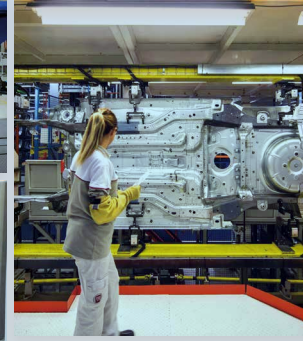


Turkish Automotive Industry Sustainability Report



OTOMOTİV SANAYİİ DERNEĞİ
AUTOMOTIVE MANUFACTURERS ASSOCIATION

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Automotive is the leading sector for Turkey's export. The sector has transformed Turkey into a global R&D and production hub in automotive manufacturing.

With continuously improved performance and increased production capacity of 2 million units, the automotive industry has been Turkey's leading exporter for the last 15 years. In 2020 marked by the pandemic, the industry continued to contribute to Turkey's economy with dedication and further investment. In the ranking of export champions in Turkey, 5 members of OSD were among the top 10 leading companies.

At the same time, working towards the target of sustainable success, the Turkish automotive industry also fulfils its environmental and social responsibilities. By embracing Sustainable Development Goals, the industry continues its progress for the future.

Continuous production during the pandemic

Despite all the unfavorable conditions during the pandemic, the industry managed to overcome the difficulties. Mindful of being the driving force behind the economy, the industry continued its business as usual by taking all necessary precautions. Our “Return to Work Guide” was prepared immediately when the effect of pandemic was in full swing. With such a quick respond, employment was increased.



6%
**Employment
increase in
the pandemic**







Collective action towards against climate change

Production-related greenhouse gas reduction*

Climate change is one of the biggest problems the world faces, and requires concerted action. Acting together, with the Paris Agreement and with different countries' climate policies, the reduction of greenhouse gases becomes important on the way to achieve climate neutrality. With awareness of its responsibility for climate change, the industry has significantly reduced its production-related greenhouse gas emissions.

** Last 10 years*



29%
**Production-
related
greenhouse
gas emissions
reduction***

A better future with the participation of women

While addressing global challenges, the industry also fulfils its social responsibilities. The industry values and supports the increasing inclusion of women in work force. In line with this, we make every effort to increase the number of white and blue collar women in the workplace.



5,312
Employment of
women in main
industry





Life cycle thinking for the future

We conducted the Life Cycle Assessment (LCA), which comprehensively evaluates all environmental aspects of production from the acquisition of raw materials to the disposal of waste.



ABOUT THE REPORT

The Automotive Manufacturers Association (Otomotiv Sanayii Derneği - OSD), established in 1974, has for the last 47 years maintained its mission to develop the automotive industry in Turkey with its 14 member companies and its team of experts in various fields. Having been a member of the International Organization of Motor Vehicle Manufacturers (OICA) since January 1995, the OSD represents Turkish automotive industry at international level. Since March 2006, the Association has represented Turkey in those emerging local and global developments - particularly those related to technical legislation and global trade - that are of utmost importance for Turkish industry's competitiveness, through its Liaison Committee. The Liaison Committee was formed by the participation of associations and companies representing EU countries' automotive industry within the body of the European Automobile Manufacturers' Association (ACEA). For detailed information, please visit OSD's website, www.osd.org.tr

Since its foundation, OSD has focused on the concept of sustainability, and publishes its Sustainability Report, representing all its stakeholders and aligned with the 'core requirements' for Global Reporting Initiative (GRI) standards, as an indicator of the steps taken towards making sustainability more relevant in the industry.

As the first sustainability report from OSD, this report has been prepared based on data pertaining to the year 2020 and preceding years. The report, compiled with contributions from the 14 member companies of OSD, was prepared in line with the GRI standards. In this report, the United Nations' Global Compact (UNGC) was taken into consideration and its Sustainable Development Objectives were included.

This report's contents were defined and prepared through the participation of internal and external stakeholders at national and international levels. OSD plans to continue such reporting in the coming years with even richer content that will respond to the sustainability agenda and the expectations of the automotive industry.

We welcome your opinions, recommendations and contributions regarding the report.

Please contact us via email, at osd@osd.org.tr



YEAR 2020 IN FIGURES

Direct and Indirect Contribution to the Country's Economic, Technological and Social Development

Production Capacity: **2 Million** (Units)

Production: **1.3 Million** (Units)

Full Competence from Design to Production for All Vehicle Categories

Produced Vehicle Categories:
Automobiles, Light Commercial Vehicles,
Trucks, Buses, Tractors

Engineering Exports in addition to Final Product and Primary Component Exports

Global Partners and Operating Structure integrated with Rest of the World

14 Members and 18 Manufacturing Plants

157 R&D Centres
(Main and Supply Chain)



OTOMOTİV SA
AUTOMOTIVE MANUFACTURING



Contribution to Tax Income¹: **7.5%**

Exports: **917 Thousand** Units

15% of Total Country Export
- **USD 26 Billion** Export

Leader for 15 Years within
the Export Rankings by Sector

USD 6.8 Billion Foreign Trade Surplus

USD 675 Million Investment

Direct Employment of **53 Thousand+** for
the Main Industry, **500 Thousand+** for
the Value Chain

TRY 167 Billion Turnover

¹ Excluding VAT and corporate taxes

YEAR 2020 IN FIGURES





USD **106** Million
R&D Export

TRY **~2.4** Billion
R&D Expenditure

R&D Centres*
157

R&D Employees
4 Thousand+

**R&D and
Innovation**

**Environmental
Performance in
Production**

Per unit Light vehicle in the last 10 years.

Production-
Related Energy
Decreased by
28%

Production-
Related Water
Consumption
Decreased by
17%

Production-Related
Wastewater Generation
Decreased by
30%

Overall Waste
Recovery Ratio
97%

Production-Related
Greenhouse Gas
Emissions Decreased by
29%
(Scope 1 + Scope 2)

* Main and Supply Industry

VISION

To make the Turkish Automotive Industry we represent an essential member of the continuously evolving global automotive ecosystem.

MISSION

To create policies towards increasing the local and global competitiveness of the automotive industry in Turkey that we represent, in line with mutual benefits; to inform related institutions in this regard and to participate in the implementation of these policies.

MEMBERS



MESSAGE FROM THE CHAIRMAN OF THE BOARD

The achievements of the members of the Automotive Manufacturers Association (OSD), each one a global player, have played a part in the creation of overall competitiveness of the industry.



Distinguished Stakeholders,

The automotive industry, the export leader of Turkey for the last 15 years, has constantly developed, achieving global transformation, and successfully preserved its leading role by directly and indirectly contributing to the country's economy.

As our automotive industry ranks 14th in the world in terms of automotive manufacturing and 4th when compared to European Union countries, carrying out studies for sustainable development purposes in all processes, strategies and operations has gained importance. The achievements of the members of the Automotive Manufacturers Association (OSD), each one a global player, have played a part in the creation of overall competitiveness of the industry.

As OSD, we have undertaken the duty of contributing to the development of industry, raising the standards higher in every field, throughout journey that we embarked on in 1974. To this end, we find it extremely important for country and our future that we present,

in a holistic approach for industry, the works carried out by members in line with sustainability, with a view to exhibit current success and shed light on our country's future policies. As an association representing the automotive industry manufacturers in Turkey, we have decided to issue for the first time a report demonstrating the sustainability approach of industry, acting with the awareness of responsibility. Within this framework, we are proud of publishing this 2020 Turkish Automotive Industry Sustainability Report, covering activities from 2020 and showing the sustainability steps we have taken to date.

The 14 members of OSD have continued contributing and adding value to the economy with manufacturing, export, R&D and innovation, localization efforts and employment, focusing on a cleaner society and a more liveable future.

Moving in the uncertainty of the ongoing pandemic which broke out in 2020, our industry has managed to perform sustainability activities and maintain its competitive nature. In this period when climate-oriented global political developments have gained momentum, the rapid change in the world's commercial environment, as well as technological transformation and the accompanying environment of uncertainty, have already determined the agenda for the forthcoming years. For instance, alteration and transformation efforts have been initiated in all sectors, pursuant to the European Green Deal. We are simultaneously and closely following this alteration process and endeavouring to shed light on the transformation in our country with the studies we conduct. We have been making preparations on highly important subjects, such as Climate Law, European Union industrial strategy, clean and circular economy, sustainable and intelligent transportation, emissions trading, energy and finance, and carbon tax.

We are aware that in the product life cycle analysis in transition to a carbon-free economy following the Paris Agreement and the European Green Deal, product life cycle analyses and developing strategies according to the results of such analyses will gain importance in the forthcoming period. On this basis, as part of the report we have performed a product life cycle analysis for an average vehicle manufactured in Turkey as part of the report. In addition to the Sustainability Report, we present this Turkish Automotive Industry – Life Cycle Assessment as a more extensive and separate report to stakeholders who are interested in the automotive industry's carbon footprint, from the perspective of product life cycle.

Such developments are crucial for our industry as we continue to work on long-term plans - as required by its very nature. With a sustainable and responsible approach to manufacturing, we will continue working together on sustainability with all stakeholders, in order to establish and put into force country-wide policies.

With only a few examples in the literature of associations representing the automotive industry across the world, we consider this study to be a very important step on behalf of Turkey. We believe that this report will be a multi-dimensional reference, evaluating the automotive industry – which is a multi-stakeholder sector – in all aspects.

I would like to express my sincere thanks to all members and the OSD Team who have played a part in putting into effect both this first Sustainability Report for our industry and the product life cycle study, which we sincerely believe to be a great contribution to the policies of the automotive industry, and we wish this report to be beneficial to the works of all stakeholders.

Haydar Yenigün
Chairman of the Board

MESSAGE FROM THE SECRETARY GENERAL

With regard to the future vision of the automotive industry, there are numerous objectives we need to attain. Accordingly, we will maintain works through good practices, contribution to the national economy and a sense of responsibility towards the world.

Distinguished Stakeholders,

With history that goes back many years, we, the Automotive Manufacturers Association, take pride in encouraging the steps that will always take our industry forward. We are of the opinion that this first Sustainability Report, provided for the use of all stakeholders, is a strong step towards contributing to the future of our country. Despite the challenging market conditions of 2020, the automotive sector has preserved its position as export leader and continued contributing to the national economy, in 15 consecutive years. The successes we achieve make us stronger and cast light on the path to extend our area of influence.

With the 2020 Turkish Automotive Industry Sustainability Report that will allow us to present transparently the sustainability studies related to the automotive industry, we are excited to share with you the truths about the sector, in a more comprehensive and participative approach.

As OSD, we are glad to develop perspectives that will establish an environmental, governance-focused, and social integrity in collaboration with members and create projects that will contribute to industry, focusing on sustainability. We also continue, uninterruptedly, works related to education, cultural activities and social development.

Environmental protection, the fight against climate change, efficient use of resources, waste minimization, implementation of social responsibility projects adding value, promotion of employment and ensuring women's participation in the labour force are among the primary objectives of our association.

With regard to the future vision of the automotive industry, there are numerous objectives we need to attain. Accordingly, we will maintain works through good practices, contribution to national economy and a sense of responsibility towards the world.

We are delighted to offer this report, which we believe will promote the Turkish automotive industry to the world of mobility due to the exemplary performance it has displayed while focusing on sustainability, for the use and benefit of all stakeholders.

Özlem Güçlüer
Secretary General



With regard to the future vision of the automotive industry, there are numerous objectives we need to attain. Accordingly, we will maintain works through good practices, **contribution to national economy and sense of responsibility towards the world.**

CORPORATE GOVERNANCE

The highest administrative body of the Automotive Manufacturers Association is the General Assembly.

Committees and Working Groups conduct studies on fundamental and current aspects related to the automotive industry with the participation of relevant experts, **contributing to the development of the industry and its information infrastructure.**



The highest administrative body of the Automotive Manufacturers Association is the General Assembly. The Board of Directors prepares the regulations pertaining to the activities to be conducted by the Association and submits them for the approval of the General Assembly. Members of the Board of Directors, comprised of 14 full members and 5 substitute members, are elected by the General Assembly through secret ballot for a term of one year.¹

Committees and Working Groups conduct studies on fundamental and current aspects related to the automotive industry with the participation of relevant experts, contributing to the development of the industry and its information infrastructure.

There are 12 Committees in total - the After-Sales Services Committee, the Environmental Committee, the Financial Affairs Committee, the Government Relations Managers Committee, the Human Resources Committee, the Intelligent Transportation Systems Committee, the International Trade Committee, the Logistics Committee, the Occupational Health and Safety Committee, the R&D Committee, the Technical Committee and the Localization Strategy Committee - and four Working Groups, namely the Education Working Group, the Energy Efficiency Working Group, the Industry Digital Transformation Working Group and the Sustainability Working Group.²



¹ For detailed information about Board of Directors, Association Charter and Management, please visit <http://www.osd.org.tr/kurumsal/hakkimizda/>
² For detailed information about Committees and Working Groups, please visit the related link. Committees: <http://www.osd.org.tr/kurumsal/komiteler/komiteler/> Working Groups: <http://www.osd.org.tr/kurumsal/calisma-gruplari/>

ETHICS AND TRANSPARENCY

OSD executes all work processes in line with human rights rules and acts in accordance to ethics rules.



OSD acts **in line with national and international laws and regulations** in its decision making, action and processes.

OSD executes all work processes in line with human rights rules and acts in accordance with ethics rules. Working in compliance with human rights, the right to organize, and combating corruption principles and displaying conduct in line with social values, OSD enables feedback through open channels to combat bribery, corruption, rights infringement, or conflict of interests.

In the light of its standing as an institution formed through years of experience, OSD acts in line with national and international

laws and regulations in its decision making, action and processes. Legal compliance is constantly monitored and reported to the General Assembly and the Board of Directors. Taking into consideration not only legal arrangements but also social norms and ethical rules, OSD takes as fundamental the criteria of accountability and transparency.

In keeping with its high prestige, OSD has faced no corruption or bribery cases, and no circumstance in contradiction with ethical rules or transparency, within the reporting period.



RISK MANAGEMENT, INTERNAL CONTROL AND AUDIT

OSD works carefully to identify and analyze the risks arising from all its activities and to take actions against these risks.

The Association shares **the financial processes and the balances pertaining to such processes with its members and the public in a full and exhaustive manner**, in line with its ethical approach.

In OSD, operational and financial risk management processes are managed by the Audit Board. Through a risk-based approach, the Association focuses on risk management and control processes. The Board supervises the Association and its members with regard to the principles of transparency, accountability, ethical conduct and protection of competitive environment. Decisions are made with respect to all processes and actions are taken in line with national and international laws and regulations. The Audit Board conducts audits in accordance with legislation, and the audit results are reported. The Association shares the financial processes and the balances pertaining to such processes with its members and the public in a full and exhaustive manner, in line with its ethical approach.

No non-compliance was experienced throughout the reporting period of 2020. OSD maintains its pursuit of the matters of determining and analyzing the risks that may emerge in all its activities in present and future processes related to financial, operational, strategic and legal compliance and of taking necessary actions pertaining to such risks. The purpose of such pursuit is to determine the approach to be implemented in relation to defining, evaluating, prioritizing, monitoring, and reporting the risks that may be faced within the body of the Association, and deciding upon and implementing the measures and the administrative steps to be taken in relation to such risks. OSD has a structure that is robust against risks and threats.

OSD's risk management approach aims for the steps indicated below:

- The Association's stance being directly or indirectly compliant to risk management.
- Supporting the reputation management strategies required for preserving the integrity of the Association.
- Creating structures resistant to all risks, for the purpose of ensuring sustainability.
- Defining alternative approaches aimed at ensuring continuity of activities.
- Presenting a proactive risk management model and opening up areas of impact that will create opportunities even in a worst-case scenario.



RISKS FACED BY THE AUTOMOTIVE INDUSTRY

OSD evaluates the risks that the automotive industry may face and presents them to the relevant units of the State in order to take precautions.

With regard to the future risks the Turkish automotive industry may face, having study reports prepared on many aspects and preparing such reports in-house, OSD submits reports to relevant Departments of the State to promote the necessary measures to be taken. This section describes the most recent reports on outstanding topics and major risks.

Risks Pertaining to Trade

The Impacts of Brexit on Turkish Automotive Industry and Exports

The decision made by the United Kingdom, one of the foremost trade partners of the Turkish automotive industry, to exit the EU is a major risk factor that will directly affect the automotive industry in Turkey, and it has been deemed necessary that the potential impacts of different scenarios regarding this exit on the automotive sector be calculated, and that the necessary measures be taken by the State in a timely manner. To this end, PwC was commissioned to prepare the report “Brexit: The Impacts on Turkish Automotive Industry and Exports”. In this report, the impacts of the scenarios following Brexit were projected via an econometric model, and the impact of Brexit on the Turkish automotive industry was assessed through 13 different scenarios, taking into account all uncertainties. Within the scope of these scenarios, the circumstances regarding agreement between the EU and the United Kingdom, and the reactions by Turkey in each scenario, along with the delays pertaining to

reaction times, were analyzed. Policy recommendations were submitted for mitigating the negative impacts of Brexit.¹

The Impacts of Free Trade Agreements on Automotive Industry Exports

A Free Trade Agreement (FTA) is one of the most effective instruments that countries can implement towards having greater trade advantage between them, as such agreements remove tariffs and non-tariff obstacles between countries and lead to facilitation and increase of trade. The report “Analysis of the Impacts of Free Trade Agreements on Automotive Industry” was commissioned to analyze the potential impacts on the Turkish economy and automotive industry of those FTAs already negotiated or in the pipeline that will facilitate penetration into significant markets for the Turkish Automotive Industry, and to communicate the conclusions to the State for use in negotiations. This report summarized the evaluations made in regard to increasing the comparative competitiveness of automotive sector companies in Turkey and having Turkey regarded as the foremost automotive production centre in the world by future automotive industry companies, and the protective measures recommended to be taken in this respect. In this context, the impacts of the 11 FTAs signed by Turkey that are in effect, and the Customs Union that Turkey agreed with the EU on the Turkish automotive industry, were analysed.²

The reports “Brexit: The Impacts on Turkish Automotive Industry and Exports” and “Analysis of the Impacts of Free Trade Agreements on Automotive Industry” were commissioned.

¹ *Brexit: The Impacts on Turkish Automotive Industry and Exports, PwC, 2018*

² *Examination of the Impacts of Free Trade Agreements on Automotive Industry Exports, PwC, 2017*

RISKS FACED BY THE AUTOMOTIVE INDUSTRY

Policies related to data and digital transformation is critical and are very important for competitiveness of countries.

Important investments and engineering studies are carried out **for data storage and processing in order to contribute to the development of R&D activities of the automotive industry.**

Data Management and International Data Transfer

According to the European Commission, 30-40% of the automotive value chain will be occupied by digital services over digital platforms and the services related to 'connected vehicles' will become an important part of this development in the long term. The policies regarding data that are becoming daily more significant within this transformation are seen as a critical aspect in respect to countries' competitiveness. Significant investments and engineering studies are made for storing data and processing it, to contribute to the development of the R&D activities conducted by the automotive industry. Global OEMs make central IT investments for the storage and interpretation of data, and thus obtain advantage in global competitiveness by preventing redundant investment and reducing their costs per unit vehicle.

Effective management is ensured for R&D activities through global brands storing and managing their data at a single point. In respect to renewed project investments or for attracting brand new investments, data management policies are beginning to be regarded as a significant factor for investment decisions.

In the world of Information Technologies that have become more and more complex over time and for which new technologies are developed constantly, Cloud Platforms provide the most logical solutions for data storage and handling, due to their flexibility and the almost unlimited capacities they present. Cloud Platforms are capable of providing the newest technological solutions with lower costs and higher security conditions for companies. Thus, their use at global scale is constantly on the rise, and in a sense they have become indispensable.

The companies that use Cloud Platforms obtain competitive advantage. Member companies that are capable of maintaining their operations with lower costs become capable of leading more investments into Turkey.

It is observed that the existing Personal Data Protection Law Regulations (GDPR) have a structure that inconveniences clients in regard to keeping their personal data on Cloud Platforms. Turkish companies are therefore faced with the burden of commissioning local solutions that are much more expensive than Cloud Platforms, which is seen to create disadvantages for efficiency and competition.

When the issue is examined in detail in consultation with experts in the sector, it is concluded that such regulations - which would in practice prevent or inconvenience the storage of personal data in secure countries or Cloud Platforms - harm the country's economy, its competitiveness, its industrial development and the diversity of the products and services that could be offered to Turkish customers. Developing legislation and standards that will not only centre on national benefit but also enable the most efficient and secure structure for the sector and for Turkish consumers is of critical significance for the industry.

Technological Risks

Disruptive technologies alter not only the forms of automotive production but also the habits and expectations of the users.

Turkey must make a leap and catch the wave of technological transformation to protect the competitiveness of the OEMs that have made investments in this regard. The Turkish automotive industry must adapt rapidly to the technological requirements in order to protect and/or increase its competitiveness under changing conditions. Structural changes in the core export markets necessitate that the legal, technological and infrastructural background in which the Turkish automotive industry functions also keeps pace with such changes. The supply and demand dynamics regarding the automotive industry are undergoing a series of structural changes that are constantly expanding at a global scale. A series of global trends such as green growth policies, disruptive technological developments, changes in purchasing power, rapid urbanization in developing

markets and change in consumer behaviour create new attracting and repulsing factors that will change the dynamics of the automotive industry. The following topics may be distinguished:

- Increase of connected vehicles,
- Autonomous drive,
- Shared mobility and linked services,
- Electric and alternative fuel cars.

In this regard, the project "Turkish Automotive Industry's Sustainability in Export and Production Competitiveness in the Light of Emerging Disruptive Automotive Technologies" was commissioned for the purpose of analyzing where and how such transformation will be felt in order to further increase the competitiveness of the Turkish automotive sector.¹

Supply Management Risks

Due to both the pandemic and the global changes caused by climate change, constraints have arisen in the manufacture of important materials and components used in automotive production - such as steel, plastic, rubber, and semiconductors - leading to incremental increases of prices and supply constraints. With logistics thus interrupted, rapidly increasing container and freight prices have significantly negatively affected those automotive manufacturers that import their raw materials and components. Thus, manufacturers have frequently had to change their entire supply chain plans and sales projections.

Considering the worldwide trade in automotive parts, it is observed that Europe, Asia and America dominate, with Asian countries proving to be major players in automotive parts supply. Asian countries command a 29% share of global parts exports and 19% of global parts imports.

A number of global trends, such as green growth policies, disruptive technological developments, changes in purchasing power, rapid urbanization in emerging markets and changes in consumer behaviour, **create attractive and repulsive factors that will change the dynamics of the automotive industry.**

¹ Turkish Automotive Industry's Sustainability in Export and Production Competitiveness in the Light of Emerging Disruptive Automotive Technologies - Project, PwC, 2018

RISKS FACED BY THE AUTOMOTIVE INDUSTRY

Mega trends such as the Internet of Things, robotics, automation and “super grids” mean that automotive and logistics will become even more integrated in the future.

Logistics accounts for 10% of the overall costs of a finished vehicle, and thus the cost- and time-efficiencies of logistics bear direct and determinative results for competition within the automotive sector.

Although the automotive industry provides a positive contribution to the foreign trade balance of Turkey, it is observed that Turkish parts and components exports do not compare well with imports when the automotive industry is evaluated together with its supply chain. It is also observed that China, which is a major competitor of ours in parts exports to the EU and fast becoming a significant actor in the global automotive sector, is ranked higher than Turkey in respect to competitiveness criteria and logistics performance.

A study was conducted by OSD for the purpose of evaluating the impacts of the global trade environment, which had incurred major changes since the COVID-19 pandemic that has prevailed since the beginning of the year 2020, on the automotive ecosystem that has already been in a significant process of change. This study evaluated that Turkey's geographical proximity to the EU will be an important opportunity for developing trade in the context of the supply chain that has undergone changes with the emergence of COVID-19. In order to benefit from such opportunity, it is important that the supply industry ensures its development within the changing automotive ecosystem, that Turkey's competitiveness is strengthened and that the logistics infrastructure is developed.

Logistics Risks

Logistics accounts for 10% of the overall costs of a finished vehicle, and thus the cost- and time-efficiencies of logistics bear direct and determinative results for competition within the automotive sector.

Mega trends such as the Internet of Things, robotics, automation and “super grids” mean that automotive and logistics will become even more integrated in the future. In essence, four mega trends (Connected transportation, Autonomous transportation, On-demand logistics and Electric freight shipping) will lead to deep changes in both the automotive and logistics sectors. These changes will create winners who are prepared and can adapt, and losers who cannot adapt. As regards the efficiency of the supply chain, it is expected that the automotive industry will realize production through one or few factories - including for electric vehicles. Such centralization will simplify the supply flow while increasing the shipping times and the cost of shipping flow.

¹ The Impacts of COVID-19 on the Global Automotive Supply Chain, OSD, 2020



The option of realizing production at centralized mega-factories instead of a production capacity distributed across various geographies has become the path taken for the manufacturing of the lithium-ion batteries that electric vehicles use. These mega-investments have also altered the geographical axis and weight of the supply chain, creating a strong production capacity within the Asia Pacific region for lithium-ion batteries. The logistics of the lithium-ion battery manufacture and packaging process is more complex than for conventional automotive logistics, and the supply chain for electric vehicles will have to adapt to this new supply chain arrangement.

It is observed that Turkey's Logistics Performance Index score and ranking has declined in recent years. As the automotive industry in Turkey is expected to grow, it is projected that automotive logistics risk will increase in line with this growth, and that will damage exports potential. The dominance of road transport and the inadequacy of the railway connection between seaports and factories obstruct Turkey's potential to change between modes of transport and lead to high shipping costs generally.¹

The study "Logistics Trends in the Future of Automotive Industry" was commissioned from PwC to determine the obstacles that will threaten the transformation momentum and competitiveness of the Turkish automotive industry, and to present tangible policy recommendations towards developing the preparation and adaptation capabilities of logistics in Turkey.

This study presented aspects of the provision of the logistics network that are adapted to the future of the automotive supply chain, analyzed in detail how Turkey could better be positioned to create a logistics network for the rapidly changing automotive value chain and provide development for the country's existing logistics capacity to support economies of scale, and gave policy recommendations.

The study aimed to contribute to automotive industry's realization of a sustainable increase in exports and to support the public authority's consideration of the needs of the industry within the logistics policies it will develop in the future.

"Logistics Trends in the Future of Automotive Industry" was commissioned from PwC to determine the obstacles that will threaten the transformation momentum and competitiveness of the Turkish automotive industry, and to present tangible policy recommendations towards developing the preparation and adaptation capabilities of logistics in Turkey.

¹ Logistics Trends in the Future of Automotive Industry, PwC, 2018

RISKS FACED BY THE AUTOMOTIVE INDUSTRY

The additional employment required for the automotive industry will play a key role in its development and in increasing its competitiveness.

Due to reasons such as the developments in automotive technologies, digital transformation, increasing quality and efficiency demands, customer expectations rising in domestic and foreign markets and challenging competition conditions, **the automotive industry needs employees who are competent, qualified, willing to work in production and permanently employed.**

Pertaining Risks to Maintain Qualified Labour Force

Turkey's Eleventh Development Plan (2019-2023) prescribed increasing domestic production and accelerating industrialization, particularly in sectors defined as priority within automotive manufacturing industry; the Plan includes Automotive within the priority sectors.

Due to reasons such as the developments in automotive technologies, digital transformation, increasing quality and efficiency demands, customer expectations rising in domestic and foreign markets and challenging competition conditions, the automotive industry needs employees who are competent, qualified, willing to work in production and permanently employed. However, there are challenges faced in balancing the increasing demand for qualified labour demand that rises in line with the growth in automotive industry with employees who have the required qualifications.

Within the context of the positive developments expected in the automotive sector, a key driver for development and increased competitiveness in the near future will be additional employment. Innovation and sustainable quality are priority aspects, the importance of which will increase further in this period. In this respect, it is of critical importance to have employees who are open to innovation, capable of presenting creative and genuine ideas, interested in automotive and continuously developing themselves.

Currently, challenge to the provision and development of a qualified labour force for the industry are; skill set requirements for the labour force in the industry; technical lack of foreign languages, inadequate interaction between high schools/universities and industry, limited availability of training programs and activities to increase interest in automotive industry, and low awareness in such areas as occupational safety, quality and efficiency. On the other hand, the 'brain drain' of qualified and internationally experienced employees to foreign countries or to other sectors has emerged as a significant risk currently experienced. It is expected that development of high-level approaches and policies by public authorities is crucial for protecting employment in the industry, which is a driving force of Turkey's economy.

The provision and development of qualified labour is a subject that needs to be handled on many levels; an education system supported by lifelong learning policies and possessing a curriculum suited to contemporary demands (data sciences, cyber security / information security, artificial intelligence etc.) should be taken as fundamental, and coordination of such a system with both public institutions and organizations and the private sector should be ensured.



In the process of restarting the production that was interrupted due to the coronavirus pandemic, the “OSD Return to Work Guide” was prepared by the Human Resources Committee in line with the specific conditions of the automotive main industry and its processes, and submitted to relevant Ministries and stakeholders.

The guide presented recommendations for the hygiene and safety measures required to be taken in combating coronavirus and the rules required to be followed by all employees working at locations linked to the companies, by the subcontractor companies and by visitors.

COVID-19 Pandemic

The OSD Coronavirus Support Committee was established to determine how automotive industry may support Turkey during the COVID-19 pandemic that the whole world is combating, and to provide whatever coordination is needed. The Committee convened with the OSD Secretary General in the role of chairperson and evaluated the actions the automotive industry is taking in the context of Turkey's fight against the pandemic. The demands for health products received by member companies were coordinated, and the actions taken by the automotive industry to cover such demands collectively in a coordinated manner were analyzed.

During the pandemic period when most companies ceased production, all relevant public institutions and organizations were contacted, and necessary applications were made regarding various subjects for the purpose of mitigating COVID-19 mobility restrictions and the pressure created on economic growth.

87 Thousand
protective visors

30 Thousand
protective masks

2 Thousand+
intubation cabins

10 Thousand+
protective suits

450
biological test cabins

SUSTAINABILITY MANAGEMENT

The United Nations Sustainable Development Goals include 17 universal goals which provide a roadmap to be completed by the year 2030.

17

The 17 universal goals, which provide a roadmap to be completed by the year 2030 with the objectives of eliminating poverty, protecting the planet, and combating inequality and injustice, are integrated into the administration models of the business world as much as into those of countries.

Sustainable Development Goals (SDGs) were enacted by United Nations member countries at the United Nations General Assembly on September 2015 and entered into force as of 1 January 2016. The 17 universal goals, which provide a roadmap to be completed by the year 2030 with the objectives of eliminating poverty, protecting the planet, and combating inequality and injustice, are integrated into the administration models of the business world as much as into those of countries.

According to The Sustainable Development Report 2021 by Sustainable Development Solutions Network (SDSN), Turkey is ranked 70th among 165 countries, with an

index score of 70.4 in its progression to 2030 Sustainable Development Goals. The report concludes that Turkey has to take rapid steps towards the realization of the 17 goals, even though there is certain progress towards ending poverty and hunger and promoting healthy individuals, quality education, clean water and sanitation, sustainable cities, responsible consumption and production, and partnership for the goals. It is highlighted in the report that Turkey has to accelerate its efforts towards gender equality, decent work and economic growth, industry, innovation and infrastructure, reduced inequalities, climate action, life below water, life on land, and peace and justice in order to achieve the 2030 goals.



¹ <http://unsdsn.boun.edu.tr/sdr2021/>

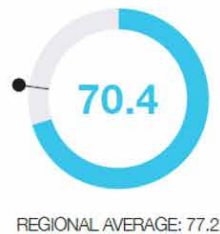
TURKEY

OVERALL PERFORMANCE

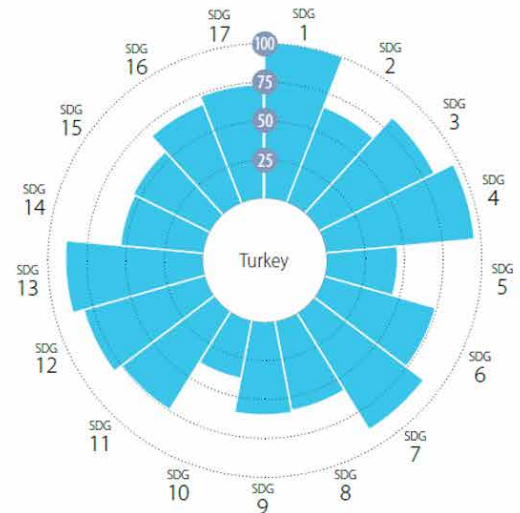
COUNTRY RANKING

Turkey
70 / 165

COUNTRY SCORE



AVERAGE PERFORMANCE BY SDG



En route to the year 2030, not only each country but also the business world has responsibilities regarding the 17 **SDGs**, and thus impacts and contributions in line with the responsibilities of automotive industry for Turkey's progress towards SDGs and targets are presented in this report.

OSD Sustainability Management

OSD focuses its sustainability topics on propagating the culture of sustainability and internalizing the sustainability ideals, expanding the impact area of these ideals to include stakeholders, and to conduct corporate social responsibility projects in line with sustainability. To this end, and to enable sustainability activities to be realized in a systematic and effective manner, the Sustainability Working Group was established with the participation of at least one person representing each Committee and Working Group.

The Sustainability Working Group aims to reveal the complete sustainability, and the sustainability culture, of the automotive industry.

In the context of the sustainable development principles of the automotive industry, activities were carried out on the topics indicated below for the purposes of protecting and developing global competitiveness:

- Organizing awareness- and consciousness-raising actions towards including all Committees and Working Groups within OSD sustainability management.
- Handling the actions of the represented Committees/Working Groups from a sustainability perspective and realizing sustainability communication among the Committees/Working Groups.
- Propagating the culture of sustainability and expanding its impact area.
- Following up the existing improvement actions within the automotive industry.
- Carrying out Association activities in line with sustainability principles.

OSD focuses its sustainability topics on propagating the culture of sustainability, internalizing the sustainability ideals and expanding the impact area of these ideals to include stakeholders.

SUSTAINABILITY MANAGEMENT

OSD has a sustainability approach covering its economic, environmental, and social responsibilities towards internal and external stakeholders.

In the scope of the OSD Sustainability Report, **priority analysis survey was conducted** with internal and external stakeholders.

Stakeholder Engagement

Having a sustainability approach, and mindful of its economic, environmental and social responsibilities, OSD forms its internal and external frameworks via an association culture that aligns with the needs and expectations of all relevant parties. The Association carries corporate values that reflect its culture, support its vision and are embraced by its member companies. In this context, an integrity that prioritizes stakeholder engagement and satisfaction in connection with social, ethical and environmental management is essential for delivering the culture and awareness of sustainability to all stakeholders.

In line with these values, OSD continues to strengthen its communication with stakeholders and work through mutual cooperation. The Association delivers support for improvement of sustainability performance in aspects that will contribute to the constant development of its members and undertakes the duty and responsibility of raising the awareness of all stakeholders and relevant parties on the topics of sustainability. In line with these joint purposes, the Association constantly develops its sustainability approach and implementations and ensures their continuity and works towards integrating sustainability within the entire value chain.

With the aim of creating value in economic, environmental and social areas, OSD cooperates with many stakeholders, particularly employees, suppliers, public institutions, civil society organizations and international organizations. OSD's memberships, and the platforms it participates in, are presented in "Annex 1".

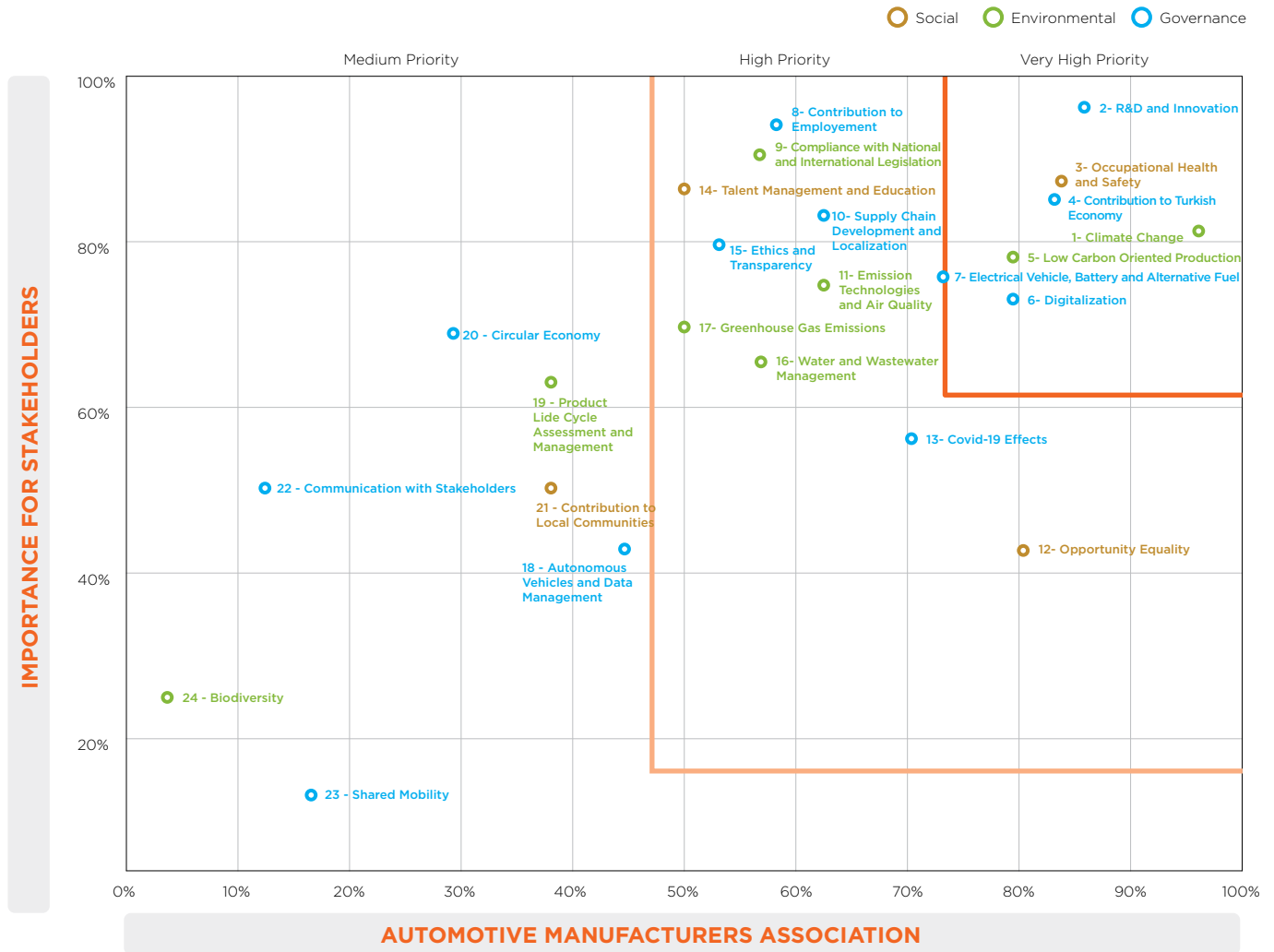
Sustainability Priorities

The preparation process of this OSD Sustainability Report began with determining priorities in line with the expectations of both internal and external stakeholders. Preliminary evaluations were made, and meetings held with the OSD Sustainability Working Group to determine sustainability priorities, before a survey study was conducted reaching out to domestic and foreign stakeholders. The feedback to the survey, received from a total of 247 people, was analyzed along the lines of domestic and foreign stakeholders and Sustainability Working Group members. This study shaped the content of the report and contributed to the formation of the GRI Index.

A prioritization matrix was revealed at the end of the analysis and evaluation, and the sustainability report was shaped by this matrix.



The priority analysis that emerged with the participation of all our stakeholders



Very High Priority				
Group	Number	Definition	OSD	Stakeholders
Environmental	1	Climate Change	4.92	4.72
Governance	2	R&D and Innovation	4.75	4.88
Social	3	Occupational Health and Safety	4.67	4.78
Governance	4	Contribution to Turkish Economy	4.67	4.76
Environmental	5	Low Carbon Oriented Production	4.58	4.68
Governance	6	Digitalization	4.58	4.64
Governance	7	Electrical Vehicle, Battery and Alternative Fuel	4.50	4.67
High Priority				
Group	Number	Definition	OSD	Stakeholders
Governance	8	Contribution to Employment	4.25	4.85
Environmental	9	Compliance with National and International Legislation	4.21	4.78
Governance	10	Supply Chain Development and Localization	4.21	4.74
Environmental	11	Emission Technologies and Air Quality	4.25	4.65
Social	12	Opportunity Equality	4.58	4.31
Governance	13	Covid-19 Effects	4.42	4.46
Social	14	Talent Management and Education	4.08	4.78
Governance	15	Ethics and Transparency	4.08	4.73
Environmental	16	Water and Wastewater Management	4.17	4.55
Environmental	17	Greenhouse Gas Emissions	4.00	4.60
Medium Priority				
Group	Number	Definition	OSD	Stakeholders
Governance	18	Autonomous Vehicles and Data Management	3.97	4.31
Environmental	19	Product Life Cycle Assessment and Management	3.75	4.53
Governance	20	Circular Economy	3.58	4.59
Social	21	Contribution to Local Communities	3.75	4.39
Governance	22	Communication with Stakeholders	3.25	4.40
Governance	23	Shared Mobility	3.33	4.00
Environmental	24	Biodiversity	3.08	4.13

CONTRIBUTION OF THE AUTOMOTIVE INDUSTRY TO THE TURKISH ECONOMY

As the case for all industrialized countries, the automotive industry is the driving force behind the Turkish economy.

With an installed capacity of over 2 million units per year, the Turkey's automotive industry is ranked 14th in the world and 4th compared to European Union countries regarding motor vehicle production of 1.3 million units in 2020.

The automotive industry is the driving force of the economy in Turkey, as is the case for all industrialized countries. While it is the recipient of input from other industries such as iron-steel, glass, rubber, textile, plastic, petro-chemistry and electronics, it is the supplier of products required by sectors such as transportation, tourism, infrastructure, construction and agriculture. At the same time, it is integrated with sales, marketing, utilities, fuel, finance and insurance for logistics and its supply industry. The automotive sector also provides very significant support to the defence industry and contributes to this sector's development.

In addition to direct and indirect contributions to Turkey's economy, the automotive industry also plays a significant role in technological and social development. Through strong know-how it provides conditions for attracting new investments, positively influencing the country's image, and helps in realizing the development of domestic brand automobile production. It has critical importance for the country.

With an installed capacity of over 2 million units per year, the automotive industry is ranked 14th in the world and 4th compared to European Union countries regarding motor vehicle production of 1.3 million in 2020. In that the same year, when the pandemic affected the whole world in socio-economic terms, our production fell by 11% compared to the previous year, though this was a better performance than the 16% reduction in global and 25% reduction in European motor vehicle production.

The automotive industry, which has been the leader of exports in Turkey for the last 15 years and has strategic importance for Turkish economy,



Contributing to our country's foreign trade despite the pandemic...

generated 15% of the country's exports with a value of USD 26 billion in the year 2020, according to data received from Turkey Exporters Assembly (TIM). The positive contribution to foreign trade balance, corresponding to approximately USD 7 billion, was achieved despite the pandemic. In addition to vehicle exports, the industry spends over USD 2.5 billion on R&D and generated R&D exports of over USD 100 million with 157 R&D centres and over 4,000 R&D employees.

In 2020, 7.5% of the State's taxation income came from the Motor Vehicles Tax and the Special Purchase Tax paid on automotive products. When the income tax,

corporate tax and VAT from sales of vehicles are taken into account, the industry contributes even more significantly to income from taxation.

One of the automotive industry's strongest aspects, and one of its most important investments, is the qualified labour it employs. While the direct labour employed by the industry is over 53 thousand, it provides employment exceeding 500 thousand when indirect employment from the supply industry, sales and after-sales service network is considered. Maintaining a qualified labour force has been the most important characteristic of the industry during the pandemic, which improved on protecting jobs at the existing level and increased employment by 6% in this period.

One of the automotive industry's strongest aspects, and one of its most important investments, **is the qualified labour it employs.**

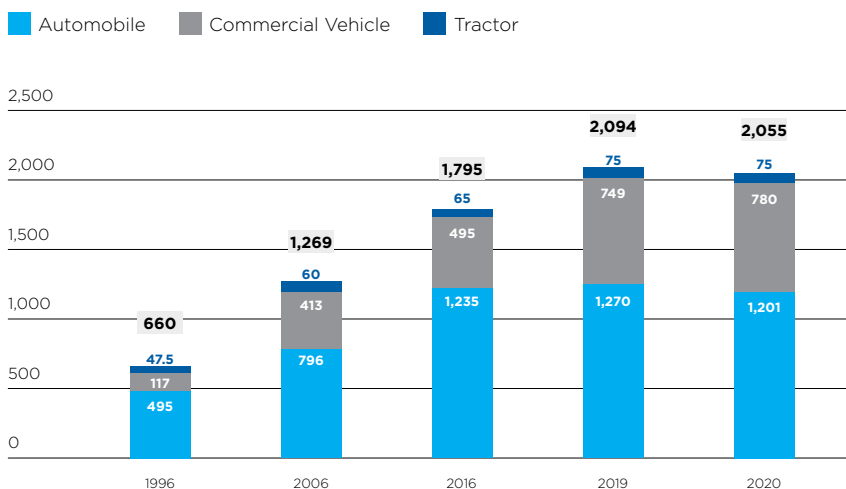


AUTOMOTIVE INDUSTRY PRODUCTION

The Turkish automotive industry has increased capacity three-fold since the year 1996.



Turkish Automotive Industry Production Capacity (x1,000 Units)



The Customs Union signed with the EU in 1996 played a critical role in the transformation of the industry, and production capacity and actual production grew in the following years in line with export-oriented growth. The automotive industry has undergone a significant structural transformation in the last 15 years and has created an export-oriented industry structure facing developed markets, expanded its sustainable competitiveness in production and in R&D, and reached the capability to design vehicles from scratch and export to the entire world. It has achieved a three-fold increase in capacity since the year 1996.

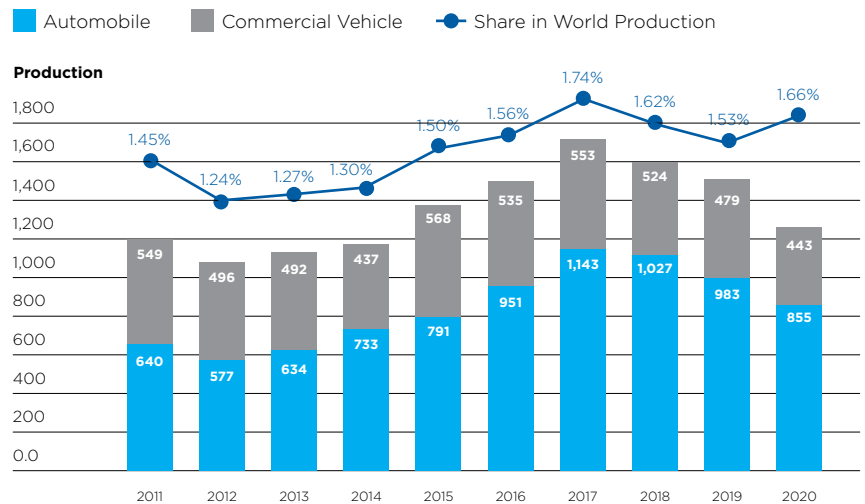
With over 2 million units installed capacity, the industry has managed very well since the beginning of the coronavirus pandemic which has turned into a global crisis unprecedented in modern times. Since January 2020, it began to design and gradually implement its health measures and its alternative plans to ensure vehicle production continuity. With the rising impacts of the coronavirus pandemic throughout the world, it became unavoidable that the factories in Turkey had to halt production in March 2020, essentially due to the three reasons listed below:

- The sudden collapse of the EU markets that constituted Turkey's most significant export market, with cancellations of orders.
- The interruptions and slowdowns that occurred regarding supply processes.
- The necessity to increase health measures due to the increase of cases in Turkey.

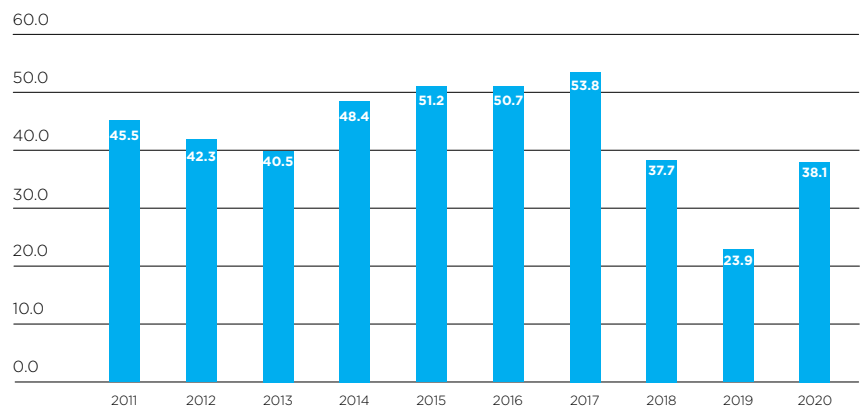
The monthly average stoppage period for the industry was 6 days in March 2020, while this value increased to 18 days in April 2020. As of 11th of May 2020, all OSD members restarted their production. With the emergence of the pandemic, for a while production had to be continued at high cost and low efficiency due to the low-capacity use caused by the need for physical distancing, the gradual restoration of demand and the many measures taken against the pandemic. However, production tempo rose during the second half of the year.

Despite the challenging conditions brought by the pandemic, in 2020 the automotive industry realized a production of 1.3 million vehicles - an 11% reduction compared to 2019. Compared to the reduction of 16% at global and 25% at European level, the Turkish automotive industry performed better, raising its share in global production from 1.53% to 1.66%. Tractor production displayed an increase of 59% compared to the previous year, due to deferred demand and a rapid recovery within the domestic market.

Turkish Automotive Industry Production (x1,000 Units)



Tractor Production (x1,000 Units)

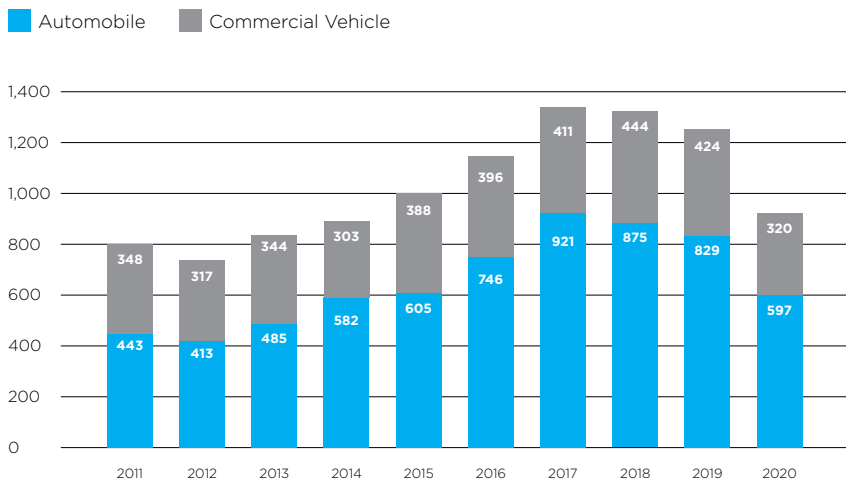


Compared to the reduction of 16% at global and 25% at European level, **the Turkish automotive industry performed better, raising its share in global production from 1.53% to 1.66%.**

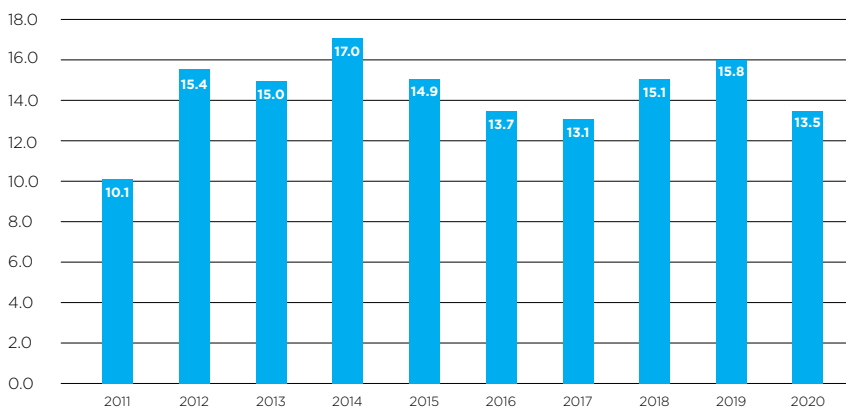
AUTOMOTIVE INDUSTRY EXPORTS

Added value to the country's economy with the foreign exchange input obtained through exports...

Exports (x1,000 Units)



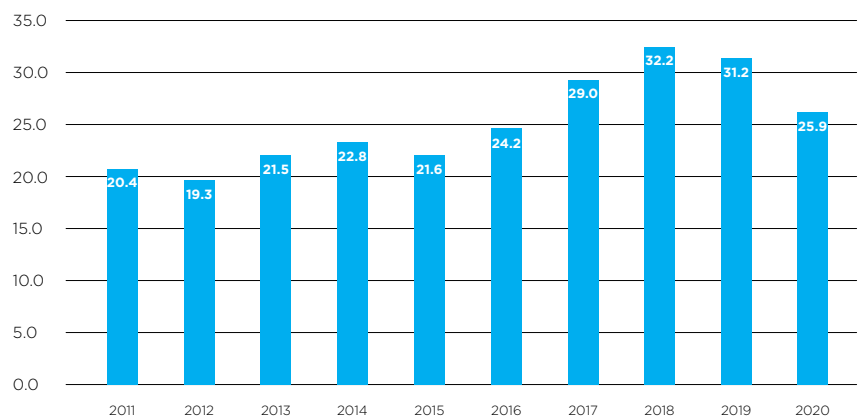
Tractor Exports (x1,000 Units)





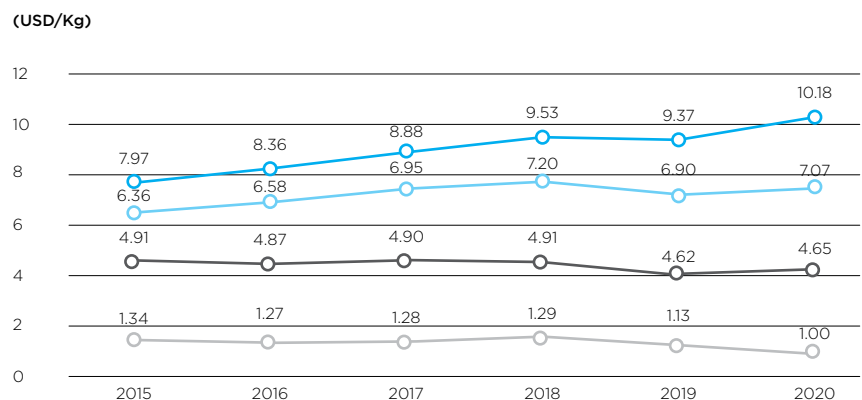
The Turkish automotive industry, which has exported 75% of its production in the last 10 years, **has carried out 80% of its exports to the EU.**

Automotive Exports (Million USD)



Development of Export per kg

○ Automotive Industry
 ○ Automotive Industry-Total
 ○ Automotive Supply Industry
 ○ Total Exports from Turkey



AUTOMOTIVE INDUSTRY EXPORTS

In its 15th year, the automotive industry continued to maintain its leader position in sectoral exports with a 15% share in 2020.

Turkey is the most important trade partner of the EU in both the automobile and commercial vehicle segments.

The EU market reduction of 24% that occurred with the emergence of the pandemic significantly impacted industry's exports, and thus exports declined by 27% by units and by 17% by value in the year 2020. Through higher added value vehicle production, the industry increased its export per kg value by 7%, raising it to 10.2%

Turkey is the most significant trade partner of the EU regarding both automobile and commercial vehicle segments. 16% by units of the automobiles and 54% by value of the commercial vehicles that the EU imports come from Turkey.

According to the values declared by Turkey Exporters Assembly (TIM) in 2020, the automotive industry continued to preserve its top place within sector-based export rankings with a share of 15% for a 15th consecutive year.

Countries Exporting Passenger Cars to the EU (Units)

	2020	% Share
UK	503,282	16.5
Turkey	494,149	16.2
Japan	483,626	15.8
USA	386,877	12.7
South Korea	318,479	10.4
Morocco	240,479	7.9
China	170,244	5.6
Mexico	170,153	5.6
South Africa	124,335	4.1
Switzerland	48,059	1.6

Countries Exporting Commercial Vehicles to the EU (EUR)

	2020	% Share
Turkey	3,445,296,660	53.8
South Africa	1,098,979,638	17.1
UK	682,417,961	10.6
China	253,792,428	4.0
Thailand	176,019,859	2.7
Morocco	170,949,191	2.7
Norway	142,054,119	2.2
Macedonia	117,907,960	1.8
Switzerland	113,709,491	1.8
USA	89,892,014	1.4

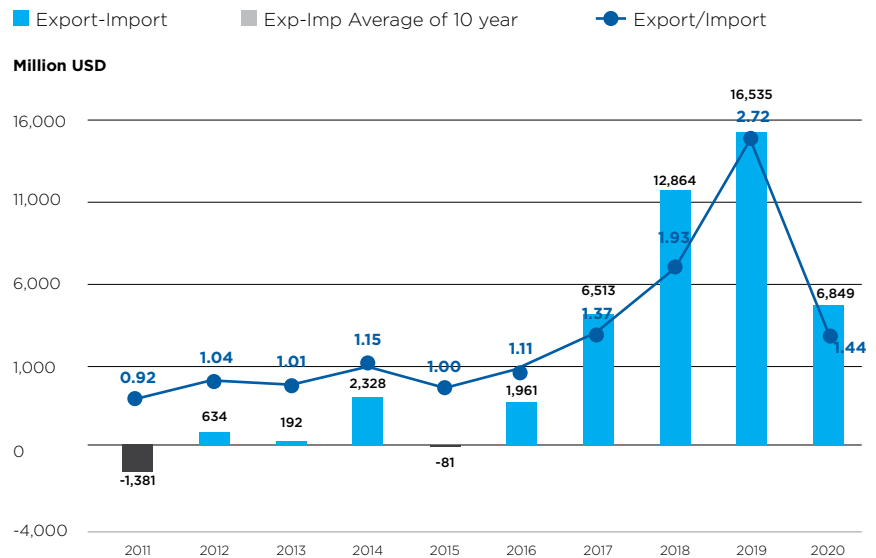
Export Numbers by Sectors (x1,000 USD)

SECTORS	1 - 31 DECEMBER				1 JANUARY - 31 DECEMBER			
	2019	2020	Change ('20/'19)	Share ('20) (%)	2019	2020	Change ('20/'19)	Share ('20) (%)
Automotive Industry	2,537,839	2,799,028	10.3	15.7	30,587,064	25,548,566	-16.5	15.1
Chemical Substances and Products	1,813,830	1,799,736	-0.8	10.1	20,588,207	18,263,488	-11.3	10.8
Ready-to-Wear and Apparel	1,326,372	1,661,882	25.3	9.3	17,697,030	17,143,441	-3.1	10.1
Steel	1,108,324	1,383,260	24.8	7.8	13,813,214	12,675,179	-8.2	7.5
Electrical-Electronic	973,436	1,221,536	25.5	6.8	11,235,669	11,055,082	-1.6	6.5
Machinery and Accessories	740,427	834,560	12.7	4.7	7,833,008	7,542,789	-3.7	4.4
Ferrous and Non-Ferrous Metals	671,675	820,334	22.1	4.6	8,120,551	8,255,705	1.7	4.9
Cereals. Pulses. Oilseeds and Products	629,239	770,362	22.4	4.3	6,787,841	7,301,341	7.6	4.3
Textile and Raw Materials	598,053	769,597	28.7	4.3	7,919,588	7,286,561	-8.0	4.3
Furniture. Paper and Forest Products	523,779	574,235	9.6	3.2	5,529,995	5,566,505	0.7	3.3
Exports - Total	15,386,718	17,843,802	16.0	100.0	180,832,722	169,514,167	-6.3	100.0

According to foreign trade data for the last 10 years, the automotive industry had a foreign trade surplus each year excluding the years 2011 and 2015. The foreign trade surplus of the automotive industry for the last 10 years averaged USD 4.7 billion. Despite the extraordinary conditions caused by the pandemic, the industry continued to provide a positive contribution to industries, foreign trade balance, with a foreign trade surplus of USD 6.8 billion in 2020.¹

Details pertaining to the global automotive sector and Turkey's position within the global platform are presented in the "OSD Global Automotive Sector Evaluation Report".²

Foreign Trade Balance of Turkish Automotive Industry in 10 Years



¹ Foreign trade carried out within the scope of TURKSTAT - 8700; motor vehicles, tractors, bicycles, motorcycles, and other land vehicles; their components, parts and accessories contain foreign trade data.

² <http://www.osd.org.tr/osd-yayinlari/kuresel-otomotiv-sektoru-degerlendirme-raporlari/>

TURKISH AUTOMOTIVE MARKET

Due to successful management in the Turkish automotive industry, the internal market expanded by 62% in 2020 compared to the previous year.



The domestic market for tractors also showed growth in the year 2020 due to deferred demand and increasing agricultural activities over the last 2 years and **expanded by 87% compared to the previous year.**

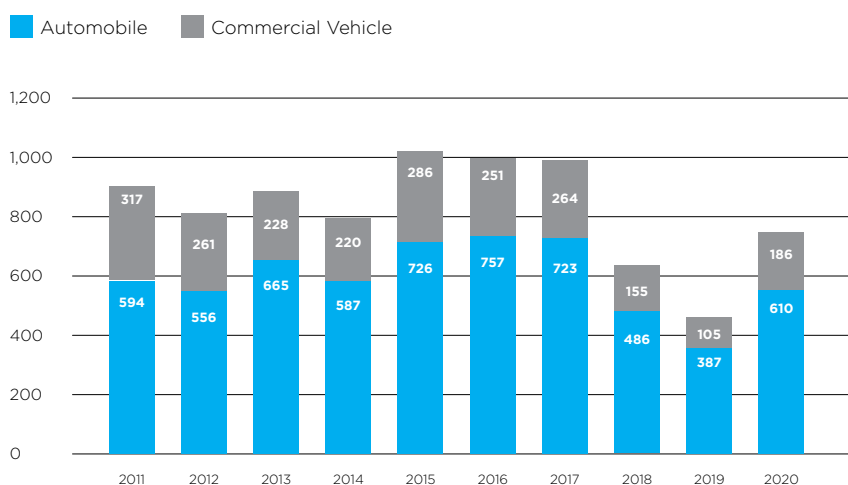
The automotive market, which reached 1 million vehicles between the years 2015 and 2017, decreased by 35% in the year 2018 and 23% in 2019 to decline below 500 thousand vehicles. With consumer transport habits changing during the pandemic, the impact of the deferred demand and the successful management of the pandemic in Turkish automotive industry, the domestic market expanded by 62% in 2020 compared to the previous year.

While automobile sales increased by 58% in 2020 compared to the previous year, it was observed that the midibus and bus market serving the needs of mass transport expanded only by 10%. Logistics demand, increasing with the change in purchase and sale demands during the pandemic period, positively affected commercial vehicle sales. The domestic market for tractors also showed growth in the year 2020 due to deferred demand and increasing agricultural activities over the last 2 years, and expanded by 87% compared to the previous year.

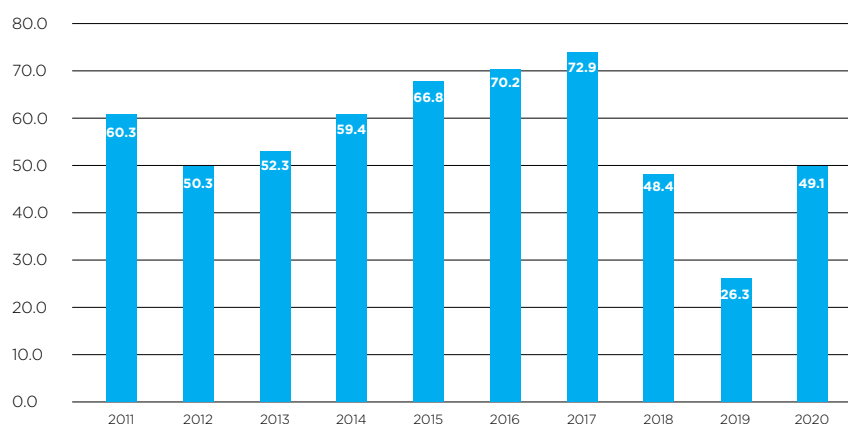
It is known that domestic market development is deeply influenced by factors such as real income per capita, foreign currency exchange rate changes, vehicle loan interest rates, economic expectations, and tax policies. In Turkey the number of vehicles per 1,000 persons is 153, displaying a considerably low vehicle ownership rate compared to countries with similar income levels such as Brazil and Mexico. In line with this evaluation, it is considered that there is a significant potential for the development of the domestic market in Turkey.

The sustainable growth and predictability of the internal market is of much importance for the industry. It is essential that long term policies are developed with a strategic perspective rather than seasonal measures. It is important that a permanent and effective scrappage scheme is commissioned for restructuring the tax system to upgrade the vehicles in use due to vehicle architecture changes along with technological developments. Achieving a sustainably growing structure for the internal market through development of long-term policies is seen as the most critical aspect that will attract inward investment.

Turkish Automotive Industry Market (x1,000 Units)



Turkish Tractor Market (x1,000 Units)



Number of Vehicle Owners Per Capita (2019)

Poland	635
Russia	341
Brazil	269
Mexico	255
Turkey	153

AUTOMOTIVE INDUSTRY INVESTMENTS

The Turkish automotive industry, which is an important player on a global scale, continues its investments in technology and innovation.

Turkey's geopolitical proximity to Europe, Asia, the Middle East and North Africa creates a strong competitive advantage regarding exports and production and after-production logistics.

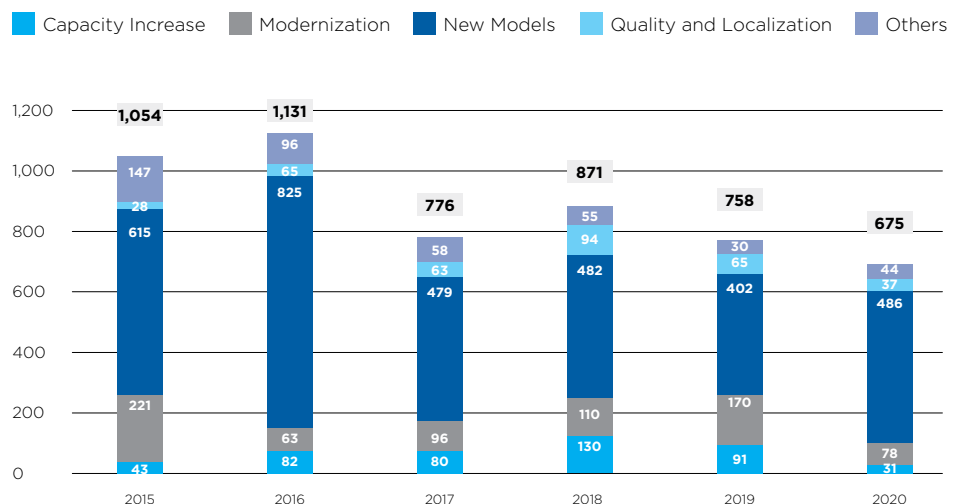
The automotive sector is one that requires constant development due to its inherent nature. Harsh conditions of global competition and changing consumer demands cause the automotive industry to make more technology and innovation investments. Turkey's automotive industry, which exports most of its production and is recognized as an important actor in the global automotive industry, similarly continued its technology and innovation investments. As of now, the industry that realizes not only product exports but also engineering exports gain momentum with its technology exports rising with each passing year.

Turkey's geopolitical proximity to Europe, Asia, the Middle East, and North Africa creates a strong competitive advantage regarding exports and production and after-production logistics. Taking into

consideration the sector's export-orientated structure and the fact that the global market will continue to expand, it is projected that Turkey's exports' impact area will expand in the coming years. The critical issue here is that the supply industry, which is one of the strongest aspects of the industry, has to adapt to this transformation and further strengthen its competence towards technology development.

Investments in the automotive industry have continued without showing signs of slowing despite the pandemic. Electrification - at the centre of global automotive transformation - is of critical importance for Turkey. There are important steps taken in this respect, and the declarations by country's automotive industry towards producing electric vehicles are of great significance to the sustainability of the industry.

Automotive Industry Investments (USD Million)

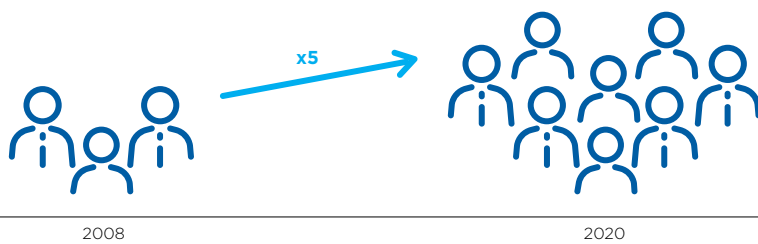




R&D AND INNOVATION

The automotive industry is among the sectors that spend the most on R&D in the world today.

R&D Employment



With the goals regarding climate change and reduction of greenhouse gas emissions, the global automotive sector is currently undergoing a deep transformation. R&D studies and innovation in technologies such as electrification, battery technologies, autonomous driving, connectivity, electric and hybrid vehicle technologies, alternative fuels, driver support, security systems and interface development, weight reduction and material technologies related to these systems, and digitalization come up as major factors for the automotive industry to preserve its global competitiveness.

The automotive industry is currently the sector that has the highest global R&D expenditure; as such, R&D investments are increased and qualified labour in this field is supported in order to preserve the global competitiveness of industry.

OSD member companies, who have increased their R&D investments every year, have increased their R&D employment five-fold between 2008 and 2020. Much importance is attached to the development of R&D personnel, and the support for graduate and doctorate degree activities of the personnel in academic fields.

Aware of the importance of the cooperation between universities and industry towards achieving technological transformation and innovation, OSD member companies collaborated with an average of 50 universities each year and enabled the realization of almost 500 projects with an overall budget of TRY 2 billion between 2008 and the end of 2020.

Realizing significant development and transformation since they began R&D activities, OSD member companies' R&D centres reached budgets totaling TRY 2.4 billion in 2020 and, as such, the R&D centres that exported R&D activities using sustainable and new automotive industry technologies achieved total R&D engineering exports of USD 750 million between 2015 and the end of 2020.





OSD member companies engaging in European Horizon 2020 R&D and innovation projects (Ford Otosan, Tofaş, Mercedes Benz Türk, Otokar and Anadolu Isuzu) received assistance of EUR 13 million within the scope of a total of 33 projects under the titles of Intelligent and green transportation, Information and communication technologies, Advanced production and processes, and Advanced materials, and participate in cooperation projects with the EU. Projects engaged in by OSD member companies, and all other projects and their details, may be accessed from the **Horizon 2020 Information Platform**.

The R&D Committee continues with its actions through regular meetings to keep track of the recent developments in R&D topics that are critical to preserve country's and industry's competitiveness, and to conduct actions that may carry industry to higher levels through a proactive approach.

R&D centres of OSD member companies, which have made a great development and transformation since the first time the R&D studies started, reached a budget of TRY 2.4 billion as of 2020.

DIGITALIZATION AND CONNECTED SERVICES

Applications such as Big Data, artificial intelligence and Internet of Things are considered as focus points in this regard.

Digitalization is seen as essential for companies to more closely interact with their supply chains and customers and to adapt to ever-changing consumer habits.

In today's world developing through the new technologies, the integration of digital solutions is of crucial importance for the sustainability of sectors. Applications such as Big Data, artificial intelligence and Internet of Things are considered as focal points in this regard. The sector must make good use of the innovations that may arrive through digitalization and the opportunities that may emerge with these innovations. Digitalization will also

contribute to energy- and resource-efficiency in respect to improving production processes, leading to positive impacts on environmental sustainability. Digitalization is also seen as essential for companies to more closely interact with their supply chains and customers and to adapt to ever-changing consumer habits. The titles and policy recommendations presented for the digital transformation of the automotive sector are summarized below.¹

Automotive Sector Digital Transformation Policy Recommendations

Title	Policy Recommendations
Awareness Level	<ul style="list-style-type: none"> • Increase sector- and company-level awareness of the automotive industry, including the public sector, on digital transformation
Digital Compliance Policy and Governance	<ul style="list-style-type: none"> • Prepare a roadmap covering digital compliance policies, risk management and legal processes • Establish an institutional structure to coordinate the digital transformation process • Strengthen the in-company digital transformation coordination process
Human Resources	<ul style="list-style-type: none"> • Define the skills and competences required for realizing and sustaining digital transformation and raise the qualifications of the labour force • Encourage employees who have digital competences to work in the automotive manufacturing industry
Digital Technology Fields	<ul style="list-style-type: none"> • Increase technological and innovative capacity, and develop talents in prioritized digital technology fields
Technical Infrastructure	<ul style="list-style-type: none"> • Strengthen the data communications infrastructure • Strengthen the IT architecture in compliance with digital transformation needs
Digital Technology Suppliers	<ul style="list-style-type: none"> • Strengthen technology acquisition and development capacities and skills of digital technology suppliers • Increase the accessibility of digital technology suppliers' products and services to customers
Cooperation	<ul style="list-style-type: none"> • Increase cooperation with the stakeholders included in the automotive industry's ecosystem



¹ otep.org.tr/Uploads/BilgiBankasi/0307202017274322019-otep-otomotiv-sektorunde-dijital-donusum.pdf

One of the best instances that may be given regarding digitalization in automotive industry that also touches people is the Vehicle Accident Emergency Call System that was implemented by the sector. This system, known as e-Call, automatically activates when a vehicle is involved in an accident to call the emergency call centre (Police - Gendarmerie - Fire Department - Ambulance), enabling the necessary interventions to be made. The use of this system, initially commissioned in 2018, has increased over the years, reaching 1,500 calls in the last quarter of 2020. With the increase in the number of vehicles using this system, it is expected that this number will continue upwards, leading to improved rates of saving lives in cases of accidents.

Autonomous vehicles will gradually become the future of the industry in line with technological advances. For the automotive industry - which aims to offer such vehicles that

function based on very high-tech communication, capable of sensing their surroundings and travelling without a driver from one point to another in the safest manner - cyber security is of utmost importance, and the industry is determined to strive towards minimizing the potential risks in this context.

Necessary follow-ups are being conducted by the Intelligent Transportation Systems and Technical Committees within the OSD regarding the draft regulations under assessment within the UN/ ECE Autonomous Vehicles Sub-Committee, in respect of vehicle cyber security and wireless software updates.

In the context of these global advances, countries must make preparations in the areas of infrastructure investment, legislation compliance and development of safety and security aspects, in line with infrastructure harmonization and connected driving requirements.

One of the best instances that may be given regarding digitalization in automotive industry that also touches people is **the Vehicle Accident Emergency Call System that was implemented by the sector.**



SUPPLY INDUSTRY AND VALUE CHAIN

In the automotive industry where competitiveness is increasing, the role of the supply industry has a critical importance in Turkey's successful and competitive position.

OSD organizes a Supplier Satisfaction Survey every two years in order to objectively and confidentially evaluate the relations of our main industry with the supplier industry, in order to determine the situation and the measures to be taken.

The role of the supply industry is of critical importance for the successful and competitive position Turkey has achieved to date within the automotive industry, in which competition increases daily with globalization, technological advances, legislative changes and the inclusion of new manufacturer companies and brands.

In this challenging competitive environment, both the main industry and the supply sector have important tasks ahead of them towards maintaining and developing the sustainable competitiveness of industry. In this context, OSD organizes a Supplier Satisfaction Survey every two years to evaluate the relationships between the main industry and the supply industry in an objective and confidential manner, conducting situational analysis and defining the measures required to be taken. The fourth survey in this context was conducted in 2020.

The automotive and logistics sectors transform each other by way of common themes such as value chain integration and global value chain transformation. Considering that the share of logistics within the overall cost breakdown of a vehicle is around 10% it is apparent that cost- and time-efficiency in logistics have direct and determinative consequences on the competitiveness and the sustainability of the automotive sector.

In addition, the amount of materials to be supplied for the vehicles of the future will be considerably lower than that for today's vehicles. In line with this transformation, it is certain that change will happen in the supply industry. Such transformation may be challenging, but the automotive sector is focused on evaluating the risk pertaining to such consequences and creating opportunities for the supply industry. Another topic of importance is that 'green' buying behaviour has moved up the agenda. Procurement departments must now also take into consideration environmental and social aspects in their cost-benefit analyses when conducting their procurement.



LOCALIZATION

It is necessary for the supply industry to activate the changing and transforming product groups in the fastest, most reliable, and most competitive way.

Turkey's supply industry has a significant level of technological and competitive knowledge in certain fields (sheet metal shaping, plastics, peening etc.) that correspond to important ratios within the current cost structure of a vehicle.



Turkey's supply industry has a significant level of technological and competitive knowledge in certain fields (sheet metal shaping, plastics, peening etc.) that correspond to important ratios within the current cost structure of a vehicle. However, the value structure of the vehicles of the future necessitates a significant change as a result of the advances and technological changes observed in the automotive industry. It is essential that the automotive industry adapts rapidly to these advances, known as 'disruptive technologies', and thus the supply industry has to commission these product groups in the most rapid, safe and competitive manner. In line with changing vehicle architectures, the components required by the automotive industry

changes and the high ratios of locally sourced parts that have great significance for the competitiveness of automotive industry are likely to decline in the future. To shine a light on the route to such transformation for the supply industry, OSD members conduct many activities to help develop their suppliers. Through the Working Groups under the umbrella of the Automotive Technology Platform (Otomotiv Teknoloji Platformu - OTEP), OSD also continues to share its knowledge on this issue, which it highlighted for the first time at the Vision Meeting held with Association of Automotive Parts and Components Manufacturers (Taşıt Araçları Tedarik Sanayicileri Derneği - TAYSAD) in 2019.



This period experienced by the automotive industry revealed the need for countries to redefine their competitiveness. The actions towards redefining competitiveness require an understanding of the period experienced and of the need for transformation that this period brings. As the transformation has many dimensions, the actions to be conducted in this direction must also be interdisciplinary.

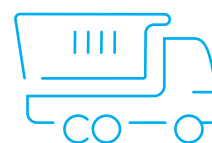
The Localization Strategy Committee was established within the OSD to conduct activities that inform local suppliers and contribute to steps

Locality rates reach up to 70% for passenger cars and up to 80% for commercial vehicles



Passenger Cars

70%



Commercial Vehicles

80%

such as digital transformation for increasing market demand. Actions are carried out in coordination with the stakeholders for the purposes of defining the topics and parts/components that are critical for automotive industry to be brought into Turkey and for reaching coordination with relevant institutions in this regard as the representative of the automotive industry, within the context of government's policy for localization. One of the most important outcomes of these actions is the Technology Oriented Industry Initiative Programme Mobility Call declared in 2021, and activities in this context were carried out through close cooperation between OSD, OTEP and TAYSAD and the Ministry of Industry and Technology for the task of compiling the list of products subject to this call.

The Localization Strategy Committee was established within the OSD to conduct activities **that inform local suppliers and contribute to steps such as digital transformation for increasing market demand.**

ENVIRONMENTAL PERFORMANCE

Climate change, which our planet is facing, stands out as an important risk factor for all humanity.



According to the United Nations, climate change and pandemic are highlighted as the most significant global issues throughout the world. In the year 2020, the destructive impacts created by the climate crisis and the negative impacts of the pandemic were felt deeply throughout the world.

The phenomenon of the climate change the planet is facing and both the economic and the environmental and social impacts due to this change, are risk factors that are of significance for all humankind and need to be forecasted.



Among the risks facing the planet, the foremost are climate risks.¹

According to the **Global Risks Report**² published by the World Economic Forum, environmental concerns are likely to be at the top of the list for the next ten years in terms of possibility and impact. According to the ranking of the global risks ordered by impact in the Global Risks Report, five out of eight foremost risks appear to be direct environmental risks: climate action failure, biodiversity collapse, natural resource crises, human-caused damage to the environment and extreme weather conditions.

With the COP21 France in 2015, the **Paris Agreement** that came into effect after year 2020 was approved. Turkey signed the Paris Convention on 22 April 2016 at the High-Level Signature Ceremony held in New York together with representatives from 175 countries, and submitted its Intended National Contribution Statement to the Convention Secretariat on 20 September 2015. According to Turkey's National Contribution Statement, it was stipulated that greenhouse gas emissions are to be reduced by 21% compared to the increase projected for the reference scenario (business as usual - BAU) for 2030.

The Convention aims to develop the implementation of the United Nations Framework Convention on Climate Change (UNFCCC) in the context of ensuring sustainable growth and eliminating poverty. The long-term objective of the Convention is defined as continuing global efforts towards keeping the global average temperature increase below 2°C compared to the pre-industrial era, with the additional objective of striving towards keeping this increase below 1.5°C. It also aims to increase the capability for adaptation and climate resilience against the negative impacts of climate change.

If the target of keeping global warming below 1.5°C set at the Paris Convention for combating climate change is not achieved, the climate crisis will have very significant economic, social and environmental consequences.

1.5°C

If the target of keeping global warming below 1.5°C, set out in the Paris Agreement to combat climate change, is not achieved, the climate crisis will have very serious economic, social and environmental consequences.



¹ Based on the Data of World Economic Forum.

² http://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf

CLIMATE CHANGE, GLOBAL DEVELOPMENTS AND AUTOMOTIVE

The Turkish automotive main industry sees efforts to become carbon neutral by 2050 as an important step towards combating the climate crisis.

55%

With the European Green Deal announced by the European Commission in December 2019, the **EU's goal of 55% reduction by 2030 and becoming a climate neutral continent by 2050** has been an important turning point in global efforts.

Climate experts are of the opinion that the country-specific targets indicated within the scope of the Paris Agreement are not adequate for keeping the global average temperature increase below 1.5-2°C. The European Commission's declaration that the EU will raise its year-2030 Paris Agreement target from 40% to 55% within the scope of European Green Deal dated December 2019, and that Europe will become a carbon-neutral continent by 2050, has been a major turning point. The EU is undergoing a significant transformation in respect of the topics of transformation, buildings, agriculture, industry, finance, digitalization and foreign trade through the European Green Deal which has been declared as the EU's new growth strategy, and thus the Commission has generated its roadmap towards updating all policies and legislation in this direction.

On the other hand, the United Kingdom's target of becoming carbon neutral by 2050 has already been processed into its legislation.

Carbon-neutral target declarations by the United States of America and Canada for the year 2050 and by China for the year 2060 following the EU's 2050 carbon-neutral target declaration show that significant steps will be taken towards the largest economies of the world transitioning to non-carbon economies.

Through the Paris Agreement climate targets, a significant transformation is underway within the automotive market with regard to reducing transport-based greenhouse gas emissions on the topics of automotive product standards, transition to electric and alternative fuel vehicles and creating infrastructure for alternative fuel vehicles. For the sustainability of industry, preparing the technological infrastructure to be ready for such a transformation through R&D and innovation activities is of utmost importance.

The Turkish automotive main industry considers the 2020 declarations, initially by the EU and subsequently by other developed economies towards raising their targets in the scope of Paris Agreement and their efforts towards becoming carbon-neutral by 2050, as important steps in the fight against the climate crisis.

Climate change is considered as one of the most important issues to be prioritized, not only by countries but also by the business world, for the sake of sustainability.





The automotive industry is also taking necessary steps in relation to the topics of defining the risks and opportunities brought by the climate crisis, reducing greenhouse gas emissions, transition to low carbon economy and adaptation to changing climate conditions. In this respect, automotive companies have also published their year-2030 and year-2050 climate targets and are reshaping their business processes in line with these targets.

Furthermore, there are companies within the main and supply industries that are engaged with the Science Based Targets initiative, and these

signatory companies commit to calculate and reduce their production greenhouse gas emissions based on scientific values.¹

Ford Otosan, Daimler Truck AG and MAN Truck and Bus SE companies, which have road freight vehicle production activities in country, also signed the Joint Statement The Transition To Zero-Emission Road Freight Transport of the European Automobile Manufacturers' Association (ACEA). With this statement, it was stipulated that all new trucks to be sold in the EU as of 2040 have to be fossil-fuel free, in line with achieving the EU's year 2050 carbon-neutral target.

Ford Otosan, Daimler Truck AG and MAN Truck and Bus SE companies, which have road freight vehicle production activities in country, also signed the Joint Statement The Transition To Zero-Emission Road Freight Transport of the ACEA.

¹ <https://sciencebasedtargets.org/companies-taking-action/?sector=Automobiles%20and%20Components#table>

² ACEA The Transition to Zero-Emission Road Freight Transport <https://www.acea.auto/files/acea-pik-joint-statement-the-transition-to-zero-emission-road-freight-trans.pdf>

CLIMATE CHANGE, GLOBAL DEVELOPMENTS AND AUTOMOTIVE

With the European Green Deal, there will be a significant transformation in every field such as transportation, buildings, agriculture, industry, finance, foreign trade.

90%

It is stated by the European Commission that, in order for the EU to reach carbon-neutrality by 2050, it is necessary to reduce transportation-based greenhouse gas emissions by 90% until the year 2050.

European Green Deal

Through the European Green Deal (EGD), declared as the new growth strategy for the EU to become a carbon-neutral continent by 2050, major transformations will occur in all fields such as transportation, buildings, agriculture, industry, finance, foreign trade etc.

Considering that 80% of Turkey's automotive export is made to EU Member States, OSD considers that it is critical for industry's sustainability to closely follow the structural changes and new rules for foreign trade to be brought in with the EGD, and to take all necessary steps in this respect. Under the direction of the Board and through relevant Working Groups, OSD approaches the impacts of EGD and the impacts of the legislation changes in the EU on industry under four main headings:

1. Product Standards and Transformation in the EU Market
2. Foreign Trade and Access to Funding
3. Circular Economy
4. Climate Change and Clean Production

In the year 2020, the topics related to all these headings, with regard both to the developments in the EU and to compliance and transformation in terms of legislation / infrastructure in Turkey, were raised in the agendas of relevant Committees and Working Groups.

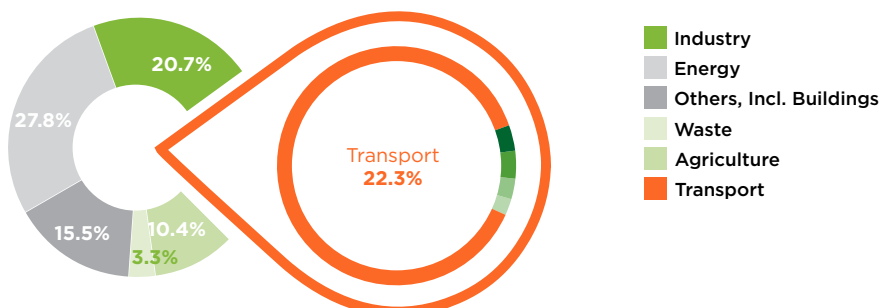
Automotive within 2050 Climate Targets

Specifically for the transportation sector, it is stated by the European Commission that, in order for the EU to reach carbon-neutrality by 2050, it is necessary **to reduce transportation-based greenhouse gas emissions by 90%** until the year 2050.

Transport-based greenhouse gas emissions in the EU:

- Transportation is responsible for 22% of the overall greenhouse gas emissions, road transport accounts for 95% of overall transport-based greenhouse gas emissions.
- Automobile- and light commercial vehicle-based CO₂ emission correspond to 73% of the EU's overall road transport emissions (70% of all transport emissions)
- Transport-based greenhouse gas emissions have been on the rise since 1990

Share of EU Greenhouse Gas Emissions, by Sector



- Road Transportation= 21.1%
 - Passenger cars= 12.8%
 - Vans= 2.5%
 - Heavy-duty trucks and buses= 5.6%
 - Motorcycles= 0.3%
 - Other road transportation= 0.0%
- Aviation= 0.4%
- Water Navigation= 0.5%
- Railways= 0.2%
- Other Transportation= 0.1%

Source: European Environment Agency (EEA)

The targets indicated below for sustainable transport have gained significance in the EU in accordance with the European Green Deal:

- Increasing the use of low- and zero-emission vehicles using renewable and low carbon fuels for reducing the dependency on fossil fuels,
- Having at least 30 million zero-emission vehicles in traffic by the year 2030,
- Having all automobiles, buses, lorry and trucks in Europe be zero-emission until the year 2050,
- Having more strict emission standards for automobiles, buses, lorry and trucks in transportation (bringing very strict air pollution emission standards for internal combustion engine vehicles),
- Reviewing the Directive on Alternative Fuels Infrastructure and increasing the availability of electric and hydrogen through more charging stations.

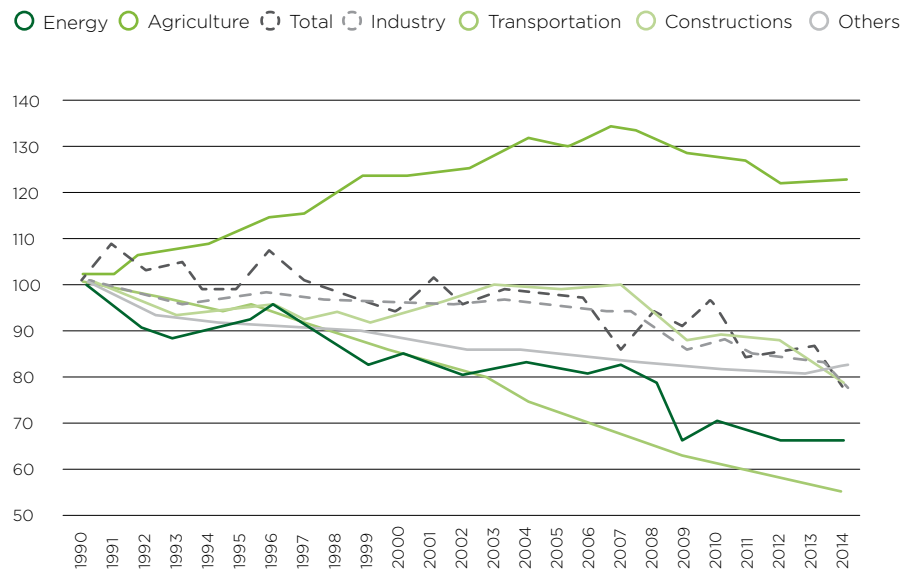
According to the planned climate targets, the existing fossil fuel use in the transport sector must be reduced by 40-42% by the year 2030. However, in order to satisfy society's increasing demands for mobility, alternative driving technologies and fuels and new mobility concepts must be launched to the market at the same time.

Sustainable and Smart Mobility Strategy

Transportation is responsible for a quarter of the EU's greenhouse gas emissions, and the EU aims to have a 90% reduction in these emissions, covering all transportation modes, by 2050 in order to achieve its target of being climate-neutral in transportation. The Commission published its Sustainable and Smart Mobility Strategy on 9 December 2020 towards the aims of: increasing zero emission vehicles, presenting sustainable alternative solutions to society and businesses, supporting digitalization and automation, and developing connectedness and accessibility.

In Turkey, the Intelligent Transportation Systems (ITS) Strategy Document and Action Plan (2020-2023) was published by the Ministry of

EU - Greenhouse Gas Emission Change by Sectors



Source: European Environment Agency (EEA)

Transportation and Infrastructure on 5 August 2020. Five fundamental strategic objectives were defined under the Action Plan:

- Developing the ITS Infrastructure
- Realizing Sustainable Smart Mobility
- Providing Road and Driving Safety
- Creating a Habitable Environment and an Aware Society
- Realizing Data Exchange and security

In line with these purposes defined, feasible, monitorable and measurable actions were outlined. An organization in charge was assigned for each action, and the organizations subject to cooperation and action implementation steps were determined.

Through OSD's Intelligent Transportation Systems Committee, established to keep track of the up-to-date developments regarding Intelligent Transportation Systems that constantly gain importance in the European Union and world-wide - including industrial activities carried out in this field and announcements of the activities across relevant platforms - all such developments in both the EU and in Turkey are followed.

New improvements in the EU and Turkey are followed through OSD's Intelligent Transportation Systems (ITS) Committee.

¹ EU Sustainable and Smart Mobility Strategy
<https://ec.europa.eu/transport/sites/default/files/legislation/com20200789.pdf>

² <https://www.uab.gov.tr/uploads/announcements/ulusal-akilli-ulasim-sistemleri-strateji-belgesi-v/ulusal-akilli-ulasim-sistemleri-strateji-belgesi-ve-2020-2023-eylem-planı.pdf>

PRODUCT EMISSION STANDARDS - THEIR DEVELOPMENT IN TURKEY

OSD participates in the “Liaison Committee” meetings held periodically within the body of ACEA in order to represent the Turkish automotive industry.

The OSD Technical Committee works in cooperation with the Ministry of Industry and Technology on the subjects of EU technical legislation and of transferring the EU technical legislation into national legislation for the purpose of increasing the competitiveness of industry.



In line with the Association's Council Decision no. 1/95 that was signed on 6 March 1995 to determine the final stage of the Customs Union between country and the European Union and entered into effect on 01 January 1996, it was decreed that EU technical legislation is to be harmonized so as to be integrated into national legislation.

In this respect, the OSD Technical Committee works in cooperation with the Ministry of Industry and Technology on the subjects of EU technical legislation and of transferring the EU technical legislation into national legislation for the purpose of increasing the competitiveness of industry.

Our Association also represents industry at the Liaison Committee meetings held quarterly within the body of European Automobile Manufacturers' Association (ACEA), an important cooperation partner for our country's automotive industry, with participation from relevant national associations from the EU, where up-to-date global and local developments are evaluated.

The Technical Committee activities within the body of the International Organization of Motor Vehicle Manufacturers (OICA), of which OSD is a member, are attended actively;

particularly the developments related to global technical legislation are monitored and necessary information is conveyed to members and to relevant institutions and organizations.

In addition to engaging in the Technical Committees within the bodies of ACEA and OICA at international level, active engagement is realized in the Technical Sub-Committee that was established within the body of Motor Vehicles Technical Committee (Motorlu Araçlar Teknik Komitesi - MARTEK) that is carried out at national level under the coordination of the Ministry of Industry and Technology.

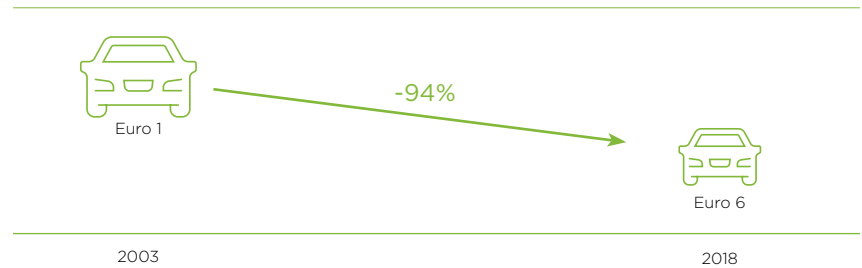
The Turkish automotive industry provides continuous improvements in relation to protecting the environment and reducing emissions through the new motor technologies and effective emission control systems being developed.

As of 1 January 2018, the Euro-6 emission level was made mandatory for national type-approved light duty vehicles (715/2007/AT) in our country, and the Euro 6 emission level was effectuated for heavy duty vehicles (595/2009/AT) as of 1 January 2016. Currently, OBD levels are consistent with the EU for light and heavy-duty vehicles.

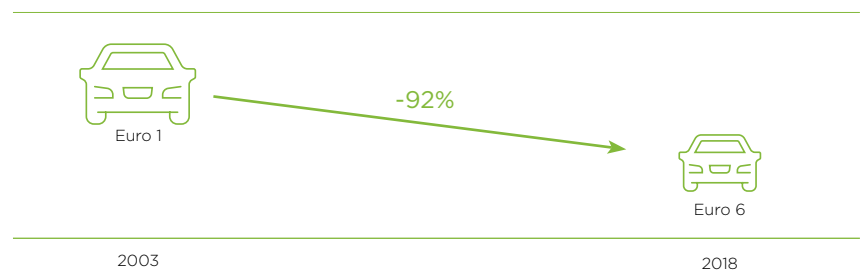
Historically, both greenhouse gas (CO₂e) and pollutant emission (NO_x, PM) parameters for motor vehicles were reduced considerably with the European standards adopted after the year 1990.

Reduction Rates in Terms of Emissions of National-Type Approved Vehicles in Turkey

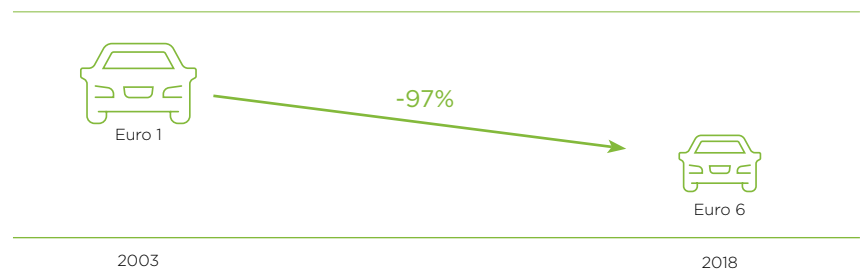
Petrol Passenger Car - NO_x



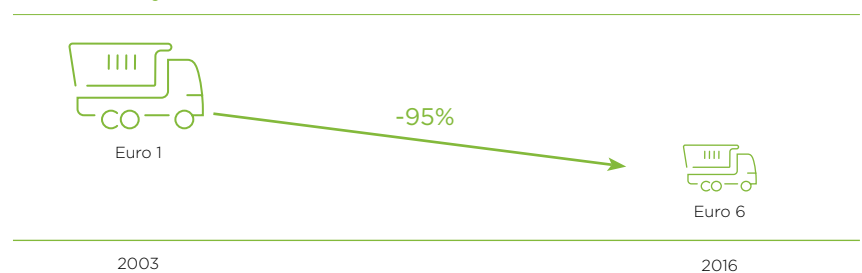
Diesel Passenger Car - NO_x



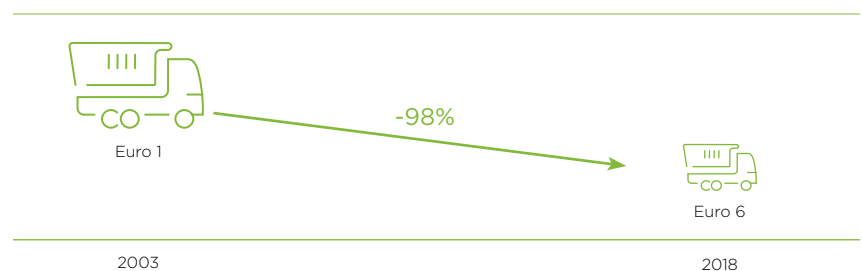
Diesel Passenger Car - PM



Diesel Heavy Commercial Vehicle- NO_x



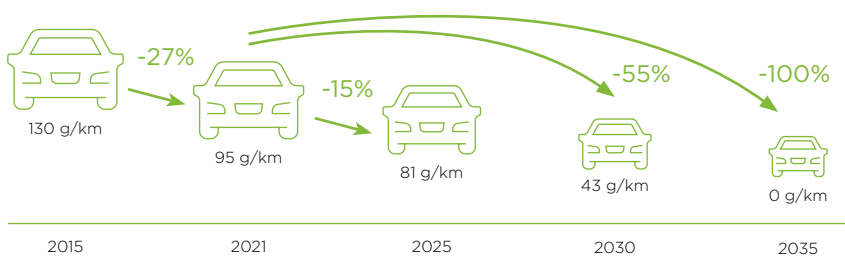
Diesel Heavy Commercial Vehicle - PM



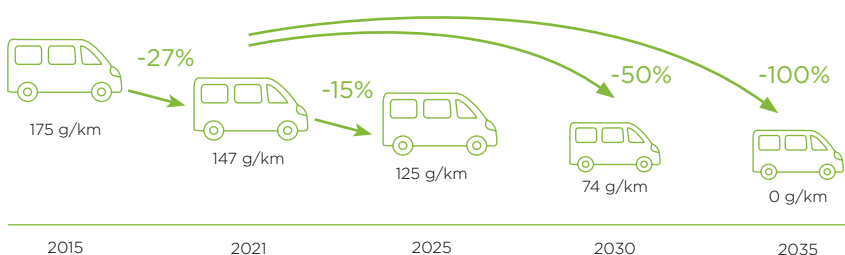
PRODUCT EMISSION STANDARDS - THEIR DEVELOPMENT IN TURKEY

On 14.07.2021, the European Commission announced the “Fit for 55” package, which is a package of proposals for the revision of EU legislation.

Passenger Car - CO₂



Light Commercial Vehicle - CO₂



Car Park in Turkey

It is known that the impacts of both greenhouse gas and pollutant matter from vehicles was significantly reduced during the transition from Euro 1 to Euro 6. In this context, it is seen that vehicles greater than 10 years old have much greater negative impacts upon the environment. It is also known that the vehicle age limit of 10 years is taken as the basis for the scrappage incentive programs already implemented or being prepared by EU countries.

As the Euro norms increase, significant improvements occur in average fuel consumptions. In this context, it is considered that renewal of the car park will provide a major contribution to the improvement of air quality, to the reduction of greenhouse gas emissions and indeed to the Turkish economy by reducing the country's petroleum demand.

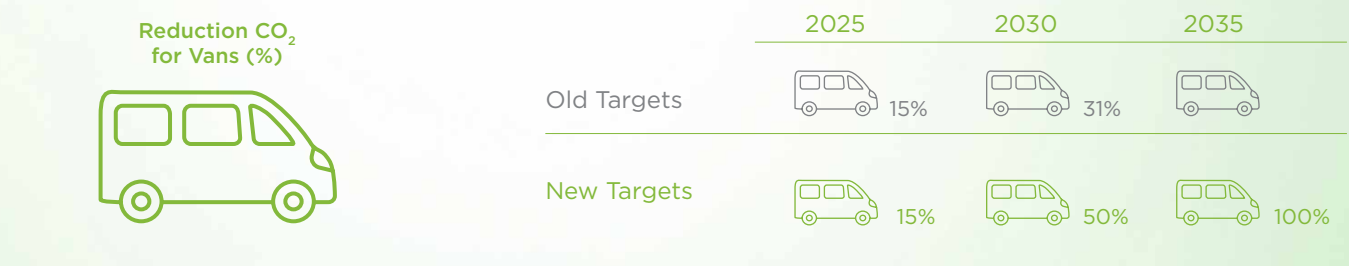
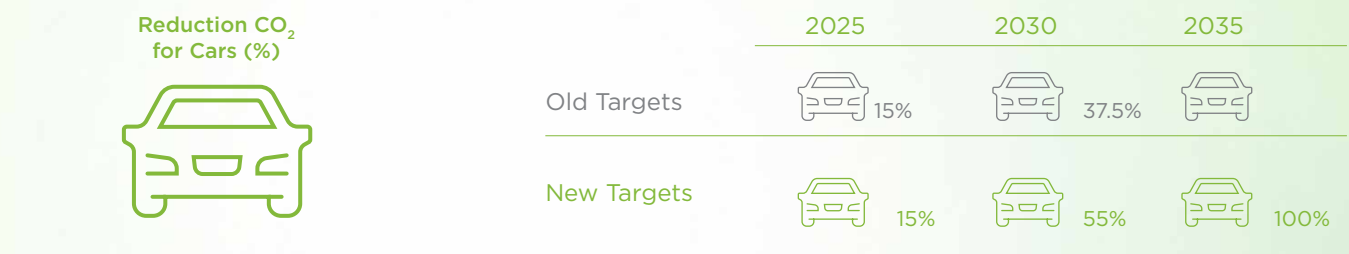
Although there is no CO₂ target regarding motor vehicles in our country because new passenger vehicles and light duty commercial vehicles are being produced in compliance with EU emission levels, the average CO₂ levels of these vehicles are at EU levels.

The European Commission presented the “Fit for 55” package, which is a package of recommendations regarding the revision of the EU legislation on 14 July 2021. The recommendations for change included in the package are as below:

- **New Passenger Cars and Light Commercial Vehicles CO₂ Emission Performance Standard Recommendation for Amendment (EU 2019/631 CO₂ Emission Performance Standards for New Passenger Cars and for New Light Commercial Vehicles Directive Amendment):** Revision of the CO₂ emission standards for light vehicles for accelerating the production and sale of low- and zero-emission vehicles. Reduction by 55% by 2030 and by 100% by 2035 in the average emissions of newly produced vehicles compared to the level in the year 2021, through the Amendment (2019/631).¹
- **Alternative Fuel Infrastructure Directive Update (EU 2014/94 Directive):** Developing the charging capacity in compliance with the zero-emission vehicle target of the EU countries through a new Regulation recommendation that will replace the existing Alternative Fuel Infrastructure Directive; stipulating a capacity of electricity charging supply every 60 km and hydrogen fuel supply every 150 km through adequate charging and fueling infrastructure.²

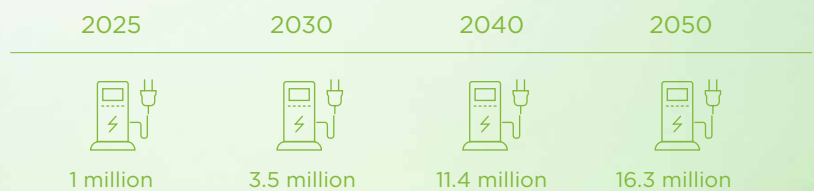
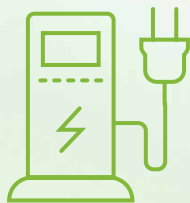
¹ Amendment of the Regulation 2019/631 setting CO₂ emission standards for cars and vans: https://ec.europa.eu/info/files/amendment-regulation-setting-co2-emission-standards-cars-and-vans_en

² Revision of the Directive on deployment of the alternative fuels infrastructure: https://ec.europa.eu/info/files/revision-directive-deployment-alternative-fuels-infrastructure_en



Public charging and hydrogen refuelling stations will be widely available, interoperable and easy to use, including at fixed intervals along Europe's major transport corridors

National fleet based target for charging stations for cars and vans - those could lead to approximately:



Source : ACEA

Under the 'Transportation Sector' heading of **the Climate Change Action Plan¹ (2011-2023)** published in country on 3 May 2010 by the Ministry of Environment and Urbanization, the objective of "Making necessary legal regulations towards increasing the use of alternative fuel and clean vehicles" was defined.

In addition, the objective "Conducting strategy development and planning activities towards developing electric vehicle and charging infrastructure" is stipulated under the heading '**Sustainable Intelligent Transportation**' in the **Green Deal Action Plan²** published by the Ministry of Commerce on 16 July

2021, while it is stipulated under the heading 'Combating Climate Change' that the "2023-2030 Climate Change Action Plan and 2050 Climate Change Strategy will be prepared in the year 2022".

Under the heading 'Transportation Sector' within the **National Energy Efficiency Action Plan³ (2017-2023)** that was published by the Ministry of Energy and Natural Resources on 29 December 2017, objectives such as "Generalizing alternative fuel and/or new technology vehicles" and "Granting tax advantages for vehicles using fuel cells, electricity and hybrid engines with high energy efficiency, low emission level, environment-friendly, small engine volume" were defined.

New passenger cars and light commercial vehicles produced in Turkey **satisfy the EU emission levels and standards.**

¹ Climate Change Action Plan (2011-2023): <https://webdosya.csb.gov.tr/db/iklim/banner/banner591.pdf>

² Green Deal Action Plan: <https://ticaret.gov.tr/data/60f1200013b876eb28421b23/MUTABAKAT%20YE%C5%9E%C4%B0L.pdf>

³ National Energy Efficiency Action Plan (2017-2023): <https://enerji.enerji.gov.tr//Media/Dizin/EVCED/tr/EnerjiVerimlili%C4%9Fi/UlusalEnerjiVerimlili%C4%9FiEylemPlan%C4%B1/Belgeler/UEVEP.pdf>

PRODUCT LIFE CYCLE ASSESSMENT (LCA) AND CARBON FOOTPRINT

The OSD and member companies regard LCA studies as important in assessing the automotive industry's production-based environmental impacts in a holistic manner.

70%

According to the Product Life Cycle Assessment (LCA), approximately 70% of the carbon footprint impact of a vehicle is the use phase.

The study of product life cycle assessment (LCA) is a scientific method defined under standards ISO 14040 and ISO 14044 assessing all environmental aspects related to a product at all stages from the acquisition of raw materials through the product's use and to the disposal of waste ('from cradle to grave') in a comprehensive and holistic manner. LCA studies are regarded as important by OSD and member companies for the production-based environmental impacts of the automotive industry from cradle to grave to be comprehended in a holistic manner.

Product Life Cycle and the Automotive Sector

When a preliminary literature survey is conducted, it is observed that there are different impacts at different stages for a vehicle, based on the stages it goes through during its life cycle and the carbon footprints during these stages.

According to the WorldAutoSteel¹ study, when the environmental impacts of a vehicle through its life cycle are assessed, it is observed that the highest impact with regard to influencing climate change occurs during the use phase of the vehicle. The stage of operating the vehicle covers the direct and indirect carbon emissions caused by fuel production and consumption. In this respect, the indirect carbon emission impacts due to fuel production are approximately 10%, while the direct (i.e. caused by combustion) fuel carbon emissions are 70%, of the total emissions. This result shows that one of the topics that should be given the highest importance by automotive industry regarding climate change are product standards and alternative fuel vehicles. In recent years, countries have leant towards electric vehicle production and incentive mechanisms, while it is also a fact that the carbon intensity of the electricity to be used from the grid when transitioning to electric vehicles will define the emission reduction opportunities. Therefore, the relationship between electric vehicles and the electricity grid was also assessed **Product Life Cycle Assessment (LCA) Report²**.

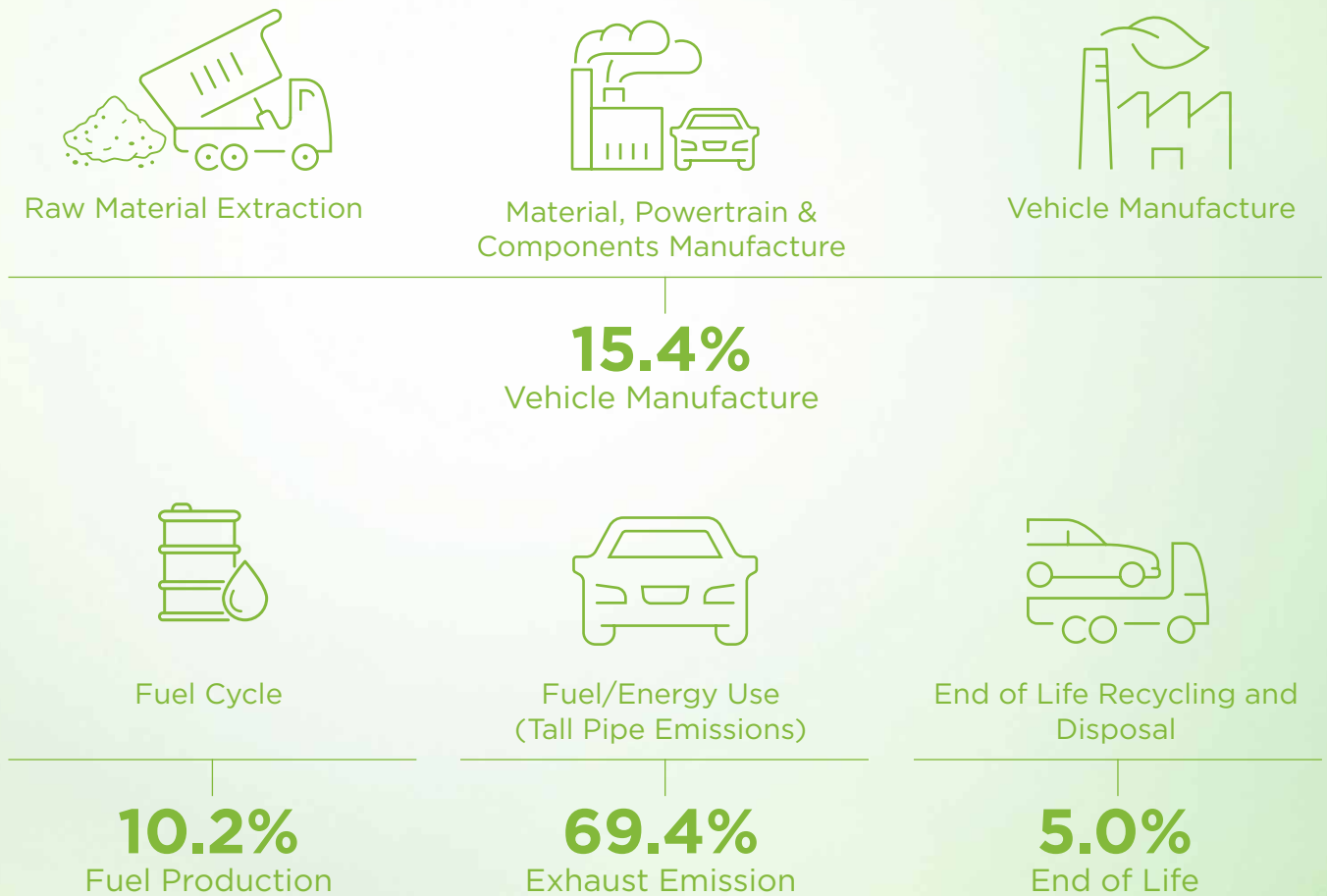
At around 1-5% climate change impacts caused by vehicle manufacturers' production processes, including the supply chain, are lower than those of the in-use stage. The definition of 'vehicle production' observed in the literature review covers extracting and processing the raw materials, processing automotive



¹ Life Cycle Assessment: Why is it Important? - AHSS Guidelines (ahssinsights.org)

² "Turkish Automotive Industry Product Life Cycle Assessment (LCA) Report" is available on www.osd.org.tr

Vehicle Emissions Based on LCA



Automobile Product Life Cycle Carbon Footprint Distribution 1 (The article World Auto Steel 'Life Cycle Assessment: Why is it Important?' was used.)

parts within the automotive supply chain, shipping of the processed parts, and finally the production stages within the automotive main industry.

It is known that the climate change impacts due to the production stages within the automotive main industry plants constitute a small portion of the approximately 1-5% share mentioned above. Despite the lower rates of impacts, member manufacturer companies continue their activities towards reducing the existing impacts of the production stage, mindful of the importance of resource- and energy-efficiency.

The greenhouse gas emissions due to removing vehicles from the market and recovery/disposal processes at the end of their life have an even smaller impact, corresponding to 5% of the total. Within the End-of-Life Vehicles (ELV) Regulation, the high recovery, recycling, and reuse rates target is handled from the design stage, and much importance is attached to this stage due to its contribution to the circular economy.

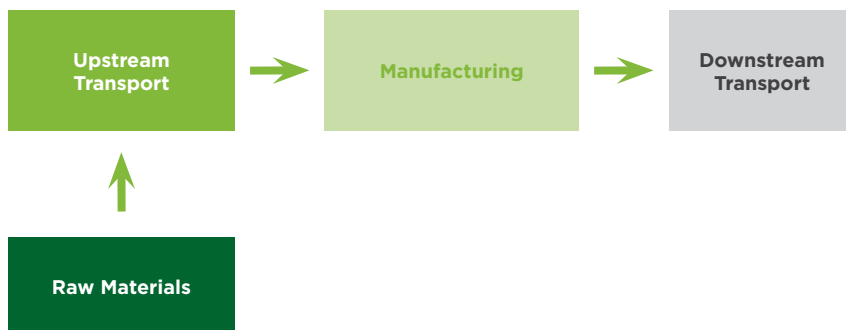
Member manufacturer companies continue their activities towards reducing the existing impacts of the production stage, **mindful of the importance of resource- and energy-efficiency.**

¹ Life Cycle Assessment: Why is it Important? - AHSS Guidelines (ahssinsights.org)

PRODUCT LIFE CYCLE ASSESSMENT (LCA) AND CARBON FOOTPRINT

We believe that the environmental impacts of the automotive industry need to be measured through a scientific assessment such as LCA in order to be better comprehended.

OSD LCA Study Scope



OSD LCA Study Scope: The scope encompasses calculation of carbon footprint in particular but also of other environmental impacts in a holistic manner caused by product and material inputs received from pre-production suppliers by six OSD member companies dealing in the production of light vehicles, shipping of such inputs up to the production plants, resource consumptions such as energy (electricity, natural gas and other) and water, volatile organic compounds due to production, and distribution of the products to final customers. As the automotive industry supply chain has a multi-layer structure, calculation of environmental performance such as carbon footprint was conducted using the databases of the material (steel, aluminum, plastic etc.) breakdown on the product within the context of this study. The carbon footprint results of the LCA study conducted in terms of climate change impacts are shown in the graph below. In this assessment conducted using the data from OSD member manufacturer companies, the vehicle operation stage and recovery/disposal stage were excluded from scope for the purpose of focusing on production.

Results of the Turkey Automotive Industry Product Life Cycle Study

Holistic assessment of environmental impacts throughout processes such as extraction of raw materials, production within the multi-layer supply industry of the automotive industry, logistics until reaching automotive main industry plants, production, post-production logistics, operation of the vehicles and recovery of the end-of-life vehicles at ELV facilities after their use requires a considerably complex and detailed study. However, it is understood that the environmental impacts of the automotive industry need to be measured through a scientific assessment such as LCA in order to be better comprehended. To this end, all calculations within the scope of LCA study from cradle to grave were calculated for the products categorized as light vehicles produced by automotive industry in accordance with ISO 14040/44 standards (excluding vehicle operation and ELV stages).¹

In conclusion, the LCA study conducted for OSD in line with the data received from OSD members found the carbon footprint value for light vehicles to be 4,669 kg CO₂ equivalent per tonne. Considering that the light vehicles of OSD manufacturers produce have an average weight of 1.2 tonnes, the ex-factory carbon footprint including distribution was found to be 5,603 kg CO₂ equivalent for one light vehicle. All values presented in this study are given for 1 tonne vehicle weight that is used as the LCA declaration unit.

¹ "Turkish Automotive Industry Product Life Cycle Assessment (LCA) Report" is available on www.osd.org.tr

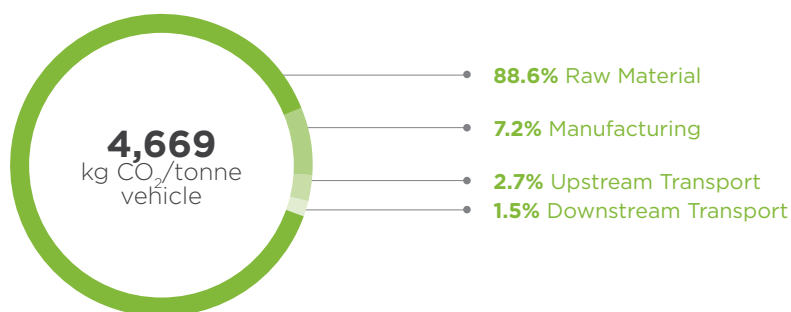
We conducted a LCA study for an average light vehicle produced in Turkey.

The materials used in production correspond to a significant portion of total emissions (88.6%). The carbon footprint value caused by materials used in vehicle production per tonne unit light vehicle was calculated as 4,136 kg CO₂ equivalent. The breakdown of this impact between the materials used is as shown right:

In terms of the materials used in the product, steel - as the metal most dominantly used in production - stands out. The European Green Deal declared by the European Commission includes the goal that zero-carbon steel production will be achieved in the EU by 2030; this study reveals that transition to low-carbon processes within steel production will have a significant impact on the carbon footprint of the automotive product life cycle. Carbon footprint values originating from materials include the extraction of raw material, logistics of delivery to the production site and the processes required for turning the materials into semi-finished products or products.

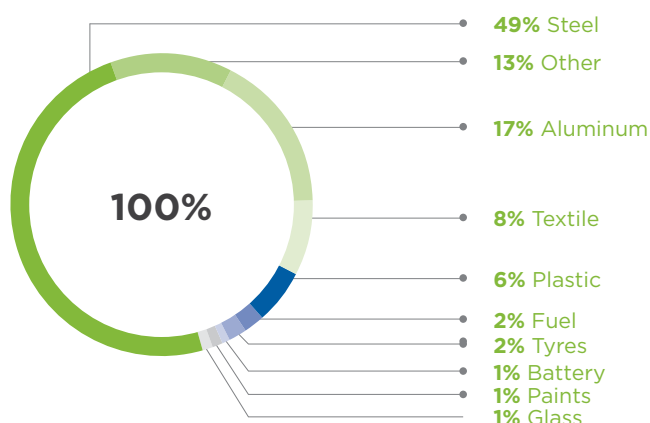
Reducing greenhouse gases in steel production will come to the fore even more in the coming period.

Carbon footprint distribution for production stages of average light vehicle category per tonne unit weight in Turkey ¹



(The operation stage of the products included in literature survey and the recovery/disposal stage of end-of-life vehicles are not covered within the scope of this study.)

The carbon footprint value caused by raw materials used in vehicle production per tonne unit light vehicle¹



¹ SimaPro 9.0, MetSims Sustainability Consulting

PRODUCT LIFE CYCLE ASSESSMENT (LCA) AND CARBON FOOTPRINT

According to our LCA study, upstream logistics accounted for 2.7% of the carbon footprint, and downstream logistics 1.5%.

One of the reasons for the fewer share of logistics in total emission is **due to the high rate of maritime transport in the logistics options** used in the purchase of raw materials and in the distribution of final products.

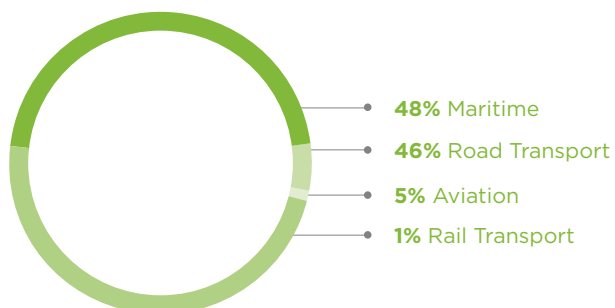


According to our LCA study, the upstream logistics portion of the carbon footprint was calculated as 2.7% and downstream logistics as 1.5%. The share of upstream and downstream logistic rates based on the transportation type is given

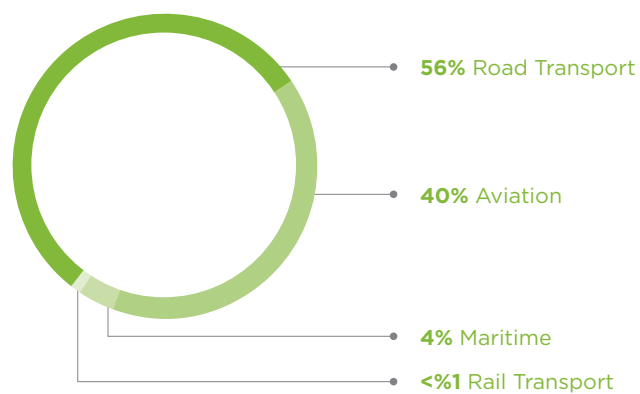
in figures. One of the reasons the emissions originating from logistics are seen to be this low may be that maritime shipping is used predominantly among the logistics options for procurement of raw materials and for the distribution of final products.



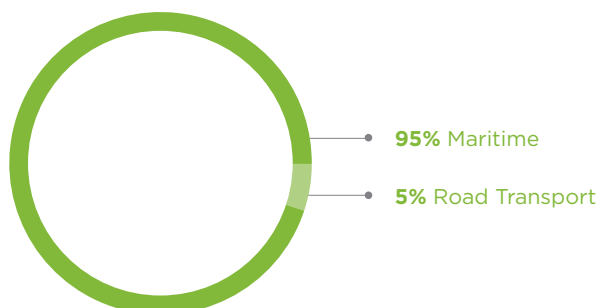
Upstream Logistics Distribution (tkm)



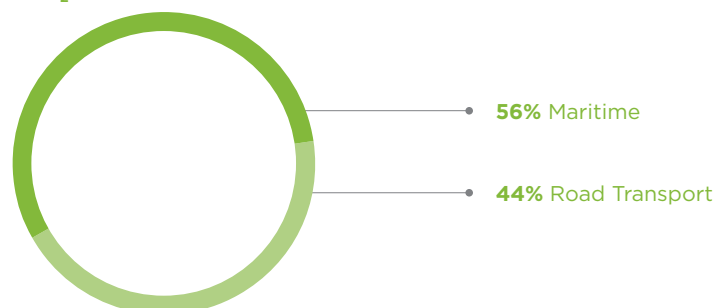
Upstream Logistics Carbon Footprint Distribution (CO₂ e)



Downstream Logistics Distribution (tkm)



Downstream Logistics Carbon Footprint Distribution (CO₂ e)



RESPONSIBLE PRODUCTION

Significant improvement has been achieved in the use of energy and the reduction of greenhouse gases, with the use of the best available technologies and investments in automotive production facilities.

The OSD Environmental Committee was established in 1996, with the environmental officers/engineers of OSD members coming together to share knowledge and experience.

The UN and the climate experts highlight that we have entered the final decade for achieving Sustainable Development Goals and Paris Agreement targets. In line with these targets, the automotive sector also has a responsibility considering its area of impact for the transition to low carbon economy and the reduction of environmental pollution.

OSD, together with all its members, has been focusing on goals such as developing efficiency-oriented projects, reducing the consumption of natural resources, keeping track of innovative processes, ensuring prevention of pollution, conducting actions towards minimizing the negative impacts on the environment, and realizing awareness-raising activities for environmental protection in the scope of life cycles for full environmental compliance. Members are distinguished in the national and international assessments and audits with the cutting-edge technologies they use in their existing manufacturing processes and the quality/environment systems and standards they follow.

The OSD Environmental Committee was established in the year 1996 in line with the ISO 14001 Environment Management Standard certification processes, with the cooperation among the environment officers and engineers of OSD members coming together to exchange knowledge and experience with regard to compliance with environment legislation. Since the Committee was established, it has continued its regular monthly activities keeping track of the developments emerging in relation to the environment. No non-conformances to environmental laws and regulations have been experienced within the reporting period.

Climate Crisis and Production (Energy Management and Production Carbon Footprint)

Energy efficiency in production has an important place in the combat against the climate crisis, and both environmental impacts and greenhouse gas emissions are reduced through energy efficiency actions.

Our member companies conduct benchmark studies with manufacturing plants both inside and outside of Turkey, set new targets for constant improvement, and have manufacturing plants that achieve advanced levels within international benchmark assessments through the use of best technologies.

Thanks to energy efficiency actions such as energy consumption monitoring, energy performance improvement in fields with high energy consumption, use of energy-saving equipment and new technologies, lighting (LED conversion) projects, paint shop heat insulation and recovery projects, economizer applications, increasing use of renewable energy resources, and manufacturing plant optimizations, reductions have been achieved in the amount of consumption of equivalent energy per unit vehicle.

For instance, when the energy consumption per unit light vehicle production between the years 2015 and 2020 (values for six plants producing light vehicles) is examined, it is observed that production declined by 3%, while overall energy consumption decreased by 25% and equivalent energy consumption per unit vehicle decreased by 16% within the same period.





In that period, heavy duty commercial vehicle production declined by 42%, while overall energy consumption decreased by 75% and equivalent energy consumption per unit vehicle decreased by 56%.

With the Regulation on Monitoring and Reporting Greenhouse Gas Emissions published on 17 May 2014, the plants in scope were obligated to prepare monitoring plans, submit them to the Ministry of Environment and Urbanization, obtain approval from the Ministry, and submit their annual greenhouse gas reports that are approved by authorized certification organizations to the Ministry. The Regulation's scope and obligations comply with the EU's MRV Regulation, and automotive plants with installed thermal power of 20 MW and above fall within its scope.

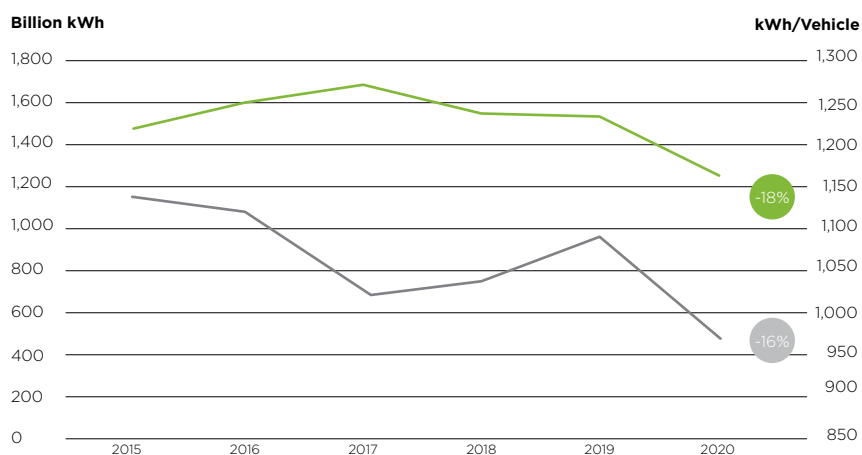
When the Scope 1 and Scope 2 greenhouse gas emission data taken from six production plants producing light vehicles for the period 2015-2020 is examined, it is observed that the greenhouse gas emissions per unit vehicle in production have decreased by 16%.

In 2017, OSD established the Energy Efficiency Working Group with the participation of energy managers from its members.

(The outcomes regarding energy management may be accessed from the energy table included under the "Annex-3 Environmental Performance Indicators.")

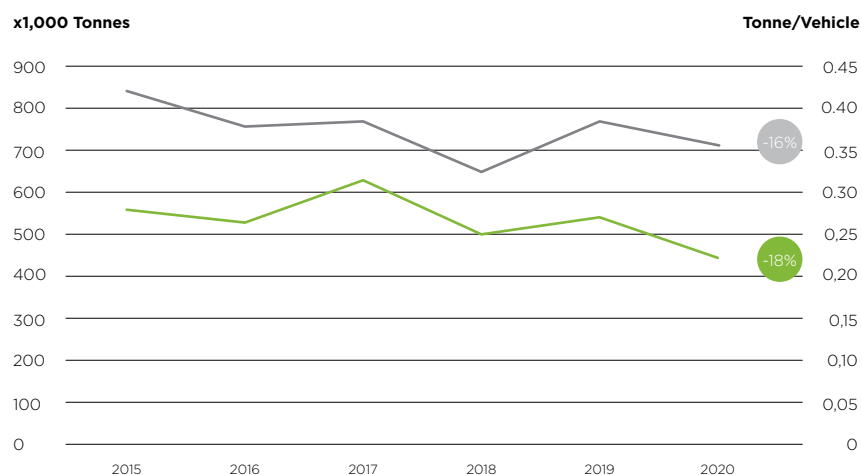
Energy Consumption in Production*

■ Total Equivalent Energy Consumption (billion kWh) ■ Unit Equivalent Energy Consumption (kWh/Vehicle)



Greenhouse Gas Emissions in Production* (Scope 1&2)

■ Total Scope 1 & 2 Greenhouse Gas (x1000 Tonne) ■ Unit Scope 1 & 2 Greenhouse Gas (Tonne/Vehicle)



* Data from 6 facilities manufacturing light commercial vehicles

RESPONSIBLE PRODUCTION

In addition to the target of being carbon neutral as of the year 2050, the EU also has the target of zero pollution within the scope of European Green Deal.

17%

Through new investments and improvement actions, the paint shop VOC parameter of the automotive plants dealing in automobile production was reduced by 17% between the years 2010 and 2020.

Industrial Emissions and Volatile Organic Compounds

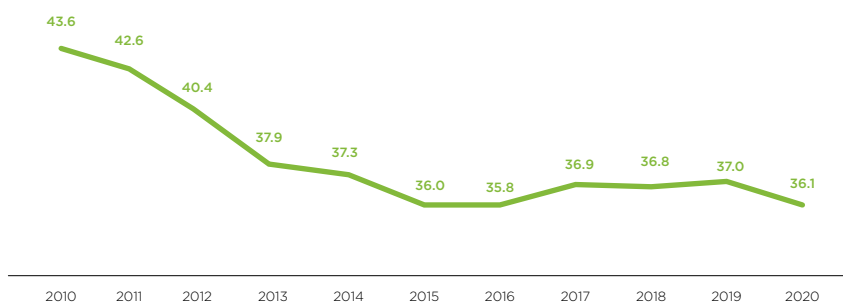
In addition to the target of being carbon neutral as of the year 2050, the EU also has the target of zero pollution within the scope of European Green Deal. In this context, the 2010/75/AT Industrial Emission Directive (IED) and implementations will be updated.

Turkey also has the objective of adapting this Regulation into its national environment legislation. The Regulation includes the best available techniques (BAT) and the certification process based on BAT reference documents (BREF) that may be obtained by application of these techniques to help prevent pollution within the production process at automotive plants. The BAT reference document to be implemented at automotive plants is STS BREF (Surface Treatment Using Organic Solvents)¹. According to this, the most critical issue is the emissions from volatile organic compounds (VOCs) at the paint shops.

A project on Determining the Compliance and Requirements of the Automotive Manufacturing Plants Subject to Integrated Environment Permit (IEP) was conducted by the Ministry of Environment and Urbanization in the year 2016. Within the scope of this project, the entirety of members plants were assessed in terms of compliance status and investment requirements. It was reported that the automotive VOC limits within Turkey's Regulation on the Control of Industrial Air Pollution and the regulation limit values were the same, and that the production plants in Turkey were in compliance with the EU's current legislation.

The 2007 version of STS BREF, which was used in the Draft Legal Notice on the Integrated Pollution Prevention and Control for the Surface Treatment Processes Using Solvents in the Automotive Sector and was handled in the scope of the IEP project, was updated in the EU; the STS BAT Final Document was published on 9 December 2020 and includes significant changes to the prior document (new parameters and lower limit values).

VOC (gr/m²)



On the agenda of the OSD Environmental Committee, 2010/75/AT Industrial Emissions Directive (IED) and relevant BAT final document developments are discussed. When making new investment decisions, the plant parameters and limit values are taken into consideration. Through new investments and improvement actions, the paint shop VOC parameter of the automotive plants dealing in automobile production was reduced by 17% between the years 2010 and 2020.

¹ <https://eippcb.jrc.ec.europa.eu/reference/surface-treatment-using-organic-solvents-including-wood-and-wood-products-preservation>

Circular Economy and Waste Management

The Circular Economy is defined as the economic system that will ensure that products, materials and resources remain as long as possible within the economic value chain and will minimize waste generation to the lowest possible levels. The European Commission indicates that half of global greenhouse gas emissions originate from raw material extraction and production, and that achieving Europe's 2050 target of becoming carbon-neutral will not be possible without transitioning to a circular economy.

According to Global Resources Outlook (2019), global raw material extraction increased three-fold between 1970 and 2017 and is still on the rise. Over 90% of the biodiversity decline and water scarcity is caused by raw material extraction and processing.

The European Commission published the New Circular Economy Action Plan communication document within the scope of European Green Deal on 11 March 2020. According to this, the aim is to accelerate the radical transformation stipulated by the European Green Deal and advance the circular economy actions that have been implemented since 2015.

In Turkey, the automotive industry has had a pioneering role for recovering production wastes back into economy since the year it first began production. Especially at the end of the 1990s, the industry made initiatives towards having wastes specific to the automotive industry (such as paint sludge, phosphate sludge, waste rubber, waste grease etc.) be used auxiliary fuels at cement factories. Currently, 97% of automotive industry's wastes are recovered into the economy, and good practices are applied in the scope of the Zero Waste Regulation.

More than 97% of the Turkish automotive industry production wastes are recovered in Turkey.



RESPONSIBLE PRODUCTION

There are laws in effect in both the EU and Turkey for all stages of a product's life cycle for the purpose of protecting the environment and recovering wastes.

95%

Reuse-recovery rates for end-of-life vehicles are at least 95% of the average vehicle weight.

End of Life Vehicles (ELV)

The processes of collection, recovery and disposal for automotive products at the end of their life are considered at the very beginning of the product's design, and it is intended that the environmental impacts from vehicles that are at the end of their lives and removed from the market are mitigated, and that they are recovered into the economy. There are laws in effect in both the EU and Turkey for all stages of a product's life cycle for the purpose of protecting the environment and recovering wastes.

EU: End of Life Vehicle Directive (2000/53/EC - ELV Directive)

With this Directive published in 2000, prevention of wastes originating from scrap vehicles and their collection, reuse and recycling for the purpose of environmental protection were set as goals. The ELV Directive defines clear

goals in relation to the reuse, recycling and recovery of vehicles and vehicle parts, and encourages manufacturers to manufacture recyclable vehicles.

Turkey: Regulation on the Control of End-of-Life Vehicles (ELV Regulation) (published in the Official Gazette no.27448 dated 30 December 2009)

The Regulation published by the Ministry of Environment and Urbanization in 2009 is mostly in compliance with the EU's ELV Directive. As of 1 January 2020, the use/recovery rates have been raised to minimum 95% of the average vehicle weight, and the use/recycling rates raised to minimum 85% of the average vehicle weight to be valid, and member companies are complying with these targets.

Battery Management

Through the EU countries' 2050 Carbon Neutral targets, the electric vehicle market will expand significantly; battery supply and management in particular are likely to be paramount on this path leading to 2050. Concerning the New Circular Economy Action Plan from the European Commission, it is observed that one of the seven designated sectors/fields is batteries.

While battery technology is a technology with a transformative characteristic for both automotive and energy sectors, its actual contribution in relation to energy consumption and climate change will only be possible if an industry dedicated to circular and sustainable economy standards could be developed. This economic approach should extend from the extraction of the materials required for batteries to materials processing,



battery cell production processes, and to areas and forms of use. In this respect, it is expected that when the batteries used in automotive are reduced to approximately 20% of their initial capacity, they will be used as second-hand batteries either in cheaper vehicles or in the field of energy storage. Due to this, it is projected that the second-hand battery market will become significant especially from 2025 onwards. In this regard, there are projects underway, in Turkey as in the EU, on the topics of the possibility to use end-of-life batteries for secondary use in energy storage, and to recycle them afterwards to recover the materials - precious metals especially - into the country's economy.

Water and Wastewater Management

The climate crisis creates a threat to existing water resources, and the resulting water scarcity threatens a major portion of world's population, while global water consumption continues to increase. According to the United Nations World Water Development Report¹ 2021, while global water consumption had increased by 15% during the last hundred years, currently consumption is increasing by 1% each year.

Considering the amount of usable water per capita, Turkey is now regarded as a water-stressed country. According to WWF's report on Turkey², the amount of water per capita will decline to 1,100 m³ in Turkey with a projected population of 100 million, and water stress in our country will become significantly apparent in the year 2030.

Due to all these reasons, OSD member companies embrace a responsible water consumption approach regarding their production activities. There are projects being developed for both increasing water consumption efficiency and reusing water, through the investments and improvement activities realized and the use of best technologies especially at paint shops.

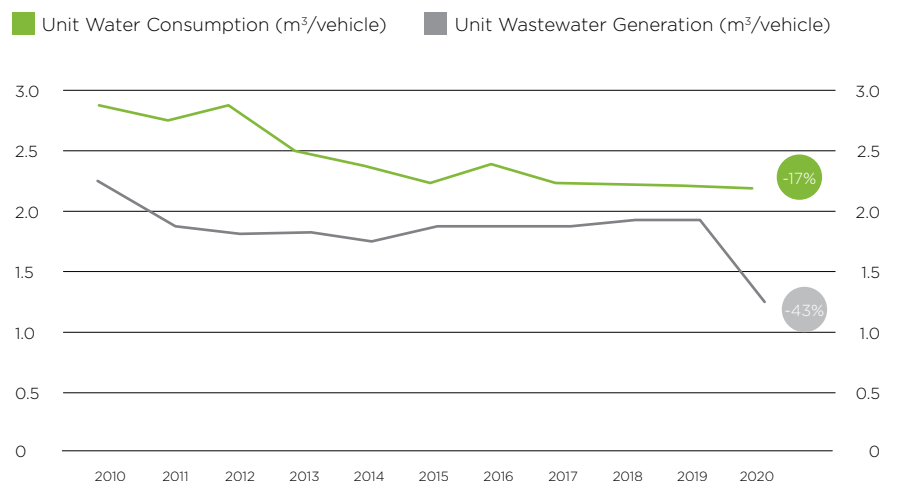
No significant change was observed in unit water consumption between the years 2015 and 2020. The reason for this may be the sector having reached its optimal point through the actions taken over many years. When current water consumption per unit light vehicle is compared with the period preceding the year 2015, it is observed that (for six manufacturing plants producing light vehicles) production increased by 22% while water consumption per unit vehicle decreased by 17% during the period between the years 2010 and 2020. When the assessment is extended to the last 15 years, it is observed that water consumption per unit vehicle decreased by a greater reduction rate of 36%.

Concerning wastewater generation, it is observed that total wastewater amount decreased by 30% and unit wastewater amount decreased by 43% due to the investments and projects realized between 2010 and 2020. These successes will encourage the sector to conduct further actions towards recovery of process water in the future period.

36%

Water consumption reduction per unit vehicle in the last 15 years.

Water Consumption and Wastewater Generation in Production*



* Data from 6 facilities manufacturing light commercial vehicles



¹ The United Nations World Water Development Report 2021: <https://digitallibrary.un.org/record/3905488?ln=en>

² WWF Turkey: https://www.wwf.org.tr/ne_yapiyoruz/ayak_izinin_azaltilmasi/su/turkiyesuzengibirulkemi/

RESPONSIBLE PRODUCTION

OSD members' production plants recovered and reused more than 300,000 m³ of wastewater in 2020 through the water technology investments they made.

The water procured for production processes is **supplied from the domestic grid and underground water resources.**



The water procured for production processes is supplied from the domestic grid and underground water resources. Underground water consumption is controlled through legislation. In this regard, OSD members using underground water abide by their legal obligations and control their impacts on the aquifer.

In addition to efficient use of water, the industrial wastewater generated due to production processes and the domestic wastewater generated inside the production plants are treated at wastewater treatment plants, and the treated waters disposed to the environment are discharged in compliance with the parameters and limits stipulated under Table 18.2 of the Regulation on the Control of Water Pollution.

Furthermore, members' production plants recovered and reused more than 300,000 m³ of wastewater. In 2020, the technology investments that OSD members made helped them recover and reuse more than 300,000 m³ of the wastewater at their production plants.

Within the scope of the environment management training provided to raise employees' awareness, knowledge is shared on the topic of water and wastewater management.

BIODIVERSITY

All measures required for preserving the existing flora and fauna and managing any potential impacts throughout all activities are taken.



Member companies contribute to the protection of biodiversity through projects for planting.

In line with the goal of protecting biodiversity, industry takes all measures required for preserving the existing flora and fauna and managing any potential impacts throughout all activities. At the forefront of these measures are the preparation of Environmental Impact Assessment (EIA) reports for projects to be undertaken, and the definition of the flora and fauna and the relevant measures to be taken

in the project region. In this context, OSD members cooperate with stakeholders such as civil society organizations and universities, develop programs including measures and recommendations, and act in coordination to define, monitor and protect the species listed as under threat of extinction through field surveys. At the same time, member companies contribute to the protection of biodiversity through projects for planting saplings of trees such as linden, fig, pine and cedar. Member companies have no activities inside the high biodiversity areas and ecosystems included under the IUCN Red List.



HUMAN RESOURCES

Retaining and developing qualified personnel, which is one of the most important aspects for competitiveness in the automotive industry, has been the topic of utmost priority in the year 2020.

53
Thousand+

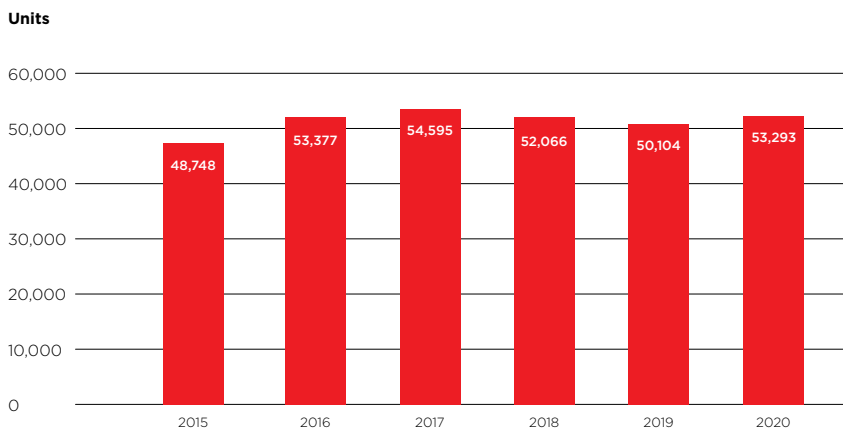
High Quality
Work Force

Human Resources Policy and Development of Employment

Establishing a culture of employment related to strategic objectives and sustainable priorities, bringing qualified employees into the sector through talent management, creating work environments that will enhance employees' performance, pursuing diversity, ensuring equal opportunities, and continuously improving human resources processes are the priorities of the human resources policies of OSD members.

Although interruptions in production became unavoidable - especially in March and April 2020 - due to the pandemic that emerged in the first quarter of 2020, project studies and investments in the industry went on as planned. Employment in the automotive main industry increased by 6% both due to new projects and as a measure against any setbacks possible due to the pandemic, and exceeded 53,000. Taking into consideration the multiplier effect of the main industry - the driving force of the automotive sector over the entire value chain - it is considered that the sector's total employment exceeds 500 thousand people.

Automotive Main Industry Employment Improvement



Retaining and developing qualified labour, which is one of the most important aspects for competitiveness in the automotive industry, has been the topic of utmost priority in the year 2020. In an industry that continued its new project studies and declared resolutions for new investments in 2021, employment will likewise continue to increase.

R&D activities, which is one of the strongest aspects of the industry, continued without interruption in the year 2020 with a total of 4,008 R&D employees.

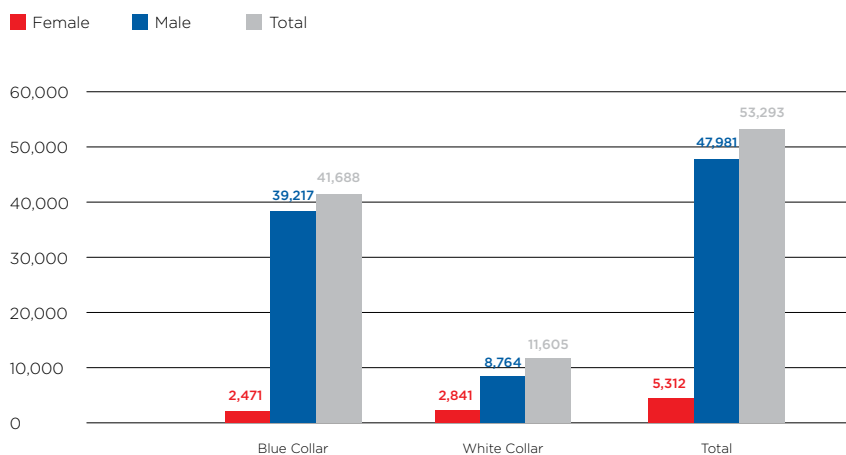
Demographic Indicators

The qualified labour force in the automotive industry has emerged as an important attractant for new investment into the country thanks to its high education and competence level and its institutional business culture that has set an example for the global business world. OSD member companies, in which 22% of total employment is in offices, continue their actions to maintain the highly qualified labour force in the industry in the long term, and make significant investments to this end.

In the automotive industry, in which there is an exemplary level of educated personnel, more than 60% of the blue collar workers are graduates of vocational high schools. Mindful of the importance of such schools for vocational development, OSD members conduct many activities to help the development of vocational schools.

In an industry where approximately 90% of the office employees are educated to graduate and post-graduate level, companies constantly undertake training activities within the academies established in-house. Ensuring constant development of the qualification level of personnel in this changing world is an ordinary part of the business processes within the automotive industry. Retaining qualified personnel within the industry is seen as an important aspect for competitiveness, and strategies are developed towards this purpose. The 'brain drain' is seen as a significant risk regarding loss of competitiveness for automotive industry.

Employment Based on Gender

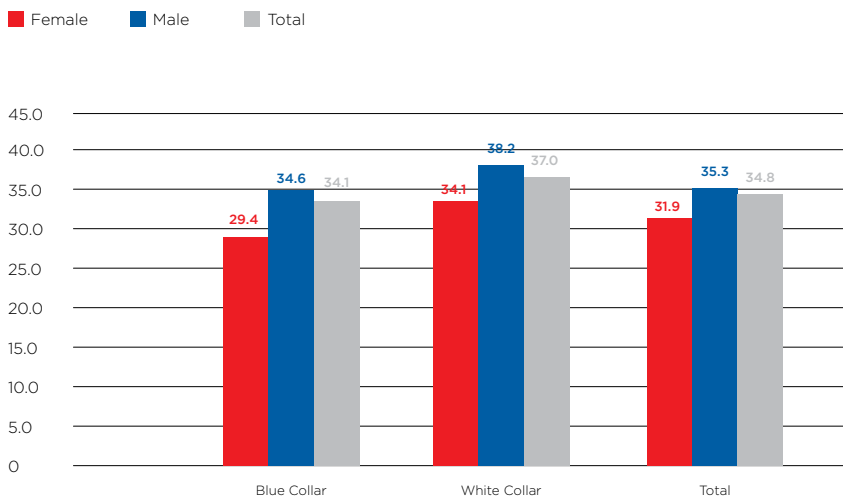


	Blue Collar	White Collar
Primary Education	7.7%	0.5%
High School	32.9%	2.2%
Vocational / Technical High School	39.3%	3.3%
Vocational Associate Degree High School	18.1%	7.0%
University	2.0%	64.9%
Master	0.1%	19.5%
Doctorate	-	0.8%
Other	-	2.0%
Total	100%	100%

HUMAN RESOURCES

OSD and its members have respected human rights since their establishment and prioritized the satisfaction of their employees.

Average Age

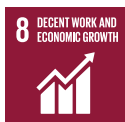
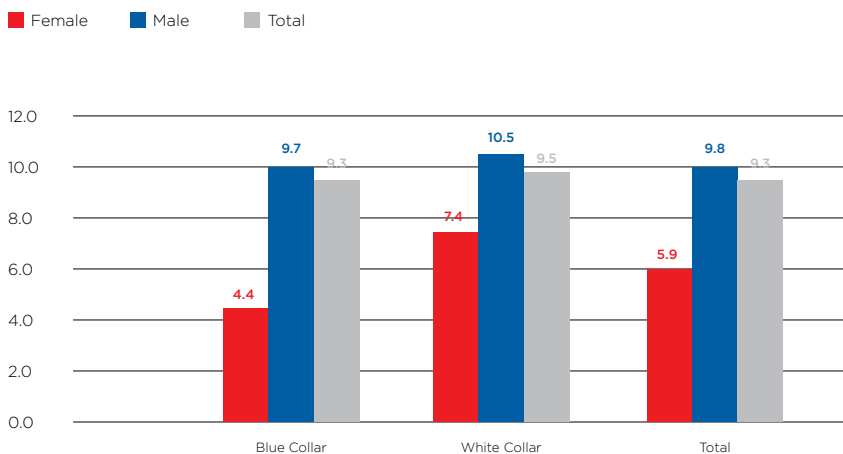


Within the main industry that houses a young labour force, the average age is 35. It is important that knowledge and experience are preserved in the sector; the average length of employment is over 9 years.

Dignity of People (Diversity, Knowledge Exchange and Appreciation)

Since their foundation until this day, OSD and its members have always respected human rights as a part of their corporate culture, seen differences as assets and turned them into advantages, and prioritized the satisfaction of employees. OSD and its members, who under no circumstances stray from these principles, see their employees - their highest priority stakeholders - as their most important asset that plays the greatest role in their success and sustainability. OSD members take into consideration the requests conveyed by their employees through internal communication channels such as employee loyalty surveys and target necessary action to be taken.

Average Length of Employment Years



Female Employees

OSD and its members who prioritize supporting and providing employment to women, aim to ensure that women are included at all levels within the economy. At the same time, they create opportunities for attracting women into the automotive sector and support them on their career path.

The joint conclusion of many studies conducted throughout the world and in Turkey points out that the presence of women in economic life has a positive impact on both the created values chain and the gains obtained. Ensuring participation of women in economic life as equals to men is seen as one of the most important issues in Turkey.

OSD and its members carry out many actions towards increasing women's employment within the automotive industry. In this context, a study entitled "Women within Turkey Automotive Industry" was conducted in 2017 by OSD in cooperation with Deloitte.

In the light of the data obtained through this study conducted with the participation of a total of 1,143 white collar female employees employed within the body of OSD members, the position of Turkish women within the automotive industry and the analyses of their standing compared with that of their colleagues in Europe and America were revealed. The study outlined the expectations of women from the sector and attempted to explain how, from their perspective, the sector could be made more attractive for women. 95% of the white collar women participating in the study were educated to degree level or higher, and 57% had an engineering education background.

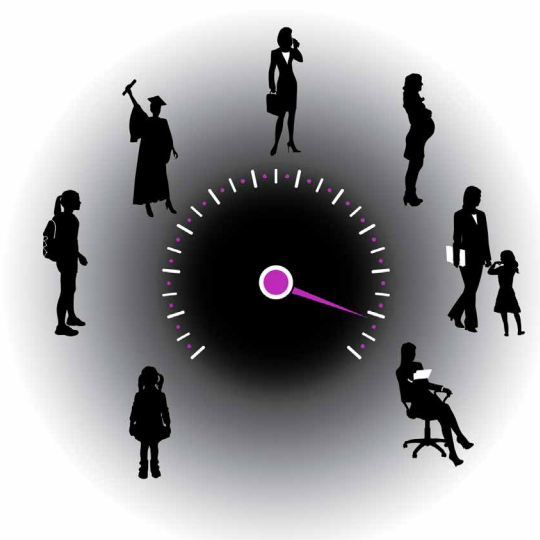
According to the study, attracting more highly qualified women to the sector is of importance in order to realize high added value production. Women within the automotive

"Women within Turkey Automotive Industry"

industry also point out the scarcity of female leaders and female employees' representation. 85% of the participants pointed out the lack of female leaders in the industry, while 78% indicated that there were not enough women in senior management in the companies they are employed in.

Having women's voices heard more in business life, particularly in the automotive industry, establishing a balanced institutional structure and developing creative perspectives, will play a very significant role in increasing economic performance.¹

Women appear as an essential asset for the future of the automotive world. Increasing women's employment, both generally and in the instance of the automotive industry, is a challenging but crucially important task for women to participate in employment and Turkey's socio-economic development, for the empowerment of women's status in society and so that the automotive industry can progress into the future with stronger steps.

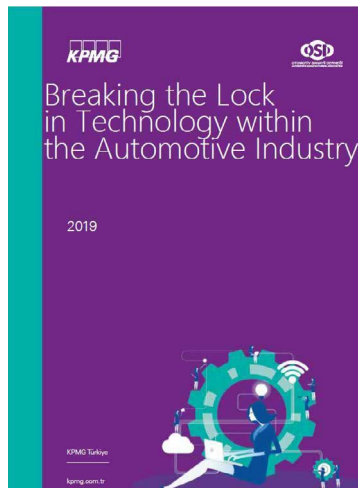


¹ <http://www.osd.org.tr/sites/1/upload/files/Turkiye-otomotiv-sanayiinde-kadin-arastirmasi-4323.pdf>

HUMAN RESOURCES

OSD and its members design processes where their employees can reveal their potential and provide an opportunity and environment for their continuous development.

Through university-industry cooperation projects, internships and employer brand processes, **qualified labour with potential is brought into employment.**



In 2019, OSD carried out the study “Breaking the Lock in Technology Within the Automotive Industry” in cooperation with KPMG Turkey by making face-to-face and in-depth interviews with women in senior management positions employed in the technology departments of manufacturers with varying positions within the automotive industry. In the scope of the study, women were asked about their careers, the secrets of their success, the challenges they face, work-home life balance and gender equality, and they were asked to provide their opinions on recommendations for the business world.

19 female managers employed in OSD member companies attended the study. Among the participants, 89% were engineers, 68% had graduate and 32% had master degrees. Female managers at ages varying between 35 and 53 and with experience in the industry varying between 13 and 30 years shared how they managed to turn the balance in support of women within the automotive world that has a low ratio of female employees.¹

According to 2020 data, a total of 5,312 women with an average age of 32 are employed at various levels from blue collar to senior management within the automotive industry. The proportion of female employees is 25% among office employees, 6% among blue collar and 10% within the overall employee population. The industry continues its actions towards the aim of increasing the proportion of female employees.

The proportion of female employees within the Association management staff of OSD is over 60%.

Talent Management

OSD and its members design processes for their employees, considered as the greatest asset towards reaching the aim of sustainability, to bring out their individual talents and potential and to provide the opportunities and the environment for their continuous development. OSD members aim to constantly support the development of their employees and prepare them for higher positions, to establish effective communication and reveal their innovative natures and creative talents, to increase their competence through training programs, to steer them towards programs that will contribute to their professional and personal development, to present them with environments designed as places fit for life, and to provide them with safe working spaces.

Some example applications pertaining to talent management are as listed below:

Through university-industry cooperation projects, internships and employer brand processes, qualified labour with potential are brought into employment. Internship opportunities are presented for students studying at industrial vocational high schools under the scope of cooperation between vocational high schools and industry.

¹ <http://www.osd.org.tr/sites/1/upload/files/otomotiv-sanayisinde-teknolojide-kilidi-kirmak-5520.pdf>



60%

OSD Female
Employment Rate

Short-term and long-term skill development programs are offered for different groups. Through these programs, the talents needed by the industry are selected for among students that are still in high school or university education. Through structured skill development programs, participants gain the skills and the knowledge they need for life at work, and employment opportunities are offered after graduation.

Communication is maintained with universities' administrations, career clubs and student communities for early identification of qualified labour for the sector; the activities organized throughout the year (summits, fairs, seminars, feasts) are attended, and the students are informed of the profiles, competences, knowledge, and skill sets required in the sector.

Careers of employees are supported through a transparent career management system operated through the principles of equal opportunities.

OCCUPATIONAL HEALTH AND SAFETY

Our member companies take all necessary precautions regarding the occupational health and safety of their employees.

The Occupational Health and Safety Management System was established at all member plants, and 13 of the member plants **were certified with the ISO 45001 Occupational Health and Safety Management System Standard.**

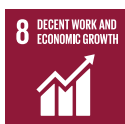
According to the Legal Notice on Workplace Occupational Health and Safety Related Hazard Classes, the automotive industry falls into the 'hazardous' class in terms of occupational health and safety. The sector sees providing a safe and healthy work environment for all employees, and protecting employees physically, mentally, and socially, as its most fundamental responsibility. Member companies identify the occupational health and safety (OHS) risks related to their activities and take any and all necessary measures related to the OHS of both their employees and all their suppliers functioning within their work sites. Compliance to national and international legislations is ensured, and OHS Boards carry out their responsibilities at all facilities within the framework stipulated under the Labour Law through the established Occupational Health and Safety Management System. Member company employees are able to convey their opinions and recommendations to managers by way of the OHS Boards and other communication channels set up at their companies.

The Occupational Health and Safety Management System was established at all member plants, and 13 of the member plants were certified with the ISO 45001 Occupational Health and Safety Management System Standard.

Every year, members periodically realize OHS training schemes, conduct health examinations, take measures for those employees with high occupational disease risk, carry out risk analysis activities for the

continuity of safe work environment, create action plans for tracking occupational accidents and near-miss incidents and follow up the progress.

According to Occupational Health and Safety Law no.6331, the employer is responsible for having its employees receive OHS training. At workplaces in the 'hazardous' class, such as the automotive Industry, the training sessions are carried out at least once every two years with training time no shorter than 12 hours. Which topics the training should minimally cover is defined under Annex-1 of the Regulation on the Principles and Procedures of Employees' Occupational Health and Safety Training. OHS training is provided especially before starting a new job, and in cases of workstation or job changes, work equipment changes or implementation of new technologies. The training sessions are reviewed in consideration of changing risks or newly emerging risks and are repeated whenever necessary and at regular intervals. Additional training is provided to any employee who has suffered an occupational accident or occupational disease, prior to restarting their job. Furthermore, those who remained away from their job for longer than six months are provided with training before restarting their jobs. Support personnel and employee representatives are also given and/or directed to receive separate training regarding the tasks for which they are to be assigned. The special needs of employees requiring special policies (such as young, disabled, pregnant and nursing employees) are taken into consideration and they are



provided with relevant training. In this direction, internalizing and making a policy of the OHS ideal is targeted, and actions towards creating secure environments for employees are undertaken.

In 2020, approximately 563 thousand hours of OHS training was provided by OSD member companies, equating to approximately 12 hours per employee. During the pandemic, in addition to the face-to-face training for white and blue collar personnel, online platforms have been used to provide OHS training that is compliant with international standards, manageable, monitorable and accessible to employees.

For the purpose of exchanging knowledge and experience on OHS legislation, the OSD OHS Committee was established with the participation of OSD members' OHS experts/managers and has functioned since 2008. The OHS Committee tracks recent OHS legislation, conducts briefing activities on OHS legislation, cooperates with relevant institutions/organizations to help resolve problems communicated by members and to develop recommendations for solutions, exchanges knowledge and experience on examples of practices (employee participation, senior management being role models, ergonomics, risk assessment, emergencies and drills, chemicals management, OHS leadership and culture cultivation, subcontractor OHS applications etc.), and presents positive and successful actions over relevant platforms to raise awareness of OHS issues.

The activities and good practices realized by OSD members in the field of occupational health and safety that receive awards are shown as examples at national and international levels. In the scope of the OHS Committee activities carried out within the body of OSD with the awareness of the subject, in 2016 OSD members decided to turn this success into a social responsibility project. The OHS Committee organizes seminars on "Good Practices in OHS Occupational Safety in Automotive Industry" as a social responsibility project for the purpose of raising the awareness across automotive subsidiary industry companies. This way, the activities and good practices carried out by the members are shared with other stakeholders through these now traditional automotive OHS seminars.

The OHS data of OSD members have been transformed into a metric tracked in terms of sustainability, enabling the members to conduct benchmark studies and exchange their good practices since the year 2016. Strategic studies are conducted among the members for the purpose of reducing occupational accident rates.

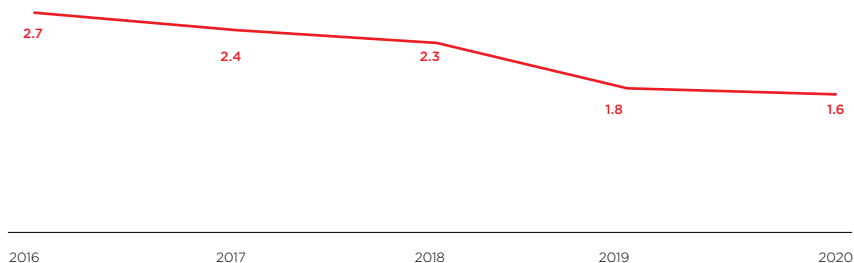
The occupational accident frequency rate expresses the number of accidents that occur within a unit work time. The number of accidents that occur per 1 million work hours is commonly used as a benchmark method. When calculating the occupational accident frequency rate, the total number of work hours and how many occupational accidents occurred during the period subject to calculation are taken into consideration.

The OHS data of OSD members have been transformed into a metric tracked in terms of sustainability, enabling the members to conduct benchmark studies and exchange their good practices since the year 2016.

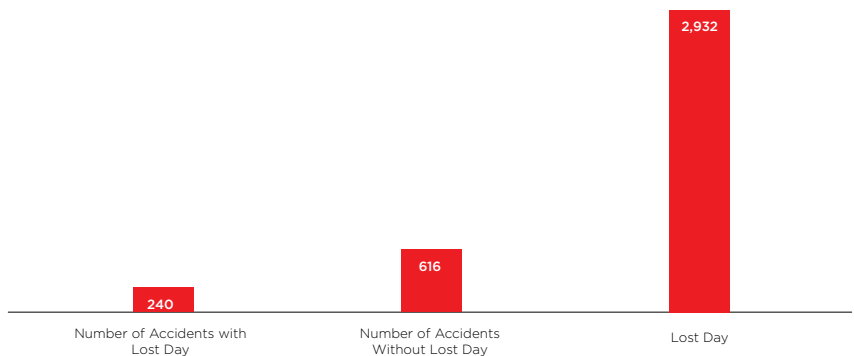
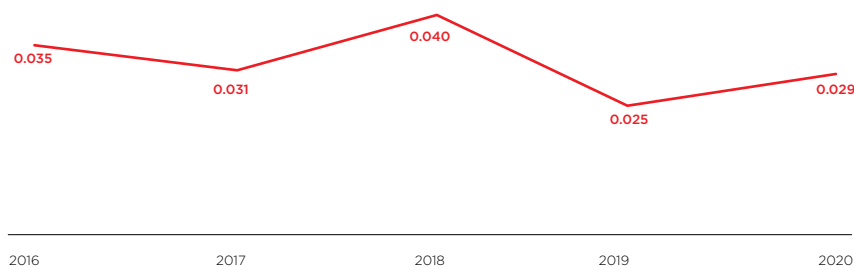
OCCUPATIONAL HEALTH AND SAFETY

Over the period 2016-2020, the accident frequency rate fell by 39% and the accident weight rate by 17%.

Accident Frequency Rate = Number of Accidents with Lost Day/ Working Hours x1,000,000



Accident Weight Rate = Number of Lost Day x1,000,000/Working Hours



The occupational accident weight rate expresses the total number of lost working days due to the occupational accidents that have occurred within a unit work period. The number of lost working days per 1,000 work hours is used as the general benchmarking method. When calculating occupational accident weight rate, the total number of days worked and the number of lost working days due to accidents during the period subject to calculation are taken into consideration.

The graphs on the left show the OSD members' accident frequency rate and accident weight rate.

Over the period 2016-2020, the accident frequency rate fell by 39% and the accident weight rate by 17% due to use of safer equipment, increasingly safe situations and behaviours, internalizing OHS culture, and compliance to legal requirements and international standards, particularly to ISO 45001. (NOTE: Data excluding Mercedes Hoşdere, Hattat, Türk Traktör)

In 2020, a total of 240 accidents with a total of 2,932 lost working days were reported across all plants, and there were 616 accidents with no lost working days.

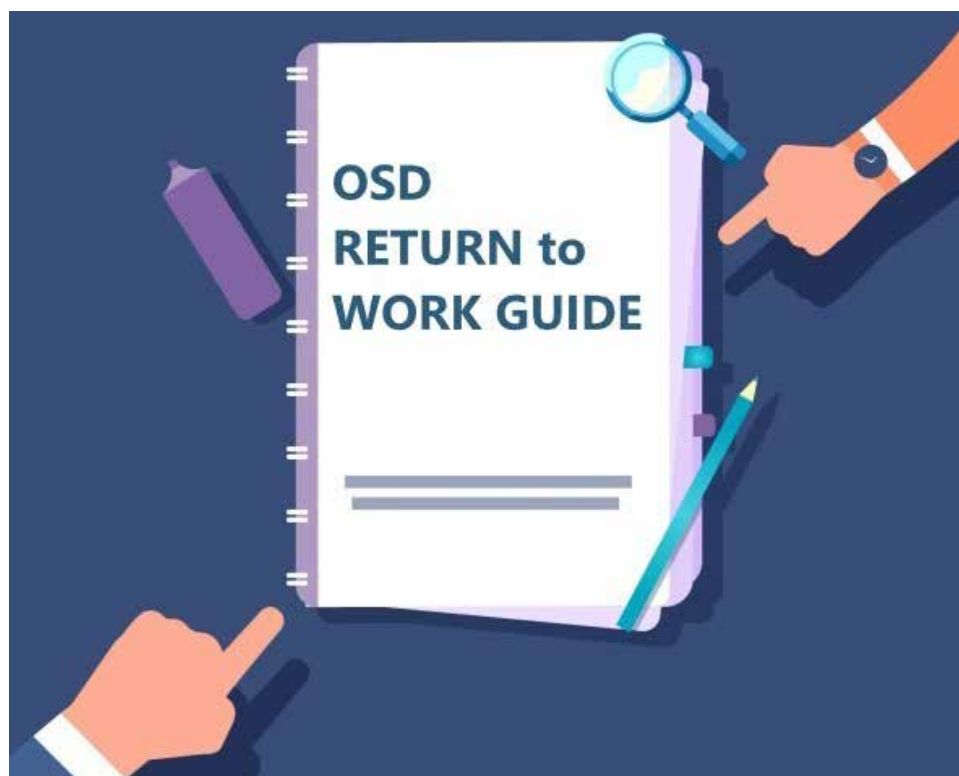
OSD members define measurable objectives within their bodies for the purposes of improving OHS performance and reducing accident frequency and accident weight rates and conduct activities to provide and maintain safe work environments.

In addition to such efforts, risk analyses are conducted towards eliminating risks, protecting employees, and increasing efficiency.

COVID-19 Pandemic and Safe Working Environment Applications

In 2020, with the emergence of the pandemic, the first priority of the automotive industry has been protecting the health of its employees and ensuring work safety. As the pandemic continued, distance-working models were launched, health measures were maximized, and the physical arrangements required at the work environment were rapidly implemented. The manner in which the main industry has reacted to the pandemic has been an example for many sectors, and a significant success has been achieved through rapid adaptation to the extraordinary circumstances.

In the process towards restarting the production that was interrupted due to the coronavirus pandemic, the OSD "Return to Work Guide" was prepared by the OSD Human Resources Committee in line with the special conditions and processes inherent to the automotive main industry. This Guide was shared with both the member companies and the relevant Ministries and stakeholders, and the applications indicated under the Guide - including the hygiene and safety measures required to be taken in line with combating COVID-19 and the rules needed to be followed by all employees, subcontractor companies



and visitors inside the locations bound to the companies - have become a guide for the whole main industry.

The procedures and applications required to provide a healthy and safe work environment during and after a return to work were implemented, and good practice examples were exchanged during OSD Human Resources Committee and OHS Committee meetings.

In 2020, with the emergence of the pandemic, the first priority of the automotive industry **has been protecting the health of its employees and ensuring work safety.**

TRAINING AND CONFERENCES

Throughout the year 2020, OSD members realized an average of 43 hours training activities per employee aimed at professional and personal development.

The International Automotive Engineering Conference (IAEC) has been organized every year since 2016 for steering engineering and R&D activities in automotive, perception management and knowledge exchange.



Throughout the year 2020, OSD members realized an average of 43 hours training activities per employee aimed at professional and personal development. Due to the pandemic, around 70% of office employees' training was via online/digital sources.

OSD also continued with its training-oriented activities during 2020.

International Automotive Engineering Conference (IAEC)

The automotive industry, which has significant impacts on the country's economy and is included among the leading industry groups in the country, requires to develop R&D and innovation capability, encourage the use of alternative resources, improve product development capacity, and support university-industry cooperation.

In line with these needs, OSD carries on with its training and conferences aligned with developing technologies, good practice examples within the sector, trends, customer expectation and environmental issues, with the target of providing contribution to the sector's development. Training and development activities are necessary for employees positioned at all levels of industry. In the light of these purposes and needs, the International Automotive Engineering Conference (IAEC) has been organized every year since 2016 for steering engineering and R&D activities in automotive, perception management and knowledge exchange. At the same time, the conference aims to convey to participants the steps needed to be taken within the automotive industry regarding engineering topics, and the existing dynamics of engineering within the industry from a technical perspective is presented by international experts in the field.





The 2016 conference was organized around the theme of Lightweight Automotive Designs; topics included lightweight design, automotive engineering education and careers in the automotive sector, focusing on the sector development to date and including various themes. The Conference, which had the themes of Mobility in the Future in 2017, The Today and Tomorrow of Electronics and Software in Automotive in 2018, and Electric Vehicle Technologies and Their Future in 2019, was organized on an online platform in 2020 due to the pandemic. 8 main speakers, 26 panelists, 20 foreign speakers and 7 academicians from 6 different countries attended the live broadcast with a total duration of 28 hours. The theme was Connected Vehicles and Smart Infrastructure; topics included the Internet of Things and 5G, data

management, cloud informatics and cyber security, communication security in connected vehicles, autonomous vehicles, an introduction to the OPINA project, intelligent cities, connected electric vehicles, education, and R&D. A total of 1039 people registered at the conference.¹

OSD Education Summit

The Education Working Group, carrying out its activities under the OSD Human Resources Committee, organized the “OSD Education Summit” in 2018 and 2019, at which novel and good practices on the topic of education within the automotive main industry were exchanged. At the summit, attended by OSD members and training managers from companies active in the supply industry, the novel and good practices of OSD members regarding training were shared with the participants.

The Education Working Group, carrying out its activities under the OSD Human Resources Committee, organized the “OSD Education Summit” in 2018 and 2019 at which novel and good practices on the topic of education within the automotive main industry were exchanged.

¹ www.iaec.ist

TRAINING AND CONFERENCES

The OSD Education Working Group planned the Automotive Online Summer Camp project primarily for engineering students.

In the International Efficiency Challenge Electric Vehicle Race organizations, cooperation **has been made between TÜBİTAK and OSD for 3 years.**

International Efficiency Challenge Electric Vehicle Races

(TÜBİTAK) and OSD have cooperated on the International Efficiency Challenge Electric Vehicle Races. Within the framework of these races, the main purposes of which are to raise the students' knowledge and experience regarding the electric vehicle technologies that will become widespread throughout the world in the future with a concept of clean and efficient energy, and to ensure that the participants are provided with the opportunity of studying and keeping track of the developments on alternative energies, OSD and its members have provided contributions during the race preparation stage to high school and university students who attended the event.

Automotive Summer Camp

Due to the pandemic, students' access to internship opportunities remained limited in 2020. In line with this knowledge and in line with social responsibility principles, in 2021 the OSD Education Working Group planned the Automotive Online Summer Camp project primarily for engineering students and held an event at which experts from OSD members shared their experience with participants, enriched with many activities. Thanks to this online activity, participants were provided with the opportunity to become familiarized with the sector. More than 50,000 students registered to take part, and the students who satisfied the joining conditions were entitled to receive Online Internship Participation certificates. The Automotive Online Summer Camp project was approved as a summer internship by Departments such as Mechanical, Industrial, Electrical Electronics Engineering at 29 different universities.

During the special sessions of the Summer Camp entitled 'Young Conversations', the students met with the sector's CEO and CHR leaders, and thanks to these activities the students had the opportunity to ask the managers the questions they had in mind and listen to the managers talk on the subjects of their study years and work experiences. Online broadcasts were watched live by more than 36 thousand students, and the total viewing count of the four special sessions with the CEO and CHR leaders was more than 188 thousand.



¹ www.otomotivyazkampi.com

OSD AWARDS & SOCIAL RESPONSIBILITY

In 2020, member Mercedes Benz Türk A.S. received a social responsibility award for its “Every Girl is a Star” project.

Since the 1990s, OSD has been granting honorary awards to its members. Among OSD members, the three members that achieved the highest exports in terms of value and the member that increased its export in terms of year-on-year percentage at annual basis are entitled to receive the OSD Exports Honorary Award. In addition, the three members that realize the highest number of patent registrations within the year are granted the Technology Honorary Award.

Since 2019, the OSD Corporate Social Responsibility Project Award has been granted as the result of an independent jury assessment. In the year 2020, member Mercedes Benz Türk A.S. received the award with its project “Every Girl is a Star”.

The project details are as indicated below.

Within the framework of the project carried out in cooperation with the Association for Supporting Contemporary Life towards ensuring that women achieve the status they deserve in all areas and that they experience equal opportunities in social and economic life, education scholarships are provided, and personal development workshops and professional development programs are organized. Through the project that began by supporting 200 girls across 17 provinces back in the year 2004, a total of 1,200 Star Girls across 60 provinces each year, 200 being in university, now receive education through Mercedes-Benz Turkey scholarships. Star Girls are visited in the cities they live in and are supported to

continue their education and have professions by way of organizing personal development workshops. Since the year 2013, more than 750 Star Girls have attended the personal development workshops across 32 provinces.

Over 300 Star Girls were provided with training in computer sciences and coding. 25 Star Girls from five different provinces each year - a total of over 350 Star Girls to date - were hosted in İstanbul for one week in order to participate in various cultural activities. At the same time, Mercedes-Benz Turkey and dealers provide internship and employment opportunities to the scholars who had their resumé within the Star Girls database, established back in 2016. 20% of the women employed in Mercedes-Benz Turkey production plants are Star Girls.

Since 1993, the Supply Industry Honorary Award has been given for the purposes of featuring successful supply industry organizations that provide parts to the automotive industry, develop cooperation and coordination between the main industry and its supply chain, and provide encouragement for development on the topics of system, quality, production plant and corporate identity.

The awards in the categories of Honorary Awards, Technology and Innovation Award and Jury's Special Award designated by OSD members after assessments of quality approach, delivery safety, competence in technology development and competitiveness, await their winners.

Among the OSD members, the three members with the highest amount of exports and the member with the highest percentage increase in exports on an annual basis **are entitled to receive the “OSD Export Achievement Award”.**



ANNEX 1: STAKEHOLDERS

Our Stakeholders:

Stakeholders Related to OSD	Activity
Uludağ Exporters' Association (UİB)	Actions Towards Developing Automotive Exports
Economic Development Foundation (İKV)	Studies on the European Union, Observer Member Status
Automotive Technology Platform (OTEP)	Actions Towards Developing R&D and Innovation Competitiveness as Founder Member Status
Technology Development Foundation of Turkey (TTGV)	Technology Development Actions as Founder Member Status
Intelligent Transportation Systems Association of Turkey (ITS TURKEY)	Actions Regarding Intelligent Transportation Systems as Founder Member Status
Federation of Industrial Associations (SEDEFED)	Member
International Organization of Motor Vehicle Manufacturers (OICA)	Member
European Automobile Manufacturers' Association (ACEA)	Liaison Committee Member

Platforms OSD Participated In:

Update of Customs Union and BREXIT Working Group under coordination of the Ministry of Commerce
Union of Chambers and Commodity Exchanges of Turkey (TOBB) Automotive Industry Assembly
Green New Deal Working Group under coordination of the Ministry of Commerce
TOBB Green New Deal Working Group
TOBB Digital Transformation Working Group
Electric Vehicles Charging Infrastructure Group under the coordination of the Ministry of Industry and Technology, the Ministry of Energy and Natural Resources, and Energy Market Regulatory Authority
Engine Technologies Technology Roadmap Working Group under the coordination of TÜBİTAK
TÜBİTAK Efficiency Challenge Electric Vehicle Races Cooperation Stakeholder
IAEC Regulatory Board
International Organization of Motor Vehicle Manufacturers (OICA) and European Automobile Manufacturers' Association (ACEA) Committees
Automotive Non-Governmental Organisations (NGOs) Meetings

ANNEX 2: ECONOMIC PERFORMANCE INDICATORS

ECONOMIC PERFORMANCE INDICATORS

METRICS	Unit	2015	2020
Automobile Production	Units	791,027	855,043
Total Production*	Units	1,410,034	1,335,981
Total Vehicle Export*	Units	1,007,355	930,031
Export Rate	%	71.4	69.6
Total Vehicle Export Value	USD	12.9 Million	16.5 Million
R&D Expenses	x1000 TRY	1,313,988	2,406,646
R&D Export	USD	121,379,971	105,765,930

*Tractor manufacturers are included.

ANNEX 3: ENVIRONMENTAL PERFORMANCE INDICATORS

ENVIRONMENTAL PERFORMANCE INDICATORS

ENERGY CONSUMPTION	Unit	2015	2020	Change
Total Energy Consumption (All Vehicles)	kWh	2,487,090,142	1,591,304,860	-36%
Unit Energy Consumption (Light Vehicles)	kWh/Vehicle	1,145	960,7	-16%
Unit Energy Consumption (Heavy Vehicles)	kWh/Vehicle	8,663	3,774	-56%
GREENHOUSE GAS EMISSIONS (SCOPE 1 + 2)				
Total Greenhouse Gas Emissions (All Vehicles)	tonne	693,883	492,508	-29%
Unit Greenhouse Gas Emissions (Light Vehicles)	tonne/Vehicle	0.424	0.356	-16%
Unit Greenhouse Gas Emissions (Heavy Vehicles)	tonne/Vehicle	2.3	1.19	-48%
WATER CONSUMPTION				
Total Water Consumption (All Vehicles)	m ³	4,281,989	4,008,329	-7%
Unit Water Consumption (Light Vehicles)	m ³ /Vehicle	2.3	2.3	0%
Unit Water Consumption (Heavy Vehicles)	m ³ /Vehicle	20.5	29.4	44%
WASTEWATER				
Total Wastewater (All Vehicles)	m ³	3,119,312	2,854,562	-8%
Unit Wastewater (Light Vehicles)	m ³ /Vehicle	1.9	1.9	1%
Unit Wastewater (Heavy Vehicles)	m ³ /Vehicle	9.7	11.9	23%
WASTE				
Total Waste (All Vehicles)	kg	316,397	250,739	-26%
Unit Waste (Light Vehicles)	kg/Vehicle	209	176	-19%
Unit Waste (Heavy Vehicles)	kg/Vehicle	718	773	7%
Total Waste Recycling Ratio (All Vehicles)	%	96	97	-

ANNEX 4: SOCIAL PERFORMANCE INDICATORS

SOCIAL PERFORMANCE INDICATORS

EMPLOYEE EDUCATION			Unit	2020	
Total Education			Hour	3,657.082	
OCCUPATIONAL HEALTH AND SAFETY PERFORMANCE			Unit	2015	2020
Occupational Accident Frequency Rate			Rate	3.8	1.6
EMPLOYEE EDUCATION LEVEL			Unit	Blue Collar	White Collar
Primary			%	7.7	0.5
High School			%	32.9	2.2
Technical High School			%	39.3	3.3
Vocational School of Higher Education			%	18.1	7.0
University			%	2.0	64.9
Master			%	0.1	19.5
Doctorate			%	-	0.8
Others			%	-	2.0
EMPLOYEE NUMBER			Unit	2015	2020
Employee Number			Person	48,748	53,293
AVERAGE AGE		Unit	Female	Male	Total
Blue Collar		Years	29.4	34.6	34.1
White Collar		Years	34.1	38.2	37.0
TOTAL		Years	31.9	35.3	34.8
AVERAGE LENGTH OF EMPLOYMENT		Unit	Female	Male	Total
Blue Collar		Years	4.4	9.7	9.3
White Collar		Years	7.4	10.5	9.5
TOTAL		Years	5.9	9.8	9.3

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103-1		Sustainable and Smart Mobility Strategy, p. 59	
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GRI 302	Climate Crisis and Production (Energy Management and Production Carbon Footprint), p. 70-71	
	Annex 3: Environmental Performance Indicators, p. 93	
	Climate Crisis and Production (Energy Management and Production Carbon Footprint), p. 70-71	
	Climate Crisis and Production (Energy Management and Production Carbon Footprint), p. 70-71	
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WATER		
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	Water and Wastewater Management, p. 75-78	
GRI 303 Water and Effluents 2018		
303-1	Water and Wastewater Management, p. 75-76	
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303-2	Water and Wastewater Management, p. 75-76	
303-3	Water and Wastewater Management, p. 75-76	
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303-5	Annex 3: Environmental Performance Indicators, p. 93	
BIODIVERSITY		
GRI 103 Management Approach 2016		
103-1	Biodiversity, p. 77	
103-2	Biodiversity, p. 77	
103-3	Biodiversity, p. 77	
GRI 304 Biodiversity 2016		
304-1	Biodiversity, p. 77	OSD has no operations within high biodiversity areas.
304-2	Biodiversity, p. 77	
304-4	Biodiversity, p. 77	OSD has no activities inside ecosystems included under IUCN Red List.
EMISSIONS		
GRI 103 Management Approach 2016		
103-1	Climate Change, Global Developments and Automotive, p. 56-59	
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	Products Emission Standards - Their Development in Turkey, p. 60-63	
	Product Life Cycle Assessment and Carbon Footprint, p. 64-69	
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	Results of the Turkey Automotive Industry Product Life Cycle Study, p. 66-69	
	Electric Vehicles from the Perspective of Product Life Cycle Assessment	Electric Vehicles from the Perspective of Product Life Cycle Assessment section refers to Life Cycle Assessment (LCA) Report
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GRI 305 Emissions 2016	Climate Change, Global Developments and Automotive, p. 56-59	Electric Vehicles from the Perspective of Product Life Cycle Assessment section refers to Life Cycle Assessment (LCA) Report
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	Electric Vehicles from the Perspective of Product Life Cycle Assessment	
	Responsible Production, p. 70-77	
305-1	Climate Crisis and Production (Energy Management and Production Carbon Footprint), p. 70-71	Electric Vehicles from the Perspective of Product Life Cycle Assessment section refers to Life Cycle Assessment (LCA) Report
	Industrial Emissions and Volatile Organic Compounds, p. 72	
	Annex 3: Environmental Performance Indicators, p. 93	
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	ENVIRONMENTAL COMPLIANCE		
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	103-2	Environmental Performance, p. 54-77	
	103-3	Environmental Performance, p. 54-77	
GRI 307	Environmental Compliance 2016		
	307-1	Responsible Production, p. 70-77	No non-confirmatory to environmental laws and regulations were experienced within the reporting period.
GRI 400	SOCIAL STANDARDS SERIES		
	EMPLOYMENT		
GRI 103	Management Approach 2016 Details		
	103-1	Year 2020 in Numbers, p. 12-15	
		Contribution of the Automotive Industry to the Turkish Economy, p. 34-49	
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	Labour-MANAGEMENT RELATIONS		
GRI 103	Management Approach 2016		
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		Occupational Health and Safety, p. 84-87	
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	103-3	Human Resources Policy and Development of Employment, p. 78	
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GRI 402	Labour-Management Relations 2016		
	402-1	Human Resources Policy and Development of Employment, p. 78	
		Occupational Health and Safety, p. 84-87	Minimum notice periods due to operational changes are in full compliance with laws and regulations.

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GRI 403	Occupational Health and Safety 2018		
	403-1	Occupational Health and Safety, p. 84-87	
	403-2	Occupational Health and Safety, p. 84-87	No occupational accidents or incidents leading to death or serious injury were experienced within the reporting period.
	403-3	Occupational Health and Safety, p. 84-87	There is no work process that would cause employees to exposure from high risk disease in OSD.
	403-4	Occupational Health and Safety, p. 84-87	
	403-5	Occupational Health and Safety, p. 84-87	
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		Talent Management, p. 82-83	
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		Talent Management, p. 82-83	
	103-3	Training and Conferences, p. 88-90	
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GRI 404	Training and Education 2016		
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GRI 405	Diversity and Equal Oppurtunity 2016		
		Dignity of People (Diversity, Knowledge Exchange and Appreciation), p. 80	
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GRI 406	Non-Discrimination 2016		
		Dignity of People (Diversity, Knowledge Exchange and Appreciation), p. 80	
	406-1	Annex 4: Social Performance Indicators, p. 94	No cases related to discrimination were experienced during the reporting period.

REPORT OWNER:



OTOMOTİV SANAYİİ DERNEĞİ
AUTOMOTIVE MANUFACTURERS ASSOCIATION

OTOMOTİV SANAYİİ DERNEĞİ
Atilla Sok. No:10 Altunizade 34676
İstanbul/TURKEY
PHONE: +90 216 318 29 94
FAX +90 216 321 94 97
www.osd.org.tr
osd@osd.org.tr

SUPPORTED BY



LCA AND REPORTING CONSULTANCY:





OTOMOTİV SANAYİİ DERNEĞİ
AUTOMOTIVE MANUFACTURERS ASSOCIATION