and India. Shifting regional

³ [http://www.bar-oriyan.com/Portals/0/mega%20trands%20exec%20summary%20v3%20\(1\).pdf](http://www.bar-oriyan.com/Portals/0/mega%20trands%20exec%20summary%20v3%20(1).pdf)

and fuel balance will see renewable and nuclear energy increasing to 36% in 2020 of the total power generation.

- **E-Mobility:** Over 40 million electric two- and four-wheelers will be sold annually around the globe in 2020. E-mobility, from electric cars to aircrafts, will usher in a new set of players with new business models offering innovative and customized sets of infrastructure and technology solutions.
- **Infrastructure Development:** Emerging transportation corridors (e.g. Trans-Siberian Rail) will lead to mushrooming of economic and technology clusters along these corridors. These integrated hubs will be the future centers of innovation, R&D and technical excellence attracting massive investment and government support

The following Illustration 6 Mega-Trends Driving Automotive Industry is showing further mega-trends, which will influence the future of the automotive sector. Especially this illustration points out the importance of the technology sector.

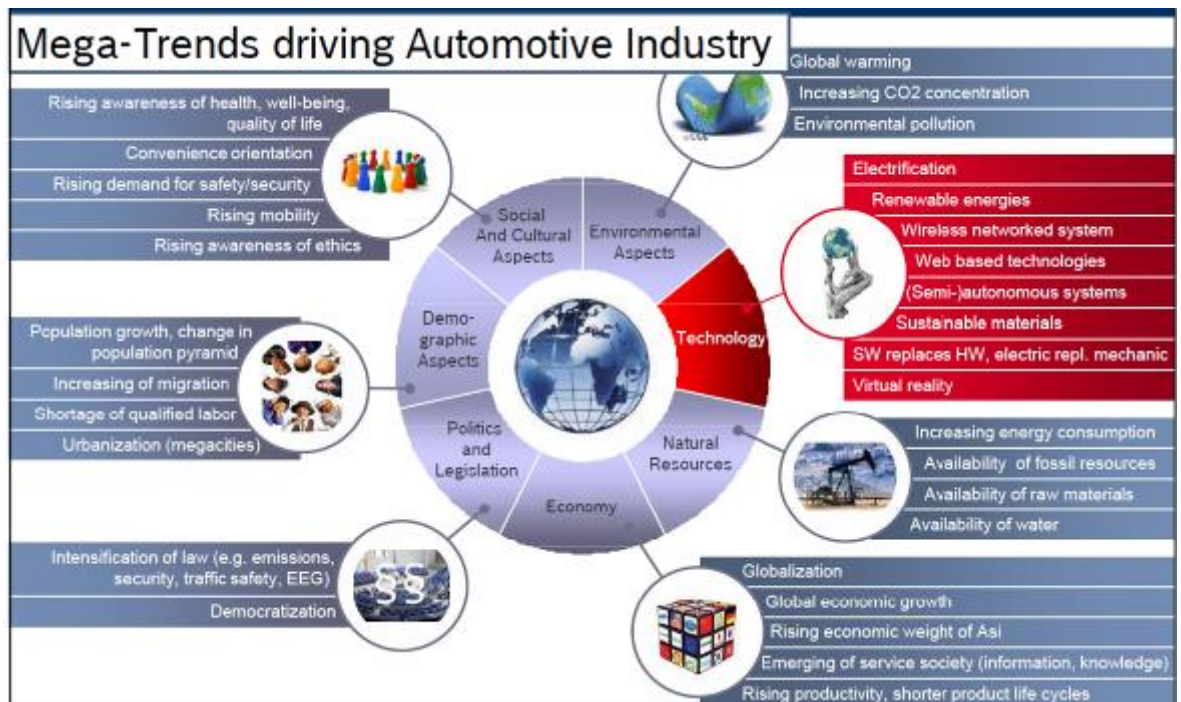


Illustration 6 Mega-Trends Driving Automotive Industry

1.6 E-Mobility

The following table shows the future key issues the society will face and the key trends leading out of it. A survey, made by KPMG, showed that the respondents think battery electric mobility will be the most important trend.

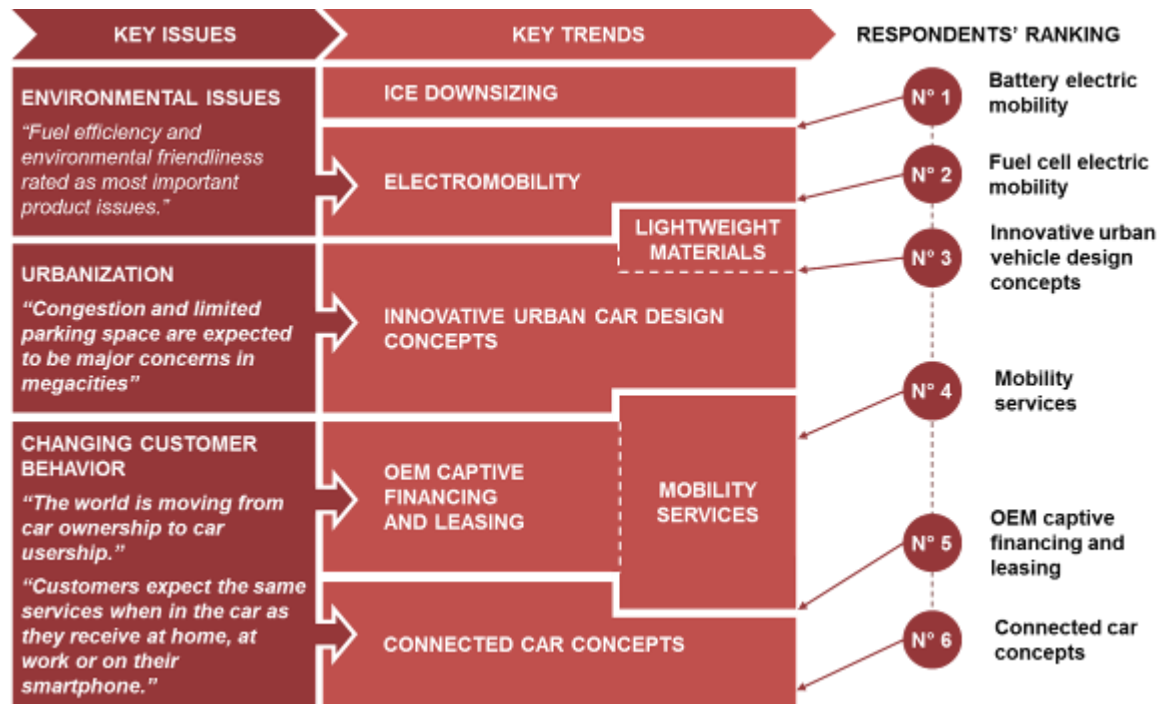


Illustration 7 Future Key Issues of Society Key Trends Leading Out

Given the growing pressures on fuel efficiency, it is no surprise that the vast majority considers electro mobility to be the most pressing trend in the automotive industry, either driven via batteries, ranked as most important, or fuel cells, which come a close second. In the face of growing urbanization, city dwellers need cars adapted to their particular environment. This explains why urban-oriented design is considered the third most important trend for the future of the automotive industry. Furthermore, as cities seek to reduce pollution and congestion, car ownership will become restricted and not available for everyone. Despite the omnipresence of electro mobility, respondents consider such approaches of mobility services as the fourth most important trend for the coming 10-15 years.⁴

The following illustration underlines the respondents' estimation of growing importance of electrical vehicles. The forecast shows that the total production of

⁴<https://www.kpmg.com/GE/en/IssuesAndInsights/ArticlesPublications/Documents/Global-automotive-executive-survey-2012.pdf>

powertrains will nearly double in five years from 2016 to 2020 and the leading force will be the production of full and mild hybrid. Although the battery, with and without range extender, will also grow in importance, the forecast is sobering. The reason for this forecast are multiple, as for example the infrastructure like charging stations are not widespread or the technology is developing not as fast as the hybrid.

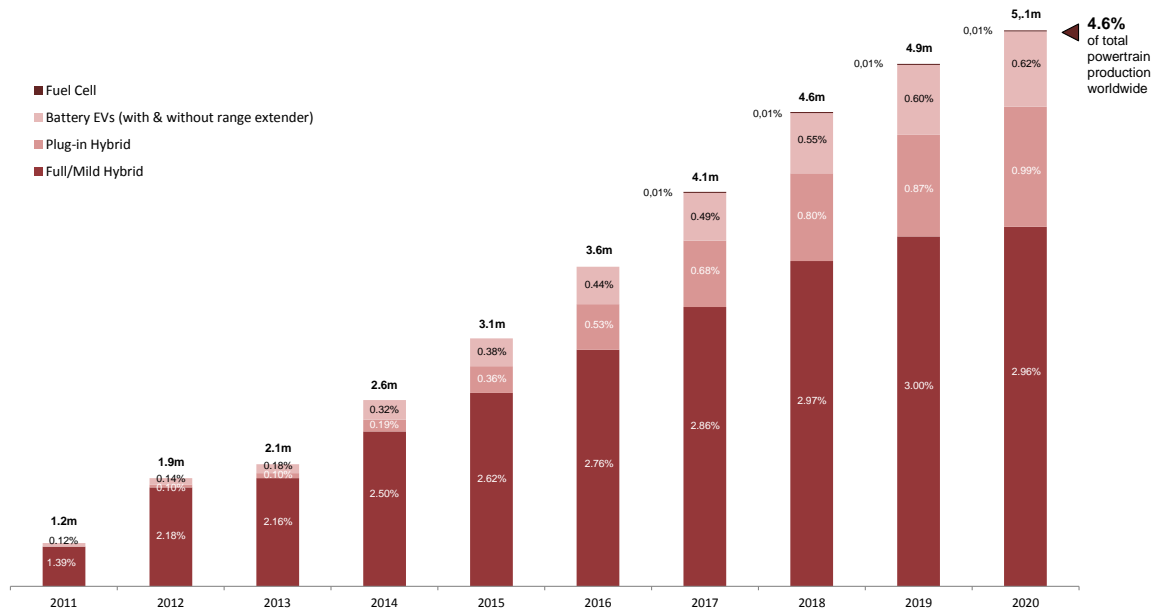


Illustration 8 Electrified Powertrain Production Forecast (2011-2020)

The percentage in this illustration shows the percentage of the technology depending on the total powertrain production. Battery will constantly gain of market share over the years whereas full and mild hybrid has fluctuation in the percentage of the production forecast. However, percentage wise the full and mild hybrid is still dominating the share of the electrified powertrain production.

The day when most of us drive fully electric cars is still on the distant horizon. In 2020, less than one in 20 vehicles produced will be equipped with electrified powertrains. The majority will be only slightly electrified with full or partial hybrids.

The excitement over the potential of fuel cell electric cars is also likely to be overhyped; by 2020 a mere 0.01% of cars are likely to be equipped with this type of propulsion – which equates to approximately 16,000 fuel cell drive units per annum.

There is considerable uncertainty over whether any of the different e-components provide much potential for differentiation, with no clear favorite emerging. Of all

the options, battery management appears to hold the most promise. Battery cell, pack or chemistry development and production are not thought to offer competitive advantage, therefore a possibility would be to outsource those or develop them via joint ventures to share R&D expenditure.

Although there is no clear winner among the various electrified technologies, hybrids are expected to outsell battery-powered cars several times over in 13 years' time.

Respondents from the BRIC nations believe fuel cell-powered vehicles will attract the most consumer demand, with the exception of China, where pure battery-powered vehicles are expected to come out on top (see Illustration 9).

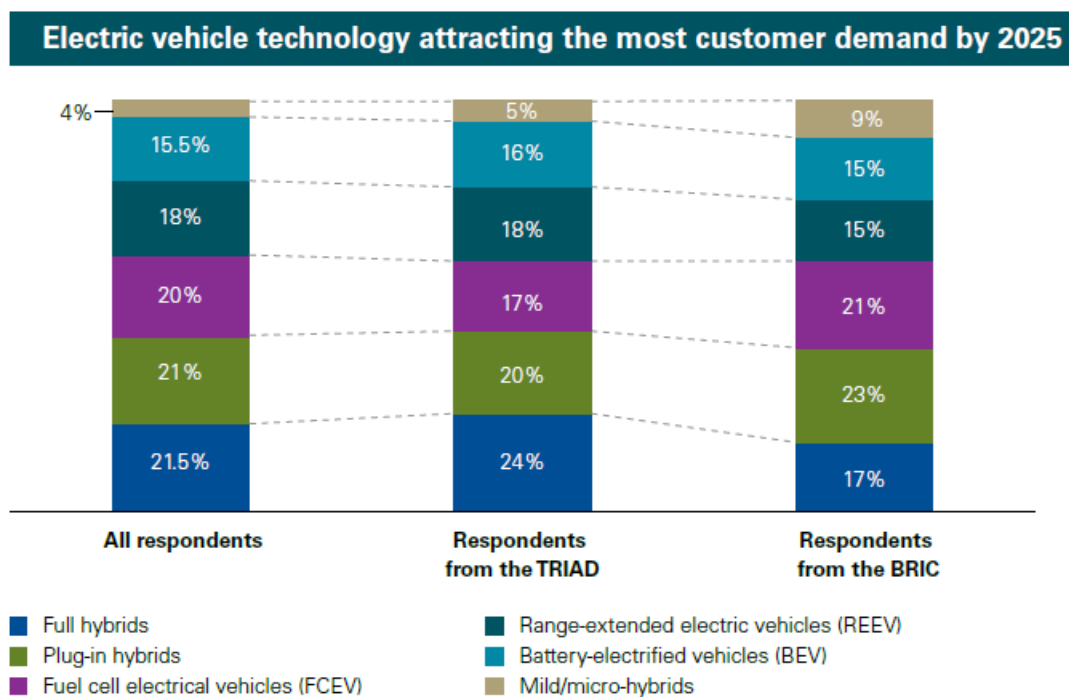


Illustration 9 Electric Vehicle Technology Attracting the Most Customer Demand by 2025

Electro mobility still has a long way to go before it can be regarded as a true replacement for the traditional ICE. Current developments foreshadow that e-vehicles will not exceed 15% of annual global sales in 15 years' time. These figures differ considerably by country and region. The Japanese market is by far the most optimistic, with 46% of the respondents from Japan predicting e-vehicle sales to gain a 25% share of domestic new car registrations in 2026, for a total of 1.4 million units. China also has relatively high expectations for e-mobility.

While these figures are relatively small percentage-wise (see Illustration 10), they still represent a huge opportunity in terms of actual vehicle numbers. With the Chinese market projected to reach 37.5 million in annual sales by 2026, e-cars could total between 4 and 6 million, compared to about 1.5 million in the U.S.

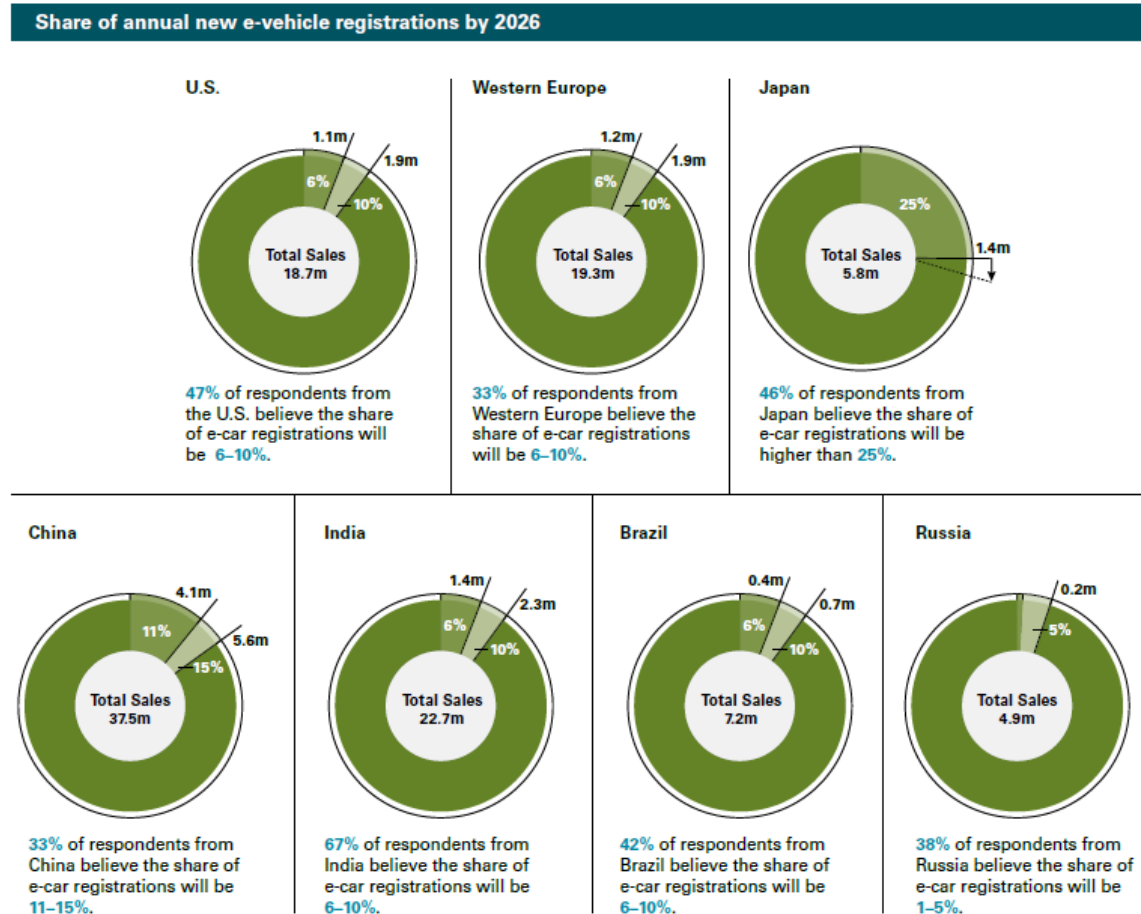


Illustration 10 Share of Annual New E-Vehicle Registration by 2026

Future Value Chain

Attempts by OEMs to consolidate their supply chains have had limited success. They aren't only faced with more and more new suppliers from the technology sector; those manufacturers expanding overseas also require their existing suppliers to move with them. Meanwhile green regulations are putting a strain on supplies of commodities such as aluminum, which is in heavy demand to reduce vehicle weight and improve fuel efficiency.

The 2011 environmental disasters in Japan and Thailand highlighted how little OEMs know about their supply chains, with a number of automakers reliant upon

a single Tier 3 or 4 supplier affected by the catastrophe. By enhancing the transparency of their supply networks, automakers can become less vulnerable to natural or financial crises, by spreading their business across multiple suppliers at each tier level. Lifecycles vary considerably between the automotive and electronics industries, so vehicle manufacturers should collaborate more closely with technology suppliers, to ensure they produce the right components at the right time in the right quantities.

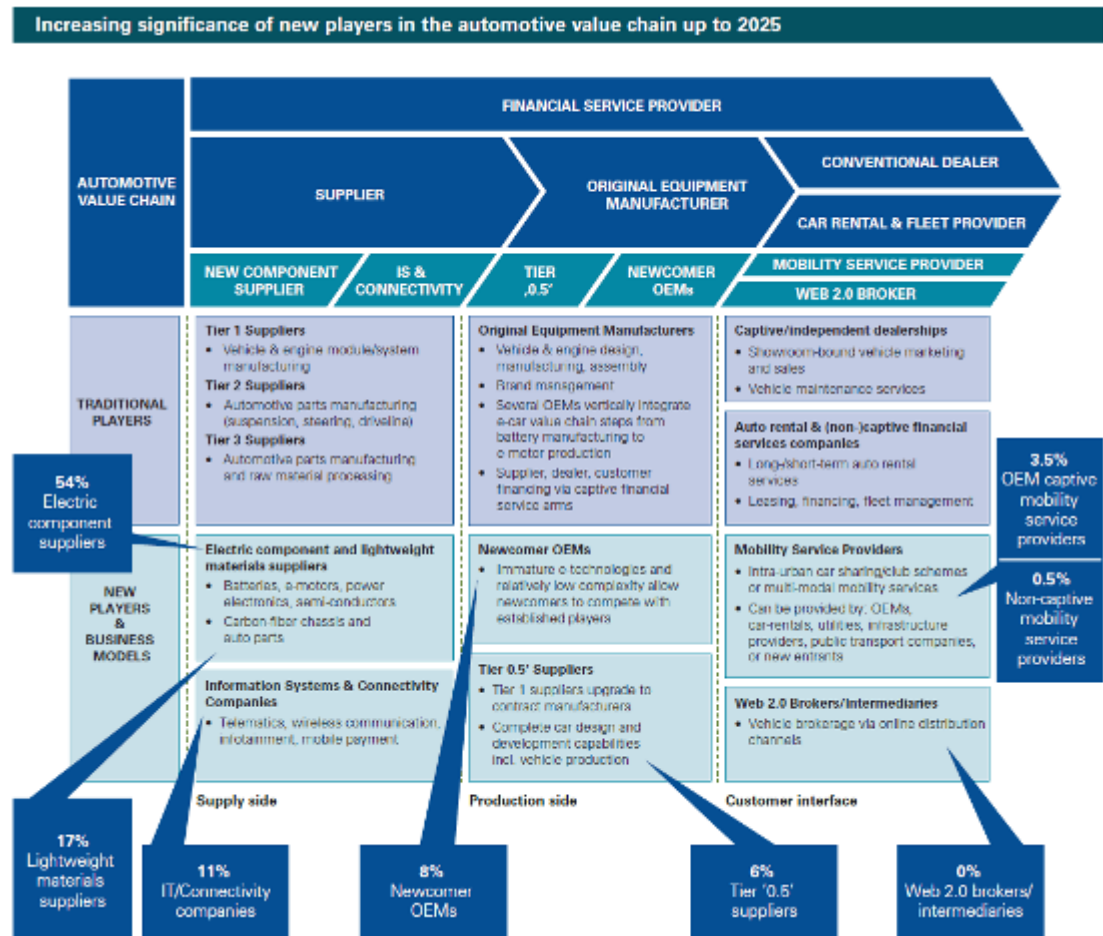


Illustration 11 Increasing Significance of New Players in the Automotive Value Chain up to 2025

The automotive value chain is undergoing change and the battle for control is heating up. Electric component suppliers will gain a more significant role in the next fifteen years, reflecting the continued rise of electric parts within both ICE-driven cars and the new electrified vehicle concepts. With efficiency and a high priority of safety, suppliers of strong, lightweight materials such as carbon fiber are also becoming more influential. Tier '0.5' suppliers are not considered to be a threat to the dominance of OEMs, which is somewhat contrary to current practice; some suppliers are already producing whole systems and even investing in re-

search and development to independently come up with completely new car concepts, e.g. Johnson Controls' ie:3. Another surprise is the low importance attached to independent mobility service providers such as Better Place or Zipcar, which already operate successfully in several cities and countries. This is all the more surprising given that OEM captive approaches from Daimler, BMW, VW and Peugeot have mostly just entered the pilot phase. Finally, despite the universal use of the internet, web 2.0 brokers and intermediaries are not thought to be a challenge to existing dealer networks.

1.7 Challenges

- Discussions concerning climate change and emissions reduction, as well as the increasingly tough consumption and emissions targets, have led to a segment shift from the upper segments with strong margins, to the lower segment with relatively weaker margins.
- Additionally, automotive manufacturers and suppliers will incur substantial expenditure in the development of the required technologies, based either on conventional drivetrains or on alternative drivetrains such as e-traction.
- Growth potential exists almost solely in the emerging markets. However companies in these markets need to introduce different product concepts and prices to the existing product portfolios of the existing manufacturers.
- New competitors are keen to enter the market and will rapidly play an important role in the volume segment, even aiming for a leadership role, for example, China in the area of electronic drivetrains.
- Customer requirements in the triad markets will change: the relevance of car ownership as a status symbol will reduce and on average the available budget for car purchase and its utilization will decrease.
- Innovative mobility concepts will evolve, offering new opportunities for the OEMs on one hand, while inducing change for the automotive suppliers and attracting new competitors from outside of the automotive industry, on the other.
- Consequently today's automotive market will develop to a mobility market, from which significant adjustments to existing and new business models

will arise. The existing market players will undertake a transformation and new players will enter the market. As a result we can expect a change to the structure of the entire automotive industry. Today's players, as well as potential new entrants, will need to adapt to the new framework to achieve sustainable success.

2 Automotive Sector Turkey

To build up an automotive production plant for a domestic car in Turkey it's important to know the development and status quo of the Turkish market. On this occasion this chapter will specify the Turkish automotive sector, in terms of total capacity of the current car production, giving an overview of current car segments and afterwards stating factors for future growth and possible trends. Finally this chapter will be summed up by challenges and opportunities of the Turkish automotive market.

2.1 General Data for Turkey

Turkey is a founding member in several federations. These are the United Nations (UN), the Organization of Islamic Cooperation (OIC), the Organization for Economic Co-operation and Development (OECD) and the Organization for Security and Co-operation in Europe (OSCE), a member state of the Council of Europe and NATO. Furthermore Turkey is member of the G20 industrial nations which brings together the 20 largest economies of the world. Since 2005, Turkey is in accession negotiations with the European Union. The negotiations have been launched with the adoption of the Negotiation Framework by the Council of the European Union. Turkey and the European Union are connected through the application of Copenhagen Criteria's⁵, the application of EU acquis and the strength of civil society dialogue.⁶

Turkey has a land area of 779,450 km² and a population of 78,505,000 in the end of 2015. The irregular development of the economy is illustrated in the following four diagrams (see Illustration 12 and Illustration 13). Turkey has a real GDP growth of 3.0% in 2014 and 4.0% in 2015. The industrial production rate decreased from 3.5% in 2014 to 3.1% in 2015, the consumer price index raised to 278.02 and the balance of trade strengthens to -4,207 million USD.

⁵ The Copenhagen criteria are the rules that define whether a country is eligible to join the European Union. The criteria require that a state has the institutions to preserve democratic governance and human rights, has a functioning market economy, and accepts the obligations and intent of the EU.

⁶ KPMG Investment in Turkey (2015), p. 10

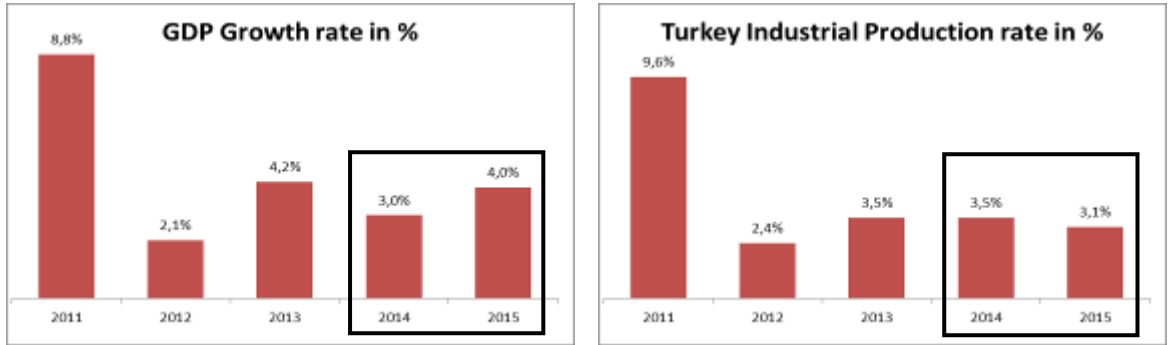


Illustration 12 Turkey GDP Growth Rate and Turkey's Industrial Production Rate⁷

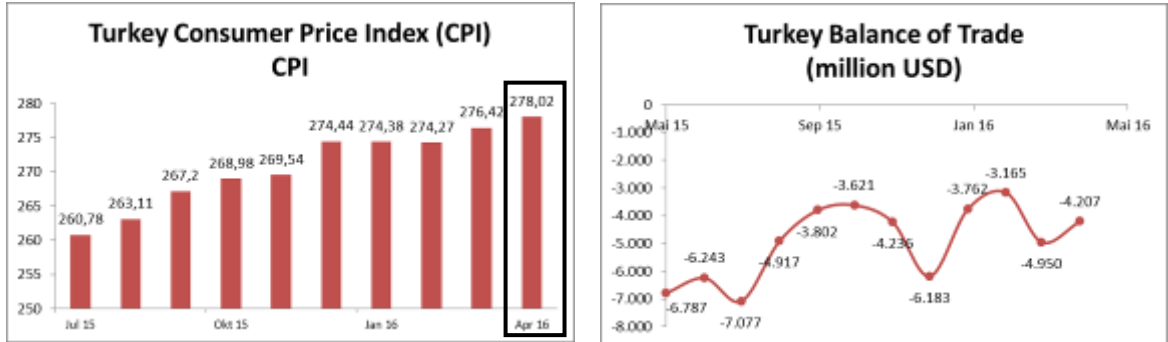


Illustration 13 Turkey Consumer Price Index (CPI) and Turkey's Balance of Trade⁸

Particularly profitable for investors, is Turkey's beneficial geographical location (see Illustration 14) and large domestic market. The more investors recognizing it the more the awareness is helping to drive FDI. Therefore half of the participants plan to increase their future investments in the country. Optimistically Turkey will be a regional and global business hub in the next ten years.⁹

⁷ <http://www.focus-economics.com/countries/turkey>

⁸ <http://www.tradingeconomics.com/Turkey>

⁹ Ernst & Young's attractiveness survey Turkey 2013, p. 5



Illustration 14 Turkey's Geographical Location

Since the beginning of the Turkish automotive cluster in 1960 (see Illustration 15) it has developed a protected market and an import substitution to a free market with perfect competition and further opportunities.

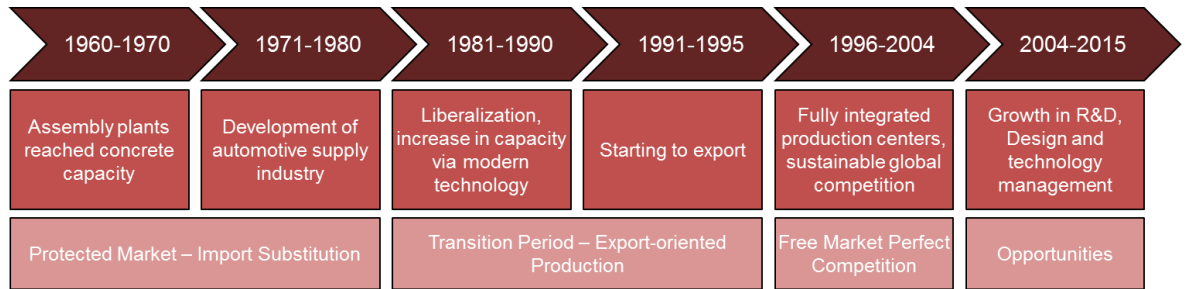


Illustration 15 Brief Timeline of Turkish Automotive Cluster

According to the decent stage of development Turkey is clustered in the second of the three stages which are considered to be “in transition” (see Illustration 16). Two criteria are used to allocate countries into stages of development. The first is the level of GDP per capita at market exchange rates. A second criterion is used to adjust for countries that, based on income, would have moved beyond stage one, but where prosperity is based on the extraction of resources. This is measured by the share of exports of mineral goods in total exports (goods and services) and assumes that countries with more than 70% of their exports made up

of mineral products (measured using a five-year average). For countries in transition, the weights change smoothly as a country develops, reflecting the smooth transition from one stage of development to another.¹⁰



Illustration 16 Stage of Development

Illustration 17 outlines the most problematic factors for doing business in Turkey. The three most problematic ones are tax rates, access to financing and inadequately educated workforce.

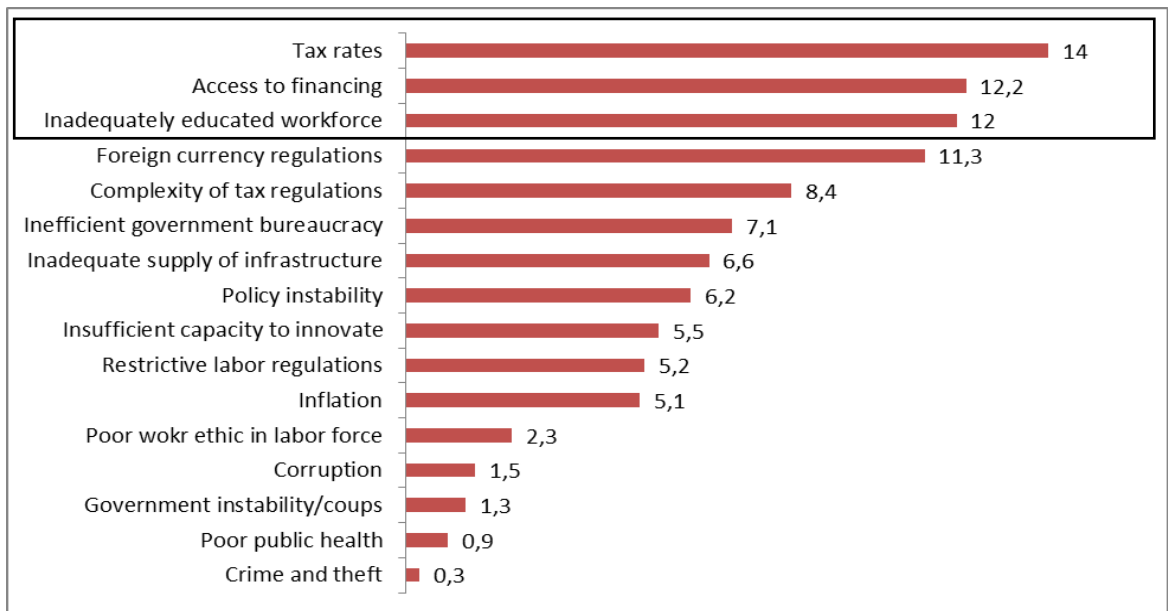


Illustration 17 Most Problematic Factors for Doing Business¹¹

The Chart below (see Illustration 18) shows the country's performance in the 12 pillars of the GCI (blue line) measured against the average scores across all the economies at the same stage of development (grey line). In most categories Turkey has nearly the same score like the emerging and developing Europe except of the market size. Here Turkey's score is twice as high as the others.

¹⁰World Economic Forum The Global Competitiveness Report 2015-2016 (2015), p. 48

¹¹World Economic Forum The Global Competitiveness Report 2015-2016 (2015), p. 368

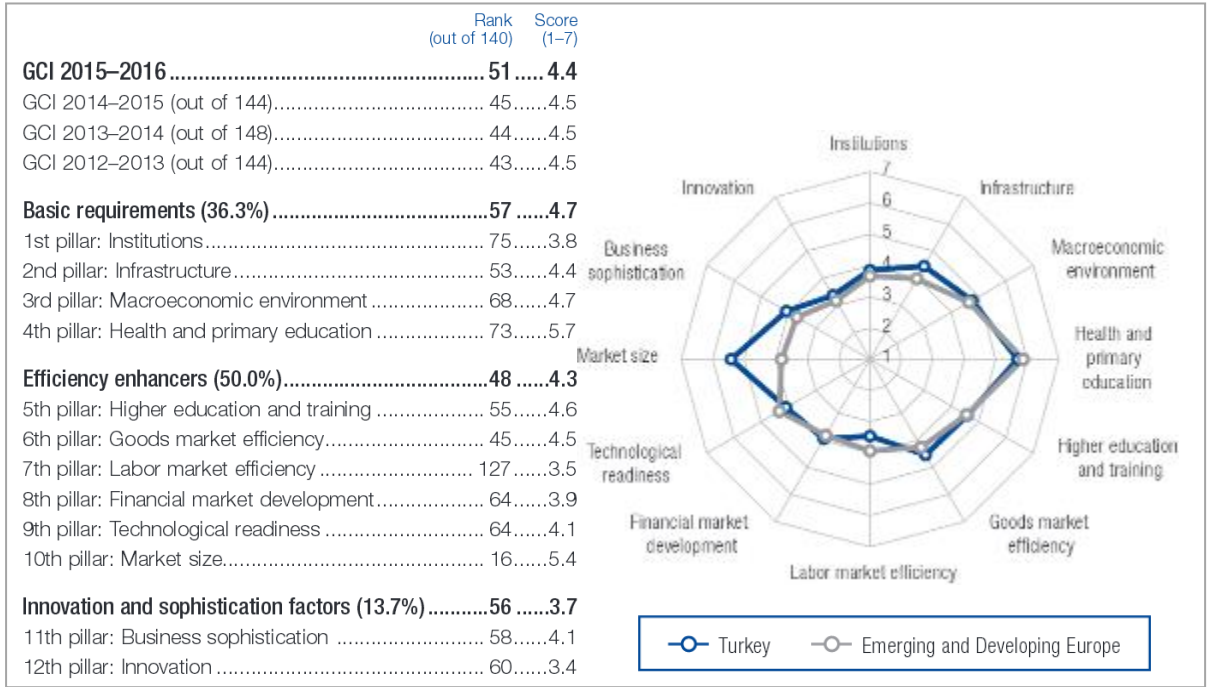


Illustration 18 Global Competitiveness Index¹²

2.2 Cars and Commercial Vehicles

Compared to the average in the EU, Turkey's average fuel consumption and CO₂ emission level of new cars and light commercial vehicles in Turkey is slightly lower. At the same time, new vehicles in Turkey tend to have less engine power and are slightly lighter and smaller than the EU average. For some vehicle models it was found that the applied level of technology is slightly lower in Turkey than for the German/EU market.

The EU targets for 2015 (cars) and 2017 (light commercial vehicles) to apply to the Turkish market, obstacles on this occasion is most likely a result of Turkey indirectly benefiting from the spillover effects of vehicle CO₂ standards in other markets through vehicle imports/exports, as well as the relatively high tax on petrol and diesel fuel in Turkey, which provides an incentive for the purchase of fuel efficient vehicles. It is estimated that the fuel consumption as well as the CO₂ emissions would roughly double by 2030. The expected increase would be largely caused by heavy-duty vehicles. Even though the number of trucks and buses is

¹² World Economic Forum The Global Competitiveness Report 2015-2016 (2015), p. 368

relatively small compared to passenger cars, their fuel consumption and CO₂ emissions have a significant effect.

17,939,447 people of the whole population in Turkey are having a registered car in 2013. Thereof 9,284,000 are passenger cars and 755,950 light-/ huge commercial cars. In 2015 there were more than 728,500 new registrations of passenger cars.¹³ As the chart below (Illustration 19) demonstrates, the automobile-ownership per 1,000 people is rising but still low with an amount of 183 in 2015 and a growth rate about 5 – 8%. The CAGR¹⁴ of 10% between 2002 and 2015 is admissible compared to the average in Europe.¹⁵

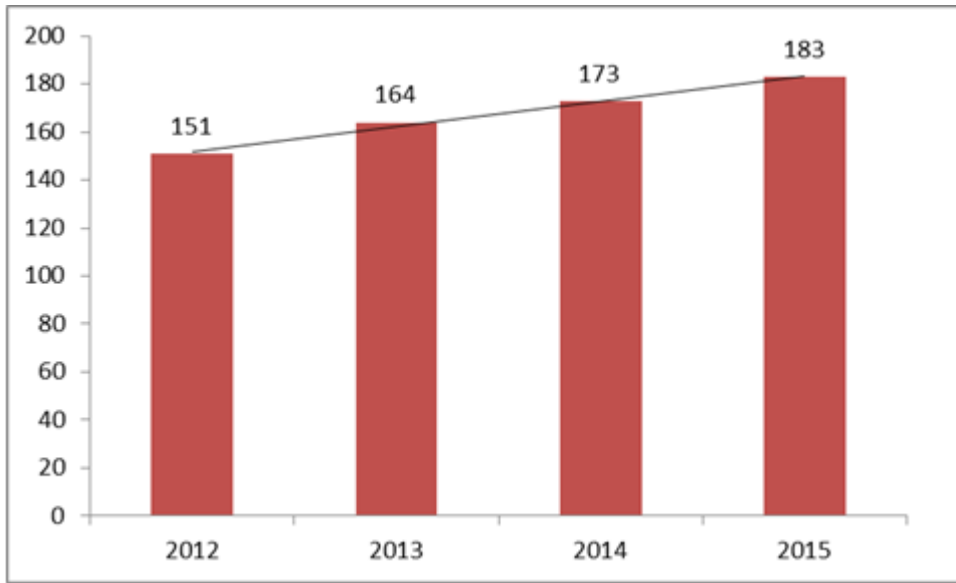


Illustration 19 Automobile-Ownership per 1,000 People

According to the factors affecting the growth of the automotive sector over the next five years, the importance of decreasing the tax burdens on the sector is rising 10% compared to the previous year. In 2014 only 22% of the participants considered this the most important issue whereas in 2015 already 32% considered the same. This aspect is followed by “growth rate of national income per capita” with 19% and “consumer loan costs” with 14% (see Illustration 20 Factors Affecting the Growth of the Sector over the Five-Year Period).

¹³ <http://www.euromonitor.com/Turkey/country-factfile>

¹⁴ Compound annual growth rate (CAGR) is a business and investing specific term for the geometric progression ratio that provides a constant rate of return over the time period.

¹⁵ <http://www.invest.gov.tr/en-us/sectors/Pages/Automotive.aspx>

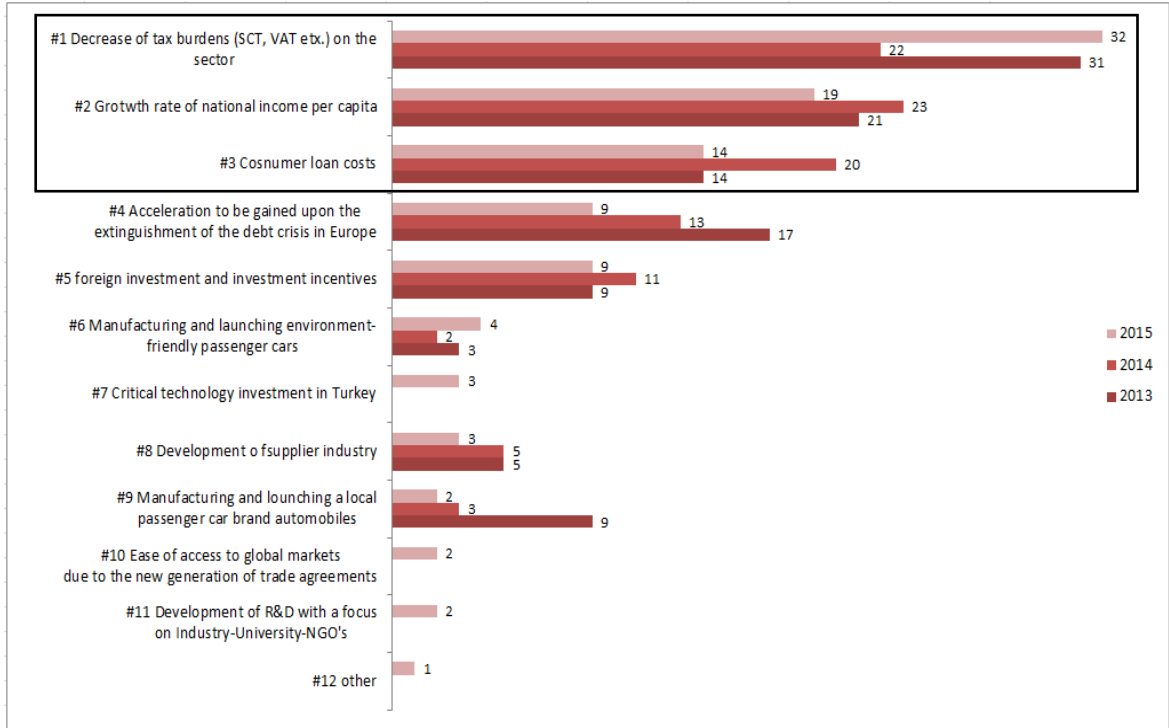


Illustration 20 Factors Affecting the Growth of the Sector over the Five-Year Period¹⁶

The annual growth rate of passenger cars is going through an annual change of up and downs. In 2015 Turkey reached again a positive growth with +24%. But according to this chart it is hard to forecast the growth in the next few years.



Illustration 21 Annual Growth Rate of Passenger Cars

¹⁶ KPMG New Strategic Investment Targets in the Turkish Automotive Sector (2015), p. 11

Illustration 22 shows that 52% of the participants of the KPMG Study (in the following named participants) share the opinion that the market decreases between 0 and 50% in the profitability of profit centers. 21% isn't expecting any changes in the sector. It is interesting that there is an increase in expectations for both a decrease and an increase compared to the previous year. In recent years, profit centers have seen a shift from sales towards after-sales services, resulting in a decrease in profitability. If this trend continues in the profit centers, the stress on the market players will increase and such a situation will require new solutions and operation models.¹⁷

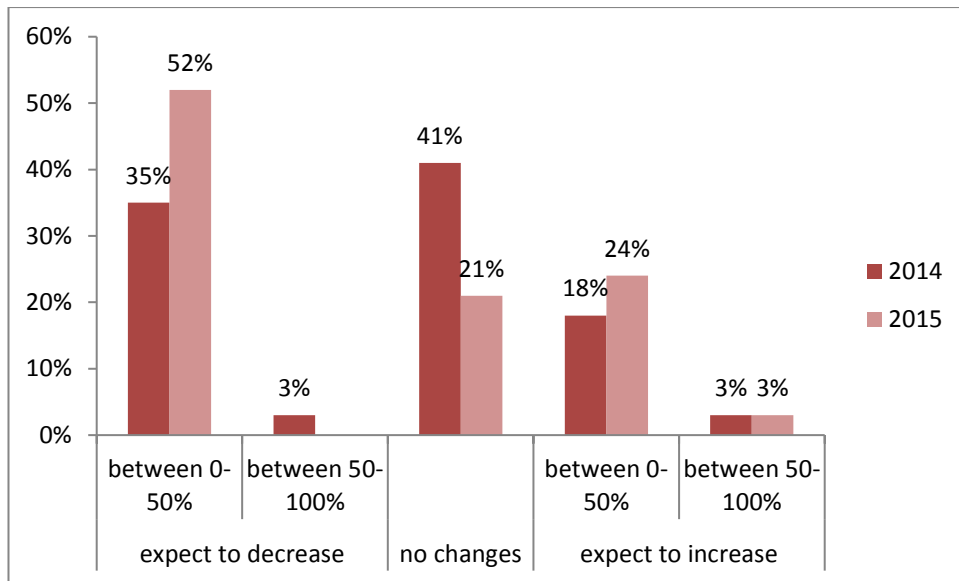


Illustration 22 The Profitability Trends in the Automotive Sector

Already many automotive factories are located in Turkey (see Illustration 23). Three of them are Ford with a capacity of 415,000 vehicles per year, Hyundai with 245,000 vehicles per year and Renault with 360,000 vehicles per year. But not only international companies have their location in Turkey. Turkish automotive manufacturer like Tofas are located there as well.

¹⁷ KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 30

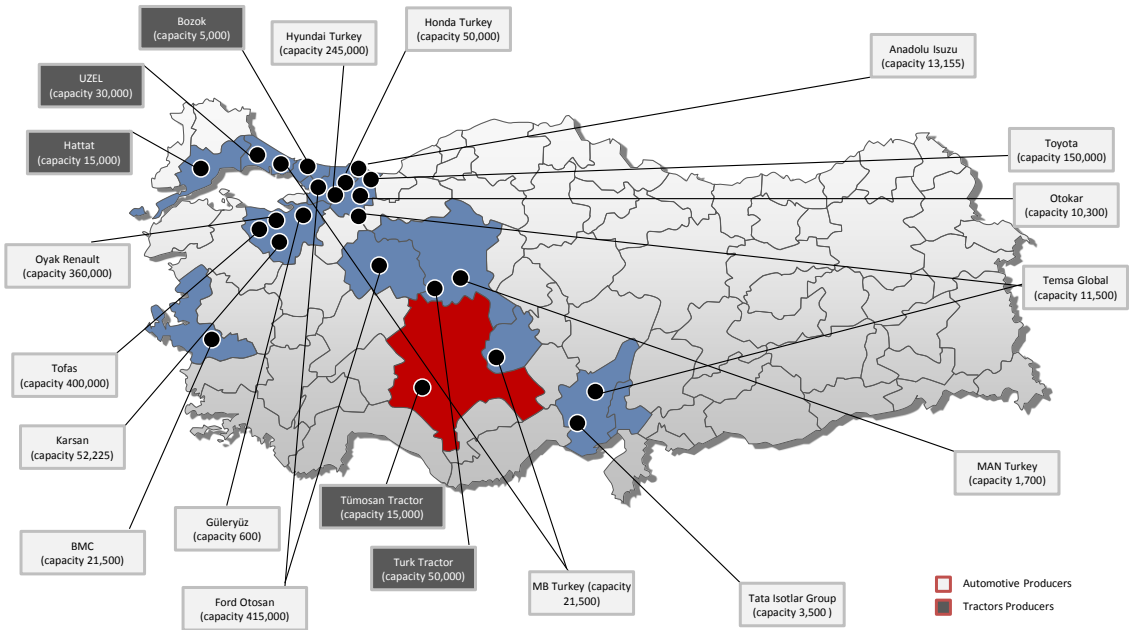


Illustration 23 Manufacturing Capacity and Network Turkish Automotive Industry 2015¹⁸

The vehicle market is separated into seven different segments. In the table below are examples for the B-, C-, and D-segment listed. Named are cars using diesel, petrol, hybrid or electro engines.










	B-Segment	C-Segment	D-Segment	
Gas/ Diesel	Ford FIESTA MCA 	Ford FOCUS 	VW PASSAT 	
Gas/ Diesel	Hyundai i20 TROY 	Honda CIVIC 	Volvo S60 	
Hybrid	Toyota YARIS 	Hyundai ACCENT BLUE 	Ford MONDEO 	

Table 3 Examples in the Different Vehicle Segments

¹⁸ OSD "OICA": General and Statistical Information Bulletin Of Automotive Manufacturers, 2016, p.4

The segments are further clustered in car types as shown in the first row of Table 4 the most sold car type is in C and D segment the Sedan.

	Total	1 S/D*	2 H/B*	3 S/W*	4 MPV*	5 CDV*	6 Sport	7 SUV*
A (Mini)	4.214	0	4.214	0	0	0	0	0
B (Entry)	219.181	48.332	131.626	5.160	2.614	10.330	2	21.117
C (Compact)	378.141	215.557	92.170	1.314	11.000	0	885	57.215
D (Medium)	95.359	69.713	374	421	0	0	6.520	18.331
E (Luxury)	23.464	17.223	25	44	107	0	266	5.799
F (Upper Luxury)	5.237	773	0	0	0	0	557	3.907
Total	725.596	351.598	228.409	6.939	13.721	10.330	8.230	106.369

* S/D: Sedan, H/B: Hatchback, S/W: Station Wagon, MPV: Multi-Purpose Vehicle, CDV: Car Derived Van, SUV: Sport Utility Vehicle

Table 4 Segmentation Details-RS-'January-December' 2015¹⁹

2.3 Main Automotive Suppliers in Turkey

35 out of the top 100 global automotive suppliers are current in Turkey. The list of the biggest producers of OEM automotive parts consists of companies as Robert Bosch (brake systems, boosters, power limiters & regulators, repair kits, brake shoes, wheel brake cylinders, drum & disk brakes), Delphi (cables, electrical/electronic architecture systems and components, fuel pumps, fuel injectors, nozzles, valves), Autoliv (steering wheels, seat belt, air bags), CMS (wheels), Stanford Profile (rubber bonded metal parts, seal & gasket sets, waist belts, hood/windshield/rocker panel seal, glass run channels), Federal Mogul (cylinder liners, piston rings & piston ring carriers, valve, lighting, fuel systems, brake parts, chassis, ignition parts), Driveline Eskisehir (joints, shafts, axles), Denso (air-conditioners, HVAC units, radiators and pipe-hose fittings), Tedrive Steering (steering systems), Yazaki (electrical and electronics components), HEMA TRW (steering wheels) and Magneti Marelli Mako (alternator, ignition coil, motors, dis-

¹⁹ ODD: Sunday model document December 2015

tributors, horn, air conditioning and heating systems etc.). Illustration 24 shows further suppliers in the regions of Turkey.

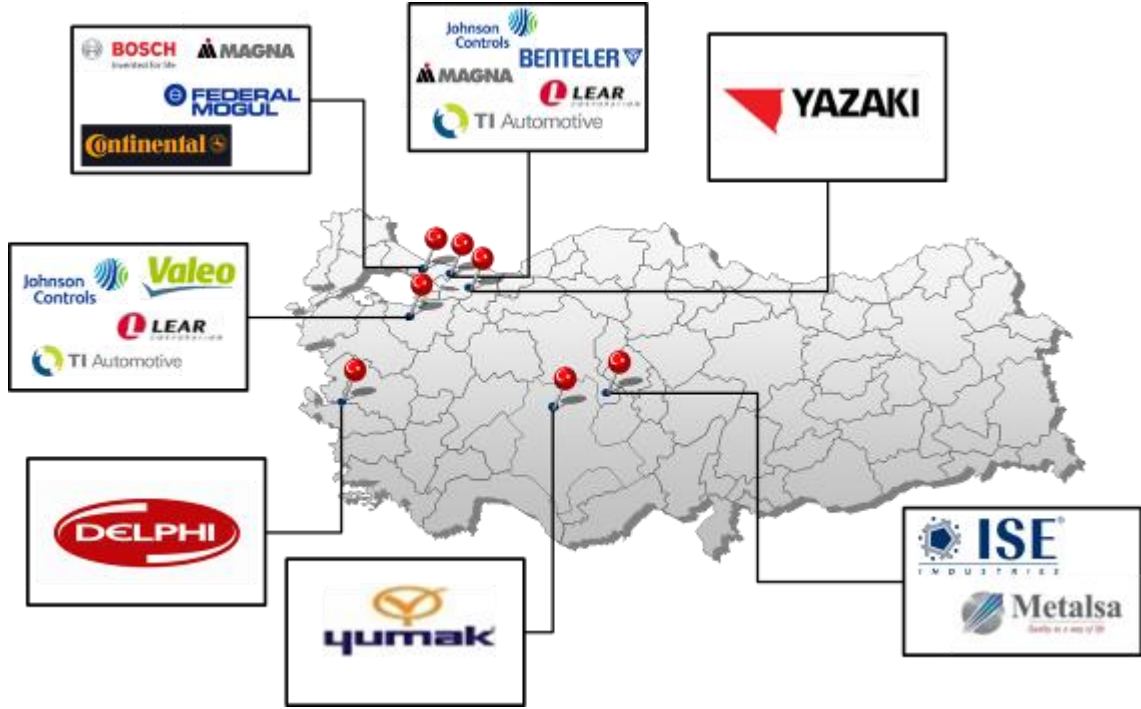


Illustration 24 Leading Automotive Suppliers in Turkey²⁰

Moreover, with Goodyear, Pirelli, Bridgestone and the domestic manufacturer Petlas, Turkey has a vital role in tire manufacturing. Total production of tires accounts over 30 million pieces annually. Approximately 10 million tires are exported. At the same time around 5 million tires are imported to Turkey.²¹

2.4 Trends for Automotive Turkey

The most common expectations for changes in the automotive sector in the next five years are that MVT systems will be changed and be based on emission and social consumption as well as tax rates will increase (see Illustration 25).

²⁰ Switzerland Global Enterprises: Business Opportunity Report Turkey, 2015

²¹ Switzerland Global Enterprises: Business Opportunity Report Turkey, 2015

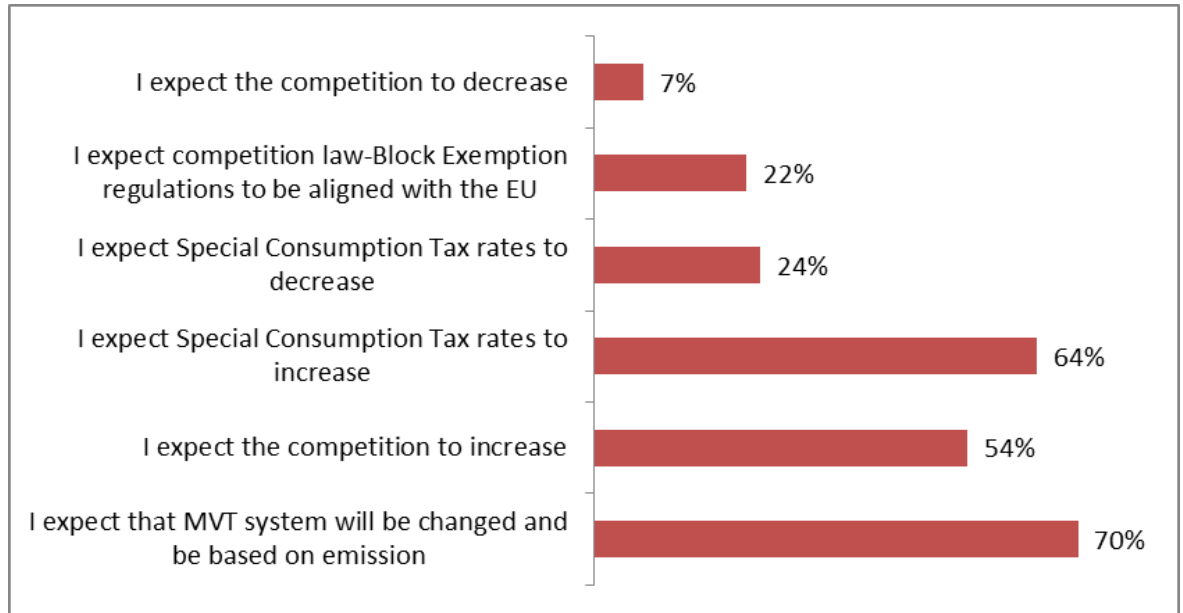


Illustration 25 Expectations for Change in the Automotive Sector in the Next Five Years²²

Further 33% of the participants predict the biggest change in consumer behaviors is “young buyers under the age of 30 will no longer be owners; they will rent on a periodic basis”. Only 11% and 8% said “hybrid or electric vehicles will be increasingly preferred if their prices decline” and “Vehicles with low exhaust emissions and environment-friendly features will be preferred”.

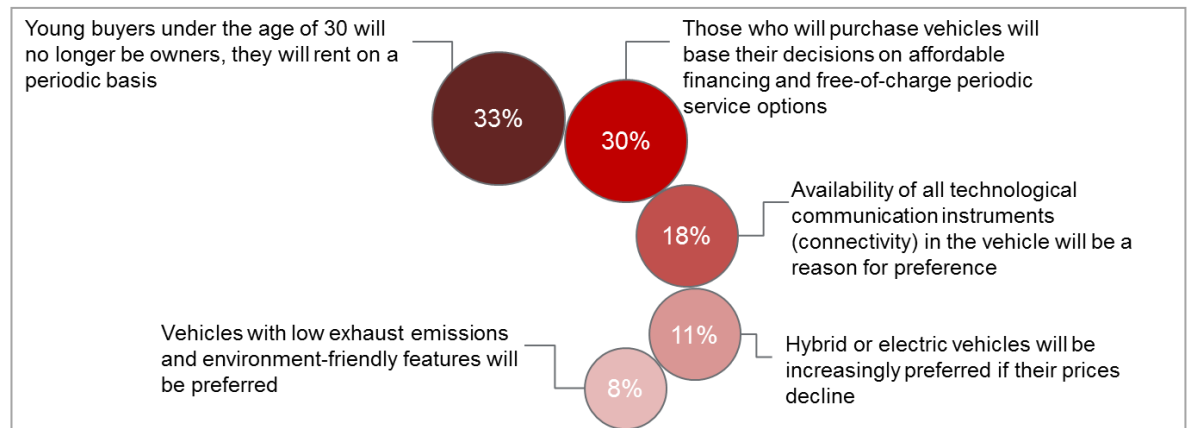


Illustration 26 Change in Consumer Behaviors²³

The more a seller is able to foresee consumer behavior, the more successful he will be. Serious changes are seen in the recent years, based on the young generation. It is anticipated that the young generation, particularly the Y Generation, is

²² KPMG Sustainable Growth in the Turkish Automotive Sector (2014)

²³ KPMG Sustainable Growth in the Turkish Automotive Sector (2014), p. 31

more likely to rent vehicles when required, rather than purchasing them. The fact that this trend is also expected to rise in, Turkey is an important outcome.²⁴

Projections related to capacity figures the investments need to be continued to achieve the big production targets of Turkey. The charts below demonstrate that most of the participants are still expecting increases but it tends towards a lower level. While this situation seems conflicting considering the production expectations it can be construed as follows: Experts for the new investments announced that the expectations for new and strategic investments in the future decrease as in the expectations for manufacturing.²⁵

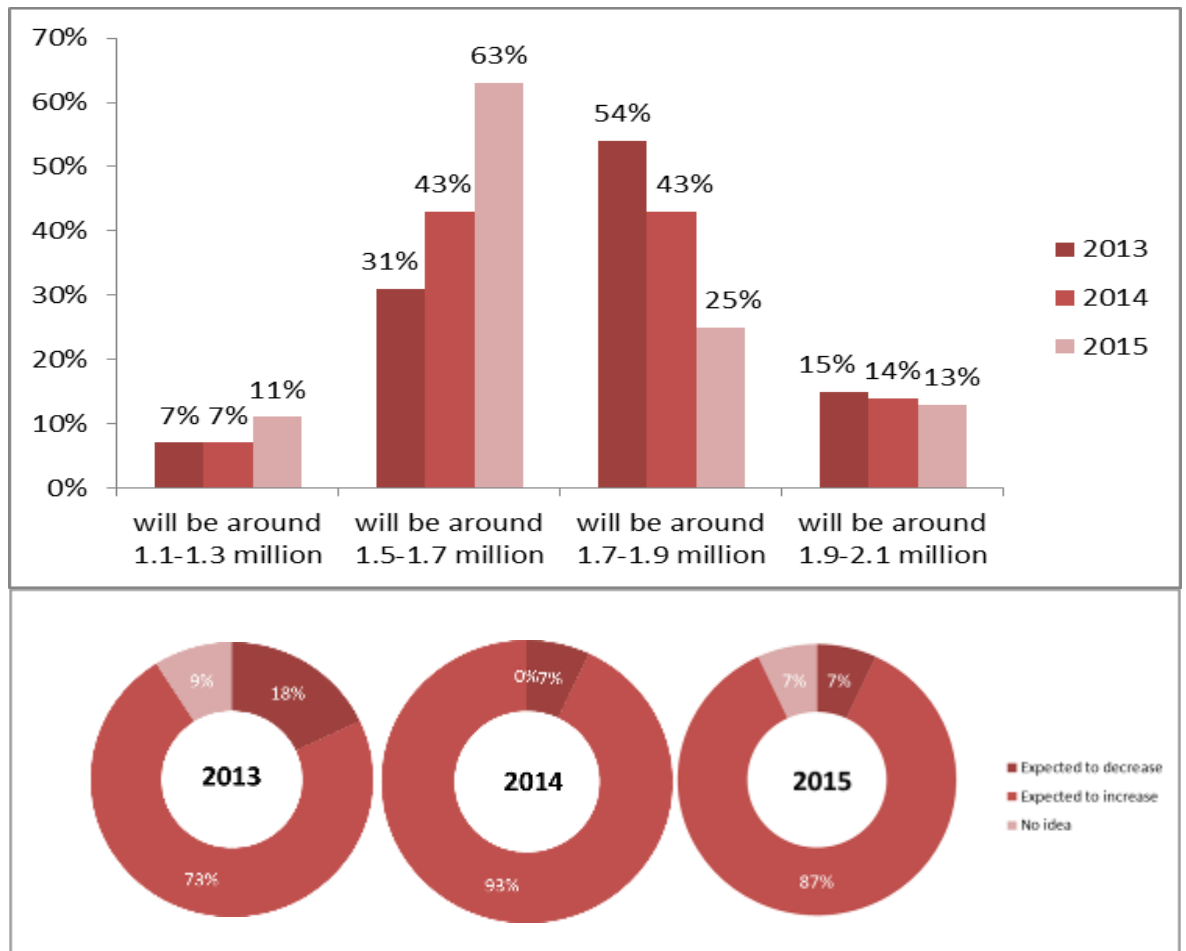


Illustration 27 Capacity Expectation of the Automotive Industry for the Next Five Years in General

²⁴ KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 45

²⁵ KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 46

2.5 Investments Made and Planned

Turkey's government hosted last year's G20 and B20 summits in Antalya. Turkey emphasized implementation of a shared agenda to realize global economic growth objectives. Combined with the goal to become a top 10 economy in 2023, the 100th anniversary of the founding of its modern republic, it has its own ambition growth agenda. This includes having prioritized eight key sectors and established plans for investments in infrastructure. To pursue the strategy of an increasingly competitive global environment, and in order to compensate for its relatively low domestic savings rate, Turkey will need to continue to push forward with business reforms that attract greater and more diversified FDI targeting higher value added industries. As already mentioned before, Turkey is serving both Europe and the Middle East and boasting the 16th largest domestic market in the world, Turkey has untapped investment potential.²⁶ The machinery manufacturing industry is expected to provide 100 billion USD in exports by 2023, accounting for 2.3% of the global market. Also, it is forecast that it will create enormous manufacturing opportunities for investors.²⁷

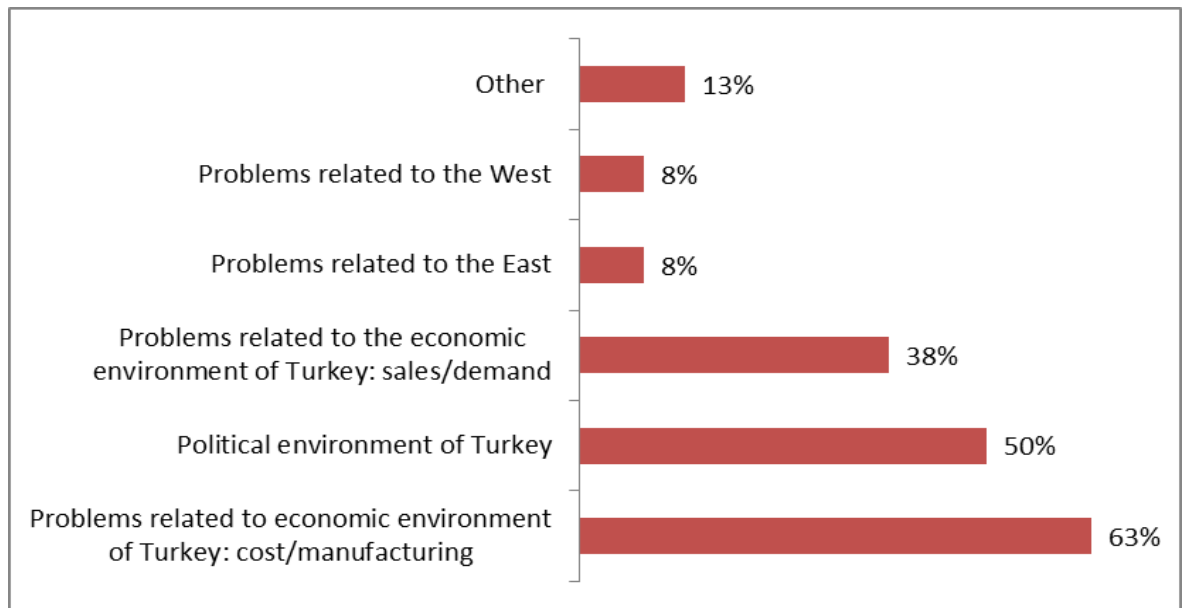


Illustration 28 What are the Obstacles New Investments into the Turkey in the Next Five Years?²⁸

²⁶ Kearney, A.T. Connected Risks: Investing in a Divergent World (2015), p. 12

²⁷ Ernst & Young's attractiveness survey Turkey 2013, p. 47

²⁸ KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 20

In 2014, FDI inflows fell slightly to 12.2 billion USD. Obstacles for new investments into the Turkey can arise in terms of problems related to economic environment like cost and manufacturing but as well of the political environment, which is very critical right now (see Illustration 28 What are the Obstacles New Investments into the Turkey in the Next Five Years?).²⁹

In April 2012 Turkey introduced a new investment incentive scheme. This is to reduce its current account deficit, boost investment in lesser developed regions and promote cluster activities. The investments are separated into four elements: general, regional, large-scale and strategic investments. To balance regional development by encouraging investment in the disadvantaged regions the country is divided into six regions based on potential and the development of the local economy. The incentives are for example generous subsidies and tax breaks to companies investing in lesser developed regions. While region 1 consists of the developed provinces of Istanbul, Bursa, Ankara and Izmir, region 6 comprises eastern Turkey, covering provinces such as Diyarbakir, Van and Ardahan. Investors vying for region 6 are entitled to income tax withholding allowance and social security premium support for 10 years. Value-added tax (VAT) and custom duty exemption are offered to encourage investment in all six regions.³⁰

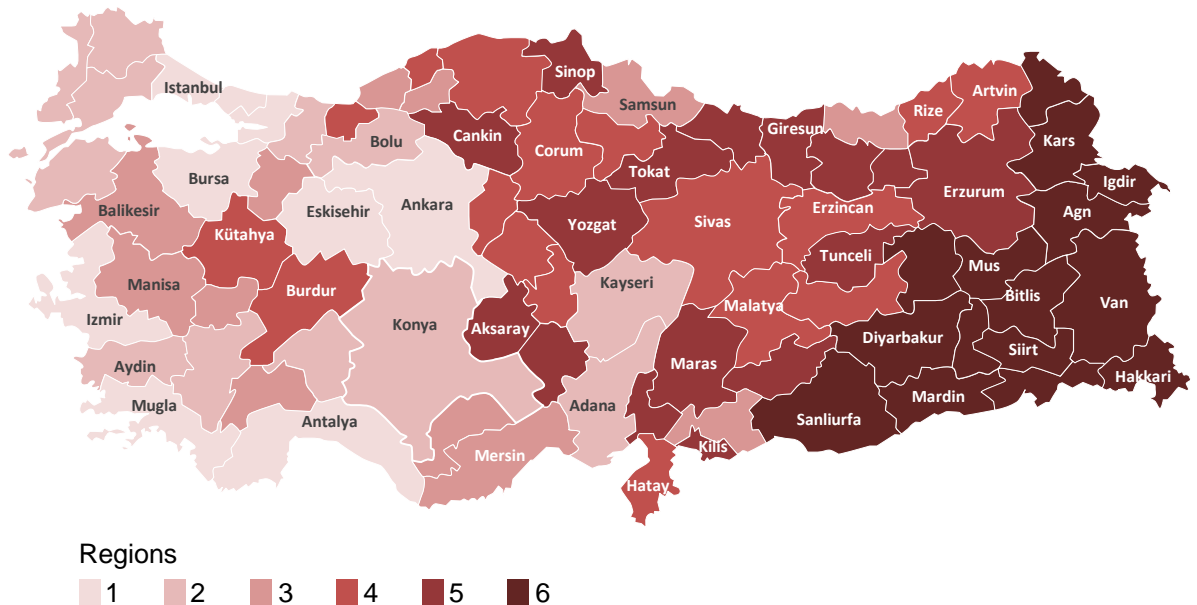


Illustration 29 Classification of Investments (Regional and Sector-Based) in Turkey

²⁹ Kearney, A.T. Connected Risks: Investing in a Divergent World (2015), p. 12

³⁰ Ernst & Young's attractiveness survey Turkey 2013, p. 39

Though infrastructure in Turkey is reasonably well developed, investors would like to see improvements. The country is currently ranked 34th for the overall quality of its infrastructure. The government is currently developing roads, railways and sea-ports to facilitate transportation and commerce. For instance, in a bid to develop a nationwide network of modern highways, the total length of dual carriageways has been increased drastically. Turkey can follow the public-private partnership (PPP) model to bolster infrastructure investment. Infrastructure projects enjoy a good track record in the country — an example is Istanbul’s Atatürk International Airport, which carried 80 million passengers in 2014, up from 14 million in 2000.³¹

2.6 Challenges for Automotive in Turkey

The most important issues for over three years are the pricing and sales incentives. While last year new product development with 20% was ranked the second, this year it decreased by 6% and financial services got the rank. The most stable trend is observed in after-sales services and marketing activities. After-sales services gained continuously importance while marketing services lost importance for the second time (see Illustration 30 Success Factors in Competition).³²

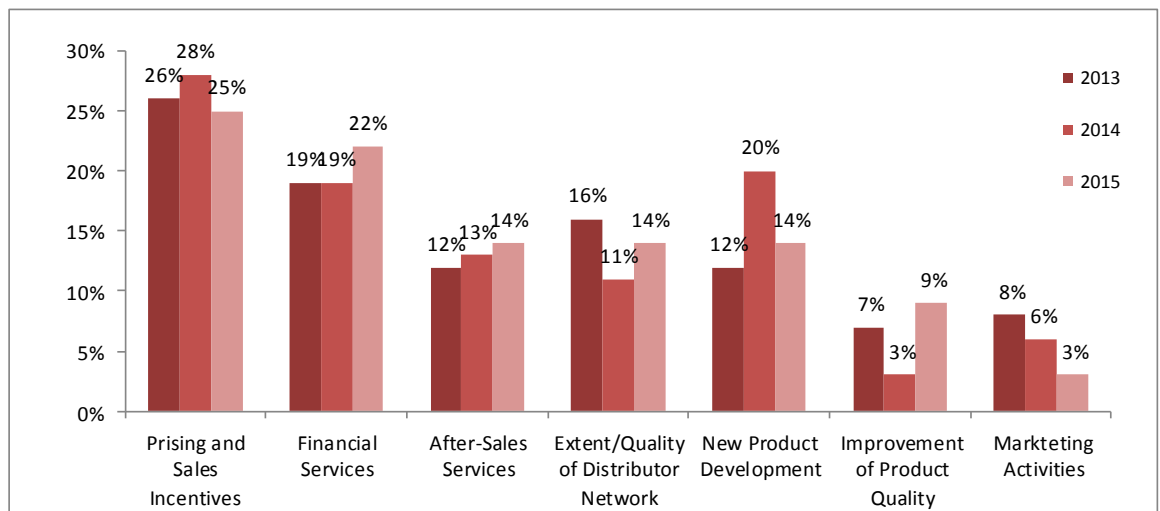


Illustration 30 Success Factors in Competition

Illustration 31 Precautions that Must be Taken by the Main and the Supplier Industry” visualizes precaution must be taken to increase the added values. The focus is on R&D and product development activities. Right after this issue follows

³¹ Ernst & Young’s attractiveness survey Turkey 2013, p. 50

³² KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 27

the precaution in continuity of new products and joint projects. Another interesting point in the results is the significant increase in the importance of "development of moulding industry". Currently, the automotive companies worldwide get their molds from China, Portugal, Italy, etc. However, the molds manufactured in Turkey have the same level of high quality and nearer to the productions in the Eastern Europe in terms of location. The Turkish automotive industry might gain importance by focusing on this issue.³³

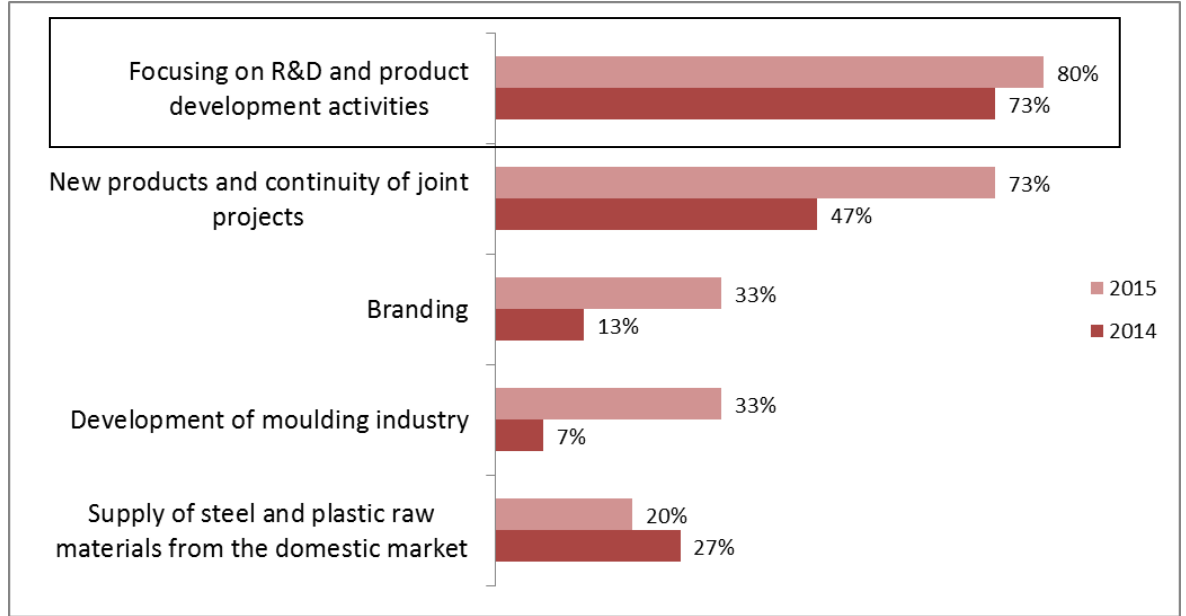


Illustration 31 Precautions that Must be Taken by the Main and the Supplier Industry

To demonstrate the need for improvements in the field of innovation management the two most important actions are establishing a R&D and testing infrastructure and improving patent and industrial design works of suppliers. If the suppliers are involved in the new vehicle projects at earlier stages, they will be able to contribute more in the design and the products will reach the high quality at an earlier stage and saving further costs. According to the other actions mentioned in the illustration, it might be a good solution to cooperate with the universities for establishing a common test center as in the USA and Europe since the establishment of the testing infrastructure is very costly. Thus, the companies can employ quali-

³³ KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 50

fied workers and the universities can offer better programs because of the financial support.³⁴

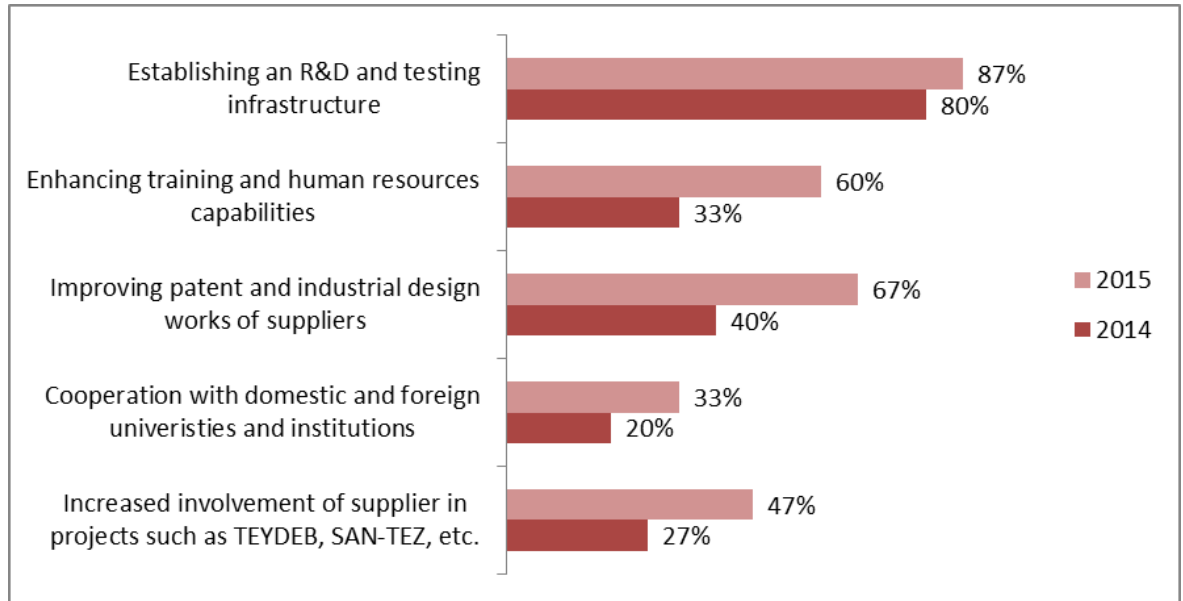


Illustration 32 Actions to Take to Increase Involvement of the Supplier Industry in New Vehicle Projects

In the following tables both SWOT³⁵ and EST³⁶ analysis about Turkey are listed.

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Significant and growing domestic market ▪ Open and young population to new products and technologies ▪ Geographical and cultural intermediary role between Europe, North and Asia ▪ Large, spread out geographic area with heterogeneous regions ▪ Well-developed basis for industries ▪ Motivated worker 	<ul style="list-style-type: none"> ▪ Low spare rate ▪ Improvable structure of vocational training ▪ Less branch and company specific vocational education ▪ Dependency on import energy sources

³⁴ KPMG Sustainable Growth in the Turkish Automotive Sector (2015), p. 51

³⁵ https://www.gtai.de/GTAI/Content/DE/Trade/Fachdaten/PUB/2015/12/pub201512078005_20537_wirtschaftstrends-kompakt---tuerkei--jahreswechsel-2015-16.pdf?v=1; Prof. Porter, M. E. Turkey Competitive-ness: National Economic Strategy and the Role of Business (2009), p. 58

³⁶ <https://www.ukessays.com/essays/economics/about-Turkey.php>;
<https://www.ukessays.com/essays/economics/pestel-analysis-of-om-in-Turkey-economics-essay.php>;
<https://www.ukessays.com/essays/international-relations/pestle-analysis-for-Turkey.php>;
www.studymode.com/essays/Pestle-Analysis-Turkey-63927859.html

Opportunities	Threats
<ul style="list-style-type: none">▪ Position as an energy hub▪ Local manufacturing of high quality goods▪ Many projects in developing the public infrastructure▪ Growing local sales market▪ High interest in renewable energies and energy efficiency▪ Sales potential due to population size	<ul style="list-style-type: none">▪ Transparency in capital transactions▪ Energy supply in rural regions▪ Exchange rate and volatility of the Turkish Lira▪ Recession of the export market

Economic Factors

- High flow of foreign investment coming from abroad
- Steadily opening up its market through
- Economic reforms by reducing government control on foreign trade and investment and the privatization of publicly owned industries
- The automotive sector is one of the key sectors in Turkey
- Turkey is a transcontinental Eurasian country (Asian part 97%, European part 3%)

Social Factors

- Growing proportion of young population as they have more than half the population being aged below 30

Technological Factors

- Developed ICT sector
- Investing in the Metrology, Standards, Testing and Quality System (MSTQ)
- Funding research and development activities
- Strengthening the framework for capital market activities.

3 Regional Overview

For finding the suitable location for the domestic car, this paper analyzes eight different provinces by standardized factors, which are important for the automotive sector. Afterwards the strengths and weaknesses for the provinces are stated for giving an idea of the current situation. All these factors are later on the basis for comparing the different provinces with each other. For quantitative factors the mean arithmetic is taken to calculate the average of these regions and depending on how the different regions are ranked.

The regions, which are analyzed, are Aksaray, Bursa, Istanbul, Izmir, Kocaeli, Konya, Manisa and Sakarya.

3.1 Aksaray

General Information

Aksaray is a city in the Central Anatolia region of Turkey and the capital district of Aksaray Province. The population of the province is 386,514. The district covers an area of 7,570.44 km².

Aksaray region was an important stopover along the Silk Road that crossed through Anatolia for centuries. The city of Aksaray has a long history.

It is a rich agricultural region producing grains, meat and dairy and many kinds of fruit and vegetables.

Today Aksaray is a quiet mid-size city. In recent past, many inhabitants migrated to Britain, Germany and other European countries for job opportunities.

Profile of Aksaray

Aksaray's profile illustrates facts about the infrastructure, human and costs and the knowledge of the province.

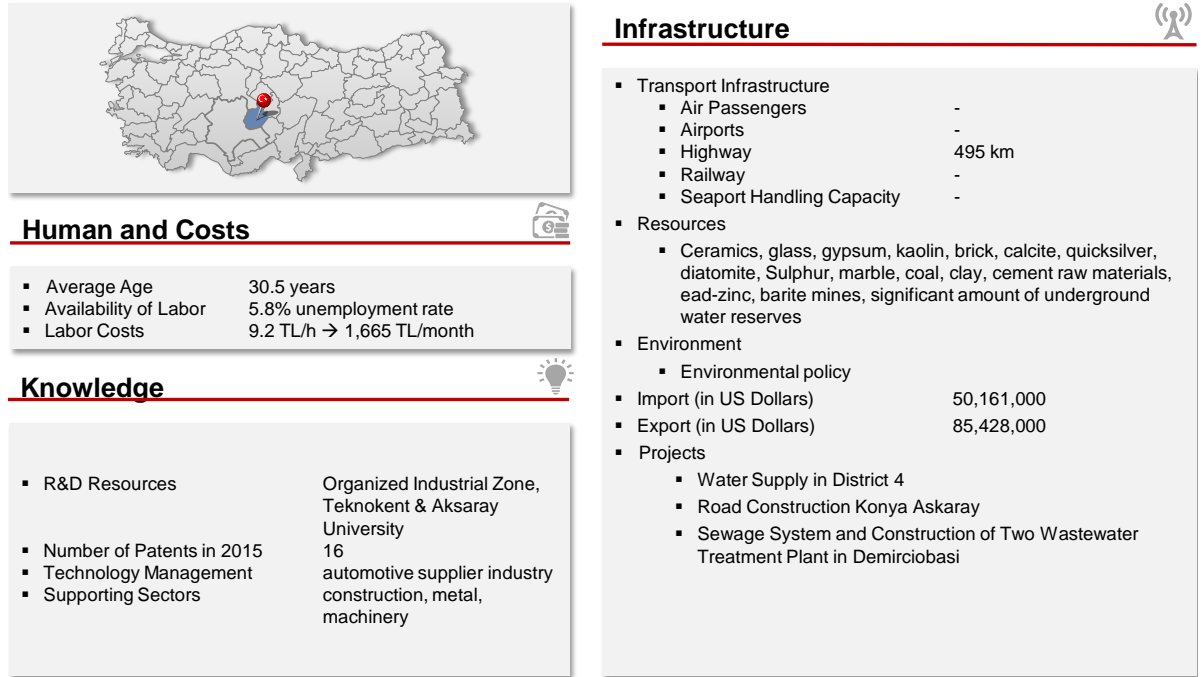


Illustration 33 Profile of Aksaray

Aksaray has a big advantage regarding the automotive sector as Mercedes Benz has his production plant there.

Mercedes-Benz Türk's truck plant in the province of Aksaray started the production in 1986. Since 1986 more than 185,000 trucks have been manufactured at the plant and sold primarily in the domestic market. In the last 12 years Mercedes-Benz Türk keeps its leading position in the domestic truck market over 6 tons thanks to its state-of-the-art products. Employing more than 1,600 people Aksaray Truck Plant's production includes: light trucks, heavy duty trucks, semitrailer tractors and construction trucks. The Aksaray Plant currently has a covered area of 107,000 m² built on a total of 560,000 m² of land. Today the trucks of the Aksaray plant are of the same quality level as those manufactured at the plant in Germany. Mercedes-Benz Türk Aksaray Plant has been exporting vehicles to Central & East European countries since 2001.³⁷

³⁷ <https://www.daimler.com/career/job-search/locations/detail-pages/location-detail-page-5067.html>

Different factors have been summarized in the following table.

Pros and Cons

+	-
<p>Pros:</p> <ul style="list-style-type: none">▪ Young population▪ Cheap cost of living▪ High tax deduction and social security premium support for investments▪ Very low labor costs▪ Car manufacturer with automotive knowledge	<p>Cons:</p> <ul style="list-style-type: none">▪ No airport▪ Less manufacturing, wholesale and retail trade, repair of motor vehicles and motorcycles, transport and storage industries▪ Less attractions for tourists

Table 5 Pros and Cons of Aksaray

3.2 Bursa

General Information

Bursa is one of the rare cities in the world which has scenic beauties and industry and technology in harmony. Due to its location on the ancient Silk Road, Bursa has always been an important commercial city in the past due to its strategic position.

Bursa, with its economic features, represents an active and leading power for the development of the Turkish economy and new momentum. Bursa displays a significant dynamism in terms of economy with its contribution to the development of the economy of the country and the region, foreign currency inflow due to its exports and strengthening the industrial infrastructure.³⁸

³⁸ <http://www.bcci.org/?page=bursaeconomy/bursaeconomy.asp>

Profile of Bursa



Human and Costs

▪ Average Age	33.7 years
▪ Availability of Labor	6.6% unemployment rate
▪ Labor Costs	13 TL/h → 2,344TL/month

Knowledge

▪ R&D Resources	Ulutek Technology Development Zone
▪ Number of Patents in 2015	136
▪ Technology Management	automotive supplier industry, machinery and equipment, automotive, textile, software,...
▪ Supporting Sectors	information and communication industry, construction, metal, machinery

Infrastructure

▪ Transport Infrastructure	
▪ Air Passengers	74,108
▪ Airports	1
▪ Highway	1,078 km
▪ Railway	16 km
▪ Seaport Handling Capacity	7 Ports
▪ Resources	tungsten
▪ Environment	
▪ Quality Policy	
▪ Human Resources Policy	
▪ Information Technology Management Policy	
▪ Financial Management Policy	
▪ Import (in US Dollars)	8,105,703,000
▪ Export (in US Dollars)	9,308,257,000
▪ Projects	
▪ Bazaar Capital Cities Project	
▪ The Bursa Finance and Commerce Center Project	
▪ Sectoral Councils	
▪ BTSO Academy Project	
▪ Healthcare Free Zone	
▪ Global Fair Agency	
▪ Green Growth Project	

Illustration 34 Profile of Bursa

Bursa's automotive sector consists of the following OEM's, like Tofas, Renault, Karsan and Güleryüz.

Automotive supply industry also benefits from sustainable competitive advantage in global markets in terms of quality and scale of production. The biggest suppliers are Bosch and Delphi.

However Bursa is relatively high in their labor costs compared to other provinces. The following table gives a rough overview of Bursa's advantages and disadvantages.

Pros and Cons



	
<p>Pros:</p> <ul style="list-style-type: none">▪ Access to qualified man power▪ Price per m² under the average▪ Cost of living is under the average▪ One of the main automotive manufacturer of Turkey▪ Important automotive suppliers are settled in Bursa▪ One out of two cars in Turkey is being manufactured in Bursa▪ Attraction center for new investments	<p>Cons:</p> <ul style="list-style-type: none">▪ Healthcare is under the average▪ Very high labor costs

Table 6 Pros and Cons of Bursa

3.3 Istanbul

General Information

Istanbul is the biggest city of Turkey, constitutes the country's economic, cultural, and historical heart. With a population of about 14 million, the city is one of the most populous locations in Europe, second largest in the Middle East and the third-largest city in the world by population within city limits.³⁹

Istanbul's vast area of 5,343 km² is coterminous with Istanbul Province, of which the city is the administrative capital. Istanbul is a transcontinental city, straddling the Bosphorus one of the world's busiest waterways — in North-Western Turkey, between the Sea of Marmara and the Black Sea.

Its commercial and historical center lies in Europe, while a third of its population lives in Asia.⁴⁰

³⁹ <http://www.bcci.org/?page=bursaconomy/bursaconomy.asp>

⁴⁰ https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/ICSE2014_Useful%20Information_For_Istanbul.pdf

Profile of Istanbul



Human and Costs

▪ Average Age	31.9 years
▪ Availability of Labor	11.2% unemployment rate
▪ Labor Costs	15.2 TL/h → 2,735 TL/month

Knowledge

▪ R&D Resources	Bio Istanbul, ITU Science Center, Metropolitan Municipality
▪ Number of Patents in 2015	638
▪ Technology Management	multi sectoral
▪ Supporting Sectors	construction, metal, machinery, information and communication

Infrastructure

▪ Transport Infrastructure	
▪ Air Passengers	80,189,812
▪ Airports	2
▪ Highway	551 km
▪ Railway	227 km
▪ Seaport Handling Capacity	8 Ports
▪ Resources	
▪ Coal – mining exhibition	
▪ Natural stone international exhibition of marble	
▪ Water – clean energy systems	
▪ Gas – international exhibition of gas industry	
▪ Environment	
▪ Environmental management system	
▪ Environmental policy	Energy and climate change, other emissions, water and wastewater, waste management and recycling
▪ Import (in US Dollars)	8,105,703,000
▪ Export (in US Dollars)	9,308,257,000
▪ Projects	
▪ Improvement of the Mattepe Cost	
▪ Channel Istanbul Project	

Illustration 35 Profile of Istanbul

One of the biggest advantages of Istanbul is that many people from around the world are attracted to the city. Therefore Istanbul has no problem with high qualified workers. However Istanbul is one of the most expensive cities in Turkey regarding labor costs or cost per m².

The following table shows that Istanbul has enormous advantages but also disadvantages regarding future investment.

Pros and Cons

+	-
<p>Pros:</p> <ul style="list-style-type: none"> ▪ Center of the country's air transport industry ▪ Highly competitive investment conditions ▪ 38% of Turkey's total industrial output ▪ 30% of total commercial firms of Turkey 	<p>Cons:</p> <ul style="list-style-type: none"> ▪ High population density ▪ High labor costs ▪ High cost of living ▪ Price per m² is very high ▪ The area of Istanbul is limited compared with other provinces in Turkey

Table 7 Pros and Cons of Istanbul

3.4 Izmir

General Information

Izmir is a sea trading port city; it was one of the ideal commerce hubs of its region for ages. İzmir is currently the third largest city in the Turkish Republic. The city's growing importance makes it an important part not only of Turkey, but also of the Eastern Mediterranean.

Izmir is uniquely located on Turkey's unequalled geography, which not only cradles Asia and Europe, but also the Mediterranean and Black Sea. İzmir hosted the "İzmir International Fair," Turkey's first international general commerce fair.

The air, sea and land transportation infrastructure is growing constantly and in a planned manner. ⁴¹

Profile of Izmir



Human and Costs

▪ Average Age	34.9 years
▪ Availability of Labor	15.4% unemployment rate
▪ Labor Costs	11.2 TL/h → 2,008 TL/month

Knowledge

▪ R&D Resources	Innovation Center, Organized Industrial Zone, 4 Technical Development Zones
▪ Number of Patents in 2015	52
▪ Technology Management	automotive subsidiary industry, chemicals, renewable energy and green technologies
▪ Supporting Sectors	renewable energy, information technologies, industrial machinery

Infrastructure

▪ Transport Infrastructure	
▪ Air Passengers	10,970,663
▪ Airports	1
▪ Highway	1,290 km
▪ Railway	362 km
▪ Seaport Handling Capacity	12 Ports
▪ Resources	
▪ Gold antimony, copper-pyrite, bauxite, clay, lead-zinc, chromium, cadmium, molybdenum, nickel, vanadium	
▪ Environment	
▪ Lloyd's Environmental Management System Certificate	
▪ Cares Environmental Management System Certificate	
▪ Import (in US Dollars)	9,931,126,000
▪ Export (in US Dollars)	9,615,988,000
▪ Projects	
▪ WizmirNET (wireless and accessible internet)	
▪ IMM Izmir City College	
▪ Increasing the Capacity of Vocational and Technical Education in Renewable Energy Technologies	
▪ CITYFIED Replicable and Innovative Future Efficient Districts and Cities	
▪ Leadership Program for Security and Rule of Law	
▪ ATHENA (use of new communication/ social media in crisis situations and management)	

Illustration 36 Profile of Izmir

Therefore, Izmir's biggest advantage is the proximity to the sea. This is why many international automotive supply companies are located in Izmir, like Mahle or Jonson Controls. In regard to a domestic car production the proximity to the sea is not

⁴¹ <http://www.investinizmir.com/en/html/1056/Why+Izmir>

that important due to the fact that products can be delivered by railway or trucks, too.

Considering these facts the investors have to evaluate if they want to benefit from a seaport and are also willing to accept high investment costs.

The positive and negative aspects of Izmir as a city to invest, is summed up in the following table.

Pros and Cons



	
<p>Pros:</p> <ul style="list-style-type: none">▪ 9.3% of Turkey's total industrial production▪ high potential in motor vehicles, chemistry, industrial machinery & equipment, food & beverage production, renewable energy, tourism, automotive OEM, information and communication technology,▪ 300 days of sun▪ High education level▪ 34 research centers which provide services to science and industry and support the R&D and innovation activities within universities	<p>Cons:</p> <ul style="list-style-type: none">▪ High unemployment rate▪ High cost of living▪ Price per m² is very high in the city and also outside of the center▪ High mortality rate

Table 8 Pros and Cons of Izmir

3.5 Kocaeli

General Information

Today, along the commercially active Black Sea and the Marmara Sea shorelines, Kocaeli boasts 34 ports and industrial facility docks, making it a logistics heaven and a gateway to global markets. The province is a hub for both national and intercontinental routes. It is adjacent to Istanbul, one of the world's largest metropolitan centers and close to two international airports; Istanbul Sabiha Gökçen (SAW) and Istanbul Ataturk (IST), 45 and 80 km from the city center respectively. Only 14 km away is the Cengiz Topel airport serving purely domestic routes.

Kocaeli is home to more than 1,600,000 people and is one of Turkey's most densely populated cities.⁴²

Profile of Kocaeli



Human and Costs

- Average Age 32.5 years
- Availability of Labor 10.1% unemployment rate
- Labor Costs 13 TL/h → 2,344 TL/month

Knowledge

- R&D Resources HEXAGON STUIDO, Innovation Center, Organized Industrial Zone
- Number of Patents in 2015 50
- Technology Management manufacturing industry production, automotive industry
- Supporting Sectors TYSAD-Association of Automotive Parts and Components Manufacturers

Infrastructure

- Transport Infrastructure
 - Air Passengers 11,841
 - Airports 1
 - Highway 393 km
 - Railway 180 km
 - Seaport Handling Capacity -
- Resources marble
- Environment
 - Environmental policy of the Kocaeli Chamber of Commerce
 - Environmental Management Activities
- Import (in US Dollars) 9,445,200,000
- Export (in US Dollars) 8,897,257,000
- Projects
 - Baskent Edas - EnerjiSA

Illustration 37 Profile of Kocaeli

Kocaeli has become the base for automotive industry with Ford, Hyundai, Honda and Isuzu's who have established facilities in the region. In addition, the region is also home to companies such as Goodyear, Pirelli and Lassa-Bridgestone.⁴³

However Kocaeli is relatively small by size, therefore finding a suitable location for domestic car production plant might be difficult.

⁴² <http://www.kocaeli.gov.tr/kocaeli-general>

⁴³ <http://www.een-matchmaking.com/m4i2016/Home/Index/9?isVariable=True>

Pros and Cons



	
<p>Pros:</p> <ul style="list-style-type: none">▪ "Industry and Investments City" with a high GDP's almost 73%▪ Contributes to 13% of Turkey's manufacturing industry production important port city▪ Base for automotive industry with Ford, Hyundai, Honda, Isuzu's▪ Techno parks of GOSB, KOU and TÜBİTAK▪ Scientific research institutions	<p>Cons:</p> <ul style="list-style-type: none">▪ High unemployment rate▪ High cost of living▪ The area of Kocaeli is limited compared with other provinces in Turkey▪ High population density▪ High labor costs

Table 9 Pros and Cons of Kocaeli

3.6 Konya

General Information

Konya is the largest province of Turkey. There are 31 districts in total and the population has 2.3 millions of residents.

Konya has a very strong industrial infrastructure in respect of its employment and added value contribution to the country and is one of the most important centers of Turkey. Konya has succeeded in economic development with its own capital is among the cities which host the most SMEs with its Organized Industrial Zones and the Special Organized Industrial Sites and has reached up to a significant potential in the field of employment. 35 million out of 250 million of SMEs, carrying out their activities throughout Turkey, are in Konya.⁴⁴

⁴⁴ Konya Chamber of Commerce: Konya The Power of Anatolia, p. 8, 20, 2015

Profile of Konya



Human and Costs

▪ Average Age	31.5 years
▪ Availability of Labor	4.7% unemployment rate
▪ Labor Costs	12.9 TL/h → 2,331 TL/month

Knowledge

▪ R&D Resources	Konya Organized Industrial Zone Science Center Innopark Teknokent
▪ Number of Patents in 2015	38
▪ Technology Management	Machinery industry, Chemical industry, textile industry, automotive spare parts, electronic products, food industry,....
▪ Supporting Sectors	automotive spare parts sector

Infrastructure

▪ Transport Infrastructure	
▪ Air Passengers	989,398
▪ Airports	1
▪ Highway	3,144 km
▪ Railway	590 km
▪ Seaport Handling Capacity	-
▪ Resources	
▪ Aluminum and magnesite, coal, clay, cement raw materials, lead, zinc, barite minerals and substantial amount of ground water reserves	
▪ Environment	Provide rapid and smooth services
▪ Import (in US Dollars)	1,1341,964,000
▪ Export (in US Dollars)	1,497,166,000
▪ Projects	
▪ Konya Chamber of Industry and Commerce Vocational Training Center	
▪ Karapınar Energy Qualified Industrial Zone	
▪ Kayacık Logistic Village Project	
▪ Tohum ve Gen Teknolojileri Vadisi	
▪ Karatay Integretd Health Campus	
▪ Konya Data Centers	
▪ Konya Metro	

Illustration 38 Profile of Konya

Konya provides enough area to build production plant for passenger cars. In addition it is totally flat and has low probability of environmental disasters. In Konya are many ongoing projects to expand the road network.

However a big disadvantage of Konya is that the next harbor is about 360 km far away. But due to the strategically important position in the center of Turkey the supply chain of products in all directions of Turkey is ensured.

Pros and Cons



	
<p>Pros:</p> <ul style="list-style-type: none">▪ Located in the center of Turkey▪ Young population▪ Largest area of Turkey▪ Highly developed OIZ▪ The first in health care system▪ Cheap cost of living▪ Under the average of the price per m²▪ Potential in education for the automotive sector▪ Big projects for renewable energy▪ Advantageous location in terms of transportation opportunities▪ Developed industrial manufacturing in automotive spare parts▪ Leader city in agricultural machines and tool manufacturing▪ Multiple projects for infrastructure and logistics▪ New high speed railway connection to seaport▪ Installation of company and branch specific education	<p>Cons:</p> <ul style="list-style-type: none">▪ In comparison to other regions higher employment rates▪ No sea side harbor▪ Current no OEM automotive (passenger cars) manufacturer▪ Nearly full employment

Table 10 Pros and Cons of Konya

3.7 Manisa

General Information

Manisa province in the Aegean Region of Turkey is neighboring the international port city and regional metropolitan center of İzmir and benefits from the presence of Turkish consumer electronics and white goods giant Vestel, established in Manisa since 1980s. Benefits as well from considerable foreign direct investment (FDI) including the Italian white goods company Indesit, German electrical goods

company Bosch, UK packaging company Rexam and Imperial Tobacco. The province also has a strong agricultural and food processing sector.

There is strong and growing industrial activity in Manisa. There are 17 firms operating in Manisa that are on the list of the top 500 industrial companies in Turkey including numerous agriculture-based industrial firms and also a limited number of high-tech firms in electronics. The industrial activity in Manisa is mainly concentrated in organized industrial zones. There are four organized zones in addition to those in the center of towns like Akhisar, Salihli and Turgutlu.

Profile of Manisa

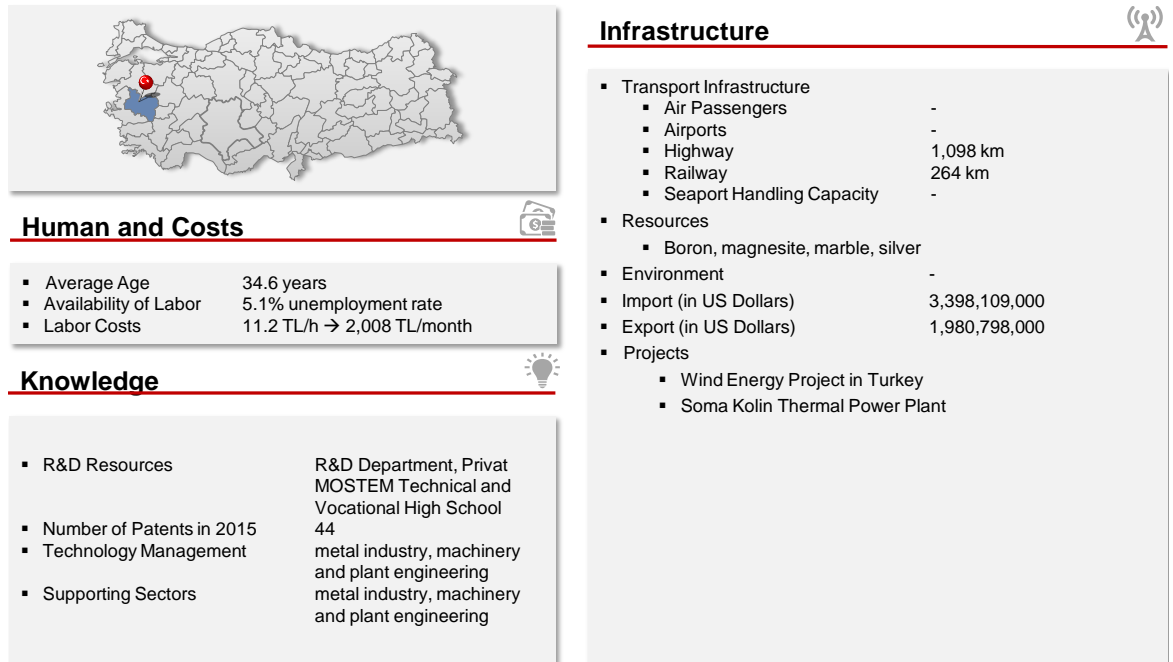


Illustration 39 Profile of Manisa

Manisa has the disadvantage of not having an airport or a harbor. Furthermore the education level in the province of Manisa is relatively low which might affect the well-being of its population. However, Manisa is one of most important cities in terms white goods production and supply in Turkey.

Pros and Cons



	
<p>Pros:</p> <ul style="list-style-type: none">▪ Low labor costs▪ Established white goods industry	<p>Cons:</p> <ul style="list-style-type: none">▪ Low education level▪ Low well-being▪ No seaport▪ No airport▪ Higher import than export share

Table 11 Pros and Cons of Manisa

3.8 Sakarya

General Information

Sakarya is a province in Turkey, located on the coast of Black Sea. The total area of Sakarya is 4,838 km² and has a population of 953,181. The Sakarya River creates a webbing of estuaries in the province. Sakarya is located in the Marmara Region. Its adjacent provinces are Kocaeli to the west, Bilecik to the south, Bolu to the southeast, and Düzce to the east. The climate is oceanic due to its close proximity to the Black Sea. Sakarya is situated on the Ankara-Istanbul Highway. It is connected through both road and rail. Sakarya is serviced by Istanbul's Sabiha Gökçen International Airport.

Profile of Sakarya



Human and Costs

▪ Average Age	32.5 years
▪ Availability of Labor	9.4% unemployment rate
▪ Labor Costs	13 TL/h → 2,344 TL/month

Knowledge

▪ R&D Resources	Organized Industrial Zone
▪ Number of Patents in 2015	18
▪ Technology Management	agriculture industry
▪ Supporting Sectors	automotive supply industry

Infrastructure

▪ Transport Infrastructure	
▪ Air Passengers	-
▪ Airports	-
▪ Highway	501 km
▪ Railway	197 km
▪ Seaport Handling Capacity	-
▪ Resources	
▪ Gold, copper-pyrite, bauxite, clay, lead-zinc, chromium, cadmium	
▪ Environment	-
▪ Import (in US Dollars)	1,663,830,000
▪ Export (in US Dollars)	2,603,843,000
▪ Projects	-

Illustration 40 Profile of Sakarya

Sakarya locates three OEM's, Toyota, Otokar and Temsa. In addition it has seven Organized Industrial Zones. Other major industries in the province are e.g. textile factories for silk and linen products. However, Sakarya is affected by natural catastrophes like earthquakes which increase investment costs due to precautions to prevent damages caused by environmental catastrophes.

Pros and Cons

+	-
<p>Pros:</p> <ul style="list-style-type: none"> ▪ On the Ankara-Istanbul Highway ▪ Automotive industry 	<p>Cons:</p> <ul style="list-style-type: none"> ▪ High labor costs ▪ No own airport

Table 12 Pros and Cons of Sakarya

3.9 Regional Comparison

Konya has the largest area of all the provinces in the Comparison with 38,873 km². The second province in the ranking is Manisa with only 13,096 km².

Konya has high capacity in terms of areas, which is very important for establishing a new automotive production plant.

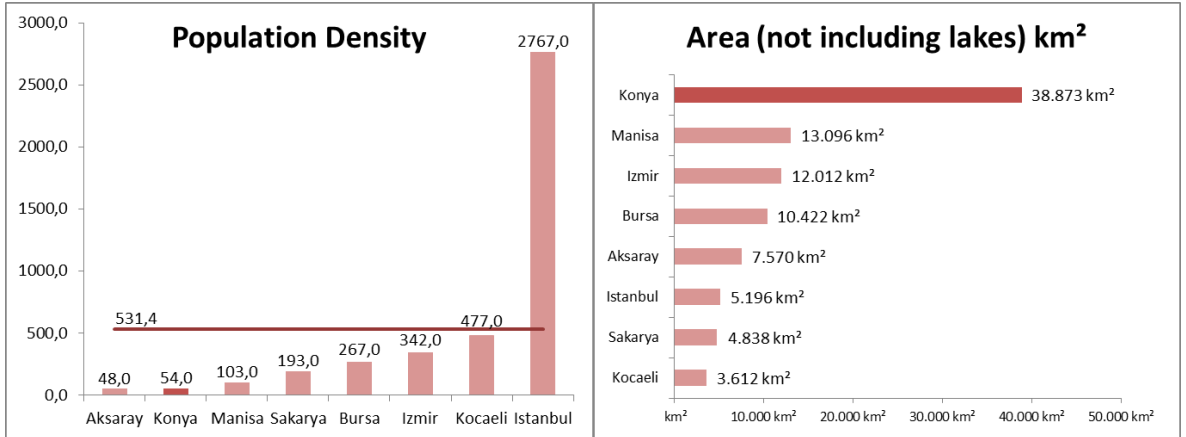


Illustration 41 Size in km² of the Provinces (Not Including Lakes) and Population Density

The left diagram above shows the population density. In comparison to Istanbul in Konya live 2,713 people per km² fewer. Only in Aksaray the population density with 48 people per km² is the lowest.

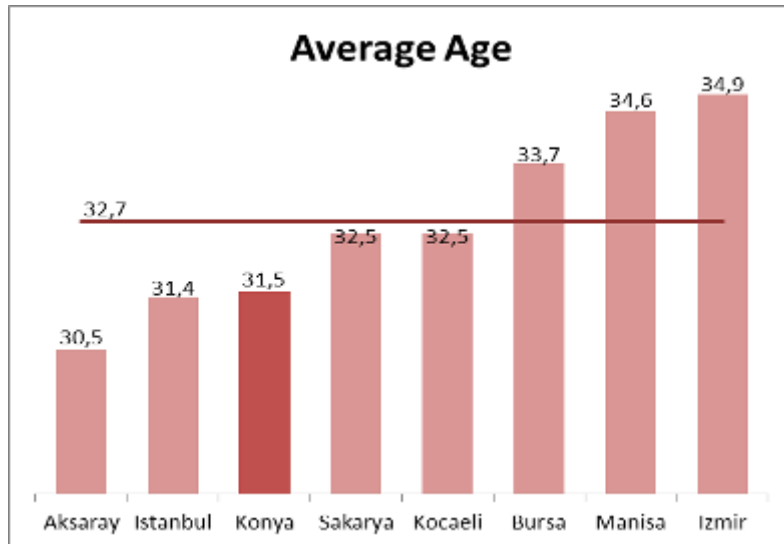


Illustration 42 Comparison of Average Age

The average age of the compared provinces is between 30 and 35 years. Konya is at the third place with 31.5 years and thus one of the provinces with the youngest population. One of the success factors for a functioning automotive production plant is well developed and ambitious workers.

Related to the diagram below and in comparison with the other provinces Konya achieves a good mid-table position. However Konya has the resources and the potential to increase the education level in the next few years.

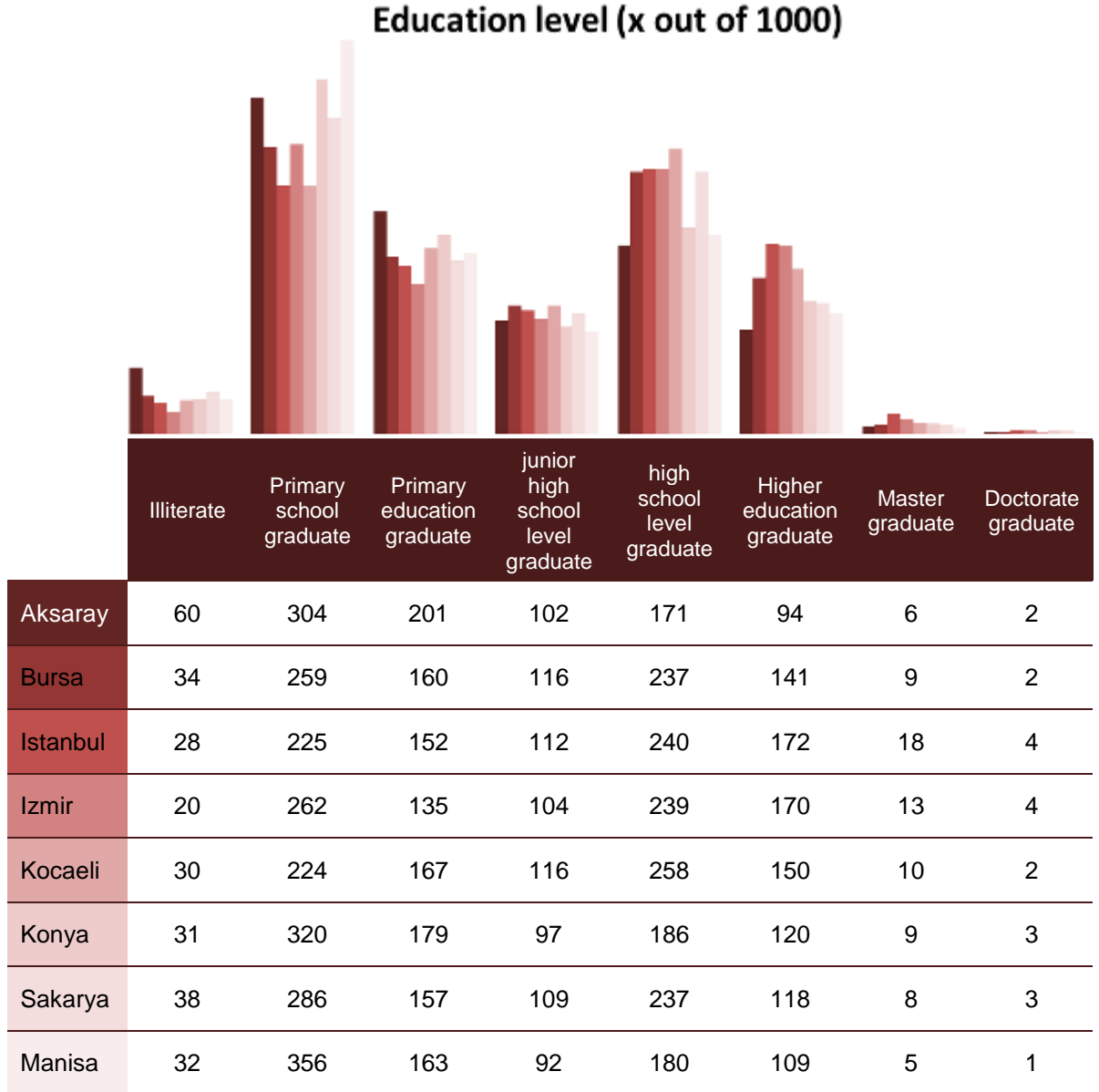


Illustration 43 Comparison of the Educational Level per 1,000 Citizens

The employment situation compared with the defined provinces Konya has an unemployment rate of about 4.7%. Regarding a full employment quote of about 5% Konya is on the first place. (Manisa 5.1%, Aksaray 5.8%, Bursa 6.6%, Kocaeli 10.1%, Istanbul 11.2% and Izmir 15.4%)

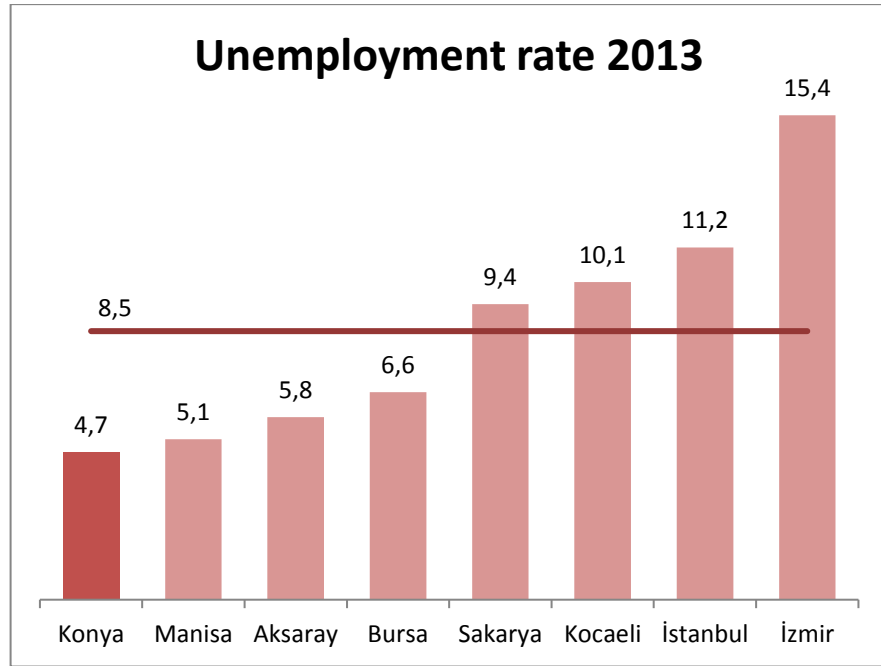


Illustration 44 Unemployment Rate 2013

To have the lowest unemployment rate also leads to the conclusion, that the satisfaction of the people in Konya is very high.

Comparing the value of imports and exports it shows that İstanbul is leading in both.

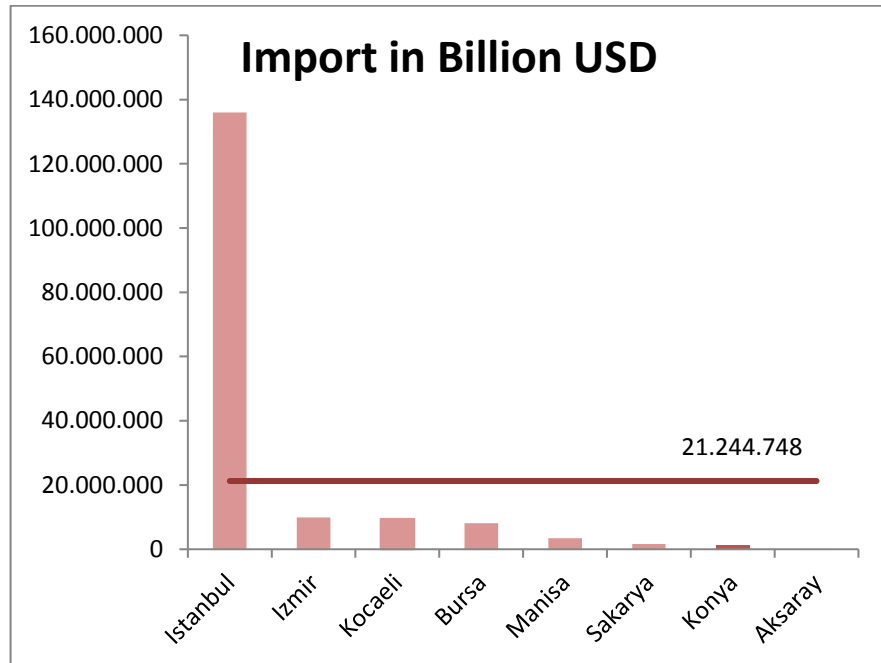


Illustration 45 Comparison of the Import in Billion USD

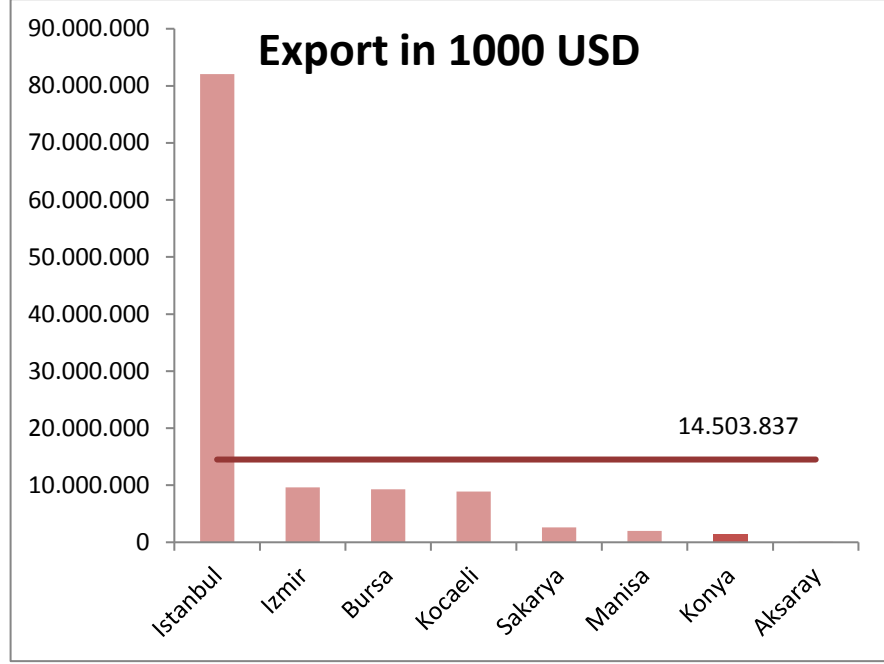


Illustration 46 Comparison of the Export in 1,000 USD

For establishing an automotive production plant for a domestic car the factor of high import and export values is minor.

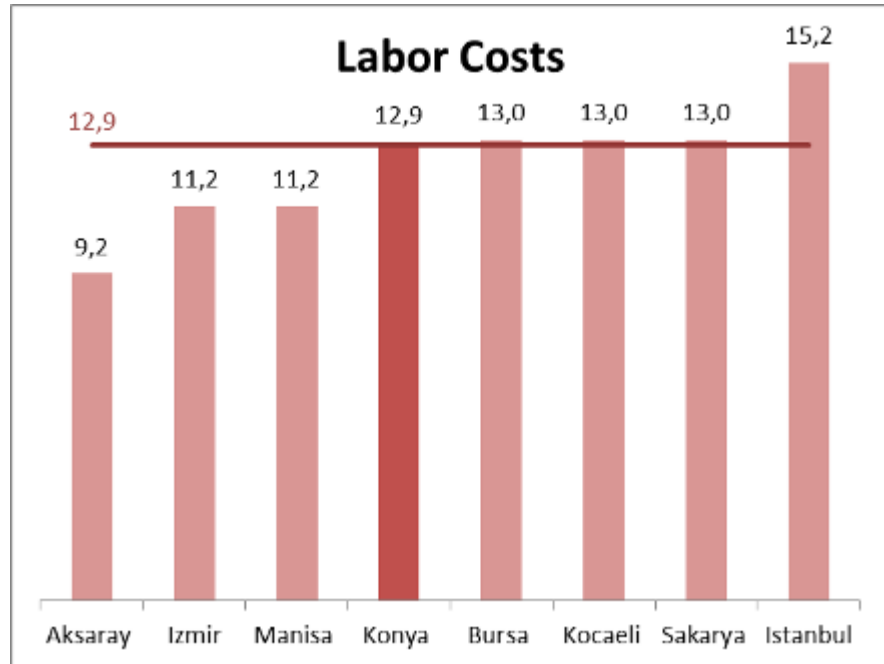


Illustration 47 Comparison of the Labor Costs 2014

The Konya labor cost rate of 12.9 TL/h is the 5th in the ranking. All well-developed provinces are higher, apart from Izmir with 11.2 TL/h. This could be an advantage for Konya to acquire Investors for an automotive production plant and suppliers for settling down in Konya.

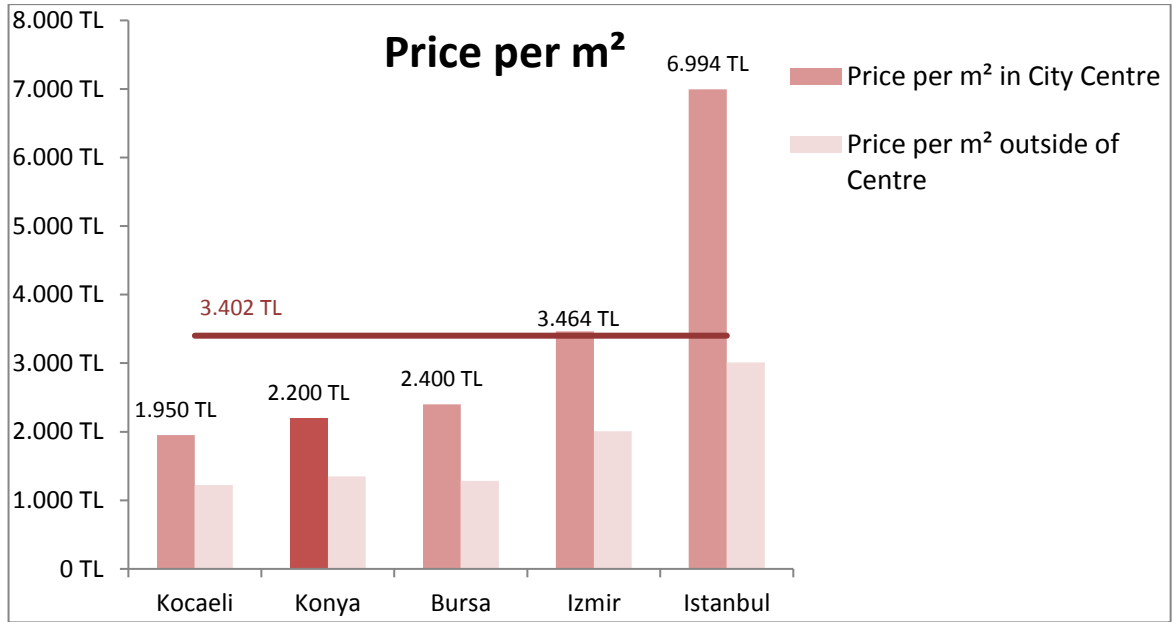


Illustration 48 Comparison of the Price per m²

Istanbul and Izmir are over the average of the prices per m². Konya is ranked second lowest behind Kocaeli with 2,200 TL/m². The low prices per m² and the low regional price level indices could be benefit for Konya to acquire high educated workers. The Immigration number of Konya also shows that most of the immigrants are between 20 and 24 years. Due to the situation Konya has high potential to attract high educated and qualified workers for the automotive industry.

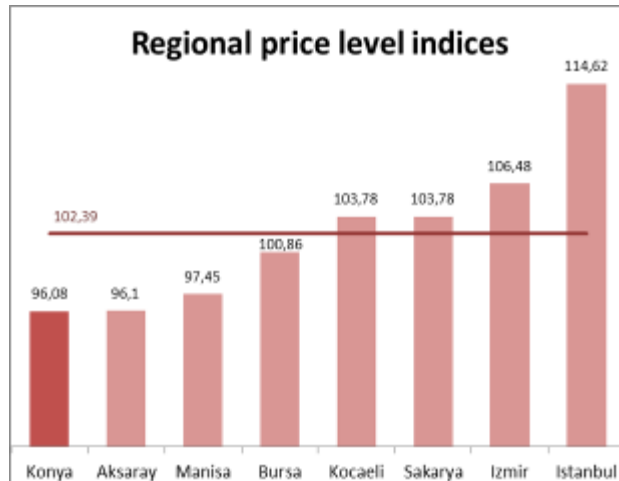


Illustration 49 Comparison of the Regional Price Level Index

Investment and Environmental Legislation

Investments are supported through four different incentive schemes and nine different incentive instruments designed within the scope of the new program. Con-

tributions provided to investors through incentive instruments depend on the characteristics of the investment and applicable schemes:

Schemes/Supports	General Investment Incentive Scheme	Regional Investment Incentive Scheme	Large Scale Investment Incentive Scheme	Strategic Investment Incentive Scheme
VAT Exemption	•	•	•	•
Customs Duty Exemption	•	•	•	•
Tax Deduction		•	•	•
SSP* Support (Employer's share)		•	•	•
Income Tax Withholding Support**	•	•	•	•
SSP Support** (Employee's Share)		•	•	•
Interest Rate Support***		•		•
Land Allocation		•	•	•
VAT Refund****				•

Table 13 Characteristics of the Investments and Applicable Schemes

- * SSP: Social Security Premium
- ** Provided that the investment is made in Region 6.
- *** Provided that the investment is made in Regions 3, 4, 5 or 6 within the frame of the Regional Investment Incentive Scheme
- **** For strategic investments with a minimum fixed investment amount of 500 Million TL.

Within the scope of the new Investment Incentives Program, all provinces in Turkey have been grouped into 6 regions according to the level of economic and social development as indicated by the 2011 socio-economic development index of the Ministry of Development. Investment Incentive Schemes based on regional development level offer the most advantageous rates and terms to Region 6 and less advantageous ones to Region 5, 4, 3, 2 and 1 respectively.

Region 1	Region 2	Region 3	Region 4	Region 5	Region 6
Bursa İstanbul İzmir Kocaeli	Konya Sakarya	Manisa		Aksaray	

Table 14 Regions of Investment Schemes

In every region are VAT exemption and / or customs duty exemption (see following tables).

Regional Investments

The next two diagrams show the tax deduction and SSP Support in the different regions.

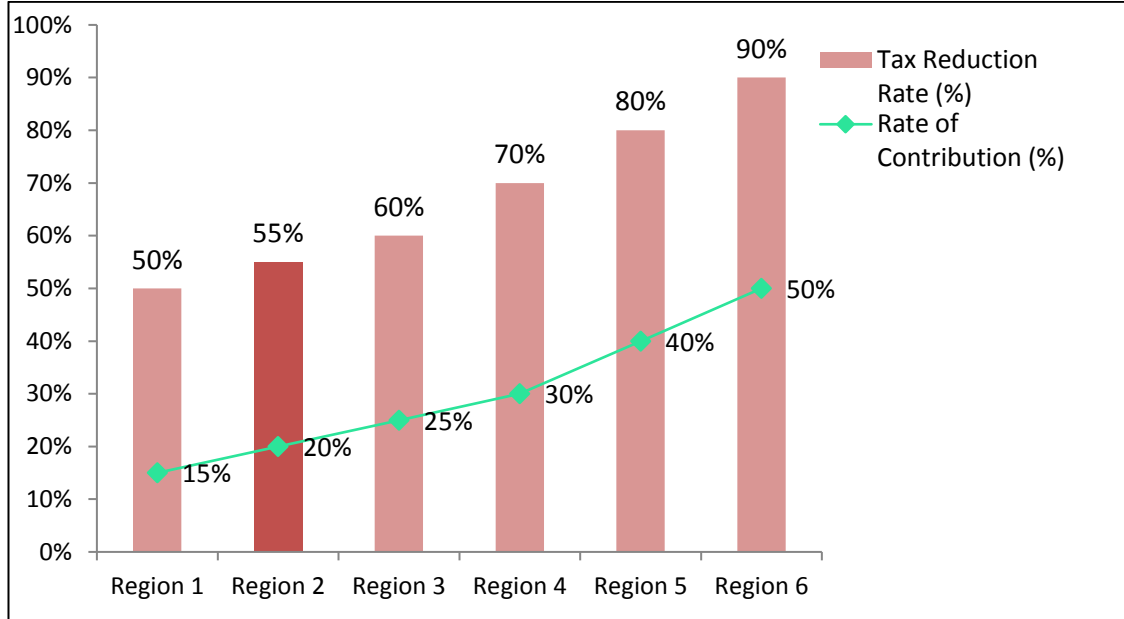


Illustration 50 Tax Deduction in the Six Regions

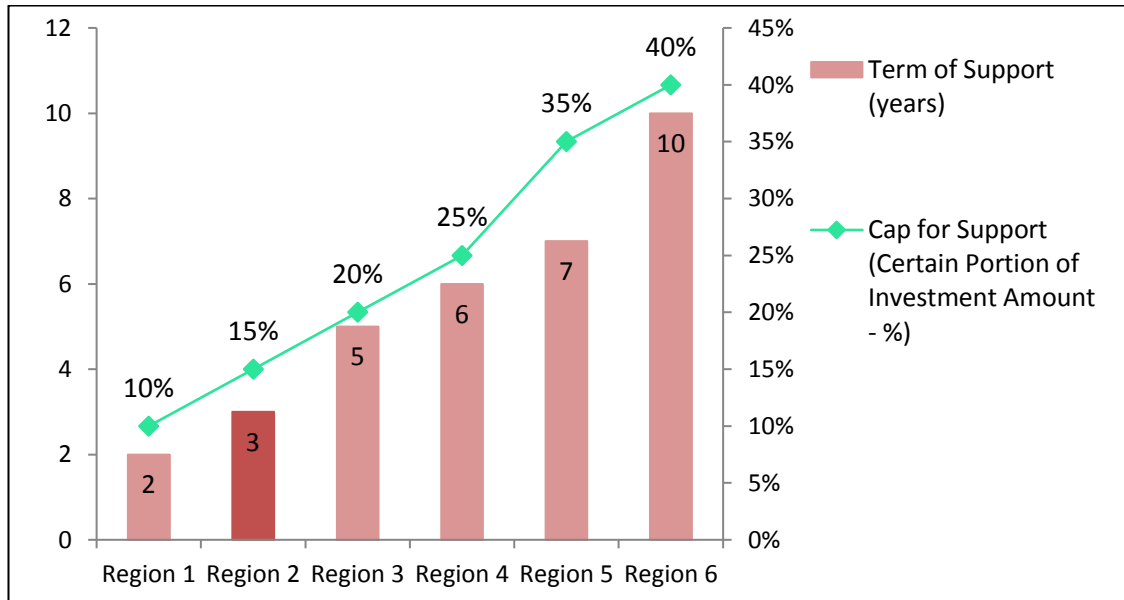


Illustration 51 SSP Support of the Six Regions

In the illustration above you see the tax deduction, it is the calculation of income or corporate tax with reduced rates until the total value reaches to the amount of

contribution to the investment according to envisaged rate of contribution and the social security premium support (employer's share) will be covered by the ministry. SSP support measure stipulates for the additional employment created by the investment, employer's share of social security premium on portions of labor wages corresponding to amount of legal minimum wage.

Region 1 includes Istanbul, Izmir, Bursa and Kocaeli. Konya and Sakarya are classified in region 2 hence they will receive a higher contribution rate in terms of tax deduction and SSP support for employer's share for a longer term.

There is also a difference between investments in and out of Organized Industrial Zones.

Incentive measures			Regions					
			1	2	3	4	5	6
Tax Deduction	Rate of Contribution to Investment (%)	Out of OIZ	15	20	25	30	40	50
		Within OIZ	20	25	30	40	50	55
SSP Support (Employer's Share)	Support Period in years	Out of OIZ	2	3	5	6	7	10
		Within OIZ	3	5	6	7	10	12

Table 15 Incentive Scheme Regional Investments

Large Scale Investments

There are 12 investment categories for large scale investments. These 12 categories are supported by government.

No.	Investment Subject	Minimum Fixed Investment Amounts (Million TL)
1	Production of Refined Petroleum Products	1,000
2	Production of Chemical Products	200
3	Harbors and Harbor Services	200
4	Automotive Investments	
4-a	Automotive OEM Investments	200
4-b	Automotive Supply Industries Investments	50
5	Railway and Tram Locomotives and/or Railway and Tram Cars	50
6	Transit Pipe Line Transportation Services	50
7	Electronics	50
8	Medical, High Precision and Optical Equipment	50
9	Pharmaceuticals	50

10	Aircraft and Aerospace Vehicles and/or Parts	50
11	Machinery (including electrical machinery and appliances)	50
12	Investments for Metal production: Investments for the final metal production of mineral ores and/or concentrates of IV/c group mines as defined in the Mining Law (including integrated mining investments)	50

Table 16 Subsidized Large Scale Investments

Incentive measures			Regions					
			1	2	3	4	5	6
Tax Deduction	Rate of Contribution to Investment (%)	Out of OIZ	25	30	35	40	50	60
		Within OIZ	30	35	40	50	60	65
SSP Support (Employer's Share)	Support Period in years	Out of OIZ	2	3	5	6	7	10
		Within OIZ	3	5	6	7	10	12

Table 17 Investment Scheme Large Scale Investments

The investments in Organized Industrial Zones of a specific province, supported by the large scale investment incentive scheme, will yield additional benefits through tax deduction and SSP Support for employers' share, as those offered by the regional investment incentive scheme. Large scale investments that are made in an Organized Industrial Zone will be eligible for rates and terms applicable to the next better region's supports in terms of tax deduction and SSP support for employers' share.

According to data from the Ministry of Economy, in the period of June 2012 till the end of 2015 investments worth a total of 309 billion Turkish Liras were supported with incentives. In the same period, region 1 - which included Istanbul - took the top slot in investments with a share of 35%. Regions 2 and 3, both of which lie in the west of the country, had a share of 31% of the investments. As a result, two thirds of the supported investments were made in already developed and relatively developed regions. The least developed Region 6, covering the eastern and

south-eastern Anatolia, took only a 5% share of the supported investments in the same period.⁴⁵

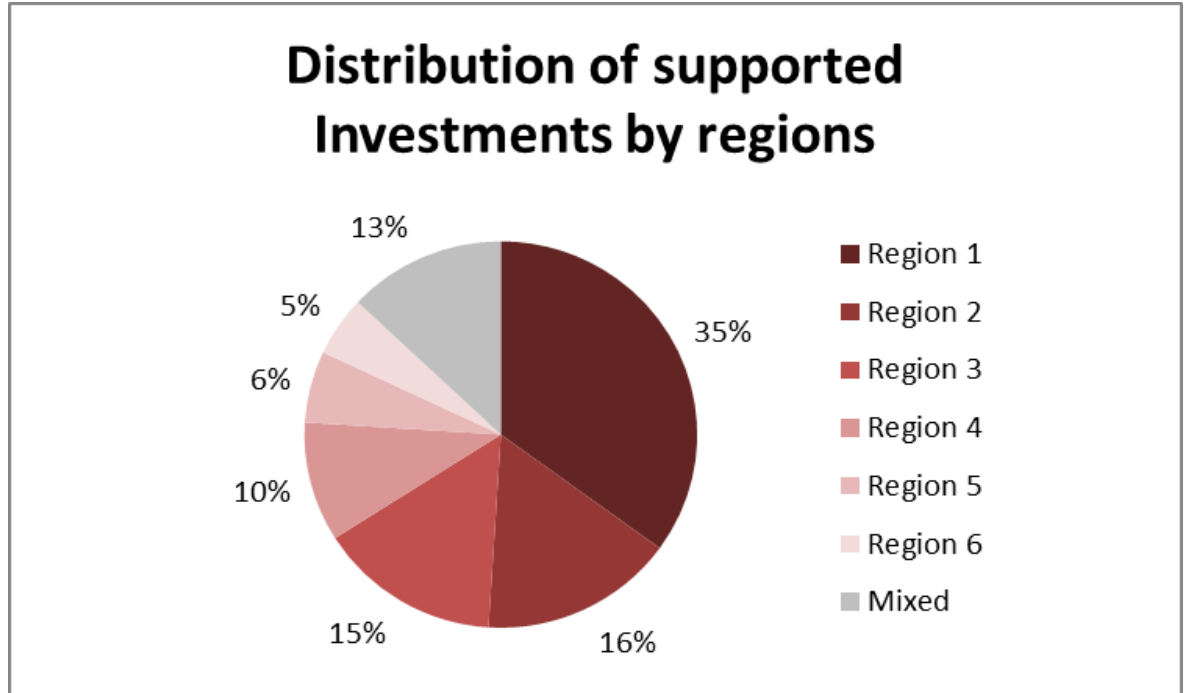


Illustration 52 Distribution of Supported Investments by Regions

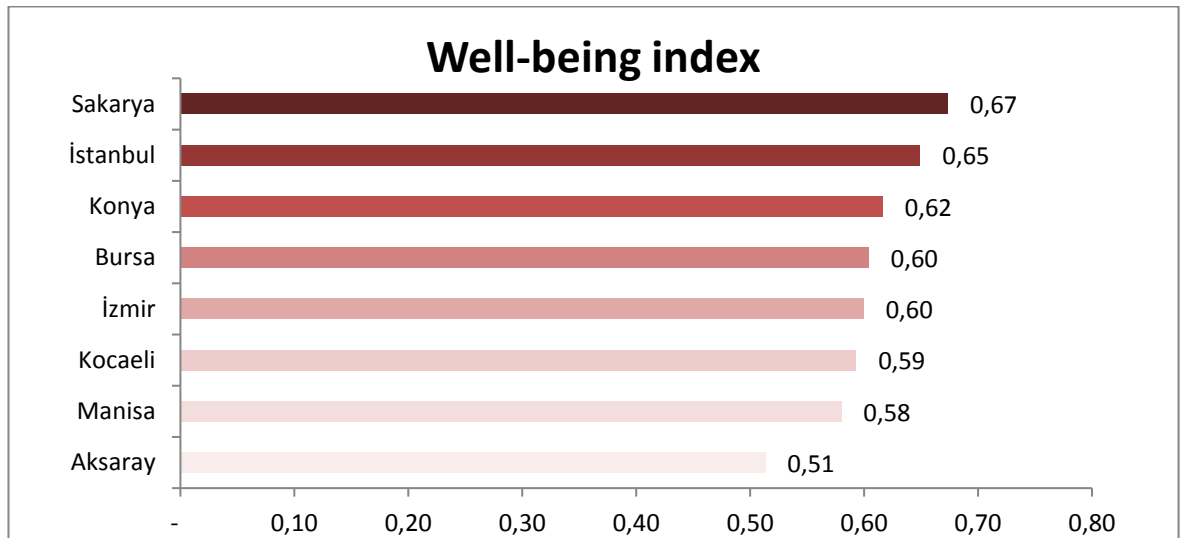


Illustration 53 Well-being Index 2015⁴⁶

This diagram shows the index of well-being in the different provinces.

⁴⁵ <http://www.hurriyetdailynews.com/regional-inequalities-in-Turkey-not-easing-.aspx?pageID=238&nID=99507&NewsCatID=344>

⁴⁶ TurkStat, Rankings and index values of well-being index for provinces, 2015

Parameter for this Index are work life, income and wealth, health, education, environment, safety, civic engagement, access to infrastructure, social life and life satisfaction.

The diagrams of the parameter for the well-being index are shown below.



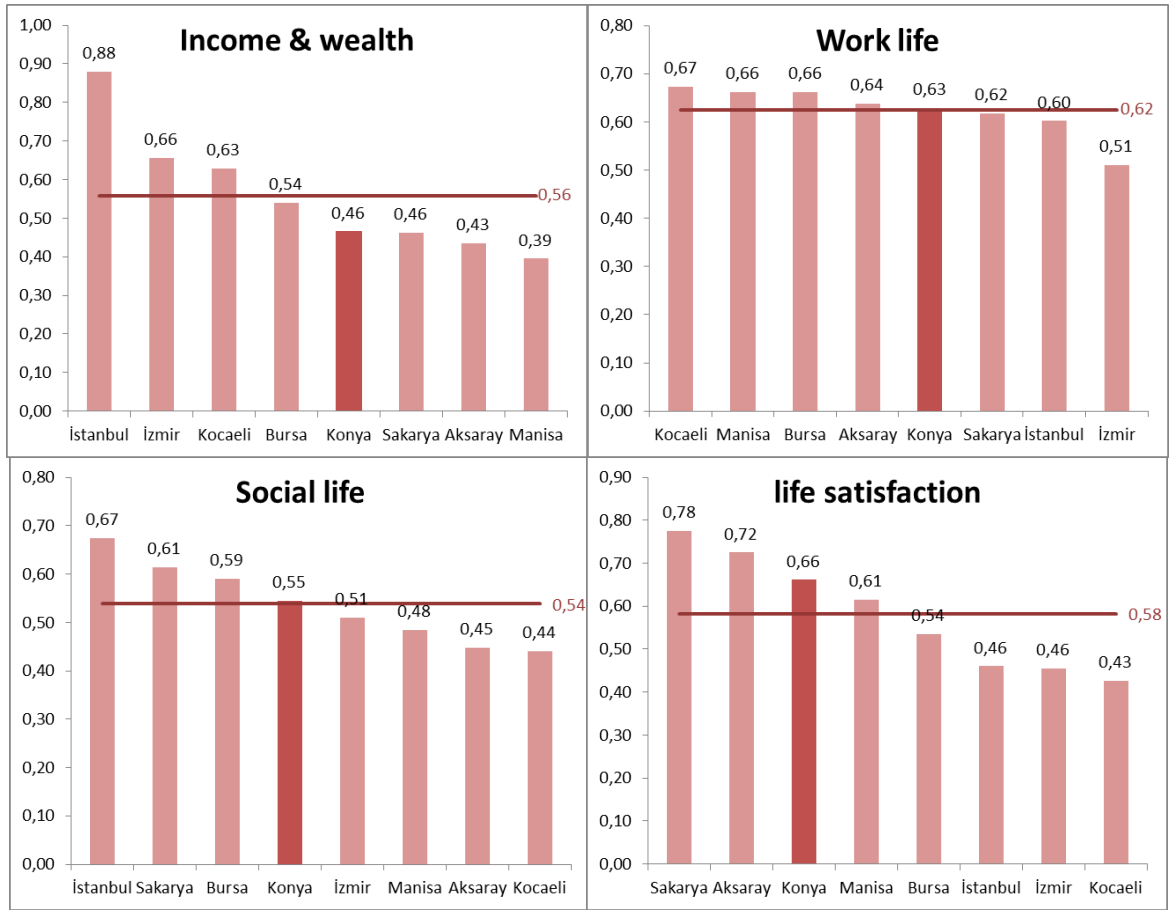


Illustration 54 Parameter for the Well-Being Index⁴⁷

Konya is on the third place in the ranking before Bursa, Izmir and Kocaeli and after Istanbul and Sakarya. Konya is in the most of the parameters over the average. Just the parameter of income and wealth is below average, but this is not usually a disadvantage. It also means that the wages of workers are lower (see Illustration 47) and this is an advantage for investors and suppliers.

In the parameter of health, Konya is the leader of the compared provinces. This is a further advantage of Konya, because the health becomes more and more important for the people, hence it is an important factor for the well-being of the population.

⁴⁷ TurkStat, Rankings and index values of well-being index for provinces, 2015

4 Analyzing Konya

Konya is bearing the title of a commercial and accommodation center much frequented due to its important commercial roads. It functions as an engine in central Anatolia in terms of agriculture, trade, industry and touristic attraction center, makes considerable contributions to the national economy, and holds the title of being an ancient agriculture city and a manufacturing city due to its various industrial centers gained pace in the last decades.⁴⁸

In several interviews the Turkish media reported that Konya would be particularly suitable as a location for the domestic car. The MP of MHP Mustafa Kalaycı and the speaker of Konya Organize Sanayi (KOS) Memiş Kütükçü justify this especially with the large industrial area and the central location of Konya. This chapter analyzes Konya in terms of population and land, education, employment and human resources, transportation, Technology, R&D and innovation infrastructure, Organized Industrial Zone and automotive industry. These facts are summarized in a SWOT-Analysis.

4.1 General Information of Konya

Population

According to the results of the Address-Based Population Registration System (ABPRS) for 2014, Konya has a population of 2,108,808, constituting 2.7% of Turkey and ranking 7th among the provinces.

Indicator	Value of Konya	% Share of Konya in Turkey	Range of Konya in Turkey	First Province in Turkey	The Value of the first Province	The Value of Turkey	Year	Source
Area (including lakes), km ²	41,001	5.22%	1.	Konya	41,001	785,347	2013	GEN. COM. Of MAP. (TUIK)
Numbers of districts	31	3.20%	2.	Istanbul	39	970	2014	TURKSTAT
Population	2,108,808	2.71%	7.	Istanbul	14,377,018	77,695,904	2014	TURKSTAT
People per km ² (not including lakes)	54		36.	Istanbul	2,767	93	2014	TURKSTAT

Table 18 Basic Information about Konya

⁴⁸ Industry City Konya: p.5, 2014

Population under 35 constitutes 60% of Konya's population. This high rate of young population in Konya is a big advantage in terms of labor force. People between the ages of 15 and 64 constitute 66% of total population. 25% of Konya is between the ages of 0 and 14 and 9% is over the age of 65.

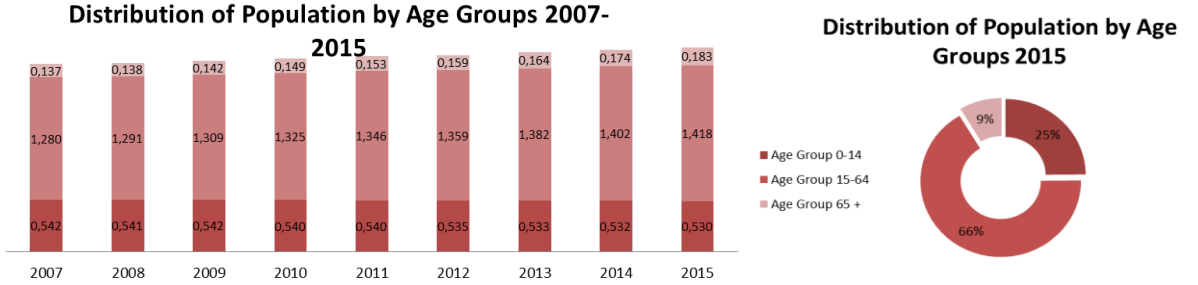


Illustration 55 Distribution of Population by Age Groups 2007-2015

Most of the immigrants moved from Ankara (6,261), İstanbul (5,198), Antalya (3,607), Karaman (2,981) and İzmir (2,589) to Konya. The least are from Ardahan (62), Tunceli (76), Yalova (78), Iğdır (85), Kilis (93) and Sinop (93).

23.2% of the immigrants are between 20 and 24 years old.

Most of the emigrants moved to Ankara (7,765), İstanbul (6,004), Antalya (5,161), İzmir (2,813) and Karaman (2,098). The least emigrate to Tunceli (61), Ardahan (61), Bayburt (76), Bartın (78) and Kilis (79).

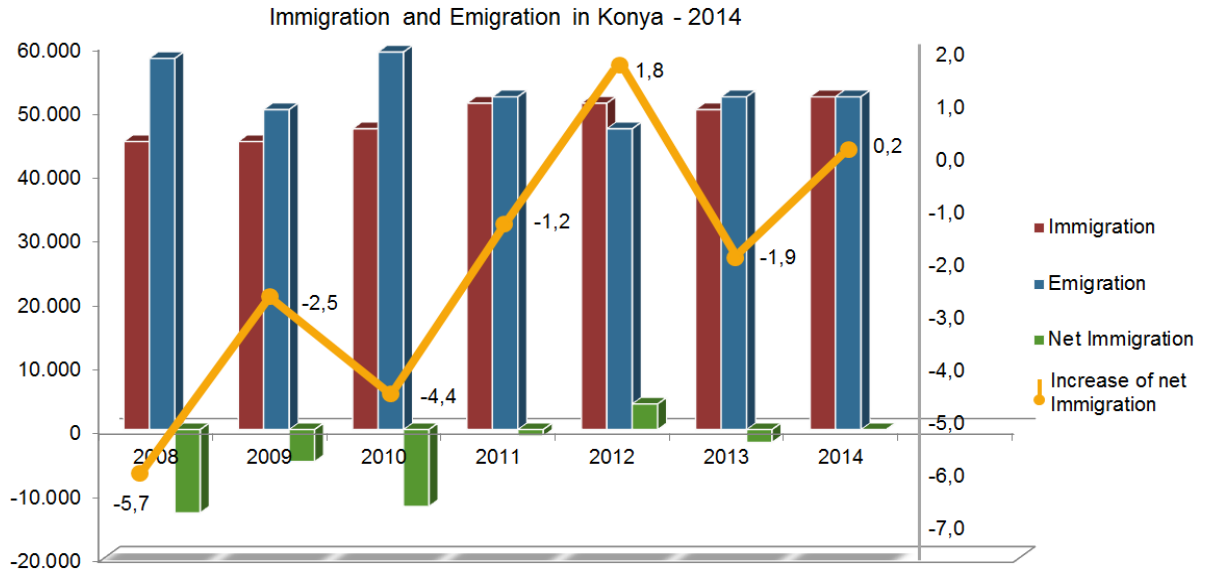


Illustration 56 Immigration and Emigration in Konya - 2014

In the end of 2014 Konya has 65 preschools, 811 primary schools, 449 secondary schools and 98 high schools. These consist of 436,000 students and 280,000 pupils in primary and secondary schools. In second place in terms of the number of

students are vocational schools. In Konya there are 148 vocational schools with a total of 5,336 teachers and 77,057 students.

School type	Number of Schools		Number of Students		Number of teachers	
	No.	%	No.	%	No.	%
Preschool	65	3.1	6,119	1.4	327	1.2
Primary School	811	38.6	169,934	38.9	8,411	32.1
Secondary School	449	21.4	111,040	25.4	7,044	26.8
Religious Secondary School	103	4.9	35,649	8.2	2,008	7.7
High School	98	4.7	36,652	8.4	2,410	9.2
Vocational High School	184	8.8	77,057	17.6	5,226	19.9
Public Education Center	31	1.5	0	0.0	106	0.4
Vocational Training Center	10	0.5	0	0.0	202	0.8
Other Institutions	350	16.7	0	0.0	507	1.9
Total	2,101	100.0	436,451	100.0	26,241	100.0

Table 19 Number of Schools, Teachers and Students in Konya – 2014⁴⁹

Within the age group older than 15 in Konya, rate of graduates from an educational institution is 88.16%, above the Turkish average of 84.53%. Breakdown of population by educational status is 35.82% of the population are primary school graduates, 21.17% are primary education graduates, 4.35% are secondary school or equivalent school graduates, 8.52% are academy or faculty graduates, 0.57% are post-graduate graduates and 0.22% are doctorate graduates. A comparison by schools of graduation reveals that the rate of graduation from primary school and primary education institutions in the province is much higher than the national average, yet the rate of graduation from secondary school, high school, university and post-graduate institutions is below the national average. This reflects the fact that Konya outdistances the national average in primary education, yet falls behind the national average in higher education. While the rate of population without graduation from any educational institution to the population of school age is 6.28% for Turkey, it drops down to 4.65% for Konya. Konya and the TR52 level 2 region exhibit similar characters in terms of educational status of the population.

⁴⁹ Community, Livability Paper: p.1

In Konya, schooling ratio of population being at school age is 101.54% in primary education and 52.86% in secondary education in 2015.⁵⁰ The assessment of schooling rate by gender reveals that male population scores a better schooling performance than female in all educational segments. While Konya slightly outdistances the national average for its schooling rate in primary education (98.67%), it falls behind the national average for its schooling rate in secondary education (67.37%).

Selcuk University, which began its educational endeavors in 1975, is one of the leading higher education institutions of Turkey, within 23 faculty, six institute, six school, 22 vocational school, one state conservatory and 9,519 graduate, 26,178 two-year degree, 38,115 undergraduate and in total 73,812 students.

With a population of about 80,000 people, including academic and administrative personnel and students, Selcuk University is according to the figures released by the Turkish Statistics Institute larger than ten provincial centers and according to the international publications data released by the Higher Education Council (HEC) ranked 8th.⁵¹

Necmetin Erbakan University, though a newly established state university in 2010, with 15 faculties, four colleges, four institutes, 13 research centers and a state musical conservatory, is privileged of housing three oldest higher educational institutions in Konya; Ahmet Keleşoğlu Faculty of Education (since 1962), the Faculty of Theology (since 1962), and Meram Faculty of Medicine (since 1982).

Over 30,000 students (more than 6,000 postgraduate and 1,000 international students) with over 3,000 academic and administrative staff are making contributions to university's academic activities, making it one of the most important institutes of higher education in Turkey.⁵²

KTO Karatay University was founded by Konya Chamber of Commerce Education and Health Foundation in July 2009 as a continuation of Karatay Madrasa which was founded in 1251 and provided training for 661 years.

⁵⁰ National Education Statistics, Formal Education 2015/16, p. 3

⁵¹ <http://www.studyinturkey.gov.tr/profiles/info/343>

⁵² <https://www.konya.edu.tr/en/>

KTO Karatay University has six faculties, two graduate schools and two vocational schools. KTO Karatay considers the whole business and industrial world as well as the society as common partners of education. The primary mission of the university is to find solutions for the current problems in cooperation with the society.⁵³

In three different universities Konya offers educations for the automotive industry.

Sector	Selçuk University		Necmettin Erbakan University		KTO Karatay University	
	students	graduates	students	graduates	students	graduates
Engineering	1,164	113	133		160	8
Electronic engineering	1,335	147	208		204	8
Industrial engineering	374	70	123			
Service	3,061	456	272		207	17
Chemical engineering	629	78				
Mechanical engineering	1,659	169	823	31	182	
Mechatronics engineering			126		174	9
Metal and materials engineering	257	43	121		34	
Vocational education						
Automotive technology			376	32		
Production technology	350	100	287	46		
Electronic technology	2,275	286	606	101		
mechanical engineering	2,260	261	793	121		
Metal technology	113	10				
Accounting/finance	2,247	474	428	79		
administrative management	278	70				
Computer science	3,338	562	234	119		

Table 20 Number of Students and Graduates in the Universities of Konya, 2014

⁵³ <https://www.higheredjobs.com/InstitutionProfile.cfm?ProfileID=16407>



Illustration 57 Distribution of Foreign Students in the Universities of Konya

The illustration above shows the students from foreign countries. Most of the students studying in Konya's universities are from China, Saudi Arabia, Kazakhstan and Great Britain. The least of students are from South America and Australia.

Employment and human resources

Since 2008, the insured employment increased to a higher level in Konya than the national average. The city ranks eighth in Turkey in terms of insured employment. The employment rate increased by 10.6% in 2011 compared to the previous year. In Konya, 60.6% of the population is younger than 35 years old, which suggests that there is a considerable amount of employable young population.

The age structure of Konya demonstrates that the working-age between 15 and 64 years old inhabitants is 66.01% of the total number of population.⁵⁴

⁵⁴ Konya Investment Guide in the service sector: p.11, 2013

Employment According to Education Level in Konya (1000 persons/2012)

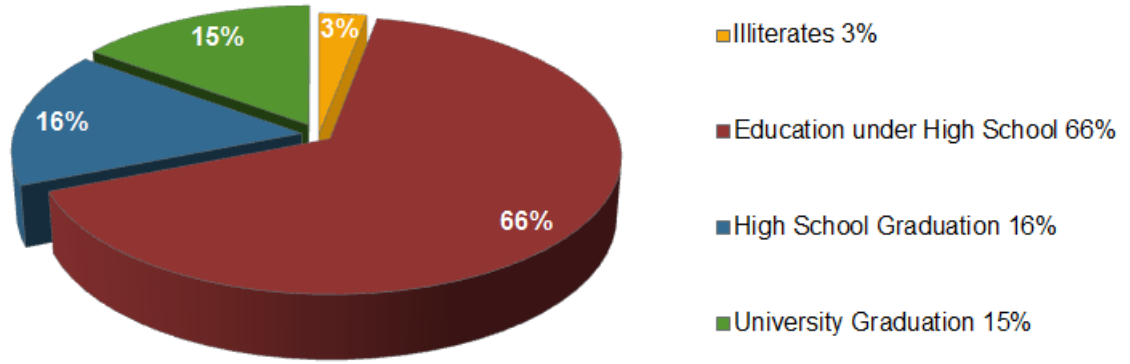


Illustration 58 Employment According to Education Level in Konya

Labor Structure:

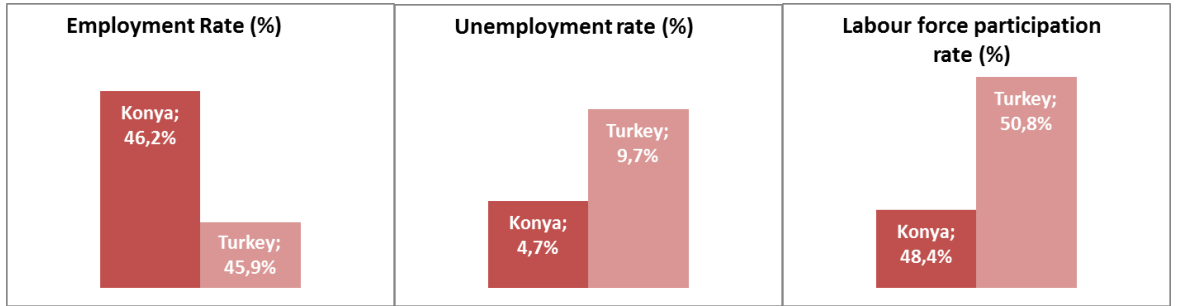


Illustration 59 Labor Structure of Konya related to Turkey

Konya offers 40,488 workplaces which are 2.4% share in Turkey. 39,712 of these workplaces are private and 776 are public.

In the Tables below you have an overview of the labor structure and the business life in Konya related to the values of Turkey.

Business Life:

	Konya	Turkey
Number of Workplace (Law no. 5510 4-1/a)	40,488	1,611,292
Number of Enterprises	92,800	3,525,431
Active Number of Employees with Social Security	455,335	18,886,989
Number of Established Businesses	1,156	57,710
Number of Closed Businesses	229	14,002
Number of Foreign Capital Companies	163	41,398
Sum of Investment Incentive Certificate	161	4,062
Investment Incentive Certificate- Sum of Fixed Investment (TL)	1,105,000,000	61,779,000,000
Investment Incentive Certificate- Employment	3,568	143,763

Table 21 Business Life of Konya Related to Turkey

Tourism

Konya is known as the city of whirling dervishes and for its outstanding Seljuk architecture. Most significant artefacts dating back to the period prior to Turkish sovereignty are Çatalhöyük, the Ivriz Rock Monument, Siyata, the Ak Monastery, the Sille Aya-Elena Church, the Eflatunpınar Hittite Monument, the Ancient City of Clistra, Karahöyük, Bolat Ören Ground and the Necropolis Square. The most famous museum is the Mevlana Museum/Mausoleum of Rumi. There are five other important museums:

- Ince Minare Museum
- Şehitler Abidesi
- Konya Archaeological Museum
- Karatay Medresesi Museum
- Ataturk House Museum

Considering to the number of visitors in the museums in Konya, it turns out that August is the main season with 325,259 visitors, whereas the month January has the lowest numbers of visitors.

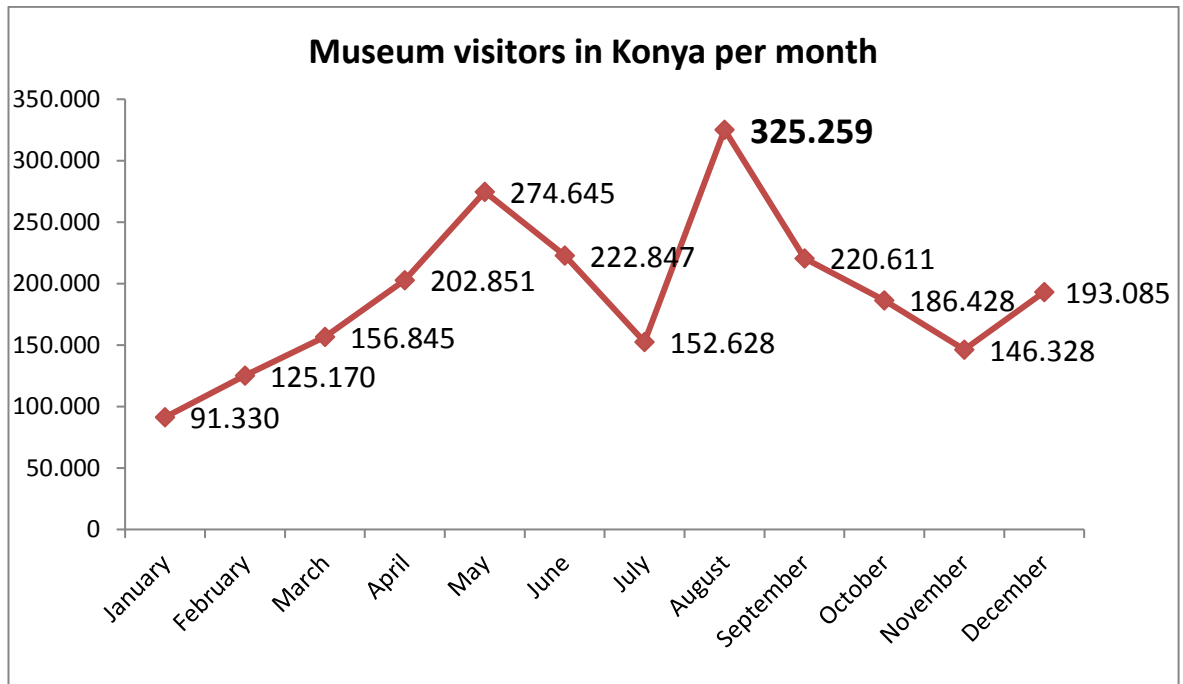


Illustration 60 Museum Visitors in Konya Per Month

Transportation

Konya is a passageway according to key highways between north and south, and east and west. The provincial center of Konya has been a crucial center of trade and accommodation throughout the history, thanks to its vital geographical situation.



Illustration 61 International Distances to Konya from Destination

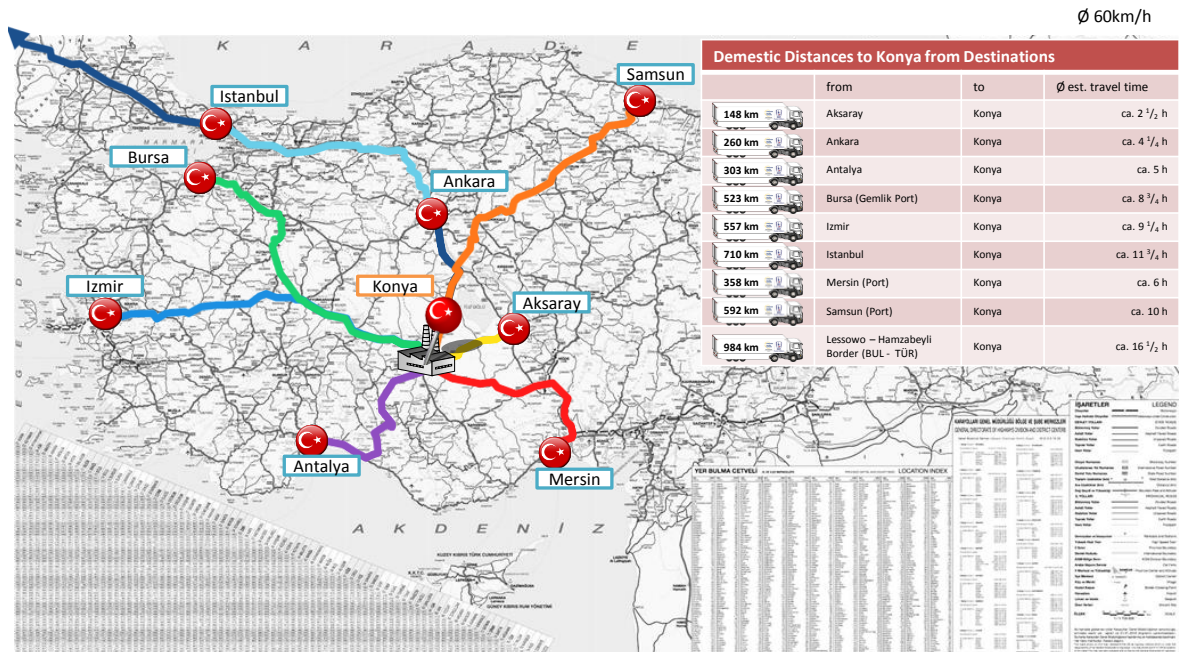


Illustration 62 Domestic Distances to Konya from Destination

Highways passing from the provincial center towards northern, north western, western, southern or north eastern directions link Konya to other provinces. Of

them, while the Konya-Afyonkarahisar, Eskişehir-Bursa-Istanbul, and Konya-Ankara motorways link the province to Ankara and other north western provinces, the Konya-Aksaray motorway links to Nevşehir and north eastern provinces, and the Konya-Beyşehir motorway extending to the west link to Izmir through the Ispart-Denizli-Aydın route. The Konya-Karaman motorway to the south is the major transport route to Mersin and Adana. Furthermore, the highway is linking to the Ankara-Adana motorway through Ereğli serves as a critical transport network connecting both Adana and south eastern provinces as well as Black Sea provinces through Kayseri. The Konya-Seydişehir motorway, put into service in 1996, is the shortest route linking Konya and the whole Central Anatolia to southern coasts.⁵⁵

	Konya	Turkey
State and Province Roads (km)	3,144.00	4.93% 63,754.000
Divided Road (km)	934.46	4.60% 20,305.143
Railroad (km)	590.00	6.07% 90,305.143
Number of Automobiles	289,030.00	2.93% 57,710.000
Number of Automobiles per 1,000 capita	137.00	127.000
Number of Airline Passengers	989,398.00	0.60% 165,720,234.000

Table 22 Transportation Values of Konya Related to Turkey⁵⁶

The motorway network throughout the province sums 4,078.46 km as accounted by 3,144 km of state and provincial road and 934.46 km of divided road. Konya, the province the biggest share, is located within the State, Provincial and divided Roads Network of the General Directorate of Highways.

Transportation via Truck

Fees for domestic freight transport based on the tariff:

The transported cargo volume in kg	Distance in km	
	0 – 100	101 and more
	Tariff in TRY	
5,000 kg	42 + Distance	1.416 X Distance
5,001-10,000 kg	54 + Distance	1.536 X Distance
10,001-15,000 kg	67 + Distance	1.667 X Distance
15,001-20,000 kg	81 + Distance	1.807 X Distance
20,001 kg and more	96 + Distance	1.962 X Distance

Table 23 Cost of Transportation via Truck⁵⁷

⁵⁵ Appropriate Investment Areas For The Konya Province: p. 33; 2011

⁵⁶ Konya with Statistics: p.3

Example 1:

Freight = 5,000 kg
Distance = 30 km
Shipping costs = $1.05 \times (42 + 30) = 75.6$ TRY

Example 2:

Freight = 16,500 kg
Distance = 200 km
Shipping costs = $1.807 \times 200 = 75.6$ TRY



Illustration 63 Railway Map of Turkey

The railway network linking the south and south east to western provinces and Istanbul is hosted by the Karaman province of the TR52 region. Inbound and out-bound railway transport in Konya is provided through the high speed train (Konya-Ankara), the Taurus Express (Istanbul-Konya-Gaziantep), Central Anatolian Blue Train (Ereğli-Konya-Istanbul) and the Meram Express (Istanbul-Konya) lines. Since load and passenger transport on current railways takes much time, the Ankara-Konya fast train line has been put into service to provide faster transport to major cities such as Ankara, Istanbul and Izmir.⁵⁸

Konya has been involved in the scope of the logistic centers project implemented by Turkish State Railways, where restructuring the Kayacık site as a logistic center is concerned. Logistic centers are defined as areas where different operators and carriers undertake national and international load transport, distribution, storage and other associated services. Logistic centers offering storage and transport services supported with means of combined transport by highway, railway, sea-way and also airway progressively gain significance. Logistic centers are established by Turkish State Railways throughout the country at 16 different modern

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http://www.kugm.gov.tr/BLSM_WIYS/KUGM/tr/Belgelik/Mevzuat/Tebliğler/20091007_145645_2769_1_64.doc
58 Appropriate Investment Areas For The Konya Province: p. 35; 2011

railway stations located in city centers of various scale tailored in line with technological and economic developments and capable of satisfying demands to load logistics on areas preferable by customers offering effective means of highway transport. The construction of the Konya-Kayacık Logistics Center has been started by virtue of the cabinet decision published in the official gazette no 27,946 on May 27th in 2011. With the Konya-Kayacık Logistics Center put into service, existing warehouses and storages in the city will be moved to the uptown area accompanied with the construction of integrated and modern facilities at logistics centers for transport and storage purposes. Process of expropriating the 70,000 m² area within the Kayacık Logistics Center is in progress and is going to bring giant economic and commercial advantages in the province once the investment is complete.

Furthermore, Turkish State Railways (TSR) pursues the scheme, under the urban transformation project, of designating TSR areas at the Konya railway station as "TSR Special Project Area", moving operations except for passenger transport off the station and assigning forwarding operations to the Kayacık Logistics Center.⁵⁹

Transportation via Railway

- minimum handling charge: 179 TL/wagon
- shortest distance: 150 km
- lowest weight:
 - wagons with two axis → 20 tons
 - wagons with four axis and more → 40 tons

⁵⁹ Appropriate Investment Areas For The Konya Province: p. 36; 2011

Distance (km)	TL / TON
1-150	9.35
151-160	12.55
161-180	14.12
181-200	15.68
201-220	17.25
221-240	18.82
241-260	20.39
261-280	21.96
281-300	23.52
301-320	25.09
...	...
2451-2500	199.58

Table 24 Cost of Transportation Via Railway⁶⁰

Example 1:

Freight	= 20 tons
Value of goods	= 17,000 TL
Wagon	= 2 axis
Minimum handling charge	= 20 tons x unit costs
Stock Bonus Plan	= (17,000/1,000) x 1 or 2
Fee = minimum handling charge + Stock Bonus Plan	

Transport via Airplane

There is a military-civil airport in Konya. Serving as a border gate to international traffic, the airport is 20 km far from the city center. The facility operated as a military-civil airport since October 29th in 2000 hosts Konya-Istanbul-Konya scheduled flights on daily basis to serve to growing mass of passengers accompanied with buoyant demand.⁶¹

Topography of Konya

A large part of the Konya Province is coincided on the high plains of Central Anatolia. Southern and western parts of Konya area are included the southern Mediterranean. Konya takes geographically in between 36° 41' and 39° 16' north latitude and 31° 14' and 34° 26' east longitude respectively (Figure 1). Surface area

⁶⁰ <http://www.tcdd.gov.tr/files/yuk/yurticiucret.pdf>

⁶¹ Appropriate Investment Areas For The Konya Province: p. 37; 2011

(excluding lakes) is 38,257 km². This area is the largest face in cities area of Turkey (Anonymous 2008a). Konya has an average level above the sea level of 1,024 meters. Average altitude is 1,016 m in Konya (Anonymous, 1998; Anonim, 1997).⁶²

Soil and Water Resources

Konya-Karaman Region is one of the geographies of intense agricultural activity implementation in the country. Due to the fact that agriculture-suited areas are in abundance, water resource potential is limited – in addition to the serious aridity risk present it is very important to establish production patterns according to limited water resources.

Another plan with the purpose to develop the country's soil and water resources is Konya Plain Project. In order to fulfil the programming, project designing, monitoring, assessment and coordination services of Konya Plain Project in this context, the Konya Plain Project Regional Development Administration was founded in the year 2011. Konya Plain Project Regional Development Administration, covering also Niğde and Aksaray along with the region's provinces, works in cooperations with development agencies and conducts joint projects and activities towards the aim of providing coordination of public investments in order to develop soil and water resources, projects and activities.

Considering the fact that the region's usable water potential will reach only 4 billion m³ it is obvious that the water resources of the region should be used in the most rational manner as to produce the highest yield, quality and profit. Even with the 400 million m³ water to be obtained with KOP project's full capacity implementation planned for the year 2016.

⁶² <http://cdn.intechopen.com/pdfs-wm/39863.pdf>

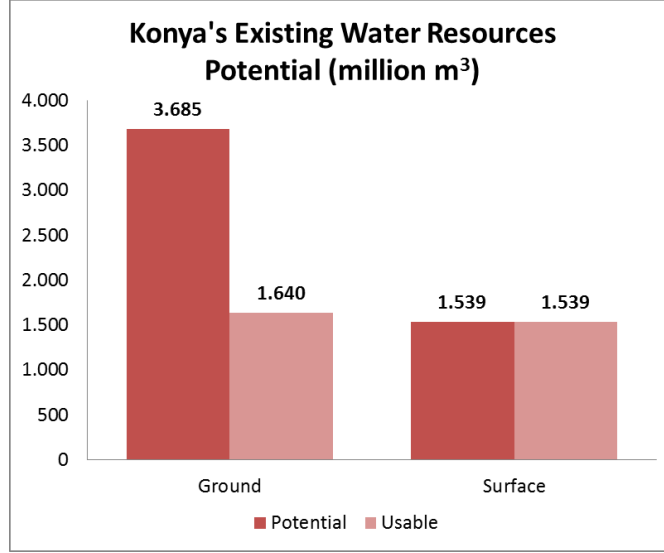


Illustration 64 Konya's Existing Water Resources Potential in Million m³ ⁶³

Energy

Energy sector is a strategic sector for the national and global competitiveness of Konya-Karaman Region. Southern districts of the region stand out in regards to solar energy. Ermenek, Başyayla and Sarıveliler districts, which are among the areas with the best radiation values throughout Turkey, are located in the mountainous areas at the southern part of our region. Thus, there are no wide fields for solar energy investments. Besides these districts, Karapınar of Konya Province and Ayrancı of Karaman province are suitable for encouraging investments regarding their solar energy potentials.

It is estimated that significant economic and social growth may be provided within regional development by investing in the renewable and clean energy technologies that are not utilized sufficiently and by putting weight on domestic production of energy equipment. Also, thanks to the developments in turbine technologies capable of generating energy at different wind velocities, there is now an opportunity to generate electricity through wind power in the southern districts such as Seydişehir, Taşkent, Ermenek, Sarıveliler and Başyayla which possess medium level wind potential. Although the wind power potential in these districts is low compared to Çanakkale Region, wind energy investments still offer an advantage to the region due to the continuity of wind.

⁶³ KOP Region Socioeconomic Indicators Report, 2012

Geothermal resources within Konya-Karaman region exist in the west/southwest parts of Konya Province. The area with the highest geothermal energy potential within Konya-Karaman region is Ilgın district of Konya province. The geothermal energy potential in Ilgın basin is used for thermal tourism, thermal spring facilities and heating of the settlement.

Energy efficiency applications in the region should initially concentrate on industry sector. The regional plan regarding the manufacturing sector where electricity is consumed the most within the region occurs. In the event the scenario foreseen in the regional plan it is estimated that the electricity consumptions in industry sector will increase even further and dominate an even larger portion of the country's energy consumption. In this sense, energy efficiency applications in industrial activities should be emphasized in line with the strategy of reducing energy densities in each industry sub-sector by at least 15% until the year 2020. This is defined in Energy Efficiency Strategy Document for 2010-2023.⁶⁴

Technology, R&D and Innovation Infrastructure

Technology Development Zone (Konya Teknokent)

Konya Technopark provides technology companies rental offices. Founded in late 2004, Konya Technopark is one of the fastest developing techno parks in Turkey with its more than 117 R&D companies, including 27 incubation and 13 preincubation companies with 220 R&D employees. Tenant companies are provided with communication facilities, operational services and consulting on legal. Konya Technopark is one of the full members of IASP- International Association of Science Parks located in Spain and has a Technology Transfer Office named Selcuk TTO.

Selcuk TTO is the sixth most successful technology transfer office in Turkey. Selcuk TTO provides technical, training, patenting, collaboration and entrepreneurship supports. The number of activities conducted by Selcuk TTO in 2013 can be listed as followed: 73 international activities, 42 training activities, 472 academic collaborations, 102 invention disclosure, 51 national patent applications (total 118 patents between 2008 and 2013) and 11 international patent applications.

⁶⁴ PLAN_ENG_SON_FUAT Paper: p. 120

In Selcuk University, researches and projects have been developed in the fields of medicine, engineering, agricultural, veterinary medicine, business and innovation. The Advanced Technology Research and Application Center is one of 31 Research and Application Centers ensuring the coordination of scientific and technological research-development activities.

Coordination Office for Scientific Research Projects supports the researchers for dissertation projects and research projects. The processes of legal foundation of the units in project development and management application research center, distance education application and research center and technology transfer office have been completed.⁶⁵

Trademarks and Patents

There were 730 patents registered in Turkey in 2015. Konya registered 42 patents in 2015 (8th in the country and 2.4% share). Konya registered more patents than 55 provinces combined.

Trademark Registrations

There were 70,111 trademark registrations in Turkey in 2015. Konya registered 1,960 trademarks in 2015 (7th in Turkey and 2.8% share). Konya registered more trademarks than 40 provinces combined.

Industrial Design

In 2015, there were 8,574 industrial designs registered in Turkey. Konya registered 370 in 2015 (6th in Turkey and 4.3% share). They have registered more industrial designs than 59 provinces combined.

Utility Models

There were 2.681 utility model registrations in Turkey in 2015. Konya registered 185 utility models in 2015 (5th in the country and 6.9% share). Konya registered more utility models than 63 provinces combined.⁶⁶

⁶⁵ <https://www.b2match.eu/sc6-int-2015/participants/28>

⁶⁶ <http://www.investinKonya.gov.tr/images/dosya/REGISTRATION%20IN%20KONYA-2015.pdf>

	Konya	Turkey
Patents	42	730
Trademarks	1,960	70,111
Industrial Designs	370	8,574
Utility models	185	2,681

Table 25 Number Registered Patents and Trademarks Related to Turkey – 2015

Supporting Industries

Unlike other provinces, the industry of Konya includes not only one sector but produces simultaneously in various industries. Especially the automotive industry and the spare parts industry has been established apart from the production of agricultural machinery, the processing industry, casting industry, paint and chemical industry, building materials, paper and packaging industry and the food and footwear industry.

Projects

Transportation Projects

Konya is one of the pioneers when it comes to the development of roads and railway network. There are four major investments in the regional transportation in Konya. The new Konya-Antalya project will shorten the Konya-Antalya distance to 250 km and reduces the duration by an hour. The second new line will connect Konya's southern provinces to the Mediterranean coastline. The third project will renovate Konya-Karaman-Mersin line which will shorten the time to reach the largest port in Turkey. The last project will build a new 120 km orbital motorway in Konya. All four projects are planned to be finished by 2018. This projects show that Konya has big advantages over other regions in Turkey in terms of infrastructure, location and transport structure.



Illustration 65 Picture of High Speed Railway

Antalya-Konya-Aksaray-Nevşehir-Kayseri HSR Project

In order to improve freight and passenger transport a 225 km long high speed railway line between Antalya and Kayseri is planned to build. It aims to connect the Mediterranean region with the Middle Anatolian region and to enhance tourism potential. Antalya and Nevşehir are two leading tourism centers in Turkey and road transport is the single alternative to connect these cities. Line 2 which is planned to operate with a speed of 250 km/h speed will reduce the travel time. In Konya Station, it is planned to integrate into the Ankara-Konya HSR. The end of the project is expected in 2023. For the main route Kayseri-Antalya nine intermediate stations are planned. Under this project 360 underpasses, 79 overpasses, 43 bridges and 82 tunnels will be built.

Hata! Burada görünmesini istediğiniz metne Überschrift 1 uygulamak için Giriş sekmesini kullanın.

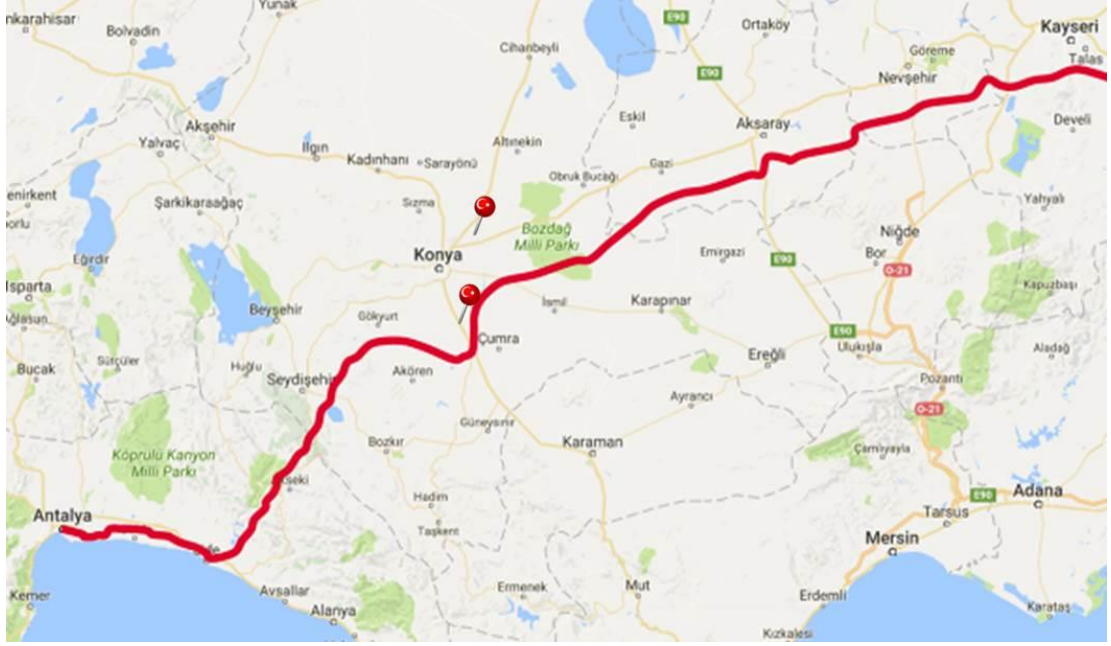


Illustration 66 Route of Antalya-Konya-Aksaray-Nevşehir-Kayseri HSR Project

Konya- Karaman- Ulukışla-Mersin HSR Project

The High Speed Railway lines between Ankara-Konya and Ankara-Eskisehir-Istanbul achieve a speed of 250 km/h. This success shows that other routes should also be switched to high-speed.



Illustration 67 Picture of Freight Train

In this context, the project Konya Karaman- Ulukisla-Mersin is been launched. The distance between Konya-Karaman is 120 km and a speed of 250-300 km/h can also be achieved. The completion is in 2018. After the construction the time of traveling will be reduced from 73 to 40 minutes. The expansion of the range up to Mersin is also planned and will be finished in 2020. Thus the ride time for goods and people from Konya to Mersin will be much shortened.

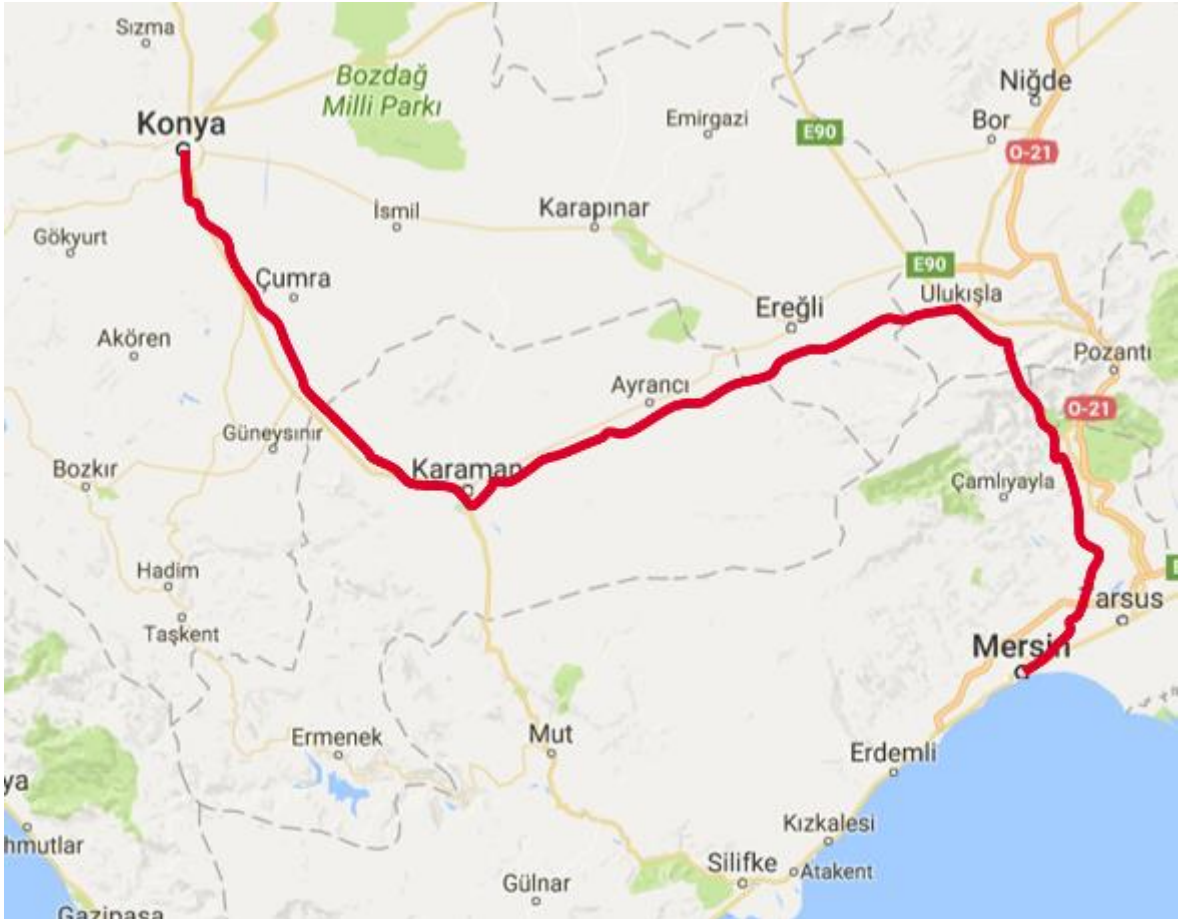


Illustration 68 Route of Konya-Karaman-Ulukışla-Mersin HSR Project

Completed projects

Licensed Warehouses

The "Seljuk Agricultural Products Licensed Warehousing Corporation" (ASLİDAŞ) was founded by the Konya Commodity Exchange. The licensed storage system has a capacity of 100,000 tons and is one of the largest warehouse systems in Turkey. These warehouses are a type of "Grain Banks" and are capable to transport the products directly from the warehouse to the farms.



Illustration 69 Licensed Warehouses

Science Center

Konya Science Center is the first truly large interactive science center in Turkey dedicated to informal learning about science and technology. TÜBİTAK, as client, is responsible for the exhibition support and funding of the project. They expect that this science center will attract 1.7 million visitors per year, which makes it a promising attraction for Konya and Turkey. The exhibition includes topics such as:

- Basic science
- New technologies
- Earth and bio systems
- Space
- Health
- Konya history and culture

The center is open to all ages and the goal is to bring people with different backgrounds together to transfer knowledge through experimental and practical spaces that are designed to trigger curiosity. The centers satisfy all senses of human

being. Konya Science Center has strived not just to give the information, but to increase their attention and the importance of science through interaction.⁶⁷



Illustration 70 Science Center

INNOPARK (Konya Regional Innovation Center)

The Konya Regional Innovation Center is rising at the Organized Industrial Zone in Konya (KOSB- Konya Organize Sanayi Bölgesi). The construction of the 20,000 m² regional innovation center in KOSB is intended to be converted into a “Technology Development Zone” in the long-term.

Officials announced that 80% of the construction of the regional innovation center is completed and they are receiving positive response for the initiative to declare the center as the Technology Development Zone. The regional innovation center was built on an area of 20,000 m², three levels high and with 4,109 m² utilized area. The center will house incubation and business development offices as well as renewable energy units. Moreover, with the addition of non-destructive testing laboratories, the center will meet the needs of the industrialists in this field.⁶⁸

⁶⁷ <http://bruns.nl/en/Konya-science-center-Konya-Turkey>

⁶⁸ <http://en.moment-expo.com/Konyas-industry-attains-its-innovation-and-r-d-centers>



Illustration 71 InnoPark – Konya’s Regional Innovation Center

Konya City Stadium

Capacity:	41,981 people ⁶⁹ 920 (in 55 skyxoes) (VIP seats) 200 (disabled seats)
Clubs	Konyaspor K
Inauguration	13/09/2014
Construction	17/10/2012 - 09/2014
Cost in TRY	146.45 million ⁷⁰

Konya City Stadium is located on the north of the city, 9 km away from the city center on an area of 450,000 m². A sports hall, swimming pool, velodrome and a concourse is also available on the site plan. The transportation is provided by private vehicles and public transport, such as railway and bus. Konya City Stadium is designed with an approach of harmonizing the cultural codes with contemporary structure.

⁶⁹ <http://www.archdaily.com/576598/Konya-city-stadium-bahadir-kul-architects>

⁷⁰ http://stadiumdb.com/stadiums/tur/Konya_buyuksehir_stadyumu



Illustration 72 Konya City Stadium

Fair Center of Konya

Having opened its doors in May 2003, Konya Chamber Of Commerce - Tüyap Konya International Fair Center has since been hosting various fairs at Konya, Turkey's "grain silo". With its advanced quality of service, the center plays an important role in the fair organization sector in a country, blended with Rumi's plea for unity, tolerance and hospitality.

Exhibition area of 86,000 m² with 66,000 m² indoor and 20,000 m² outdoor spaces offers a wide range of services and facilities at international standards.⁷¹ With its multi-purpose meeting rooms and seminar halls, its technical infrastructure equipment, cafeterias and restaurants, it offers an ideal working environment. Visitors and exhibitors can also enjoy transportation, cleaning, courier and secretarial services of the center.

Konya Chamber of Commerce is one of the institutions which Tüyap Konya International Fair Center cooperates with in Konya. This ensures a development of the

⁷¹ <http://tuyap.com.tr/en/Konya/fair-convention-center#technical-information>

city in nearly every aspect. Being the most essential place for city's commerce life the center provides a platform for a wide range of sectors in one building, including industry, trade, agriculture, metal processing, construction, decoration, food and dairy.



Illustration 73 Fair Center of Konya

Ongoing projects

Konya Chamber of Commerce Vocational Training Center

In January 2015, the project Konya Chamber of Commerce Vocational Training Center was started by the Mevlana Development Agency projects and should be completed within 24 months. The education center should ensure the qualifications of the technicians through short-term trainings and courses.

Initially eight vocational training in the industrial sector and six vocational training in the service-sector are offered in the Vocational Training Center. Depending on the needs and requirements of the company's the professional training will be diversified. The offered professions are as followed:

Industry Sector	Service Sector
▪ Welder	▪ Computerized business accounting system
▪ CNC lathe	▪ Sales and marketing
▪ CNC milling operator	▪ Computer graphics design
▪ CNC metalworker	▪ 3D modelling
▪ Worker in sheet metal forming	▪ Executive assistant
▪ Computer Aided Design and CAM (CAD/CAM)	▪ Cashier
▪ Plastic-Injection molding operator	
▪ Industrial Automation Systems (hydraulic and pneumatic, PLC-programming)	

Table 26 Offered Professions in the Vocational Training Center



Illustration 74 Konya Chamber of Commerce Vocational Training Center

Logistic Village

The logistics village construction just beside Konya OIZ with over 100 ha is ongoing. With the completion of this project, annual transport capacity of 634,000 tons is going to increase to 1.7 million tons.

Balo Project

To collect the shipments in Anatolia by railway and to achieve a new route that passes Bandırma-Tekirdağ by train ferry trough Marmara Sea as an alternative to current railway route that reaches to Europe through the Istanbul Strait.



4.2 The Organized Industry Zone of Konya

The industry in Konya developed after 1980s in a variety of sectors. Leading sectors are machine production, automotive spare parts industry, metal casting, food industry, vehicle-mounted equipment production, plastics-packaging, shoemaking, agricultural machinery and tools and milling machine production.

The share of Konya in the Turkish market in terms of metal processing machines industry is 45%. Besides importing from many countries, the region also holds 70% of the Turkish market for vehicle mounted equipment.⁷²

⁷² <http://www.bcct.org.tr/news/Turkeys-Konya-province-the-investment-climate/13284>

A strong chamber organization in Konya with a good networking attitude is supporting the industrialization. Developing and organizing a huge industrial area of about 3,500 ha is a challenge for all related organizations.

An excellent development of this new industrial area with an additional infrastructure e.g. roads with connection to the main traffic network junctions, rail connection into the plant, power and IT supply, industrial waste- and hazardous waste-, and wastewater disposal is a very complex and important item.



Illustration 75 Aerial Image of Konya Organized Industrial Zone

A visit in the industrial area shows a very clean and organized impression with well-kept green areas, roads and official buildings. It offers more than 30 different services related to industrial and organizational demands of the companies within the zone.

The services which are offered in Konya's Organized Industrial Zone are:

Electricity, Gas and Water Services

Companies located in the OIZ getting more efficient services and a more favorable price compared to companies outside the OIZ.

Water supply and Distribution Service

The drinking water treatment plant provides the TSE Standard Class 1 for drinking water.



Today the capacity of the drinking water treatment plant is 7,000 m³/day. But in future the capacity should be increased to 21,000 m³/day.



Illustration 76 Konya OIZ's Checkpoint

Fire Brigade

The fire department in the OIZ is ready for use every week, 7 days and 24 hours a day.



Illustration 77 Photograph of the Konya OIZ's Fire Brigade

Security Services

In the OIZ are three registered checkpoints, with 38 employees which are in use 365 days a year. They provide control and video surveillance.

Environment protection, waste- and wastewater treatment, emergency and medical services, social- and qualification facilities, innovation center, conference rooms and halls, restaurants and hotels are as well available.

General Data

- In 1986, the First Stage foundation works were started for 300 ha area
- The first company started its operations in the First Stage in 1990
- In 1996, the Second Stage foundation works were started for 900 ha area
- In 1998, companies started its operations in the Second Stage zone

- In 2006, with additional 400 ha area, Organized Industry Zone has reached 1,600 ha area
- In 2012, Fifth Stage foundation works were started for 700 ha area

Total area	23,000,000 m ²	
Total number of parcels	630	
Number of allocated parcels	509	
Number of empty parcels	121	
Number of parcels under construction	50	
Number of active enterprises	520	
Fields of active enterprises in OIZ	Fields of Activity	Number of facilities
	Automotive Supply Industry	95
	Machine and Spare Parts production Industry	69
	Plastic Packaging Industry	52
	Casting Industry	40
	Agriculture Equipment Industry	45
	Trailer, Dumpers and hydraulics Industry	36
	Others	183

Table 27 Basic Information About Konya Organized Industrial Zone

As the Project Konya Chamber of Commerce Vocational Training Center in chapter 4.1 shows, the education and training of qualified students and employees is an important issue to the government. Thus the government supports companies in the OIZ which are investing in vocational training centers.

With this project Konya shows how developed and innovative they are. They want to bring their population to the next level in terms of education and employment.

4.3 Automotive Industry in Konya

The industry of Konya has achieved an assertive position in its production capacity and its quality in the field of automotive spare parts industry, which is increasingly gaining market share in the world market over the past decade.

The automotive subsidiary industry started in small businesses with the production of various parts, especially vehicle bodies. It gained pace with the development of TŪMOSAN. Both the fact that TŪMOSAN became active and the improvements in the automotive sector in the country led the present industrial infrastructure to the automotive spare part industry. The spare part industrial production started in small industrial complexes needed to be improved due to the changing supply and demand balance, and led to larger businesses realizing pro-

duction in Organized Industrial Zones and exporting all or a great amount of their productions.

The automotive spare part industry sells both to the national market to present automotive factories and abroad. The most important producer for engine valve, engine piston, cylinder liner, crank, gear and gasket factories are located in Konya. Next to the mentioned products in the sector, the following spare parts and accessories are also produced in Konya: manifold and complete axle parts and production, trailer production, automotive heater and equipment, brakes and parts, hydraulic pump, hydraulic and pneumatic systems, suspension parts, safety parts, automotive glass, seats, molding and forged parts and others. Many of these manufacturers are producing under world standards and have ISO 9000 certification. Spare parts for all present automobile brands in the world are manufactured and exported mainly to EU countries and South America, North and South Africa, Middle East, Turkic Republics and the Far East.⁷³

	Turkey	Konya	
Pistons	Number of Producers	30	18
	Employment	2,022	651
	Production (number)	47,866,828	34,145,000
Valves	Number of Producers	21	16
	Employment	3,532	485
	Production (number)	43,319,842	29,536,482
Axle, Shaft	Number of Producers	58	26
	Employment	6,579	834
	Production (number)	1,126,176	627,547
Piston Rings	Number of Producers	4	2
	Employment	843	15
	Production (number)	18,554,750	
Rod, The Rod	Number of Producers	61	15
	Employment	5,788	733
	Production (number)	39,524,616	20,989,937
Hydraulic Pump	Number of Producers	4	1
	Employment	289	41
	Production (number)	547,488	

Table 28 Leading Products of Automotive Spare Part Industry in Konya

⁷³ <http://www.kso.org.tr/sayfa/en/industry--1>

Sectors	Capacity	Fixed Investment Value (TL)	Employment (persons)
Wheel Balancing Machines and Test Devices	3,650 pcs/year	3,320,000	30
Motor Road Vehicles, etc. Iron/Steel Forged Appurtenances and Parts for Vehicles	5,000 tons/year	4,915,000	25
Prefabricated Structural Components	25,000 pcs/year	2,850,000	25
Thermally Insulated Glass, Tempered Glass	Thermally Insulated Glass 51,000 m2/year Tempered Glass 230,000 m2/year	2,100,000	15
Engines, Parts and Accessories for Motor Road Vehicles	Brake drums 10,000 pcs/year Brake hubs 10,000 pcs/year Brake discs 10,000 pcs/year Flywheels 3,000 pcs/year	28,000,000	40
Loaders, Trailers, Dampers, Body Sheets	2,550 tons/year	580,000	6
Commercial Vehicle Air-Conditioners and Cooling Systems, Machine Cooling Systems	Commercial vehicle air-conditioners 1,000 pcs/year Machine cooling systems 200 pcs/year Refrigerators 500 pcs/year	3,300,000	30
Wheel Rims, Trailer Swivel Jacks, Trailer Lifts	Wheel Rims 5,000 pcs/year Trailer Swivel Jacks 25,000 pcs/year Trailer Lifts 35,000 pcs/year	4,025,000	10
Axle Gear, Engine, Gear Box and Brake Replacement Parts	32 tons/year	820,000	6
Tractor Parts and Accessories.	Tractor drums 240,000 pcs/year Tractor exhausts 60,000 pcs/year Tractor shift covers 3,500 pcs/year Tractor dust boots 77,000 pcs/year Tractor air filters 70,000 pcs/year	4,900,000	110
Vehicle Headlights and Signalization Components	700,000 pcs/year	7,550,000	15

Table 29 Overview of Capacity and Investment Value of Industry Sectors

4.4 Premises for Konya Passenger car Production

Product Strategy and Premises

Strategy and Premises: Product

1. The plant should have a yearly production capacity of 100,000 cars in two shifts based on six working days per week. Max. output in three shifts would be 150,000 cars per year.
2. The SOP (Start of Production) is scheduled in 2019.
3. An average growth in the passenger car segment from 2020 to 2025 is based on the growth of the time period from 2011 to 2015 of round about 5% per year. This means a total production volume of ca. 127,000 u/y in 2025.
4. The market share of D-class segment cars covers an average rate of about 10% with a minor growth.
5. The reference model for all types is the Saab 9-3.
6. In the first step into the passenger car market with four different types (Sedan, Station, SUV, Coupé) based on the Saab platform will be done within the Turkish market.
7. Adjacent markets like Iran, Syria, Egypt, and rest of North Africa will be developed in further steps in about five to ten years.
8. The market entrance will be done first with a combustion engine a later expanding to electric power engines will be taken into account to close as early as possible electric driven cars customer requests.

Recommendation Regarding Product Strategy and Premises

1. The plant could be ready for production in June 2019 if all preconditions regarding the milestones of the proposed schedule draft will be reached.
2. Challenging M&S actions are necessary to increase the sales and production units within the small market share.

Labor Structure

Strategy and Premises: Labor Structure

1. The availability of industrial qualified workers in Konya is a potential for the passenger car business. A good and sufficient training in passenger car production items could be a good access with higher quality and quantity demands in mass production.

2. The employment situation compared with the defined provinces Konya has an unemployment rate of about 4.7%. Regarding a full employment quote of about 5% Konya is on the 1st place (Manisa 5.1%, Aksaray 5.8%, Bursa 6.6%, Kocaeli 10.1%, Istanbul 11.2%, Izmir 15.4%).

3. The Konya labor cost rate of 12.9 TL/h is the 4th in the ranking. All well-developed provinces are higher, apart from Izmir with 11.2 TL/h. This could be an advantage for Konya to acquire investors for an automotive production plant and suppliers for settling to Konya.

4. Employment situation: The good employment situation in Konya could be a competitive factor for the existing companies. The attractiveness of the automotive manufacturers including suppliers combined with training and education to acquire skills for workers and engineers could cause a movement from the established companies to the automotive business and an increase of labor cost in the Konya industrial area.

5. Experienced labor force: The staff in the established industry interested in automotive production will also be a precondition to keep the good reputation of the high quality standard in the Turkish automotive business. The training and education on automotive production for the future staff will be not so extensive due to the basics and experiences of partly recruited employers from other industrial manufacturing companies in Konya.

6. Availability direct workers / blue collar workers.

7. Availability Indirect workers /white collar workers.

8. Skilled/ semi-skilled worker.

9. Availability high qualified professionals (automotive mechanic, electrician, painter, body manufacturer, mechatronics fitter...).

10. Availability high qualified employees (engineers, automotive technicians, mechatronic, body making, welding, IT...)

11. Efficiency and productivity key figures.

12. Unions and work council.

Recommendation Labor Structure and Qualification Status

1. Labor qualification: Data about the availability of worker qualification like semi-skilled and skilled worker capacity is not available.
2. To establish an automotive production it is advisable to make a clear prediction about qualifications of direct workers (blue collar) these are basically: Automotive car mechanics, car electrician, painter, body maker, body welder etc. are proposed to prepare the operation processes, car maturity and training on the job for non-skilled workers.
3. Indirect labor qualifications (white collar) like car- and general engineers, electronic and mechatronic engineers and professionals are essential in the engineering period and launch of the production.

Recommendation Engineering Qualifications and University Structure

1. Four universities and advanced technical colleges are settled in Konya: The Selcuk University with around 80,000 people is the biggest in Konya thereof around 11,000 students are registered in IT, technical and engineering science (74,000 students, 2,700 academics and additional administration staff) Necmettin Erbakan KTO Karatay.
2. In the IT, technical and engineering science sectors are about 16,000 students in the above mentioned universities registered. The section of automotive technology has compared with the other sections only a few of students (376) and graduates (32) in the Necmettin Erbakan University.
3. Basically a four year and two year professional education in technical and engineering subjects and a high school qualification is offered for about 25,000 students.
4. The main subjects indicate the right direction regarding technical subjects, e.g. electric electronics, general engineering, IT, mechatronic, industrial engineering etc.
5. Business and administration, finance and controlling are the 2nd relevant focus for managing and supporting an automotive production plant.
6. The automotive sector on technician- and engineer level also the R&D capacity outside of scientific university level should be supported intensively by external companies to challenge the entire industrial and automotive business in Konya.

Technology, Innovation Capacity and Know How

Strategy and Premises: Technology, Innovation Capacity and Know How

1. Konya Technopark provides to technology companies rental offices. Founded in late 2004, Konya Technopark is one of the fastest developing technoparks in Turkey with its more than 117 R&D companies, includes 27 incubation, 13 preincubation companies with 220 R&D employees. Tenant companies are provided with communication facilities, operational services, consulting on legal. Konya Technopark is one of the full members of IASP- International Association of Science Parks located in Spain and has a Technology Transfer Office named Selcuk TTO.
2. Konya Science Center is the first truly large interactive science center in Turkey dedicated to informal learning about science and technology. TÜ-BITAK, as client, is responsible for the exhibition support and funding of this project.
3. With the three Universities, Selçuk University, Necmettin Erbakan University and KTO Karatay University Konya has a large offer for education to establish an extensive know how in the automotive industry.

Recommendation Technology, innovation capacity and know how

1. Regarding the competence in automotive business it is suggested to provide the study with facts and figures about competencies on this subject to convince the investor and government organizations of the possibilities of Konya industry.
2. It would be helpful for new established automotive companies in Konya to have engineering and development assistance of specialized companies to develop further engineers in car development and production tasks compared to the Bursa or Marmara region.
3. It is a need to promote the project by showing the academic standard of university and professional qualifications in mechanical, electronics and automotive engineering.
4. Vision, trends and strategy in automotive business supported by the chambers (e.g. KSO) should be listed in a project list to show the serious intention and credibility to the automotive industry development partners including the influential political circles in Konya.

Traffic Infrastructure

Strategy and Premises: Traffic Infrastructure

1. Konya is basically situated as an industrial hub with a long distance transport network in the central Anatolia region.
2. That is offering a lot of opportunities regarding car distribution into the northern, western and the eastern region of Turkey in the first step of market development.
3. Two highways D 715 and D 300 should be accessible for supply and distribution purposes.
4. The next possible harbor for exporting cars on sea freight is Mersin. Due to the distance of about 360 km and the road conditions, a shipping time of approximately five to six hours have to take into consideration.
5. A rail connection for distribution purposes and suppliers are mandatory. The railway line to Mersin as port for shipments to Africa and Arabia is useful for export businesses in these countries.
6. Therefor the distribution of cars in the Arabian and the North African Market could be developed from Konya without further ado.
7. Compared with the Marmara region which is well connected to harbors, Mersin is closer to the African and Arabian market entrance ports than Bursa or Istanbul. That could be a positive factor establishing automotive business in Konya. E.g. distance Istanbul – Alexandria 735 NM, Mersin – Alexandria 423 NM.
8. The next commercial airport is Konya airport with more passenger facilities than in air freight.

Technical Infrastructure and Power Supply

Strategy and Premises: Technical Infrastructure and Power Supply

1. The actual size of the organized industrial zones 2, 3, 4 and 5 is about 2,300 ha. The new industrial zone 6 will have 3,500 ha additional surface area.
2. More than 460 companies with about 30,000 jobs in 40 different branches are established.
3. The current drinking water capacity is about 7,000 m³/h and is planned to be increased to 20,000 m³/h.

4. Capacity of natural gas is 75,000 m³/h.

5. Power supply is about 407 MW.

Recommendation Technical Infrastructure and Power Supply

1. It cannot be assessed whether these capacity figures are enough for a first stage of a car plant development or construction. It is mandatory to extent all technical infrastructure capacities in the industrial zone 6.

2. Regarding the request of an automotive greenfield plant it has to be considered as followed:
- Electricity demand 50-70 MW with 100% redundant feed on 110-220 kV or 10-20 kV level
 - Stable electricity net with good current (99% security of supply with a stabile amplitude)
 - Between 300-400 m³/h fresh water/wastewater request it is one of the weakness that water resources are precious resources. To assure enough water the rational consumption with an operational mechanism and distribution plan is recommended
 - Between 60-100 MW natural gas >3.5 bar pressure
 - two complete independent fiber optic broadband feeder and access
 - Rainwater disposal possibility depending on area and buildings about 20 m³ to 40 m² per second
 - Use of waste water treatment facilities otherwise additional cost of 5 – 10 Mio € required
 - Use of geo thermal energy resources which are available in the Konya region
-

4.5 SWOT & EST

Strengths	Weaknesses
<ul style="list-style-type: none">▪ Located in the center of Turkey▪ Vast and for industry available area▪ Geological stable▪ Young population▪ High quantity of potential workforce▪ High level of social security standard▪ Availability of educated workforce due to three big universities of Konya▪ Availability of qualified workforce due to already established automotive industries▪ Vocational training enables company and branch specific education▪ Well developed and innovative province<ul style="list-style-type: none">○ Innovation Center “InnoPark”○ High number of collaboration with universities▪ well-developed diverse industrial branches in Konya▪ Knowledge of automotive industry available▪ The most important producer of engine valve, engine piston, cylinder liner, crank, gear and gasket factories are located in Konya▪ Cheap and easy transportation▪ The strongest logistic infrastructure in Turkey suitable for freight and passenger▪ Ongoing projects to infrastructure<ul style="list-style-type: none">○ High speed railway between Antalya-Kayseri and Konya-Mersin○ Logistic center near OIZ	<ul style="list-style-type: none">▪ Konya is still a hidden champion▪ Current no OEM automotive (passenger cars) manufacturer▪ Low import and export volume▪ No sea side and own harbor

Opportunities	Threats
<ul style="list-style-type: none">▪ The current supplier companies in Konya are basically orientated to tractor and agricultural manufacturing but they have a long tradition in industrial manufacturing▪ Using this potential for good and sufficient training in passenger car production items▪ The highways and the Ankara-Pozantı Motorway are currently under construction and soon completed, accessibility to Şanlıurfa, Diyarbakır, Ankara and Istanbul will greatly be eased▪ The province is one of the developed provinces within the country's production and foreign trade composition promising potential in terms of development dynamics, eligible for support through new-generation investment incentives▪ Renewable energy resources such as wind and solar energy allow resource diversity and supply safety in energy	<ul style="list-style-type: none">▪ Good aftermarket infrastructure in Konya, but rather commercial vehicles than passenger cars

Economic Factors

- Rich natural resources
- Strong industrial infrastructure
- Incentives, supports and exemptions for industrial investments
- One of the most significant energy producing centers in Turkey with the establishment of the Karapınar Specialized Energy Industrial Zone
- Potential areas to establish wind power plants
- Nine Organized Industrial Zones
- The strongest exhibition center of the region

Social Factors

- Young and qualified human capital
- In Konya 60.6% of the population is younger than 35 years old
- The insured employment has been increasing to a higher level in Konya than the national average
- Low crime rate
- Qualified living spaces
- Qualified and widespread sport facilities for different disciplines
- Dense and qualified cultural activities

- Low risk of earthquakes
- Life in unique Seljukian cultural monuments

Technological Factors

- Regional Innovation Center
- 5th province in trademark registration, 8th in industrial design registration and 7th in patent registration
- Region in terms of General Incentive Scheme,
 - SANTEZ supported by the Ministry of Science, Industry and Technology
 - TECHNOENTREPRENEURSHIP supported by the Ministry of Science, Industry and Technology
 - Turkey Technology Development Foundation

5 Analyzing Different Plant Structures

The best practice of plant design and structuring depends first of all on the product structure and on the vertical range of manufacturing.

The following examples of described plants are principally comparable in function and process. Regarding the vertical range of manufacturing, structure and supplier linkage differences are obvious.

The most connected plant with a very intensive supplier system on site is the plant of Smart in Hambach (F). The intention of the system is to bring the volume and assembly cost intensive material like body-frame, cockpit, drive train and rear axle module, outer plastic parts and doors as close as possible and so directly to the assembly line.

Also materials like front axles, interior panels, windows, seats and carpets are delivered via docking stations in the assembly building directly JIT or JIS to the assembly station. The intention of this production system is to reduce material at lineside basically for logistic effort and cost reduction.

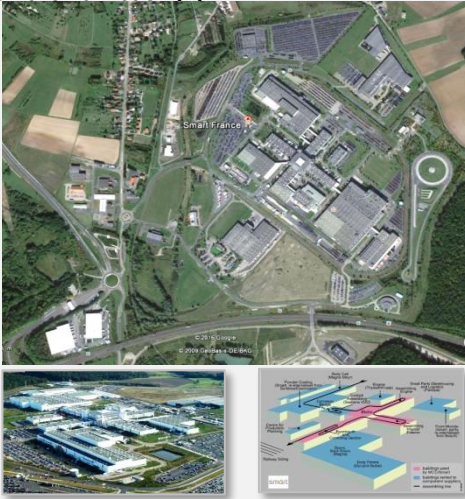



<p>smart Hambach (F)</p> 	<p>Description:</p> <ul style="list-style-type: none">▪ Products:<ul style="list-style-type: none">• Smart fortwo • Smart fortwo electric ▪ Transport connection:<ul style="list-style-type: none">• Directly next to A4 ▪ Employee: 1,600▪ Area in total: 695,000 m² (137,647 m² build up)▪ Output: 187,500 p.a. → 750/Day▪ Vertical range of manufacture: 10%▪ Supplier:<ul style="list-style-type: none">• Magna Chassis (tridion-safetycells)• Magna Doors (doors, tailgate)• Faurecia (bodypanels)• ThyssenKrupp (rear axle drive moduls and front axle)• SAS (Cockpit)
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Illustration 78 Profile of Smart Hambach Plant

The other plants are different caused by the product structure and the logistic system. But some plants use the same concept of establishing suppliers on or close to the site plant, too.

Kesckemet as a Mercedes plant for B-class, a class car derivate CLA and shooting break has also integrated in the assembly building the seat supplier Johnson Controls. Adjacent close to the assembly building Brose, Tenneco and HPBO are suppliers for door systems including electronics, exhaust systems and front end modules.

Comparable with Kesckemet is Rastatt where the A-class and the A-class SUV GLA are produced. Both plants have a linkage to suppliers on the site plant. Both plants have no press shop. The press-parts are mostly delivered from separated press shops in Sindelfingen and Kuppenheim.




<p>Daimler Rastatt (DE)</p> 	<p>Description:</p> <ul style="list-style-type: none">▪ Products:<ul style="list-style-type: none">• A-Class (started in 1997)• B-Class (started in 2005)• GLA▪ Transport connection:<ul style="list-style-type: none">• B36• A 5• Rail connection on site▪ Employee: 6,300▪ Area in total: ca. 140 ha (1,400,000 m²)▪ Output: 290,000/p.a. → 1,160/Day▪ Supplier on site: e.g. Johnson Controls, Brose <div style="text-align: center;"></div>
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Illustration 79 Profile of Daimler Rastatt Plant

Only Toyota in Valenciennes uses its press shop on site for big press parts like body side walls.

Toyota Valenciennes (F)



Description:

- **Products:**
 - Toyota Yaris (3 Generation)
 - Toyota Yaris Verso (until 2005)
 - Daihatsu Charade
 - Engines (started April 2002)
 - D-4D turbodiesel
 - common-rail-technology
 - diesel engine (D-CAT)
- **Employee:** 4,000
- **Area in total:** 233 ha (13 ha build up)
2,330,000m²
(130,000m²)
- **Output:** 270,000/p.a. → 1,100/day





Illustration 80 Profile of Toyota Valenciennes

The usual OEM processes body-, paint- and assembly are principally similar in all plants.



All plants use a railway connection for car shipping.

Plant Ford Otosan Gölcük Fabrikası (TR)
Plant Ford Otosan Yeniköy Fabrikası (TR)



Description:

- **Products:**

 - Plant Yeniköy
 - Ford Courier
 - Plant Gölcük:
 - Custom 130k-150k
 - Transit 140k-160k
- **Transport connection:**
 - Direct harbor connection
 - Direct railway connection
 - Next to D130 motorway
- **Employee:** 10,676
- **Area in total:**
 - New production facility (Yeniköy) at Gölcük plant site opened on May 2014 → 70,000m²
 - Gölcük=1,600,000 m² total area;
 - 340,000 m² covered area
- **Output:**
 - Ford Courier 110,000 p.a.
 - Transit 140,000 – 160,000 p.a.
 - Custom 130,000 – 150,000 p.a.

Illustration 81 Profile of Ford Otosan Plant

6 Choice Plant Location

As described in previous chapters, the perfect location of the plant is among other factors dependent on the accessibility to resources (gas, oil, etc.) and available parcels. In this chapter different sites in the industrial areas near Konya are described and compared. The location in the north-west of area I is perfectly suitable with respect to infrastructure. The location in the south of area I is perfectly in respect expandability and provides enough nearby space for a supplier park.

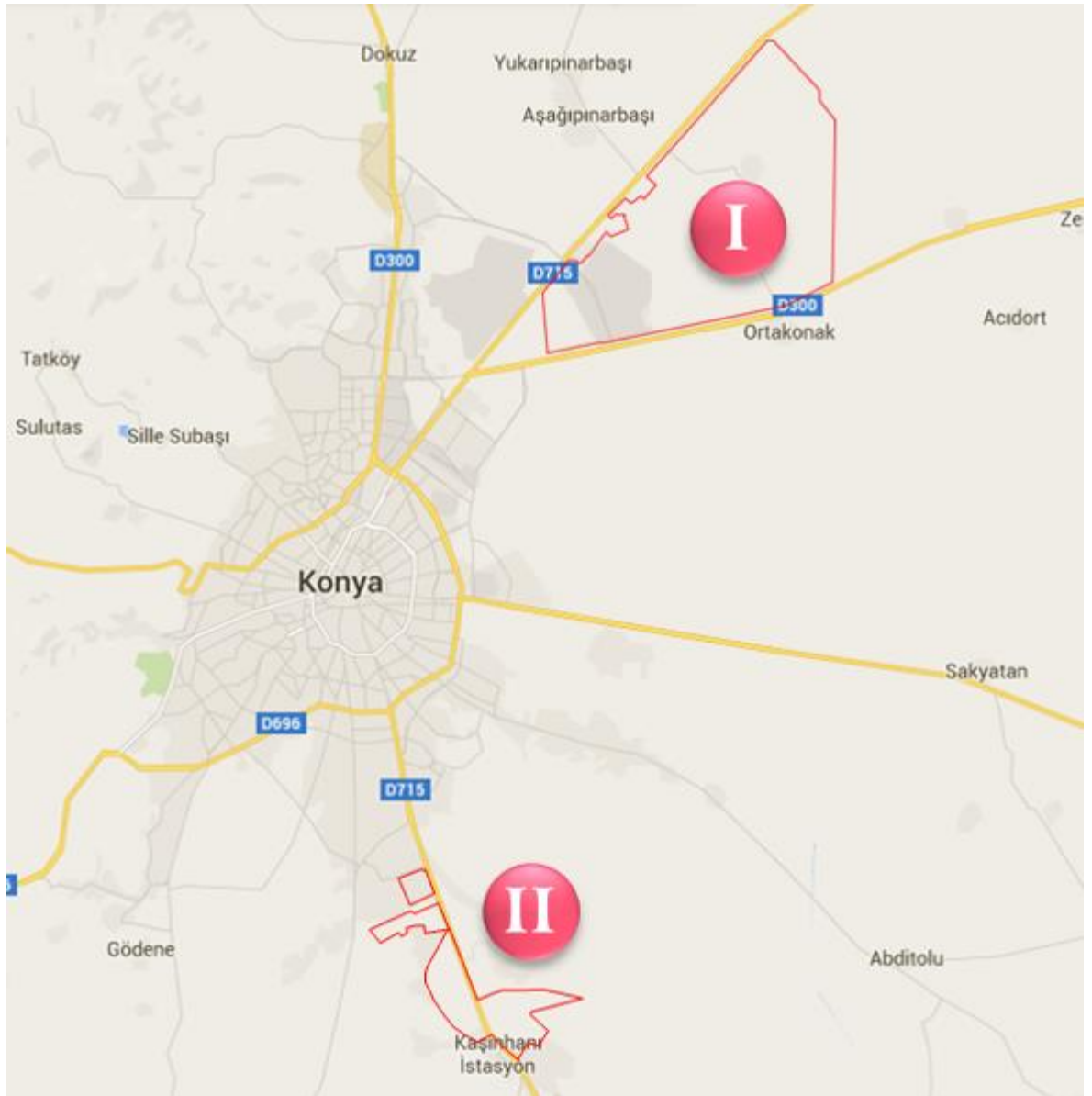


Illustration 82 Location of the Possible Industrial Area

6.1 Industrial Area I - “Konya Organize Sanayi Bölgesi”

The industrial area “Konya Organize Sanayi Bölgesi” is located north east of Konya between the Highways D300 and D715.

The development of the area started in 1976 with 300 ha (3,000,000 m²). Until December 2011 further 2,000 ha of land were developed. The “Konya Organize Sanayi Bölgesi” is divided in four sections which are with approximately 2,300 ha in total one of the largest industrial areas in Turkey.

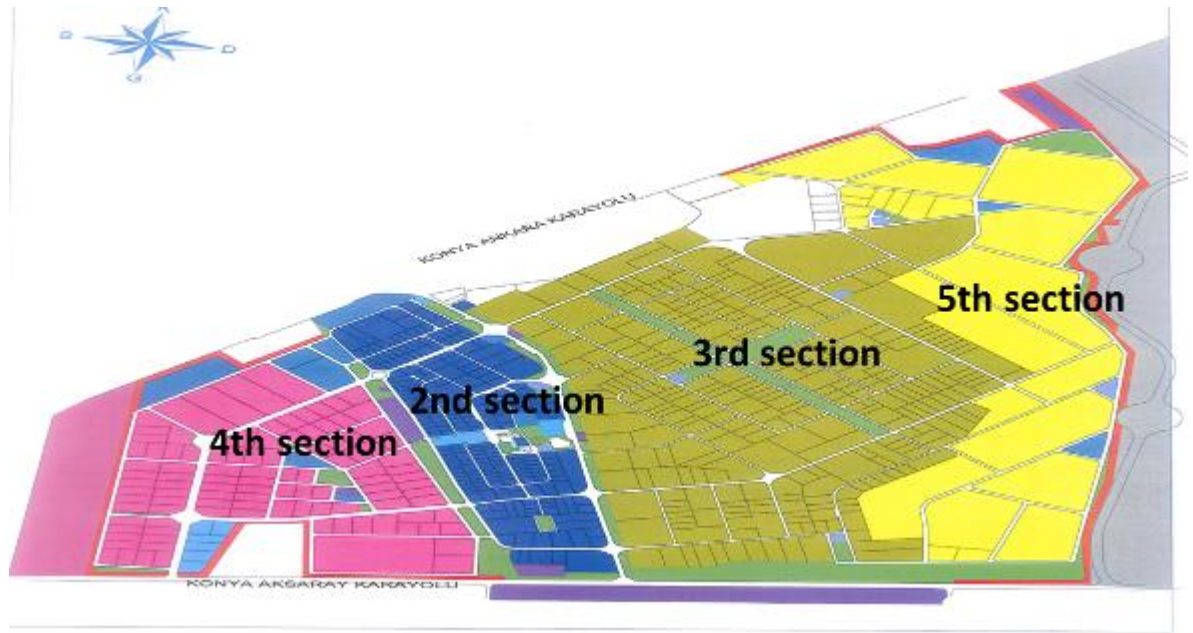


Illustration 83 Overview of the Section in Konya's OIZ

In two steps it is planned to enlarge this area to a total of 9,000 ha (see Table 30)

Section	Area
2 nd section	300 ha
3 rd section	900 ha
4 th section	400 ha
5 th section	700 ha
1 st step	2,750 ha
2 nd step	3,950 ha
Total	9,000 ha



Table 30 Overview of the Size of Konya's OIZ

The red shaded area in the planned development area (see Illustration 84) is available as a possible location for the plant and supplier park. The area in general has good connection to two highways (D300 and D715 - yellow), to the railway (green) and to the airport (orange).

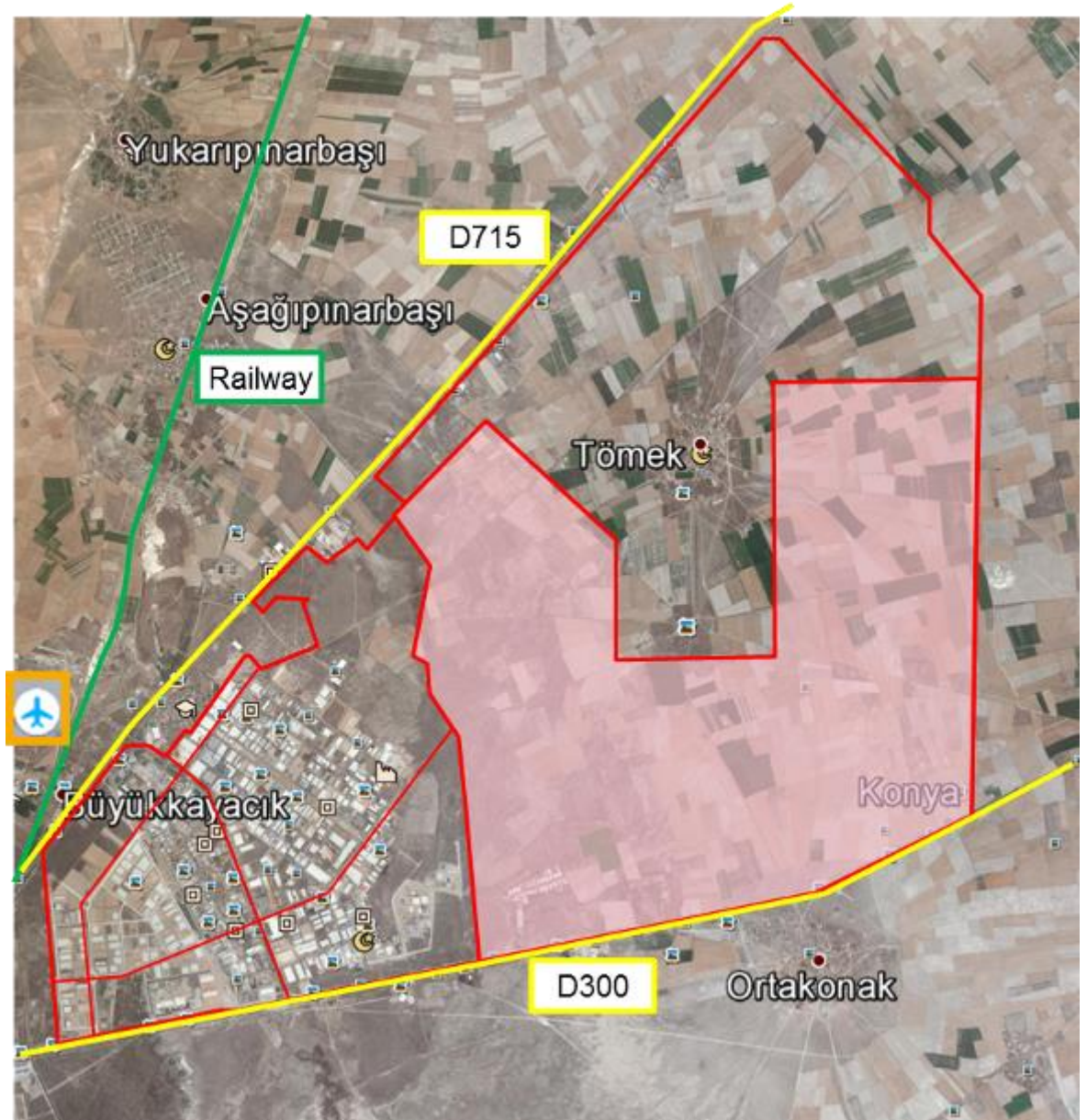


Illustration 84 Possible Area for the Automotive Production Plant

To have good access to the infrastructure, it is recommended to build a four lane connecting road between both highways for a short cut to the national traffic network. Additionally a rail link is necessary to the existing railway network.

6.2 Industrial Area II - “MERAM Organize Sanayi Bölgesi”

The industrial area “MERAM Organize Sanayi Bölgesi” is located approximately 20 km southern of Konya on the highway D715.

The red shaded area in the planned development area (Illustration 85) is available as a possible location for the plant and supplier park. The area in general has good connection to highway D715 (yellow) and to railway (green). The airport is a long way of compared to Konya OIZ.

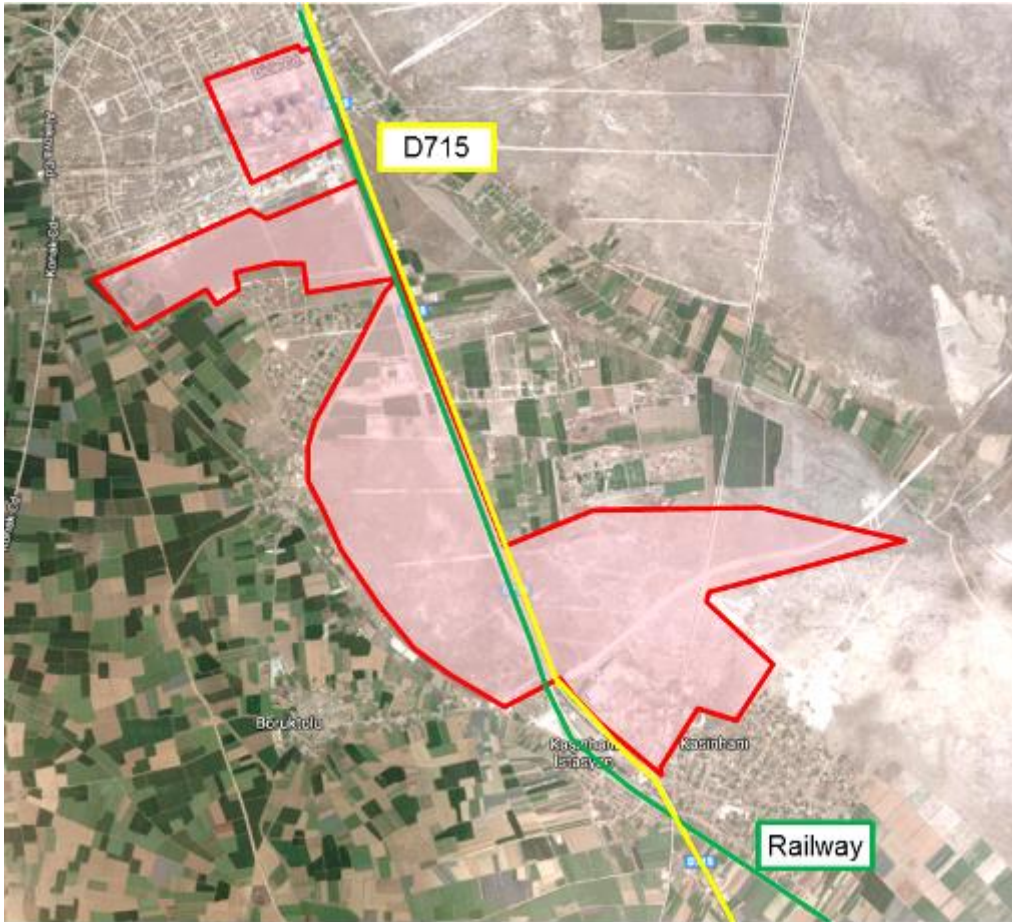


Illustration 85 Possible Area for the Automotive Production Plant

6.3 Possible Site Locations in the Industrial Areas Close to Konya

In the available area, different locations are potentially, with several advantages and disadvantages. The following illustrations give a rough overview. Possible layouts of the plant with an integrated or external supplier park are described in chapter 7.

6.3.1 Location A: North-West (incl. Supplier Park)



Illustration 86 Location A North West incl. Supplier Park

The location in the North-West is closest to the railway, the highway D715 and the airport. The accessibility to the site is therefore very good. Required links to the infrastructure are short. The site is restricted on three sides, which reduces the expandability.

6.3.2 Location B: North-East (incl. Supplier Park)



Illustration 87 Location B North East incl. Supplier Park

The location in the North-East is located between both highways (D 300 and D 715) and in a medium distance to the railway and airport. The accessibility to the site is limited. As far it is not close to a highway a link to all infrastructures is needed. The site is restricted on two sides enabling average expandability.

6.3.3 Location C: South (incl. Supplier Park)

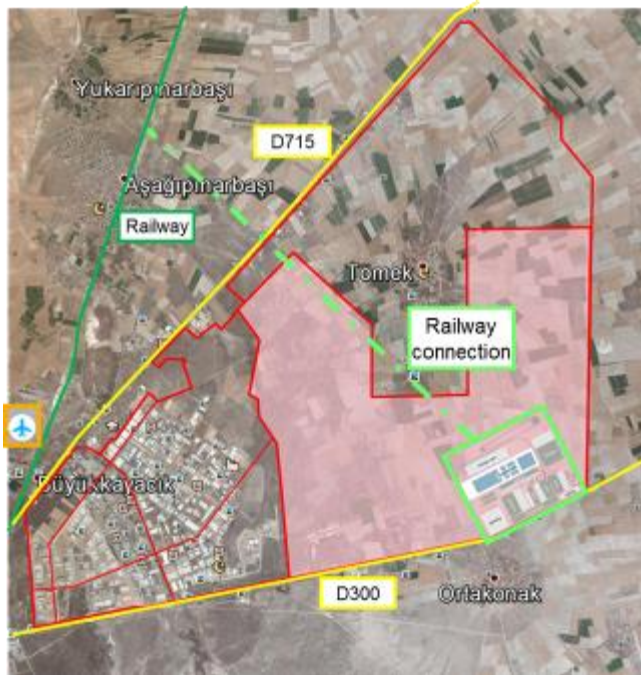


Illustration 88 Location C South incl. Supplier Park

The location in the South is nearest to the highway D300, but furthest away from the highway D715 and the railway. The required link to the railway is the longest, which limits the accessibility to the site. The site is restricted on only one side, enabling the best expandability.

6.3.4 Location D: South (external Supplier Park)



Illustration 89 Location D South external Supplier Park

As the location C provides the best expandability, it is best suited to provide enough space for a close external supplier park. The specifications of infrastructure and accessibility are equal to Location C: South (incl. Supplier Park). An Autonomous character of the supplier park increases the acceptance of suppliers to move and invest in this area.

6.3.5 Location E MERAM: South (external Supplier Park)



Illustration 90 Location D MERAM South external Supplier Park

The location in the MERAM OSB is directly connected to the highway D715 (yellow) and the railway (green). The Highway D300 is not as close as at the other sites. Due to the shape of the OSB and the available area, the site is restricted in regard to expandability.

6.3.6 Comparison of Possible Locations

The location A in the North-West is optimal regarding the infrastructure and accessibility, but is too limited in expandability. The location C in the South is optimum in respect expandability and provides enough closed by space for a supplier park, but requires the longest links to railway and the highway D715.

	Distances				Access-ability	Expand-ability	
	Airport	Rail-way	D715	D300			
A KISIM (incl. supplier park)	+	+	+	-	+	-	
B KISIM (incl. supplier park)	+	-	-	-	-	-	
C KISIM (incl. supplier park)	+	-	-	+	+/-	+	
D KISIM (external supplier park)	+	-	-	+	+/-	+	
E MERAM (external supplier park)	-	+	+	-	+	-	

Table 31 Comparison of Possible Plant Locations

Depending on the supplier park strategy either Location A or C / D is recommended. In the next chapter, possible layouts and requirements for a plant and supplier park are described.

7 Plant Layout

A plant consists of different functional areas and facilities. First, typical facilities and data need to be investigated for a detailed layout and for possible plant layouts. These are listed and followed by two examples one with an integrated supplier park and the other with an external supplier park.

7.1 Typical Facilities and Required Data Evaluation

A typical plant setup contains usually – besides non product related facilities like employee parking, roads and administration – the following facilities:

- Press shop
- Body shop
- Paint shop
- Assembly
- Logistics and maintenance
- Storage
- Resources (paint, gas, etc.)
- Test track
- Finished car parking lot

The most important facilities and sizes of the required areas strongly correlated to the companies' vision (e.g. direct deliveries versus storage capacities) and the vertical integration (make-or-buy).

Therefore the next step is to evaluate a variety of data, for a detailed layout, such as:

- Maximum production capacity
- Product specifications
- Storage strategy
- Production strategy

- Wanted expandability
- Juridical restrictions
- Administrative restrictions
- etc.

7.2 Possible Plant Layout (incl. Supplier Park)

The plant, shown in Illustration 91 visualizes a variant where the typical facilities and key suppliers (e.g. seats) are located on the site of the plant. Also expansion areas are considered. A usual size for such a layout for passenger car plants is approximately 340 ha.

The integration of the key suppliers requires a close partnership with those and enables a high flexibility. The suppliers are usually strongly connected to the plant systems and integrated into internal logistic processes.

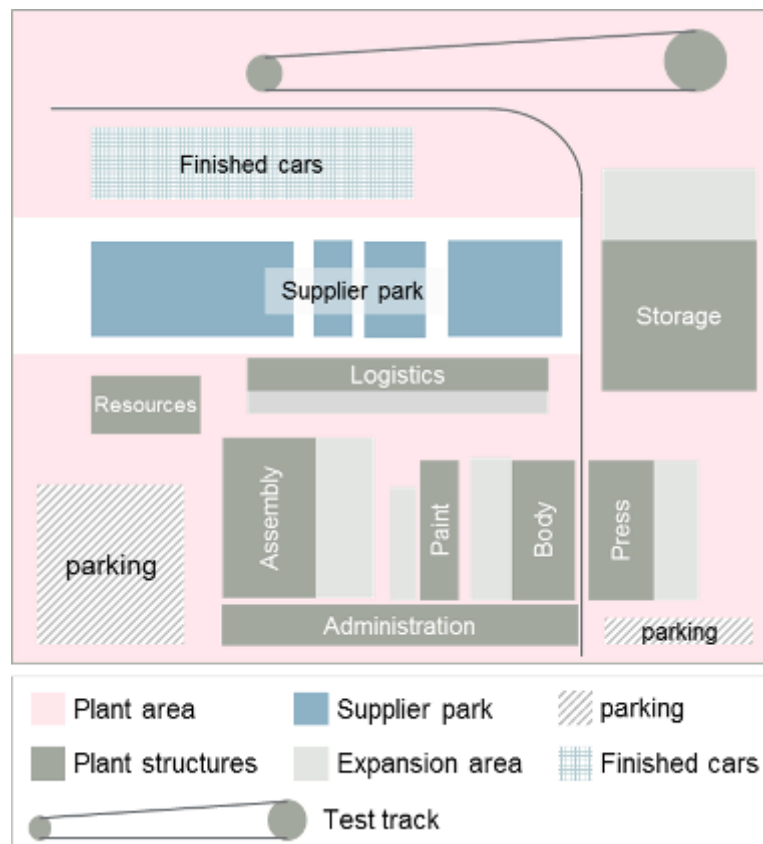


Illustration 91 Possible Plant Layout incl. Supplier Park

Additionally to key suppliers located on the site plant, an external supplier park usually grows close.

7.3 Possible Plant Layout (external Supplier Park)

The plant below shows a variant, where the typical facilities are located on site, but the supplier park is on an external area. A typical size of such a layout for passenger car plants is approximately 300 ha.

Although a close partnership is established to key suppliers, there is a lead time to be considered and the goods from all suppliers need to be stored in the storage facilities.

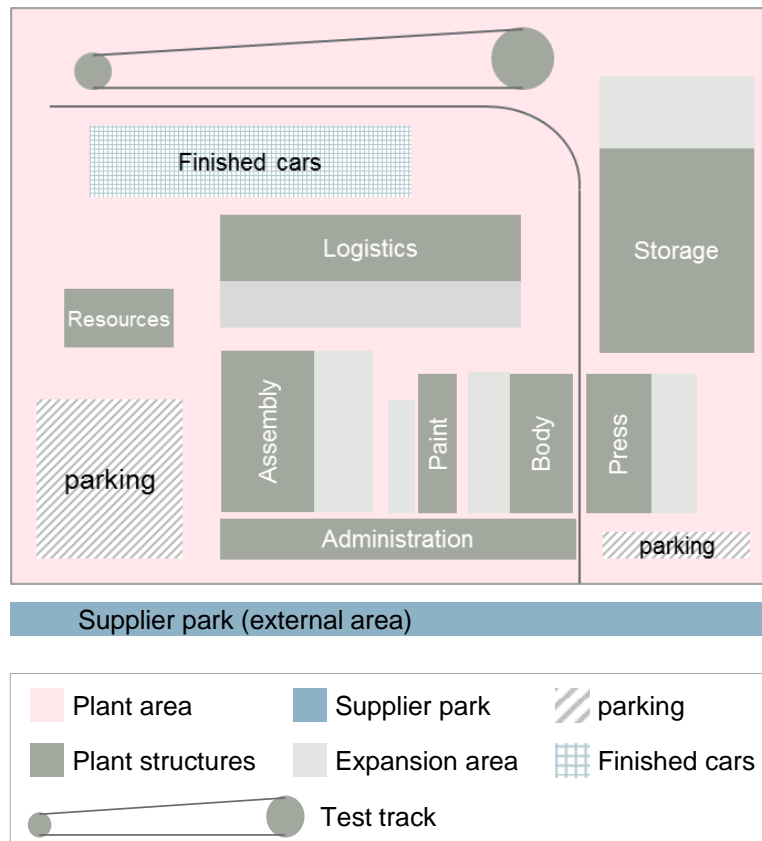


Illustration 92 Possible Plant Layout external Supplier Park

One part of the supplier park can be a cross dock to consolidate and distribute goods from all suppliers (key and non-key), that might also be a long way off. This cross dock can also provide Just-in-Sequence or Just-in-Time delivery and so improve the logistics processes.

7.4 Comparison of Possible Plant Layouts

The rectangular shape of both layout variants support perfect material flow directions.

Administrative facilities, the test track and the finished cars parking lot are not dependent on whether there is an internal or external supplier park. But each setup provides different advantages.

7.4.1 PRO included Supplier Park:

The flexibility of key suppliers on site is higher, because no lead times due to possibly large distances need to be considered.

A layout with an internal supplier park requires usually a smaller storage facility. If the supplier park is external, there might be additional storage capacities required for modules of suppliers, which otherwise would be produced directly on site and store these finished goods.

7.4.2 PRO external Supplier Park

The cross dock in an external supplier park can consolidate and distribute goods from all suppliers. In this case no other requirements need to be considered and the area can be used more flexible.

7.4.3 Recommendation

To develop a more detailed layout, it is crucially important to execute a detailed data analysis.

The decision for or against an integrated supplier park depends mostly on the company's strategy. It is recommended, that suppliers should only be integrated on the own site, if a good and especially a long term partnership is already established.

For building up a new business with all supplier structures and supply chains to be established yet, it is advisable to acquire a parcel large enough for expansion and also consider areas where potential key suppliers can migrate to in the future.

7.5 Site Premises for Konya Passenger Car Factory

Site Area, Shape, Dimensions and Location

Strategy and Premises: Site Area, Shape, Dimensions and Location

1. The new zone 6 will include around 3,500 ha land for industrial purposes and is an exorbitant space for developing an industrial area.
2. The purposed size of the site will be about 250 – 350 ha with an additional extension of about 50 – 100 ha.
3. The development of a new “organized industrial zone” is in progress. Actually the zone 5 is in an ongoing filling process with new plants of diverse companies (Unilever-Food Industry, Alpa- Plastic Packaging Industry).
4. The area is totally flat and it is expected an additional investment to flatten the area for the automotive plant is not necessary.
5. The climate and the rainfall situation based on figures of the report 2012* is out of any risks. The Konya industry zone is situated in an intensive solar energy belt within Turkey the use of alternative (1,700 kWh/m² & year) energy is a great opportunity.
6. The official degree of development of 70% is satisfying. An exception of a higher rate seems possible.
7. In the zone 6 are no restriction of building height known.
8. The position of the site is not in a geological (earthquake) or ecological sensitive area.
9. The position of the site in zone 6 is around 2 – 3 km apart from the airport approach path.
10. The distance to Konya center as congested area is about 22 km.
11. The distance to the next residential areas of Konya is about 7 – 12 km, compared to other locations within an easy reach.
12. Three power lines crossing the industrial zone 6. Depending on the location of the site, relocation might be necessary. Pipelines affected to gas and oil supply are not known but should be investigated due to cost intensity in case of relocation.
13. No passenger car competitor is in the area. Aksaray is the next automotive location for truck manufacturing.

Recommendation Site Area, Shape, Dimensions and Location

1. Due to the availability of area in industrial zone 6 the size of the site should be around 300 – 400 ha with an additional extension of about 100 ha to obtain enough space and expansion possibility from the beginning.
2. The layout of the industrial zone 5 is not an ideal shape because of the used space capacity and the corner and angles of the zone.
3. The traffic link to the two highways should be evaluated regarding the additional truck traffic (1,000 - 1,500 trucks per day) for part suppliers and car distribution.
4. Construction delays because of influences like archaeological findings, seldom animal species are not expected but should be verified for each site positions.
5. A reloading area for a distribution service provider with enough space for buffering cars on site or external have to be considered.

Supplier Structure

Strategy and Premises: Supplier Structure

1. Due to a strong and well developed supplier area for passenger car parts in the Marmara region it is to assume that in the beginning of a car production in Konya the suppliers will be start the supply from their current plant using available capacity.
2. The automotive supplier companies in Konya are basically orientated to tractor and agricultural manufacturing and have a long tradition in industrial manufacturing.
3. Good aftermarket infrastructure in Konya.

Recommendation Supplier Structure

1. Depending from the increase of car production figures in Konya it will become more attractive for suppliers to build up additional capacities within the industrial zone areas or partly on site of the car production plant.
2. The site should have therefore enough extension opportunities to establish supplier close to the automotive production. The development of suppliers in an adjacent area or on site should be appropriately taken into account to strengthen the new automotive business in Konya.
3. Using the potential of qualified tractor manufacturer for good and sufficient training in passenger car production items could be a good access to the

passenger car industry with higher quality demands and quantity in mass production.

Manufacturing premises for plant design

Strategy and Premises: Manufacturing Premises for Plant Design

1. The range of manufacturing is basically foreseen as a full size plant with press shop, body shop, paint shop and assembly shop.
2. The part suppliers are actually situated in the Marmara Region. Therefore it has to be assumed that they will deliver from the actual plants.
3. Due to the less information about the product it is assumed that e.g. the powertrain and axles will be supplied as preassembled units to a final assembly line to complete customer relevant functions.
4. Additional car production will be feasible with a third shift. Utilization of the technical capacity and investment in a two shift production are being assumed.
5. In the first stage about 1,500 – 2,000 workers will be expected depending from manufacturing, degree of automation and supplier strategy.
6. About 3,000 – 4,000 workers will be expected due to doubling or tripling production u/y and increase of car versions and a growth of functions and innovations in the car.
7. In full operation with 100,000 u/y and more the entrance into the plant should be prepared with four to five gates to manage an in- and outgoing truck traffic volume of about 1,000 – 1,500 per day.

Recommendation Regarding Manufacturing Assumptions for Plant Design

1. The flexibility in operation time in Turkey will be one positive fact for an investment in a new automotive plant in Konya.
2. Optimal cycle time in the automotive industry is around 1 min.
100,000 u/y in two shifts results in a cycle time of around 3 min. (300 wdays/y, 48 h/wk, 6 days/wk), one shift results in a cycle time of 1.5 min.
This will be decided based on cost factors by the future car manufacturer.
3. Later on an enhancement of production capacity using additional investment and technology standards is an opportunity.
4. Depending on the car production u/y and a total accounted cost consideration it could be an attractive strategy to establish suppliers on site or in the Konya industrial area.

5. A transshipment or logistic consolidation center operated by a service provider within the plant area or adjacent is recommended.
 6. Provision of a trailer yard area buffering incoming material and enable a direct unload via docking station close to the mounting place e.g. in the assembly line or material consolidation center.
-

7.6 Required Space and Investments

In comparison of modern and innovative automotive plant structures the following space footprints per functional area are required. This is a first estimation and has to be verified during the concept and planning phase:

- Press plant area min. 15,000 m²
- Body shop area min. 20,000 m²
- Paint area min. 15,000 m²
- Subassemblies min. 15,000 m²
- Assembly shop area min. 30,000 m²
- Logistics Area min. 25,000 m²

In this first estimation rough building dimension are projected. Any infrastructure area, trailer yard, administration, supplier park, secondary areas and expansion area are not included. The total required area is about 300 – 400 ha with an additional extension of about 100 ha to obtain enough space and expansion possibility from the beginning. The suggested size of the site will be about 250 – 350ha with an additional extension of about 50 – 100 ha.

The investment for a green field automotive plant is influenced by the maximum capacity in output per shift, the region of realization, the public subsidies and specification of location and finally the complexity of car structure. The proposed output of 20 jobs/h (cycle time 3 minutes) and the regional projection in evaluation of comparable automotive plants built up in the last few years, shows that the minimum investment of approx. 600 Million USD and a maximum investment of approx. 900 Million USD is required. This is a first rough estimation and should be verified and detailed in the next concept phase.

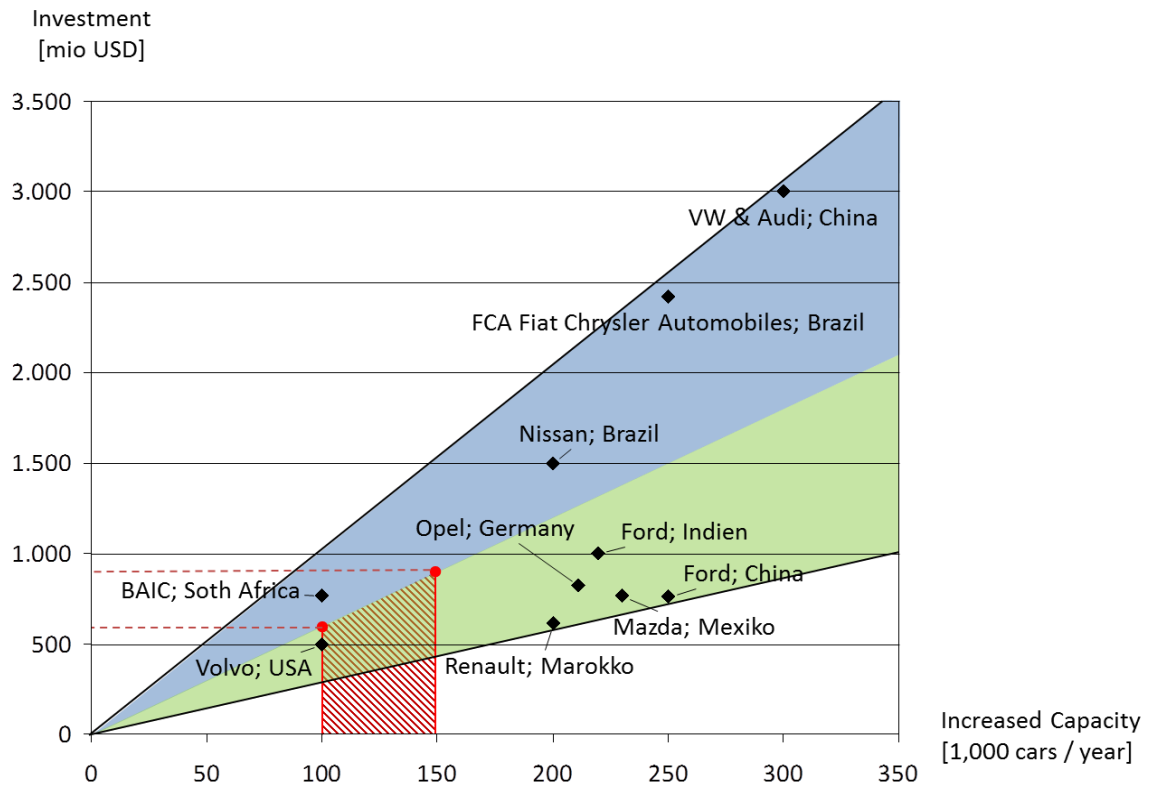


Illustration 93 Comparison Investments to Increased Capacity for Greenfield

7.7 Roadmap for Implementation

Based on the proposed Job 1 in August 2019 and market launch in April 2020 retrograde calculated milestones in the roadmap 42m (42 month) are describing the due dates of major steps. The duration of the steps is based on the comparison of relevant plants and the experience in realization automotive factories. The roadmap shows the planned time period and ideal schedule under consideration of the fulfilment of all prerequisites. In case of any unpredictable specifics the impact has to be evaluated (critical path). In preparation of the project from beginning it's important to implement a transparent and strict action and time tracking but also the cost controlling should be established within the project management.

The major milestones are:

- 10/2016 Decision for setting up automotive factory
- 02/2017 Finalizing detailed site planning
- 04/2017 Authorization e.g. building permit
- 08/2017 Construction- and infrastructure engineering

06/2017	Site-, infrastructure- , power-supply preparation
09/2017	Operation approval by Konya administration
08/2018	Construction infrastructure, buildings & facilities
11/2018	Installation production equipment
02/2019	Approval equipment and start of operation
08/2019	Try Out Series
04/2020	Market launch

In collaboration with relevant engineering and building companies the roadmap should be detailed and a project plan will be created. For each panning and functional area a TIP (Tactical Implementation Plan) with visualized back space should be implemented. Every postponement or shifting of activities must be evaluated on risk impact. Based on project experience also in the selection of contracting party and all involved companies the evolution of e.g. reliability, experience, references, financial situation, company size and company location should take place.

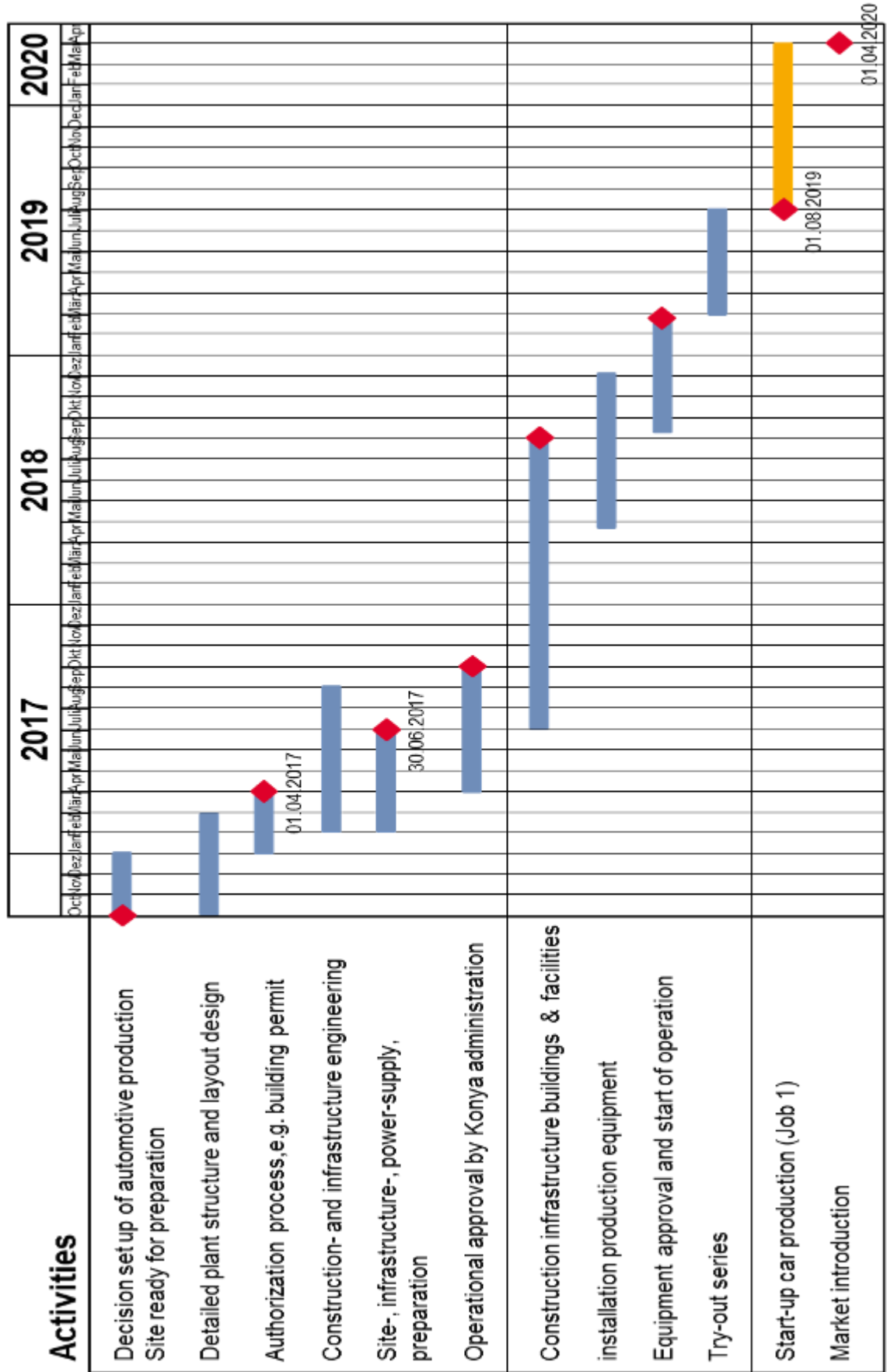


Illustration 94 Roadmap for Implementation

8 Factors to Success

To enable Konya to successfully build up a domestic automotive industry with a high developed automotive plant, different prerequisites need to be defined to ensure the success factors.

8.1 Technical Prerequisites

Before building the manufacturing plant, following strategies need to be developed:

- Fully developed market strategy (road to an electric car)
- Fully developed car (car specifications)
- Supplier strategy (vertical integration <-> supplier park)
- Investment strategy

According to the strategies more detailed concepts must be made:

- Functional areas (body shop, paint shop, assembly, etc.)
- Infrastructure concept (links to railway / road)
- Detailed roadmap for building, authorization processes and equipment installations

In parallel to the above mentioned topics, human resources need to be hired and / or qualified.

8.2 Success Factors

The above mentioned prerequisites lead to specific factors that are important for the success of the project domestic car.

Strategy:

- Very good product maturity regarding the strategic target of an innovative electric drive train system
- Efficient battery technology to replace the combustion engine technology as soon as possible

- Rapid development of an infrastructure network for battery charging
- Intensive support on R&D subjects in passenger car business by universities and engineering companies
- Investment capital to prepare the industrial zone and industrial grants for R&D in automotive technologies in universities and technological colleges

Concept:

- Efficient infrastructure to connect the plant to the public traffic net
- Speed of approval process and plant realization incl. SOP in time
- Completion of the railway track to Mersin as an port of departure for the new market area development in Arabia and North Africa

Human Resources:

- Human resources and qualifications of workers, professionals, technical staff, automotive related engineering and management competencies
- Education and qualification courses financed by government aids

9 Recommendation for Action

Considering different plants and the global and Turkish automotive sector a few critical factors have been analyzed and derived. These factors have to be considered before investing in an automotive company. If all of these factors are implemented on different degrees, Konya could become a leading automotive area in Turkey.

Following different fields of actions for Konya for implementing the important factors to become an automotive location will be provided. Some of them are very general and almost applicable for all industries and others are very specific to the automotive industry.

Basically, Konya is a very good place to invest and to build an automotive production plant. The advantages stated in this study make Konya a unique place.

One important field of action is the quick realization of transport and logistic projects. Konya has to invest and expand their railways and roads. Priority has to be finishing the high speed railway lines between Antalya-Kayseri and Konya-Mersin. That would lead to higher delivery speed and lower logistic costs. Furthermore, it can be a perfect station to other markets like the STAN⁷⁴- or Middle East / Asia countries.

There is also the possibility that the railroads can directly deliver to the production site, which will decrease transportation cost due to handling cost elimination.

By implementing a passenger car production it is getting more and more attractive for automotive suppliers to have a nearby production plant or a warehouse. Therefore, the considered area for the automotive plant should be big enough to be able to settle different suppliers nearby in form of a supplier park and to provide enough space for the automotive plant to expand by increasing numbers of production. Konya provides enough parcels to have opportunities of expanding the actual plant and to provide a nearby area to suppliers for a production site, warehouse or a supplier park. Konya could also increase this advantage by ensur-

⁷⁴ Countries or Counties in Central Asia whose names mainly end with "STAN", like Pakistan, Afghanistan, Turkmenistan, etc.

ing the automotive supplier companies reduced prices for land cost, due to the fact that the city is setting the land costs. The development of suppliers in an adjacent area or on site should be appropriately taken into account to strengthen the new automotive business in Konya.

In Konya are automotive suppliers with their production lines, but they are basically orientated to tractor and commercial vehicles. Konya has to analyze the current supplier structure regarding employees, machinery and capacity utilization. Then evaluate the possibility that some of these suppliers could produce for the automotive manufacturer. If suppliers have the basic knowledge and machinery for producing OEM parts, the suppliers can be developed and trained. Using this potential for good and sufficient trainings in passenger car production items, it could be a good access to the passenger car industry with high quality demands and quantity in mass production. To attract new automotive suppliers to establish a new production plant in Konya, a collaborative logistics center for all local suppliers can be installed. Consolidated logistics services are to reduce effort, handling, logistics costs and complexity for the suppliers.

As stated in chapter 8 Factors to Success, one of the key factors is the human capital, knowledge, qualification and training of the people in Konya. This can be done by different models, like partnerships with university, different incentives or governmental aid for investing into a solid training of engineers or staff.

Close partnerships to universities or external engineering companies are crucial for R&D and investment in technologies by the government will drive innovation in the automotive sector in Turkey.

People with sufficient technology and automotive knowledge are needed for putting the automotive industries into operation. Konya has the advantage of three universities. Therefore, Konya has to communicate this project and offer different cooperation models so that the universities are willing to establish new study courses related to the field of automotive and technology innovations. An especially good cooperation model could be innovation laboratories. The automotive plant provides so called innovation laboratories on its premises. Students and professors can use this premises for working on different ideas and innovations and develop useful technologies which the automotive manufacturer can use afterwards for further developments. That would be a win-win situation for all mem-

bers, the automotive manufacturer would increase the innovation level of its company and use the technology for its own products, the students will get real hands-on experience and the universities would increase their image and prestige due to the cooperation with companies and partners in the real business world. Furthermore, the car manufacturer and suppliers will be able to train the students in their early stage, increase the automotive knowledge and quality of human capital in Konya and additionally set a good foundation for future employment options. Supported vocational training enables company and branch specific education.

To get already qualified human capital from other cities, Konya has to provide different incentives. These incentives can be in form of subsidized housing rents for automotive engineers or a more superior place to live which have been recruited from other cities. Even though the well-being index in Konya is almost the highest, more places for spending quality time have to be established. This can be in form of parks, locations for after work activities and special programs for exploring Konya's surrounding areas. Even coupons for the museums or cultural events can be incentives for qualified workers and their families to show them the variety of activities in Konya. Also a certain infrastructure has to be given, for example bus lines to the next city from the production plant or even pick-up services for the employees.

Other important factors are the technology management and R&D activities in the provinces. Konya has to increase their activities in the field of technology besides the initiatives which have been started or carried out with universities. This can be done by partnerships with external engineer offices or for applying to different projects with TÜBİTAK. Additionally, renewable resources can be used and developed more intensively, due to the characteristics of the Konya provinces. The hours of sunshine are predestinated to invest more in solar technology and offering investors even the opportunity of a green plant. This will increase the prestige and image of Konya as an innovative city and province.

This paper proves that Konya has many advantages and provides good opportunities to invest in. However, the marketing activities which show that Konya is such a developed region may not be sufficient enough. Konya has already well-known companies which settled their production plant here, like Unilever or ALPLA. Analyzing the factors why other sectors than automotive industry settled

in Konya might give insights of motivations which also can be communicated. A clear statement of vision, trends and strategy of Konya supported by the different chambers have to be stated, communicated and implemented to show that Konya is a hidden champion in Turkey. A marketing strategy should be developed and implemented by stating the projects. This includes the projects which have been successfully accomplished projects, are currently under construction and projects which are planned.