Ecology Awareness of Sustainable Green Development: Collaboration of Universities and Local Actors

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COUNTRY-BASED LEGAL ANALYSIS
TÜRKİYE

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EXECUTIVE SUMMARY

This document provides an analysis of the legal framework driving sustainable green development in Turkey and the role of universities in collaboration with local actors. The study covers key areas such as green economy, sustainable finance, social responsibility, environmental protection, agriculture and food systems, sustainable urban development and smart cities. The legal framework governing cooperation between universities and local governments is also analyzed.

Turkey's sustainable green development efforts are supported by a comprehensive legal framework covering environmental regulations, green economy policies, sustainable finance, social responsibility, agriculture and food systems, urban development, and smart cities. To align with the European Green Deal, Turkey introduced the Green Deal Action Plan in 2021 under the Ministry of Trade, establishing various economic and fiscal instruments to promote sustainability. Environmental taxes, such as the Environmental Cleaning Tax and Special Consumption Tax, aim to reduce environmental impacts, while market-based mechanisms like carbon emissions trading are expected to play a key role in greenhouse gas reduction by 2025.

In the area of sustainable finance, Turkey is developing its Green Taxonomy to align financial sector practices with environmental goals, and the Banking Regulation and Supervision Agency (BRSA) has introduced the Sustainable Banking Strategy to encourage environmentally responsible financial decision-making. Additional regulations, such as the Green Bond and Sustainable Debt Instrument Guidelines and mandatory Sustainability Reporting Standards effective from 2024, enhance transparency and accountability in corporate sustainability practices.

Environmental protection and agricultural policies focus on sustainable water management, biodiversity conservation, and climate adaptation. Regulations such as the Water Pollution Control Regulation, the Protection of Wetlands Regulation, and the pending Water Law aim to improve water governance, while the Organic Agriculture Law, Soil Conservation and Land Use Law, and Seed Law support sustainable agricultural practices. The National Climate Change Strategy and Action Plan integrates climate resilience into agriculture and rural development policies. In urban sustainability

and smart cities, Turkey has enacted legal frameworks such as the Energy Efficiency Law, supporting smart lighting and energy-efficient urban infrastructure. The National Smart Cities Strategy and Action Plan promotes digital transformation in urban areas, while the Twelfth Development Plan (2024-2028) aims to enhance urban sustainability by incorporating climate resilience, green infrastructure, and digital innovation. Collaboration between universities and local governments is legally facilitated through regulations such as the Metropolitan Municipalities Law and the Municipal Law, which allow local authorities to engage in joint sustainability projects with academic institutions. The Development Agencies Law further enables universities to participate in regional development initiatives, while climate action plans involve universities in knowledge transfer and policy development for environmental sustainability. Overall, Turkey's legal and policy framework for sustainable green development is evolving to align with European Union standards, fostering a transition to a low-carbon economy while integrating environmental responsibility across economic and institutional sectors.

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The comparative legal analyses in respect of green economy, sustainable financing, social responsibility, green environment and agrifood, sustainable urban development and smart cities and collaboration of universities and local actors is required for modern society and the environment.

This fostered cooperation between universities, local government, communities and citizens to achieve sustainable projects and promote environmentally friendly and economically responsible practices. Laws and regulations play a crucial role in how different countries implement policies and interdisciplinary cooperation. Their institutional systems may foster sustainability and innovation differently, and their comparison will help identify the positive and negative aspects and gaps that need to be mitigated for better intersectoral cooperation.

Using comparative analysis, partners will examine the impact of laws and policy on the achievement or obstruction of goals such as sustainable green development. For example, understanding how laws facilitate and promote SGD is a starting point for developing networking strategies and action plans between universities and other local actors in a more productive way.

Legal comparison allows partners to appreciate the matters which need to improve in the policies of their countries. That target may translate to concrete proposals for legal changes or modifications that would render collaboration more effective. These proposals will assist the universities and local governments in ways that will research the SGD Guide and Action Plan, allowing for greater coordination, efficiency, and impact of their activities towards global sustainability.

Universities can serve as an innovation engine and instruct communities on how to adopt less harmful practices. Under enabling legislation and regulations, the universities can help in facilitation of the transfer of information, support local actors to solve problems, and assist university students and citizens in active problem solving of the local environmental issues.

GREEN ECONOMY

1.1 Environmental Taxes

In response to the escalating environmental pollution driven by societal habits and unsustainable economic activities, numerous international initiatives have been undertaken to encourage environmentally conscious economic practices and behavioral changes. Turkey actively engages with these global efforts and strives to align its environmental policies and legislation with those of the European Union, particularly in the context of its EU accession negotiations. In this regard, and in line with the European Green Deal, Turkey's Ministry of Trade introduced the Green Deal Action Plan in 2021. This plan establishes a framework for achieving a green and circular economy through the implementation of various economic instruments aimed at environmental protection and sustainable growth. Among these instruments, fiscal policies are particularly emphasized due to their cost-effectiveness in promoting sustainability. Accordingly, Turkey seeks to integrate environmental considerations into its tax policies, utilizing fiscal measures as a mechanism to support the transition to a circular economy. However, despite these efforts, Turkey lacks a comprehensive environmental tax framework explicitly designed for environmental protection and pollution prevention. The Environmental Cleaning Tax (ECT) remains the primary regulatory instrument in this domain, serving as the principal environmental tax currently in effect.

1.1.1. Environmental Cleaning Tax

Environmental Cleaning Tax, which is the only environmental tax levied directly for the protection of the environment in Turkey, is a pollution (waste) tax regulated under the Law No. 2464 on Municipal Revenues. According to this regulation, it is levied on 'residential, business and other buildings located within the municipal boundaries and neighbouring areas and benefiting from the environmental cleaning services of the municipalities'. The taxpayer of the tax is those who use these buildings.

In terms of its subject matter, ECT consists of two basic taxes: solid waste and wastewater. Tax on solid waste is levied on the provision of garbage collection service by the municipality, while tax on wastewater is levied on the provision of sewerage service by the relevant municipalities (Pirler, 1994: 35, 39 ; Çelikkaya, 2011: 113). The ECT for residential buildings is calculated as 3.30 TL for metropolitan municipalities and 2.40 TL for other municipalities per cubic metre based on the amount of water consumption as of 2025. The ECT for workplaces and other buildings used for other purposes is calculated on the basis of monthly tariffs determined according to building groups and grades, and this tariff is applied with a 25% increase in metropolitan areas (BGK, Repeated Art. 44). The amounts determined for dwellings, workplaces and buildings used for other purposes are applied with a 50% discount for municipalities in priority regions for development and municipalities with a population of less than 5,000, except for those located within the borders of metropolitan municipalities (Art. 5 of the General Communiqué No. 56 of the ISC).

Although ECT is introduced for the purpose of protecting the environment in general and preventing waste in particular, it is taxed according to the amount of water consumption in residences, and according to building groups and grades in workplaces and other buildings. Therefore, since there is no direct relationship between the tax and the amount of waste, the tax burden does not have any effect on waste generation. Therefore, the environmental effectiveness of ECT is limited since it cannot be associated with the amount of waste and only covers the costs of waste collection and disposal (Çelikkaya, 2011: 113).

1.2 Other Regulations

In Turkey, apart from the environmental cleaning tax directly introduced for the protection of the environment, there are various taxes and fees scattered in various tax laws, as well as fees and administrative fines levied in accordance with the Environmental Law, and there are limited regulations for the protection of the environment, prevention of pollution and making polluters pay for pollution (Gülşen, 2021: 39). These regulations can be classified under three headings: taxes collected by the central government, taxes, fees and contribution shares to expenditures collected in accordance with the Law on Municipal Revenues, and regulations introduced in accordance with the Environmental Law. Practices other than the ECT and the fees or administrative fines levied pursuant to the Environmental Law are considered to be regulations enacted to generate revenue by prioritizing the potential impacts on the environment and the financial purpose, rather than directly serving the purpose of protecting the environment (Aydın and Deniz, 2017: 449).

1.2.1. Taxes Collected by the Central Government

Although some taxes collected by the central administration are enacted for fiscal purposes, they indirectly have a positive impact on the environment. These taxes consist of value added tax, special consumption tax and motor vehicles tax.

Value Added Tax

Value added tax is a consumption tax levied on the delivery of all kinds of goods and services. In this context, since it is based on the deliveries of goods and services, VAT is a regulation enacted for the purpose of generating revenue, not for the protection of the environment. On the other hand, VAT can be used as a policy tool in protecting the environment, even indirectly, by discouraging the consumption of environmentally harmful products by taxing environmentally harmful products at a

higher rate and/or encouraging the consumption of environmentally beneficial products by taxing them at a lower rate, not including them in the tax base or exempting them from taxation. For example, in Turkey, the ammunition subject to refund is excluded from the tax by being counted among the items not included in the tax base according to the VAT Law (Şenyüz et al., 2022: 274). At the same time, the exemption of 'delivery of metal, plastic, tyre, rubber, paper, glass scraps and wastes and garment trimmings' from tax under Article 17/g-4 of the VAT Law is important in terms of encouraging the recycling of such environmentally harmful products (Aydın and Deniz, 2017: 452).

Special Consumption Tax

Special Consumption Tax (SCT) is a consumption tax levied on the goods listed in the tables annexed to the law. Schedule I of the Law covers petroleum and petroleum products, Schedule II covers motor vehicles, Schedule III covers tobacco products and cola sodas, and Schedule IV covers white goods and luxury consumer goods. Although the purpose of SCT is to tax the consumption of the goods included in these lists, especially the petroleum and petroleum products included in lists I and II and motor vehicles cause negative effects on the environment by emitting wastes such as lead and particulate matter. In SCT, the tax base is determined by taking into account the sales prices and lump sum tax amounts together with measurements such as kilograms, cubic metres, kilocalories according to the lists (Article 11 of SCT Law). Therefore, there is no relationship between the tax base and environmental pollution. Although the purpose of SCT is not to protect the environment, the prices of such products can be increased by increasing the tax burden on such products. Thus, by changing the behaviour of users in a way to reduce the consumption of such products, the negative effects on the environment can be reduced (Gülşen, 2021: 139).

Motor Vehicle Tax

MTV is a tax levied on motor vehicles included in the tariffs numbered I, II and IV attached to the law. Motor vehicles may cause negative impacts on the environment by emitting carbon dioxide, greenhouse gases and carbon emissions. Therefore, in order to eliminate the effects of motor vehicles on the environment, it is necessary to apply motor vehicles tax in a way to reduce the amount of carbon dioxide emissions, greenhouse gases and carbon emissions (Gürsoy, 2021: 3; Gürdin, 2017: 42). In Turkey, the MTV base is determined as fixed or proportional amounts based on the age, engine displacement or electric power and prices of motor vehicles in tariff I, the type, age, weight and seat of the motor vehicle and electric power (kW) in electric vehicles in tariff II, and the age and weight of the motor vehicle in tariff IV (MTV Law Art. 5-6). Since the MTV does not include emission amount, greenhouse gas or carbon emissions among the elements that constitute the tax base, it can be said that there is no direct relationship between MTV and environmental protection.

1.2.2. Taxes, fees and contributions to expenditures levied in accordance with the Law on Municipal Revenues

Regulations pursuant to the Law on Municipal Revenues consist of electricity and air gas consumption tax, fees and participation shares in expenditures and solid waste fees. These regulations are not directly aimed at protecting the environment, but indirectly have a positive impact on the environment.

Electricity and Gas Consumption Tax

No. 2464 is a tax collected by municipalities in accordance with the Municipal Income Law. Although the purpose of this tax is not directly environmental protection, it is accepted as an indirect environmental tax that can be considered within the scope of energy taxes. According to the Law on Municipal Revenues, this tax is levied on electricity and air gas consumption costs. In this context, the tax is collected together with the sales price by the organisations distributing electricity and gas and paid to the municipality by these organisations. Electricity and Gas Consumption Tax is applied as 5% of the sales price of gas and 1% of the electricity sales price.

Solid Waste Fee

Domestic solid waste collected by municipalities in Turkey from water subscribers through water collection receipts. Regarding the regulation of the municipal solid waste fee in 2010 . The Regulation on the Procedures and Principles to be followed in Determining the Tariffs of Waste Water Infrastructure and Municipal Solid Waste Disposal Facilities was put into force in 2010. In the relevant regulation, it is stated that the purpose of collecting solid waste fee is to realise the activities of waste water infrastructure facilities and municipal solid waste disposal facilities.

Fees and Expenditure Participation Fee Collected Pursuant to the Municipal Law

Fees and participation shares to be collected by municipalities are listed in the Law No. 2464 on Municipal Revenues. Although there are no regulations directly related to the protection of the environment among these fees and contribution to expenditures, there are various fees and contribution to expenditures, the main purpose of which is to generate revenue and which are also considered to contribute to the protection of the environment, albeit indirectly. An example of such fees is the spring water fee. Examples of expenditure participation fees are sewerage and water expenditure participation fees.

1.2.3. Regulations to the Environmental Law

Administrative Fines Imposed Pursuant to the Environmental Law

Pursuant to Article 8 of the Environmental Law titled 'prohibition of pollution', it is prohibited to carry out activities that will directly or indirectly harm the environment in violation of the standards and methods set out in the relevant regulations. In order to enforce these prohibitions, the Environmental Law imposes a number of material and formal obligations on individuals and institutions regarding the protection of the environment and the elimination of pollution. Failure to comply with these obligations is considered as a misdemeanour under the Environmental Law and administrative fines are imposed. Article 20 of the Environmental Law stipulates administrative fines in different amounts for a wide range of different offences.

Environmental Pollution Contribution Fee

In Turkey, with the amendment of the law in 2006, the 'environmental pollution prevention fund' was abolished and replaced by environmental pollution contribution share. The purpose of the environmental pollution contribution fee is stated in the relevant law as preventing environmental pollution, improving the environment and supporting environmental investments. For this purpose, environmental pollution contribution fee is levied at the rate of one per cent of the CIF value of fuels and wastes subject to control permitted for import and five per cent of the CIF value of scrap. In addition, one percent of the water and wastewater removal fee collected by metropolitan municipalities water and sewerage administrations is collected as environmental contribution fee. (Environmental Law Art. 18).

Recycling Participation Fee

Plastic material is used in many areas of people's daily lives. However, most of the plastic materials produced are used in the production of disposable products. This situation causes an increase in the amount of plastic materials in nature and causes significant harmful effects on the environment (Turna, 2021: 248). In particular, unlike other wastes, the spontaneous extinction time of plastic bags in nature is quite long, and the fact that they are broken into pieces and added to the soil, water and food chain can have significant harmful consequences for all living things in nature. For this reason, many countries prefer taxing, charging or banning single-use plastic products in order to minimise the harmful effects on nature by reducing the use of plastic products (Ertekin and Dam, 2020: 76-77; Şahin, 2020: 112). In this context, in Turkey in 2018, with the 'Law on Amendments to the

Environmental Law and Certain Laws', additional article 11 was added to the Environmental Law and the practice of charging plastic products and environmentally harmful products under the name of 'recovery participation fee' was started to be implemented as of 2019.

Plastic bags, batteries, mineral and vegetable oils, electrical and electronic equipment, pharmaceuticals and packaging are covered by the recycling participation fee. The recycling participation fee is to be paid 'from the points of sale for plastic bags among the products in the list (1), and from the marketers or importers for other products'. Points of sale, marketers or importers fulfil their obligations by paying a certain amount per unit. These lump sum amounts are applied each year by increasing the previous year's lump sum amount by the revaluation rate. Recycling participation fees are declared to the tax office to which the relevant persons are affiliated in terms of income or corporate tax until the end of the twenty-fourth day of the month following the date the product is placed on the market or imported, and by those who are not liable for income or corporate tax, to the tax office to be determined by the Revenue Administration and paid until the end of the same month (Environmental Law, additional article. 11). Regarding the recovery contribution fee, those who are found to have not paid the recovery contribution fee in violation of the Environmental Law will be subject to an administrative fine of 20% of the contribution fee. In addition, those who do not comply with the procedures and principles determined by the ministry are subject to administrative penalties in accordance with the Environmental Law (Art. 20/z of the Environmental Law).

Bag Fee

In addition to charging a fee under the recovery participation share to those who market plastic bags, in order to manage resources efficiently and prevent environmental pollution caused by plastic bags, additional article 13 of the Environmental Law requires users who buy plastic bags from points of sale to pay a bag fee. The bag fee has been introduced only for plastic bags among the products covered by the recycling contribution share. It can be concluded that the legislator's inclusion of only plastic bags within the scope of the fee aims to 'limit the use of individual plastic bags due to the fact that the harmful effects of plastic wastes on the environment are increasing day by day as people frequently use plastic bags in their daily activities, whether necessary or unnecessary'. As a matter of fact, with this regulation, plastic bag sales points can reflect some or all of the recovery contribution fee they pay to the consumer. The base fee for plastic bags is determined by a commission to be established by the Ministry of Environment and Urbanisation and is updated every year. For the year 2025, the base bag fee for the user or consumer is determined as 50 kurus, while the bag sales points in 2025 will pay 86 kurus recovery participation fee. Therefore, bag sales points will collect 50 kurus of the 86 kurus recovery participation fee from consumers or users, while they will bear the remaining 36 kurus bag cost themselves. In addition, the Environmental Law stipulates that those who sell

plastic bags free of charge or produce plastic bags contrary to the standards determined by the Ministry will be subject to administrative fines in accordance with the Environmental Law (Article 20/z-bb of the Environmental Law).

Environmental Labelling

Environmental labelling is one of the regulations introduced to protect the environment, human, health, climate and natural life. In line with sustainable environmental targets, it refers to a label that shows that the negative effects of a product or service on the environment are reduced throughout the entire life cycle of the product or service from the raw material procurement process to the disposal of the product or service. In simpler terms, it is the label that shows that the product or service is environmentally friendly (Karaca, 2019: 73). With the environmental labelling application, it is aimed to raise awareness about environmentally sensitive products by providing accurate and scientifically based information to citizens, and to encourage environmentally sensitive enterprises by taking into account low carbon emissions, waste prevention, energy efficiency, water saving and harmful chemicals in products and services. Since the application is voluntary and covers the product and service groups determined by the Ministry, enterprises are not obliged to use environmental labels.

Deposit

With the regulation introduced by the additional article 12 of the Environmental Law, those who carry out the sales of products covered by the deposit are obliged to participate in the deposit application collection system for packaging and products to be determined by the Ministry. Producers, importers and marketers of the products subject to mandatory deposit application and wholesale or retail sales units that offer the products covered by the deposit to consumers/users are obliged to fulfil their administrative, financial and technical obligations for the establishment, operation and monitoring of the deposit system. Those who fail to fulfil these obligations are subject to administrative fines in accordance with the Environmental Law (Article 20/z-ee of the Environmental Law).

Motor Oils

In order to eliminate the impact of waste oils on environmental pollution and to ensure the reuse of waste oils, it is obligatory to change motor oil by the places authorised by the Ministry of Environment

and Urbanisation or to deliver waste motor oils to these places. Those who do not comply with this obligation are subject to administrative fines in accordance with the Environmental Law (Art. 20/z-dd of the Environmental Law).

1.3. Incentives

In Turkey, there are incentive mechanisms scattered in various laws for environmental protection. These incentive mechanisms generally consist of tax incentives, incentives for energy efficiency and emission trading. However, since tax incentives are explained under the heading of other regulations as regulations that indirectly have positive effects on the environment, they are not mentioned here.

1.3.1. Energy Saving and Efficiency and Renewable Energy Incentives

Energy efficiency is the reduction of energy consumption per unit or per product quantity without leading to a decrease in the standard of living and quality of service in buildings and the quality and quantity of production in industrial enterprises.

Energy efficiency policies are one of the areas that need to be handled sensitively due to its direct link with the sustainability of economic growth and social development targets and its critical role in reducing greenhouse gas emissions. In this context, energy saving and efficiency policies in Turkey are one of the basic building blocks of national climate and energy policies. The realisation of energy saving and efficiency policies has various objectives such as ensuring Turkey's energy supply security, reducing external dependency, protecting the environment and achieving the 2053 net zero target.

Bu amaçlar doğrultusunda Türkiye'de enerji verimliliği çalışmalarının ana çerçevesi 2007 yılında yürürlüğe giren 5627 sayılı Enerji Verimliliği Kanunu ile çizilmiştir. 2012 yılında yayımlanan Enerji Verimliliği Strateji Belgesi (2012-2023) ile Türkiye'nin enerji yoğunluğunun (milli gelir başına tüketilen enerji) 2023 yılına kadar en az %20 (2011 yılına göre) azaltılması hedeflenmiştir. 2023 yılına yönelik ülkemizde yapılacak çalışmaların yol haritası olarak Türkiye'nin ilk enerji verimliliği eylem planı olan Ulusal Enerji Verimliliği Eylem Planı (2017-2023) hazırlanmış ve 2 Ocak 2018 tarihinde yürürlüğe konulmuştur.

Enerji tasarrufu ve verimliliğine yönelik çalışmalar doğrultusundan sağlanan teşvikler, verimlilik artırıcı proje hibe programları, Enerji ve Karbon Azaltımı Destek Programı ve 5. Bölge teşviklerinden oluşmaktadır.

Productivity Enhancing Project (VAP) Support Program

It is a program covering the support of energy efficiency implementation projects of real and legal persons in all sectors from energy production to final consumption over the investment amounts. Projects on increasing energy efficiency through methods such as replacement of energy-consuming inefficient equipment (fans, pumps, boilers, furnaces, compressed air systems, steam traps, electric motors, etc.), rehabilitation and process regulation, heating and cooling systems, waste energy recovery, cogeneration systems where heat and electricity are produced simultaneously, and heat generation based on renewable energy sources are within the scope of the support program.

Energy and Carbon Reduction (EKA) Support Program

This program covers the support of energy expenses for the year specified in the criteria if the applicants reduce one of the energy intensity, carbon intensity or specific energy consumption criteria compared to the current situation within the framework of the criteria determined by the Ministry.

Fifth Region Incentives

In order to encourage long-term investments of industrialists, energy efficiency investments designed to save at least 15% of energy compared to the current situation, to be realized in existing manufacturing industry facilities with a minimum annual energy consumption of 500 TOE, based on the project approval to be given by the Ministry of Energy and Natural Resources, will benefit from the incentives provided for investments to be made in the fifth region, regardless of the region where they will be made. The incentives to be benefited from are value added tax exemption, customs duty exemption, tax reduction, insurance premium employer's share support, interest support and allocation of investment space.

Renewable Energy Incentives

In order to increase the share of renewable energy resources in total electricity generation and resource diversity, incentive mechanisms such as the Renewable Energy Support Mechanism (YEKDEM), support for domestically manufactured components used in facilities generating electricity from renewable energy resources (Domestic Components) and Renewable Energy Resource Areas (YEKA) Model incentive mechanisms were used. These incentives are explained by the Ministry of Energy and Natural Resources of the Republic of Turkey as follows:

YEKDEM: As in many European countries, YEKDEM is a support mechanism that has emerged to support renewable energy production in order to reduce fossil fuel energy production in the short term and to bring it to a point close to completion in the long term. The renewable energy generation

sources that are considered within the scope of YEKDEM in Turkey are HEPP (Hydroelectric), GPP (Geothermal), WPP (Wind), SPP (Solar) and BES (Biogas and Biomass).

Domestic Component: refers to the support given to the components and/or integrative parts that make up the components used in facilities that generate electricity from renewable energy sources by being manufactured domestically. The conditions for this support are regulated by the Regulation on Supporting Domestic Components Used in Facilities Generating Electrical Energy from Renewable Energy Sources.

Yeka Model: These are special areas allocated for renewable energy projects, the characteristics and critical elements of which are determined by law. It is the effective and efficient use of renewable energy resources by creating large-scale renewable energy resource areas (YEKA) on public and treasury immovables and privately owned immovables, and the rapid realization of investments by allocating these areas to investors (Senerji, 2025).

1.3.2. Green Transformation Support Program

A green transformation support program was established in 2023 to support resource-efficient and low-carbon investments that are compatible with the circular economy approach, conserve natural resources and contribute to climate and sustainability goals. This program covers capital companies resident in Turkey, production facilities and auxiliary units operating in the manufacturing industry, and priority investments. Accordingly, support is provided for land-land purchase, building-construction expenditures, machinery, equipment, technology, software and hardware purchases, measurement, survey, testing and consultancy services for one or more of the green transformation practices. In addition to tax reductions, interest or profit share support and insurance premium employer's share support are also provided.

1.3.3. Emission Trading System

The Emissions Trading System is a trading system where carbon emission rights given to businesses can be traded through the cap-and-trade system. In Emission Trading Systems, businesses can trade carbon with each other. Emission trading systems are operated on a market basis, not on a project basis. Emissions Trading System can be briefly defined as trading carbon emissions through barter. In

the emission trading system, the trade is made over carbon allowances. The purpose of emission trading systems is to reduce greenhouse gas emissions caused by energy-intensive enterprises. This system is used by governments and international organizations as part of their environmental policies. The ETS gives companies the right to emit a certain amount of carbon and aims to achieve environmental goals by making it possible to trade these rights.

As a result of the emission limitations imposed on countries by the Kyoto Protocol, countries have started to establish the Emissions Trading System. The purpose of the emission trading system is to ensure that countries do not exceed the limit set by the United Nations. If countries exceed the emission limit, the allowance to be transferred to the United Nations climate change fund will be provided from the emission trading system. Turkey's Emissions Trading System is among the Emissions Trading Systems in the establishment phase. The target date for the commissioning of emission trading in our country is 2025. "Draft Regulation on Turkish Carbon Markets" was published for the first time in relation to the Turkish Emissions Trading System.

2.1 EU Taxonomy for Sustainable Activities

Türkiye is in the process of developing a regulatory framework like the EU Taxonomy for sustainable activities. The Draft Regulation on Türkiye's Green Taxonomy[1], published in October 2024, aims to establish a comprehensive framework for identifying and promoting environmentally sustainable economic activities. This initiative seeks to align Türkiye's sustainability efforts with international standards, particularly the European Union's Green Taxonomy, and to support the country's transition to a low-carbon economy.

This draft regulation defines the Green Taxonomy as a classification system establishing principles and criteria for economic activities that contribute to climate finance mobilization and combat climate change, aligning with environmental goals. It identifies six environmental objectives:

1. Reduction of greenhouse gas emissions
2. Climate change adaptation
3. Sustainable use and protection of water and marine resources
4. Transition to a circular economy
5. Pollution prevention and control
6. Protection and restoration of biodiversity and ecosystems

For an economic activity to be considered sustainable under this taxonomy, it must make a substantial contribution to at least one of these objectives, do no significant harm to the others, adhere to minimum social safeguards, and meet specific technical screening criteria.

This initiative is part of Türkiye's broader efforts to align with international sustainability standards and promote green finance. The Green Taxonomy aims to provide a common language and clear criteria to identify environmentally sustainable investments, supporting economic activities aligned with sustainable development goals, promoting green finance, ensuring market transparency, and advancing harmonization with the EU Taxonomy.

As of March 2025, the Draft Regulation has been published for public consultation, and stakeholders are encouraged to provide feedback to refine and finalize the framework. Once implemented, this regulation will serve as a cornerstone in Türkiye's transition to a sustainable economy, guiding investments and economic activities towards environmental sustainability.

Scope and Objectives

[1] For further information on Draft Regulation on Türkiye's Green Taxonomy (in Turkish), please look at: https://tls.tc/U8JpZ

The Draft Regulation applies to entities required to conduct sustainability reporting under Türkiye's Sustainability Reporting Standards (TSRS). Its primary objectives include supporting economic activities aligned with sustainable development goals, promoting green finance, ensuring market transparency, and preventing greenwashing.

Criteria for Taxonomy Compliance

For an economic activity to be considered taxonomy-compliant, it must meet the following criteria:

1. **Substantial Contribution**: The activity must make a significant contribution to at least one of the six environmental objectives, mentioned above.
2. **Do No Significant Harm (DNSH)**: The activity must not significantly harm any of the other environmental objectives.
3. **Minimum Social Safeguards**: Compliance with social security measures and human rights principles, as outlined in international declarations and guidelines, is required.
4. **Technical Screening Criteria**: The activity must meet specific technical criteria established for each environmental objective.

Eligible Economic Activities

The Draft Regulation outlines various sectors considered eligible for taxonomy compliance, including:

- Forestry
- Environmental protection and restoration
- Manufacturing
- Energy
- Water supply, sewerage, waste management, and remediation
- Transportation
- Construction and real estate
- Information and communication
- Agriculture
- Tourism
- Arts, entertainment, and recreation
- Financial and insurance
- Human health and social work

These sectors are detailed in Appendix-1 of the Draft Regulation.

Reporting and Verification Requirements

Entities obligated under the TSRS must annually report their taxonomy-aligned economic activities. This involves:

- **Reporting**: Submitting verified information about compliant economic activities from the previous year to the Directorate of Climate Change's online taxonomy system, alongside their sustainability reports.
- **Verification**: Ensuring that reported information is validated and accurate through internal and external verification processes. [2]

Failure to fulfill these reporting obligations may result in administrative fines in accordance with Environmental Law No. 2872.

Implementation Timeline

The reporting obligation is set to commence on January 1, 2027. However, entities may opt for voluntary reporting until December 31, 2026.

By establishing clear criteria and reporting mechanisms, the Draft Regulation aims to facilitate the identification of environmentally sustainable investments, promote green finance, and enhance market transparency in Türkiye.

2.2 Sustainability Reporting

The evolution of sustainability reporting in the EU has progressed through several key legislative steps:

1. **2001 – EU Sustainability Strategy**: The EU introduced its first sustainability policy framework, encouraging corporate social responsibility (CSR) and voluntary sustainability reporting.
2. **2014 – Non-Financial Reporting Directive (NFRD) (Directive 2014/95/EU)**: Large companies (500+ employees) were required to disclose non-financial information on environmental, social, and governance (ESG) matters.
3. **2022 – Corporate Sustainability Reporting Directive (CSRD) (Directive (EU) 2022/2464)**: Expanded reporting requirements to 50,000+ companies, including SMEs and non-EU firms with significant EU operations. Introduced the European Sustainability Reporting Standards (ESRS) for standardized disclosures.
4. **2024 – Corporate Sustainability Due Diligence Directive (CSDDD) (Directive (EU) 2024/1760)**: Imposed mandatory due diligence obligations on large EU and non-EU companies regarding human rights and environmental impacts across value chains.

The Corporate Sustainability Due Diligence Directive (CSDDD), officially known as Directive (EU) 2024/1760, is the latest European Union (EU) regulation which aims to ensure that companies operating within the EU integrate human rights and environmental considerations into their operations and value chains. This directive amends Directive (EU) 2019/1937 and Regulation (EU) 2023/2859.

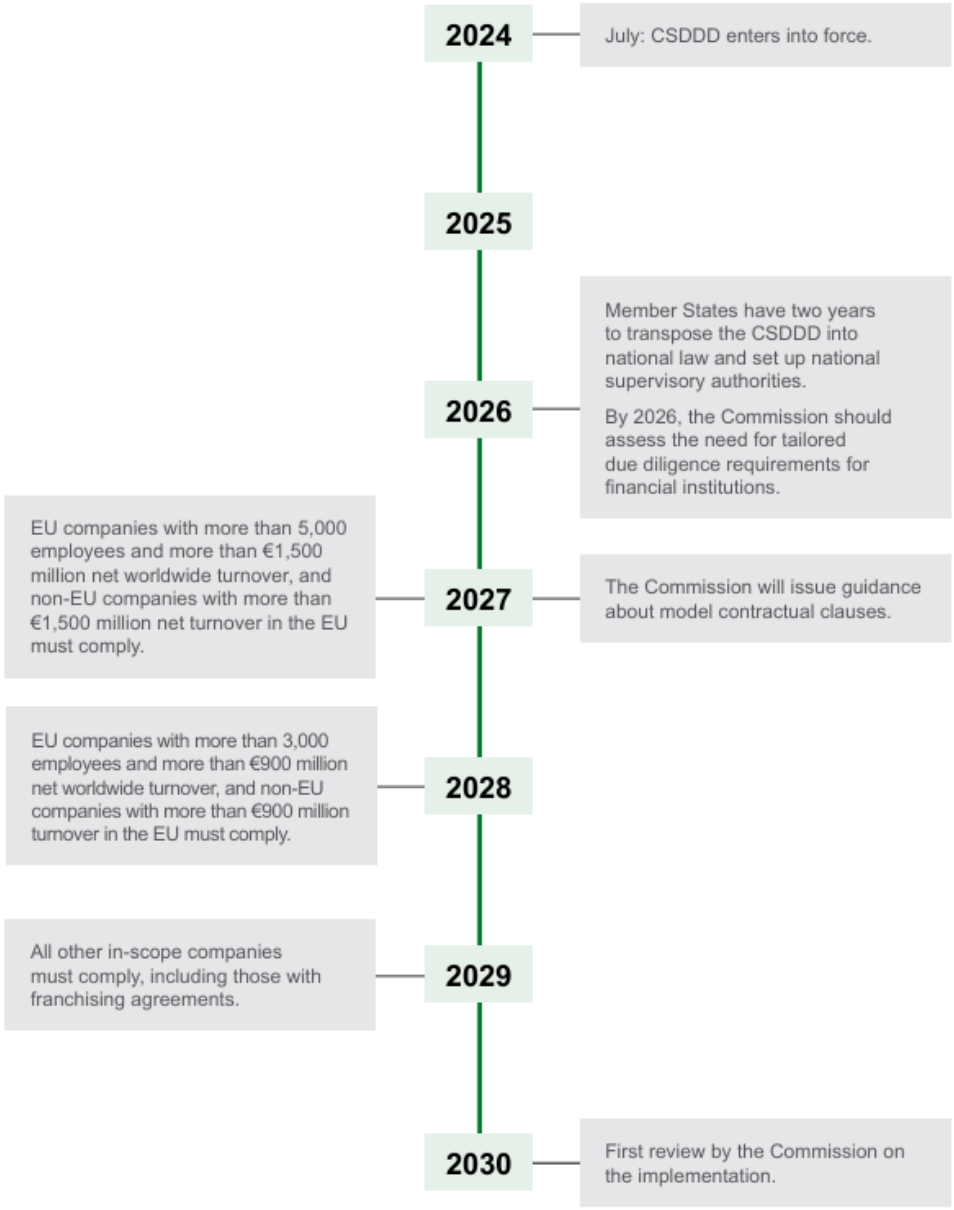
[2] "Preparation of Guidelines for Reporting and Identification of Users and Beneficiaries of Green Taxonomy in Türkiye, " Republic of Türkiye Ministry of Environment, Urbanization and Climate Change, Directorate of Climate Change, (Accessed from: iklim.gov.tr)

Table 1. The Scope of CSDDD

	Employee Threshold	Turnover Threshold
EU Companies	More than 1,000 employees average	More than €450 million turnover worldwide
Non-EU Companies	N/A	More than €450 million turnover in the EU
Franchised Companies (EU)	More than 1,000 employees average	More than €80 million net worldwide turnover, and generating royalties of more than €22.5 million
Corporate Due Diligence	N/A	More than €80 million net turnover in the EU, and generating royalties of more than €22.5 million in the EU

The EU's Corporate Sustainability Due Diligence Directive (CSDDD) introduces significant obligations for companies to ensure responsible business conduct and sustainability. This directive's extra-territorial scope means it also affects non-EU countries like Türkiye, particularly those with strong economic ties to the EU market. The CSDDD requires companies in Türkiye with substantial operations in the EU to identify, prevent, and mitigate adverse human rights and environmental impacts across their supply chains. Chart 1. below indicates the implementation timeline of CSDDD with the expanded scope of companies and sectors.

Chart 1. The Implementation Timeline of the CSDDD



Source: Latham & Watkins (LLP), "The EU's Corporate Sustainability Due Diligence Directive — Obligations for Companies" (2024) https://www.lw.com/admin/upload/SiteAttachments/The-EUs-Corporate-Sustainability-Due-Diligence-Directive-Obligations-for-Companies.pdf

Given the EU's influence on global sustainability reporting and due diligence obligations, some companies operating in Türkiye will be directly subject to CSRD, while others will be indirectly impacted due to their commercial relationships with EU businesses (e.g., as part of supply chains). Companies in Türkiye supplying EU-based firms may be required to provide sustainability data to facilitate compliance with CSRD reporting obligations.

To align with global sustainability reporting frameworks, Türkiye has taken significant steps toward developing its own national sustainability reporting standards. With the amendment to the sixth paragraph added to **Article 88 of the Turkish Commercial Code No. 6102** with the amendment made by the Official Gazette dated June 4, 2022 and numbered 31856, the Public Oversight Accounting and Auditing Standards Authority (KGK) was granted the authority to establish and publish Türkiye's Sustainability Reporting Standards (TSRS). The latest updates and detailed information regarding these standards are accessible via KGK's official website.[3]

In this context, the KGK has translated and adopted the International Sustainability Standards Board's (ISSB) IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures) into Turkish. Furthermore, Türkiye has incorporated International Auditing and Assurance Standards Board (IAASB) guidance on sustainability-related assurance engagements, including ISAE 3410 (Assurance on Greenhouse Gas Statements) into its regulatory framework.

Following the formal licensing agreement signed between KGK and ISSB in June 2023, Türkiye finalized the adoption of these sustainability disclosure standards through **the Official Gazette Decision No. 32414**, **dated December 29, 2023**, which outlines the scope of Türkiye's Sustainability Reporting Standards (TSRS) implementation.

"Sustainability Reporting" has been made mandatory as of 01/01/2024 for companies that exceed the threshold values of at least two of the following criteria in two consecutive reporting periods.
Threshold values determined within the scope of TSRS:

- Number of employees 250 people
- Total assets: 500 Million Turkish Lira
- Annual net sales revenue: 1 Billion Turkish Lira

Although not mandatory, out-of-scope entities may also voluntarily report in accordance with the TSRS, and in-scope entities are obliged to report their sustainability performance in more detail and

[3] https://www.kgk.gov.tr/Home

to present information in accordance with TSRS standards. This regulation aims to encourage more transparent and comprehensive reporting on sustainability by institutions that have a significant impact in terms of financial size, income level and number of employees.

In addition, with **the Decree published in the Official Gazette dated September 5, 2024 and numbered 32653**, assurance audits on sustainability reporting became mandatory and it was decided that assurance audits will start with limited assurance in order to increase the reliability and international validity of sustainability reports. Currently, sustainability assurance audits are conducted **under GDS 3000** (Assurance Engagements Other than Independent Audits or Review Engagements of Historical Financial Information) and **GDS 3410** (Assurance Engagements on Greenhouse Gas (GHG) Disclosures), which serve as interim standards until the publication of **SGDS 5000**, Türkiye's official sustainability assurance standard.

Current Assurance Standards

1. GDS 3000 – Assurance Engagements Other than Independent Audits or Review Engagements of Historical Financial Information

- This standard provides a framework for assurance engagements beyond traditional financial audits.
- It applies to sustainability reports, ESG disclosures, and other non-financial corporate reporting.
- It ensures the credibility and reliability of sustainability data presented by companies.

2. GDS 3410 – Assurance Engagements on Greenhouse Gas (GHG) Disclosures

- This standard specifically addresses the verification and assurance of corporate GHG emissions reports.
- It ensures compliance with national and international GHG accounting frameworks.
- It enhances transparency and accountability in reporting climate-related impacts.

Türkiye is in the process of developing **SGDS 5000**, an official national standard for sustainability assurance audits. Once enacted, it will provide a unified and comprehensive framework tailored to Türkiye's regulatory environment, ensuring consistency in sustainability assurance practices across industries. Until **SGDS 5000** is officially implemented, corporate sustainability assurance in Türkiye will continue to follow **GDS 3000** and **GDS 3410** standards. This evolving framework reflects Türkiye's commitment to enhancing corporate transparency, environmental accountability, and compliance with global sustainability assurance practices.

2.3 Guidelines in Sustainable Finance

Key guidelines and regulations in sustainable finance in Türkiye are:

1. Sustainability Principles of the Banking Sector (2021) – BRSA

Issued by the **Banking Regulation and Supervision Agency (BRSA)**, these principles set out the sustainability framework for banks operating in Türkiye.

- Encourages banks to integrate ESG risks into their risk management strategies.
- Requires financial institutions to develop sustainable lending policies.
- Supports the financing of green and sustainable projects.

2. Green Bond and Sustainable Debt Instrument Guidelines (2022) – CMB

Published by the **Capital Markets Board (CMB)**, this guideline regulates the issuance of **green, social, and sustainability-linked bonds** in Türkiye.

- Defines eligibility criteria for sustainable debt instruments.
- Establishes transparency and reporting requirements for issuers.
- Aligns with the **International Capital Market Association (ICMA) Green Bond Principles**.

3. Türkiye's Sustainable Banking Strategy (2021) – TBB

The **Banks Association of Türkiye (TBB)** issued this roadmap to encourage sustainable banking practices.

- Recommends integrating climate risks into financial decision-making.
- Promotes financing mechanisms for renewable energy and low-carbon projects.
- Supports ESG reporting and risk management among financial institutions.

4. Environmental and Social Risk Management (ESRM) Framework for Banks

- Encourages banks to conduct environmental and social risk assessments in their lending decisions.
- Introduced by **BRSA** and **TBB** to align with **IFC Performance Standards**.

5. Türkiye Green Taxonomy (Draft – Expected in 2024-2025)

- Modeled after the **EU Taxonomy**, this framework will define green and sustainable economic activities.
- Aims to prevent greenwashing and standardize sustainable investments.

6. Green Economy Action Plan (2021)

- Developed by the **Ministry of Treasury and Finance**, this plan aims to strengthen sustainable finance policies.
- Encourages **green public-private partnerships (PPPs)** and sustainability-linked lending.

GREEN ENVIRONMENT AND AGRIFOOD

3.1 Water Management

Water management in Türkiye is governed by a complex legal framework, with various national ministries and executive bodies overseeing its implementation. While some legislation dates back to the early years of the Republic, growing water demand and diminishing supply have necessitated new regulations and reforms. A **Draft Water Law** is currently pending approval, aiming to provide a more comprehensive and modern approach to water governance, addressing sustainability and efficiency challenges.

Key Water Regulations are;

Law on Groundwater (Law No. 167) – Regulates the extraction and conservation of groundwater resources.

Regulation on the Protection of Wetlands – Establishes sustainable water use principles, particularly in agriculture.

Regulation on Water Pollution Control (2004) – Defines measures to prevent agricultural water pollution.

Regulation on Irrigation Unions (2017) – Governs the management of irrigation systems to ensure efficient water use.

National Water Strategy and Policy Developments

During the 3rd National Water Council Meeting, Ministry of Agriculture And Forestry highlighted the increasing threat of climate change on water resources, emphasizing that access to clean water has become a national security issue. Türkiye is implementing critical initiatives to enhance water efficiency across multiple sectors, including agriculture, industry, energy, and tourism.

Key strategic actions include:

Water-centered agricultural production planning

Expansion of modern irrigation systems

AI-supported irrigation automation

Drought forecasting and early warning systems

Flood hazard and risk mapping

Flood forecasting and early warning systems

3.2 Agriculture and Biodiversity

Türkiye is implementing a range of legal and policy measures to harmonize agriculture with green sustainability principles, focusing on biodiversity protection, mitigating the negative impacts of intensive agriculture, and adapting to climate change. The **National Agricultural Strategy Plan** and **Türkiye's National Biodiversity Strategy and Action Plan (NBSAP)** outline the country's vision for

sustainable agriculture, biodiversity conservation, and rural development. These strategic plans align with global sustainability goals and aim to ensure food security while preserving the country's rich natural resources.

In line with international commitments such as the Paris Agreement and the European Green Deal, Türkiye is working towards transitioning to a smart, sustainable, competitive, and resilient agricultural sector. The **Strategic Plan of Türkiye's Agriculture and Rural Development 2021-2025** supports climate action, protection of natural resources, and biodiversity enhancement while strengthening the socio-economic fabric of rural communities.

Key Regulations and Laws

- **Agriculture Law (Law No. 5488)**: Defines sustainable agricultural production, rural development, and food security policies.
- **Organic Agriculture Law (Law No. 5262)**: Regulates organic farming standards, production, certification, and incentives for organic agriculture.
- **Environmental Law (Law No. 2872)**: Provides a legal framework for biodiversity conservation, pollution control, and environmental impact assessment.
- **Law on Soil Conservation and Land Use (Law No. 5403)**: Ensures sustainable land use and soil protection to prevent erosion and degradation.
- **Seed Law (Law No. 5553)**: Regulates the production, certification, and trade of seeds, including conservation of genetic diversity.
- **Pasture Law (Law No. 4342)**: Governs the management and use of pastures for sustainable livestock grazing.
- **Law on Veterinary Services, Plant Health, Food and Feed (Law No. 5996)**: Establishes hygiene, food safety, and environmental standards in agricultural production.
- **Fisheries Law (Law No. 1380)**: Regulates sustainable fisheries management and marine biodiversity protection.
- **Water Law** (Draft under discussion): Aims to provide an integrated approach to water resource management, including irrigation and agricultural water use.

Biodiversity Protection and Conservation

Biodiversity protection is anchored in the **Environmental Law (Law No. 2872)** and the **Biodiversity Strategy and Action Plan**, which provide a legal framework for conserving natural ecosystems, protecting endangered species, and ensuring sustainable resource management. Türkiye is also part of the **Convention on Biological Diversity (CBD)** and has integrated biodiversity conservation into its agricultural policies.

Additional regulations include:

- **Regulation on the Protection of Wetlands (Official Gazette No. 25818, 2005)**: Protects wetlands as critical habitats for biodiversity.
- **Regulation on the Identification, Registration, and Monitoring of Genetically Modified Organisms and Their Products (Official Gazette No. 27533, 2010)**: Controls the use of GMOs in agriculture.
- **National Forestry Program (2020-2034)**: Supports reforestation, sustainable forest management, and biodiversity conservation.
- **Regulation on Nature Protection Areas (Official Gazette No. 30281, 2017)**: Establishes protected areas and defines management rules for biodiversity conservation.

Climate Change and Sustainable Agriculture

To further enhance environmental resilience, Türkiye is implementing the **National Climate Change Strategy and Action Plan**, which includes cross-sectoral measures such as reforestation, sustainable land use practices, and support for climate-smart agriculture. The strategy also emphasizes genetic diversity conservation through the **National Plant Gene Bank** and related programs aimed at preserving indigenous plant varieties.

Key regulations supporting climate adaptation include:

- **Regulation on Good Agricultural Practices (Official Gazette No. 27778, 2010)**: Encourages sustainable farming techniques that reduce environmental impact.
- **Climate Change Action Plan (2011-2023)**: Provides sector-specific measures to adapt agriculture to climate change.
- **National Adaptation Strategy and Action Plan (2011)**: Focuses on water resources, soil conservation, and biodiversity protection.

Sustainable Rural Development

Türkiye's efforts to enhance rural sustainability are guided by the **Rural Development Strategy (2021-2027)** and supported by funding mechanisms such as:

- **IPARD (Instrument for Pre-Accession Assistance for Rural Development)**: Provides financial support for sustainable agriculture projects.
- **Regulation on Rural Development Supports (Official Gazette No. 32061, 2023)**: Defines incentives for organic farming, irrigation efficiency, and eco-friendly agricultural practices.

Overall, Türkiye's legal and policy framework for agriculture and biodiversity aligns with international and regional sustainability standards. The country continues to strengthen its integrated management approach to effectively protect its rich biological diversity and ensure long-term ecological resilience for future generations.

SUSTAINABLE URBAN DEVELOPMENT AND SMART CITIES

4.1. Regulatory Framework for Smart Cities

For the European Union (EU), the development of smart cities, their sustainability, digital updates and the integration of citizens into smart cities are important. Although Turkey is not an EU member country, it is a European country that has applied for full membership to the EU and has fulfilled many EU acquis for the completion of its membership. In this context, Turkey has initiated a digital transformation for its cities, with a particular focus on smart cities and sustainability.

In Turkey, the policies of the central government and local governments have gained importance for the realization of the smart city vision, and legal grounds have been created for the implementation of these policies. For example, the Ministry of Environment, Urbanization and Climate Change (formerly the Ministry of Environment and Urbanization) established the Department of Smart Cities and Geographical Technologies within the General Directorate of Geographical Information Systems, giving smart cities an institutional structure and policy ownership in Turkey (T.C. Ministry of Environment and Urbanization, n.d.). Considering that smart cities and sustainability are mutually supportive practices in terms of their goals, the Sustainability Standards Department was established in Turkey. The mission of the Department is to increase confidence, comparability and transparency in sustainability reporting by developing and promoting internationally recognized reporting and assurance standards. The Department is legally based on the Decree Law on the Organization and Duties of the Public Oversight, Accounting and Auditing Standards Authority and the amendment to the Turkish Commercial Code (Public Oversight Authority, n.d.).

4.1.1. Constitution of the Republic of Turkey 1982

Article 56 under the title of Social and Economic Rights and Duties in Chapter 3 of the Constitution of the Republic of Turkey, directly commands health services and environmental protection. In this context, Article 56 states that everyone has the right to live in a healthy and balanced environment and that it is the duty of the state and citizens to improve the environment, protect environmental health and prevent environmental pollution (Turkish Constitution, 1982).

4.1.2. Energy Efficiency Law No. 5627

One of the objectives of the Law is the protection of the environment. In this context, Article 1 of the Law states that “the purpose of this law is to increase efficiency in the use of energy resources and energy in order to use energy effectively, prevent waste, alleviate the burden of energy costs on the economy and protect the environment”. Smart cities come to the forefront especially in terms of

energy saving (Official Gazette, 2007/ Number: 26510). The implementation of this law is seen with the Smart Street Lighting Application in Smart Cities. Thanks to this application, it is aimed to make lighting covering large areas such as ring roads, avenues, boulevards, streets, parks, open or closed parking lots, campuses and shopping malls more efficient and economical by controlling them with a central system (Republic Of Turkey Ministry of Environment, Urbanization and Climate Change, 2024).

Within the scope of energy efficiency, Turkey has adopted the "Energy Efficiency 2030 Strategy and II. National Energy Efficiency Action Plan (2024-2030)" (Republic of Turkey Ministry of Energy and Natural Resources, 2024). It takes its legal basis from the Energy Efficiency Law No. 5627 (Republic of Turkey Ministry of Energy and Natural Resources, 2024:11). During the implementation period of the I. National Energy Efficiency Action Plan covering the period between 2017-2023, it was stated that the energy savings achieved in the transportation sector was provided to local governments within the scope of the construction of bicycle paths, green walking paths, environmentally friendly streets and noise barriers, and it was also stated that the number of smart stops in 30 metropolitan municipalities exceeded 11 thousand and the length of existing bicycle paths exceeded 2 thousand km (Republic of Turkey Ministry of Energy and Natural Resources, 2024: 35). Plan II, on the other hand, focused on energy efficiency, especially in the transportation sector, within the scope of the smart city.

4.1.3. Sustainability and Smart City in the Development Plans of the Republic of Turkey

The Tenth Development Plan covering the years 2014-2018 directly emphasized the smart city concept. Article 656 of the Plan states that "urbanization and urban transformation will be handled in an integrated manner with the manufacturing industry. In this framework, production and export capacity will be increased in areas such as smart buildings, building materials, public transportation vehicles and signaling systems", emphasizing the procurement of the necessary equipment for the creation of smart cities (Republic of Turkey Ministry of Development, 2013: 90). Article 731 under the heading of Information and Communication Technologies states that "the use of smart applications, especially in areas such as health, transportation, building, energy, disaster and water management, will be expanded. Cities will be supported to transform into smart cities by increasing their infrastructure, capacity and skill levels in the field of information and communication technologies" (Republic of Turkey Ministry of Development, 2013: 97). Article 841 under the heading of Logistics and Transportation deals with the traffic problem. The relevant article refers to the smart transportation component of the smart city in traffic control by stating that "The use of Traffic Electronic Control Systems will be expanded in an integrated manner with Intelligent Transportation Systems in line with the target of reducing the deaths due to traffic accidents by 50% in the Road Traffic Safety Strategy and Action Plan" (Republic of Turkey Ministry of Development, 2013: 111). For

example, according to the situation analysis of this implementation, in many cities, especially metropolitan cities, infrastructure investments such as underpasses, overpasses, tunnels and bridges that increase highway vehicle mobilization and smart transportation and traffic management models such as Traffic Electronic Supervision System (TEDES) have increased average vehicle speeds on main arteries (Republic of Turkey Ministry of Development, 2013: 130). Likewise, Article 987 determines the policy of the smart city in the transportation dimension with the statement "information technologies and intelligent transportation systems will be effectively utilized in traffic management and public transportation services in urban transportation" (Republic of Turkey Ministry of Development, 2013: 131). It emphasized that smart bicycle networks should be established to increase energy efficiency in transportation and smart building technologies should be used to encourage domestic and innovative production in urban transformation (Republic of Turkey Ministry of Development, 2013: 177-197).

The Eleventh Development Plan, which covers the years 2019-2023, includes policies based on legal foundations for the smart city. Article 99 directly states that the National Smart City Strategy and Action Plan prepared in Turkey is a roadmap for local governments to become smart cities (Presidency of the Republic of Turkey Strategy and Budget Directorate, 2019:13). Although not under the heading of city, Article 384 states that importance will be given to the development of critical technologies such as smart mobility, which can be considered as one of the smart city components that help regulate mobility in the city, albeit indirectly (Presidency of the Republic of Turkey, Presidency of Strategy and Budget Directorate, 2019: 85). Regarding energy, Article 493.1 states that smart grid applications will be increased and 493.3 states that the use of technological systems such as smart meters and remote reading will be expanded and inspections will be increased (Presidency of the Republic of Turkey, Presidency of the Republic of Turkey, Strategy and Budget Directorate, 2019: 113). Article 511.5 under the heading of logistics and transportation states that "the architecture related to Intelligent Transportation Systems (ITS), which ensure energy and time savings, traffic safety, and efficient use of road capacity on the road network, will be completed and put into practice in a way to include local governments" and refers to cooperation with local governments within the scope of the smart transportation component of the smart city (Presidency of the Republic of Turkey, Presidency of Strategy and Budget Directorate, 2019: 118). Under the Urbanization heading of the Plan, smart cities and local governments are emphasized more frequently. In this context, Article 683 states that "local governments will be encouraged to prepare smart city strategies and road maps to be followed, smart city projects will be selected and implemented by taking into account the areas and capabilities prioritized at the national level, and the development of domestic production for smart city applications will be supported". Article 683.1 emphasizes that the National Smart City Strategy and Action Plan will guide local governments in the creation of a smart city (Presidency of the Republic of Turkey Strategy and Budget Directorate, 2019: 160). 683.2 assessment and resource allocation constraints; 683.3. states that the use of domestic technology in smart city applications will

be supported; and Article 683.4. emphasizes governance by stating that the smart city ecosystem will be analyzed and the stakeholders of the sector such as entrepreneurs, system developers and technology providers will be brought together on the digital platform to be created (Presidency of the Republic of Turkey, Presidency of Strategy and Budget, 2019: 160).

The vision, main objectives and principles of the current Twelfth Development Plan covering the years 2024-2028 include creating disaster-resilient living spaces and civilization-based smart, sustainable cities (Presidency of the Republic of Turkey Strategy and Budget Directorate, 2023: 51). The objective under the heading of urbanization is described as "to create smart, safe, sustainable cities and settlements that are resilient to climate change and disasters, have qualified residential areas in harmony with their historical and cultural background, provide accessible urban services for all, have a high quality of life, and are based on green and digital technologies" (Presidency of the Republic of Turkey Strategy and Budget Directorate, 2023: 206). It is also stated under the heading that the use of smart cities will be expanded according to the unique character of each city, local governments will shape smart city applications according to local needs, the capacities of local governments to implement smart city applications will be increased, intelligent transportation systems (ITS) will be developed and ITS-compatible applications will continue to be installed with dynamic passenger, driver and pedestrian information systems and participatory national intelligent transportation system (Presidency of the Republic of Turkey, Strategy and Budget Directorate, 2023: 215).

4.2. Action Plans Implemented within the Scope of Smart Cities

The Smart City Project Fiche and Feasibility Study Guide (Republic of Turkey Ministry of Environment, Urbanization and Climate Change General Directorate of GIS, 2020) contains information on how to prepare smart city project applications. In the guide, it is emphasized that sustainability is important in making the application, and it is pointed out that the technologies used in smart cities should be sustainable in the environmental impact analysis (Republic of Turkey Ministry of Environment, Urbanization and Climate Change General Directorate of GIS, 2020:42). In addition, it was mentioned that applications that help keep the environment clean such as energy, conservation applications, garbage and irrigation automation should be integrated with the smart city within the framework of sustainability (Republic of Turkey Ministry of Environment, Urbanization and Climate Change General Directorate of GIS, 2020:42).

In the Integrated Urban Development Strategy and Action Plan, 2010-2023, it is stated that the need to increase innovation capacity in cities in line with sustainable urbanization, giving importance to inventiveness by taking advantage of technological developments and contributing to local development are among urbanization policies. In order to increase innovative urban capacity based on sustainable urbanization, it is emphasized that urban organizations and institutional structure

should be established for learning information and producing information and technology at all levels (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2010: 10). The Plan includes a series of actions for the creation of smart cities. For example, Action 5.5.2. aims to increase the service quality and technological level of public transportation systems and identifies municipalities as responsible institutions (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2010: 26). Action 5.5.3. emphasizes the adoption of environmentally friendly technologies in the selection of fuel and vehicle types used in public transport systems and again points to municipalities as the responsible institution (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2010: 27). Action 5.5.4. states that arrangements will be made for the effective use of information technologies in urban transportation and again identifies municipalities as the responsible institution for the realization of the action (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2010: 27).

National Intelligent Transportation Systems (ITS) Strategy Document and Action Plan 2020-2023, The Plan, organized under the auspices of the Ministry of Transport and Infrastructure of the Republic of Turkey, defines the vision of Turkey's intelligent transportation systems as creating a "human and environment-oriented transportation system in Turkey with advanced information technologies" (Ministry of Transport and Infrastructure of the Republic of Turkey, 2020: 12). The mission of the Plan is defined as "to create an efficient, safe, effective, innovative, dynamic, environmentally friendly, value-added and sustainable smart transportation network in Turkey that is integrated to all modes of transportation, uses up-to-date technologies, utilizes domestic and national resources" (Republic of Turkey Ministry of Transport and Infrastructure, 2020: 12). Within the framework of the stated vision and mission, the Plan sets five strategic objectives: developing ITS infrastructure, ensuring sustainable smart mobility, ensuring road and driving safety, creating a livable environment and conscious society, and ensuring data sharing and security (Republic of Turkey Ministry of Transport and Infrastructure, 2020: 12).

Integrated Traffic Management Application; The Ministry of Environment, Urbanization and Climate Change of the Republic of Turkey has prepared a guideline as a roadmap for organizations that want to implement Integrated Traffic Management Application, one of the smart city applications (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2024a). The application is defined as a smart traffic system that quickly collects and analyzes data from different traffic systems, identifies potential traffic congestion and takes measures to reduce congestion (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2024a).

2020-2023 National Smart Cities Strategy and Action Plan; The vision of the 2020-2023 National Smart Cities Strategy and Action Plan of the Republic of Turkey Ministry of Environment, Urbanization and Climate Change is "Livable and Sustainable Cities that Add Value to Life". The Action Plan aims to

produce solutions by anticipating the problems and needs in cities as a result of Smart City policies, to provide urbanization services in a better quality and faster manner and thus to increase satisfaction with their services and to increase the quality of life as the ultimate goal (T.R. Ministry of Environment, Urbanization and Climate Change, 2019: 39).

The Action Plan includes actions that combine sustainable urban development and smart city. Within the scope of the action plan, which defines the preparation and implementation of smart city maturity development programs and guidance mechanism, it is aimed to establish the Sustainable Smart Cities Guidance Program (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2019: 103). Action 15.2. is organized as “Maturity of Smart Environment Component will be Increased”. It is defined as “In order to increase the maturity of the Smart Environment component, which is determined by Smart City Maturity Assessment practices in order to ensure the Smart City transformation of cities by utilizing the Smart City Technology Portfolio and the National Smart City Solution Portfolio; environmental management will be carried out by taking into account waste, air, water, land, effective fight against climate change and management of protected assets, ensuring the sustainability of the environment and nature and green city planning” (Republic of Turkey Ministry of Environment, Urbanization and Climate Change, 2019: 298).

COLLABORATION OF UNIVERSITIES WITH LOCAL ACTORS

5.1. Municipality Law (Cooperation with the municipality regarding NGOs)

Municipal laws also refer to the smart city and provide a legal basis for municipalities to create smart cities by prioritizing sustainability.

5.1.1. Metropolitan Municipality Law No. 5216

The third chapter of the Law on Metropolitan Municipality, where the duties, powers and responsibilities of the municipality are determined, is important in terms of smart city. In this context, subparagraph (h) of Article 7 obliges metropolitan municipalities to establish geographical and urban information systems (Official Gazette, 2004/ Number: 25531). Subparagraph (aa) of Article 7 assigns duties related to the planning, design, construction and maintenance of bicycle paths and lanes, bicycle and electric scooter parking and charging stations, pedestrian paths and noise barriers, including sustainability and smart city components (Official Gazette, 2004 / Issue: 25531).

5.1.2. Municipality Law No. 5393

Several provisions in the sixth part of the Municipal Law have been amended with additions appropriate to the present day. Article 73 covers urban transformation and development. In this context, it states that the municipality can implement urban transformation policies to create technology parks with the decision of the municipal council (Official Gazette, 2005 / Issue: 25874). Civil society organizations are also counted among the stakeholders of smart city implementation projects carried out by some municipalities. Some of the projects are;

- Antalya- Matchup Project (URL 1).
- Edirne Municipality - Sustainable Energy Action Plan, Climate Change Adaptation Plan and Greenhouse Gas Inventory Studies (URL 2).
- Gaziantep - E-Climate Game Project (URL 3).
- Kütahya- Hope for Stray Paws Project. (URL 4).
- Izmir- Duraktayım-" A Digital Solution for Accessible Transportation in Izmir Municipal Buses. (URL 5).

5.2. Legislation on NGOs

Civil society organizations working on smart city and sustainability themes in Turkey are as follows.

- AUS Turkey - AUSDER (Intelligent Transportation Systems Association of Turkey) carries out activities on technological solutions and smart systems in transportation. It aims to realize sustainable transportation by using information and communication technologies (AUS Turkey, n.d.).
- Informatics Foundation of Turkey (TBV); works on digital transformation and smart city technologies (TBV, n.d.).
- Fark Labs is an organization that aims to raise awareness on urban mobility in Turkey through the EIT Urban Mobility RIS Hub Turkey movement and includes smart city and infrastructure in its mobility verticals (Fark Labs, n.d.).
- The Urban Transformation and Urbanism Foundation (KENTSEV) is a foundation working on sustainable and smart city issues. In this context, it organized webinars on “financing urban transformation and smart cities”, “transportation and geographical information systems applications in smart cities”, “smart contracts and blockchain system applications in smart cities” and “the importance of determining strategies and road maps in smart cities” (KENTSEV, n.d.).

5.3. Higher Education Law

Subparagraph (c) of Article 4 of the Law No. 2547 on Higher Education states that “higher education institutions have the duty to conduct scientific studies and research at a high level, to produce knowledge and technology, to publish scientific data, to support development and improvement in the national field, to cooperate with domestic and foreign institutions...” (Official Gazette, 1981/ Number: 17506).

In the Law, subparagraph (e) of Article 12, which specifies the duties of higher education institutions, is stated as “to conduct teaching and research on problems concerning the scientific, cultural, social and economic progress and development of the country, in cooperation with other institutions, by making recommendations to public institutions, to present the results for the benefit of the society, and to report their opinions and suggestions by concluding the examinations and researches to be requested by public institutions” (Official Gazette, 1981/ Number: 17506). With this article, a legal basis has been established for cooperation on the specified issues.

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