



**İSTANBUL
CHAMBER OF INDUSTRY**

ELECTRICAL LIGHTING EQUIPMENT PRODUCTION INDUSTRY

**The Project of Istanbul Chamber of Industry Profession
Committees' Sectoral Strategies
in Global Competition**



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SANAYİ ODASI

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ISBN: 978-605-137-730-8 (Electronic)
ICI Publication No: 2019/2
Certification No: 19176

July 2019
İstanbul

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PRESENTATION

Having maintained its business for 67 years with the mission of contributing to the development and competitive capacity of the industry sector which is the locomotive power of our economic growth, Istanbul Chamber of Industry attaches significant importance to the projects on sectoral strategy and political development accordingly this mission. Within this scope, *“The Project of Istanbul Chamber of Industry Profession Committees’ Sectoral Strategies in Global Competition”* has been carried out with the demands and contributions of ICI Profession Committees.

The number of our sectoral reports where we have focused on the current situation of different sectors in each year, their positions in the Turkey and world economies and their needs has reached to twenty two with this year’s sectoral report “Electrical Lighting Equipment Production Industry”.

In parallel with the technological developments continuing with its whole speed in global scale, also the Lighting systems are in a radical transformation period. Various revolutionary developments such as substitution of traditional lamps with LED Lamps, usage of electronic sections instead of mechanical parts and sections, spread of smart Lighting systems from buildings to city Lighting activities have been experienced. Effective usage of the Lighting systems in energy efficiency which has gained importance and taken part among the strategical targets recently in our country is of vital importance.

Findings of our reports shows that Turkey’s Lighting production sector has noticeably expanded in terms of

scale recently and provided improvement in the structure of added value steadily. The sector has a strong potential especially in terms of product and quality standards, human resource and logistic infrastructure. If this potential is made use of in a much effective way, we believe that we will be able to get to the net exporter position after the foreign trade deficit is closed which has already been decreasing in recent years.

We see that the sector is in need of a breakthrough in terms of technological developments as well as the design activities which the sector has noticeably developed in order to catch up with the new global trends, compete with new rivals increasing in Asia especially and to have much say in the markets growing around us. Our report provides significant strategical and political suggestions to all stakeholders especially the public in order to meet these needs as soon as possible.

I would like to extend my gratitudes for Dr. Can Fuat Gürlelel, our project consultant, the members of ICI 50th Group Lighting Equipment Industry Profession Committee who have contributed to our project with their significant opinions and suggestions and ICI Economical Researches Branch which has contributed to the publication of this report while we are presenting our sectoral report of Electrical Lighting Equipment Production Industry with the wish of our sector maintains the strong growth trend and increase its contribution to the country’s economy.

Erdal BAHÇIVAN

Istanbul Chamber of Industry
Chairman of the Board of Directors



Definition and Scope of Electrical Lighting Equipment Production Industry

Lighting is the application of light on objects, to around them and small or large parts in order to make them visible. Lighting is defined with these words in old and new dictionaries of “International Commission on Lighting”, which was established in 1913 and has been a fully authorized establishment in its own field today.

Lighting has been divided into three groups in terms of resources of Lighting which is used; natural Lighting, artificial Lighting and integrated Lighting. Lighting has been divided into two groups in terms of usage areas; interior Lighting and exterior Lighting.

Lighting is grouped in the following way according to their usage purposes; functional Lighting, decorative Lighting, accent Lighting and lightening.

Manufacturing industry of electrical Lighting equipment has been carrying out the production of all equipment necessary for Lighting. Equipment produced are bulbs, headlamps, fixtures and other secondary equipment, lamps, boards and automation systems which convert electricity into resource of light. Equipment production carried out by the manufacturing industry of electrical Lighting equipment has different features for each Lighting type. These are residential Lighting, non-residential building Lighting, industrial Lighting, Lighting for transportation vehicles, urban Lighting, road and street Lighting, mining Lighting, lightening and background Lighting.

Lighting products produced in the manufacturing industry of Lighting equipment consist of six main groups. The first group consists of the lamps which have the resources of light. The second group includes Lighting devices with monobloc headlight units and visual signalization equipment for transportation vehicles. The third group comprises Lighting fixtures, other electrical sections and secondary parts, lamp-shades, chandeliers, bracket lamps, spots and projectors. The fourth group consists of street Lighting devices. The fifth group consists of electrical lamps, electric torches, gas and luxury lamps, electronic components and control and automation systems. And the sixth group is composed of the advertisement and led boards, signalization tables and signals and so on.

Manufacturing industry of electrical Lighting equipment is listed under the Division 27, defined as electrical equipment manufacturing industry, within the NACE classification of the industries.

Primary Indicators of the Sector

The number of enterprises which was 1,849 in 2010 in

electrical Lighting equipment production industry is estimated to be 4,375 in 2018. This significant increase in the number of enterprises reflects the fast growth in Lighting equipment industry. Another significant increase in total employment figure has been realized after 2010 in parallel with the enterprise figure. The total number of employees which was 13,474 in 2010 is estimated to be 25,500 in 2018. Production value in the manufacturing industry of electrical Lighting equipment was 1,46 billion TL in 2010; but it is estimated to reach 6,45 billion TL in 2018. Real increase in production value is another indicator of the reflecting the development experienced in the Lighting equipment industry.

Output between the years 2010 and 2018 in the manufacturing industry of electrical Lighting equipment increased by 112,7 percent. While there has been a significant output growth in the industry, that growth has shown fluctuations throughout the years. Labor force efficiency in the manufacturing industry of electrical Lighting equipment between the years of 2010 and 2018 showed an increase by 17,6 percent.

Lighting equipment production and activities in Turkey has focused on the field of general Lighting; however, production and activities in automotive Lighting has shown a fast development. There are 4,375 firms carrying out production in Lighting equipment sector. Approximately 50 large and 400 small-mid scale establishments among the said firms have been realizing the majority of the production in the sector with their corporate structures. Other firms have been carrying out production in an atelier scale.

61,5 percent of the firms in manufacturing industry of electrical Lighting equipment have gathered in Istanbul. Share of Ankara is 10,6 percent, while Izmir ranks as the third with its share of 6,7 percent. Istanbul has production activity in each field of general Lighting. However, decorative Lighting is common in Ankara and Izmir mostly. Automotive and industrial Lighting are common in Bursa and Kocaeli mainly. And mostly interior and exterior Lighting have been carried out in other cities.

Developments in Lighting technology have been shaping the Turkish Lighting equipment sector. Technological activities in the manufacturing industry of Lighting equipment in Turkey are just work in progress in terms of development process. The industry is mostly foreign-dependent in terms of production and product technology. Therefore, the technological activities are limited. Industrial design is a field which has been mainly focused.

Export of electrical Lighting equipment was 481 million dollars in 2013; however, it decreased to 445 million dollars in 2017. Export in 2018 rose by 4,7 percent and reached 466.02 million dollars.

Import of electrical Lighting equipment was 926 million dollars in 2013; however, it decreased to 727 million dollars in 2017. Recession in the import resulted from the effects of the protection measures. Import in 2018 shrank by 15,4 percent and decreased to 615,37 million dollars.

Foreign trade balance of electrical Lighting equipment has decreased based on the developments in export and import. The deficit which was 444,59 million dollars in 2013 contracted to 149,35 million dollars in 2018.

The shares which the sub-product groups have taken out of the total export in 2018 are as follows: Lighting devices rank as first with a share of 45,09 percent. Vehicle headlights and lamps rank as second with the share by 45,03 percent, with a slight difference. Share of sections and parts is 4,8 percent, while that of the lamps is 4,3 percent. Shares of other two product sub-groups are very small.

Export markets of Turkey for electrical Lighting equipment consist of four groups. European countries take place in the first group. Second group consists of Turkmenistan, Kazakhstan and Russia. Third group includes the Gulf and Middle East countries. Algeria and Morocco in North Africa take place among the top 20 countries for which export activities has been realized. The USA is also within the top 20 export destinations.

According to the import volum ranking of electrical Lighting equipment, vehicle headlights and lamps hit to the first rank with the share of 34,0 percent. Lighting devices rank as second with a share of 30,0 percent. Share of the lamps of 24,4 percent maintains its high performance. Share of sections and parts is 9,1 percent. Lamp bases and self-energy-based lamps have small shares in import.

China has a share of 49 percent in Lighting devices, sections and parts imports of Turkey. After China, the top 20 countries consist of European and Asian producer and exporter countries. 6 European countries, namely Germany, Romania, Italy, Czech Republic, France and Poland follow China, and other European and Asian countries follow these. The USA takes place within these top 20 countries apart from the two said groups.

Key Characteristics and Domestic Market Size of the Turkish Lighting Industry

Primary characteristics of Turkish Lighting equipment industry are as follows: Manufacturing industry of Lighting equipment is competitive and has a potential of becoming a regional production center. Production is carried out in line with the European Union norms. Production and market surveillance in domestic market and improvement in infrastructure have been experienced. Manufacturing industry of Lighting equipment carries out export in a

significant scale. There has also been a fast growth in the domestic market of the Lighting equipment. Turkish Lighting equipment industry has offered significant opportunities for foreign capital investments with its infrastructure and market opportunities. Also, Lighting equipment industry is foreign-dependent in terms of technology. Import in technological component has experienced competition pressure.

Domestic market size of Lighting equipment was 2,45 billion dollars in 2013; and it reached to 2,59 billion dollars in 2014. While the domestic market grew in real terms during 2015 and 2016, it contracted in dollar terms. The domestic market experienced a fast growth in 2017 in real terms and despite the depreciation of the Turkish lira, it expanded to 2,31 billion dollars. Domestic market contracted in 2018 in real terms and it shrank to 1,94 billion dollars.

World Electrical Lighting Equipment Production Industry

The technological advance is the main driver behind the developments and tendencies in electrical Lighting equipment industry. Significant developments have been experienced in three branches in a technological sense. The first is the lamp technology. The second is the transition from mechanical systems to electronic systems in general Lighting technology. The third is the smart Lighting technologies developed along with the digitalization. The need of energy efficiency, which has grown in importance due to the sustainability approach, shapes the developments and inventions in Lighting technologies.

Traditional lamps and Lighting systems are quickly replaced by the LED lamps and Lighting systems in the world Lighting equipment industry, thanks to their superior features. This development in lamp technology has affected the world's giant companies producing traditional lamps.

Mechanical sections and parts are being substituted by electronic parts in the Lighting systems. Developments and inventions in the electronic industry and technology are used in Lighting systems as well. Within this scope, both transition into smart Lighting systems can be realized and different energy resources can be used in Lighting.

Efforts for saving on energy used for Lighting and increasing the efficiency are carried out with the aim of providing the energy efficiency necessary for reaching the sustainability goals in a global scale. The most important one is the transition into smart Lighting with the contribution of the developments in the technology.

Structures are also turning out to be smart thanks to the developments in Lighting, automation, electronic and digital technologies.

Just as the structures, the cities are turning out to be smart cities thanks to the developments in Lighting, automation, electronic and digital technologies.

Significant developments shaped by the technology in automotive Lightings have been experienced. LED lights have been started to be mainly used in automotive headlights and other signal, blinker and Lighting lamps. Lighting patterns, LED lights and semi-conductors suitable for these elements, electronic circuits/cards have been used in this field. Exterior Lightings in driverless autonomous vehicles will be the most significant components in the smart vehicles.

Producer countries in electrical Lighting industry vary and diversify depending on the technological developments. Shares of the countries such as China, Japan, South Korea and Taiwan which have been producing technology in this field have increased, with LED technology and electronic technology dominating the Lighting industry. Countries such as Vietnam, Malaysia and Thailand in Asia have started to make their presence felt in the industry with their production capabilities. Although traditional producers in Europe, especially the Netherlands, Germany, Italy, France and Spain lost their superiority in lamp technology against Asian countries, they have maintained their existence in the industry. Czech Republic, Poland and Slovakia have been improving rapidly as two new production centers in Europe. The idea of relocating the production, which has been focused mainly in China now, into the continent is gaining strength in Europe. The US and Canada take place in Lighting sector as two traditional technology and production countries. Mexico has turned out to be the production center of Lighting equipment for North America, especially thanks to its free-trade area opportunities. It exports the majority of the production to the USA and Canada.

While the world's Lighting market size was 99 billion dollars in 2010, it has been estimated to increase to 119.00 billion dollars in 2018. It is predicted that the growth in the market will be 3.0 percent annually until 2022 on average and the market size will reach 141 billion dollars in 2022. The basis for this growth will be the developments in the general Lighting field. Development in automotive Lighting is limited; and contraction is expected in the background Lighting market.

In the following period, much faster growth is expected in the markets such as Asia, Latin America, Middle East and North Africa, which mostly consist of developing countries. With 63.2 billion dollars, Asia will be the largest market in the world's Lighting market, which will expand to 141 billion dollars by 2022.

Global electrical Lighting equipment export was 84,18 billion dollars in 2013. This increased in 2014 and 2015; however, before shrinking in 2016.

World's electrical Lighting equipment export increased by 7,3 percent in 2017 and reached 93,66 billion dollars. Electrical Lighting equipment export is predicted to grow by 6,0 percent in 2018 and reach 99,3 billion dollars. Much faster export growth was experienced in the first half of the year; however, it was decelerated by the protectionist measures in the second half.

The highest export in world's Lighting equipment export was realized in Lighting devices. Lighting devices' export is predicted to reach 48,42 billion dollars in 2018. And vehicle headlight and lamps export which is at the second rank is expected to reach 21,9 billion dollars in 2018. Lamps rank as the third.

China has been realizing approximately 45 percent of the world's export with its export volume of 42,84 billion dollars. There has been a great difference between the export of China and that of the countries following it. Germany ranks as the second and USA ranks as the third. Mexico has turned out to be an important exporter. And Turkey has ranked as 23rd in the world export as of 2017.

The following developments have been experienced in the share of the export of Turkey's manufacturing industry of Turkish electrical Lighting equipment within the world exports. A share of 0,57 percent from the world export was obtained with 481 million dollars in 2013 and 533 million dollars in 2014. Export decelerated in 2015-2017 and the export share of Turkey declined to 0,48 percent in 2017. In 2018 the export is predicted to increase to 466 million dollars and its share is predicted to be 0,47 percent within the world's export.

Development Dynamics of Turkish Lighting Equipment Production Industry and Suggestions

General Lighting sector has the capacity of carrying out production in almost all products in high standards. The Lighting sector is turning out to be smart with electronical and automated systems. General Lighting sector in Turkey aims to comply with this transformation.

Sub-sector of automotive Lighting continues to demonstrate a significant development. The sector uses advanced technology and makes technological progress. While meeting the domestic needs, the sector realizes significant amount of export. Turkey meets global expectations in terms of products, while offering engineering services across the border in the field of Lighting systems.

Sub-sector of decorative Lighting has headed towards the production of small-scale, boutique and design-oriented products. The sector develops and produces Lighting systems and designs exclusive to projects and customers.

Decorative Lighting sector has started to focus on e-trade and architecture services and cooperation.

Sub-sector of lightening operates based on project and produces project-based products. Therefore, the firms operate as engineering firms, application firms and contracting firms. The sub-sector has high experience, knowledge and production capacity in industrial advertisements and corporate identity works.

Sub-sector of sections and parts are in the position of followers of technological developments and they are foreign-dependent especially in terms of new-generation products. Asian countries have a high competition capacity in this sense and Turkey's sub-sector of sections and parts has challenges in this competition.

The structure which will meet the increasing need of the software sector in the manufacturing industry of Turkish Lighting equipment has not been formed corporately yet. The sector is a specialization area and there is no need for specialization in software in this field.

One of the most significant potentials of Turkish Lighting equipment industry is to become the regional production center. The industry has this potential with its features and superiorities. There have been a significant production infrastructure and experience in the industry, firstly. Also, product and quality standards comply with the EU. It has a fast-growing domestic market potential. Close and neighbor markets are offering significant opportunities and sufficient logistic substructure and services exist. Developments have gained pace in technology; and engineering and human resources are also sufficient.

There is a need for corporate structures to develop advanced technologies and to carry out high value added production in the manufacturing industry of Lighting equipment. Firstly, specialized colleges in engineering should be established. And research universities and industrial design centers should be established as well.

Two factors are coming to the forefront in the development of software activities in the manufacturing industry of Lighting equipment. Firstly, a platform where the representatives of both the manufacturing industry of Lighting equipment and software sector can meet should be established. Secondly, software engineers should be trained on formation which is necessary for the Lighting industry software, and mutual software projects should be carried out with the support of the public.

Intercorporate cooperation activities should be carried out to increase the competitive capacity and enlarge the scales in the manufacturing industry of Lighting equipment. can be carried out in four fields.

Pre-competition cooperation project in technology and product development, mutual participation in local and foreign tenders, purchases, mergers and partnerships, and cooperation projects in critical components and software. Clustering projects in 3-4 sub-sectors should be applied to support these cooperation activities.

Suggestions for the public are as follows: Smart cities strategy and action plans across Turkey should be specified; hence arising the long-term need for Lighting equipment; and renewal program for city Lightings should be announced and applied. Transformation for street lights should be prioritized. Necessary renewal program for energy efficiency at commercial buildings and public service buildings should be announced and applied. Minimum Lighting standards should be kept high in the specifications of Public-Private cooperation projects, TOKI projects and the public projects.

Turkey's manufacturing industry of Lighting equipment has a significant potential in export. The industry has superiorities in small party productions, featured products and minor deliveries. Significant potentials are still observed in the markets of Germany, Russia, Saudi Arabia, UAE, Romania, Kazakhstan, Iraq, Qatar, Morocco.

The domestic market of electrical Lighting equipment offers a significant growth potential. Using this potential is closely related with the policies and projects which especially the public will conduct. Assuming that the public tightens the minimum conditions and brings out obligations to freshen the renewal market in line with the energy efficiency target, the market is expected to grow by 10 percent annually on average. With this growth, the size of the inner market reaches 3,12 billion dollars in 2023. And assuming that the public specifies ambitious targets and realizes especially LED transformation oriented smart city projects in line with the energy efficiency target, the market is expected to grow by 15 percent annually. With this growth, the size of the domestic market reaches 3,89 billion dollars in 2023.

1.1. Definitions and Scope of Lighting

Lighting is the application of light on objects, to around them and small or large parts in order to make visible them. Lighting is defined with these words in old and new dictionaries of “International Commission on Lighting” (CIE- Commission Internationale de l’Éclairage), which was established in 1913 and has been a fully authorized establishment in its own field today.

Lighting method is a method which handles the lighting light’s all spectral and photometric characteristics, opacity characteristic of objects, all characteristics regarding absorption or opacity (colorful-colorless, dark-light, shiny-opaque) and the characteristics of human eye on light and color perception as a whole; and determines the usage ways according to visual perception needs. While the Lighting method provides the most appropriate seeing circumstances, it enables this to be realized with the minimum effort.

Lighting is a significant event which requires the application of a particular method, which is beyond the escape from darkness by turning sufficient light on or embellishing the surrounding with self-sparkling objects as mostly thought and applied. Lighting method has reached to the spot where it is now through long-lasting development and experiences. The benefits to result from the application of this method includes such an extensive area varying from economy and health to efficiency and safety.

Lighting is not just to illuminate a place with a light source. It only enables to move without hitting somewhere. Lighting is realized by taking the primary principles into the consideration in line with the visual perception of human and the needs in this sense.

Different methods are used with different light sources for Lighting varying from place to place and need to need.

Lighting divides into three groups in terms of the light sources used;

Natural Lighting; It is defined as the Lighting which enables to provide visual comfort with the use of day light coming from primary energy source, the sun.

Artificial Lighting; It is defined as the Lighting which enables to provide visual comfort with the use of the artificial light sources.

Embedded Lighting; It is defined as the Lighting realized by using both day light and artificial light to provide visual comfort.

Lighting has been divided into two groups in terms of usage areas;

Interior Lighting; are the ones made within building or construction.

Exterior Lighting; are the artificial ones in various scales apart from building and constructions.

They are used for different purposes in the constructions where we used Lighting systems for different functions. Lightings according to the usage purposes are grouped in the following way;

Functional Lighting; Lighting in houses, schools, offices, hospitals, shopping malls and similar constructions and places meets different visual needs. All these Lighting systems which provides visual needs/comfort in these places are called as functional Lighting. The purpose of functional Lighting is to see things with their shapes, colors and details easily and fast. Effects (glare) which can give harm to eyesight and cause functional discomforts is avoided in physiological Lighting just as in any Lighting type.

Decorative Lighting; Place and surrounding elements which have different functions are aimed to be seen in wanted shape, form and color instead of their natural form. A showcase of a store, restaurant, hotel lobby, an entertainment place, a landscape element, facades of buildings, etc. can be wanted to be seen different than they are, even to be more attention grabbing. The Lighting systems which are made to meet such demands are called as decorative Lighting. The purpose of decorative Lighting is not showing the objects with all their details but rather waking aesthetic effects.

Accent Lighting; The purpose of this Lighting is to draw attention to an event or object/objects by using light. The most common place for this Lighting type is stage Lightings such as ballet, opera, theater, concert, etc. The purpose in accent Lighting is to draw attention to the area which is wanted to be seen first. High Lighting levels, colorful lights, variable lighted shapes or flashing mechanisms are used for this scope.

Event Lighting; Another usage area of Lighting is the advertisement-purposed Lighting. This subject is a concept out of the general Lighting and defined as “lightening” generally.

Lighting is a subject including technical and aesthetic parameters. Various information and scientific researches such as light and color vision characteristics of the eye, light sources, different features of lamps, lighting tools, transparency and reflectiveness of the objects and surfaces, etc. are used in the application.

Production industry of electrical Lighting equipment has been realizing the manufacture of all equipment necessary for Lighting. Equipment manufactured there are lamps, headlamps, fixtures and other secondary equipment, boards and automation systems which convert electricity into light resource.

Equipment manufacture of electrical Lighting equipment production industry has different features for different Lightings. Therefore, different usage areas shaping the industrial manufacture should be focused on firstly.

1. Lighting in Residential Buildings

The selection of Lighting equipment and Lighting systems to be used in a house is of vital importance. Fully functional or decorative Lighting is used in houses according to the life in the house or to the usage purposes of the rooms. Lighting equipment used in the houses are much more homogeneous and they consist of a significant part of the Lighting market.

2. Lighting in Non-Residential Buildings

Non-residential buildings are divided into two groups. First of them is hotels, offices, business places, shopping malls and stores and other commercial buildings where commercial activities are carried out. Second group is the buildings which provide services with social purposes. They include hospitals, fitness centers, theaters and similar performance centers, schools, colleges and other education institutions, temples and other buildings with similar purposes.

Fully functional or decorative Lighting in a limited scale is used in non-residential buildings according to the life in the house or to the usage purposes of the rooms.

3. Industrial Lighting

Industrial Lighting is the Lighting used in the places where goods and service production is carried out. Separate Lighting systems are used in each building according to the characteristics of good and service production. Industrial Lighting includes all industrial facilities, dams, power plants and similar buildings, especially the petroleum refineries. On the other hand, the service facilities such as harbors, rail systems, metro and stations, especially the airports are included also.

4. Traffic Lighting

Exterior and interior Lighting equipment with driving security purposes are used in air, sea and railway transportation vehicles, especially the motor land devices. Headlights and interior Lighting elements are the mostly used equipment.

5. City Beautification

City Lighting includes all Lighting types which enable to live within the city in various senses when it is dark and make the city life attractive for the users. City Lighting is divided into two main groups such as functional and architectural Lightings. Functional Lighting carries out the purpose of security, safety, transportation, direction and events. Architectural Lighting carries out the purpose of Lighting for architectural buildings, purposes, gardens, historical works and open areas.

6. Road and Street Lighting

It is about the Lighting of the intercity roads, local avenues and streets with transportation and security purposes. The main purpose here is to carry out highway transportation in a safe way. The secondary purpose is to make the living activities of the public sustainable thanks to this urban and street safety.

7. Mining Lighting

Main purpose of underground mining Lighting is to increase the safety by creating a visual space during the studies and to provide opportunity for taking measures for the miners to realize the dangers in advance in this visual space. A sufficient Lighting in the minings is of great importance, but also creating the said situation is a specific subject.

8. Lightings

First function of lighting is not Lighting, but it is a part of the industry and sector. The usage area of the lighting is the Lighting with advertisement and advertising purposes. Such Lighting is defined as "lighting" generally.

9. Back Lighting

Back lighting is used for various electrical equipment products and the Lighting of the electronic products. Back lighting is carried out for various electronic products such as computers, laptops, tablets, smart phones, game consoles and especially televisions. Similarly, inner lightings of equipment products like white appliances, etc. are considered within this scope.

1.2. Definitions and Scope of Lighting Equipment

Definition and scope of Lighting has been explained in the above chapter in details. And definition and scope of the main Lighting equipment which consists of the business subject of the electrical Lighting equipment production industry in this chapter.

Lighting products manufactured in production industry of Lighting equipment consist of six sub-main groups. These are:

1. Resources of light; lamps
2. Monobloc headlight units and Lighting equipment and visual synchronization equipment for transportation vehicles.
3. Lighting fixtures and other electrical sections and parts (metal, plastic, glass)
4. Lamp-shade, chandeliers, applique, spots, projectors, street Lighting equipment, portable electrical lamps, electric torch, gas and luxury lamps
5. Electronic components, control and automation systems
6. Others; advertising and led boards, signalization tables, signals, etc.

Lamps which are resource of light are divided into three groups. These are incandescence bulbs which produce thermal light lamps, non-thermal light lamps and LED lamps.

Bulbs which produce thermal light are incandescence bulbs. They are preferred because of their ease of use and low purchase costs. Such bulbs emphasize colors in a much better way. Lifetime of incandescence bulbs are much shorter and their light efficiency is much lower. Also incandescence-filament bulbs are prohibited to be used in Europe and Turkey.

Non-thermal light lamps are defined as the low and high pressure steam discharge lamps. Light efficiency of such lamps are high and life time is long. Because they have larger effects compared to incandescent lamps, they are preferred to use in the Lighting of residences, offices, libraries, hospitals, schools and business facilities. The most commonly used is fluorescent lamps.

LED lamps are the new one which constitutes the third group. The word LED is the abbreviation of "light emitting diode" which means "diode spreading light". Having the advantages such as low energy consumption, long lifetime, durability, high endurance and safety, LED lamps are more advantageous compared to other bulbs/lamps in terms of light efficiency and energy consumption. LED lamps are getting more and more preferred rapidly because they have long lifetime, durability, small sizes and they do not include any hazardous gas within themselves and they are provided in various colors.

1.3. Classification and Scope of Electrical Lighting Equipment

Production industry of electrical Lighting equipment takes place within the 27 no. electrical equipment production industry within NACE classification of the industry. The scope of electrical equipment production industry within this classification as follows:

27 Electrical Equipment Production

27.1 Electricity distribution through electrical engine, generator, transformer and manufacture of control devices

27.11 Manufacture of electrical engines, generators and transformers

27.12 Manufacture of electricity distribution and control devices

27.2 Production of accumulator and battery

27.3 Production of wires, cables and tools used in cabling

27.31 Production of fiber optic cables

27.32 Production of other electronic and electric wires and cables

27.33 Production of tools used in cabling

27.4 Production of electrical Lighting equipment

27.5 Production of household appliances

27.51 Production of electrical household appliances

27.52 Production of non-electrical household appliances

27.9 Production of other electrical equipment

Production of electrical Lighting equipment is the main subject of our study. Within this scope the definition and scope of the electrical Lighting equipment are as follows:

27.4 Production of electrical Lighting equipment

27.40 Production of electrical Lighting equipment

This class includes the Lighting bulbs and tubes and their lamp equipment (excluding glass for electrical Lighting bulbs) of sections and components and their production (excluding the live tools used in wiring). This class includes the following: production of discharge lamp, electrical filament lamp, fluorescent, ultra-violets, infrared, etc. lamps,

lamp equipment and bulbs; production of ceiling lighting equipment, production of chandeliers (candelabras), production of table lamps (including lamp-shade), production of lighting sets for Christmas trees, production of electrical back hearth, production of electric torch, production of electrical fly-repellent lamps, production of torches (e.g.: work with carbide, electricity, gas, gasoline oil), production of spot lights, production of street Lighting equipment (excluding traffic lights), production of Lighting equipment for transportation vehicles (e.g.: for motor land vehicles, aircrafts, boats). Also this class includes the production of non-electrical Lighting equipment.

However, this class excludes the production of glass for tableware and Lighting equipment. See: 23.19, production of the tools used in live wiring for Lighting equipment. 27.33, production of Lighting-equipped ceiling or bathroom ventilators. See: 27.51, production of electrical signal equipment (including signal equipment for traffic lights and pedestrians). See: 27.90, production of electrical signs. Baz: 27.90.

NACE Code	Definition of NACE
27.4.0.01	The production of discharge bulb, ultraviolet or infrared bulb, arch bulbs, tungsten halogen filament bulb, other filament bulb and flash bulb and flash cube used in photography and others.
27.4.0.02	The production of monoblock headlight units for aircrafts and motor land vehicles; electrical Lighting equipment or visual signalization equipment for land vehicles, aircrafts and water crafts (including exterior warning lights of police vehicles, ambulance, etc.)
27.4.0.03	The production of the lamps such as chandelier, applique and other Lighting fixture, projectors for stage, photography or cinema studios and spot lights, electrical table lamps, lamp-shades, etc. (including the Lighting sets for decoration)
27.4.0.04	The production of street Lighting equipment (excluding the traffic lights)
27.4.0.05	The production of Lighting fixture such as battery, accumulator or magneto-powered portable electrical lamps and non-electrical lamps and torches, gas and luxury lamps, etc. (excluding the ones for the vehicles)
27.4.0.06	The production of led boards, led advertising boards and similar.
27.4.0.07	The production of lamps and Lighting fixture and sections and parts of the lamps, Lighting fixture and similar ones which are not classified under any category (excluding the glass and plastics)

Table 1: Scope of the Electrical Lighting Equipments according to NACE 2 Classification

2. PART: PRIMARY INDICATORS OF THE SECTOR

2.1. General Scope and Methodology

The development of electrical Lighting equipment production industry is evaluated by using the primary indicators such as enterprise number, production, added value, employment, efficiency, foreign trade, domestic market, activities to gain net exchange and technological events. Statistics and data of official institutions, especially Turkish Statistical Institute are used for these primary indicators.

Annual industry and service statistics of Turkish Statistical Institute are used for the enterprise number, production, added value and employment indicators of electrical Lighting equipment production industry. Updated data are for the 2009 and 2017 in NACE.2 classification for these indicators. Realization expectations towards 2018 are also calculated by using the other data of Turkish Statistical Institute.

Annual Industry and Service Statistics have been produced based on Council regulations of EU dated 20 December 1996, numbered 58/97 and dated 11 March 2008 and numbered 295/2008 since 2002. TUIK Industry and Service Statistics have been classified according to NACE Rev. 2 since 2009. Quadripartite class activities have been specified according to NACE Rev. 2 classes in the level of every enterprise which have more than 20 employees as the limit of a whole number in the calculation methods of Annual Industry and Service Statistics.

Within this framework, evaluations regarding the enterprise volume, employment, production value and added value indicators of electrical Lighting equipment production industry have been made especially. Annual Industry and Service Statistics of Turkish Statistical Institution are used in the evaluations. Definition and concepts used in these statistics are as follows:

Enterprise number; It is the number of all units which operate in the sector and are active during the reference period.

Paid employee number; It is the number of employees who are paid with salary, price, commission, premium, piece-rate pay or payment in kind and who have employment contract and work for an employer.

Total employee number; It includes all the employees such as temporary employees, unpaid employees, employees working as interns or in a similar positions.

Production value; It is the monetary value of the amount actually produced by the selling-based unit which includes the stock changes and re-selling of goods and services.

Added value by factor cost; It is the gross income obtained from the business activities after readjustments in business subventions and indirect taxes.

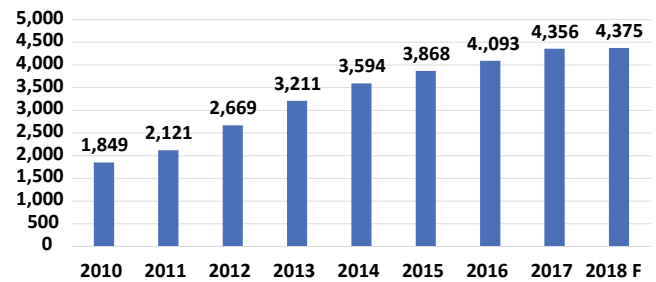
2.2. Main Indicators

A significant increase has been experienced after 2010 in the enterprise number in electrical Lighting equipment production industry. The enterprise number which was 1,849 in 2010 exceeded three thousand of items by 3,211 in 2013. The enterprise number which was 4,093 in 2016 exceeded the level of four thousands in a short period. Enterprise number which increased to 4,356 in 2017 is estimated to reach 4,375 in 2018. This significant increase in enterprise figure reflects the fast increase in Lighting equipment industry.

Years	Enterprise Number	Total Employee Number	Paid Employee Number
2010	1,849	13,474	12,176
2011	2,121	15,897	14,378
2012	2,669	18,280	16,291
2013	3,211	20,827	18,409
2014	3,594	23,389	20,667
2015	3,868	24,020	21,123
2016	4,093	24,819	21,760
2017	4,356	25,234	21,952
2018 F	4,375	25,500	22,100

Table 2: Basic Indicators in Electrical Lighting Equipments Manufacturing Industry

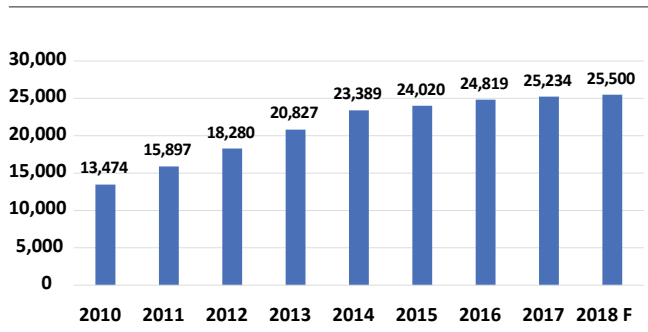
Source: TURKSTAT, Annual Industry and Service Statistics.



Graphic 1: Enterprise Number in Electrical Lighting Equipments Manufacturing Industry

Kaynak: TURKSTAT, Annual Industry and Service Statistics.

A significant increase experienced after 2010 in the total employee number in electrical Lighting equipment production industry in parallel with the enterprise number. Total employee number which was 13,474 in 2010 exceeded twenty thousands of employee number level by 20,827 in 2013. Total employee number maintained its increase in the following years and reached 25,234 in 2017. Total employee number is estimated to have reached 25,500 in 2018. The increase in the total employee number reflects the development in the Lighting equipment industry. The same development is seen in the increase of paid employee number.



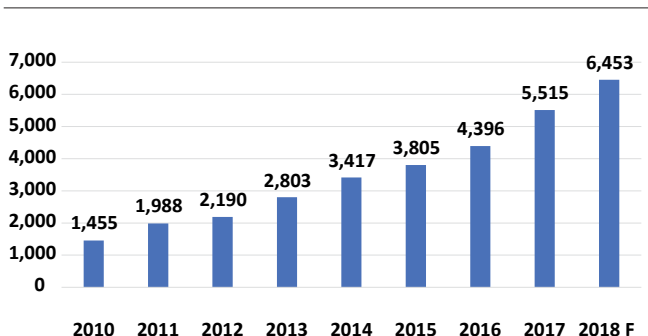
Graphic 2: Total Number of Paid Employees in Electrical Lighting Equipment Production Industry
Kaynak: TURKSTAT, Annual Industry and Service Statistics.

A significant growth and development are experienced in the production of electrical Lighting equipment production industry. An increase is realized in production value and added value created based on this situation.

Years	Production Value Million (TL)	Added Value Million (TL)	Added Value/Production Value (%)
2010	1,455	284	19.5
2011	1,988	395	19.9
2012	2,190	465	21.2
2013	2,803	643	22.9
2014	3,417	777	22.7
2015	3,805	954	25.1
2016	4,396	1,145	26.0
2017	5,515	1,450	26.3
2018 F	6,453	1,742	27.0

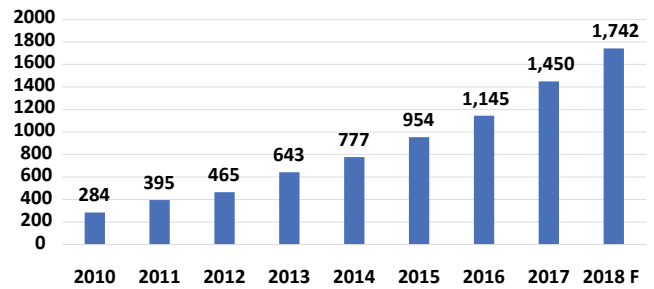
Table 3: Production Value and Added Value in Electrical Lighting Equipment Production Industry
Source: TURKSTAT, Annual Industry and Service Statistics

A significant increase was experienced after 2010 in the production value in electrical Lighting equipment production industry. The production value which was 1,46 billion TL in 2010 reached 3,42 billion TL in 2014. The increase in production value maintained its existence in the following years and reached 5,52 billion dollars in 2017. The production value is estimated to have reached 6,45 billion TL in 2018. Real increase in manufacture value is another indication for the reflection of the development in Lighting equipment industry.



Graphic 3: Production Value in Electrical Lighting Equipment Production Industry (Million TL)
Source: TURKSTAT, Annual Industry and Service Statistics.

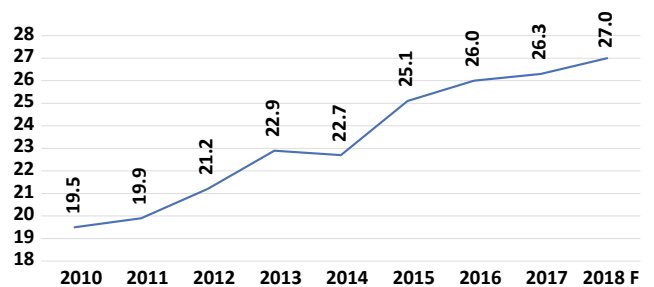
A relatively slow increase in added value created in electrical Lighting equipment production industry was experienced from 2010 to 2015. The production value which was 284 million TL in 2010 reached 954 million TL in 2015. A much faster increase in the added value during the last three years was experienced. Created added value had been 1,15 billion TL in 2016 and was 1,45 billion TL in 2017; and it is estimated to have reached 1,75 billion TL in 2018. Speed-up in the increase of added value shows that a much higher added value production in the Lighting equipment industry has taken place.



Graphic 4: Created Added Value in Electrical Lighting Equipment Production Industry (Million TL)
Kaynak: TURKSTAT, Annual Industry and Service Statistics.

The relation between added value created in the sectors carrying out production in the production industry and the production value indicates the added value level in the production and the development in the added value created. Increase of the share of added value created within the production value indicates that a higher added value production is carried out.

The development of the of the proportion of added value created in electrical Lighting equipment production industry to the production value after 2010 is as follows: According to this, the proportion which was 19,5% in 2010 was in tendency of constant increase until 2018 and reached 27,0% in 2018. A higher added value production has been carried out for years in electrical Lighting equipment production industry. The sector focuses on the production of much higher added value products.



Graphic 5: Share of Created Added Value in Electrical Lighting Equipments Production Industry within Production Value (Percent)
Source: Calculated based on the data of TURKSTAT, Annual Industry and Service Statistics.

2.3. Developments in Shares Taken from the Electrical Equipment Production Industry

Shares taken out of the general electrical equipment production industry and the developments in these shares as of the primary indicators of electrical Lighting equipment production industry are as follows: The share of enterprise number of general electrical equipment production industry increased from 24,29% to 43,97% between 2010 and 2018. Its share within the employment showed limited increases and reached 13,08% in 2018. Its share as the production value had been 6,22% in 2010 and increased up to 6,63% in 2016 and reached 5,80% in 2018. Its share within the added value created had been 5,13% in 2010 and increased 7,95 in 2017 and realized 7,25% in 2018.

Years	Enterprise Number	Paid Employee	Production Value Million (TL)	Added Value Million (TL)
2010	7,613	109,841	23,377	5,533
2011	7,922	122,846	37,491	7,239
2012	8,219	133,163	40,790	7,316
2013	8,544	143,346	47,814	9,926
2014	8,775	150,131	52,303	10,623
2015	9,199	158,022	59,833	12,830
2016	9,462	163,884	66,310	14,792
2017	9,876	168,669	85,591	18,230
2018 F	9,950	169,000	111,250	24,100

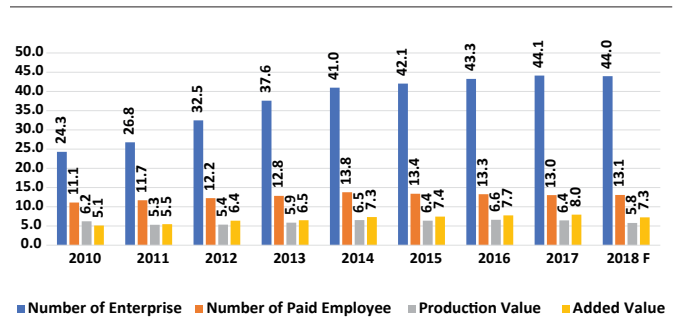
Table 4: Basic Indicators in Electrical Equipment Production Industry
Source: TURKSTAT, Annual Industry and Service Statistics.

Years	Enterprise Number	Paid Employee	Production Value Million (TL)	Added Value Million (TL)
2010	1,849	12,176	1,455	284
2011	2,121	14,378	1,988	395
2012	2,669	16,291	2,190	465
2013	3,211	18,409	2,803	643
2014	3,594	20,667	3,417	777
2015	3,868	21,123	3,805	954
2016	4,093	21,760	4,396	1,145
2017	4,356	21,952	5,515	1,450
2018 F	4,375	22,100	6,453	1,742

Table 5: Basic Indicators in Electrical Lighting Equipments Production Industry
Source: TURKSTAT, Annual Industry and Service Statistics.

Years	Enterprise Number	Paid Employee	Production Value Million (TL)	Added Value Million (TL)
2010	24.29	11.09	6.22	5.13
2011	26.77	11.70	5.30	5.46
2012	32.47	12.23	5.37	6.36
2013	37.58	12.84	5.86	6.48
2014	40.96	13.77	6.53	7.31
2015	42.05	13.37	6.36	7.44
2016	43.26	13.28	6.63	7.74
2017	44.11	13.01	6.44	7.95
2018 F	43.97	13.08	5.80	7.25

Table 6: Share of Electrical Lighting Equipments Production Industry within Electrical Equipment Production Industry
Source: Calculated based on the data of TURKSTAT, Annual Industry and Service Statistics.



Graphic 6: Share of Electrical Lighting Equipments within Electrical Equipment Production Industry (Percent)
Source: Calculated based on the data of TURKSTAT, Annual Industry and Service Statistics.

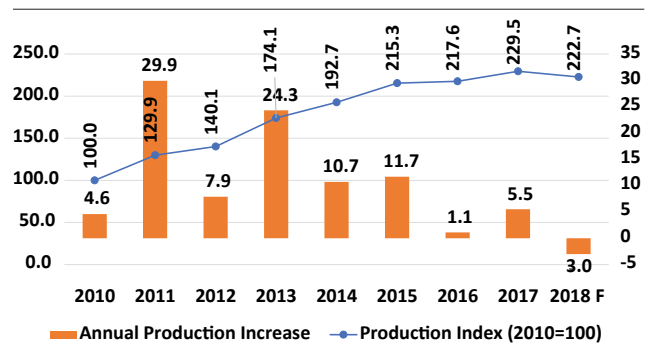
2.4. Industry Production

Manufacture between the years of 2010-2018 in manufacturing industry in electrical Lighting equipment was increased to 112,7%. A significant increase experienced in that period in electrical Lighting equipment production industry.

There has been an important manufacturing increase in industry, and this manufacturing increase has shown fluctuations throughout years. Electrical Lighting equipment production showed high jumps by %29,9% in 2011 and 24,3% in 2013. Production increase by 10,7% and 11,7% in 2014 and 2015 had been experienced.

Electrical Lighting equipment production increase had been very weak by 1,1% in 2016; however, it increased by 5,5% in 2017. Production was recessed by 3,0% in 2018.

Electrical Lighting equipment production is determined by both domestic demand and foreign demand. Fluctuations in domestic and foreign demands seen during the years have effect on production also.



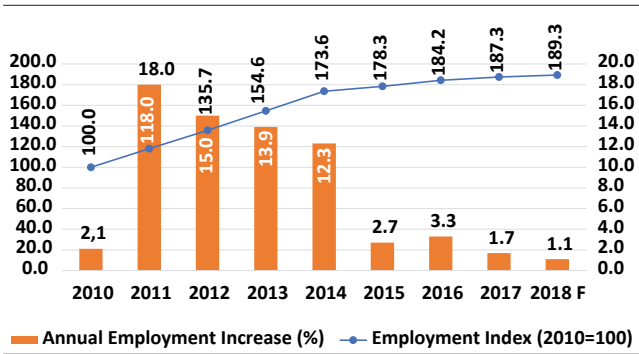
Graphic 7: Electrical Lighting Equipment Manufacturing Industry Manufacture
Source: TURKSTAT, Industry Production Index

2.5. Employment and Labor Force Efficiency

Employment in electrical Lighting equipment industry showed an increase by 89,3% in the period of 2010-2018. Employment increase was very high in the period of 2011-2014.

Employment showed an increase by 73,6% between 2010-2014. However, it decelerated in the years following this increase. Employment increase which was 1,7% in 2017 is estimated to have realized as 1,1% in 2018.

Increase both in the enterprise number and the production in electrical Lighting equipment production industry after 2010 created a high increase in employment naturally. However, production and employment increase was decelerated in the period of 2016-2018.



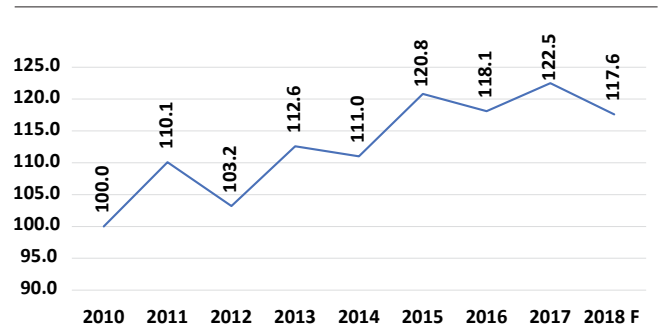
Graphic 8: Employment in Electrical Lighting Equipment Production Industry
Source: TURKSTAT, Industry Labor Force Input Index

Labor force efficiency in electrical Lighting equipment production industry is measured with the change in the production per employment. A significant increase in both production and employment was experienced between 2010 and 2018. Employment increased by 89,3% while production increased by 122,7% in this period.

Labor force efficiency in electrical Lighting equipment production industry increased by 17,6% between the years of 2010 and 2018 according to the calculations of these data. A constant increase in labor force efficiency was experienced between 2010 and 2017. Labor force efficiency increased by 22,5% since the end of the 2017. However, the labor force efficiency decreased with a deceleration in production in 2018. This deceleration is resulted from the shrank experienced in the second half of the 2018 rather than the dynamics of the sector.

Years	Employment Index	Production Index	Labor Force Efficiency Index
2010	100.0	100.0	100.0
2011	118.0	129.9	110.1
2012	135.7	140.1	103.2
2013	154.6	174.1	112.6
2014	173.6	192.7	111.0
2015	178.3	215.3	120.8
2016	184.2	217.6	118.1
2017	187.3	229.5	122.5
2018 F	189.3	222.7	117.6

Table 7: Labor Force Efficiency in Electrical Lighting Equipments Production Industry
Source: TURKSTAT, Industry Production Index, Industry Labor Force Input Index.



Graphic 9: Labor Force Efficiency in Electrical Lighting Equipments Production Industry
Source: TURKSTAT, Industry Production Index, Industry Labor Force Input Index.

Developments in the number of paid employee working in electrical Lighting equipment production industry are as follows: Accordingly, the total paid employee number which was 12,176 in 2010 is estimated to have been 22,100 in 2018. The number of paid employee showed an increase by 81,5% between 2010 and 2018.

Staff expenditure born for paid employees in electrical Lighting equipment production industry was 174,8 million TL in 2010 and increased to 852,1 million TL in 2018. A 4 times bigger increase was experienced in annual staff expenditures.

Annual staff expenditure per paid employee was 14,356 TL in 2010; and it reached to 38,555 TL in 2018. Staff expenditure per paid employee increased by 168,6% between 2010 and 2018. Staff expenditures per paid employee were 2 times higher than the increase in the paid employee number.

Years	Paid Employee Number	Staff Expenditures Million (TL)	Staff Expenditure per Paid Employee (Annual, TL)
2010	12,176	174.8	14,356
2011	14,378	225.6	15,691
2012	16,291	285.8	17,543
2013	18,409	362.4	19,686
2014	20,667	463.1	22,408
2015	21,123	531.5	25,162
2016	21,760	670.0	30,790
2017	21,952	752.3	34,270
2018 F	22,100	852.1	38,555

Table 8: Number of Paid Employees and Personnel Expenditures in Electrical Lighting Equipment Production Industry
Source: TURKSTAT, Annual Industry and Service Statistics.

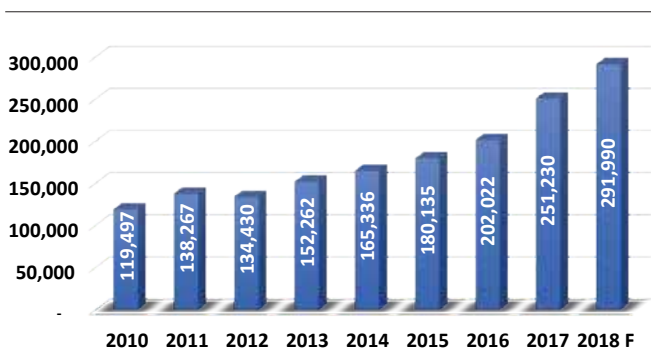
Another indicator of efficiency of paid employees in electrical Lighting equipment production industry is the production value per paid employee. Production value per paid employee in 2010 was 119,497; however, it increased to 291,990 TL in 2018. Production value per paid employee between 2010 and 2018 increased by 114,3%. A significant increase was experienced in labor force efficiency.

Producer price increase experienced in electrical Lighting equipment production industry between 2010 and 2018 is

used to calculate the real increase in labor force efficiency. Accordingly, producer price increase by 116,1% was experienced between 2010 and 2018.

When the percentage between 2010 and 2018 per employee is demeaned with the increase of production value in the rate of 144,3% and with the increase in producer price in the rate of 116.1%, it is calculated that there has been a real production value increase by 24.3% per employee.

The efficiencies of paid employees in electrical Lighting equipment production industry which were calculated with the production value per employee in both nominal and real terms increased in the period of 2010-2018.



Graphic 10: Labor Force Efficiency of Electrical Lighting Equipment Production Industry; Annual Production Value Per Paid Employee (TL)

Source: Calculated from Turkstat data by the research team.

2.6. Lighting Equipment Production

General Lighting of Lighting sector in a global scale operates as automotive (vehicle) Lighting and background Lighting. Lighting equipment production and activities in Turkey has focused on the field of general Lighting; however, production and activities in automotive (vehicle) Lighting has shown a fast development.

There are 4375 firms carrying out production in Lighting equipment sector. Approximately 50 large and 400 small-midscale establishments among them have been realizing the significant part of the manufacture in the sector with their corporate structures. Other firms have been carrying out production in atelier scale.

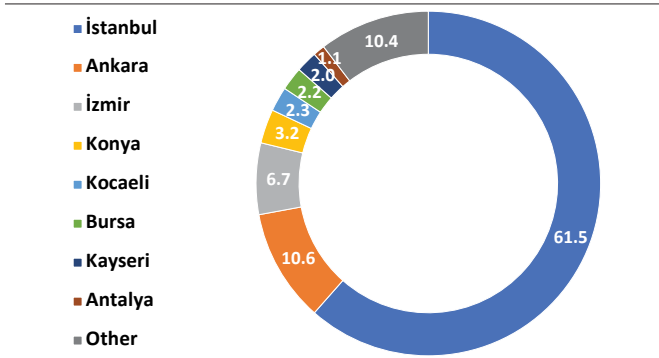
Production structure in Turkish Lighting equipment production industry is evaluated below:

1. Production of lamps which are used as resource of lights (thermal light resource, incandescent bulbs, non-thermal light resource lamps and LED lamps) are not carried out in the industry.
2. Mechanical fixtures and ballasts and sections and parts are produced in the industry in any way.

However, there has been an intense and unfair competition and import pressure in this field especially in terms of China. Production of crystal and glass parts used in decorative Lighting has not been carried out anymore because of the competition by China. And also the mechanical products are being substituted by electronic products rapidly.

3. Electronic components and sections and parts are produced in a limited amount in the industry. The industry has been work in progress in this term. Production costs are very high in this field and imported products are preferred mostly in the production.
4. Production of any Lighting products such as lamps, Lighting devices, spots, projectors are carried out and the industry has a significant competition capacity in this field. Local and imported sections and parts are used in the production of these products.
5. The industry is in a significant progress process in automotive and vehicle Lighting equipment production.
6. Production in the fields such as electronic components, smart circuits, sensors and other smart products which are within the scope of smart Lighting systems is very limited. However, the industry has been progressing in the smart systems and automation systems.
7. Transition into much higher value added production and small party production in mass production in the industry is being experienced with the pressure of technology and competition. The industry especially is turning into a production structure for short-term, small party and fast shippings in the export.
8. The industry/sector is changing its direction towards the high value added fields in especially decorative Lighting products. Original design and quality features are coming forefront in these fields.

61,5% of production firms in production industry of electrical Lighting equipment have gathered in Istanbul. Share of Ankara is 10,6%. And Izmir ranks as the third with its share by 6,7%. Istanbul has production in each field of general Lighting. However, decorative Lighting weight is common in Ankara and Izmir mostly. Automotive and industrial Lighting take place in Bursa and Kocaeli mainly. And mostly interior and exterior Lighting have been carried out in other cities.



Graphic 11: Provincial Distribution of Electrical Lighting Equipment Production Firms (Percent, 2018)
Source: TOBB Industry Data Base

2.7. R&D and Technology Activities

Developments in Lighting technology has been shaping the Turkish Lighting equipment sector. Technological activities in production industry of Lighting equipment in Turkey is just at the beginning of development process. It is mostly foreign-dependent in production and product technology. Therefore, it is limited to technological activities. Industrial design is a field which has been mainly focused.

Outputs of technological activities in Electrical Lighting equipment production industry are measured with the number of the patents and industrial design registrations.

Accordingly, the number of patent obtained in in electrical Lighting equipment production industry in 2000 was 2, it increased gradually and steadily in the following years; thus it reached to 66 in 2018. Industrial design registrations showed a significant increase during these years. While the design registration number had been 115 in 2000, it increased to 505 in 2010. And 620 industrial design registrations were obtained in 2018.

Years	Patent Registrations 32 Production of Lighting Equipment with Electricity Bulbs and Lamps	Industrial Design 26 Lighting Devices
2000	2	115
2005	16	278
2010	47	505
2011	57	553
2012	51	515
2013	23	683
2014	69	697
2015	74	713
2016	70	685
2017	77	654
2018	66	620

Table 9: Number of Patent Obtained and Industrial Design Registrations
Source: Turkish Patent Institute.

Diversities and needs in lamps are increasing because of public regulations focused on energy efficiency and energy saving and customer demands in Lighting equipment sector. Therefore, production development researches are turning out to be an integral part of the production process. While the major companies have research and development units, activities of various minor and medium companies are very limited in this field. Cheap and poor quality import and unrecorded production which create unfair competition in the sector are the most significant handicaps in front of the technological activities and engineering researches.

2.8. Foreign Trade of Electrical Lighting Equipments

Developments in foreign trade, total export and import volumes in electrical Lighting equipment production industry are presented and evaluated under the titles of export and import and export markets and import countries because of the sub-sectors.

2.8.1. Import and Export of Electrical Lighting Equipment

Developments in export, import and foreign trade balance in electrical Lighting equipment foreign trade for 2013-2018 are given below: Accordingly, while the export was fluctuating during this period, the import is seen to have decreased. A deficit in electrical Lighting equipment foreign trade has been observed but this deficit has been significantly decreased during the years.

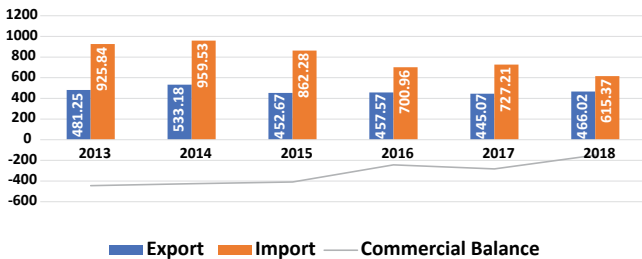
Export of electrical Lighting equipment was 481.25 million dollars in 2013; however, it increased to 533.18 million dollars in 2014 and thus realized the highest export volume in a year. The export decreased to 452,67 million dollars in 2015 and similar export volumes were realized in 2016 and 2017. Export in 2018 showed an increase by 4,7% and increased to 466.02 million dollars.

Import of electrical Lighting equipment had been 925.84 million dollars in 2013; however, it reached to its maximum level with 959,53 million dollars in 2014. Import decelerated to 862 million dollars in 2015 continued to decrease in the following years and realized as 727,21 million dollars in 2017. Recession in the import resulted from the effects of the protection precautions. Import in 2018 recessed by 15,4% and decreased to 615,37 million dollars.

Foreign trade balance of electrical Lighting equipment has decreased resulting from the developments in export and import. Deficit of 2013 was 444,59 million dollars but it recessed to 149,35 million dollars in 2018.

Years	Export	Import	Foreign Trade Balance
2013	481.25	925.84	-444.59
2014	533.18	959.53	-426.35
2015	452.67	862.28	-409.61
2016	457.57	700.96	-243.39
2017	445.07	727.21	-282.14
2018	466.02	615.37	-149.35

Table 10: Foreign Trade of Electrical Lighting Equipments (Million Dollars)
Source: Calculated by TURKSTAT, Foreign Trade Statistical Data.



Graphic 12: Foreign Trade of Electrical Lighting Equipments (Million Dollars)
Source: Calculated by TURKSTAT, Foreign Trade Statistical Data.

2.8.2. Export of Electrical Lighting Equipment

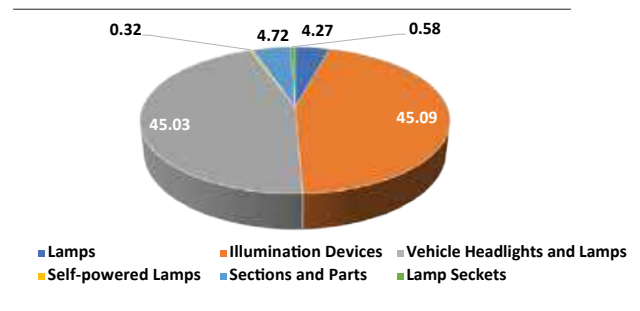
Export of electrical Lighting equipment is reviewed and evaluated in details with its sub-product groups. Accordingly, there are 6 main product group in export. According to export volume ranking, these sectors are Lighting devices, vehicle headlight and lamps, sections and parts, lamps and lamp sockets, and self-energy lamps. Recession in the export which lasted for 4 years ended in 2018 and the export increased by 4,7%, thus it reached to 466 million dollars.

When the developments in product groups from 2013 are evaluated, it is seen that a significant increase in the export of vehicle headlight and lamps were experienced but there was a deceleration in other product groups. There was a deceleration tendency in the export of Lighting devices and sections and parts and lamps from 2013 to 2018 especially.

Years	Lamps	Lighting Devices	Vehicle Headlights and Lamps	Self-Energy Resourced Lamps	Sections and Parts	Lamp Sockets	Total
2013	32.75	262.91	145.08	1.51	32.63	6.37	481.25
2014	30.49	288.06	180.49	2.31	26.46	5.37	533.18
2015	26.33	229.24	173.74	1.78	18.52	3.06	452.67
2016	21.32	236.48	175.56	1.64	19.70	2.87	457.57
2017	19.22	210.75	189.74	1.48	21.35	2.53	445.07
2018	19.91	210.11	209.85	1.47	22.00	2.68	466.02

Table 11: Export of Electrical Lighting Equipment (Million Dollars)
Source: TURKSTAT, Foreign Trade Statistics.

Within the framework of these developments experienced in the sub-product groups after 2013, the shares which sub-product groups have taken out of the total export volume since 2018 are as follows: Accordingly, the Lighting devices rank as the first with a share by 45,09%. Vehicle headlights and lamps rank as the second with a share by 45,03%. Share of sections and parts is 4,8% while that of the lamps is 4,3%; those of other two secondary product groups are highly small.



Graphic 13: Main Product Groups' Shares in Electrical Lighting Equipment Export (Percent)
Source: Calculated by TURKSTAT, Foreign Trade Statistical Data.

Lamp export has been decreasing year by year. This decrease has a role in losses in the production. Hot cathoded fluorescent and filament lamps are the ones which are mostly exported. Export increased in a limited scale in 2018.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
853910	Monobloc headlight units	817,446	537,577	565,329	624,085	523,654	517,757
853921	Tungsten filament halogen bulbs	2,868,458	3,294,888	2,072,060	1,686,158	1,720,516	2,052,749
853922	Filament bulbs (power<200w, resistance > 100v)	7,113,580	6,212,665	4,485,830	2,891,092	1,821,719	1,755,412
853929	Other filament bulbs	3,758,052	3,830,444	3,056,277	3,247,634	3,102,948	3,274,078
853931	Hot cathoded fluorescents	9,122,524	7,260,516	8,124,578	5,386,859	4,999,754	5,257,556
853932	Mercury and sodium vapor bulbs	4,705,502	4,666,773	4,900,478	4,057,118	2,764,805	2,070,711
853939	Other discharge bulbs (excluding ultraviolet bulbs)	1,312,915	988,499	742,566	1,054,527	546,265	677,278
853941	Arc lamps	93,008	79,892	140,313	131,713	146,884	125,701
853949	Ultraviolet and infrared lamps	1,613,257	1,387,856	639,961	452,036	346,883	370,590
853950	LED lamps					2,097,371	3,211,960
	Total Lamps	31,404,742	28,259,110	24,727,392	19,531,222	18,070,799	19,313,792
853990	Section and parts of furnace, discharge electrical bulbs and arc lamps	1,341,102	2,228,426	1,601,044	1,785,260	1,156,124	598,104
	Total Lamps and Parts	32,745,844	30,487,536	26,328,436	21,316,482	19,226,923	19,911,896

Table 12: Lamp Export (Value, Dollar)**Source:** TURKSTAT, Foreign Trade Statistics.

One of the two biggest sub-product groups in electrical Lighting equipment export is Lighting devices. Three products are drivers in export within this group. They are chandeliers, Lighting devices for wall and roof, other electrical lamps and Lighting devices and advertising lamps, led boards and led advertising plates. These three product

groups carry out export significant amount of export. However, it is seen that the export within these three groups have been in deceleration tendency since 2013.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
940510	Chandeliers; Lighting devices for wall and roof	128,451,729	130,467,702	108,543,681	111,459,437	97,632,526	94,632,876
940520	Floor lamp for tables, desks, bedrooms, and floors	6,330,231	6,114,014	6,266,896	4,903,372	4,715,016	6,334,753
940530	Electrical illuminators used on Noel trees	1,344,151	553,186	1,056,750	1,143,050	382,279	449,752
940540	Other electrical lamps, Lighting devices	85,796,289	99,204,908	71,214,098	73,325,482	73,431,794	75,207,732
940550	Non-electrical Lighting devices	3,860,066	3,945,543	3,208,164	4,477,959	2,221,646	2,050,260
940560	Advertising lamps, led boards and led name plates, etc.	37,126,617	47,779,185	38,951,483	41,169,265	32,367,226	31,438,787
	Total Lighting Devices and Fixtures	262,909,083	288,064,538	229,241,072	236,478,565	210,750,487	210,114,160
940591	Sections-parts of glass Lighting devices	9,395,954	7,931,096	6,680,405	8,242,041	5,552,134	4,357,879
940592	Sections-parts of plastic Lighting devices	637,784	1,059,009	1,100,257	1,735,330	2,131,845	1,505,794
940599	Other sections-parts of Lighting devices	22,598,288	17,472,657	10,741,944	9,722,874	13,664,041	16,134,395
	Total Parts of Lighting Devices	32,632,026	26,462,762	18,522,606	19,700,245	21,348,020	21,998,068
9405	Lighting Devices	295,541,109	314,527,300	247,763,678	256,178,810	232,098,507	232,112,228

Table 13: Lighting Devices Export (Dollar)**Source:** TURKSTAT, Foreign Trade Statistics.

Turkey carries out production and export in all sub-groups in sections and parts export. A recession had been experienced in sections and parts export from 2013 to 2017; and a limited recovery was realized in export in 2018.

Export of vehicle headlights and other signal, sign and Lighting lamps which ranked as the first in Lighting devices export comprises of two significant product groups.

Export of any headlights in the first group was 53,0 million dollars in 2013; it reached to 59,8 million dollars in 2018.

The second group is the other Lighting, sign and signal export. A significant increase has been experienced in the export in this product group. The export volume which was 91,89 million dollars in 2013 increased to 149,94 million dollars in 2018.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
851220000011	Lighting dynamos; which are used in motor vehicles, bicycles or motorcycles	179,439	175,279	285,364	205,528	247,169	94,346
851220000012	Any headlights (excluding monobloc headlights)	53,007,434	55,946,464	53,020,978	51,169,084	49,870,792	59,816,373
851220000019	Other Lighting/sign devices	91,893,643	124,366,341	120,435,611	124,189,307	139,620,421	149,940,678
851220	Other Lighting/visible sign devices	145,080,516	180,488,084	173,741,953	175,563,919	189,738,382	209,851,397

Table 14: Vehicle Headlight and Lamps Export (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

The lamp socket export had been 6,37 million dollars in 2013; however it decelerated in the following years and decreased up to 2,53 million dollars in 2017.

A limited increase was experienced in export in 2018.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
853661	Lamp Sockets	6,374,590	5,371,714	3,061,630	2,874,170	2,533,956	2,676,222

Table 15: Lamp Socket Export (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

Self-energy resourced lamps are the featured lamps used mostly in mining sector and similar fields. Export figure of these lamps was 1,51 million dollars in 2013.

After the export increased to 2,31 million dollars in 2014, it decelerated in the following years and was decreased to 1,41 million dollars in 2018.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
851310	Self-energy resourced lamps	1,455,574	2,232,677	1,721,157	1,544,351	1,454,153	1,441,580
851390	Sections and parts of self-energy resourced lamps	56,866	78,264	57,670	97,538	22,324	28,589
8513	Self-energy resourced (e.g.: dry cells, accumulators, magnetos) portable electrical lamps	1,512,440	2,310,941	1,778,827	1,641,889	1,476,477	1,470,169

Table 16: Self-Energy Resourced Lamps Export (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

2.8.3. Export Markets of Electrical Lighting Equipment

Electrical Lighting equipment export markets are reviewed and evaluated in terms of products. General export markets and the export markets of top five sub-product groups for the years of 2017 and 2018 are given.

Export markets of Turkey for electrical Lighting equipment consist of four groups. There are European countries in the first group. Top three export countries are Germany, Italy and France. Other European countries with which export is carried out mostly are Romania, Spain, Poland, United Kingdom and Belgium.

Turkmenistan, Kazakhstan and Russia consist of other group. Turkmenistan is our fourth biggest export market. Another market group includes Gulf countries and Middle East countries. S. Arabia is the fifth country with which export is mostly carried out. Algeria and Morocco in North Africa take place among the top 20 countries for which export activities has been realized. USA is among the top 20 export countries.

Order	Country	Million Dollars	Share (%)
	Total	466	100.0
1	Germany	67	14.4
2	Italy	46	9.9
3	France	26	5.6
4	Turkmenistan	16	3.4
5	Saudi Arabia	14	3.0
6	Romania	14	3.0
7	Slovenia	14	3.0
8	Iraq	13	2.9
9	Spain	12	2.7
10	England	11	2.4
11	United Arab Emirates	11	2.4
12	Morocco	11	2.4
13	Algeria	11	2.4
14	Iran	10	2.1
15	Belgium	9	2.0
16	Poland	8	1.9
17	Russia	8	1.9
18	Kazakhstan	7	1.7
19	USA	7	1.7
20	Qatar	7	1.7
	Other	144	30.9

Table 17: Export Markets of Turkey's Lighting Equipment, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Turkey has a wide market range in electrical Lighting devices export. Germany which has ranked as the first has a share by 14,4% in export. Export is carried out into numerous countries. Share of the top 20 countries with which export is mostly carried out has been 69,1 as of 2017. Rest of the export markets has a share by 30,9%.

The export carried out into numerous developed countries especially the European countries shows the international qualities and high standards of Turkish products. Quality and standards of products continue to be high as a result of harmonization with EU especially.

Export of three products within Lighting devices sub-product groups are in rise. S. Arabia ranked as the first in 2017 and UAE ranked as the first in 2018 in the export of chandeliers and Lighting devices for wall and roof. When the top 10 markets in the export are reviewed, it is seen that Gulf Countries, Middle Asian countries and EU countries take place within these markets. And some neighbor countries such as Russia, Iraq, Romania and Azerbaijan take place within the export markets as well as Algeria and North Africa countries.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	8,411,656	97,632,526	11.61
1	Saudi Arabia	301,742	5,954,881	19.74
2	Turkmenistan	563,597	5,949,843	10.56
3	UAE	318,283	4,956,622	15.57
4	Norway	207,149	4,940,123	23.85
5	Kazakhstan	196,272	4,101,148	20.90
6	Spain	98,366	4,087,911	41.56
7	Germany	261,657	3,420,349	13.07
8	Iraq	418,626	3,151,333	7.53
9	Turkish Republic of Northern Cyprus	203,368	3,080,468	15.15
10	Azerbaijan	304,720	2,733,097	8.97

Table 18: Export of Chandeliers, Lighting Devices for Walls and Roofs on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	7,074,923	88,294,504	12.48
1	UAE	362,565	7,288,923	20.10
2	Qatar	240,240	4,046,561	16.84
3	Russian Federation	205,704	3,584,817	17.43
4	Algeria	398,654	3,368,576	8.45
5	Germany	209,009	3,106,744	14.86
6	Saudi Arabia	175,168	2,917,193	16.65
7	Spain	81,722	2,914,372	35.66
8	Azerbaijan	280,515	2,816,572	10.04
9	Denmark	113,443	2,743,694	24.19
10	Romania	252,723	2,649,206	10.48

Table 19: Export of Chandeliers, Lighting Devices for Walls and Roofs on Country Basis (January-November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

Turkmenistan and Qatar ranked as the first in 2017 and 2018 respectively in other electrical lamps export. When the top 10 markets in export are reviewed, S. Arabia, UAE, Qatar and Gulf Countries are coming forefront. And Germany, Italy, Poland from EU countries are the markets taking place among the top 10. Apart from some neighbor countries such as Russia, Iraq and Iran, various North African countries like Algeria and Morocco take place within the export markets.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	5,771,063	73,431,794	12.72
1	Turkmenistan	368,108	4,967,765	13.50
2	Saudi Arabia	236,343	3,365,068	14.24
3	Qatar	199,567	3,364,484	16.86
4	Germany	138,595	3,201,164	23.10
5	UAE	207,767	3,072,303	14.79
6	Italy	167,848	2,894,979	17.25
7	Algeria	133,424	2,846,921	21.34
8	Iran	107,604	2,829,944	26.30
9	Iraq	436,372	2,574,904	5.90
10	Morocco	371,758	2,340,901	6.30

Table 20: Export of Other Electrical Lamps Lighting Devices, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	5,141,215	68,371,318	13.30
1	Qatar	533,162	6,620,452	12.42
2	UAE	220,166	6,002,683	27.26
3	Saudi Arabia	221,964	3,878,271	17.47
4	Italy	193,110	3,512,917	18.19
5	Algeria	236,946	2,985,791	12.60
6	Germany	108,235	2,298,177	21.23
7	Azerbaijan	134,179	2,109,660	15.72
8	Iraq	261,252	1,994,114	7.63
9	Russian Federation	129,121	1,941,742	15.04
10	Poland	129,262	1,709,668	13.23

Table 21: Export of Other Electrical Lamps Lighting Devices on Country Basis, (January - November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

The third product group which carries out export mostly within Lighting devices are advertising lamps and led boards. The first rank was occupied by Morocco in 2017 and Germany in 2018 in advertising lamps and led boards export. When the top 10 markets in export are reviewed, it is seen that EU countries have higher share in this product group. Export with EU countries such as Germany, United Kingdom, Holland, France are carried out. Also another two neighbor countries, namely Greece and Romania are other export markets. Gulf countries in this product group take place in a limited scale. And also Central Asian countries do not take place within top 10 markets regarding this product group. Apart from Morocco and Algeria, African countries such as Ghana and Kenya take place within top 10 markets.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	3,228,263	32,367,226	10.03
1	Morocco	365,965	2,957,587	8.08
2	Germany	251,924	2,612,149	10.37
3	United Kingdom	216,805	2,135,206	9.85
4	Algeria	137,798	1,900,157	13.79
5	Ghana	171,534	1,580,054	9.21
6	Netherlands	86,054	1,349,325	15.68
7	Turkmenistan	47,554	1,216,364	25.58
8	Greece	108,784	1,114,451	10.24
9	Iran	80,478	825,140	10.25
10	France	82,421	796,297	9.66

Table 22: Export of Advertisement Lamps LED Boards on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	3,068,196	29,074,130	9.48
1	Germany	203,837	2,454,647	12.04
2	Morocco	362,209	2,245,029	6.20
3	Kosovo	218,267	1,906,278	8.73
4	Algeria	286,538	1,845,148	6.44
5	Greece	127,155	1,284,295	10.10
6	Netherlands	66,737	1,250,672	18.74
7	Romania	163,528	1,185,569	7.25
8	Kenya	98,188	1,059,835	10.79
9	Ghana	95,678	865,375	9.04
10	Qatar	83,292	730,140	8.77

Table 23: Export of Advertisement Lamps LED Board on Country Basis, (January-November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

The export markets of headlights of vehicles include the countries which carry out production in automotive industry. France ranked as the first within the markets in 2017 and 2018. Germany and Italy ranked as the second and third respectively. Developing automotive manufacturer countries of Europe such as Slovenia, Romania and Poland take place among these top 10 markets. And Russia, Belgium, Algeria, Egypt and Iran are the other countries within these markets.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	3,786,784	49,870,792	13.17
1	France	644,846	11,325,404	17.56
2	Germany	465,433	7,118,181	15.29
3	Italy	447,310	6,947,905	15.53
4	Slovenia	337,487	5,282,760	15.65
5	Romania	247,022	4,283,205	17.34
6	Belgium	147,820	2,831,500	19.16
7	Russian Federation	260,809	1,716,667	6.58
8	Poland	97,921	916,558	9.36
9	Iran	59,548	714,567	12.00
10	Algeria	114,141	686,149	6.01

Table 24: Export of Any Headlights (Excluding Monoblock Headlights) on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	3,979,581	56,020,426	14.08
1	France	726,132	12,650,618	17.42
2	Italy	520,095	8,798,858	16.92
3	Germany	472,219	7,408,366	15.69
4	Slovenia	421,850	6,217,875	14.74
5	Belgium	208,049	4,925,956	23.68
6	Algeria	228,540	3,411,542	14.93
7	Russian Federation	286,639	1,920,458	6.70
8	Poland	111,233	1,000,308	8.99
9	Iraq	79,259	591,017	7.46
10	Corn	110,889	584,552	5.27

Table 25: Export of Any Headlights (Excluding Monoblock Headlights) on Country Basis (January-November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

Export markets of other Lighting and sign devices in vehicles includes the countries carrying out production in automotive industry. Germany ranked as the first within the markets in 2017 and 2018 in the export of these product group. Italy and France ranked as the second and third respectively. Developing automotive manufacturer countries of Europe such as Slovenia, Slovakia, Romania and Poland take place among these top 10 markets. And Spain, United Kingdom, USA and Iran are the other countries within these markets.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	7,652,661	139,620,421	18.24
1	Germany	1,477,621	43,375,986	29.36
2	Italy	1,924,791	31,487,727	16.36
3	France	503,416	11,122,478	22.09
4	Slovenia	413,712	6,822,477	16.49
5	Poland	407,270	5,143,462	12.63
6	Spain	226,842	4,693,675	20.69
7	USA	153,488	3,818,425	24.88
8	Romania	194,197	3,470,424	17.87
9	Iran	113,629	2,262,989	19.92
10	United Kingdom	137,719	2,246,029	16.31

Table 26: Other Lighting and Indicator Devices Used in Vehicles on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	7,115,046	139,996,344	19.68
1	Germany	1,361,554	41,464,479	30.45
2	Italy	1,681,569	26,754,141	15.91
3	France	514,684	11,443,671	22.23
4	Slovakia	256,421	7,481,046	29.17
5	Slovenia	409,812	7,134,978	17.41
6	USA	170,473	6,708,209	39.35
7	Spain	201,404	4,803,082	23.85
8	Poland	332,723	4,726,619	14.21
9	United Kingdom	158,830	2,493,296	15.70
10	Romania	104,553	2,244,785	21.47

Table 27: Other Lighting and Indicator Devices Used in Vehicles on Country Basis, (January-November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

2.8.4. Import of Electrical Lighting Equipment

Import of electrical Lighting equipment is reviewed and evaluated in details with its sub-product groups. Accordingly, there are 6 main product group in import. According to the export volume size, these sectors are vehicle headlight and lamps, Lighting devices, lamps, sections and parts, self-energy resourced lamps and lamp sockets.

When the developments of product groups since 2013 is evaluated, it is seen that a significant deceleration has been experienced in import of Lighting devices and lamp import. Protection measures applied in import have had a role in this deceleration.

And an increase in vehicle headlights and lamps has been experienced. Along with the production and export of automotive in Turkey, the import has increased also. And import of sections and parts have been experienced. Because of the protection measures applied in final product import, tendency of import of sections and parts and that of production have come forefront; thus the import of sections and parts have increased. And a deceleration in import of lamp sockets and self-energy resourced lamps has been experienced.

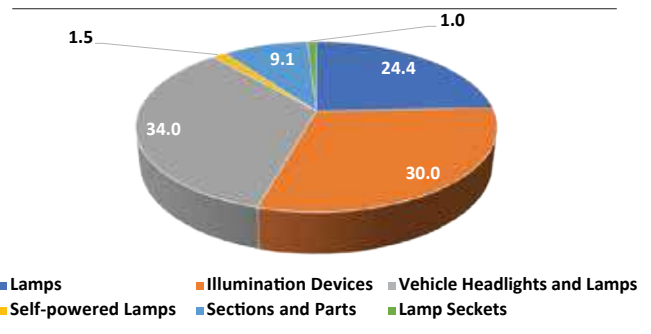
Years	Lamps	Lighting Devices	Vehicle Headlights and Lamps	Self-Energy Resourced Lamps	Sections and Parts	Lamp Sockets	Total
2013	246.97	455.82	155.93	16.81	40.19	10.12	925.84
2014	203.90	533.58	158.14	15.49	39.33	9.09	959.53
2015	168.97	470.78	164.73	13.97	36.32	7.51	862.28
2016	146.20	316.62	178.55	10.11	42.24	7.24	700.96
2017	175.50	264.13	218.09	11.13	50.90	7.46	727.21
2018	150.76	183.74	210.44	8.86	54.92	6.65	615.37

Table 28: Import of Electrical Lighting Equipment (Million Dollars)
Source: TURKSTAT, Foreign Trade Statistics.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
853910	Monobloc headlight units	1,677,968	1,590,080	1,588,868	2,931,546	2,776,502	2,387,703
853921	Tungsten filament halogen bulbs	41,669,561	38,091,883	38,191,082	33,779,786	32,978,227	24,695,797
853922	Filament bulbs (power<200w, resistance > 100v)	7,813,568	5,261,381	4,095,599	3,576,407	3,130,856	2,213,234
853929	Other filament bulbs	18,398,722	20,148,696	19,679,954	20,497,550	18,964,640	14,524,682
853931	Hot cathoded fluorescents	140,248,411	101,572,538	76,978,611	63,178,202	40,951,065	30,730,549
853932	Mercury and sodium bulbs	25,666,422	25,582,233	17,875,664	11,983,102	14,464,645	11,233,598
853939	Other discharge bulbs (excluding ultraviolet bulbs)	2,966,120	2,918,594	2,474,401	1,565,715	1,369,181	1,486,906
853941	Arc lamps	2,641,866	3,494,676	1,698,613	2,181,079	2,721,374	2,305,164
853949	Ultraviolet and infrared lamps	5,579,304	4,626,182	5,970,958	6,102,417	7,299,986	6,005,567
853950	LED lamps					50,614,274	53,573,350
	Total Lamps	246,661,942	203,286,263	168,553,750	145,795,804	175,270,750	149,156,550
853990	Section and parts of furnace, discharge electrical bulbs and arc lamps	307,394	613,391	418,776	410,610	678,567	1,602,816
	Total Lamps and Parts	246,969,336	203,899,654	168,972,526	146,206,414	175,949,317	150,759,366

Table 29: Lamp Import (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

Within the framework of these developments experienced in the sub-product groups after 2013, the shares which sub-product groups have taken out of the total import volume since 2018 are as follows: Accordingly, vehicle headlights and lamps hit to the first rank with the share by 34,0%. Lighting devices rank as second with the share by 30,0. Share of the lamps by 24,4 maintains its high progression. Share of sections and parts are 9,1%. Lamp bases and self-energy based lamps take small shares in import.



Graphic 14: Main Product Groups' Shares in Electrical Lighting Equipment Import (Percent)
Source: Calculated by TURKSTAT, Foreign Trade Statistical Data.

Lamps maintain their importance within the import of electrical Lighting equipment. Turkey meets the majority of its need of almost each lamp type through import. There has been a shrank in import because of protection measures; however, the dependence on import continues.

Lamp import of Turkey is given below in amounts. Accordingly, 362 million lamps had been imported in 2013 totally. This figure decreased 339,9 million items in 2017. Import of LED lamps started to support the increase in the

total import. The imported LED lamps increased in 2018 and total lamp import reached 294,84 million items.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
853910	Monobloc headlight units	1,914,078	89,535	79,850	117,161	105,298	76,830
853921	Tungsten filament halogen bulbs	61,505,490	55,074,017	68,231,503	71,857,801	68,418,239	48,427,672
853922	Filament bulbs (power<200w, resistance > 100v)	32,839,994	23,022,772	19,944,353	17,239,972	18,078,292	12,002,826
853929	Other filament bulbs	92,531,647	109,334,343	101,949,754	106,251,944	101,617,909	90,649,604
853931	Hot cathoded fluorescents	148,802,820	120,494,323	103,608,758	96,178,927	68,605,001	50,570,969
853932	Mercury and sodium bulbs	4,909,621	6,103,578	3,642,421	2,689,681	3,799,637	3,159,492
853939	Other discharge bulbs (excluding ultraviolet bulbs)	19,486,064	16,431,116	21,994,569	23,871,505	23,600,246	22,319,304
853941	Arc lamps	30,486	40,548	44,875	129,423	82,165	63,468
853949	Ultraviolet and infrared lamps	388,630	286,046	294,616	507,765	2,819,923	2,673,862
853950	LED lamps					52,778,464	64,712,957
Total Lamps		362,408,830	330,876,278	319,790,699	318,844,179	339,905,174	294,836,984

Table 30: Lamp Import (Item)
Source: TURKSTAT, Foreign Trade Statistics.

One of the three biggest sub-product groups in electrical Lighting equipment import is Lighting devices. Two products are main drivers in export within this group. They are chandeliers, Lighting devices for wall and roofs and other electrical lamps and Lighting devices. These two product

groups carry out import significant amount of export. However, it is seen that the import in these two groups have been decelerated rapidly after 2015 as a result of the application of protection measures. And import in all product groups noticeably decreased in 2018.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
940510	Chandeliers; Lighting devices for wall and roof	186,914,323	219,530,250	196,939,600	114,061,981	87,883,836	59,624,640
940520	Floor lamp for tables, desks, bedrooms, and floors	25,104,119	23,873,332	20,552,730	13,433,036	12,259,508	7,840,376
940530	Electrical illuminators used on Noel trees.	1,984,511	1,756,057	3,811,072	2,584,038	3,068,199	2,645,171
940540	Other electrical lamps, Lighting devices	213,010,132	259,518,631	219,661,754	164,397,227	138,812,666	100,115,678
940550	Non-electrical Lighting devices	18,779,408	21,978,287	22,820,738	16,203,576	16,101,954	8,772,354
940560	Advertising lamps, led boards and led name plates, etc.	10,031,436	6,918,764	6,997,415	5,941,388	6,007,694	4,736,672
Total Lighting Devices		455,823,929	533,575,321	470,783,309	316,621,246	264,133,857	183,735,026
940591	Sections-parts of glass Lighting devices	14,649,610	14,015,174	11,829,336	11,848,791	16,039,279	15,388,380
940592	Sections-parts of plastic Lighting devices	5,127,650	5,971,437	5,608,232	6,579,314	7,841,088	8,866,832
940599	Other sections-parts of Lighting devices	20,415,406	19,342,661	18,877,953	23,815,189	27,018,550	30,661,144
Lighting Devices Sections and Parts		40,192,666	39,329,272	36,315,521	42,243,294	50,898,917	54,916,356
9405	Lighting Devices	496,016,595	572,904,593	507,098,830	358,864,540	315,032,774	238,651,382

Table 31: Lighting Devices Import (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

And import of sections and parts have been experienced. Because of the protection measures applied in final product import, tendency of import of sections and parts and that of production have come forefront; thus the import of sections and parts have increased.

Import of vehicle headlights and other signal, sign and Lighting lamps which ranked as the first in Lighting devices import comprises of two significant product groups. Import of any headlights in the first group was 98,0 million dollars in 2013; it reached to 125,83 million dollars in 2017. Import in 2018 decreased to 121 million dollars.

The second group is the other Lighting, sign and signal export. A significant increase has been experienced in the import in this product group.

The import volume which was 57,71 million dollars in 2013 increased to 92,0 million dollars in 2017. Import in 2018 decreased to 89.1 million dollars.

HS6	HS6 name	2013	2014	2015	2016	2017	2018
85122000011	Lighting dynamos; which are used in motor vehicles, bicycles or motorcycles	223,826	171,404	121,629	317,037	227,143	339,348
85122000012	Any headlights (excluding monobloc headlights)	97,997,541	101,790,017	101,272,196	103,470,001	125,831,635	120,995,495
85122000019	Other Lighting/sign devices	57,713,266	56,177,173	63,334,987	74,763,321	92,029,358	89,102,209
851220	Other Lighting/visible sign devices	155,934,633	158,138,594	164,728,812	178,550,359	218,088,136	210,437,052

Table 32: Vehicle Headlight and Lamps Import (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

Self-energy resourced lamps are the featured lamps used mostly in mining sector and similar fields. Import figure of these lamps was 16,8 million dollars in 2013. Import has been in tendency of recession since 2014.

And the import was carried out for 11,13 million dollars in 2017. Import in 2018 decreased to 8.86 million dollars.

HS6	HS6 Name	2013	2014	2015	2016	2017	2018
851310	Self-energy resourced lamps	16,631,767	15,374,499	13,676,419	9,774,906	10,730,866	8,469,521
851390	Sections and parts of self-energy resourced lamps	177,175	112,026	296,119	343,004	404,088	392,541
8513	Self-energy resourced portable electrical lamps (e.g.: dry cells, accumulators, magnetos)	16,808,942	15,486,525	13,972,538	10,117,910	11,134,954	8,862,062

Table 33: Self-Energy Resourced Lamps Import (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

The lamp socket import had been 10,12 million dollars in 2013; however it decelerated in the following years and decreased up to 7,46 million dollars in 2017.

The deceleration in import maintained its existence during 2018.

HS6	HS6 Name	2013	2014	2015	2016	2017	2018
853661	Lamp Sockets	10,122,291	9,089,235	7,505,678	7,242,003	7,462,771	6,653,581

Table 34: Lamp Socket Import (Dollar)
Source: TURKSTAT, Foreign Trade Statistics.

2.8.5. Import Countries of Electrical Lighting Equipment

Supplier countries with which Turkey has carried out import for electrical Lighting equipment are reviewed and evaluated in terms of products. The top 20 countries and eight sub-product groups which have the highest rates in terms of import volume for the years of 2017 and 2018 are given.

6 European countries, namely Germany, Romania, Italy, Czech Republic, France and Poland follow China. And other European and Asian countries follow them. USA takes place within these top 20 countries apart from these two groups. Turkey carries out its import with much fewer countries. Therefore, the shares of the countries apart from the top 20 countries have a share only by 0.3% in import.

China has a share by 49% in the import of Turkey's Lighting devices and components. After China, the top 20 countries consist of European and Asian manufacturer and exporter countries.

Order	Country	Million Dollars	Share (%)
	Total	728	100.00
1	China	357	49.0
2	Germany	57	7.8
3	Romania	38	5.2
4	Italy	32	4.5
5	Czech Republic	25	3.5
6	France	25	3.4
7	Poland	22	3.0
8	India	22	3.0
9	South Korea	20	2.7
10	Spain	17	2.4
11	Japan	17	2.3
12	Hungary	13	1.8
13	Slovakia	12	1.7
14	USA	10	1.4
15	Taiwan	9	1.3
16	Thailand	9	1.2
17	England	6	0.8
18	Belgium	5	0.7
19	Austria	5	0.7
20	Slovenia	5	0.7
	Other	22	3.0

Table 35: Turkey's Import Countries of Lighting Equipment, 2017
Source: TURKSTAT, Foreign Trade Statistics.

China and EU countries and USA take place in the import of chandeliers and Lighting devices for wall and roof. China is the top first country with which import was carried out in 2017 and the first 11 months of 2018. China meets the 70% of total import of Turkey on its own. Other import countries following China are Italy, France and Germany. Import with various EU countries such as Spain, Poland, Hungary and Austria has been carried out. A deceleration in the import carried out with all countries in 2018 was experienced. USA was among the top 10 countries with which import was carried out.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	6,347,455	87,883,836	13.85
1	China	5,526,551	62,584,965	11.32
2	Italy	242,175	7,139,482	29.48
3	France	39,210	3,219,217	82.10
4	Germany	76,830	3,171,318	41.28
5	Spain	77,969	2,240,494	28.74
6	Hungary	48,377	1,109,501	22.93
7	Austria	29,129	1,090,414	37.43
8	Poland	37,330	862,584	23.11
9	Lithuania	75,387	771,993	10.24
10	United Kingdom	17,678	707,346	40.01

Table 36: Import of Chandeliers, Lighting Devices for Walls and Roofs on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	4,583,272	57,196,650	12.48
1	China	3,960,787	38,848,847	9.81
2	Italy	142,489	4,626,131	32.47
3	France	39,979	2,821,776	70.58
4	Germany	57,403	2,653,524	46.23
5	Spain	49,855	1,633,477	32.76
6	Poland	26,292	819,963	31.19
7	Hungary	45,082	813,934	18.05
8	USA	9,781	716,341	73.24
9	Austria	17,993	588,739	32.72
10	United Kingdom	9,885	466,370	47.18

Table 37: Import of Chandeliers, Lighting Devices for Walls and Roofs on Country Basis (January-November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

China and European countries take place in the import of other electrical lamps and Lighting devices. China is the leading country with which import was carried out mostly in 2017 and 2018. China has a share by 60% in the import market with this product. Germany, Italy, Poland and South Korea follow China. And other countries taking place among the top 10 import countries are European countries and USA again.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	6,303,412	138,812,666	22.02
1	China	4,520,276	82,862,609	18.33
2	Germany	430,086	12,521,685	29.11
3	South Korea	351,826	8,582,818	24.40
4	Italy	232,116	7,947,263	34.24
5	Poland	180,157	5,328,332	29.58
6	Spain	154,235	4,838,986	31.37
7	USA	49,849	2,918,359	58.54
8	Czech Republic	96,969	2,105,965	21.72
9	United Kindom	30,530	1,759,990	57.65
10	Hungary	91,837	1,720,033	18.73

Table 38: Import of Other Electrical Lamps and Lighting Devices on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	5,590,559	93,380,412	16.70
1	China	4,453,663	53,463,026	12.00
2	Germany	339,965	9,612,755	28.28
3	Italy	241,050	9,249,318	38.37
4	Poland	103,980	3,198,978	30.77
5	South Korea	129,967	3,176,999	24.44
6	Czech Republic	55,571	2,352,899	42.34
7	USA	16,056	2,252,247	140.27
8	Spain	53,847	2,079,013	38.61
9	France	19,381	1,311,747	67.68
10	United Kingdom	18,667	1,285,021	68.84

Table 39: Import of Other Electrical Lamps Lighting Devices on Country Basis, (January - November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

China ranks as the first in import of sections and parts of Lighting devices. China has the highest share in the import of this product group. And European countries follow China. Germany, Italy and Belgium are the leading European countries in terms of import. Pakistan, Vietnam, Egypt and USA take place within the top 10 countries in sections and parts import. While products of which unit price is higher and which are limited in terms of amount are imported from European countries and USA, products of which unit price is much lower in substantial amounts are imported from China and other countries.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	6,374,977	27,018,550	4.24
1	China	5,586,282	20,203,834	3.62
2	Germany	44,606	1,995,740	44.74
3	Italy	35,116	1,402,043	39.93
4	Belgium	18,222	615,852	33.80
5	Finland	21,532	424,660	19.72
6	Slovakia	11,361	420,820	37.04
7	Pakistan	601,507	398,129	0.66
8	USA	2,409	369,426	153.35
9	France	5,411	248,335	45.89
10	Spain	11,064	241,102	21.79

Table 40: Import of Parts and Sections of Lighting Devices on Country Basis, 2017

Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	6,773,279	29,684,579	4.38
1	China	5,952,856	24,011,577	4.03
2	Germany	28,783	1,564,980	54.37
3	Italy	20,622	1,334,525	64.71
4	Belgium	21,928	563,229	25.69
5	France	7,542	335,660	44.51
6	USA	672	320,931	477.58
7	Pakistan	664,932	297,882	0.45
8	Vietnam	17,348	197,515	11.39
9	Corn	7,150	139,906	19.57
10	Spain	11,367	134,967	11.87

Table 41: Import of Parts and Sections of Lighting Devices on Country Basis, 2017

Source: TURKSTAT, Foreign Trade Statistics.

Import has been carried out from the countries which has developed in automotive sub-industry and are preferred by the main producer firms in Turkey in the import of any headlights excluding the monoblock headlights. The leading county with which the import was carried out mostly in 2017 and first 11 months of 2018 is Romania for this product group. Czech Republic and China ranked as the second and third respectively. European countries and Asian countries such as Taiwan, Japan, India and Thailand take place within the other countries among the top 10 importers. Import with the lowest unit prices are carried out with China, Taiwan and Thailand.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	6,456,381	125,831,635	19.49
1	Romania	1,077,303	26,216,035	24.33
2	Czech Republic	400,689	15,699,725	39.18
3	China	1,515,139	15,394,119	10.16
4	France	1,010,491	11,294,909	11.18
5	Germany	224,211	6,669,744	29.75
6	Taiwan	479,023	5,611,212	11.71
7	Japan	151,913	5,422,637	35.70
8	India	223,707	5,222,165	23.34
9	Spain	170,110	5,191,394	30.52
10	South Korea	167,984	3,797,131	22.60

Table 42: Import of Any Headlights (Excluding Monoblock Headlights) on Country Basis, 2017

Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	5,511,612	113,048,226	20.51
1	Romania	979,342	26,801,482	27.37
2	China	1,244,766	13,890,325	11.16
3	Czech Republic	315,092	12,131,056	38.50
4	Taiwan	574,865	7,426,927	12.92
5	Japan	145,166	5,257,238	36.22
6	Germany	165,125	5,186,404	31.41
7	Spain	141,199	4,692,186	33.23
8	Thailand	404,772	3,992,827	9.86
9	Slovakia	84,367	3,933,959	46.63
10	India	154,450	3,268,061	21.16

Table 43: Import of Any Headlights (Excluding Monoblock Headlights) on Country Basis (January-November, 2018)

Source: TURKSTAT, Foreign Trade Statistics.

It is seen that import is carried out with various countries in the supply of other signal, sign and Lighting lamps in automotive industry. Asian and European countries take place within the top 10 import countries once again. India, Romania and China are the first three countries within these top 10 countries. Other countries include European countries such as Germany, Italy, France, Czech Republic and Slovakia and Asian countries such as South Korea, Japan and Thailand.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	4,066,170	92,029,358	22.63
1	India	678,030	10,921,071	16.11
2	Romania	355,435	10,649,453	29.96
3	China	872,924	8,151,861	9.34
4	Germany	174,485	7,793,891	44.67
5	South Korea	165,906	6,374,894	38.42
6	Czech Republic	95,121	6,218,509	65.37
7	Slovakia	116,385	5,565,067	47.82
8	Italy	150,295	5,119,378	34.06
9	Japan	182,521	4,998,952	27.39
10	Thailand	548,373	4,948,864	9.02

Table 44: Import of Other Signal, Indicator and Lighting Lamps, 2017

Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Dollar	Kg/Dollar
	Total	3,740,310	83,237,326	22.25
1	India	678,157	10,490,068	15.47
2	Romania	281,700	9,171,549	32.56
3	China	819,200	8,393,307	10.25
4	Germany	149,488	6,535,943	43.72
5	Thailand	654,359	6,152,331	9.40
6	South Korea	168,819	5,218,415	30.91
7	Czech Republic	60,375	4,889,785	80.99
8	Slovakia	79,187	4,364,433	55.12
9	Italy	108,736	3,913,657	35.99
10	France	148,364	3,260,146	21.97

Table 45: Import of Other Signal, Indicator and Lighting Lamps, (January-November, 2018)

Source: TURKSTAT, Foreign Trade Statistics.

Lamps have an important role in the import of Turkish Lighting equipment. Turkey is import-dependent country for almost each lamp type mostly. The countries which take place in Turkey's lamp import are given below according to the lamp groups. Germany ranks as the first while China ranks as the second in the import of Tungsten filament halogen lamps. Unit prices of lamps imported from Germany are much higher than those of China. Poland, Hungary, France and Italy are the other countries with which import has been carried out from Europe. Asian countries such as Japan, India, South Korea, and USA and Mexico take place in the import of halogen lamps.

Order	Country	Kg	Item	Dollar	Kg/Dollar	Item / Dollar
	Total	1,948,500	68,418,239	32,978,227	16.92	0.48
1	Germany	190,603	11,441,348	12,317,629	64.62	1.08
2	China	1,548,415	47,547,639	11,716,974	7.57	0.25
3	Poland	69,512	3,549,851	3,934,219	56.60	1.11
4	Hungary	52,980	3,145,260	1,982,305	37.42	0.63
5	Japan	1,399	26,482	721,142	515.47	27.23
6	France	26,811	890,847	690,605	25.76	0.78
7	USA	9,691	390,741	561,286	57.92	1.44
8	India	12,847	426,601	251,743	19.60	0.59
9	South Korea	7,830	242,242	214,544	27.40	0.89
10	Italy	2,624	89,040	114,117	43.49	1.28

Table 46: Import of Tungsten Filament Halogen Lamps on Country Basis, 2017

Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Item	Dollar	Kg/Dollar	Item / Dollar
	Total	1,215,661	46,013,428	22,926,451	18.86	0.50
1	Germany	152,951	9,561,666	9,184,508	60.05	0.96
2	China	861,920	27,912,658	6,450,010	7.48	0.23
3	Poland	84,428	3,379,346	3,515,836	41.64	1.04
4	Hungary	32,359	2,380,355	1,120,627	34.63	0.47
5	Japan	1,854	59,875	768,608	414.57	12.84
6	France	45,670	1,560,887	714,477	15.64	0.46
7	USA	7,285	294,214	437,396	60.04	1.49
8	South Korea	15,077	396,964	368,191	24.42	0.93
9	India	7,670	275,703	115,636	15.08	0.42
10	Mexico	731	8,560	71,662	98.03	8.37

Table 47: Import of Tungsten Filament Halogen Lamps on Country Basis, (January-November, 2018)

Source: TURKSTAT, Foreign Trade Statistics.

First three countries with which hot cathoded fluorescent lamp import is carried out is China, Poland and Germany. China has a share by almost 75% for this product. Unit prices in the import of these countries are approximately similar with each other in general. Other import countries Russia, Hungary, Italy, USA, Japan and United Kingdom. Also import with France and Belgium is carried out.

Order	Country	Kg	Item	Dollar	Kg/ Dollar	Item / Dollar
	Total	6,686,035	68,605,001	40,951,065	6.12	0.60
1	China	4,019,940	45,255,339	30,493,509	7.59	0.67
2	Poland	1,870,610	16,319,529	6,166,907	3.30	0.38
3	Germany	257,076	2,065,723	1,590,765	6.19	0.77
4	Russian Federation	420,323	3,217,500	1,022,415	2.43	0.32
5	Hungary	62,097	1,127,260	769,936	12.40	0.68
6	Italy	21,482	266,261	322,229	15.00	1.21
7	USA	19,199	179,989	272,335	14.18	1.51
8	Japan	558	2,859	121,586	217.90	42.53
9	France	8,635	117,556	90,650	10.50	0.77
10	United Kingdom	289	3,522	44,504	153.99	12.64

Table 48: Import of Hot Cathoted Fluorescent Lamps, 2017

Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Item	Dollar	Kg/ Dollar	Item / Dollar
	Total	4,603,869	48,385,206	29,154,603	6.33	0.60
1	China	2,916,281	33,143,210	22,030,852	7.55	0.66
2	Poland	1,279,682	11,722,773	4,869,112	3.80	0.42
3	Germany	126,925	944,216	809,665	6.38	0.86
4	Russian Federation	220,838	1,677,368	457,565	2.07	0.27
5	Hungary	41,122	691,346	404,616	9.84	0.59
6	Italy	13,737	164,568	195,387	14.22	1.19
7	USA	3,563	25,689	149,455	41.95	5.82
8	Japan	872	5,160	128,045	146.84	24.81
9	United Kingdom	243	2,590	63,904	262.98	24.67
10	Belgium	64	590	24,623	384.73	41.73

Table 49: Import of Hot Cathoted Fluorescent Lamps (January-November, 2018)

Source: TURKSTAT, Foreign Trade Statistics.

Turkey carries out in LED lamps which are the products of advanced technology in Lighting sector in a significant amount. China ranks as the first in LED lamp import. 96% of the import of this product is carried out with China. A limited amount of import is carried out with other countries which are among the top 10 countries in import.

Order	Country	Kg	Item	Dollar	Kg/ Dollar	Item / Dollar
	Total	3,287,274	52,778,464	50,614,274	15.40	0.96
1	China	3,238,703	51,672,729	48,558,562	14.99	0.94
2	Japan	3,584	158,222	789,254	220.22	4.99
3	Germany	16,673	257,223	416,224	24.96	1.62
4	Taiwan	7,783	135,657	198,078	25.45	1.46
5	Italy	2,395	41,729	113,238	47.28	2.71
6	Malaysia	6,211	114,672	84,554	13.61	0.74
7	United Kingdom	2,166	37,463	82,661	38.16	2.21
8	Hungary	2,233	34,651	69,607	31.17	2.01
9	France	1,174	62,051	55,928	47.64	0.90
10	South Korea	66	267	50,883	770.95	190.57

Table 50: Import of LED Lamps on Country Basis, 2017
Source: TURKSTAT, Foreign Trade Statistics.

Order	Country	Kg	Item	Dollar	Kg/ Dollar	Item / Dollar
	Total	3,506,794	59,719,481	49,935,124	14.24	0.84
1	China	3,427,571	58,100,933	48,075,755	14.03	0.83
2	Corn	48,333	1,112,856	538,249	11.14	0.48
3	Germany	13,403	257,609	311,779	23.26	1.21
4	Bulgaria	6,477	94,036	302,443	46.69	3.22
5	Japan	3,737	53,525	258,899	69.28	4.84
6	United Kingdom	648	4,689	80,359	124.01	17.14
7	Hungary	1,710	26,042	61,229	35.81	2.35
8	Taiwan	635	15,180	56,287	88.64	3.71
9	Italy	1,583	27,312	53,335	33.69	1.95
10	Netherlands	286	2,074	43,533	152.21	20.99

Table 51: Import of LED Lamps on Country Basis (January-November, 2018)
Source: TURKSTAT, Foreign Trade Statistics.

2.9. Sizes of Lighting Equipment Industry and Domestic Market

Characteristics of Turkish Lighting equipment industry and developments and the domestic market size of Lighting equipment have been provided in this chapter.

2.9.1. Lighting Equipment Industry

Development of Lighting sector in Turkey first began with the production of transparent bulb and fluorescent during 1960s. And the production of fixture, ballast and other components and secondary parts and any Lighting tools started in the following years. An important development has been obtained in the production of conventional and mechanical Lighting equipment.

A new and different development has existed in the Lighting equipment industry in Turkey since 2000s. Liberalization in the world trade, competition in imported products, especially in China and technological developments in Lighting sector shaped the developments after 2000s.

Turkish Lighting equipment industry underwent a transportation during 2000s and thus became obligated to give up on the production of transparent bulbs; and a fixture-production oriented structure focusing on the electronic applications in the industry was launched. Furthermore, while the production in Lighting field for motor land vehicles was growing rapidly, production of high added value functional and decorative Lighting tools was focused on.

Main features of Turkish Lighting equipment industry within this framework have been given below;

1. Lighting Equipment Production Industry is Competitive in Production and Has Regional Production Center Potential.

Turkish Lighting equipment production industry is highly experienced in production and at the same time, it is competitive in the added value production. Its competitiveness capacity in the production primarily results from the sufficient amount of producers who can carry out production in each field of the production. A noticeable improvement has been provided in the production chain.

The industry follows the technological developments in the production closely and enables the transformation from mechanical and electric structure into electronic structure rapidly. This transformation is experienced in all stakeholders of the sector.

Competitive capacity in the production provides for Turkey with the potential of being regional production center in Lighting equipment industry. Turkey provides lower costs compared to the Europe, and quality, speed and superiorities on small party production compared to Asian countries for the region markets.

2. Production under the European Union norms is carried out.

Lighting equipment production industry in Turkey carries out production within the framework of European Union rules and norms. Regulations of the Ministries which are in compatible with EU norms have been applied in supply, product and waste management fields of the industry. Regulation on environment and waste by the Ministry of Environment and Urbanization, product standards and regulations on chemicals by TSI, and minimum standards on energy efficiency by the Ministry of Energy constitute the minimum conditions for the production in the industry under the international standards.

3. Production and Market Controls in Domestic Market and Improvement in Infrastructure Have Been Experienced.

Improvement has been provided in unrecorded and poor quality production which cause unfair competition and poor quality and damped imports which cause unfair competition in the domestic market. Especially the application of anti-dumping tax at the rate of 20% and improvements in market controls, customs taxes and specialized customs have been provided since 2015. Better import and domestic market experiences are provided in the market. Import of poor quality final product has decreased.

Turkish Standards Institute has increase its product standards. Improvements in measurement, test and control infrastructure which are necessary for the active market control and observation have been provided. Laboratory infrastructure within public and universities have improved qualitatively and quantitatively. Various tests have become applicable.

4. Lighting Equipment Production Industry Carries out Export in a Significant Scale.

Lighting equipment sector has been increasing its export in the recent period. Export products are mainly the decorative Lighting products. The sector has started to create its own brands day by day against its structure which carries out contract production/export for global brands. Business activities of the construction services abroad has a significant contribution to the Lighting equipment export. Lighting equipment markets of close and neighbor countries are among the prioritized markets.

5. A Rapid Growth in Domestic Market of Lighting Equipment Has Been Experienced.

Because the Lighting culture and consciousness is newly developing in Turkey and Lighting unit number for each household/residence/building is much lower compared to the developed countries, significant opportunities have been provided for the Lighting equipment sector.

Improvement potential in urban transformation, residence need, non-residential building investments, exterior Lighting indicate to the growth dynamics of the sector.

Also the renewal demand to be created by the usage of Lighting equipment which have high energy efficiency and energy saving capacity provides for domestic market with a great dynamic. The share of the LED and energy-saving lamps among the products in the domestic market is expected to increase. Substitution of 90 million lamps, 5 for each, in 18 million houses in Turkey with the energy efficient and LED lamps creates an important renewal market potential.

Development in the Lighting consciousness and addition of the architectural and designation factors will support the growth.

Public infrastructure projects and other mega projects are the primary significant customers for the Lighting equipment industry in the domestic market.

6. Turkish Lighting Equipment Industry Has Offered Significant Opportunities for Foreign Capital Investments with its Industry Infrastructure and Market Opportunities.

Growth tendency in inner demand of Turkish Lighting equipment industry, potential provided by close and neighbor countries and development in infrastructure of the industry and competitive capacity in the production provide significant opportunities for foreign capital investments. There is a suitable potential for each option such as new investments, technology, cooperation in production and distribution, purchases and partnerships.

7. Lighting Equipment Industry is Foreign-Dependent in terms of Technology.

Developments in Lighting technology has been shaping the Turkish Lighting equipment sector. What determines the future of the Lighting industry in a global scale is the LED technology today. Another determinative factor is the researches carried out with the aim of usage of the energy efficiently and the regulations put into force in line with this aim.

Lighting equipment production industry is much more foreign-dependent in production and product technology in Turkey. Similarly, Turkey is foreign-dependent in the smart system products and automation field. Also, there has been a significant awareness in the industry within this scope. Turkey tries to meet its technological deficit with high added value production, industrial designs, featured and exclusive order production skills.

8. Competition Pressure Has Been Experienced in the Import of Technological Components.

A significant pollution started to be experienced in the import of LED products which are the advanced technology of the recent years. Heating volume, heating color and energy saving performances of LED products produced with imported components can be low with the optic and thermal efficiencies. Their product performances and lifetime are low since the components located within the power sources used in the LED systems which are locally produced are of poor quality and non-standard imported products.

2.9.2. Domestic Market Size of Lighting Equipment

Domestic market size of Lighting equipment is given below. Production export and import values and the assumptions specified at the end of the following table are used in the calculation of the domestic market size of Lighting equipment.

Accordingly, the domestic market size of Lighting equipment was shrank in 2016 and 2018 in the period of 2013-2018 in real terms and showed growth in real terms in the rest years. Domestic market was shrank in real terms in 2018. The growth in 2014 and 2017 was very high in real terms.

Market size fluctuated because of the value loss in the Turkish Lira in the calculation of the domestic market in dollars.

Accordingly, domestic market size reached to 2,45 billion dollars in 2013 and 2,59 billion dollars in 2014. Domestic market growth increased in a real sense in 2015 and 2016; and recorded as 2.19 billion dollars in 2016 by decreasing in terms of dollar. Domestic market experienced a fast growth in 2017 in real sense and despite of value loss of Turkish Lira, it increased to 2,31 billion dollars. Domestic market decreased in 2018 in real sense and it recessed to 1,94 billion dollars.

		2013	2014	2015	2016	2017	2018 F
I	Production Value Million TL	2,803	3,417	3,805	4,396	5,515	6,453
II	Export Million Dollars	481	533	453	458	445	466
	Million TL	919	1,118	1,232	1,383	1,624	2,313
III	Production Value of Export Million TL	835	1,016	1,120	1,257	1,476	2,100
(I-III)	Production for Domestic Market Million TL	1,968	2,401	2,685	3,139	4,039	4,353
IV	Market (Selling) Value of Production For Domestic Market Million TL	2,558	3,120	3,490	4,080	5,250	5,660
V	Import Million Dollars	926	960	862	701	727	615
	Million TL	1,770	2,093	2,345	2,117	2,655	3,185
VI	Market Value of Import Million TL	2,124	2,510	2,814	2,540	3,186	3,822
(IV+VI)	Total Domestic Market Million TL	4,682	5,630	6,304	6,620	8,436	9,482
	Million Dollars	2,451	2,585	2,320	2,190	2,310	1,935
	Average Exchange Rate of Dollar Turkish Lira	1.91	2.18	2.72	3.02	3.65	4.90

Assumptions

- 1,1 (10%) coefficient has been used for the production value of export.
- 1,30 (30%) coefficient has been used for the market value of production for domestic market.
- 1,20 (20%) coefficient has been used for market value of import.

Table 52: Market Size of Lighting Equipment
Source: Calculated by TURKSTAT data.

3. PART: PRODUCTION INDUSTRY OF WORLD ELECTRICAL LIGHTING EQUIPMENT

World electrical Lighting equipment production industry has been examined under three main titles. The first is the developments and tendencies experienced in the electrical Lighting equipment production industry and the significant producer countries in the industry. Secondly, the developments and expectations in the market size of the electrical Lighting sector are evaluated. The third focuses on the world trade of electrical Lighting equipment and significant exporter and importer countries. And for the last, Turkey's position is evaluated with the foreign trade indicators.

3.1. Developments and Tendencies Experienced in Electrical Lighting Equipment Production Industry

Mainly developments experienced in technology shapes the developments and tendencies in electrical Lighting equipment industry. Significant developments have been experienced in three branches in a technological sense. First of those is the lamp technology. Second is the transition from mechanical systems to electronic systems in general Lighting technology. Third is the smart Lighting technologies developed with the digitalization. Energy efficiency need of which importance has significantly increased because of the sustainability approach gives shape to the developments and inventions in Lighting technologies.

3.1.1. Developments in Lamp Technology and LED Lighting Systems

LED consists of the first letters of the word "Light Emitting Diode". LEDs are actually semi-conductive diode and they provide light via the photons which they spread in junction regions, which is different than the ordinary diodes. However, the LEDs do not cause radiation as a result of any thermal or chemical process like other incandescent filament lamps or fluorescent tubes. Therefore, their lifetime and efficiency are much higher; but on the contrary their physical sizes are much smaller. They are preferred as an optimal solution for the usage in the environments where there are explosive liquids and gases which have low activation energy and where other accidents are possible to be experienced because they do not dissipate high heat and do not have any refraction possibility.

Other lamps are in the metal form and sodium lamps include high amount of mercury. When it has been taken into consideration that the broken lamps aren't included in the recycle process mostly, poisonous mercury in these bulbs mix with the soil and water. Mercury, lead, cadmium and similar substances has been prohibited to be used in electronic materials within the scope of the directive on RoHs (Restriction of Hazardous Substances) in European Union; so any of these prohibited substances are not included in LEDs.

LED Lighting systems operate through low voltages. LEDs don't have the potential for fire outbreak because of the arches which the gas discharged bulbs (florescent, metallic and sodium and mercury vapor bulbs) which are used in the environment where inflammable gases can exist (refineries and factories which can carry out chemical production) create. Therefore, LED lamps have both high-energy efficiency and high safety.

Traditional lamps and Lighting systems where these traditional lamps are used are substituted by LED lamps and Lighting systems thanks to their features in the World Lighting equipment industry rapidly. This development in lamp technology has effected the world giant companies production traditional lamps.

3.1.2. Electronic Era in Lighting Technologies

Lighting hasn't considered as just a resource of light now; and it has undertaken various functions. The most significant factor which enables this development is the substitution of mechanical sections and parts with the electronic parts in the Lighting systems. Developments and inventions in electronic industry and technology are used in Lighting systems.

Within this scope, both transition into smart Lighting in Lighting and smart Lighting systems can be realized and different energy resources can be used in Lighting.

Transformation from conventional to electronic in the Lighting with the LED technologies has gained speed. Electronic drivers and circuits have taken the places of mechanical ballast production. Long-time constant Lighting can be enabled with the development of portable minimum cells.

Physical lifetime of the products in the Lighting industry is prolonged; however their technological lifetime is getting short in the Lighting industry with the technological developments. New products are developed constantly with the dynamism of electronic technologies.

Different energy resources are transformed into a usable form for the Lighting with the developments in the electronic technologies.

Lighting with the solar energy takes the lead in this scope. Sun is enormously big energy resource and the solar radiation is turned into thermal or electric energy. Solar panels convert the light energy of the sun into usable electric energy.

Technological developments are experienced in the Lightings which are carried out by using the daylight.

Interior environments are lighted with the light tubes during daytime. For example, fiber optic light tubes decrease the energy consumption resulting from interior Lighting and create more natural Lighting after they are linked to a sun-light collector dish located on the roof.

Another developed Lighting method is fiber Lighting. Fiber Lighting light is a new Lighting technique defined as a carriage through fiber wires without including the negative effects of electricity or heat energy. It is the best alternative for the Lighting of the precious objects and places which have high potential to explode because the light does not include Ultraviolet (UV) or infrared (IR) radiations in the fiber optic systems. Locating the resource of light and the fixture at different places provides easiness in the Lighting of the spaces which are difficult to access and maintain. Also it has a significant place in the design thanks to its effect and different modeling options.

3.1.3. Smart Lighting Systems, Smart Structures and Cities

Smart Lighting Systems

Providing energy efficiency and saving which are necessary for meeting the sustainability goals in global scale is of great importance. Accordingly, important researches are being carried out for providing energy saving used with the aim of Lighting and increasing the efficiency. The most important one of them is transition into smart Lighting with the contribution of the developments in the technology.

Smart Lighting is provided in interior places primarily, and also through the Lighting control units connected to the fixtures used in the Lighting of avenues, streets and parks. Lighting control units can focus on fixture, track time for open and close, apply the instructions for the open and close and determine the energy which the fixture have consumed and its current lifetime and transmit these factors into data control unit. In each fixture, a linked Lighting control unit communicates with data control unit on electrical line or via wireless technologies.

In today's world, we see that the demand for smart Lighting system has highly increased with the aim of decreasing the energy consumption cost and enabling energy saving. The fact that the smart Lighting application is expanding and traditional lamps are substituted with LED lamps contribute to the growth of this market.

Smart Constructions

Constructions are also turning out to be smart thanks to the developments in Lighting, automation, electronic and digital technologies. Smart constructions have an automation system in principle All support functions, Lighting,

ventilation, heating, communication, elevator, safety, etc. in the constructions can be directed in the desired way through the automation system. Smart constructions are constructed increasingly day by day and the current constructions are turned into smart constructions also. Smart constructions are planned with this feature in terms of engineering, architecture and design.

Smart constructions actually increase the user comfort to the highest point because they have energy efficient usage and control, safety systems, communication systems and central management. Infrastructure systems which enable central control and functioning to operate since the beginning of the design process should be considered as integrated in order to consider these constructions as smart buildings completely.

Smart buildings are designed in a way that they will consume energy in minimum amount during lifetime in terms of energy efficiency. Therefore, heating, lighting and cleaning systems consume energy at the minimum level. For example, heating is adjusted at the optimum level based on the temperature. The main purpose of the lighting is to benefit from day light at maximum level. Solar energy is used for the ventilation systems.

Photoelectric Lighting, smoke and heat sensors, gaseous extinguishing systems in the smart buildings are considered as the factors of smart building technology. Especially the applications of smart Lighting is an integral part of the smart buildings.

Smart Cities

Just as the constructions, the cities are turning out to be smart cities thanks to the developments in Lighting, automation, electronic and digital technologies.

Smart cities aim to provide all services provided for the public with a large automation system in a perfect and most effective way and provide the highest energy efficiency and saving while providing these services.

Lighting, energy, water, waste and transportation systems operate in an integrated and automated way in the cities. Smart city applications and technological solutions applied are considered as a step taken to make the world a space which is much more livable.

One of the most significant applications in the smart cities is the exterior Lighting automation. Thanks to the exterior Lighting automations in the smart cities, Lighting opportunities and options appropriate to the need come into existence, decreased electric energy need and CO2 emission are enabled, Lighting facility management is professionalized and facility efficiency increase,

much more contemporary environment and happier public who are provided with much better service are enabled.

Smart cities become popular around the world rapidly. Also smart cities result in successful and role model smart Lighting examples. Amsterdam, Barcelona and Tokyo are one of these examples.

Amsterdam;

The purpose of Amsterdam smart city projects is to decrease the traffic and provide energy saving and public safety. Smart energy meters which provide active energy saving have been located in some parts of the houses. Smart Lighting systems which adjust the brightness of the street lamps and enable the control of smart traffic management and Smart Lighting which enable a system where the drivers can determine the best routes in advance are among the most effective enterprises of the city. Significant developments on smart Lighting have been obtained in Amsterdam. The purpose of this project realized with the cooperation of the companies in private sector in the Lighting industry is to create safe cities with adjustable and sensor-fitted light technology and increase the energy saving to the maximum level. Amount of lighting depending on the weather conditions, traffic density and human density can be determined with the sensors located in the street lamp poles in public places. Therefore, the energy saving acquired from the lighting can be transmitted into different fields which are needed by the city such as Wi-Fi networks or measurement of the air quality.

Barcelona;

Overcoming numerous traffic problems and reaching to a high living standards for the city-dwellers in various fields focused on waste-collection and economic growth with the effective management of the service and resources of the city through the smart city project. Various significant applications are realized in numerous fields. Smart Lighting applications lead the way of these applications.

Integral Solutions for Urban Infrastructures Project (SIUR) is applied. Researches within the scope of the project of which the application's main purpose is to increase energy efficiency, decrease the pollution and meet the needs of the citizens and institutions in a better way focus on the controlled usage planning of the street Lighting systems. Usage of the LED technology in street Lightings has been designed and realized in order to test the efficiency of the environment-friendly and economical Lighting systems with sensors detecting heat, moisture, noise and pollution; and integrate new technologies into real smart city environments.

Tokyo;

Tokyo couldn't reach the target of decreasing the CO₂ emission under the Kyoto Protocol signed in 1997. And because of the Fukushima Disaster and the negative outputs of the production plants, a decision on transforming into smart city application was taken rapidly. Within this framework, an Emergency Energy Saving programme was realized in 2011. Increase in the usage of LED lamps, decrease of the standards of brightness of the lamps, usage of devices in energy-save mode are among the energy usage priorities of both minor and major business facilities and residences.

3.1.4. LED and Advanced Technology in Automotive Lightings

Significant developments shaped by the technology in automotive Lightings have been experienced. LED lights have been started to be mainly used in Automotive headlights and other signal, indicator and Lighting lamps. Lighting patterns in this field, LED light and semi-conductors suitable for these elements, electronic circuits/cards have been used.

Headlights, brake lamps, fog lights which are outside in the automotive Lightings are transforming into LED and electronic system. Similar tendencies are seen in interior Lightings also. Interior Lighting is transforming into both functional and design and comfort focused interior trim. Automotive Lightings are developing as a specialization field on its own.

Development in automotive Lighting technology maintains its existence rapidly. Also transformation from LED Lighting into OLED Lightings is experienced. Another development field is laser headlights. Researches in both fields are continuing.

Significant transformation in the automotive industry is both into the electrical vehicles and also into driverless vehicles. Lighting technologies have an important role in both of them.

Exterior Lightings will undertake the sensor position in driverless autonomous vehicles especially and also they will be the most important elements of the smart vehicles. Headlights and other Lighting lamps in these vehicles will enable the communication of the vehicle. Headlights and Lighting equipment will sense the outside and provide more efficient and comfortable Lighting.

3.2. Countries in Electrical Lighting Industry

Production countries in electrical Lighting industry varies and diversifies according to the developments experienced in the technology.

Shares of the countries such as China, Japan, South Korea and Taiwan which have been production technology in this field have increased because of the LED technology and electronic technology have prevailed on the Lighting industry. Countries such as Vietnam, Malaysia and Thailand in Asia has started to exist in the industry with their production power.

Although traditional producers in Europe, especially Holland, Germany, Italy, France and Spain lost their superiority in bulb technology against Asian countries, they have maintained their existence in industry. Czech Republic, Poland and Slovakia have been improving as two new production center in Europe. The idea of placing the manufacture which has been focused mainly in China into the continent again gains strength in Europe.

USA and Canada take place in Lighting sector as traditional two technology and production countries. Mexico has turned out to be production center of North America's Lighting equipment especially because it has the free-trade area opportunities. It is exporting the large part of its manufacture into USA and Canada.

Turkey is rather foreign-dependent in Lighting equipment technology and continues to develop as a production center in its own region.

3.3. Sectoral Size of Electrical Lighting Equipments

World Lighting sector has three main product groups. These are residence, store and other internal places; "general Lighting" including industrial buildings, external places, medical, signal, projector and machine Lightings; "vehicle Lightings" including headlight, stop, signal, plate, internal Lightings and background Lightings in the products such as television, monitor, smart phones, laptops.

An important development and transformation process is being experienced in the world Lighting sector. Resources of this development and transformation are the improvements in the lamp technology of the sector which is the feeding field of the sector, Lighting solutions in the architecture which has turned out to be the internal part of the Lighting, increase of the Lighting consciousness and the developments in the energy saving and efficiency fields as the latest and the most important factor.

The determinative factor in Lighting sector within this framework come to the forefront as the LED technology. LED (light emitting diode) technology shapes the sector in a global scale with its long lifetime and energy saving capacity. Share of the LED products are expanding throughout the world with the usage of the energy-saving lamps necessarily and intentionally.

Its share is expected to reach up to the 60% in 2022. The usage of LED lamps and the technologies of other sections and equipment transform into a more energy saving oriented modes which are compatible with LED.

While the world Lighting market size was 99 billion dollars in 2010, it reached to 112.00 billion dollars in 2014. The market size is expected to reach to 119,0 billion dollars in 2018. Growth in the market is expected to expand by 3,0% on average annually until 2022; and to reach to 133 billion dollars in 2020 and to 141 billion dollars in 2022. The base of this growth will consist of the developments in the general Lighting field. While development in automotive Lighting is limited, a decrease in background Lighting is predicted.

	2010	2014	2018	2020	2022
Total	99.0	112.0	119.0	133.0	141.0
LED Lighting	13.0	34.5	56.5	79.6	85.3
General Lighting	75.3	87.3	93.1	104.5	111.4
LED Lighting	7.5	28.8	48.4	68.0	75.0
Automotive	16.8	21.3	22.6	25.3	26.8
LED Lighting	2.0	2.7	5.0	8.4	10.0
Background Lighting	6.9	3.4	3.3	3.2	2.8
LED Lighting	3.5	3.0	3.1	3.2	2.8

Table 53: World Lighting Market Size (Billion Dollar)
Source: Boston Consulting Group; Future Lighting Market Model, 2017

The most significant development in Lighting market will be the growth in LED Lighting market. LED Lighting market which has share by 13,1% in the total Lighting market with 13,0 billion dollars since 2010 is estimated to reach to 85,3 billion dollars and its share is estimated to reach to 60% in 2022.

In the regional evaluations on Lighting market sizes and expectations, it is seen that Asia has turned out to be the biggest market at all. And China is the determinative country in this development. A much faster growth in the markets where developing countries take place mainly such as Asia, Latin America, Middle East and North Africa are expected in the following period. With 63,2 billion dollars, Asia will be the largest market in the Lighting market which will reach to 141 billion dollars in 2022.

	2010	2014	2018	2020	2022
Total	99.0	112.0	119.0	133.0	141.0
Non-Lamp	81.3	92.2	97.6	109.0	115.6
Europe	27.8	31.3	32.4	33.5	34.5
Non-Lamp	21.6	24.2	25.7	26.0	26.7
North America	21.0	23.5	24.7	26.5	28.0
Non-Lamp	16.2	18.0	18.6	20.0	21.2
Asia	38.2	44.3	48.3	58.5	63.2
Non-Lamp	33.4	38.5	41.0	49.7	53.2
Latin America	6.6	6.9	7.3	8.0	8.5
Non-Lamp	5.8	6.5	6.8	7.0	8.0
Middle East Africa	5.4	6.0	6.2	6.5	6.8
Non-Lamp	4.3	5.0	5.5	6.3	6.5

Table 54: World Lighting Market's Regional Size (Billion Dollar)
Source: Boston Consulting Group; Future Lighting Market Model, 2017

3.4. World Electrical Lighting Equipment Trade

World export in foreign trade of world electrical Lighting equipment, export, exporter and importer countries in terms of sub-product groups and Turkey's position in the world trade are reviewed and evaluated.

3.4.1. World Export of Electrical Lighting Equipment

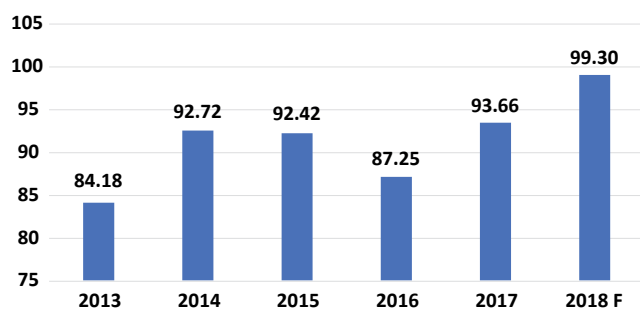
World electrical Lighting equipment export was 84,18 billion dollars in 2013. Export increased to 92,72 and 92,42 billion dollars in 2014 and 2015 respectively. However, the export decreased to 87,25 billion dollars in 2016. Slowdown in the world economy and investments have effect on this deceleration. And also general world good export decelerated in 2016.

World electrical Lighting equipment export increased by 7,3% in 2017 and reached to 93,66 billion dollars. Both the refreshment in the world economy and trade and growth in the investments and construction sector have an effect on this increase.

Electrical Lighting equipment export is predicted to grow by 6,0% in 2018 and reach to 99,3 billion dollars. Much faster export increase was experienced in the first half of the year however export increase was decelerated by protectionism precautions in the second half.

Years	World Export
2013	84.18
2014	92.72
2015	92.42
2016	87.25
2017	93.66
2018 F	99.30

Table 55: Export of World Electrical Lighting Equipment (Billion Dollars)
Source: UN Trade Data Base, World Trade Organization, Research Team.



Graphic 15: World Export of Electrical Lighting Equipment
Source: UN Trade Data Base, World Trade Organization, Research Team

Exports and developments in the sub-product groups in world Lighting equipment export have been given below. Accordingly, the highest export is experienced in Lighting devices. Lighting devices' export is predicted to reach to 48,42 billion dollars in 2018. Vehicle headlights and lamps rank as the second. Export for 21,9 billion dollars is estimated for 2018. Lamps ranks as the third.

When the developments in the export is reviewed, it is seen that the steady increase was experienced in vehicle headlights and lamps. Lighting devices export has not been able to reach to its highest level, which was experienced for the last time in 2015. And export of sections and parts, lamp sockets and self-energy resourced lamps fluctuated.

Years	Lamps	Lighting Devices	Vehicle Headlights and Lamps	Self-Energy Resourced Lamps	Sections and Parts	Lamp Sockets	Total
2013	17,838	37,816	15,595	3,918	8,429	584	84,180
2014	15,896	49,313	17,601	4,004	5,297	605	92,715
2015	13,201	52,101	17,013	4,018	5,526	560	92,420
2016	11,770	47,346	18,611	3,933	5,071	521	87,252
2017	17,268	46,018	20,550	3,595	5,655	513	93,600
2018 F	18,510	48,420	21,900	3,740	6,140	590	99,300

Table 56: Sub-Sectors of Export of World Lighting Equipment (Million Dollar)
Source: UN Trade Data Base, World Trade Organization, Research Team

3.4.2. World Electrical Lighting Equipments Export Countries

The countries which carry out the highest export volumes in the export of world Lighting equipment has been given and evaluated below: Accordingly, China has been realizing approximately 45% of the World export with its 42,84 billion dollars export. There has been a great difference between the export of China and that of the countries following China. Germany ranks as the second and USA ranks as the third. Mexico has turned out to be an important producer and exporter country.

Subsequently, Italy and France; and Czech Republic and Poland take place as traditional and new European exporter countries. And Spain follows them.

Taiwan and Japan are the tenth and eleventh exporter countries. Again Asian and European countries follow the top 10 exporter countries. North America and Canada take place within this group.

Majority of the top 20 exporter countries are the developed and technologically improved countries.

The improvement of Slovakia, Hungary and Romania is remarkable. And Turkey ranks as 23 in the world export as of 2017.

Order	Country	Million Dollars
	Total	93,638
1	China	42,838
2	Germany	8,095
3	USA	4,498
4	Mexico	3,950
5	Italy	2,680
6	France	2,468
7	Czech Republic	2,455
8	Poland	2,406
9	Spain	1,748
10	Taiwan	1,739
11	Japan	1,653
12	Austria	1,608
13	Netherlands	1,577
14	South Korea	1,530
15	Belgium	1,231
16	England	1,213
17	Canada	1,161
18	Hong Kong	1,131
19	Slovakia	1,092
20	Hungary	1,060
21	Romania	603
23	Turkey	445

Table 57: Export Countries of World Lighting Equipments (Million Dollar, 2017)
Source: UN Trade Data Base, World Trade Organization, Research Team.

Exporter countries according to the sub-product groups are evaluated in this stage. Accordingly, China is leading the way of export of chandeliers and Lighting devices for wall and roof which has the highest export volume with its export for 6,8 billion dollars. Mexico follows China with its export for 1,66 billion dollars. Germany, Italy and USA follow this first two countries. And Poland takes place within the top 10 exporter countries. Turkey is the 20th biggest exporter within this product group.

Order	Country	Million Dollars
	Total	15,909
1	China	6,804
2	Mexico	1,663
3	Germany	1,155
4	Italy	885
5	USA	535
6	Austria	460
7	Canada	412
8	Spain	375
9	Poland	362
10	France	355
20	Turkey	98

Table 58: Export of World Chandeliers, Lighting Devices for Walls and Roofs on Country Basis, 2017
Source: UN Trade Data Base, World Trade Organization, Research Team.

China ranks as the first with its export for 14,0 billion dollars in the export of other electrical lamps. Germany follow China with its export for 1,5 billion dollars. USA, Italy and Mexico follow this first two countries. And Poland takes place within the top 10 exporter countries. Turkey is the 24th biggest exporter within this product group.

Order	Country	Million Dollars
	Total	22,952
1	China	14,040
2	Germany	1,507
3	USA	808
4	Italy	697
5	Mexico	586
6	Netherlands	483
7	Poland	476
8	Hong Kong	400
9	Spain	320
10	Canada	319
24	Turkey	73

Table 59: Export of World Other Electrical Lamps Lighting Devices on Country Basis, 2017

Source: UN Trade Data Base, World Trade Organization, Research Team.

Germany ranks as the first with its export for 2,52 billion dollars in export of vehicle headlights and Lighting lamps and devices. China follows Germany with its export for 2,29 billion dollars. Czech Republic, USA and Mexico follow this first two countries. And Slovakia takes place within the top 10 exporter countries. Turkey is the 20th biggest exporter within this product group.

Order	Country	Million Dollars
	Total	20,550
1	Germany	2,525
2	China	2,291
3	Czech Republic	1,929
4	USA	1,765
5	Mexico	1,558
6	Taiwan	1,278
7	Japan	975
8	France	909
9	South Korea	836
10	Slovakia	823
20	Turkey	190

Table 60: Export of Vehicle Lighting and Indicator Devices on Country Basis, 2017

Source: UN Trade Data Base, World Trade Organization, Research Team.

China ranks as the first with its export for 354 million dollars in the export of advertising lamps and led boards. Germany follow China with its export for 151 million dollars. USA, Poland and France follow this first two countries. And Malaysia takes place within the top 10 exporter countries. Turkey is the 11th biggest exporter within this product group.

Order	Country	Million Dollars
	Total	1,286
1	China	354
2	Germany	151
3	USA	61
4	Poland	56
5	France	50
6	Spain	47
7	Canada	46
8	Netherlands	43
9	Italy	37
10	Malaysia	33
11	Turkey	32

Table 61: Export of World Advertisement Lamps and Lighted Signboards on Country Basis, 2017

Source: UN Trade Data Base, World Trade Organization, Research Team.

3.4.3. World Electrical Lighting Equipment Import Countries

Import market of world Lighting equipment has been given and evaluated below. Accordingly, USA is the biggest import market with its 19,39 billion dollars which carries out the highest export volume. There is a significant difference between USA and the other countries. Germany ranks as the second with its export for 8,27 billion dollars. France, England and Canada follow USA and Germany.

Order	Country	Million Dollars
	Total	84,831
1	USA	19,390
2	Germany	8,265
3	France	3,719
4	England	3,606
5	Canada	3,558
6	China	3,043
7	Japan	2,386
8	Netherlands	2,099
9	Spain	1,873
10	Italy	1,741
11	Poland	1,520
12	Russia	1,391
13	Australia	1,386
14	Belgium	1,330
15	Sweden	1,280
16	South Korea	1,114
17	India	1,065
18	Austria	990
19	Brazil	989
20	Hong Kong	959
26	Turkey	728

Table 62: Significant Import Countries of World Lighting Equipment (Million Dollar, 2017)

Source: UN Trade Data Base, World Trade Organization, Research Team.

Although China is the biggest exporter of the world, it is the sixth biggest importer. Japan, Holland, Spain and Italy are the other big importer countries taking place within the top 10. Having come a long way in import, Poland is at the 11th biggest importer position in the world. Russia, Australia, Belgium and Sweden are the other follower countries. India and Brazil are the other important markets taking place within the top 20. Turkey ranked as the 26th with its import for 728 million dollars in 2017.

USA is leading the way of import of chandeliers and Lighting devices for wall and roof which has the highest import volume with its export for 4,48 billion dollars. Germany follow USA with its import for 1,22 billion dollars. France, Canada and England follow this first two countries. Majority of the other countries taking place for this product are developed countries. Russia S. Arabia and UAE are the countries taking place within the top 20. Turkey is the 30th biggest importer within this product group.

USA ranks as the first again with its export for 4,62 billion dollars in the import of other electrical lamps. Germany follow USA with its import for 1,37 billion dollars. England, France and Canada follow this first two countries. Apart from the developed countries, the market of UAE draws attention for being the 7th biggest market. Also Russia, China and Mexico take place within the top 20 importer countries. Turkey is the 29th biggest importer within this product group.

Order	Country	Million Dollars
	Total	16,048
1	USA	4,482
2	Germany	1,220
3	France	901
4	Canada	674
5	England	626
6	Australia	453
7	Spain	409
8	Netherlands	377
9	Italy	377
10	Japan	352
11	Poland	304
12	Switzerland	285
13	Austria	280
14	Belgium	266
15	Russia	232
16	Sweden	224
17	Norway	222
18	Mexico	217
19	United Arab Emirates	199
20	Saudi Arabia	171
30	Turkey	88

Table 63: Import of World Chandeliers, Lighting Devices for Walls and Roofs on Country Basis, 2017

Source: UN Trade Data Base, World Trade Organization, Research Team.

Order	Country	Million Dollars
	Total	17,983
1	USA	4,616
2	Germany	1,373
3	England	800
4	France	676
5	Canada	666
6	Netherlands	628
7	United Arab Emirates	389
8	Japan	380
9	Italy	380
10	Hong Kong	326
11	Australia	324
12	India	322
13	Sweden	317
14	Spain	285
15	Poland	280
16	Belgium	267
17	Russia	266
18	China	254
19	Switzerland	248
20	Mexico	246
29	Turkey	139

Table 64: Import of World Other Electrical Lamps Lighting Devices on Country Basis, 2017

Source: UN Trade Data Base, World Trade Organization, Research Team.

USA ranks as the first with its import for 3,62 billion dollars in import of vehicle headlights and Lighting lamps and devices. Germany follow USA with its import for 3,56 billion dollars. China, Canada and England follow this first two countries. Mexico is the sixth biggest importer country. Automotive producer countries take place within the top 20 for this product group. Turkey is the 19th biggest importer within this product group.

Order	Country	Million Dollars
	Total	19,967
1	USA	3,618
2	Germany	3,560
3	China	1,513
4	Canada	1,288
5	England	891
6	Mexico	852
7	France	796
8	Japan	609
9	Spain	519
10	Slovakia	410
11	Russia	407
12	Czech Republic	366
13	Sweden	352
14	Belgium	321

Table 65: Import of Vehicle Lighting and Indicator Devices on Country Basis, 2017

Sıra	Ülke	Milyon Dolar
15	Brazil	303
16	Italy	285
17	Thailand	263
18	Netherlands	233
19	Turkey	218
20	Poland	212

Table 65: Import of Vehicle Lighting and Indicator Devices on Country Basis, 2017 (continued)

Source: UN Trade Data Base, World Trade Organization, Research Team.

USA ranks as the first with its import for 196 million dollars in the import of advertising lamps and led boards. Germany follow USA with its import for 76 million dollars. England, France and Austria follow this first two countries. S. Arabia and Russia take place within the top 20 countries. Turkey is the 37th biggest importer within this product group.

Order	Country	Million Dollars
	Total	1,161
1	USA	196
2	Germany	76
3	England	52
4	France	51
5	Australia	48
6	South Korea	44
7	Canada	44
8	Switzerland	40
9	Belgium	32
10	Norway	29
11	Spain	26
12	Austria	25
13	Sweden	24
14	Italy	23
15	Mexico	23
16	Netherlands	22
17	China	18
18	Saudi Arabia	16
19	Indonesia	15
20	Russia	15
37	Turkey	6

Table 66: Import of World Advertisement Lamps and Lighted Signboards on Country Basis, 2017

Source: UN Trade Data Base, World Trade Organization, Research Team.

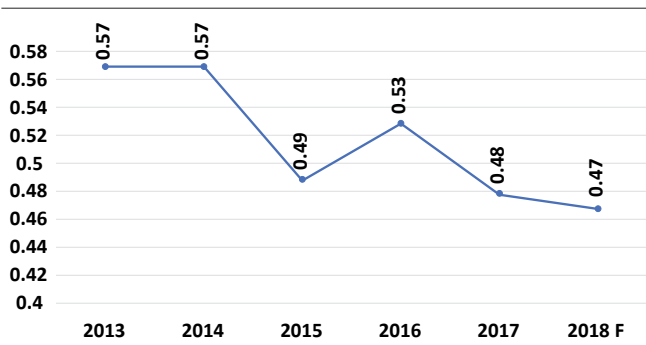
3.5. Turkey's Position in the World Export

The share and development of the import of Turkish electrical Lighting equipment production industry within the import of world electrical Lighting equipment has been given below. Share for 0,57% from the world export was obtained with 481 million dollars in 2013 and 533 million dollars in 2014.

Export was decelerated in 2015-2017 and the export share of Turkey was recessed to 0,48% in 2017. In 2018 the export is predicted to increase to 466 million dollars and its share is predicted to be 0,47% within the World export.

Years	Export of Turkish Electrical Lighting Equipment (Million Dollars)	Export of World Electrical Lighting Equipment (Million Dollars)	Export Share of Turkish Electrical Lighting Equipment
2013	481	84,180	0.57
2014	533	92,720	0.57
2015	453	92,420	0.49
2016	458	87,250	0.53
2017	445	93,660	0.48
2018 F	466	99,300	0.47

Table 67: Export of World Electrical Lighting Equipment and Turkey's Share
Source: UN Trade Data Base, World Trade Organization, Research Team.



Graphic 16: Share of Turkey's Electrical Lighting Equipments' Export in Share of World Export (Percent)

Source: UN Trade Data Base, World Trade Organization, Research Team.



4. PART: DEVELOPMENT DYNAMICS OF TURKISH LIGHTING EQUIPMENT PRODUCTION INDUSTRY AND SUGGESTIONS

Development dynamics for the following years in Turkish Lighting equipment production industry and suggestion for these fields are presented in the fourth and last chapter of the study.

4.1. Development Tendencies in Sub-Sectors

Five main sub-product groups come to forefront in Turkish Lighting equipment sector. The development tendencies of these five sub-sectors for the following period are as follows;

Sub-sector of General Lighting;

Developments in the general Lighting sector in Turkey is determined by the developments in the product standards, developments in the product technologies and needs and quality preferences of the public and private section creating the demand.

Within this framework, Turkish Lighting equipment production industry is compatible with EU standards and it has to carry out its whole production in these standards minimum. This grants superiority in competition to Turkey in especially general Lighting equipment field. General Lighting sector has the authorization of carrying out production in approximately all products through high standards.

Furthermore, a rapid transformation is being experienced in the Lighting sector. Lighting sector is turning out to be smart electronically with automation systems. General Lighting sector in Turkey complies with this transformation.

Production of LED and fixture and Lighting devices including electronics which have higher added value is aimed instead of the production of the factors such as conventional fixtures which have been turned out to be standard for now.

An important parameter which determines the developments in the general Lighting sector is the demand part. Quality preferences of the constructors in private sector shape the development. However, more important parameters are the standards which the public applies and the regulations they have brought in the field of energy efficiency.

General Lighting sector has a great potential in development when taken into the needs and demands of the private and public sector which will be formed in the following term in terms of both quality and quantity.

Technology, product development, industrial design and engineering business should be more focused on in order for general Lighting sector to comply with the new EU norms, use the potential in the domestic market and take higher share from the import market.

A general tendency in global Lighting industry is the decrease of the demand for standard fixtures, and instead, the increase of the demand for various fixture types. Also, all fixtures are becoming electronic and software embedded. Therefore, special and boutique fixture types are coming fore front and the competence of the sub-sector in Turkey should be increased in this field.

Sub-sector of Automotive Lighting;

Sub-sector of automotive Lighting continues to show a significant development. The sector uses the advance technology and provides technological developments. There are developed R&D centers in the firms which take place in the automotive Lighting sector. Accordingly, while meeting the domestic needs, the sector realizes significant amount of export.

Engineering infrastructure has also improved in the automotive Lighting sector. Accordingly, product development activities are increasing. Turkey meets global expectations in terms of products and in the same time offers engineering services for abroad in Lighting systems.

Turkish automotive Lighting sub-sector has molding technologies, plastic molds and local and sufficient advanced technology in the production of reflector. Turkey is in a highly competitive position in the automotive Lighting molding.

Big main players which have role in the automotive Lighting sector contribute to the development of the other business facilities which are their suppliers. And increase of the quality and competencies of these firms are enabled.

Automotive producers in the European countries in the automotive Lighting sub-sector is provided with export and they have high export potential.

A significant limit for automotive Lighting sector is that the automotive production is carried out by foreign brands in Turkey and major decisions are taken by their HQs.

Sub-sector of Decorative Lighting;

The sub-sector of decorative Lighting is the oldest and most traditional sub-sector in Turkish Lighting sector. However, this sector has lost power because of the competition with China especially. For today, the sub-sector of decorative Lighting has directed to the production of high value added, small scaled, boutique and design-contented products. The sector develops and manufactures Lighting systems and designs exclusive to projects and customers. Against the competition of mass production by China, the sector has directed to high value added field.

Decorative Lighting sector has started to focus on e-trade and architecture services and cooperation and design fields. The sector has started to be integrated with the furniture sector. The growth in the furniture sector also supports the sub-sector of decorative Lighting.

Producers of Lighting devices in the Lighting sector use the technology; however, the sub-sector of decorative Lighting combines Lighting equipment and design skills.

Sub-sector of Lighting

The sub-sector of lighting carries out boutique production and realizes lightings including architectural applications defined as the city furniture and corporate identity applications.

Sub-sector of lightening operates based on project and manufactures project-based products. Therefore, the firms operate as engineering firms, application firms and commitment firms. Different projects are drawn and products are produced for each activity. Sub-sector in industrial advertisements and corporate identity studies has high experience, knowledge and product capacity.

Technologies used in the sub-sector of lighting have directed to LED technologies; and sections and parts have directed to electronic components and software are used in an increased rate. Majority of the sections and parts used in the production has been imported.

Products have turned out to be smart products in the sub-sector of lighting. The sector is improving in this field, too. The critical software have mostly foreign origins in this stage; and the local software are started to be used recently.

Sub-sector of Sections and Parts;

Sub-sector of sections and parts are in the position of followers of technological developments and foreign-dependent in terms of especially new generation products. Conventional products in sections and parts used in the sub-sector of general Lighting are substituted by electronic section and parts which are compatible with LED. And fixtures, drivers, circuits, sensors are becoming electronic. There has been a high competition capacity of Asian countries in this field and Turkey's sub-sector of sections and parts have difficulty in this competition. Technological development and production should be aimed for critical sections and parts with the cooperation of main industry firms in this field. Main firms should establish cooperation with sub-industry in technology and industrial design field.

Sub-sector of Software in Lighting Sector;

Software are becoming an integral part of the Lighting equipment production industry day by day. In today's world, each Lighting project or product requires a software. In addition, the harmonization of the sections and parts which will be used in the projects and products with the software are of great importance. Each fixture has started to include an embedded software within itself in the Lighting sector. Thanks to these software, the fixtures are becoming smart and an integral part of the smart automation systems.

The structure which will meet the increasing need of the software sector in Turkish Lighting equipment production industry has not been formed corporately yet. The sector is a specialization area and there is no need to specialization in software in this field.

4.2. Potential for Being Regional Production Center and Suggestions

One of the most significant potentials of Turkish Lighting equipment industry is to become the regional production center.

The industry has this potential with its features and superiorities. There have been a significant manufacture substructure and experience in the industry, firstly. Also product and quality standards comply with EU. It has a fast growing domestic market potential. Close and neighbor markets are offering significant opportunities and there has been sufficient logistic substructure and services. Developments have gained speed in technology and engineering, human resources are also sufficient.

Requirements are handled within two different titles in order to use the potential of the industry to become a regional production center. Firstly, the environment and conditions of investment should be improved in Turkey apart from the sector. Secondly, much larger masses should be accessed and a capital stock should be realized through the cooperations in the sector.

4.3. Technological Activities and Suggestions

The competition in the Lighting equipment production industry is becoming more and more technology-focused. Therefore, improvement of the technological activities in the Lighting equipment production industry should be one of the priorities and targets of high importance.

The first development field in the technology activities in the sector is the integration of the products and production with the software sector and electronics sector.

Therefore, firstly cooperation platforms which will enable the cooperation between the Lighting equipment production industry and software and electronic sectors should be established, and cooperation models in technology development and production fields should be developed.

There is a need for corporate constructions to develop advanced technologies in Lighting production industry and carry out high value added production. Firstly, specialization universities in engineering should be established. And research universities and industrial design centers should be established.

Cooperation in education, technology development, prototype development fields should be established between the industry and these corporate structures. Another suggestion is the purchase of the highly technologically competent foreign firms in order to contribute to the technological activities.

Also cooperation prior to competition should be established between the firms in technology field. 8-10 firms in the sector should come together and take the support of the public institutions and carry out technology development projects.

4.4. Software Activities and Suggestions

Lighting sector is becoming more and more dependent on the software sector. Lighting industry needs software which are compatible with different features and functions which it has just like other sectors. Therefore, two factors are coming forefront in the development of software activities in the Lighting equipment production industry.

Firstly, a platform where the representatives of both production industry of Lighting equipment and software sector can meet should be established; and the parties should know each other and meet the needs of each other firstly in this platform.

Secondly, software engineers should be trained on formation necessary for the Lighting industry software and mutual software projects should be carried out with the support of the public. Therefore a software developer pool which will work in the industry or serve to the industry should be created.

4.5. Intercorporate Cooperations and Suggestions

Intercorporate cooperations should be carried out to increase the competitive capacity and enlarge the scales in manufacture industry of Lighting equipment. Cooperations can be carried out in four fields.

- a. Cooperation projects prior to the competition in technology and product development
- b. Reciprocal participation to the domestic and foreign tenders
- c. Purchases, mergers and partnerships
- d. Cooperation projects in critical components and software

Clustering project in 3-4 sub-sector should be applied to support these cooperations.

4.6. Public Projects and Development Dynamic and Suggestions

Public regulations, public projects and public employment are one of the most significant dynamics of the development in Lighting equipment production industry. Within this framework, suggestions for public are provided below:

1. Smart cities strategy and action plans should be determined throughout Turkey and thus long-run Lighting equipment need shows up.
2. Renewal programme in city Lighting should be announced and applied. Transformation for street lights should be prioritized.
3. Highway Lighting renewal programme should be determined and applied.
4. Countryside Lighting renewal programme should be determined and applied.
5. Necessary renewal program for energy efficiency at commercial buildings and public service buildings should be clarified and applied.
6. Minimum Lighting standards should be kept high in Public-Private cooperation projects, TOKİ projects, Public projects and specifications.

4.7. Export Potential and Suggestions

Production industry Turkish Lighting equipment has a significant potential in export. The industry has superiorities in small party productions, featured products high value added products and small shippings. Lighting equipment industry should focus on the export of general Lighting equipment and devices; and that of high value added, small party and featured products in terms of decorative Lighting.

And also increase in the production and export of high value added and advanced technological products should be aimed in automotive Lighting.

Lighting equipment industry should be special to the projects in the export market and directed to the activities which Turkish constructors have undertaken and export for retail sale medias should be prioritized. It should use the logistical superiorities and other competencies in this field effectively.

Turkey’s potential in Lighting equipment export is being reviewed and evaluated in terms of the selected export markets. Accordingly, the import activities of our 12 export markets since 2017 in terms of product groups are provided below:

Countries which are of importance in terms of our export and also alternative countries take place within these 12 markets. Germany, Russia, UAE, S. Arabia are drawing attention as the countries which have relatively high import volume in the world.

Countries	Lighting Devices	Lighting Devices Sections and Parts	Auto Headlights and Signals	Self-Energy Resourced Lamps	Lamps	Lamp Sockets	Total
Germany	3,178	280	3,572	191	1,021	23	8,265
Romania	163	39	78	10	95	4	388
Russia	581	28	407	27	339	9	1,391
Kazakhstan	104	4	10	4	23	1	146
Turkmenistan	18	1	1	1	5	0	25
Azerbaijan	30	3	2	1	7	0	43
Georgia	35	1	2	1	8	0	47
Iraq	153	15	22	23	100	12	324
S. Arabia	377	40	13	25	102	4	560
UAE	651	47	125	46	130	5	1,003
Qatar	184	20	11	6	15	1	237
Morocco	127	5	23	5	59	1	220

Table 68: World Exports of Our Selected Export Markets (Million Dollar, 2017)
Source: UN Trade Data Base, TURKSTAT

Export of Lighting equipment into 12 export markets selected as the second group are provided below in terms of the product groups again for the year of 2017. Accordingly, the highest export realized into Germany.

Countries	Lighting Devices	Lighting Devices Sections and Parts	Auto Headlights and Signals	Self-Energy Resourced Lamps	Lamps	Lamp Sockets	Total
Germany	14.8	4.7	46.6	0.0	1.8	0.1	68.0
Romania	4.0	0.9	7.7	0.0	0.8	0.1	13.5
Russia	4.0	0.0	3.1	0.0	0.0	0.1	7.2
Kazakhstan	9.7	0.1	0.3	0.0	0.1	0.0	10.2
Turkmenistan	12.3	0.9	0.1	0.0	1.3	0.0	14.7
Azerbaijan	5.7	0.4	0.1	0.0	0.0	0.0	6.2
Georgia	4.1	0.3	0.3	0.0	0.0	0.0	4.7
Iraq	9.8	1.2	0.0	0.4	0.2	0.4	12.0
Saudi Arabia	8.8	0.3	0.0	0.1	1.3	0.0	10.5
UAE	7.4	0.8	0.8	0.0	0.1	0.1	9.3
Qatar	5.6	0.6	0.0	0.2	0.2	0.4	7.0
Morocco	6.5	0.1	2.0	0.0	0.1	0.0	8.7

Table 69: Turkey’s Export to Selected EXPORT Markets (Million Dollar, 2017)
Source: UN Trade Data Base, TURKSTAT

Our shares and position in Lighting equipment export markets are given below: Turkey has a share by 0,8% in German market where it carries out export with the highest rate and there is a large market potential which it can fulfill Turkey has a share by only 0,5% in Russian market with which Turkey carried out high import. Russian market provides high opportunities with the business activities which Turkish constructors have undertaken especially.

Turkey takes low shares by 1,9% and 0,9 respectively from S. Arabia and UAE relatively which carry out high import relatively. There still has been a great potential in Romanian market although the share by 3,5% has already been taken. And Moroccan market has an important potential despite our share by 4.0%.

Turkey has an important superiority in Turkmenistan market with its share by 57,7% in Lighting equipment export. Also Turkey has obtained high shares in Azerbaijani and Georgian markets. Also Kazakhstan market has a potential to expand.

Turkey has lost market volume in Iraq market in a significant rate and its share has decreased to 3,7% since 2017. However, Iraq market provides potential for Turkey in a middle-long run.

Qatar is developing as a new market with improved relations. Export for 7,0 million dollars was carried out in 2017 and share by 3,0% was taken from the market. Qatar market is also open for improvement.

Countries	Lighting Devices	Lighting Devices Sections and Parts	Auto Headlights and Signals	Self-Energy Resourced Lamps	Lamps	Lamp Sockets	Total
Germany	0.5	1.7	1.3	0.0	0.2	0.3	0.8
Romania	2.5	2.3	9.9	0.0	0.8	3.7	3.5
Russia	0.7	0.2	0.8	0.0	0.0	0.7	0.5
Kazakhstan	9.3	2.7	3.2	0.0	0.5	1.3	7.0
Turkmenistan	69.0	70.2	7.8	4.2	27.1	42.9	57.7
Azerbaijan	19.2	11.0	4.2	4.8	0.0	0.0	14.3
Georgia	11.8	27.5	11.1	3.3	0.0	17.6	10.0
Iraq	6.4	8.0	0.0	1.7	0.2	3.3	3.7
Saudi Arabia	2.3	0.8	0.0	0.6	1.2	0.0	1.9
UAE	1.1	1.8	0.6	0.1	0.1	1.6	0.9
Qatar	3.0	3.0	0.0	3.3	1.3	40.0	3.0
Morocco	5.2	1.6	8.8	0.1	0.1	1.8	4.0

Table 70: Turkey's Share in Selected Export Markets (Percent, 2017)

Source: UN Trade Data Base, TURKSTAT

	Scenario 1 Annual Growth 3%	Scenario 2 Annual Growth 5%	Scenario 3 Annual Growth 10%	Scenario 4 Annual Growth 15%
2018	1,935	1,935	1,935	1,935
2019	1,995	2,030	2,130	2,225
2020	2,050	2,135	2,340	2,560
2021	2,115	2,240	2,575	2,945
2022	2,180	2,350	2,830	3,385
2023	2,290	2,470	3,120	3,890

Table 71: Domestic Market Predictions

Source: Research Team's Calculations.

4.8. Domestic Market Predictions

Domestic market of electrical Lighting equipment offers a significant growth potential. Using this potential is closely related with the policies and projects which especially public will apply. Predictions on growth in domestic market are carried out in USD through the following 4 scenarios.

In the first scenario, the domestic market is estimated to grow by 3% annually in Turkey just like the world market. With this growth, the size of the domestic market reaches to 2,29 billion dollars in 2023.

In the second scenario, the domestic market in Turkey is estimated to grow by 5% in real terms annually just like the period between 2013 and 2018. Annual average growth is estimated to be 5% in USD with the estimation that Turkish Lira will maintain its value. With this growth, domestic market size reaches to 2,47 billion dollars in 2023.

In the third scenario, the public is assumed to tighten the minimum conditions and bring out obligations to freshen the renewal market in line with the energy efficiency target, the market is estimated to grow by 10% annually on average. With this growth, the size of the domestic market reaches to 3,12 billion dollars in 2023.

In the fourth scenario, the public is assumed to specify aggressive targets and realize especially LED transformation oriented smart city projects in line with the energy efficiency target, the market is estimated to grow by 15% annually. With this growth, the size of the domestic market reaches to 3,89 billion dollars in 2023.



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