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Possible Impacts of the European Green Deal on Turkey's Logistics Industry

Fatih Cura[1] and Sercan Demir[2]

1 – KTO Karatay University

2 – Harran University

Purpose: *The concept of the Green Deal is one of the important roadmaps adopted to build a more livable world against the climate crisis and make the current system cleaner and more sustainable. Businesses in the EU are subject to sustainability rules required by the Green Deal. Since Turkey is a signatory power to the agreement, the Turkish companies are also hinged on to the Green Deal. The logistics sector emerges as one of the priority areas on this matter. In this sense, Turkey has also prepared a 'Green Deal Action Plan' to adapt to the new situation. In this study, Turkey's competencies in international logistics will be evaluated, and the compatibility of the planned actions with the green deal process will be discussed.*

Methodology: *This research is conducted to review literature from recent journals, governments reports, and the World Bank's logistics performance index (LPI) to draw out secondary data that helped analyze the drivers of the EU's green deal practices and the challenges faced by Turkey's logistics industry in implementing them.*

Findings: *Turkey's competencies in international logistics and action plans to comply with the Green Deal are examined.*

Originality: *This study is novel in examining Turkey's logistics compatibility with EU's Green Deal rules.*

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1 Introduction

Logistics is defined as “an important part of the supply chain process that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services, and information flowing between the point of origin and the point of consumption in order to meet the needs of customers” (David, 2007).

The concept of logistics, which is very important in every period of history, appears as a military term that provides food/ammunition supply and transportation for armies. Logistics management also aims to provide resources and manage physics flows in this process. What is meant by physical flow is defined as the technical and managerial control flow between the production and consumption point of raw materials and products (Tudor, 2012).

Significant developments in the global economy and increasing trade competition have improved the importance of the logistics industry. Accordingly, thanks to the developments in this sector, logistics has become a driving force in the economic development of countries. Since trade and transportation are so important economically, it can be said that the development of a country largely depends on logistics activities (Martínez, 2011).

An effective logistics system necessitates the common use of more than one transportation type and strengthens the technical infrastructure. Providing such an infrastructure reduces the economic cost of transportation and logistics activities and contributes to economic and social sustainability by eliminating externalities that negatively affect the population (Leal, 2011).

According to Globaltranz (2015), the benefits to be achieved through sustainable practices in logistics are listed as follows.

Emission reduction: The transportation sector causes a serious carbon emission by transporting products from one place to the targeted places. Emission rates can be reduced by reducing the total distance traveled and using clean technology and energy-based vehicles instead of fossil fuels. Solutions such as electric vehicles, multi-modal transportation, and route optimization can be offered. In general, multi-modal

transportation, which brings together the best of every mode of transportation in terms of reliability and flexibility, has many advantages in terms of economic, environmental, and social aspects (Abiral et al., 2020).

Reducing the amount of waste products: The service life of existing vehicles and equipment is increased by reducing distances in transportation and increasing efficiency. Thus, all parts in these vehicles remain in use for a longer period of time. In addition, road damage will be reduced, and savings will be achieved in road construction.

Reducing energy consumption: The fastest option is not always the most efficient option. In line with sustainability goals, new generation technologies that consume less energy are used, and renewable and clean energy sources are preferred. Both energy savings are made, and environmental benefits are provided thanks to the conversion to clean energies.

Compliance with official regulations: Sustainable logistics activities facilitate compliance with the states' regulations as penal and incentives within the scope of sustainability. In this way, both sustainable activities are rewarded, and illegal activities are prevented due to penal sanctions.

Increasing awareness among consumers: thanks to the increase in sustainable activities, there is an increase in consumers' awareness of the products they buy and how the relevant vendors work. This ensures that, besides economy and quality, sustainable activities are also determinants in determining the image of companies.

2 Theoretical Background

Logistics and transportation activities are responsible for approximately 25% of greenhouse gas emissions, one of the biggest environmental problems today (Çetin and Sain, 2018). In addition, in line with the countries' development plans, logistics is very important both in ensuring economic growth and environmental improvement and in line with the employment areas it includes. While protecting and developing its natural capital by reconsidering its economic growth strategies, the EU aims to protect the health and well-being of its citizens from environmental risks (Abiral et al., 2020).

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According to the Sustainable and Intelligent Transport Strategy announced by the EU within the scope of the European Green Deal, increasing the share of sustainable and green transport modes by developing combined transport; increasing rail and inland waterway transport in freight transport; launching zero-emission vehicles in the road, air and maritime transport; development of electric vehicle infrastructure; increasing the production/use of sustainable and alternative fuels in all modes of transport; Green pricing in transportation and the development of smart transportation systems are gaining importance. In addition, by creating an environmentally friendly, smart, competitive, safe, accessible, and affordable transportation system, it aims to reduce transportation emissions by 90% until 2050. In line with this target, it has been decided to reduce emissions by at least 55% by 2030. The Green Deal is the economic transformation model to be used as a roadmap to achieve this goal (European Commission).

A significant portion of 75% of inland freight transport carried by road is planned to be shifted to railways and inland waterways. Airlines emissions will be greatly reduced by re-starting the Single European Sky in Aviation. Thanks to digitalization, smart traffic management systems will be created, and thus traffic congestion and air pollution will be reduced, especially in crowded cities. In addition, transportation pricing will be calculated by considering the impact of traffic density on the environment and health. In other words, taxation encourages people to prefer clean transportation vehicles. In addition, measures will be taken to increase the production of sustainable alternative automobile fuels. It is expected that 13 million zero or low emission vehicles will be on European roads by 2025. It means that one million public charging and filling stations will be needed for these vehicles (Mısır and Arıkan, 2022).

In July 2021, the Ministry of Trade of Turkey published the Green Deal Action Plan. The action plan includes steps to be taken in a wide range of areas, such as combating climate change, green finance, EU border carbon regulation, a green and circular economy, clean, economical, and safe energy supply, sustainable agriculture, sustainable smart transportation, and diplomacy.

The plan aims to inform companies, especially Small and Medium-Sized Enterprises (SMEs), on environmental labeling and waste management issues, to raise awareness for recycling food scraps and waste, and to raise awareness of consumers.

2.1 Turkey's Logistics Industry

According to Erkan (2014), logistics is among the most popular sectors after tourism, and Turkey sees logistics as a tool to achieve its foreign trade and sustainability goals on the international platform. It is seen that the importance of logistics in the changing world trade is gradually increasing. Located between two continents with the largest share of world trade in terms of its geopolitical position, Turkey has important airline and seaway infrastructures on its logistics routes. Turkey is beginning to stand out in logistics by strengthening its technical infrastructure in transportation and logistics with increasing infrastructure investments.

Logistics Performance Index data is accepted by local governments, regional groups, and international organizations such as the OECD and the United Nations (Arvis, 2018). According to the World Bank data, the Logistics Performance Index (LPE) is a benchmarking tool created to reveal the difficulties and opportunities encountered in countries' trade logistics and improve them. The LPE is based on a worldwide survey of global shipping companies and carriers that provides information on the logistics performance of the countries in which they operate and trade. Feedback from operators in the field provides quantitative data on the performance of key logistics components in that country. LPE consists of six different components, including customs performance of countries, quality of infrastructure, and timeliness of shipments. Measured data for Turkey are presented in Table 1 (World Bank, 2022).

Table 1: LPE evaluations (Turkey)

Year	LPE Score	LPE Rank	Customs	Infrastructure	International shipments	Logistics quality and competence	Tracking and tracing	Timelines
2007	3,15	34	3,00	2,94	3,07	3,29	3,27	3,38
2010	3,22	39	2,82	3,08	3,15	3,23	3,09	3,94
2012	3,51	27	3,16	3,62	3,38	3,52	3,54	3,87
2014	3,50	30	3,23	3,53	3,18	3,64	3,77	3,68
2016	3,42	34	3,18	3,49	3,41	3,31	3,39	3,75
2018	3,15	47	2,71	3,21	3,06	3,05	3,23	3,63

Source: World Bank (2022)

Turkey ranked 34th in the world with 3.15 points in 2007. In 2018, it dropped to 47th place with 3.15 points. Here, it is seen that the biggest decrease is due to customs. Turkey showed its best period in terms of logistics performance in 2012-2014 and ranked 27th in the world in 2012. Timing is the part where Turkey gets the highest score from the logistics components, and certain stability is maintained. Although it is quite efficient in terms of logistics timing in Turkey, it is clear that there is a problem in the customs with the lowest score and a need for improvement.

Industry professionals in Turkey make recommendations to the decision-makers for the Turkish logistics sector to adapt to the Green Deal. The best ways for adaptation include; investing in environmentally friendly technologies, encouraging the sector's environmentally friendly technology investments, promoting sustainable alternative fuel and electric vehicle use, increasing investment support during the transition to green technologies, and increasing the use of environmentally sensitive vehicles in road transport, strengthening the railway infrastructure, enabling uninterrupted transportation, promoting intermodal transport, the establishment of railway connections of ports, and facilitation and development of transit transportation (Eldener, 2020).

Transit passes provide great gains, especially when they are by rail. The Middle Corridor, in which Turkey is located, is the most important railway corridor of the new silk road, starting from Western China and reaching the borders of Western Europe through Kazakhstan, Azerbaijan (with the Caspian Sea passage), Georgia, and Turkey. With the completion of the Baku-Tbilisi-Kars railway, the Turkish connection to this line has also been strengthened. In this context, Turkey has geographical importance will improve trade relations between China and Europe (Tümenbatur, 2021).

3 Research method

Pianta and Lucchese (2020) state that the European Green Deal (EGD) is a major climate change policy that the European Commission launched in December 2019. It is a long-term strategy for the transition to a low-carbon economy in alignment with the 2015 Paris Agreement. It aims to make Europe the first carbon-neutral continent by 2050 (Pianta and Lucchese, 2020).

In their study Maris and Flouros explain the EU's target to meet the aims set for 2030 as follows:

1) reduce greenhouse gas (GHG) emissions by a minimum of 40 percent,
2) increase the renewable energy sources (RES) quota to a minimum of 32 percent EU energy use,

3) increase energy efficiency by a minimum of 32.5%,

4) guarantee a minimum of 15% electricity inter-connection levels among neighboring the member states, and

5) support Research and Innovation (R&I) initiatives through the available financing tools. (Maris and Flouros, 2021)

This research used content analysis to review literature from recent journals, magazines, and newspapers to draw out secondary data that helped analyze the drivers of the EU's green deal practices and the challenges Turkey's logistics industry faced in implementing them. The main objective of this paper is to investigate Turkey's competencies in international logistics and evaluate the compatibility of the planned actions with the green deal process. The following research questions address the purpose of this paper:

RQ 1: Is Turkey's logistics performance ready for the green deal?

RQ 2: Will the action to be taken for the green agreement increase the logistics performance of Turkey?

RQ 3: Will Turkey be able to implement its action plan?

We illustrated our extended research framework in figure 1.

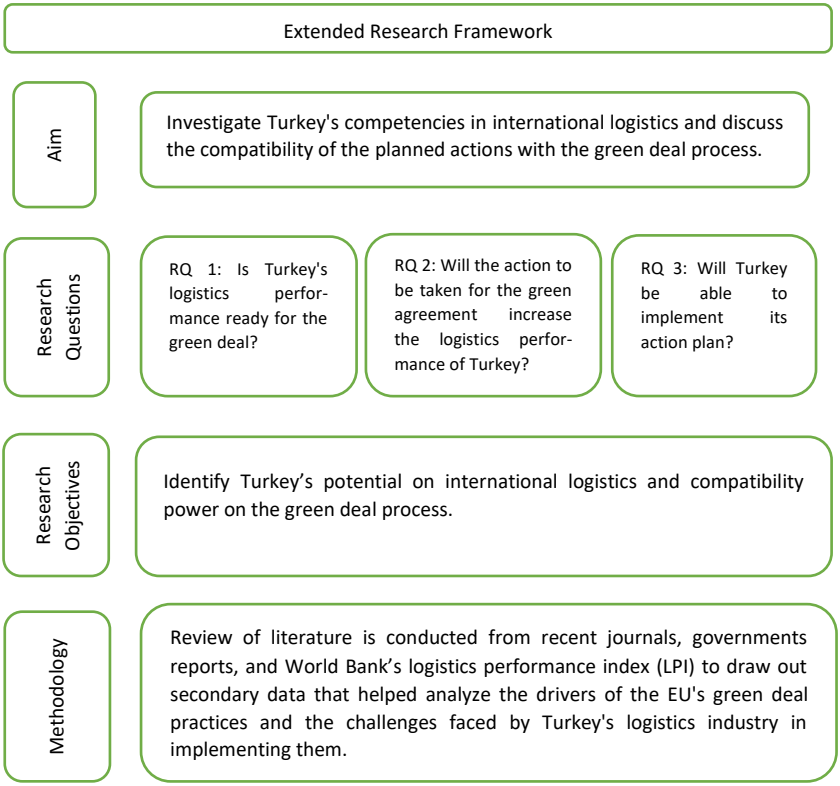

Figure 1: Extended Research Framework (adopted from Mohr & Khan, 2015)

4 Results

The European Green Deal is a growth strategy of the European Union aiming at net zero emissions of greenhouse gases by 2050 in the fight against climate change and global warming. Since the EU's weight in Turkey's total exports is just over 40 percent, Turkey has also prepared a 'Green Deal Action Plan' to adapt to the new situation. According to

the Ministry of Trade of Turkey (2021), “Action Plan has been announced in order to contribute to the transition to a sustainable and resource-efficient economy and to adapt Turkey to the comprehensive changes envisaged by the European Green Deal, in a way that will preserve and further the integration achieved under the Turkey-EU Customs Union. Therefore, information and awareness activities classified as; border carbon regulations, green and circular economy, green finance, clean, affordable and secure energy supply, sustainable agriculture, sustainable smart transportation, combating climate change, diplomacy and European Green Deal implementation”.

Road transport is mainly used in trade with the EU. Road transport accounts for about 40% of the increase in global oil demand. This shows that emissions from road transport are in a rapid increase trend. For this reason, the road transport sector, which is one of the sectors that have the most impact on greenhouse gas emissions worldwide, and businesses that want to exist in the sector, should prioritize environmental awareness, implement strategies that will minimize their negative economic effects and increase their service quality, and turn to environmentally sensitive transportation methods (Eldener, 2020).

In line with the goal of sustainable smart transportation, a road map that the Turkish officials announce includes:

- The Combined Transport Regulation will be put into effect.
- Logistics Centers Regulation will be put into effect to support the balanced development of transportation types and methods.
- Developing railway infrastructure between the EU and Turkey will be continued.
- It is aimed at preparing the national legislation regarding the Green Port Certificate Program.
- Preparatory work will be carried out to declare the Mediterranean Sea as a SECA (Sulfur Emission Control Area).
- Research will be conducted to reduce harmful emissions from the maritime sector and to support green shipping.
- Strategy development and planning will be made to develop electric vehicle and charging infrastructure.

- Effective implementation of the use of electric vehicles in public transport fleets and encouragement of public transport action will be planned.
- In order to reduce exhaust emissions and to provide alternative fuel, low emission individual transportation opportunities, necessary legislative studies will be completed to increase the use of micro-mobility vehicles.
- Bicycle/e-scooter roads, parking, and charging stations will be built. (Ministry of Trade of the Republic of Türkiye, 2021)

Hundreds of standardization, certification and accreditation studies are carried out to increase the quality of logistics in Turkey and Europe. In Turkey, there is a need for a budget to be allocated for logistics companies to have these standards and a workforce that will bring these standards to institutions and operate according to the standards in practice. International standards give prestige in the global market. It gives strength in the competition. It ensures that innovation takes place in the routine work of the institution and works in coordination with strategic partners. In the process of Turkey's accession to the European Union, these standards should be known in all rings of the supply chain and the necessary quality certificates should be obtained, and the legislation should be updated to include these standards (Adıgüzel, 2020).

According to the subject matter experts, although it may seem difficult for Turkey to adapt to the green deal, it is predicted that the transformation can take place rapidly with the right regulations and incentives. As a result of the interviews, we came up with the following results:

- In the transformation process, public, private sector, and non-governmental organizations and universities should act together.
- It is of great importance that the processes of data collection and carbon footprint calculation regarding the transformation are carried out transparently.
- In order to reduce the total greenhouse gas emissions originating from the logistics sector in Turkey, more importance should be given to railway investments by both the public and private sectors.
- It is necessary to shift the freight transported mainly by road to environmentally friendly transportation types such as rail and combined transportation.

- Logistics centers, where freight transfers between transportation modes are facilitated, should be designed correctly, and legislation and implementation changes should be updated based on the sustainability principle.

In addition, Turkish companies that are the logistics industry stakeholders make investments by developing some practices to minimize the damage they cause to the environment during their activities. In particular, efforts to reduce carbon emissions in transportation activities are of great importance in the green transformation process. Practices of companies related to Sustainable and Green Logistics:

- Using alternative environmentally friendly fuel vehicles such as LPG and CNG in production and shipment,
- Using vehicles with environmentally friendly engines such as EURO 5,
- Installing noise and sound suppressors on vehicles,
- Using environmentally friendly, efficient transportation and distribution systems,
- Reducing general packaging processes and materials used,
- Using recycled materials instead of plastic materials in packaging,
- Using pure (unmixed) products in a sustainable way,
- Environmentally friendly recycling,
- Training of personnel in cognitive and affective fields,
- Efforts to raise awareness of customers.

5 Conclusion

Globalizing trade and rapid change in technology are changing the needs of countries day by day, revealing the importance and necessity of foreign trade in terms of growth and development goals of countries. One of the elements whose influence is felt strongly in this process of change is logistics network services. The performance of countries in logistics and administrative processes is of great importance in terms of both foreign trade and the effectiveness of inter-country competitiveness. This paper presents the EU's Green Deal implementations and their possible effects on Turkey's logistics industry. Turkey's responsive and adaptive action plans are also mentioned regarding the issue.

In Turkey's adaptation process to the Green Deal, establishing an incentive mechanism for Turkish companies as in Europe will make the transformation faster and more successful with the support of the state. For Turkey to continue its cooperation with the EU, it will need to understand the regulations in the logistics sector better, follow the developments and develop the ability to take quick steps to comply with the standards established within the Green Deal scope.

Turkish companies that foresee green transformation and implement it in their structures and make it a part of their strategies; will be more agile and more competitive in both national and international markets; be able to access and benefit from global financial resources easily; they will make their product portfolio greener and more sustainable. In addition, it will be easier for these companies to reach international standards, and their opportunities to open up to international markets and do business will increase.

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