



# **NATIONAL REPORT TURKEY**

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# INTRODUCTION

## PHYSICAL CONTEXT AND GEOGRAPHY

Turkey extends for almost 1650 km from west to east. It lies between 36<sup>0</sup>N and 42<sup>0</sup>N latitudes and between 26<sup>0</sup>E and 45<sup>0</sup>E longitudes. A small part of the country is geographically located in Europe, Thrace. The rest of the country, Anatolia or Asia Minor, is in Asia. Asia, with a total area of 780.000 km<sup>2</sup>, is surrounded by the Black Sea, Bulgaria in the north, the Aegean Sea and Greece in the west, the Mediterranean Sea, Syria and Iraq in the south, Iran in the east and Armenia and Georgia in the north-east (Figure 1). The total length of border and coastline is 10.765 kilometers, of which 7.816 kilometers are coastlines. (Adem, et al., 2009)



Figure 1. Map of Turkey Turkey

<http://www.nationsonline.org/oneworld/map/turkey-map.htm>

Turkey has a unique geographical and cultural position at the crossroads between Europe and Asia. Its historical and cultural links with the people of the Balkans, Caucasia, Central Asia, Middle East and North Africa give a special geo-political significance. Hence, it is called as a “cradle of civilizations” and “bridge between the continents”.

The climate of Turkey is semi-arid with some extremities in temperature. Climate and precipitation figures exhibit great variance throughout the country: in the higher interior Anatolian Plateau, winters are cold with late springs, while the surrounding coastal fringes enjoy the very mild-featured Mediterranean Climate. Average annual precipitation is 643 mm, ranging from 250 mm in the Central Anatolia, to over 2500 mm in the coastal area of north-eastern Black Sea. (DSİ, Foreign Relations Office, 2012)

Concerning the natural resources of TR; water resources are greater than in the Middle East but generally less than in other European countries. Known oil and natural gas deposits are small, but the country has relatively large amounts of coal. There is great potential for renewable energy e.g. solar and wind and the long coastlines with a temperate climate support commerce, tourism, and fishing (1).

Turkey is the world's 19th largest economy, a key member both in G20 and the OECD and the second most populated nation in Europe with 77.5 million inhabitants. Turkey is challenged with ensuring economic growth together with environmental and social progress to achieve sustainable development. The country faces increasing environmental pressure which can partly be explained by growing sectors such as energy, industry, transport and tourism.

The EU accession and cooperation with the EU has had a significant impact for Turkey to strengthen its environmental commitments and responsibilities. Turkish environmental legislation is moving towards an alignment with EU. The Chapter on Environment was opened to accession negotiations at the Intergovernmental Conference which was held in Brussels on December 21, 2009 (2).

## **1.CURRENTLY EMPLOYED GREEN LOGISTIC SYSTEMS**

### **1.a Current Situation of LOGISTICS in Turkey**

Turkey possesses a highly important position on the world, due to its strategic location; bridging continental Europe with the Middle East and Asia, makes it the perfect transport and logistics hub. This bridging position between the West and the East makes logistics a highly critical sector for the surrounding region's economic development (1). In Turkey, especially after 2008 crisis, the emphasis on the logistics sector has increased. For the last few years the importance of establishing logistics centres and ports in Turkey is increasing exponentially. To become a regional center in logistics in this framework; many studies have been started to increase the logistics facilities by

decreasing the logistics costs, improving the trade and increasing the competitive advantage, technology infrastructure, especially information and communication technologies (2). The logistics sector in Turkey experienced a four-fold increase in load capacity and increase in the container volume as well the sector, which provides jobs to around 400,000 people, is an important employment area for the country (3). The share of the logistics sector in Turkey's GDP has reached around 14 percent. Since 2003, when a new transportation policy was passed, about 20 billion EUR were invested already in the modernisation of the transportation and communication sectors between 2003 and 2009 and two core approaches have been followed with respect to the logistics sector. Next to the investments into the domestic infrastructure, a strategic shift is pursued in the transportation modal mix: from rail to road.

However, according to Logistics Performance Index, which gives insight into the attractiveness of the countries to the investors, Turkey ranked 30th in 2014 that dropped to 47 th position in 2018.

	2007	2010	2012	2014	2016	2018
LPI Rank	34	39	27	30	34	47
LPI Score	3,15	3,22	3,51	3,50	3,42	3,15

The reasons behind that decline in rankings should be examined keeping in mind that the lack of green logistics applications as one of the factors.

There exist about 1,500 logistics companies in Turkey according to 2015 data. These companies differ from each other by factors such as organizational structure, mode of operation and turnover. Logistic companies could be classified as;

- Small firms that are aimed at turnover and profitability and who work with traditional methods,
- SMEs aiming at growth and working with both traditional and global methods,
- Large companies with the potential for international business,
- Branches of foreign companies aiming both taking the advantage of local markets and and contributing the sector,
- Companies that are established as a cargo company and aim to be a leader in the sector.

Although logistics activities have a great potential to increase (4), Turkey does not have a special authority for the management of the logistics centres and ports.

### **1.b. Current Situation of GREEN LOGISTICS in Turkey**

In fact, the term “green logistics” is not a fully defined in the laws and regulations but has been newly accepted issue in Turkish logistics sector. Among 1500 various sized logistic firms operating in Turkey, only 17 of them declared that they are more or less working in perspective of green logistics (5).

Those companies prefer mostly to have environmental management certification to take part in international markets and in competitive environment. Green logistics companies operate with environmental, economic and social concerns, while companies that do not have green logistics operate only with economic concerns.

Logistic companies that do not claiming green logistics actions are mostly offers cargo-transport services, it is not too much at the forefront of environmental concerns, it is seen that they are only hosting activities aimed at ensuring economic profits (5).

When most of the companies are evaluated, the following results are revealed:

- All companies have background (idea) about green logistics. However they do not consider establishing a separate green logistics department. 59.6 % of the logistic companies doing nothing related to green logistics issues,
- Most of the companies (especially local based enterprises) have the idea that green logistics applications will increase the costs. However, green logistic companies are aware of green logistic activities will decrease the overall costs in the mid-run,
- The reasons not to apply green logistics are; no legal obligations, increase in costs and the need for more qualified personnel,
- There is no enough support and information (6).

Fortunately, “Association of International Forwarding and Logistics Service Providers” (UTIKAD)’s statements on ‘green logistics’ are promising. They explained that; “supported by legislation in Europe 'green logistics' is now on the agenda of Turkey. The fleets are renewed by green vehicles and more green modes are used. Customers also prefer environmentalists. Experts say it is imperative to switch to green logistics. Sector representatives estimate that customers and business partners in the future will not work with environmentally unconscious companies. This means that companies investing in green logistics will increase their competitiveness as well as their contribution to the environment. Moreover, it is expected that legal regulations will be strengthened in a way that will not allow the companies that do not protect the environment.” (7)

One of the most important components of green supply chain management is collaboration and coordination with customers are also included in the company's policies (8). Executives and customers' requests for the implementation of green affiliates are most important than the existing related legislations.

However, when costumers' expectation from logistic companies are asked (9); priority is given to cost (39 %) and only 5 % of the customers declared that, they concern about sustainability and environmental issues.

The effect of NGOs and various pressure groups is also effective on the green logistics decisions of companies.

In summary; green logistics activities are new concern in Turkey for international competition in global markets. Regarding the items related with the current structure of Turkey (incentive system, port or logistic centre management, dry port or logistics centre, infrastructure standards of logistics areas, selection of location of logistics areas or port) Turkey has not any regulation (10). Only legislation on energy use and efficiency is binding.

Extensively used green logistic applications are;

- measures to reduce energy consumption,
- emission rate and carbon footprint,
- use of environmentally friendly vehicles,
- use of intermodal transportation systems,
- reverse logistics practices and efforts to minimize waste.

Meanwhile there is no any activity concerning creation restricted areas for logistics applications (restriction zones), determination of low emission zones, coordinated transport systems and use of renewable energy.

It could be said that; 'green supply chain management' practices are starting out with a long way to travel and there are still rooms for application of logistics activities in a green way. In spite of having ISO 14000, the companies and the customers are not aware of the benefits of this certification properly as mentioned above.

## **1.1. Green Transport**

### **1.1.1. Mode of Transport**

Turkey is situated on main trade arteries and is the logistic hub of three continents (Fig. 1).



Figure 1. Turkey Logistic Hub of Three Continents

As it is seen in Table 1, in Turkey, highway transportation takes up the greatest share.

Table 1. The Current Situation and 2023 Targets of Transportation Shares in Turkey

Transportation Shares Tons-Km (Domestic Shipping)	Current Situation	2023 Target
Highways	80.63%	60
Railways	4.76%	15
Airways	0.44%	1
Seaways	2.66%	10
Pipelines	11.51%	14

In Turkey, land transport is the main mode for freight and passenger transportation representing about 90% of the country’s total transportation (11). However, goals have been set to shift modes of transportation from highways to rails and seaways. Turkey has a great potential for intermodal transportation (12). It is expected that by connecting sea, road and railway systems with the contribution of logistics centers intermodal transportation will have a great percentage among freight transportation in Turkey. Turkey discovered that to make the transportation of freights easy and fast, there must be logistics centers. So, 4 logistics centers were opened by the end of 2012, while 18 logistics centers will have been opened by 2023.



Figure 2. Logistic Centers operated by TCDD (State Railways)  
Source: ([www.tcdd.gov.tr/](http://www.tcdd.gov.tr/))

Concerning the **railways**; after having been rather neglected by government policy and investment for more than 50 years, now railways in Turkey experience an increased attention and revitalisation. In 1960, their domestic modal share was about 30% and declined in the 1980s to less than 10% (11). Since 2003, however, important steps have been initiated to enhance and modernise the existing railway network. Performance and service offering, and thus, the quality have been significantly improved by TCDD in recent years. The Turkish Ministry of Transportation and Communication plans to restructure TCDD which, for example, will finally separate freight and passenger transportations as well as the infrastructure.

The Turkish **seaports** have been managed by TCDD from the very beginning of its existence, and they are connected with the domestic railway system. The most volume-handling seaports are located in Istanbul (Haydarpaşa, Ambarlı) and Izmir, the last of which is Turkey's biggest export hub for ocean freight. Further important seaports are found in İskenderun and Mersin, which are the central ocean freight gates for Turkey's Near and Middle East trade. In addition, Samsun on the Black Sea coast covers significant transport flows, like Derince, Tekirdağ and Bandırma on the Marmara Sea. These three ports are closely situated to the Istanbul area and become more and more important for the intermodal transportation offering to Russia, Romania and crossing the Bosphorus.





Figure 3. TCDD and TÜRKLİM Seaports (11)

With respect to **airfreight**, as Turkey is becoming an active participant in the global economy, the country's air cargo transport is also growing rapidly. 7% of all Turkish exports, expressed in monetary value, and 10% of imports are moved by air (11).

#### 1.1.2. Impact on Climate Change

According to the 2009 emissions inventory, greenhouse gas emissions from the transportation sector represented 17% of total emissions in Turkey. Transport on highways is responsible for 85% of CO<sub>2</sub> emissions originating from the sector (13).

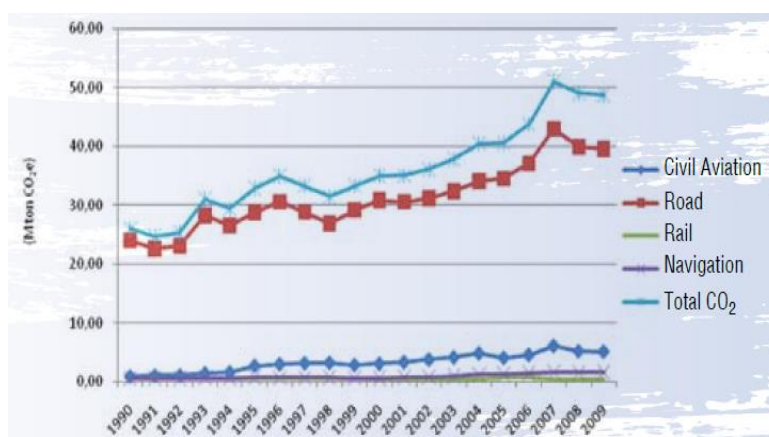


Figure 4. CO<sub>2</sub> emissions in transportation sub-sectors in Turkey in Mt CO<sub>2</sub> equivalent (1990-2009) (NCCAP, 2011).

National Climate Change Action Plan of Turkey which is published by Ministry of Environment and Urbanization (MoEU) indicates that GHG emissions from transport sector in Turkey have increased almost %80 between 1990 and 2009. According to Figure 4, road transportation plays a significant role on this rise. In fact, road transport causes the most CO<sub>2</sub> emissions generated by the transport sector.

In order to control greenhouse gases emissions from the transportation sector, the Turkey Transportation and Communication Strategy Document (2011-2023) and National Climate Change Strategy Document (2010-2020) have established targets. Some of these targets, as stated in the National Climate Change Action Plan (NCCAP) include:

- as of 2023, the share of railroad use (5% in 2009) should increase to 15% and the share of railroads for passenger transportation (2% in 2009) should increase to 10%;
- as of 2023, the share of the use of highways for freight transportation (80% as tonne-km in 2009) should decrease to 60%, and the share of passenger transportation on highways (89% as passenger-km in 2009) should decrease to 72%;
- emission increases from the use of individual vehicles should be limited in urban transportation;
- necessary legislation, institutional structures and guideline documents should be prepared to develop sustainable transportation planning approaches across all cities; and
- legal amendments should be made and capacity developed to increase alternative fuels and clean vehicle use through 2023.

There are important ongoing studies on vehicle technologies for alternative fuels in the transportation sector based on partnerships between the public and private sectors and universities.

### 1.1.3. Efficient Fleet and Personnel Management

Turkey is the home of one of the biggest land transportation fleets in Europe (about 5-7m units like: minibuses, buses, small trucks, heavy trucks, special purpose trucks and tractors)(11). Thanks to this, Turkey has become the biggest production location for coaches and the third biggest manufacturing market for light commercial vehicles in Europe. Turkey is also one of the biggest European sales markets for commercial vehicles, especially for medium and heavy trucks as well as for long-distance coaches (14,16 an

estimated international heavy truck fleet of about 50,000 truck units and 49,000 trailers is available for international services (11,14). This truck fleet operates across the European, (Central) Asian, and North African continents.

Turkey introduced further road transport regulations in 2005, which banished by law commercial vehicles being older than 22 years and led to a vitalisation of commercial vehicle production in the Turkish market (11). Changes of this sort generate both, opportunities and risks for the Turkish and international companies in this segment. It can be assumed that the run of the smaller transport companies without a diversified service portfolio will be increasingly exposed to risks, including ones of a financial nature (11).

*The applications of companies claiming that they are doing green logistics could be summarized as follows:*

#### **1.2. Green Warehouses**

- To minimize carbon footprint by developing environmental operations,
- Reduce energy consumption in warehouses by automatic separation systems,
- To measure the electricity in the company and to take measures for saving with automatic meter reading systems.

#### **1.3. Green Packaging and Waste Management**

- To benefit from production technologies where waste rate is minimized,
- To keep the packaging material used during product packaging as low as possible,
- Pay attention to the high rate of recyclability of packaging material selection,
- To realize product recycling in an environmentally friendly manner,
- Establishment of a waste water treatment plant within the company,
- To ensure that waste motor oils are collected and disposed of without damage to the environment.

#### **1.4. Green Logistics Data Collection and Management**

- Preparing strategic management plans,
- Establishing sustainability reports and demonstrating that they act with environmental concerns,
- Having ISO 9001 Quality Management System and ISO 14001 Environmental Management System.

#### **1.5. Overall Green Logistics Applications**

- Add environmentally friendly supply chain activities to business policies,

- To revise the organizational structure with a green perspective,
- To prioritize environmental sensitivity in raw material and technology procurement,
- Reduce the noise pollution in the production and distribution stages,
- To raise the awareness of the personnel and customers working in the company about environmental sensitivities.

Besides, according to the Green Logistics Report (14), the concept of green logistics has started to applied in the construction of environmental friendly warehouses and airports. Furthermore, the use of EURO 5 and above vehicles is becoming widespread in transportation vehicles. In addition to this, trainings are given to drivers not to harm the environment and reduce fuel consumption.

## **2. GREEN LOGISTICS POLICIES**

### **2.1. International/National Regulations and Legislations**

As mentioned in the Introduction part, Turkey's logistic sector has developed during the last period with a tendency for more rapid growth. Also, for the last few years the importance of establishing logistics centres and ports in Turkey is increasing exponentially. Based on a weighted assessment of these facts, a most likely estimate of Turkey's current national logistics expenditure will be in the range of 6–7% of GDP. However, Turkey does not have a special authority for the management of the logistics centres and ports. There is not an independent structure for the management of the ports nor is there any incentive system for establishing logistics centres or ports (10) and Turkey has not any direct regulation (10). Although logistics in Turkey is not institutionalised, tasks related to logistics have been included in the foundation laws of the Ministry for Customs and Commerce, European Union Ministry, Ministry of Economy and the Ministry of Transport, Maritime Affairs and Communications (4).

Additionally, The Turkey Exporters' Assembly (TEA) established the logistics council. Apart from these developments the Prime Ministry has issued the Turkey logistics coordination committee circular, defining the committee's structure and stating that the committee will be making advisory decision regarding logistics (15).

According to the most recent policy document (Strategic Plan) released by the government on logistics sector entitled as "Strengthening Combined Transport in Turkey"

and “A Strategic Shifting Program From Transportation to Logistics” in 19 locations, TCDD (Turkish State Railways) started to plan and build logistic centers close to relevant cities (16). By this plan, it is aimed to contribute Turkey's exports, growth and sustainable development potential via logistics to achieve their goals and are intended to be entered in the Logistics Performance Index among the top 15 countries. It focuses on legislation, urbanization, customs, infrastructure, domestic and international logistics centers and increasing the competitiveness of firms to be able to make efficient and effective plans and programs in logistics.

The targets of strategic shifting program from transportation to logistics are given as:

- Strengthening the international position of Turkey in logistics,
- Reducing the cost of logistics within the total cost of industrial products,
- Shortening the time of transportation of the final products to the consumption markets.

As clearly can be noticed, there is nothing mentioned about green logistics.

In relation to Governmental climate change prevention and adaptation measures; *Republic of Turkey Climate Change Strategy Plan (2010- 2023)* prepared by Ministry of Urbanisation and Environment, targets for TRANSPORTATION sector are given as:

**Medium Term Plans** will be developed to increase the share and load factor of railways, seaways and airways in freight and passenger road transport.

- Studies will be carried out to assess the potential for the improvement of combined transport.
- Shortdistance maritime and lake transport shall be encouraged.
- Arrangements facilitating the expansion of the use of environmentally friendly transport vehicles such as bicycles and the pedestrian access in cities, will be encouraged.
- Public transportation systems by means of subways and light rail systems shall be expanded especially in metropolitan areas.
- The use of alternative fuels and clean vehicle technologies in public transport vehicles will be expanded in cities.
- Research and development studies will be carried out in order to raise the geometrical and physical standards of road networks to ensure lower fuel consumption.

- Smart transportation system practices will be improved.
- Other practices to improve energy efficiency in the transport system shall be developed.

### **Long Term**

- The share of railways and seaways in freight and passenger transportation, which is currently 2%, will be increased, and airway transportation shall be supported.
- The use of alternative fuels, new technology engines which can minimize both CO<sub>2</sub> and NO<sub>x</sub> emissions and environmentally friendly hybrid transportation vehicles will be expanded.

Besides Strategy Plan, Turkey’s National Climate Change Adaptation Action Plan ( 2012) set only one Action related to logistics (in transport) (17):

Table 2. Logistics Actions

Action	Assessment
U3.1.3.1. Setting up a platform where all sector stakeholders can work together on limitation of GHG emission increase in the transportation sector and adaptation of the transport infrastructure to the impacts of climate change	No information was found with regard to issues such as member structure of shareholder platform, duty, authorizations and liabilities, work principles and procedures, or Joint protocol of the Platform.

### *International Legislation*

With respect to international agreements in land transportation, Turkey is part of the most important conventions like the Land Transportation Agreement (1949), the Customs Agreement on International Transportation / TIR Agreement (1975), the International Convention on Harmonization of Border Control (1982), the Convention on the Contract for the International Carriage of Goods by Road (CMR) as well as the European Agreement Concerning the International Carriage of Dangerous Goods by Road (11).

Additionally, EU Twinning Project named “Strengthening Intermodal Transport in Turkey” with the purpose of ‘to promote a balanced, environment-friendly, safer and sustainable transport system in Turkey and alignment with EU legislation’ is a promising development concerning green logistics applications in Turkey.

## **3. DRIVERS AND BARRIERS FOR GREEN LOGISTICS IMPLEMENTATION**

### **3.1. Drivers**

The reasons behind the adoption of green logistics practices of companies in Turkey are;

- Recognition of environmental damage on a global scale and make environmental policies compulsory in a competitive environment,
- Increasing importance of green investments,
- Advantage of working with environmentally friendly products for company advertisement and promotion,
- Green logistics has become a globally widespread and distinguishing company and it is known that it has the effect of strengthening the brand image,
- Taking the advantages of having environmental certifications in global market,
- Adopting the social dimension of green logistics, enriching the organization structures with a green perspective, ensuring customer satisfaction,
- Increase in sustainability and environmental awareness of consumers.

### 3.2.Barriers

The reasons for not reaching the desired level in green logistics sector in TR could be summarized as:

- Higher investment costs,
- Lack of qualified personal,
- Higher percentage of highways usage,
- Inadequacy of port and railway infrastructure,
- Inadequate institutionalization of the sector,
- Failure to establish transport corridors suitable for mixed transport,
- Failure to create logistics villages,
- The role of different institutions in the establishment of logistics villages, logistics centers, logistic zones and free zones and the lack of coordination among the institutions,
- Unfair competition conditions,
- The lack of a logistics master plan that determines the logistic roadmap (see policies).

Logistic companies stated that, company executives and customers are more effective in the implementation of green affiliates compared to laws and regulations. Therefore environmental awareness of companies' executives/managers become more important for transition to green logistics.

## 4. TRAINING

In parallel with the growth rate of the sector, there is increasing interest in logistics education. Logistics training provided in Turkey will be examined under two headings; academic trainings and trainings provided by logistics companies. 'Green Logistics' trainings will be examined inline with 'Logistics' training in general.

### 4.1. Academic Trainings

The first academic program is launched on 1999, with the need of qualified and expertised human resources and later on many similar programs in various universities and high schools followed on.

#### 4.1.1. Secondary Level Logistics Training

The number of logistics departments in the field of Transport Services is 118 in higher education (3 % of total VET) as of 2017-2018 training semester. In these programs, there are no direct and indirect courses related to green logistics, both within the major courses and in elective courses (18).

#### 4.1.2. a. Under Graduate / Vocational Training Programs (2 years)

Number of Universities with Logistics Program: 77

Number of Vocational Schools with Logistics Program: 99

Distance Learning Programs: 2

Logistics Open Education: 2

Air Logistics Program: 1 (19).

A rapid increase in the number of undergraduate programs in **logistics** in Turkey are observed. In 2011, there were 60 Vocational School with "Logistics" program and the number of students were around 4800 (OSYM, 2011). There are 142 associate degree programs in 73 universities for 2017-2018 academic year (53 state and 20 foundations) with approximately 10 000 students.

However, there is no any program directly for "Green Logistics". Under graduate level logistics programs are mostly offered by Vocational High Schools and under the 'Management and Organization' departments. The courses given under "Logistics" programs are;

Table 3. Logistics Courses at Undergraduate Level (2 years VET)

Departmental courses	Law, Logistics, Supply Chain Management, Storage, Purchasing, Distribution, Transportation, Operation, Foreign Language, Foreign Trade, Customs etc
Compulsory courses	History, Turkish, Math, etc



Elective courses	E-commerce, Quality Management, Transport of Hazardous Wastes, Occupational Health and Safety, Insurance, etc.
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Some of the elective courses are said to be indirectly related with the environmental issues and green logistics.

#### 4.1.2.b. Under Graduate Level Logistic Programs (4 years)

Number of Universities with Logistics Departments: 64

Number of Logistics Departments: 92 (20 of them in EN)

Logistics Open Learning: 1 (20)

The courses given under “Logistics” departments are;

Table 4. Logistics Courses at Undergraduate Level (4 years Programs)

Departmental courses	Business Management, General English and Professional English, Mathematics, Statistics, Logistics and Supply Chain Management, Finance, Foreign Trade, Procurement, Economics, Accounting, Law, Numerical Methods In Enterprises, Warehouse, Inventory and Inventory Management, Distribution, Marketing, Customs, Computer And Logistics Information Systems, Transportation Management, Production And Stock Management, Logistics Planning and Modeling
Elective courses	Organizational Behavior, Business Ethics, E-Commerce, Money and Bank, Insurance and Risk Management, Reverse and Green Logistics, Hazardous Wastes Transport

Some of the elective courses are said to be directly related with the environmental issues and green logistics.

#### 4.1.3. Graduate/Master's Degree Logistics Training

In Turkey in 23 universities, 44 programs are offered master's degree on “Logistics and Supply Chain Management”. Unfortunately there exists no specific program on “green logistics”. However as in the case of under graduate training programs, there are ‘courses’ on “green logistics” in some of the universities as summarized in Table 5.

Table 5. Logistics M. Sc. Programs and Courses

	Name of the University	Institute	Program	Courses related with Green Logistics
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1	AKDENİZ UNIVERSITY	Social Sciences	International Trade and Logistics	-
2	ATATÜRK UNIVERSITY	Social Sciences	International Trade and Logistics	?
3	ATILIM UNIVERSITY	Social Sciences	International Trade and Logistics	-
4	BEYKOZ UNIVERSITY	Social Sciences	International Trade and Logistics	-
5	ÇANAKKALE 18 MART UNIVERSITY	Social Sciences	International Trade and Logistics	?
6	DOKUZ EYLÜL UNIVERSITY	Social Sciences	Logistics Management	-
	DOKUZ EYLÜL UNIVERSITY	Science and Technology	Logistics Engineering	Logistics and Environment
7	ERCİYES UNIVERSITY	Social Sciences	International Trade and Logistics	?
8	GAZİANTEP UNIVERSITY	Social Sciences	International Trade and Logistics	-
9	HASAN KALYONU UNIVERSITY	Social Sciences	International Trade and Logistics	-
10	İSTANBUL AREL UNIVERSITY	Social Sciences	International Trade and Logistics	-
11	İSTANBUL ESENYURT UNIVERSITY	Social Sciences	Logistics Management	-
12	İSTANBUL GRLİŞİM UNIVERSITY	Social Sciences	International Logistics and Transport	-
13	İSTANBUL TİCARET UNIVERSITY	Social Sciences	Logistics Management	-
14	İSTANBUL UNIVERSITY	Management	Logistics Management and Transport	-
	İSTANBUL UNIVERSITY	Faculty of Transport and Logistics	Logistics Management and Transport	Sustainable and Green Logistics (E)
15	İZMİR ECONOMY UNIVERSITY	Social Sciences	Logistics Management	Hazardous Waste Logistics
16	SÜTÇÜ İMAM UNIVERSITY	Social Sciences	International Trade and Logistics	-
17	MALTEPE UNIVERSITY	Social Sciences	Logistics and Supply Chain Management	Logistics Optimisation
18	MERSİN UNIVERSITY	Social Sciences	Logistics and Supply Chain Management	-
19	OKAN UNIVERSITY (Private University)	Distance Learning	Logistics Management	Green Logistics Reverse Logistics

	OKAN UNIVERSITY	Social Sciences	Logistics Management	Green Logistics Reverse Logistics
20	PİRİ REİS UNIVERSITY	Social Sciences	Logistics and Supply Chain Management	-
21	TOROS UNIVERSITY	Social Sciences	International Trade and Logistics	-
22	YAŞAR UNIVERSITY	Social Sciences	Int. Logistics	-
23	YEDİTEPE UNIVERSITY	Social Sciences	International Trade and Logistics	-

As can be seen from Table; among 23 logistic graduate Program; the curriculum of the 3 could not be reached. There are green logistics directly related courses only in 4 out of 20 (20 %) Universities.

#### 4.1.4. Graduate/ Doctoral Degree Logistics Training

Table 6. Doctoral Degree Logistics Training Programs and Courses

	Name of the University	Institute	Program	Courses related with Green Logistics
1	DOĞUŞ UNIVERSITY	Science and Technology	Logistics and Supply Chain Management	-
2	GAZİANTEP UNIVERSITY	Social Sciences	International Trade and Logistics	-
3	HASAN KALYONU UNIVERSITY	Social Sciences	International Trade and Logistics	-
4	İSTANBUL UNIVERSITY	Faculty of Transport and Logistics	Logistics Management and Transport	Sustainable and Green Logistics (E)
5	MALTEPE UNIVERSITY	Social Sciences	Logistics and Supply Chain Management	Logistics Optimisation
6	YEDİTEPE UNIVERSITY	Social Sciences	International Trade and Logistics	-

As can be seen from the Table 6, only in one of the doctoral program, there exist “Sustainable and Green Logistics» as elective course.

Tablo 7: Türkiye’deki Üniversitelerde Bulunan Lojistik Derecelerinin Dağılımı Tablosu

No of Universities in TR	No of 2 years VET/Undergraduate Training Programs	No of Logistics Dept (4 years)	No of Master Degree Programs	No of Doctoral Degree Programs
206	77	64	23	6
% 100	% 36,8	% 31	% 11	% 3

Additionally, the distribution of courses in Turkey at undergraduate and graduate levels are given in Figure 3.

It could be said that, there is no direct courses on “green logistics”. This type of courses are given as elective courses under the heading of ‘electives/supporting courses’ which has only 13 %.

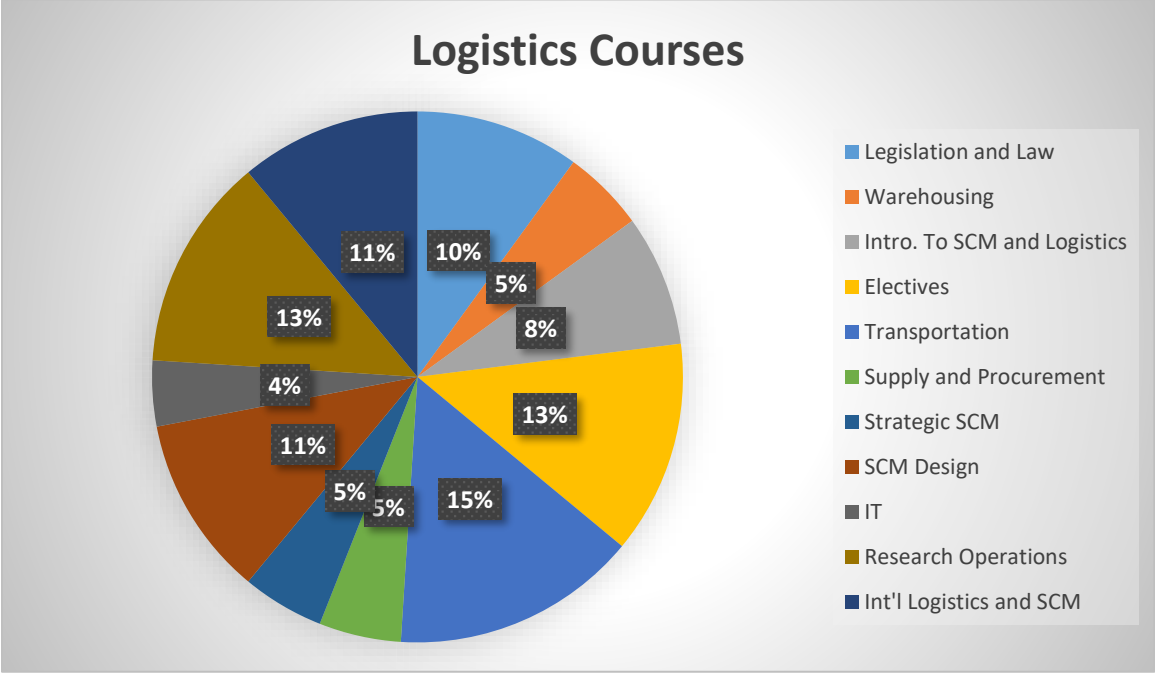


Figure 5: Distribution of Logistic Courses (21)

**4.2. Trainings Given by the Logistic Companies**

Sustainable Transport and Logistics Web-Based Training: Available for everybody interested in transport and logistics environmental performance assessment, emissions inventories and decision making (modal shift, supplier selection etc.)

*Course A: Freight transport and logistics emissions monitoring and reporting*

This training course covers all aspects of transport and logistics emissions monitoring, accounting and reporting for companies and public organisations such as local authorities.

*Course B: Road Freight Transport and Logistics Energy Efficiency Management (ENFORCE)*

This course covers all aspects with an impact on energy (fuel) efficiency in road freight transport and logistics and is developed for consultants and (in-house) Energy Efficiency Managers at retailers, manufacturers, logistics service providers and freight transport companies partnering in the ENFORCE programme.

*Course C: Introduction in Energy Management in road transport and logistics*

This webinar provides participants a good introduction in practical energy management systems in transport and logistics operations including the applicability of the new ISO 50001 standard for transport and logistics. ISO 50001 is intended to provide organizations with a recognized framework for integrating energy performance into their management practices.

*Course D: Training course on carbon credits trading strategies for aircraft operators in the EU Emissions Trading Scheme*

This interactive practical training course provides a comprehensive overview of the basics of CO2 emission rights trading and trading strategies in the EU ETS for aircraft operators. The course has been developed for financial managers and EU ETS managers in the aviation sector.

As a result, transition to green logistics in our country, specific programs including below topics should be developed at all levels:

- Waste management
- Reverse logistics
- Accurate fuel selection and fuel safety
- Energy management in green warehouses and warehouses
- Carbon accreditation
- How can we improve the environmental functions of operations in transport and logistics?
- Monitoring and reporting of freight transport and logistics emissions (road transport - air transport - sea transport - rail transport)
- Greenhouse gases and other pollutants in transport and logistics
- Calculation of emissions in transport
- Monitoring and reporting of transport emissions

## **5. BEST PRACTICES**

### **5.1. EKOL Logistics Company**

Ekol, an integrated logistics company founded in 1990, provides international freight, warehousing, domestic distribution, foreign trade, customs, and supply chain management services in 15 countries with the utilization of its 2 Ro-Rovessels, 48 block trains per week and 5,500 vehicles and multinational team of more than 7500 staff

member. **Ekol Turkey**'s delivery centers are equipped with cutting-edge technology and eco-friendly fleets, and allow Ekol to render all types of internationally integrated services which the new economy calls for. The said services incorporate state-of-the-art intermodal and transportation equipment, and take advantage of a large warehouse with a capacity of 570,000 square meters and extensive cross-dock facilities.

**Intermodal**

Every day, Ekol provides services in all corners of the globe, aspiring to use natural resources optimally and creating a more sustainable business model, while employing the Intermodal transportation model it introduced in 2008. By doing so, the company saves 365,000 trees each month.

In a single Intermodal trip, Ekol achieves the following savings without having to cover a 2,429-km long road;

- 823 liters of fuel
- 2221 kg of CO<sub>2</sub>
- 5,8 kg of NO<sub>x</sub>
- 0,08 kg of particles.

Ekol reduces the mileage on road with its intermodal solution created by combining railroad, land and maritime transportation and minimizes the carbon dioxide, hydrocarbon, particle and nitrogen emission. With this environmentalist approach, Ekol Logistics aims to leave a better world for the next generations.

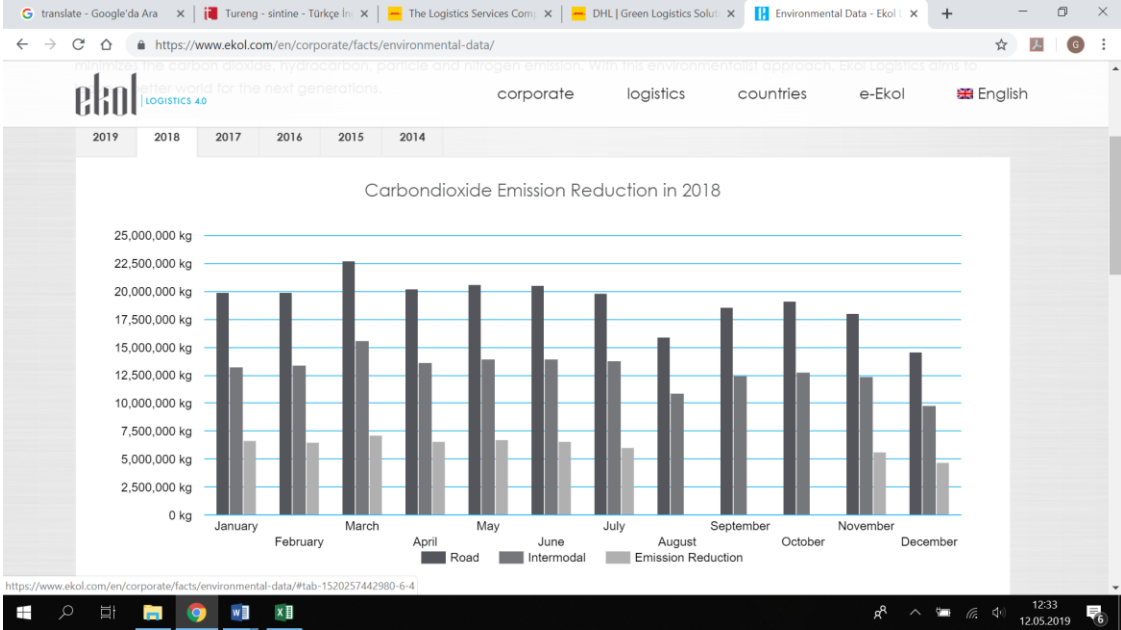


Figure 6. CO<sub>2</sub> Emission Reductions in 2018

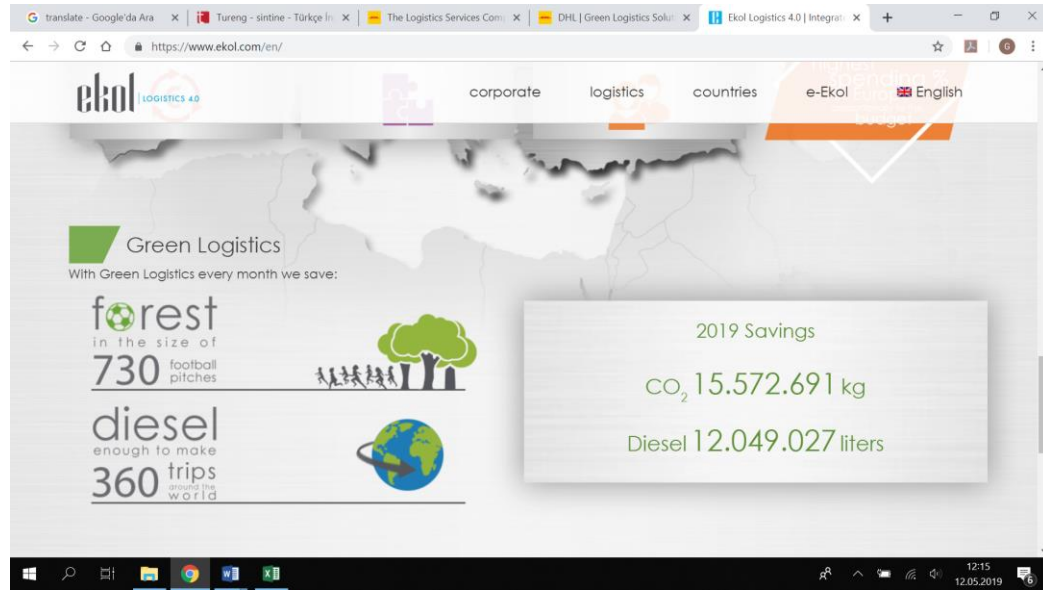


Figure 7. 2019 Savings in CO<sub>2</sub> and Diesel

### WWF Green Office Program

Ekol Logistics is pleased to be the first ever logistics company in Turkey to get involved in the WWF Green Office Program. As part of the program, it formulates and implements improvements in savings in the areas of Waste Management and Electricity and Paper Usage. The work is focused on increasing awareness among personnel.

Indeed, the Green Office Program entails awareness training for employees at Ekol facilities. Training sessions cover such topics as “WWF, Green Office, system/ecosystem, ecological footprint, water footprint, and climate change.”

### Waste Management

Ekol perceives and recognizes that improperly disposed waste remains in the wild for countless years – continuing to harm the environment in the process. Accordingly, Ekol Logistics took the initiative in Waste Management as part of the WWF Green Office Program with the goal of properly disposing of all types of waste created during its processes. Ekol Logistics aims to reduce the amount of trash by collecting waste separately and decreasing the utilization of raw materials, energy, and other natural resources through proper sorting. Sorted waste can be disposed of or recycled properly by licensed companies contracted by Ekol.

**Collecting Food Waste:** We aspire to feed our animal friends by taking food waste from the cafeterias to nearby animal shelters.

**Sorting Food Waste:** We aim to support recycling by sorting the recyclable waste from the cafeterias.

### **Scrap Waste Recycling Campaign**

We sorted scrap waste created in the facilities in 2011 and gave them to advanced recycling companies. We supported the adoption campaign of the World Wildlife Fund Turkey (WWF Turkey) with the revenues generated from this operation.

### **Paper Consumption**

Ekol also initiated a paper saving and recycling project to protect forests, the lungs of the Earth, under the headings it identified as part of the WWF Green Office Program.

Ekol has developed solutions to decrease paper consumption by determining the amount of paper usage per department. Each ton of recycled paper prevents the cutting down of 17 trees, which provide for the oxygen requirements of 144 people. By using recycled paper, Ekol also brings about huge savings in water and energy use in paper production.

### **Electricity Consumption**

Ekol knows that even a single person can make a great difference in electricity consumption by being careful. As such, it is working to create a mass movement and take a step up from individual efforts by providing employee training. The company is also building a roadmap of improvements based on the measurement results obtained by using different measuring tools for each office.

In our country, 20 percent of electricity is consumed for lighting purposes. A 20-percent move to energy-efficient lighting systems provides savings equal to the electricity produced by the Keban Hydroelectric Power Plant in one year. Thus, Ekol uses energy-efficient lamps in its facilities.

Launched in 2011, the Virtual Server Project achieves 20 percent savings in our electricity consumption each year.

### **WWF – Earth Hour Campaign**

Ekol Logistics is the ambassador for the Earth Hour Campaign by the WWF, one of the world's most prominent environmental proponents. Accordingly, it supports the Earth Hour Campaign to bring attention to global climate change.

### **Ekol Memorial Forests**

Ekol Logistics concluded the years 2012, 2013, 2014, and 2015 with significant social responsibility projects in line with its green logistics operations. The company believes that a new forest in Turkey is the best New Year's gift.

### **Ekol Supports the TEMA Nature Training Program**



Having made donations to TEMA for the preservation of forests on behalf of our clients, Ekol also contributed to TEMA Nature Education Program in 2016.

Donations were raised to support children's natural science education during a special NTV show broadcast live by the Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA) to celebrate its 25th anniversary. As a part of this special live broadcast, Ekol pledged to meet the education expenses of 2,500 children. (26)

## **5.2. ARKAS Logistics**

ARKAS, which provides services in logistics, ship fleet, shipowner and port operations, was established in 1989 and provides sea, air, land and railway combined transports, open cargo and project transports, forwarding and warehousing services. ARKAS employs 850 employees and serves with 706 wagons, 1250 containers suitable for rail transportation, 450 trucks, numerous loading and unloading vehicles and equipment, as well as large container storage areas. The company, which prioritizes environmental concerns, is implementing green logistics practices.

Green logistics activities are as follows:

- Health-safety-environment department has been established at company ports.
- A wastewater treatment plant was established within the company and all kinds of domestic and industrial wastes are treated according to the standards determined by the regulations and discharged to the receiving environment. Wastes are handled to have minimum impacts on the environment by recycling or disposal. Hazardous wastes are also given to licensed firms and disposed according to regulations.
- Bilge waters are collected by PETDER (Petroleum Industry Association) for the purpose of disposing in a way that will not harm the environment and human health.
- Natural resource consumption values (rates) are measured by the Company regularly and studies are carried out to minimize these values.
- With the use of electric winches, the energy costs of the company are reduced by a quarter and the energy is used more efficiently.
- The company ships are operated with "economic speed", thus saving 20 tons of fuel per day per ship. (5)

## REFERENCES

- (1) Yardımcıoğlu, M., Kocamaz, H. and Özer, Ö. (2012). Transportation systems in logistic management and cost methods, II. Regional Problems and Turkey Symposium, Kahramanmaraş. pp: 245-259.
- (2) Demir, E. E. (2017). Sustainability in logistics sector: green logistics. International Congress of the New Approaches and Technologies for Sustainable Development, Mersin. p. 309.
- (3) <https://www.dailysabah.com/economy/2018/01/09/turkeys-logistics-sector-brings-in-nearly-2b-investments-in-10-years> (09.05.2019)
- (4) Tabak, Ç. and Yıldız, Y. (2015). Institutional structuring of logistics in Turkey, Transport Congress, 11th ed., Transport Congress, İstanbul, pp: 2-3.
- (5) Zengin, E. (2017). Yeşil lojistik göstergeleri ve Türkiye’de yeşil lojistik uygulamaları, Dissertation Thesis, Gazi Üniversitesi, FBE.
- (6) Üstünbaş, N., N. (2018). Marmara bölgesindeki lojistik firmaların yeşil lojistik uygulamaları, Dissertation Thesis, İstanbul Ticaret Üniversitesi, SBE.
- (7) <http://www.utikad.org.tr/SektorelHaber.aspx?DataID=11897&Baslik=YE%C5%9E%C4%B0L%20LOJ%C4%B0ST%C4%B0%C4%9EE%20GE%C3%87MEYEN%20F%C4%B0RMANIN%20%C3%96MR%C3%9C%20KISALACAK> (11.05.2019)
- (8) Mohammad H., Zavvar, S., Ozturkoglu, Y. And Taebok K. (2016). Green supply chain management practices’ effect on the performance of Turkish business relationships, International Journal of Supply and Operations Management, 2 (4), pp. 982-1002.
- (9) Transportation and Logistics Sector Report. (2018), ULUK, İstanbul. <http://ulk.ist/kutuphane/> (12.05.2019)
- (10) Tabak, Ç. and Yıldız, Y. (2018). Turkey’s logistics impact compared to the Netherlands, Germany and Belgium, International Journal of Logistics Systems and Management, 31(1), pp. 1-19.
- (11) Iskan, S. and Klaus, P. (2013). Transport, Logistics and Supply Chain Services in Turkey, UTİKAD.
- (12) Deveci, Ali., (2010). Türkiye’de çoklu taşımacılığın geliştirilmesine yönelik bir model önerisi, Dokuz Eylül Üniversitesi Denizcilik Fakültesi Dergisi, 2 (2).
- (13) Turkey's Fifth National Communication under UNFCCC. (2013), Ministry of Urbanisation and Environment.

- (14) MÜSİAD Araştırma Raporları, (2016). Lojistik Sektöründe Sürdürülebilirlik: yeşil lojistik, İstanbul.
- (15) Tanyaş M. et al. (2011) Strategy Paper for Turkey Logistics Master Plan, Turkey Exporters Assembly, Istanbul, Türkiye.
- (16) Ministry of Transport, Maritime Affairs and Communications, Ministry of Development (2018), Taşımacılıktan Lojistiğe Dönüşüm Programı Eylem Planı (2014 - 2018).
- (17) Algedik, Ö. (2013). Climate Change Action Plan, Assessment Report July, Tüvik Der.
- (18) MEGEP, (2018), <http://www.megep.meb.gov.tr/Default.aspx> (08.05.2019)
- (19) <http://www.lojistikbolumu.com/kategori/lojistik-onlisans-bolumleri> (08.05.2019)
- (20) Şahin, E. (2018), Türkiye’de lojistik eğitimi, lojistik eğitim standartları, mesleki yeterlilik ve Bologna süreci, AB üye ülkeleri ile Türkiye kıyaslaması, Dissertation Thesis, Maltepe Üniversitesi, SBE.
- (21) Çıkmak, S. (2019), Situation of logistics education in Turkey and suggestions for the development of logistics education, RTEÜ Journal of Social Sciences, Vol.3, pp.1-13.
- (22) <https://www.ekol.com/en/> (12.05.2019)