REPUBLIC OF TÜRKİYE
MINISTRY OF ENVIRONMENT,
URBANIZATION AND CLIMATE CHANGE

7TH STATE OF ENVIRONMENT REPORT FOR REPUBLIC OF TÜRKİYE

GENERAL DIRECTORATE OF ENVIRONMENTAL IMPACT ASSESSMENT, PERMIT AND INSPECTION
ANKARA - 2025

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"PREVENTIVE MEASURES SHOULD BE TAKEN BEFORE THE HAPPENING OF DISASTERS, OTHERWISE IT'S USELESS TO LAMENT AFTER DISASTERS OCCURED"

Mustafa Kemal ATATÜRK

Environmental problems such as global warming, drought, lack of water, desertification, decrease of biological diversity and extinction of some species wait for a solution as the common issue of the whole world in the age we live in.

On the other hand, rapid increase in population, cities, industrial facilities and the diversification of consumption habits with economic activities cause the aforementioned issues to grow even more.

Under this situation threatening the future of humanity, strengthening international cooperation has become a must.

Türkiye, undertaking crucial roles in international studies for environmental problems, is always appreciated and shown as an example with the environmentalist policies it carries out in many fields such as economy, urbanization, energy.

We see the whole of nature, especially the environment in which we live, as a trust that must be handed over to future generations in a safe and sound manner, and we have been providing services with this awareness for 22 years.

In July 2021, we drew the framework of our fight against climate change and our policies to support green transformation with the "Green Consensus Action Plan" we published. Within this framework, we continue our efforts to improve institutional capacity and standards without slowing down.

On the other hand, we are decisively implementing our sustainable development policies in line with the "Net Zero Emission by 2053" target set by the United Nations with the Paris Agreement.

Türkiye, which aims to reduce its greenhouse gas emissions by 41% by 2030, will fulfil its leading role in this process.

Türkiye, which has undertaken important responsibilities so far with the aim of protecting biological diversity, managing natural resources with the awareness of sustainable development, spreading environmentally friendly Urbanization and ending the existing environmental pollution, will continue to follow the efforts carried out to bequeath a more liveable environment to future generations.

I sincerely believe that this report, prepared every four years by the Ministry of Environment, Urbanization and Climate Change, will serve to better understand Türkiye's environmental efforts.

I would like to take this opportunity to congratulate those who have contributed to the preparation of the State of Environment Report of Türkiye and wish that the report will bring good to Türkiye and humanity.

Recep Tayyip ERDOĞAN
President of Türkiye

Türkiye is a rich country with its geographical location, historical and cultural heritage. However, the pressure on the country's natural resources and ecosystems is increasing day by day. Increasing urbanization, industrialisation and agricultural activities in recent years have put significant pressure on Türkiye's natural resources and ecosystems.

Environmental problems such as air pollution, water pollution, soil pollution are among the biggest threats facing Türkiye and the whole world. In addition, global environmental problems such as loss of biodiversity and climate change significantly affect Türkiye as well as the whole world.

In particular, the global Covid-19 Pandemic has caused us to question the fragility of humanity and the balance of its relationship with nature. In this challenging period, we have clearly seen how important the damage to nature and the principles of sustainability are.

Türkiye is aware of these environmental problems and is taking important steps in this regard. We do not see our nature and environment as an object of consumption, but as a unique trust in which all kinds of blessings are presented in abundance. In this respect, knowing the importance of environmental awareness and sustainability principles and being aware of its responsibility in this field, we produce policies in an effort to build a healthier world for future generations.

In addition, the way to combat environmental problems effectively and efficiently is to continuously review the current situation, develop and implement solution-oriented and strong policies.

This report aims to comprehensively analyse Türkiye's overall environmental situation and identify the necessary steps to transition to a sustainable future. The report covers environmental pressures, their consequences and the steps Türkiye is taking to protect the environment.

I hope that the "The State of Environment Report of Türkiye" will be an important resource for those who contribute to efforts to protect the environment.

I would like to thank all participants who contributed to the preparation of the report.

Murat KURUM
Minister of Environment,
Urbanization and Climate Change

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ABBREVIATIONS

LULUCF	Land Use, Land Use Change and Forestry
BEPA	Biomass Energy Potential Atlas
BEKRA	Reducing the Risks of Major Industrial Accidents
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
BOTAŞ	Pipeline Petroleum Transport Corporation
GIS	Geographic Information Systems
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLRTAP	Convention on Long-Range Transboundary Air Pollution
EIA	Environmental Impact Assessment
ÇEMGM	General Directorate for Combating Desertification and Erosion
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MSFD	EU Marine Strategy Framework Directive
SHW	State Hydraulic Work
GDEA	General Directorate of Energy Affairs
MENR	Ministry of Energy and Natural Resources
FEE	International Foundation for Environmental Education
SPP	Solar Energy Based Electricity Generation Plant
IMO	International Marine Organization
IUCN	International Union for Conservation of Nature
PRTR	Pollutant Release and Transport Register
TSMS	Turkish State Meteorological Service
MAPEG	General Directorate of Mining and Petroleum Affairs
MTA	General Directorate of Mineral Research and Exploration
MTEP	Million Tonnes of Oil Equivalent
NİBİS	Nitrate Information System
OECD	Organisation for Economic Co-operation and Development
REACH	The Registration, Evaluation, Authorisation and Restriction of Chemicals
REPA	Wind Energy Potential Atlas
WPP	Wind Energy Based Electricity Generation Plant

CWMS	Continuous Wastewater Monitoring Systems
CEMS	Continuous Emission Measurement Systems
TAGEM	General Directorate of Agricultural Research and Policies
MoAF	Ministry of Agriculture and Forestry
TÜBİTAK	Scientific and Technical Research Council of Türkiye
TÜÇA	Turkish Environment Agency
TURKSTAT	Turkish Statistical Institute
NEEAP	National Energy Efficiency Action Plan
YEKA	Support Mechanism for Renewable Energy Sources
YİDEP	Local Climate Change Action Plan

EXECUTIVE SUMMARY

State of Environment Report for Republic of Türkiye is prepared by the Ministry of Environment, Urbanization and Climate Change (MoEUCC) every 4 years in order to guide decision-makers, to provide an overview of the period to which it belongs, to reveal the current state of the environment and to compare the previous and subsequent periods.

The report covers the years 2020-2023, but also includes data and information for 2019 and 2024 for some sectors.

In the report, after an overview of Türkiye, the following topics are covered: Air, Climate Change, Water Use and Wastewater Management, Waste, Chemicals Management, Nature Conservation and Biodiversity, Land Use, Institutional Structure and Activities of the Ministry of Environment, Urbanization and Climate Change, and finally Environmental Expenditures and Financial Liability Insurance.

TÜRKİYE OVERVIEW section, a summary of the general situation of Türkiye is given, and information and data on Natural Resources, Energy, Transport, Tourism, Agriculture, and Industry are included.

In terms of **Natural Resources**;

- While the ratio of SPPs in total installed capacity was **6.57%** as of the end of 2019, it reached **9.1%** as of the end of 2022.
- According to the Wind Energy Potential Atlas of Türkiye (REPA), the wind energy potential of Türkiye is determined as 48,000 MW, while it is predicted that it can reach up to 150,000 MW levels thanks to the developments in wind turbine technologies.
- Türkiye's forest areas were 22.7 million hectares (29.2%) in 2019 and 23.4 million hectares (30%) in 2023.
- As of 2023, 13,147,701 determinations were made within the scope of the Pasture Law, and a total of 2,957 Meadow Pasture Improvement and Management Projects were carried out on an area of 22,011,202 decares.

In the **Energy** sector, the installed capacity of Türkiye's electrical energy was 91,267 MW by the end of 2019 and reached 103,809 MW by the end of 2022. The share of renewable energy in this installed capacity increased from 49.05% to 54.3%. The primary energy supply of Türkiye was 157.8 million Total Equivalent Petroleum (TEP) in 2022. The share of natural gas in primary energy supply is 27.4%, coal 26.2%, oil 28.6% and renewable energy 17.2%.

With the studies carried out within the scope of the National Energy Efficiency Action Plan (NEEAP) between 2017-2023, it was determined that a total of 8.47 billion USD was invested in energy efficiency in Türkiye and 24 million 625 thousand TOE energy savings and 68.62 million tonnes of CO_2 equivalent emission reduction were achieved in return for this investment. In addition, approximately 45 thousand new green jobs have been created in the sector.

In **Transport**, among the vehicles registered to traffic, hybrid vehicles increased from 13,901 in 2019 to 222,586 in 2023, and electric vehicles increased from 35,843 to 367,692. While the High Speed Line in the railway network in Türkiye was 1,184 km in 2019, it increased to 1,978 km in 2023. Within the framework of the "Green Port Policy" developed in 2014, 20 port facilities in Türkiye were awarded "Green Port Certificate".

In **Tourism**, according to the World Tourism Organisation data, Türkiye ranks 5th in the world and 4th in Europe in terms of the number of tourists in 2023, and ranks 7th in the world and 5th in Europe in terms of tourism revenues in the same year.

In the **industrial sector**, within the scope of the 'Green OIZ Certification Programme', the responsibilities for the Green OIZ Certification System in 2023 have been determined and 21 of the 26 OIZs that have passed these preliminary criteria have entered the evaluation phase.

In the **AIR** section, in the National Air Emission Inventory data, when the status of emissions for the years 1990-2021, which are covered by the reporting based on 2023, is analyzed, it is seen that emission totals are **not in a very serious** course depending on emission management policies, especially in combustion-derived pollutants. When the 2000-2021 time series of the nationally calculated road emissions totals are analyzed, it is seen that there is **a decreasing trend in vehicle** emissions with the renewed engine technologies.

Air quality measurement stations have been established by the MoEUCC in 81 provinces in order to monitor air quality throughout Türkiye. Starting with 35 stations in 2005, the number of stations included in the National Air Quality Monitoring Network reached 380 by 2023.

Between 2015 and 2019, according to the results of measurements made by air quality measurement stations across Türkiye, 16% improvement was achieved in PM10 parameter and 37% improvement was achieved in SO_2 parameter. From 2020 to the present, it is seen that the said decreasing trend has been maintained.

In terms of Noise Management, within the scope of national and international projects carried out by the MoEUCC, noise maps were prepared for the residential areas of 66 provinces and action plans for 22 provinces were finalized. In addition, strategic noise maps of 49 airports were prepared.

In terms of the issue of **CLIMATE CHANGE**, negative impacts such as extreme rainfall, floods, storms, landslides, heat waves and forest fires have become more frequent and severe in Türkiye in the last two decades. When the temperature changes between 1970 and 2023 in Türkiye are analyzed, there has been an increase in temperature since 2007, except for 2011.

In Türkiye, a total of 1,475 natural disasters of meteorological nature were reported in 2023. Looking at the distribution of long years, the number of meteorological disasters occurring in 2023 was recorded as the highest value in the 1940-2023 period.

The main policies and measures to combat climate change are concentrated in the energy, transport, agriculture, building sector, waste and land use and forestry sectors.

As a result of the 2053 Net Zero Emission Target announced by our President in 2021 and Türkiye's will to become a party to the Paris Agreement, the **green transformation process**, which marks a comprehensive change and transformation in all sectors, has started in Türkiye.

In line with Türkiye's goal of achieving the 2053 Net Zero Emission Target, the Climate Change Presidency was established under the Ministry of Environment, Urbanization and Climate Change to carry out activities related to taking necessary measures to combat climate change and determining plans, policies and strategies for green transformation. In line with the "Updated First National Contribution Declaration" submitted to the Secretariat of the United Nations Framework Convention on Climate Change, the rate of reduction from increase in greenhouse gas emissions, which was announced as 21%, was increased to 41% for 2030.

According to the results of the greenhouse gas inventory, total greenhouse gas emissions in 2022 were calculated as 558.3 million tonnes (Mt) CO_2 equivalent (eq.) with a decrease of 2.4% compared to the previous year. The largest share in total greenhouse gas emissions in 2022 in terms of CO_2 equivalent is energy-related emissions with 71.8%, followed by agriculture with 12.8%, industrial processes and product use with 12.5% and waste sector with 2.9%.

The amount of ozone depleting substances allowed to be imported on a quota basis in accordance with Türkiye's Montreal Protocol commitments was reduced to 200 tonnes in 2019, 100 tonnes in 2020 and 2021, and 50 tonnes in 2022, 2023 and 2024 within the phased phase-out programme implemented under the Montreal Protocol. Imports of these gases, known as hydrochlorofluorocarbons (HCFCs), will cease as of 01/01 /2025.

Under the heading of **WATER AND WASTEWATER MANAGEMENT**, data and information on Türkiye's water resources, environmental infrastructure and pollution prevention activities stand out.

Considering water resources, Türkiye is not a water-rich country. According to the annual amount of water per capita, Türkiye is a water scarce country. Türkiye has an annual water potential of 1,652 m^3 per capita. Considering that Türkiye's population will reach 87.9 million in 2030 and water use will increase in this direction, Türkiye is facing the danger of a decrease in water potential per capita per year.

It is extremely important to carry out planning studies in order to protect water resources and to leave clean and sufficient water resources to future generations by using them in a sustainable manner. As a result of this, River Basin Management Plans have been prepared in 12 of the 25 river basins in Türkiye and planning studies are ongoing in 7 basins.

In order to prevent sea saliva (Marine Mucilage) in the Marmara Sea, the "Marmara Sea Action Plan" consisting of 22 Articles was prepared and signed by the senior executives of all provinces bordering the Marmara Sea on 06.06.2021. Within the framework of the action plan, the works have been started rapidly and all necessary works have been carried out to eliminate the pollution in the Marmara Sea.

Under the coordination of the MoEUCC, Coordination and Information Centre was established in Istanbul and Provincial Coordination Centres were established in 7 provinces under the cha-

irmanship of the Governor. Sub-working groups were established for clean-up activities and pollution prevention to be carried out within the framework of the Action Plan. Within the framework of the Marmara Sea Action Plan, the Integrated Strategic Plan for the Marmara Sea for the period 2021-2024 has entered into force.

With the implementation of the Zero Waste Blue Movement and Marine Litter Provincial Action Plans, approximately 220,000 tonnes of marine litter was collected and disposed of by the end of 2023.

The approval of emergency response plans for coastal facilities in Türkiye started in 2009 and the risk assessment and Emergency Response Plans of 377 coastal facilities, including 57 facilities in 2023, were approved by the MoEUCC.

Within the scope of the "By-law on Waste Collection from Ships and Control of Wastes" published in 2004, as of 2023, waste reception services are provided in 334 coastal facilities and 58 waste reception vessels.

Within the scope of **Blue Flag** application, in the period between 1994 and 2024, the number of Blue Flags in Türkiye increased steadily and reached 567 beaches, 27 marinas, 18 tourism boats and 9 individual yachts by 2024. As of 2024, Türkiye ranked 3rd among the 50 member countries of the International Foundation for Environmental Education (FEE) in terms of the number of Blue Flag beaches with 567 beaches, after Spain (639) and Greece (625).

In Türkiye, as a result of the works carried out for environmental protection within the scope of **Environmental Wastewater Infrastructure** and the financial and technical support provided by the MoEUCC, there has been a significant increase in the number of municipalities served by sewerage networks and wastewater treatment plants and the population served by these facilities in recent years.

While the ratio of the population served by sewerage to the municipal population was 69% in 1994, this ratio reached 93% in 2022. While 13% of the municipal population was served by waste water treatment in 1994, this ratio reached 68% in 2014 and 78% in 2022.

There are 361 Organised Industrial Zones in Türkiye. Out of 361 OIZs, 281 are active and the wastewater of 173 of them is treated and discharged. The number of OIZs with wastewater treatment plants is 123. A total of 1,208 Wastewater Treatment Plant Project Approval procedures were carried out by the MoEUCC between 2019-2023. The reuse rate of treated wastewater increased from 2.5% in 2020 to 5.30% in 2023.

Within the scope of the By-law on the Use of Domestic and Urban Sewage Sludge in Soil, 19,978 tonnes km/year of sewage sludge generated in different wastewater treatment plants between 2020-2023 was allowed to be used on 9,989 decares of land.

All articles of the By-Law have become applicable with the declarations made as of 08/06/2015 through the **Contaminated Sites Information System** established within the scope of the By-Law on Control of Soil Pollution and Point Source Contaminated Sites. 48,710 Preliminary Activity Information Forms were submitted by the activity owners to the system, which can be accessed at https://ecbs.cevre.gov.tr, by the end of 2023.

In the agricultural nitrate pollution monitoring network established to detect agricultural pollution and to identify Nitrate Sensitive Areas, monitoring of agricultural nitrate pollution in waters is carried out at a total of 4,852 stations, including 2,533 surface water and 2,319 groundwater.

WASTE MANAGEMENT is one of the most important issues related to the environment in terms of reducing wastes in the environment where they are generated, sorting them according to their qualities, collecting them and transporting them to temporary storage areas, recycling them, disposing of them and finally ensuring their control.

The amount of **municipal waste** collected in Türkiye is 30.283 million tonnes/year for 2022. The ratio of the population served by waste disposal and recovery facilities to the municipal population was 82% in 2019 and 89% in 2023. The number of municipalities served by sanitary landfill facilities increased from 1,179 in 2019 to 1,241 in 2023.

In general, **packaging wastes** constitute 30 per cent by weight and 50 per cent by volume of discarded wastes. The legal, administrative and technical principles for the separate accumulation, collection, transport, separation and recycling of packaging wastes at source within a certain management system are determined by the "By-Law on Control of Packaging Wastes (AAKY)", which entered into force after being published in the Official Gazette dated 26/06/2021 and numbered 31523 by the MoEUCC.

AAKY includes the provision that "Packaging wastes are collected in accordance with the zero waste management system practices and Provincial Zero Waste Management System Plans, based on the provisions of the Zero Waste By-law." and the management of recyclable wastes is ensured within the scope of the Zero Waste By-law.

According to the Waste Statistics Bulletin of the MoEUCC (2021), According to the declarations made to the Waste Declaration System, 105,103 facilities declared that they produced 3,031,048 tonnes of hazardous waste and 29,635,926 tonnes of non-hazardous waste in 2021, of which 17,569,247 tonnes were recovered, 14,017,774 tonnes were disposed, 242,731 tonnes were exported and 837,222 tonnes were in stock.

In 2021, 52,168 tonnes of **waste mineral oil**, 33,872 tonnes of **waste cells-batteries**, 16,680 tonnes of **waste vegetable oil** were produced. In addition, 31,422 tonnes of **end-of-life tyres** and 52,129 tonnes of waste **electrical and electronic equipment** were collected in 2021.

In Türkiye, there are 97 delivery points authorised for **end-of-life vehicles** according to 2024 data of MoEUCC and 105 temporary storage areas with Temporary Activity Certificate (GFB) and permit-licence from MoEUCC as of the end of 2023. The number of vehicles registered for scrapping in the End-of-Life Vehicles Disposal Tracking System is 3,117 for 2020 and 4,099 for 2023.

2019 and 2020 medical waste quantities include the data of health institutions (university, maternity and general-purpose hospitals and clinics) declaring to the MoEUCC Waste Declaration System (TABS), and 2021 medical waste quantities include the data of all waste generators declaring medical waste. 90,920 tonnes of medical waste was declared to the MoEUCC TABS in 2019 and 135,869 tonnes of **medical waste** was declared in 2021.

In line with the "Waste Recovery" awareness, 81 waste codes in the cement sector, 15 codes in the brick sector, 4 codes in the ceramic sector, 6 codes in the concrete sector and 3 codes in the lime sector were **approved for alternative raw material use**. In addition, as of the end of 2023, 7 different types of waste from 10 facilities were approved **for use as by-products**.

According to the results of water, wastewater and waste statistics of mining enterprises, 2022 survey conducted by TURKSTAT, 860.6 million tonnes of **mining waste** (812 million tonnes in 2018) was generated in mining enterprises in 2022. In 2022, 99.9% of the 860.6 million tonnes of waste generated in mining enterprises were mineral wastes. In 2022, the amount of stripping material/rubble was determined as 26.3 million tonnes excluding 834 million tonnes (795 milli-

on tonnes in 2018) of rubble. A total of 79 facilities were granted "Mining Waste Storage Facility" approval certificates between 2011-2023.

The **Zero Waste** Project was launched in 2017 under the leadership of the MoEUCC, and by the end of 2023, the number of buildings/compounds that have adopted the zero waste management system has reached approximately 178 thousand, and 20 million people have been trained. The recovery rate, which was 13% in 2017, increased to 30.13% in 2022 and 34.92% in 2023. By recycling the collected wastes, 185 billion TRY was saved for the national economy, 2.6 billion kWh of energy was saved, 819 million m^3 of water was saved, 104 million m^3 of landfill space was saved, 5.9 million tonnes of greenhouse gas emissions were prevented, 498 million trees were saved, and 127 million barrels of oil were saved.

With the Law dated 24.12.2020 and numbered 7261, the **Turkish Environment Agency** (TÜÇA) was established and started its activities in order to carry out activities for the establishment, operation, monitoring and supervision of the deposit management system on a national scale. In this context, within the scope of the Deposit Management System, an online "Deposit Information Management System (DBYS)" was established and started to be operated, where the system will be monitored and managed in a secure and transparent manner from end to end. The packages within the scope of the system were marked with the special inked Deposit Management System Mark (DYS logo and product barcode) and started to be produced and recorded as traceable and identifiable.

Regarding the **Management of Chemicals**, The "By-law on Persistent Organic Pollutants" published in the Official Gazette dated 14 November 2018 and numbered 30595 for the purpose of effective implementation of the Stockholm Convention at national level and harmonisation and implementation of the EU By-law on Persistent Organic Pollutants by Türkiye was amended in 2021 and the number of harmful chemicals banned under the By-law increased to 16 and the number of restricted substances increased to 21.

Within the framework of the "By-law on Registration, Evaluation, Authorisation and Restriction of Chemicals" published in the Official Gazette dated 23/06/2017 and numbered 30105 (Repeated), 79068 Safety Data Sheets (SDS) prepared for the protection of harmful substances and mixtures supplied to the market from the negative effects of human health and the environment are uploaded to the MoEUCC System and recorded.

According to the first paragraph of Article 43 of the "By-law on Classification, Labelling and Packaging of Substances and Mixtures (SEA By-law)" published in the Official Gazette dated 11/12/2013 and numbered 28848 (Repeated), the MoEUCC is tasked with establishing and maintaining a classification and labelling inventory in the form of a database. The Chemicals Data System (KİMVES) established within this scope constitutes one of the important outputs of the SEA By-law.

Under the heading of **NATURE PROTECTION AND BIOLOGICAL DIVERSITY**, in addition to protected areas and Türkiye's biological diversity, the issues of combating erosion and desertification are also included.

It can be said that **Türkiye's Biological Diversity** is rich due to the fact that it has agricultural, forest, mountain, steppe, wetland, coastal and marine ecosystems and different forms and combinations of these ecosystems, and this ecosystem and habitat diversity brings with it a significant diversity of species. While the number of plant species in the entire European con-

tinent is around 12,500, the number of plant species identified in Türkiye today almost reaches this number. Around 3,000 of these are endemic species unique to Türkiye. While the number of species constituting the fauna and flora of Europe is about 60,000, in Türkiye it is about 80,000.

There are around 150 mammal, 480 bird, 130 reptile and 300 fish species in Türkiye. Of these, 15 mammal species, 46 bird species, 18 reptile species and 5 frog species are in danger of extinction. The total wetland area of Türkiye exceeds 1 million hectares. There are approximately over 250 wetlands. Despite the lack of data, invertebrates constitute the largest number among the living species identified. The number of invertebrate animal species is approximately 19,000 and approximately 4,000 species/subspecies are endemic. The total number of vertebrate animal species identified to date is close to 1,500. Among vertebrates, more than 100 species, 70 of which are fish species, are endemic. Türkiye's location on two major bird migration routes increases its importance as a feeding and breeding area for birds.

Special Environmental Protection Zones, Wetlands, Natural Protected Areas and Natural Assets, National Parks, Protected Wildlife Reserves, Nature Reserves, Nature Parks and Nature Monuments, Wildlife Development Areas and Breeding Stations constitute Protected Areas in Türkiye. The total area of **Protected Areas in Türkiye** is 10,332,969 hectares. Of this area, 3,832,960 ha are Natural Protected Areas, 2,854,906 ha are Special Environmental Protection Areas, 909,158 ha are National Parks, 1,165,448 ha are Wildlife Development Areas, 1,161,205 ha are Wetlands, 108,036 ha are Nature Parks, 46,453 ha are Nature Reserves, 8,356 ha are Natural Monuments and 246,446 ha are Protection Forest.

As of 2024, there are 48 National Parks, 266 Natural Parks, 31 Nature Reserves, 110 Natural Monuments, 85 Wildlife Development Areas and 55 Protection Forest in Türkiye.

There are 19 Special Environmental Protection Areas in Türkiye and the area of these areas is 3,832,959.54 hectares. There are 4,034 natural protected areas in Türkiye and the area of these areas is 2,755,773 hectares. The total area of Special Environmental Protection Areas corresponds to 4.9 per cent of Türkiye and the total area of Natural Protected Areas corresponds to 3.5 per cent of Türkiye.

There are 14 Ramsar Sites (184,487 ha), 59 Wetlands of National Importance (869,967 ha) and 47 Wetlands of Local Importance (107,021 ha) in Türkiye. In addition, the total number of trees registered as natural assets in Türkiye is 10,510 and the total number of registered caves is 296.

The desertification in our agricultural areas, the deterioration of the species diversity and natural structure in our forest and pasture areas, improper land use, the concretisation of fertile and well-qualified agricultural lands, the continuation of soil pollution, the significant dimensions of **erosion and soil loss** are the facts that reveal the high sensitivity of Türkiye to **desertification**.

65% of Türkiye has arid and semi-arid characteristics and 86% of the country's land is under the threat of **erosion**, making erosion the most important cause of **desertification**. In the World Desertification Hazard Map, a significant part of Türkiye, especially Central Anatolia, is shown as "vulnerable to desertification".

Changes in erosion are monitored and evaluated with the "Dynamic Erosion Model Monitoring System (DEMIS)". Within the scope of combating desertification/land degradation, afforestation, erosion control, rehabilitation of degraded forest areas and pasture improvement works were carried out on 9.72 million hectares as of the end of 2023.

When the CORINE data of 2012 and 2018 are compared in order to examine the change in **LAND USE** and areas in Türkiye, it is seen that Agricultural Areas decreased by 74,514.53 ha, Forest and Semi-Natural Areas decreased by 97,871.23 ha, Wetlands increased by 1,118.24 ha, Water Bodies increased by 30,247.58 ha and Artificial Regions increased by 141,019.95 ha.

1/100,000 scale **Territorial Plans** of 99% of the provinces in Türkiye have been completed. Except for Ankara, Istanbul, Kocaeli, Bursa, Eskişehir, Sakarya, Kahramanmaraş, Hatay and Gaziantep, which are metropolitan municipalities, the works and procedures related to the Environmental Plans in all provinces are carried out by the MoEUCC. Türkiye Spatial Strategy Plan studies are ongoing.

Within the scope of the **Institutional Structure and Activities of the Ministry of Environment, Urbanization and Climate Change**, the number of **Environmental Impact Assessment** (EIA) Decisions issued by the MoEUCC is analyzed. 511 EIA Positive, 4,224 EIA Not Required and 55 EIA Required Decisions were issued in 2023 within the scope of the By-law on Environmental Impact Assessment, while the EIA process of 780 projects was cancelled/refused. Within the framework of the By-law on Strategic Environmental Assessment (SEA), SEA was/is being conducted for 40 (forty) planning processes prepared in spatial planning, coastal management, tourism, agriculture and water management sectors.

Within the scope of the By-law on **Environmental Permit and Licence**, a total of 15,666 Temporary Activity Certificates and 22,011 Environmental Permit and Licence Certificates were issued between 2020-2023.

While 41,136 Environmental Inspections were carried out by the MoEUCC in 2020, 53,782 inspections were carried out in 2023. While 240,274,660 TRY administrative fines were imposed in 2020, 1,156,462,676 TRY administrative fines were imposed in 2023.

As of March 2024, according to the Major Industrial Accident Risk Reduction (**BEKRA**) Notification System, 648 BEKRA organizations (354 upper level and 294 lower level) have notified.

As of 2023, the number of environmental engineers/authorised persons granted "Environmental Management Service Qualification Certificate" reached 12,531, the number of environmental consultancy firms granted "Environmental Consultancy Firm Qualification Certificate" reached 675 and the number of environmental management units granted "Environmental Management Unit Qualification Certificate" reached 403.

Within the scope of the By-law on Qualification of Environmental Measurement and Analysis Laboratories, the number of laboratories authorised by the MoEUCC to carry out measurement and analysis activities within the framework of the Environmental Legislation was 228 in 2020 and reached 233 laboratories in 2023, of which 39 were public and 194 were private.

The Environmental Reference Laboratory operating within the body of the MoEUCC conducts analyses of over 1,200 parameters, 655 of which are accredited, in water, wastewater, seawater, soil, waste, sewage sludge, waste oil, isolation fluid, sediment, flue gas, coal, pomace and fuel-oil samples.

Within the scope of the procedures and principles regarding the determination of the qualifications of Waste Tracking Service Providers, 4 (four) companies have been granted qualification certificates. Within the scope of the "Communiqué on Qualification Certificate for the Control of Soil Pollution and Cleaning of Point Source Contaminated Sites", as of December 2023, there are a total of 14 institutions / organizations operating by obtaining a certificate.

Within the scope of the "Communiqué on Authorisation of Institutions and Organizations to Prepare Risk Assessment and Emergency Response Plans for Pollution of the Marine Environment with Oil and Other Harmful Substances", the applications of a total of 10 (ten) institutions / organizations were finalized and "Certificate of Competence" was given as of July 2020.

In order to provide consumers with accurate, non-misleading and science-based information about the environmental status of products and services, Türkiye Eco-label System, which was established on a voluntary basis for the promotion of products and services with environmental labels and prepared in accordance with the EU Eco-Label By-law, has been put into practice in Türkiye with the Environmental Label By-law published on 19/10/2018, and as of the end of 2023, "Environmental Label Certificate" has been issued to 12 companies in 5 product groups: textiles, ceramics, hand washing dishwashing detergent, cleaning paper and hard surface cleaners.

ENVIRONMENTAL PROTECTION EXPENDITURES increased by 111.4% in 2022 compared to the previous year and totalled TRY 140.3 billion. 70.3% of environmental protection expenditures were made by financial and non-financial corporations, 26.1% by general government and non-profit organizations serving households and 3.6% by households.

Environmental protection expenditures were composed of 60.9% on waste management services, 25.3% on wastewater management services, 4.2% on protection of ambient air and climate, 4% on protection of biodiversity and landscape, 2.4% on protection and improvement of the quality of soil, groundwater and surface water and 3.3% on other environmental protection issues. The ratio of environmental protection expenditures in gross domestic product was 0.91% in 2021 and 0.93% in 2022.

With the **Coastal Facilities Marine Pollution Compulsory Financial Liability Insurance**, clean-up costs, costs to be incurred for the transportation of collected wastes, damages arising from injuries and deaths of third parties and damages to private property caused by the pollution or danger of pollution arising in the maritime jurisdiction areas consisting of inland waters, territorial waters, continental shelf and exclusive economic zone of Türkiye as a result of the incident caused by coastal facilities are compensated. The number of policies issued in 2023 was 458 and premium production was realized as 16,977,637 TRY.

Environmental Pollution Financial Liability Insurance provides coverage for compensation claims that the insured will be legally obliged to pay due to the sudden and unexpected pollution or danger of pollution of the soil, groundwater, inland waters, seas and air in one, several or all of them, depending on the scope of the contract, within the framework of environmental legislation. The number of policies issued in 2023 was 2,481 and premium production was realized as 21,883,984 TRY.

STATE OF ENVIRONMENT REPORTING STUDIES IN TÜRKİYE

Rapidly increasing population, Urbanization, economic activities and diversifying consumption habits increase the pressure on the environment and natural resources. Environmental problems such as environmental pollution, climate change, desertification, deforestation, loss of biodiversity and drought have a significant impact on human life and development process day by day.

It is seen that climate change, which is accelerating with the effect of high greenhouse gas emissions, causes an increase in natural disasters and poses a serious threat to humanity on a global scale. In today's world of increasing demand and consumption, sustainable environmental and natural resource management and the construction of livable cities are becoming more and more important.

Problems such as global warming, climate change, desertification, drought, increase in natural disasters and cross-border transport of pollutants, viruses that spread from destroyed areas and can be transmitted to humans give signs that our world will become increasingly difficult to live in unless measures are taken. As a result, we risk destroying our well-being and nature's ability to meet our needs.

In summary, it has become clear that our ecological footprint has begun to exceed the self-renewal capacity of our planet. Environmental degradation caused by air and water pollution, noise, radiation, chemicals or biological factors, destruction of natural areas, especially forests, have negative effects on human health. Environmental problems have become a global element that concerns all people without borders.

In order to reduce our ecological footprint, a life cycle approach to resource management has recently been introduced as a guide, a basic principle. In Türkiye, efforts to reach a society with zero waste as the ultimate goal have gained momentum. As a result of the efforts targeting a zero-waste lifestyle, great progress is being made in the internalisation of concepts such as "green economy" and "green cities".

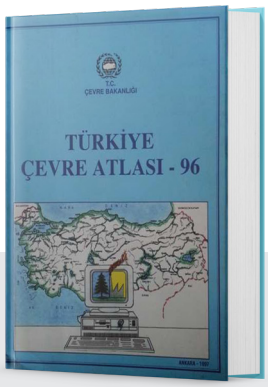
In Türkiye, for the first time, the environmental sector has been included in national programmes as a part of development plans since the 5th Five-Year Development Plan covering the years 1985-1989. In the 11th Development Plan covering the years 2019-2023, under the axis of "Livable

Cities and Sustainable Environment", targets and policies for protecting the environment in parallel with increasing economic and social benefits, improving the quality of life in cities and rural areas and reducing interregional development differences are included.

It is emphasised in the 11th Development Plan that while increasing food demand, climate change, Urbanization, soil and water resources, agricultural products and producers are under pressure, development of plant and animal species suitable for the changing climate, protection of the environment and biological diversity are gaining importance, and the need for qualified labour force and technology is increasing in order to meet food demand with less resources.

In the 11th Development Plan, environmental protection and pollution prevention are integrated into other sectors such as development, agriculture, energy, industry, health, transport, tourism and disaster management. Integration of environmental issues in all sectors aims to reduce the pressure on environment and natural resources.

The Plan emphasises that the main objective is to protect the environment and natural resources, to improve their quality, to ensure their effective, integrated and sustainable management, to implement environment and climate-friendly practices in all areas, and to increase environmental awareness and sensitivity of all segments of society.

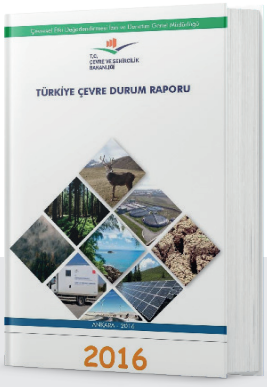


1997: The first National The State of Environment Report of Türkiye was published under the title "Türkiye Environmental Atlas"

2004: The 2nd Report, published after Türkiye's EEA membership, included information on EU relations.

2007: The third report was named "The State of Environment Report of Türkiye".

2011: The State of Environment Report of Türkiye were integrated into the 4th National Report.



2016: The report included a DPSIR assessment that detailed climate change in a separate chapter.

2020: 6th The State of Environment Report of Türkiye included Türkiye's zero waste practices and climate-friendly practices.

As a result of integrating the environment into other sectors with a sustainable development approach, Türkiye has become a party to many important international environmental agreements and fulfils its obligations.

Pursuant to the Presidential Decree on the Organisation of the Presidency (10.07.2018/30474), the Ministry of Environment, Urbanization and Climate Change was assigned the task of "preparing The State of Environment Report of Türkiye". Within this framework, on behalf of the Ministry, State of Environment Report of the Republic of Türkiye is prepared every 4 (four) years under the coordination of the General Directorate of Environmental Impact Assessment, Permit and Inspection.

This Report is an important source in terms of showing the relationship between the institutions and sectors related to the environment, revealing the studies and results carried out in the field of environment at the country level, providing information about the general policies and progress in Türkiye and providing a basis for national and international studies in developing our environmental policy.

The report, the first of which was published in 1997 under the title "Türkiye's Environmental Atlas", was prepared for the publication of the last "7th State of Environment Report for Republic of Türkiye" in 2024.

The book "7th State of Environment Report of Türkiye" covers the years 2020-2023. The report also includes data and information for 2019 and 2024 for some sectors. Previously published State of the Environment Reports of the Republic of Türkiye can be accessed from the link (https://ced.csb.gov.tr/turkiye-cevre-durum-raporu-i-82673).

In addition, within the scope of Türkiye's membership to the European Environment Agency (EEA), Directorate General of EIA, Permit and Inspection, Department of Environmental Inventory and Information Management, State of the Environment Reports Branch Directorate of MoEUCC was appointed as the Primary National Focal Point for Environmental Status Reports (NRC-SoE). Within the scope of the "State of the Environment in Europe and Outlook Report" (SOER), which is prepared and published every 5 years by the Agency; necessary active participation and contribution is provided on behalf of Türkiye.

OVERVIEW OF TÜRKİYE

1. Geography

Türkiye's territory lies between 36°- 42° North latitudes and 26°- 45° East meridians. Including lakes and islands, the actual area covered is 814,578 km^2 and the projection area is 779,578 km^2. The main geographical regions of Türkiye are Mediterranean Region, Eastern Anatolia Region, Aegean Region, Southeastern Anatolia Region, Central Anatolia Region, Black Sea Region and Marmara Region.

More than half of Türkiye consists of high areas with an elevation of more than 1,000 metres, about one third is covered by medium-height plains, plateaus and mountains, and 10 per cent by low-lying areas. The highest and most mountainous areas are located in the eastern part. The Northern Anatolian Mountains hilly the northern part and the Taurus Mountains hilly the sout-

Map 1 Türkiye's Geographical Regions

hern, eastern and southeastern parts. The highest point of Türkiye is Mount Ağrı, while the main plains are Çukurova, Konya Plain and Harran plains. Mountains of Türkiye: Mount Ağrı (5,137 m), Glacier (Cilo) Mountain (4,116 m), Mount Cudi (2,089 m), Mount Süphan (4,058 m), Mount Kaçkar (3,932 m), Mount Erciyes (3,917 m), Mount Uludağ (2,543 m).

Rivers of Türkiye: The longest river with its source and the place where it flows into the sea within the borders of the country is the Kızılırmak, which is 1,355 kilometres long. Other rivers are Yeşilırmak (418 km), Sakarya (824 km), Fırat (2,800 km), Dicle (1,900 km), Büyük Menderes (584 km), Seyhan (560 km), Ceyhan (509 km), Meriç (590 km), Küçük Menderes (450 km), Göksu and Çoruh.

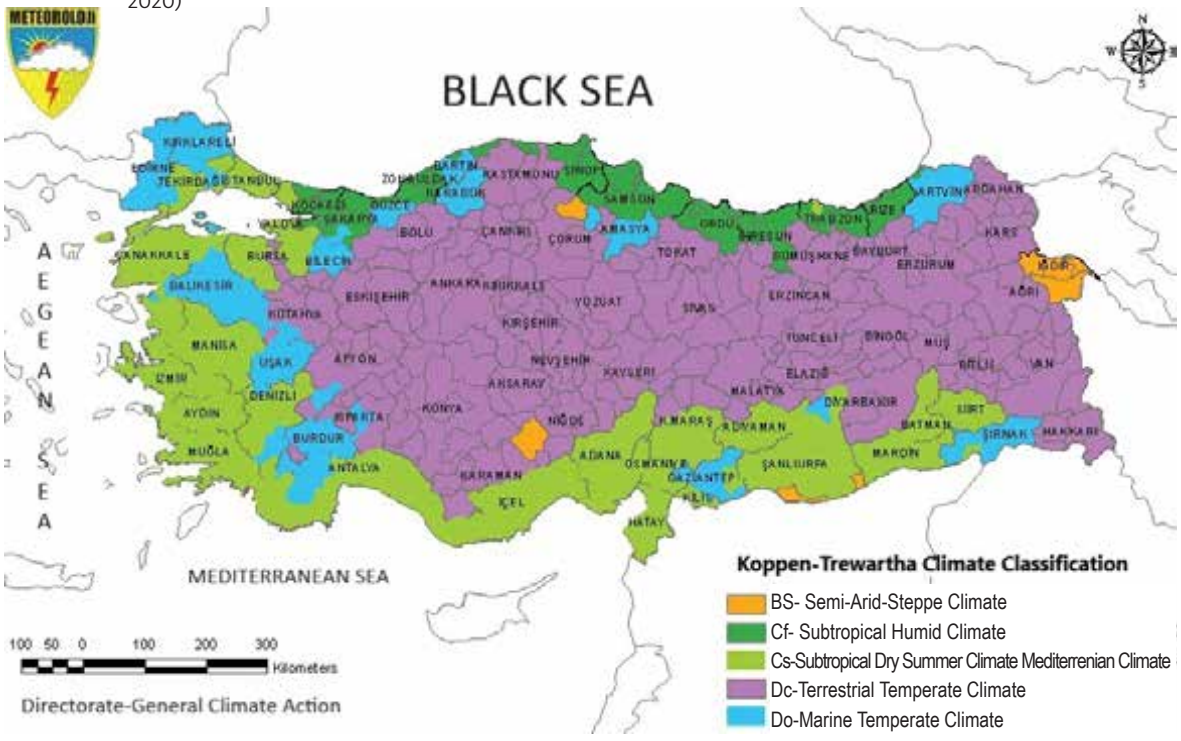
Natural lakes: Türkiye's largest natural lake is Lake Van, covering an area of 3,713 km^2. Spread over an area of 817 km^2, Lake Atatürk Dam is the largest artificial lake in the country. Lake Van 3,713 km^2, Lake Tuz 1,500 km^2, Lake Beyşehir 656 km^2, Lake Eğridir 468 km^2, Lake Akşehir 353 km^2, Lake Iznik 298 km^2, Lake Burdur, Lake Salda, Lake Eymir.

Islands: The area of Gökçeada, the largest island of Türkiye, is 279 km^2. The area of other large islands is as follows: Balıkesir Marmara Island 117 km^2, Bozcaada 36 km^2, Uzunada 25 km^2, Balıkesir Alibey Island 23 km^2, Balıkesir Paşalimanı Island 21 km^2, Balıkesir Avşa Island 21 km^2.

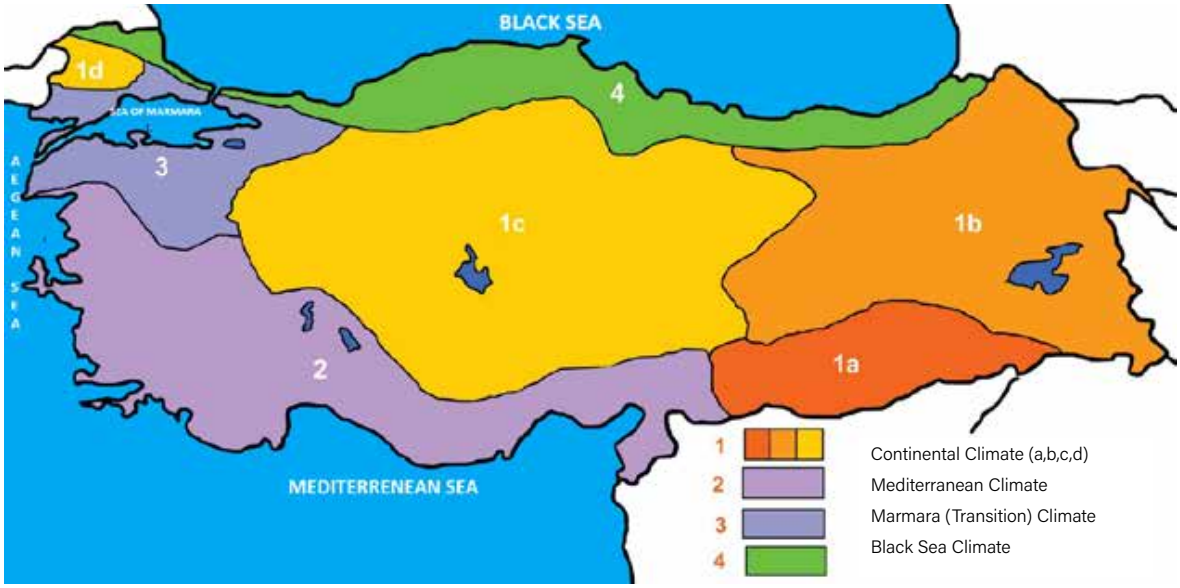
2. Climate

Türkiye is located between the temperate zone and the semi-tropical zone. The fact that Türkiye is surrounded by seas on three sides, the extension of the mountains and the diversity of landforms have led to the emergence of climate types with different characteristics. In the coastal regions of Türkiye, milder climate characteristics are observed with the effect of the seas. The Northern Anatolian Mountains and Taurus Mountain Range prevent the sea effects from entering the interior. Therefore, continental climate characteristics are observed in the interior of Türkiye.

Map 2 Climate of Türkiye according to Köppen-Trewartha Climate Classification (General Directorate of Meteorology, 2020)



Map 3 Current Climate Zones in Türkiye (Atalay, İ., 1997)



According to Köppen-Trewartha climate classification, it shows the main classes of Türkiye's climate. Accordingly, most of the country, especially the area covering the central and eastern Anatolia regions, is defined as continental temperate climate, while the Aegean, Mediterranean and Southeastern Anatolia regions show subtropical dry summer climate characteristics. The Black Sea coastal areas are characterised by a subtropical humid climate, while some provinces in Thrace and the Inner Aegean have a maritime temperate climate. Iğdır province, Konya-Ereğli, Urfa- Ceylanpınar and Çorum Osmancık have semi-arid steppe climate characteristics (Map 2).

Atalay, İ., (1997), based on the criteria used in climate classifications made on a world scale, has defined the following climate types regionally for Türkiye (Map 3);

1. Continental Climate (a, b, c, d)
2. Black Sea Climate
3. Mediterranean Climate
4. Marmara (Transition) Climate

3. Population

Population growth is the most important driving force underlying human activities that put pressure on the environment. Population growth and population growth rate is one of the basic indicators in "Environmental Performance Measurement" and "Environmental Sustainability Index" studies in the international arena.

Table 1 Türkiye's Population (TURKSTAT, 2024)

	2020	2021	2022	2023
MALE	41,915,985	42,428,101	42,704,112	42,734,071
FEMALE	41,698,377	42,252,172	42,575,441	42,638,306
TOTAL	**83,614,362**	**84,680,273**	**85,279,553**	**85,372,377**

Economic factors lie at the root of the relationship between population and environment. As in all countries, economic, social, cultural, geographical, demographic and political reasons are among the main causes of internal migration in Türkiye.

Although Türkiye's population has been increasing continuously, there has been a decline in the population growth rate since the 1990s. In the 2019-2023 period, there is an average annual population growth rate of 0.66%.

Table 2 Population Growth Rate in Türkiye (TURKSTAT, 2024)

YEARS	2019-2020	2020-2021	2021-2022	2022-2023
Population Growth Rate (%)	0.55	1.27	0.71	0.11

Table 3 City (City/District Centres) and Village (Town/Villages) Population in Türkiye (TURKSTAT, 2024)

	CITY	VILLAGE
2019	77,151,280	6,003,717
2020	77,736,041	5,878,321
2021	78,908,631	5,771,642
2022	79,613,279	5,666,274
2023	79,399,292	5,973,085

4. Natural Resources

4.1. Oil

By the end of 2022, oil reserves in Türkiye's onshore areas were recorded as 507 million barrels. As of the end of May 2023, within the scope of the studies carried out following the oil discovery with the Şehit Esma Çevik-1 (SEÇ-1) exploration well drilled by TPAO on 10 May 2021 within the borders of Şırnak province, daily oil production exceeded 10 thousand v/g in 9 wells that were put into production in the Şehit Esma Çevik Field.

The most recent development in 2023 was the discovery of oil with a gravity of 41 o API in the Şehit Aybüke Yalçın-1 exploration well located 7 km north-east of the Şehit Esma Çevik Field, 20 km north-west of Cizre. This discovery is the largest ever made onshore in Türkiye and the initial production level from the well is 1,200 v/g (TPAO Sector Report, 2022).

With the rapid growth of the economy and industry, Türkiye's demand for petroleum products is constantly increasing. In 2021-2022, 72 v/g of crude oil was produced while 672 v/g of crude oil was imported. In the same period, 208 v/g processed petroleum products were imported.

4.2. Natural Gas

In 2022, Turkish Petroleum Corporation (TPAO) produced a total of 408.67 million Sm^3 of natural gas from natural gas fields, with natural gas reserves of 3.1 billion m^3 . Of this production, 99 per cent was obtained from Thrace and 1 per cent from the Southeastern Anatolia Region. The crude oil equivalent of the natural gas produced is 2.4 million barrels. Natural gas demand varies seasonally and reaches its highest level in winter months with the increase in housing demand. In order to ensure more effective and sustainable natural gas supply security in Türkiye, natural gas storage capacity has been increased in the last 4 years.

In marine areas, TPAO's successive discoveries in the Black Sea are noteworthy for their contribution to the country's marine reserves. On 21 August 2020, TPAO made a discovery in Sakarya field in the Western Black Sea with a reserve of 405 billion m^3 (approximately 2.5 billion vpe).

On 4 June 2021, a second discovery was made with the Amasra-1 well, also located in the Black Sea, with a reserve of 135 billion m^3 , bringing the total reserves in the Black Sea to 540 billion m^3. Finally, in December 2022, 58 billion m^3 of reserves were discovered in the Çaycuma-1 well with the Fatih Drilling Ship (TPAO Sector Report, 2022).

Table -4 Underground Natural Gas Storage and Back Generation Capacity (Energy Market Regulatory Authority (EMRA), 2024)

Year	Natural Gas Storage Capacity, billion Sm^3	Back Production Capacity, million m^3 /day
2019	3.44	45
2020	3.84	45
2021	4.2	68
2022	5.8	115

Table 5 Domestic Natural Gas Sales Amounts (%*) (EMRA, 2024)

Year	Electric	Housing	Industry	Wholesale
2019	24.1	41.1	32	2.8
2020	28.27	32.35	26.31	13.07
2021	34.81	27.87	25.54	11.78
2022	27.10	33.64	25.00	14.26

* It shows the domestic sales percentages realized by BOTAŞ and does not express national consumption percentages.

4.3. Coal

Coal is the most common fuel used for electricity generation. Coal is expected to remain the most widely used fuel for electricity generation for the foreseeable future.

Lignite is a type of coal that is generally used as fuel in thermal power plants due to its low calorific value and high ash and moisture content. However, it is a frequently used energy raw material because it is found in large amounts in the earth's crust. Hard coal is in the group of high calorific coals.

In terms of reserves and production amounts, Türkiye can be evaluated at the middle level in the world scale in lignite and at the lower level in hard coal. Approximately 1.6% of the total world lignite reserves are in Türkiye.

Table 6 Coal Production Amounts for the Years 2015-2022 (Tonnes) (General Directorate of Mining and Petroleum Affairs (MAPEG), 2023)

Year	Hard Coal	Lignite	Total
2019	1,805,118	92,993,461	94,798,579
2020	1,613,624	84,811,522	86,425,146
2021	1,726,109	90,780,037	92,506,146
2022	1,794,712	102,097,457	103,892,169

4.4. Geothermal

Geothermal energy is the energy obtained by transporting the heat accumulated in the depths of the earth's crust to the surface in liquid and vapour phase. Türkiye ranks 1st in Europe in terms of geothermal potential and 4th in the world in terms of installed power. The top five countries in electricity generation from geothermal energy are USA, Indonesia, Philippines, Türkiye and New Zealand.

Türkiye is a country rich in geothermal resources due to its geological structure. Low-temperature (20-70°C) fields are utilised directly as heat energy. The main areas where heat energy is directly used are greenhouses, thermal hotels and spas and tourism sector, food industry applications on fruit and vegetable drying, urban heating applications. Medium-temperature (70-150°C) and high-temperature (higher than 150°C) fields can be utilised in integrated heating-electricity generation applications depending on re-injection conditions as well as electricity generation.

Türkiye's total theoretical geothermal apparent heat potential is 35,500 MWt (thermal megawatts) and total theoretical geothermal electricity potential is 4,500 MWe. As of the end of 2022, the geothermal installed capacity of Türkiye is 1,691 MW. In terms of direct heat energy use, the theoretical potential is estimated to be 7.5 million housing equivalent heat energy and the economic potential is estimated to be 1 million housing equivalent heat energy. Currently, geothermal central heating systems provide heat energy equivalent to ~140,000 dwellings (~1,205 MWt) and 46,400 dwellings equivalent heat energy for spas, thermal hotels and timeshare facilities.

4.5. Solar

Türkiye has a very high potential in terms of solar energy with an average annual global solar radiation value of 1,635 kWh/m^2. This value is higher than many European countries for electricity generation from solar energy and is at the level of countries such as Spain and Italy. As of the end of 2022, the solar installed capacity of Türkiye is 9,425 MW and constitutes 9.1 % of the total installed capacity.

In line with its domestic and national energy targets, Türkiye is developing various initiatives such as "Unlicensed Electricity Generation" and Renewable Energy Resources Support Mechanism (YEKA) model.

4.6. Wind

According to the Wind Energy Potential Atlas of Türkiye (REPA), the wind energy potential of Türkiye can reach up to 150,000 MW thanks to the developments in wind turbine technologies.

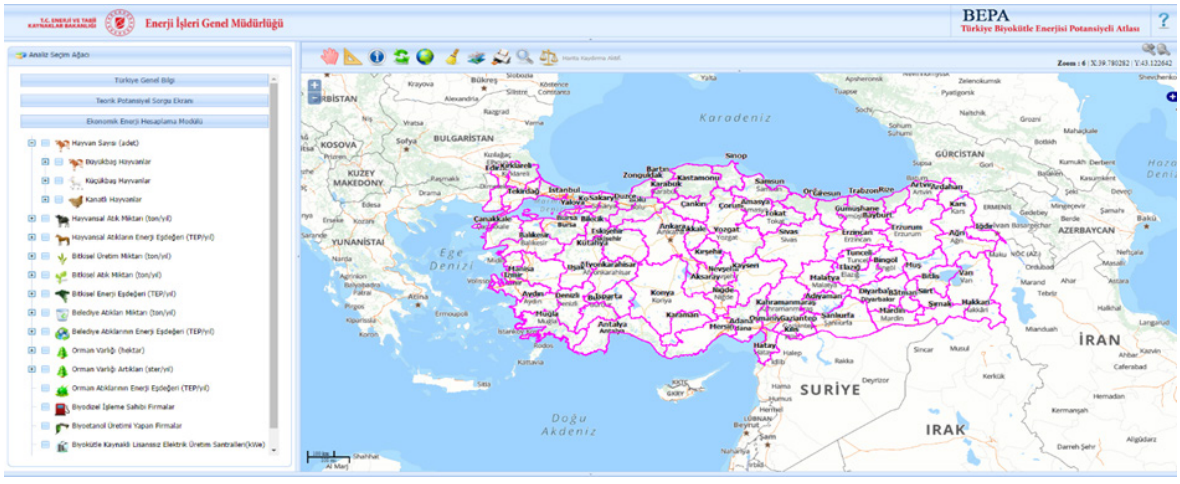
Between 2017 and 2023, YEKA tenders were held for wind power plants with a total capacity of 2,850 MWe. With the wind power plants established as a result of these tenders, it is aimed to meet a significant portion of Türkiye's energy needs and accelerate the transition to renewable energy. By encouraging the use of domestically produced wind turbines, it was aimed to create an important technology development and production base in Türkiye in this field.

4.7. Biomass

Biomass is considered as the total mass originating from living organisms. Türkiye offers various alternatives in terms of biomass resources. The Biomass Energy Potential Atlas of Türkiye (BEPA) prepared by the Ministry of Energy and Natural Resources (MENR) provides a database for biomass resources in Türkiye. BEPA can be accessed from the website of MENR at https://bepa.enerji.gov.tr. As of the end of 2022, the installed capacity of biomass (including waste heat) sourced electricity reached 2,309 MW and 9,454 GWh of biomass sourced electricity was generated as of the end of 2022.

In addition to analysing different biomass sources in different provinces and districts, BEPA also provides data for technology selection according to biomass source in energy production. The development of agricultural-based BEPA based on geographical information system by the Ministry of Agriculture and Forestry continues with the support of the Ministry of Energy and Natural Resources.

Map 4 Türkiye Biomass Energy Potential Atlas (BEPA) https://bepa.enerji.gov.tr



4.8. Mines

In terms of mineral diversity and reserves, Türkiye ranks 28th in total mineral production and 10th in terms of the variety of minerals produced among the 132 countries mentioned in mining in the world.

In addition to boron and lignite, Türkiye has considerable reserves of minerals such as marble, trona, barite, chrome and magnesite. On the other hand, it is far from being self-sufficient particularly in the field of energy raw materials, especially in the fields of oil, natural gas and hard coal. In addition, the fact that most of the available iron ores are of low grade and therefore cannot be utilised increases the dependence on foreign sources for this type of minerals.

Table -7 Resource Quantities of Some Mines in Türkiye (2015-2023)

Mine Name	Resource (tonnes)	Tenor
Chromium	42,877,559	4.5 %-10.9 Cr_2O_3
Bentonite	1,360,000,000	Bleaching value: Classified as usable. good. very good.
Copper	1,770,000,000	0.12 %-1.63 %
Iron	567,000,000	8-51%
Zinc	693,000,000	0.36 %-21 %
Coal	21,730,000,000	
Feldspar	5,870,047,297	3.52-10.58 % Na_2O+K_2O
Kaolinite	6,300,000	20 % Al_2O_3
Clay	13,601,402	
Aluminium	25,235,894	18-33 % Al_2O_3
Nickel	636,000	0.15 % - 1.91% NH_2O_3
Trona	900,000,000	97 % Na_2CO_3
Trona/Thenardite	2,311,845,631	68.1 % Ave. NaCl

73% of the world boron reserve, 23% of the world feldspar reserve and 20% of the world bentonite reserve are located in Türkiye. Türkiye has an important place in soda production, especially the facility established to operate the Beypazarı Trona Deposit, the second largest soda ash reserve in the world.

Table -8 Soda-Trona Production and Natural Stone Production (Ignimbrite, Marble, Travertine and Onyx Production) (MAPEG, 2024)

Year	Soda-Trona Production (tonnes)	Natural Stone Production (tonnes)
2019	4,301,807	12,818,213
2020	14,612,653	13,422,392
2021	17,381,069	16,730,419
2022	17,626,419	16,861,581

In the researches conducted in Türkiye, it has been determined that there are up to 650 types of marble in colour and texture. According to current data, 40% of the world's marble reserves (approximately 5-6 billion m^3 of marble) are found in Türkiye.

4.8.1. Gold and Silver Mining

Table -9 Resource Quantities of the Gold Fields where MTA is the Finder (General Directorate of Mineral Research and Exploration (MTA), 2024)

Year	Resource (tonnes)	Tenor
2019	825,306,901	0.26 gr/tonne Au
2020	75,750,000	0.19-1.034 gr/tonne Au
2021	42,190,000	0.175-3.26 gr/tonne Au
2022	74,000,000	0.106-1.76 gr/tonne Au
2023	980,000,000	0.1-3.27 gr/tonne Au

Table -10 Resource Quantities of the Silver Fields that MTA has been awarded as the Finder (MTA, 2024)

Year	Resource (tonnes)	Tenor
2019	268,955,414	14.94 gr/tonne Ag
2020	4,430,000	16 gr/tonne Ag
2021	4,390,000	1.53-83.1 gr/tonne Ag
2022	23,240,000	2.24-41 gr/tonne Ag
2023	302,000,000	1.53-83.1 gr/tonne Ag

4.9. Forest Asset

Almost all of the forests of Türkiye are under the rule and possession of the state and are managed by the General Directorate of Forestry (GDF) based on the principle of sustainability. Pursuant to Article 26 of the Forestry Law No. 6831, all forests of the country are managed in accordance with forest management plans. In terms of the size and changes in forest areas, according to the results of forest inventory assessments carried out to date, the size of the general forest area was determined as 20.2 million hectares (26.1%) in 1963-1972, the first inventory period, and 23.4 million hectares (30%) in 2023, the last inventory year. According to the results of this inventory, there has been an increase of approximately 3.2 million hectares in the forest area in the last 51 years.

Table -11 Distribution of Forest Areas, 1946-2023 (GDF, 2024)

Forest Form	1963-1972	2019	2020	2021	2022	2023
Forest Total (ha)	20,199,296	22,740,297	22,933,000	23,110,000	23,245,000	23,363,071
Grove (ha)	10,934,607	21,540,131	21,656,366	21,833,366	22,248,680	22,367,745
Coppice Forest (ha)	9,264,689	1,200,166	1,276,634	1,276,634	996,320	995,326

Table -12 Türkiye's Tree Wealth (Planted Bark Trunk Volume) (GDF, 2024)

	Grove (m^2)	Coppice Forest (m^2)	Total (m^2)
Normal Closed	1,693,480,606	12,092,622	1,705,573,228
Hollow Closed	64,834,630	3,264,429	68,099,059
Total	1,758,315,236	15,357,051	1,773,672,287

4.10. Pasture, Meadow, Grassland, Summer Pasture, Winter Pasture

Within the scope of the Pasture Law No. 4342, the Ministry of Agriculture and Forestry carried out pasture surveys on an area of 13,147,701 ha.

Meadow Pasture Improvement and Management Projects are implemented by the Ministry of Agriculture and Forestry in order to increase the grazing capacity of pastures, summer pastures and winter pastures by improving their grazing capacity, improving the quality of grass, preventing erosion by applying soil conservation measures. In this context, a total of 2,957 Meadow Pasture Improvement and Management Projects have been implemented on an area of 22,011,202 decares so far.

5. Energy

5.1. Renewable Energy Sources

Population growth, Urbanization and industrialisation phenomena, increasing trade opportunities as a result of globalisation are gradually increasing the demand for natural resources and energy. Among the Organisation for Economic Co-operation and Development (OECD) countries, Türkiye is one of the countries with the fastest increase in energy demand in the last 10 years. Projections made by the Ministry of Energy and Natural Resources indicate that this trend will continue in the medium and long term.

The strategies and policies of the Ministry of Energy and Natural Resources are based on the principles of energy supply security, alternative energy resources, resource diversification, bringing domestic resources into the economy, sustainability, liberalisation of energy markets and energy efficiency.

As of the end of 2022, Türkiye's installed capacity of electrical energy has reached 103,809 MW, of which 54.3% is renewable energy and 45.7% is other sources. Efforts are underway to maximise the use of hydraulic energy, which constitutes the majority of the renewable installed capacity. Within the scope of these efforts, the installed capacity of hydraulic energy reached 31,571 MW by the end of 2022.

The share of natural gas in electricity generation decreased from 33.2% at the end of 2021 to 22.9% at the end of 2022. 20.3% of the total electricity generation was generated from hydroelectric power plants, 13.7% from lignite coal, 20.9% from imported coal, 10.6% from wind, 5.1% from solar and 3.4% from geothermal sources.

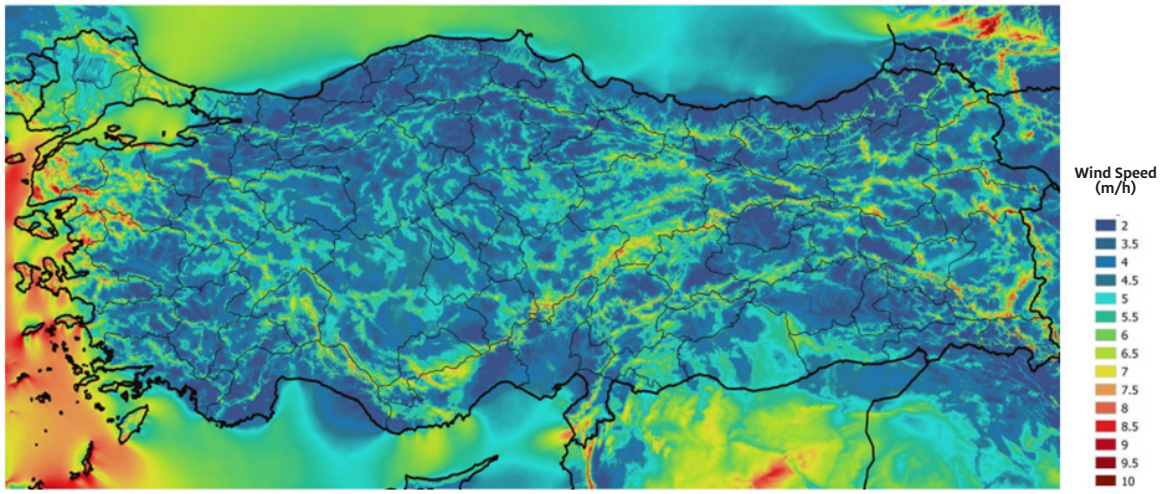
Map -5 Solar Energy Potential (General Directorate of Energy Affairs (GDEA), 2024); https://gepa.enerji.gov.tr/

The installation of the solar power plant in Konya-Karapınar was completed and commissioned on 01.03.2023 with an installed capacity of 1,350 MWp/1,000 MWe. This facility generates at least 2 billion kWh of electricity per year.

With the YEKA SPP-3 Competitions held in 2021, it was aimed to allocate a total of 1,000 MWe connection capacities of 10 MWe, 15 MWe and 20 MWe each, covering 36 provinces, to 74 different investors, and the YEKAs to be announced on the condition of using photovoltaic modules with at least 70% domestic contribution rate. Environmental Impact Assessment (EIA) processes are ongoing for the projects.

Within the scope of YEKA SPP-4 Competitions held in 2022, competitions were held for the installation of 15 solar power plants in 50-100 MWe capacities in Niğde-Bor, Hatay-Erzin and Şanlıurfa-Viranşehir YEKA in order to allocate a total of 1,000 MWe connection capacity with the condition of using photovoltaic modules with at least 75% domestic contribution rate.

Map -6 Türkiye Wind Energy Potential Atlas (General Directorate of Energy Affairs (GDEA), 2024)



The installation of the 25 MWe Akköy Wind Power Plant (WPP) Project in Aydın Region was completed in 2023. EIA and zoning studies are ongoing for the remaining capacity.

Within the scope of the 12th Development Plan, energy sector targets for 2028 are given in Table 13.

Table -13 Energy Sector Targets for 2023 (12th Development Plan, 2024)

Targets	Target Year: 2028
Primary Energy Demand (BTEP)	190,000
Electric Energy Demand (TWh)	430
Per Capita Primary Energy Consumption (TEP/Person)	2
Per Capita Electricity Consumption (kWh/Person)	4,700
Share of Natural Gas in Electricity Generation (%)	15
Share of Renewable Resources in Electricity Generation (%)	50
Amount of Electric Energy Generated from Domestic Sources (TWh)	270
Electricity Installed Capacity (MW)	136,000

Table -14 Gross Energy Supply from Renewable Energy Sources in Türkiye (Million TEP) (General Directorate of Energy Affairs (GDEA), 2024)

	2017	2018	2019	2020	2021	2022
Wood	1,356	0,971	1,046	1,152	1,191	1,360
Animal and Vegetable Residues	1,050	1,883	1,937	2,123	2,678	2,993
Hydraulic	5,007	5,155	7,639	6,716	4,810	5,745
Geothermal (including Geothermal Heat)	7,128	8,343	9,651	10,576	11,234	11,514
Biofuel	0,125	0,159	0,175	0,122	0,229	0,160
Wind	1,540	1,716	1,869	2,135	2,704	3,005
Solar	1,091	1,547	1,622	1,784	2,059	2,321

5.2. Electric Generation

In 2022, the distribution of the electricity generated by the organizations and their contributions are given in Table 15 below. Total electricity generation in 2022 was approximately 328.4 TWh. In 2022, Türkiye's electricity generation was 328,379 GWh and gross demand was 331,105 GWh. As of the end of 2022, the foreign purchase value was 6,439 GWh and the export value was 3,713 GWh.

Table -15 Electricity Generation and Shares by Institutions (by the End of 2022) (GDEA, 2024)

	Generation Quantity (GWh)	Generation Share (%)
EÜAŞ	46,971	14.30%
Transfer of Operating Rights	8,025	2.44%
Build-Operate	0	0.00%
Build-Operate-Transfer	188	0.06%
Independent Production Companies	257,475	78.41%
Unlicensed Power Plants	15,721	4.79%
Total	**328,379**	**100.00%**

Table -16 Distribution of Electricity Generation by Sources (By the End of 2022) (GDEA, 2024)

	Generation Quantity (GWh)	Generation Share (%)
Natural Gas	75,059	22.86%
Lignite	45,140	13.75%
Hard Coal	3,596	1.10%
Asphaltite Coal	1,568	0.48%
Imported Coal	63,415	19.31%
Fuel Oil	382	0.12%
Diesel Oil	10	0.00%
Other	1	0.00%
Biomass	9,453	2.88%
Geothermal	11,119	3.39%
Hydraulic Total	66,802	20.34%
Solar	16,888	5.14%
Wind	34,945	10.64%
Total Generation	**328,379**	**100.00%**

332.9 billion kWh of gross electricity demand in 2021 reached 331.1 billion kWh in 2022. By the end of 2022, Türkiye's total installed electricity capacity reached 103,809 MW. In this context, the distribution of installed capacity by fuel types as of the end of 2022 is given in Table 17. By the end of 2022, the share of renewable energy power plants in total installed capacity reached 54.3%.

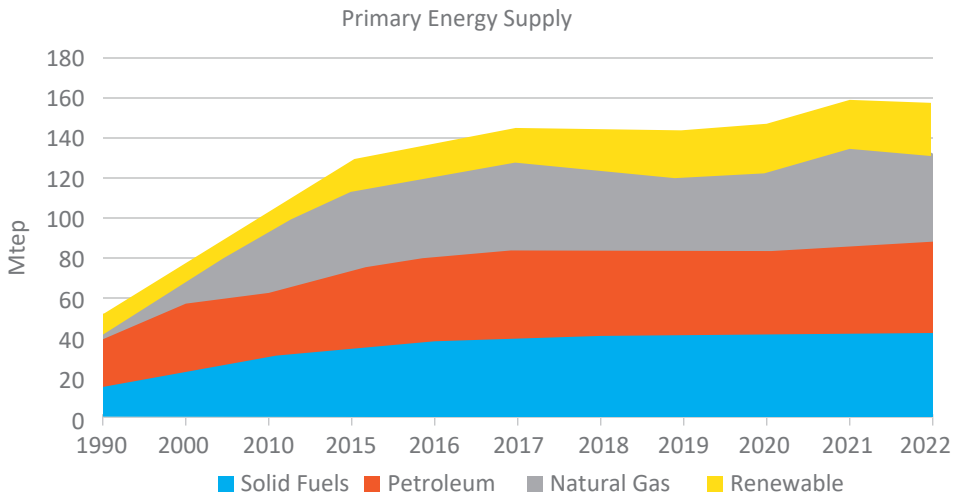
Table -17 Distribution of Installed Capacity in Türkiye (by the End of 2022) (Turkish Electricity Transmission Corporation (TETC), 2024) https://www.teias.gov.tr/turkiye-elektrik-uretim-iletim-istatistikleri

FUEL TYPES	NO. OF PLANTS	INSTALLED POWER (MW)	CONTRIBUTION (%)
Stream	610	8,296.3	8.0%
Asphaltite Coal	1	405.0	0.4%
Waste Heat	94	387.5	0.4%
Dammed	141	23,275.2	22.4%
Biomass	384	1,921.3	1.9%
Natural Gas	345	25,345.3	24.4%
Fuel Oil	9	251.9	0.2%
Solar	9,353	9,425.4	9.1%
Imported Coal	16	10,373.8	10.0%
Geothermal	63	1,691.3	1.6%
Lignite	46	10,191.5	9.8%
Lng	1	2.0	0.0%
Diesel Oil	1	1.0	0.0%
Naphtha	1	4.7	0.0%
Wind	358	11,396.2	11.0%
Hard Coal	4	840.8	0.8%
Total	**11,427**	**103,809.3**	**100.0%**

5.3 Total Primary Energy Supply

Graph 1 presents the development of Türkiye's primary energy supply over the years. Türkiye's primary energy supply was 157.8 million Total Equivalent Petroleum Equivalent (TOE) in 2022. The share of natural gas in primary energy supply is 27.4%, coal 26.2%, oil 28.6% and renewable energy 17.2%.

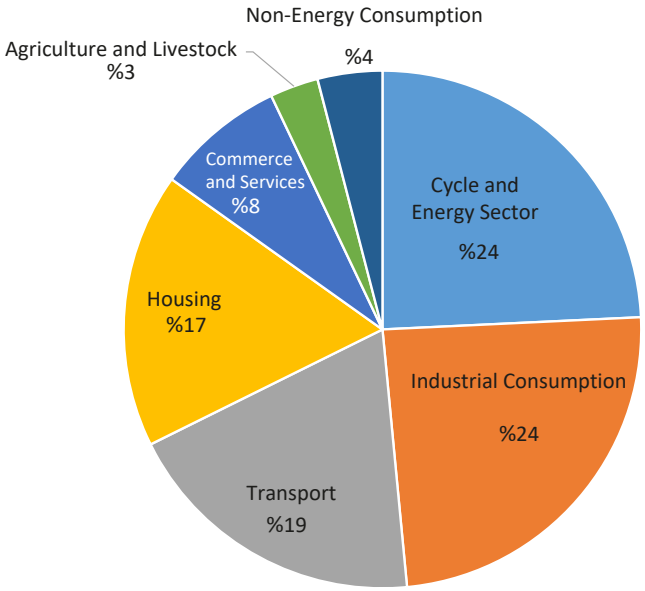
Graph 1 Türkiye's Primary Energy Supply (Ministry of Energy and Natural Resources, 2024)



5.4. Energy Consumption by Sector

In 2022, Türkiye's primary energy demand was realized as 257,770 thousand TOE. For 2022, the distribution of Türkiye's energy consumption by sectors is given in Chart 2. When the chart is analyzed, 24% was used in cycle and energy, 24% in industry, 19% in transport, 17% in housing, 8% in trade and services, 3% in agriculture and animal husbandry, 4% in non-energy consumption sectors.

Graph 2 Sectoral Breakdown of Türkiye's Energy Consumption in 2022 (Ministry of Energy and Natural Resources, 2024)



The ratio of meeting Türkiye's primary energy demand with domestic production was 32.2% in 2022. In other words, Türkiye's dependence on foreign energy is 67.8 per cent.

5.5 Energy Efficiency Studies

The main framework of energy efficiency studies in Türkiye was drawn with the Energy Efficiency Law No. 5627, which entered into force in 2007. With the Energy Efficiency Strategy Document (2012-2023) published in 2012, Türkiye's energy intensity (energy consumed per national income) is targeted to be reduced by at least 20% (compared to 2011) by 2023. For 2023, the National Energy Efficiency Action Plan (2017-2023), Türkiye's first energy efficiency action plan, was prepared as a roadmap for the work to be carried out in Türkiye and put into effect on 2 January 2018.

It is envisaged that a total of USD 10.9 billion will be invested in energy efficiency until 2023 for the realisation of 55 actions in 6 sectors (building, industry, transport, energy, agriculture and horizontal issues) in the Action Plan, and with the realisation of these investments, a cumulative energy saving of 23.9 million tonnes of oil equivalent (MTEP) and greenhouse gas emission reduction of 66.6 million CO_2 equivalent will be achieved. With the studies carried out within the scope of the National Energy Efficiency Action Plan (NEEAP) between 2017-2023, it was determined that a total of 8.47 billion USD was invested in energy efficiency in Türkiye, and 24 million 625 thousand TEP energy savings and 68.62 million tonnes of CO_2 equivalent emission reduction were achieved in return for this investment. In addition, approximately 45 thousand new green jobs have been created in the sector.

As for energy intensity, Türkiye's primary energy intensity index decreased by 1.7% and final energy intensity index decreased by 1.8% on average on annual basis in the period 2000-2022. Compared to 2000, there is an improvement of 31.2% in primary energy intensity index and 32.3% in final energy intensity index in 2022. With the Energy Efficiency Strategy Document (2012-2023), the target of reducing Türkiye's energy intensity by 20% in 2023 compared to 2011 was achieved before 2023 and Türkiye's energy intensity was reduced by 20.4% in 2022 compared to 2011.

The Energy Efficiency 2030 Strategy and NEEAP II, which will cover the period between 2024 and 2030, were prepared and announced to the public on 8 January 2024 in order to continue energy efficiency efforts without slowing down and to pursue an energy policy in line with national climate targets. With the NEEAP II, which includes a total of 61 actions in 7 sectors including buildings and services, energy, transport, industry, agriculture, start-ups and digitalisation and horizontal issues, it is aimed to invest USD 20.2 billion in energy efficiency between 2024-2030 and to achieve a cumulative primary energy saving of 37.1 Mtoe and a greenhouse gas reduction of 100 million tonnes CO_2 equivalent.

The Presidential Circular No. 2019/18 defined a 15% saving target for public buildings until the end of 2023. As a result of the notifications made by public institutions to MENR after this date, it was determined that a total of 72,642 TEP savings were achieved thanks to the energy efficiency measures implemented in 2019, 2020, 2021, 2022 and 2023. The economic equivalent of this saving is 1.4 billion TRY/year in 2023 prices. If energy efficiency measures are implemented in buildings with missing 2023 notifications, the amount of savings achieved will be even higher than this value. By evaluating the successful practices within the scope of the 15% savings target, the current savings target was updated with the Presidential circular numbered 2023/15 to be 30% by 2030. In this way, it is aimed to save 5.7 billion TRY/year, 300,000 TEP energy savings and 1 million tonnes of CO_2 equivalent emission reduction in return for 40 billion TRY of public investment at 2023 prices.

"Savings Target and Implementation Guide for Public Buildings (2024-2030)", prepared under the coordination of the Ministry of Energy and Natural Resources (MENR) in order to ensure energy efficiency and emission reduction by reaching the determined savings target, was published on the MENR website. In this guide, energy efficiency measures that can be implemented are explained and 3 different models are addressed for the realisation of investments. The legislative infrastructure for the dissemination of energy performance contracts in the public sector has been established, and studies are being carried out to improve the financial and technical infrastructure.

The heating and cooling sector is one of the important issues under the energy heading in terms of the 2053 net zero target. In this context, one of the studies carried out is the Türkiye Waste Heat Potential Assessment Project, which was completed in 2022, and the waste heat potential of Türkiye was determined as a result of survey studies, administrative records and sectoral consultations. The calculated potential for district heating from waste heat and intermediate vapours of industrial plants and thermal power plants is at a level to meet the heating needs of approximately 3.8 million houses. With the By-law made in the legislation, thermal power plants of 20 MWe and above are obliged to carry out waste heat-oriented studies. In this context, templates and guidelines for waste heat orientated studies have been published. As a result of the studies, the potential for district heating, waste heat recovery, renewable energy utilization and emission reduction in the surrounding areas with the heat to be obtained from thermal power plants will be revealed. In addition, cogeneration systems that produce electricity and heat together and save at least twenty percent of primary energy will be granted an efficiency certificate in order to benefit from licence exemption and subsidies.

In addition to providing the minimum efficiency and power/heat ratio specified in the Communiqué on the Procedures and Principles Regarding the Calculation of the Efficiency of Cogeneration and Microcogeneration Facilities, the facilities are required to save at least 10 per cent of primary energy resources. The total electrical installed capacity of the facilities for which Cogeneration Facility Efficiency Certificate is issued is 687 MWe and thermal installed capacity is 732 MWt. With these facilities, 3,537 GWh of primary energy resources will be saved annually. Within the scope of Phase 3 of the ongoing Türkiye-Denmark Strategic Sector Cooperation Energy Project on "Efficient and Low Carbon Heating and Cooling", it is planned to prepare templates for national and local heat plans for the development of efficient and low carbon heating and cooling in Türkiye, to develop capacity through case studies and to update the heat maps created in previous phases. As one of the case studies, Parmakören District Heating System Feasibility Study is being carried out in Kütahya Municipality.

Furthermore, in the Türkiye Heat Pump Market Assessment Project financed by the World Bank Energy Sector Management Assistance Programme (ESMAP), a Geographic Information Systems (GIS) based ground source heat pump potential map will be produced and evaluated together with other clean energy alternatives. With the studies carried out for the heating and cooling sector, it is aimed to reduce energy intensity and thus greenhouse gas emissions associated with energy consumption. In the short and medium term, it is aimed to establish the legislative infrastructure especially for district heating/cooling and heat pumps and to increase exemplary practices.

With the understanding that the cheapest energy is saved energy, energy efficiency investments are supported by the Ministry of Energy and Natural Resources through the Efficiency Improvement Project (VAP) and Voluntary Agreement (GA) grant programmes and by the Ministry of Industry and Technology within the scope of fifth region incentives with the aim of replacing inefficient equipment with efficient ones, raising the level of energy efficiency awareness and technological development and increasing energy efficiency practices.

- Within the scope of VAP, approximately 513 Million TRY support payments were made for 532 projects completed in accordance with the implementation project from 2009 to 2023, and the total investment amount of the projects is 129 Million TRY. As a result of the implementation of these projects, 118,325 TEP energy and approximately 842 Million TRY monetary savings were achieved annually. It is estimated that approximately 174 Million TRY support payments will be made for 295 ongoing projects and the total investment amount for the implementation of the projects is 578 Million TRY. With the implementation of these projects, it is expected that approximately 37,015 TEP energy and 221 Million TRY monetary savings will be achieved annually. In addition, in order to increase the efficiency of the efficiency-enhancing project support programme and to expand its scope, amendments were made to the Energy Efficiency Law No. 5627 with the Law No. 7501 on Amendments to the Mining Law and Certain Laws, which entered into force after being published in the Official Gazette dated 11/05/2024 and numbered 32543. With the arrangement made, sectoral restrictions for those who want to benefit from efficiency-enhancing project supports have been removed and with a general and inclusive approach, real and legal persons operating in all sectors from energy production to final consumption have been given the opportunity to apply for supports.

- The project fee of 5 million TRY, which was an obstacle to the implementation of projects with high energy saving potential, was removed and process and facility-based projects were included in the scope instead of equipment-based projects such as lighting, fans, pumps, electric motors, and projects with high saving potential, technological, innovative and contributing to digitalisation were enabled to benefit from the support.
- The amount of support provided to the projects was increased 10 times from 1.5 million TRY to 15 million TRY. Support of 30 per cent of the project value per project, up to a maximum of 15 million TRY will be provided.
- The support fee updated according to the current conditions will be increased every year at the revaluation rate announced for the previous year, effective from the beginning of the calendar year.
- Within the scope of GA, 0.9 million TRY support has been provided to 8 industrial enterprises that have reduced their energy intensity at the committed rate since 2009. As a result of this support, 5,542 TEP energy savings and 5.7 million TRY monetary savings were achieved annually. It is foreseen that 38 million TRY support payments will be made to 38 industrial enterprises with ongoing voluntary agreements and it is expected that 124.6 million TRY investment and 13,752 TEP energy savings will be achieved within the scope of voluntary agreements.
- Within the scope of the fifth region incentives, a total of 20 project applications have been made since 2014. With 1 completed project, annual monetary savings of 13.71 million TRY and annual energy savings of 978.40 TEP were achieved, and the investment amount of the project is 53 million TRY. In addition, with the implementation of 8 projects for which a favourable report has been prepared, approximately 361.69 million TRY monetary savings and 44,026.30 TEP energy savings will be achieved annually and the total investment amount of the projects is 1,546 million TRY.

6. Transport

6.1. Number of Vehicles Registered in Türkiye

Table -18 Number of Motor Land Vehicles by Years (TURKSTAT, 2024)

	2019	2020	2021	2022	2023
Car	12,503,049	13,099,041	13,706,065	14,269,352	15,221,134
Minibus	493,373	493,395	484,806	487,381	502,628
Bus	213,358	212,407	208,882	208,442	210,740
Pickup Truck	3,796,919	3,938,732	4,115,205	4,277,424	4,487,244
Truck [1]	844,481	859,670	886,303	919,125	959,793
Motorcycle [2]	3,331,326	3,512,576	3,744,370	4,141,914	5,079,396
Special purpose	65,470	70,309	78,482	85,276	93,407
Tractor	1,908,999	1,958,727	2,025,006	2,093,933	2,186,150
TOTAL	**23,156,975**	**24,144,857**	**25,249,119**	**26,482,847**	**28,740,492**

[1] Includes heavy tonnage freight vehicles (tow trucks, dump trucks, tankers, garbage trucks etc.)

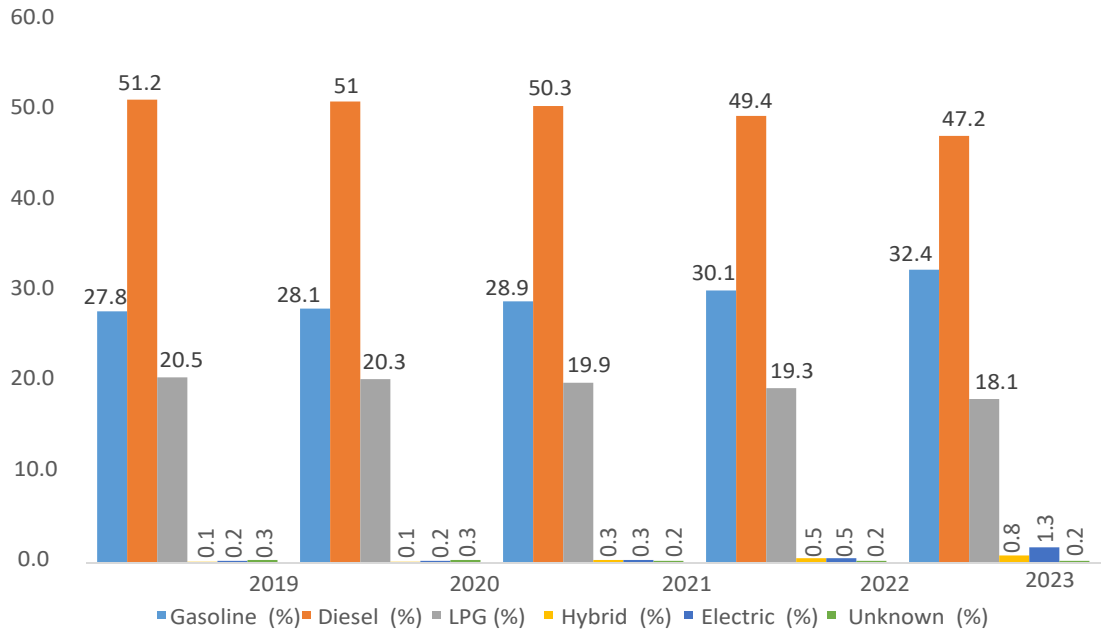
[2] Includes motorised bicycles.

Table -19 Distribution of Vehicles Registered in Traffic by Fuel Type, 2004 - 2023 (TURKSTAT, 2024)

Year	Total	Gasoline		Diesel		LPG		Hybrid[1]		Electric		Unknown[2]	
		Piece	%	Piece	%	Piece	%	Piece	%	Piece	%	Piece	%
2004	**10,236,357**	5,569,192	54.4	3,346,355	32.7	819,007	8.0	-	-	-	-	501,803	4.9
2005	**11,145,826**	5,606,321	50.3	3,836,399	34.4	1,298,830	11.7	-	-	-	-	404,276	3.6
2006	**12,227,393**	5,935,725	48.5	4,372,042	35.8	1,569,951	12.8	-	-	-	-	349,675	2.9
2007	**13,022,945**	5,980,516	45.9	4,850,837	37.2	1,880,023	14.4	-	-	-	-	311,569	2.4
2008	**13,765,395**	5,952,746	43.2	5,323,478	38.7	2,276,283	16.5	-	-	-	-	212,888	1.5
2009	**14,316,700**	5,887,559	41.1	5,654,350	39.5	2,592,695	18.1	-	-	119	0.0	181,977	1.3
2010	**15,095,603**	5,762,156	38.2	6,195,898	41.0	2,973,832	19.7	-	-	145	0.0	163,572	1.1
2011	**16,089,528**	5,709,606	35.5	6,899,420	42.9	3,335,566	20.7	-	-	280	0.0	144,656	0.9
2012	**17,033,413**	5,722,940	33.6	7,549,806	44.3	3,649,739	21.4	63	0.0	576	0.0	110,289	0.6
2013	**17,939,447**	5,733,725	32.0	8,169,410	45.5	3,934,753	21.9	98	0.0	995	0.0	100,466	0.6
2014	**18,828,721**	5,788,505	30.7	8,782,462	46.6	4,161,003	22.1	128	0.0	3,067	0.0	93,556	0.5
2015	**19,994,472**	5,977,352	29.9	9,576,896	47.9	4,358,751	21.8	343	0.0	5,504	0.0	75,626	0.4
2016	**21,090,424**	6,142,806	29.1	10,337,907	49.0	4,527,674	21.5	540	0.0	8,996	0.0	72,501	0.3
2017	**22,218,945**	6,321,658	28.5	11,102,943	50.0	4,705,599	21.2	949	0.0	17,312	0.1	70,484	0.3
2018	**22,865,921**	6,390,297	27.9	11,592,878	50.7	4,785,035	20.9	4,439	0.0	25,728	0.1	67,544	0.3
2019	**23,156,975**	6,427,550	27.8	11,865,482	51.2	4,749,808	20.5	13,901	0.1	35,843	0.2	64,391	0.3
2020	**24,144,857**	6,782,575	28.1	12,311,225	51.0	4,904,546	20.3	33,805	0.1	48,905	0.2	63,801	0.3
2021	**25,249,119**	7,296,270	28.9	12,704,380	50.3	5,028,359	19.9	86,899	0.3	70,254	0.3	62,957	0.2
2022	**26,482,847**	7,969,926	30.1	13,070,762	49.4	5,115,423	19.3	134,914	0.5	129,415	0.5	62,407	0.2
2023	**28,740,492**	9,300,769	32.4	13,571,596	47.2	5,215,533	18.1	222,586	0.8	367,692	1.3	62,316	0.2

TURKSTAT, Motor Land Vehicles
Figures in the table may not sum to the total due to rounding.
[1] Includes hybrid, petrol-electric and diesel-electric cars.
[2] Unknown fuel type includes cars for which the fuel type is left blank or incorrect data is entered by mistake in the registration process.
- No information available.

Graph 3 Distribution of registered vehicles according to fuel type, 2019- 2023



6.2. Domestic Freight and Passenger Transport in Türkiye

Cargo and passenger transport in Türkiye is largely carried out by road transport. As of March 2024, the General Directorate of Highways has a total road network of 68,654 km, of which 3,726 km (5.4%) are motorways.

Table -20 Length of Highway Network under the Responsibility of General Directorate of Highways (GDH) by Years (kms) (Ministry of Transport and Infrastructure, 2024)

Years	State Road	Provincial Road	Motorway	Total
2019	31,006	34,165	3,060	68,231
2020	30,974	34,136	3,523	68,633
2021	30,967	34,042	3,532	68,541
2022	30,940	34,116	3,633	68,689
2023	30,864	34,064	3,726	68,654

Table -21 Values of Freight and Passenger Transport on Highways by Years (Ministry of Transport and Infrastructure, 2024)

	2019	2020	2021	2022	2023
Passenger-Km (Million)	339,601	288,992	336,188	348,489	380,178
Tonnes-Km (Million)	267,579	272,913	311,818	323,512	335,126

Table -22 2019 - 2023 Total Railway Length (kms) (Ministry of Transport and Infrastructure, 2024)

	2019	2020	2021	2022	2023
TRUNK LINE	**10,378**	**10,378**	**10,546**	**10,651**	**11,417**
Conventional Line	9,194	9,194	9,158	9,235	9,235
High Speed Line	1,184	1,184	1,184	1,212	1,978
Fast Line	-	-	204	204	204
STATION AND INTERCONNECTION LINES	**2.425**	**2.425**	**2.476**	**2.477**	**2.502**
Conventional Line	2,396	2,396	2,432	2,433	2,433
High Speed Line	29	29	29	29	54
Fast Line	-	-	15	15	15
TOTAL RAILWAY LENGTH	**12.803**	**12.803**	**13.022**	**13.128**	**13.919**

Table -23 Domestic Freight and Passenger Transports by Rail (Including International) (Ministry of Transport and Infrastructure, 2024)

Number of Passengers (HST, Suburban, International, Conventional)					
YEAR	**2019**	**2020**	**2021**	**2022**	**2023**
Number of passengers (million)	246	149	192	322	342
Passenger-km (million)	14,259	8,297	10,663	19,789	21,122
Load Amount (Including Private Sector)					
YEAR	**2019**	**2020**	**2021**	**2022**	**2023**
Cargo quantity (tonnes) (million)	34	35	38	39	32
Freight tonnes-km (million)	14,707	15,428	15,863	16,187	13,108

Table -24 All Aircraft and Passenger Traffic at Airports in Türkiye (Ministry of Transport and Infrastructure, 2024)

		2019	2020	2021	2022	2023
Aircraft Traffic	Domestic	839,894	572,994	738,352	786,150	869,404
	International	716,523	280,756	466,266	702,476	816,473
	Total	**1,556,417**	**853,750**	**1,204,618**	**1,488,626**	**1,685,877**
Passenger Traffic	Domestic	99,946,572	49,740,303	68,466,177	78,323,824	90,390,766
	International	108,427,124	31,875,837	59,689,585	103,465,515	123,302,397
	Total	**208,373,696**	**81,616,140**	**128,155,762**	**181,789,339**	**213,693,163**

Table -25 Maritime Freight and Passenger Numbers (Ministry of Transport and Infrastructure, 2024)

YEAR	LOAD Tonnes x Km (Million)	Passengers Passenger x Km (Million)
2019	17,612	2,257
2020	20,742	1,204
2021	20,973	1,391
2022	22,119	1,831
2023	21,789	1,735

Entering into force in 2022, the "Combined Transport By-law" is an important step in ensuring Türkiye's transition to a sustainable and green future in national and international logistics. This By-law aims to encourage more environmentally friendly modes of transport, such as rail and maritime, by reducing the dependence on road transport.

Objectives of the By-law:

- Reducing environmental impacts and increasing energy efficiency in transport and logistics,
- Reducing carbon emissions and air pollution,
- Promoting green logistics practices,
- Ensuring holism and fair access in transport and logistics,
- Improving the quality of transport and logistics infrastructure,
- Making Türkiye a regional transit center for international freight flows.

The Main Elements of the By-law can be listed as follows:

- Green Logistics Certificate: It is given to Transport Organisers (TIO) that meet certain criteria such as performing at least 200 combined freight transport trips per year, meeting at least 5% of energy consumption from renewable energy sources.
- Combined Transport Expedition Certificate: Required for freight transport voyages using at least two of the following modes: road, maritime, railway and airway.
- Incentives and Supports: The Ministry of Transport and Infrastructure offers various incentives and supports to TIOs holding Green Logistics Certificate.

- Compliance and Audit: TIOs holding a Green Logistics Certificate must meet certain environmental performance standards and be subject to regular audits.

Among the main benefits of the By-law are the following:

- Environmental Benefits: Significantly reduces greenhouse gas emissions and air pollution by reducing reliance on road transport.
- Economic Benefits: Helps reduce logistics costs and increase energy efficiency.
- Social Benefits: Reduces health problems and traffic accidents caused by air pollution.

In conclusion, the Combined Transport By-law is an important step in Türkiye's transition to a sustainable transport system. This By-law will contribute to Türkiye's progress towards becoming a global actor in the logistics sector by providing many environmental, economic and social benefits.

6.3. International Maritime Transport

The IMO Initial Strategy of the International Maritime Organisation (IMO) to prevent air pollution and reduce greenhouse gas emissions from international maritime transport, which includes establishing regulatory rules and supporting the effective implementation of these regulatory rules around the world, and carrying out global capacity building projects to promote innovation and technology transfer, was adopted in 2018.

In the First IMO Strategy, which sets out with the target of reducing total emissions by 50% by 2050 compared to 2008, the emission reduction process is designed to be carried out in three stages as short-, medium- and long-term measures. Short-term measures include technical and operational measures to increase energy efficiency in ships, medium term measures include a basket of economic and technical measures such as carbon pricing and fuel standards, and long-term measures are determined as practices to support the conversion of alternative low-carbon fuels. In order to reach the 2030 carbon intensity target, technical measures to increase the energy efficiency of ships within the scope of short-term measures (Energy Efficiency Design Index for Ships (EEDI) and Energy Efficiency Index for Existing Ships (EEXI)) and operational measures to increase the energy efficiency of ships (Energy Efficiency Management Plan for Ships (SEEMP) and Carbon Intensity Index for Ships (CII) were put into effect.

Adopted in 2018, the IMO First strategy was updated in 2023 and new more stringent targets were set for reducing emissions. With the 2023 Strategy, it is aimed to reduce the increase in greenhouse gas emissions from maritime transport as soon as possible, to calculate emissions with life cycle assessment and to reach net-zero emissions around 2050.

In accordance with Annex VI of the International International Convention for the Prevention of Pollution from Ships (MARPOL), the sulphur limit in fuels used in ships has been limited to 0.5% as of 01/01 /2020 in order to reduce air pollution from ships and these limitations have started to be implemented all over the world and in Türkiye. In Sulphur Oxide (SO_x) Emission Control Areas (ECA), the sulphur content limit in fuel is applied as 0.1%.

As a result of the amendment to MARPOL Annex VI in 2022, the entire Mediterranean Sea was designated as an Emission Control Area (ECA) for Sulphur Oxides (SO_x) and Particulate Matter (PM). In this context, in order to limit sulphur emissions from ships, to reduce the negative effects of air pollution on human and environment and to create a clean environment, the Ministry

of Transport and Infrastructure published the "Inspection Directive on Determination of Sulphur Content in Ship Fuels" on 14/06/2022. With the Directive, ships anchored in the administrative responsibility areas of Port Authorities or docking at the coastal facility must immediately switch to the use of marine fuels whose sulphur content does not exceed 0.1% by mass and inspections are carried out in these areas.

A "Green Port Policy" framework was developed in 2014 as a long-term plan for implementing sustainable practices and determining the direction of future port development and operations. In this context, the "By-law on Issuing Green Port Certificate to Coastal Facilities" prepared by the Ministry of Transport and Infrastructure was published in the Official Gazette dated 18/11 /2023 and numbered 32373. The Green Port certification programme aims to be a guide to strengthen the competitiveness of Turkish port operators and stakeholders, and to date, 20 port facilities of Türkiye have been awarded "Green Port Certificate" by the Ministry of Transport and Infrastructure within the scope of the project.

6.4. General Transport Policies on Energy Efficiency and Environment

In line with Türkiye's 2053 "Net Zero" target, the Ministry of Transport and Infrastructure considers the reduction of emissions from the transport sector as a critical parameter in its forward-looking plans. In this context, the 2053 Transport and Logistics Master Plan is the supporting document for future infrastructure and transport projects in Türkiye.

When Türkiye's greenhouse gas emissions are analyzed, it is seen that greenhouse gas emissions from transport are mostly road-based. Based on this, in the 2053 Transport and Logistics Master Plan, it is aimed to reduce the greenhouse gas emissions of Türkiye by adopting the "Environmental (Sustainable) Scenario" with the main objective of shifting road-dominated passenger and freight transport to railways and to ensure decarbonisation of the transport sector in particular.

Within the scope of the 2053 Transport and Logistics Master Plan, it is aimed to ensure a shift from road transport on both passenger and freight basis by focusing on railway infrastructure projects. In this context, it is aimed to increase Türkiye's railway infrastructure from 13,919 km in 2023 to 17,011 km in 2028 and to 28,590 km in 2053.

2053 Transport and Logistics Master Plan aims to increase the number of railway passengers from 25 million to 270 million by 2053, to increase the number of provinces connected by high-speed train line from 11 to 52 and to increase the annual freight transport from 32 million tonnes to 448 million tonnes. In this direction, important projects such as Ankara-Sivas high-speed train line and Konya-Karaman high-speed train line within the scope of 2053 Transport and Logistics Master Plan have been put into service, and the construction works of 3,776 km railway projects, especially İzmir-Ankara, Mersin-Adana-Gaziantep and Halkalı-Kapıkule high-speed train line projects, are continuing.

In the 2053 Transport and Logistics Master Plan, in addition to expanding the railway network, it is also aimed to increase the number of logistics centres, which are important in terms of intermodal transport activities, from 12 to 28, and to increase the number of transmission line connections to ports, organised industrial zones, mining sites and logistics centres in order to develop rail freight transport. The Ministry of Transport and Infrastructure carries out the necessary international dialogues to strengthen rail transport in international corridors (Development Road,

Middle Corridor) and to ensure decarbonisation in international freight transport and prioritises railway projects integrated to the international railway network.

In addition, the "Carbon-Neutral Airport Project" was initiated by the Ministry of Transport and Infrastructure in order to control the possible impacts of all ongoing activities at airports on the environment, to leave a more livable world to the next generations through measures taken against global warming and climate change, and to ensure sustainable airport operations.

7. Tourism

According to the World Tourism Organization data, Türkiye ranks 5th in the world and 4th in Europe in terms of the number of tourists in 2023, and ranks 7th in the world and 5th in Europe in terms of tourism revenues in the same year.

Table -26 Distribution of Foreign Visitors to Türkiye by Year and Month (Ministry of Culture and Tourism, 2024)

	YEARS			
MONTHS	2020	2021	2022	2023
JANUARY	1,787,435	509,787	1,281,666	2,005,967
FEBRUARY	1,733,112	537,976	1,541,393	1,870,414
MARCH	718,097	905,323	2,079,565	2,335,728
APRIL	24,238	790,687	2,574,423	3,321,824
MAY	29,829	936,282	3,873,212	4,500,242
JUNE	214,768	2,047,596	5,014,821	5,584,021
JULY	932,927	4,360,952	6,664,970	7,148,044
AUGUST	1,814,701	3,982,168	6,304,770	6,660,700
SEPTEMBER	2,203,482	3,513,453	5,475,453	5,786,027
OCTOBER	1,742,303	3,471,540	4,803,198	4,987,112
NOVEMBER	833,991	1,763,982	2,551,483	2,525,345
DECEMBER	699,330	1,892,520	2,399,441	2,483,756
TOTAL	**12,734,213**	**24,712,266**	**44,564,395**	**49,209,180**

8. Agriculture

8.1. Organic Agriculture and Good Agricultural Practices

Organic agriculture is a sustainable, traceable, and certified production system that designs animal and plant production as a whole, increases its productivity with an understanding that does not disrupt the structure of the soil, is based on animal welfare, aims to use inputs provided from within the enterprise, utilises the latest information and technology, and requires control and certification within certain rules from seed to soil, from input to processing.

In Türkiye, organic agriculture activities are carried out within the framework of the contract between the entrepreneurs and the Control and Certification bodies authorised by the Ministry of Agriculture and Forestry, based on the principle of voluntariness within the scope of the provisions of the Organic Agriculture Law No. 5262 and the "By-law on the Principles and Imple-

mentation of Organic Agriculture" published in the Official Gazette No. 27676 dated 18/08/2010, issued on the basis of this law, following international standards and legislation.

Activities related to Good Agricultural Practices are carried out in accordance with the provisions of the "By-law on Good Agricultural Practices" published in the Official Gazette dated 07/12/2010 and numbered 27778. The Dissemination and Control of Organic Agriculture Project has been implemented since 1997 and the Dissemination and Control of Good Agricultural Practices Project has been implemented since 2012.

Table -27 Organic Crop Production Data (2019-2022), (Ministry of Agriculture and Forestry, 2024)

Year	Number of crops	No. of farmers *	Area (ha) *	Production Amount (tonnes)*
2019	213	74,545	545,870	2,030,466
2020	235	52,590	382,665	1,631,943
2021	263	48,244	351,919	1,590,086
2022	268	44,927	310,584	1,600,858

*Transition process data included.

Table -28 Organic Animal Production Data (2019-2022) (Ministry of Agriculture and Forestry, 2024)

Year	Cattle (Number)*	Sheep (Number)*	Poultry (Number)*	Hive (Number)*
2019	5,543	17,184	848,619	71,584
2020	7,888	2,454	1,119,823	89,128
2021	8,109	2,004	800,252	94,736
2022	7,220	5,330	684,408	95,733

*Transition process data included.

Table -29 Good Agricultural Practices Crop Production Data (2019-2022) (Ministry of Agriculture and Forestry, 2024)

Year	No. of Provinces	No. of Producers	Production Area (da)	Production Amount (Tonnes)
2019	66	61,894	5,396,073	7,706,404
2020	61	14,051	2,547,544	5,716,616
2021	63	10,265	3,894,849	6,162,544
2022	70	9,570	2,068,933	5,336,252

8.2. Fertiliser, Soil Conditioners and Pesticide Use

Fertiliser use in Türkiye remains below both the World and European Union averages and the potential need. In 2023, a total of 2.9 million tonnes of chemical fertilisers were used in Türkiye on the basis of soil nutrients of plant matter.

9. Industry

One of the most important elements of economic and sustainable development is industrial production. In particular, the manufacturing industry is of critical importance in terms of its capacity to generate income and employment as well as its impact on reducing the current account deficit due to its links with the agriculture and services sectors.

In Türkiye, since the establishment of the Republic, policies to encourage the industrial sector and especially the manufacturing industry have been emphasised. The improvements in productivity and competitiveness achieved through industrialisation policies have led to a significant increase in the value added of the manufacturing industry in Türkiye compared to the 1980s.

When the development of the industrial sector in Türkiye is analyzed, it is noteworthy that its share in the Gross Domestic Product (GDP) increased in the 2002-2023 period. As a matter of fact, its share in GDP, which was 20.1% in 2002, reached its highest level of 26.4% in 2022 and 22.7% in 2023. In the same period, the share of manufacturing industry in GDP increased from 16.9 per cent to 19.4 per cent.

Industrial production has continuously increased except for the crisis years. The industrial sector is an important sector especially in terms of creating permanent employment.

Organised Industrial Zones (OIZ):

OIZ implementations, which are one of the many incentive measures implemented for the development of industry in Türkiye were first initiated with the establishment of an OIZ in Bursa in 1962. As of today, the number of OIZs that have been granted legal personality by the Ministry of Industry and Technology has reached 361.

Another study is the 'Green OIZ Certification Programme'. In 2023, responsibilities regarding the Green OIZ Certification System were determined. The Ministry of Industry and Technology has determined 6 preliminary criteria, and the OIZs that have passed these preliminary criteria have started to be evaluated according to the performance indicators created by the Turkish Standards Institute. In 2023, 26 applications were made and 21 of them passed to the evaluation stage.

References

Ministry of Energy and Natural Resources
Ministry of Culture and Tourism
Ministry of Agriculture and Forestry
Ministry of Transport and Infrastructure
Ministry of Industry and Technology
Energy Market Regulatory Authority
General Directorate of Energy Affairs
Turkish Statistical Institute
General Directorate of Meteorology
General Directorate of Forestry
General Directorate of Mining and Petroleum Affairs
General Directorate of Mineral Research and Exploration
Turkish Electricity Transmission Corporation

A. AIR

A.1. Maintaining Air Quality

The Ministry of Environment, Urbanization and Climate Change (MoEUCC) carries out the activities within the scope of the "Long-Term Financing of the Cooperation Programme for Monitoring and Assessment of Long-Range Transboundary Air Pollution in Europe - EMEP Protocol" of the United Nations Economic Commission for Europe (UN-ECE) "Convention on Long-Range Transboundary Air Pollution (CLRTAP)" to which we are a party. The Convention entered into force on 13/11/1979 and Türkiye became a party to the Convention on 18.04.1983.

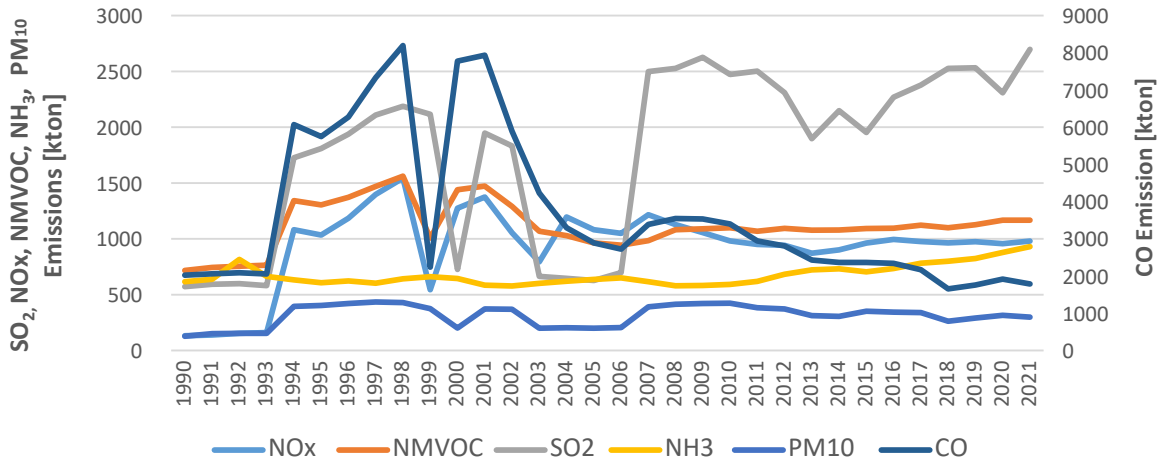
With the "EMEP Protocol", to which Türkiye became a party on 20/12/1985, it is aimed to collect air pollutant emission inventories of all party countries, to model the inventory data for the EMEP region and to verify the model results with air quality measurements at long-range stations.

Within the scope of EMEP Protocol, annual air pollutant emission inventory reporting has been carried out by the MoEUCC as of 2012. Emission totals for selected air pollutants (PM10, PM2.5, NOx, SO_2, NMVOC, NH_3, CO, selected heavy metals) are calculated in kilotonnes (ktonnes) under the guidelines prepared by EMEP/European Environment Agency (EEA). This reporting is processed as official statistics on behalf of the MoEUCC within the Official Statistics Programme of TURKSTAT.

Access information for reporting on the web page of the MoEUCC is available at https://cygm.csb.gov.tr/hava-yonetimi- department-baskanligi-i-i-85473. Informative Inventory Report based on the inventory is reported together with the national air pollutant emission inventory. The files within the scope of reporting are registered in the EEU EIONET (European Environmental Information and Observation Network) database together with the UN Convention secretariat. Since 2016, the emission calculations for indirect greenhouse gases—classified among the air pollutants reported by the Ministry of Environment and Urbanization—have been used in the greenhouse gas reporting coordinated by TÜİK in compliance with the United Nations Framework Convention on Climate Change.

Under the umbrella of the Convention and Protocol, "Country Review" meetings are organised every 5 years for regular country reporting, and since 2012, reviews for Türkiye have been carried out by the Convention Task Forces in 2012, 2016 and 2019.

Graph 4 Emission Totals for SO_2, NO_X, NMVOC, NH_3, CO and PM10 for the years 1990-2021 (MoEUCC, 2024)



When the status of emissions for the years 1990-2021, which are covered by the reporting based on 2023 above, is analyzed, it is seen that emission totals are not in a very serious increase course, especially in combustion-derived pollutants, depending on emission management policies. As of 2021, national emission totals are NOx 980 ktonnes, NMVOC 1,166 ktonnes, SOx 2,697 ktonnes, NH_3 930 ktonnes, PM10 299 ktonnes and CO 1,786 ktonnes.

The time series and emission changes both since 1990 and compared to the previous year are presented in Table 30.

Table -30 Emission Trends for SO_2, NOx, NMVOC, NH_3, CO and PM10 (MoEUCC, 2024)

Change by Years (%)	SO_2	NO_X	NMVOC	NH_3	CO	PM_{10}
Trend (1990-2021)	372%	643%	63%	51%	-12%	135%
Trend (2020-2021)	17%	2%	-1%	6%	-7%	-5%

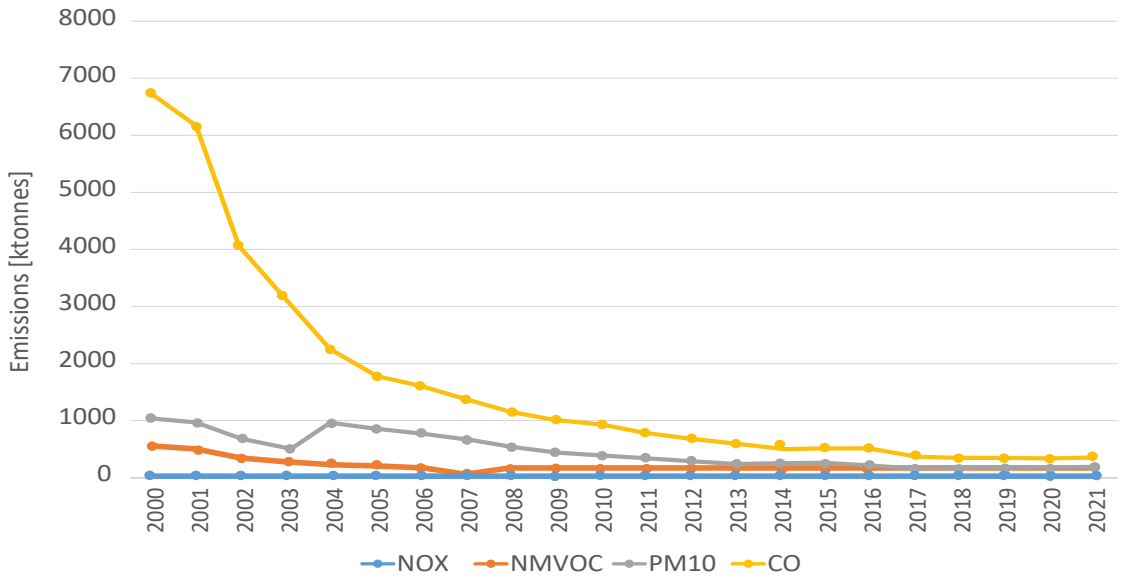
From the 2021 national emissions, SO_2 emissions originated from power generation plants with 68.6% and domestic heating with 13.9%. NO_x emissions originated from power generation plants with 37%. 21.7% of NMVOC emissions originated from livestock sector. The main source of NH_3 emissions was also due to livestock breeds.

A.1.1. Air Pollutants from Transport

Another important sector included in the National Air Pollutant Emission Inventory is transport. Emissions from transport are calculated separately for road, maritime, airway and railway sectors.

Graph 5 shows the 2000-2021 time series section of nationally calculated road emissions totals. When the emissions are analyzed, the downward trend in vehicle emissions with the renewed engine technologies is noteworthy.

Graph 5 Total Emissions from Road Transport (2000-2021) (MoEUCC, 2024)



A.2. Measurement Stations

A.2.1. Air Quality in Cities

In Türkiye, air pollution is observed in some city centres especially in winter season depending on meteorological conditions. As a result of the use of natural gas and quality fuels in heating, air pollution has decreased especially in big cities compared to the 1990s.

Air quality measurement stations have been established in 81 provinces by the MoEUCC in order to monitor air quality throughout Türkiye. Starting with 35 stations in 2005, the number of stations included in the National Air Quality Monitoring Network reached 380 by 2023.

The data received from the measuring stations are published simultaneously on the official website of the MoEUCC "Continuous Monitoring Centre" sim.csb.gov.tr and www.havaizleme.gov.tr. In order to facilitate public access to information on air quality, monitoring results are published on the web address www.havaizleme.gov.tr. National Air Quality Index (expressed as Good, Moderate, Sensitive, Unhealthy, Poor, Hazardous) has been created for the public to better understand the issue.

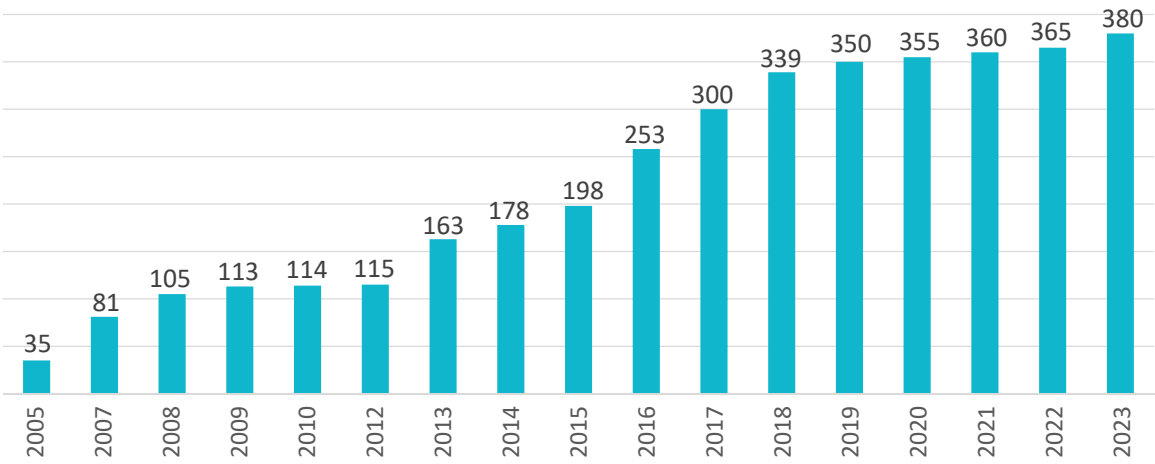
Within the scope of the harmonisation process with the EU Legislation, air quality limit values have been gradually reduced since 2008 in order to improve the air quality in Türkiye, and full compliance with the EU limit values for particulate matter and sulphur dioxide parameters has been achieved as of 2019. For nitrogen dioxide, full compliance with EU limit values was achieved as of 1 January 2024.

In addition, 8 Regional Clean Air Centres (RCAC) have been established throughout the country in order to carry out air quality monitoring activities effectively, and the list of stations connected to RCAC is given in Table 31.

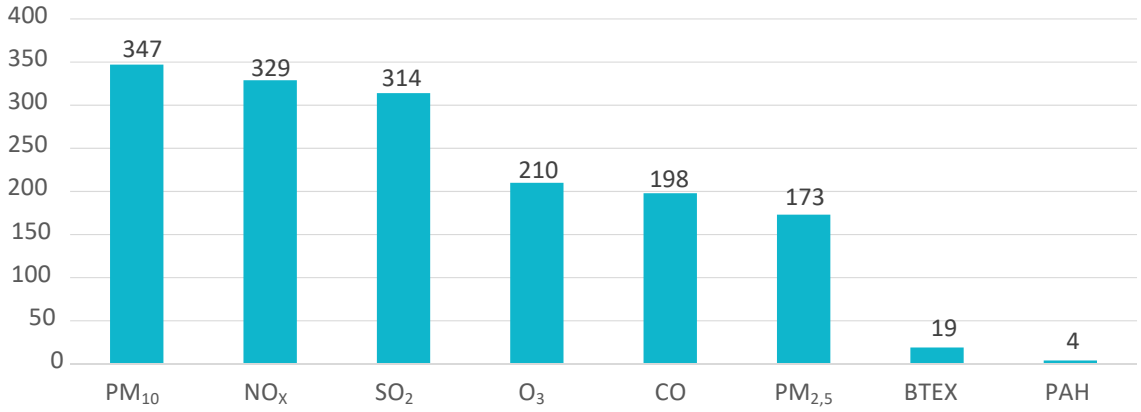
Table -31 Clean Air Centres and Affiliated Provinces (MoEUCC, 2024)

Clean Air Centre	Centre	Affiliated Provinces
Marmara	İstanbul	İstanbul, Bursa, Kocaeli, Sakarya, Çanakkale, Balıkesir, Yalova, Bilecik, Tekirdağ, Edirne, Kırklareli
Aegean	İzmir	İzmir, Manisa, Uşak, Denizli, Aydın, Muğla
Southern Central Anatolia	Konya	Konya, Isparta, Burdur, Antalya, Karaman, Niğde, Aksaray, Afyonkarahisar, Nevşehir, Kayseri
Northern Central Anatolia	Ankara	Ankara, Kütahya, Eskişehir, Kırşehir, Kırıkkale, Yozgat, Çankırı, Kastamonu, Karabük, Bartın, Zonguldak, Düzce, Bolu
Mediterranean	Adana	Adana, Mersin, Kahramanmaraş, Kilis, Gaziantep, Hatay, Osmaniye
Middle Black Sea	Samsun	Samsun, Sinop, Amasya, Çorum, Tokat, Sivas, Ordu, Giresun
Southeast Anatolia	Diyarbakır	Diyarbakır, Urfa, Mardin, Şırnak, Hakkari, Siirt, Van, Bitlis, Batman, Muş, Bingöl, Tunceli, Elazığ, Malatya, Adıyaman
Eastern Anatolia	Erzurum	Erzurum, Ağrı, Iğdır, Kars, Ardahan, Artvin, Rize, Trabzon, Gümüşhane, Erzincan, Bayburt

Graph 6 Air Quality Measurement Stations (MoEUCC, 2024)



Graph 7 Number of Parameters Measured at Stations (MoEUCC, 2024)



Map 7 Air Quality Stations Website Home Page (www.havaizleme.gov.tr; sim.csb.gov.tr, 2024)

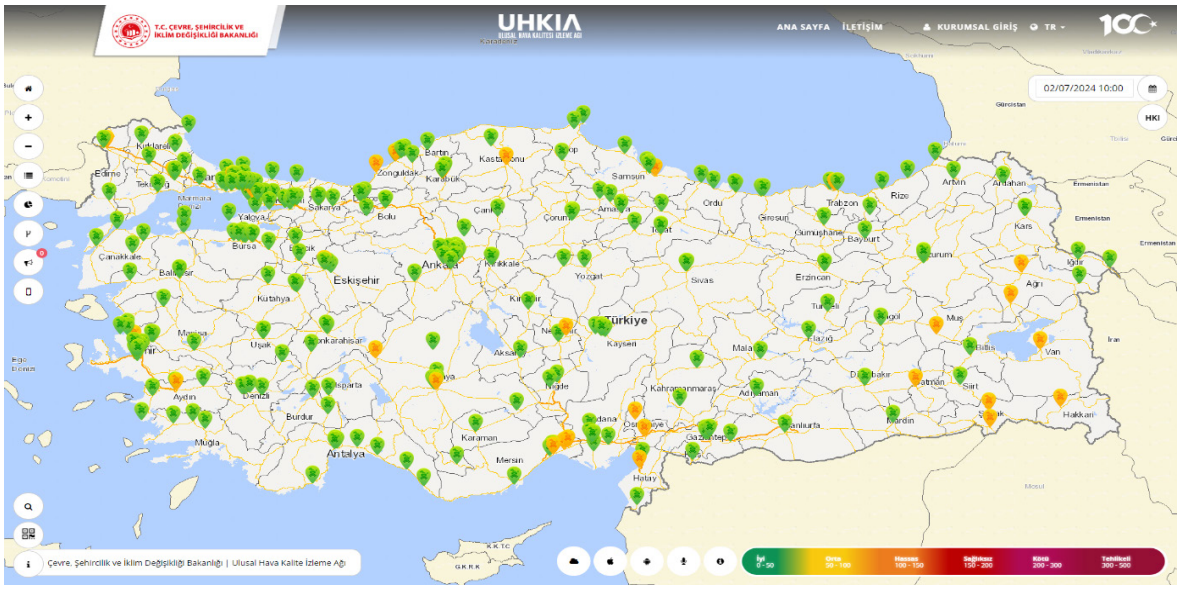


Table -32 Annual Averages of Particulate Matter (PM10) Obtained from Stations Measured in Provincial and District Centres (MoEUCC, 2024)

Station Name	2020	2021	2022	2023
Adana - Çatalan	20	23	26	24
Adana - Çukurova	*	36	35	38
Adana - Doğankent	9	39	42	45
Adana - Meteoroloji	44	28	81	66
Adana - Valilik	51	53	45	39
Adana-Seyhan	*	63	49	41
Adana-Turhan Cemal Beriker Bulvarı	*	43	50	48
Adana-Yakapınar	*	50	52	48
Adıyaman	53	56	26	25
Afyon - Merkez/Karayolları	*	50	33	36
Afyon - Sandıklı	*	*	44	33
Afyon-Selçuk Cami	39	37	38	33
Ağrı	53	86	51	44
Ağrı - Doğubeyazıt	80	99	70	47
Ağrı - Patnos	87	73	61	43
Aksaray	45	44	44	37
Amasya	37	30	39	38
Amasya - Merzifon	44	31	31	30
Amasya - Suluova	55	43	40	38
Amasya - Şehzade	63	54	57	44
Ankara - Bahçelievler	53	33	38	34

Station Name	2020	2021	2022	2023
Ankara - Batıkent	51	38	43	48
Ankara - Çankaya	41	20	19	19
Ankara - Demetevler	53	35	27	33
Ankara - Etimesgut	88	33	39	33
Ankara - Etlik	41	29	27	29
Ankara - Kayaş	40	55	43	53
Ankara - Keçiören Sanatoryum	41	36	33	30
Ankara - Mamak	-	25	26	34
Ankara - Ostim	64	48	48	52
Ankara - Polatlı	40	41	34	30
Ankara - Sıhhıye	48	46	44	42
Ankara - Sincan	56	51	42	43
Ankara - Siteler	92	100	80	70
Ankara - Törekent	37	26	34	35
Ankara - Ulus	*	51	42	52
Ankara Yaşamkent	39	28	27	23
Antalya - Alanya	*	16	15	13
Antalya - Gazipaşa	*	21	26	26
Antalya - Kepez	44	42	45	51
Antalya - Kumluca	*	36	29	37
Antalya - Manavgat	*	44	40	30
Antalya - Muratpaşa	*	37	39	33
Antalya - Serik	*	31	33	24
Antalya - Trafik	*	27	33	35
Ardahan	30	56	53	41
Artvin	22	24	25	16
Artvin - Hopa	34	32	38	16
Aydın	42	38	48	23
Aydın - Didim	*	41	38	28
Aydın - Efeler	*	48	43	37
Aydın - Germencik	*	96	65	63
Aydın - Nazilli	*	92	85	77
Aydın - Söke	*	49	46	56
Aydın - Trafik	*	25	72	72

Station Name	2020	2021	2022	2023
Balıkesir	44	63	54	43
Balıkesir - Bandırma-MTHM	44	45	42	45
Balıkesir - Edremit - MTHM	35	45	57	60
Balıkesir - Erdek-MTHM	22	19	20	14
Balıkesir - Merkez - MTHM	52	57	67	69
Bartın	53	48	39	32
Batman	96	108	90	72
Bayburt	31	54	49	26
Bilecik	30	27	22	23
Bilecik - Bozüyük-MTHM	58	51	44	44
Bingöl	37	40	57	48
Bitlis	18	23	28	19
Bolu - Abant	14	24	34	33
Bolu - Karaçayır Parkı	38	37	52	32
Bolu - Kızılay Parkı	53	47	51	42
Burdur	41	39	42	37
Burdur - Bucak	*	42	44	43
Bursa	53	48	48	45
Bursa - Beyazıt Cad.-MTHM	52	47	48	46
Bursa - İnegöl-MTHM	58	64	66	50
Bursa - Kestel-MTHM	41	44	60	76
Bursa-Gürsu	*	*	*	52
Bursa-Kestel (Hilal Parkı)	*	*	*	49
Bursa-Nilüfer	*	*	66	75
Çanakkale	40	36	41	34
Çanakkale - Biga - MTHM	23	23	24	28
Çanakkale - Biga İçdaş	31	32	45	27
Çanakkale - Çan-MTHM	47	49	52	*
Çanakkale - Lapseki-MTHM	*	*	*	52
Çankırı	44	38	41	31
Çorum	44	42	54	47
Çorum - Bahabey	65	66	59	44
Çorum - Mimar Sinan	65	50	43	41
Denizli - Bayramyeri	72	76	79	51

Station Name	2020	2021	2022	2023
Denizli - Çivril	*	83	85	48
Denizli - Honaz	107	62	52	26
Denizli - Merkezefendi	48	51	53	45
Denizli - Sümer	*	164	92	45
Denizli - Trafik	*	93	95	71
Diyarbakır	39	44	43	40
Düzce	71	67	54	51
Düzce - Bahçeşehir	39	18	30	34
Düzce - Belediye	52	47	65	51
Edirne	68	81	53	49
Edirne - Karaağaç-MTHM	*	*	*	*
Edirne - Keşan-MTHM	45	45	43	41
Elazığ	53	42	41	36
Erzincan	64	56	53	41
Erzincan - Trafik	22	24	54	16
Erzurum	34	32	38	30
Erzurum - Aziziye	26	38	48	23
Erzurum - Palandöken	30	56	53	41
Erzurum - Pasinler	23	24	31	*
Erzurum - Taşhan	51	58	59	51
Eskişehir - Cumhuriyet Bulvarı	52	45	55	49
Eskişehir - Metin Sonmez	19	23	27	23
Eskişehir - Odunpazarı	54	44	42	43
Eskişehir - Tepebaşı	*	41	44	45
Eskişehir - Vişnepark	39	30	34	37
Gaziantep	54	55	56	63
Gaziantep - Beydilli	*	68	83	73
Gaziantep - Fevzi Çakmak	*	52	61	46
Gaziantep - Gaski D6	*	48	85	71
Gaziantep - Nizip	*	49	55	44
Gaziantep-Atapark	*	48	59	58
Giresun	53	48	39	29
Giresun - Gemilercekeği	38	30	30	23
Gümüşhane	48	37	49	49

Station Name	2020	2021	2022	2023
Hakkari	15	14	111	73
Hatay - Antakya	41	36	51	*
Hatay - İskenderun	13	10	30	21
Hatay - İskenderun Merkez	*	67	69	96
Hatay - Mustafa Kemal Üniv.	48	74	50	41
Hatay - Samandağ	56	51	31	41
Hatay - Vali Kavşağı	*	71	76	*
Iğdır	90	119	110	87
Iğdır - Aralık	49	77	86	56
Isparta	43	36	31	28
İstanbul - Aksaray	41	40	42	39
İstanbul - Alibeyköy	66	47	42	32
İstanbul - Arnavutköy	41	36	40	36
İstanbul - Avcılar	26	25	31	25
İstanbul - Bağcılar	40	38	38	40
İstanbul - Başakşehir-MTHM	40	43	35	42
İstanbul - Beşiktaş	28	31	37	38
İstanbul - Büyükada	18	16	16	22
İstanbul - Çatladıkapı	22	21	37	30
İstanbul - Esenler	33	33	40	33
İstanbul - Esenyurt-MTHM	52	59	52	53
İstanbul - Göztepe	81	60	95	116
İstanbul - Kadıköy	32	29	36	33
İstanbul - Kağıthane	60	40	59	60
İstanbul - Kandilli	13	19	14	28
İstanbul - Kandilli-MTHM	28	32	30	29
İstanbul - Kartal	40	41	47	55
İstanbul - Kumköy	14	9	20	22
İstanbul - Maslak	29	32	33	29
İstanbul - Mecidiyeköy-MTHM	51	52	55	52
İstanbul - Sancaktepe	36	36	48	47
İstanbul - Sarıyer	18	29	24	22
İstanbul - Selimiye	24	23	43	46
İstanbul - Silivri-MTHM	27	33	31	30

Station Name	2020	2021	2022	2023
İstanbul - Sultanbeyli-MTHM	33	33	34	30
İstanbul - Sultangazi 1	62	52	35	50
İstanbul - Sultangazi 2	48	42	64	48
İstanbul - Sultangazi 3	85	80	101	58
İstanbul - Sultangazi-MTHM	55	49	49	49
İstanbul - Şile-MTHM	24	26	25	21
İstanbul - Şirinevler-MTHM	42	40	41	36
İstanbul - Şişli Eğitim -MTHM	*	*	*	*
İstanbul - Tuzla	41	41	50	56
İstanbul - Ümraniye	31	34	42	43
İstanbul - Ümraniye-MTHM	33	43	40	35
İstanbul - Üsküdar	26	24	28	26
İstanbul - Üsküdar-MTHM	30	28	29	35
İstanbul - Yenibosna	40	35	30	52
İzmir - Aliağa	52	56	44	35
İzmir - Aliağa - Bozköy	*	51	53	36
İzmir - Alsancak İBB	38	42	55	52
İzmir - Bayraklı İBB	37	39	39	44
İzmir - Bornova İBB	37	42	43	46
İzmir - Bornova (ETHM)	*	*	*	*
İzmir - Çeşme	*	24	26	23
İzmir - Çiğli İBB	35	29	45	22
İzmir - Eğitim İstasyonu	*	65	71	51
İzmir - Gaziemir	47	48	51	37
İzmir - Güzelyalı İBB	31	31	32	29
İzmir - Karabağlar	*	46	46	48
İzmir - Karaburun	*	34	44	31
İzmir - Karşıyaka	*	57	70	63
İzmir - Karşıyaka İBB	32	31	33	30
İzmir - Menemen	*	42	47	48
İzmir - Ödemiş	*	87	79	48
İzmir - Şirinyer İBB	34	20	28	32
İzmir - Torbalı	*	104	73	57
İzmir - Yenifoça	*	40	39	36

Station Name	2020	2021	2022	2023
İzmir-Kemalpaşa	*	83	48	57
Kahramanmaraş - Dulkadiroğlu	*	66	73	*
Kahramanmaraş - Elbistan	62	83	54	79
Kahramanmaraş - Kent Meydanı	*	64	72	*
Kahramanmaraş - Onikişubat	68	54	49	54
Karabük - 75. Yıl	52	53	48	38
Karabük - Safranbolu	42	42	43	28
Karabük - Tören Alanı	45	44	47	45
Karaman	37	30	21	34
Karaman - Ermenek	*	46	41	34
Kars * İstasyon Mah.	39	50	44	35
Kars - Trafik	46	54	44	46
Kastamonu	41	45	57	59
Kastamonu - Azdavay	*	20	13	12
Kayseri - Hürriyet	53	56	49	52
Kayseri - Kocasinan	*	*	50	50
Kayseri - Melikgazi	*	*	47	49
Kayseri - OSB	72	42	46	49
Kayseri - Talas	*	*	38	32
Kayseri - Trafik	53	61	61	58
Kırıkkale	49	52	50	43
Kırıkkale - Bulvar Park	40	45	41	37
Kırklareli	43	44	40	40
Kırklareli - Limanköy-MTHM	*	19	20	20
Kırklareli - Lüleburgaz-MTHM	30	30	25	19
Kırşehir	31	42	34	27
Kilis	73	66	69	60
Kocaeli	40	43	45	40
Kocaeli - Alikahya-MTHM	40	42	43	41
Kocaeli - Dilovası	39	50	44	33
Kocaeli - Dilovası-İMES OSB 1-MTHM	14	*	*	39
Kocaeli - Gebze - MTHM	39	53	58	52
Kocaeli - Gölcük-MTHM	29	30	30	27
Kocaeli - İzmit-MTHM	46	49	56	54

Station Name	2020	2021	2022	2023
Kocaeli- Kandıra-MTHM	21	20	22	
Kocaeli - Körfez-MTHM	39	41	38	38
Kocaeli - Yeniköy-MTHM	33	37	36	43
Konya - Akşehir	*	42	34	61
Konya - Bosna	*	33	39	45
Konya - Karatay	*	60	74	77
Konya - Karkent	57	70	67	74
Konya - Laboratuvar	49	39	35	33
Konya - Meram	32	30	29	48
Konya - Sarayönü	*	25	22	14
Konya - Trafik	*	43	52	70
Konya-Ereğli	34	25	30	23
Konya-Erenköy-Belediye	65	51	53	*
Kütahya - Atatürk Bulvarı	40	59	77	51
Kütahya - Heymeana Cad.	42	57	38	35
Kütahya - Kentpark	59	54	60	47
Kütahya - Tavşanlı	54	45	43	39
Malatya	67	70	75	86
Manisa	19	33	33	40
Manisa-Akhisar	*	54	76	74
Manisa-Alaşehir	*	54	62	*
Manisa - Kırkağaç	*	31	37	21
Manisa - Salihli	*	69	46	38
Manisa - Soma	57	54	53	47
Manisa - Turgutlu	*	96	62	65
Manisa - Ulupark	*	137	77	75
Manisa - Yunusemre	*	62	61	56
Mardin	27	53	55	54
Mersin - Akdeniz	*	87	84	84
Mersin - Huzurkent	*	50	55	44
Mersin - İstiklal Cad.	*	107	83	73
Mersin - Tarsus	*	51	62	52
Mersin - Tasucu	*	*	37	30
Mersin - Toroslar	*	42	47	40
Mersin - Yenişehir	*	43	60	49

Station Name	2020	2021	2022	2023
Muğla - Datça	*	34	21	24
Muğla - Fethiye	*	54	72	67
Muğla - Milas	*	68	69	70
Muğla - Milas Ören	*	73	53	48
Muğla - Musluhittin	53	43	43	37
Muğla - Trafik	*	28	45	41
Muğla - Yatağan	*	45	37	32
Muş	106	90	77	73
Nevşehir	42	42	50	35
Nevşehir - Avanos	*	22	58	56
Niğde	45	45	43	47
Niğde - Bor	*	*	57	56
Ordu - Fatsa	48	37	36	29
Ordu - Karşıyaka	49	36	42	28
Ordu - Stadyum	42	42	41	43
Ordu - Ünye	63	70	64	64
Osmaniye	52	75	73	80
Osmaniye - Kadirli	*	67	57	77
Rize	31	23	24	20
Rize - Ardeşen	43	42	47	29
Sakarya	47	40	40	42
Sakarya - Merkez - MTHM	45	33	31	31
Sakarya - Ozanlar - MTHM	41	42	40	48
Samsun - Atakum	33	33	34	31
Samsun - Bafra	37	34	32	40
Samsun - Canik	46	40	33	40
Samsun - İlkadım Hastane	45	45	40	45
Samsun - Tekkeköy	39	44	41	39
Samsun - Yüzüncüyıl	51	52	54	46
Siirt	43	45	50	43
Sinop	38	33	31	23
Sinop - Boyabat	62	61	61	35
Sinop - Erfelek	24	19	16	12
Sivas - Başöğretmen	45	38	42	36
Sivas - İstasyonkavşağı	57	53	62	43

Station Name	2020	2021	2022	2023
Sivas - Meteoroloji	42	41	49	51
Şanlıurfa	45	57	61	60
Şırnak	71	76	78	69
Şırnak - Silopi.	*	*	*	73
Tekirdağ	26	44	48	34
Tekirdağ - Çerkezköy - MTHM	41	44	39	36
Tekirdağ - Çorlu - MTHM	39	51	45	36
Tekirdağ-Merkez-MTHM	39	42	38	39
Tokat	29	20	38	37
Tokat - Erbaa	69	48	49	50
Tokat - Meydan	53	51	51	43
Tokat - Turhal	53	55	42	39
Trabzon - Akçaabat	33	35	29	23
Trabzon - Beşirli	53	65	56	57
Trabzon - Fatih	40	39	41	35
Trabzon - Meydan	40	40	38	39
Trabzon - Uzungöl	20	13	15	15
Trabzon - Valilik	30	30	29	25
Tunceli	44	46	45	37
Uşak	*	39	43	33
Uşak-Trafik	*	40	39	33
Van	40	42	44	39
Yalova	38	48	43	49
Yalova - Armutlu-MTHM	33	22	21	29
Yozgat	38	42	39	39
Yozgat - Sorgun	38	53	56	37
Zonguldak - Çatalağzı Cumayanı	54	59	62	57
Zonguldak - Çatalağzı Kuzyaka	54	52	61	53
Zonguldak - Çaycuma	41	46	36	31
Zonguldak - Karadeniz Ereğli	68	64	45	48
Zonguldak - Kilimli	71	52	53	38
Zonguldak - Kozlu	45	47	50	46
Zonguldak - Muslu Tepeköy	41	44	42	42
Zonguldak - Trafik	61	55	43	39

*It indicates that the mentioned stations did not start measurements that year.

Table -33 Annual Averages of Sulfur Dioxide (SO_2) Concentrations Obtained from the Stations Measured in Provincial and District Centres (MoEUCC, 2024)

Station Name	2020	2021	2022	2023
Adana - Çatalan	5	5	5	3
Adana - Çukurova	*	9	11	8
Adana - Doğankent	11	10	10	12
Adana - Meteoroloji	5	14	7	8
Adana - Valilik	10	18	18	16
Adana-Seyhan	*	7	8	6
Adana-Turhan Cemal Beriker Bulvarı	*	*	*	*
Adana-Yakapınar	*	35	53	51
Adıyaman	9	6	5	7
Afyon - Merkez/Karayolları	*	11	7	7
Afyon - Sandıklı	*	*	6	9
Afyon-Selçuk Cami	6	7	7	6
Ağrı	6	13	16	13
Ağrı - Doğubeyazıt	8	14	15	10
Ağrı - Patnos	19	21	24	26
Aksaray	14	16	17	16
Amasya	9	7	14	7
Amasya - Merzifon	10	10	7	7
Amasya - Suluova	12	15	12	9
Amasya - Şehzade	*	*	*	*
Ankara - Bahçelievler	4	3	3	3
Ankara - Batıkent	7	*	12	15
Ankara - Çankaya	6	13	*	*
Ankara - Demetevler	4	4	3	3
Ankara - Etimesgut	6	15	15	9
Ankara - Etlik	7	8	11	5
Ankara - Kayaş	5	9	6	8
Ankara - Keçiören Sanatoryum	2	2	2	3
Ankara - Mamak	-	7	8	8
Ankara - Ostim	6	3	3	3
Ankara - Polatlı	5	5	3	4
Ankara - Sıhhıye	6	6	3	3
Ankara - Sincan	2	6	4	5

Station Name	2020	2021	2022	2023
Ankara - Siteler	8	14	16	15
Ankara - Törekent	11	12	4	3
Ankara - Ulus	*	4	4	5
Ankara Yaşamkent	8	3	3	2
Antalya - Alanya	*	*	*	*
Antalya - Gazipaşa	*	2	2	2
Antalya - Kepez	3	4	4	6
Antalya - Kumluca	*	3	4	*
Antalya - Manavgat	*	2	2	3
Antalya - Muratpaşa	*	9	4	3
Antalya - Serik	*	3	5	9
Antalya - Trafik	*	*	*	*
Ardahan	5	5	5	4
Artvin	5	9	8	4
Artvin - Hopa	*	*	*	*
Aydın	6	9	10	11
Aydın - Didim	*	2	8	4
Aydın - Efeler	*	6	12	8
Aydın - Germencik	*	11	8	4
Aydın - Nazilli	*	20	28	15
Aydın - Söke	*	14	14	7
Aydın - Trafik	*	*	*	*
Balıkesir	10	15	14	8
Balıkesir - Bandırma-MTHM	4	6	9	10
Balıkesir - Edremit - MTHM			15	7
Balıkesir - Erdek-MTHM	3	4	6	6
Balıkesir - Merkez - MTHM	*	*	*	*
Bartın	6	6	6	6
Batman	7	6	6	6
Bayburt	6	9	7	8
Bilecik	6	4	5	3
Bilecik - Bozüyük-MTHM	6	6	10	11
Bingöl	9	15	11	8
Bitlis	29	19	9	11
Bolu - Abant	5	6	7	5

Station Name	2020	2021	2022	2023
Bolu - Karaçayır Parkı	10	16	7	12
Bolu - Kızılay Parkı	7	9	4	2
Burdur	7	10	10	10
Burdur - Bucak	*	20	8	12
Bursa			11	7
Bursa - Beyazıt Cad.-MTHM	5	5	5	7
Bursa - İnegöl-MTHM	9	13	12	8
Bursa - Kestel-MTHM	10	12	12	9
Bursa - Kültür Park-MTHM	6	6	8	7
Bursa - Uludağ Üniv.-MTHM	4	5	4	3
Bursa-Gürsu	*	*	*	5
Bursa-Kestel (Hilal Parkı)	*	*	*	8
Bursa-Nilüfer	*	*	9	9
Çanakkale	8	7	8	6
Çanakkale - Biga - MTHM	7	11	14	8
Çanakkale - Biga İçdaş	8	10	8	6
Çanakkale - Çan-MTHM	17	18	30	16
Çanakkale - Lapseki-MTHM	6	6	7	5
Çankırı	20	15	12	8
Çorum	12	11	11	7
Çorum - Bahabey	*	*	*	*
Çorum - Mimar Sinan	15	27	23	17
Denizli - Bayramyeri	10	7	14	11
Denizli - Çivril	*	48	28	11
Denizli - Honaz	10	9	7	11
Denizli - Merkezefendi	12	11	9	12
Denizli - Sümer	*	28	12	16
Denizli - Trafik	*	*	*	*
Diyarbakır	6	6	4	5
Düzce	5	5	5	3
Düzce - Bahçeşehir	6	12	6	14
Düzce - Belediye	5	9	5	5
Edirne	10	4	4	2
Edirne - Karaağaç-MTHM	5	5	7	4
Edirne - Keşan-MTHM	69	42	39	17

Station Name	2020	2021	2022	2023
Elazığ	6	7	7	8
EMEP - Ankara Çubuk	3	6	2	2
EMEP - İzmir Seferihisar	6	4	7	4
EMEP - Kırklareli Vize	3	11	12	*
Erzincan	8	6	6	7
Erzincan - Trafik	9	11	11	6
Erzurum	8	14	10	8
Erzurum - Aziziye	9	12	12	6
Erzurum - Palandöken	5	5	5	5
Erzurum - Pasinler	3	4	4	5
Erzurum - Taşhan	*	*	*	*
Eskişehir - Cumhuriyet Bulvarı	11	15	18	7
Eskişehir - Metin Sonmez	7	9	10	5
Eskişehir - Odunpazarı	7	8	11	5
Eskişehir - Tepebaşı	*	68	13	7
Eskişehir - Vişnepark	7	4	*	*
Gaziantep	9	8	10	12
Gaziantep - Beydilli	*	33	47	20
Gaziantep - Fevzi Çakmak	*	*	*	*
Gaziantep - Gaski D6	*	21	21	20
Gaziantep - Nizip	*	13	17	14
Gaziantep-Atapark	*	21	24	29
Giresun	12	12	13	11
Giresun - Gemilercekeği	12	14	13	7
Gümüşhane	6	6	6	5
Hakkari	175	110	60	34
Hatay - Antakya	11	8	8	*
Hatay - İskenderun	20	10	15	8
Hatay - İskenderun Merkez	*	11	9	8
Hatay - Mustafa Kemal Üniversitesi	12	23	18	22
Hatay - Samandağ	9	8	7	21
Hatay - Vali Kavşağı	*	*	*	*
Iğdır	7	5	6	7
Iğdır - Aralık	5	6	7	6
Isparta	9	10	9	13

Station Name	2020	2021	2022	2023
İstanbul - Aksaray	3	4	4	4
İstanbul - Alibeyköy	4	5	4	5
İstanbul - Arnavutköy	5	6	4	4
İstanbul - Avcılar	4	3	4	3
İstanbul - Bağcılar	4	5	4	3
İstanbul - Başakşehir-MTHM	6	5	6	5
İstanbul - Beşiktaş	4	4	4	4
İstanbul - Büyükada	*	*	*	*
İstanbul - Çatladıkapı	*	*	*	*
İstanbul - Esenler	4	4	4	4
İstanbul - Esenyurt-MTHM	4	4	5	3
İstanbul - Göztepe	*	*	*	*
İstanbul - Kadıköy	4	3	4	4
İstanbul - Kağıthane	16	11	3	10
İstanbul - Kağıthane-MTHM	4	5	5	*
İstanbul - Kandilli	*	*	*	*
İstanbul - Kandilli-MTHM	8	6	5	5
İstanbul - Kartal	4	3	3	4
İstanbul - Kumköy	*	*	*	*
İstanbul - Maslak	3	3	4	4
İstanbul - Mecidiyeköy-MTHM	*	*	*	*
İstanbul - Sancaktepe	6	10	5	7
İstanbul - Sarıyer	2	5	4	15
İstanbul - Selimiye	*	*	*	*
İstanbul - Silivri-MTHM	2	3	3	2
İstanbul - Sultanbeyli-MTHM	4	8	5	4
İstanbul - Sultangazi 1	*	*	*	*
İstanbul - Sultangazi 2	*	*	*	*
İstanbul - Sultangazi 3	*	*	*	*
İstanbul - Sultangazi-MTHM	7	5	4	5
İstanbul - Şile-MTHM	2	3	4	3
İstanbul - Şirinevler-MTHM	7	6	4	*
İstanbul - Şişli Eğitim -MTHM	*	*	*	*
İstanbul - Tuzla	9	11	6	8
İstanbul - Ümraniye	3	4	3	5

Station Name	2020	2021	2022	2023
İstanbul - Ümraniye-MTHM	8	10	8	*
İstanbul - Üsküdar	3	3	3	3
İstanbul - Üsküdar-MTHM	*	*	*	*
İstanbul - Yenibosna	3	3	3	3
İzmir - Aliağa	14	12	14	8
İzmir - Aliağa - Bozköy	*	7	7	5
İzmir - Alsancak İBB	9	9	7	6
İzmir - Bayraklı İBB	7	12	10	11
İzmir - Bergama İBB	*	*	*	*
İzmir - Bornova	*	*	*	*
İzmir - Bornova İBB	12	17	8	17
İzmir - Çeşme	*	*	*	*
İzmir - Çiğli İBB	12	12	11	10
İzmir - Eğitim İstasyonu	*	20	13	11
İzmir - Gaziemir	11	15	9	8
İzmir - Güzelyalı İBB	9	13	8	11
İzmir - Karabağlar	*	16	10	9
İzmir - Karaburun	*	*	*	*
İzmir - Karşıyaka	*	*	*	*
İzmir - Karşıyaka İBB	11	7	12	12
İzmir - Konak	*	*	*	*
İzmir - Menemen	*	10	10	5
İzmir - Ödemiş	*	32	21	12
İzmir - Şirinyer İBB	11	15	11	13
İzmir - Torbalı	*	7	7	4
İzmir - Yenifoça	*	*	*	*
İzmir Güzelbahçe İBB	*	*	*	*
İzmir-Kemalpaşa	*	19	18	25
Kahramanmaraş - Dulkadiroğlu	*	50	58	*
Kahramanmaraş - Elbistan	16	23	27	9
Kahramanmaraş - Kent Meydanı	*	*	*	*
Kahramanmaraş - Onikişubat	22	26	34	18
Karabük - 75. Yıl	10	9	7	4
Karabük - Safranbolu	20	17	15	7
Karabük - Tören Alanı	16	13	16	9

Station Name	2020	2021	2022	2023
Karaman	6	6	5	6
Karaman - Ermenek	*	*	7	8
Kars - İstasyon Mah.	8	10	10	7
Kars - Trafik	*	*	*	*
Kastamonu	11	15	5	6
Kastamonu - Azdavay	*	11	8	8
Kayseri - Hürriyet	7	6	7	9
Kayseri - Kocasinan	*	*	15	8
Kayseri - Melikgazi	*	*	13	28
Kayseri - OSB	10	13	11	16
Kayseri - Talas	*	*	*	*
Kayseri - Trafik	*	*	*	*
Kırıkkale	14	112	24	20
Kırıkkale - Bulvar Park	11	11	15	12
Kırklareli	14	7	7	4
Kırklareli - Limanköy-MTHM	2	3	3	4
Kırklareli - Lüleburgaz-MTHM	8	7	9	7
Kırşehir	9	5	6	5
Kilis	8	8	8	11
Kocaeli	3	4	5	3
Kocaeli - Alikahya-MTHM	5	5	12	10
Kocaeli - Dilovası	18	20	20	7
Kocaeli - Dilovası-İMES OSB 1-MTHM	*	*	*	*
Kocaeli - Dilovası-İMES OSB 2-MTHM	*	*	*	*
Kocaeli - Gebze - MTHM	10	7	12	8
Kocaeli - Gebze OSB - MTHM	11	6	7	8
Kocaeli - Gölcük-MTHM	5	5	8	6
Kocaeli - İzmit-MTHM	*	*	*	*
Kocaeli - Kandıra-MTHM	*	*	*	*
Kocaeli - Körfez-MTHM	7	7	13	7
Kocaeli - Yeniköy-MTHM	5	5	5	*
Konya - Akşehir	*	15	21	15
Konya - Bosna	*	9	7	9
Konya - Karatay	*	14	20	24
Konya - Karkent	5	8	8	9

Station Name	2020	2021	2022	2023
Konya - Laboratuvar	7	7	13	8
Konya - Meram	12	13	13	38
Konya - Sarayönü	*	*	*	*
Konya - Trafik	*	*	*	*
Konya-Ereğli	5	7	3	*
Konya-Erenköy-Belediye	5	6	6	*
Konya-Karatay	11	9	9	9
Konya-Selçuklu-Belediye	*	*	*	*
Kütahya - Atatürk Bulvarı	16	16	9	10
Kütahya - Heymeana Cad.	13	10	7	8
Kütahya - Kentpark	14	18	18	14
Kütahya - Tavşanlı	39	29	20	24
Malatya	11	15	14	11
Manisa	19	6	11	13
Manisa - Akhisar	*	11	15	7
Manisa - Alaşehir	*	7	7	13
Manisa - Kırkağaç	*	14	13	7
Manisa - Salihli	*	55	28	11
Manisa - Soma	96	71	57	53
Manisa - Turgutlu	*	28	22	15
Manisa - Ulupark	*	*	*	*
Manisa - Yunusemre	*	*	*	*
Mardin	16	21	20	22
Mersin - Akdeniz	*	6	7	7
Mersin - Huzurkent	*	7	6	5
Mersin - İstiklal Cad.	*	*	*	*
Mersin - Tarsus	*	8	6	5
Mersin - Tasucu	*	7	5	4
Mersin - Toroslar	*	8	8	7
Mersin - Yenişehir	*	8	6	5
Muğla - Datça	*	*	*	*
Muğla - Fethiye	*	4	3	3
Muğla - Milas	*	50	29	44
Muğla - Milas Ören	*	36	42	27
Muğla - Musluhittin	22	6	10	8

Station Name	2020	2021	2022	2023
Muğla - Trafik	*	*	*	*
Muğla - Yatağan	*	13	7	9
Muş	8	9	8	5
Nevşehir	10	8	14	8
Nevşehir - Avanos	*	6	*	*
Niğde	9	6	6	7
Niğde - Bor	*	33	15	19
Ordu - Fatsa	16	7	12	6
Ordu - Karşıyaka	12	11	9	10
Ordu - Stadyum	27	22	10	9
Ordu - Ünye	12	16	10	9
Osmaniye	5	15	17	10
Osmaniye - Kadirli	*	6	6	9
Rize	3	4	4	5
Rize - Ardeşen	4	4	4	4
Sakarya	6	9	11	6
Sakarya - Hendek OSB - MTHM	4	5	5	5
Sakarya - Merkez - MTHM	*	*	*	*
Sakarya - Ozanlar - MTHM	5	5	9	4
Samsun - Atakum	8	11	8	7
Samsun - Bafra	11	7	6	8
Samsun - Canik	15	13	8	6
Samsun - İlkadım Hastane	12	29	12	9
Samsun - Tekkeköy	15	21	10	8
Samsun - Yüzüncüyıl	*	*	*	*
Siirt	17	16	11	10
Sinop	5	6	19	11
Sinop - Boyabat	20	15	18	11
Sinop - Erfelek	*	*	*	*
Sivas - Başöğretmen	14	18	15	12
Sivas - İstasyonkavşağı	*	*	*	*
Sivas - Meteoroloji	21	17	15	7
Şanlıurfa	38	35	37	15
Şırnak	39	19	15	36
Şırnak - Silopi.	*	*	*	7

Station Name	2020	2021	2022	2023
Tekirdağ	9	13	10	8
Tekirdağ - Çerkezköy - MTHM	12	12	16	18
Tekirdağ - Çorlu - MTHM	15	14	12	8
Tekirdağ - Çorlu OSB - MTHM	14	14	13	*
Tekirdağ - Merkez - MTHM	14	11	13	10
Tokat	10	15	6	6
Tokat - Erbaa	11	11	15	7
Tokat - Meydan	*	*	*	*
Tokat - Turhal	12	13	13	8
Trabzon - Akçaabat	7	9	9	7
Trabzon - Beşirli	*	*	*	*
Trabzon - Fatih	4	5	5	5
Trabzon - Meydan	8	12	8	6
Trabzon - Uzungöl	3	3	4	4
Trabzon - Valilik	7	9	9	7
Tunceli	29	23	20	18
Uşak	*	33	20	10
Uşak-Trafik	*	*	*	*
Van	22	15	10	11
Yalova	7	10	*	6
Yalova - Altınova-MTHM	7	9	9	9
Yalova - Armutlu-MTHM	5	4	1	3
Yozgat	13	16	13	10
Yozgat - Sorgun	34	22	11	9
Zonguldak - Çatalağzı Cumayanı	13	17	19	20
Zonguldak - Çatalağzı Kuzyaka	15	15	14	14
Zonguldak - Çaycuma	6	7	6	5
Zonguldak - Karadeniz Ereğli	5	4	5	6
Zonguldak - Kilimli	9	14	12	9
Zonguldak - Kozlu	5	4	5	5
Zonguldak - Muslu Tepeköy	9	11	16	13
Zonguldak - Trafik	7	12	9	10
Zonguldak - Trafik	7	12	9	10

*It indicates that the mentioned stations did not start measurements that year.

According to the measurement results made by air quality monitoring stations across Türkiye between 2019 and 2023, a 4% improvement has been achieved in the PM_{10} parameter and a 9% improvement in the SO_2 parameter.

Table -34 Annual Averages of Carbon Monoxide (CO) Concentrations Obtained from Stations Measured in Provincial and District Centres (MoEUCC, 2024)

Station Name	2020	2021	2022	2023
Adana - Çatalan	*	*	*	*
Adana - Çukurova	*	*	*	*
Adana - Doğankent	*	*	*	*
Adana - Meteoroloji	445	540	477	562
Adana - Valilik	234	398	452	623
Adana-Seyhan		490	599	819
Adana-Turhan Cemal Beriker Bulvarı		648	648	983
Adana-Yakapınar		330	279	395
Afyon - Merkez/Karayolları		667	542	541
Ağrı - Doğubeyazıt	719	633	1,052	
Ağrı - Patnos	718	782	766	741
Aksaray	397	401	371	390
Amasya - Şehzade	790	851	684	868
Ankara - Bahçelievler	540	543	563	
Ankara - Çankaya	851	313	414	475
Ankara - Etimesgut	587	1,111	828	848
Ankara - Etlik	610		787	722
Ankara - Mamak	-	613	1,258	1,134
Ankara - Ostim	664			
Ankara - Polatlı	422	379		
Ankara - Sıhhıye	689	842	702	1,044
Ankara - Siteler	1,093	1,148	790	1,078
Ankara - Törekent	585	447	502	805
Ankara Yaşamkent	619	300	262	293
Antalya - Kepez	538	476	508	542
Antalya - Kumluca		257	395	268
Antalya - Serik		408	519	570
Antalya - Trafik		623	574	533
Aydın-Nazilli	*	1,323	1,141	1,596
Aydın-Efeler	*	770	1,093	885
Aydın - Söke	*	1,366	1,074	1,315
Balıkesir - Merkez - MTHM	963	650	714	742
Bartın	548	704	636	861

Station Name	2020	2021	2022	2023
Bolu - Abant		375	358	387
Bolu - Karaçayır Parkı	543	564	610	578
Bolu - Kızılay Parkı	906	629	653	977
Burdur	743	502	542	822
Bursa-Beyazıt Cad, MTHM	1,143	1,736	2,081	-
Bursa-Kestel (Hilal Parkı)	*	*	*	388
Bursa-Nilüfer			846	2,044
Çanakkale-Biga-MTHM	492	473	431	-
Çanakkale - Biga İçdaş	1,081	1,074	647	844
Çankırı	451	461	399	395
Çorum - Bahabey	1,271	1,136	-	855
Denizli - Çivril		1,055	530	1,120
Denizli - Honaz	1,000	516	462	339
Denizli - Trafik		1,091	874	971
Düzce	635	743	628	695
Düzce - Bahçeşehir				
Düzce - Belediye	810	665	839	1,008
Erzincan - Trafik	1,030	1,099	1,081	1,034
Erzurum - Aziziye	623	649	602	640
Erzurum - Palandöken	339	325	345	358
Erzurum - Taşhan	973	1066	987	708
Eskişehir - Cumhuriyet Bulvarı	673	755	528	627
Eskişehir - Metin Sonmez	317	382	365	248
Eskişehir - Odunpazarı	466	378	499	436
Eskişehir - Vişnepark	509	243	325	309
Gaziantep - Beydilli		1,986	2,561	
Gaziantep - Fevzi Çakmak		958	1,314	965
Gaziantep - Gaski D6		2,246	1,144	1,263
Gaziantep - Nizip		1,092	1,042	1,084
Gaziantep-Atapark	*	1,322		
Giresun - Gemilercekeği	1,084	650	648	534
Hatay - Antakya	1,097	554	534	*
Hatay - İskenderun	985	515	483	
Hatay - Vali Kavşağı		1,554	1,092	*

Station Name	2020	2021	2022	2023
Isparta	605	543	621	810
İstanbul - Aksaray	511	605	734	708
İstanbul - Alibeyköy	750	1,892	475	535
İstanbul - Arnavutköy	817	1,661	323	346
İstanbul - Avcılar	320			
İstanbul - Bağcılar	721	565	480	537
İstanbul - Başakşehir-MTHM	524	733	733	355
İstanbul - Beşiktaş	389	572	619	503
İstanbul - Çatladıkapı	953	1,446	613	664
İstanbul - Esenler	631	500	744	682
İstanbul - Göztepe	900	835	1,859	1,369
İstanbul - Kadıköy	668	308	605	652
İstanbul - Kağıthane	977	1,066	576	614
İstanbul- Kandilli-MTHM	556	712	671	755
İstanbul - Kartal	657	429	496	555
İstanbul - Kumköy	612	856	188	319
İstanbul - Mecidiyeköy-MTHM	679	941	904	
İstanbul - Sancaktepe	672	926	448	900
İstanbul - Selimiye	821	1,474	546	645
İstanbul - Şirinevler-MTHM	930	1,190	1,045	651
İstanbul - Tuzla	468	385	415	473
İstanbul - Ümraniye-MTHM	782	1,020	-	-
İstanbul - Üsküdar-MTHM	742	850	-	-
İstanbul - Yenibosna	793	898	811	815
İzmir - Aliağa	631	737	633	429
İzmir - Aliağa - Bozköy	*	646	698	494
İzmir - Bayraklı İBB				
İzmir - Bornova İBB	296	226	340	832
İzmir-Bornova (ETHM)	*	*	*	*
İzmir - Çiğli İBB	37			
İzmir - Eğitim İstasyonu		876	869	1,019
İzmir - Güzelyalı İBB	272	286	272	300
İzmir - Karşıyaka		528	780	795
İzmir - Konak		1,053	1,197	1,089
İzmir - Ödemiş		1,088	1,267	1,060

Station Name	2020	2021	2022	2023
İzmir - Torbalı		670	848	1,551
İzmir - Yenifoça		367	299	217
İzmir-Kemalpaşa		630	1,023	1,701
Kahramanmaraş - Dulkadiroğlu		827	586	*
Kahramanmaraş - Elbistan	1,866	959	645	656
Kahramanmaraş - Kent Meydanı		1,454	1,295	*
Karabük - 75, Yıl	585	351		
Karabük - Safranbolu	787	699	744	777
Karabük - Tören Alanı	816	800	831	841
Karaman	446	378	398	378
Kars - İstasyon Mah,	449	531	690	*
Kars - Trafik	475	461	563	710
Kastamonu	532	616	723	643
Kastamonu - Azdavay		296	548	
Kayseri - Hürriyet	715	732	737	922
Kayseri - Kocasinan		1,372	492	643
Kayseri - OSB	690	577	646	1,201
Kayseri - Trafik	764	815	792	840
Kırıkkale	512	519	476	601
Kırıkkale - Bulvar Park	722	668	824	1,207
Kırşehir	460	504	539	565
Kilis	540	448	427	435
Kocaeli - Dilovası	761	625	572	664
Kocaeli - İzmit-MTHM	964	1,241	1,011	802
Konya – Karatay - (Sunay Park)		911	924	1,024
Konya - Karkent	613	714	790	643
Konya - Laboratuvar	376	465	398	473
Konya - Meram	915	981	830	754
Konya - Sarayönü		220	202	214
Konya - Trafik		829	845	959
Konya-Erenköy-Belediye	512	533	459	
Konya-Karatay	653	1,726	1,120	928
Kütahya- Atatürk Bulvarı	1,516	787	947	1,129
Kütahya - Heymeana Cad,	1,361	490	842	493

Station Name	2020	2021	2022	2023
Kütahya - Kentpark	596	497	438	
Kütahya - Tavşanlı	556	495	756	661
Manisa - Akhisar		1,894	943	1,131
Manisa -Alaşehir	*	*	*	*
Manisa - Kırkağaç		558	618	1,100
Manisa - Salihli		512	858	1,132
Manisa - Soma	1,577	1,854	652*	622*
Manisa - Turgutlu		798	1,480	956
Manisa - Ulupark		791	996	944
Manisa - Yunusemre		1,005	793	955
Mersin - Akdeniz		496	520	527
Mersin - Huzurkent		386	468	403
Mersin - İstiklal Cad,		1,276	1,024	813
Mersin - Tarsus		941	454	561
Mersin - Yenişehir	*	429	381	396
Muğla - Fethiye	*	816	1,349	2,710
Muğla-Milas	*	999	1,515	2,096
Muğla-Milas Ören	*	527	881	1,208
Muğla - Trafik		889	1,008	1,618
Muğla - Yatağan		951	882	1,243
Nevşehir	458	417	394	521
Niğde	406	375	331	388
Ordu - Karşıyaka	764	673	780	619
Osmaniye	*	679	734	769
Osmaniye - Kadirli		693	654	682
Sakarya - Merkez - MTHM	1,293	1,121	555	763
Samsun - Tekkeköy	1,538	1,679	381	347
Samsun - Yüzüncüyıl	565	567	624	635
Sinop - Boyabat	-	647	760	442
Sivas - İstasyonkavşağı	1,522	875	900	830
Şırnak - Silopi,				373
Tekirdağ - Çerkezköy-MTHM	255	336	234	-
Tekirdağ - Merkez - MTHM	693	543	582	-
Tokat - Meydan	921	833	765	741

Station Name	2020	2021	2022	2023
Trabzon - Akçaabat	659	521	624	*
Trabzon - Beşirli	445	430	414	500
Trabzon - Fatih	693	643	569	775
Uşak		1,205	1,083	811
Uşak-Trafik		1,040	1,044	1,104
Yozgat	417	521	441	554
Yozgat - Sorgun	436	460	514	532
Zonguldak - Çatalağzı Cumayanı	857	839	740	697
Zonguldak - Çatalağzı Kuzyaka	852	513	867	730
Zonguldak - Çaycuma	490	875	398	458
Zonguldak - Karadeniz Ereğli	511	607	529	817
Zonguldak - Kilimli	615	561	907	662
Zonguldak - Kozlu	367	373	528	609
Zonguldak - Muslu Tepeköy	2,782	697	413	575
Zonguldak - Trafik	600	492	488	554

Table -35 Annual Averages of Nitrogen Dioxide (NO_2) Concentrations Obtained from the Stations Measured in Provincial and District Centres (MoEUCC, 2024)

Station Name	2020	2021	2022	2023
Adana - Çatalan	14	14	8	8
Adana - Çukurova		18	22	
Adana - Doğankent	10	20	13	
Adana - Meteoroloji	50	41	29	41
Adana - Valilik	55	28	28	31
Adana-Seyhan		25	22	
Adana-Turhan Cemal Beriker Bulvarı		75	76	77
Adana-Yakapınar		25	33	22
Afyon - Merkez/Karayolları		53	41	47
Afyon - Sandıklı		30	23	24
Afyon-Selçuk Cami	36	29	33	33
Ağrı	10	12	12	12
Ağrı - Doğubeyazıt	29	21	21	19
Ağrı - Patnos	30	37	35	29
Aksaray	44	22	21	29
Amasya - Merzifon	24	21	25	38

Station Name	2020	2021	2022	2023
Amasya - Suluova	40	17	18	22
Amasya - Şehzade	71	27	41	48
Ankara - Bahçelievler	51	58	63	68
Ankara - Batıkent				37
Ankara - Çankaya	68	61	42	41
Ankara - Demetevler	47	51	44	50
Ankara - Etimesgut		45	68	62
Ankara - Keçiören Sanatoryum	49	62	69	74
Ankara - Mamak		29	92	50
Ankara - Ostim	42	37	40	70
Ankara - Polatlı	34	34	41	43
Ankara - Sıhhıye	51	57	108	94
Ankara - Sincan	43	41	49	61
Ankara - Siteler	47	42	42	
Ankara - Törekent	53	52	57	65
Ankara - Ulus		100	105	108
Ankara Yaşamkent		39	32	29
Antalya - Alanya	*	29	22	
Antalya - Gazipaşa		4	4	5
Antalya - Kepez	37	36	31	
Antalya - Kumluca	*	11	11	*
Antalya - Manavgat		21	*	*
Antalya - Muratpaşa	*	36	33	35
Antalya - Serik		23	31	
Antalya - Trafik		78	59	38
Ardahan	22	24	22	22
Artvin	16	14	11	11
Artvin - Hopa	8	9	11	10
Aydın - Didim		12	8	4
Aydın - Efeler	*	18	28	19
Aydın - Germencik	*	23	22	14
Aydın - Nazilli	*	40	25	21
Aydın - Söke	*	11	21	30
Balıkesir	24	24	20	13

Station Name	2020	2021	2022	2023
Balıkesir - Bandırma-MTHM	24	23	39	37
Balıkesir - Edremit - MTHM	21	-	-	-
Balıkesir - Erdek-MTHM	7	8	9	7
Balıkesir - Merkez - MTHM	30	26	31	-
Bartın	31	29	38	38
Bayburt	23	27	25	28
Bilecik	9	15	29	19
Bilecik - Bozüyük-MTHM	23	25	26	21
Bolu - Abant	4	18	59	8
Bolu - Karaçayır Parkı	28	31	29	32
Bolu - Kızılay Parkı	36	47	62	61
Burdur	32	27	33	35
Bursa - Beyazıt Cad,-MTHM	60	57	58	62
Bursa - İnegöl-MTHM	31	29	38	32
Bursa - Kestel-MTHM	26	27	28	25
Bursa - Kültür Park-MTHM	40	48	41	31
Bursa - Uludağ Üniv,-MTHM		17	19	19
Bursa-Gürsu	*	*	*	15
Bursa-Kestel (Hilal Parkı)	*	*	*	29
Bursa-Nilüfer			50	56
Çanakkale	20	18	5	21
Çanakkale - Biga - MTHM	7	15	6	13
Çanakkale - Biga İçdaş	12	18	11	5
Çanakkale - Çan-MTHM	7	17	20	20
Çanakkale - Lapseki-MTHM	6	6	9	13
Çankırı	33	27	29	29
Çorum - Bahabey	64	57	47	49
Çorum - Mimar Sinan	42	28	43	28
Denizli - Çivril		28	26	40
Denizli - Trafik		72	73	91
Düzce	19	18	17	21
Düzce - Bahçeşehir	17	32	23	43
Düzce - Belediye	39	54	68	53
Edirne	14	9	8	13
Edirne - Karaağaç-MTHM	8	9	7	7

Station Name	2020	2021	2022	2023
Edirne - Keşan-MTHM	11	10	9	10
EMEP - Ankara Çubuk	1	4	8	7
EMEP - İzmir Seferihisar	8	7	12	10
EMEP - Kırklareli Vize	5	14	5	5
Erzincan	34	31	31	33
Erzincan - Trafik	63	52	58	52
Erzurum	49	46	39	39
Erzurum - Aziziye	31	31	35	40
Erzurum - Palandöken	22	11	12	12
Erzurum - Pasinler	37	25	24	26
Erzurum - Taşhan	51	55	53	54
Eskişehir - Cumhuriyet Bulvarı	48	64	69	74
Eskişehir - Metin Sonmez	13	38	26	21
Eskişehir - Odunpazarı	38	32	31	38
Eskişehir - Vişnepark	69	33	30	34
Gaziantep - Beydilli		91	65	71
Gaziantep - Fevzi Çakmak		94	96	
Gaziantep - Gaski D6		38	58	84
Gaziantep - Nizip		34	37	27
Gaziantep-Atapark	*	37		
Giresun - Gemilercekeği	39	47	25	30
Gümüşhane	23	13	19	34
Hatay - Antakya	61	19	19	*
Hatay - İskenderun	19	23	24	*
Hatay - İskenderun Merkez	*	47	35	*
Hatay - Vali Kavşağı	*	64	59	*
Iğdır	28	24	24	23
Iğdır - Aralık	10	12	15	11
Isparta	41	29	28	
İstanbul - Aksaray	87	81	70	85
İstanbul - Alibeyköy	41	46	38	43
İstanbul - Arnavutköy	20	20	21	22
İstanbul - Avcılar	32	48	36	28
İstanbul - Bağcılar	44	43	43	42

Station Name	2020	2021	2022	2023
İstanbul - Başakşehir-MTHM	9	28	27	26
İstanbul - Beşiktaş	56	43	38	53
İstanbul - Çatladıkapı	48	66	49	38
İstanbul - Esenler	58	51	48	48
İstanbul - Esenyurt-MTHM	14	21	30	35
İstanbul - Göztepe	57	53	73	67
İstanbul - Kadıköy	101	66	33	38
İstanbul - Kağıthane	36	52	27	37
İstanbul - Kağıthane-MTHM	21	49	35	36
İstanbul - Kandilli-MTHM	23	20	23	23
İstanbul - Kartal	44	46	42	42
İstanbul - Kumköy	14	18	13	32
İstanbul - Maslak	26		17	22
İstanbul - Mecidiyeköy-MTHM	48	49	46	30
İstanbul - Sancaktepe	29	32	30	31
İstanbul - Sarıyer	22	22	13	31
İstanbul - Selimiye	65	70	34	19
İstanbul - Silivri-MTHM	17	18	13	14
İstanbul - Sultanbeyli-MTHM	14	21	20	27
İstanbul - Sultangazi-MTHM	42	37	18	20
İstanbul - Şile-MTHM	3	5	4	7
İstanbul - Şirinevler-MTHM	53	46	46	49
İstanbul - Tuzla	40	46	43	44
İstanbul - Ümraniye	35	45	23	34
İstanbul - Ümraniye-MTHM	45	54	34	42
İstanbul - Üsküdar	46	67	38	37
İstanbul - Üsküdar-MTHM	37	40	33	31
İstanbul - Yenibosna	42	46	54	48
İzmir - Aliağa	39	46	55	37
İzmir - Alsancak İBB			9	
İzmir - Bornova	*	35	30	48
İzmir - Bornova İBB	5	5	6	7
İzmir - Çeşme		7	7	8
İzmir - Çiğli İBB				
İzmir - Eğitim İstasyonu	*	86	59	42

Station Name	2020	2021	2022	2023
İzmir - Güzelyalı İBB	12	12	9	13
İzmir - Karabağlar		27	29	21
İzmir - Karaburun		11	6	11
İzmir - Karşıyaka		78	81	70
İzmir - Konak		93	84	72
İzmir - Menemen		24	28	23
İzmir - Ödemiş		36	30	34
İzmir - Torbalı		40	33	41
İzmir - Yenifoça		22	29	17
İzmir-Kemalpaşa		29	30	47
Kahramanmaraş - Dulkadiroğlu		48	42	*
Kahramanmaraş - Elbistan	33	29	30	29
Kahramanmaraş - Kent Meydanı		97	106	*
Kahramanmaraş - Onikişubat	67	50	52	44
Karabük - 75, Yıl	23	23	27	
Karabük - Safranbolu	29	30	38	33
Karabük - Tören Alanı	17	15	19	18
Karaman	29	18	23	25
Karaman - Ermenek		40	21	17
Kars - İstasyon Mah,	18	24	24	25
Kars - Trafik	34	33	28	28
Kastamonu	27	26	26	31
Kayseri - Hürriyet	61	48	62	78
Kayseri - Kocasinan		50	33	40
Kayseri - OSB	44	35	29	
Kayseri - Talas		54	36	38
Kayseri - Trafik	71	64	79	95
Kırıkkale	29	24	24	
Kırıkkale - Bulvar Park	37	48	61	61
Kırklareli	14	12	11	15
Kırklareli - Limanköy-MTHM	5	6	2	2
Kırklareli - Lüleburgaz-MTHM	9	11	15	16
Kırşehir	31	29	25	29
Kilis	32	22	22	26
Kocaeli	14	21	19	28

Station Name	2020	2021	2022	2023
Kocaeli - Alikahya-MTHM	10	27	19	21
Kocaeli - Dilovası	-	-	33	-
Kocaeli - Gebze - MTHM	-	-	30	-
Kocaeli - Gebze OSB - MTHM	32	30	23	-
Kocaeli - Gölcük-MTHM	15	25	21	28
Kocaeli - İzmit-MTHM	43	45	42	38
Kocaeli - Kandıra-MTHM	3	6	4	5
Kocaeli - Körfez-MTHM	33	35	38	27
Konya - Akşehir		36	27	28
Konya - Bosna			29	31
Konya - Karkent	45	39	33	*
Konya - Laboratuvar	47	28	36	
Konya - Meram	46	41	33	67
Konya - Sarayönü		6	8	7
Konya - Trafik		75	59	45
Konya-Ereğli	44	43	63	57
Konya-Erenköy-Belediye	38	32	41	
Konya-Karatay	25	49	39	44
Kütahya - Atatürk Bulvarı	102	83	92	89
Kütahya - Heymeana Cad,	83	46	53	48
Kütahya - Kentpark	33	43	31	30
Kütahya - Tavşanlı	30	41	53	46
Manisa - Akhisar		37	27	25
Manisa - Alaşehir	*	15	10	33
Manisa - Kırkağaç		13	12	13
Manisa - Salihli		25	21	25
Manisa - Soma	27	30	26	21
Manisa - Turgutlu		83	40	41
Manisa - Ulupark		63	41	39
Manisa - Yunusemre		46		
Mersin - Akdeniz		72	55	
Mersin - Huzurkent		33	31	
Mersin - İstiklal Cad,		74	63	46
Mersin - Tarsus		42	34	

Station Name	2020	2021	2022	2023
Mersin - Tasucu	*	10	6	
Mersin - Toroslar		36	37	
Mersin - Yenişehir	*	32	30	22
Muğla - Datça		9	2	9
Muğla - Fethiye		38	23	28
Muğla - Milas		50	37	55
Muğla - Milas Ören		28	9	113
Muğla - Trafik		43	24	35
Muğla - Yatağan		30	17	17
Nevşehir	32	23	25	28
Nevşehir - Avanos		32	24	18
Niğde	33	28	29	33
Niğde - Bor		180	97	*
Ordu - Fatsa	31	24	17	23
Ordu - Karşıyaka	29	41	40	41
Ordu - Ünye	56	22	24	31
Osmaniye		37	28	42
Osmaniye - Kadirli		16	32	26
Rize	25	28	24	26
Rize - Ardeşen	7	8	7	7
Sakarya	12	20	24	29
Sakarya - Hendek OSB - MTHM	31	30	-	-
Sakarya - Merkez - MTHM	29	33	34	31
Sakarya - Ozanlar - MTHM	12	21	28	28
Samsun - Atakum	22	45	27	30
Samsun - Bafra	23	17	18	22
Samsun - Canik	69	51	35	34
Samsun - Tekkeköy	40	30	21	25
Samsun - Yüzüncüyıl	57	55	52	61
Sinop - Boyabat	30	22	25	31
Sinop - Erfelek		10	13	8
Sivas - Başöğretmen	56	42	32	38
Sivas - İstasyonkavşağı	65	62	71	82
Şırnak - Silopi,				14
Tekirdağ	19	17	17	19
Tekirdağ - Çerkezköy - MTHM	23	21	16	21

Station Name	2020	2021	2022	2023
Tekirdağ - Çorlu - MTHM	41	29	25	-
Tekirdağ - Merkez - MTHM	24	24	25	24
Tokat - Erbaa	23	20	25	46
Tokat - Meydan	71	65	56	48
Tokat - Turhal	45	40	25	30
Trabzon - Akçaabat	22	28	16	25
Trabzon - Beşirli	39	38	38	33
Trabzon - Fatih	44	46	42	43
Trabzon - Meydan	41	33	30	39
Trabzon - Uzungöl	*	18	23	14
Trabzon - Valilik	27	30	21	18
Uşak	*	53	36	39
Uşak-Trafik	*	81	50	42
Yalova	34	29	22	19
Yalova - Altınova-MTHM	15	17	23	23
Yalova - Armutlu-MTHM	-	7	4	8
Yozgat	29	24	24	27
Yozgat - Sorgun	18	27		
Zonguldak - Çatalağzı Cumayanı	12	14	26	15
Zonguldak - Çatalağzı Kuzyaka	18	17	21	24
Zonguldak - Çaycuma	16	24	19	23
Zonguldak- Karadeniz Ereğli	11	15	28	8
Zonguldak - Kilimli	20	35	26	35
Zonguldak - Kozlu	14	6	12	15
Zonguldak - Muslu Tepeköy	7	8	9	15
Zonguldak - Trafik	35	38	49	55

Table -36 Annual Averages of Ozone (O_3) Concentrations Obtained from Stations Measured in Provincial and District Centres (MoEUCC, 2024)

Station Name	2020	2021	2022	2023
Adana - Çatalan	40	73	60	29
Adana - Çukurova		42	22	12
Adana - Doğankent	35	54	52	40
Adana - Meteoroloji	53	74	57	53
Adana - Valilik	45	61	60	43
Adana-Yakapınar		52	36	11
Afyon-Selçuk Cami	46	50	38	23

Station Name	2020	2021	2022	2023
Ağrı	59	69	72	63
Ağrı - Doğubeyazıt	26	70	64	20
Ağrı - Patnos	23	59	51	53
Aksaray	61	38	47	39
Amasya - Şehzade	25	31	28	30
Ankara - Çankaya	22			19
Ankara - Keçiören Sanatoryum	43	47	24	19
Ankara - Mamak		11	8	
Ankara - Ostim	21	27	13	37
Ankara - Polatlı	6	7	49	32
Ankara - Sıhhıye	27	23	14	14
Ankara - Siteler	27	19	27	
Ankara- Törekent				
Ankara - Ulus			33	30
Ankara Yaşamkent	38	42	42	9
Antalya - Gazipaşa	*	83	101	97
Antalya - Kepez	42	44	41	45
Antalya - Kumluca	*	54	61	*
Antalya - Manavgat	*	60	50	49
Antalya - Trafik	*	37	36	20
Ardahan	60	64	76	62
Artvin	37	54	43	40
Artvin - Hopa	65	69	73	31
Aydın - Didim	*	76	85	88
Aydın - Efeler	*	31	62	58
Aydın - Germencik	*	27	48	49
Aydın - Nazilli	*	31	39	40
Aydın - Söke	*	22	38	37
Balıkesir	48	49	-	-
Balıkesir - Bandırma-MTHM	56	57	47	-
Balıkesir - Edremit - MTHM	51	47	66	57
Balıkesir - Erdek-MTHM	63	63	89	-
Bartın	16	33	13	15
Bayburt	58	65	63	54
Bilecik	58	53	51	40
Bilecik - Bozüyük-MTHM	56	39	30	30
Bolu - Abant	49	90		

Station Name	2020	2021	2022	2023
Bolu - Karaçayır Parkı	22	32	49	41
Burdur	58	46	37	46
Bursa	38	37	38	-
Bursa - Kestel-MTHM	42	43	37	44
Bursa - Kültür Park-MTHM	43	45	45	50
Bursa - Uludağ Üniv,-MTHM	52	54	50	54
Bursa Gürsu	*	*	*	19
Bursa-Kestel (Hilal Parkı)	*	*	*	52
Bursa-Nilüfer			33	25
Çanakkale	55	52	47	41
Çanakkale - Biga İçdaş	27	30	38	28
Çanakkale - Çan-MTHM	64	52	43	41
Çanakkale - Lapseki-MTHM	68	65	68	74
Çankırı	10	5	8	29
Çorum - Bahabey	13	38	38	23
Denizli - Çivril		29	58	48
Denizli - Honaz	23	33	65	44
Denizli - Sümer		63	46	47
Düzce - Bahçeşehir	32	21	29	35
Edirne	30	31	-	33
Edirne - Karaağaç-MTHM	52	50	48	49
Edirne - Keşan-MTHM	66	62	65	-
EMEP - Ankara Çubuk	53	77	45	58
EMEP - İzmir Seferihisar	58	113	73	70
Erzincan	45	55	51	44
Erzurum	61	57	60	50
Erzurum - Palandöken	84	101	97	109
Erzurum - Pasinler	54	73	69	81
Eskişehir- Cumhuriyet Bulvarı				
Eskişehir - Vişnepark	16	19	34	31
Gaziantep - Fevzi Çakmak		29	29	29
Gaziantep - Gaski D6		87	42	45
Gaziantep - Nizip		62	60	54
Gaziantep-Atapark	*	63	82	*
Giresun - Gemilercekeği	24	25	29	32
Gümüşhane	35	34	42	44
Hatay - Antakya	23	23	24	*
Hatay - İskenderun	91	68	63	75

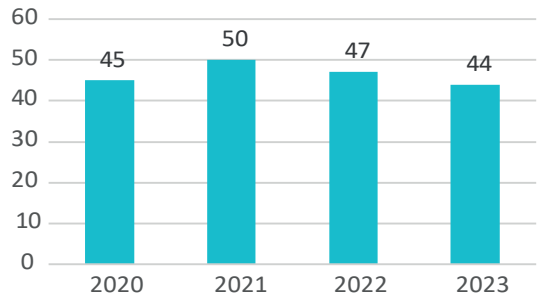
Station Name	2020	2021	2022	2023
Hatay - İskenderun Merkez		57	54	33
Iğdır	55	64	29	65
Iğdır - Aralık	69	78	75	75
Isparta	60	60	38	28
İstanbul - Aksaray	19	17	13	13
İstanbul - Alibeyköy	15	22	338	20
İstanbul - Arnavutköy	50	54	48	44
İstanbul - Avcılar	38	36	36	34
İstanbul - Bağcılar	40	36	39	38
İstanbul - Başakşehir-MTHM	69	74	36	56
İstanbul - Beşiktaş	32	14	8	27
İstanbul - Büyükada	18	14	12	7
İstanbul - Çatladıkapı	27	32	33	36
İstanbul - Esenler				33
İstanbul - Esenyurt-MTHM	21	43	30	44
İstanbul - Göztepe	25			
İstanbul - Kadıköy	17	20	56	37
İstanbul - Kağıthane	12	3	14	13
İstanbul - Kağıthane-MTHM	69	53	49	39
İstanbul - Kartal	50	48	39	36
İstanbul - Maslak	18	24	28	29
İstanbul - Sarıyer	27	30	44	44
İstanbul - Selimiye	46	27	18	42
İstanbul - Silivri-MTHM	64	62	55	76
İstanbul - Sultanbeyli-MTHM	58	59	51	56
İstanbul - Sultangazi-MTHM	29	52	45	50
İstanbul - Şile-MTHM	76	66	52	50
İstanbul - Tuzla	43	30	27	21
İstanbul - Ümraniye	17	30	22	36
İzmir - Aliağa	22	35	52	50
İzmir - Aliağa - Bozköy		24	20	27
İzmir - Bornova	*	31	41	41
İzmir - Çeşme		48	40	72
İzmir - Eğitim İstasyonu	*	16	31	32
İzmir - Karabağlar		25	37	22
İzmir - Karaburun		33	27	47
İzmir - Menemen		38	48	43

Station Name	2020	2021	2022	2023
İzmir - Ödemiş		31	33	26
İzmir - Torbalı		32	38	31
İzmir - Yenifoça		39	52	65
İzmir-Kemalpaşa	*	46	44	50
Kahramanmaraş - Elbistan	23	8	25	19
Kahramanmaraş - Onikişubat	22	15	13	20
Karabük - Tören Alanı		19	16	16
Karaman	53	60	45	36
Kars - İstasyon Mah,	50	58	44	59
Kastamonu	22	31	25	24
Kastamonu - Azdavay		66	24	37
Kayseri - OSB	47	50	41	24
Kayseri - Talas		18	36	36
Kayseri - Trafik	32	28	29	24
Kırıkkale	22	5	4	8
Kırklareli	58	55	52	67
Kırklareli - Limanköy-MTHM	82	73	81	90
Kırşehir	26	43	51	40
Kilis	48	40	42	39
Kocaeli	32	34	32	-
Kocaeli - Dilovası	40	34	-	-
Kocaeli - Gebze - MTHM	41	45	43	40
Kocaeli - Gebze OSB - MTHM	61	52	49	-
Kocaeli - Gölcük-MTHM	50	52	51	47
Kocaeli - Kandıra-MTHM	70	71	45	45
Kocaeli - Körfez-MTHM	44	45	48	46
Kocaeli - Yeniköy-MTHM	47	49	45	42
Konya - Bosna		61	39	28
Konya - Karatay		62	17	31
Konya - Karkent	38	39	25	9
Konya - Laboratuvar	53	59	51	31
Konya - Sarayönü		58	61	55
Konya - Trafik		51	18	40
Konya-Erenköy-Belediye	56	8	9	
Konya-Karatay	23	14		12
Kütahya - Heymeana Cad,	28	74	21	11
Kütahya - Kentpark	14	45	16	37

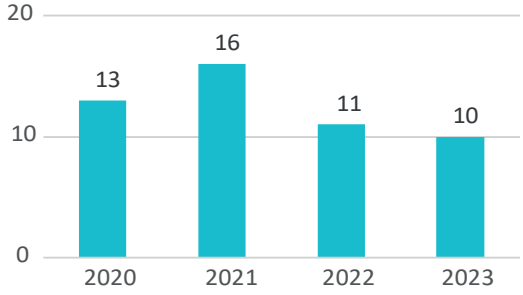
Station Name	2020	2021	2022	2023
Manisa - Akhisar		34	57	69
Manisa - Alaşehir	*	71	77	70
Manisa - Kırkağaç		18	63	70
Manisa - Salihli	*	55	55	42
Manisa - Soma	32	30	58	59
Manisa - Turgutlu		19	40	26
Manisa - Yunusemre			20	7
Mersin - Huzurkent		44	20	18
Mersin - İstiklal Cad,		31	22	
Mersin - Tasucu	*	65	55	46
Mersin - Toroslar		54	33	
Mersin - Yenişehir	*	60	43	30
Muğla - Datça		64	67	47
Muğla - Fethiye		31	37	45
Muğla - Milas		50	50	53
Muğla - Milas Ören		64	74	67
Muğla - Yatağan		35	61	55
Nevşehir	53	59	45	41
Ordu - Ünye	38	48	39	37
Osmaniye		51	46	24
Rize	33	47	45	57
Rize - Ardeşen	67	70	70	72
Sakarya	26	32	-	-
Sakarya - Hendek OSB - MTHM	-	-	28	28
Sakarya - Ozanlar - MTHM	39	43	42	37
Samsun - Atakum	13	34	39	45
Samsun - Yüzüncüyıl	36	27	20	24
Sinop - Erfelek	51	73	63	59
Sivas - Başöğretmen	-	42	32	38
Sivas - İstasyonkavşağı	-	61	72	81
Şırnak - Silopi				29
Tekirdağ	25	30	34	35
Tekirdağ - Çerkezköy - MTHM	51	51	54	-
Tekirdağ - Çorlu - MTHM	36	30	38	66
Tekirdağ - Çorlu OSB - MTHM	45	46	37	35
Tokat - Meydan	49	40	41	28
Trabzon - Akçaabat	48	49	57	55
Trabzon - Uzungöl	55	55	52	51

Station Name	2020	2021	2022	2023
Trabzon - Valilik	51	55	44	45
Uşak	*	16	52	47
Uşak-Trafik	*	*	*	*
Yalova	52	52	41	59
Yalova - Armutlu-MTHM	-	62	41	64
Yozgat - Sorgun	32	15	26	15
Zonguldak - Çatalağzı Cumayanı	47	40	31	30
Zonguldak - Çatalağzı Kuzyaka	43	45	36	32
Zonguldak - Çaycuma				
Zonguldak - Karadeniz Ereğli	25	32	12	17
Zonguldak - Kozlu	17	17	20	
Zonguldak - Muslu Tepeköy	77	77	71	57

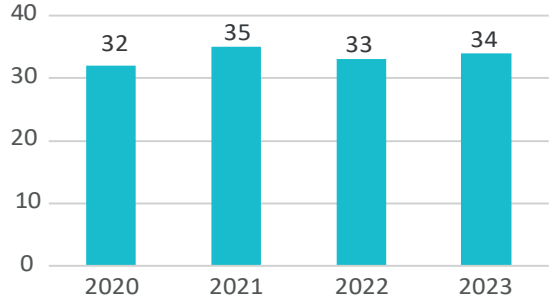
Graph 8 Rates of Change for PM10 by Years (MoEUCC, 2024)



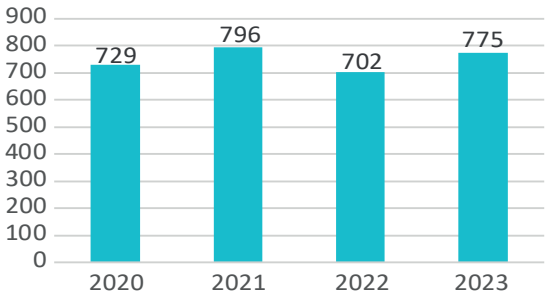
Graph 9 Rates of Change for SO_2 by Years (MoEUCC, 2024)



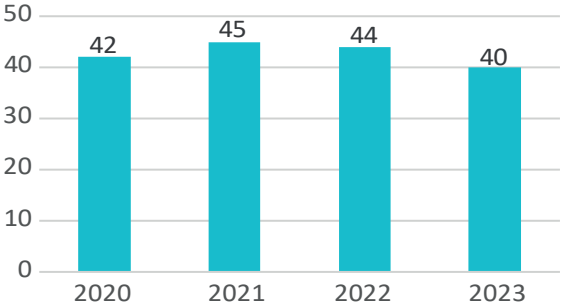
Graph 10 Rates of Change for NO_2 by Years (MoEUCC, 2024)



Graph 11 Rates of Change for CO by Years (MoEUCC, 2024)



Graph 12 Rates of Change for O_3 by Years (MoEUCC, 2024)



A.2.2. Air Quality in Forested Areas in Türkiye

In Türkiye, air pollution in forest lands is measured for 4 parameters and the averages of the measurement results between 2020-2024 are given in the following tables.

Table -37 Annual Averages of Sulphur Dioxide (SO_2) Concentrations Obtained from Stations Measured in Forested Areas (General Directorate of Forestry, 2024)

Monitoring Station No (Observation Area No)	Regional Directorate of Forestry (Province)	SO_2 averages (µg/m³)		
		2020	2021	2022
4	Ankara	1.87	4.098	2.67
6	Bolu	2.21	3.668	2.14
8	Balıkesir	2.02	3.590	2.24
10	Antalya	3.27	4.821	2.84
11	Antalya	1.38	4.015	3.45
12	İzmir	4.78	3.900	2.28
17	Giresun	1.20	3.566	2.76
18	Kars	1.41	2.421	2.79
22	Trabzon	1.46	5.682	3.10
23	Sinop	2.15	4.987	4.84
27	Mersin	1.41	4.290	3.28
29	Kahramanmaraş	4.39	3.638	4.31
30	Kırklareli	2.85	4.343	2.86
34	Konya	3.56	3.890	2.44
50	Kastamonu	1.50	3.794	2.54
51	İzmir	2.34	4.220	4.24
52	Eskişehir	2.15	3.505	2.38
54	Kocaeli	1.99	3.414	2.26

Table -38 Annual Averages of Ammonia (NH_3) Concentrations Obtained from Stations Measured in Forested Areas (General Directorate of Forestry, 2024)

Monitoring Station No (Observation Area No)	Regional Directorate of Forestry (Province)	NH_3 averages (µg/m³)		
		2020	2021	2022
4	Ankara	3.27	6.04	4.48
6	Bolu	3.46	5.66	7.62
8	Balıkesir	3.26	4.33	8.39
10	Antalya	4.11	5.70	5.78
11	Antalya	3.34	4.61	5.64
12	İzmir	5.37	6.68	6.29
17	Giresun	5.79	5.87	4.97

Monitoring Station No (Observation Area No)	Regional Directorate of Forestry (Province)	NH_3 averages (µg/m³)		
		2020	2021	2022
18	Kars	3.28	6.33	9.50
22	Trabzon	4.17	5.00	9.55
23	Sinop	4.36	3.96	6.05
27	Mersin	4.74	5.30	11.4
29	Kahramanmaraş	4.55	4.19	9.44
30	Kırklareli	6.23	5.02	4.31
34	Konya	5.23	5.31	4.76
50	Kastamonu	3.30	6.29	3.21
51	İzmir	4.24	6.35	3.47
52	Eskişehir	2.65	6.61	4.44
54	Kocaeli	4.01	5.14	3.09

Table -39 Annual Averages of Nitrogen Dioxide (NO_2) Concentrations Obtained from Stations Measured in Forested Areas (General Directorate of Forestry, 2024)

Monitoring Station No (Observation Area No)	Regional Directorate of Forestry (Province)	NO_2 averages (µg/m³)		
		2020	2021	2022
4	Ankara	3.40	2.81	3.58
6	Bolu	2.46	2.55	4.21
8	Balıkesir	2.57	3.21	4.61
10	Antalya	3.58	3.09	3.77
11	Antalya	1.55	1.93	2.78
12	İzmir	14.39	6.52	6.17
17	Giresun	1.74	1.51	1.98
18	Kars	1.91	2.59	3.97
22	Trabzon	3.03	2.53	3.08
23	Sinop	1.86	1.61	2.45
27	Mersin	2.19	1.77	4.36
29	Kahramanmaraş	7.56	3.66	4.04
30	Kırklareli	4.65	1.89	2.19
34	Konya	1.29	1.95	3.27
50	Kastamonu	2.60	1.80	4.08
51	İzmir	3.31	2.12	5.06
52	Eskişehir	2.46	2.07	3.31
54	Kocaeli	3.81	2.40	4.61

Table -40 Annual Averages of Ozone (O_3) Concentrations Obtained from Stations Measured in Forested Areas (General Directorate of Forestry, 2024)

Monitoring Station No (Observation Area No)	Regional Directorate of Forestry (Province)	O_3 averages (ppb*)		
		2020	2021	2022
4	Ankara	89.76	116.8	120.0
6	Bolu	94.85	69.36	92.5
8	Balıkesir	86.98	105.40	117.0
10	Antalya	81.54	88.33	106.0
11	Antalya	87.68	91.64	118.0
12	İzmir	119.09	103.3	113.0
17	Giresun	80.71	97.22	100.0
18	Kars	101.24	77.56	99.4
22	Trabzon	64.95	102.80	112.0
23	Sinop	89.90	103.9	121.0
27	Mersin	124.40	123.00	111.0
29	Kahramanmaraş	101.22	77.82	110.0
30	Kırklareli	97.69	96.15	102.0
34	Konya	84.63	107.20	121.0
50	Kastamonu	84.07	105.00	118.0
51	İzmir	105.95	94.01	118.0
52	Eskişehir	94.25	100.70	106.0
54	Kocaeli	93.45	85.34	117.0

A.2.3. Continuous Emission Measurement Systems (CEMS)

Continuous monitoring of emissions from the chimneys of highly polluting industrial facilities is carried out according to the legislation regulated by the Ministry of Environment, Urbanization and Climate Change (MoEUCC).

Table -41 Number of Plants and Chimneys with CEMS according to Provinces in Türkiye (by the End of 2023) (MoEUCC, 2024)

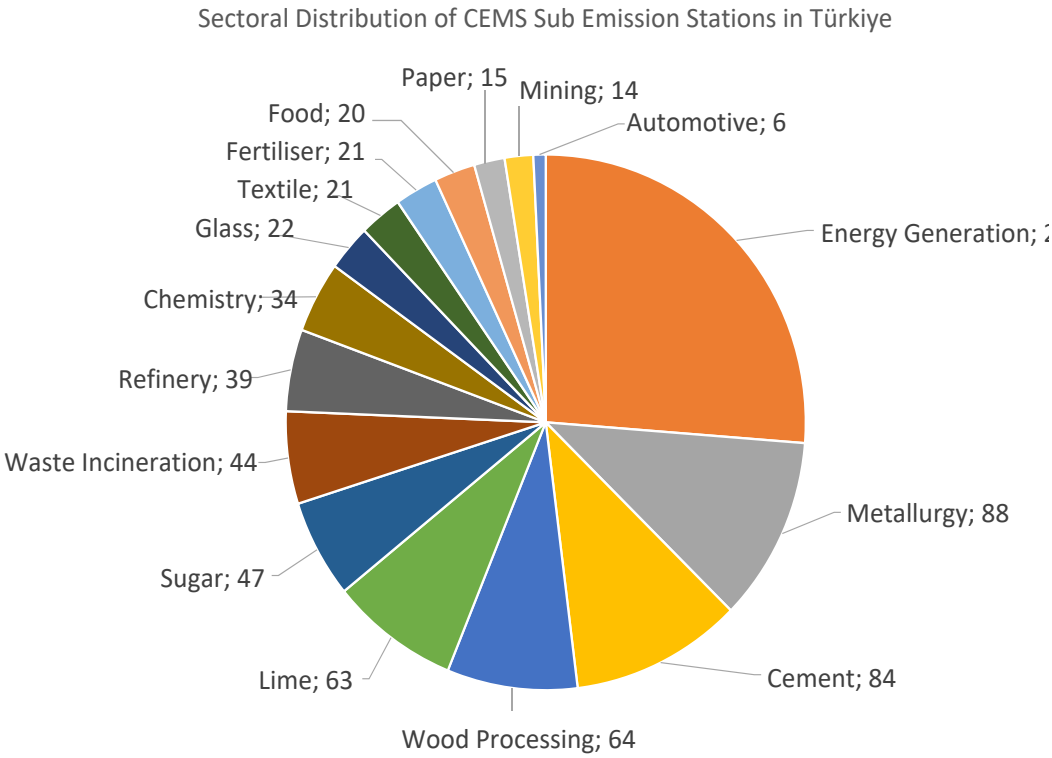
Province Name	Number of CEMS Stations	Province Name	Number of CEMS Stations
Adana	36 chimneys belonging to 16 facilities	Karaman	3 chimneys belonging to 2 facilities
Adıyaman	1 chimney belonging to 1 facility	Kars	1 chimney belonging to 1 facility
Afyonkarahisar	10 chimneys belonging to 6 facilities	Kastamonu	11 chimneys belonging to 4 facilities
Ağrı	1 chimney belonging to 1 facility	Kayseri	4 chimneys belonging to 2 facilities
Amasya	4 chimneys belonging to 1 facility	Kırıkkale	9 chimneys belonging to 3 facilities
Ankara	25 chimneys belonging to 13 facilities	Kırklareli	18 chimneys belonging to 12 facilities
Antalya	8 chimneys belonging to 4 facilities	Kırşehir	2 chimneys belonging to 2 facilities

Province Name	Number of CEMS Stations	Province Name	Number of CEMS Stations
Artvin	1 chimney belonging to 1 facility	Kilis	1 chimney belonging to 1 facility
Aydın	10 chimneys belonging to 9 facilities	Kocaeli	103 chimneys belonging to 36 facilities
Balıkesir	21 chimneys belonging to 12 facilities	Konya	15 chimneys belonging to 9 facilities
Bartın	3 chimneys belonging to 2 facilities	Kütahya	16 chimneys belonging to 7 facilities
Batman	2 chimneys belonging to 1 facility	Malatya	6 chimneys belonging to 5 facilities
Bilecik	5 chimneys belonging to 4 facilities	Manisa	25 chimneys belonging to 14 facilities
Bolu	5 chimneys belonging to 5 facilities	Mardin	8 chimneys belonging to 4 facilities
Burdur	4 chimneys belonging to 3 facilities	Mersin	20 chimneys belonging to 9 facilities
Bursa	46 chimneys belonging to 25 facilities	Muğla	9 chimneys belonging to 4 facilities
Çanakkale	19 chimneys belonging to 7 facilities	Muş	1 chimney belonging to 1 facility
Çankırı	1 chimney belonging to 1 facility	Nevşehir	1 chimney belonging to 1 facility
Çorum	2 chimneys belonging to 2 facilities	Niğde	3 chimneys belonging to 2 facilities
Denizli	19 chimneys belonging to 12 facilities	Ordu	2 chimneys belonging to 2 facilities
Diyarbakır	1 chimney belonging to 1 facility	Osmaniye	2 chimneys belonging to 2 facilities
Düzce	2 chimneys belonging to 2 facilities	Sakarya	11 chimneys belonging to 6 facilities
Edirne	2 chimneys belonging to 2 facilities	Samsun	28 chimneys belonging to 13 facilities
Elazığ	9 chimneys belonging to 7 facilities	Siirt	1 chimney belonging to 1 facility
Erzincan	5 chimneys belonging to 2 facilities	Sivas	4 chimneys belonging to 2 facilities
Erzurum	3 chimneys belonging to 2 facilities	Şanlıurfa	3 chimneys belonging to 2 facilities
Eskişehir	9 chimneys belonging to 5 facilities	Şırnak	2 chimneys belonging to 1 facility
Gaziantep	5 chimneys belonging to 4 facilities	Tekirdağ	25 chimneys belonging to 20 facilities
Gümüşhane	1 chimney belonging to 1 facility	Tokat	4 chimneys belonging to 2 facilities
Hatay	16 chimneys belonging to 8 facilities	Trabzon	2 chimneys belonging to 1 facility
Isparta	6 chimneys belonging to 2 facilities	Uşak	3 chimneys belonging to 3 facilities
İstanbul	22 chimneys belonging to 9 facilities	Van	2 chimneys belonging to 2 facilities
İzmir	59 chimneys belonging to 22 facilities	Yalova	4 chimneys belonging to 1 facility
Kahramanmaraş	20 chimneys belonging to 9 facilities	Yozgat	6 chimneys belonging to 3 facilities
Karabük	14 chimneys belonging to 2 facilities	Zonguldak	24 chimneys belonging to 6 facilities

Throughout Türkiye, Continuous Emission Measurement Systems (CEMS) were installed in facilities within the scope of the Communiqué on Continuous Emission Measurement Systems (CEMS) published in the Official Gazette dated 12 October 2011 and numbered 28082 and the Circular on Online Monitoring of Continuous Emission Measurement Systems (CEMS) dated 24 April 2014 and numbered 2014/12 in order to monitor industrial air pollution.

As of the end of 2023, monitoring systems were installed in 776 chimneys of 390 facilities (Table 41) and measurement data are monitored online by the MoEUCC. The sub-type sector distribution of the monitored stations is given in the graph below.

Graph 13 Sectoral Breakdown of CEMS Sub Emission Stations in Türkiye (MoEUCC, 2023)



In addition, 14 laboratories that can perform calibration studies of Continuous Emission Measurement Systems within the scope of monitoring emissions from the chimneys of industrial facilities have been authorised by the MoEUCC.

A.3. Exhaust Gas Emission Control

Factors affecting emissions from transport, especially road emissions, are technologies as well as fuel and engine characteristics. Exhaust Gas Emission Control By-law has been published in order to protect living beings and the environment from the effects of air pollution caused by exhaust gases from motor vehicles travelling in traffic, to ensure the reduction of exhaust gas pollutants, to control by making measurements and to determine the procedures and principles regarding the implementation.

In order to ensure the follow-up of exhaust gas emission measurements and to carry out measurements more effectively, "Exhaust Gas Emission Measurement Tracking System" was put into practice by the MoEUCC as of 01.01.2018. According to the Tracking System data, the number of measurements by provinces and months in 2019-2023 are as follows:

Table -42 Number of Vehicles Measured by Month in 2019-2023 According to Exhaust Gas Emission Measurement Tracking System Data (MoEUCC, 2024)

Month/No. of Measurements	2019	2020	2021	2022	2023
JANUARY	610,425	724,886	741,377	677,179	766,737
FEBRUARY	594,369	641,773	675,670	682,784	621,320
MARCH	709,511	682,543	838,378	771,692	820,547
APRIL	736,030	300,066	645,141	555,033	717,940

Month/No. of Measurements	2019	2020	2021	2022	2023
MAY	826,566	522,334	662,197	591,510	819,434
JUNE	673,166	1,030,571	922,752	948,785	875,300
JULY	827,031	1,034,788	854,398	901,400	992,010
AUGUST	716,091	855,472	882,988	949,775	976,687
SEPTEMBER	753,739	881,297	872,017	961,041	972,501
OCTOBER	766,380	883,097	821,379	941,111	955,000
NOVEMBER	818,458	845,707	893,914	1,003,387	1,015,886
DECEMBER	914,740	968,941	1,032,619	1,161,826	1,203,286
TOTAL	**8,946,506**	**9,371,475**	**9,842,830**	**10,145,523**	**10,736,648**

Table -43 Number of Measurements by Provinces in 2019-2023 According to Exhaust Gas Emission Measurement Tracking System Data (MoEUCC)

Provinces/No. of Measurements	2019	2020	2021	2022	2023
Adana	229,293	240,916	248,708	255,345	266,927
Adıyaman	49,959	52,631	57,289	57,628	52,588
Afyonkarahisar	78,730	81,609	87,718	92,430	97,052
Ağrı	21,611	22,128	21,650	22,637	23,198
Aksaray	44,866	47,132	49,971	49,413	53,295
Amasya	41,865	44,900	47,863	48,417	50,832
Ankara	700,407	734,143	757,698	793,346	833,435
Antalya	374,757	390,777	422,145	437,439	481,929
Ardahan	6,402	7,658	8,209	8,152	8,285
Artvin	20,837	22,519	23,229	23,332	23,490
Aydın	141,841	147,065	160,503	160,403	169,911
Balıkesir	158,812	172,716	177,872	186,073	192,995
Bartın	23,946	26,922	26,189	28,920	29,237
Batman	37,704	38,770	40,949	42,294	46,916
Bayburt	7,754	8,316	8,437	8,554	9,000
Bilecik	26,781	30,939	31,374	33,454	33,379
Bingöl	15,618	16,968	17,019	17,606	19,581
Bitlis	16,078	16,799	17,509	18,334	20,159
Bolu	45,673	49,602	50,538	51,926	53,869
Burdur	37,311	39,354	42,902	43,489	45,567
Bursa	353,448	376,379	385,591	411,524	424,170
Çanakkale	64,899	70,541	73,522	75,432	79,630
Çankırı	20,530	21,387	23,058	22,972	24,420
Çorum	61,944	67,452	68,661	71,688	74,253
Denizli	149,765	155,572	166,142	168,239	177,587
Diyarbakır	93,620	98,739	105,168	107,797	115,564
Düzce	43,590	47,248	48,587	51,850	55,073

Provinces/No. of Measurements	2019	2020	2021	2022	2023
Edirne	54,757	57,059	60,027	61,656	63,608
Elazığ	54,667	57,822	62,187	63,460	67,165
Erzincan	25,016	26,430	26,817	27,640	28,749
Erzurum	55,315	57,844	59,141	60,088	63,552
Eskişehir	108,731	111,756	115,783	120,223	126,365
Gaziantep	186,428	192,892	207,520	219,592	223,924
Giresun	51,047	55,490	58,569	61,813	63,736
Gümüşhane	11,662	12,722	13,485	13,274	14,333
Hakkari	13,291	13,445	13,716	13,858	15,260
Hatay	167,447	175,562	186,371	192,601	175,729
Iğdır	16,840	17,217	17,928	18,465	20,544
Isparta	58,026	60,655	63,607	65,518	68,792
İstanbul	1,546,052	1,582,681	1,645,251	1,679,417	1,809,435
İzmir	519,164	538,818	578,504	565,363	619,159
Kahramanmaraş	122,293	124,786	135,423	137,370	138,950
Karabük	29,609	32,034	32,607	33,335	34,202
Karaman	34,507	33,022	35,101	35,609	38,301
Kars	17,579	18,022	18,091	18,190	19,221
Kastamonu	44,099	48,376	49,806	52,616	53,777
Kayseri	170,343	179,267	188,325	198,572	209,175
Kırıkkale	50,157	50,553	51,736	49,474	53,627
Kırklareli	40,900	43,501	45,916	49,338	52,051
Kırşehir	29,655	30,644	31,455	33,388	34,858
Kilis	14,017	14,704	16,257	17,039	18,081
Kocaeli	222,889	235,875	242,937	250,532	272,407
Konya	284,169	298,850	323,667	333,945	356,911
Kütahya	73,375	76,638	80,735	81,357	84,950
Malatya	75,999	80,624	84,036	88,080	81,569
Manisa	174,140	181,087	193,576	201,489	215,436
Mardin	55,157	57,183	58,695	61,710	64,796
Mersin	220,786	236,940	250,352	258,101	279,928
Muğla	168,109	178,579	189,946	198,058	208,123
Muş	20,391	20,809	21,526	22,143	25,324
Nevşehir	41,638	44,613	46,170	47,387	51,309
Niğde	41,353	44,221	45,699	48,893	52,643
Ordu	77,847	83,411	89,676	93,089	98,735
Osmaniye	62,760	66,642	69,246	71,071	73,586
Rize	46,569	49,444	50,946	51,627	53,205
Sakarya	123,254	132,200	137,052	144,577	154,272
Samsun	143,705	153,268	160,680	169,405	176,635
Siirt	14,852	15,220	16,114	16,729	18,305
Sinop	25,381	27,866	28,417	29,544	31,018
Sivas	70,321	75,289	77,513	80,250	84,189

Provinces/No. of Measurements	2019	2020	2021	2022	2023
Şanlıurfa	147,184	148,886	168,627	173,760	196,640
Şırnak	29,247	30,866	33,219	35,351	37,611
Tekirdağ	111,933	124,059	129,829	136,673	146,971
Tokat	60,133	64,138	69,442	70,166	75,362
Trabzon	101,468	101,754	110,845	112,584	117,128
Tunceli	6,487	6,648	6,207	6,213	6,821
Uşak	45,893	47,754	50,032	52,504	55,728
Van	71,732	75,304	75,101	77,464	80,093
Yalova	37,207	38,089	37,485	37,969	40,771
Yozgat	42,169	44,615	47,606	47,924	51,226
Zonguldak	60,926	66,281	65,411	70,335	70,020
TOTAL	**8,946,717**	**9,371,637**	**9,842,911**	**10,145,523**	**10,736,648**

A.4. Noise

In Türkiye, the necessary legal and technical By-laws on noise have been addressed by the By-laws and circulars put into force by the MoEUCC.

The first legal By-law for the control of noise in Türkiye was made in 1983 with the Environmental Law No. 2872. The first technical By-laws based on this Law were made with the "By-law on Noise Control" dated 1986. The said By-law was harmonised with the EU Directive 2002/49/EC on Environmental Noise Management and published in the Official Gazette dated 4 June 2010 and numbered 27601 under the name of "By-Law on Assessment and Management of Environmental Noise". On 30 November 2022, the By-Law on Assessment and Management of Environmental Noise (AMEN) was repealed and the "By-Law on Environmental Noise Control" entered into force by adopting the approach of noise control at the source instead of noise control at the receiver for ease of implementation.

The purpose of the By-law is to prevent the adverse effects of environmental noise on the environment and human health, to prepare noise maps and noise action plans, to implement noise control measures to reduce environmental noise and to inform the public about environmental noise management studies.

In accordance with the By-law, it is essential that noise maps and action plans are taken into consideration in all kinds of planning. Strategic noise maps and action plans should be prepared by taking into account in the zoning plan studies and licensing phase and necessary measures should be taken in this regard in the plans.

Regarding Strategic Noise Maps and Action Plans, the MoEUCC is obliged to give opinion on the noise maps and action plans prepared by the institutions and organizations responsible for noise mapping. According to the By-law, Municipalities are responsible for preparing strategic noise maps and noise action plans and implementing strategic noise action plans. Strategic noise maps are prepared separately for the areas where highways, railways, airports, harbours, industrial facilities, music broadcasting workplaces and other workplaces are located. By making use of the map data prepared for each source group, combined noise maps are created to show the total effect of all sources.

The Ministry of Transport and Infrastructure is authorised and responsible for preparing noise maps of the main highways, railways, airports and sea ports under its responsibility and transmitting the results of these maps to the relevant Municipality to be used in the strategic noise action plan studies of the provinces.

Within the scope of environmental noise control and management, strategic noise maps are required to be prepared for all provincial centres and areas with a population density of more than 1,000 people per square kilometre. In this context, within the scope of national and international projects carried out by the MoEUCC, noise maps were prepared for the residential areas of 66 provinces and action plans for 22 provinces were completed. In addition, strategic noise maps of 49 airports have been prepared.

By the end of 2023, provinces for which noise maps for residential areas have been prepared are İstanbul, Bursa, İzmir, Ankara, Kocaeli, Antalya, Konya, Malatya, Adana, Adıyaman, Balıkesir, Elazığ, Erzurum, Eskişehir, Gaziantep, Kahramanmaraş, Kayseri, Manisa, Mersin, Sakarya, Samsun, Sivas, Trabzon, Diyarbakır, Bolu, Afyonkarahisar, Amasya, Aydın, Batman, Bingöl, Çorum, Denizli, Edirne, Hatay, Karabük, Karaman, Kütahya, Mardin, Muğla, Ordu, Rize, Şanlıurfa, Tekirdağ, Tokat, Uşak, Van, Kars, Zonguldak, Düzce, Aksaray, Isparta, Ağrı, Yozgat, Çanakkale, Giresun, Osmaniye, Kırıkkale, Erzincan, Siirt, Kastamonu, Kırşehir, Şırnak, Nevşehir, Yalova, Niğde, and Kırklareli. The number of provinces that need to prepare a noise map is 15.

Strategic noise maps of 49 airports have been prepared: İstanbul Atatürk, İstanbul Sabiha Gökçen, Ankara Esenboğa, Antalya, İzmir Adnan Menderes, Kayseri, Kahramanmaraş, Batman, Van Ferit Melen, Elazığ, Erzurum, Diyarbakır, Sivas Nuri Demirağ, Balıkesir Merkez, Trabzon, Gaziantep, Adıyaman, Samsun Çarşamba, Balıkesir Koca Seyit, Konya, Kocaeli Cengiz Topel, Amasya Merzifon, Hatay, Muğla Dalaman, Muğla Milas Bodrum, Nevşehir Kapadokya, Şanlıurfa GAP, Tokat, Adana, Çanakkale, Isparta Süleyman Demirel, Bursa Yenişehir, Erzincan, Malatya, Tekirdağ Çorlu, Uşak, Ağrı, Mardin, Siirt, Bingöl, Şırnak, Denizli Çardak, Hakkari Yüksekova Selahattin Eyyubi, Iğdır Şehit Bülent Aydın, Kars Harakani, Kastamonu, Muş Sultan Alparslan, Ordu-Giresun and Sinop Airports.

The General Directorate of Highways has prepared noise maps of certain sections in their area of responsibility.

Noise maps have also been prepared for some ports located within the borders of Samsun (Samsun Port), Istanbul (Haydarpaşa and Ambarlı Ports) and Kocaeli (Rota Port).

Regarding the noise action plan studies carried out under the coordination of the MoEUCC, taking into account the results of the strategic noise map, environmental noise action plan of the provinces of Konya, Bursa, Mersin, Kayseri, Sivas, Manisa, İstanbul, Kocaeli, Antalya, Bolu, Balıkesir, Tekirdağ, Gaziantep, Eskişehir, Kahramanmaraş, Trabzon, İzmir, Kütahya, Uşak, Ankara, Sakarya and Denizli was finalized.

Training Programmes on “Basic Acoustics, Noise Mapping, Action Plans” have been prepared in order to meet the need for trained and experienced personnel in the competent authorities, as well as in the industry, universities, institutions and private consultancy firms in order to strengthen the technical infrastructure on noise and to ensure specialisation throughout the country.

References

Ministry of Environment, Urbanization and Climate Change

General Directorate of Forestry

B. CLIMATE CHANGE

Climate change, the effects of which we experience more intensely in the world and in Türkiye every year, affects every segment of society socially and economically as a global crisis.

As a result of the 2053 Net Zero Emission Target announced by our President in 2021 and Türkiye's will to become a party to the Paris Agreement, the green transformation process, which marks a comprehensive change and transformation in all sectors, has started in Türkiye.

The institutional structure of the Ministry of Environment, Urbanization and Climate Change has been strengthened to increase its capacity accordingly. The name of the Ministry was changed as the Ministry of Environment, Urbanization and Climate Change and the Climate Change Presidency was established under the Ministry of Environment, Urbanization and Climate Change in order to carry out activities related to taking necessary measures to combat climate change and determining plans, policies and strategies for green transformation in line with Türkiye's 2053 Net Zero Emission Target.

Türkiye expresses its sensitivity on a global scale by setting decisive targets within the scope of combating climate change. In this direction, "Updated First National Contribution Statement" was prepared by the MoEUCC with the contribution of relevant institutions and organizations and submitted to the Secretariat of the United Nations Framework Convention on Climate Change. The mitigation rate from the increase announced as 21% has been increased to 41% for 2030.

Accordingly, after the announcement of the "National Contribution Declaration", work on the road map to reach the 2030 target of Türkiye has started. Within the scope of the studies, two complementary plans, namely "Climate Change Mitigation Strategy and Action Plan 2024-2030" and "Climate Change Adaptation Strategy and Action Plan 2024-2030", which include key and priority targets in combating climate change, were finalized.

Due to the fact that the greenhouse gases in the atmosphere are permeable to the incoming solar radiation, but much less permeable to the long-wave ground radiation emitted back, the natural process that enables the earth to warm up more than expected and regulates the heat balance is called the natural greenhouse effect.

The United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol (KP) require the control of six major greenhouse gases (CO_2, CH_4, N_2O, Hydrofluorocarbons-HFC, Perfluorocarbons-PFC and Sulphurhexafluoride-SF_6). Chlorofluorocarbons-CFC and Hydrochlorofluorocarbons-HCFC, which cause ozone depletion in the stratosphere, are controlled by the Montreal Protocol.

In the fight against climate change, the main policies and measures that come to the forefront are concentrated in the energy, transport, industrial processes, agriculture, waste and land use and forestry sectors.

B.1. General Climate Data

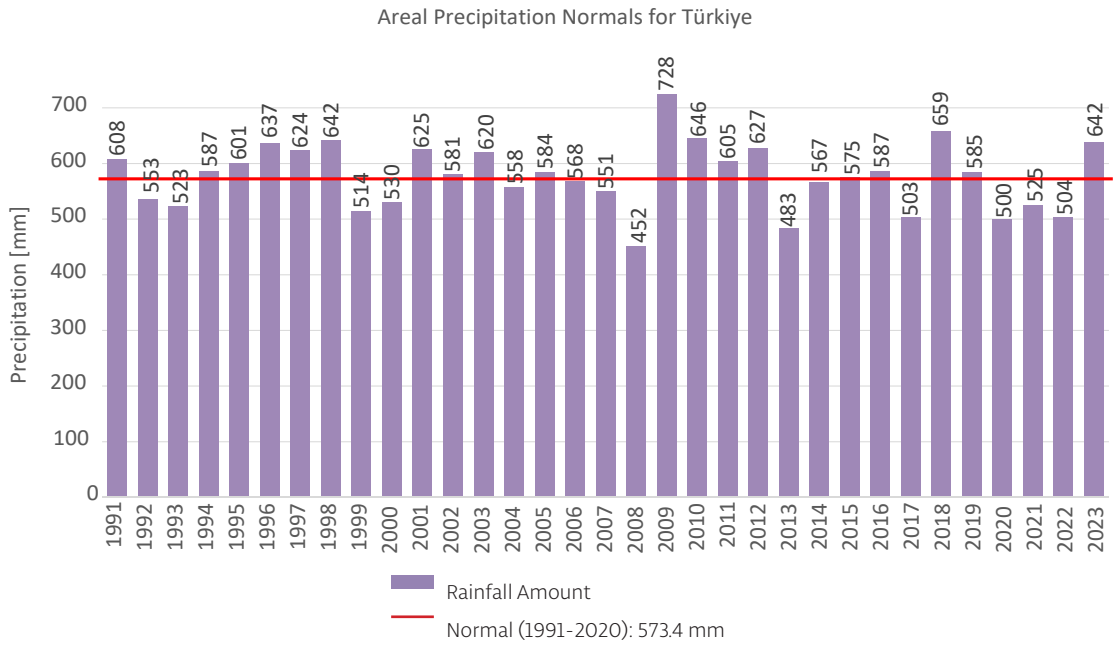
B.1.1 Precipitation Distribution of Türkiye

The average annual areal precipitation in Türkiye is 573 mm (1991-2020). According to the long-term averages, the highest precipitation in Türkiye is over 1,600 mm in Rize and Artvin coasts of the Eastern Black Sea Region, while the lowest precipitation is observed in the central parts of Central Anatolia and around Şanlıurfa, Ağrı and Iğdır (Map 8).

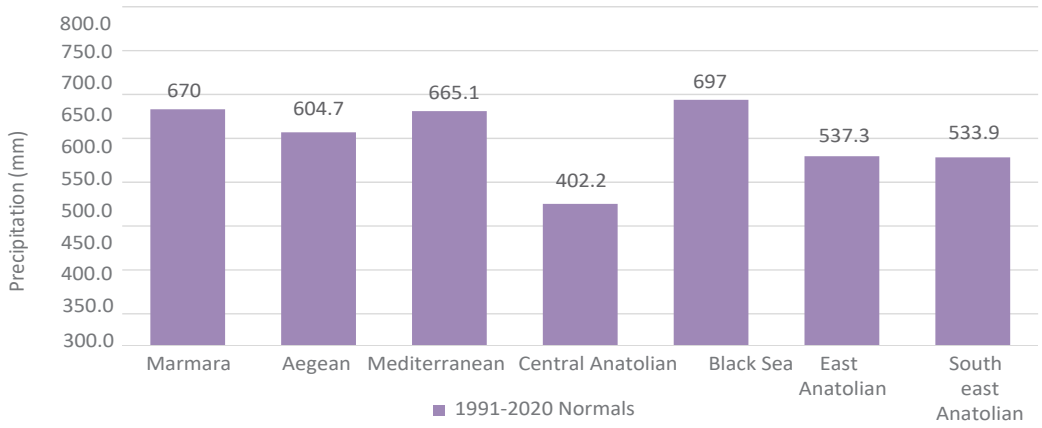
Annual precipitation is irregular throughout Türkiye, some years below normal and some years above. While 2008 was the driest year since 1974 (452 mm), the following year was the wettest year since 1974 (728 mm) (Graph 14).

In terms of regional precipitation, the Black Sea Region receives the most precipitation and the Central Anatolia Region receives the least precipitation in Türkiye. While the annual precipitation norms of the Marmara, Aegean, Mediterranean and Black Sea regions are above 600 mm, they fall around 402 mm in the Central Anatolia Region (Graph 15).

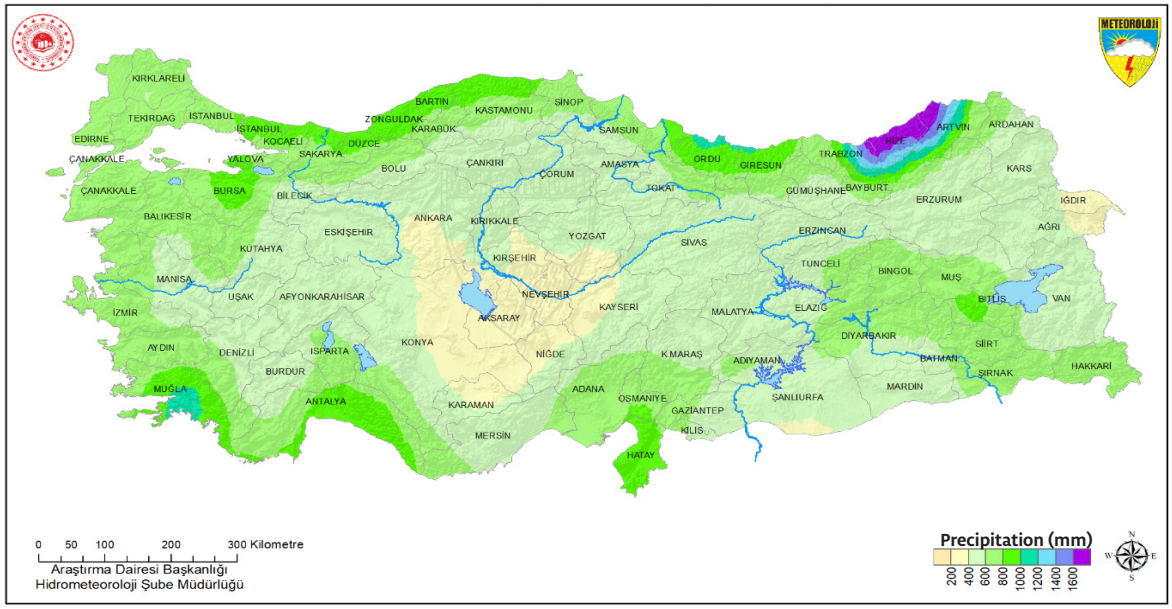
Graph 14 Areal Precipitation Normals for Türkiye (1991-2020) General Directorate of Meteorology (TSMS), 2024)



Graph 15 Region-wide Areal Precipitation Normals (1991-2020) TSMS, 2024)

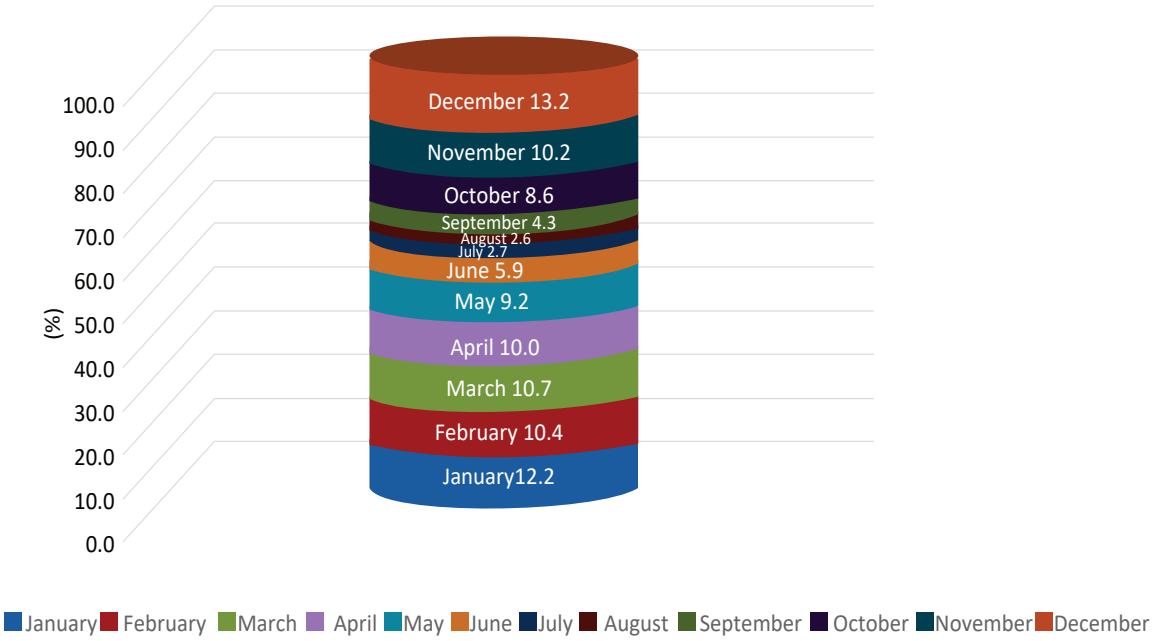


Map 8 Annual Areal Total Precipitation Distribution of Türkiye (1991-2020) (TSMS, 2024)



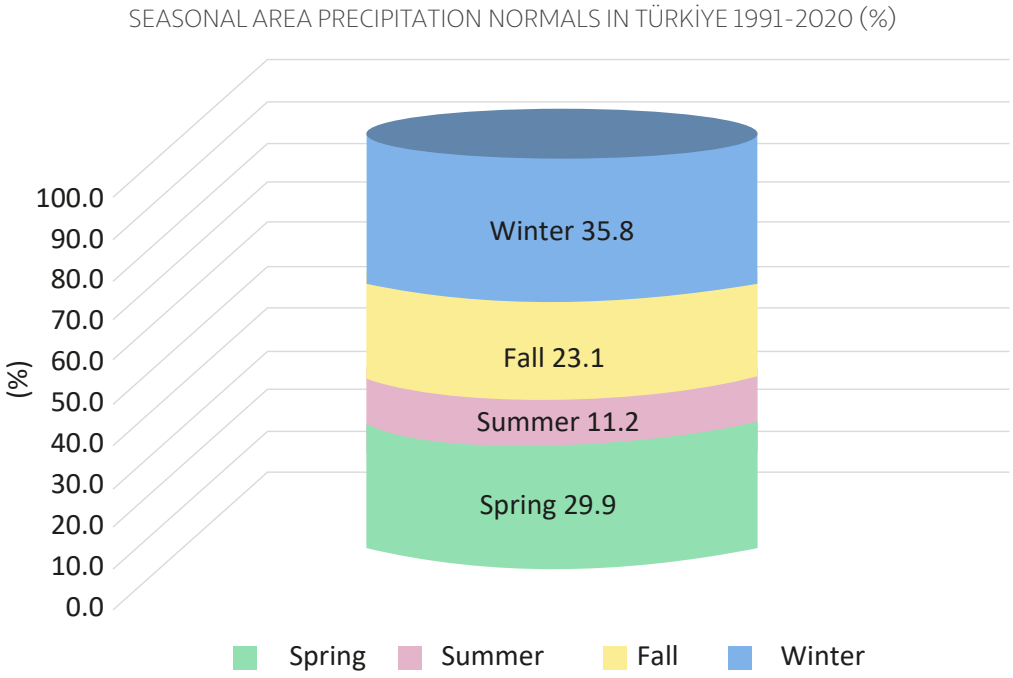
The months with the lowest precipitation in Türkiye are July and August. In these months, only 5.3% of the total precipitation is realized. The months with the highest precipitation in Türkiye are December and January, 25.4% of the total precipitation occurs in these months (Graph 16).

Graph 16 Areal Precipitation Normals of Türkiye by Months (1991-2020) (TSMS, 2024)



The season with the lowest precipitation in Türkiye is summer, while the highest precipitation occurs in winter (Graph 17).

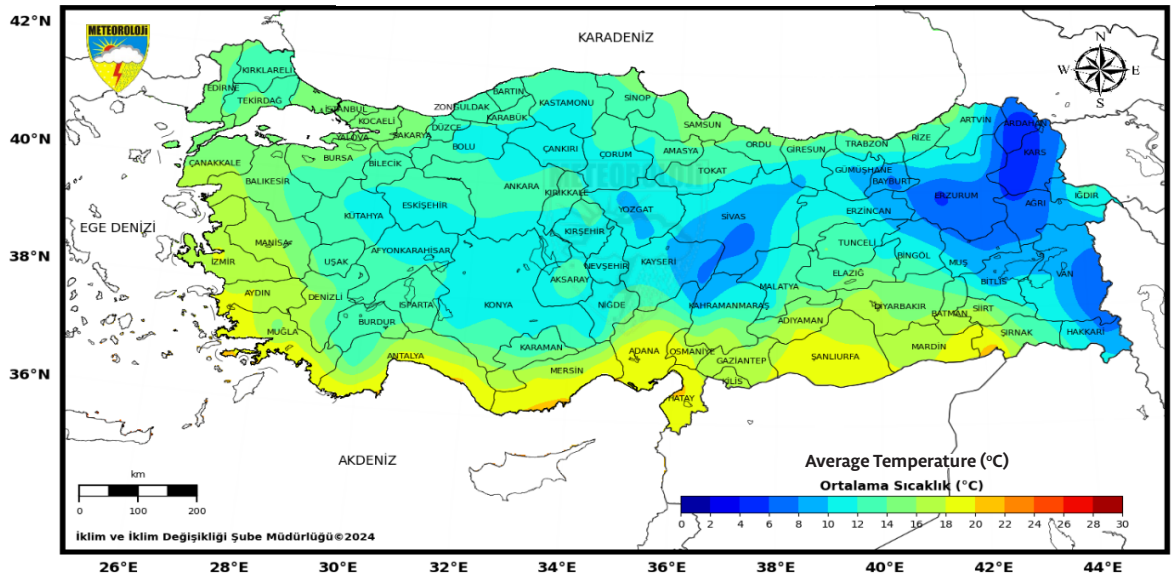
Graph 17 Seasonal Areal Precipitation Normals in Türkiye (1991-2020) (TSMS, 2024)



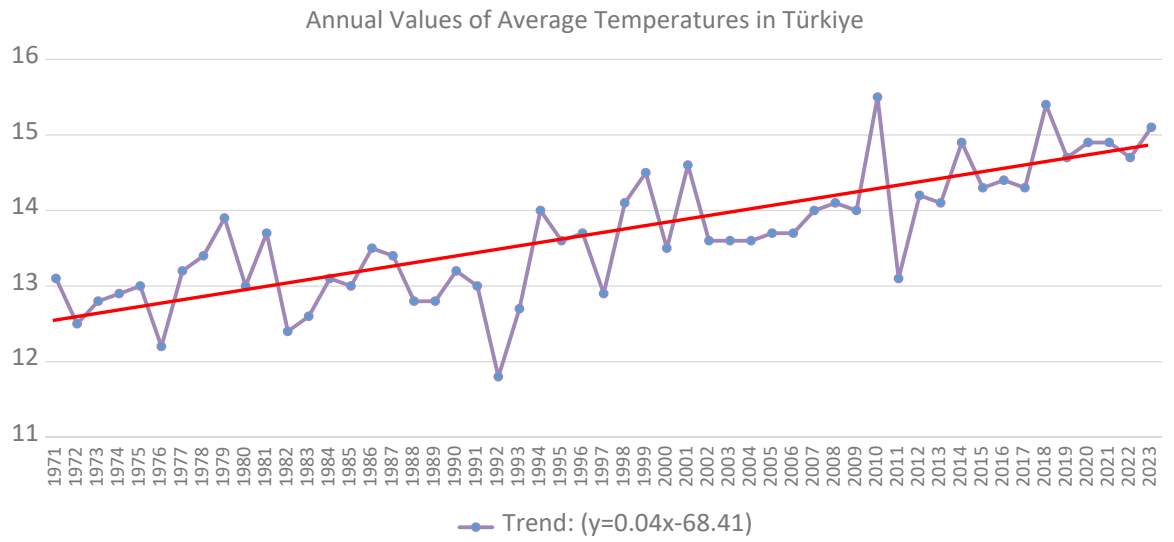
B.1.2. Temperature Distribution in Türkiye

When the average temperature distribution of Türkiye according to 1991-2020 climate normals is analyzed, it is seen that the highest average temperature is in the Southeastern Anatolia Region (17.4 °C) and the lowest average temperature is in the Central Anatolia Region (11.2 °C) (Map 9). When the temperature changes between 1970 and 2023 are analyzed, it is seen that there has been an increase in temperature since 2007, except for 2011 (Graph 18). The hottest year in Türkiye was 2010 with 15.5°C. The average temperature, which was 13.2°C between 1971-2000, increased to 13.9°C between 1991-2020 (TSMS, 2024).

Map 9 Areal Distribution of Average Temperatures in Türkiye (1991-2020) (TSMS, 2024)



Graph 18 Graph of Annual Values of Average Temperatures in Türkiye (TSMS, 2024)



B.1.3. Temperature Measurement Results in Türkiye

The General Directorate of Meteorology carries out monthly, seasonal and annual climate monitoring studies and shares these studies with the national and international public.

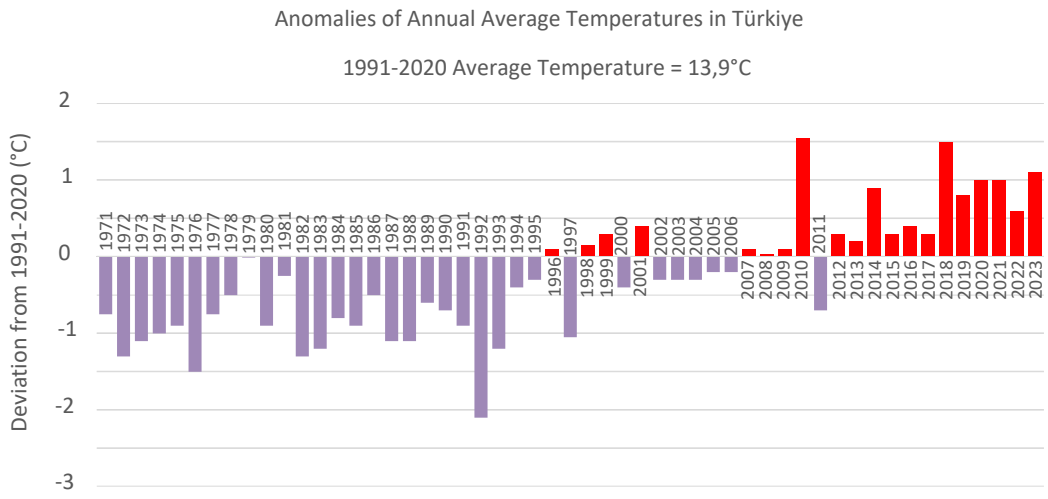
When the temperature changes between 1970 and 2023 are analyzed, there has been an increase

in temperature since 2007, except for 2011 (Graphs 19 and 20). The hottest year in Türkiye was 2010 with 15.5 °C. The year 2023 was the 3rd warmest year since 1971.

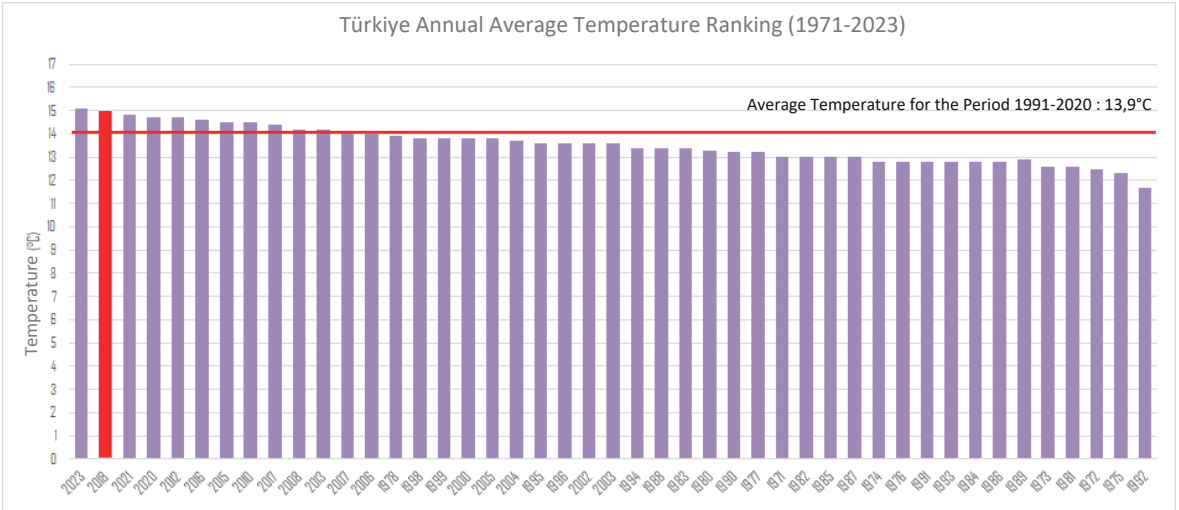
The average temperature, which was 13.2 °C between 1971-2000, increased to 13.9 °C between 1991-2020 (TSMS, 2024). In 2022-2023, winter average temperature was 5.5 °C, 1.6 °C above normal, spring average temperature was 12.8 °C, 0.4 °C above normal, summer average temperature was 24.7 °C, 1.0 °C above normal and Fall average temperature was 23.4 °C, 0.7 °C above normal.

In 2023, the lowest temperature was -31.3 °C in Erzurum in February and the highest temperature was 49.5 °C in Sarıcakaya (Eskişehir) in August.

Graph 19 Graph of Anomalies of Annual Average Temperatures in Türkiye (1991-2020) (General Directorate of Meteorology, 2024)



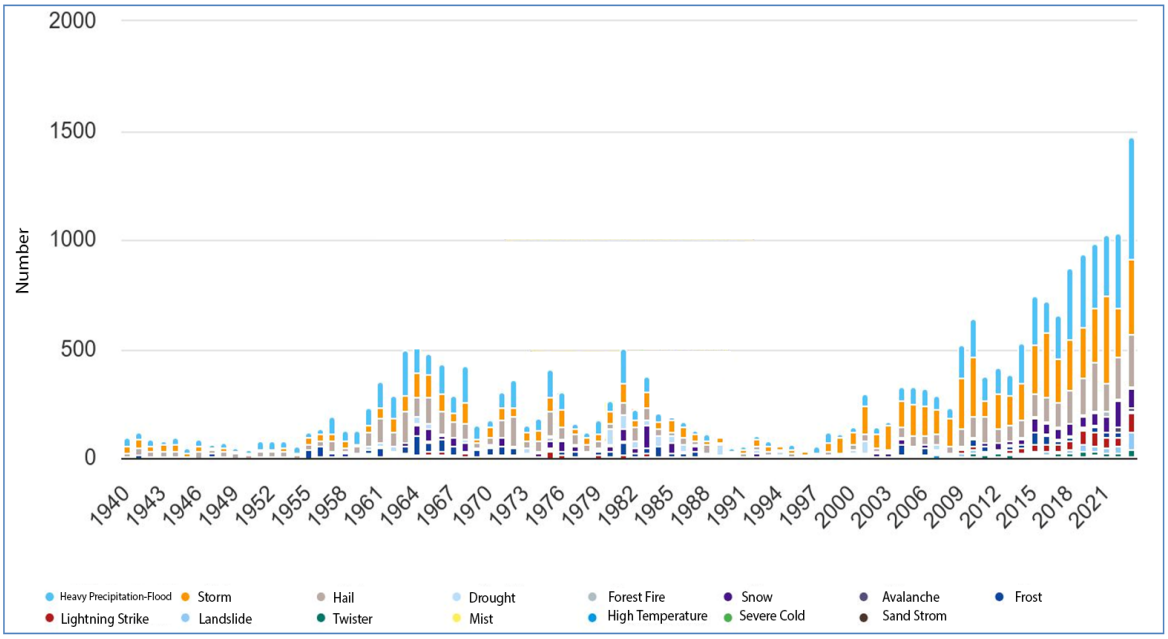
Graph 20 Türkiye Annual Average Temperature Ranking (TSMS, 2024)



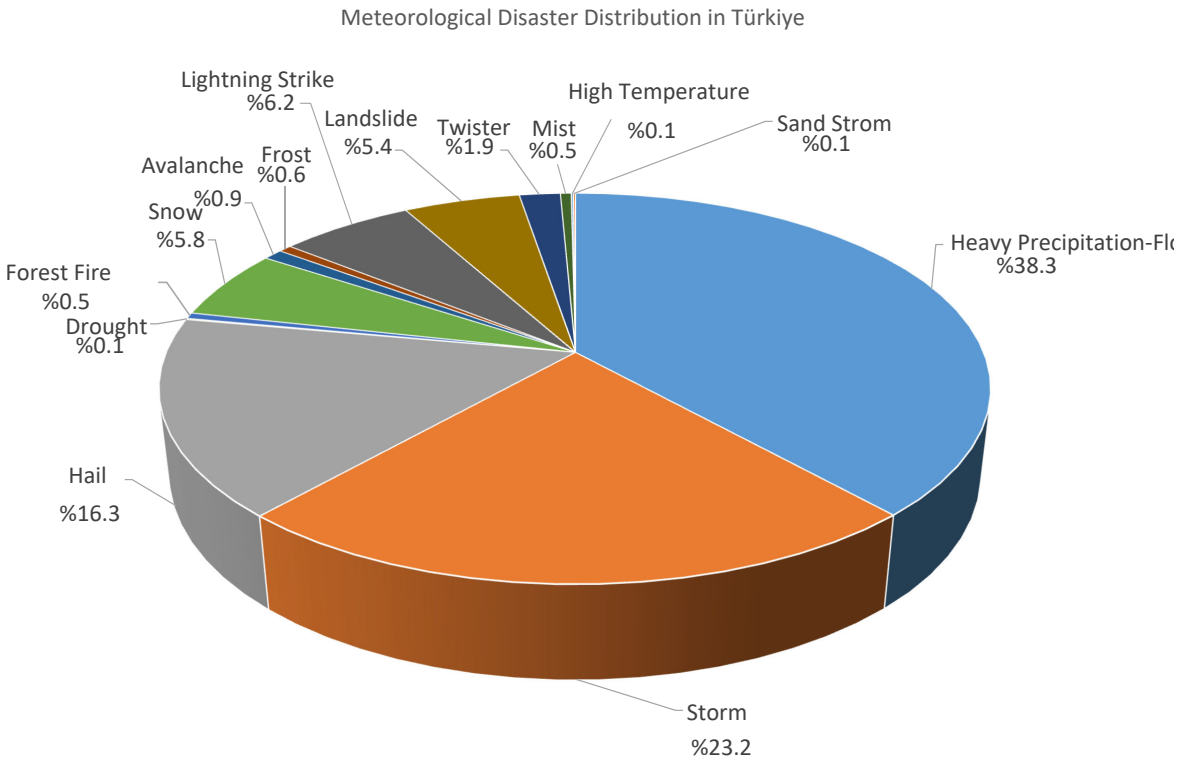
In 2023, there were meteorological disasters that affected different parts of Türkiye to different extents. A total of 1,475 natural disasters of meteorological nature were reported in Türkiye in 2023.

Looking at the long-term distribution, the number of meteorological disasters occurring in 2023 was recorded as the highest value in the 1940-2023 period (Graph 21). The most common meteorological disasters that occurred in Türkiye in 2023 were Heavy Rainfall/Flood (38.3%), Storm (23.2%) and Hail (16.3%) events, respectively (Graph 22).

Graph 21 Meteorological Disaster Distribution in Türkiye (1940-2023) (TSMS, 2024)



Graph 22 Meteorological Disaster Distribution in Türkiye (TSMS, 2023)



B.2. Climate Change in Türkiye and Studies Carried Out

As it is known, the negative effects of climate change are nowadays showing its effects all over the world and in our geography. It is seen that the number and severity of these effects have increased to a more palpable position today.

However, Türkiye is located in the Mediterranean Basin, which is defined as one of the vulnerable regions against the negative impacts of climate change in the Intergovernmental Panel on Climate Change (IPCC) reports. The average temperature in the Mediterranean Basin has increased by 1.5 degrees Celsius since the late 19th century, compared to the global average of 1.1 degrees Celsius, and temperatures are expected to increase by an additional 1.5 degrees Celsius by 2050 if targeted global climate actions fail.

Especially in the last two decades, adverse effects such as extreme rainfall, floods, storms, landslides, heat waves and forest fires have become more frequent and severe in Türkiye.

Türkiye is among the risk group countries in terms of potential impacts of global climate change. Natural disasters that are expected to increase in Türkiye due to climate change are listed as forest fires, storms, floods, hail, heat waves, landslides and avalanches. Irregular, sudden and heavy rainfall and floods that we experience with the changing climate increase landslides, erosion and desertification. Along with drought, famine, forest fires, heat waves, locust invasion, ticks, mosquitoes, etc. pests and related long-distance migrations are also increasing. Increasing wind storms cause disasters such as heavy rain, hail, tornadoes, lightning, flash floods, city floods to be more frequent, more severe, longer lasting and effective everywhere.

Within the framework of the principle of "common but differentiated responsibilities and relative capabilities" of the United Nations Framework Convention on Climate Change (UNFCCC), to which Türkiye became a party in 2004, Türkiye continues to work on both reducing greenhouse gas emissions and adapting to the adverse effects of climate change. In this context, Türkiye became a party to the Paris Agreement on 11 November 2021 in line with the 2053 Net Zero Emission Target announced by our President as a whole with the green development revolution.

UPDATED FIRST NATIONALLY DETERMINED CONTRIBUTION

The Republic of Türkiye submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC in September 2015 for the ultimate goal set out in Article 2 of the Convention. With INDC, Türkiye announced its greenhouse gas mitigation target of up to 21% by 2030 according to the reference scenario. Parties to the Paris Agreement are obliged to submit a "Nationally Determined Contribution (NDC)" to the UNFCCC every five years, each time including more ambitious mitigation targets (and optionally climate change adaptation targets). In this context, Türkiye submitted its First Updated NDC to the UNFCCC on 13 April 2023. In the updated NDC, the emission reduction previously announced as 21% has been increased to 41% in 2030 compared to the reference scenario. The main sectoral policies and key transparency indicators under the NDC are as follows.

Energy Sector;

- Maximising the use of energy efficiency and renewable energy potential, taking into account feasibility, market conditions and energy security,
- In line with Türkiye's National Energy Plan, reaching an average installed capacity of 33 GW in solar energy, 18 GW in wind energy, 35 GW in hydroelectric energy, and 4.8 GW in nuclear energy,

- Achieving a battery capacity of 2.1 GW and electrolyser capacity of 1.9 GW by 2030,
- Increasing renewable energy sources in primary energy consumption by 20.4 percent by 2030,
- Realisation of primary energy intensity as 0.113 TEP/1,000 USD (at 2015 exchange rate) and final energy intensity as 0.08 TEP/1,000 USD (at 2015 exchange rate) in 2030,

Industry Sector;

- Increasing the use of biofuels, refuse derived fuel (RDF), alternative fuels and raw materials in industrial plants,
- Reducing the carbon footprint of industrial products and increasing the use of renewable energy and resource and energy efficiency in the industrial sector,
- Supporting "Green Transformation in Industry" by prioritising the certification of industrial facilities using "Best Available Techniques" as an indicator of clean and green industrial production.

Transport Sector;

- Ensuring a balanced use of transport modes in freight and passenger transport by reducing the share of road transport and increasing the share of maritime and rail transport,
- Developing low or zero emission, energy efficient, alternative clean fuel transport options and expanding urban passenger and freight transport with international and intercity trains,
- Increasing the use of electricity and alternative energy sources instead of fossil fuels on motorways,
- Encouraging electric vehicles by creating a nationwide network of fast charging stations,
- Increasing the efficiency and coverage of the intercity railway network and electrification,
- Implementation of sustainable transport approaches in urban areas,
- Promoting sustainable aviation fuel production with national resources,
- Supporting and promoting sustainable aviation fuels at international airports,
- Promotion of green harbour practices,
- Development of combined transport,
- Promotion of alternative fuels and clean vehicles.

Agriculture Sector;

- Controlling methane emissions by regulating animal feed rations,
- Ensuring optimum nitrogen fertiliser use in crop production,
- Increasing the fertilisation process in biogas plants,
- Reducing the use of nitrogen fertilisers in crop production and using legumes as an alternative,
- Improvement of practices for cattle breeding, ration feeding, and By-law of animal numbers,
- Improving the use of agricultural biomass for energy production and methane production from manure,
- Development of rice cultivation technologies using subsurface irrigation system,
- Optimising crop allocation as well as improving the application methods and standards of mineral and organic fertilisers,
- Improve risk reduction practices for natural hazards to food security, including agriculture-related adaptation measures, such as crop rotation, agrotechnical forecast development, and soil conservation practices to reduce drought, water and wind erosion.

Building Sector;

- Renovation of existing buildings,
- Construction of more energy efficient buildings,
- Use of central heating solutions in densely populated areas,
- Where feasible, use of new techniques (e.g. renewable technologies, heat pumps, combined energy production plants, small-scale power generation systems, geothermal energy for home heating, use of waste heat, and options for heat storage) in locations away from the city centre,
- Develop and promote integrated building design, Building Information Modelling (BIM) and modular construction technologies using the best available techniques throughout the entire planning and construction processes and life cycles of buildings in order to increase resource and energy efficiency and reduce environmental impacts and carbon emissions,
- Increasing self-consumption of renewable energy,
- Implementation of renewable portfolio targets, energy efficient labelling, retrofitting existing buildings, smart grid systems and centralised energy system,
- Increasing the use of technologies such as combining heat and energy, waste heat boilers, efficient lighting, green building, green chiller, efficient electric motors, gas pipeline networks, photovoltaic solar energy systems and solar water heaters,
- Increasing the use of energy efficient white goods and electrical household appliances.

Waste Sector;

- Preventing waste generation and reducing the amount of waste generated within the framework of circular economy principles,
- Increasing the recovery rate of urban waste to 60% by 2035,
- Increasing the recovery rate of methane gas from biodegradable wastes,
- Reducing the percentage of waste landfilled in organized landfill to reach the target of zero landfilling of municipal waste without pre-treatment by 2053,
- Increasing RDF production from municipal waste,
- Converting wastewater treatment plants into bio-retreatment plants, increasing the percentage of reuse and expanding the utilization areas of treated wastewater

Land Use, Land Use Change and Forestry (LULUCF);

- Increasing the sink capacity of forests through improved/sustainable forest management, afforestation/reforestation, restoration and revitalisation of existing forested areas and long-term planning,
- Promote nature and/or technology-based solutions that increase sink capacity, such as reforestation, rural and agricultural land conservation and pasture improvement,
- Prevention, control and mitigation of desertification and land degradation.

CLIMATE CHANGE MITIGATION STRATEGY AND ACTION PLAN 2024-2030 (CCMAP)

Since the implementation period of the existing Climate Change Action Plan (2011-2023) has come to an end, a Climate Change Mitigation Strategy and Action Plan (CCMAP) was prepared to cover the implementation period 2024-2030, taking into account the 2053 Net Zero Emission Target, 12th Development Plan, Medium Term Programme, NDC and Climate Council Decisions. During the document preparation process, more than 100 meetings were held with stakeholders from all sectors. More than 2,000 people from public, private sector and non-governmental organizations participated in the meetings. Within the scope of CCMAP, a needs analysis was carried out to address Türkiye's climate change policies, strategies, plans and measures within the scope of greenhouse gas emission mitigation. As a result of the analysis, sectoral mitigation strategies and actions were identified with the participation of experts and stakeholders. Within the scope of the Plan, 49 strategies and 260 actions were prepared focusing on "industry, energy, buildings, transport, agriculture, waste and LULUCF (Land Use, Land Use Change and Forestry) sectors and cross-cutting issues identified as just transition and carbon pricing. The Action Plan was adopted by the Climate Change and Adaptation Coordination Board on 27 December 2023 and published on 21 March 2024.

CCMAP's main sectoral strategies include;

- Mainstreaming energy efficiency in all sectors,
- Maximising the use of renewable energy,
- Reducing carbon footprint and carbon intensity on product basis in industry,

- Dissemination of sustainability reports,
- Promoting circular economy and resource efficiency in manufacturing industry sectors,
- Popularisation of almost zero-energy buildings,
- Extending the use of district heating and cooling systems,
- Development of electrification systems in the transport sector,
- Development of integrated transport systems,
- Ensuring transition to zero/low emission transport systems,
- Protecting and enhancing sinks for effective combating climate change,
- Ensuring the transition of forestry and agricultural enterprises to a circular bioeconomy with high added value,
- Promotion of environmentally friendly agricultural practices,
- Ensuring conscious fertiliser use,
- Reducing methane emissions from livestock,
- Prevention and minimisation of waste before they occur ,
- Increasing the use of waste as raw material/resource in production,
- Establishment of emission trading system in Türkiye,
- Carrying out infrastructure studies on other carbon pricing mechanisms,
- Development and dissemination of clean technologies,
- Ensuring digitalisation in all sectors,
- Developing incentive and support mechanisms for greenhouse gas mitigation,
- Development of sustainable investment instruments,
- Planning the transition to a low-emission economy with the principle of fair transformation,
- Capacity building for just transition and employment transformation,
- Integrating Türkiye's net zero emission target into the education system.

In order to monitor the Action Plan effectively, an online monitoring system will be established under the Climate Portal prepared by the **Climate Change Directorate of the MoEUCC**, and it will be ensured that the activities of all responsible and relevant institutions are continuously monitored and reported in an up-to-date manner.

LONG-TERM CLIMATE STRATEGY

On the other hand, in line with Türkiye's 2053 Net Zero Emission Target, the 12th Development Plan and the Annual Programme of the Presidency of the Republic of Türkiye for 2024, the preparation of the Long-Term Climate Strategy (LTS), which will include Türkiye's long-term climate vision and sectoral roadmaps, is ongoing. With Türkiye's first Climate Council held between 21-25 February 2022, the framework for the LTS was determined with all stakeholders. In this docu-

ment, strategies for climate change mitigation and adaptation sectors as well as finance, technology, carbon pricing, just transition and sustainable development objectives are put forward. Building on the NDC and CCMAP, long-term strategies that Türkiye should put into practice to achieve the 2053 Net Zero Emission Target are determined together with the public, private sector, academia and non-governmental organizations. The LTS document is planned to be finalized and submitted before the 29th Conference of the Parties of the UNFCCC.

On the other hand, the "Capacity Building Activities for the Implementation of Türkiye's Long Term Climate Strategy (LTS) Project (2050 Pathways)", which started in 2024, aims to provide capacity building trainings for the implementation of LTS and net zero target. With the project, it is planned to provide trainings to the relevant stakeholders under each sector in line with their needs in line with the stakeholder profile.

CLIMATE LAW

In order to transfer international conventions to our domestic law, to establish the Directorate of Climate Change and most importantly, to put the fight against climate change on a legal basis as soon as possible, the Climate Law, which is the first and only By-law of Türkiye in this field, is being prepared.

With the Law, it is aimed to determine the responsibilities and obligations of all public institutions and organizations and real and legal persons in cooperation regarding climate change, which we face regardless of any discrimination such as geographical area or sector, and in order to achieve the Net Zero Emission target, public institutions and organizations are given the responsibility to develop, adapt and implement planning and implementation tools within the framework of greenhouse gas emission mitigation and climate change adaptation activities. On the other hand, it is aimed to make By-laws regarding the Emission Trading System (ETS), which will be newly implemented in Türkiye, to make it compulsory for the enterprises within the scope to obtain greenhouse gas emission permits, and to make By-laws regarding sanctions and supervision in the fight against climate change.

In summary, with the draft Climate Law, the work on which started in coordination with all relevant institutions and organizations as of 2021 and reached the final stage, it is aimed to establish the legal basis of greenhouse gas emission mitigation and climate change adaptation activities, planning and implementation tools and institutional framework in order to develop the legal infrastructure of Türkiye in terms of combating climate change in line with green development and 2053 Net Zero Emission target.

CLIMATE CHANGE ADAPTATION STRATEGY AND ACTION PLAN 2024-2030

Within the scope of the decision of Türkiye's first Climate Council held between 21-25 February 2022, "Adaptation actions of sectors at national, regional and local scales should be determined, implemented and monitored by conducting climate change impact, vulnerability and risk analyses.", the preparation of the Climate Change Adaptation Strategy and Action Plan for 2030 has started.

In this context, within the scope of the "Strengthening Action to Adapt to Climate Change in Türkiye Project" (IPA-II) financed by the European Union and the Republic of Türkiye and implemented by the Ministry of Environment, Urbanization and Climate Change and the United Nations Development Programme (UNDP) for the preparation of the National Climate Change Adaptation Strategy and Action Plan for 2024-2030, The National Climate Change Adaptation Strategy and Action Plan 2024-2030, which sets out strategies and actions for the year 2030,

was prepared with the vision of "a more resilient, more sustainable and greener Türkiye in economic, social and ecological terms in order to ensure the preparedness and adaptation of Türkiye's inhabitants, public and private sector institutions against the impacts of climate change". The final version of the Action Plan (2024-2030) was approved by the members of the Climate Change and Adaptation Coordination Board (CCACB).

In the development of the general framework in which the current situation is presented within the framework of the Strategy and Action Plan preparations, climate change adaptation studies currently carried out by public, private sector, universities and non-governmental organizations in Türkiye have been compiled, national and international legislation, plans, programmes and documents in force and national practices have been evaluated.

In the second stage, the results of the regional climate projection studies produced by different institutions were used to analyse the climate hazards foreseen in the current and future periods, and in line with the results, vulnerability and risk analyses were carried out on a national scale for each sector. Action options developed based on sectoral vulnerability and risk analyses were discussed in stakeholder consultation meetings attended by 180 different public, private sector, university and non-governmental organizations.

Climate Change Adaptation Strategy and Action Plan consists of 40 strategic targets and 129 actions prepared for 11 main sectors and cross-cutting issues listed as Urban, Water Resources Management, Agriculture and Food Security, Biodiversity and Ecosystem Services, Public Health, Energy, Industry, Tourism and Cultural Heritage, Transport and Communication, Social Development and Disaster Risk Reduction.

Considering the wide scope of the subject and the necessity to implement many sub-actions in order to realize the actions, detailed "Sectoral Implementation Plans" have also been prepared to guide the implementation of the actions in the Action Plan by the responsible institutions. On the other hand, monitoring and evaluation is a critical step in ensuring the long-term success of climate change adaptation action plans. Within the scope of the Strengthening Climate Change Adaptation Action in Türkiye Project, studies on the establishment of an online monitoring and evaluation system for the Climate Change Adaptation Strategy and Action Plan (e-CCASAP) are being carried out.

In addition, the Climate Portal, which aims to create a national climate change memory by collecting the content and data produced by stakeholders related to climate change in a single source and making it accessible to all stakeholders in Türkiye, has been integrated with e-government and opened for use. The e-İDUSEP tool, which is designed for monitoring the actions to be included in the Climate Change Adaptation Strategy and Action Plan, will be integrated into the Climate Portal and will be made accessible to the relevant stakeholders.

LOCAL CLIMATE ACTION STUDIES

On the other hand, "Local Climate Change Adaptation Strategies and Action Plans" for Konya, Muğla, Sakarya and Samsun provinces selected within the scope of the Strengthening Climate Change Adaptation Actions in Türkiye Project are about to be finalized.

An additional excel-based greenhouse gas inventory calculation tool has been prepared within the scope of the globally accepted GPC Protocol (Global Protocol for Local Greenhouse Gas Emissions) for local governments to calculate and enter their greenhouse gas inventories into the system.

The other internet-based application is e-YIDEP. Designed as a tool within the Climate Portal, e-YIDEP is designed as a monitoring and evaluation mechanism for the actions included in the climate change action plans of local governments and enables local governments to enter their greenhouse gas inventories on an annual basis. The actions to be included in the plan, responsible and relevant organizations will be entered into the system and the progress of the actions to be determined will be monitored.

In addition, a draft by-law and technical guidelines are being prepared by the Climate Change Directorate of the MoEUCC Climate Change Department in order to determine the administrative and technical basis and principles for the preparation, approval, implementation, monitoring and evaluation of Local Climate Change Action Plans in the provinces. In line with the By-Law, it is aimed to prepare a holistic Local Climate Change Action Plan in 81 provinces, which includes the greenhouse gas emission inventory of the province and determines climate change adaptation and greenhouse gas mitigation actions.

Preparation of Local Climate Change Action Plans for Tekirdağ, Çanakkale and Yalova Provinces Project: Within the scope of the project on Preparation of Local Climate Change Action Plans for Çanakkale, Tekirdağ and Yalova Provinces, carried out by the MoEUCC and TUBITAK-MAM, local climate change action plans for these three provinces were finalized.

Strengthening Climate Change Adaptation Action in Türkiye Project (IPA II): This is a comprehensive project which includes updating the National Climate Change Adaptation Strategy and Action Plan, developing Local Climate Change Adaptation Action Plans (YUSEP) for Konya, Muğla, Sakarya, Samsun provinces, developing a portal on climate change called Climate Portal and providing 6.8 million Euros grant support for adaptation studies.

European Union Partnership for Local Climate Action in Türkiye Project (IPA III): The project, financed by the European Union, started on 1 May 2023. The project is implemented by the United Nations Development Programme Türkiye Office and the beneficiary is the Ministry of Environment, Urbanization and Climate Change/Directorate of Climate Change. The project duration is 60 months and the project budget is EUR 22,206,000 in total. Of this budget, EUR 7,500,000 is allocated for Technical Assistance and EUR 14,706,000 is allocated for Grants.

The overall objective of the project is to support Türkiye's efforts to combat climate change by enhancing implementation capacity at local level, which will ultimately contribute to sustainable, low carbon and climate resilient development. The ultimate objective is to improve Türkiye's climate change mitigation and adaptation capacity at the local level.

Within the scope of the project, activities related to Türkiye's climate projections will be carried out in the IPCC AR6 period; updating and improving the resolution of SSP (Shared Socioeconomic Pathways) scenarios, preparing the model for the first time in Türkiye with a resolution of up to 3 kilometers in line with current SSP scenarios, developing climate change action plans that include adaptation and mitigation components for 6 pilot provinces (Kahramanmaraş, Elazığ, Antalya, Isparta, Ordu, Kastamonu), developing web-based decision support tools to support local climate action on the climate portal, and carrying out capacity building and training activities, establishing a regulatory framework for Local Climate Change Action Plans, and implementing a grant program with a budget of 14,700,000.

INTERNATIONAL REPORTING

8th National Communication and 5th Biennial Reports were prepared and submitted to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC). Pursuant to Article 12 of the United Nations Framework Convention on Climate Change, the parties are obliged to ensure the communication of the practices they have made within the scope of the Convention. Accordingly, the parties communicate with other party countries and the secretariat by preparing National Inventory Report, National Communication Report and Biennial Report. The national inventory report is prepared and submitted every year in April under the responsibility of TURKSTAT. The national communication is submitted to the secretariat every 4 years and the biennial report is submitted to the secretariat every 2 years by the Directorate of Climate Change. In this context, the 8th National Communication and the 5th Biennial Report were prepared and submitted to the Secretariat by the Directorate of Climate Change of the MoEUCC in 2023.

8th National Communication and 1st and 2nd Biennial Transparency Reports were prepared and submitted to the GEF Secretariat and approved by the Secretariat (UNFCCC). In 2020, when the Kyoto Protocol was replaced by the Paris Agreement, Article 13 of the Agreement established the Enhanced Transparency Framework (ETF) and obliged all parties to prepare Biennial Transparency Reports. Türkiye is also recognised as a developed country under the convention and its obligation to prepare national communications continues. With the project, 9 National Communications and 1st and 2nd Biennial Transparency Reports will be prepared and submitted to the secretariat. In addition, important studies on issues such as adaptation, mitigation, national contribution declaration will be carried out with the activities to be organised.

Studies on the Impact of Climate Change on Water Resources and Agriculture:

Within the scope of the studies to determine the effects of climate change on water resources, which have been carried out by the Ministry of Agriculture and Forestry since 2011, with the projects "Impact of Climate Change on Water Resources" and "Determination of the Effect of Climate Change on Snow Melts and Flows", it has been determined how climate change will affect the water potential in 25 basins until 2100, the effect of climate change on snow load and melts and the changes that these melts will cause in river flows. In order to adapt to the identified impacts, detailed analyses on rainwater harvesting, use of grey water and correct pricing of water were carried out with the "Adaptation to Climate Change in Water Resources Project".

The results of studies on the impacts of climate change on water resources and adaptation activities are shared on the web address https://www.tarimorman.gov.tr/SYGM/Sayfalar/Detay.aspx.SayfaId=110.

In addition, the Industrial Water Efficiency Project (2021-2023) was carried out according to NACE Codes in order to increase the adaptation capacity of the industrial sector to climate change. With the said project, industrial activities with high water consumption, especially in the food, textile, chemical and basic metal industries, were analyzed and water efficiency assessment was carried out at the scale of approximately 400 pilot plants based on 152 NACE codes. Within the scope of the study, specific water use values of the facilities were determined, compared with sectoral reference values, potential water recovery rates and wastewater reduction amounts were determined. In addition, sectoral water efficiency guides were prepared for 152 NACE codes by classifying the best available sectoral techniques in water efficiency and published on https://www.suverimliligi.gov.tr/yayinlar.

In addition, Water Efficiency Campaign was launched in January 2023 under the coordination of the Ministry of Agriculture and Forestry in order to increase the adaptation capacity of Türkiye's water resources to the impacts of climate change. Within the scope of the Campaign, firstly, the Water Efficiency Strategy Document and Action Plan (2023-2033), which is the road map of the Campaign, was published and action plans were established to increase urban, agricultural, industrial and individual water use efficiency. Within the scope of these action plans, a total of 114 actions and the institutions/organizations responsible for each action have been determined. In this framework, efforts are underway to disseminate water efficiency practices and raise awareness on climate change and effective use of our water resources.

Within the scope of the IPAIII Programme, the "Project on Assessment of the Impacts on Pilot Lakes, Wetlands and Coasts in Türkiye", which is planned to start in 2024, aims to determine the possible effects of the sea rise expected to occur as a result of climate change on coastal areas in Türkiye, to examine the effects of climate change on pilot lakes and wetlands in Türkiye and to develop strategies against these risks. In addition, with the "Climate Change Impacts on Water Resources Phase II Project", which will start in 2024, analyses of the impact of climate change on water resources will be updated by using more and improved climate models, up-to-date data sets and scenarios made available through the IPCC Coupled Model Intercomparison Project Phase 6 (CMIP-6) in order to combat climate change more effectively.

Within the scope of the project titled "The Effect of Climate Change on Fisheries Stocks and Determination of the Distribution Areas of Invasive Species in Our Seas", which was initiated in 2022 with the support of the Ministry of Agriculture and Forestry (MoAF), General Directorate of Agricultural Research and Policies (TAGEM), the effect of climate change on the seas of Türkiye is monitored.

National Action Plans have been prepared for combating Climate Change, including sectoral impacts. The main ones are as follows;

- National Climate Change Action Plan (2011-2023)- Agriculture and Food Security in Mitigation and Adaptation;
- Türkiye's Climate Change Adaptation Strategy and Action Plan (2011-2023);
- MoAF Strategy and Action Plan (2019-2023)-Climate Change and Combating Erosion.

In the Strategy and Action Plan of the MoAF (2019-2023), it is defined as carrying out services related to global climate changes, agricultural environment, drought, desertification, other agricultural disasters and agricultural insurance, and providing assistance to farmers damaged by natural disasters within the framework of the principles set out in special legislation. In the Strategy Plan, under the title of R&D, the subjects of measuring the possible effects of climate change on agricultural systems and developing proposals for taking measures are defined.

After the drought experienced in Türkiye in 2007, "Türkiye Agricultural Drought Fighting Strategy and Action Plan" was put into practice by MoAF on drought, which is one of the most important indicators of climate change.

The action plan was first put into practice in 2008-2012 and has been updated three times for the years 2013-2017, 2018-2022 and 2023-2027. Agricultural drought action plan aims to solve the problems that will occur due to drought in agriculture with the participation of all instituti-

ons, organizations and water users in the face of the measures to be taken in order to reduce the effects of possible drought in Türkiye.

In the National Action Plan on Climate Change (2011-2023), Agriculture under the Mitigation Section and Agriculture Sector and Food Security under the Adaptation Section are included. Under these headings, limiting greenhouse gas reductions originating from the agriculture sector, integrating the adaptation approach to the impacts of climate change into agriculture sector and food security policies, developing and disseminating R&D studies and scientific studies for determining the impacts of climate change in agriculture and ensuring adaptation to climate change, planning agricultural water use in a sustainable manner, protecting soil and agricultural biodiversity against the impacts of climate change and improving institutional capacity and inter-institutional cooperation in Türkiye on adaptation options in agriculture are included.

R&D, practices and activities are carried out by the units of the Ministry of Agriculture and Forestry in line with the targets included in the Action Plan for Agriculture, and strategies and policies are developed in the light of data. Some of these studies are listed below.

- R&D Studies for Reduction of Greenhouse Gas Emissions in Agriculture,
- Evaluation of the Effects of Increased CO_2 Concentrations and Temperature Values on Wheat Crops under Dry Conditions (2017-2021),
- "Determination of Seasonal and Annual Carbon Dioxide Output Amounts of Şanlıurfa Harran Plain Soils" Project (2014-2020),
- "The Effect of Split Nitrogen Fertiliser Applications on Nitrous Oxide (N_2O) Greenhouse Gas Emissions" Project (2017-2020),
- "Determination of the Effects of Different Tillage Methods on CO_2 Emission and Some Physical, Chemical and Biological Properties of Soil" (2016-2020),
- Türkiye Organic Carbon Database,
- Use of Renewable Energy Sources,
- "The Effect of Soil Characteristics, Yield and CO_2 Emission of Alfalfa (Medicago sativa L.) Grown in Organic and Conventional Farming Systems" (2021-2025),
- "Modelling of Soil Organic Carbon Amount in Different Land Uses: The Case of Güvenç Basin" (2022-2025),
- "Measurement of Greenhouse Gas Emissions from Paddy Agriculture and Comparison with Remote Sensing" (2024-2026),
- "Development of Carbon Sequestration and Greenhouse Gas Emission Accounts in Agriculture Sector" (2024¬2026),
- Production Systems and Environmental Impacts of Greenhouse Gas Emissions from Animal Production and Manure Management (2019-2021),
- Determination of Carbon Sequestration Properties of Some C3-C4 Plants in Marginal Areas "Konya- Karapınar Case" Project (2018-2022),

- "Determination of the Effectiveness of Biochar Applications for Reducing Greenhouse Gas Emissions from Agricultural Sources" Project (2021-2022),
- "Application of Closed Chamber Method in the Calculation of Greenhouse Gases from Paddy Agriculture and its Relationship with Environmental Factors" Project (2021-2023),
- "The Effect of Various Rotation Systems on Greenhouse Gas Emission and Soil Quality Parameters" Project (2021-2025),
- "Effects of Aggregation Dynamics on Carbon Sequestration and Erosion Susceptibility in Pasture and Agricultural Soils Project" (2021-2025),
- "Prediction of Soil Organic Carbon and Related Physical Soil Degradation Indicators under Future Climate Conditions" Project (2022-2025),
- "Model Study for Determination of Rumen Methane Production in Animals of Different Culture Breeds" Project (2021-2022),
- R&D Studies on Adaptation to Climate Change in Agriculture,
- "Determination of the Effects of Climate Change on the Population Distribution of Coccinellidae (Coleoptera) Species in Three Different Ecological Locations (2020-2022 "Determination of the Effects of Land Degradation Trends on Land Productivity Dynamics",
- "Investigation of Local Characteristic Olives and Olive Oils with Climatic and Topographical Conditions" (2020-2022),
- Analysis of Sensitivity of Sunflower and Wheat Crops to Climate Change with Aqua-Crop Model (2016-2020),
- "Dendroclimatological Determination of the Effects of Climatic Fluctuations on Olive Trees Grown in İzmir-Kemalpaşa Region" (2014-2020),
- "Mapping and correlation of flora with soil and land parameters in Ilgaz Mountain National Park" (2018-2020),
- "Changes, Effects and Environmental Assessment of Land Degradation in Manisa Akselendi Plain Under Wind Erosion" (2015-2020),
- "Determination of the Effect of Climate Change on Yield and Some Physiological Parameters in Wheat Varieties with Different Plant Growth Models",
- "Analysis and Modelling of the Effects of Climatic Variability on Coastal Aegean Olive Growing Areas",
- "Determination of the Effect of Climate Change Related Temperature and Humidity Index on Milk Yield and Fertility in S. Alaca and S. Alaca x Montbeliarde F1 Crosses",
- "Effects of Climate Change Projections on Potato (Solanum tuberosum L.) Crop in Relation to Drought Stress under Climate Room Conditions",
- "Determination of Vulnerability and Adaptive Capacity of Wheat Cultivation to Climate Variability",

- "Determination of the Effects of Snow Cover Change Due to Climate Change on Crop Production",
- "Effects of Climatic Changes on Soy Crop in Mersin Region",
- "Determination of Perceptions of Sheep Breeders towards Global Climate Change in Diyarbakır Province",
- "Investigation of the Effects of Climatic Factors on Phenology and Fruit Quality of Fig" (2015-2022),
- "Investigation of the Effect of Climatic Factors on Fruit Yield and Quality in Viticulture: Manisa Region (2021-2025),
- "Determination of the Effects of Climate Change on Crop Water Consumption of Irrigated Crops: The Case of Lower Gediz Basin (2021-2022)",
- "Determination of the Effects of Climate Change on the Suitability Areas of Some Important Agricultural Products Countrywide Project (2020-2022),
- "Countrywide Project on Determining Resilience to Climate Change in Agricultural Production" (2020-2022)
- "Project on Relating Climate Variables and Damage Determinations in Some Crops and Creating Risk Maps" (2019-2021).

B.3. Global Climate Models and Climate Change Projections

Since global climate modelling studies are not sufficient in terms of resolution, higher resolution and more detailed studies are carried out by downscaling studies on the basis of regions or countries. In this context, climate change projections were produced by the Turkish State Meteorological Service (TSMS) for the first time in Türkiye. The results were included in the 7th National Communication on Climate Change and OECD Türkiye Report prepared in 2018.

Climate change data produced by the global climate model are shared with public institutions and organizations, universities and the private sector. These data are used in climate change and adaptation studies and scientific researches.

According to the results of climate change projection studies for Türkiye, the annual average temperature increase in Türkiye is projected to be between 1.0°C - 2.0°C for the period 2016-2040, between 1.5°C - 4.0°C for the period 2041-2070 and finally between 1.5°C - 5.0°C for the period 2071-2099. In some scenarios, the temperature increases for the period 2071-2099 is projected to reach 3.0°C in winter and 8.0°C in summer.

In terms of precipitation, increases in precipitation are projected for the winter season throughout the country, decreases in precipitation in the spring season except for the coastal and north-eastern parts of the country in all periods, decreases in precipitation in the summer season except for the west coast and north-eastern parts of the country, and an overall decrease in precipitation in the fall season. According to the results of the projection study, although there is no regular upward or downward trend in precipitation during the projection period (2016-2099), the irregularity of the precipitation regime is noticeable (TSMS- TRCC- 2015; MoEU, 2018).

In the context of climate change, serious risks are foreseen to occur in the river basins of Türkiye under new climatic conditions. One of these is the decrease in the amount of precipitation in the basins in the interior and south of Anatolia, especially in the Fırat-Dicle basin. The second is that increasing temperatures cause changes in the type of precipitation and winter snowfall turns

into rain. Snow is an important source of water throughout the year. In addition, increasing temperatures will cause the snow to melt early in spring. The third problem is the risk of excessive precipitation, especially in the summer season and in the western and northern coastal parts of Anatolia (Coastal Aegean, Marmara and Black Sea regions). These extreme precipitations are likely to cause floods and overflows as in recent years.

The results obtained by the Ministry of Agriculture and Forestry General Directorate of Water Management (SYGM) for the period 2071-2100 in the "Project for Determining the Effect of Climate Change on Snow Melts and Flows", in which the effect of climate change on snow load and melts until the end of the 21st century and the changes that these melts will cause in river flows in the Upper Fırat Basin (Keban Dam upstream), where approximately 70% of the total annual water potential consists of snow melts, are given below:

- Snow-covered areas in the Upper Fırat Sub basin have decreased by up to 44% compared to the period 1970-2000;
- 'Snow-covered days' in more than half of the basin will decrease by 1.5 months compared to the past (1970-2000),
- Precipitation is mostly in the form of rain and precipitation in the March-June period decreases by at least 10%,
- Bringing forward the start of the snowmelt period by up to 10-15 days,
- The basin will be fed by precipitation falling as rain instead of precipitation falling as snow,
- Later accumulation and earlier melting of snow cover.

The results of the studies carried out by the Ministry of Agriculture and Forestry to determine the effects of climate change on water resources are shared on the web address http://iklim.tarimorman.gov.tr.

Within the framework of the Strategic Plan of the Ministry of Agriculture and Forestry (2019-2023) and the National Climate Change Action Plan (2011-2023), within the scope of the integrated project titled "Impacts of Climate Change on Agriculture", in order to monitor the effects of global climate change on agricultural ecosystems, the positive / negative effects of climate variability are carried out with regional and national studies by using climate-atmospheric models and different climate scenarios in products with high added value in the country.

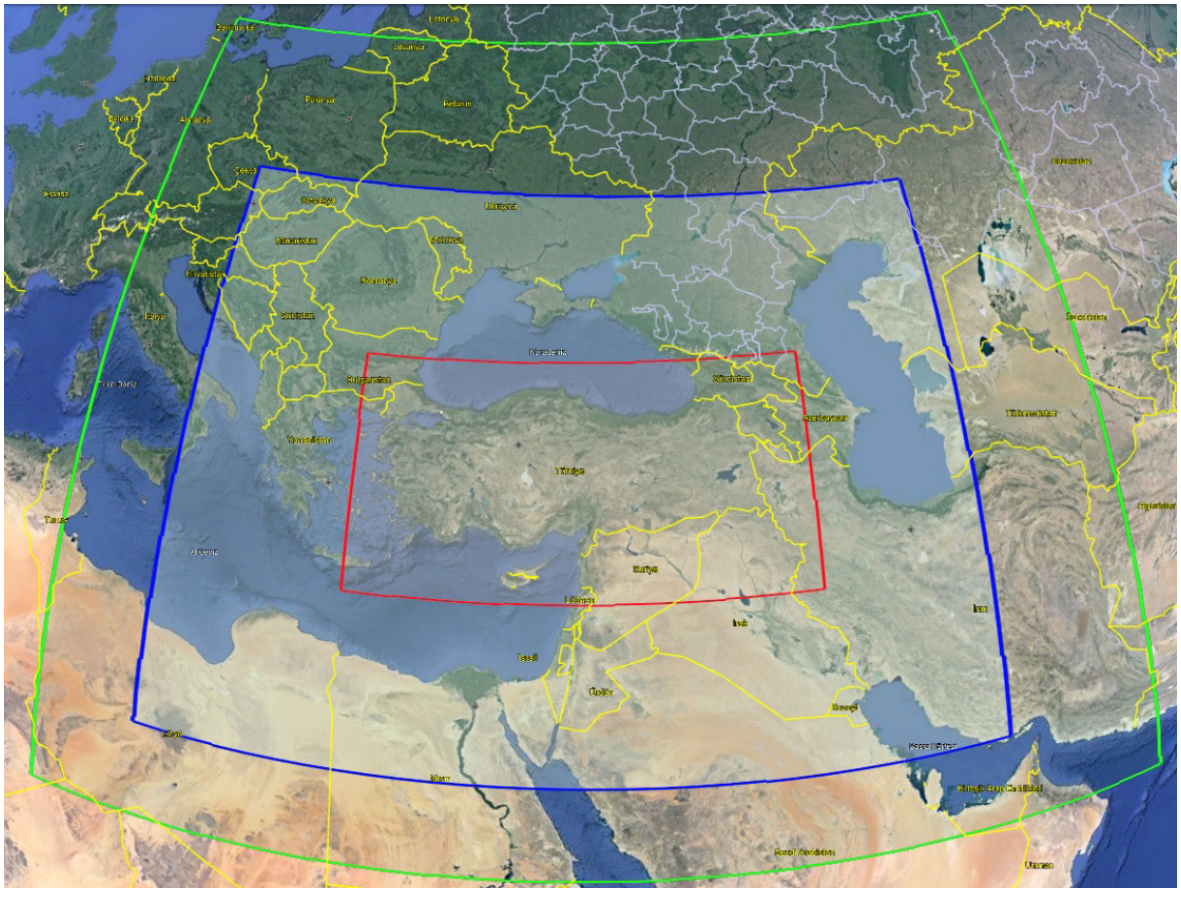
Within the scope of the study carried out by TSMS and SYGM by using the Representative Concentration Pathways (RCPs) published in line with the 5th Assessment Period of the Intergovernmental Panel on Climate Change (IPCC), 20-kilometre resolution projection outputs were produced using 3 global climate models RCP 4.5 and RCP 8.5 scenarios. There was a need to update the existing climate projections in line with the emission scenarios published within the scope of the IPCC 6th Assessment Report (AR6), which was updated in order to remove uncertainty by determining the hazards and risks that Türkiye will face due to climate change with the highest accuracy. In this direction, Climate Projections Study will be carried out by the Directorate of Climate Change with a resolution of 3 kilometres by using 6 Global Climate Models (GCMs) for the reference period 1940-2015 and the future period 2015-2100, and 2 different emission scenarios (SSP 2-4.5 and SSP 5-8.5) updated within the scope of IPCC AR6 by dynamic downscaling method.

Using the high-resolution outputs obtained as a result of climate projections, vulnerability and risk analyses will be carried out on a sectoral basis specific to the Classification of Statistical Regional Units-1 of Türkiye, and projection results will be made available to stakeholders carrying out studies on climate change. The outputs of this study will prepare the scientific basis of local climate change action plans and will enable the consideration of climate change related risks and hazards in the top policy documents and investment programmes at national level. Considering that Türkiye is located in the east of the Mediterranean Basin, which will be most seriously affected by climate change, it is aimed to determine the hazards and risks arising from climate change and to provide scientific basis and direction to the policies to be determined at national level and the actions to be implemented at local level.

Within the scope of the study, firstly, the global climate models updated in line with the IPCC Coupled Model Intercomparison Project Phase 6 (CMIP-6) and best reflecting the geography where Türkiye is located will be determined and 6 Global Climate Models that best reflect the atmospheric parameters among these models have been selected.

The selected models will be downscaled to a scale of 3 kilometres by dynamic downscaling method in line with the study area shown in the map below using the Regional Climate Model. Taking into account Türkiye's domestic and foreign policy interests and the climate and atmospheric events affecting our region, a wide study area up to Egypt, Italy, Russia, Iran and Uzbekistan has been selected and the red area representing Türkiye in the area shown in the map below will be studied at a scale of 3 kilometres, the blue area 9 kilometres, and the green area 27 kilometres.

Map 10 Climate Projections Study Area



B.4. Amount of Greenhouse Gases at National Level

According to the results of the greenhouse gas inventory, total greenhouse gas emissions in 2022 were calculated as 558.3 million tonnes (Mt) CO_2 equivalent (eq.) with a decrease of 2.4% compared to the previous year. Total greenhouse gas emissions per capita were calculated as 4.1 tonnes CO_2 equivalent in 1990, 6.8 tonnes CO_2 equivalent in 2021 and 6.6 tonnes CO_2 equivalent in 2022.

Table 44 Greenhouse Gas Emissions (CO_2 equivalent), 1990 - 2022 (Million tonnes) (TURKSTAT, 2024)

YEAR	CO_2	CH_4	N_2O	F-gases	TOTAL
1990	154.1	51.3	22.2	0.4	228.0
1991	160.6	52.3	22.0	0.5	235.4
1992	166.7	52.2	22.4	0.5	241.8
1993	173.8	51.8	23.2	0.5	249.1
1994	170.1	51.3	20.9	0.4	242.8
1995	184.1	50.8	21.2	0.4	256.5
1996	202.5	51.1	21.8	0.4	275.9
1997	214.9	50.0	21.4	0.4	286.7
1998	215.0	50.2	22.5	0.4	288.1
1999	210.7	51.8	22.8	0.4	285.6
2000	232.4	51.5	22.0	0.5	306.4
2001	216.3	50.6	20.1	0.6	287.6
2002	223.7	47.9	20.1	0.8	292.5
2003	239.2	50.6	21.3	1.0	312.1
2004	247.2	51.2	22.1	1.2	321.7
2005	267.0	53.3	23.1	1.4	344.8
2006	284.6	54.7	24.2	1.6	365.2
2007	315.6	57.6	23.8	2.0	399.0
2008	311.7	58.5	22.6	2.1	394.9
2009	317.5	58.1	23.6	2.1	401.3
2010	317.6	60.1	24.4	3.2	405.3
2011	343.0	62.9	25.4	3.5	434.8
2012	357.4	67.1	26.4	4.2	455.2
2013	349.2	65.8	28.0	4.3	447.3
2014	365.7	67.7	28.2	4.8	466.4
2015	386.3	60.5	28.6	4.6	480.1
2016	404.6	64.1	30.5	4.8	504.1
2017	429.4	65.3	31.5	5.0	531.1
2018	422.1	69.6	31.6	4.8	528.1

YEAR	CO_2	CH_4	N_2O	F-gases	TOTAL
2019	404.3	73.0	32.9	5.4	515.6
2020	414.4	73.5	36.1	6.2	530.2
2021	455.2	73.9	35.9	6.9	572.0
2022	441.4	72.2	34.3	10.4	558.3

TURKSTAT, Greenhouse Gas Emission Statistics, 1990 - 2022
Figures in the table may not sum up due to rounding.
The 1990-2021 data in the table have been revised.
Emissions and sequestration from forestry and other land use are not included.

Graph 23 Total and Per Capita Greenhouse Gas Emissions, 1990-2022 (TURKSTAT, 2024)

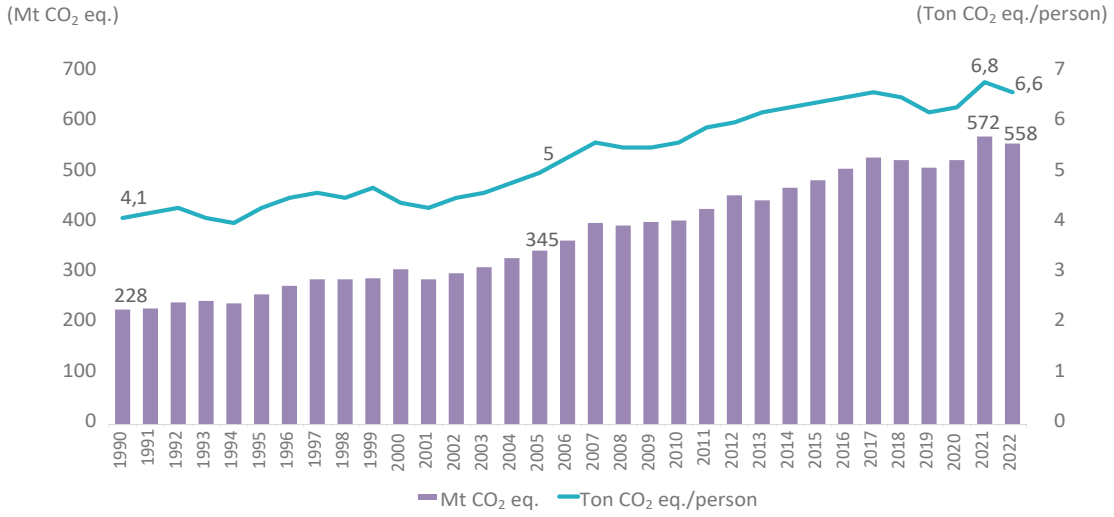


Table 45 Greenhouse Gas Emissions by Gases, 1990-2022 (TURKSTAT, 2024)

(Billion tonnes CO_2 eq.)

	1990	1995	2000	2005	2010	2015	2020	2021	2022	1990-2022 change (%)	2021-2022 change (%
Total emission	**228.0**	**256.5**	**306.4**	**344.8**	**405.3**	**480.1**	**530.2**	**572.0**	**558.3**	**144.9**	**-2.4**
CO_2	154.1	184.1	232.4	267.0	317.6	386.3	414.4	455.2	441.4	186.4	-3.0
CH_4	51.3	50.8	51.5	53.3	60.1	60.5	73.5	73.9	72.2	40.8	-2.4
N_2O	22.2	21.2	22.0	23.1	24.4	28.6	36.1	35.9	34.3	54.6	-4.5
F-gases	0.4	0.4	0.5	1.4	3.2	4.6	6.2	6.9	10.4	2,349.0	50.6

The figures in the table may not add up to the total due to rounding. F-gases are fluorinated gases.

The greenhouse gas emission statistics news release covers the direct greenhouse gases carbon dioxide (CO_2), methane (CH_4), dinitrogenmonoxide (N_2O) and fluorinated gases (F-gases) from the energy, industrial processes and product use, agriculture and waste sectors.

The fluorinated gases reported in this bulletin are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphurthexafluoride (SF_6). Nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), ammonia (NH_3), carbon monoxide (CO) and sulphur dioxide (SO_2), which cause indirect greenhouse gas impact, are not included. Global warming potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) were used.

Graph 24 Greenhouse Gas Emission Rates for 2022 (TURKSTAT, 2024)

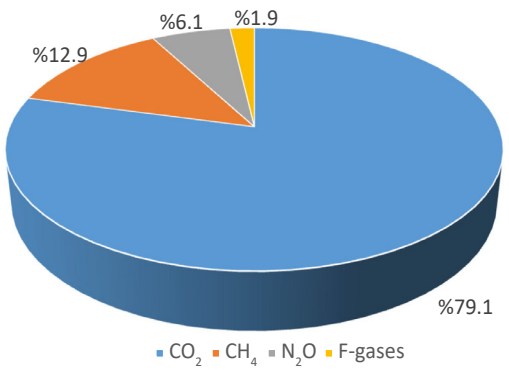


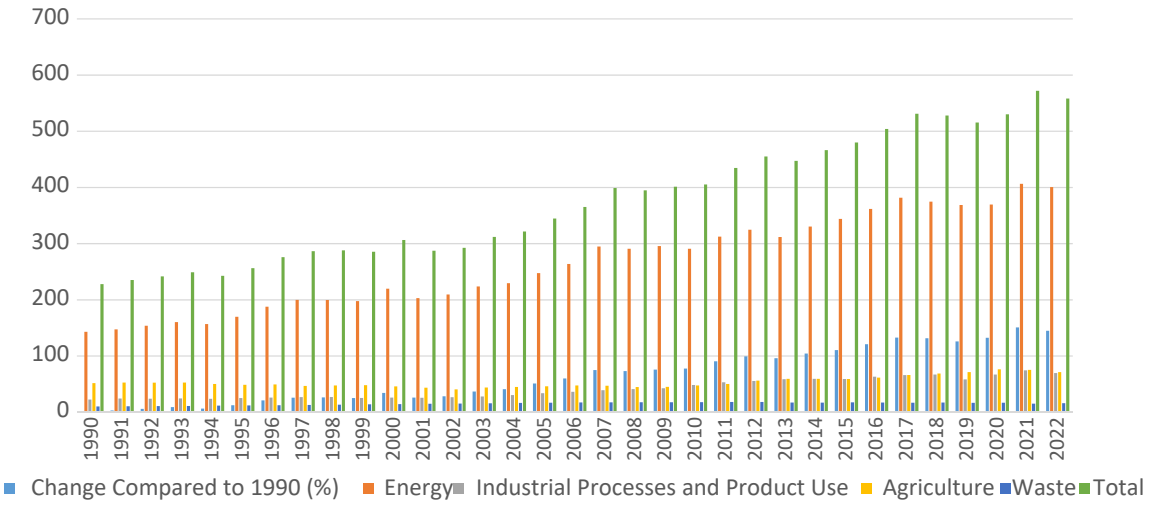
Table 46 Total Greenhouse Gas Emissions by Sector (CO_2 equivalent),1990 - 2022 (TURKSTAT, 2024)

Year	Change by 1990 (%)	Energy	Industrial processes and product use	Agriculture	Waste	Total
1990	*	143.1	22.7	51.8	10.3	**228.0**
1991	3.2	147.5	24.4	52.9	10.7	**235.4**
1992	6.1	154.0	24.1	52.7	11.0	**241.8**
1993	9.3	160.4	24.6	52.8	11.3	**249.1**
1994	6.5	156.8	24.0	50.3	11.7	**242.8**
1995	12.5	170.0	25.4	49.0	12.1	**256.5**
1996	21.0	187.8	26.0	49.5	12.5	**275.9**
1997	25.8	199.9	26.9	46.8	13.1	**286.7**
1998	26.4	199.7	27.2	47.7	13.5	**288.1**
1999	25.3	197.8	25.6	48.2	14.0	**285.6**
2000	34.4	219.8	26.1	46.0	14.5	**306.4**
2001	26.1	203.1	25.7	43.7	15.1	**287.6**
2002	28.3	209.6	26.7	40.7	15.5	**292.5**
2003	36.9	223.9	28.0	44.2	16.0	**312.1**
2004	41.1	229.7	30.6	45.0	16.5	**321.7**
2005	51.2	247.7	34.0	46.3	16.9	**344.8**
2006	60.2	263.9	36.4	47.6	17.4	**365.2**
2007	75.0	294.9	39.3	47.2	17.7	**399.0**
2008	73.2	291.0	41.3	44.8	17.8	**394.9**
2009	76.0	295.7	42.7	45.1	17.8	**401.3**
2010	77.7	290.9	48.6	47.7	18.1	**405.3**
2011	90.7	312.6	53.4	50.3	18.4	**434.8**
2012	99.6	324.9	55.7	56.3	18.3	**455.2**

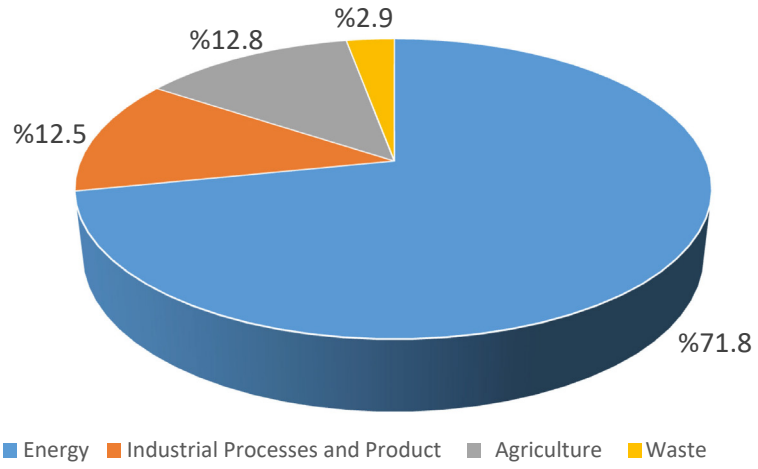
Year	Change by 1990 (%)	Energy	Industrial processes and product use	Agriculture	Waste	Total
2013	96.2	311.9	58.7	59.4	17.3	**447.3**
2014	104.6	330.4	59.4	59.5	17.1	**466.4**
2015	110.6	344.0	59.2	59.2	17.7	**480.1**
2016	121.1	361.9	63.2	61.7	17.3	**504.1**
2017	132.9	381.8	66.1	66.3	16.9	**531.1**
2018	131.6	374.7	67.1	68.9	17.3	**528.1**
2019	126.1	368.9	58.4	71.5	16.8	**515.6**
2020	132.5	369.5	67.2	76.4	17.0	**530.2**
2021	150.9	406.5	74.7	75.4	15.4	**572.0**
2022	144.9	400.6	69.9	71.5	16.3	**558.3**

TURKSTAT, Greenhouse Gas Emission Statistics, 1990 - 2022
Figures in the table may not sum up due to rounding.
The 1990-2021 data in the table have been revised.
Emissions and sequestration from forestry and other land use are not included.
*Not applicable.

Graph 25 Breakdown of Greenhouse Gas Emissions by Sectors (TURKSTAT, 2024)



Graph 26 Greenhouse Gas Emission Rates by Sectors in 2022 (TURKSTAT, 2024)



The energy sector ranks first in the amount of emissions by sectors. The largest share in total greenhouse gas emissions in terms of CO_2 equivalent in 2022 is energy-related emissions with 71.8%, followed by agriculture with 12.8%, industrial processes and product use with 12.5% and waste sector with 2.9%.

Energy sector emissions are calculated as 400.6 Mt CO_2 equivalent in 2022, increasing by 179.8% compared to 1990, but decreasing by 1.4% compared to the previous year. Emissions from industrial processes and product use are calculated as 69.9 Mt CO_2 equivalent, increasing by 208.1% compared to 1990, but decreasing by 6.4% compared to the previous year.

Agriculture sector emissions in 2022 are calculated as 71.5 Mt CO_2 equivalent, increasing by 37.9% compared to 1990 but decreasing by 5.1% compared to the previous year, while waste sector emissions are calculated as 16.3 Mt CO_2 equivalent, increasing by 57.7% compared to 1990 and 5.5% compared to the previous year.

Data on greenhouse gas emissions (excluding LULUCF sector) are given above by using the Greenhouse Gas Emission Statistics, published by TURKSTAT on 05 June 2024 (https://data.tuik.gov.tr/Bulten/Index.p=Sera- Gazi-Emisyon-Istatistikleri-1990-2022-53701).

On the other hand, the results in the news bulletins published in 2023 and before are based on the greenhouse gas inventory for the same period. The greenhouse gas inventory, which is reported annually by 15 April under the UNFCCC, consists of National Inventory Report (NIR) and Common Reporting Format (CRF) tables, and National greenhouse gas inventories are available at (https://unfccc.int/ghg-inventories-annex- i-parties/2023).

1990-2022 National Greenhouse Gas Inventory Reports consist of National Inventory Document (NID) and Common Reporting Tables (CRT) and can be accessed at (https://unfccc.int/ghg-inventories-annex-i-parties/2024).

Table 47 Greenhouse Gas Amounts of Transport Sector (kilotonnes) (UAB, 2024)

Greenhouse gas amounts by source	CO_2	CH_4	N_2O
Transport	90,063.67	16.60	5.05
a. Domestic aviation	3,334.88	0.05	0.12
b. Road transport	84,698.25	16.41	4.72
c. Railways	456.71	0.03	0.18
d. Domestic navigation	1,135.55	0.11	0.03
e. Other transport	438.27	0.01	0.0008

Table 48 Annual Greenhouse Gas Amounts Sequestration by the Land Use, Land Use Change and Forestry (LULUCF) Sector between 1990-2023 (Kilotonnes CO_2 equivalent) (General Directorate of Forestry, 2024)

Years	Annual Greenhouse Gas Sequestration by the LULUCF Sector (CO_2 equivalent - Kt)
1990	-66,637.32
1991	-67,448.74
1992	-67,591.59

Years	Annual Greenhouse Gas Sequestration by the LULUCF Sector (CO_2 equivalent - Kt)
1993	-66,755.07
1994	-68,386.16
1995	-67,854.54
1996	-67,290.05
1997	-70,532.45
1998	-70,702.72
1999	-71,280.05
2000	-68,346.54
2001	-70,887.24
2002	-69,409.10
2003	-71,271.07
2004	-69,782.71
2005	-71,853.05
2006	-71,592.57
2007	-71,973.42
2008	-68,321.41
2009	-70,978.31
2010	-71,998.93
2011	-75,712.14
2012	-73,592.96
2013	-76,712.89
2014	-77,006.40
2015	-72,944.73
2016	-73,313.39
2017	-75,160.71
2018	-69,886.35
2019	-62,911.78
2020	-57,246.40
2021	-48,419.66

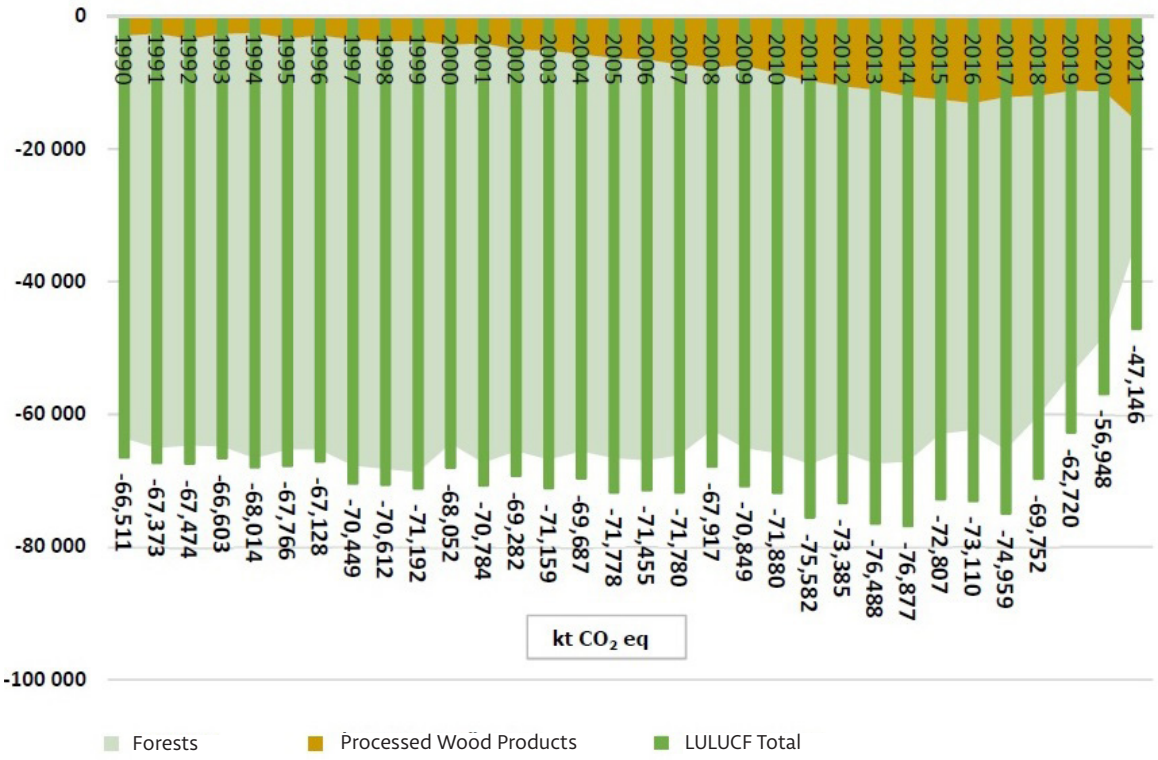
B.5. Sinks in Türkiye

Table 49 Total CO_2 Sequestration of Forestry and Processed Forest Products and LULUCF Sector of the National Greenhouse Gas Inventory Report (General Directorate of Forestry, 2024)

	Annual Greenhouse Gas Sequestration of Our Forests (CO_2 equivalent - Kt)	Annual Greenhouse Gas Sequestration of Processed Forest Products (CO_2 equivalent - Kt)	LULUCF Annual Greenhouse Gas Sequestration (CO_2 equivalent - Kt)
1990	-63,731.32	-2,906.72	-66,637.32
1991	-65,154.53	-2,573.34	-67,448.74
1992	-64,837.08	-3,379.68	-67,591.59
1993	-64,998.42	-2,619.79	-66,755.07
1994	-66,966.46	-2,507.13	-68,386.16
1995	-65,400.66	-3,361.05	-67,854.54
1996	-65,471.69	-2,882.62	-67,290.05
1997	-67,786.81	-3,494.10	-70,532.45
1998	-68,290.52	-3,773.12	-70,702.72
1999	-68,748.34	-3,730.50	-71,280.05
2000	-64,640.79	-4,337.47	-68,346.54
2001	-67,389.00	-4,037.91	-70,887.24
2002	-65,633.68	-4,998.85	-69,409.10
2003	-66,882.01	-5,178.07	-71,271.07
2004	-65,663.97	-5,699.48	-69,782.71
2005	-66,630.51	-6,284.96	-71,853.05
2006	-67,015.31	-6,496.68	-71,592.57
2007	-66,275.48	-7,247.49	-71,973.42
2008	-62,724.34	-7,699.03	-68,321.41
2009	-65,132.19	-7,407.52	-70,978.31
2010	-65,912.81	-8,587.37	-71,998.93
2011	-67,549.37	-9,742.43	-75,712.14
2012	-65,815.85	-10,510.74	-73,592.96
2013	-67,602.96	-11,080.78	-76,712.89
2014	-67,143.81	-12,048.84	-77,006.40

	Annual Greenhouse Gas Sequestration of Our Forests (CO_2 equivalent - Kt)	Annual Greenhouse Gas Sequestration of Processed Forest Products (CO_2 equivalent - Kt)	LULUCF Annual Greenhouse Gas Sequestration (CO_2 equivalent - Kt)
2015	-62,971.91	-12,541.04	-72,944.73
2016	-62,470.46	-13,101.86	-73,313.39
2017	-65,418.86	-12,133.31	-75,160.71
2018	-60,216.40	-11,973.45	-69,886.35
2019	-54,079.21	-11,215.10	-62,911.78
2020	-48,400.98	-11,280.86	-57,246.40
2021	-35,101.71	-15,725.04	-48,419.66

Graph 27 Annual Amount of Greenhouse Gas Sequestered by the LULUCF Sector (Kilotonnes CO_2 Equivalent) (General Directorate of Forestry, 2024)



B.6. Climate Finance and Incentives

Climate finance is a type of finance provided from public, private and alternative finance sources aiming to support climate change mitigation and adaptation efforts. Climate finance is one of the most important tools to meet the need for large-scale investments in mitigation and adaptation.

The taxonomy defines for companies, investors and policy makers which economic activities can be considered environmentally sustainable. Preparations for the National Green Taxonomy By-law are ongoing. Consultation meetings were organised with public and private sector representatives on the technical screening criteria determined for each economic activity within the scope of the 6 environmental objectives included in the annexes of the By-law. Within the framework of the opinions received from the public and private sector, a Climate Finance Working Group Meeting was organised, which will guide the National Green Taxonomy studies and create a road map. In line with the consultation meetings held with the sectors and the decisions taken at the Climate Finance Working Group Meeting, it is planned to finalise the National Green Taxonomy By-law and its Annexes in a short time.

The Project "Preparation of Reporting Guidelines in Türkiye and Identification of Potential Users and Beneficiaries of Green Taxonomy", which started in 2022 and completed by the end of 2023, aimed to strengthen the technical capacity on the National Taxonomy to be used in line with Türkiye's climate targets. The reports published within the scope of the project can be accessed from the website https://iklim.gov.tr/taksonomi-proje.

"Preparation of Reporting Guidelines in Türkiye and Identification of Potential Users and Beneficiaries of Green Taxonomy" Project was carried out with the French Development Agency. The project aimed to strengthen Türkiye's technical capacity on the National Taxonomy to be used in line with climate targets. The project included various components such as analysing global practices and examples related to taxonomy, analysing and identifying potential users of green taxonomy, analysing reporting and disclosure standards related to taxonomy and organising workshops. Within the scope of the project, 5 reports were prepared. In addition, a workshop was organised in May 2023 with the participation of public and private sector representatives. At the workshop, stakeholders were consulted on the financial actors in the Turkish financial system that will benefit from the green taxonomy, the potential areas of use of the taxonomy, and other complementary regulatory policy initiatives to promote the effective and widespread use of the taxonomy. The project ended at the end of 2023 with the preparation of the final report.

In addition, "Strengthening National Capacity for Climate Finance" project studies are being carried out under IPA III. The project aims to improve institutional capacity on climate finance, to provide more effective access to international and national climate finance, and to raise awareness on the management and provision of finance.

The works planned to be carried out in the project are as follows. These are;

- Developing a Methodology for Monitoring National Climate Finance in Türkiye,
- Preparation of National Draft Climate Finance Strategy,
- Literature Review and EU Legislation Review for Sustainable Finance,
- Drafting the National Green Taxonomy,
- Review of Global Standards on Green Finance Instruments,
- Climate Change - Insurance Sector Analysis,
- Climate Change Presidency Training for Target Groups and Other Stakeholders,
- Needs Analysis and Organisation of Trainings,
- Organization of Climate Finance Internship Programme.

In accordance with the "Communiqué on the Implementation Procedures and Principles of the Green Transformation Support Programme" published in the Official Gazette dated 26/07/2024 and numbered 32613, improvements to be made for the green transformation of manufacturing industry enterprises will be supported by the Ministry of Industry and Technology within the scope of the investment incentive system within the framework of the Priority Investments application of the Decree No. 3305 on State Aids in Investments. The Green Transformation Support Programme will be open to applications from all enterprises, regardless of Small and Medium-Sized Enterprises (SMEs) and large enterprises. During the application process, investors are expected to submit Road Map Reports containing their medium and long-term plans for green transformation and project information for which they will apply to the Green Transformation Support Programme. Through these Road Map Reports, which will guide enterprises in the green transformation process, it is aimed to provide enterprises with a green transformation vision. Within the framework of this Programme, the Ministry of Industry and Technology will grant the title of "Green Transformation Centre" to the facilities whose Road Map Report is deemed appropriate and which implement the projects for which a support decision is taken, during the implementation period of the road map.

B.7. Monitoring, Reporting and Verification of Greenhouse Gas Emissions from Energy and Industry (IRD)

Within the scope of the "By-law on Monitoring of Greenhouse Gas Emissions", which entered into force after being published in the Official Gazette dated 17 May 2014 and numbered 29003, almost all industrial facilities with high emission volume have been monitored since 2015.

Table 50 Number of Monitored Industrial Facilities and Emission Data (2015-2023) (Climate Change Directorate (İDB), 2024)

Year	No. of Facilities	Total Emission (tonnes CO_2 /year)
2015	694	234,870,702
2016	708	245,085,840
2017	731	264,019,058
2018	734	274,582,194
2019	711	251,709,554
2020	717	260,536,325
2021	741	296,161,131
2022	757	275,769,354
2023	769	270,577,306

Table 51 Sectoral Emission Data for the Year 2022 (İDB, 2024)

	Sector	Tonnes CO_2 Equivalent
1	Plaster	266,905
2	Aluminium	872,012
3	Glass	2,811,032
4	Cement	65,128,144

	Sector	Tonnes CO_2 Equivalent
5	Processing of Non-Ferrous Metals	691,264
6	Processing of Ferrous Metals	2,413,541
7	Other (Food, Textile, Automotive and others)	9,130,44 9
8	Electricity - Natural Gas	33,799,478
9	Electricity - Coal	99,695,950
10	Paper and Pulp	3,006,737
11	Chemistry	6,838,645
12	Lime	3,278,709
13	Mineral Fibre	304,723
14	Pig Iron and Steel (Including Integrated)	27,560,355
15	Refinery	8,558,766
16	Ceramic	2,524,085
17	Brick	899,677
18	Fertiliser	2,796,834
	Total Emission Data	270,577,306

- The details of Monitoring, Reporting and Verification (İRD) have been determined with the "Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions" and "Communiqué on Verification of Greenhouse Gas Emission Reports and Accreditation of Verification Bodies", which are sub-legislation of the By-law on Monitoring Greenhouse Gas Emissions.
- Verified emission reports are available through the Data Management System (VYS).
- Four technical guidance documents (Uncertainty, Biomass Sampling and Analysis and Data Flow Guides) were prepared in addition to the monitoring guide, reporting guide, sectoral examples, uncertainty guide within the scope of the studies to improve the implementation by examining the implementation methods and details that may provide the potential for improvement in data quality and in line with the needs of the sector.
- As a result of the work carried out in coordination with the Directorate General of Civil Aviation of the Ministry of Transport and Infrastructure, a system for monitoring, reporting and verification of greenhouse gas emissions from national and international aviation activities was established with a Data Management System (VYS) at its centre.

In order to support the implementation of the Turkish version of the EU Emissions Trading System (ETS), studies are being carried out to develop a Turkish version of the ETS that will adapt the existing VYS to include the relevant data by analysing the EU Legislation to determine the additional data points required for the grandfathering allocation method based on historical emissions.

As a result of the work carried out in coordination between the General Directorate of Civil Aviation of the Ministry of Transport and Infrastructure and the Directorate of Climate Change of MoEUCC, the "By-Law on Monitoring of Greenhouse Gas Emissions from Aviation Activities" was

published and the processes of monitoring, reporting and verification of greenhouse gas emissions from national/international aviation activities were initiated for Türkiye. A data management system, which enables the collection and evaluation of greenhouse gas emission data arising from national and international aviation activities, was prepared, tested and made ready for use.

In addition, the revision of the modular data management system that will enable information exchange for the MoEUCC was also realized. With the publication of the By-Law, the system became operational and was able to monitor greenhouse gas emissions from aviation activities. In addition, a guideline for aircraft operators and verification bodies on monitoring, reporting and verification of greenhouse gas emissions specific to the aviation sector was also developed.

Capacity Building Project on Monitoring, Reporting and Verification of Greenhouse Gas Emissions (IRD) is being implemented with the German Agency for International Cooperation (GIZ)

B.8. Studies on Emission Trading in Türkiye

The main purpose of the National Emission Trading System, which is being prepared by the Directorate of Climate Change, is to support the 2053 Net-Zero Emission target with an economy-based mechanism recognised by developed countries and to protect the competitiveness of the Turkish economy and industry against the European Union's Carbon Border Adjustment Mechanism. In addition, with the establishment of the National Emissions Trading System, the targets set out in the 12th Development Plan (2024-2028) and Medium Term Programme (OVP) (2024-2026) will also be achieved.

In April 2021, the Letter of Intent regarding the Partnership for Market Implementation (PMI) Programme participation request was submitted to the World Bank, and the Project, whose application was accepted in January 2023, was published in the Official Gazette on 12 December 2023 and became effective as of 08.01.2024. The overall objective of the Partnership for Market Implementation (PMI) Project is to support Türkiye in the development and implementation of carbon pricing mechanisms and to increase the technical and administrative capacity for the carbon market.

Within the scope of the project, announcements were made for the procurement of Consultancy Services for the Design and Legislation Development of Emission Trading System in Türkiye and Consultancy Services for the Economic Modelling of Emission Trading System in Türkiye.

In addition, the Protocol on the Establishment of a "National Carbon Crediting Programme" between the Turkish Standards Institute and the Directorate of Climate Change was signed on 12 May 2023.

Within the scope of harmonisation with the European Union, negotiations with the European Union are ongoing and High-Level Climate Dialogue is being conducted with the European Commission. Within the scope of the dialogue, a Carbon Pricing Working Group was established.

There is also an approved EU project to technically improve harmonisation with the EU ETS legislation, which is expected to start in 2025.

At the same time, the procedures and principles regarding the Emission Trading System to be implemented in Türkiye are being determined by the draft Climate Law and secondary legislation.

B.9. Studies on the Management of Ozone Depleting Substances (OTIM) and Fluorinated Greenhouse Gases in Türkiye

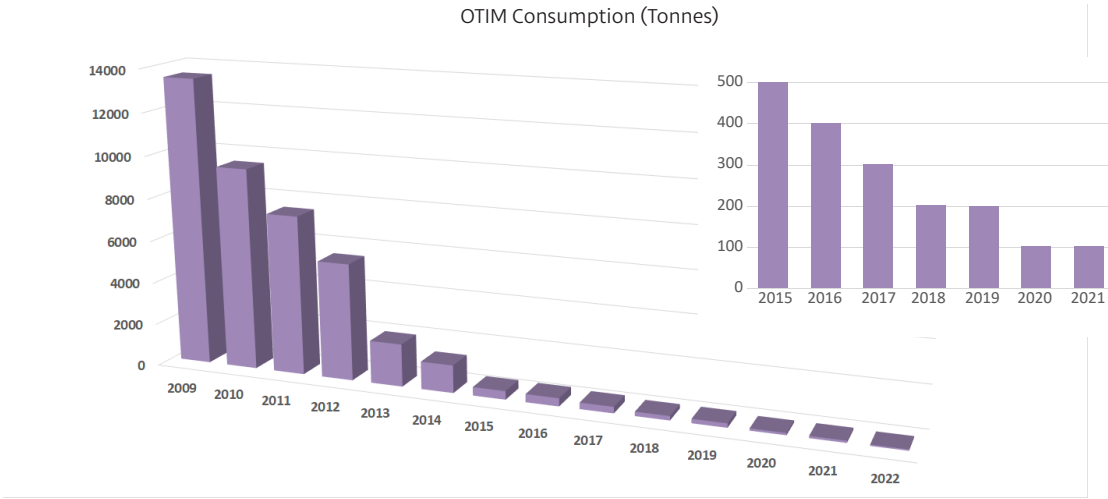
National and international studies on the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, to which Türkiye became a party in 1991, are carried out under the coordination of the MoEUCC.

Türkiye has ratified all amendments to the Montreal Protocol and receives funding from the Multilateral Fund (MLF) under the Montreal Protocol for the implementation of the Protocol. Türkiye is among the countries that have successfully implemented the Montreal Protocol, to which 197 countries are parties.

Within the scope of the By-law on Substances that Deplete the Ozone Layer, which entered into force after being published in the Official Gazette dated 7 April 2017 and numbered 30031, the MoEU controls the imports of these substances, which are not produced in Türkiye, and terminates their use. OTIMs are allowed to enter the country within the framework of the import quota determined by decreasing every year, and they are monitored by the MoEUCC electronic tracking system from the import stage to their use at the service stage in the country.

The amount of ozone depleting substances allowed to be imported on a quota basis in accordance with Türkiye's Montreal Protocol commitments was reduced from 13,200 tonnes in 2009 to 200 tonnes in 2019, 100 tonnes in 2020 and 2021, and 50 tonnes in 2022, 2023 and 2024 within the phased phase-out programme implemented under the Montreal Protocol. Consumption of OTIMs over the years is as follows. Imports of these gases, known as hydrochlorofluorocarbons (HCFC), will end as of 01.01.2025.

Graph 28 Ozone Depleting Substances (OTIMs) Consumption in Türkiye (İDB, 2024)



Türkiye accepted the Kigali Amendment to the Montreal Protocol on 10 November 2021. Accordingly, Türkiye, like other signatory countries to the Kigali Amendment, continues to protect the ozone layer by committing to the phased reduction of the production and consumption of hydrofluorocarbons (HFCs), and continues to increase its contribution to the fight against climate change in line with the Montreal Protocol and the Paris Agreement. In accordance with our international obligations, we are expected to start reducing our HFC consumption by 2024 and the first 10% reduction is expected to be achieved by 2029.

The By-law on Fluorinated Greenhouse Gases was updated and entered into force by being published in the Official Gazette dated 29 June 2022 and numbered 31881 in order to regulate the procedures and principles regarding the use of fluorinated greenhouse gases and products or equipment containing fluorinated greenhouse gases, both within the scope of harmonisation with the EU Acquis, with the necessity of transposition of the EU By-law No. 517/2014 on "Fluorinated Greenhouse Gases" into national legislation and within the framework of the Kigali Amendment obligations.

The By-law aims to regulate the procedures and principles regarding the management of fluorinated greenhouse gases and other fluorinated substances in order to control the emission of hydrofluorocarbons (HFCs) with high global warming potential, which are included in the annex of substances controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer to which Türkiye is a party. In this context, it includes the reduction of hydrofluorocarbons within the framework of a calendar for the period 2024-2045 and beyond, controlling their trade, and certifying the personnel and companies using these gases in service.

Within the framework of the reduction schedule of HFCs, a control certificate (licence) was introduced as of May 2023 for imports and exports. In this context, approximately 800 control certificates were issued by the Directorate of Climate Change until 31 December 2023. On 1 January 2024, quota application for the import of HFCs started. In this direction, the development and technical support of the Database of Activity Reports (FARAVET) software installed on the system servers of the MoEUCC, financed within the scope of the National Ozone Unit Capacity Building Project carried out by the United Nations Industrial Development Organization (UNIDO), started in October 2020 and will be completed in October 2024.

With the F-gas Equipment Operators Database (EKOMVET) application, it is aimed to track the interventions made to equipment containing fluorinated greenhouse gases and meeting certain criteria (such as stationary refrigeration, air conditioning and heat pumps, stationary fire protection, refrigeration units in refrigerated trucks and trailers, Organic Rankin Cycles, Electrical switchgear equipment). In addition, equipment related activities (installation, maintenance or technical service, repair, decommissioning and leakage checks and recycling) reported by the equipment operator.

The Communiqué on Certification of Real and Legal Persons Intervening in Equipment Containing Fluorinated Greenhouse Gases or Operating Based on These Gases was published in the Official Gazette dated 24 September 2020 and numbered 31254 in order to determine the minimum requirements and related principles for the certification of real and legal persons who intervene in equipment containing fluorinated greenhouse gases or operating based on these gases and carry out related activities in order to increase qualified workforce in the field. As a result of the certification of technical personnel carrying out all kinds of maintenance, repair and service operations on equipment containing fluorinated greenhouse gases, it is aimed to increase the qualified workforce in Türkiye as well as to reduce emissions from leakage. In this context, approximately 6,000 technicians were certified by the Vocational Qualifications Authority by 2023.

Legal entities or technical services that carry out the installation, maintenance, repair or decommissioning of devices and equipment containing fluorinated greenhouse gases or whose operation is based on fluorinated greenhouse gases must have a Service Competence Certifica-

te by the Turkish Standards Institute within the scope of TS 13905 standard. As of 2023, Service Competence Certificate was issued to 150 enterprises.

The Multilateral Fund for the implementation of the Montreal Protocol (MLF) is currently funding three ongoing projects. The projects currently underway in Türkiye with funding support are the Hydrochlorofluorocarbons (HCFC) Phase-out Management Plan Project (HPMP) and the National Ozone Unit Institutional Strengthening Project (IS) implemented with the support of UNIDO, and the Kigali Implementation Plan Preparation Project (KIP-PRP) implemented in cooperation with UNIDO and the United Nations Development Programme (UNDP).

Ongoing projects also include the COOL_UP Project for the Mainstreaming of Sustainable Cooling in the Middle East, coordinated by Guide House, which supports the transition to natural refrigerants.

References

Ministry of Environment, Urbanization and Climate Change

Climate Change Directorate

Ministry of Agriculture and Forestry

TURKSTAT

General Directorate of Meteorology

General Directorate of Forestry

C. WATER AND WASTE WATER MANAGEMENT

A significant part of the world population has problems in accessing clean water resources and does not have enough healthy water. Water demand is increasing day by day and accessible fresh water resources are decreasing day by day due to pollution. As a result of the pollution of limited water resources and the increasing need for water, sustainability and controlled use of natural resources have gained importance all over the world, especially in the last two decades, and studies on alternative water resources have increased. Developing technology has had accelerating positive effects in this process, and applications have become widespread with the ability to safely recover wastewater.

C.1. Türkiye's Water Resources and Potential

Türkiye is not a water rich country. According to the annual amount of water per capita, Türkiye is a water scarce country. According to the water potential calculations of SHW, Türkiye has an annual water potential of 1,652 m^3 per capita. According to the projections, Türkiye's population will reach 87.9 million in 2030 and the water potential is in danger of decreasing per capita per year, since water use will increase accordingly. Therefore, Türkiye will be among the countries experiencing water scarcity and will have to follow policies aiming to utilise its resources much more effectively.

C.1.1. Surface Waters

Türkiye is divided into 25 basins in line with its hydrological characteristics. The average total annual flow in the basins is 178.70 km^3 for 2022. The Fırat and Dicle Basin, which has 28.4 per cent of Türkiye's potential, is the largest basin in terms of its surface area and water potential, and it transcends the borders of the country. The other transboundary basins are, from north to south, the Çoruh River Basin, the Aras River Basin, the Asi River Basin and the Meriç River Basin in the west. These basins have an important place in Türkiye's international relations due to their transboundary characteristics.

Table 52 Annual Average Surface Water Potential by Basins, 2019-2023 (SHW, 2024)

Basin No	Name of Basin	2019			2020			2021			2022		
		Basin Precipitation area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)	Basin Precipitation area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)	Basin Precipitation area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)	Basin Precipitation area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)
1	Meriç Ergene	14,486.0	1.7	0.9	14,486.0	1.7	0.9	14,486.0	1.7	0.9	14,486.0	1.6	0.9
2	Marmara	23,074.0	7.4	4.0	23,074.0	7.4	4.0	23,074.0	7.4	4.0	23,074.0	7.4	4.1
3	Susurluk	24,319.0	5.0	2.7	24,319.0	5.0	2.7	24,319.0	5.0	2.7	24,319.0	4.5	2.5
4	Northern Aegean	9,861.0	2.0	1.1	9,861.0	2.0	1.1	9,861.0	2.0	1.1	9,861.0	1.8	1.0
5	Gediz	17,137.0	1.8	1.0	17,137.0	1.8	1.0	17,137.0	1.8	1.0	17,137.0	1.5	0.8
6	Little Menderes	6,963.0	0.6	0.3	6,963.0	0.6	0.3	6,963.0	0.6	0.3	6,963.0	0.5	0.3
7	Greater Menderes	25,960.0	3.0	1.6	25,960.0	3.0	1.6	25,960.0	3.0	1.6	25,960.0	2.7	1.5
8	Western Mediterranean	20,956.0	6.5	3.5	20,956.0	6.5	3.5	20,956.0	6.5	3.5	20,956.0	6.2	3.5
9	Antalya	20,249.0	12.9	7.0	20,249.0	12.9	7.0	20,249.0	12.9	7.0	20,249.0	12.8	7.2
10	Burdur Lakes	6,294.0	0.2	0.1	6,294.0	0.2	0.1	6,294.0	0.2	0.1	6,294.0	0.2	0.1
11	Akarçay	7,995.0	0.4	0.2	7,995.0	0.4	0.2	7,995.0	0.4	0.2	7,995.0	0.4	0.2
12	Sakarya	63,303.0	6.5	3.5	63,303.0	6.5	3.5	63,303.0	6.5	3.5	63,303.0	6.0	3.4
13	Western Black Sea	28,855.0	10.8	5.8	28,855.0	10.8	5.8	28,855.0	10.8	5.8	28,855.0	10.3	5.7
14	Yeşılırmak	39,595.0	7.0	3.8	39,595.0	7.0	3.8	39,595.0	7.0	3.8	39,595.0	6.9	3.9
15	Kızılırmak	82,181.0	7.0	3.8	82,181.0	7.0	3.8	82,181.0	7.0	3.8	82,181.0	6.5	3.6
16	Konya Closed	49,930.0	2.4	1.3	49,930.0	2.4	1.3	49,930.0	2.4	1.3	49,930.0	2.2	1.2
17	Eastern Mediterranean	21,150.0	7.6	4.1	21,150.0	7.6	4.1	21,150.0	7.6	4.1	21,150.0	7.0	3.9
18	Seyhan	22,035.0	6.2	3.3	22,035.0	6.2	3.3	22,035.0	6.2	3.3	22,035.0	6.2	3.5
19	Asi	7,886.0	1.8	1.0	7,886.0	1.8	1.0	7,886.0	1.8	1.0	7,886.0	1.6	0.9
20	Ceyhan	21,391.0	7.7	4.2	21,391.0	7.7	4.2	21,391.0	7.7	4.2	21,391.0	7.4	4.2
21	Fırat-Dicle (*)(**)	176,143.0	56.3	30.4	176,143.0	56.3	30.4	176,143.0	56.3	30.4	176,143.0	54.5	30.5
22	Eastern Black Sea	22,846.0	16.4	8.9	22,846.0	16.4	8.9	22,846.0	16.4	8.9	22,846.0	16.4	9.2
23	Çoruh	20,248.0	7.0	3.8	20,248.0	7.0	3.8	20,248.0	7.0	3.8	20,248.0	7.1	4.0
24	Aras	27,775.0	4.5	2.4	27,775.0	4.5	2.4	27,775.0	4.5	2.4	27,775.0	4.6	2.6
25	Lake Van	17,861.0	2.6	1.4	17,861.0	2.6	1.4	17,861.0	2.6	1.4	17,861.0	2.5	1.4
	Total	**778,493**	**185.37**	**100**	**778,493**	**185.37**	**100**	**778,493**	**185.37**	**100**	**778,493**	**178.70**	**100**

NOTE:
1. 2013-2015 data are unchanged.
2. Reason for the changes in the data in 2016, 2017; Within the scope of the "Determination of Türkiye's Water Budget Project" under the activities of the Hydrology Specialised Committee within the Ministry of Agriculture and Forestry, Türkiye's areal average precipitation, surface and groundwater potential and evapotranspiration values are updated. "Türkiye's Surface Water Potential Project" study was started in September 2014 and completed by the end of 2015 for 25 basins of Türkiye by the General Directorate of State Hydraulic Works (SHW) by determining 401 AGIs located in the main streams, tributaries and basin outlets that can represent the basin and have a period of 1981-2010, and the results obtained as a result of the said project study are given in the table for the years 2016 and 2017.
3. As a result of the completed basin master plan studies, the data was updated in 2018.
4. The data for the year 2022 were determined within the scope of the "Basin Water Potential Determination Work", which was tendered in 2022 and completed in 2023. The main data source of the work carried out within this framework was the Basin Master Plans completed by SHW and the Drought Management Plans and Sectoral Water Allocation Plans completed and/or ongoing by the General Directorate of Water Management (SYGM).
5. National Basin Coding has been used.

(*) Fırat River mainstream annual flow is 31.61 km^3 (2013-2015), 30.64 km^3 (2016,2017), 31.13 km^3 (2018).
(**) Dicle River mainstem annual flow is 21,33 km^3 (2013-2015), 24,78 km^3 (2016,2017), 25,19 km^3 (2018).
(***) These values were obtained from base station flows at the most downstream of the basins.

C.1.2. Groundwater

Changes in annual groundwater potential according to basins in Türkiye are given below.

Table 53 Annual Groundwater Potential by Basins (hm^3/year), 2019-2023 (SHW, 2024)

Basin No	Name of the Basin	2019		2020		2021		2022		2023	
		Groundwater Supply	Groundwater Operating Reserve	Groundwater Supply	Groundwater Operating Reserve	Groundwater Supply	Groundwater Operating Reserve	Groundwater Supply	Groundwater Operating Reserve	Groundwater Supply	Groundwater Operating Reserve
1	Meriç Ergene	507.7	498.2	507.7	498.2	507.7	498.2	507.7	498.2	507.7	498.2
2	Marmara	241.7	210.7	241.7	210.7	241.7	210.7	241.7	210.7	241.7	210.7
3	Susurluk	780.4	585.9	780.4	585.9	780.4	585.9	780.4	585.9	780.4	585.9
4	Northern Aegean	289.4	212.9	289.4	212.9	289.4	212.9	289.4	212.9	289.4	212.9
5	Gediz	1,155.9	866.9	1,155.9	866.9	1,155.9	866.9	1155.9	866.9	1,155.9	866.9
6	Little Menderes	179.2	179.2	179.2	179.2	179.2	179.2	179.2	179.2	179.2	179.2
7	Greater Menderes	1,045.4	761.5	1,045.4	761.5	1,045.4	761.5	1,045.4	761.5	1,045.4	761.5
8	Western Mediterranean	473.2	316.7	473.2	316.7	473.2	316.7	473.2	316.7	473.2	316.7
9	Antalya	1,164.7	576.3	1,164.7	576.3	1,164.7	576.3	1,164.7	576.3	1,164.7	576.3
10	Burdur Lakes	106.4	89.5	106.4	89.5	106.4	89.5	106.4	89.5	106.4	89.5
11	Akarçay	345.4	345.4	345.4	345.4	345.4	345.4	345.4	345.4	345.4	345.4
12	Sakarya	2,197.1	1,545.2	2,197.1	1,545.2	2,197.1	1,545.2	2,197.1	1,545.2	2,197.1	1,545.2
13	Western Black Sea	641.2	607.6	641.2	607.6	641.2	607.6	641.2	607.6	641.2	607.6
14	Yeşılırmak	907.2	872.8	907.2	872.8	907.2	872.8	907.2	872.8	907.2	872.8
15	Kızılırmak	2,003.1	1,762.9	2,003.1	1,762.9	2,003.1	1,762.9	2,003.1	1,762.9	2,003.1	1,762.9
16	Konya Closed	2,597.0	2,023.0	2,597.0	2,023.0	2,597.0	2,023.0	2,597.0	2,023.0	2,597.0	2,023.0
17	Eastern Mediterranean	96.5	70.5	96.5	70.5	96.5	70.5	96.5	70.5	96.5	70.5
18	Seyhan	838.8	749.9	838.8	749.9	838.8	749.9	838.8	749.9	838.8	749.9
19	Asi	393.2	289.5	393.2	289.5	393.2	289.5	393.2	289.5	393.2	289.5
20	Ceyhan	985.3	533.5	985.3	533.5	985.3	533.5	985.3	533.5	985.3	533.5
21	Fırat-Dicle	4,994.8	3,763.7	4,994.8	3,763.7	4,994.8	3,763.7	4,994.8	3,763.7	4,994.8	3,763.7
22	Eastern Black Sea	490.9	490.9	490.9	490.9	490.9	490.9	490.9	490.9	490.9	490.9
23	Çoruh	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0	30.0	20.0
24	Aras	388.5	294.4	388.5	294.4	388.5	294.4	388.5	294.4	388.5	294.4
25	Lake Van	179.2	148.2	179.2	148.2	179.2	148.2	179.2	148.2	179.2	148.2
	Total	**23,032.3**	**17,815.3**	**23,032.3**	**17,815.3**	**23,032.3**	**17,815.3**	**23,032.3**	**17,815.3**	**23,032.3**	**17,815.3**

* Following the completion of the Hydrogeological Survey Studies in the Basins, the Groundwater potential will be updated.

C.1.3. Seas

Seas have a very important place in the daily life of mankind. On the one hand, it is an important source of food and life for humans and other living creatures, on the other hand, it is an important economic resource for maritime transport, marine tourism, mineral extraction and energy extraction.

Data on the Black Sea Oceanographic Situation

The mean, standard error, minimum and maximum values of the oceanographic data obtained in the seasonal measurements titled "Determination of the Effects of Terrestrial Source Pollutants on Coastal and Marine Ecosystem in the Eastern Black Sea Region" carried out with the support of the Ministry of Agriculture and Forestry General Directorate of Agricultural Research and Policies (TAGEM) are given in the following tables with the depths sampled.

Table 54 Data on Oceanographic Measurements at 20 Metres in the Black Sea (MoAF, 2024)

Season	Temperature (°C)	Salinity (0% S)	Sigma-t (kg/m³)	Conductivity (S/m)	pH	Oxygen (mg/L)	Chlorophyll-a (mg/m³)
Spring	11.91	18.13	13.52	2.20	8.35	11.59	3.47
Summer	22.15	18.10	11.24	2.78	8.37	7.56	0.84
Fall	15.29	18.14	12.95	2.38	8.38	7.72	1.34
Winter	9.13	18.17	13.97	2.05	8.34	9.29	1.72

Table 55 Data on Oceanographic Measurements at 50 Metres in the Black Sea (MoAF, 2024)

Season	Temperature (°C)	Salinity (0% S)	Sigma-t (kg/m³)	Conductivity (S/m)	pH	Oxygen (mg/L)	Chlorophyll-a (mg/m³)
Spring	8.69	18.42	14.20	2.06	8.46	9.00	0.82
Summer	9.44	18.34	14.03	2.10	8.27	8.46	0.77
Fall	11.59	18.35	13.74	2.21	8.28	7.62	0.43
Winter	8.66	18.34	14.17	2.04	8.29	9.04	0.52

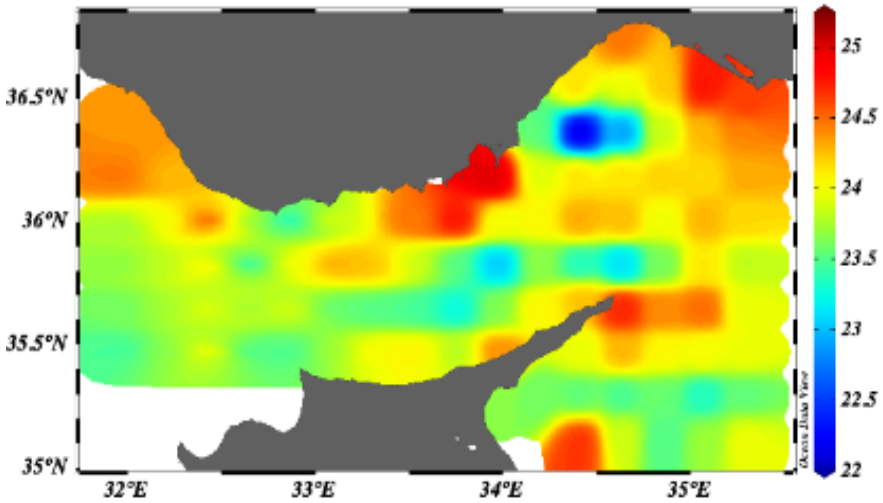
Table 56 Data on Oceanographic Measurements at 100 Metres in the Black Sea (MoAF, 2024)

Season	Temperature (°C)	Salinity (0% S)	Sigma-t (kg/m³)	Conductivity (S/m)	pH	Oxygen (mg/L)	Chlorophyll-a (mg/m³)
Spring	8.28	19.30	14.92	2.13	7.96	4.82	0.42
Summer	8.49	19.41	15.00	2.15	7.88	3.40	0.31
Fall	8.66	19.36	14.94	2.15	7.93	4.04	0.27
Winter	8.62	20.47	15.83	2.27	7.73	1.32	0.28

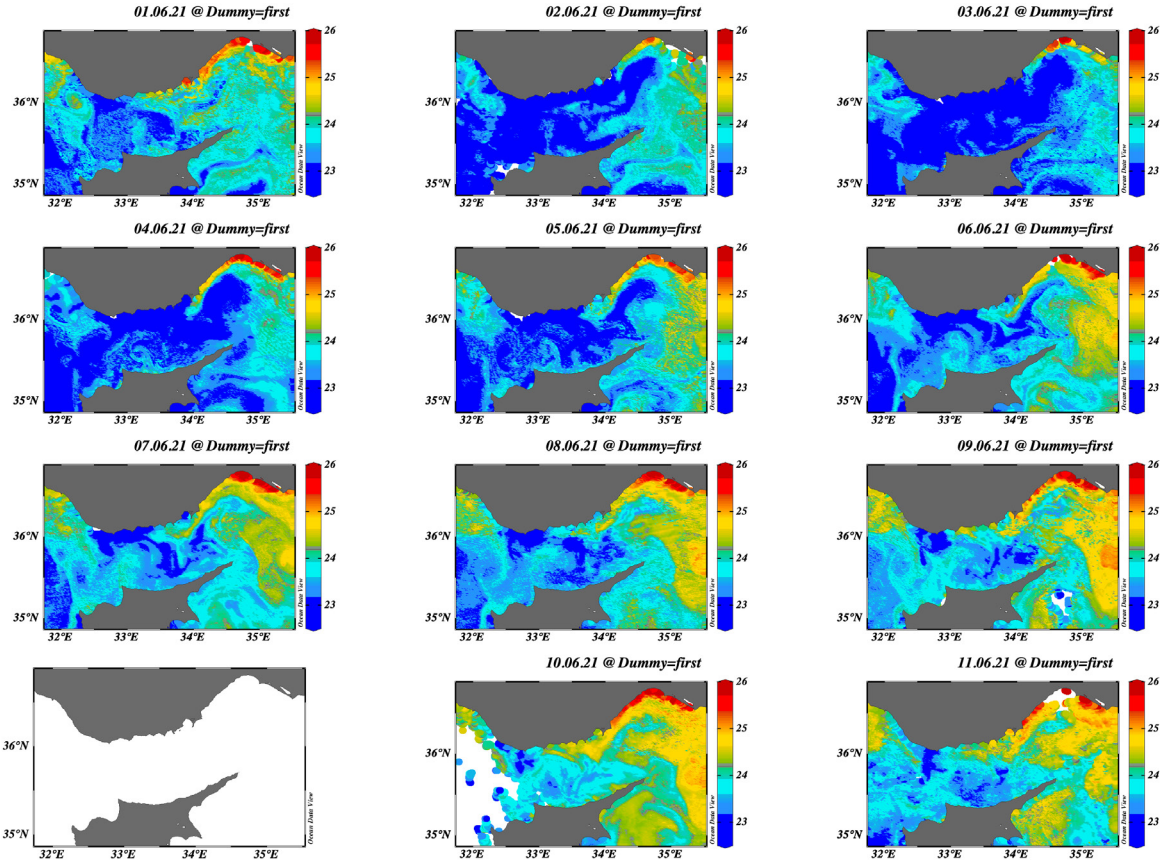
Data on Mediterranean Oceanographic Conditions

During the field study carried out with the support of MoAF TAGEM, it was determined that the temperature values were distributed between 13.90°C and 25.10°C in the station measurements made with the "Conductivity, Temperature, Depth" (CTD) device. CTD temperature measurement profiles of all stations are presented in the figures below.

Map 11 Temperature (°C) profiles of CTD measurements during 2021-2022), surface distribution of all stations.



Map 12 Satellite-based surface water temperature (°C) distributions for 2021 (data source: https://data.marine.copernicus.eu).



Oceanographic Status and Environmental Parameters in the Marmara Sea

The physico-chemical characteristics of the Marmara Sea during the fieldwork carried out with the support of MoAF TAGEM are given below.

Table 57 Seasonal Physico-Chemical Parameters for 2021-2022

Spring	Surface		5		10		20		30	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
WATER TEMPERATURE	19.2	20.3	18.1	19.7	16.9	18	12	15.3	10.06	14
Ph	8.01	8.44	8.3	8.39	8.33	8.41	8.34	8.43	8.18	8.39
OXYGEN	7.1	8.7	7.13	9	8.07	14.3	8.64	11.55	5.73	11.56
CONDUCTIVITY	24.32	25.05	24.68	25.19	24.98	25.81	26.39	28.35	26.91	32.85

	Lowest	Highest
DEPTH (fathom)	32	78
SECHİ DEPTH (m)	5	7

Summer	Surface		5		10		20		30	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
WATER TEMPERATURE	21.3	22.2	21.2	21.6	21.1	21.6	16.6	21.1	15.7	21
Ph	8.45	8.63	8.54	8.69	8.58	8.7	8.46	8.66	8.4	8.64
OXYGEN	7.63	7.79	7.39	8.15	7.36	7.96	3.7	6.82	3.64	6.84
CONDUCTIVITY	22.19	23.11	22.6	23.55	22.7	23.86	23.51	25.86	24.14	36.81

	Lowest	Highest
DEPTH (fathom)	16.7	62.5
SECHİ DEPTH (m)	7	10

Fall	Surface		5		10		20		30	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
WATER TEMPERATURE	15.1	15.5	15	15.3	15	15.3	15	16.4	16	16.5
Ph	8.2	8.66	8.49	8.72	8.54	8.73	8.51	8.74	8.4	8.59
OXYGEN	7.4	8.59	7.4	7.91	7.2	7.61	4.85	7.46	4.63	5.65
CONDUCTIVITY	24.76	25.12	24.76	25.72	24.81	25.29	25.11	32.57	31.96	37.68

	Lowest	Highest
DEPTH (fathom)	29.9	54.3
SECHİ DEPTH (m)	5	13

Winter	Surface		5		10		20		30	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
WATER TEMPERATURE	11.4	12.1	11.4	12.2	11.6	12.2	12	12.8	12	14
Ph	8.22	8.61	8.33	8.56	8.2	8.56	8.3	8.53	8.23	8.47
OXYGEN	7.84	8.53	7.96	8.48	7.91	8.44	6.1	7.81	6.23	7.8
CONDUCTIVITY	26.57	28.44	27.77	28.64	27.8	28.83	28.39	32.97	28.38	34.52

	Lowest	Highest
DEPTH (fathom)	31.5	46.9
SECHİ DEPTH (m)	6	8

According to the findings of the study, chlorophyll-a variation is between 0.1 and 2.8 p.g/l. The highest chlorophyll-a value was found at a depth of 20 m in spring when mucilage formation was observed. Surface water temperatures at these stations varied between 11.4 and 22.4 °C. The highest surface water temperature was 22.2 °C in September and the lowest surface water temperature was 11.4 °C in December

C.1.3.1. Factors Affecting the Marine Environment

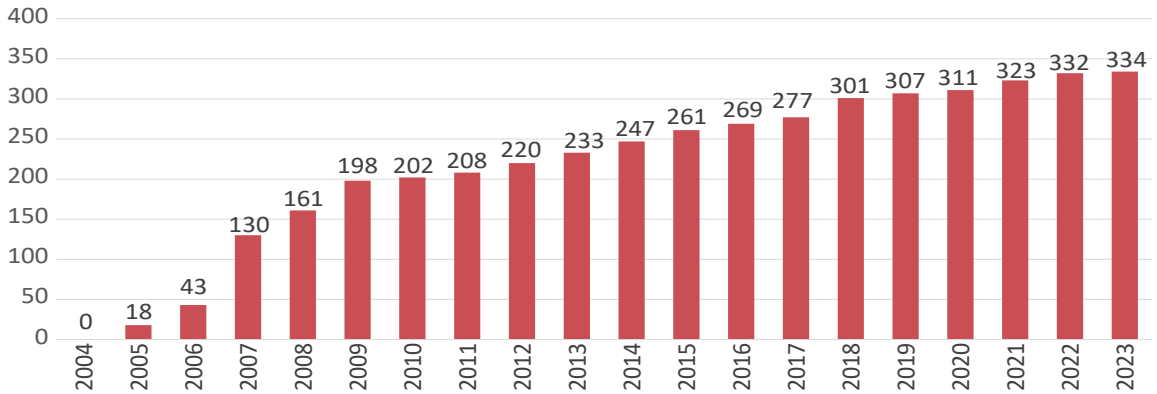
C.1.3.1.1. Pollution from Ships

90% of world trade is carried out by sea, that is, by ships. From this point of view, the management of wastes arising from the operational activities of ships in a way that does not cause marine pollution is of great importance.

At the international level, By-laws within this scope are carried out within the framework of the "International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)". Türkiye became a party to the convention in 1990.

Necessary legislation has been published in line with our obligations arising from this convention and our national needs. At the beginning of this legislation is the "By-law on Waste Collection from Ships and Control of Wastes" which was first published in 2004. In this context, as of 2023, 334 coastal facilities in Türkiye provide waste reception services through waste reception facilities and 58 waste reception vessels.

Graph 29 Number of Waste Reception Facilities (MoEUCC, 2024)



C.1.3.1.2. Marine Litter Management

Marine litter is defined as permanent, processed solid materials discharged, discarded or left on the shore or in the marine environment. Marine litter is a global problem that threatens the health of the oceans, seas and rivers and the organisms living in and interacting with these ecosystems. Due to these effects, it is among the priority issues in national and international arena. For this reason, Provincial Action Plans were prepared in all coastal provinces to combat marine litter and started to be implemented in 2020.

Marine Litter Provincial Action Plans have been prepared for 5 years for all 28 coastal provinces under the chairmanship of Governors with the participation and contributions of responsible

institutions, organizations and non-governmental organizations in the provinces. The provincial action plans include the identification of risky areas in terms of marine litter by taking into account the geographical scope of the province and the general situation of the province, research, monitoring and evaluation studies, creating region-specific solutions, determining the source and current situation, cleaning the litter, planning for the prevention of its formation and public awareness raising activities. Provincial Action Plans prepared for 28 coastal provinces under these headings have been published on the web pages of Provincial Directorates of Environment, Urbanization and Climate Change.

With the implementation of the Zero Waste Blue Movement and Marine Litter Provincial Action Plans, approximately 220,000 tonnes of marine litter was collected and disposed of by the end of 2023.

In addition, the G20 countries, consisting of 19 countries among the world's largest economies, including Türkiye, and the European Union Commission, have been following the "G20 Marine Litter Action Plan" since 2017 and have been carrying out their activities in this direction. Within the scope of the G20 activities carried out by the Indian Presidency, a coastal cleaning activity was held simultaneously in G20 countries on 21 May 2023. In Türkiye, under the leadership of the MoEUCC, a coastal cleaning activity was carried out at Ala Beach in Şile district of Istanbul province with the participation of the Consuls General of Australia, Indonesia and India, as well as citizens of G20 countries and environmental volunteers. The event was hosted by Şile Municipality with the participation of consulates of G20 countries, local administrations, civil society organizations and environmental volunteers. The event was organised under the leadership of the MoEU, which holds the G20 Presidency, and was also supported by the Embassy of India, Şile Municipality and Turkish Marine Environment Protection Association/TURMEPA. The coastal clean-up in Şile was organised with the motto "A Small Step has a Big Impact". During the event, the G20 coastal clean-up pledge board was signed.

C.1.3.1.3. Seabed Dredging Activities

In Türkiye, dredging and the discharge of dredged material, especially in the marine area, are carried out within the scope of the Additional Protocols of the Barcelona and Bucharest Conventions. The "By-law on Environmental Management of Dredging Material" entered into force after being published in the Official Gazette dated 14/01 /2020 and numbered 31008 in order to ensure the necessary compliance with the said conventions, environmental management of dredging activities carried out in sea and coastal areas and river mouths, beneficial use of dredging materials resulting from these activities, and determination of the procedures and principles regarding the discharge or disposal of dredging materials into the marine environment in a way that does not harm the environment and human health.

The legislation covers the determination of the characteristics of discharge areas in our territorial waters, quality standards for pollutant parameters of discharge materials, the issuance of the necessary permit for dumping in discharge areas, and the monitoring and inspection of discharge areas in terms of pollution load.

In addition, the Circular on the Implementation and Delegation of Authority for Dredging and Discharge Activities No. 2020/4, which includes the methods of discharge into the sea within

the scope of environmental management of dredging material, discharge areas, ecotoxicological analysis methods, Monitoring and Ecological Report formats to be submitted to the Administration, and delegation of authority for the supervision of discharge activities, was published on 20/02/2020.

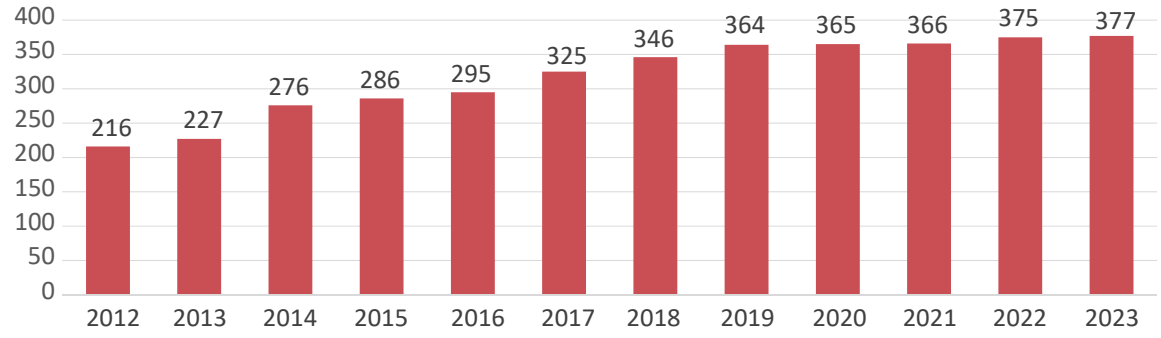
C.1.3.1.4. Risk Management and Emergency Response for Pollution Caused by Marine Accidents

Türkiye is a party to regional and international conventions in order to prevent pollution of our seas and environment. In this context, in order to fulfil the requirements of the conventions to which we are a party and to ensure the prevention of pollution of our seas with oil and other harmful substances, "Law No. 5312 on Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances" (11 March 2005) and the Implementing By-law of the Law (21 October 2006) entered into force.

With the legislation in question, the principles of intervention and preparedness to be applied in order to eliminate the danger of pollution of our seas and their environment or to reduce, limit and eliminate pollution, the principles of determination and compensation of damages resulting from the incident, and the duties, powers and responsibilities of public institutions / organizations within the scope of the legislation are clearly defined.

Within the scope of the Law, the approval of emergency response plans for coastal facilities started in 2009, and the risk assessment and Emergency Response Plans of 377 coastal facilities, including 57 facilities in 2023, were approved by the MoEUCC.

Graph 30 Number of Facilities with Approved Emergency Response Plans (MoEUCC, 2024)



On the other hand, within the scope of Law No. 5312 and its Implementing By-law, determination of environmental risks and classification of coastal facilities for effective response to marine pollution by coastal facilities obliged to prepare Risk Assessment and Emergency Response Plans, and preparedness for pollution events on all our coasts and planning of the response, "Project for Planning Response in Marine Pollution Incidents (2022-2024)" is being carried out by the MoEUCC in order to update the response planning to include the principles of response, waste collection and disposal, rehabilitation of polluted areas, compensation for damages and cooperation.

In addition, within the scope of the "Establishment of Emergency Response Centres and Determination of the Current Situation in Our Seas Project" by the Ministry of Transport and Infrastructure, it was aimed to establish emergency response stations against marine pollution to dominate the coasts of Türkiye and to coordinate them from a centre, and the Directorate of National

Maritime Safety (DNMS), the largest Emergency Response Centre in Europe, was established in Tekirdağ, which is located in the north-west of the Marmara Sea, which is the most risky region in terms of ship traffic, and has extensive logistics facilities.

DNMS operates as the decision support system of the Ministry of Transport and Infrastructure in order to perform all kinds of tasks such as preparedness, planning, coordination and intervention related to ensuring maritime safety with personnel, equipment, hardware, software and all necessary infrastructure facilities in our maritime jurisdictions. DNMS, which is the most important pillar of the project and where all emergency response operations are carried out, acts as the brain and coordination centre of Türkiye in response to marine pollution and our seas are protected at the highest level with the stations on our coasts. In addition, in DNMS, which is designed to be an international training and R&D centre, activities such as providing trainings, conducting drills, testing and certification of equipment and materials used in response, pollution modelling and sample analyses related to marine pollution continue.

C.1.3.1.5. Aquaculture Activities

With the "By-law on Environmental Management of Fish Farms Operating in the Seas" published in the Official Gazette dated 28 October 2020 and numbered 31288, it is aimed to determine the sensitive areas where fish farms operating in the seas cannot be established and to determine the effects of fish farms on the marine environment and to establish procedures and principles regarding their environmental management.

The By-law provides for the preparation of an environmental management plan to ensure the environmental management of fish farms operating in the seas. Within this framework, in 2023, Environmental Management Plans of fish farms that applied to the MoEUCC and have a capacity of 1,000 tonnes/year or more for fish production/breeding were prepared and a Certificate of Conformity was issued for 131 fish farms. In addition, monitoring of the marine areas where the facilities are located is carried out annually.

"Fisheries Law No. 1380", "By-law on Fisheries" and some communiqués were published in order to regulate the obligations, limitations and prohibitions related to fisheries in order to ensure the protection and sustainable operation of fisheries resources by taking into account scientific, environmental, economic and social issues to be applied in fisheries, to prevent overfishing, to protect and sustain fisheries stocks.

In this context, the basic policy of Türkiye regarding aquaculture is to operate the resources in a sustainable manner by considering the balance of protection and utilization of aquaculture products and habitats, and to ensure the security of supply in aquaculture products by developing aquaculture in our marine and inland waters within this framework.

In order to continue aquaculture activities in Türkiye within the framework of blue growth and sustainable aquaculture, activities for the protection, development and By-law of aquaculture areas are continued.

Projections indicate that fishing will not increase in parallel with the decrease in fish stocks, whereas aquaculture will develop and its share in aquaculture production will increase over the years. As a matter of fact, similar to the world aquaculture production, while the amount obta-

ined by fishing in Türkiye shows a fluctuating course at certain levels, aquaculture production continues to increase and the share of aquaculture in total production increases every year.

Aquaculture production in Türkiye was 373,356 tonnes in 2019, 421,411 tonnes in 2020, 471,686 tonnes in 2021, 514,805 tonnes in 2022 and 556,287 tonnes in 2023.

All the seas around Türkiye are part of the Mediterranean water system. However, these seas differ from each other in terms of their ecological, geographical, geomorphological and meteorological characteristics. The difference between the Black Sea and the Mediterranean is more evident. When this situation is evaluated in terms of fisheries, it is reflected in species diversity and abundance.

Türkiye's annual aquaculture production varies from year to year due to the fluctuation in fishing production, and between 2014 and 2023, 537-1,010 thousand tonnes of aquaculture products were produced annually. Similar to the world production, Türkiye's aquaculture production continues to increase and the share of aquaculture in total production is increasing.

Aquaculture production increased by 18.9% in 2023 compared to the previous year and reached 1,010,346 tonnes. 44.9% of the production consisted of fishery products and 55.1% of aquaculture products.

Table 58 Türkiye Aquaculture Production (tonnes) (TURKSTAT, 2024)

Years	FISHERY			AQUACULTURE			TOTAL PRODUCTION
	Sea	Inland Water	Total	Sea	Inland Water	Total	
2010	445,680	40,259	485,939	88,573	78,568	167,141	653,080
2011	477,658	37,097	514,755	88,344	100,446	188,790	703,545
2012	396,322	36,120	432,442	100,853	111,557	212,410	644,852
2013	339,047	35,074	374,121	110,375	123,019	233,394	607,515
2014	266,078	36,134	302,212	126,894	108,239	235,133	537,345
2015	397,731	34,176	431,907	138,879	101,455	240,334	672,241
2016	301,464	33,856	335,320	151,794	101,601	253,395	588,715
2017	322,173	32,145	354,318	172,492	104,010	276,502	630,820
2018	283,955	30,139	314,094	209,370	105,167	314,537	628,631
2019	431,572	31,596	463,168	256,930	116,426	373,356	836,524
2020	331,281	33,119	364,400	293,175	128,236	421,411	785,811
2021	295,018	33,140	328,158	335,644	136,042	471,686	799,844
2022	301,747	33,256	335,003	368,742	146,063	514,805	849,808
2023	420,527	33,532	454,059	399,529	156,758	556,287	1,010,346

According to the data of Turkish Statistical Institute (TURKSTAT), it is observed that the production of fishery products has been fluctuating since 1989, the amount of landed catch has decreased in the last 20 years in general, and has displayed a fluctuating but relatively stable trend in recent years.

Seafood fishing, especially sea fish, has an important place in Türkiye's fishing production. In 2023, 92.6% of the total catch production was obtained from the seas, and 85.3% of the total catch was sea fish catch.

Table 59 Türkiye Aquaculture Fishery Production (Tonnes) (TURKSTAT, 2024)

Years	SEA			INLAND WATER			TOTAL FISHERY
	Fish	Other Aquaculture Products	Total	Fish	Other Aquaculture Products	Total	
2010	399,656	46,024	445,680	36,458	3,801	40,259	485,939
2011	432,246	45,412	477,658	34,328	2,769	37,097	514,755
2012	315,637	80,686	396,322	33,787	2,333	36,120	432,442
2013	295,168	43,879	339,047	32,281	2,793	35,074	374,121
2014	231,058	35,019	266,078	33,263	2,871	36,134	302,212
2015	345,765	51,966	397,731	32,376	1,800	34,176	431,907
2016	263,725	37,739	301,464	31,509	2,347	33,856	335,320
2017	269,677	52,496	322,173	29,773	2,372	32,145	354,318
2018	222,024	61,931	283,955	27,607	2,532	30,139	314,094
2019	374,726	56,846	431,572	28,618	2,978	31,596	463,168
2020	291,910	39,371	331,281	30,150	2,969	33,119	364,400
2021	262,290	32,728	295,018	31,168	1,972	33,140	328,158
2022	254,535	47,212	301,747	31,692	1,564	33,256	335,003
2023	387,115	33,412	420,527	31,695	1,837	33,532	454,059

The prices of small pelagic species such as anchovy, sprat, sardine, white sand mussel, sea snail, pearl mullet, silver and silvery pond fish, which are widely fished in inland waters, are generally low. Although the amount of fishery products related to these species is higher, their value is lower than aquaculture products. Depending on the increase in aquaculture production, the total value of aquaculture products is increasing every year.

Table 60 Amount and Value of Aquaculture Production (Tonnes) (TURKSTAT, 2024)

Years	FISHERY		AQUACULTURE		TOTAL	
	Amount (tonnes)	Value (TRY)	Amount (tonnes)	Value (TRY)	Amount (tonnes)	Value (TRY)
2010	485,939	1,078,515,200	167,141	1,066,778,600	653,080	2,145,293,800
2011	514,755	1,143,272,172	188,790	1,270,028,140	703,545	2,413,300,312
2012	432,442	1,209,028,426	212,410	1,605,293,700	644,852	2,814,322,126
2013	374,121	1,188,432,525	233,394	1,704,471,151	607,515	2,892,903,676
2014	302,212	1,099,738,850	235,133	2,160,070,890	537,345	3,259,809,740
2015	431,907	1,246,810,168	240,334	2,569,208,590	672,241	3,816,018,758
2016	335,320	1,340,901,947	253,395	3,239,416,760	588,715	4,580,318,707
2017	354,318	1,535,702,592	276,502	4,049,199,270	630,820	5,584,901,862
2018	314,094	1,852,651,626	314,537	5,606,828,410	628,631	7,459,480,036
2019	463,168	2,380,414,908	373,356	7,694,124,480	836,524	10,074,539,388

2020	364,400	2,848,969,147	421,411	10,859,581,980	785,811	13,708,551,127
2021	328,158	3,614,712,762	471,686	18,482,440,710	799,844	22,097,213,472
2022	335,003	6,931,545,030	514,805	42,047,980,280	849,808	48,979,325,310
2023	420,527	11,346,867,112	556,287	67,295,413,500	1,010,346	78,642,280,612

When the production figures are analyzed, it is seen that anchovy, sardine, horse mackerel, bonito and sprat constitute the majority of the fish species fished in the seas throughout Türkiye. In the period after 2000, 40-75% of the annual Seafood fishing production has been anchovy fishery, which varies from year to year but constitutes a very large portion. When the seas of Türkiye are evaluated among themselves, the Black Sea constitutes the most important fishing area of Türkiye. In 2023, 75.2% of the aquaculture production was obtained from the Black Sea. Therefore, it is of great importance to know the structure of the stocks of commercially important species in the Black Sea and to identify possible problems in advance.

C.1.3.2. Environmentally Responsible Programmes at Seas

MoAF In 2014, the "Project for Cleaning the Seas from Abandoned Fishing Gears" was put into practice by MoAF in order to clean the fishing gears that were forgotten or abandoned in the seas and inland waters of Türkiye and abandoned in the seas due to ground structure, weather conditions, net overlap or usage errors and similar reasons during aquaculture, which are called "ghost nets" among the people, and to reduce the negative impact in this direction by raising public awareness.

Within the scope of the activities, firstly, the locations of the lost nets were determined regularly through the interviews with the fishermen and the notifications provided, and the ghost fishing gears were removed from the places where they were found with the participation of the relevant NGOs, fishermen, municipalities participating in the studies, universities and some companies. Our activities, which were initially carried out in the seas, have been expanded to cover our inland waters.

Within the scope of the said project, an area of 310 million square metres has been scanned since 2014 and 1,050,000 square metres of ghost nets and 52,000 pieces of other fishing gear have been removed from our waters. Within the scope of the ghost net project, 3.5 million aquatic organisms have been prevented from dying, approximately 3.2 million nets cleaned from our aquatic environments so far and approximately 300 thousand baskets/fish pots /traps. In order to increase the awareness of fishermen, citizens, relevant official institutions / organizations and non-governmental organizations against ghost fishing gears, awareness trainings were organised in Ankara, Konya, Van, Elazığ, Samsun, Isparta, Eskişehir, Bursa, Muğla and Antalya provinces selected as pilot provinces under the coordination of the General Directorate of Fisheries and Aquaculture with the organisation of Provincial Directorates of Agriculture and Forestry.

Artificial reef applications are implemented in many parts of the world in order to support sustainable aquaculture production and biodiversity increase. In this context, within the scope of the Burhaniye Artificial Reef Project, which was initiated in cooperation with the Burhaniye Chamber of Commerce in Balıkesir Province in 2021, a total of 500 reef blocks were released into the sea in 2022 and 2023, 796 reef blocks were released in an area of 22 ha in Erdemli District within the scope of the "Mersin Artificial Reef Project" in 2022, and 485 reef blocks were released in Karataş District of Adana Province within the scope of the "Karataş Artificial Reef Project".

Within the scope of "İskenderun Bioactive Reef Project", artificial reef fields were created with 11 (bioactive) reef blocks in İskenderun District of Hatay Province. Balıkesir Province, Marmara Island Gündoğdu Village Beautification Association created a reef field with 278 reef blocks. On 12 September 2023, approval was given to the "Aliağa Artificial Reef Project" of Aliağa District of İzmir Province, consisting of 600 blocks, and the reef field was started to be created.

C.1.3.2.1. Blue Flag and Bathing Water Programme

The Blue Flag is an international environmental award given to qualified beaches, marinas and yachts that meet the required standards. Under the coordination of the International Foundation for Environmental Education (FEE), the Blue Flag application, which is carried out in beaches, marinas and yachts in order to prevent pollution of the sea by wastewater, started in 1993 under the leadership of the former Ministry of Tourism. Thanks to the activities carried out in Türkiye for the prevention of marine pollution, the number of Blue Flags is increasing rapidly as an indicator of clean seas.

The Blue Flag award is given for one year and the Blue Flag Programme supports sustainable development in bathing water areas. It also places responsibilities on local authorities and beach operators to achieve high standards in bathing water quality, environmental management, environmental education and life safety.

Today, the Blue Flag has become an important eco-label that brings together the tourism and environment sectors at local, regional and national levels. The Blue Flag Programme has an important place in coastal protection, raising environmental awareness and tourism marketing. Although it is actually an environmental award, it is of great importance for the tourism sector as it is an international standard and its application area is the coasts.

In the Blue Flag application, there are 33 criteria for beaches, 38 criteria for marinas and 4 criteria for individual yachts and 17 rules of behaviour. Within the scope of these criteria, samples are taken from bathing water areas every 15 days during the bathing water season in order to control water quality and microbiological analyses are carried out. Within the scope of the Blue Flag Programme, funds are transferred from the Ministry of Culture and Tourism to the Ministry of Health every year for microbiological analyses. The water quality data obtained as a result of these analyses are evaluated within the scope of the By-law on the Management of Bathing Water Quality and the quality classification of bathing water areas is made.

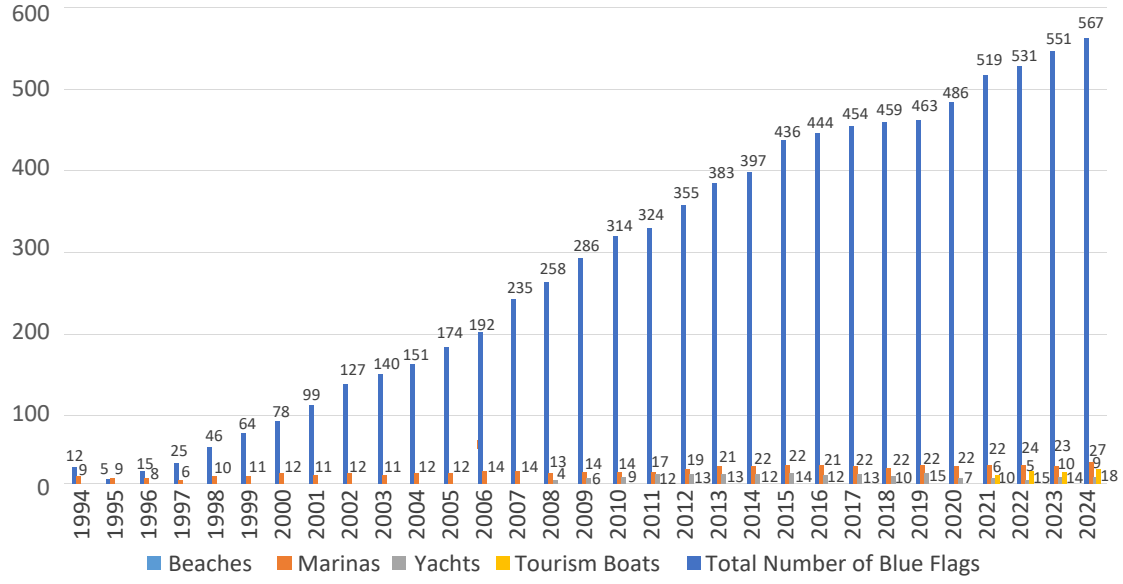
In the Blue Flag process, places that are found to meet all the criteria are entitled to receive the Blue Flag for a period of one year with the approval of the national jury and then the international jury.

As can be seen in Graph 31, the number of Blue Flags in Türkiye increased steadily between 1994 and 2024, reaching 567 beaches, 27 marinas, 18 tourism boats and 9 individual yachts by 2024. As of 2024, Türkiye ranked 3rd in terms of the number of Blue Flag beaches among the 50 FEE member countries with the Blue Flag scheme, with 567 beaches, after Spain (639) and Greece (625).

In order to ensure the necessary harmonisation with the Bathing Water Directive 2006/7/EC of the European Union, the By-law on the Management of Bathing Water Quality was published in the Official Gazette dated 25.09.2019 and numbered 30899 and entered into force. Within the scope of Article 16 of the By-law titled "Determination of bathing water profiles", the profile document for each swimming area must be prepared every 4 years. Bathing water profiles are also among the documents that are mandatory for each beach within the scope of the Blue Flag application.

In this context, profile documents for swimming areas have been prepared for 1,436 swimming areas in Türkiye and opened to citizen access at plaj.csb.gov.tr in the Swimming Area Information System in order to inform our citizens about swimming areas.

Graph 31 Number of Blue Flags in Türkiye by Years (1994 -2024) (Ministry of Culture and Tourism, 2024)



It is aimed to further increase the number of Blue Flags in Türkiye thanks to the effective work carried out by the Ministry of Culture and Tourism and the Ministry of Environment, Urbanization and Climate Change.

C.1.3.2.2. Environmentally Friendly Accommodation Facility Certificate (Green Star)

According to the statistical data announced by the Ministry of Culture and Tourism, as of 25.07.2024, the number of Environmentally Friendly Accommodation Facilities is 436 and the number of rooms is 132,822 and the number of beds is 284,021.

Since 1993, the Ministry of Culture and Tourism has been awarding Eco-Friendly Establishment Certificate (Pine Symbol) to accommodation facilities within the scope of sustainable tourism.

Facilities that have received the Environmentally Friendly Accommodation Facility (Green Star Symbol) Certificate from the Ministry of Culture and Tourism have an environmental management policy and action plan, and periodic measurement, monitoring and archiving of data on water and energy consumption, chemical substances and waste amounts are carried out. Periodic training is provided to the personnel. It is ensured that waste water is disposed of outside the septic tank. It is thought that the facilities that receive the Environmentally Friendly Accommodation Facility Certificate will contribute to the protection of the environment, create a privilege in their promotion and marketing, contribute to their businesses and the economy of Türkiye through savings without compromising their service quality, and be exemplary facilities with their roles in protecting the environment.

In addition, with the communiqués numbered 5/1 and 5/2 of the Ministry of Agriculture and Forestry - General Directorate of Fisheries, places or regions that are deemed necessary are declared as protected areas and closed to fishing. Thus, it is aimed to ensure the continuity of the species in the protected area.

C.1.3.2.3. Türkiye Sustainable Tourism Programme

Sustainable tourism, which has become the focus of resilient and inclusive transformation to strengthen the sector after the Covid-19 pandemic crisis, has also increased its importance in inter-country competition.

In 2022, Türkiye signed a cooperation agreement with the Global Sustainable Tourism Council (GSTC), which sets and manages global standards for sustainable tourism, and became the first country in the world to prepare a National Sustainable Tourism Programme at the government level. In 2023, the Sustainable Tourism Programme, which is an exemplary step towards sustainability on a global scale, continued to be implemented with the aim of developing a common understanding in the field of sustainable tourism and ensuring the sustainable transformation of tourism.

The Türkiye Sustainable Tourism Programme, acknowledged by the GSTC, aims to accelerate the sustainable transformation of the entire tourism sector, including accommodation facilities, destinations and tour operators. Planned to be completed by 2030, the programme will be implemented in gradual phases. Thus, by 2030, all international standards will be met.

With 42 criteria and 167 indicators and recognised by the GSTC (recognized) "Türkiye Sustainable Tourism Programme Industry Criteria (TR-I)" Sustainable Management consists of Cultural, Socio-economic and Environmental Sustainability. Among these headings, resource management, efficient purchasing, waste management, waste water management and energy saving criteria under environmental sustainability will directly contribute to the protection of environmental health, the reduction of the consumption of our natural resources and environmental pollution, and will form the basis of continuity for environmental transformation.

As of July 2024, more than 1,000 facilities have been awarded the "Türkiye Sustainable Tourism Certificate" 100% compliant with the GSTC Criteria, 1 facility has been awarded the 2nd Stage Certificate and more than 16,000 facilities have been awarded the 1st Stage Sustainable Tourism Certificate, making a total of more than 17,000 accommodation facilities entitled to receive certificates.

All certified facilities are published on the website of the Turkish Tourism Promotion and Development Agency (TGA) and the Ministry of Culture and Tourism. All GSTC-recognised Türkiye

Sustainable Tourism Programme facilities that have been awarded certificates for compliance with all criteria are also promoted on GoTurkey, Türkiye's official tourism platform.

C.1.3.3. Legally Protected Marine Areas

The decision of the United Nations Environment Programme (UNEP) to include the protection of the Mediterranean Sea among its priority objectives resulted in the establishment of the Mediterranean Action Plan (MAP) in 1975 with the participation of the riparian countries and the EU. The Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention), which was prepared to form the legal basis for the activities to be carried out within the framework of the MAP, was opened for signature in Barcelona on 16 February 1976. In 1995, the Barcelona Convention was extended to cover the coastal areas as well as the marine environment, the name of the Convention was changed to "Convention for the Protection of the Marine Environment and Coastal Regions of the Mediterranean" and entered into force on 9 June 2004.

Türkiye became a party to the new version of the Barcelona Convention in 2002, which was ratified by the Council of Ministers on 7.12.1980. The "Protocol Concerning Mediterranean Specially Protected Areas", which is one of the protocols annexed to this convention, was renewed as the "Protocol on Specially Protected Areas and Biological Diversity in the Mediterranean" and its content was expanded.

In this framework, the areas named below are legally protected marine areas that have been declared as Special Environmental Protection Areas. Detailed information on these areas is given in the section "E.3.1. Special Environmental Protection Zones".

- Belek Special Environmental Protection Area
- Datça–Bozburun Special Environmental Protection Area
- Foça Special Environmental Protection Area
- Gökova Special Environmental Protection Area
- Fethiye–Göcek Special Environmental Protection Area
- Kaş–Kekova Special Environmental Protection Area
- Göksu Delta Special Environmental Protection Area
- Köyceğiz–Dalyan Special Environmental Protection Area
- Saros Bay Special Environmental Protection Area
- Patara Special Environmental Protection Area
- Finike Seamounts Special Environmental Protection Area
- Karaburun–Ildır Bay Special Environmental Protection Area
- Marmara Sea and Islands Special Environmental Protection Area

C.1.3.4. Integrated Pollution Monitoring in Seas

In order to protect the seas against pollution, starting from the 1970s, coastal countries have developed joint research programmes and signed agreements. The first joint initiative for the Mediterranean countries was the signing of the Barcelona Convention for the reduction of pollution and the implementation of the International Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MEDPOL) was accepted. Similar efforts were developed by the Black Sea neighbouring countries and the Black Sea Strategic Action Plan was prepared and the Black Sea Integrated Monitoring and Assessment Programme (BSIMAP) was established within this scope. Within the framework of these programmes, the countries parties are obliged

to establish pollution monitoring programmes at national/international level.

With the monitoring programmes, it is envisaged to determine the change in water quality in the coastal zone, which is affected by land-based pollutants at different levels in our seas, and to evaluate the risks posed by anthropogenic pollution on the marine ecosystem.

Eutrophication in the Black Sea and Marmara Sea caused by increasing terrestrial pollutants after the 1970s has created irreversible new ecological features in these seas.

Similar eutrophic conditions started to be observed especially in the Adriatic, Aegean and Baltic seas in the 1970s. In this framework, initiatives for regular integrated coastal and marine monitoring studies gained momentum and ecosystem-based management approach and integrated monitoring approach were introduced in the 2000s with the EU Water Framework Directive (WFD), which introduced a holistic approach to basin management and monitoring, and the EU Marine Strategy Framework Directive (MSFD), which aims to bring European marine waters to "Good Environmental Status" by 2020.

The monitoring activities started in 1990s in Türkiye were combined with an integrated and ecosystem-oriented approach in 2011 and started to be carried out under the name of "Integrated Marine Pollution Monitoring Programme (DEN-İZ)". In the national marine monitoring programme, the strategies of the EU Water Framework Directives (2000/60/EC) and Marine Strategy Framework Directives (2008/56/EC) have been adopted and marine monitoring activities have reached an integrated and ecosystem-oriented approach. In the programme, which was developed and designed in line with WFD and MSFD, monitoring and assessments are carried out in designated coastal water bodies and marine assessment areas. Since 2014, the programme has been continuing regularly in triennial periods without any data interruption.

With the "Integrated Marine Pollution Monitoring Programme (DEN-İZ)", which has been carried out regularly since 2014 in cooperation with the MoEUCC EIA, General Directorate of Environmental Impact assessment, Permit and Inspection and TÜBİTAK-MAM, the pollution occurring in all our seas is evaluated within the framework of our national legislation, Barcelona and Bucharest Conventions and EU directives, the basis for the measures, policies and strategies to be taken is formed and the effectiveness of the measures taken is evaluated. The work for the 2023-2025 period of the programme, which is carried out for three years, has started.

Currently, 97 stations in the Black Sea within the framework of the DEN-IZ Programme, covering 85 coastal water bodies (23 in the Marmara Sea, 17 in the Black Sea, 24 in the Aegean Sea and 21 in the Mediterranean Sea) and 15 Marine Assessment Areas (3 in the Marmara Sea, 5 in the Black Sea, 3 in the Aegean Sea and 4 in the Mediterranean Sea), Monitoring and evaluation studies are carried out at 425 stations in all our seas, including 150 stations in the Marmara Sea (with the Marmara Sea Integrated Modelling System (MARMOD) Project), 96 stations in the Aegean Sea and 82 stations in the Mediterranean Sea. Monitoring is carried out in the Black Sea, Mediterranean Sea and Aegean Sea in 2 periods per year, summer and winter, and in the Marmara Sea in 3 periods per year, spring, summer and winter.

In terms of monitoring scope, the DEN-IZ Programme includes a wide range of components such as biodiversity monitoring, physicochemical and nutrient monitoring, radioactivity monitoring, monitoring of pollutants in sediment and biota, monitoring of underwater noise, monitoring of climate change impacts, monitoring of marine mammals, monitoring and assessment of marine litter. Marine monitoring data are reported to UNEP/MAP Secretariat, Black Sea Commission Secretariat, TURKSTAT and national institutions. At the end of each triennial programme, information and assessments are shared with the public through summary reports and symposia.

In the new period, in order to be compatible with the MSFD and the Mediterranean Integrated

Pollution Monitoring Programme (IMAP), the Programme was developed according to the MSFD Good Environmental Status (GES) descriptors and new components were added.

Among the new planned studies in the period 2023-2025, monitoring of coral reefs and collargens, which are important in climate change studies, monitoring of microplastics in biota within the scope of zero pollution policy, development of "Open Sea Monitoring Programme" and use of NEAT (Evaluation of Biodiversity and Pollutants Data Together) assessment tool in the programme, monitoring of Pharmaceuticals and Endocrine Disruptors in seawater in a pilot area can be listed.

"III. National Marine Monitoring and Assessment Symposium" was held on 06-09 December 2019 in order to share and disseminate the results obtained from the marine monitoring activities of the 2020-2022 monitoring period with a wider audience within a scientific event and to create a national platform where they can be evaluated together with other scientific findings and recommendations that can support these studies. The book of abstracts can be found in the publications section of the web address of the MoEUCC https://ced.csb.gov.tr/.

Within the scope of the Integrated Marine Pollution Monitoring Programme, ecological quality status assessments of water management units (WMUs) are carried out every three years according to the Water Framework Directive, where biological parameters (phytoplankton (as Chlorophyll-a), macro flora and benthic invertebrates) and supporting parameters (nutrients, TP, NOx (NO_3+NO_2-N) and SDD) are evaluated together. The classification map for 2021 is shown in Map 13 according to WFD colour codes. Blue colour represents very good quality, green represents good quality, yellow represents medium, orange represents poor and red represents poor ecological quality.

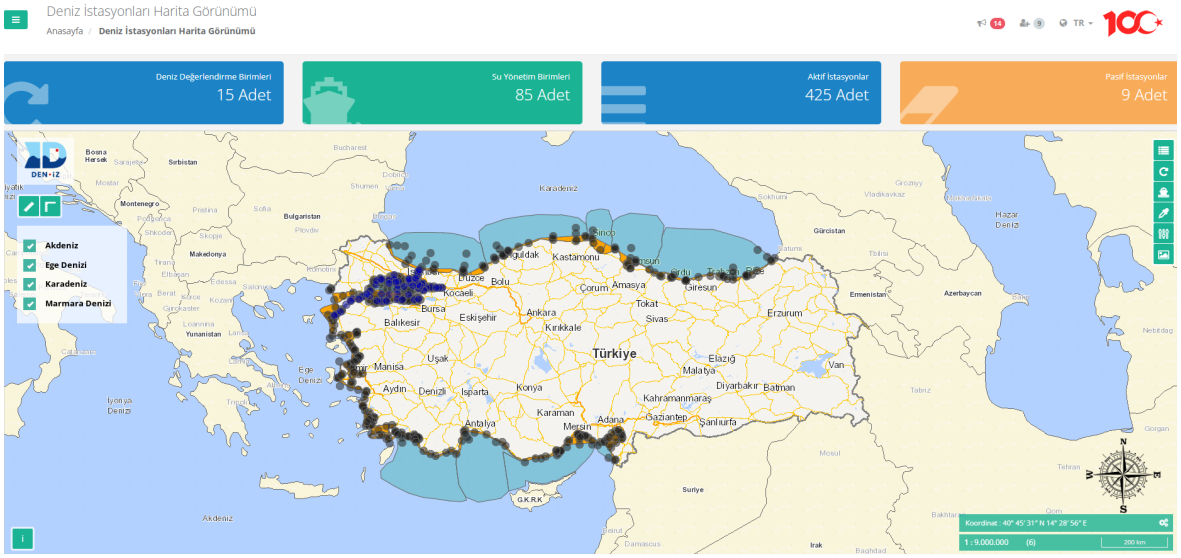
In 2021, the quality of 1 WMU in the Mediterranean was determined as "poor" (AKD05: Mersin Inner Bay) and 4 WMUs (AKD04_1: Karataş, AKD04_2: Karataş - Mersin East Entrance, AKD09: Taşucu, AKD-18: Fethiye Göcek SEPA) were determined as "moderate". The other WMUs with "good" quality are AKD01 (Yayladağ - Samandağ), AKD02 (İskenderun Inner Bay), AKD07 (Erdemli), AKD08 (Silifke), AKD11_2 (Manavgat - Antalya), AKD12 (Kemer), AKD16 (Patara SEPA), AKD19 (Dalaman-Ortaca). The remaining 7 WMUs ((AKD03: Outside İskenderun Bay), AKD6 (Outside Mersin Bay), AKD11_1 (Gazipasa - Manavgat), AKD13 (Kumluca - Finike), AKD14 (Kas - Kekova SEPA), AKD15 (West of Kekova SEPA - East of Patara SEPA) and AKD17 (Fethiye Gocek SEPA Offshore)) are of "very good" quality.

In 2021, in the Aegean Sea, it was observed that the inner part of EGE10 Izmir Bay is in poor ecological condition. EGE5-1 (Güllük Bay), EGE 9-2 (Izmir Outer Bay-Gediz) and EGE 16-2 (Maritsa Coastal Impact Area) are in poor ecological quality. The status of the other WMUs was assessed as "moderate, good/very good" quality.

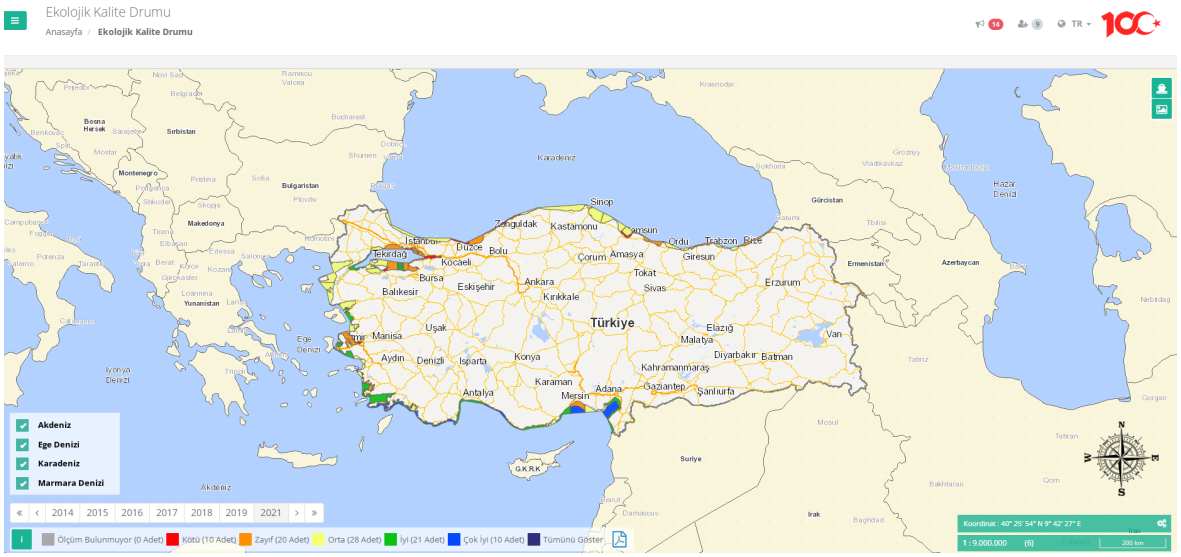
In 2021, our Black Sea coasts (KAR02 (Sakarya River influence area), KAR04 (Filyos-Bartın) and KAR08 (Samsun coast) are of poor quality, KAR03: Ereğli-Zonguldak, KAR10: Yeşilırmak, KAR11: Ünye-Fatsa, KAR13: Giresun, KAR15: Rize, KAR16: Hopa) are of poor quality. WMUs located on other coasts were assessed as "moderate" quality.

According to the 5-class assessment of WFD in the Marmara Sea in 2021, a significant part of the WMUs are of medium and below ("poor/bad") quality. South Entrance of the Dardanelles, South of Tekirdağ-Gelibolu Peninsula, İmralı Island, Susurluk River Offshore (MAR07, MAR08, MAR22, MAR02) are determined as good quality. Bandırma Bay, Gemlik Inner Bay, Büyükçekmece-Istanbul Strait, Izmit Inner Bay and Izmit Outer Bay are of poor ecological quality.

Map 13 Monitoring Points of Integrated Marine Pollution Monitoring Study (MoEUCC, sim.csb.gov.tr, 2024)



Map 14 Ecological Status Assessment of Coastal Water Bodies in 2021 (MoEUCC, sim.csb.gov.tr, 2023)



C.1.3.5. Sea Water Temperatures

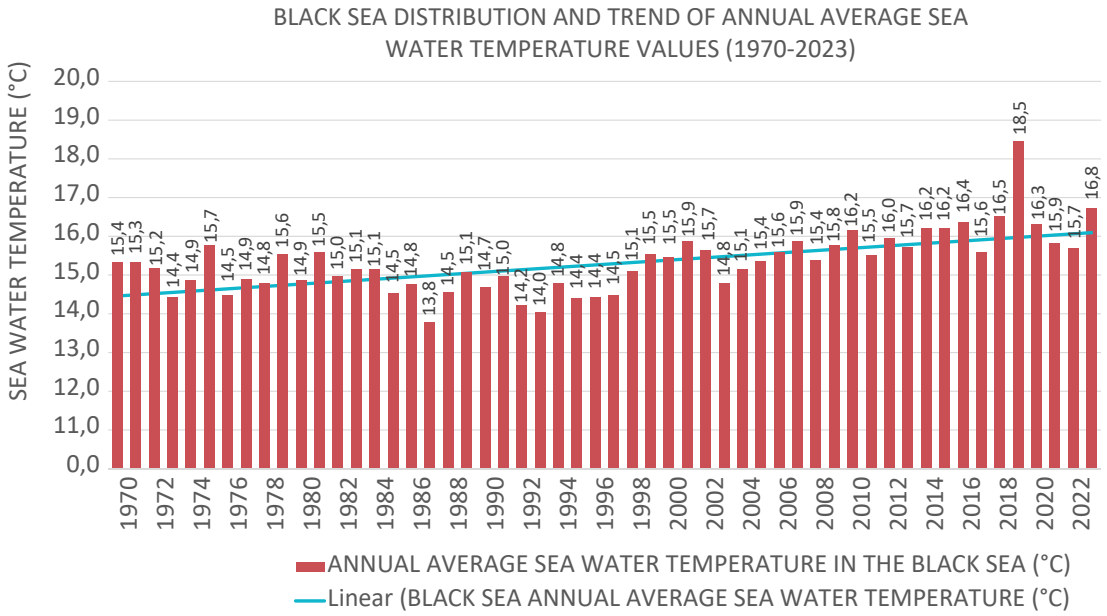
The main source of weather events and air masses in the atmosphere is the oceans and seas. The most accurate indicator of climate change is the warming and cooling of sea water. The warming or cooling of seawater changes the ecological structure of the seas, affecting many living things, as well as closely affecting an important segment that economically benefits from the seas.

According to the data of the General Directorate of Meteorology, although there is a slight upward trend in the long-term average sea water temperatures in Türkiye, it is not correct to talk about global warming at this stage.

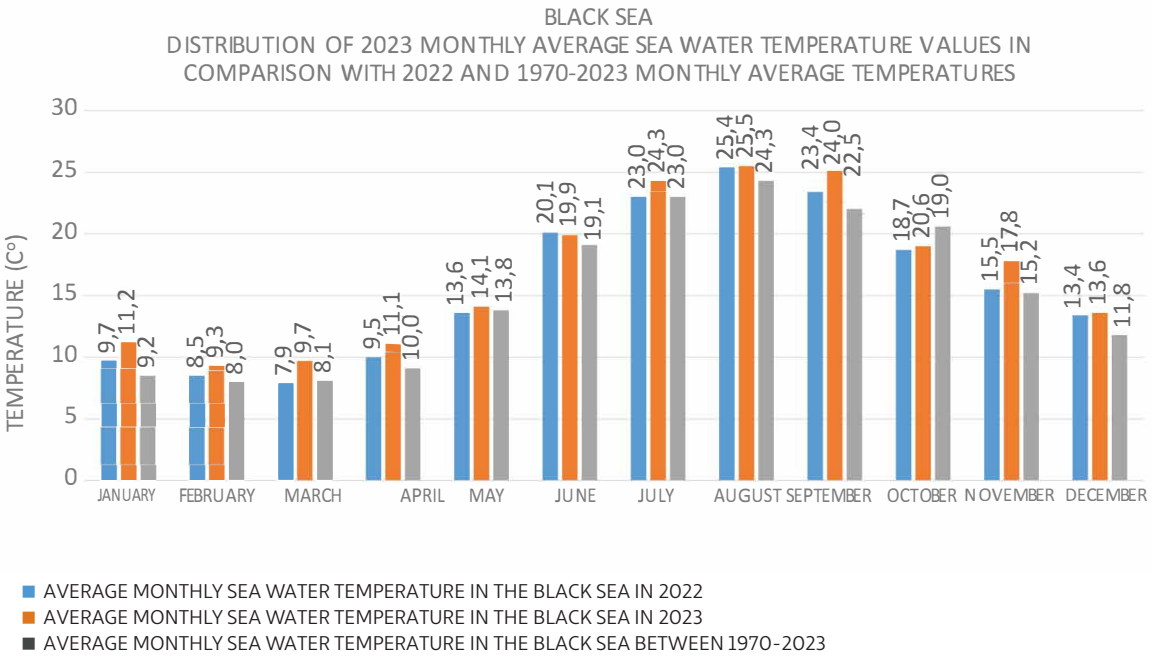
In order to monitor this process, the General Directorate of Meteorology continues to carry out sea water temperature measurement studies to cover all our seas in a way to represent all our coasts. In this way, a higher resolution data source will be available for our seas. In 2023, the ave-

rage sea water temperatures were 22.6 °C in the Mediterranean Sea, 20.5 °C in the Aegean Sea, 17.6 °C in the Marmara Sea and 16.8 °C in the Black Sea. Between 1970 and 2023, annual average sea water temperatures (in °C) measured in the seas are given in the graphs below.

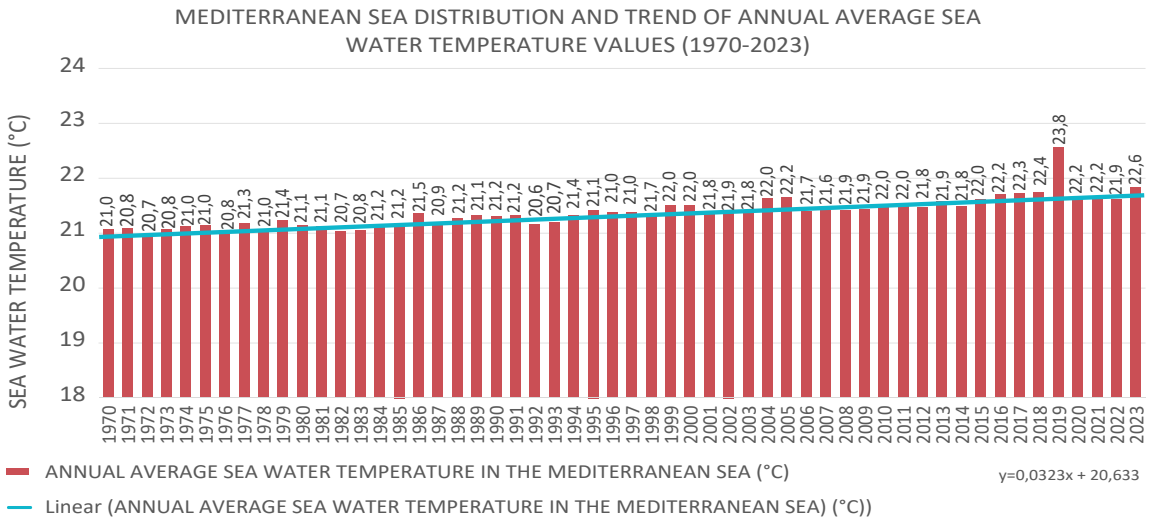
Graph 32 Annual Average Sea Water Temperature Distribution and Trends in the Black Sea (General Directorate of Meteorology, 2024)



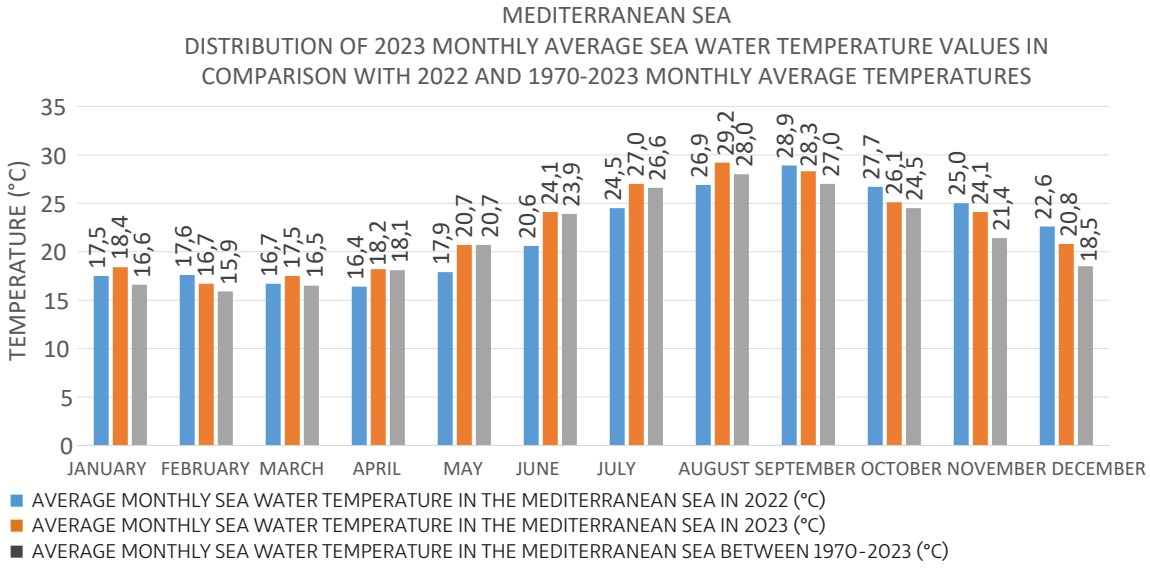
Graph 33 Comparison of 2023 Monthly Average Sea Water Temperature Data of the Black Sea with 2022 and 1970-2023 Monthly Average Values (General Directorate of Meteorology, 2024)



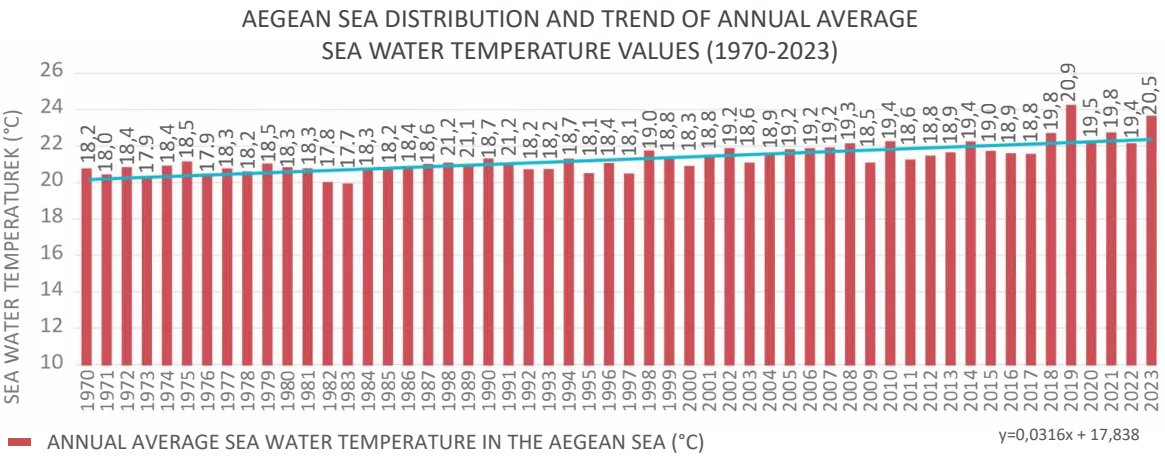
Graph 34 Annual Average Sea Water Temperature Distribution and Trends in the Mediterranean Sea (General Directorate of Meteorology, 2024)



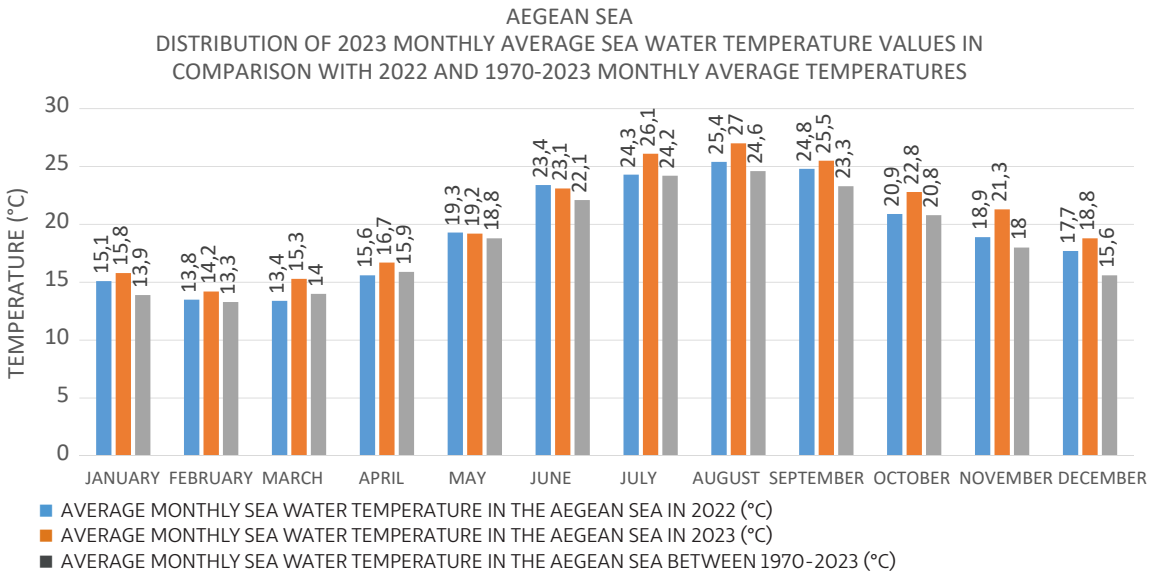
Graph 35 Comparison of 2023 Monthly Average Sea Water Temperature Data of the Mediterranean Sea with 2022 and 1970-2023 Monthly Average Values (General Directorate of Meteorology, 2024)



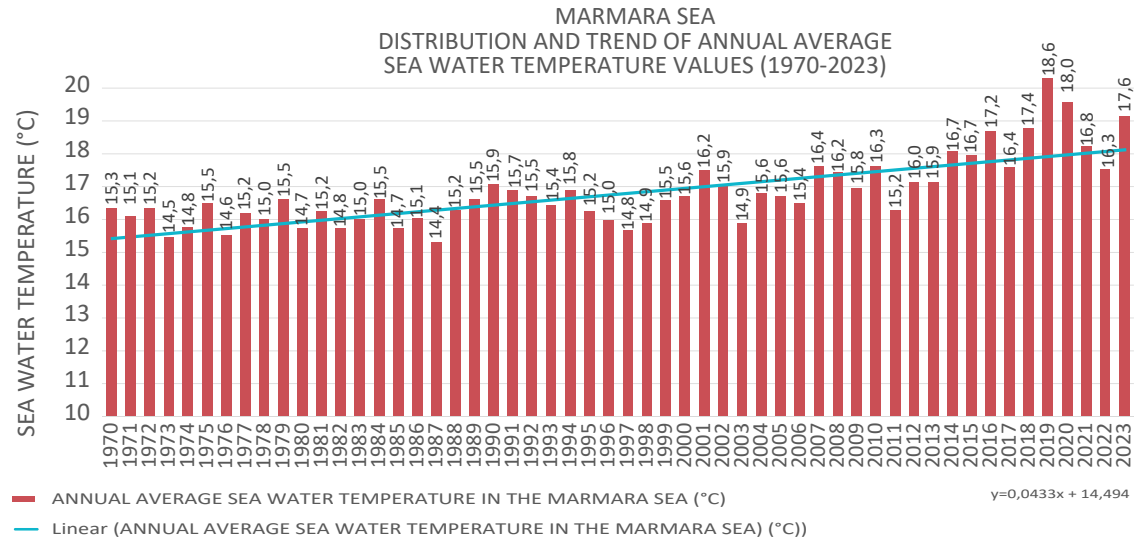
Graph 36 Annual Average Sea Water Temperature Distribution and Trends in the Aegean Sea (General Directorate of Meteorology, 2024)



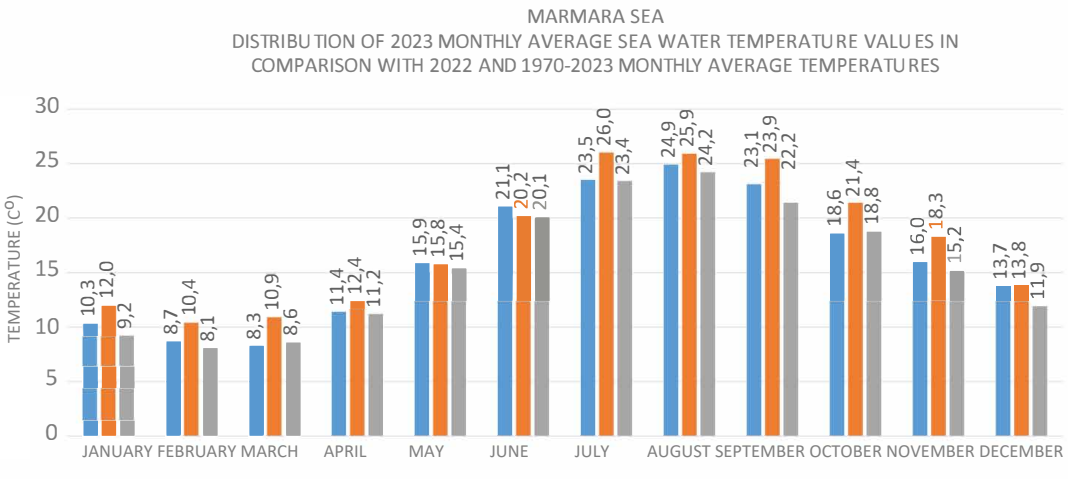
Graph 37 Comparison of 2023 Monthly Average Sea Water Temperature Data of the Aegean Sea with 2022 and 1970-2023 Monthly Average Values (General Directorate of Meteorology, 2024)



Graph 38 Annual Average Sea Water Temperature Distribution and Trends in Marmara Sea (General Directorate of Meteorology, 2024)



Graph 39 Comparison of 2023 Monthly Average Sea Water Temperature Data of Marmara Sea with 2022 and 1970-2023 Monthly Average Values (General Directorate of Meteorology, 2024)



C.1.3.6. International/Regional Co-operation in the Prevention of Marine Pollution

It is not sufficient to carry out the activities related to the protection of the seas against pollution by a single country with the same coastline, and there is a need for inter-country co-operation on the protection of the seas where the countries have common benefits. For this purpose, regional co-operation agreements have been signed between countries in order to prevent pollution of the marine environment, reduce and control pollution, and ensure sustainable use of natural resources.

These are the Convention on the Protection of the Black Sea Against Pollution (Bucharest), to which the countries bordering the Black Sea, including Türkiye, are parties, and the Convention on the Protection of the Marine Environment and Coastal Areas of the Mediterranean Sea (Barcelona), to which the countries bordering the Mediterranean Sea are parties. With these conventions, co-operation activities are carried out among the littoral countries for the protection and sustainable use of the Mediterranean and Black Sea marine environment. In this context, measurements and analyses are carried out and pollution monitoring data and assessments are reported within the framework of these conventions in order to monitor pollution in all our seas and to form the basis for determining national marine and coastal management policies and strategies. Türkiye hosts the Permanent Secretariat of the Black Sea Commission. The activities of the advisory groups, national focal points and activity centres established under the Convention are followed.

Under the Conventions, National Action Plans are required to be updated every 5 years. Within this framework, the work on updating the National Action Plan for the Protocol on Land-Based Pollutants for 2023-2028 is being carried out by the TUBITAK Marmara Research Centre for the Project on Updating the National Action Plan for the Protection of Our Seas against Land-Based Pollutants.

At the 21st Meeting of the Countries Parties held in 2019 within the scope of the Barcelona Convention, Türkiye was elected as a bureau member of the Secretariat for 2020-2021 and it was decided to hold the 22nd Meeting of the Countries Parties in Antalya. The COP22 Meeting held in Antalya between 07-10 December was successfully completed. Türkiye served as the Bureau Chairmanship for 2 years. Türkiye will continue to serve as a member of the Bureau for the 2024-2025 period.

Furthermore, at the 23rd Conference of the Parties (COP23) held in Slovenia on 05-08 December 2023, the decision to establish a Regional Activity Centre on Climate Change in Türkiye was unanimously adopted. Thus, a United Nations (UN) office will be established in Türkiye and the Mediterranean Region will be actively involved in policy-making activities related to climate change. This centre will also contribute to the active utilization of international funding mechanisms.

The "By-law on the Implementation of the Protocol on Environmental Protection in Antarctic" prepared within the framework of the transposition of the Environmental Protection Protocol, which is an annex protocol to the Antarctic Treaty, was published in the Official Gazette dated 13.06.2020 and numbered 31154. The Management Plan for the declaration of Antarctic Special Protection Area (ASPA) on Horseshoe Island, where Türkiye has a temporary base, submitted together with the UK and Belgium within the scope of the Antarctic Convention studies, was approved in 2023. In addition, the 9th Our Ocean Conference (OOC) with the theme "An Ocean of Potential" was held in Athens (Greece) on 16-17 April 2024 with a side event titled "Leading Steps for the Sustainability of Our Oceans". In addition, a commitment was made that we will complete our National Action Plan for the protection of the marine environment in Türkiye by the end of 2025.

C.1.3.7 Deep Sea Discharge

In the deep sea discharge of industrial wastewater (cooling waters, concentrated brines, etc.) and domestic wastewater with a wastewater capacity of more than 5,000 m^3/day, the dilution and modelling criteria specified in the Water Pollution Control By-law must be complied with, and it is necessary to apply to the MoEUCC for project approval within the scope of the Wastewater Treatment/Deep Sea Discharge Plant Project Approval Circular No. 2018/14.

On the other hand, for the discharge of industrial wastewater with a wastewater capacity of less than 5,000 m^3/day into the sea, discharge can be made from the shore, except for bathing water areas, by ensuring dilution in a circular boundary with a radius of 75 metres from the discharge point.

C.1.3.8. Environmental Management of Shipyards

With the "By-law on Environmental Management of Shipyards, Boat Building and Towing Houses", which entered into force after being published in the Official Gazette dated 07/12/2022 and numbered 32036, the procedures and principles regarding the environmental management of pollutants that are generated as a result of construction, modification and / or maintenance and repair activities in shipyards, boat building and towing yards operating in the coastal areas of Türkiye and that cause marine pollution and ecosystem destruction in the long term by accumulating on the seabed are determined.

Within the scope of the By-law, there are shipbuilding, maintenance-repair and yacht, boat construction and maintenance-repair facilities of 20 metres or more that are subject to Environmental Permit Licence, and in order to reduce the negative impacts of these facilities on the marine environment, clean production techniques including the following issues have been determined.

- Prevention of emissions during blasting and painting processes,
- Removal of waste from ships before maintenance,
- Collecting wastewater in the facility area and preventing it from reaching the sea without treatment,
- Energy efficiency.

Since infrastructure investments are required for the implementation of cleaner production techniques, a transition period is foreseen and these techniques will be implemented as of 01.01.2025. At the same time, sea water quality will be monitored annually in the sea areas where the facilities are located to determine the contribution of cleaner production techniques to the marine environment.

C.2. Quality of Water Resources

The main reasons for the deterioration of the quality of water resources in Türkiye are the over-exploitation of natural resources, untreated domestic and industrial wastewater reaching water resources as a result of unplanned and rapid industrialisation and unplanned urbanization, inadequate capacity and technology of existing wastewater treatment plants, inefficient transmission and agricultural activities. The basic approach in the protection of water resources should be the prevention of pollution. Measures to be taken after the sources are polluted are more difficult and expensive. Therefore, control of pollution sources is of great importance in terms of effective water quality management and achieving the goal of good water quality.

On 21/12/2009, within the scope of the Environment Chapter including the "Water Quality Sec-

tor", which was opened for negotiation, studies have been carried out for the harmonisation and implementation of our national legislation with the EU acquis. In this context, the Water Framework Directive (WFD) (2000/60/EC), which forms the basis of water quality management, has been prioritised. With the "By-law on Surface Water Quality (YSKY)" published in the Official Gazette dated 30/11 /2012 and numbered 28483, the procedures and principles regarding the management of water resources with an ecosystem-based holistic approach in accordance with the requirements of WFD have been laid down.

On the other hand, efforts were made to strengthen the legislative infrastructure necessary for the protection and improvement of the quality of water resources. The "Communiqué on the Determination of Environmental Targets for Surface Water Bodies" prepared for determining the environmental targets to be achieved in surface waters was published in the Official Gazette dated 21/07/2020 and numbered 31192 and entered into force.

1672 monitoring points determined in the 2024 surface water quality monitoring programme were determined by the Regional Directorates for the needs of SHW (irrigation, drinking water). Parameters that can be measured by SHW Laboratories were determined for the needs of SHW. The results of the basin monitoring activities carried out by the General Directorate of SHW are reported to the General Directorate of Water Management on an annual basis.

In the water quality assessment for lakes, ponds and reservoirs, their trophic status is revealed by taking into consideration the limit values in the By-law on Surface Water Quality. The most important factor threatening lakes, ponds and reservoirs is eutrophication. In order to control the eutrophication problem, nitrogen and phosphorus loads reaching the receiving water bodies should be classified.

For this purpose, as a result of the studies carried out by the MoAF, urban and nitrate sensitive areas in 25 river basins that have been polluted or are under the threat of pollution due to excessive accumulation of nitrogen and phosphorus compounds resulting from urban and industrial wastewater and agricultural activities have been identified and the measures to be taken to improve water quality have been set out and the "By-law on the Identification of Sensitive Water Bodies and Areas Affecting These Bodies and Improvement of Water Quality" (R.G: 23.12.2016/29927), and the said areas covering 50 per cent of the surface area of Türkiye were published. In addition, pressures in terms of nitrogen and phosphorus have been identified in 422 lakes, ponds and reservoirs, water quality and trophic status have been revealed through monitoring studies, water budget and assimilation capacities have been determined and measures to improve water quality have been put forward, and studies are ongoing in 330 lakes, ponds and reservoirs.

Water quality action plans are prepared to improve the quality of water resources, which are particularly under the threat of intense pollution, and the progress of action steps is continuously monitored. Some of the action plans currently being implemented are "Uluabat Lake Water Quality Action Plan", "Mogan-Eymir Lake Sub-Basin Water Quality Action Plan", "Manyas Lake Water Quality Action Plan", "Ilgın Lake Sub-Basin Water Quality Action Plan", "Burdur Lake Sub-Basin Action Plan", "Lakes and Wetlands Action Plan", "Işıklı Lake Water Quality Action Plan" and "Gölköy Dam Lake Action Plan".

With the "Establishment of Reference Monitoring Network in Türkiye Project (2016-2020)", which is one of the steps of the establishment of the Water Quality Ecological Assessment System specific to Türkiye, a reference monitoring network was established by identifying natural and/or near-natural reference areas that are not affected or minimally affected by human activities in 25 basins of Türkiye to be used in determining the ecological status of water quality. With the Project completed in December 2020, biological, hydromorphological and chemical monitoring studies were carried out at 1065 points in 25 basins of Türkiye and reference areas and reference

points representing these areas were determined in 853 water bodies. In 25 basins, Reference Monitoring Network and Reference Monitoring Programmes were established for each biological quality component, including the monitoring points determined in the reference areas, the parameters to be monitored at these points and the monitoring frequencies.

The "Communiqué on Biological Monitoring", which entered into force after being published in the Official Gazette dated 21 June 2019 and numbered 30808, covers the determination of biological sampling points/areas, sampling periods and monitoring frequencies, sampling methodology and equipment used for each biological quality component to be used in biological monitoring studies, transportation and preservation of samples, analysis and identification of samples.

Within the scope of ecological water quality monitoring and assessment studies, biological quality elements and physicochemical and hydromorphological quality elements supporting these elements should also be monitored. Hydromorphological monitoring aims to determine the changes in aquatic habitat due to anthropogenic pressures and habitat potential. In order to be used in hydromorphological monitoring and assessment studies, MoAF has developed hydromorphological monitoring and assessment indices for rivers, lakes, coastal and transition waters specific to Türkiye. These indices are used within the scope of water quality monitoring studies.

The "Communiqué on Hydromorphological Monitoring (Communiqué No: 2023/19) published in the Official Gazette dated 25 April 2023 and numbered 32171 covers the issues regarding the selection of monitoring areas, basic parameters to be monitored, monitoring periods, monitoring frequencies and hydromorphological monitoring trainings to be used in hydromorphological monitoring studies in surface waters. Within the scope of the Communiqué, guidance documents have been prepared for rivers and lakes for the application of hydromorphological indices. Guidance documents for coastal and transitional waters are planned to be completed in 2024.

Hydromorphological Pressure Assessment Process is one of the important stages within the scope of River Basin Management Plans (RBMP). This stage includes the identification of Substantially Modified Water Bodies (MSWBs) and pressure and impact assessment studies. In this context, studies on the development of pressure assessment criteria specific to Türkiye for hydromorphological pressures were carried out by MoAF. As a result of the study, hydromorphological pressure assessment methods consisting of hydromorphological pressure assessment parameters for rivers, lakes, coastal and transition waters suitable for the conditions of Türkiye were established.

On the other hand, with the "By-law on the Protection of Groundwater against Pollution and Degradation", which entered into force after being published in the Official Gazette dated 07.04.2012 and numbered 28257, the provisions of the Council Directive on the Protection of Groundwater against Pollution and Degradation (2006/118/EC) and the Water Framework Directive (2000/60/EC) on groundwater have been transposed into national legislation and basically the quantity and quality of groundwater are managed together.

In order to fulfil the requirements related to groundwater management with the said by-law and to determine the quantity and quality of groundwater in our basins, a programme of measures has been established for the identification of groundwater bodies, pressure-impact analysis, characterisation of bodies, risk assessment, groundwater quantity and quality monitoring, determination of threshold values, determination of quality and quantity status of bodies, and finally, protection of the current status of the bodies in good condition and improvement of those in poor condition. Guidance documents specific to Türkiye have been prepared for each implementation step listed above. These studies have been completed in 12 basins and are ongoing in 6 basins.

Within the scope of hydrogeological surveys carried out by the MoAF General Directorate of State Hydraulic Works at the scale of groundwater basins, in addition to the implementation steps of the "By-law on the Protection of Groundwater against Pollution and Degradation", groundwater supply-discharge relations, natural background levels caused by lithological formations, current concentrations and increase/decrease trends of pollutants caused by anthropogenic pressure factors in sources and wells, origin analysis of water and its relations with surface water resources are revealed.

In addition, within the scope of surveillance monitoring, physicochemical parameters were measured in situ and basic ions, heavy metals, pesticides and organic pollutant groups that pose a risk were analyzed in water samples taken from the study areas. After the holistic evaluation of the project outputs of the completed hydrogeological studies, operational monitoring studies were started.

C.3. Sectoral Water Uses and Water Allocations

According to the Official Statistics Programme, "Water Withdrawal and Use Statistics" are produced by the Turkish Statistical Institute (TURKSTAT).

Within the scope of "Water Statistics", TURKSTAT compiles data from manufacturing industry workplaces employing 50 or more people, all active thermal power plants with an installed capacity of 100 MW or more, all OIZ Directorates with completed infrastructure, mining enterprises declaring production for the reference year to the General Directorate of Mining and Petroleum Affairs and all municipalities in Türkiye. Water statistics for villages are obtained from the Ministry of Interior (General Directorate of Provincial Administration) and agricultural irrigation data are obtained from DSI and these data on water are reported to international organizations in a holistic manner.

According to 2022 reference period TURKSTAT data, the total amount of surface and groundwater supplied by municipalities and villages in Türkiye is 7.07 billion cubic metres and the total amount of surface and groundwater supplied by manufacturing industry, thermal power plants and mining enterprises excluding sea waters is 1.24 billion cubic metres.

Table 61 Amount of Water Withdrawn from Water Resources by Place of Use/Sector (Billion m^3/year) (TURKSTAT, 2024)

	2012	2014	2016	2018	2020	2022
Municipalities	4.94	5.24	5.84	6.19	6.49	6.68
Villages	1.04	0.43	0.38	0.39	0.42	0.39
Manufacturing Industry Workplaces	1.67	2.2	2.12	2.68	2.60	2.80
Thermal Power Plants	6.40	6.53	8.61	7.87	8.28	8.88
Organised Industrial Zones	0.12	0.14	0.15	0.16	c	c
Mining Operations	0.11	0.21	0.23	0.24	c	c
Irrigation [1]	47,563	41,268	48,284	49,670	50,289	51,688

[1] 1) SHW data. Total amount of surface water used in irrigation and total amount of groundwater allocation for irrigation. (Calculated according to the data taken from the table '2.7. Comparison of Total Groundwater Allocation and the Amount of Surface Water Used for Irrigation in Türkiye, 2000-2022' available at https://www.dsi.gov.tr/Sayfa/Detay/1847) It is the sum of sea water and fresh water.
(c) Confidential information

Table 62 Amount of Water Supplied from Natural Resources and Networks 2020-2022* (TURKSTAT, 2024)

	Total amount of water supplied		Amount of water supplied by municipal and village networks		Amount of water supplied by other networks and own facilities	
	2020	2022	2020	2022	2020	2022
Manufacturing Industry Workplaces	2,842,208	3,065,013	47,271	58,191	2,794,938	3,006,822
Thermal Power Plants	8,290,295	8,907,836	789	5,015	8,289,507	8,902,822
Mining Operations	282,981	291,233	3,531	3,443	279,449	287,790
Household	3,709,482	3,793,609	3,641,848	3,719,807	67,635	73,802

*(Water and Wastewater Statistics, 2022)

C.3.1. Drinking and Potable Water

Since Türkiye is located in the Mediterranean climate zone, it is among the countries adversely affected by climate change. In addition, the loss and leakage rate in drinking and potable water supply and distribution systems throughout Türkiye is at levels in need of improvement. In addition, rapid population growth and sudden demographic changes also increase the demand for drinking and potable water and thus lead to increased pressure on natural water resources. While it is predicted that the rate of urbanization in the world will reach 70% in 2050, this rate is already over 70% in Türkiye.

Therefore, effective water management and infrastructural development are of vital importance for ensuring "water supply security", which can be defined as ensuring sustainable, equitable and reasonable access to water in sufficient quantity and quality. In this context, "Gaziantep Source-to-Tap Drinking Water Security Plan Preparation Project", which is the first drinking water security project of Türkiye, was carried out by the General Directorate of Water Management of the MoAF between 2021-2023 in the provincial centre of Gaziantep, which was selected as the pilot province, under the beneficiary of Gaziantep Water and Sewerage Administration. Guidance documents and annexes related to the project are available at https://www.tarimorman.gov.tr.

In addition, the By-law on the Protection of Drinking and Potable Water Basins was published in the Official Gazette dated 28.10.2017 and numbered 30224 and entered into force. Within the scope of the By-law, basin protection plans are prepared with a scientific study by taking into account the characteristics of each drinking-water basin in order to ensure the protection and improvement of the quality of drinking-water resources in a way that does not endanger human health and minimises the treatment needs and costs required for use as drinking-water.

Within the scope of the monitoring of Drinking Water Treatment Plants and Disinfection Units by MoAF, the inlet and outlet waters of the Drinking Water Treatment Plants of 81 provinces are monitored within the framework of the provisions of the "By-law on the Quality and Treatment of Water Supplying Drinking Water" published in the Official Gazette dated 06/07/2019 and numbered 30823, and as a result of the evaluations made, the revision needs of the facilities are determined and the said needs are notified to the relevant municipalities every year.

Table 63 Indicator Data on Potable Water in Türkiye (TURKSTAT, 2024)

	2018	2020	2022
Türkiye population	82,003,882	83,614,362	85,279,553
Total number of municipalities	1,389	1,389	1,391
Total population of municipalities	76,888,607	78,920,614	80,785,141
Number of municipalities served with drinking and potable water network	1,397	1,387	1,390
Population of municipalities served with drinking and potable water network	75,779,007	77,915,139	79,830,591
Ratio of the population served with drinking and potable water network to the total municipal population (%)	99	99	99
Total amount of water withdrawn for drinking and potable water network (thousand m^3/year)	6,193,158	6,492,402	6,676,197
Dam	2,468,103	2,658,335	2,869,119
Well	1,740,116	1,903,511	1,943,865
Spring	1,138,388	1,013,074	1,103,111
Stream	560,356	656,985	516,160
Lake/pond/sea (1)	286,196	,260,497	243,941
Amount of surface water withdrawn for drinking and potable water network (thousand m^3/year)	3,314,654	3,575,817	3,629,220
Amount of groundwater withdrawn for drinking and potable water network (thousand m^3/year)	2,878,503	2,916,585	3,046,977
Daily water withdrawal per person (litres/person-day)	224	228	229
Amount of water distributed through drinking and potable water network (thousand m^3/year)	4,045,486	4,309,405	4,568,750
Number of drinking and potable water treatment plants	629	714	784
Physical	22	16	15
Conventional	197	220	243
Advanced	410	478	526
Drinking and potable water treatment plant capacity (thousand m^3/year)	6,023,791	6,239,288	6,850,386
Physical	31,000	21,501	11,597
Conventional	5,437,331	5,668,930	6,073,387
Advanced	555,461	548,858	765,402
Amount of water treated in drinking and potable water treatment plants (thousand m^3/year)	3,574,058	3,900,478	4,061,607
Physical	3,677	9,160	1,018
Conventional	3,292,165	3,631,079	3,669,764
Advanced	278,216	260,240	390,825
Number of municipalities served with drinking and potable water treatment plant	443	459	493
Population of municipalities served by drinking and potable water treatment plant	46,229,893	48,381,682	50,650,358
Ratio of population served with drinking and potable water treatment plant to total municipal population (%)	60	61	63

(1) The amount of water withdrawn from the sea since 2010 is included.

C.3.2. Irrigation

The surface area of Türkiye is approximately 77.95 million hectares and 24 million hectares, i.e. 1/3 of this area is agricultural land. According to the surveys carried out in Türkiye, 8.5 million hectares of land that can be economically irrigated has been identified and 6.65 million hectares (net) of land has been opened for irrigation. This area corresponds to 78 per cent of the total economically irrigable land. The area opened for irrigation by SHW is 4.36 million hectares. 1.1 million hectares (net) were put into operation by the former General Directorate of Rural Services. In addition, approximately 1.19 million hectares (net-gross) have been opened for irrigation by the public.

Table 64 Amount of Surface Water Used for Irrigation in Türkiye (km³/year) (2019-2022) (SHW, 2024)

Years	Amount of Irrigation Water Used in the Irrigation Area Constructed and Put into Operation by SHW	Estimated Amount of Irrigation Water Used in the Irrigation Area Operated by Other Institutions	Total Amount of Surface Water Used for Irrigation in Türkiye
2019	18.876	14.912	33.788
2020	18.337	14.927	33.264
2021	18.393	13.641	32.034
2022	19.488	14.145	33.633

https://www.dsi.gov.tr/Sayfa/Detay/1847

C.3.3. Industrial Water Supply

Table 65 Manufacturing Industry Water Indicators (thousand m³/year) (TURKSTAT, 2024)

	2020	2022
Amount of Water Withdrawn	**2,842,208**	**3,065,013**
City Network	46,951	57,642
Sea	1,975,576	2,085,532
Lake	14,423	15,227
Stream	50,425	106,060
Dam	106,434	115,673
Source/Well	445,989	466,628
Tanker	7,214	6,231
OIZ Network	146,225	176,504
Other(1)	48,971	35,516
Amount of Water Consumed	**2,810,406**	**3,035,287**
Process Water	498,234	584,248
Boiler Water Booster	50,070	49,459
Booster Coolant	2,107,544	2,210,082
Domestic Water	97,308	104,731
Other(2)	57,249	86,767

Figures in the tables may not sum to the total due to rounding.
(1) Includes waters supplied from sources of SHW irrigation canal, village network, free zone network, other workplace, carboy, unions/companies providing water supply and treatment services, pond, rainwater, etc.
(2) It includes the amounts of water given to other workplaces, used in air conditioners, fire water, garden irrigation, water preparation unit, vehicle washing, road irrigation to prevent dust, water use in wastewater treatment plant, etc.

C.3.4. Water Use for Energy Generation

In 2022, the most important share in renewable energy is taken by hydroelectric power plants with dams and rivers, which constitute 30.4% of the total installed capacity.

Table 66 Profile of Hydroelectric Power Plants by the End of 2022 (TETC, 2024)

Number of Power Plants	751
Installed Power	31,571.5 MW
Ratio to Installed Capacity	30.4 %
Annual Electricity Generation	66,802 GWh
Ratio of Hydraulic Source Production to Total Consumption	20.3 %
Licence Status	733 Licenced, 18 unlicensed

C.4. Environmental Infrastructure

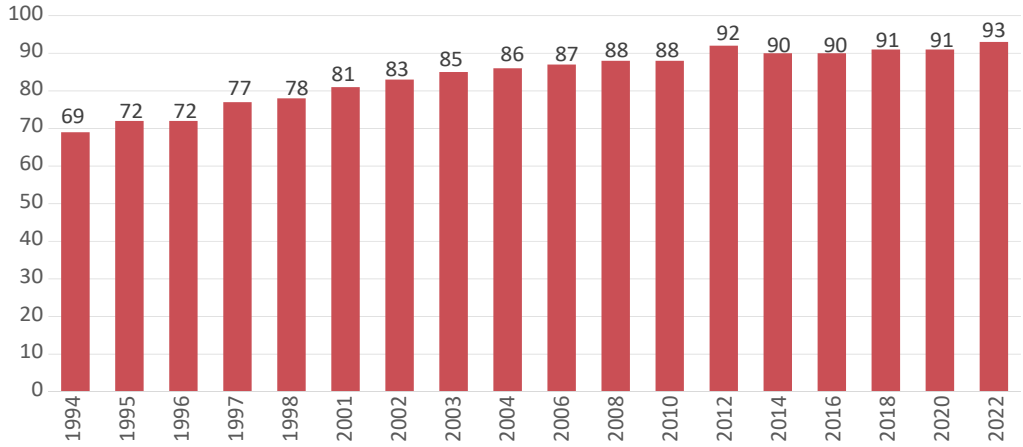
C.4.1. Urban Sewerage System and Population Served

Wastewater infrastructure systems consist of sewerage, storm water and wastewater treatment plants (WWTP). Since the establishment of the Republic of Türkiye, there have been significant changes and developments in the management of urban municipal water services. In recent years in Türkiye, sewerage networks are generally constructed as split systems, which are systems that carry wastewater and storm water separately. However, some of the previous sewerage networks are still in use as combined systems where wastewater and storm water are carried together.

Sewerage network investments, which started in 1970s, were carried out under the leadership of the General Directorate of İlbank until 1980s and reached a very high level in these years. In the 1990s, investments continued, albeit at a lower level. In the beginning, these investments were concentrated in big city centres, and then they were extended to small settlements. The new trend observed in water management is that the private sector has started to assume a role in the provision of these infrastructure services in addition to local administrations. The establishment of water and sewerage administrations in metropolitan municipalities is an example of localisation in this field.

While the ratio of population served by sewerage to municipal population was 69% in 1994, this ratio reached 90% in 2014. While it was 92% in 2012, it decreased to 90% in 2014. This situation has occurred due to the Municipalities transformed into neighbourhood/village status with the Municipality Law No. 6360. The ratio of the population served by sewerage to the municipal population reached 93% in 2022.

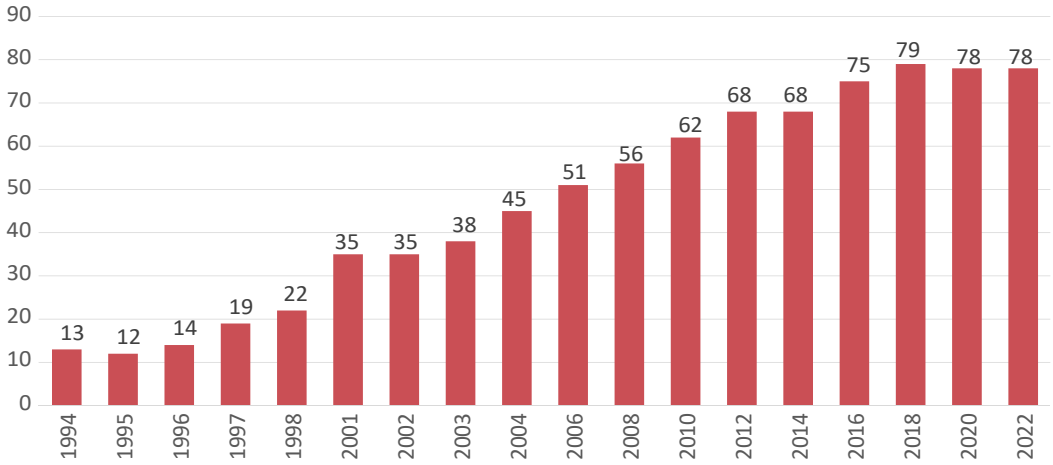
Graph 40 Ratio of Population Served by Sewerage Network to Total Municipality Population (%) (TURKSTAT, 2024)



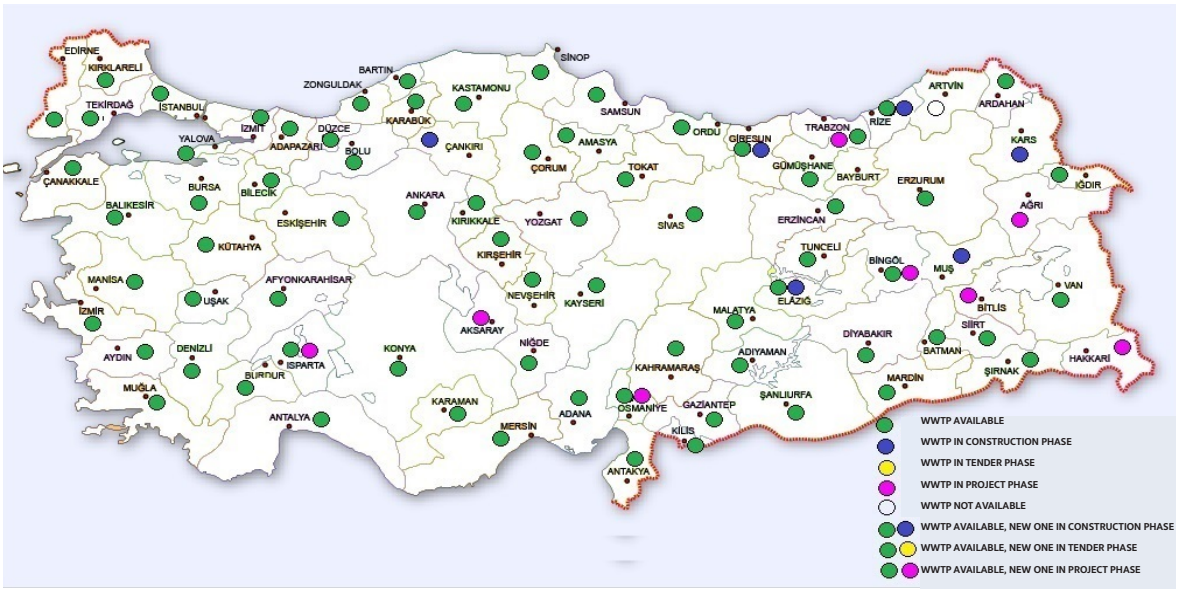
C.4.2. Domestic Wastewater Treatment Plants

As can be seen in the graph below, while 13% of the municipal population was provided with waste water treatment services in 1994, this rate reached 68% by the end of 2014 and 78% in 2022.

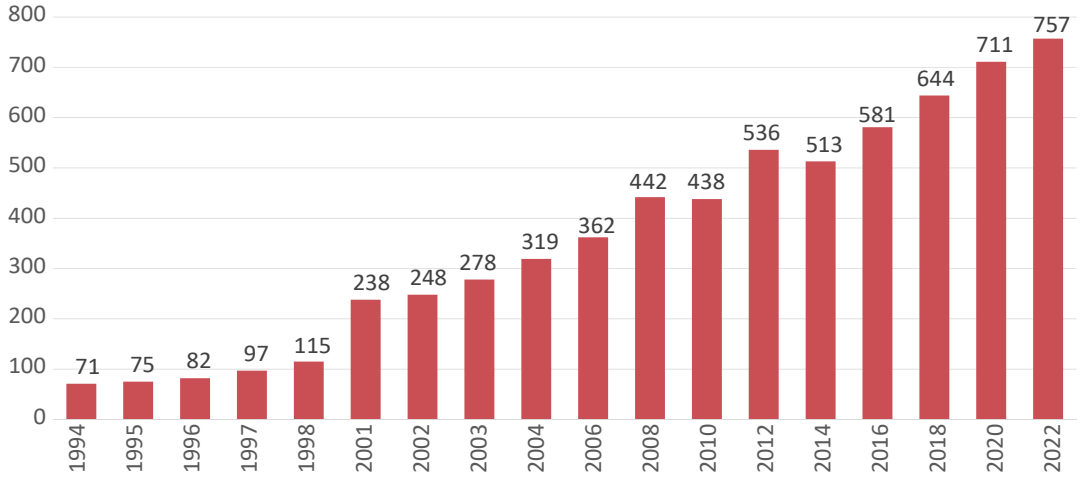
Graph 41 Ratio of Municipal Population Served by Wastewater Treatment Plant to Total Municipal Population (%) (TURKSTAT, 2024)



Map 15 Waste Water Treatment Plant Status of Provincial Centres in Türkiye (MoEUCC, 2024)



Graph 42 Number of Municipalities Providing Wastewater Treatment Plant Service (TURKSTAT, 2024)



*The data for 2014 is lower than that of 2012 due to the municipalities that were transformed into neighbourhoods/villages with the Municipality Law No. 6360.

Graph 43 Number of Municipal Wastewater Treatment Plants (TURKSTAT, 2024)

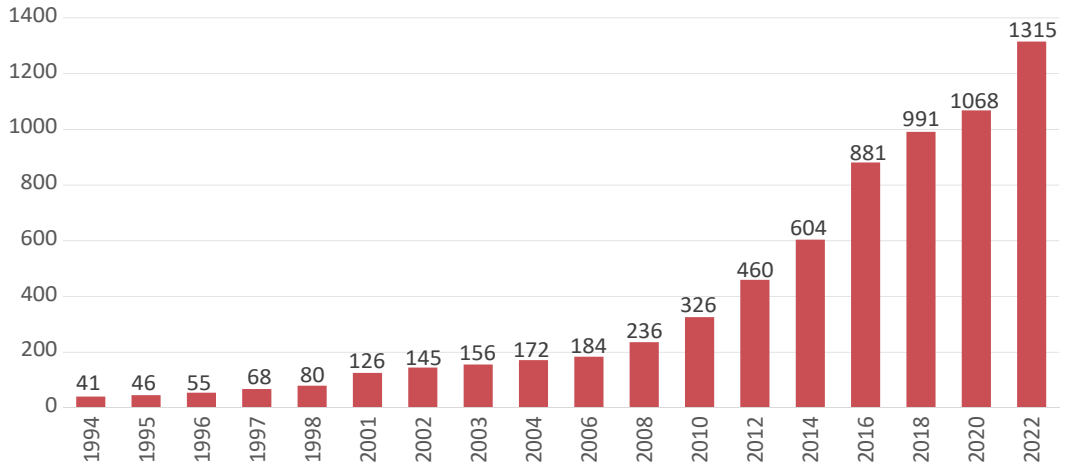


Table 67 Amount of Wastewater Discharged from Municipality Network to Receiving Environments by Type of Receiving Environments (TURKSTAT, 2024)

	2018		2020		2022	
	Amount	%	Amount	%	Amount	%
Amount of wastewater discharged	**4,795,130.05**	**100.00**	**4,959,675.02**	**100.00**	**5,380,233.43**	**100.00**
Treated	4,236,418.82	88.35	4,358,270.19	87.87	4,631,600.47	86.09
Untreated	558,711.23	11.65	601,404.82	12.13	748,632.96	13.91
To Sea	**1,949,474.85**	**40.66**	**1,908,947.46**	**38.49**	**2,074,428.82**	**38.56**
Treated	1,883,205.28	96.60	1,864,021.17	97.65	2,038,190.68	98.25
Untreated	66,269.56	3.40	44,926.29	2.35	36,238.14	1.75
To Lake/Pond	**67,934.55**	**1.42**	**63,882.92**	**1.29**	**103,961.74**	**1.93**
Treated	53,363.06	78.55	54,330.51	85.05	99,634.04	95.84

	2018		2020		2022	
	Amount	%	Amount	%	Amount	%
Untreated	14,571.49	21.45	9,552.40	14.95	4,327.70	4.16
To Stream	**2,248,588.68**	**46.89**	**2,439,264.15**	**49.18**	**2,614,486.25**	**48.59**
Treated	1,911,077.97	84.99	2,024,390.59	82.99	2,056,626.35	78.66
Untreated	337,510.71	15.01	414,873.55	17.01	557,859.90	21.34
To Dam	**148,734.61**	**3.10**	**154,568.59**	**3.12**	**150,728.47**	**2.80**
Treated	104,291.69	70.12	129,228.61	83.61	141,269.58	93.72
Untreated	44,442.92	29.88	25,339.98	16.39	9,458.89	6.28
To Land	**19,051.81**	**0.40**	**20,203.96**	**0.41**	**19,816.54**	**0.37**
Treated	13,173.35	69.14	14,060.67	69.59	13,770.66	69.49
Untreated	5,878.46	30.86	6,143.29	30.41	6,045.89	30.51
To Other Environments	**361,345.56**	**7.54**	**372,807.94**	**7.52**	**416,811.61**	**7.75**
Treated	271,307.47	75.08	272,238.64	73.02	282,109.16	67.68
Untreated	90,038.09	24.92	100,569.30	26.98	134,702.45	32.32

Note: The amount of wastewater treated outside the municipal facilities is included. Figures in the table may not sum up due to rounding.

In order to collect and treat wastewater from settlements and to protect the environment and human health, the strategic target of the MoEUCC has been set as increasing the population of municipalities with wastewater treatment service to 100% in 2028 and the works are carried out within this framework.

C.4.3. Organised Industrial Zones and Individual Industries Wastewater Infrastructure Facilities

Solving the environmental problems arising from industrialisation and ensuring the controlled development of industrialisation can be achieved by disciplining the industry. Organised industrial zones have important functions in terms of disciplining the industry, protecting the environment and supporting the enterprises to make production in accordance with environmental norms. The use of common treatment facilities in the prevention of environmental pollution caused by industry is one of the most important advantages of organised industrial zones.

There are 361 Organised Industrial Zones in Türkiye. The General Directorate of Industrial Zones of the Ministry of Industry and Technology provides loans to OIZs for the construction of wastewater treatment plants, which play a key role in reducing the environmental impact of OIZs in production. Out of 361 OIZs, 281 are active and wastewater is treated and discharged in 173 of them. The number of OIZs with wastewater treatment plants is 123. General Directorate of Industrial Zones has 76 projects in its investment programme for 2024. In addition to wastewater treatment plant projects, loans are also provided for water recovery projects, which are becoming increasingly important today.

Table 68 Manufacturing Industry Wastewater Data, 2016 - 2022 (TURKSTAT, 2024)

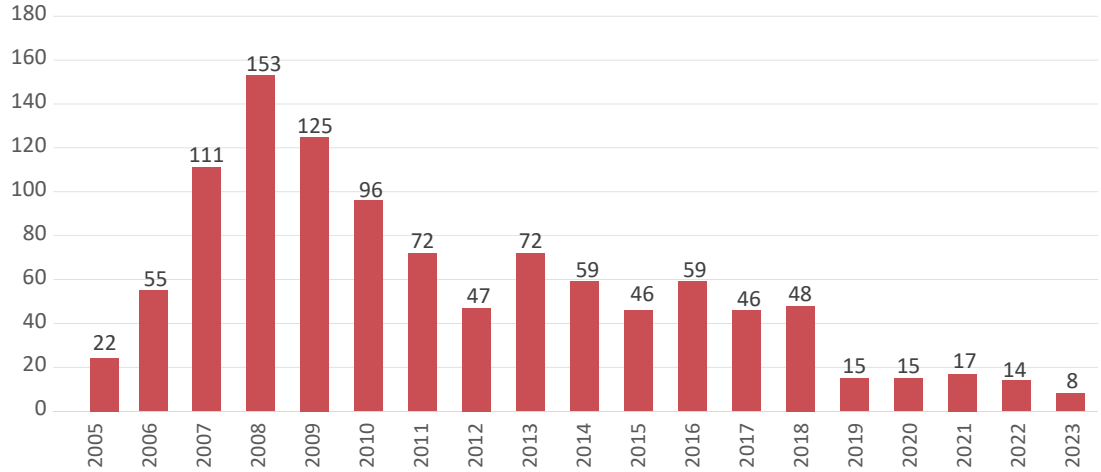
	2020	2022
Amount of Wastewater Discharged (Thousand m³)	**2,311,953**	**2,426,599**
Amount of Cooling Water Discharged	1,821,671	1,849,533
Amount of Wastewater Discharged Excluding Cooling Water	490,282	577,065
Total Amount of Wastewater Treated and Discharged (Thousand m³)	**278,266**	**332,496**
Amount of Cooling Water Treated and Discharged	12,864	15,295
Amount of Wastewater Treated and Discharged Excluding Cooling Water	265,401	317,201
Amount of Wastewater Discharged by Receiving Environment (Thousand m³)		
City Sewerage	67,552	68,327
Sea	1,846,445	1,879,795
Lake	c	c
Stream	167,930	202,837
Dam	c	c
Waste Dam	c	c
Foseptic	3,736	2,925
OIZ Sewerage	166,405	205,867
To Other Receiving Environments	50,809	52,221
Number of Wastewater Treatment Plants	**2,814**	**2,976**
Physical /Chemical	1,420	1,583
Biological	1,268	1,262
Advanced	126	131
Wastewater Treatment Plant Capacity (Thousand m³/year)	**702,119**	**810,013**
Physical /Chemical	245,487	338,786
Biological	361,694	372,021
Advanced	94,938	99,207
Amount of Wastewater Treated in Wastewater Treatment Plants (Thousand m³/ year)	**342,533**	**414,319**
Physical /Chemical	113,669	189,234
Biological	179,707	176,588
Advanced	49,157	48,497

Figures in the table may not sum to the total due to rounding.
(1) It includes the amount of wastewater discharged to receiving environments such as village sewerage, free zone sewerage, small industrial site sewerage, wastewater treatment plants belonging to cooperatives, SHW canal, dry stream bed, irrigation inside or outside the workplace area, quarry, etc.
(c) Confidential data

C.4.4. Wastewater Treatment Plant Project Approvals

WWTP Project Approval works and procedures have been carried out by the MoEU since 2004 in order to ensure the selection of wastewater treatment technologies that will provide the desired level of treatment efficiency and have low investment and operating costs during the construction phase of wastewater treatment plants (WWTP). Wastewater treatment plant project approvals are carried out within the scope of the "Circular on Wastewater Treatment/Deep Sea Discharge Plant Project Approval" numbered 2018/14, and a total of 1,208 Wastewater Treatment Plant Project Approval procedures were carried out by the MoEUCC, 69 of which were carried out by the General Directorate of Environmental Management (GDEM) of the MoEUCC between 2019-2023.

Graph 44 Number of Facilities with Project Approval by MoEUCC GDEM (MoEUCC, 2024)



C.4.5. Recycling and Reuse of Wastewater

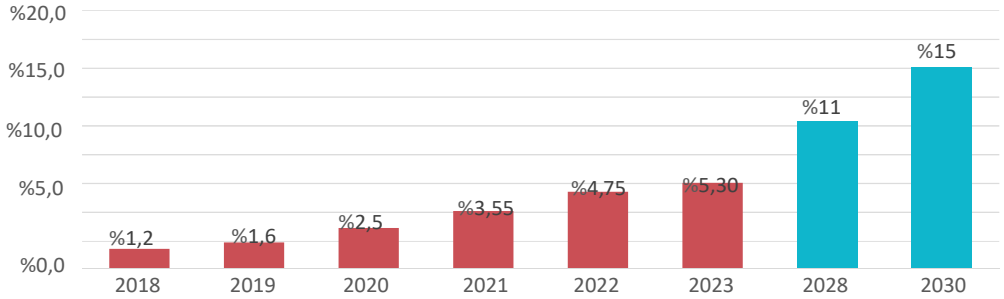
Practices regarding wastewater management in Türkiye are carried out within the framework of the Environmental Law No. 2872. The main policy of the MoEUCC in wastewater management is to adopt clean production that does not generate wastewater, uses water economically or recovers and reuses the wastewater generated, to prevent pollution at the source and to promote the reuse of treated wastewater in different areas within the framework of the approach that wastewater is an alternative water source and circular economy principles.

Urban wastewater is a serious water potential for Türkiye. Although there are urban Wastewater Treatment Plants (WWTPs) with wastewater recovery and reuse applications in Türkiye, considering our developing wastewater infrastructure and the increasing number of treatment plants throughout the country, the size of our reuse potential can be seen more clearly.

As the MoEUCC, it is aimed to increase the reuse rate of treated wastewater by applying appropriate treatment technologies to 6% in 2024, 11% in 2028 and 15% by 2030. In order to achieve this target, the subject is listed as action "880.5." in the 12th Development Plan covering the years (2024-2028) and as "PG 1.1.3. Re-use rate of treated wastewater" in the Strategic Plan of the MoEUCC for 2024-2028. is included as an action.

In this framework, 5.5% of the total amount of treated wastewater is currently reused, and it is aimed to expand the recovery and reuse of treated wastewater through basin-based studies in the coming period.

Graph 45 Reuse Rate of Treated Wastewater and Targets (MoEUCC, 2024)



At the same time, wastewater recovery policies, planning of local administrations, and legal By-laws are very important for the applicability of the subject in Türkiye. In Türkiye, MoEUCC has also made arrangements on the basis of legislation in order to promote the treatment and reuse

of wastewater in many areas such as agriculture and industry and to encourage reuse.

In this context, it is aimed to increase the utilization rate of treated wastewater with the following:

- With the revision of the Environmental Law No. 2872, the reimbursement rate of up to 50% of the electrical energy used in wastewater treatment plants is paid to organizations that reuse wastewater treated with advanced treatment techniques, with an increase up to 100% according to the reuse rate;
- With the revision of the By-law on Water Pollution Control, it is obligatory for metropolitan municipalities and provincial municipalities to prepare feasibility reports in order to determine the reuse potential of at least 10% of the total wastewater treated in urban wastewater treatment plants for agricultural irrigation and recreational purposes as well as industrial, environmental and other areas and the necessary investment needs;
- With the revision of the Communiqué on Technical Procedures for Wastewater Treatment Plants, the reuse areas of treated wastewater will be expanded to include landscaping and agricultural irrigation, industrial use, groundwater and surface water supply, recreational uses, domestic and industrial applications.

Within the scope of sectoral studies, studies on clean production and reuse of treated wastewater are carried out primarily in the textile sector, where water consumption is the most intensive and pollution load is high, and the "Clean Production Practices in the Textile Sector" project was carried out by the MoEUCC in 2021 in order to bring the standards in the textile sector to international level and improve environmental indices. Within the scope of the project, prototypes have been developed that provide colour removal and salt recovery in dye bath wastewater without changing the existing process flow in dyeing textile enterprises, and with the "Circular on Cleaner Production Practices in the Textile Sector No. 2022/20", Best Available Techniques for reuse of wastewater, reduction of pollution and minimisation of water use have been made mandatory.

Wastewater Treatment Action Plan

The "By-law on Identification of Sensitive Water Bodies and Areas Affecting These Bodies and Improvement of Water Quality" entered into force after being published in the Official Gazette dated 23.12.2016 and numbered 29927, and taking into account the urban sensitive areas identified by the said By-law, the "Wastewater Treatment Action Plan" published by the MoEUCC in 2015 was updated for the years 2017-2023 and the plans for wastewater management were included in the said action plan.

Within the period of 2017-2023 Wastewater Treatment Action Plan, studies have started to be carried out with the aim of operating wastewater treatment plants in line with the circular economy approach, contributing to climate and sustainability targets, resource and energy efficient, protecting water resources and saving water by reducing the amount of wastewater discharged to receiving environments.

The sensitive areas in the annex of the "By-law on Identification of Sensitive Water Bodies and Areas Affecting These Bodies and Improvement of Water Quality", which aims to identify sensitive water areas for the implementation of the By-law on Urban Wastewater Treatment, have been

updated with the amendment published in the Official Gazette dated 30/12/2021 and numbered 31705 (2nd repeated).

In addition, Article 11, subparagraph (e) of the By-law on Urban Wastewater Treatment stipulates that "In sensitive water areas to be newly determined in accordance with subparagraph (d), the highest local administrative authority shall take the necessary measures to ensure that the above conditions are complied with within seven years from the determination and designation of these areas."

In this context, regarding the newly declared sensitive areas with the amendment made on 30/12/2021, in accordance with subparagraph (e) of Article 11 of the By-law on Urban Wastewater Treatment, municipalities are required to take the measures specified in the By-law for discharge to sensitive areas until 30.12.2028 at the latest.

On the other hand, the Wastewater Treatment Action Plan covering the years 2017-2023 has been updated for the period 2024-2028 in line with the policies and strategies set out by the MoEUCC.

C.5. Pollution Prevention Works in Basins

C.5.1. Domestic and Industrial Pollution Monitoring in Basins

Periodical monitoring studies have been carried out in Ergene, Küçük Menderes, Gediz, North Aegean, Sakarya and Susurluk Basins since 2014 with the Domestic and Industrial Pollution Monitoring Programme (EKİP) carried out by the MoEUCC. With the programme, it is aimed to determine the hot spots by carrying out water monitoring studies in the receiving environment in the basins under the pressure of intense domestic and industrial pollutants and to provide data for taking necessary measures to prevent pollution on basin basis. With EKİP, periodical samples are taken in basins and analyzed in mobile water and wastewater laboratory and Environmental Reference Laboratory (ERL).

Regular implementation of the monitoring programme (EKİP) every year, monitoring of pollution, effective implementation of action plans to be prepared with the data produced by the programme contribute positively to the protection of our water resources and human and environmental health. The relevant units of the MoEUCC benefit from EKİP data, especially in basin action plans or projects for pollution prevention, while guiding basin-based limits in legislative studies.

C.5.2. Pollution Prevention Action Plans in Basins

Determination of the characteristics and pollution status of surface and ground waters and the pressures and impacts caused by urban, industrial, agricultural, economic and similar activities, detailed examination of pollution sources and loads determined on basin basis, determination of the environmental infrastructure status of the basin, "Pollution Prevention Action Plans" were prepared in Gediz, Büyük Menderes, Seyhan, Ceyhan, Western Mediterranean, Northern Aegean, Eastern Mediterranean and Küçük Menderes Basins in order to prevent pollution in the basin, to protect and improve the basin, to carry out studies and planning for the measures to be taken in the short, medium and long term.

These action plans include plans for the completion of environmental infrastructure investments within the framework of the targets envisaged to be achieved in the short, medium and long term.

C.5.3. Activities Carried Out Within the Scope of Prevention of Marine Mucilage Pollution in the Marmara Sea Basin

C.5.3.1. Marmara Sea Protection Action Plan

In order to clean up the mucilage pollution and eliminate the causes of mucilage formation in the Marmara Sea, studies have been initiated with the contributions and participation of scientific institutions, relevant institutions and organizations, Non-Governmental Organizations (NGOs) under the coordination of the MoEUCC.

In order to prevent sea saliva in the Marmara Sea, the "Marmara Sea Action Plan" consisting of 22 Articles was prepared and signed by the senior executives of all provinces bordering the Marmara Sea on 06.06.2021. Within the framework of the action plan, the works have been started rapidly and all necessary works have been carried out to eliminate the pollution in the Marmara Sea.

The Marmara Sea Protection Action Plan, consisting of 22 articles for the prevention of sea saliva in the Marmara Sea under the coordination of the MoEUCC, was prepared with the participation of governarates, local administrations, relevant institutions /organizations, non-governmental organizations and academicians in the Marmara Sea Basin in order to eliminate the catastrophic mucilage pollution that occurs in the Marmara Sea and affects natural life, and was shared with the public on 06.06.2021.

In order to carry out the works to be conducted by all relevant institutions /organizations in the basin in a coordinated manner, the "Circular on the Implementation of the Marmara Sea Action Plan" numbered 2021/12 was published on 7 June 2021 and Coordination and Information Centre was established in Istanbul under the coordination of the MoEUCC and Provincial Coordination Centres were established in 7 provinces under the chairmanship of the Governor in the Governorates.

On the other hand, the Marmara Sea Action Plan Coordination Board was established on 13 June with the Presidential Circular No. 2021/10 in order to complete the works envisaged within the framework of the Marmara Sea Action Plan within the specified periods, to carry out the necessary works in integrity and to decide on the implementations to be made within the framework of the action plan. The 1st Meeting of the Marmara Sea Action Plan Coordination Board was held on 15 June 2021 and sub-working groups were established regarding the cleaning works and pollution prevention to be carried out within the framework of the Action Plan.

In addition, under the coordination of the MoEUCC, with the participation of mayors, representatives of public institutions and organizations, artists and athletes, on 8 June 2021 in Caddebostan, Istanbul, a campaign was initiated and activities were carried out in Istanbul, Kocaeli, Yalova, Tekirdağ, Bursa, Balıkesir and Çanakkale, which have coasts on the Marmara Sea. Within the scope of mucilage cleaning activities, a total of 11,129.3 m^3 of mucilage was collected and disposed of by the MoEUCC.

However, in order to reduce the point source pollution in the Marmara Sea, "Circular on Restriction in Discharge Standards within the Scope of Marmara Sea Action Plan" dated 22/06/2021 and numbered 2021/13 was published by the MoEUCC. With the Circular, in the Marmara Sea Hydrological Basin, including the Straits and Susurluk Basin, and in all of the provinces of Istanbul, Bursa and Kocaeli, for industrial and domestic wastewater treatment plants, restrictions up to 20% in urban wastewater and up to 50% in industrial wastewater were made by regulating a new discharge standard for each sector in the Chemical Oxygen Demand (COD) parameter, which is an indicator of pollution and which is included in the annex of the By-law on Water Pollution Control and the By-law on Urban Wastewater Treatment. In addition, deadlines for compliance with the conditions amended by the Circular were determined and work deadline plans were taken.

On the other hand, within the scope of the action plan, studies continued to be carried out in order to determine the point and diffuse pollution, which are the sources of pollution in the Marmara Sea.

C.5.3.2. Marmara Integrated Strategic Plan (2021-2024)

Within the framework of the Marmara Sea Action Plan signed on 06 June 2021, the Marmara Sea Integrated Strategic Plan for the Period 2021-2024 was approved and entered into force at the 3rd Meeting of the Marmara Sea Action Plan Coordination Board held on 22/10/2021 in order to determine and implement policies and strategies to achieve good environmental status in the Marmara Sea Basin.

Efforts to prevent point and diffuse pollution sources in the Marmara Sea Basin and to achieve Marmara with good environmental status are carried out within the framework of 9 strategic objectives, 18 objectives belonging to these objectives and 134 sub-activities under 44 main activities belonging to these objectives in the Marmara Sea Integrated Strategic Plan. Responsible and related institutions have been determined for all activities and sub-activities and job descriptions have been made. The indicators determined for these sub-activities are monitored in 6-month periods and progress is monitored through annual reporting. According to the 2nd period reporting of 2023, 106 of 134 sub-activities have been completed and work on 28 of them is ongoing.

In addition, a series of mission meetings were held with the World Bank within the scope of the studies carried out by the MoEUCC for finding the financing source for the investments that need to be made for the conversion of wastewater treatment plants to advanced treatment, capacity increases and/or revisions in wastewater treatment plants in the Marmara Sea Basin but no progress has been made. Information on the facilities for which finance can be used was obtained from wastewater infrastructure administrations and a prioritisation study was carried out.

Within the scope of combating mucilage, Marmara Sea and Islands were declared as Special Environmental Protection Area with the Presidential Decree dated 04/11 /2021 and numbered 4758.

In order to determine the biological diversity of the region, to classify and map endemic, rare, threatened and endangered species and habitats, to reveal the threats and data on the basis of protection, to provide protection and use principles and management, "Land-Coastal and Marine Biological Diversity Research Project in the Marmara Sea and Islands Special Environmental Protection Area" was initiated as of 2023. The project will last approximately 2 years and will be completed by the end of 2024.

In addition, in 2023, in order to determine the causes and consequences of the intensive increase of jellyfish, especially invasive species, in the Marmara Sea due to reasons such as mucilage, climate change and pollution, and the necessary measures, the "Project for Investigation of the Causes and Consequences of Jellyfish Increases in the Marmara Sea (MarmANA)" Phase I was carried out. The data obtained from the project were shared with non-governmental organizations and the scientific community at a meeting held at Istanbul University on 22 December 2023.

As of 2024, the "Marmara Sea Jellyfish Increase Research-Phase 2 Project", which is planned as the 2nd stage of the mentioned project, and the "Project for Determination of Seagrass Distribution Areas in the Marmara Sea" on seagrasses in the Marmara Sea within the scope of combating marine pollution and mucilage. The project aims to determine the distribution areas, terrestrial pressure and protection strategies in this direction.

Likewise, the "Pina (Pinna nobilis) Conservation and Monitoring Project in the Sea of Marmara" was initiated in order to determine the conservation strategy for the Pina Mussel (Pinna nobilis) species, which is critically endangered and has an important role in the cleaning of sea water by filtering 6 litres of water per hour, which has disappeared as a result of mass deaths throughout the Mediterranean Sea and is found to live only in the Sea of Marmara.

C.5.3.3. Determination of Point Pollution Loads in Marmara Sea Basin (MAR-AAT)

MAR-AAT Project was carried out in 2021 with the participation of representatives of MoEUCC, Provincial Directorates of MoEUCC, 5 Universities (Istanbul Technical University, Yıldız Technical University, Konya Technical University, Bursa Technical University, Gebze Technical University) and Water and Sewerage Administration in order to determine the point pollution caused by wastewater in the Marmara Sea Basin.

Within the scope of the project, 445 domestic/urban and industrial wastewater treatment plants with a capacity of over 50 m^3 out of 691 active wastewater treatment plants in the Marmara Sea basin were examined on-site, and,

- Their current status has been determined,
- Needs analyses were made,
- Pollution loads caused by wastewater coming to the Marmara Sea have been revealed.

C.5.4 Lake Van Basin Protection Action Plan and Lake Van Protection Implementation Programme

In order to ensure the protection and sustainable use of Lake Van, the Lake Van Basin Protection Action Plan and Implementation Programme, consisting of 3 main activities and 13 sub-activities to achieve these main activities, was established in 2020 with the approval of the relevant institutions under the coordination of the MoEUCC, and monitoring studies are ongoing.

Activities for 13 activities defined within the scope of the action plan are ongoing and developments are reported to the Presidency on a quarterly basis. In addition, 5 coordination meetings were held in the basin in order to evaluate the problems encountered in implementation and solutions.

In addition, within the scope of the Action Plan, "Cooperation Protocol for Improvement of Wastewater and Municipal Waste Management Services within the Scope of Lake Van Basin Protection Action Plan" was signed on 6 November 2023 with the participation of relevant institutions / organizations in order to improve wastewater and municipal waste management services, to support the rehabilitation and cleaning of streams, and to share training and experience in order to ensure the protection and sustainability of the basin.

C.6. Water Management Plans

C.6.1. River Basin Management Plans

The procedures and principles for the preparation, implementation and follow-up of River Basin Management Plans are regulated by the "By-law on Preparation, Implementation and Follow-up of Basin Management Plans" published in the Official Gazette dated 17/10/2012 and numbered 28444. According to the said By-law, after the River Basin Management Plans are prepared, they are approved by the National Water Board and enter into force.

The National Water Board was established by Article 435/A of the Presidential Decree No. 1 in order to ensure high-level coordination and co-operation for the effective management and efficient use of water resources. Basin Water Boards for 25 river basins and Provincial Water Boards in 81 provinces, which were established together with the National Water Board, ensure the follow-up of the measures at the local level and make an important contribution to the implementation of the measures.

Discussing and approving River Basin Management Plans in the National Water Board, which is formed by senior representatives of stakeholder public institutions, ensures high-level coordination and cooperation in ensuring the implementation of the plans by stakeholder institutions. Within the scope of the By-law, the task of monitoring the implementation of the plans is assigned to Provincial Water Boards in provinces and Basin Water Board in basins.

Currently, River Basin Management Plans have been prepared in 12 of the 25 river basins in Türkiye and planning studies are ongoing in 7 basins. River Basin Management Plans, which are targeted to be completed for all basins by 2030, will be updated every 6 years.

Under the coordination of the General Directorate of Fisheries and Aquaculture of the MoAF, water quality monitoring is carried out in receiving environments in order to protect aquatic organisms and the health of those who consume/use them and their means of production from damages and to ensure the sustainability of their habitats. Monitoring data are shared when there is a "data request" within the scope of River Basin Management Plans.

C.6.2. Basin Protection Action Plans

Basin Protection Action Plans were prepared in 25 river basins with a holistic basin management approach and started to be implemented as of 2014. During the preparation of the Basin Protection Action Plans, plans, programmes and prioritisation of the works for the measures to be implemented in the short, medium and long term within the framework of 15 action titles were made.

C.6.3. Control of Water Losses and Leaks

Within the scope of the By-law on the Control of Water Losses in Drinking Water Supply and Distribution Systems, all municipalities report their water losses to the General Directorate of Water Management of MoAF annually. In addition, water loss rate targets for the scales of municipalities have been determined by the said By-law. In this context, metropolitan and provincial municipalities are obliged to reduce their water loss rates to 25% until 2028 and other municipalities until 2033.

According to 2022 data, the average water loss rate for Türkiye is determined as 32 per cent. In order to inform municipalities on practices to reduce water losses and to increase their technical capacities, two guidance documents, namely Methodological Guide on Water Efficiency in Drinking Water Sector and Handbook on Control of Water Losses in Drinking Water Supply and Distribution Systems, were prepared and published on https://www.suverimliligi.gov.tr/yayinlar/. In addition, Municipality-Water Fellowship was initiated in order to increase the exchange of information and experience among municipalities. Until 2024, 47 municipalities were included in the said practice with 34 municipal water brotherhoods.

C.6.4. Sectoral Water Allocation Plan

Sectoral Water Allocation Plans (SWAP) aim to ensure the allocation of water resources at the basin and sectoral sub-basin scale, to plan for the future and to meet the water needs of each sector in a fair, efficient and sustainable manner.

In Türkiye SWAP studies started in 2015 and plans have been completed in 11 basins (Seyhan, Akarçay, Konya, Gediz, Küçük Menderes, Burdur, Büyük Menderes, North Aegean, Western Mediterranean, Aras and Çoruh). Preparation of Sectoral Water Allocation Plans for Sakarya and Susurluk Basins is in progress. By 2030, it is aimed to complete the SWAP studies for all basins.

In SWAP studies, how much income can be obtained when how much irrigation water is allocated to the agricultural sector (irrigation areas in the basin) in normal and dry years is determined by plant pattern optimisation. Studies to determine the optimum plant pattern in agricultural areas are important for farmers to obtain more income with less water compared to their current practices.

C.6.5. Flood Management and Plans

Flood management is a set of activities including pre-flood, flood and post-flood activities and the General Directorate of State Hydraulic Works (SHW) carries out flood and sediment control works in 3 stages.

Pre-Flood Activities

The General Directorate of State Hydraulic Works aims to eliminate the destructive effects of floods or minimise their damages through structural and non-structural activities.

a) Structural activities;

These are the facilities including river bed correction and arrangements, flood walls, embankments, diversion channels, etc. to keep the rainwater away from the flood risk area in case of flood, structures constructed single or gradually perpendicular to the stream axis for upstream rehabilitation (reversal dam, reclamation bench, base belt, etc.) and control structures including facilities regulating the flow regime of water such as flood traps and dams.

In addition, within the scope of structural measures, the General Directorate of State Hydraulic Works carries out works such as cleaning the stream bed, construction of embankments and

stone fortifications, widening the stream bed, arranging the stream bed, cleaning the stream and canal, etc. before flooding with mass mechanised works.

b) Non-structural activities:

Hydrometric and Meteorological Observation Studies: In order to reveal the water resources potential of Türkiye, observations are made instantaneously within the scope of observation activities in order to make observations and evaluate them, publish them and make them available to all users. In this context, General Directorate of State Hydraulic Works has a total of 2,683 observation stations, including 2,001 flow observation stations on rivers, 98 lake observation stations, 187 meteorological stations, 242 snow stations and 155 sediment measurement stations.

Activities carried out within the framework of Law No. 4373: Within the framework of the relevant provisions of the Law No. 4373 (Articles 1 and 3), the areas under flood risk in different regions of Türkiye were declared as areas prohibited for any kind of construction by the Decree of the Council of Ministers. Between 1943-1980, 143 rivers were included in the scope of the law. In line with these articles, the General Directorate of State Hydraulic Works analyses the requests received regarding the rivers within the scope of the Law No. 4373 and gives its opinion. In addition, if it is determined that there are illegal practices in areas declared as floodplains, necessary warnings are given to the relevant institutions and organizations.

Studies carried out within the scope of Law No. 7269: In line with the relevant provisions of Law No. 7269, the General Directorate of State Hydraulic Works (SHW) and the Disaster and Emergency Management Presidency (AFAD) are carrying out joint studies on floods in order to declare the settlement areas surveyed by the General Directorate of State Hydraulic Works (SHW), and as a result of the surveys, it is understood that it is not possible to provide protection from floods with engineering measures for technical and economic reasons, to be designated as Disaster Areas and then to be relocated in a safe place.

Training Activities: Within the scope of training activities, General Directorate of State Hydraulic Works also organises National Flood Symposiums on flood and sediment control activities and flood management.

Flood Early Warning Systems (TEUS): In addition to the structural measures carried out by the General Directorate of State Hydraulic Works for flood and sediment control, studies for the establishment of Level Observation Stations (LOS) have been initiated within the scope of TEUS project. Within the scope of TEUS project, 322 LOS units have been installed throughout Türkiye, a significant part of which is in the Black Sea Region. The river beds are monitored with cameras through the LOS units, and it is planned to start providing pre-flood information to local administrations, local administrative authorities and AFAD via SMS for the whole of Türkiye.

Within the General Directorate of State Hydraulic Works, there is a Flood Management Room which aims to carry out the analysis, planning, decision-making and evaluation processes in a timely and effective manner by organising the available resources for the purposes of preparedness, mitigation, response and recovery against possible floods. In the Flood Management Centre, basins are kept under observation by monitoring meteorological observations from Level Observation Stations, Current Observation Stations (COS) and various sources within the scope of TEUS.

Flood Failure and Intervention Information System (TAMBIS) : TAMBIS Project, which has a web and mobile application, has been implemented in order to collect data containing information such as flood events experienced, flood control facilities put into operation, interventions made to river beds, flood hazard maps, etc., to ensure the sustainability of these data by strengthening them and to provide easy access to them.

Activities During Flooding

At the General Directorate of State Hydraulic Works, the Departments of Flood Control, Survey Planning and Allocations, Operation and Maintenance, Machinery Manufacturing and Equipment evaluate the flood information received from the Regional Directorates of State Hydraulic Works and determine the measures to be taken urgently.

Following the notification of the flood, the personnel in charge at the Regional Directorates of SHW reach the flood zone and transfer the news and information to the General Directorate of SHW and the local authority of the flooded area according to the flood event and the magnitude of the damage. In order to protect the facilities in operation, maintenance teams are mobilised in sensitive areas and the General Directorate of State Hydraulic Works is regularly informed about the developments during the flood.

Post-Flood Activities

After the flood, determination of flood damages, determination of works to be carried out and creation of work programmes, taking temporary and urgent measures, determination of damages in flood control facilities and removal of flood damages with mass mechanised works, cleaning of sediment and debris are carried out. To date, 10,697 flood control facilities have been constructed and put into operation. It is planned to construct 903 flood control facilities in 2024-2028.

Preparation of flood management plans is an important work to be done in order to ensure flood preparedness, reduce vulnerability and flood control. In order to minimise the flood risk in Türkiye, flood management plans have been completed in 24 basins and the preparation of plans in Meriç-Ergene Basin is ongoing. In four basins (Yeşilırmak, Susurluk, Antalya, Sakarya basins), the work on updating the plans is ongoing.

Flood Forecasting and Early Warning Centre (TATUM) continues its activities under the General Directorate of Water Management of MoAF in order to predict and warn possible floods before they occur and to reduce the possible negative effects of floods with the effective use of existing information and technology.

National Flood Forecasting and Early Warning System (TATUS) is a system that predicts the flow that will occur in the river bed and whether the river will overflow from its bed after predicted and/or realized precipitation events (rain, snow, etc.) and other factors (snowmelt, release of water from storage facilities, etc.), and shows the area where the water will spread as a result of any flood prediction. Currently, the studies carried out in Pilot Basins (15 sub-basins) have been completed and dissemination studies have started.

C.6.6. Drought Management Plans

Türkiye is highly susceptible to drought disaster due to the characteristic features of arid and semi-arid climatic conditions.

Drought Management Plans have been prepared for 25 basins in Türkiye. Drought Management Plans are management plans that include the measures to be taken before, during and after drought in order to control the negative effects of possible drought risks and to solve drought problems. With Drought Management Plans, drought analyses, hydrological studies, sectoral vulnerability analyses are carried out and drought maps are prepared and it is aimed to plan and direct activities such as recovery and intervention before, during and after drought.

C.6.7. Studies to Determine the Impact of Climate Change on Water Resources

Türkiye as a whole indicates an increase of at least 3.5°C in average temperatures. Total annual precipitation is projected to vary regionally, with decreases of up to 350 mm in the western and southern parts, but increases of around 200 mm, especially in the north-east of the country.

Furthermore, in the Upper Fırat Basin, it is predicted that snow-covered areas will decrease by 44%, snow cover will accumulate later and melt earlier, and expected flows during the melting period will decrease by 12-15%. When the water situation is analyzed on the basis of basins, serious water deficit is expected to be experienced in the Fırat-Dicle and Konya Closed Basins. The results of the studies carried out by the General Directorate of Water Management of the MoAF to determine the effects of climate change on water resources are shared at https://www.tarimorman.gov.tr/SYGM/Sayfalar/Detay.aspx.SayfaId=110.

In addition, within the framework of the TAGEM Action Plan, TAGEM continues its R&D activities to determine and monitor agricultural drought and to develop drought-resistant seed breeding and variety development by using data on precipitation, topography, socio-economic factors, irrigation and land use patterns, meteorological data, soil properties and moisture monitoring and drought indices in order to protect sustainable agriculture and yield.

C.7. Soil Pollution and Control

Soil is not only an economic resource but also one of the most important natural resources with its ecological elements such as climate, flora and fauna. The balanced and permanent realisation of economic and social development is closely related to the determination and identification of these resources in the light of scientific data, taking into account the needs of the country.

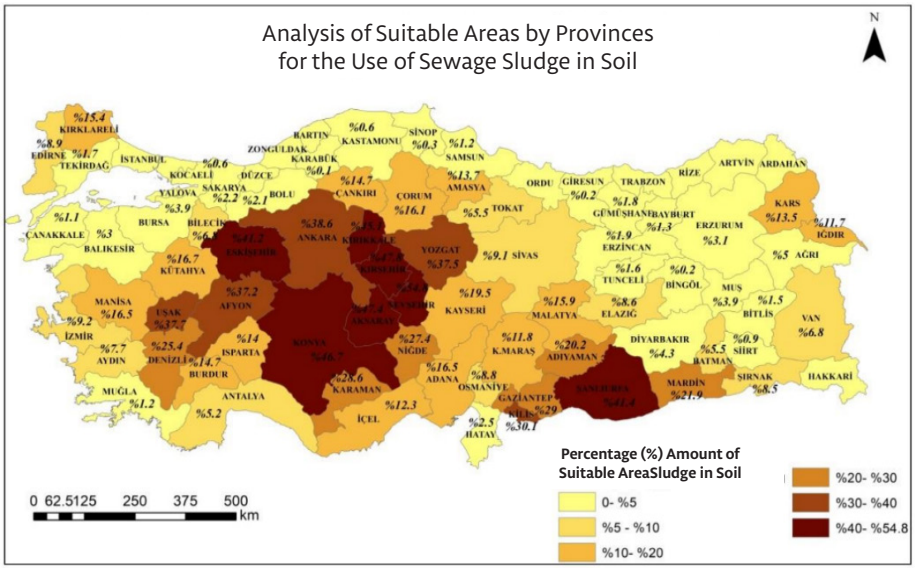
C.7.1. Point Source Contaminated Sites

Within the scope of the By-law on Control of Soil Pollution and Point Source Contaminated Sites published in the Official Gazette dated 08 June 2010 and numbered 27605, all articles of the By-law became applicable with the declaration of the sectors listed in Annex-2, Table-2 of the By-law through the Contaminated Sites Information System as of 08.06.2015. 48,710 Activity Preliminary Information Forms were submitted by the activity owners to the system accessible at https://ecbs.cevre.gov.tr by the end of 2023.

C.7.2. Utilization of Sewage Sludge in Soil

The By-law on the Use of Domestic and Urban Treatment Sludge in Soil was published in the Official Gazette dated 03/08/2010 and numbered 27661 and entered into force in order to utilise the soil-improving properties of sewage sludge resulting from the treatment of domestic and urban wastewater, and at the same time to determine the technical and administrative principles for the controlled use of sewage sludge in the soil in a way that does not harm soil, plants, animals and humans in Türkiye. Within the scope of the said By-law, 19,978 tonnes km/year of treatment sludge generated in different wastewater treatment plants between 2020-2023 was allowed to be used on a total of 9,989 decares of land. Within the scope of the "Treatment Sludge Management and Action Plan in Türkiye", which is being prepared by the MoEUCC in order to ensure effective and sustainable management of sewage sludge, the potential areas where sewage sludge can be applied to land in Türkiye are shown in Map 16.

Map 16 Soil Suitability Map of Türkiye for the Use of Sewage Sludge in Soil (MoEUCC, 2024)



C.7.3. Control and Prevention of Agricultural Pollution Studies

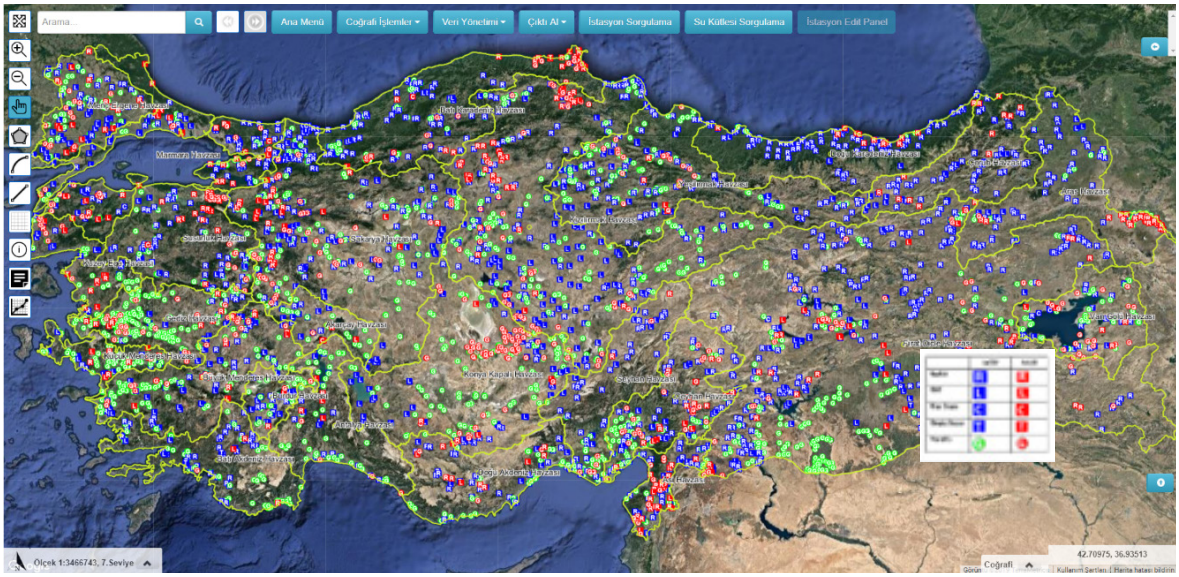
The "By-law on the Protection of Waters against Nitrate Pollution from Agricultural Sources" published in the Official Gazette dated 18/02/2004 and numbered 25377 within the scope of harmonisation studies of the Nitrate Directive (91/676/EEC) during the harmonisation process with the European Union was revised and entered into force in the Official Gazette dated 23 July 2016 and numbered 29779.

The main provisions of the By-law are identification of polluted or threatened polluted waters, identification of nitrate sensitive areas, preparation of Good Agricultural Practices Code, establishment of Agricultural Action Plans in Sensitive Areas and establishment of Monitoring Network and Reporting System.

C.7.3.1. Monitoring of Agricultural Pollution

In the agricultural nitrate pollution monitoring network established to detect agricultural pollution and to identify Nitrate Sensitive Areas, monitoring of agricultural nitrate pollution in waters is carried out at a total of 4,852 stations, including 2,533 surface water and 2,319 groundwater.

Map 17 Nitrate Pollution Monitoring Network (Nitrate Information System -NİBİS, 2024) https://nibis.tarbil.gov.tr/) (MoAF, 2024)



In addition, the General Directorate of Agricultural Reform of the MoAF has started to work within the scope of the project to be carried out by TÜBİTAK MAM in 2019 to determine Nitrate Sensitive Regions and to prepare Action Plans to be implemented in these regions. Within the scope of the project, it is planned to identify Nitrate Sensitive Areas, prepare Action Plans and prepare cost-benefit analyses for the measures to be implemented in the action plans simultaneously.

In 2019, studies were completed in the Gediz Basin and North Aegean Basin, which were selected as pilots, and in 2020 in Yeşilırmak, Akarçay, Burdur, Kızılırmak, Küçük Menderes, Konya Closed, Meriç-Ergene, Büyük Menderes, Western Mediterranean Basins. In 2022, studies were completed for 25 River Basins.

C.8. Legal By-laws and Developments in Water and Wastewater Management

The National Water Plan targets implementing stakeholders covering different levels (in particular public institutions/organizations, municipalities, local authorities, etc.) and provides a framework for complementary strategies and plans adapted to the national level, taking into account the varying conditions at basin level.

The National Water Plan (2024-2034), which is currently being updated, includes a comprehensive table of "Objectives and Actions" which serves as a guideline. This table discusses the functioning of the strategies related to water management, follow-up, related institutions, implementation period and financing, the works to be carried out for the protection of the environment and prevention of pollution, the foreseen targets and projections, the contributions to be made on the environment and human health, and the results and evaluations.

By-law on the Quality and Treatment of Drinking Water Supply Waters: The purpose of the by-law published in the Official Gazette dated 06/07/2019 and numbered 30823 is to determine the principles, quality criteria and treatment classes that must be determined in order for the waters to be used as drinking and utility water and the issues related to the determination of treatment efficiency.

Since 2019, as a result of the studies carried out, consultations with municipalities and relevant institutions, there has been a need to update the said By-law and the By-law Amending the By-law on the Quality and Treatment of Water Supplying Drinking Water was published on 24/09/2021 and numbered 31608.

Communiqué on Technical Procedures for Drinking Water Treatment Plants: The purpose of the communiqué published in the Official Gazette dated 07/03/2020 and numbered 31061 is to regulate the design principles and norms of drinking water treatment plants to be constructed for the treatment of water supplied from surface and underground water sources.

This Communiqué covers the technical procedures to be applied during the design and operation of drinking water treatment plants.

Drinking Water Treatment Plant Project Approval Circular: The purpose of this circular dated 07/05/2020 and numbered 2020/1 is to ensure that the effluent of the drinking water treatment plants will meet the drinking water standards specified in the By-law on Water Intended for Human Consumption, and for the parameters not included in the By-law on Water Intended for Human Consumption, to ensure the selection of the appropriate treatment project that will bring the quality of the plant effluent to A1 class, which can be used as drinking and potable water as specified in Annex 1 of the By-law on the Quality and Treatment of Water Supplied for Drinking Water.

Communiqué on Technical Procedures of the By-law on Control of Water Losses in Drinking Water Supply and Distribution Systems: Within the scope of the Official Gazette No. 31253 published on 23 September 2020, the Communiqué on Technical Procedures of the By-law on Control of Water Losses in Drinking Water Supply and Distribution Systems has been revised. Within the scope of the said communiqué, the report format for projects related to drinking water supply and distribution systems prepared by municipalities and the guideline on the necessary measures for the control of water losses are presented.

Circular on Work Termination Plan for Reducing Water Losses in Drinking Water Systems: Water losses of municipalities are monitored by the General Directorate of Water Management of MoAF through annual reports. As a result of these reports, it is seen that the water loss rates of most municipalities are currently not approaching the target rates and even the current situation determination for the purpose of reducing water losses and the necessary works to reach the target are not planned. Accordingly, Circular No. 2021-47 entered into force in 2021 in order to ensure that the necessary planning can be made by the relevant administrations in order to reduce water loss rates to 25% and below (the lowest level that can be technically and economically reduced) and to ensure that this planning is committed. Within the scope of the Circular, a Guideline on Actions to Reduce Water Losses in Drinking Water Systems was prepared for the reduction of water losses.

Water Efficiency Strategy Document and Action Plan within the Framework of Adaptation to a Changing Climate (2023-2033): Within the scope of the document published with the Presidential Circular dated 4 May 2023 and numbered 2023/9, it is aimed to reduce water losses in drinking water supply and distribution systems by 25% and individual water use to 120 litres/person-day, to increase agricultural irrigation efficiency to 60% and to ensure water recovery up to 50% in industrial activities by 2030. In this framework, the responsibilities of the relevant and responsible institutions and the timetables for the realisations are determined and presented in the sectoral action plans.

By-law on Water Pollution Control: Based on the 2872 numbered Environmental Law, the By-law on Water Pollution Control (WPCR) published by the MoEUCC based on the Environmental

Law No. 2872, works are carried out for the disposal of wastewater generated as a result of all kinds of activities, the protection of existing water quality and the prevention of water pollution in a manner compatible with sustainable development goals in order to protect the potential of groundwater and surface water resources and to ensure the best use of them.

The By-law regulates the following matters:

- Principles on Water Protection;
- Principles of Direct Discharge of Wastewater to Sewerage Systems and Receiving Environment;
- Domestic/Industrial Wastewater Discharge Standards;
- Deep Sea Discharge Criteria, Wastewater Treatment Plant Project Approval;
- Prohibitions on pollution of lakes, groundwater, seas;
- Reuse of Treated Wastewater;
- Principles of Taking and Evaluation of Composite Samples;
- Monitoring, Inspection, Enforcement.

In WPCR, industries are grouped according to their production types and sixteen sectors are formed and receiving environment discharge standards are determined for each sector. In the discharge of wastewater from these sectors to the receiving environment, receiving environment discharge standards are regulated between Table 5 and Table 20 in the annex of WPCR, and the enterprises producing industrial wastewater are obliged to provide the values in the table of the sector to which they are affiliated in the discharge of their wastewater to the receiving environment.

In addition, in order to protect our water resources within the framework of the developing and changing conditions of the day, the By-law on Water Pollution Control (WPCR) was amended and the "By-law on Amendments to Water Pollution Control" was published in the Official Gazette dated 17 December 2022 and numbered 32046 and entered into force.

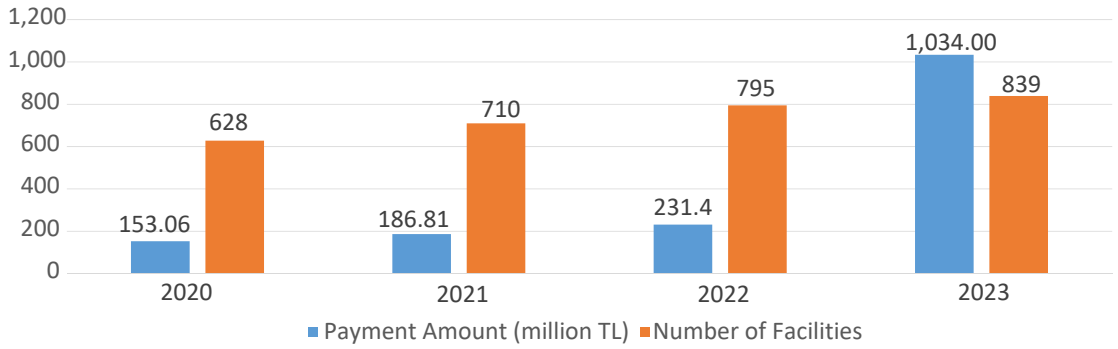
With the amendment made to Article 43 of the By-law on Water Pollution Control, the obligation to prepare a treatment sludge management plan in accordance with circular economy principles has been introduced by the administrations of wastewater infrastructure facilities and operators of individual industrial facilities.

In this context, the amendments made to the By-law on Water Pollution Control include reuse of treated wastewater and making reuse up to 10% compulsory in municipalities, action plan for treatment sludge management, industrial wastewater monitoring for municipal wastewater treatment plants, management of wastewater from health institutions, dredging in lakes, monitoring of groundwater pollution, By-laws on deep sea discharge and technical By-laws for implementation.

By-law on Wastewater Treatment Plant Energy Incentive: Pursuant to Article 29 of the Environmental Law, the "By-law on the Procedures and Principles to be followed in Benefiting from Incentive Measures for Wastewater Treatment Plants" was published in the Official Gazette dated 01/10/2010 and numbered 27716 and entered into force. In order to ensure the effective operation of wastewater treatment plants and to improve the water quality of the receiving environment and to protect natural resources, the By-law was amended and the "By-law on Wastewater Treatment Plant Energy Incentive" was published in the Official Gazette dated 11/11/2023 and numbered 32366 and entered into force.

Within the scope of the By-law, up to fifty percent of the energy costs of the wastewater treatment plants operated in accordance with the legislation, and up to one hundred percent of the reimbursement rate can be applied to the organizations that reuse the treated wastewater in order to expand the reuse of treated wastewater according to the reuse rate.

Graph 46 Wastewater Treatment Plant Energy Incentive (MoEUCC, 2024)



By-law on Urban Waste Water Treatment: The By-law on Urban Wastewater Treatment, which entered into force after being published in the Official Gazette dated 08/01 /2006 and numbered 26047, regulates the procedures and principles regarding the collection, treatment and discharge of urban wastewater and the prevention of the negative effects of wastewater discharge from certain industrial sectors.

The "By-law on Identification of Sensitive Water Bodies and Areas Affecting These Bodies and Improvement of Water Quality", which aims to identify sensitive water areas for the implementation of the By-law on Urban Wastewater Treatment, was first published in the Official Gazette dated 23.12.2016 and numbered 29927 and entered into force. The sensitive areas in the annex of the relevant By-law were updated with the amendment published in the Official Gazette dated 30/12/2021 and numbered 31705 (2nd repeated).

In addition, due to the cancellation of the provisions "Concentration values or treatment efficiencies will be applied." under Annex IV tables of the By-law on Urban Wastewater Treatment in the decision of the 6th Chamber of the Council of State with no. 2021/9696 and due to the fact that this issue caused problems in practice, the sections on treatment efficiency in Table I and Table II were removed from the By-law and the By-law Amending the By-law on Urban Wastewater Treatment was published in the Official Gazette dated 12/08/2023 and numbered 32393.

Communiqué on Water Pollution Control By-law on Sampling and Analysis Methods: The purpose of this Communiqué, published on 10.10.2009 with number 27372, is to determine the procedures and principles regarding the determination of the quality of the water environment, the continuous or intermittent sampling of wastewater and/or water environments during the discharge of domestic and industrial wastewater to wastewater infrastructure facilities or discharge to receiving environments, and the measurement / analysis methods of the quality parameters foreseen to be inspected in accordance with the relevant provisions of the Water Pollution Control By-law.

Communiqué on Water Pollution Control By-law Administrative Procedures: This Communiqué was prepared and published on 10 October 2009 with the number 27372 in order to regulate the administrative procedures and practices related to the responsibility, principles of obtaining permits and administrative procedures and practices stipulated by the By-law on Water Pollution Control published in the Official Gazette dated 31/12/2004 and numbered 25687. The Communiqué covers the principles of obtaining permission for the direct discharge of all kinds of urban, domestic and/or industrial wastewater to the receiving environment.

Monitoring of wastewater from land-based fisheries facilities is also carried out within the framework of the communiqués in question. However, following the evaluation of the requests and complaints received from the sector, the Communiqué on Sampling and Analysis Methods and the Communiqué on Administrative Procedures were amended and entered into force after being published in the Official Gazette dated 16/12/2022 and numbered 32045.

Communiqué on Technical Personnel Working in Waste Water Treatment Plants: As a result of the "Project for Determining the Current Situation of Domestic / Urban Waste Water Treatment Plants across the Country and Identifying the Need for Revision" carried out by the MoEUCC in 2016, the importance of the employment of qualified personnel in order to ensure the operation of waste water treatment plants in accordance with the legislation has been seen and the need for a By-law in this direction has emerged. As a result of these studies, "Communiqué on Technical Personnel Working in Waste Water Treatment Plants" was prepared and entered into force after being published in the Official Gazette dated 23/05/2019 and numbered 30782.

Facility supervisor certificates are issued to the trainees who are successful in the exams held as a result of the training, and a total of 8,481 facility supervisor certificates were issued until the end of 2023.

Wastewater Information System Circular (2020/17): With the "Wastewater Treatment Plants Identity Certificate Circular No. 2015/6" published on 05/05/2015, all wastewater treatment plants in Türkiye whose wastewater is discharged to the receiving environment or recycled were given an identity certificate. The Circular was repealed and replaced by the 2020/17 Waste Water Information System Circular dated 15/06/2020. In this context, Waste Water Treatment Plant Energy Incentive and Waste Water Treatment Plant Identity Certificate issuance processes have been integrated into the Waste Water Information System.

Communiqué on Continuous Wastewater Monitoring Systems: With Continuous Wastewater Monitoring Systems, 420 wastewater treatment plants are monitored 24/7 instantaneously and data are collected and evaluated in the data centre of the MoEUCC.

The parameters being monitored are physical parameters such as pH, conductivity, temperature, dissolved oxygen and flow rate, as well as COD and AKM parameters. However, in addition to the existing monitoring practice in the basins, studies have been completed to be applied to facilities with a capacity of less than 10,000 m^3/day, and the Communiqué Amending the Communiqué on Continuous Wastewater Monitoring Systems was published in the Official Gazette dated 16 July 2019 and numbered 30833 and entered into force. The obligation to install a continuous wastewater monitoring system, which is currently valid for wastewater treatment plants with an installed capacity of 10,000 m^3/day and above, has been made mandatory for plants with an installed capacity of 5,000 m^3/day and above with the newly published communiqué.

Within the scope of the Communiqué, automatic sampling devices are installed in the facilities where COD and AKM parameters are monitored according to the warning received in case of limit exceedances and the system is used for early warning purposes. Samples taken in case of limit exceedances are taken under the supervision of Provincial Directorates of Environment, Urbanization and Climate Change and sent to authorised laboratories and necessary legal actions are initiated. User names and passwords are defined to both facilities and Provincial Directorates for access to the system via internet and data are accessed via continuous monitoring centre web software (sim.csb.gov.tr).

Circular on the Implementation of the Marmara Sea Action Plan (2021/12): "Circular on the Implementation of the Marmara Sea Action Plan" dated 07.06.2021 and numbered 2021/12 was published by the MoEUCC on 07/06/2021 in order to ensure that the works to eliminate the pollution in the Marmara Sea are carried out in an effective and coordinated manner. With the Circular, it was instructed to carry out the works for the removal and disposal of mucilage in a coordinated manner at the highest level under the coordination of the Governorates with the participation of responsible institutions / organizations, local administrations, unions and non-governmental organizations and to support the works with all personnel, machinery, equipment and similar facilities.

Presidential Circular on the Establishment of the Marmara Sea Action Plan Coordination Board (2021/10): The Marmara Sea Action Plan Coordination Board was established on 13 June with the Presidential Circular No. 2021/10 in order to complete the works envisaged within the framework of the Marmara Sea Action Plan within the specified periods, to carry out the necessary

works in integrity and to decide on the implementations to be made within the framework of the action plan.

Circular on Restriction in Discharge Standards within the Scope of Marmara Sea Action Plan (2021/13): Since one of the most important factors causing the formation of mucilage is the discharges to the Marmara Sea from point sources, with the Marmara Sea Action Plan, it is envisaged that "the discharge standards of wastewater treatment plants discharging to the Marmara Sea will be updated and implemented within 3 months".

In this context, it has been decided that "Within 15 days, the General Directorate of Environmental Management of the Ministry of Environment, Urbanization and Climate Change will publish legislation on the restriction of the Chemical Oxygen Demand discharge standard of the wastewater treatment plants in the Marmara Sea Basin by the General Directorate of Environmental Management within 15 days" in Article 6 of the decision minutes of the Marmara Sea Action Plan Coordination Board meeting dated 15 June 2021 and numbered 2021/1, which was established with the Presidential Circular No. 2021/10." In accordance with the provision, the Circular on Restriction of Discharge Standards within the Scope of Marmara Sea Action Plan No. 2021/13 was published on 22/06/2021 by the MoEUCC on 22/06/2021 for the restriction of the Chemical Oxygen Demand (COD) discharge standard of the wastewater treatment plants located in the Marmara Sea Basin, including the Straits and Susurluk Basin.

Circular on "Real Time Monitoring of Waste Water Treatment Plants in Marmara Region" (2021/14): The "Marmara Sea Action Plan" prepared under the coordination of the MoEUCC on the measures to be taken and works to be carried out to eliminate the pollution caused by mucilage in the Marmara Sea was shared with the public on 06 June 2021.

Within the framework of the Marmara Sea Action Plan activities carried out by the Marmara Sea Action Plan Coordination Board established by the Presidential Circular No. 2021/10, it was decided by the Board to "*carry out legislative work for on-line monitoring of all treatment plants regardless of treatment method and flow rate in order to control all point sources of pollution to the Marmara Sea" and "carry out legislative work for on-line monitoring of cooling waters at the entrance of the facilities".*

In this framework, legislative work was completed and the Circular No. 2021/14 on "Real-Time Monitoring of Waste Water Treatment Plants in the Marmara Region" was published on 02/07/2021. With the Circular, treatment plants with an installed capacity of 1,000 m^3/day and above in the Marmara Region are monitored in terms of inlet and outlet flow rates and sampling. In addition, facilities with an installed capacity of 1,000 m^3 /day and above that discharge water to the receiving environment by using water for heat transfer (cooling water) convey the measurements of inlet and outlet water flow and temperature values to the Continuous Monitoring Centre.

Communiqué on Technical Procedures for Wastewater Treatment Plants: The "Criteria for Reuse of Treated Wastewater as Irrigation Water" section in Annex-7 of the Communiqué on Technical Procedures of Wastewater Treatment Plants (AATTUT) for the reuse of treated wastewater in order to expand the usage areas of treated wastewater, to facilitate and popularise the applications, is prepared for the reuse of treated wastewater as environmental, industrial and other (fire water, dust control / field irrigation water, reuse of grey water as urinal and flush water) and the By-law entered into force after being published in the Official Gazette dated 25/10/2022 and numbered 31994.

Clean Production Practices in Textile Sector: The first step in the sectoral practices of cleaner production was taken in the textile sector, where water consumption is the most intensive, and the "Communiqué on Integrated Pollution Prevention and Control in the Textile Sector" was

published in the Official Gazette dated 14 December 2011 and numbered 28142 in order to minimise the negative impacts of the textile sector on the environment and to ensure the control of all kinds of emissions, discharges and wastes to be given to water/air/soil during production and to ensure the efficient use of raw materials and energy and the use of the best available techniques.

Textile facilities within the scope of the Communiqué with an installed capacity of over 10 tonnes/day are responsible for preparing clean production plans and reporting the developments within the framework of the targets set in the production plans.

At this point, the "Circular on Cleaner Production Practices in the Textile Sector" numbered 2022/20 was published. The Circular has been prepared in order to minimise the negative effects of textile sector activities on the environment, to prevent air and water pollution, to apply clean production technologies to reduce water and energy consumption, and contains mandatory provisions for textile facilities engaged in the production of textile materials (fibre, yarn, fabric and carpet production including nonwovens, etc.), printing and dyeing processes and all textile facilities engaged in fabric mercerisation.

Circular on Restriction in Discharge Standards in Ergene River: In accordance with Article 38 of the By-law on Water Pollution Control, "Circular on Restriction in Discharge Standards in the Ergene River" dated 26.12.2019 and numbered 2019/17 was published. With the Circular, in order to improve the water quality in the Ergene Basin, approximately 30%-40% restrictions were made in the COD parameter, which is a pollution parameter in the discharge standards in the annex of the By-law on Water Pollution Control.

Within the scope of the Circular, individual industrial facilities discharging to the Ergene Basin, domestic/urban wastewater treatment plant managements and organised industrial zones whose wastewater treatment plant construction has been completed are required to meet the restricted COD discharge standards, Organised Industrial Zones (OIZ) to be connected to the Marmara Deep Sea Discharge system are required to make their connections on the dates determined within the scope of the Circular, and until the connections are made, industrial facilities within the OIZ are required to comply with the discharge standards in the annex of the By-law on Water Pollution Control.

Circular on the Transition of Olive Oil Enterprises to 2 Phase Production: Circular No. 2023/2 on the Transition of Olive Oil Enterprises to 2 Phase Production entered into force on 23/01/ 2023. It is aimed to implement 2-phase production technologies in order to minimise the negative effects of olive oil sector activities on the environment, prevent water pollution, reduce water consumption and wastewater amount.

References

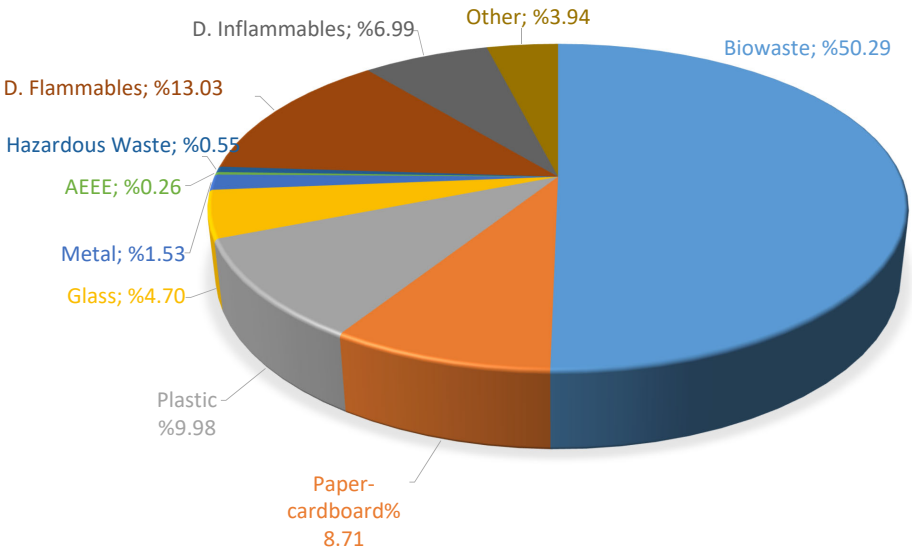
Ministry of Environment, Urbanization and Climate Change
Ministry of Culture and Tourism
Ministry of Agriculture and Forestry
Ministry of Energy and Natural Resources
Ministry of Industry and Technology
Ministry of Transport and Infrastructure
General Directorate of Meteorology
General Directorate of State Hydraulic Works
Turkish Statistical Institute

D. WASTE

D.1. Municipal Waste (Solid Waste Disposal Facilities)

Municipal waste consists of commercial, industrial and institutional waste that is generated from households or is similar in content or structure, for which the municipality is responsible for management. The general composition of municipal waste in Türkiye is given in the graph below.

Graph 47 Composition of Municipal Waste by 2023 (National Waste Management and Action Plan (2023-2035) (MoEUCC, 2024)



It is important to know the waste composition in terms of planning and implementation of the waste management system. Within the scope of the National Waste Management and Action Plan (NWMAP), province-based waste characterisation studies carried out in various periods were evaluated regionally and municipal waste characterisation data were created for each region.

Recyclable wastes can be reused as raw materials and waste of primary raw materials can be avoided. Thus, there will be no need for energy-intensive activities to extract the primary raw material and carbon emissions will be reduced by avoiding the incineration or disposal of recyclable wastes in landfill sites. In addition, energy efficiency is implemented at the highest levels in production and logistics where recycled materials are used as raw materials.

The whole of the legal legislation on the subject consists of Environmental Law No. 2872, Metropolitan Municipality Law No. 5216, Municipal Law No. 5393, By-law on Waste Management, By-law on Zero Waste, By-law on Landfilling of Wastes, By-law on Control of Excavation Soil, Construction and Demolition Wastes, By-law on Incineration of Wastes, By-law on General Principles of Waste Pretreatment and Recovery Facilities, Communiqué on Waste Collection Centres, Communiqué on Waste Derived Fuel, Additional Fuel and Alternative Raw Materials, Communiqué on Composting, Communiqué on Mechanical Separation, Biodrying, Biomethanisation Facilities and Fermented Product Management.

With the Circular No. 2003/8 issued by the former Ministry of Environment, Urbanization and Climate Change and Forestry, municipalities that can establish regional co-operation and alternative integrated waste management facilities were identified throughout the province, and rehabilitation works were initiated by closing the irregular (wild) dumping areas.

Site selection for integrated waste management facilities stands out as one of the important problems. The presence of many local administration units in the same region makes co-operation in waste management services as in other infrastructure services compulsory. Local administration union model practices encouraged by new legal By-laws draw attention as a structure that facilitates the realisation of environmental services at local level. Practices of unions established jointly by municipalities facing similar environmental problems are important in terms of using time and financial resources more efficiently.

In this framework, it is observed that waste management projects carried out by local administration unions are increasing. Moreover, within the scope of regional development policies, it is envisaged to use service unions models in solving regional scale environmental problems. As a matter of fact, establishment of service unions is recommended in EU supported regional development projects.

The amount of municipal waste collected in Türkiye is 30,283 million tonnes/year for 2022.

Table 69 Municipal Waste Amounts (TURKSTAT, 2024)

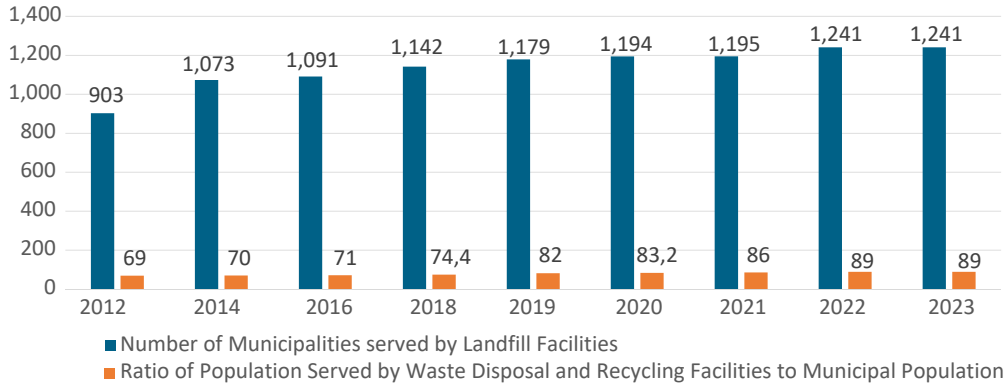
Years	Amount of Waste Collected (1,000 tonnes/year)
2016	31,584
2018	32,209
2020	32,324
2022	30,283

While wastes in Türkiye were generally dumped uncontrollably in irregular dumping areas in the previous years, nowadays, landfills are rapidly being constructed and put into operation. Following the start of sending municipal wastes to integrated waste management facilities including landfill facilities established in accordance with the relevant legislation, waste dumping to irregular dumping sites should be stopped by the relevant local administration and rehabilitated in accordance with rehabilitation projects. Preparation of rehabilitation projects by local administrations and implementation of these rehabilitation projects are ongoing.

Table 70 Number of Municipalities Served by Landfill Facilities and Population Ratio by Years (MoEUCC, 2024)

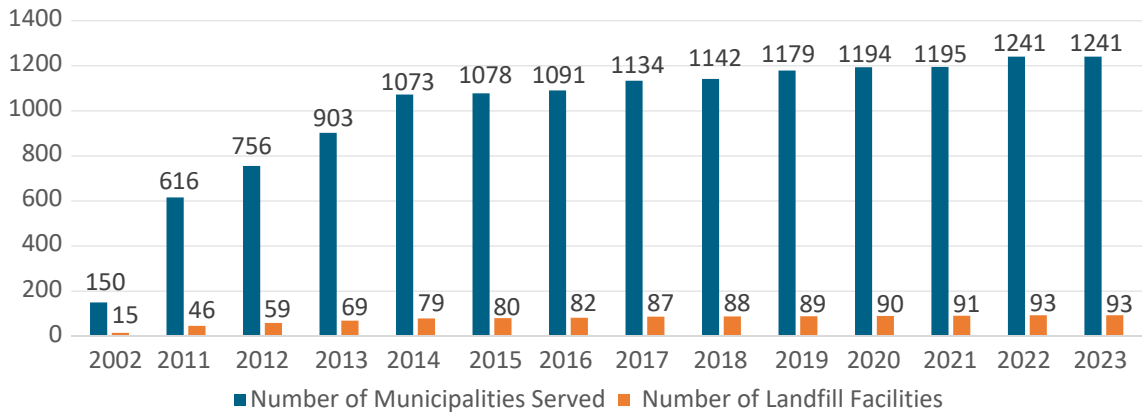
	2012	2014	2016	2018	2019	2020	2021	2022	2023
Number of Municipalities Served by Landfill Facilities	903	1,073	1,091	1,142	1,179	1,194	1,195	1,241	1,241
Ratio of Population Served by Waste Disposal and Recovery Facilities to Municipal Population	69	70	71	74,4	82	83,2	86	89	89

Graph 48 Number of Municipalities Served by Landfill Facilities and Population Ratio by Years (MoEUCC, 2024)



According to "Law No. 5491 on Amendments to the Environmental Law No. 2872", "By-law on Waste Management", "Metropolitan Municipality Law" No. 5216 and "Municipal Law" No. 5393, Municipalities within the boundaries of municipalities and adjacent areas and the highest local authority outside these areas are obliged to classify and collect separately the recyclable solid wastes within the domestic solid wastes and to take measures to ensure the disposal of domestic and domestic industrial solid wastes without harming the environment, to reduce environmental pollution, to make maximum use of landfills and to contribute to the economy.

Graph 49 Number of Landfill Facilities and Number of Municipalities Served by Years (MoEUCC, 2024)



An integrated waste management is carried out with the newly established facilities by the municipalities. In other words, all wastes collected separately from various sources by the municipality and brought to waste processing facilities can be disposed of by sending recyclable wastes to recycling, processing biodegradable wastes in waste processing facilities and storing the wastes that cannot be utilised in any way in an orderly manner, instead of being discharged

directly to the landfill site. Grant support has been provided to local governments since 2018 in order for local governments to make waste management investments and fulfil their environmental obligations in this sense.

Number of Waste Disposal and Recovery Facilities and Municipal Waste Statistics are published by TURKSTAT according to the Official Statistics Programme. (https://data.tuik.gov.tr/Bulten/Index.p=Atik- Istatistikleri-2022-49570)

D.1.1 Municipal and Biodegradable Waste Management

In Türkiye, it is the responsibility of the municipalities to establish, have established, operate or have operated the waste processing facilities where municipal wastes are processed. According to Article 11 of the Environmental Law No. 2872, Metropolitan Municipalities are obliged to establish, have established, operate or have operated municipal solid waste disposal facilities. In Türkiye, there are 30 Metropolitan Municipalities, 51 Provincial Municipalities, 922 District Municipalities and 390 Town Municipalities, totalling 1,393 municipalities.

According to Laws No. 5216 on Metropolitan Municipalities and No. 5393 on Municipalities, local governments are responsible for the planning, management and monitoring of waste generated in line with the relevant legislation. Metropolitan municipalities are responsible for performing services related to the recycling, storage and disposal of wastes and excavations, except for the collection of wastes at the source and transporting them to the transfer station; establishing, having established, operating or having operated or having operated for this purpose; carrying out services related to industrial and medical wastes, establishing, having established, operating or having operated the necessary facilities for this purpose; collecting, having collected, treating the wastes of marine vessels and making the necessary arrangements for this purpose. District municipalities other than metropolitan municipalities are obliged to collect domestic waste at source and transport it to transfer stations or disposal sites.

On the other hand, municipalities in non-metropolitan areas carry out waste collection and disposal services within the framework of union models in accordance with the Law on Local Administration Unions dated 26/05/2005 and numbered 5355 in order to ensure that local administrations are not technically, institutionally and financially sufficient and that waste management systems can be carried out more effectively and financially appropriate. The number of unions operating in this field in Türkiye is 65.

D.2. Excavation Soil, Construction and Demolition Wastes

When we look at the legal legislation in Türkiye, the determination of excavation soil and rubble dumping areas is given to metropolitan municipalities by subparagraph (i) of Article 7 of the Metropolitan Municipality Law No. 5216 and to municipalities by subparagraph (o) of Article 15 of the Municipal Law No. 5393. In addition, the "By-law on the Control of Excavation Soil, Construction and Demolition Wastes", which includes technical and administrative issues and general rules to be complied with regarding the reduction of excavation soil and construction and demolition wastes at the source, collection, temporary accumulation, transport, recovery, evaluation and disposal of excavation soil and construction and demolition wastes in a way not to harm the environment, was published in the Official Gazette dated 18 March 2004 and numbered 25406 and entered into force.

Pursuant to Article 12 of the Environmental Law, municipalities may be authorised to inspect and fine collection, transport, temporary accumulation, storage, recycling.

The MoEUCC delegated authority to Istanbul, Kocaeli, Sakarya, Gaziantep, Bursa, Ordu, Ankara, Trabzon, Antalya Metropolitan Municipalities in accordance with Article 12 of the Environmental Law for the inspection of excavation wastes and administrative sanctions under the By-law on Control of Excavation Soil, Construction and Demolition Wastes.

D.3. Packaging Waste

In Türkiye, the composition of waste is also changing with changing consumption habits, population growth, rising living standards and increase in sales of packaged products. In general, packaging wastes constitute 30% by weight and 50% by volume of discarded wastes.

The change in the waste composition is mostly a result of the increase in packaging wastes such as paper, cardboard, glass, plastic, metal, etc. in the waste. Considering that many purchased products are presented in paper, metal, glass and plastic packaging materials, separate collection of wastes at source and recycling of these materials to the economy constitutes an important step in waste management.

In order to reduce the environmental pollution caused by packaging wastes, which have an important place among the wastes in Türkiye, and to transform them into economic values, necessary legal and technical arrangements have been made and the legislation, which has been put into force in a narrower scope since 1991, was started to be implemented in 2005 with the harmonisation of the European Union Packaging and Packaging Waste Directive 1994/62/EC. The legal, administrative and technical principles for the separate collection, collection, transport, separation and recycling of packaging wastes at source within a certain management system are determined by the "By-law on the Control of Packaging Wastes (AAKY)" published in the Official Gazette dated 26/06/2021 and numbered 31523 by the MoEUCC.

AAKY includes the provision of "Packaging wastes are collected in accordance with the zero waste management system practices and Provincial Zero Waste Management System Plans based on the provisions of the Zero Waste By-law." and recyclable wastes are managed within the scope of the By-law on Zero Waste.

With the By-law regulated with the main purpose of protecting and improving the environment;

- It is stated that it is essential to reduce the amount of waste to be disposed of by primarily reusing, recycling, recovering and/or using packaging waste as an energy source,
- By-laws have been made to collect packaging wastes within the zero waste management system based on the provisions of the Zero Waste By-law, to take material recycling as a basis in the recovery of packaging wastes, not to send recyclable packaging wastes to landfill facilities, and not to accept recyclable packaging wastes by landfill facilities,
- Regulatory measures have been taken to reduce environmental risks in the production and consumption of packaging, especially plastic bags and other disposable packaging, and to develop clean products and technologies in the production of packaging,
- Within the scope of the principle of extended producer responsibility, the duties and obligations of packaging producers, packaged product marketers and sales points have been determined, the minimum conditions that the packaging should have and the marking-labelling obligations for these packages have been defined, and it has been stated that the

financial responsibilities within the scope of the principle of "extended producer responsibility" for the packages placed on the market after 01/01 /2020 will be fulfilled only through the recovery contribution share application,

- By stating that the procedures and principles regarding the implementation of the deposit management system will be determined by the Turkish Environment Agency and that the Agency will act as the "deposit system manager", By-laws have been made for the Agency's activities other than deposits on packaging and packaging wastes,
- It is regulated that the mandatory Deposit Management System applications will be started as of 01/01/ 2022 with priority for glass, PET and aluminium beverage packages, and it has been stated that the evaluations and By-laws regarding the deposit management system will be made by the Turkish Environment Agency,
- It is regulated that the existing packaging waste management plan practices of the municipalities will continue to be maintained until their transition to zero waste management system practices in line with the Zero Waste By-law,
- It is regulated that existing packaging waste collection-separation and recovery facilities will be able to continue their activities until the MoEUCC makes a new By-law in this direction,
- A provisional article has been amended stating that marketers and existing authorised institutions will fulfil their obligations regarding the recycling and/or recovery targets remaining from the repealed By-law on Control of Packaging Wastes in line with the procedures and principles to be determined separately by the MoEUCC.

In order to achieve the recovery and recycling targets with the current By-law, marketers are required to pay a recovery contribution share according to the type and amount of packaging they place on the market within the scope of extended producer responsibility. The procedures and principles regarding the fulfilment of the obligations of the marketers are set out in the "By-law on Recovery Contribution Share" published in the Official Gazette dated 31/12/2019 and numbered 30995 fourth repeated.

The Environment Agency was established with the "Law on the Establishment of the Turkish Environment Agency and Amendments to Certain Laws" dated 24/12/2020 and numbered 7261. While the Environment Agency is the manager of the deposit management system, it is also tasked with taking the necessary actions for stakeholders to fulfil their duties and responsibilities regarding other packaging.

With the current By-law, it should be ensured that the total recycling and recovery targets should be achieved throughout the country as of 2021, regardless of the type of material, at least at the following rates.

Table 71 Packaging Waste Recovery Targets (MoEUCC, 2021)

Years	Total Recovery Rate (%)	Total Recycling Rate (%)
For each year between 2021 and 2025 (including 2025)	60	55
For each year between 2026 and 2030 (including 2030)	-	65
2031 and after	-	70

With the current By-law, it should be ensured that at least the following material type-based annual recycling rates are achieved throughout the country as of 2021.

Table 72 Material-Based Recycling Rate (%) (MoEUCC, 2021)

Years	Annual Recycling Rate Based on Material Type (%) (Including Preparation for Reuse)				
	Glass	Plastic	Metal	Paper/Card-board	Wood
Until 2026	70	55	60	75	25
Until 2031	75	55	70	85	30
2031 and after	75	55	70	85	30

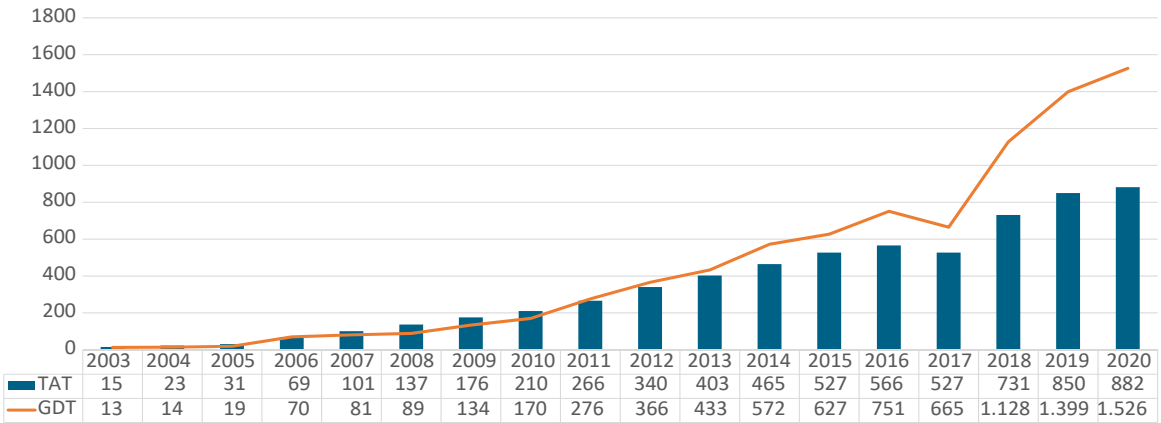
Composite packages are subject to evaluation within the scope of Material Based Recycling Rates in terms of the type of material in the composition of the unit package and constituting the highest amount by weight.

A healthy and sustainable waste management system requires that recyclable wastes are collected separately at source without mixing with garbage and that the recovery process is carried out in an organised structure. With the recycling process, it is possible to protect natural resources, prevent waste of resources and reduce the amount of waste to be disposed of. In addition, both the amount of waste going to landfill can be reduced and recyclable wastes can be brought into the economy as raw materials. For this purpose, separation of packaging wastes at source is accepted as a principle in the By-law and a system for separate collection has been established.

Within this system defined in the By-law, since municipalities are responsible for the collection of wastes under the Metropolitan Municipality Law No. 5216 and Municipality Law No. 5393, the responsibility of separate collection and transport of packaging wastes at source is also assigned to municipalities.

According to the By-Law, packaging waste collection-sorting facilities and recycling facilities have to obtain a licence from the MoEUCC. The licence application was started for the first time in 2003. The distribution of licenced facilities by years is given in Graph 50.

Graph 50 Number of Packaging Waste Processing Plants with Temporary Activity Certificate/Licence (MoEUCC, Packaging and Packaging Waste Bulletin 2020, 2022)

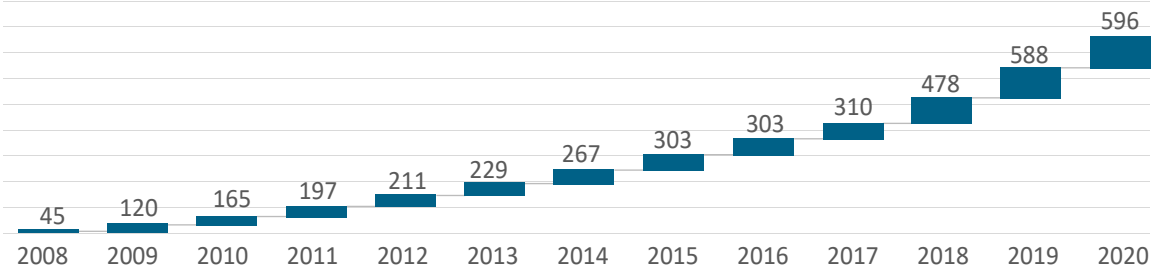


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
TAT	15	23	31	69	101	137	176	210	266	340	403	465	527	566	527	731	850	882
GDT	13	14	19	70	81	89	134	170	276	366	433	572	627	751	665	1.128	1.399	1.526

Before the By-law on Packaging Waste Control was published on 26 June 2021, municipalities were preparing a packaging waste management plan to ensure effective management of packaging waste. The number of municipalities with approved packaging waste management plans

between 2015-2020 is given in Graph 51. While 45 municipalities' plans were approved in 2008, it reached 596 in 2020.

Graph 51 Number of Municipalities with Approved Packaging Waste Management Plan (2020 Packaging Bulletin, MoEUCC, 2022)



Municipalities are obliged to collect or have packaging wastes collected according to the By-law. In order to carry out these activities, they prepare and submit their packaging waste management plans to the MoEUCC in order to specify by whom, how, in what way and when the accumulation, collection and transport of packaging wastes separately from other wastes at the source will be carried out. These studies, which were initiated for the first time in 2008, continue.

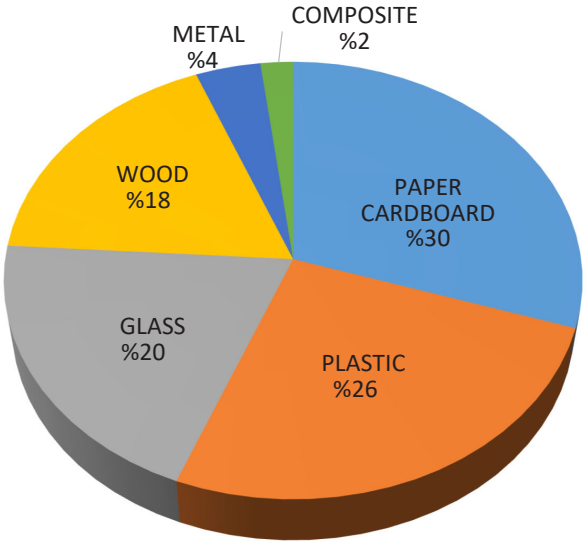
The results obtained from the users who entered data into the packaging information system regarding packaging production, amounts and rates of packaging placed on the market based on intended use, amounts and recovery rates of packaging waste recovered are given in the following Table and Graphic.

Table 73 2020 Packaging and Packaging Waste Statistics Results (MoEUCC, (Packaging and Packaging Waste Bulletin 2020, 2022), 2022)

Waste Code	Type	Packaging Produced (tonnes)	Within the Scope of B-1[1]			Released to the Market under B-2[2] (tonnes)	Covered under C[3] (tonnes)
			Released to the Market (tonnes)	Recovered (tonnes)	Realized Recovery Rate (%)		
15.01.02	Plastic	2,870,185	926,551	615,988	66	99,540	15,755
15.01.04	Metal	525,627	129,545	72,666	56	73,503	15,828
15.01.05	Composite	273,495	95,412	66,973	70	9,159	26
15.01.01	Paper Cardboard	3,260,126	1,198,603	1,079,857	90	28,820	11,550
15.01.07	Glass	1,742,759	802,067	242,226	30	65,428	109,339
15.01.03	Wood	776,551	555,152	222,714	40	2,026	98,500
	Total	9,448,743	3,707,329	2,300,425	62	278,476	250,998

1) B-1: Packages whose disposal is carried out within the framework of the PWC By-law
2) B-2: Packages whose disposal is carried out within the framework of legislation other than the PWC By-law
3) C: Packages placed on the market with deposit under the PWC By-law

Graph 52 Ratios according to types of packaging placed on the market within the scope of B-1 in 2021 (MoEUCC, Packaging and Packaging Waste Bulletin 2021, 2023)



Within the scope of the By-law on Packaging Waste Control (PWC), "Packaging Information System" has been established by the MoEUCC in order to create an inventory on packaging and packaging waste. The users of the system are the Ministry of Environment, Urbanization and Climate Change, Provincial Directorates of Environment, Urbanization and Climate Change, packaging producers, suppliers, enterprises placing their products on the market with packaging, packaging waste collection, sorting, recycling and recovery facilities, authorised institutions and municipalities. Since 2005, all data such as production, sales and recycling quantities of packaging from packaging producers, marketers of packaged products and licensed enterprises have started to be recorded by the MoEUCC.

Since 2012, the Packaging Statistics newsletter includes data on packaging producers, marketers, suppliers, licensed enterprises that collect-separate and recycle/recover packaging wastes, packaging produced, imported, exported, supplied, placed on the market with packaging, packaging wastes collected-separated and recycled, and data on packaging waste management in municipalities.

On the other hand, within the scope of the By-law on Packaging Waste Control published in the Official Gazette dated 26.06.2021 and 31523, data on packaging producers, marketers and suppliers, packaging produced, imported, exported, supplied, packaging placed on the market will be included in the Packaging Statistics bulletin to be prepared starting from 2023, and data on packaging wastes will be published under the Non-Hazardous Waste Statistics Bulletin.

Furthermore, since 2008, data on packaging and packaging waste have been officially published in annual bulletins in February.

Starting from 2021 statistics, it has been decided to produce packaging waste statistics from the declarations in the Waste Declaration System, which is carried out under the responsibility of the General Directorate of EIA, Permit and Inspection of the MoEUCC. In this context, the amounts of packaging waste declared by waste generators in the Waste Management Application waste declaration system in 2021 are given in the following table.

Table 74 Amount of Packaging Waste in 2021 (tonnes) (MoEUCC, Waste Statistics Bulletin, 2021)

Waste Code	150101	150102	150103	150104	150105	150107	Total
Type	Paper Cardboard	Plastic	Wood	Metal	Compo-site	Glass	
Waste Amount (tonnes)	452,160	187,479	251,658	16,250	8,643	30,967	947,157

D.4. Hazardous and Non-Hazardous Wastes

According to the Environmental Law, wastes and substances contaminated with these wastes that cause deterioration of the ecological balance and natural structures of humans and other living things by having a negative physical, chemical and / or biological effect are called hazardous wastes.

Hazardous wastes are wastes that have one or more of the hazardous characteristics listed in Annex-3/A of the By-law on Waste Management and have an asterisk (*) next to the six-digit waste code in Annex-4 of the By-law on Waste Management.

While recovering and disposing of these wastes, measures should be taken to prevent harm to human and environmental health. For this reason, it is obligatory to obtain a licence from the MoEUCC for the recovery and disposal of hazardous wastes. In addition to this, the companies that will transport hazardous wastes must also obtain a hazardous waste transport licence.

Waste data consists of the declarations made by waste generators to the MoEUCC Waste Declaration System (TABS) and includes the waste data generated at the waste generator's facility and sent to the waste treatment facility for recovery/disposal in the declaration year.

Table 75 Number of Facilities Declaring to Waste Declaration System between 2019-2021 and Amount of Hazardous and Non-Hazardous Waste (MoEUCC, Waste Statistics Bulletin, 2021)

	2019	2020	2021
Number of Declared Facilities	76,496	82,053	105,103
Total Amount of Hazardous Waste* (tonnes)	1,650,106	1,856,371	3,031,048
Total amount of non-hazardous waste *	23,678,313	27,853,863	29,635,926

* Mining sector wastes are not included in the sum.

Table 76 Amount of Waste by Waste Processing Method between 2019-2021 (Tonnes) (MoEUCC, Waste Statistics Bulletin, 2021)

Year	Recovery	Disposal	Stock	Export	Total
2019	12,605,373	7,981,748	4,601,820	139,478	25,328,419
2020	15,074,363	13,686,550	645,949	303,372	29,710,234
2021	17,569,247	14,017,774	837,222	242,731	32,666,974

D.5. Waste Mineral Oils

With the "By-law on Waste Oil Management" published in the Official Gazette dated 21.12.2019 and numbered 30985, it is aimed to ensure the protection of the environment and human health and the efficient use of natural resources by determining the technical and administrative

principles regarding the temporary storage, collection, transport, refining, energy recovery and disposal of waste oils with the objectives of increasing the amount of waste oil collected, preventing the illegal use of waste oil, using the base oil obtained from waste oil in the production of lubricants with high added value, strengthening the technical capacity of existing and newly established facilities and ensuring an effective waste oil management.

In Türkiye, the concept of trial production has been introduced during the licensing of the facilities where the waste oils collected are refined. It is ensured that waste oils are processed in high-tech clean production facilities. The system has been strengthened by making arrangements to protect the environment and human health and to ensure a more effective waste oil management by collecting waste oils only by refining facilities.

With the circular economy approach adopted on an international scale, In addition to the prevention of waste generation, it is aimed to use waste as a resource and thus to obtain less raw materials from nature, to use natural resources in a more controlled manner, to use the wastes generated as a result of production processes as raw materials or to use recycled materials (products produced from waste) in the production of other products in order to provide economic benefit from wastes instead of disposing them by methods such as storage and incineration. Within the scope of the By-law on Waste Oil Management, producers are obliged to use base oil produced from waste oil in lubricant production. Lubricant producers are obliged to use base oil produced from waste oil in their production at a rate of 2% for 2023 and at increasing rates in other years.

Collection and transport of waste oils by unauthorised third parties is prohibited. Mineral waste oils must be collected and transported by authorised institutions and waste oil refining facilities that have received waste oil collection authorisation from the Ministry of Environment, Urbanization and Climate Change and these facilities contribute to our economy by obtaining high added value base oil.

Engine Oil Change Point Permit Certificate is issued to the enterprises where engine oil is changed. Engine oil changes of vehicles registered to traffic are recorded at engine oil change points and the accumulated oils are sent to refining facilities. Total waste oil data consists of the declarations made by waste generators to the MoEUCC Waste Declaration System and includes the waste generated at the waste generator's facility in the declaration year and sent to the waste treatment facility for recovery/disposal.

Table 77 Total amount of waste oil between 2019-2021 (tonnes) (MoEUCC, Waste Statistics Bulletin, 2021)

	2019	2020	2021
Total Waste Oil Amount (tonnes)	70,878	67,379	52,168

D.6. Waste Battery and Accumulators

By-law on Control of Waste Batteries and Accumulators (WBAC) was published in the Official Gazette dated 31.08.2004 and numbered 25569 and entered into force as of 01.01.2005. With the said By-law, issues regarding the marking and labelling of battery and accumulator products are determined and restrictions are imposed on the amount of harmful substances in the production and import of these products.

In the By-law on Control of Waste Batteries and Accumulators, a quota application, which is defined as the collection of waste batteries at a rate corresponding to the amount of batteries

placed on the market, has been introduced for the collection of waste batteries. With this application, collection rates starting from 15% for Group I batteries (batteries other than nickel cadmium and mercury oxide batteries) and ending with 40% at the end of the fifth year (for 2010), and starting from 25% for Group II batteries (nickel cadmium and mercury oxide batteries) and ending with 80% at the end of the fifth year (for 2010) have been determined for a 5-year period, with rates varying according to years. Collection rates are applied in the following years at the rates to be determined by the MoEUCC.

In order to ensure that waste accumulators are returned to the producer for recovery, producers must apply a deposit on the sale of accumulators. In this respect, pursuant to Article 29 of the By-law, quota and deposit rates have been determined with the provisions of "Waste accumulators subject to deposit application must be collected, recovered and disposed of at a rate not less than 70% in the first year, 80% in the second year and 90% in the third year following the date of entry into force of this By-law and the relevant documents must be submitted to the Ministry together with the deposit applications every year".

In this context, in the determination and implementation of national strategies and policies for the management of batteries and accumulators and their wastes, in accordance with the principle of extended producer responsibility in Article 18 of the By-law on Waste Management and the polluter pays principle in Article 8 of the Environmental Law No. 2872, within the scope of extended producer responsibility, waste management is ensured by sharing responsibility for battery and accumulator producers/authorised institutions, marketers and suppliers, sales points and other relevant stakeholders.

Taking into account the 2053 Net Zero and Green Transformation targets of Türkiye, joint studies have been initiated by the MoEUCC together with the relevant public institutions and organizations on the transposition of the EU By-law No. 2023/1542/EU, which introduces obligations that will concern the entire life cycle of all types of batteries, including electric vehicle batteries, from design to waste (Digital Passport, Obligation to Use Recovered Content, etc.) and provides for the management of batteries/waste batteries, into our national legislation.

On the other hand, the materials contained in electric vehicle batteries may contain toxins harmful to the environment due to mercury, cadmium, lithium, nickel, other heavy metals, flammable and explosive chemicals.

Proper management of electric vehicle batteries (determining conditions such as transport, temporary storage, etc.) and recycling can prevent the release of these toxins into the environment and enable the reuse of resources. Total waste batteries and accumulators data consists of the declarations made by waste generators to the MoEUCC Waste Declaration System (TABS) and includes the waste generated at the waste generator's facility in the declaration year and sent to the waste treatment facility for recovery/disposal.

Table 78 Total amount of waste batteries and accumulators between 2019-2021 (tonnes) (MoEUCC, Waste Statistics Bulletin, 2021)

	2019	2020	2021
Total Waste Battery and Accumulator Amount (tonnes)	32,230	32,601	33,872

D.7. Vegetable Waste Oils

Vegetable waste oils are currently managed by the By-law on the Control of Vegetable Waste Oils published in the Official Gazette dated 06/06/2015 and numbered 29378. In general, the oils generated after the use of oils obtained from oilseeds such as olive, sunflower, corn, cotton, soya, canola, safflower are considered as vegetable waste oil.

It is essential to reduce vegetable waste oils at the source and to ensure recovery by collecting them separately. It is forbidden to mix vegetable waste oils directly or indirectly with cooking oils and crude oils, and to pour them into receiving environments such as garbage, sink, soil, water, etc. Vegetable waste oils generally originate from catering companies, restaurants, cafes, public institutions and households.

Institutions, organizations or enterprises producing vegetable waste oil are obliged to make an annual contract with environmentally licensed recovery facilities or vegetable waste oil interim storage facilities for the collection of these oils. Vegetable waste oil producers are obliged to collect vegetable waste oils separately from other waste materials and garbage by using leak-proof, corrosion-resistant collection containers and send them to processing facilities to ensure the recovery of vegetable waste oils by licensed carriers.

Vegetable waste oils are collected and processed directly from waste generators through interim storage facilities or by recovery facilities. Vegetable waste oils from households are collected through the collection system established by municipalities and sent to recovery facilities. Vegetable waste oils processed by recovery facilities with environmental licences are converted into biodiesel products. The biodiesel obtained is blended with the diesel oil marketed in Türkiye at a rate of five per thousand and put into use.

In this context, efforts are being made to increase the amount of collection by establishing a more effective collection system for vegetable waste oils generated in Türkiye and to obtain high value-added products by processing them in high-tech facilities and utilising them in biofuel production. Total vegetable waste oil data consists of the declarations made by waste generators to the MoEUCC Waste Declaration System (TABS) and includes the waste data generated at the waste generator's facility and sent to the waste treatment facility for recovery/disposal in the declaration year.

Table 79 Total Amount of Vegetable Waste Oil between 2019-2021 (tonnes) (MoEUCC, Waste Statistics Bulletin, 2021)

	2019	2020	2021
Total Amount of Vegetable Waste Oil (tonnes)	17,006	13,008	16,680

D.8. Polychlorinated Biphenyls and Polychlorinated Terphenyls

Administrative and technical procedures and principles for ensuring the complete elimination of used polychlorinated biphenyls (PCBs) and polychlorinated biphenyl-containing substances and equipment without harming the environment and human health are carried out within the scope of the "By-law on the Control of Polychlorinated Biphenyls and Polychlorinated Terphenyls" published in the Official Gazette dated 27/12/2007 and numbered 26739.

Preparation of inventory of Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCB/PCT), used PCBs and PCB-containing substances and equipment, obligations of the holders, carriers, temporary storage, decontamination and/or disposal operators are determined by the By-law. It is obligatory to ensure the decontamination or disposal of Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCB/PCT), used PCBs and PCB-containing equipment. PCBs are waste types that tend to remain in the environment for a long time because they are highly resistant to degradation. They are known to have negative effects on the environment and human health. During the transport of such wastes, all materials contaminated with PCBs are processed and disposed of within the scope of hazardous waste. Expenses incurred for the elimination of any environmental damage arising from the management of PCBs shall be borne by the real or legal persons causing pollution according to the "polluter pays" principle. Those who hold PCB-containing substances and equipment are obliged to register them in the PCB inventory of the MoEU. Used PCBs and PCB-containing substances and equipment must be decontaminated or disposed of by the end of 2025.

D.9. End of Life Tyres (EoLT)

The principles regarding the management of end-of-life tyres generated in Türkiye are carried out under the By-law on Control of End-of-Life Tyres. Original or retreaded tyres, which are removed from the vehicle by determining that they have completed their useful life and cannot be used as tyres on the vehicle again, and discarded tyres generated during production are defined as end-of-life tyres and must be recycled.

It is forbidden to use end-of-life tyres as filling material in valleys or pits, to accept and store them in solid waste storage facilities, to use them for heating, to burn them in a way to cover demonstrations and similar acts. It is essential to ensure the recovery of end-of-life tyres.

In order to ensure the management of end-of-life tyres in harmony with the environment with the zero waste approach and circular economy principle in Türkiye, manufacturers and importers, which are obliged within the scope of producer responsibility, are obliged to ensure that the wastes they collect are sent to licensed recycling facilities by creating their own waste management plan.

End-of-life tyres collected by authorised carriers throughout Türkiye are primarily used in material recovery facilities to obtain rubber granules, steel wire and textile particles by physical crushing method, and rubber granules are used in regenerated rubber, shoes and shoe soles, sports and playgrounds, furniture parts, floor covering materials. End-of-life tyres that cannot be processed in material recovery facilities are sent to cement factories to be used as additional fuel for energy recovery.

End-of-life tyres have become an important raw material and energy source as raw materials such as pyrolytic oil and carbon black are obtained as a result of the recovery and processing of end-of-life tyres. Recently, there has been an increase in the number of material recovery facilities and pyrolysis facilities in Türkiye to recover end-of-life tyres, but the amount of EoLT collected in Türkiye remains far below the current waste processing capacities of the facilities. For this reason, it is aimed to increase the amount of collection by establishing a more effective collection system for end-of-life tyres in the future.

End-of-life tyre data consists of the declarations made by waste generators to the MoEUCC Waste Declaration System (TABS) and includes the waste data generated at the waste generator's facility and sent to the waste treatment facility for recovery/disposal in the declaration year.

Table 80 End-of-Life Tyres Collected between 2019-2021 (tonnes) (MoEUCC, TABS, 2024)

	2019	2020	2021
End-of-Life Tyres (tonnes)	28,907	20,601	31,422

D.10. Waste Electrical and Electronic Equipment

"By-law on the Management of Waste Electrical and Electronic Equipment" was regulated within the framework of the harmonisation of the legislation of Türkiye with the current European Union legislation (2012/19 / EU, WEEE), taking into account our national scale strategies and policies, and published in the Official Gazette dated 26/12/2022 and numbered 32055.

With the said By-law, it is aimed to regulate the administrative, legal and technical procedures and principles for the following for the protection of the environment in a sustainable way:

- Based on the principles of circular economy and resource efficiency, determination of reuse, recycling and recovery methods and targets to prevent the generation of waste electrical and electronic equipment (WEEE), to collect WEEE separately when it cannot be prevented, and to reduce the amount of WEEE to be disposed of,
- Managing waste electrical and electronic equipment within a specific management system, including the zero waste management system, in a way that does not harm the environment and human health,
- Determining the framework for the implementation of extended producer responsibility for producers of electrical and electronic equipment.

Within the collection systems defined in the "By-law on the Management of Waste Electrical and Electronic Equipment" for the collection of waste electrical and electronic equipment, obligations are imposed on environmentally licensed facilities, distributors, producers and competent authorities.

Waste electrical and electronic equipment data consists of the declarations made by waste generators to the MoEUCC Waste Declaration System (TABS) and includes the waste data generated at the waste generator's facility in the declaration year and sent to the waste treatment facility for recovery/disposal.

Table 81 Total Amount of Waste Electrical and Electronic Equipment between 2019-2021 (MoEUCC, Waste Statistics Bulletin, 2021)

	2019	2020	2021
Total Waste Electrical and Electronic Equipment (tonnes)	46,360	67,153	52,129

Manufacturers shall organise take-back campaigns at least once a year for the collection of waste electrical and electronic equipment, regardless of the brand, model, manufacturer and content, individually and/or in cooperation with distributors, and shall announce them to the public through appropriate communication channels, including social media.

On the other hand, the relevant sector is registered by the MoEUCC through the "Electrical and Electronic Equipment (EEE) Information System" within the scope of the said By-law and the reports on their activities are monitored through this system, thus enabling more effective implementation of the By-law by the sector.

D.11. End of Life Vehicles

The End-of-Life Vehicles Directive 2000/53/EC dated 18 September 2000, which sets out the strategy for the management of end-of-life vehicles of the European Union, to which we are in the process of membership candidacy, is included in Türkiye's National Programme for the Adoption of the EU Acquis in the section "directives to be harmonised first".

Within the scope of the harmonisation of the said directive to our national legislation, it is aimed to prevent the generation of waste from vehicles in order to protect the environment and human health, to reduce the amount of waste to be disposed of by reuse, recycling and recovery processes of end-of-life vehicles and their parts.

"By-law on Control of End-of-Life Vehicles" was prepared and published on 30/12/2009 within the scope of harmonisation of the above-mentioned Directive with our national legislation. The By-law covers vehicles in the categories M1 (motor vehicles for passenger transport with a maximum seating capacity of 8 persons, excluding the driver), N1 (motor load carrying vehicles with a maximum mass not exceeding 3,500 kg), three-wheeled vehicles other than motorcycles and motor bicycles and their parts.

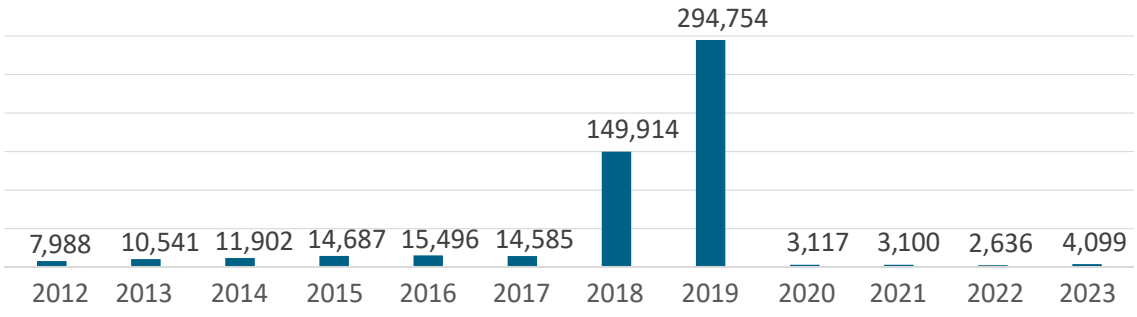
In Türkiye, there are 97 delivery points authorised by the MoEUCC 2024 data and 105 temporary storage areas with GFB and permit-licence from the Ministry as of the end of 2023. End-of-life vehicles are delivered to licensed facilities and recorded with the End-of-Life Vehicles Disposal Tracking System (EoLV System).

The number of vehicles registered for scrapping through the EoLV System is 3,117 for 2020, 3,100 for 2021, 2,636 for 2022 and 4,099 for 2023. Looking at the numbers, the effects of the ÖTA-discounted scrap incentive scheme implemented between 27/03/2018 and 31.12.2019 can be seen in Graph 53.

Table 82 Number of Vehicles Registered for Scrapping through the End-of-Life Vehicle Disposal Tracking System (MoEUCC, 2024)

YEARS	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of registered EoLVs	7,988	10,541	11,902	14,687	15,496	14,585	149,914	294,754	3,117	3,100	2,636	4,099

Graph 53 Number of registered EoLVs (MoEUCC, 2024)



D.12. Non-Hazardous Waste

D.12.1. Iron and Steel Industry and Slag Waste

In the "Waste Statistics, 2022" Newsletter published on the website of TURKSTAT Corporate (tuik.gov.tr), the amount of waste generated by the manufacturing industry sub-sectors is presented in the table "Table-1 Manufacturing industry sub-sectors waste statistics".

D.12.2. Thermal Power Plants and Ash

According to the "Waste Statistics, 2022" News Bulletin published on the website of TURKSTAT Corporate (tuik.gov.tr), "A total of 27.8 million tonnes of waste, 10.5 thousand tonnes of which is hazardous, was generated in thermal power plants.

Table 83 Waste Statistics of Thermal Power Plants, 2020-2022 (Tonnes) (TURKSTAT, 2024)

Thermal power plants waste statistics, 2020, 2022	Tonnes	
	2020	2022
Amount of total waste	**24,375,356**	**27,815,548**
Amount of non-hazardous waste	24,365,343	27,805,036
Ash and slag waste	19,362,267	22,956,942
Other wastes(1)	5,003,077	4,848,093
Amount of hazardous waste	10,012	10,512
Amount of waste by waste treatment methods		
Disposed of in ash disposal area/ash dam/controlled landfilled sites	20,929,936	24,453,948
Sold/sent to licenced waste treatment facilities/backfilling of mines and quarries	3,227,052	3,157,193
Disposed of by other methods(2)	218,368	204,406

TurkStat, Waste Statistics, 2022
Figures in table may not add up to the totals due to rounding.

(1) Includes metal, paper, glass, plastic waste, wastewater treatment sludges, household and similar wastes.
(2) Includes wastes temporary stored in the establishment site, wastes collected by municipalities etc.

Of the total non-hazardous waste, 82.6% is ash and slag waste and 17.4% is other waste. While 87.9% of the total waste was disposed of in ash mountain, ash dam or sanitary landfill facilities, 11.4% was sent to licensed facilities or used in backfilling of mines/quarries and 0.7% was disposed of by other methods.

D.13. Medical Waste

In Türkiye, the principles regarding the safe management of medical wastes are determined by the "By-law on Control of Medical Wastes". The By-law covers the medical wastes generated as a result of the activities of health institutions and the principles regarding the separate collection of these wastes where they are generated, their transport within the health institution, temporary storage, transport to the medical waste processing facility and disposal. Infectious wastes, pathological wastes and sharp-piercing wastes are defined as medical waste. All persons, institutions

and organizations that generate medical waste as a result of their activities are defined as health institutions.

It is forbidden to discharge medical wastes directly or indirectly into the receiving environment in a way to harm the environment and human health. It is essential that medical wastes are not mixed with other wastes such as hazardous, non-hazardous, municipal or packaging wastes. Medical wastes must be collected, temporarily stored, transported and disposed of separately from other wastes at the source.

Those involved in the collection, transport, temporary storage and disposal of medical waste are jointly and severally liable for impacts caused by environmental pollution and degradation caused by medical waste. Persons, institutions/organizations responsible for the management of medical waste are obliged to take the necessary measures to reduce the harmful effects of these wastes on the environment and human health. Health institutions are obliged to meet the necessary expenses for the collection, transport, sterilisation and disposal of their wastes.

The responsibility for separate collection of medical waste at source, transport and temporary storage of medical waste within the health institution belongs to the health institutions; the responsibility for taking the wastes from medical waste temporary storages/containers, transporting/having transported them to the medical waste processing facility, sterilisation and/or disposal, establishing/having established, operating/having operated a medical waste processing facility for this purpose belongs to metropolitan municipalities in metropolitan areas, municipalities in other areas or persons and institutions to which they have delegated their authority.

Infectious wastes and sharp-piercing wastes can be rendered harmless by sterilisation. Medical wastes can also be disposed of by incineration. However, due to factors such as the high investment and operating costs of incineration plants, difficulties in the treatment of flue gases such as dioxin and furan that will be formed as a result of combustion, and the separate disposal of wastes that are considered hazardous wastes, wastes that are rendered harmless by sterilisation and lose their medical waste quality can be disposed of in Class II sanitary landfills instead of incineration of medical wastes.

Provided that it complies with the provisions of the By-law, the medical waste fee to be based on collection, transport, sterilisation and disposal expenditures shall be determined and announced by the local environmental board of the province where the medical waste is generated each year and notified to the Ministry. In the determination of the medical waste disposal fee, the transportation distance of the waste to the sterilisation and/or disposal facility and the sterilisation and/or disposal costs are taken into consideration.

From 2017 to 2021, Medical Waste Statistics were prepared based on the declarations made to the Waste Declaration System (TABS) of the Ministry of Environment, Urbanization and Climate Change (MoEUCC) within the scope of the annual study between the MoEUCC and the Turkish Statistical Institute and published in the bulletin prepared under the common logo of the two institutions. Within the scope of the Official Statistics Programme, medical waste statistics were transferred to the responsibility of the MoEUCC as of 2021 statistics. In this context, medical waste statistics for 2021 are prepared by the Directorate General of EIA, Permit and Inspection of MoEUCC and published on the website of the Directorate General under the title of "Medical Waste Statistics Bulletin".

The amount of medical waste in 2019 and 2020 given in Table 84 includes the data of health institutions (university, maternity and general purpose hospitals and clinics) declaring to MoEUCC TABS, and the amount of medical waste in 2021 includes the data of all waste generators declaring medical waste.

Table 84 Amount of Medical Waste in 2019-2021 (tonnes) (TURKSTAT, MoEUCC -TABS, 2024)

	2019	2020	2021*
Number of Health Institutions	1,524	1,536	
Number of Facilities Declaring Medical Waste			17,935
Amount of Medical Waste (Tonnes)	90,920	110,000	135,869
Disposed in Incineration Plants (Tonnes)	7,910	10,340	16,650

(TURKSTAT, Medical Waste and Waste Statistics Bulletins, 2019 and 2020)
*Data for 2021 Data generated by the MoEUCC in line with the medical waste declarations of waste generators

D.14. Alternative Raw Material

The wastes generated as a result of the activity of a facility, which are equivalent to raw materials in terms of mineral properties, can be used as alternative raw materials and natural resources are protected by using them instead of natural raw materials. Technical, administrative and general rules and principles regarding the use of wastes as alternative raw materials are determined by the "Communiqué on Waste Derived Fuel, Additional Fuel and Alternative Raw Materials" published in the Official Gazette dated 20/06/2014 and numbered 29036.

As alternative raw materials, wastes containing silica, aluminium, iron oxide and/or calcium oxide such as construction wastes, treatment sludges, mining wastes are used as substitutes for natural resources by facilities producing cement, concrete, lime, brick, tile and ceramics. Thus, instead of sending the wastes to disposal facilities, they are brought into the economy and managed effectively by reusing or recycling them as much as possible in accordance with the waste hierarchy. At the same time, waste disposal costs are reduced, the amount of waste sent to landfill is reduced and the service life of landfill facilities is extended.

Facilities that will use the wastes generated as a result of the activity of a facility as alternative raw materials are exempted from the environmental licence application, while they are obliged to apply with the necessary information and documents and obtain approval from the MoEUCC. In line with the "Waste Recovery" awareness, 81 waste codes in the cement sector, 15 in the brick sector, 4 in the ceramic sector, 6 in the concrete sector and 3 in the lime sector were approved for alternative raw material use.

D.15. By-Product

The concept of by-product defined by the Waste Framework Directive 2008/98/EC has started to be implemented with the By-law on Waste Management. It is ensured that the evaluable materials arising from industrial facilities are utilised in a way to contribute to the economy as by-products instead of being disposed of as waste. With the by-product concept, which also forms the basis of industrial symbiosis practices, it is ensured that waste is transformed into economic value and managed within the framework of circular economy policies by increasing the use of waste instead of natural resources.

Substances or materials arising in the production process, but for which the main purpose is not the production of this substance;

- If it is produced as an integral part of the production process and is included as a product / by-product in the capacity report,
- If the demand for its use in the future is continuous,
- If it can be used directly in a process and does not undergo other processes, except physical processes, at the place of production,
- If it is documented that the substance to be substituted complies with the standards of the substance to be substituted or that the final product does not deteriorate the product standard if it is used as raw material,
- If precautions are taken in its use that will not harm the environment and human health, it is not considered as waste, but can be recognised as a by-product.

By the end of 2023, 7 different types of waste from 10 facilities were approved for use as by-products.

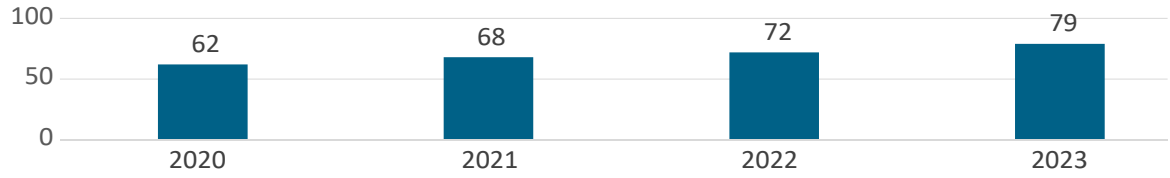
D.16. Mining Waste

The procedures and principles regarding the management of wastes generated as a result of exploration, extraction, preparation/enrichment or storage of mines in Türkiye in a way that does not harm the environment and human health from production to final disposal are carried out within the scope of the By-law on Mining Waste published in the Official Gazette dated 15/07/2015 and numbered 29417.

Beneficiation wastes released during mineral ore processing activities and acid-generating waste from mine excavation/extraction are stored in mining waste disposal facilities licensed by the MoEUCC. Mining waste storage facilities are monitored by the MoEUCC from the beginning to the end of the construction works and "Mining Waste Storage Facility" approval certificate is given to the facilities whose construction is found to be completed in accordance with the legislation.

"Mining Waste Storage Facility" approval certificate was given to 79 facilities between 2011-2023.

Graphic 54 Number of Facilities Receiving Mining Waste Storage Facility Approval Certificates (MoEUCC,2024)



According to the results of water, wastewater and waste statistics of mining enterprises, 2022 survey conducted by TURKSTAT, 860.6 million tonnes of waste was generated in mining enterprises in 2022 (812 million tonnes in 2018). 99.9% of the 860.6 million tonnes of waste generated in mining enterprises in 2022 was mineral waste. In 2022, the amount of stripping material/rubble was determined as 26.3 million tonnes excluding 834 million tonnes (795 million tonnes in 2018) of rubble.

76.1% of the total waste was disposed of in tails dumps, tailings dams or landfills, 20.9% was backfilled into the pit, 3% was recovered or disposed of by other methods.

Circular Economy

The circular economy is a production and consumption model based on sustainability and innovation, which includes the efficient use of resources, extending the life of materials and products, reusing, sharing, repairing, renewing, increasing the efficiency of separate collection and including waste back into the production process, from raw material procurement method to product design, production, distribution, consumption, waste collection and recycling.

In this context, the "Technical Assistance Project for the Assessment of Türkiye's Potential for Transition to Circular Economy" was launched in February 2022. With the outputs of the project, transition to circular economy, which also contributes to more efficient resource and waste management, will be promoted across Türkiye. It is aimed to strengthen Türkiye's institutional and technical capacity in various aspects such as knowledge base, strategic documents including relevant legislation and human resources.

Within the scope of the project, the circular economy potential in Türkiye will be investigated and a country-specific "National Circular Economy Strategy and Action Plan"; Sectoral Impact Assessment Report, Regulatory Impact Assessment Report for Single Use Plastics, Alternative Collection Models to be Evaluated and Guidelines on Good Practices will be prepared and institutional capacity will be strengthened.

A National Circular Economy Strategy and Action Plan for 2024-2028 will be prepared to ensure the transition of Türkiye to a circular economy. With the Circular Economy Action Plan, sustainable circular models will be established.

D.17. Zero Waste

The Zero Waste Project was launched in 2017 under the leadership of the MoEUCC. With Zero Waste, it is aimed to protect the environment and human health and all resources by preventing/reducing waste generation, prioritising reuse, accumulating and collecting the generated waste separately at source, and reducing the amount of waste to be sent to disposal by ensuring recycling and/or recovery.

The studies within the scope of zero waste, which started on a pilot scale, have been included in development plans and have become a national policy. Provincial Zero Waste Management System Plans have been prepared by 81 provinces in order to ensure the sustainability and efficiency of the zero waste management system to be implemented by local administrations and buildings and campuses at provincial level within a strategic integrity at both local and national scale.

With the activities carried out within the scope of Zero Waste Movement;

- From June 2017 to the end of 2023, the number of buildings/campuses that have switched to zero waste management system has reached approximately 178 thousand.
- By the end of 2023, approximately 20 million people were trained.
- Our recovery rate, which was 13% in 2017, increased to 13% in 2018, 18% in 2019, 22.4% in 2020, 27.2% in 2021, 30.13% in 2022 and 34.92% in 2023.
- It is aimed to increase our recovery rate to 60% in 2035.
- Eleven zero waste management system implementation guidelines were prepared for practitioners in order to guide the work on the establishment, operation and monitoring of the zero waste management system.

- Since the beginning of the project, 29.3 million tonnes of paper-cardboard, 7.8 million tonnes of plastic, 2.9 million tonnes of glass, 3.7 million tonnes of metal and 16.2 million tonnes of organic and other recyclable wastes, totalling approximately 59.9 million tonnes of recyclable wastes, have been processed by enterprises licensed by the MoEUCC and brought into the economy.
- By recycling the collected wastes, 185 billion TRY was saved for the national economy, 2.6 billion kWh of energy was saved, 819 million m^3 of water was saved, 104 million m^3 of landfill space was saved, 5.9 million tonnes of greenhouse gas emissions were prevented, 498 million trees were saved, 127 million barrels of oil were saved.

D.18. Wastes from Ships

As emphasised under the heading "C.1.3.1.1.1. Pollution from ships", the management of wastes from ships is provided within the framework of the "By-law on Waste Collection from Ships and Control of Wastes".

Ship wastes are received by coastal facilities such as ports, shipyards, marinas, fishing harbours and the related metropolitan municipalities, and these coastal facilities and the related metropolitan municipalities are responsible for the disposal of these wastes. Ship wastes are taken from ships separately according to their types without mixing and stored in separate tanks in waste reception facilities.

In this context, "Maritime Wastes Application (MWA)", which provides service under the Integrated Environmental Information System, is used for online monitoring and effective control of wastes received from ships. Thus, starting from the waste notifications made by the ships to the ports, the whole process from receiving and temporary storage of waste to disposal can be followed online by the relevant stakeholder institutions and organizations.

D.19. Türkiye Environment Agency (TÜÇA) Studies

Zero Waste Management Studies

Türkiye Environment Agency Zero Waste Management Directorate develops and manages projects on zero waste approach in order to prevent waste generation, reduce waste at source, reuse waste, increase recovery rates, improve zero waste practices, and raise awareness and consciousness on these practices.

In order to improve, develop and support the zero waste system, within the scope of the "By-law on Financial and Technical Supports and Cooperation to be provided by the Türkiye Environment Agency", which entered into force after being published in the Official Gazette dated 08.06.2022 and numbered 31860, it is aimed to cooperate with local administrations, special provincial administrations, educational institutions and other institutions and organizations, as well as to provide financial and technical support to the places deemed necessary and appropriate within the scope of the projects submitted.

Between 2022-2023, "Project for Determining and Developing Environmental Strategies and Policies Suitable for the Transition to Deposit Management System in Kızılcahamam District of Ankara Province" and "Project for Establishing Zero Waste Practices and Deposit Management Systems in University Campuses and Developing Standard Practices in Türkiye" were completed on zero waste issues.

With the "Project on Determination and Development of Environmental Strategies and Policies Suitable for the Transition to Deposit Management System in Kızılcahamam District of Ankara Province", within the scope of the works for the establishment and operation of "National Scale

Deposit Management System" in Kızılcahamam district, reducing waste generation, improving zero waste implementation, increasing recovery rates, increasing the appearance and awareness of zero waste implementation, establishing the basic principles of zero waste city, preparing the zero waste implementation plan to cover deposit practices and ensuring the integration of the deposit management system pilot region implementation in accordance with zero waste principles and strategies were aimed.

With the "Establishment of Zero Waste Practices and Deposit Management Systems in University Campuses and Development of Standard Practices Across Türkiye Project", a sample feasibility report was prepared for the necessary investments and services in order to provide integrity in zero waste practices, to develop standard practices, and to ensure the establishment and sustainability of the zero waste system in each university.

It is aimed to continue efforts to improve, develop and raise awareness of zero waste and zero waste management system. It is envisaged to complete the processes of the files on zero waste, which are deemed appropriate within the scope of the "By-law on Financial and Technical Support and Cooperation to be provided by the Environment Agency of Türkiye", and to continue financial and technical support through cooperation with institutions and organizations. Supports within the framework of the said By-law are within the scope of "Zero Waste (Waste Collection Centre, Mobile Waste Collection Centre, Waste Container, Zero Waste Points, etc.), Bicycle and Walking Path (Bicycle Path), Other Issues (Improvement of the Environment, Treatment System, Noise Barrier, Landscaping and National Garden)" project.

In addition, with the "By-law on Green Certificate for Buildings and Settlements" prepared by the MoEUCC and published in the Official Gazette dated 12 June 2022, YeS-TR, which is defined as the National Green Certificate System where the whole process from the design of a building to its use is evaluated environmentally, socially and economically within the framework of combating climate change, green and sustainable cities, zero waste and circular economy model, has been implemented.

The "Green Certificate" system, which was prepared as a domestic and national application for the first time in order to certify sustainable green buildings in Türkiye by completing the necessary infrastructure works by the Turkish Environment Agency, which acts as an "Evaluation Organisation", has started to serve. It is planned to increase the proportion of green certified buildings and settlements with the aim of saving energy, turning towards renewable resources and increasing the number of green buildings in accordance with the zero waste and circular economy concept. In 2022, registration and certification fees were determined and applications were started to be received in 2023. The applications received were evaluated according to the Guidelines attached to the By-law. The Guideline includes 76 criteria for buildings and 85 criteria for settlements. Authorised Green Certificate Experts evaluate the compliance of new or existing buildings with these criteria by giving credits.

Compulsory Deposit Management System Studies

In Türkiye, the transition to mandatory deposit application for single-use packaging is regulated by the Environmental Law No. 2872, and studies on deposit management system applications are carried out in line with the By-law on Control of Packaging Waste and By-law on Zero Waste. In 2022, technical projects were carried out to determine the final setup of the system, the estimated cost, and the criteria for the return points and verification facilities to be established within the scope of the system.

With the implementation of the Mandatory Deposit Management System across Türkiye, it is estimated that approximately 37 thousand tonnes of greenhouse gas emissions will be prevented, 1.3 billion kWh of energy, 6.3 million m^3 of landfill space and 3.6 million barrels of oil will be saved. Within 20 years, it is estimated that approximately 100 billion TRY will be contributed to our economy and employment will be provided for nearly 20,000 citizens.

System Benefits;

ENVIRONMENT	SOCIAL	ECONOMICAL	GLOBAL
• Reduction in environmental pollution • Reduction of carbon emissions • Increasing the economic life of landfill sites	• Additional employment and support to the economy • Making the participation of citizens in the recycling system visible • Increased environmental awareness	• More efficient and sustainable recovery system • Recycled materials with high economic value • Cost reduction in environmental services of municipalities • Reduction in the need for primary raw materials and reduction in raw material imports	• Compliance with the Circular economy concept • Supporting Türkiye's participation in global sustainable development action

With the Law dated 24/12/2020 and numbered 7261, the Türkiye Environment Agency (TÜÇA) was established and started its activities in order to carry out activities for the establishment, operation, monitoring and supervision of the deposit management system on a national scale.

TÜÇA published the Procedures and Principles on Mandatory Deposit Management System Implementation in April 2022. In the following process, the said Procedures and Principles needed to be detailed in administrative, technical and financial matters and were revised and published with the number 273 dated 01/12/2022.

For the mandatory deposit management system to be established in Türkiye, TÜÇA has been defined as the system administrator and 2 different operational application structures (Information Management and Field Management) have been envisaged for the applications. Within the scope of the Deposit Management System, the online "Deposit Information Management System (DBYS)", which will monitor and manage the system in a secure and transparent manner from end to end, was established and started to be operated. With DBYS, firstly, the registration procedures of the marketers and label/packaging producers were carried out.

The packages within the scope of the system were marked with the special ink Deposit Management System Mark (DBYS logo and product barcode) and started to be produced and recorded as traceable and identifiable. As of 2025, it is planned to make the Deposit Field Management System infrastructure ready, which includes the establishment and operation of deposit return points, collection, transport and recovery of empty packages with deposits from these points, and to make the system available to our citizens and to expand it through pilot applications.

Pilot applications were carried out in the Main Service Building of the MoEUCC and Kızılcahamam District of Ankara Province in order to test the functioning of the system before the transition to national scale implementation in June 2022. Information, announcements and news on the Mandatory Deposit Management System applications, stakeholders' registration procedures and screens where they switch to user modules can be accessed via dbys.gov.tr.

Environmental Protection Works

The Environmental Protection Directorate has undertaken the following duties: "To carry out activities to improve the environment, to carry out audits within the framework of the zero waste and deposit management system and the relevant legislation for the recovery of the environment, to carry out works and procedures regarding administrative sanctions in case of violation or breach of the legislation, to prepare, develop and ensure the implementation of audit plans

and programmes, to establish and operate map and buoy systems, to contribute to the protection, improvement, development and sustainability of the operation of green areas". Currently, the Environmental Protection Directorate is also responsible for carrying out marine pollution inspections from ships and issuing administrative sanction decisions.

In addition, with the Delegation of Authority Circular dated 23/01/ 2023 and numbered 2023/3, TÜÇA was delegated the authority in the Marmara Region (Istanbul and Kocaeli Provinces) and assigned the task of detecting marine pollution caused by ships and imposing administrative sanctions. With the said Delegation Circular, a total of 562,888,026.00 TRY administrative fines were imposed on 105 vessels as of the date when the authority of inspection and judgement in the Marmara Region was transferred to us. In this context, early warning systems will be established to detect marine pollution at an early stage.

In Fethiye-Göcek Special Environmental Protection Area, with the Map-Buoy Project, it is planned to place about 700 map-buoys at 50 metre intervals in the area. In the last quarter of 2024, the tender process will be completed and the ground delivery will be made, the system will be installed and ready for operation in Fethiye-Göcek Region by April 2025, and it is aimed to be extended to other special environmental protection areas in 2026.

Recycling and Producer Responsibility Studies

With the By-law on Control of Packaging Wastes published by the MoEUCC in 2021, many obligations, especially the mandatory deposit system for the management of packaging wastes, were transferred to TÜÇA. In 2022, with the By-law on the Management of Waste Electrical and Electronic Equipment published in the last days of 2022, authorisation transfers, especially voluntary agreements, were made. In addition to the authorisations given by the aforementioned By-laws, studies are being carried out to reveal the framework of the Extended Producer Responsibility (EPR) for products within the scope of Extended Producer Responsibility (EPR), especially batteries and accumulators, and to establish an EPR monitoring system.

Within the scope of the General Deposit Management System, Accumulator Deposit Information System and Deposit System for Reusable Packaging were being used by the Directorate of Recycling and Producer Responsibility as of March 2023 in accordance with the procedures and principles of delegation of authority dated 30/12/2022.

References

Ministry of Environment, Urbanization and Climate Change

Turkish Environment Agency

TURKSTAT

E. MANAGEMENT OF CHEMICALS

In 2010, in order to fulfil the obligations of the "Stockholm Convention on Persistent Organic Pollutants (POPs)" to which Türkiye became a party, preparation and updating of the National Implementation Plan, creation of persistent organic pollutant inventories, taking measures to reduce their stocks and emissions and carrying out monitoring activities, reporting to the Convention secretariat at regular intervals are ongoing. The National Implementation Plan for Persistent Organic Pollutants (POPs) has been updated in line with the changes in the Stockholm Convention and submitted to the Convention Secretariat in 2022.

The Elimination of POPs Residues and Reduction of POPs Emissions Project was completed in 2021 in cooperation with the United Nations Development Programme (UNDP) and the United Nations Development and Industrial Organisation (UNIDO) with the large-scale project support from the Global Environment Facility (GEF) in order to eliminate POPs residues and reduce POPs emissions in Türkiye. With the said project, 3,000 tonnes of Lindane stock and 300 tonnes of PCB-containing materials and equipment in Türkiye were eliminated, 41.6 tonnes of PCB oil was disposed of, as well as 42.6 tonnes of PCB oil decontamination activities and analysis of 6,100 transformers likely to contain PCBs were carried out.

The "By-law on Persistent Organic Pollutants" published in the Official Gazette dated 14 November 2018 and numbered 30595 for the purpose of effective implementation of the Stockholm Convention at national level and harmonisation and implementation of the EU By-law on Persistent Organic Pollutants by Türkiye was amended in 2021 and the number of harmful chemicals banned under the By-law increased to 16 and the number of restricted substances increased to 21.

In 2013, the "Project on Improving Environmental Performance in Compressed and Expanded Polystyrene Industries in Türkiye" is being carried out by the Ministry of Environment, Urbanization and Climate Change and UNIDO with the support provided by the GEF to end the use of Hexabromocyclododecane (HBCD), one of the POPs added to the Stockholm Convention, in Türkiye. It is aimed to ensure environmentally compatible management of existing HBCD stocks in Türkiye, to evaluate alternative chemicals that can be used instead of HBCD, to use alternatives at the production stage and to build capacity for relevant stakeholders on the efficiency of pro-

ducts prepared with alternatives. Currently, with the legal arrangements made by Türkiye, the import and use of HBCD in the amount of 240 tonnes per year has been prevented.

In addition, the "By-law on the Export and Import of Certain Hazardous Chemicals" entered into force after being published in the Official Gazette dated 28 January 2023 and numbered 32087 for the effective implementation of the Rotterdam Convention on the Prior Informed Consent Procedure in the International Trade of Certain Hazardous Chemicals and Pesticides at national level and for the harmonisation and implementation of the relevant legislation of the EU.

In addition, as of 4 October 2022, Türkiye officially became a party to the "Minamata Convention on Mercury", which was signed by Türkiye on 24 September 2014 and prepared under the leadership of the United Nations Environment Programme (UNEP) in order to contribute to the efforts to prevent mercury-related environmental pollution on a global scale.

The "Preliminary Assessment Project on Mercury" supported by GEF, which includes an infrastructure study for the implementation of the Minamata Convention in Türkiye, was carried out between 2017-2019, and within this scope, the process of becoming a party to the Minamata Convention was completed and the current situation regarding mercury in the country was determined.

The draft "By-law on Mercury" prepared for the effective implementation of the Minamata Convention at the national level and harmonisation and implementation of the relevant EU legislation is expected to enter into force in 2025.

Amendments and updates made since 2017 in the European Union's REACH By-law No. 1907/2006/EC have been transferred to the By-law on Registration, Evaluation, Authorisation and Restriction of Chemicals and the revision works of the other two By-laws in force harmonising the EU's CLP By-law No. 1272/2008/EC and Test Methods By-law No. 440/2008/EC are in progress.

The basis of the work on Chemicals Management is primarily the identification (classification) of the hazardous properties of chemicals and the effective communication of hazardousness through labels and safety data sheets containing this information. In this way, protection of people exposed to chemicals and the environment is ensured at every stage.

However, over time, it has been observed that the studies carried out in order to maximise the protection of human health and the environment from the possible harm of chemicals and to prevent the negative consequences that may occur in advance have exhibited differences at the global level. This situation, together with the increasing globalisation of trade as in every field and the increasing share of chemicals in the global market day by day, has created differences in the safe use of chemicals in commercial circulation due to the various systems they are subject to.

For this reason, international organizations have initiated efforts to harmonise worldwide communication about the hazardous properties of chemicals and the rules for their safe use so that everyone exposed to chemicals can be protected in the same way, and to minimise trade barriers by standardising the requirements for control at customs or on the market.

Regarding the quantity, hazard properties, areas of use and risk communication of chemicals produced and imported in Türkiye, risk communication has been ensured between consumers/professional users and producers/importers through safety data sheets and the negative effects on human health and the environment have been minimised. Manufacturers and importers of chemical substances submit their safety data sheets to the MoEUCC through web-based software.

Currently, within the framework of the "By-law on Registration, Evaluation, Authorisation and Restriction of Chemicals" published in the Official Gazette dated 23/06/2017 and numbered 30105 (Repeated), 79068 Safety Data Sheets (SDS) prepared for the protection of harmful substances and mixtures supplied to the market from the negative effects of human health and the environment are uploaded to the Ministry System and recorded.

E.1. Registration of Chemicals

In order to ensure effective management of chemicals in Türkiye, harmonisation studies with the European Union (EU) chemicals legislation have been carried out since 2002. In this context, REACH By-law No. 1907/2006/EC, which is the most comprehensive and technical legislation in the field of chemicals management in the world, started to be implemented in Türkiye with the By-law on Registration, Evaluation, Authorisation and Restriction of Chemicals (KKDİK By-law), which was published and entered into force in 2017. According to this By-law, all chemicals manufactured/imported in Türkiye in 1 tonne or more per year must be registered to the MoEUCC by the companies. Starting in 2021, the registration process is still ongoing.

Under the By-law on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), due to the high data costs associated with registrations that were to be completed by the end of 2023, and considering the structural challenges of the chemicals sector, the by-law was amended — upon the joint request and consensus of the sector and relevant institutions — to introduce a gradual, tonnage band–based approach. In this context, a gradual registration process has been and will be implemented until the end of 2026 - 2028-2030. As of the end of the specified dates, chemicals manufactured/imported in quantities of 1 tonne or more and without a registration number will not be placed on the market. Consultations have been held with industrialists and public institutions regarding the effective progress of the process, and work is being carried out on the preparation of 'Procedures and Principles' on the subject. The Procedures and Principles are planned to be published in 2024.

So far, 51 Training Organizations for Chemical Assessors (CAs) preparing chemical registration files have been approved by the MoEUCC, 7 CA Certification Organizations have been accredited by the Turkish Accreditation Agency (TÜRKAK) following MoEUCC approval, and there are currently approximately 1,600 certified CAs.

E.2. Authorisation and Restriction/Banning of Chemicals

In the light of the physico-chemical, toxicological and eco-toxicological information, areas of use, etc. collected through registration files, the chemicals in the Turkish market that pose a risk to human health and the environment and whose risks cannot be controlled will be identified. Risk assessment and socio-economic analyses will be carried out for these chemicals of high importance, which pose a threat to our environment, and road maps for maximum protection from the effects of chemicals will be determined within the framework of sustainable development principles. Within the scope of these studies, existing risk management measures such as permits, restrictions and bans will be extended to cover these chemicals.

Various restrictions/prohibitions have already been imposed on 64 chemical substances/substance groups within the scope of KKDİK By-law. For example, restrictions on azobol colourants and nonylphenols in textile products, nickel and cadmium in jewellery, benzene, polycyclic-aromatic hydrocarbons (PAHs) and phthalates in toys, chloroform in surface cleaners, acrylamide in joint sealants and ammonium nitrate in fertilisers can be given as examples.

One of the ultimate goals in chemicals management is to ensure the control of the risks of high-significance substances supplied to the market by substituting them with safer substances in an economically and technologically appropriate manner. This constitutes an important step in transferring concepts such as cleaner production and green production from theory to practice in Türkiye. As a result of the transition to the best production technologies for the restriction and replacement of chemicals with substitutes, the rate of pollution in waste, emissions and wastewater will be reduced.

E.3. Chemicals Data System (KİMVES)

An inventory of electronic notifications sent to the MoEUCC by manufacturers or importers of hazardous chemicals since 2014, which contain information on the classification and labelling of the hazardous chemical, has been created and made publicly accessible through the Chemicals Data System (KİMVES) (https://kimves.cevre.gov.tr/KIMVES/). Here, the hazard classification information and labelling information declared by chemical manufacturer/importer companies for approximately 20 thousand different substances can be accessed.

According to the first paragraph of Article 43 of the "By-law on Classification, Labelling and Packaging of Substances and Mixtures (By-law on SEA)" published in the Official Gazette dated 11/12/2013 and numbered 28848 (repeated), the MoEUCC is tasked with establishing and maintaining a classification and labelling inventory in the form of a database. The Chemicals Data System (KİMVES) established within this scope constitutes one of the important outputs of the By-law on SEA.

The classification and labelling inventory in KİMVES includes categories of how chemical substances are classified by the companies manufacturing or importing them in terms of their physico-chemical, human health and environmental hazards according to the rules set out in the SEA By-law, and the hazard statements, hazard signs and warning codes that should be included on the labels of substances according to these hazard categories. Currently, 94,085 classification and labelling notifications sent for approximately 20,000 different substances are published in KİMVES and the database is expanding every day with the notifications sent by companies.

The classification and labelling inventory provides a rich source of information on how industrialists classify chemicals according to existing rules and also shows how firms classify the same substance differently. The information provided by industrialists within the scope of classification and labelling notification is declarative, i.e. it is published in the inventory as submitted to the Chemicals Registration System without any quality or conformity check. Officially valid classification and labelling information for approximately 4,000 hazardous chemicals is given in Table 3 in Annex-6 of the SEA By-law, and the hazards, labelling and packaging information of other substances not included in the table are determined by the manufacturers/importers/marketers according to the rules in the same By-law and its annexes.

The classification and labelling inventory in KİMVES is the first publicly available inventory of hazardous chemicals manufactured or imported in Türkiye and will provide important support to companies, employees and ultimately consumers in communicating hazard information and safe use of chemicals. It is a fact that chemicals are a problem for human health and the environment, but they can also be the solution to many other problems. The important thing is to know how to benefit from chemicals without being harmed.

References

Ministry of Environment, Urbanization and Climate Change

F. NATURE CONSERVATION AND BIODIVERSITY

F.1. Türkiye's Biological Diversity and Importance

Türkiye has agricultural, forest, mountain, steppe, wetland, coastal and marine ecosystems and different forms and combinations of these ecosystems.

This ecosystem and habitat diversity has brought with it an important species diversity. When the biological diversity of the countries in the temperate zone is compared in terms of biological diversity, it is noticeable that animal (fauna) biodiversity is quite high in Türkiye. Despite the lack of data, invertebrates constitute the largest number among the identified living species. The number of invertebrate animal species is approximately 19,000, of which approximately 4,000 species/subspecies are endemic. The total number of vertebrate animal species identified to date is close to 1,500. Among vertebrates, more than 100 species, 70 of which are fish species, are endemic. The fact that Türkiye is located on the world's two major bird migration routes increases its importance as a feeding and breeding area for birds.

To understand the richness of Türkiye in terms of plant (flora) species, it will be sufficient to compare it with the European continent. While there are 12,500 open and closed seeded plant species in the whole European continent, it is known that there are close to this number (approximately 11,000) species only in Anatolia.

Türkiye's genetic diversity gains importance especially with its plant genetic resources. Because Türkiye is located at the intersection of the Mediterranean and Near East Gene Centre. These two regions have a very important role in the emergence of cereals and horticultural crops. There are 5 micro-gene centres in Türkiye, where more than 100 species show wide variation and are the origin or diversity centres of many important cultivated plants and other economically important plant species such as medicinal plants. These centres provide very important genetic resources for the future sustainability of agriculture of a large number of cultivated plant species in the world. In terms of animal genetic resources, due to its location, many indigenous animal breeds are considered to have been bred in Anatolia and spread from there to other parts of the world.

Another important issue in the conservation of biological diversity is the incorporation of the principles of "sustainable use" into sectoral practices. Sustainable utilization is the establishment of a balance between utilization and conservation, taking into account the self-renewal and sustainability capacity of natural resources. Thus, both optimum benefit can be obtained from biological diversity and the continuity of this diversity is guaranteed.

Although the number of plant species in the whole of the European continent is around 12,500, the number of plant species identified in Türkiye today almost reaches this number. About 3,000 of these are endemic species unique to Türkiye. While the number of species constituting the fauna and flora of Europe is about 60,000, in Türkiye it is about 80,000.

There are around 150 mammal, 480 bird, 130 reptile and 300 fish species in Türkiye. Of these, 15 mammal species, 46 bird species, 18 reptile species and 5 frog species are in danger of extinction. The total wetland area of Türkiye exceeds 1 million hectares. There are approximately over 250 wetlands. These natural riches and living resources need to be protected. For this purpose, Türkiye has become a party to various international conventions and efforts to become a party are continuing. As a result of the deterioration and destruction of the ecosystem, many animals have become endangered and extinct.

The Convention on Biological Diversity was ratified by Türkiye with Law No. 4177 dated 29 August 1996 and entered into force on 14 May 1997. The Ministry of Agriculture and Forestry is the national focal point of the UN Convention on Biological Diversity and is responsible for ensuring inter-agency coordination and cooperation in activities carried out for the conservation and sustainable use of Türkiye's biological diversity.

Türkiye has been participating in the meetings of the Conference of the Parties as a country party since 1998. Within the scope of Article 17 of the Convention, a clearing mechanism has been established with the addresses www.bcs.gov.tr in Turkish and www.cbd.gov.tr in English in order to exchange information at national and international level.

Türkiye has three phytogeographic regions, each with its own unique species and natural ecosystems. These are Europe-Siberian, Irano-Turanian and Mediterranean. The diversity in Anatolian geography and climate has resulted in the formation of many micro-gene centres for species.

In microgene centres, there are species such as wheat, barley, chickpea, lentil, which are the primary gene centres of Anatolia, as well as species such as apple, pear, sour cherry, cherry, melon, watermelon, whose original gene centre is Central Asia, but which have diversified and enriched in Anatolia over time and formed secondary gene centres.

Table 85 Microgenic Centres and Common Species in Türkiye (Şehirali et al., 2005).

MICROGEN CENTRE	COMMON SPECIES
Thrace-Aegean	Bread Wheat, Durum Wheat, Geranium dissectum Wheat, Topbaş Wheat, Kaplıca Wheat, Spelt Wheat, Coarse Grain, Melon, Lentil, Chickpea, Common Vetch, Lupins, Combs.
South-Eastern Anatolia	Kaplıca, Emmer Wheat, Durum Wheat, Marrow, Water Melon, Melon, Cucumber, Vine, Bean, Lentil, Chickpea, Broad Beans, Fodder Crops.
Samsun -Tokat- Amasya	Amasya Fruit Types and Species, Beans, Lentils, Broad Beans, Legume Forage Crops.
Kayseri and Neighbourhood	Apple, Almond, Pear, Fruit Species, Vine, Lentil, Chickpea, Clover, Sainfoin.
Agri and Neighbourhood	Apple, Apricot, Sour Cherry, Cherry, Melon, Legume, Forage Crops.

The Mediterranean region is the richest region in terms of endemic species, followed by Eastern and Central Anatolia, Black Sea, Aegean, Marmara and Southeastern Anatolia.

Table 86 Distribution of Endemic Species in the Flora of Türkiye by Regions (Eken et al., 2006).

REGIONS	No. of ENDEMICS
Mediterranean Region	862
Aegean Region	171
Eastern Anatolia Region	471
Marmara Region	102
Central Anatolia Region	335
Southeastern Anatolia Region	64
Black Sea Region	277
Total	**2,282***

* The remaining endemic species are distributed in more than one geographical region.

The total number of cereal varieties developed and registered by the public sector in Türkiye over the last three decades using local and imported inbreds is 333, of which 150 are wheat, 28 maize, 35 maize lines, 50 barley, 44 rice, 16 sorghum, 8 oats and 1 rye variety. While the National Seed Programme is constantly breeding new varieties and thus the number of cultivated species is steadily increasing, field crops such as small red wheat (*Triticum monococcum*), double grain wheat (*Triticum dicoccum*), bitter vetch and lupin are not used as much as they used to be. Therefore, these species have started to disappear. Türkiye has been participating in the meetings of the Conference of the Parties as a country party since 1998. Within the scope of Article 17 of the Convention, a clearing house mechanism has been established at http://biodiversity.gov.tr/ for the exchange of information at national and international level.

F.1.1. Türkiye Ecosystems

F.1.1.1. Agricultural Ecosystems

The main ecological regions of Türkiye in terms of agriculture are Mediterranean Coastal Region, Aegean Coastal Region, Black Sea Coastal Region, Thrace and Marmara Region, Central Anatolia Region, Southeastern Anatolia Region, Eastern Anatolia Region, and Gateway Regions (Northwestern Gateway, Western Gateway, Northeastern Gateway, Eastern Gateway, Southeastern Gateway). This zoning system, based on main climatic elements such as precipitation and temperature, covers the diversity of agricultural products and the regional and phenological characteristics of agriculture. Coastal regions can be defined as agricultural production regions in the Mediterranean climate zone in general. Central, Eastern and Southeastern Anatolia Regions are the regions where the harsh continental climate is predominant; agricultural product characteristics also bear the effects of these ecological regions. Transitional regions are agricultural regions, each of which covers a few provinces in the transition from the centre of Central Anatolia to other regions, and which are more or less different from each other in terms of both climatic factors and general agricultural characteristics.

Due to high rainfall and better soil conditions, more productive pasture vegetation has been formed in these areas. The grazing areas of arid and semi-arid regions with annual rainfall totals between 200-700 mm are called steppe pastures. In terms of altitude and topography, steppe pastures are divided into two as “mountain steppes” and “lowland steppes”. Since altitude and rainfall are relatively higher in mountain steppes, more valuable wheatgrass and legume forage crops grow.

F.1.1.2. Steppe Ecosystems

Steppe and grassland areas in Türkiye, which are defined as areas covered with herbaceous plants, are currently around 21 million hectares. Steppe ecosystems are distributed especially in the high mountain layers of Central Anatolia, Aegean and Mediterranean regions and in a large part of Eastern Anatolia in Türkiye. The most characteristic feature of the steppe ecosystem is the dominance of annual or perennial herbaceous plants. The floristic composition of steppe vegetation is very rich and includes many endemic plants.

Steppe formation in Türkiye is generally divided into two as “Lowland Steppe” and “Mountain Steppe” according to the topographical structure of the area where it spreads. The lowland steppe occurs in flat or slightly sloping areas between 800-1,200 metres and provides habitat for species such as salt halophytes, family chenopodiaceae, rush family members, sedge family members, and species such as vetch, wild sage, thyme and sage.

Mountain steppe is generally common between 1,300-2,500 metres. It harbours species such as milk vetch, spiky medic, quill, ryegrass and thyme. Unlike other regions, the predominance of fennel species increases in Eastern Anatolian mountain step. Subalpine and alpine meadows cover large areas in the high parts of the Eastern Black Sea Mountains and in the northern and northeastern parts of Eastern Anatolia.

F.1.1.3. Forest Ecosystems

Forests consisting of coniferous trees are more common in Türkiye. Coniferous trees are found at all altitudes from sea level to the upper limit of forests. In the Aegean and Mediterranean regions, moist, semi-moist coniferous and dry forests (oak, larch and red pine) are found in addition to shrubs and maquis.

Forest types according to biogeographical regions are:

Euro-Siberian Biogeographic Region:

- Leafy-coniferous Forests (Beech, Chestnut, Hornbeam; 500-1.200 m),
- Moist-semi-moist Coniferous Forests (larch, yellow pine, spruce, fir; 1.000-1.500 m),
- Arid oak and pine forests (Oak<1.500 m; larch >600 m; Red pine: 400-500 m)
- Shrub (maquis - false maquis) formation (Red pine <500 m)

Mediterranean Biogeographic Region:

- Shrub (Maquis and Garigue) formation (Oaks, sandalwood, gum, myrtle vb. 350 m Marmara, 600 m Aegean; 800 m Mediterranean),
- Low Altitude Mediterranean belt Forests (Red pine<1.000 m; Larch:800-1.500 m),
- Aegean High Mountain Forests (Chestnut<1000 m; Beech, Linden, Hazelnut >1.500 m; Scotch pine>1.600 m; Oak, larch >700 m, Red pine<600 m),
- Mediterranean High Mountain Forests (Oak:500-1,200 m; larch:1,200-200 m; Fir:1,200-1,800 m; Cedar:1,000-2,000 m; Juniper:100-1,800 m; Beech-Hornbeam:1,100-1.900 m)

Irano-Turanian Biogeographic Region:

- Central Anatolia Steppe Forests (Mossy and downy oak, Larch, Juniper: 800-1.500 m),
- Central Anatolia Arid Larch, Oak and Juniper Forests (Oaks: <1.200 m; Larch:1,000 m- 1,500 m; Scotch pine>1,500 m),
- Eastern Anatolia Arid Oak Forests (oak species <850 m).

Türkiye's rich forest ecosystems provide habitat for many endemic plant species, important bird species and many wildlife species. In these ecosystems, there are wild relatives of many cultivated plants that are important for agricultural biodiversity.

F.1.1.4. Mountain Ecosystems

In Türkiye, there are mountain systems formed by folds, fractures and volcanism. Types of mountain ecosystems vary according to biogeographic regions, formation type and altitude.

Mountains formed by fracture are located in the Aegean Region. These mountains lie perpendicular to the coast and are rich in water resources. Kaz Mountains, Yunt Mountains, Boz Mountains, Aydın and Menteşe Mountains are important mountains of this region. Mount Ida is the habitat of Mount Ida Fir (Abies nordmanniana ssp. equi-trojani), which is important both for its endemicity and genetic diversity.

The most important mountain ranges of Türkiye, formed as a result of Alpine-Himalayan folds, are Yıldız, Köroğlu, Küre, Canik, Eastern Black Sea Mountains in the north, Western and Central Taurus Mountains in the south, Nur and Southeastern Taurus Mountains in the south-east, Hınzır, Tahtalı, Munzur, Palandöken, Allahüekber and Aras Mountains in central and eastern Anatolia. These mountain systems, especially the Taurus Mountains, are important ecosystems in terms of biological diversity with their high endemism rate. Subalpine and alpine meadows dominate the high parts of the Eastern Black Sea Mountains and the northern and northeastern parts of Eastern Anatolia, while steppe and meadow ecosystems dominate the high mountain levels of other regions. As one descends downwards, forest ecosystems differentiating according to re-

gions begin. In addition, lakes with different characteristics and isolated from each other in high mountain areas form special habitats.
The most important volcanic mountains that add unique values to biodiversity especially with volcanic lake formations are Ağrı, Tendürek, Nemrut, Süphan, Karacadağ, Erciyes, Hasan and Kula mountains. Volcanic mountains are also important for agricultural biodiversity with their mineral-rich soil.

F.1.1.5. Inland Water Ecosystems

Türkiye has inland water resources which are very important for maintaining biological diversity with its rivers and lakes covering an area of approximately 10,000 km^2. In the studies carried out so far, 921 wetlands larger than 8 ha have been identified throughout Türkiye. Türkiye has 7 drainage basins including 25 river basins and groundwater is estimated to be 94 billion km^3. The average annual precipitation level is about 640 mm and about one third of this amount reaches water reserves and contributes to the survival of wetlands.

The largest of the natural lakes is Lake Van in Eastern Anatolia, with an area of 374,000 ha and high salinity. There are some saline shallow lakes on the Central Anatolian Plateau, the largest of which is Salt Lake (128,000 ha). Salt Lake dries up almost completely in summer and is covered with a 30 cm thick layer of salt. Only salt-resistant vegetation grows around the lake. Lakes, marshes, deltas, reeds and mud flats are very important for wildlife, especially birds. More than half of the bird species in Türkiye are migratory. Wetlands are important resting and wintering habitats for water birds.

There are nine rivers in Türkiye with a length of more than 500 km: Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilırmak and Ceyhan. The annual discharge of the rivers in Türkiye is about 41 billion m^3 into the Black Sea and 36 billion m^3 into the Mediterranean Sea. The Dicle and Fırat rivers flow into Iraq and Syria, respectively. Deltas are of great importance in terms of biological diversity, especially for water birds. Meriç, Gediz, Büyük Menderes and Küçük Menderes Deltas formed by the rivers flowing into the Aegean Sea and Göksu, Seyhan and Ceyhan Deltas formed by the rivers flowing into the Mediterranean Sea create habitats suitable for a large number and species of waterfowl, especially as a result of the freezing of lakes in Anatolia in winter. The delta formed by the Kızılırmak River, which flows into the Black Sea, is of great importance especially for migratory birds crossing the Black Sea directly.

The geographical structure of Türkiye is very complex and the rivers are separated by mountainous regions, which greatly hinder the spread of species, resulting in high endemism and genetic diversity. The vast majority of invertebrates living in river ecosystems are therefore endemic. Since the salinity of the waters in the Köyceğiz-Dalyan region varies from zero to extremely salty, it is a good example of the relationship between habitat and species diversity. *Lindenia tetraphylla* is a new species in Türkiye and has been recorded as endangered in the Balkans. *Artodiaptomus burduricus*, which lives in Lake Burdur and has adapted to different conditions, is an endemic invertebrate species and is important in terms of genetic diversity. *Aphanius burduricus*, also living in Lake Burdur, is an endemic fish species adapted to lake conditions. Similarly, *Alburnus tarichi*, an endemic fish species living in Lake Van, has adapted to the extreme conditions of this lake.

In the wetlands of Türkiye, plants such as sedge (*Typha sp.*), reed (*Phragmites sp.*), cattail (*Schoenoplectus sp.*), toad rush (*Juncus sp.*) form large communities. In addition to plants such as water lily (*Nymphae sp.*) covering the water surface, duckeodendron (*Phodophyllum sp.*), duckweed (*Wolffia sp.*), lemna minor and underwater plants such as *Ceratophyllum sp., Myriophyllum sp., Potamogeton sp.* are found in shallow lakes.

As a result of the studies carried out so far, 236 species/subspecies of fish taxa belonging to 26 families have been identified in freshwater ecosystems. The most common species found in our wetlands are trout, horned pike, crane, carp, black trout, mullet, rudd, pike perch and freshwater perch. Due to its location on bird migration routes, Türkiye is a key country for many bird species. It is known that there are approximately 482 bird species in Türkiye. Storks, flamingos, spoonbills, stilts, avocets, cranes, and herons and ducks are the bird species commonly seen in Türkiye's wetlands.

F.1.1.6. Coastal and Marine Ecosystems

The fact that the seas surrounding Türkiye, including the Black Sea, Marmara, Aegean and Eastern Mediterranean, have different characteristics from each other has led to the differentiation of the biological resources they harbour. The Mediterranean Sea, which has the highest salinity and temperature ratio among the seas of Türkiye, is the region with the richest biological diversity. After the opening of the Suez Canal, many species belonging to the Indo-Pacific region migrated from the Red Sea to the Mediterranean and settled in this region. As a result of migration, 26 species settled in this region. There are 388 species of fish in the Turkish waters of the Mediterranean, 389 species in the Aegean Sea, 249 species in the Sea of Marmara and 151 species in the Black Sea.

The Black Sea is the world's largest enclosed sea and the most isolated from the oceans. There are 151 fish, 1.619 fungi, algae and higher aquatic plants and 1983 invertebrate species in the Black Sea. Fish species such as sturgeon, which are important both in terms of biodiversity and economic value, and 3 marine mammal species live in the Black Sea. There are 6 seagrass species, which are the spawning grounds of 34 fish, although their area is decreasing (*Zostera marina, Z. Noltii, Potamogeton pectinatus, Ruppia maritima, R. Spiralis and Zannichellia major*).

The Turkish Straits System, consisting of the Istanbul and Dardanelles Straits and the Sea of Marmara, is an inland marine system that provides water transport between the Aegean Basin of the Eastern Mediterranean and the Black Sea and serves as a biological corridor for fish species such as bonito, mendregal, bluefish, etc. It has been observed that the surface of the Marmara Sea is under the influence of the Black Sea waters coming through the Bosphorus. The deeper areas of the Sea of Marmara contain Aegean-Mediterranean waters and harbour more than 400 species of benthic organisms. The Sea of Marmara is a spawning ground for many pelagic fish species. *Gerardia savaglia*, a coral species, still survives at a depth of 30 m.

Coastal ecosystems are very special ecosystems as they are important abrupt transition zones (econton) where marine and terrestrial ecosystems intersect. Coastal ecosystems constitute 4.1% of the terrestrial resources that make up the country's surface area. The fact that the way the mountains descend to the sea and the coastal topography are different from each other in the coastal regions of Türkiye has led to the emergence of various coastal ecosystems such as dunes, caves, deltas, lagoons, fishponds, and calcareous terraces that differ according to the regions.

Among all these coasts, especially the coastal areas in the Eastern Mediterranean region are rich ecosystems with very high flora and fauna diversity. Along the Turkish coast, there are thousands of sea caves with very different geological structures and harbouring many fish species and other marine creatures. Some of these caves have been identified as shelter and breeding areas for the Mediterranean monk seal. There are approximately 3,000 species on our coasts. Mediterranean monk seal, sea turtle, seagrasses, seabirds are among the most important species of coastal biodiversity.

F.1.2.Species Diversity of Türkiye

Türkiye has a position that can be considered quite rich in terms of plant species, especially in terms of seed plants, considering the climate zone in which it is located.

Algae are the most primitive organisms in the plant group. The organisms in this group can be small enough to be seen under a microscope, or they can reach 50-60 metres or even 100 metres in length.

Although the number of studies on algae has increased, the Algal Flora of Türkiye has not yet been completed.

Distribution of Endemic Plant Species by Plant Geography Regions (PGR) (including subspecies and varieties)

Europe -Siberia	320
Mediterranean	1,325
Irano-Turanian	1,250
Not specific to Plant Geographical Regionsn	1,030
Total	**3,925**

Lichens are a living group based on the symbiosis of fungi with algae. They are distributed almost everywhere in the world. The number of species known in the world is around 20,000. In Türkiye, studies on lichens have increased rapidly in recent years. The number of lichen species known in Türkiye today is around 1,000 and this number is increasing day by day.

Bryophytes are the group of plants with the most primitive, poorly developed vascular bundles. In Türkiye, 3 anthoceratophytas, around 165 liverworts and around 740 bryophytes have been identified.

Ferns are the best known plant group together with seed plants. Ferns are distributed in all regions of Türkiye except the very arid regions, but the Black Sea region is the most widespread region of this plant group. There are 8 species of characeae (Equisetales), 6 species of yellow bugles (Lycopodiales) and about 80 species of true ferns in Türkiye.

The number of vascular plant species identified in Türkiye has reached 11.707 considering the number of genera and subgenus taxa. This number is increasing day by day with the identification of new species. This species richness is not found in any country in Europe. Therefore, Türkiye is a continent in terms of plant diversity. Because the number of species in the whole Europe is around 12.500.

In the project studies carried out with the support of MoAF TAGEM, the genetic resources of aquaculture products at the national level were determined and recorded in the National Food Starter Culture Gene Bank, which became operational in 2021. In the sampling carried out in the last 5 years, 27,550 genetic samples and 8,500 DNA samples belonging to 279 aquaculture species were recorded.

F.1.2.1. Endemic / Endangered Plant Species

Türkiye is one of the richest countries in the world in terms of endemic plants due to its geographical zone. Since the species belonging to seedless plant groups are widely distributed as in the whole world, the rate of endemism is also low. In addition, studies on seedless plant groups in Türkiye are not yet at the desired level. The best known plant group among the seedless plants is the Ferns (Pteridophytes). The number of species and subspecies of ferns identified in Türkiye is 101 and only 3 of them are endemic.

The rate of endemism is low in gymnospermae (Gymnosperms), the most primitive group of seed plants. In this group, there are only 5 endemic taxa at variety and subspecies level. In the flowering plant group (Angiospermae), the rate of endemism is very high and when subgenus taxa are added, the total number is 11,707 and 3,649 of them are endemic. The rate of endemism is around 31.82%. In Greece, which has the highest rate of endemic species among European countries, it has been determined that there are around 1,000 endemic plants. This shows how rich Türkiye is in terms of endemic plants.

Some of the endemic plant species spread in Türkiye are narrowly spread while some of them are widely spread. Narrowly spread endemics mostly survive in certain mountains and mountain ranges and in certain habitats. The main mountains with high endemism rates are Amanos Mountains, Sandras Mountain, Bey Mountains, Bolkar and Aladağlar, Uludağ, Kazdağı, Munzur Mountains. Apart from mountain ranges, regions with high endemism rates include the Central Taurus Mountains (Ermenek, Gülnar, Mut, Anamur), the Antitoros (Maraş, Adana, Niğde), the gypsiferous areas around Sivas and Çankırı, the area around Salt Lake, the high mountains around Rize and Artvin, and the region covering the Van-Bitlis-Hakkari provinces.

The richest family in terms of endemic seed plant species is the Daisy family (Compositae), with 435 endemic species. This family is also the family with the highest number of species in Türkiye. The second family is Legumes (Leguminosae) with around 400 endemic species. This family ranks second in Türkiye in terms of the total number of species it contains. The third place is occupied by the family Mint Family (Labiatae) with approximately 310 endemic species. The richest genus in terms of the number of endemic species is tragacanth (Astragalus) with about 250 species. This genus is followed by mullein (Verbascum) with 175 species, cornflower (Centaurea) with 115 endemic species and Hieracium with 66 species. However, although the number of species is low, the endemism rate of the genera Ebenus (14 species) and Bolanthus (6 species), all of which are endemic in Türkiye, is 100%.

Türkiye is not only rich in endemic species but also in endemic genera. The endemic genera represented by one species are Kalidiopsis and Cyathobasis (Chenopodiaceae), Phryna and Thurya (Caryophllaceae), Physocardamum and Tchihatchewia (Cruciferae), Nephelochloa and Pseudophleum (Wheatgrass-Gramineae), Dorystoechas (Labiatae), Sartoria (Leguminosae), Crenosciadium, Ekimia, Postiella and Aegokeras (Umbelliferae).

Among the plant geography regions, Iran Turan region harbours the most endemic species. This is followed by the Mediterranean and Euro-Siberian plant geography regions. Among the geographical regions, the Mediterranean region has the highest number of endemic species with about 800 species, followed by Eastern Anatolia with 380 species and Central Anatolia with 280 species.

Although Türkiye is very rich in endemic plants, some of these species that make up this richness face serious threats. According to the criteria of the International Union for Conservation of Nature (IUCN 2001), about 600 of our endemic species are categorised as “Critically endangered CR” and 700 as “Endangered EN”. As a result of the “Türkiye Endemic Plant Project” carried out between 1992-1997 and supported by the abolished SPO, the seeds of many endemic plants were collected and taken under protection in the Menemen Gene Bank at the Aegean Agricultural Research Institute.

The flora of Türkiye, where the rate of endemism is quite high, is also very rich in terms of medicinal and aromatic plants. Some important genera and species used for medicinal and aro-

matic purposes can be listed as follows: Delphinia (*Delphinum sp.*), Foxglove (*Digitalis sp.*), Chalk Plant (*Gypsophila sp.*), Ceterach (*Helichrysum sp.*), Loddon Lily (*Leucojum Aestivum*), Flax (*Linum sp.*), Anatolian Sweetgum Tree (*Liqiudambar Orientalis*), Mallow (*Malva sp.)*, Chamomile (*Matricaria sp.*), Peppermint (*Mentha sp.*), Black Cumin (*Nigella sp.*), Orchid (*Orchis sp.*), Salep (*Ophrys sp.*), Marjoram (*Origanum sp.*), Anise (*Pimpinella sp.*), Rose (*Rosa sp.*), Sage (*Salvia sp.*), Vervain (*Sideritis sp.*), Herba chamaedyris (*Teucrium sp.*) and Thyme (*Thymus sp.*).

F.1.2.2. Animal Species

Türkiye is not only rich and interesting in terms of flora, but also rich and interesting in terms of fauna due to its location. This is mainly due to the fact that Anatolia is a bridge between the continents of Europe and Asia and therefore Anatolia is located on the migration route, it has different climate and ecosystem types, its flora is rich and therefore many animal species that need food can find suitable habitats for themselves.

Since many studies have been carried out on the vertebrate fauna of Türkiye, the fauna has been revealed to a great extent. According to the latest data, 481 species of birds, 150 mammals, 130 reptiles, 480 sea fish, and 236 freshwater fish have been identified in Türkiye.

Table 87 Number of Species and Subspecies Taxa of Various Animal Groups, Endemism Status, Number of Rare and Threatened Species, Extinct Species (MoAF, 2024)

Animal Groups	Defined Species	Endemic Species/ Subspecies, Variety	Rare and Endangered Species	Extinct Species
VERTEBRATES				
Reptiles Amphibians (Reptilia Ambhibia)	141	16	10	-
Birds (Avez)	460	-	27	-
Mammals (Mammalia)	162	37	23	-
Freshwater Fish (Pisces)	236	70	-	-
Sea Fish (Pizces)	450		-	-
INVERTEBRATES				
Molluscs (Molluzca)	322	203	unknown	unknown
Butterflies (Lepideptera)	6,500	59	59	unknown
Grasshoppers (Orthoptera)	600	270	-	-
Libellae (Odonata)	114		-	-
Beetles (Coleoptera)	10,000	-3,000	-	-
Hemipterous Insects (Heteroptera)	-1,400	-2.00		-
Homoptera	-1,300	-2.00	-	-

As in the whole world, the insect (Insecta) group is also very rich in Türkiye. However, it is possible to give estimated figures about the insect fauna of Türkiye due to the lack of studies in some groups and insufficient studies in some groups. The insect species identified so far in Türkiye are around 30.000. However, the estimated number is between 60.000-80.000.

These figures show how insufficient the studies on insects are. Nevertheless, a faunistic list of some insect groups has been compiled to a great extent. For example, in Türkiye, liballaes (Odonata) are represented by 114 species, grasshoppers (Orthoptera) by 600 species (270 of which are endemic), beetles (Coleoptera) by 10.000 species, molluscs (Mollusca) by 522 species (203 of which are endemic), hemipteroptera (Heteroptera) by 1.400 species, homoptera by 1.500 species, butterflies (Lepidoptera) by 6.500 species (600 of which are diurnal and the rest nocturnal).

Even though some habitats in Türkiye have been degraded or even destroyed, the Mediterranean and Aegean coasts provide shelter for endangered species such as the Mediterranean Monk Seal (Monachus monachus), Sea Turtle (Caretta caretta) and Green Sea Turtle (Chelonia mydas).

F.1.2.3. Endemic / Endangered Animal Species

Türkiye is very rich and interesting faunistically as well as floristically. Many studies have been carried out and continue to be carried out on vertebrate animals of Türkiye. For this reason, there are healthy data on the endemism status, endangerment classes and protected species of vertebrate animals. Accordingly, 16 of the 141 reptile and amphibian species distributed in Türkiye are endemic and 10 of them are under threat. Among birds, there are no species endemic to Türkiye. However, 5 species and 32 subspecies of mammals, 16 species and/or subspecies of reptiles and 70 species/subspecies of freshwater fish are endemic.

Some of the endemic and endangered reptile and amphibian species are as follows;

- Luchan's salamander (Mertensiella Luschani),
- Neurergus (Neurergus Crocatus Crocatus and n. Strauchii Barani),
- Common newt (Triturus Vulgaris Kosswiigi),
- Banded newt (Triturus Vittatus Cilicensis),
- Fire-bellied toad (Bombina Bombina Arifiyensis),
- Taurus frog (Rana Holtzi),
- Armenian lizard (Lacerta Saxicola),
- Anatolian lizard (Lacerta Cappadocica),
- Taurus lizard (Lacerta danfordi Anatolica),
- Balkan green lizard (Lacerta Trilineata),
- Caucasian rat snake (Elaphe Hohenackeri),
- Meadow viper (Vipera Ursinii),
- Pontic adder (Vipera Pontica),
- Anatolian viper (Vipera Anatolica),
- Fırat turtle (Rafetus Euphraticus).

Of the 481 bird species identified, 23 species are under threat, although only one is not endemic. Some of the threatened bird species are as follows:

- Dalmatian pelican (Pelecanus Crispus),
- Lesser White-fronted goose (Anser Erythropus),
- Red-breasted goose (Branta Ruficollis),
- Redhead goose (Aythya Ferina),
- White-headed duck (Oxyura Leucocephala),
- Greater spotted eagle (Clanga Clanga),
- Eastern imperial eagle (Aquila Heliaca),
- Lesser kestrel (Falco Naumanni),
- Corn crake (Crex Crex),
- Toy (Otis Tarda),
- Slender-billed curlew (Numenius Tenuirostris).

The Bald Ibis (Geronticus Eremita), whose natural population is extinct, is under active protection. The majority of other bird species are also among the species requiring protection.

Of the 161 mammal species registered in Türkiye, 37 subspecies and/or varieties are endemic. Of these species, 23 are threatened and under protection. Gazelle (Gazella Subgutturosa), Hatay Mountain Gazelle (Gazella Gazella), fallow deer (Cervus Dama) and mouflon (Ovis Orientalis), which are naturally spread in Türkiye, can be counted among the important species. In addition, Hyena Hyena (Hyena Hyena) is a rare species. Panther (Panthera Pardus Tulliana), Caspian Tiger (Panthera Dicle Virgata) and Lion (Panthera Leo Persica) are known to be extinct in Anatolia.

There are no endemic and threatened species of marine fish. However, 70 of the 236 species spread in fresh waters are endemic and 4 species have been extinct. Some of the endemic and threatened species in fresh waters are as follows;

- Tooth carp (Aphanius Asquamatus),
- Beyşehir bleak (Alburnus Akili),
- Pearl fish (Alburnus Timarensis),
- Feeler (Barbus Plebejus Kosswiigi),
- Eğirdir barb (Capoeta Antalyensis),
- Gudgeon (Gobio Gobio İnsuyanus),
- Dicle chub (Leuciscus Kurui),
- Abant trout (Salmo Trutta Abanticus),
- Van bleak (Alburnus Tarichi).

Although the invertebrate fauna of Türkiye is not as well known as the vertebrate fauna, iit's known that the number of identified species is 30,000 while the total estimated number is 60,000-80,000. The rate of endemism in invertebrate animal groups is also very high.

MoAF Directorate General of Fisheries and Aquaculture is the competent management authority for aquaculture products including terrestrial invertebrates, molluscs, bivalves, plants found in seas and inland waters, their eggs and marine mammals.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Certificate is a permit document issued for the import, export, re-export or entry by sea of live, dead or easily recognisable parts and derivatives of wild animal and plant species included in the annex lists of the convention, provided that certain conditions specified in the convention are met.

The annual export quota for medical leech species and eels collected/hunted in Türkiye is determined together with the General Directorate of Fisheries and Aquaculture of the MoAF, which is the competent management authority, and the Scientific and Technological Research Council of Türkiye (TÜBİTAK), which is the scientific authority, and is announced and monitored by the MoAF General Directorate of Fisheries and Aquaculture.

Communiqués on the allocation of eel export quota, allocation of medical leech export quota and the principles regarding the issuance of CITES Certificate were prepared and published in the Official Gazette. In addition, endangered aquatic products are identified and taken under protection as a result of scientific studies and organizations of which Türkiye is a member.

F.1.3.Genetic Diversity in Türkiye

Plant genetic diversity is very important for both Türkiye and world agriculture. Türkiye is in a very special position in terms of plant genetic resources. Among the centres of origin and diversity described by Vavilov, the Mediterranean and Near East centres overlap in Türkiye. According to J. Harlan, Türkiye has 5 micro-gene centres where more than 100 species show wide variation and is the centre of origin or diversity of many important cultivated and other plant species.

Türkiye is located at the crossroads of two important Vavilovian gene centres, the Mediterranean and the Near East.

- Thrace-Aegean Region: Bread Wheat, Durum Wheat, Poulard Wheat, Degnek Wheat, Einkorn, Lentil, Chickpea, Melon, Bitter Vetch, Lupine and Clover.
- Southern – South-eastern Anatolia: Emmer (Tritucum dicoccum), einkorn, Aegilops speltoides, marrow, melon, cucumber, common bean, lentil, broad bean, vine, and forage plants.
- Samsun, Tokat, Amasya: Various fruit families and species, broad bean, common bean, lentil, and various legumes used as animal feed.
- Kayseri and neighborhood: almond, apple, green peas, fruit species, vine, lentil, chickpea, alfalfa, and sainfoin.
- Ağrı and neighborhood: apple, apricot, cherry, sour cherry, forage grain plants, and watermelon.

Some cultivated plants where Türkiye is the center of gene and origin, located where these two separate gene and diversity centers overlap, can be listed as follows: Triticum, Hordeum, Secale, Avena, Linum, Allium, Cicer, Lens, Pisum, Medicago, and Vicia. In Türkiye, there are 25 wild relatives of wheat (Triticum and Aegilops), 8 wild relatives of barley (Hordeum), 5 wild relatives of rye (Secale), and 8 wild relatives of oat (Avena).

Türkiye is also rich in wild relatives of edible legumes and forage plants. There are 4 species of lentil (Lens), 10 species of chickpea (Cicer), 104 species of trefoil (Trifolium; 11 of them are ende-

mic), 34 species of clover (Medicago), 42 species of sainfoin (Onobrychis), 60 species of vetches (Vicia; 6 of them are endemic) in Türkiye. Türkiye is also a micro-gene center of Amygdalus spp., Cucumis melo, C.sativus, Cucurbita moshata, C. pepo, Malus spp., Pistachio spp., Prunus spp., Pyrus spp. and Vitis vinifera species (Tan, 1998). Additionally, Türkiye is the native land of many ornamental plants such as tulip and snowdrop.
With the awareness of the importance of agricultural plants, many species and varieties of each of these genera are grown in Türkiye within the framework of seed production and distribution programme. Field crops include Wheat, Barley, Corn, Chickpea, Lentil, Common Bean, Sunflower, Potato, Soya Bean, Peanut, Sesame, Tobacco, Cotton and Sugar Beet; Animal Feeds include Sorghum, Rye, Genista and Meadow Grass. More than 200 plant species are covered by this programme. There are also thousands of local varieties, ecotypes and transitional forms that farmers grow from their own resources.

The total number of cereal varieties developed and recorded in Türkiye over the last three decades using local and imported breeds is 256, of which 95 are wheat, 91 corn, 22 barley, 19 rice, 16 sorghum, 11 oats and 2 rye varieties. While the National Seed Programme is continuously breeding new varieties and thus the number of cultivated species is steadily increasing, field crops such as Einkorn (Triticum monococcum), Emmer (Triticum dicoccum), Bitter Vetch and Lupine are not being used as much as before. Therefore, these species have started to disappear.

Horticultural crops include about 50 species and about 100 varieties that are cultivated and distributed. These include tomato, pepper, aubergine, lettuce, cabbage, radish, onion, courgette, cucumber, melon, watermelon, beans, vegetable marrow, pea, spinach, carrot, broad bean, leek, rocket, purslane, fennel, cauliflower, parsley, bean and gherkin cucumber. When local varieties and varieties obtained from other sources are taken into consideration, it is estimated that the total number of varieties cultivated in the country reaches 200.

Variety richness is also observed in fruit production. The number of fruit species is estimated to be around 138, 80 of which are cultivated in Türkiye. Fruit and nut varieties in Türkiye include apple, pear, quince, cherry, sour cherry, apricot, peach, fig, pomegranate, mulberry, almond, hazelnut, walnut and pistachio. Viticulture also has an important place in Turkish agriculture. Anatolia, which hosts the wild grapevine species (Vitis Silvestris), is also the gene centre of the grape vine (Vitis Vinifera).

Türkiye is also very rich in terms of forest gene resources. Among the nationally and globally important native forest trees, there are 5 pine, 4 fir, 20 oak, 8 juniper species, as well as valuable gene resources of Taurus Cedar, Oriental Spruce and Oriental Beech. Important forest trees are as follows: Pine Species (Pinus Brutia, P. Nigra, P. Sylvestris, P. Halepensis, and P. Pinea) Fir Species (Abies Nordmanniana subsp. Nordmanniana, A. Nordmanniana subsp. Bornmulleriana, A. Nordmanniana subsp. Equitrojani, A. Cilicica subsp. Cilicica, A. Cilicica subsp. Isaurica), Taurus Cedar (Cedrus Libani), Beech (Fagus orientalis), Spruce (Picea orientalis), Linden (Tilia spp.), Alder (Alnus spp. 2 species, total 6 taxa), Juniper (Juniperus spp. 8 species), Oak (Quercus about 20 species).

Türkiye is an agricultural country where plants and animals have been cultivated since ancient times. The Southeastern Anatolia region, also known as Northern Mesopotamia, is considered to be one of the cultural centres where humans first started settled agriculture. For this reason, it can be assumed that many indigenous animal breeds obtained by passing civilisations were raised and spread to other parts of the world from here.

The crossbreeding of local breeds of livestock with foreign breeds has brought about the dangers of loss of local gene resources. In the Black Sea coastline, almost all local cattle have been converted into Jersey breeds. However, only 25% of the indigenous breeds have been crossbred with cultivated breeds and 75% remain pure. Again, the 'Kıvırcık' sheep of the Thrace Region has been crossed with the German 'Ots-Friz' breed in order to improve the Tahirova breed, and this has led to genetic erosion of both endemic breeds. Some sheep varieties such as 'Karakul' living in the northern transition zone and 'Tuj' living in Kars region are under the threat of extinction. Another threatened native animal breed is the Ankara goat, which is under protection to prevent its complete extinction.

Studies on the genetic diversity of aquatic species and invertebrates (especially insects) are insufficient.

F.1.4. Agricultural Land and Steppe Biodiversity

Agricultural biodiversity is a broad term that encompasses all of the biodiversity components related to food and agriculture and that make up agroecosystems. It refers to the diversity and variability of plant, animal and micro-organisms at the genetic, species and ecosystem levels that are necessary to sustain the key functions, structure and processes of agro-ecosystems.

In a more detailed definition, agricultural biodiversity includes plant genetic resources, including genetic resources of trees, animal genetic resources, including fish and insect genetic resources, microbiological and fungal genetic resources, components of agricultural biodiversity that provide ecosystem services and abiotic factors (nutrient cycling, organic matter decomposition and maintenance of soil fertility, pest and disease management, pollination, enrichment and maintenance of local wildlife and habitats within their landscapes, maintenance of the water cycle, erosion control, climate and carbon balance) and socio-economic and cultural factors (traditional knowledge, cultural factors, agricultural landscapes, etc.).

The main ecological regions of Türkiye in terms of agriculture are Mediterranean Coastal Region, Aegean Coastal Region, Black Sea Coastal Region, Thrace and Marmara Region, Central Anatolia Region, Southeastern Anatolia Region, Eastern Anatolia Region and Gateway Regions (Northwest Gateway, Western Gateway, Northeastern Gateway, Eastern Gateway, Southeastern Gateway). This zoning system, based on main climatic elements such as precipitation and temperature, covers the diversity of agricultural products and the regional and phenological characteristics of agriculture.

Coastal regions can generally be defined as agricultural production regions located in the Mediterranean climate zone. The Central, Eastern and Southeastern Anatolia Regions are the regions where the harsh continental climate is predominant, and the characteristics of agricultural products also bear the effects of these ecological regions. Transitional regions, on the other hand, are agricultural regions covering a few provinces in the transition from the centre of Central Anatolia to the other regions, which are more or less different from each other in terms of both climatic factors and general agricultural characteristics.

Table 88 Indigenous Animal Breeds of Steppe Ecosystem (MoAF, 2024)

INDIGENOUS ANIMAL BREED	BREED REGION
CATTLE BREEDS	
Anatolian Black	All regions except the north-east and Thrace
East Anatolian Red	Eastern Anatolia all the way to Ankara
Grey Steppe Cattle	Eskişehir, Kütahya
Kutlak Cattle	Çorum territory
Southern Yellow	South and Southeast Anatolia
Kilis Cattle	Gaziantep
Native Buffalo Breeds	Afyon, Kütahya, Uşak, Denizli, Kayseri
SHEEP BREEDS	
Akkaraman	From Eskisehir to Hakkari
Morkaraman	Erzurum, Erzincan, Bingöl
Ulaş-Kangal Karamanı	Sivas, Malatya
Güney Karamanı	South and Southeast Anatolia
Karakaş Sheep	Güneydoğu, especially Diyarbakır
Ödemiş Sheep	İzmir
Dağlıç	Bilecik, From Eskisehir to the Aegean Region
İvesi	Southeastern Anatolia
Herik Sheep	Eastern Black Sea
Hemşin Sheep	East of the Eastern Black Sea
Tuj Sheep	Kars
Kıvırcık Sheep	Thrace, South Marmara
Karakaya Sheep	Eastern Black Sea
Sakız Sheep	Aegean coast
İmroz Sheep	Çanakkale
Turkish Merino	Marmara
Central Anatolian Merino	Central Anatolia
Malya Sheep	Central Anatolia
GOAT BREEDS	
Ankara Goat	Ankara, Central Anatolia
Hair Goat	All Regions
Kilis Goat	Southeastern Anatolia
White Goat	Central Anatolia
HORSE BREEDS	
Anatolian Horse	Central Anatolia
Çukurova Horse	Southern and Southeastern Anatolia

Native Arabian Horse	Southeastern Anatolia
Uzunyayla Horse	Kayseri, Sivas
Canik Horse	Black Sea Region
Malakan Horse	Kars
Arabian Horse	Southeastern Anatolia
POULTRY	
Native Chicken	All Regions
Denizli Breed	Denizli and neighbourhoods
Gerze Breed	Sinop
Naked Neck	Muğla
Zile Breed	Sivas
Native turkeys	All over the country
Native Geese	All over the country
Native Ducks	All over the country
Ankara Rabbit	All over the country

Agricultural installations in Türkiye are small, fragmented and disorganised. This structure, which has negative consequences for agricultural production, creates an advantage in terms of biodiversity as it provides small habitats that allow wild plant and animal species to live. On the other hand, the fact that agricultural areas are generally located within steppe ecosystems makes it difficult to distinguish between agricultural biodiversity and steppe biodiversity. For this reason, these two ecosystem structures are considered together.

F.1.5. Forest Biodiversity

The forest ecosystem in Türkiye covers a total area of 23,363,071 hectares (30% of the country's total area), including 9,654,099 hectares of hollow closed forests. Coniferous forests are more common in Türkiye (32% broad-leaved trees, 47% coniferous, 21% mixed). Coniferous trees are found at all altitudes from sea level to the upper limit of forests. In the Aegean and Mediterranean regions, moist, semi-moist, coniferous and dry forests (oak, black and red pine) are found in addition to scrub and maquis.

Topographical structure, climate and soil differences have made Türkiye's forests very rich in terms of plant diversity. One of the main reasons for this richness is the climate changes that occurred in the fourth geological period. Approximately one third of the plant species in Türkiye are from the old geological periods and most of them are endemic. Most of the endemic species are found in the Mediterranean Plant Geography (especially in the Taurus Bolkar and Nur Mountains) and Iran-Turanian Plant Geography Regions.

In Türkiye, there are many ecosystems based on both ecological and floristic composition of forest habitats and the function of each ecosystem is more or less different from each other. These rich forest ecosystems of Türkiye provide habitats for many endemic plant species, important bird species and many wildlife species. Again, in these ecosystems, there are wild relatives of many cultivated plants that are important in terms of agricultural biodiversity.

The Mediterranean Plant Geography Region covers all regions bordering the Mediterranean Sea and the western parts of Thrace. In these regions, forest ecosystems form different vegetation series from sea level to the highest parts of the mountains depending on soil-climate-plant relations. Within each vegetation series, different forest ecosystems develop depending on other ecological parameters.

In the Mediterranean and Aegean regions of Türkiye, where the Mediterranean climate is effective, the "Warm Mediterranean and Main Mediterranean vegetation layer" is observed between 0-1.000 metres in the Mediterranean and Aegean regions of Türkiye, where the Mediterranean climate is effective, the "Warm Mediterranean and Main Mediterranean Vegetation Level" is observed and within these levels, Xerophyllous Maquis (Oaks, Sandalwood, Gum, Myrtle, etc.) Ecosystem, Red Pine (Pinus Brutia) Forest Ecosystem, Aleppo Pine (Pinus Halepensis) Forest Ecosystem, Logwood (Liquidambar Orientalis) Forest Ecosystem, Cypress (Cupressus Sempervirens) Forest Ecosystem, Mixed Oak (Quercus Cerris-Q. Infectoria-Q. Libani-Q. Brantii) Ecosystem and Peanut Pine (Pinus Pinea) Forest Ecosystems are seen.

Between 1.000-2.000 metres, "Upper Mediterranean and Mediterranean Mountain Vegetation Layers" are observed. Black Pine (Pinus Nigra), Taurus Fir (Abies Cilicica), Cedar (Cedrus Libani), Beech and Hornbeam (Ostrya Carpinifolia-Carpinus Orientalis), Mixed Oak (Quercus Petraea-Quercus Cerris- Qurcus Trojana) forest ecosystems are observed between these elevations. In the Aegean High Mountain Forests, unlike the Mediterranean, there are mixed forest ecosystems including chestnut, beech, linden, hazelnut, yellow pine, oak and red pine trees in most places. After 2.000 metres, "High Mountain Mediterranean Vegetation Level" is found. In this section, there is a mixed Juniper (Juniperus excelsa-Juniperus foetidissima) forest ecosystem and a Mediterranean High Mountain Steppe ecosystem consisting of semi-shrub and herbaceous plants in pillow form.

The Iran-Turanian region is the largest of the plant geography regions and extends from Central Anatolia to Mongolia. Terrestrial climate and steppe plants are dominant in the region. Although the region covers a much wider area, forest ecosystems here include arid zone forest and high mountain ecosystems. The main ones are Steppe Forest (Tree)-Central Anatolia (Haired and Hairy oak, Black pine, Juniper: 800-1.500 m), Arid Black pine, Oak and Juniper Forests-Central Anatolia (Oaks: <1.200 m; Black pine: 1.000 - 1.500 m; Yellow pine > 1.500 m), Arid Forests-Eastern Anatolia Oak Forests (Oak species < 850 m).

The Euro-Siberian plant geography region extends across Northern Anatolia and the parts of the Thrace Region facing the Black Sea. It is the wettest climatic zone, its large parts are covered with forests. In this region, forest ecosystems in the formations of arid oak and pine forests (oak, larch, red pine) and shrubs (maquis - false maquis) stand out below 1.500 m. Between 500-1,200 m, Leafy-Coniferous Forests (Beech-Fagus Orientalis-, Chestnut-Castanea Sativa, Hornbeam-Carpinus Orientalis- Carpinus Betulus, Alder-Alnus Glutinosa); Between 1,000-1,500 m, Moist-Semi Moist Coniferous Forests (Larch, Scots Pine-Pinus Sylvestris, Spruce-Picea Orientalis, Fir-Abies Nordmanniana-) are found. Mixed Rhododendron (Rhododendron Ponticum, Rhododendron Luteum, Rhododendron Ungernii, Rhododendron Smirnowii), White Kumar and Birch (Betula Pendula) forest ecosystems are found especially in the higher parts of the eastern Black Sea. Floodplain Mixed Forest (Fraxinus Angustifolius-Qurcus Robur - Fagus Orientalis) ecosystems are found in flat alluvial areas with high ground water in Thrace and Western Black Sea regions.

Most large mammals in Türkiye live in forest ecosystems. For example, the forests provide habi-

tats for mammals such as Brown bear (Ursus arctos), Red fox (Vulpes vulpes), Wolf, Jackal (Canis aureus), Eurasian lynx (Lynx lynx), Hyena (Hyena hyena), Deer (Cervus elaphus), Chamois (Rupicapra rupicapra), Wild goat (Capra aegagrus), Wild boar (Sus scrofa scrofa), European badger (Meles meles), European pine marten (Martes martes), Hedgehog (Erinaceus europea), Rabbit (Lepus capensis), Least weasel (Mustela nivalis), Red squirrel (Sciurus vulgaris); reptiles such as Snake, Chameleon (Chameleo chameleon), Lizard (Lacerta agilis, L. armeniaca, L. parvula, L. derjugini, L. princeps, L. trilineata, L. viridis, Anguis fragilis), Spur-thighed tortoise (Testudo graeca) species; and birds such as Ring-necked Pheasant (Phasianus colchicus), Caspian snowcock (Tetraogallus caspius), Caucasian grouse (Tetrao mlokosiewiczi), Woodpecker (Dendrocopus sp.), Accipitriformes (eagle species-Aquila sp., Pandion sp., goshawk species-Accipiter sp., Hen harrier species-Circus sp., hawk species-Buteo sp., Falcon species (Falco sp., Pernis sp. v.s.), strigiformes (Tawny owl -Strix aluco, Long-eared owl -Asio otus, Boreal owl -Aegolius funereus etc.) and many passeriformes species. Among these species, the Chamois (Rupicapra Rupicapra), Wild Cat (Felis Silvestris), Cinereous Vulture (Aegypius Monachus), Eastern Imperial Eagle (Aquila Heliaca), Greater Spotted Eagle (Aquila Clanga) and Lesser Spotted Eagle (Aquila Pomarina) are among the forest fauna species protected under international conventions.

F.1.6. Mountain Biodiversity

Mountain ecosystems provide habitat for both different forest flora and many animal species depending on factors such as variability in the topographical structure of Türkiye and distance to the sea. In terms of ecosystem diversity, mountains are divided into sub-ecosystems such as alpine meadows, sub-alpine meadows, moving slopes, thorny pillow formation steppes and the floristic composition of each ecosystem is different from each other. Information on species richness in mountain steppes is given under the heading "E.1.4. Agricultural Area and Steppe Biodiversity". The fauna species given above under forest biodiversity are also valid for many mountain ecosystems.

The Mediterranean region contains more than 25 important mountains characterised by high mountain ecosystems. This is followed by the Iran-Turanian biogeographic region with 19 mountains. There are 11 important mountain ecosystems in the Europe-Siberia biogeographic region. Mountains contain important habitats for birds, plants, economically important species and wildlife. The total number of species and endemics in most of these mountain ecosystems is unknown. Among the known ones, Bolkars, Amanos (Nur) Mountains, Munzur Mountains, Sultan Mountains and Tecer Mountains are the mountain ecosystems with the highest number of endemic plant species.

Since mountain ecosystems include different ecosystems such as wetland, steppe, meadow-pasture and forest, institutional responsibility in these ecosystems is not single-centred. For example, the management of pastures within forests is carried out by the General Directorate of Forestry, while other pastures are managed by the Ministry of Agriculture and Forestry. Therefore, many institutions that have direct or indirect authority over biodiversity also have authority over mountain ecosystems.

F.1.7. Inland Water Biodiversity

Türkiye has important inland water ecosystems in terms of biodiversity, with rivers and lakes covering an area of approximately 10,000 km^2 (1.6% of Türkiye's area). Türkiye has 7 drainage

basins, including 25 river basins, and groundwater is estimated at 94 billion km^3 . The average annual precipitation level is about 640 mm and about one third of this amount reaches water reserves and contributes to the survival of wetlands. However, according to the annual amount of water per capita, Türkiye is a water scarce country. The annual amount of usable water per capita is around 1.500 m^3.

Türkiye's inland water potential consists of 33 rivers (177,714 km), 200 natural lakes (906,118 ha), 159 reservoirs (342,377 ha) and 750 ponds (15,500 ha). There are nine rivers in Türkiye with a length of more than 500 km: Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilırmak and Ceyhan.

Especially lakes have a special importance in inland water ecosystems. Because many of our lakes are surrounded by mountains and under the influence of their environment, their waters show more or less different characteristics from each other. The waters of closed basin lakes are fresh, salty or sodal. The aquatic fauna elements of these lakes, most of which are isolated from each other, have also differentiated as a result of the prevention of gene flow. Many lakes are inhabited by unique and rare fish species. The largest of the natural lakes is Lake Van in Eastern Anatolia, with an area of 374,000 hectares and high salinity. On the Central Anatolian Plateau there are some saline shallow lakes, the largest of which is Salt Lake (128,000 hectares). Salt Lake dries up almost completely in summer and is covered with a 30 cm thick layer of salt. Only salt-resistant vegetation grows around the lake.

Streams are also sensitive ecosystems that separate natural habitats. The valleys, caves, islets and flood plains formed by rivers are often a way for aquatic organisms to spread and sometimes a means of refuge. Some rivers in Anatolia have enriched the aquatic fauna with the effect of physical isolation.

Lakes, marshes, deltas, reeds and mud flats are very important for wildlife, especially birds. More than half of the bird species in Türkiye are migratory. Wetlands are important resting and wintering habitats for water birds. Meriç, Gediz, Büyük Menderes and Küçük Menderes Deltas formed by the rivers flowing into the Aegean Sea and Göksu, Seyhan and Ceyhan Deltas formed by the rivers flowing into the Mediterranean Sea form habitats suitable for a large number and species of waterfowl, especially as a result of the freezing of lakes in Anatolia in winter. The delta formed by the Kızılırmak River, which flows into the Black Sea, is of great importance especially for migratory birds crossing the Black Sea directly.

F.1.8. Marine Biodiversity of Türkiye

Türkiye consists of two peninsulas (Anatolia and Thrace) and its coastline, including the Turkish Straits System (Bosphorus and Dardanelles, Marmara Sea), is approximately 8,592 km excluding islands. 2,083 km of coastline is protected (24%). The different characteristics of the seas surrounding Türkiye have led to the differentiation of the biodiversity it contains. Approximately 3 thousand plant and animal species live along the coastline. A total of 472 species of fish live in the seas of Türkiye. This number may vary every year with lessepsian species. Our total marine protected areas are 1,495,513 ha.

F.1.8.1. Marine Mammals in the Seas of Türkiye

Marine mammals are one of the most important groups of marine organisms in Türkiye. There are 11 species of marine mammals in Turkish waters. Although there are 21 cetacean species living in the Mediterranean Sea, only 3 of them live in the Black Sea. It is stated that the Mediterranean monk seal (Monachus monachus) has not been seen in the Black Sea since 1994. Hunting of all marine mammals has been banned since 1983.

F.1.9. Turkish Islands and Island Biodiversity

There are approximately 500 islands and islets within the borders of Türkiye. 212 islands and islets are located in the Aegean Sea. Some of the islands have rich biological diversity and endemic species, some of them are isolated areas away from human intervention, providing a living and breeding environment for many species, helping to protect both marine and terrestrial biodiversity and hosting threatened marine mammals, seabirds and amphibians such as the Mediterranean Monk Seal.

The islands also have an important role as stopover sites for birds during bird migration. Thousands of birds stay here every year. The Aegean Islands are the habitat and breeding grounds of the globally endangered Audouin's Gull (Larus Audouinii). The Aegean Islands are the nesting and breeding grounds of many birds such as Yelkouan Shearwaters (Puffinus Yelkouan), Audouin's Gull (Larus Audouinii), Eleonora's Falcon (Falco Eleonorae) and Osprey (Pandion Haliaetus). For these reasons, small islands are considered as priority areas for protection.

F.2. Biodiversity Conservation Studies

F.2.1. Studies carried out within the scope of CITES

On 22 December 1996, Türkiye became a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which entered into force on 01 March 1975.

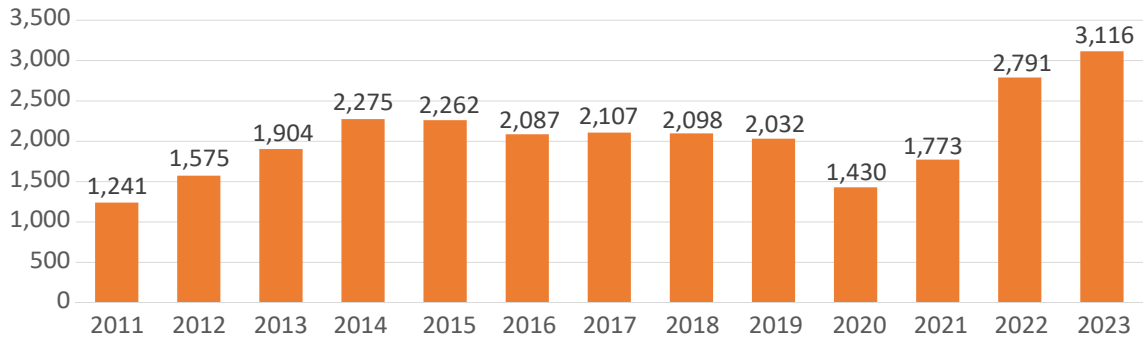
The 184 signatories to the Convention have undertaken to comply with the obligations set out in this Convention in the international trade (import, export, re-export, entry by sea) of plant and animal species listed in Annex I, Annex II, Annex III of the Convention. Within the scope of this convention, legislative measures were taken in Türkiye and the "By-law on the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora" entered into force after being published in the Official Gazette dated 27 December 2001 and numbered 24623, and the said By-law was revised by being published in the Official Gazette dated 20.07.2019 and numbered 30837.

CITES Management Authorities are the institutions that issue permits. The CITES Management Authority in Türkiye is the Ministry of Agriculture and Forestry (MoAF). MoAF General Directorate of Nature Conservation and National Parks is the Focal Point of the CITES Convention and ensures coordination between the Convention Secretariat and relevant institutions. It also carries out tasks such as reporting and training.

In accordance with the provisions of the Convention, Türkiye is in Category A because it has prepared the CITES National Implementation By-law in accordance with the Convention within 5

years from the year it became a party, is the management and scientific authority, controls trade by issuing CITES Permits for species listed in the CITES appendices and their parts and derivatives, regularly submits annual and biennial reports to the Secretariat on behalf of the country and carries out its practices in accordance with the terms of the Convention.

Graph 55 Distribution of the Number of CITES Documents Issued by Years (MoAF, 2024)



Some of our smuggled species are endemic species that grow only in Türkiye and are therefore even more important. In order to prevent the smuggling of species, in order to raise awareness on CITES applications and species, Inspection and Conservation Officers working in the Ministry of Trade are regularly trained in Ankara several times a year and the importance of the issue is explained.

The CITES Database (CITES Application System) has been in use since 1 January 2016. Through this database, CITES Permit Documents are issued electronically in a much faster way (citesbasvuru.tarimorman.gov.tr). The system can be accessed via e-government. CITES Database is also integrated into the TPS (Single Window System) of the Ministry of Trade.

F.2.2. Studies carried out within the scope of the European Landscape Convention

Since 2000, we have been a party to the European Landscape Convention, which is carried out by the "Committee on Culture, Heritage and Landscape (CDCPP)" of the Council of Europe, and 40 countries have become parties to date. The Convention is the first international treaty in Europe to address landscapes with all their characteristics. It covers landscapes that are considered to be outstanding with their characteristics as well as ordinary or degraded landscapes. MoAF is the focal point of the Convention.

In order to fulfil the obligations of the Convention and to transfer the rich natural and cultural landscape diversity and heritage values of Türkiye to future generations by considering the conservation-use balance, it is necessary to prepare a national landscape inventory, to define and classify the landscape, and to determine protection and development strategies. For this purpose, the project studies, which were initiated at local scale in Konya and transferred to provincial scale in Malatya, have been carried to basin scale with the landscape atlas preparation studies.

In this context, the Büyük Menderes Basin, which was initiated in 2018 within the scope of expanding the "Basin Landscape Atlas" projects to other basins, was completed in 2021. The method used in the preparation of the Yeşilırmak Basin Landscape Atlas was developed and used in this project.

The project covers the preparation of 1/100.000 scale landscape atlas in GIS environment, the works to be carried out for the management of all kinds of information and data prepared for this purpose on a relational database and the establishment of a landscape information system.

With the project, landscape character types and landscape character areas, landscape diversity and biodiversity and landscape quality of the basin were determined, ecologically sensitive areas, areas that need to be protected and restored, ecological corridors, connection corridors were identified, and micro-basins showing ecological sensitivity for each sector were identified. Landscape protection and development strategies were determined, spatial targets, landscape quality targets, landscape management targets were set for micro-basins and sectoral landscape guides were prepared.

In the landscape atlas studies, problematic micro-basins in terms of discharge (domestic and industrial) points in the basin, problematic micro-basins in terms of solid waste storage areas, water pollution and pressure situation in micro-basins, etc. were revealed, based on the amounts of nitrogen and phosphorus transmitted to the rivers, micro-watersheds were evaluated in terms of diffuse pollutants, the pressure of Hydro-Electric Power Plants on micro-watersheds, areas with construction pressure on agricultural lands, environmental problems caused by stone, sand and mine quarries, etc. were determined and recommendations were made.

The target for 2024 is to disseminate the Basin Landscape Atlases in other basins representing each geographical region. After the dissemination projects are completed, the preparation of the "National Landscape Strategy and Action Plan" will be initiated. National landscape policies should be established as soon as possible and horizontal and vertical integration should be ensured as stated in the guidelines published for the implementation of the European Landscape Convention.

F.2.3. Other Studies

As a result of the studies carried out by the General Directorate of Forestry of the MoAF, the integration of biological diversity into forest management plans was carried out for the first time in 2020 in Kumluca Forest Management Directorate of Antalya Regional Directorate of Forestry. In these planning studies, plants, birds, large mammals, small mammals, reptiles, amphibians and butterflies were studied.

In addition, on the basis of Ecosystem Based Functional Forestry, biodiversity elements, natural old forests, areas with tree species richness, in-forest water resources, etc. are considered within the scope of planning. In the planning areas, target species are selected by evaluating biodiversity with all its elements. Absolute protection and implementation zones and ecological corridors are planned for the habitats of target species and endangered species. Prescriptions are prepared for the implementation zones and forestry activities are carried out in accordance with the determined rules and principles. Thus, protection and sustainability of biological diversity is ensured.

Within the scope of "Türkiye Climate Resilient Forestry Project (IDOP)" and "Preparation of Forest Ecosystem Services Assessment Report and Integration of Biological Diversity into Forest Management Plans" project financed by the World Bank within the General Directorate of Forestry, biological diversity planning is carried out in 9 Forest Management Directorates in 2024 and integration into Forest Management Plans.

National Biodiversity Inventory and Monitoring Project (UBENIS) and Noah's Ark National Biodiversity Database

In order to reveal and protect our biological diversity, the "National Biological Diversity Inventory and Monitoring Project" was prepared by the MoAF General Directorate of Nature Conservation and National Parks (DKMPGM) and carried out between 2013-2020. In 81 provinces, biological diversity inventory studies were completed and the Biological Diversity Map of Türkiye was revealed.

Within the scope of the project, biodiversity inventory studies of Türkiye, literature and field studies for vascular plants, mammals, birds, fish, reptiles, ambhibians, and literature review for seedless plants and invertebrates were carried out. In total, 918 subject matter experts carried out biodiversity inventory studies. Inventory studies lasted 7 years for the whole country. 25 thousand man/day field work was carried out.

Biodiversity inventory data from all provinces of Türkiye are entered and stored in the Noah's Ark National Biodiversity Database. Thus, the biodiversity data of Türkiye can be queried on the basis of tables, graphics and maps through a database, and the changes that will occur in the name of the protection and sustainability of our biological diversity are observed.

With the "National Biodiversity Inventory and Monitoring Project", flora, fauna, habitat and special area data were transferred and the number of data reached 1 million 900 thousand.

The biodiversity inventory study of Türkiye was carried out at a total of 852,643 spatial observation points. Of these points, 472,016 are fauna points and 380,627 are flora points. When the number of points where species are detected coordinately on the basis of living groups is analyzed, it is seen that vascular plants have the highest number of points with 380,627 points. Vascular plants are followed by birds with 349,354 points, mammals with 61,808 points, reptiles with 23,770 points, inland water fishes with 23,347 points and bivalves with 13,737 points. A total of 13,404 taxa were identified. Of these, 12,141 are flora taxa and 1,263 are fauna taxa. Among the taxa inventoried, 428 local endemic and 3,275 endemic taxa were identified. Local endemic species were identified at 1.626 points and endemic species at 35.954 points.

Table 89 Number of Species (MoAF, 2024)

LIVING GROUP	TÜRKİYE*	EUROPE
Vascular Plants	12,141	15,535
Mammals	175	402
Birds	500	874
Inland Water Fish	403	546
Reptiles	146	256
Bivalves	39	107

* Türkiye species numbers are taken from "Noah's Ark Biodiversity Database".

Ayrıca In addition, monitoring studies have been initiated in 81 provinces where inventory studies have been completed within the scope of the project, and it is proposed to monitor flora and fauna species and habitats (special areas) that are important in terms of biological diversity through indicators determined at species/population and habitat/ecosystem level within the

scope of the project. Since 2015, monitoring activities have been carried out and 355 flora, 224 fauna and 284 featured areas were monitored in 2023.

- Noah's Ark Biodiversity Database is the largest biodiversity database in Türkiye.
- Noah's Ark Biodiversity Database contains inventory and monitoring data of biodiversity species and featured areas. Many attribute data for species and areas are kept here. In addition, the identification card of each species has been created and species-specific data are also stored. In this way, long-term data flow on species is aimed.
- The data in the Noah's Ark Biodiversity Database are completely numerical and spatial data and have all kinds of querying possibilities. Map representations of the queried data are also made using different base maps.
- The data in the Noah's Ark Biodiversity Database will constitute an important basis in many fields such as food, agriculture, forestry, medicine, pharmacy, pharmaceuticals, cosmetics, perfumes, natural dyes, energy and defence where biodiversity is transformed into economy. It also constitutes an important data source for other public institutions connected to biodiversity.
- One of the most important problems in medicinal and aromatic plants in Türkiye is that while our biological richness is so high, this richness has not been transformed into economic contribution. Taking into account the demands of national and international markets, product diversity and production diversity by making use of the data in the Noah's Ark Biodiversity Database has the potential to increase the share of Türkiye in this sector.
- Elaborating researches on the species identified as medicinal plants from the data in the Noah's Ark Biodiversity Database, increasing multidisciplinary studies, cultivating the species to be identified and carrying out breeding studies will increase the product diversity of Türkiye.
- With the National Biological Diversity Inventory and Monitoring Project, studies were carried out in areas where inventory studies had not been carried out before and the density of inventory points was increased. Therefore, Noah's Ark Biodiversity Database has created an inclusive biodiversity data network across Türkiye.
- The major indicator of healthy ecosystems is healthy biodiversity. In order to ensure this, a data source is needed and Noah's Ark Biodiversity Database serves this task.

Capacity Building in Biodiversity Monitoring Project

Biodiversity monitoring activities are carried out by the relevant Branch Directorates of 15 Regional Directorates under the MoAF General Directorate of Nature Conservation and National Parks. In this context, the Project for Capacity Building in Biodiversity Monitoring was carried out between 2021-2023 in order to ensure that monitoring at the national scale, species and habitat level is carried out at the same standard and to meet the missing and insufficient requirements in the provincial organisation.

Anti-Biosmuggling Project

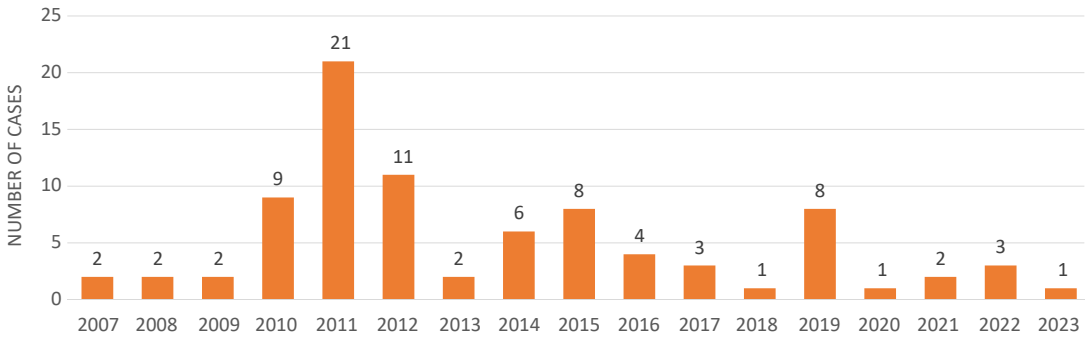
Biosmuggling refers to the unauthorised export of biological resources owned by Türkiye and their use for various purposes outside the control and/or partnership of Türkiye. Living organisms themselves or their tissue samples are genetic resources. Countries rich in biological diversity such as Türkiye are constantly exposed to biosmuggling, especially in terms of genetic resources.

Anti-biosmuggling activities are carried out by the MoAF DKMPGM in order to prevent the abuse and damage of our biological diversity through biosmuggling, and to ensure that the economic, social, scientific, technological, medical, commercial and cultural potential benefits that can be obtained from the genetic resources of Türkiye are used for the benefit of Türkiye. In this direction, the first Anti- Biosmuggling Project was carried out in Türkiye between 2013 and 2015. The repercussions of this project are still ongoing and training activities on combating biosmuggling are being carried out in order to protect our genetic resources. Within the scope of the Environment and Nature, Animal Protection Course at the Presidency of Gendarmerie and Coast Guard Academy, especially in the provincial organizations that are in charge of enforcement, non-commissioned officers are given a course on "The Importance of Combating Biosmuggling" during the year.

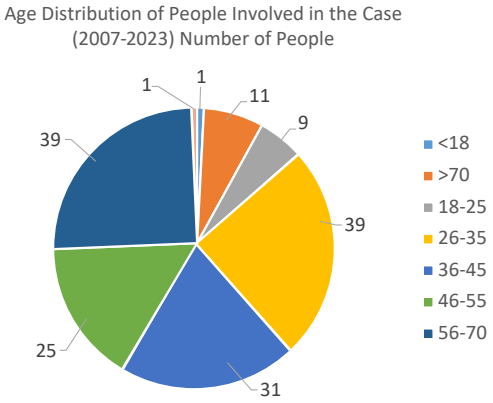
However, within the framework of a protocol signed between the Ministry of Interior and the Ministry of Agriculture and Forestry, direct and immediate data flow is provided to the Ministry of Interior. By starting to share data and information electronically with law enforcement agencies, biosmuggling cases are monitored and biosmuggling cases are aimed to be prevented.

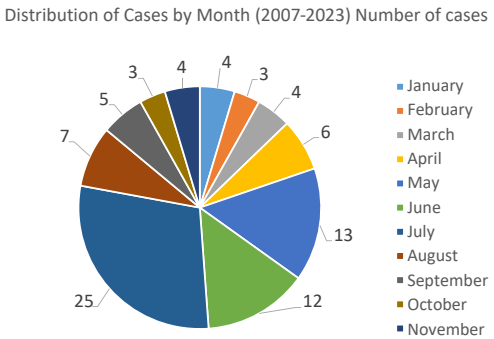
Within the scope of the fight against biosmuggling in Türkiye, an administrative fine of approximately 5.6 million TRY was imposed on 156 persons from 21 different countries in 86 cases between 2007 and 2023. 15 of these cases were detected between 2019-2023.

Graph 56 Distribution of Biomuggling Cases between 2007-2023 by Years (MoAF, 2024)

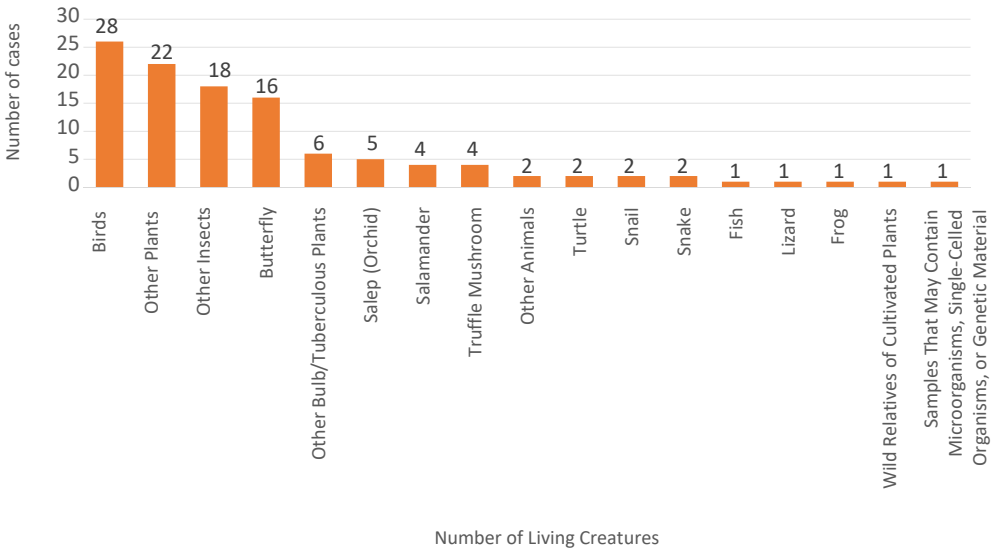


Graph 57 (A) Age Distribution of Persons Involved in Biomuggling Cases and (B) Distribution of Biomuggling Cases by Month between 2007-2023 (MoAF, 2024)





Graph 58 Distribution of Living Groups Subject to Biosmuggling Cases between 2007-2023 (MoAF, 2024)



Recording Traditional Knowledge Based on Biodiversity Project

Launched in 2017 with the slogan "Bi'OLogical Diversity from Tradition to Future", the "Recording Traditional Knowledge Based on Biological Diversity (BGB) Project" was implemented as a "first" in the history of the Republic and completed by the end of 2023. With this project, information on traditional products such as medicines, yeast, dyes, etc. developed by the people by making use of natural biological resources is compiled and recorded and protected in the "Biodiversity-Based Traditional Knowledge Management System (BGBYS)", which will be subject to limited access.

The main objective in establishing this system is to protect intellectual property rights based on our genetic resources and related traditional knowledge. The system can be used as an effective and important tool to prevent foreigners from patenting products obtained by using traditional knowledge based on the biological diversity of Türkiye / to ensure the cancellation of wrongly acquired patent rights. On the other hand, the system will provide a rich basis for the R&D activities to be carried out by the researchers of Türkiye in order to develop products with 100% domestic and national facilities.

Established in 2019 and started active data entry in 2020, in addition to the collection of the Republican period country literature in the BGBYS, literature data are collected again from the provinces where fieldwork is carried out and included in the system. Approximately 118,000 data on traditional knowledge based on biodiversity (BGB), obtained from the field and literature, have been recorded in the system. Of the recorded data, 86% are related to plant genetic resources, 12% to animal genetic resources and 2% to fungal genetic resources.

F.3. Protected Areas

In Türkiye, conservation activities are carried out in areas with different statuses such as special environmental protection areas, national parks, nature parks, nature conservation areas, nature monuments, wildlife development areas, conservation forests, seed stands, seed gardens and gene conservation areas, agricultural enterprises, natural and archaeological sites, wetlands and biosphere reserve areas. Natural Protected Areas, Special Environmental Protection Areas, National Parks, Wildlife Development Areas, Wetlands, Nature Parks, Nature Reserves, Protection Forest and Nature Monuments constitute the Protected Areas in Türkiye.

There are 19 Special Environmental Protection Areas in Türkiye and the surface area of these areas is 3,832,959.54 hectares. There are 4,034 natural protected areas in Türkiye and the surface area of these areas is 2,755,773 hectares. The total area of Special Environmental Protection Areas corresponds to 4.9% of Türkiye and the total area of Natural Protected Areas corresponds to 3.5% of Türkiye.

Table 90 Protected Areas under the Responsibility of the Ministry of Environment, Urbanization and Climate Change (MoEUCC, 2024)

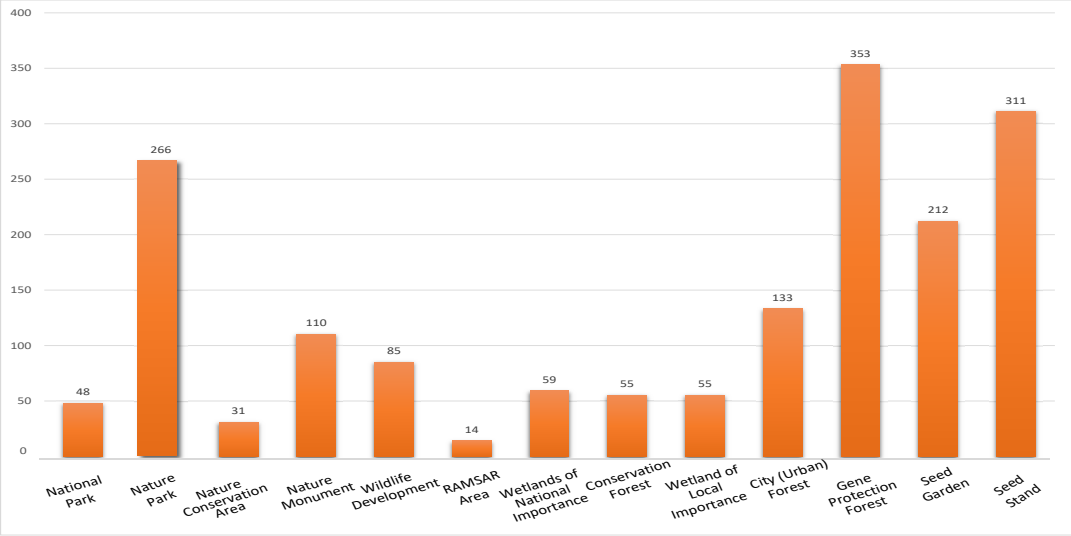
	PROTECTION STATUS	PIECES	AREA
PROTECTED AREA	1st Degree Natural Protected Area	639	639,621,23
	2nd Degree Natural Protected Area	232	32,694,11
	3rd Degree Natural Protected Area	350	95,752,67
	Degree Unspecified	62	18,960,52
	Sensitive Area to be Strictly Protected	587	444,861,10
	Qualified Natural Protected Area	1,159	869,812,51
	Sustainable Conservation and Controlled Use Area	1,005	654,070,87
	Special Environmental Protection Area (SEPA)	19	3,832,959,54
TOTAL		**4,053**	**6,588,732,55**
MONUMENTAL TREE AND CAVE	Monumental Tree	10,510	
	Cave	296	

* Includes data for February 2024.

Land, water or sea areas with protection status managed according to the relevant legislation in order to ensure the protection and continuity of biological diversity, natural and related cultural resources.

In Türkiye, conservation activities are carried out in areas with different statuses such as special environmental protection areas, national parks, nature parks, nature reserves, nature monuments, wildlife development areas, protection forest, seed stands, seed gardens and gene conservation areas, agricultural enterprises, natural and archaeological sites, wetlands and biosphere reserve areas.

Graph 59 Protected Areas under the Responsibility of MoAF (MoAF, 2024)



In protected areas that have natural, historical and cultural values on a global and national scale but are under pressure from urbanization, tourism and agriculture, it is important to protect biological diversity and manage the areas with an understanding of sustainability by ensuring coordination between sectors with an integrated area management approach and a multi-dimensional perspective.

Conservation and monitoring of species and habitats, which are important components of biodiversity in protected areas, and ensuring the continuity of ecosystem services by protecting their existing populations are important not only for nature conservation but also for the management of protected areas.

In Türkiye, conservation activities are carried out in areas with different statuses such as special environmental protection areas, national parks, nature parks, nature reserves, nature monuments, wildlife development areas, protection forest, seed stands, seed gardens and gene conservation areas, agricultural enterprises, natural and archaeological sites, wetlands and biosphere reserve areas.

Natural Protected Areas, Special Environmental Protection Areas, National Parks, Wildlife Development Areas, Wetlands, Nature Parks, Nature Reserves, Nature Conservation Areas, Protection Forest and Natural Monuments constitute Protected Areas in Türkiye. The total area of Protected Areas in Türkiye is 10,332,969 hectares.

Table 91 Areas of Protected Areas in Türkiye (MoEUCC, MoAF, 2024)

PROTECTED AREA	AREA (ha)
Natural Protected Area	3,832,960
Special Environmental Protection Areas	2,854,906
National Park	909,158
Wildlife Development Area	1,165,448
Wetland	1,161,205
Nature Park	108,036
Nature Reserve	46,453
Natural Monument	8,356
Protection Forest	246,446
TOTAL	**10,332,969**

There are 19 Special Environmental Protection Areas in Türkiye and the area of these areas is 2,854,906 hectares. There are 3,962 natural protected areas in Türkiye and the area of these areas is 3,832,960 hectares. The total area of Special Environmental Protection Areas corresponds to 3% of Türkiye and the total area of Natural Protected Areas corresponds to 2% of Türkiye.

In addition, there are 87 protected areas and 59 protected species within the framework of the Law No. 1380 on Fisheries and related legislation.

F.3.1 Special Environmental Protection Areas

The efforts for the protection of biological diversity in the Mediterranean, aiming at international cooperation on protected areas at regional level, were initiated within the framework of the "Protocol on Special Protection Areas in the Mediterranean Sea", one of the annexes of the "Convention for the Protection of the Mediterranean Sea against Pollution", which was signed in Barcelona on 16.2.1976 and entered into force upon publication in the Official Gazette dated 12.06.1981 and numbered 17368.

Currently, Special Environmental Protection Areas are declared in accordance with Article 109 of the Presidential Decree No.1, Article 9 of the Environmental Law, Decree Law No. 383 and the By-law on the Procedures and Principles Regarding the Determination, Registration and Approval of Protected Areas. Article 109 of Presidential Decree No. 1, Article 9 of the Environmental Law, Decree Law No. 383 and the By-law on the Procedures and Principles Regarding the Determination, Registration and Approval of Protected Areas. There are 19 Special Environmental Protection Areas in Türkiye and the area of these zones is 3.832.959,54 hectares.

As of 2020, there were 18 Special Environmental Protection Areas in Türkiye and the area of these zones was 2,585,940 hectares, while as of 2024, the number of Special Environmental Protection Areas increased to 19 with the declaration of Marmara Sea and Islands Special Environmental Protection Area, and the area of these areas increased to 3,832,959.54 hectares.

F.3.1.1. Belek Special Environmental Protection Area

Belek Special Environmental Protection Area has a 29 km coastal area shaped by coastal dunes. Extensive dune and forest areas with regional characteristics make the area very rich in terms of biodiversity richness. Endemic fish species Aphanius Anatoliae, endemic Serik Pear (Pyrus Serikensis), Caretta Caretta and Chelonia Mydas sea turtle species are among the riches of the region.

With the "Belek Special Environmental Protection Area Biodiversity Research Project" completed in 2019, 556 seeded plant taxa, 53 seedless plant taxa, 57 large and small mammal taxa, 245 bird species, 273 marine/inland water flora and fauna taxa, 25 reptiles, 4 bivalves, 248 invertebrate taxa, 50 new records of seeded plants and 90 invertebrate taxa were identified.

Since 2021, reptile species have been monitored for the first time in Antalya, Muğla and Trabzon Provinces, Serik, Kaş, Köyceğiz, Ortaca and Çaykara districts of Antalya, Muğla and Trabzon Provinces, together with Belek SEPA, Köyceğiz-Dalyan, Kaş-Kekova, Fethiye-Göcek and Uzungöl Special Environmental Protection Areas. Within the scope of the monitoring study, 500 reptiles (Herpetofauna Elements) were chipped and reptiles were monitored with radio telemetry system.

Within the scope of the project, a total of 472 individuals, including 285 Red Newts (Lyciasalamandra Fazilae), 103 Tortoises (Testudo Graeca), 34 Chameleons (Chamaleo Chameleon), 5 Earth Lizards (Ophiomorus Kardesi) and 45 Caucasian Frogs (Pelodytes Caucasicus) were captured and tagged. Especially the Red Newt (Lyciasalamandra Fazilae) is one of the most important endemic and endangered species in Türkiye, living only in the provinces of Muğla (Dalyan and Fethiye).

F.3.1.2. Datça- Bozburun Special Environmental Protection Area

Datça-Bozburun Special Environmental Protection Area is particularly rich in vegetation. Olive trees, Red pine communities, endemic Datça Date Palm (Phoenis Theophrast), Almond, Local Thyme, Oleander, Laurel and Locust reflect the typical Mediterranean vegetation characteristics. In this region, 807 species of marine fauna and flora, 1.047 taxa of flora, 167 terrestrial invertebrates, 110 fish, 4 bivalves, 27 reptiles, 123 bird and mammal species were identified.

The peninsula is defined as an archeological site including areas that need to be protected as they are the products of various civilizations from history to the present and they are archaeological, urban, natural, historical, etc. areas that represent the social, economic, architectural, and similar characteristics of the periods they lived. These areas are scattered on the peninsula.

In 2023, to reveal the current spreading status of the Otter (Lutra lutra) species in the Datça-Bozburun SEPA and Köyceğiz-Dalyan, Fethiye-Göcek and Gökova SEPA together with the Datça-Bozburun SEPA, to determine the possible protection measures against the threats to the species, to prevent these threats, to obtain information about the existing aquatic ecosystem in the region and to determine the presence of other important species in the region together with the otter, the "Otter (Lutra Lutra) Conservation and Monitoring Project in the Special Environmental Protection Areas of Muğla Province" was launched in order to identify threats to the species and develop solutions, and observations were made with photo-traps placed in 38 different areas in 4 SEPAs.

F.3.1.3. Foça Special Environmental Protection Area

Foça has been declared as a Special Environmental Protection Area in order to protect its natural and historical richness. Foça is a well-known region for the Mediterranean Monk Seal (Monachus Monachus), which is among the endangered species. Pine forests and maquis shape the vegetation and have created habitats for creatures such as wolves, foxes, jackals, martens, partridges, pigeons and quail. The Gediz Delta within Foça SEPA is very rich in fish species and is frequented by migratory birds.

The peninsulas forming the coasts of Foça and on which there are no settlements (British and Fener Cape etc.) are protected areas in terms of Foça silhouette and environmental values as natural extensions opening to the sea. İncir, Fener, Eşek, Hayırsız, Orak Islands and Siren Rocks also adorn these bays.

F.3.1.4. Gökova Special Environmental Protection Area

Gökova Special Environmental Protection Area is an ecologically important region with its rich flora and fauna and shows the vegetation characteristics of the Aegean Region and the Mediterranean Region together. Boncuk Cove is a sand shark (Carcharinus plumbeus) breeding area and Akyaka Kadın Creek is an otter (lutra lutra) breeding and feeding area. In addition, the region is the habitat of Audouin's Gull (Larus Audoinii), Mediterranean Monk Seal (Monachus Monachus) and European Shag (Phalacrocorax Aristotelis) species.

One of the important areas in the region is Sedir Island, known as Ketra, Setra, Sedir or Şehirlioğlu Island. The island is located in the southern part of the Gulf of Gökova and contains inscriptions from the Hellenistic and Roman periods.

The area is also quite rich in fauna. Winged animal species are distributed all over the area and these include turtle dove, quails, partridge, cormorant, heron, Eurasian nightjar, swallow, woodpecker, starling, ouzel, reed bunting, crow, kite, black francolin, mallard, greylag goose, tree sparrow, eagle, hawk, accipiter and owl.

F.3.1.5. Gölbaşı Special Environmental Protection Area

Mogan-Eymir Lakes and wetlands are used by birds for sheltering, breeding and accommodation purposes and are one of the important bird areas nominated for Ramsar in Türkiye. 83 different bird species were identified. In addition, 3 species of bivalves, 25 mammals, 12 reptiles, 13 fish and 493 plant species live in the region and 47 of the plant species are endemic. Among the plant species that characterise the region, Chive, Iridescent or Cornflower (Centaurea Tchihatcheffii) is spread in a limited area.

"Wetland-Marshlands" in the region are the cradle of living species and diversity, providing water and primary production that countless plant and animal species depend on for survival. Therefore, they are of strategic importance for the survival of many species. Mogan-Eymir Lakes and wetland-marsh areas are important bird areas used by 227 bird species for sheltering, breeding and accommodation purposes and nominated for Ramsar in Türkiye. 40 of these bird species breed in the region, 30 of them are observed all year round and the others are seen during migration or only around the lake.

F.3.1.6. Fethiye- Göcek Special Environmental Protection Area

Fethiye Beach is one of the breeding areas of Caretta Caretta and Chelonia Mydas species, which are protected by the Bern Convention and CITES. Sweet Gum Tree (Liquidambar Orientalis), which grows in Fethiye-Göcek SEPA creeks, deltas and places where ground water is high, is among the endemic plant species. The sweet gum oil obtained from sweet gum tree is used in cosmetics and pharmaceutical industry.

The important herb species of the area are caterpillar-plant, thistle, efek, reed canary grass, couch, nutgrass, wormseed, Avena fatua, pennyroyal, berberis, horsemint, sage, salep, bağdibi, blackthorn, gum thistle, eryngo.

Most of the arable land in Muğla province is in Fethiye district. The district centre is surrounded by highly fertile 1st class irrigated agricultural soils.

F.3.1.7. Kaş- Kekova Special Environmental Protection Area

Kekova, which gives its name to the region, is the largest island in the region. Kekova Island extends by forming a strait attached to the Anatolian side. Within the region, there are 187 genera belonging to 51 families and 272 species and subspecies taxa belonging to these genera and 26 of these species are endemic. In addition, there are 20 mammal species, 96 bird species, 16 reptile and 4 amphibian species. Among the plant species, Daucus Conchitae W. Greuter (Wild Carrot-Endemic) and Onopordum Rhodense were identified for the first time as new records for Türkiye.

Kaş-Kekova Special Environmental Protection Area Biodiversity Research Project identified 447 seeded plant taxa, 116 non-seeded plant taxa, 70 large and small mammal taxa, 141 bird species, 968 marine/inland water flora and fauna taxa, 23 reptile species, 5 bivalve species, 229 invertebrate taxa and 289 new taxa. Of these, 163 are plants, 43 are birds, 2 are marine fauna and 81 are invertebrate taxa.

Within the scope of the project, 15 European Nature Information System (EUNIS) habitat types were identified in Kaş-Kekova SEPA and 11 sensitive habitats, 1 of which is a recommended area, were identified in the light of the information obtained as a result of literature reviews and field studies. In addition, according to the evaluations made within the scope of the Habitat Directive, it was determined that 15 of the habitats identified in Kaş-Kekova SEPA are among the habitats listed in Annex I of the Habitat Directive and should be protected/sustainable. As a result of the assessments made within the scope of the Birds Directive, it was determined that 59 bird species are included in the additional lists of the Birds Directive.

İç Island, Toprak Island, Aşırlı Island and Kişneli Island are other important islands. The Sıcak Peninsula and Kekova Island, which lie parallel to the coast, form Ölüdeniz, which is an inland sea. In addition to natural beauties, the richness of ancient and historical artefacts makes the region attractive for archaeological tourism.

F.3.1.8. Göksu Delta Special Environmental Protection Area

Göksu Delta is also a Ramsar site and an important wetland for many migratory birds. Göksu Delta is one of the most important main nesting areas in the Mediterranean where sea turtles "Caretta Caretta" and "Chelonia Mydas" lay their eggs. It is also one of the nesting areas of the soft-shelled Nile Softshell Turtle (Trionyx Triunguis). There are 507 plant taxa in Göksu Delta Special Environmental Protection Area and 10 of them are endemic taxa.

It is observed that the Göksu Delta is mostly dominated by saline plants and dune vegetation. Especially the species belonging to the genera Salicornia and Euphorbia are concentrated in the west of the Delta, around Akgöl and Paradeniz. The presence of aquatic plants in the lakes in the Göksu Delta depends on the water regime and salinity of the lagoons.

Numerous bird species use the Göksu Delta as a wintering and incubation area, contributing to the formation of an interesting and vibrant landscape in almost every season of the year.

F.3.1.9. Pamukkale Special Environmental Protection Area

Thermal water springs, which are important natural resources in the region and form Pamukkale Travertines, have affected a wide region and in this context, there are 17 hot water springs with temperatures ranging between 35-100°C.

There are two main soil groups in the region, brown forest soil and colluvial soil, and natural vegetation is mostly found on stream banks, border lines between agricultural areas, groves, pastures and hills that are not suitable for agriculture. On the plateau plain of Hierapolis, there are visible natural mass greenery Nerium Oleander (Oleander) and Ficus Inur and Vitex Agnus Castus groups. Some species of herbaceous plants are distinguished by seasonal and temporary leaf-flower colour effects.

In 2023, "Pamukkale Travertines Research Project" was carried out in order to investigate the causes of mass movements such as tipping and falling that occur in travertine deposits in Pamukkale travertines, to carry out researches to prevent and reduce the impacts beforehand, to investigate the causes of the colour changes observed on the travertine surface and to determine solution proposals.

In the studies carried out within the scope of the project, samples were taken from the falling blocks as a result of tipping/falling mass movements that occurred in existing concrete travertine pools, natural pool sedimentation environment outer walls and waterfall type travertine environments and the results of the analyses performed in the laboratory environment were recorded. In the field, physical and mechanical properties of travertines were determined by using appropriate equipment without damaging their natural formations, and a model designed in accordance with the natural structure of the region in accordance with the results of the analyses was tested on site. In order to determine the causes of colour changes in travertines and to contribute to solution proposals, physical-chemical and biological samples were collected from 10 points and hydrobiological and microbiological analyses were carried out.

F.3.1.10. Ihlara Special Environmental Protection Area

The Ihlara Special Environmental Protection Area is a region rich in biological diversity. Research conducted in the Ihlara Valley has identified 364 taxa comprising 54 families and 218 species. The fact that the valley interior is not subject to intensive grazing and has abundant shaded areas has ensured a high number of species. The fact that 43 of these species are endemic plant species clearly demonstrates the importance of the region's natural vegetation cover. In addition, the region is rich in hot thermal water sources and historical remains.

According to the results of observations and research, 35 bird species belonging to 21 families have been identified in the region. Eleven of these birds breed in the region. Furthermore, four fish species have been identified in the Melendiz River, the region's most important watercourse. The species of economic value and most frequently caught is the freshwater chub (Leuciscus Cephalus), locally known as Pullu.

F.3.1.11. Köyceğiz- Dalyan Special Environmental Protection Area

Iztuzu beach area in the region is one of the most important breeding areas of sea turtles (Caretta Caretta and Chelonia Mydas) and Nile Softshell Turtle (Trionyx Triunguis) in the Mediterranean. The area is also the breeding and living area of the Otter species (Lutra Lutra). 126 bird species and 282 marine fauna and flora species have been identified in the region.

The most common vegetation in the Köyceğiz Special Environmental Protection Area consists of red pine and sweet gum forests, shrubs and shrubs belonging to maquis and frigana, and herbaceous plants growing in the wetlands and barren marshes around Köyceğiz Lake.

The lake surroundings, canals and forests have a rich potential as a breeding and sheltering place for various animals. Wild goose, white stork, Izmir kingfisher, swallow, marsh warbler, gull-billed tern, short-toed eagle, bee-eater, seagull, glossy ibis, little egret and various other bird species use the region as wintering and incubation areas.

F.3.1.12. Salt Lake Special Environmental Protection Area

The lake is the second largest lake in Türkiye and the second saltiest lake in the world. It is on the Tentative List of World Natural Heritage Sites.

Salt Lake basin is an important wetland according to international criteria, which is of great importance for the protection of biological diversity in Türkiye. Endemic plant species that are not seen in other parts of the world have been identified in Salt Lake Special Environmental Protection Area. Unlike other regions, endemic plants of the Salt Lake contain salt and drought resistant races.

These areas are an invaluable genetic resource in our rapidly arid and barren world. Many new plant species have been identified in the area. These are VU (Vulnerable) species according to IUCN categories and are also protected by the Bern Convention.
In order to ensure the continuity of flamingo presence in Türkiye, the protection of breeding colonies in Salt Lake is of great importance. In this context, it is ensured that the populations of Flamingo (Phoenicopterus Roseus), Gustard (Otis Tarda), Steppe Eagle (Aquila Nipalensis), which are the species adapted to the steppe climate and most affected by environmental factors within the borders of Salt Lake SEPA, are surveyed every year, the specified species are monitored, important threats to the species are determined, the water level, aquatic nutrients and water quality in the area are examined, information and awareness-raising activities are carried out.

- In the studies carried out within the scope of the Biological Diversity Research Project of Salt Lake Special Environmental Protection Area, it was determined that Salt Lake has very special and important habitats in terms of biological diversity.
- With this project, 71 endemic plant species that are not seen in other parts of the world were identified in the area. Unlike other regions, endemic plants of Salt Lake contain salt and drought resistant races. These species are an invaluable genetic resource in our rapidly arid and barren world.
- Eight of the 226 plant species identified in the area are new records. Two of these eight species are VU (Vulnerable) species according to IUCN categories and one species is protected by the Bern Convention.
- A total of 48 fauna species, including 41 invertebrates, three aquatic benthic macroinvertebrates, one fish, one reptile and two mammals, were recorded for the first time in the same area.

F.3.1.13. . Uzungöl Special Environmental Protection Area

In terms of wildlife in Uzungöl Special Environmental Protection Area, various animal species such as bear, wolf, wild goat, fox, Caucasian black grouses are sheltered in the mountains. There are 658 plant taxa belonging to 311 genera including 125 subspecies and 68 varieties, 90 mammal species, 8 amphibian species, 7 reptile species and 250 bird species in the region. Primrose (Primula x Uzungolensis) was identified for the first time in the region.

In terms of wildlife, various animal species such as bears, wolves, wild goats, foxes, Caucasian black grouse are found in the mountains around Uzungöl.

Although the water surface of the lake varies slightly depending on the amount of water coming in during the season, it is generally 1,000 metres long, 500 metres wide and 15 metres deep. Trout live in the lake.

The Haldizen stream valley extending towards the south has great natural riches. About 10 to 20 kilometres from Uzungol, about 10 small lakes located at the heights of the mountains increase the richness of the activities in the region.

F.3.1.14. Saros Gulf Special Environmental Protection Area

Saros Gulf is considered as a large and natural aquarium by marine biologists and diving enthusiasts due to the rich fish species it harbours. Captain Cousteau dived in this gulf during his visit to Türkiye with his ship "Calipso" in the 1970s and described it as "the Northern version of the Red Sea".

Saros Gulf and its coasts were declared as a Special Environmental Protection Area in order to protect its geomorphological, landscape, ecological, floristic, biogenetic and touristic features without deterioration.

Mediterranean type climate is dominant in the Gulf Region. The highest point in the basin is Koru Mountain (385 m) located at the north-northeast end of the gulf. The only river feeding the basin is Kavak Creek.

Saros Gulf, one of the saltiest parts of the Aegean Sea, is characterised by complex eddying currents. Due to these currents, it is a self-cleaning gulf.

F.3.1.15. Patara Special Environmental Protection Area

Patara Special Environmental Protection Area consists of Fethiye and Kaş districts of Muğla and Antalya provinces and 5 towns and 4 villages affiliated to them. Patara is an ancient city belonging to the Lycian Civilisation period, located within the borders of Kaş district-Gelemiş village in Antalya province. The region is also an important nesting area for sea turtles.

The economy of the region is generally based on agriculture and tourism has started to develop in recent years. Agriculture has started to be carried out with modern methods around Ova Lake and greenhouse cultivation is widespread and orange fruit and vegetable production is carried out.

In Patara Beach, a 7 km long and 25 m wide wet strip from the mouth of Eşen Stream towards the east consists of very fine clean sands. This area is the 1st degree spawning area of Caretta Caretta and Chelonia Mydas species of Mediterranean turtles. According to the results of the "Sea Turtle Research Project" carried out in this area in 1992 in cooperation with the Presidency of the Special Environmental Protection Authority and Dokuz Eylül University, the frequency of turtle nests was determined between 2-19 nests/km.

Administratively, a large part of the Patara Special Environmental Area is located within the borders of Antalya-Kaş district and the other part within the borders of Muğla-Fethiye district. According to the archaeological researches carried out in the region, Patara, one of the oldest cities of the Lycian Civilisation, was the main port of the period in the 9th century BC and was established on a triangular shaped plain west of Kalkan Erendağı throughout history.

- During the studies carried out within the scope of the Patara Special Environmental Protection Area Biodiversity Research Project, a total of 373 seeded plant species belonging to 74 families in species and subspecies categories were identified. Of the 373 seed plant species, 343 species are new records and were identified for the first time in the region with this study. In the region, 16 endemic species were identified.
- A total of 261 fauna species including 107 terrestrial invertebrates, 11 aquatic benthic macroinvertebrates, 13 fish, 29 amphibians and reptiles, 76 birds and 25 mammals were identified in the area. Six of the identified species are endemic.

- A total of 125 fauna species, including 81 terrestrial invertebrates, four aquatic benthic macroinvertebrates, nine fish, 23 reptiles and eight mammals, were recorded for the first time in the area.

F.3.1.16. Finike Seamounts Special Environmental Protection Area

Finike Seamounts Special Environmental Protection Area, which was declared by the Decree of the Council of Ministers and published in the Official Gazette dated 16 August 2013 and numbered 28737, is the first protection area declared in the marine area of Türkiye.

Finike Seamounts Special Environmental Protection Area, which is added to a total of 15 Special Environmental Protection Areas located on the Aegean and Mediterranean coasts of Türkiye and in various regions of Anatolia and includes a marine protected area of 1,124,173 ha, is important in terms of deep-sea biodiversity, rare banks, special ecosystems such as submarine mountains, endangered species and rare ecosystems.

In addition, the area is expected to help realize the Aichi Targets set under the Convention on Biological Diversity and to fulfil the country's obligations under the Barcelona Convention, the General Commission for Fisheries in the Mediterranean (GFCM) and the Bern Convention, in order to improve the status and management of Mediterranean Marine Protected Areas.

F.3.1.17. Karaburun-Ildır Gulf Special Environmental Protection Area

Karaburun-Ildır Gulf Special Environmental Protection Area was determined and declared as a Special Environmental Protection Area by the Presidential Decree dated 14.03.2019 and numbered 823 and published in the Official Gazette dated 15.03.2019 and numbered 30715.

Karaburun-Ildır Gulf Special Environmental Protection Area covers the marine area and islands of Ildır Gulf, Karaburun Peninsula, Izmir province. The total area of Karaburun-Ildır Gulf Special Environmental Protection Area is 946.57 km^2, with a terrestrial area (including lakes) of 435.93 km^2 and a marine area of 510.64 km^2.

The destruction of the red pine communities in Karaburun Peninsula has formed the maquis formation and the destruction of this formation has formed the Frigana formation. In Karaburun Peninsula, the vegetation cover is generally formed by maquis. The dominant tree species of the forest vegetation is Red Pine (Pinus Brutia) (there are approximately 27.000 ha of red pine forests), the tree species of the maquis formation that can be encountered in every area is Kermez Oak (Quercus Coccifera), and the species of the garig formation that can be encountered in almost every area are thorny burnet (Sarcopoterium Spinosum) and various ladens (Cistus sp.).

Although there are some regional variations, the species that make up the vegetation are mostly Italian ryegrass, arbutus, sandalwood, terebinth, kermes oak, Staphylea, white birch maple tree, mastic, wild strawberry, carob, laurel, agave, capers, broom, sunflower, alkanna orientalis, onosma bornmuelleri, mercurialis annua, clover, caterpillar-plant, wild onion, dede derneği, fabaceae, muscari muscarim, and alçak esme. On the other hand, the most common frigana species are thorny burnet, various ladens erica arborea, pink star.

In the flora of the peninsula, 15 endemic species, 4 rare species and 5 species within the scope of CITES were identified. Again, 21 species belonging to and outside these species, but in the IUCN category, were identified. In addition, 76 species of medicinal, 38 species of beekeeping, 30 species of food, 39 species of commercial, 34 species of landscape and 19 species of fodder species with economic value were identified. In Karaburun Peninsula, Bozdağ mass and areas covered with forests are rich areas in terms of wildlife.

Karaburun, whose coastal and marine area is the breeding and habitat of the endangered and internationally protected Mediterranean Monk Seals (Monachus Monachus), also has bird species such as Audouin's Gull, Short-Toed Eagle, Lesser Kestrel, and Elenorae's Falcon, which are also under national/international protection. Otter (Lutra Lutra) and Caracal (Caracal Caracal), greek spur-thighed tortoise, Mediterranean Horseshoe Bat are among the endangered species living on the peninsula.

F.3.1.18. Salda Lake Special Environmental Protection Area

Salda Lake Special Environmental Protection Area is geographically located within the borders of Yeşilova district of Burdur province in the Mediterranean Region. The total area of the SEPA is 295.65 km^2, including 43.7 km^2 of terrestrial area. Since the area is a wetland, it is an area with high biological diversity. In this context, there are 301 aquatic and terrestrial plant species belonging to 61 families and 20 species in terms of endemism and endangerment class among these species.

It is an area of international and national importance that hosts critical species protected by the International Union for Conservation of Nature (IUCN), which meets the criteria of important nature area and important bird area with its geological and chemical features and endemic species. Studies conducted in the region show that Salda Lake is one of the two regions in the world that have the surface characteristics of the planet Mars (white rocks loaded with magnesium).

F.3.1.19. Marmara Sea and Islands Special Environmental Protection Area

The Marmara Sea, Islands and the Turkish Straits System, with its natural structure, rich flora and fauna, is one of our rare areas that should be protected with its feature of being a biological corridor, which is of great importance for the biological diversity of the Black Sea and the Mediterranean.

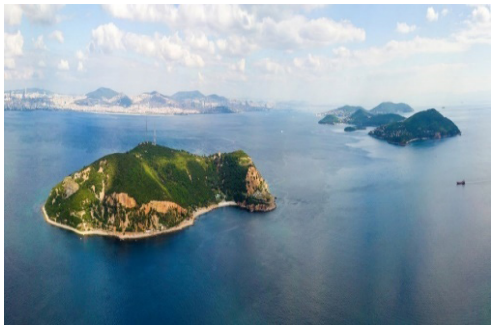
In order to ensure the rational use of the natural values of the Marmara Sea and Islands Special Environmental Protection Area, to ensure the continuity of natural life in these areas and to maintain ecosystem stability, an area of 1,223,666 hectares covering the provinces of Istanbul, Kocaeli, Yalova, Bursa, Balıkesir, Çanakkale and Tekirdağ and the Prens Islands, Kapıdağ Peninsula and Marmara Island was declared as the Marmara Sea and Islands Special Environmental Protection Area with the Presidential Decree No. 4758 dated 04.11.2021.

Map 18 Marmara Sea and Islands Special Environmental Protection Area (MoEUCC, 2024)

The Marmara Sea is an important and rich region in terms of biodiversity and is home to 52 marine species including Mediterranean monk seals and 200 fish species. It is also the spawning ground for many migratory species. There are also special habitats such as soft coral reefs consisting of corals endemic to the Mediterranean, seagrass beds, coralligenous habitats, canyons, sea caves, mussel and oyster banks.

The Marmara Sea has become the last refuge for the critically endangered Pina Mussel (Pinna nobilis) as a result of mass deaths across the Mediterranean due to the infectious parasite seen between 2016-2019. The Pina Mussel, which lives with a part of its shell buried in the seabed and filters and cleans about 6 litres of sea water per hour, is a holding, breeding and hiding place for many living things with such shells.

Image 1 Prens Islands



PRENS ISLANDS

The Prens Islands include 9 islands (Kınalıada, Burgazada, Heybeliada, Büyükada, Sedefada, Kaşıkadası, Tavşanadası, Yassıada, Sivriada) in the Marmara Sea and harbour 4 different ecosystems: forest ecosystem, maquis ecosystem, meadow ecosystem and cliff ecosystem.

Image 2 Kruner's Nuthatch (Sitta Krueperi)

According to the International Union for Conservation of Nature (IUCN), it harbours important populations of 3 bird species, the Glede (Milvus milvus), the Raven (Coracias garrulus), the Krtiper's Nuthatch (Sitta krueperi) and 2 mammal species. the Long-toed Bat (Myotis capaccinii) and the Mehelyi Bat (Rhinolophus mehelyi), which are categorized as "Vulnerable" according to the IUCN.

Image 3 Red Helleborine (Cephalanthera Rubra)

The endemic Lir-shaped Bellflower (Campanula Lyrata subsp. Lyrata) and an orchid species called Red Helleborine (Cephalanthera Rubra), which is protected under the "Convention on International Trade in Endangered Species of Wild Fauna and Flora", live as the princesses of these islands.

KAPIDAĞ PENINSULA

Image 4 Kapıdağ Peninsula

Kapıdağ Peninsula, which is connected to the mainland by an isthmus and was an island in ancient times, has been the centre of attention of many historians with its cultural richness and natural beauties. The historian Herodotus mentioned the grapes, olives and olive oil, and Evliyaçelebi mentioned the healing waters of Zeytinli Island in his Travelogue.

With cultural values such as Kzykos Ancient City, Zeytinli Island, Kirazlı Monastery and Narlı Church, Kapıdağ peninsula is a candidate to be an important star of cultural tourism and faith tourism.

Image 5 Narlı Church, Kzykos Ancient City, Zeytinli Island, Kirazlı Monastery

Kapıdağ Peninsula is also very important in terms of Natural Habitats in Türkiye. The western part of the peninsula has been partially filled by large, dense and modern living areas, especially in the coastal part. However, most of the peninsula, especially the high eastern parts, preserves its natural structure. A large part of the peninsula has maquis vegetation cover, especially broad-leaved forests in places. The peninsula is a summary of the flora and fauna of the North Aegean, Marmara and Black Sea Regions. It has the characteristics of all three regions.

Image 6 Brown Bear (Ursus Arctos) and Lynx (Lynx Lynx)

Globally Endangered (EN) Species; Lynx Lynx (Lynx), Monachus Monachus (Mediterranean Monk Seal); Vulnerable (VU) Species: Bluefish (Pomatomus Saltatrix), Mackerel (Trachurus Trachurus), Turtle Dove (Streptopelia Turtur), Turtle (Testudo Graeca), Ionian Dolphin (Stenella Coeruleo-

alba), Horseshoe Nose Bat (Rhinolophus Mehely Mehely), Razorback (Balaenoptera Physalus), Long-toed Bat (Myotis Capaccinii), Mediterranean Horseshoe Nose Bat (Rhinolophus Euryale).

Critically Endangered (CR) Species at the National Scale; Finsch's Wheatear (Oenanthe finschii), Ring Ouzel (Turdus torquatus); Endangered (EN) Species; Cuckoo (Cuculus Canorus), Blackcap (Sylvia Atricapilla), Black-headed Gull (Larus Ridibundus), Black-Eared Wheatear (Oenanthe Hispanica), Rock Nuthatch (Sitta Neumayer), Kestrel (Falco Tinnunculus), Tawny Pipit (Anthus Campestris), Little Gull (Hydrocoloeus Minutus), Sardinian Warbler (Sylvia Melanocephala), Blue Titmouse (Cyanistes Caeruleus), Eurasian buzzard (Buteo Buteo), etc.

MARMARA ISLAND

Image 7 Marmara Island

Image 8 Manastir Bay; Pirate Castle and Mills

Marmara Island, which is located in a shallow sea area between Kapıdağ Peninsula and Şarköy in the southwest of the Marmara Sea and named after marble and Marmor, has an area of approximately 110 km^2. The island has attracted the attention of the most famous commanders of the Roman and Byzantine Empires who wanted to develop the country due to its marble deposits since ancient times, and the marbles of the mosques and palaces built during the Ottoman period were supplied from here. With its windmills, Ottoman Cemetery, Octimot Oak, Manastır Bay, Pirate Castle and unique nature, the island is also a centre of interest for nature lovers.

Image 9 Caspian Gull (Larus Cachinnans Michahellis)

Marmara Islands are important in terms of plants, birds, mammals, reptiles and butterflies. The area is important for Verbascum Aschersonii and Verbascum Simavicum mullein species which are endangered and endemic to Türkiye.

Among the seabirds breeding on the islands are the Eleonorae's Falcon (Falco Eleonorae), Crested Cormorant (Phalacrocorax Aristotelis Desmarestii) and Caspian Gull (Larus Cachinnans Michahellis).

F.3.2. Wetlands

There are 14 Ramsar Sites (184.487 ha), 59 Wetlands of National Importance (869.967 ha) and 47 Wetlands of Local Importance (107.021 ha) in Türkiye. According to the Ramsar Convention, which has international validity in this field, wetlands are defined as "all waters, natural or artificial, permanent or temporary, stagnant or flowing, fresh, brackish or salty, and marshes, reeds, wet meadows and peatlands, including areas of sea water not exceeding six metres in depth at low tide".

Wetlands, which are of great importance in ensuring ecological balance and protecting biological diversity, have great contributions to the economy of the region and the country. Wetlands, which are one of the most biologically productive ecosystems after rainforests, have great importance due to their ability to store water, shelter water products such as fish and reeds, prevent floods and floods, regulate the water regime in the basin, act as a filter by retaining nutrient salts such as nitrogen phosphorus and contribute to agricultural production.

Table 92 RAMSAR Sites of Türkiye (MoAF, 2024)

	WETLAND NAME	SURFACE AREA (ha)	PROVINCE	REGISTRATION STATUS	REGISTRATION DATE
1	Akyatan Lake	14,700	Adana	Ramsar	15.04.1998
2	Burdur Lake	24,800	Burdur	Ramsar	28.05.1994
3	Gediz Delta	14,900	İzmir	Ramsar	15.04.1998
4	Göksu Delta	15,000	Mersin	Ramsar	28.05.1994
5	Kızılırmak Delta	21,700	Samsun	Ramsar	15.04.1998
6	Kızören Sinkhole	127	Konya	Ramsar	02.05.2006
7	Kuyucuk Lake	416	Kars	Ramsar	28.08.2009
8	Manyas (Kuş) Lake	20,400	Balıkesir	Ramsar	28.05.1994
9	Meke Maar	202	Konya	Ramsar	21.07.2005
10	Nemrut Lake	4,589	Bitlis	Ramsar	17.04.2013
11	Seyfe Lake	10,700	Kırşehir	Ramsar	28.05.1994
12	Sultan Reedy	17,200	Kayseri	Ramsar	28.05.1994

	WETLAND NAME	SURFACE AREA (ha)	PROVINCE	REGISTRATION STATUS	REGISTRATION DATE
13	Uluabat Lake	19,900	Bursa	Ramsar	15.04.1998
14	Yumurtalık Lagoon	19,853	Adana	Ramsar	21.07.2005
	TOTAL	**184,487**			

Table 93 Wetlands of National Importance in Türkiye (MoAF, 2024)

	WETLAND NAME	SURFACE AREA (ha)	PROVINCE	REGISTRATION STATUS	REGISTRATION DATE
1	Karakuyu Reedy	12,625	Afyonkarahisar	Wetlands of National Importance	7.02.2019
2	Akşehir and Eber Lakes	117,779	Afyonkarahisar, Konya	Wetlands of National Importance	19.04.2017
3	Acıgöl	55,095	Afyonkarahisar, Denizli	Wetlands of National Importance	8.04.2015
4	Doğubeyazıt Reedy	22,179	Ağrı	Wetlands of National Importance	10.06.2016
5	Sarısu Plain Wetlands	10,092	Ağrı	Wetlands of National Importance	8.04.2015
6	Tol Lake	1,414	Ankara	Wetlands of National Importance	19.04.2017
7	Avlan Lake	10,062	Antalya	Wetlands of National Importance	10.06.2016
8	Aktaş Lake	5,847	Ardahan	Wetlands of National Importance	8.04.2015
9	Çıldır Lake	27,058	Ardahan	Wetlands of National Importance	8.04.2015
10	Putka Lake	4,181	Ardahan	Wetlands of National Importance	8.04.2015
11	Azap Lake	2,183	Aydın	Wetlands of National Importance	7.02.2019
12	Gönen Delta	9,770	Balıkesir	Wetlands of National Importance	10.06.2016
13	Ahlat Reedy	243	Bitlis	Wetlands of National Importance	8.04.2015
14	Arin (Sodalı) Lake	4,322	Bitlis	Wetlands of National Importance	10.06.2016
15	Heybeli (Norşin) Lake	53	Bitlis	Wetlands of National Importance	8.04.2015
16	Nazik Lake	11,164	Bitlis	Wetlands of National Importance	8.04.2015
17	İron Reedy	13,746	Bitlis, Muş	Wetlands of National Importance	8.04.2015
18	Yeniçağa Lake	8,224	Bolu	Wetlands of National Importance	9.04.2015
19	Çorak Lake	7,892	Burdur	Wetlands of National Importance	10.06.2016
20	Gölhisar Lake	5,877	Burdur	Wetlands of National Importance	10.06.2016
21	Yarışlı Lake	13,219	Burdur	Wetlands of National Importance	10.06.2016
22	Yazır Lake	2,705	Burdur	Wetlands of National Importance	10.06.2016
23	Kocaçay Delta	17,025	Bursa	Wetlands of National Importance	13.08.2018
24	İznik Lake	61,606	Bursa	Wetlands of National Importance	13.08.2018
25	Gökçeada Lagoon	3,491	Çanakkale	Wetlands of National Importance	7.02.2019
26	Işıklı Gökgöl	33,693	Denizli	Wetlands of National Importance	10.06.2016
27	Efteni Lake	8,314	Düzce	Wetlands of National Importance	30.05.2018
28	South Keban Dam	41,424	Elazığ	Wetlands of National Importance	8.04.2015

	WETLAND NAME	SURFACE AREA (ha)	PROVINCE	REGISTRATION STATUS	REGISTRATION DATE
29	Hazar Lake	28,846	Elazığ	Wetlands of National Importance	8.04.2015
30	Ekşisu Reedy	8,736	Erzincan	Wetlands of National Importance	12.06.2017
31	Tortum Lake	2,709	Erzurum	Wetlands of National Importance	19.04.2017
32	Balıkdamı Lake	14,147	Eskişehir	Wetlands of National Importance	7.02.2019
33	Karkamış Floodplain	27,396	Gaziantep, Şanlıurfa	Wetlands of National Importance	8.04.2015
34	Yüksekova (Nehil) Reedy	21,533	Hakkari	Wetlands of National Importance	9.04.2015
35	Gölbaşı Lake	792	Hatay	Wetlands of National Importance	19.04.2017
36	Aras Karasu Floodplains	9,090	Iğdır	Wetlands of National Importance	10.06.2016
37	Aygır Lake	1,034	Kars	Wetlands of National Importance	8.04.2015
38	Çalı Lake	391	Kars	Wetlands of National Importance	10.06.2016
39	Hürmetçi Reedy	15,713	Kayseri	Wetlands of National Importance	8.04.2015
40	Gölmarmara Lake	24,893	Manisa	Wetlands of National Importance	12.06.2017
41	Dipsiz Lagoon	1,035	Mersin	Wetlands of National Importance	12.06.2017
42	Bulanık Plain Wetlands	3,496	Muş	Wetlands of National Importance	10.06.2016
43	Acarlar Floodplain Forest	17,528	Sakarya	Wetlands of National Importance	7.02.2019
44	Ladik Lake	1,836	Samsun	Wetlands of National Importance	8.04.2015
45	Tödürge Lake	4,340	Sivas	Wetlands of National Importance	10.06.2016
46	Ulaş Lake	7,994	Sivas	Wetlands of National Importance	10.06.2016
47	Akgöl	1,203	Van	Wetlands of National Importance	8.04.2015
48	Bendimahi Delta	27,177	Van	Wetlands of National Importance	10.06.2016
49	Çelebibağ Reedy	1,337	Van	Wetlands of National Importance	10.06.2016
50	Dönemeç Delta	5,945	Van	Wetlands of National Importance	10.06.2016
51	Erçek Lake	22,269	Van	Wetlands of National Importance	10.06.2016
52	Karasu Delta	339	Van	Wetlands of National Importance	8.04.2015
53	Turna (Keşiş) Lake	3,045	Van	Wetlands of National Importance	8.04.2015
54	Karamuk Reedy	15,785	Afyonkarahisar	Wetlands of National Importance	31.07.2019
55	Metruk Saltpan	3,376	Muğla	Wetlands of National Importance	31.07.2019
56	Tuzla Palas Lake	17,320	Kayseri	Wetlands of National Importance	31.07.2019
57	Meriç Delta	29,046	Edirne	Wetlands of National Importance	19.03.2020
58	Yeşılırmak Delta	34,340	Samsun	Wetlands of National Importance	19.03.2020
59	Kozanlı Gökgöl	5,723	Konya	Wetlands of National Importance	19.03.2020
	Total	**869,697**			

Table 94 Wetlands of Local Importance in Türkiye (MoAF, 2024)

WETLANDS OF LOCAL IMPORTANCE					
	WETLAND NAME	SURFACE AREA (ha)	PROVINCE	REGISTRATION STATUS	REGISTRATION / RENEWAL DATE
1	Aksaz Lake	133	Sinop	Wetlands of Local Importance	23.02.2016
2	Bakkal Lake	25	Çankırı	Wetlands of Local Importance	23.02.2016
3	Çiğ Lake	129	Ordu	Wetlands of Local Importance	11.08.2019
4	Hersek Lagoon	1,324	Yalova	Wetlands of Local Importance	23.02.2016
5	Samsam Lake	931	Konya	Wetlands of Local Importance	23.02.2016
6	Büyük Akgöl	2,957	Sakarya	Wetlands of Local Importance	11.08.2019
7	Şeytansofrası Wetland	17	Balıkesir	Wetlands of Local Importance	24.01.2017
8	Karakoç Stream Wetland	38	Balıkesir	Wetlands of Local Importance	24.01.2017
9	Erzurum Reedy	8,632	Erzurum	Wetlands of Local Importance	18.05.2018
10	Küçük Akgöl	187	Sakarya	Wetlands of Local Importance	11.08.2019
11	Keremali Lake	188	Sakarya	Wetlands of Local Importance	11.08.2019
12	Kaz Lake	315	Sivas	Wetlands of Local Importance	19.11.2019
13	Haydarlar Lake	794	Hatay	Wetlands of Local Importance	25.05.2020
14	Haçlı Lake	4,285	Muş	Wetlands of Local Importance	31.03.2021
15	Çiçekli Lake	523	Van	Wetlands of Local Importance	31.03.2021
16	Akdoğan Lake	3,698	Muş	Wetlands of Local Importance	31.03.2021
17	İzmit Gulf Wetland	446	Kocaeli	Wetlands of Local Importance	31.03.2021
18	Batmış Lake	4,273	Muş	Wetlands of Local Importance	31.03.2021
19	Mileyha Wetland	126	Hatay	Wetlands of Local Importance	6.09.2021
20	Kastabala Wetland	796	Osmaniye	Wetlands of Local Importance	6.09.2021
21	Eğri Lake	589	Antalya	Wetlands of Local Importance	6.12.2021
22	Dipsiz Lake	17	Konya	Wetlands of Local Importance	6.12.2021
23	Akçay Reedy	48	Balıkesir	Wetlands of Local Importance	3.11.2022
24	Buyer Baba Lake	20	Tunceli	Wetlands of Local Importance	3.11.2022
25	Cizre Dicle River Wetland	232	Şırnak	Wetlands of Local Importance	3.11.2022
26	Çavuşçu Lake	12,017	Konya	Wetlands of Local Importance	3.11.2022
27	Balıklı Lake	137	Aksaray	Wetlands of Local Importance	4.11.2022
28	Ereğli Reedy	43,165	Konya	Wetlands of Local Importance	29.12.2022
29	Taşkısığı Lake	444	Sakarya	Wetlands of Local Importance	29.12.2022
30	Girdev Lake	4,041	Muğla	Wetlands of Local Importance	29.12.2022
31	Gölcük Lake	1,521	İzmir	Wetlands of Local Importance	29.12.2022
32	Karagöl Çinili Lake	188	Niğde	Wetlands of Local Importance	29.12.2022
33	Van Reedy	153	Van	Wetlands of Local Importance	20.07.2023

WETLANDS OF LOCAL IMPORTANCE					
	WETLAND NAME	SURFACE AREA (ha)	PROVINCE	REGISTRATION STATUS	REGISTRATION / RENEWAL DATE
34	Gelingüllü Pond	6,770	Yozgat	Wetlands of Local Importance	20.07.2023
35	Gölköy Lake	149	Muğla	Wetlands of Local Importance	20.07.2023
36	Sulu Adalı Lake	178	Tokat	Wetlands of Local Importance	20.07.2023
37	Tuzaklı Pond	209	Kastamonu	Wetlands of Local Importance	2.08.2023
38	Üçağaç Pond	359	Yozgat	Wetlands of Local Importance	2.08.2023
39	Gövelek Lake	287	Van	Wetlands of Local Importance	2.08.2023
40	Karaca Lake	33	Tokat	Wetlands of Local Importance	2.08.2023
41	Edremit Reedy	321	Van	Wetlands of Local Importance	2.08.2023
42	Melen Lake	15	Tekirdağ	Wetlands of Local Importance	19.09.2023
43	Asar Pond	339	Kastamonu	Wetlands of Local Importance	19.09.2023
44	Demre Çayağzı Bird Paradise	606	Antalya	Wetlands of Local Importance	19.09.2023
45	Beymelek Lagoon	4,561	Antalya	Wetlands of Local Importance	19.09.2023
46	Aladağ Pond	747	Bolu	Wetlands of Local Importance	19.09.2023
47	Karagöl	58	Giresun	Wetlands of Local Importance	10.12.2023

E.3.3. Natural Protected Areas and Natural Assets

Table 95 Number of Natural Protected Areas and Natural Assets (MoEUCC, 2024)

	PROTECTION STATUS	PIECES	SURFACE AREA
PROTECTED AREA	Category 1 Natural Protected Area	639	639,621,23
	Category 2 Natural Protected Area	232	32,694,11
	Category 3 Natural Protected Area	350	95,752,67
	Category Not Specified	62	18,960,52
	Sensitive Area to be Strictly Protected	587	444,861,10
	Qualified Natural Protected Area	1,159	869,812,51
	Sustainable Protection and Controlled Use Area	1,005	654,070,87
	Special Environmental Protection Area (ÖÇKB)	19	3,832,959,54
TOTAL		**4,053**	**6,588,732,55**
MONUMENTAL TREE AND CAVE	Monumental Tree	10,510	
	Cave	296	

F.3.4. National Parks, Nature Reserves, Nature Parks and Natural Monuments

Within the framework of the National Parks Law No. 2873, protected areas are declared as National Park, Natural Reserve, Natural Park and Natural Monument.

National Parks are defined as "Scientifically and aesthetically, nationally and internationally rare natural and cultural resource values and nature pieces with conservation, recreation and tourism areas". As of 2023, there are 48 National Parks in Türkiye (Table 95). National Parks are of great importance in terms of protecting biological diversity in forest, steppe, wetland and coastal ecosystems.

When the "National Parks Law" came into force in 1983, the term "nature pieces" was used alongside the term "forests", allowing the law to be applied to areas other than forests that required protection. Since the main purpose is to protect nature, the term "Natural Reserve" has also been added to the law. Natural Reserve are defined as "nature pieces that contain outstanding examples of ecosystems, species and natural events that are on the verge of extinction and are important in terms of science and education, and that require absolute protection and are reserved for use only for scientific and educational purposes." As of 2023, there are 31 Natural Reserve.

Natural parks are defined as natural parts with vegetation and wildlife features, suitable for public recreation and entertainment within the integrity of the landscape. There are 204 Nature Parks declared for this purpose in Türkiye as of 2015, 208 as of 2016, 247 as of 2020 and 266 as of 2023.

Table 96 National Parks of Türkiye (MoAF, 2024)

NO	PROVINCE	NATIONAL PARK NAME	SURFACE AREA (Decare)	ANNOUNCEMENT YEAR
1	Yozgat	Yozgat Pine Grove	5,173	05.02.1958
2	Osmaniye	Karatepe-Aslantaş	4,143	29.05.1958
3	Ankara	Soğuksu	1,186	19.02.1959
4	Balıkesir	Bird Paradise	17,058	27.07.1959
5	Bursa	Uludağ	13,024	20.09.1961
6	Bolu	Yedigöller	1,623	29.04.1965
7	Aydın	Dilek Peninsula- B. Menderes D.	27,598	19.05.1966
8	Manisa	Spil Mountain	6,801	22.04.1968
9	Isparta	Kızıldağ	80,200	09.05.1969
10	Antalya	Güllük Mountain-Termessos	6,670	03.11.1970
11	Isparta	Kovada Lake	6,551	03.11.1970
12	Tunceli	Munzur Valley	42,674	21.12.1971
13	Antalya	Beydağları Coast	31,166	16.03.1972
14	Antalya	Köprülü Canyon	47,473	12.12.1973
15	Kastamonu	Ilgaz Mountain	1,118	02.06.1976
16	Afyon	Commander-in-Chief T MP	34,834	08.11.1981
17	Trabzon	Altindere Valley	4,468	09.09.1987
18	Çorum	Boğazköy-Alacahöyük	2,600	21.09.1988
19	Adıyaman	Nemrut Mountain	13,827	07.12.1988
20	Konya	Beyşehir Lake	82,157	11.01.1993

NO	PROVINCE	NATIONAL PARK NAME	SURFACE AREA (Decare)	ANNOUNCEMENT YEAR
21	Balıkesir	Kazdağı	20,935	17.04.1994
22	Antalya	Altınbesik Cave	1,147	31.08.1994
23	Artvin	Hatila Valley	16,944	31.08.1994
24	Artvin	Karagöl-Sahara	3,251	31.08.1994
25	Rize	Kaçkar Mountains	52,970	31.08.1994
26	Niğde	Aladağlar	55,064	21.04.1995
27	Muğla	Marmaris	29,206	08.03.1996
28	Muğla	Saklıkent	1,643	06.06.1996
29	Çanakkale	Troya T MP	13,517	07.11.1996
30	Denizli	Honaz Mountain	9,429	21.04.1998
31	Kastamonu	Küre Mountains	37,753	07.07.2000
32	Kars	Sarıkamış Allahüekber Mountains	22,520	19.10.2004
33	Ağrı	Ağrı Mountain	88,015	17.11.2004
34	Edirne	Gala Lake	5,923	05.03.2005
35	Kayseri	Sultan Reedy	24,358	17.03.2006
36	Şanlıurfa	Tek Tek Mountains	19,335	29.05.2007
37	Kırklareli	İğneada Longoz Forests	3,155	13.11.2007
38	Adana	Yumurtalık Lagoon	16,980	06.12.2008
39	Erzurum	Nene Hatun T MP	387	06.06.2009
40	Ankara	Sakarya Pitched Battle T MP	13,850	08.02.2015

F.3.5. Wildlife Development Areas and Breeding Stations

Areas where wild animals that are in danger of extinction are naturally found within the framework of the Land Hunting Law No. 4915 are protected in order to protect these species together with their habitats without damaging their ecosystem features. In some areas, it also produces species. 84 Wildlife Development Areas have been declared in Türkiye. Protection efforts are being carried out on a project basis for species such as the Anatolian Wild Sheep, Black Vulture, Great Bustard, Wood Grouse, Gazelle, Hyena, Fallow Deer and Bald Ibis, which are in danger of extinction. The populations of Wild Sheep (Ovis Gmelinii Anatolica) in Bozdağ, Konya, Gazelle (Gazella Subgutturosa) in Kızılkuyu, Urfa, Bald Ibis (Geronticus Eremita) in Birecik, Urfa have been protected and the extinction of these species has been partially prevented. In order to support natural populations of wild animals by breeding and releasing them into nature, Red Deer (Cervus Elaphus) breeding stations have been established in Istanbul Bahçeköy, Eskişehir-Mihalıççık, Istanbul-Polenezköy and Samsun-Vezirköprü, Fallow Deer (Dama Dama) in Antalya Eşenadası, Mountain Gazelle (Gazella Gazella) in Hatay Kırıkhan, Ankara Nallıhan (Ovis Gmelinii Anatolica) and Gaziantep Erikçe (Gazella Subgutturosa) breeding stations have been established.

The number of wild animal species in Türkiye has been determined as 761. It has been recorded that 150 of these species are mammals, 481 are birds and 130 are reptiles. A total of 629 species of wild animals, including 121 mammals, 378 birds and 130 reptiles, have been protected, and a total of 113 species, including 10 mammals and 103 birds, have been identified as game animals.

F.4. Invasive Alien Species in Türkiye (The Most Dangerous Invasive Alien Species in Türkiye)

With the support for puffer fish hunting, which started in 2020 and continued between 2021-2023, for the first time, both the protection of aquatic biodiversity and support for fishermen have been achieved at the same time. For the first time, both the protection of aquatic biodiversity and support for fishermen have been achieved at the same time. Thanks to the supported catch of puffer fish, approximately 14 million new individuals have been prevented from entering the ecosystem.

F.5. Areas Susceptible to Desertification and Erosion in Türkiye

Türkiye is among the countries that will be most affected by climate change and desertification due to its location in the world, geological structure, topography and climate, etc. Reasons such as topography, climate change, destruction of vegetation, misuse of agricultural and forest lands, faulty agricultural practices, incorrect and irregular use of pastures, unplanned and excessive irrigation, soil pollution, and illegal mining activities are also among the factors that accelerate desertification.

In the World Desertification Threat Map, a significant part of Türkiye, especially Central Anatolia, is shown as "vulnerable to desertification". Nevertheless, 65% of Türkiye has arid and semiarid characteristics. Currently, 4.17% of forest areas, 38.71% of agricultural areas, 53.66% of pastures and 3.46% of other areas are exposed to medium and severe erosion. The fact that 86% of the country's land is under threat of erosion makes erosion the most important cause of desertification.

The desertification of our agricultural lands, the deterioration of species diversity and natural structure in our forests and pastures, improper and irrelevant land use, the concreting of fertile and good quality agricultural lands, the ongoing soil pollution, and the significant levels of erosion and soil loss are facts that reveal that Türkiye is highly susceptible to desertification.

46% of Türkiye's total area has a slope greater than 40%, and more than 62.5% has a slope greater than 15%. In Türkiye, there is active erosion in 59% of agricultural areas, 54% of forest areas and 64% of pasture areas.

Fırat, Çoruh, Yeşilırmak and Kızılırmak are among the rivers that carry the most soil to our seas, lakes and dams. The rivers carrying the least amount of soil are Dalaman Stream and İyidere. The main reason why these rivers carry little soil is that their basins are covered with forests and the strong natural vegetation protects the soil.

Although there is no real desert in Türkiye, nearly 2/3 of our land consists of arid and semi-arid areas. However, due to the climate changes observed in recent years, an expansion has been observed in arid areas towards the west of Central Anatolia. Risk zones with semi-arid areas prone to desertification spread from the Konya Plain to the Eastern Mediterranean. In a study conducted on a Turkish scale, when two 30-year periods (1950-1980 and 1981-2010) were compared, it was determined that semi-arid areas in the country increased by approximately 14%.

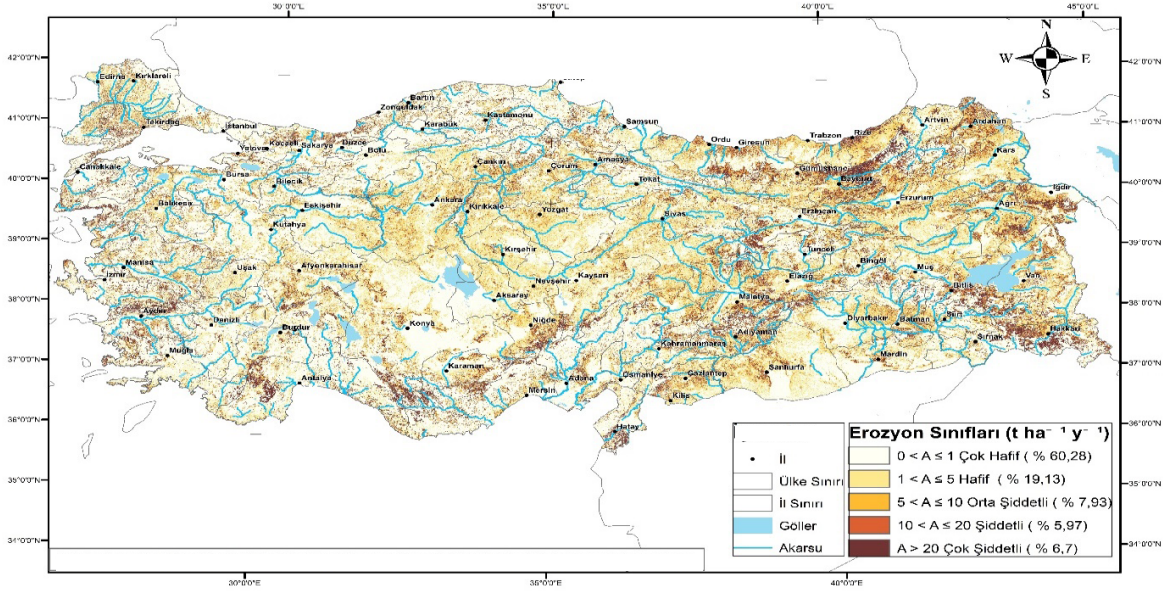
Türkiye signed the UNCCD on 15 October 1994 to combat the effects of desertification/land degradation and drought. Türkiye's accession to the convention was accepted by Law No. 4340 dated 11 February 1998 and entered into force upon publication in the Official Gazette on 16 May 1998.

According to the Desertification Vulnerability Map, one of the most important studies on desertification/land degradation in Türkiye, while 22.5% of Türkiye has high desertification vulnerability, 50.9% has medium desertification vulnerability.

According to the national scale desertification criteria and indicators determined in the Türkiye Desertification Model, while climate, water, soil, land cover and land use, topography and geomorphology, socio-economy and management stand out as the main factors in desertification/land degradation in Türkiye, it has been determined that the Konya Closed Basin, the central and southern parts of the Sakarya and Kızılırmak Basins, a significant part of the Fırat-Dicle Basin, the part of the Thrace Region outside the Black Sea coast and the Iğdır-Aralık part of the Aras Basin are highly susceptible to desertification.

F.5.1. Combating Desertification and Erosion

Map 19 Türkiye Water Erosion Map (MoAF, 2024)



The Ministry of Environment, Urbanization and Climate Change, General Directorate of Combating Desertification and Erosion (GDCDE) Studies

Türkiye is extremely sensitive to desertification/land degradation, erosion and drought due to its geographical location, climate, topography and soil conditions. In addition, the effects of desertification/land degradation, erosion and drought are increasing with climate change and human activities. Erosion in agricultural, forest and pasture areas as a result of incorrect land use, destruction of agricultural and pasture lands, decrease or loss of productivity, destruction of natural ecosystems such as forests, wetlands and steppes and loss of biodiversity, misuse and irregular utilization of productive agricultural and pasture areas, rapid population growth and negative effects of urbanization are the basic phenomena that occur.

As a result of land degradation, not only in production areas such as agricultural lands and pas-

tures, but also in natural areas such as forests, wetlands, steppes and maquis/heathery, there is a decrease or loss of productivity biologically/ecologically and economically. This situation has negative effects on the living conditions and livelihoods of the population, especially women and youth, who live dependent on natural resources, especially in areas affected by desertification/land degradation.

In Türkiye, 642 million tons of soil is displaced each year as a result of water erosion, and this value corresponds to an average of 8.24 tons of soil per hectare per year. In terms of water erosion severity classes, 60.28% of the country's surface area is very light, 19.13% is light, 7.93% is moderate, 5.97% is severe, and 6.7% is very severe.

When water erosion is evaluated in terms of land use in Türkiye, it has been determined by ÇEMGM that it occurs mostly in pastures with 53.6% and in agricultural areas with 38.7%, the rest in forests and other areas. When the continuity of agricultural activities and animal production for human life is evaluated and the formation process of the soil is considered, it will be better understood how important a natural resource it is when it is considered that it takes approximately 400 years for the formation of 1 cm of top soil.

Other effects can be summarized as follows;

- Warmer and less rainy climate conditions,
- Increase in extreme meteorological events,
- Increase in hydrometeorological disasters (floods, avalanches, landslides),
- Decrease in water resources,
- Increase in drought severity,
- Increase in forest fires,
- Deterioration of water and soil quality,
- Deterioration of ecosystem and decrease in biodiversity,
- Shift in ecological areas,
- Food supply and security are encountered.

For this reason, Türkiye, which is under the threat of desertification, is among the countries that have to carry out the fight against desertification and erosion most seriously.

ÇEMGM monitors and evaluates changes in erosion with the "Dynamic Erosion Model Monitoring System (DEMİS)". As a result of monitoring activities, it was determined that the most erosion occurred in agricultural and pasture areas. For this reason, it is necessary to prevent incorrect land use and techniques in agricultural lands, to increase awareness activities, and to prevent early and excessive grazing in pasture areas.

Türkiye has gained significant success and experience in combating desertification/land degradation since 1946, primarily in afforestation, erosion control, rehabilitation of degraded forest areas and pasture reclamation. In this context, afforestation, erosion control, rehabilitation of

degraded forest areas and pasture reclamation works have been carried out in an area of 9.72 million hectares as of the end of 2023. In the period of 1946-2023, afforestation was carried out in 2,559,083 hectares of land, and erosion control work was carried out in 1,687,503 hectares of land as of the end of 2023, and in the period of 1992-2023, rehabilitation was carried out in 3,445,272 hectares of land, and pasture improvement work was carried out in 307,031 hectares of land as of the end of 2023.

Various laws have been enacted to date for the protection of soil. These are Article 44 of the Constitution of the Republic of Türkiye, Law No. 5488 on Agriculture, Law No. 5403 on Soil Protection and Land Use, Law No. 4342 on Pastures, Law No. 6831 on Forests, Law No. 4142 on National Afforestation and Erosion Control Mobilization, and Law No. 2872 on the Environment. Within the framework of the law, relevant institutions and organizations carry out projects to combat erosion.

Ministry of Agriculture and Forestry, General Directorate of Agricultural Research and Policies (TAGEM) Studies

Climate change and disrupted precipitation balance due to global warming have increased the frequency of unusual meteorological events. This has further increased the risk of land degradation and erosion in agricultural lands and pastures in the highly vulnerable regions of Türkiye. Within this framework, in Konya-Karapınar region where wind erosion is most common, Mediterranean, Aegean and Central Anatolia, Eastern Anatolia and Black Sea Transition Regions, land protection and erosion preventive soil tillage and protective cover projects are carried out in agricultural and pasture lands, and land degradation trends in different land uses - vegetation changes, effects of wind erosion and sediment transport. With 5 projects carried out in Konya, Aksaray and Tokat provinces where wind erosion and sediment transport are high in arid and semi-arid areas, the amount of sediment moved by wind, its distribution according to years and the seasonal effect on the relationship between soil properties and dry aggregates, the effects of soil tillage and rotation systems on some physical properties of the soil, erosion and sediment/soil transport were determined and suggestions were developed that include minimum soil losses.

Regional studies on determining the effects of climate change on land degradation, processes in ensuring the deterioration and recovery of land productivity dynamics, determination of carbon sequestration and erosion sensitivity dynamics in pasture and agricultural soils, determination of phosphorus pollution carried by sediment with models are ongoing. “Research Project on Change, Effects and Environmental Assessment of Land Degradation in Manisa Akselendi Plain Affected by Wind Erosion” was completed in 2020 and the final report was published. With the study, land degradation and land transformation maps in the plain were obtained, and land change and degradation maps, temporal changes and environmental effects in dune areas, areas lost due to wind erosion, and agricultural gains in the process were presented in detail.

The “Estimation of Soil Organic Carbon and Physical Soil Degradation Indicators under Future Climate Conditions” Project continues regionally in the Black Sea Region. Within the scope of the guided project “Determination of Soil and Water Loss in Scots Pine Stands with Different Closures, Çamlıdere and Erdemli Example”, research activities have been completed and the final report of the project has been prepared. The “Geographic Information System Modeling and Agricultural Land Use Plan - Vezirköprü Example Project” carried out in the Vezirköprü District

of Samsun Province, which has a high agricultural potential for the Black Sea Region and Türkiye, was concluded in 2023 and the distribution areas of the study area soils were classified and mapped according to the new taxonomic system and land use planning was made.

F.5.1.1. Creation of New Carbon Sinks

The creation of new carbon sinks is an effective strategy in combating desertification and erosion. Carbon sinks contribute to the fight against climate change by reducing the amount of carbon in the atmosphere. Therefore, the creation of new sink areas is critical for both environmental protection and combating climate change. These areas promote the restoration of the environment and the regeneration of ecosystems. This increases biodiversity, prevents soil erosion and regulates the water cycle. In addition, it improves air quality by increasing carbon absorption and reduces the effects of climate change. The biggest obstacle to the creation of new carbon sink areas is grazing pressure and social problems. In order to overcome these problems, it is important to work in regions where there is cooperation and willingness with the local. In this regard, new carbon sink areas have been established in 2,550 areas in order to protect the environment and prevent pollution. Targets foreseen for 2028 include increasing the number of new carbon sinks to a total of 13,000 acres and reducing soil erosion. These projections increase biodiversity by restoring the natural environment, protecting water resources, increasing soil fertility and reducing the effects of climate change. This provides positive effects on human health.

F.5.1.2. Soil Classification and Mapping

Since there is no detailed soil map produced specifically for Türkiye, today, many projects still use the 1/100,000 scale "Large Soil Groups Map (BTG)", which was produced in the 1960s by the former General Directorate of TOPRAKSU using 1 /25,000 scale topographic maps. BTG is a study prepared mostly for agricultural areas and although it has undergone various revisions over time, it is not sufficient for many plans and applications, especially in forest and pasture areas.

Various institutions and organizations are working to eliminate this deficiency in the country. In this context, a study was carried out in order to determine the soil profile locations in non-agricultural areas in the Kemalpaşa Sub-Basin of the Gediz Basin by remote sensing methods and to perform 1 /25,000 scale soil classification and soil mapping.

F.5.1.3. Upper Basin Flood Control Projects

Flood impacts due to climate change and improper land use are increasing day by day. In order to protect the soil and natural resources and reduce the impacts caused by floods, 62 Flood Control Projects were produced and project support was provided between 2019 and 2023.

F.5.1.4. Landslide Projects

Türkiye is among the countries where natural disasters occur frequently due to its geological, geomorphological, climatic and topographic features. Among these disasters, landslides are the most destructive after earthquakes. In Türkiye, especially in the Eastern Black Sea Region, floods and landslides are intertwined. Floods trigger landslides, and landslides increase the destructive power of floods.

In order to minimize the damage caused by landslides, 13 Landslide Inventories and Susceptibility Maps were prepared between 2019-2023 and circulated to the implementing units.

F.5.1.5. Avalanche Projects

As a result of increasing human activities (tourism facilities, hunting, mountaineering, etc.) in mountainous areas, there is an increase in the loss of life and damage caused by avalanches. In order to reduce the damage caused by avalanches, avalanche projects are being produced by taking into account active and passive avalanche prevention techniques. Between 2019-2023, 5 Avalanche Control Projects and 12 Avalanche Hazard Assessment Projects were prepared. In addition, Potential Avalanche Starting Zones for all of Türkiye have been determined. The studies have been sent to implementation units.

F.5.1.6. Afforestation and Erosion Control Projects

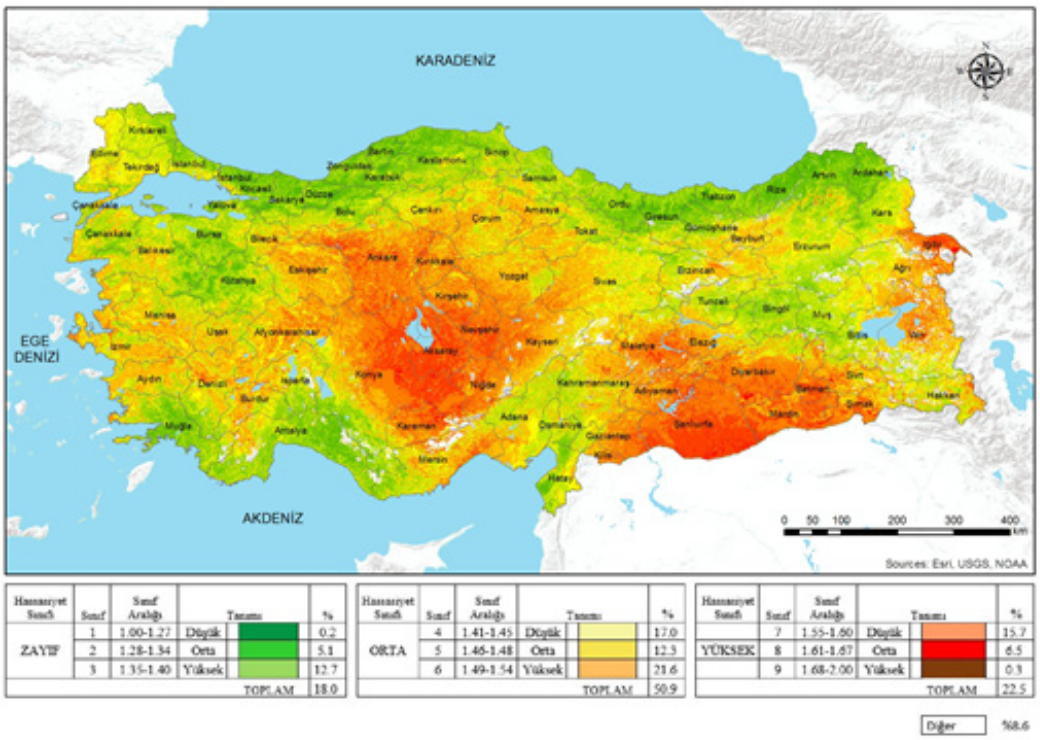
Afforestation and erosion control projects are being prepared with the aim of increasing the economic life of our dams that require large investments, protecting dams and water basins, increasing water quality and efficiency, creating new recreation and tourism areas, and creating new habitats for wildlife. Between 2019 and 2023, 12 Green Belt Afforestation and 3 Afforestation and Erosion Control Projects were produced and project support was provided.

F.5.1.7. Türkiye Desertification Model and Sensitivity Map

Desertification is defined as land destruction in arid, semiarid, and subhumid areas as a result of climate change and human activities. Desertification negatively affects the natural environment and all living things, including the people living in it, and indirectly causes major problems such as hunger and migration on a global scale.

One of the most important elements of combating desertification is to monitor desertification throughout the country and identify priority and sensitive areas. In this context, within the scope of the "Türkiye Desertification Model and Vulnerability Map Project" carried out in cooperation with TÜBİTAK to monitor desertification, ÇEMGM determined desertification criteria and indicators specific to Türkiye. With the study in question, 7 criteria and 48 indicators were determined. Thus, the desertification model presented has addressed desertification in a holistic manner with all its aspects as climate, water, soil, land cover, land use, topography, geomorphology, socio-economy and management. Within the scope of the project in question, a GIS-based desertification model suitable for Türkiye was created and the "Türkiye Desertification Vulnerability Map" was produced by identifying areas susceptible to desertification on a national scale.

Map 20 Türkiye Desertification Vulnerability Map



Hassasiyet Sınıfı	Sınıf	Sınıf Aralığı	Tanımı	%
ZAYIF	1	1.00-1.27	Düşük	0.2
	2	1.28-1.34	Orta	5.1
	3	1.35-1.40	Yüksek	12.7
			TOPLAM	18.0

Hassasiyet Sınıfı	Sınıf	Sınıf Aralığı	Tanımı	%
ORTA	4	1.41-1.45	Düşük	17.0
	5	1.46-1.48	Orta	12.3
	6	1.49-1.54	Yüksek	21.6
			TOPLAM	50.9

Hassasiyet Sınıfı	Sınıf	Sınıf Aralığı	Tanımı	%
YÜKSEK	7	1.55-1.60	Düşük	15.7
	8	1.61-1.67	Orta	6.5
	9	1.68-2.00	Yüksek	0.3
			TOPLAM	22.5

Diğer %8.6

According to the 'Türkiye Desertification Vulnerability Map', approximately 22.5 percent of Türkiye's lands are highly susceptible to desertification. While Konya-Karapınar, Iğdır-Aralık and Urfa-Ceylanpınar are seen as regions with a very high degree of vulnerability to desertification, the Salt Lake basin, the Ereğli-Karaman region, the Urfa-Ceylanpınar-Mardin-Batman line and the Eskişehir area are in the group with a medium and high degree of vulnerability to desertification.

Within the scope of the Türkiye Desertification Model Verification and Calibration Project, pilot field studies were carried out in Aksaray and Mersin provinces in 2016, in Çorum-Amasya-Samsun and Şanlıurfa-Adıyaman provinces in 2017, and in Bursa-Balıkesir-Çanakkale-Edirne-Tekirdağ-Kırklareli and Iğdır-Kars-Erzurum-Ardahan-Artvin provinces in 2018. In 2019, the Upper Sakarya Basin pilot field studies were carried out and all verification and calibration studies were completed. As a result of the verification and calibration studies, 22.5% of Türkiye's areal assets are highly susceptible to desertification, while 50.9% are moderately and 18% are lowly susceptible to desertification.

Project for Contributing to the Establishment of Land Degradation Neutrality (ATD) Targets by Implementing the ATD Approach in the Upper Sakarya Basin for the Purpose of Spreading it at the National Level: In September 2015, the Sustainable Development Goals adopted in New York, sub-target number 15.3 (SDG 15.3) was accepted as "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world." (UNSDG 15.3) In order to contribute to Türkiye's achievement of the ATD targets, the "Land Degradation Neutrality, Upper Sakarya Basin Project" was put into practice during the GEF 6 period.

The aim of the project is to increase the awareness and capacity of all relevant stakeholders regarding ATD, to prepare a Decision Support System (KDS) that will guide decision makers, to carry out field applications and to disseminate the final results at the country level, as well as to be an example for other countries in terms of technique and practice. The ATD Decision Support System, one of the most important outputs of the Project, has been created and is being actively used.

The Decision Support System (KDS) was developed within the scope of the "Land Degradation Neutrality, Upper Sakarya Basin Project" carried out in cooperation with the General Directorate of Combating Desertification and Erosion, which is the focal point of the United Nations Convention to Combat Desertification (UNCCD), and the Food and Agriculture Organization of the United Nations (FAO).

This system, which was established to reveal the current situation in order to achieve voluntary ATD targets, is an open source system based on Google Earth Engine, which allows decision makers to make accurate and effective decisions with integrated data and models. Three basic criteria have been determined by the UNCCD Secretariat in determining the changes in ATD over time and reporting the progress made towards ATD targets. These are land cover, land productivity dynamics and soil organic carbon.

Three-way interactions provide a detailed understanding of degradation and help identify areas requiring urgent intervention. The "all but one" approach used in the ATD methodology assumes that if any of the indicators show degradation, the entire area is considered degraded.

Building on the ATD Intervention Hierarchy adopted for Land Degradation Neutrality, the System provides a versatile platform for the interpretation of a wide range of inputs. These inputs cover a variety of factors such as land use change, soil organic carbon (SOC), land productivity index, erosion data specific to Türkiye, and desertification vulnerability maps. The System enables comprehensive analysis through various interactive features.

This system shows decision makers which areas need to be taken into account within the framework of ATD indicators and subcomponents, which areas are stable or improving, and the transitions between land covers.

By preparing the document "Decision Support System for Balancing Land Degradation with System Outputs, Provincial Statistics and Sustainable Land Management Approaches and Practices", areas that are sensitive in terms of land degradation and need to be protected and areas that need to be repaired through restoration and rehabilitation works have been determined on a provincial basis.

Soil Organic Carbon (SOC) Stock Monitoring Project: Soil Organic Carbon (SOC) is an extremely important and effective indicator in terms of balancing land degradation, sustainable use of country lands and reducing and/or eliminating the negative effects of climate change. Determining the land use types where SOC stocks are low, sufficient or high at the national scale and mapping their locations are also necessary for the development of national land use policies.

In this context, as a result of the "Türkiye Soil Organic Carbon (KARBON) Project" carried out in cooperation with the General Directorate of Combating Desertification and Erosion (GDCDE) and TÜBİTAK- Informatics and Information Security Advanced Technologies Research Center (BİLGEM)-Software Technologies Research Institute (YTE), a high-resolution and very detailed Türkiye Soil Organic Carbon Stock Map has been prepared.

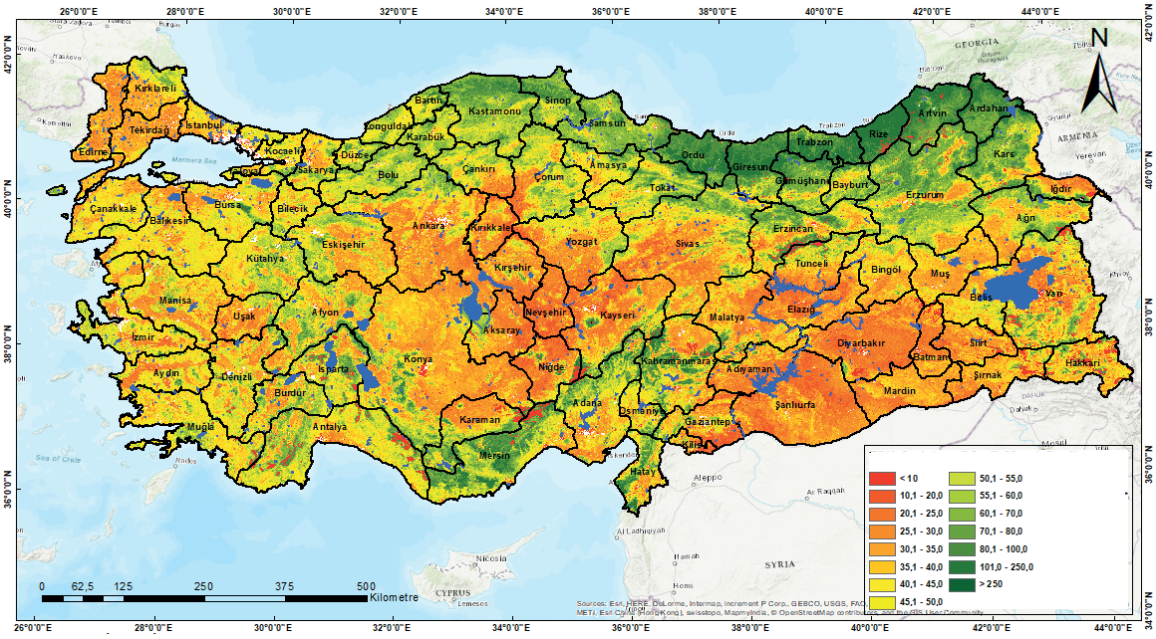
As a result of this study, the total amount of carbon stock in Türkiye at 30 cm soil depth was determined as 3.51 billion tonnes. The areas where the soil C stock is stored the most are forest areas (38.33%), followed by pastures with 33.39% and agricultural areas with 26.94%.

As a result of the modeling, the average carbon amounts per unit area for 6 land use classes are as follows;

- For Forest Areas, it is estimated as 55.68 tons C ha^{-1},
- For Pasture Areas 49.77 tons C ha^{-1},
- For Wetlands and Water Surfaces 49.71 tons C ha^{-1},
- For Agricultural Areas 35.96 tons C ha^{-1},
- For Artificial Areas 16.12 tons C ha^{-1}
- For Bare Areas 12.78 tons C ha^{-1}.

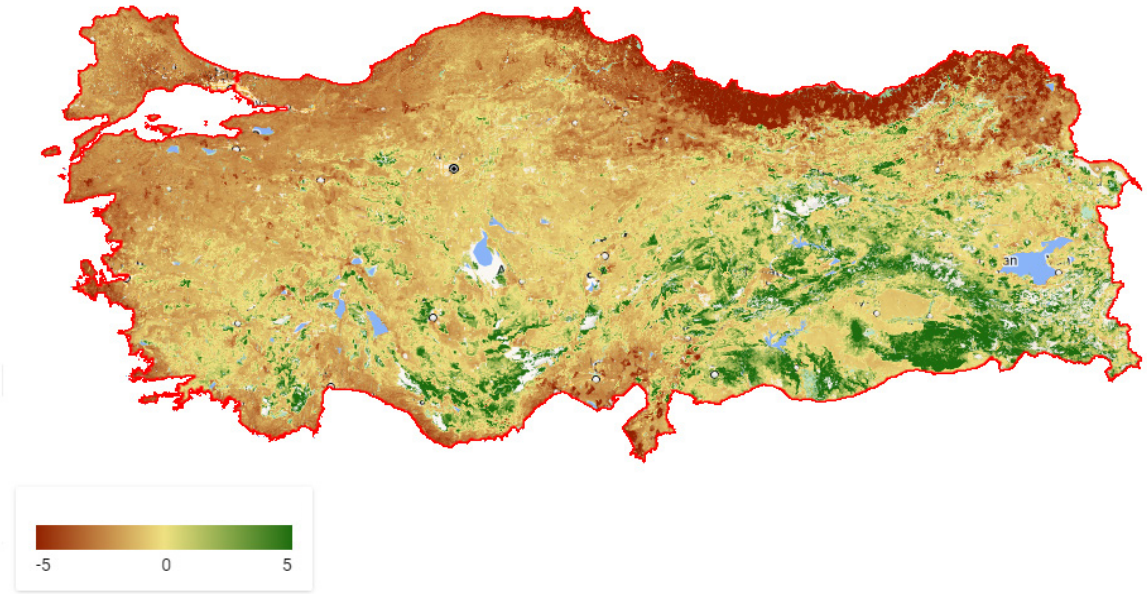
The highest unit SOC amount at the basin scale was determined in the "Eastern Black Sea Basin" (100.68 tons C ha^{-1}), while the lowest unit SOC amount was determined in the "Meriç Ergene" basin (34.03 tons C ha^{-1}). The SOC distribution statistics are also compatible with the statistics of the Türkiye Desertification Risk Map produced by ÇEMGM-TÜBİTAK/BİLGEM cooperation in 2015. The SOC amount was found to be the highest (63.79 tonnes C ha^{-1}) in the "Very Low-Low" desertification risk class and the lowest (31.49 tonnes C ha^{-1}) in the "Very High-High" desertification risk class.

Map 21 Soil Organic Carbon Stock Map of Türkiye Prepared with Soil Data Obtained Between 2007-2017 (0-30 cm)

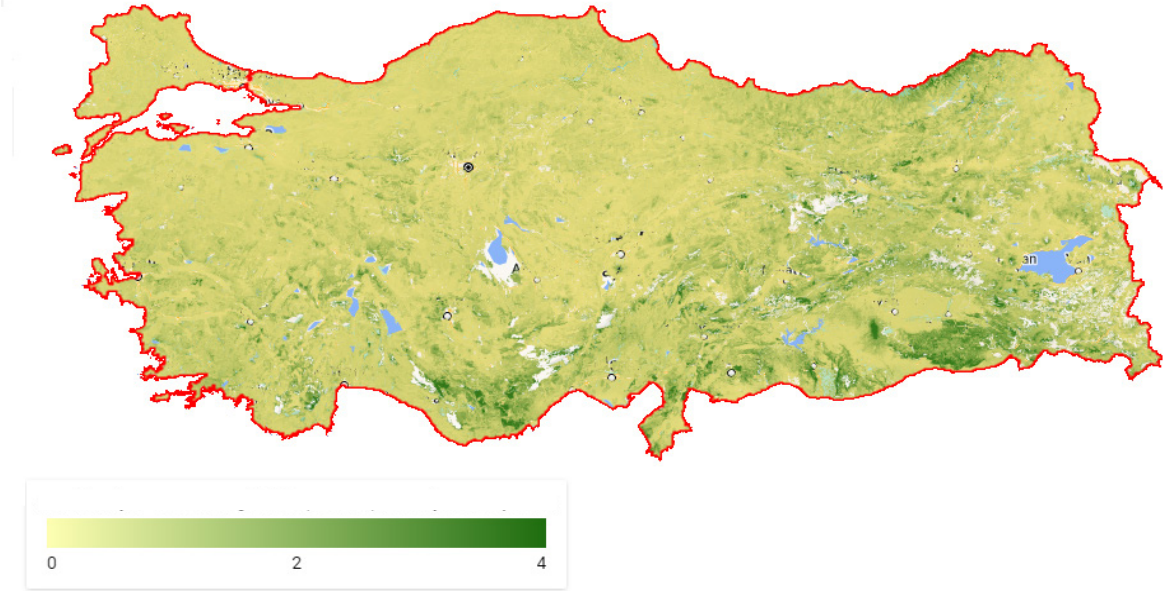


With the ÇEMGM-FAO collaboration integrated into the Land Degradation Balancing Decision Support System, in Türkiye, SOC Change (Map 21) and Potential SOC Storage Amounts (Map 22) as of 2040 were calculated and maps were created.

Map 22 Türkiye Organic Carbon Change Map as of 2040 (MoEUCC, 2024)



Map 23 Map of Potential Soil Organic Carbon Storage by 2040 (MoEUCC, 2024)



F.5.2. Basin Rehabilitation

Basin Rehabilitation is the work carried out to improve the social, cultural and economic welfare of the people living in the basin by taking technical, cultural and administrative measures to ensure the natural balance between soil, water and vegetation. The work carried out in Türkiye's water basins remains within the jurisdiction and authority of many state institutions.

In addition, it has been understood that the participation of other interest groups such as local people and non-governmental organizations in basin rehabilitation works is of great importance for sustainable natural resource management. For this reason, since the 1990s, "Integrated Basin Rehabilitation Plans and Projects" that include ecological, social, cultural and economic dimensions have been carried out with the participation of all sectors and all interest groups in the area on a water basin basis. In this context, 25 integrated basin projects prepared with our internal resources are listed below.

1. Şanlıurfa; Tektek Mountains Micro-catchment Integrated Flood Control Project (2014-2016)
2. Konya-Hadim and Taşkent; Upper Göksu Basin, Gökdere Integrated Micro-catchment Rehabilitation Project (2014-2017)
3. Konya-Taşkent; Upper Göksu Basin, Sazak-Avşar Integrated Micro-catchment Rehabilitation Project (2015-2019)
4. Karaman-Ayrancı; Konya Closed Basin, Başlamışlı-Kocadere Integrated Micro-catchment Rehabilitation Project (2015-2019)
5. Afyonkarahisar-Şuhut; Akarçay Basin, Hüseyinli-Belenyurdu Integrated Micro-catchment Rehabilitation Project (2014-2018)
6. Afyonkarahisar-Şuhut; Akarçay Basin, Şuhutçayı Integrated Micro-catchment Rehabilitation Project (2015-2019)
7. Konya-Bozkır-Hadim; Upper Göksu Basin, Bağbaşı Dam Integrated Micro-catchment Rehabilitation Project (2015-2019)
8. Denizli-Çameli; Western Mediterranean Basin, Karanfilli Stream Integrated Micro-catchment Rehabilitation Project (2017-2021)
9. Manisa-Selendi; Gediz Basin, Selendi Stream Integrated Micro-catchment Rehabilitation Project. (2017-2021)
10. Denizli-Çameli; Western Mediterranean Basin; Akdere Stream Integrated Micro-catchment Rehabilitation Project (2018-2022)
11. Manisa-Selendi; Gediz Basin; İlke Stream Integrated Micro-catchment Rehabilitation Project (2018-2022)
12. Burdur-Çavdır; West Mediterranean Basin; Çavdır Dam Integrated Micro-catchment Rehabilitation Project (2019-2023)
13. Kütahya-Center; Sakarya Basin; Porsuk Dam-1 Integrated Micro-catchment Rehabilitation Project (2019-2023)
14. Eskişehir-Sivrihisar; Upper Sakarya Basin; Porsuk Stream Integrated Micro-catchment Rehabilitation Project (2019-2023)
15. Iğdır-Aralık Integrated Flood and Erosion Control Project (2019-2023)
16. Ankara Province Beypazarı District; Upper Sakarya Basin Kargı Dam Integrated Micro-catchment Rehabilitation Project (2020-2024)
17. Eskişehir-Sivrihisar; Upper Sakarya Basin; Nasrettin Hoca Integrated Micro-catchment Rehabilitation Project (2020-2024)
18. Manisa-Akhisar; Gediz Basin; Gürdük Stream Integrated Micro-catchment Rehabilitation Project (2022-2026)
19. Bingöl - Karlıova; Fırat-Dicle Basin Büyüksu Stream Integrated Basin Rehabilitation Project (2022-2026)
20. Malatya-Yeşilyurt; Fırat-Dicle Basin Büyükgüncük Stream Integrated Micro-Basin Rehabilitation Project (2023-2027)
21. Gümüşhane- Şiran; Yeşilırmak Basin; Değirmen Stream Integrated Micro-catchment Rehabilitation Project (2023-2027)
22. Gümüşhane-Merkez; Doğukaradeniz Basin; Arzular Stream Integrated Micro-Basin Rehabilitation Project (2023-2027)

23. Kahramanmaraş-Afşin; Yukarı Ceyhan Basin; Hurman Stream Integrated Micro-Basin Rehabilitation Project (2024-2028)
24. Kahramanmaraş-Elbistan; Upper Ceyhan Basin; Hurman Stream Integrated Micro-Catchment Rehabilitation Project (2024-2028)
25. Kayseri Erciyes Integrated Flood and Erosion Control Project (2024-2028)

F.5.3. National Land Cover Classification and Monitoring System

Within the scope of the National Land Cover Classification and Monitoring System (NLCCMS) project, which was completed by the General Directorate of Combating Desertification and Erosion (GDCDE) and TÜBİTAK-BİLGEM in cooperation, determining the current status of land cover and monitoring changes in land cover over the years are important in terms of evaluating the effects of climate, water, soil, land cover and use, topography, geomorphology and anthropogenic processes.

NLCCMS is an open-source national software system that can semi-automatically produce land cover classes specific to Türkiye using artificial intelligence and machine learning technologies and monitor changes. In line with the needs of all stakeholders using land cover data, 79 sub-land cover classes have been determined in 5 main classes specific to Türkiye (settlement, forest and semi-natural areas, agriculture, wetlands, waterways and water bodies). As a result of the studies carried out, 32 of the 79 land cover classes are produced automatically and 47 are produced using auxiliary data. The land cover map produced by the system allows the classification of all areas larger than 0.25 hectares in all classes and the monitoring of changes.

As a result of the study, land cover data, tree cover data, surface impermeability data and land cover change data are produced. The obtained land cover data can be used effectively in all projects related to Erosion, Desertification, Flood, Landslide, Product Estimation Models, Carbon Emission Calculations, Climate Change Impact Scenarios, Land Cover Variability Monitoring Studies, National and International Reporting.

Targets and Projections

The agricultural, forestry and pasture activities carried out in Türkiye, primarily by the General Directorate of Forestry (GDF), the General Directorate of Agricultural Research and Policies (TAGEM) and the General Directorate of Agricultural Enterprises (TİGEM) within the Ministry of Agriculture and Forestry, affect soil erosion. In this context, any changes to be made by GDF in forest areas are revealed by ÇEMGM by monitoring the change in soil erosion. The evaluation and monitoring of activities carried out by relevant institutions and organizations in agricultural and pasture areas in terms of erosion are carried out by GDCDE. In addition, GDCDE carries out the task of preventing and monitoring erosion by afforestation, pasture improvement and combating desertification within the scope of its activities.

F.6. Forest and Nature Conservation Policies, Developments

F.6.1. Forest Protection

Fires are being fought with 25 thousand personnel, 776 fire watchtowers and 1,600 forest fire first response teams throughout the country. In the last 10 years covering the years 2014-2023, an average of 2,568 forest fires occurred annually in Türkiye, and an average of 23,326 hectares

of forest were damaged annually in these fires, and 85% of the forest fires occurred in the fire season covering the months of May-November, and 15% in the period of December-April.

The General Directorate of Forestry carries out erosion control and pasture improvement activities. Initially implemented between 2013 and 2017 but extended for an additional two years, the Erosion Control Action Plan (2013-2019), the Upper Basin Flood Control Action Plan (2013-2019), and the Dam Basin Green Belt Afforestation Action Plan (2013-2019), erosion control, flood control, afforestation, and pasture improvement activities are being carried out.

As of September 16, 2024, 3,110 forest fires have occurred. These fires have damaged 25,763 hectares of forest. During the same period, as of September 16, 2023, 1,956 forest fires have occurred, and 13,440 hectares of forest have been damaged. This year, there has been an increase of approximately 58% in the number of fires and a 91% increase in the burned area compared to last year in terms of number and area of fires.

When compared with Mediterranean countries that are in a similar climate zone and have similar forest structures, according to figures from the European Forest Fire Information System (EFFIS), which reports fire data, it is seen that the country is among the most successful countries in combating forest fires.

Since approximately 90% of forest fires are caused by human activities, forest fires have also increased in the provinces where population density has increased.

F.6.2. Nature Conservation Policies

In the provinces of Artvin, Bayburt and Erzurum located in the Çoruh River Basin, with the aim of ensuring integrated basin rehabilitation including vegetation, soil and water resources, improving the living conditions of the people living in rural areas, protecting the soil, rehabilitating degraded forests, and preventing natural disasters such as avalanche, flood and inundation control, the Çoruh River Basin Rehabilitation Project (2012-2021) was carried out under the coordination of the General Directorate of Forestry.

The General Directorate of Forestry carries out erosion control and pasture improvement activities. Initially implemented between 2013 and 2017 but extended for an additional two years, the Erosion Control Action Plan (2013-2019), the Upper Basin Flood Control Action Plan (2013-2019), and the Dam Basin Green Belt Afforestation Action Plan (2013-2019), erosion control, flood control, afforestation, and pasture improvement activities are being carried out.

In our forest areas, honey forests are being established in a planned manner within the scope of the Honey Forest Action Plans covering the years 2013-2017 and 2018-2023 and the Strategic program covering the years 2024-2028 in order to support beekeeping, expand the production of organic honey and bee products and ensure food security. To date, 823 Honey Forests with a capacity of 1 million hives in 98,217 hectares of forest area have been established, supporting beekeeping and contributing to the economy.

In addition, soil conservation (erosion control), flood control, avalanche control and pasture improvement activities are carried out by the General Directorate of Forestry.

Between 2019 and 2023;

- Erosion control in 94,984 hectares,
- Flood control in 55,893 hectares,
- Avalanche control in 195 hectares, totalling 151,072 hectares of soil conservation work was carried out, and pasture improvement work was carried out in 56,588 hectares.

Table 97 Erosion Control and Pasture Improvement Activities between 2019-2023 (GDF, 2024)

Activity (ha)	Years					
	2019	2020	2021	2022	2023	Toplam
Soil Conservation Work (Erosi-on-Flood-Avalanche)	16,538	20,902	36,695	36,088	40,849	151,072
Pasture Improvement	8,088	10,438	12,394	12,893	12,775	56,588

A total of 221 soil conservation projects, 21 flood control projects, 3 dam/pond green belt afforestation projects, 273 pasture improvement projects and 2 micro-basin plan construction works were carried out by the General Directorate of Forestry between 2019 and 2023.

In addition, within the framework of the Upper Basin Flood Control Action Plan covering the years 2024-2028, it was planned to carry out work in a total of 194 flood basins, and within the framework of the Dam Basins Erosion Control Action Plan covering the years 2024-2028, it was planned to carry out erosion control work in 429 dam and pond basins.

The "Rehabilitation Project in the Çoruh River Basin", which was initiated in 2012 under the coordination of the General Directorate of Forestry in the provinces of Artvin, Bayburt and Erzurum in the Çoruh River Basin with the aim of ensuring integrated basin rehabilitation including vegetation, soil and water resources, improving the living conditions of the people living in rural areas, protecting the soil, rehabilitating degraded forests, and preventing natural disasters such as avalanches, floods and inundations, has been completed as of 2021.

In addition, integrated micro-catchment studies are carried out by the General Directorate of Forestry in different regions of Türkiye on a micro-catchment basis. In this context, there are 27 integrated micro-catchment projects prepared and implemented with the internal resources of the General Directorate of Forestry. Some of these micro-catchment projects have been completed and some of them are still under study.

Türkiye Resilient Landscape Integration Project (TULIP Project)

The "Türkiye Resilient Landscape Integration Project (TULIP Project)", which is the combined version of the Bolaman and Çekerek Basin Rehabilitation Projects coordinated by the General Directorate of Forestry, is being carried out. (2021-2028) The "Bolaman Basin Rehabilitation Project" covers Ordu and Tokat provinces, while the "Çekerek Basin Rehabilitation Project" covers Yozgat, Tokat, Çorum and Sivas provinces. Within the scope of the TULIP Project, it is aimed to provide added value to both the forestry and agricultural sectors with the pasture improvement, erosion, flood, flood control projects to be carried out in the basins, restoration/rehabilitation of natural resources, gray and green infrastructure projects developed considering the geological, topographic and demographic characteristics of the basins, restoration and optimal use of natural resources, and sub-projects prepared for improving the livelihoods of the local people living in rural areas.

References

Ministry of Environment, Urbanization and Climate Change

Ministry of Agriculture and Forestry

General Directorate of Forestry

G. LAND USE

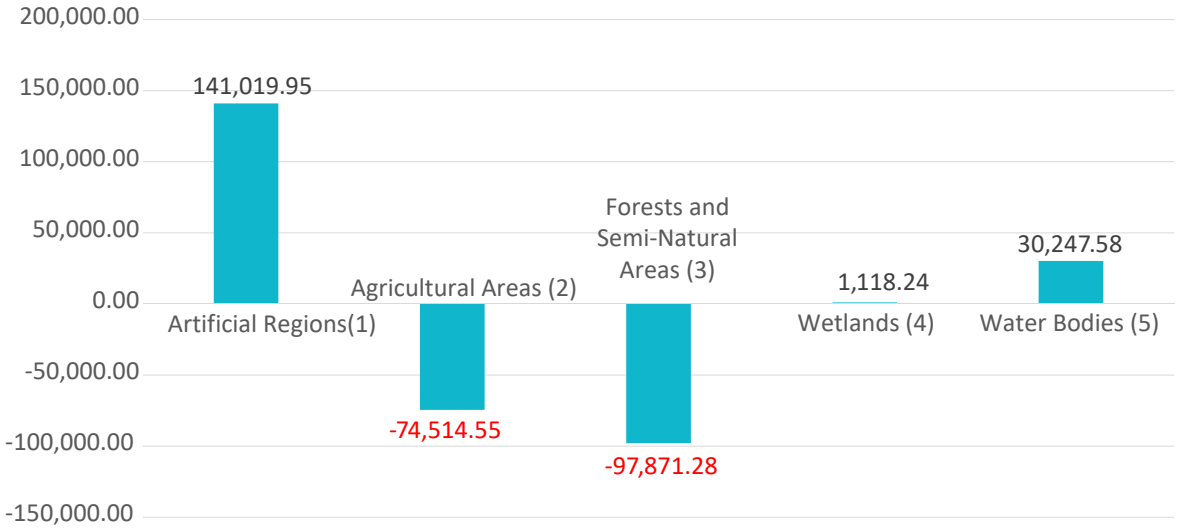
The term land cover is often used in conjunction with the term land use. However, the two terms are not synonymous. Land cover refers to the vegetation and man-made structures that cover the surface of the earth. Land use refers to human activities in relation to the land. The term land use is normally used in a relative sense, encompassing both the types of land cover and the actual use of the land, as opposed to the suitability or potential use of the land.

G.1. Land Use Data

Table 98 Land Use Distribution in Türkiye (https://corinecbs.tarimorman.gov.tr/, 2024)

	2006		2012		2018	
	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)
Artificial Regions	1,300,589.00	1.61	1,456,764.95	1.81	1,565,407.01	1.94
Agricultural Areas	33,997,989.52	42.16	34,137,732.58	42.34	34,079,354.82	42.26
Forest and Semi-Natural Areas	40,985,568.14	50.83	40,643,583.57	50.4	40,564,303.45	50.31
Wetlands	417,587.84	0.52	412,519.01	0.51	413,786.96	0.51
Water Bodies	3,938,293.88	4.88	3,985,920.76	4.94	4,013,668.63	4.98
TOTAL	**80,640,028.38**		**80,636,520.87**		**80,636,520.87**	

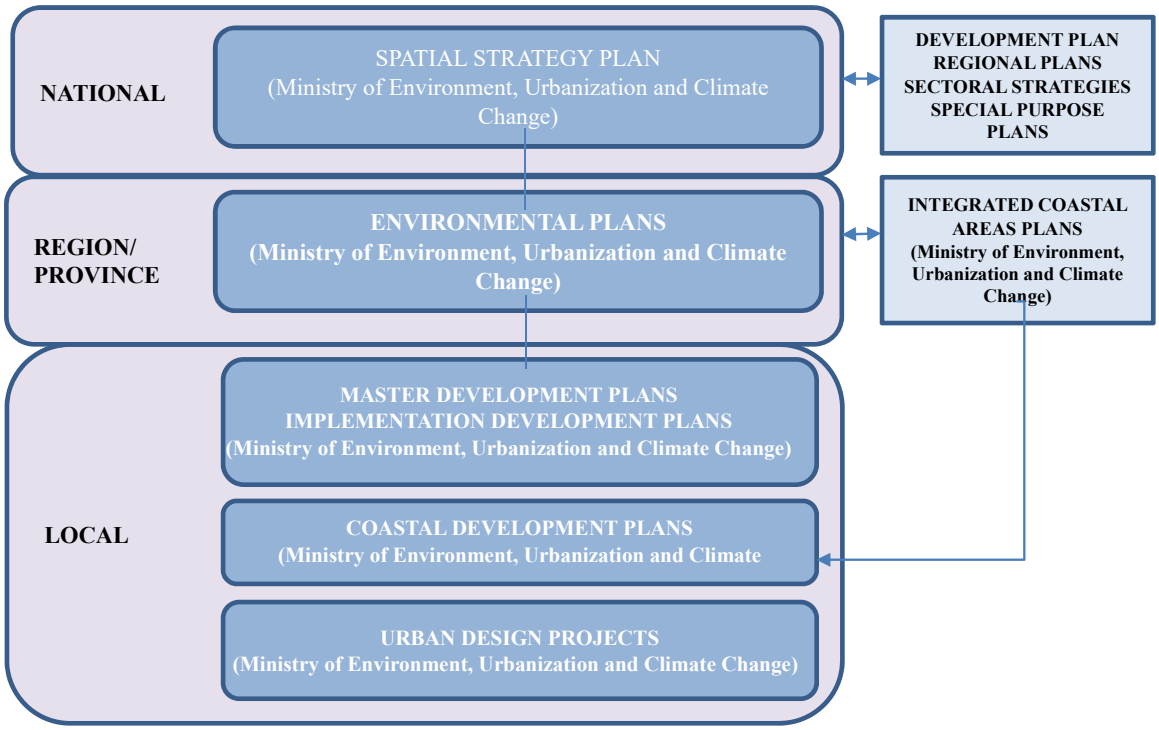
Graph 60 Change in Land Use Distribution in Türkiye Between 2012-2018 (https://corinecbs.tarimorman.gov.tr/, 2024)



G.2. Spatial Planning

Spatial Planning is the determination of land use and construction decisions in order to protect and develop physical, natural, historical and cultural values, to ensure the balance between protection and use, to support sustainable development at the country, region and city level, and to create healthy and safe environments with high quality of life.

Figure 1 Gradation between Spatial Plans within the Framework of Legislation in Türkiye (MoEUCC, 2024)

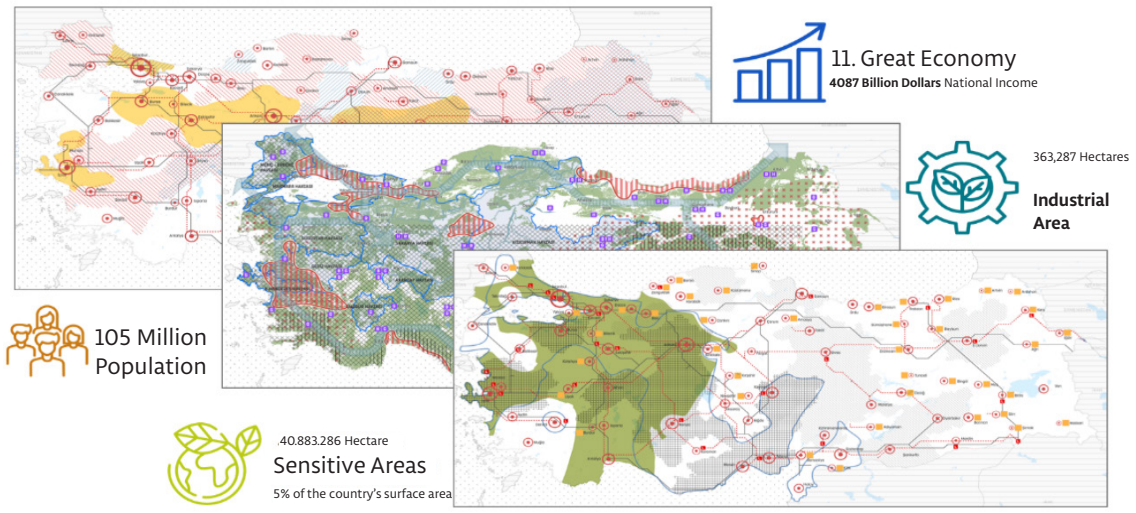


G.2.1. Türkiye Spatial Strategy Plan (Türkiye MSP)

Within the scope of the works of MoEUCC General Directorate of Spatial Planning, the Türkiye Spatial Strategy Plan studies, which were prepared in line with our sustainable development in line with our "Green Development Revolution" and "net zero emission" goals, the development of social welfare by distributing investments to all regions of Türkiye, ensuring the harmony of all types of land use with nature and the effective implementation of national climate change policies, were completed in 2023 and the studies are ongoing.

The vision of the Türkiye Spatial Strategy Plan, prepared in the light of scientific analyses with the contributions of all our institutions and local governments by establishing joint decision-making processes with a strategic planning approach, has been determined as "Inclusive, livable, innovative, competitive, sensitive to climate change and disasters, resilient and sustainable country space".

Map 24 Türkiye Spatial Strategy Plan 2053 (Draft) Key Development Diagram (MoEUCC, 2024)



G.2.2. Environmental Plan

Environmental plans at a scale of 1/50,000 or 1/100,000, which determine settlement and land use decisions such as housing, industry, agriculture, tourism and transportation in accordance with regional plans, strategic plans and development plans and cover 80 provinces except Kütahya province, at the planning region or provincial level, have been approved within the framework of the relevant legislation.

In order to eliminate the problems encountered in the implementation of Environmental Plans and to meet the emerging needs, studies are carried out in cooperation with metropolitan municipalities, local administrations, public institutions and all relevant segments.

1/100,000 scale ÇDPs have been completed for 99% of the provinces in Türkiye. Except for the metropolitan municipalities of Ankara, Istanbul, Kocaeli, Bursa, Eskisehir, Sakarya, Kahramanmaras, Hatay and Gaziantep, the works and operations regarding the environmental plans in all provinces are carried out by the MoEUCC.

G.2.2.1. Countrywide Environmental Plans

Map 25 Environmental Plans in Türkiye (MoEUCC, 2024)

The 1/100,000 scale Environmental Plans prepared by the Ministry of Environment, Urbanization and Climate Change are published on the General Directorate of Spatial Planning's page at http://www.mpgm.csb.gov.tr.

G.2.3. Integrated Coastal Areas Plan

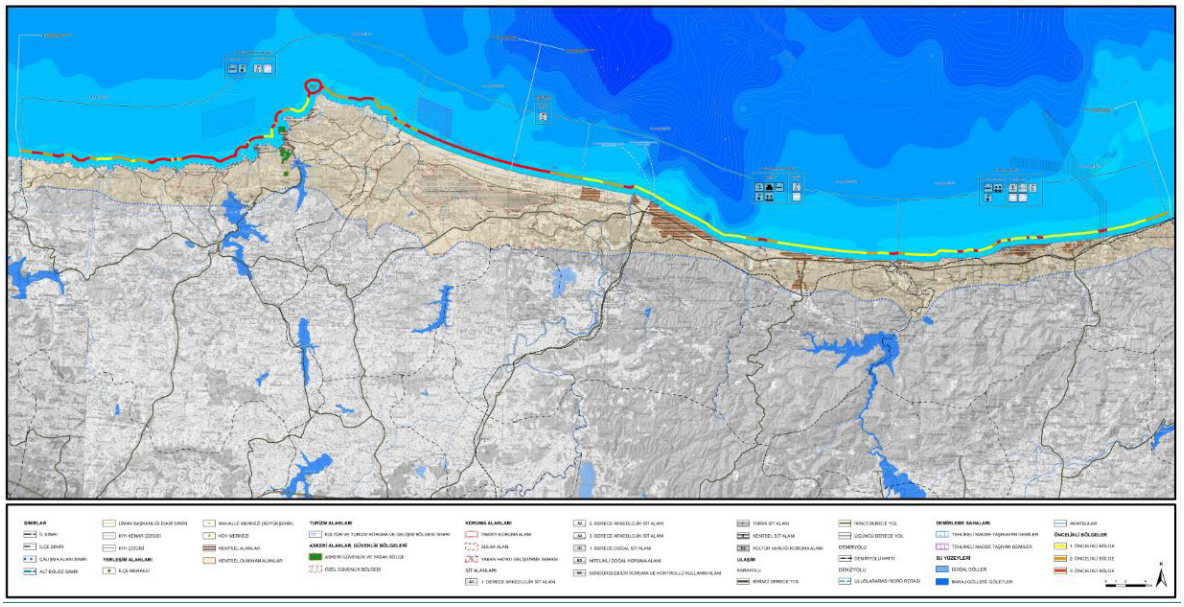
Approaches and studies on coastal areas are of great importance in terms of addressing these areas at international and national levels and concerning sectoral policies. Models put forward for the planning and management of coasts, which are considered as an important resource area, shape national development dynamics and sectoral development trends.

In this context, competition in marine areas for coastal structures, renewable energy facilities, aquaculture and other coastal uses requires a holistic approach to planning and management of the marine area and the terrestrial interaction affecting it.

Significant progress has been made in coastal area planning efforts to ensure the planned development of Türkiye's coasts. In 2023;

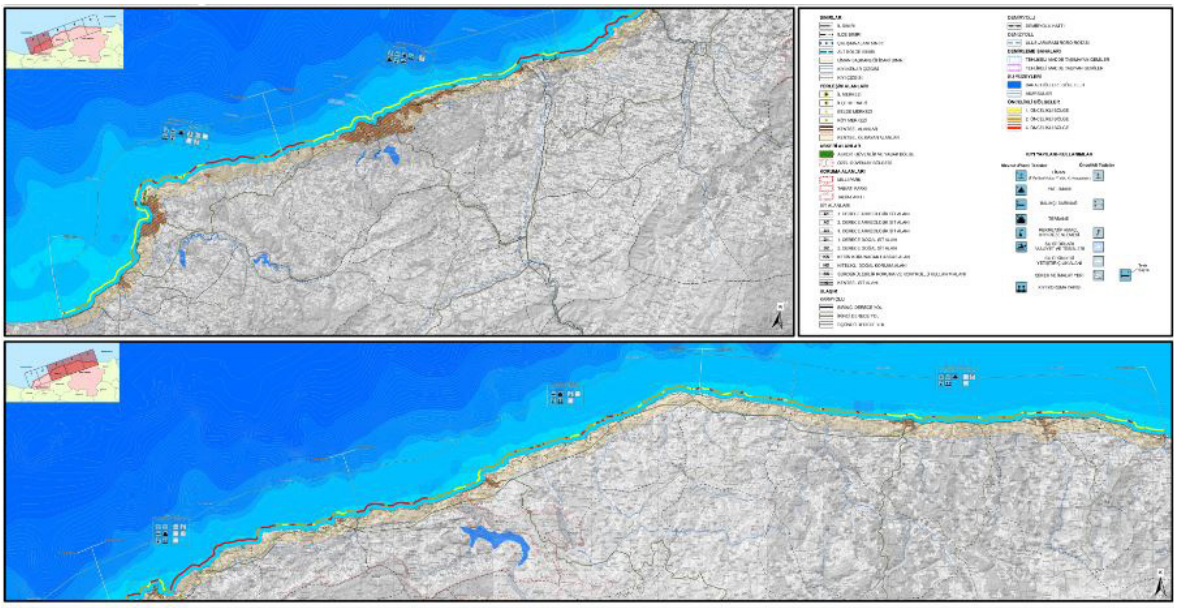
- Integrated Coastal Zone Plan of Kocaeli-Sakarya-Düzce Provinces Black Sea Coast with a coastline length of approximately 146 km,

Map 26 Kocaeli-Sakarya-Düzce Provinces Black Sea Coasts Integrated Coastal Zone Plan (MoEUCC, 2024)



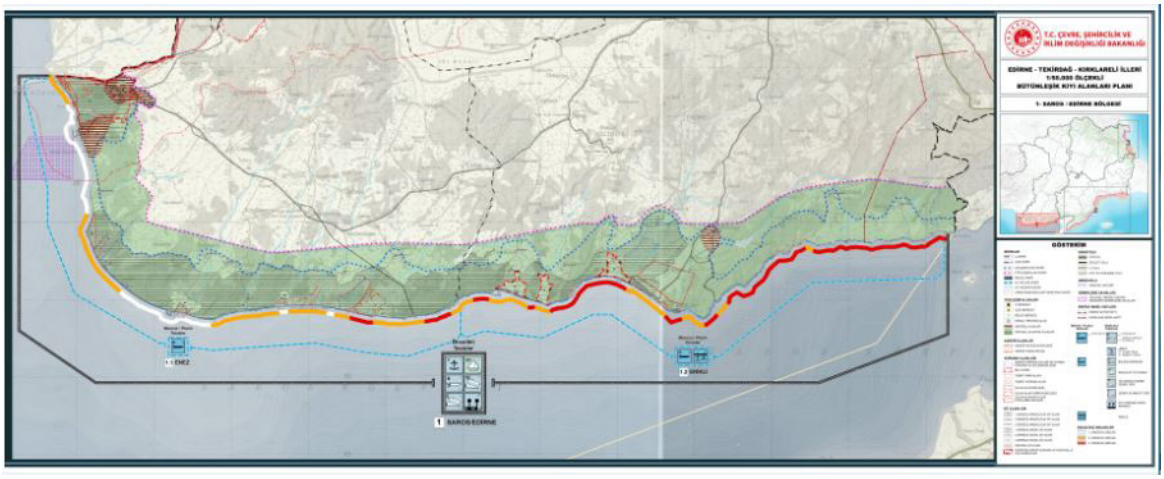
- Integrated Coastal Zone Plan of Zonguldak-Bartın-Kastamonu Provinces with a coastline length of approximately 410 km;

Map 27 Zonguldak-Bartın-Kastamonu Provinces Integrated Coastal Zone Plan (MoEUCC, 2024)



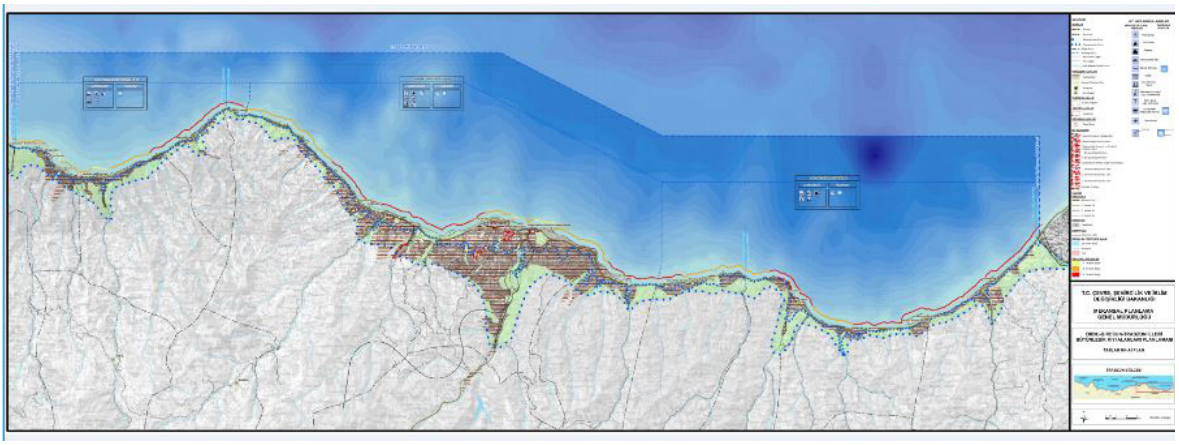
- Integrated Coastal Zone Plan of Edirne-Tekirdağ-Kırklareli Provinces with a coastline length of approximately 305 km,

Map 28 Edirne-Tekirdağ-Kırklareli Provinces Integrated Coastal Zone Plan (MoEUCC, 2024)



- The Integrated Coastal Zone Plan of Ordu-Giresun-Trabzon Provinces, with a coastline length of approximately 400 km, has been approved by the MoEUCC.

Map 29 Ordu-Giresun-Trabzon Provinces Integrated Coastal Zone Plan (MoEUCC, 2024)



As of 2023, Integrated Coastal Zone Planning studies (Strategy Documents and Plans) of 74% of Türkiye's coasts have been completed.

As a result, as of the end of 2023, Integrated Coastal Zone Planning studies (Strategy Documents and Plans) of 74% of Türkiye's coasts have been completed.

Map 30 Integrated Coastal Zone Plans in Türkiye (MoEUCC, 2024)

G.2.3.1. International Obligations in Integrated Coastal Zone Plans

Blue growth emerged as a long-term strategy with the "Sustainable Growth for the Marine and Maritime Sector" statement of the European Commission in 2012, which included oceans and seas on its agenda together with the sustainable development agenda (SDG 14) and blue economy concepts put into practice by the United Nations. Within the framework of the Protocol on Integrated Coastal Zone Management in the Mediterranean (ICZM) to the Barcelona Convention, which Türkiye has signed, activities are carried out as the National Focal Point within the Priority Action Program Activity Center (PAP/RAC), the National Focal Point of the Bucharest Convention Integrated Coastal Zone Management Advisory Group, and the Primary Focal Point of the European Environment Agency (EEA) for Land Use and Spatial Planning.

The General Directorate of Spatial Planning prepares Integrated Coastal Zone Plans that address the Turkish coasts with their interaction areas, all sectoral activities and plans, social and economic issues with a holistic approach, and that guide zoning plan decisions by covering spatial targets, strategies and action proposals and management plans in a way that will ensure a balance between protection and use, in accordance with Article 102 of the Presidential Decree No. 1 on the Presidency.

Integrated Coastal Zone Plans are defined as a planning tool that provides for the guidance and support of local expectations and demands in coastal areas with national investment programs, while bringing solution-oriented innovative approaches to overlapping jurisdictions in coastal areas, reconciling coastal stakeholders and accelerating investment processes, thus reshaping the institutional decision-making processes of Türkiye's coastal area planning and establishing the balance between environmental health and economic development when evaluated in terms of the land side of the coast. As of 2023, Integrated Coastal Zone Planning studies of 74% of Türkiye's coasts have been completed within the framework of strategy documents and plans.

On the other hand, the General Directorate of Spatial Planning is responsible for the indicators it is responsible for monitoring within the scope of 11 ecological targets defined by the Integrated Monitoring and Assessment Program (IMAP) of the Barcelona Convention (Biodiversity, Non-native species, Commercial species, Marine food webs, Eutrophication, Hydrography, EH-8 Coastal Ecosystems and Landscapes, Contaminants, Marine litter, Underwater noise), under the title of IMAP Ecological Target 8- Coastal Ecosystems and Landscapes. The target in question has 2 monitoring indicators. Among these, studies on the indicator "Common Indicator 16 - Length of coastline exposed to man-made structures" have not been defined for Türkiye. Studies on the definition of "Good Environmental Status" regarding the indicator in question have been completed and the area monitored within the scope of the United Nations Monitoring Program Common Indicator 16 is shown below.

Map 31 United Nations Monitoring Programme Zone Monitored under Common Indicator 16 (MoEUCC, 2024)

G.2.3.2. Adaptation to Environment and Climate Change in Integrated Coastal Zone Plans

In the new integrated coastal zone plans, considering that coastal areas with high eutrophication risk are also high-risk areas against climate change, attention should be paid to coastal projects in these regions. In the new integrated coastal zone plans, policies, strategies and actions have been developed for the regions defined in the Plan against climatic events such as sea level rise, flood and flood potential, storm surge and river overflow in the context of climate change adaptation and mitigation approach in coastal areas. In this direction, areas sensitive to climate change have been determined and classified in the plans. Medium and long-term projections have been made for areas exposed to disaster risks such as flood, inundation and sea level rise with the mappings made using Geographic Information System tools.

Another tool for healthy and sustainable spatial development is environmental assessment methods. The Strategic Environmental Assessment method, implemented by the European Union, is used to assess the environmental impacts of large-scale plans and programs. The Strategic

Environmental Assessment method is a method in which the significant impacts of the plan or program on the environment are determined. This process is not a decision-making process on its own, but a process that develops and supports the decision-making process. It is the analysis and evaluation of the potential permanent or temporary impacts of new projects and developments on the environment, including their social consequences and alternative solutions. With this method, the plan or program is supported by the feedback method.

New integrated coastal zone plans are subject to the strategic environmental assessment process, and both processes are carried out together.

G.3. Developments in Zoning Legislation

In addition to the zoning legislation carried out by MoEUCC, R&D studies and pilot projects were carried out with universities to determine the construction conditions in villages within the scope of local characteristics and needs with protection-oriented rural area planning. By benefiting from the results of these projects, amendments were made to the "Unplanned Areas Zoning By-law" on July 11, 2021. With the arrangements made, it was possible to determine rural and village settlement areas and their surroundings in accordance with the unique structure of the rural area, taking into account disaster zones, and the definition of "scattered settlements" was introduced.

References

Ministry of Environment, Urbanization and Climate Change
Ministry of Agriculture and Forestry

H. INSTITUTIONAL STRUCTURE OF THE MINISTRY OF ENVIRONMENT, URBANIZATION AND CLIMATE CHANGE AND ACTIVITIES CARRIED OUT

H.1. Organisational Structure

Figure 2 Organisational Chart of the MoEUCC (October 2024)

Ministry of Environment, Urbanization and Climate Change; was established by the Decree Law No. 644 on the Organization and Duties of the Ministry of Environment, Urbanization and Climate Change, published in the Official Gazette No. 27984 dated 04.07.2011.

The duties, powers and responsibilities of the Ministry of Environment, Urbanization and Climate Change, which was established by bringing together the environmental wing of the repealed Ministry of Environment and Forestry and the repealed Ministry of Public Works and Settlement under one roof, were further strengthened by the Decree Law No. 648 published in the Official Gazette dated 17.08.2011 and numbered 28028.

The organization, duties and authorities of the Ministry of Environment, Urbanization and Climate Change have been reorganized by the Presidential Decree No. 1 on the Presidential Organization.

Establishment of the Ministry of Environment, Urbanization and Climate Change; The Ministry of Environment, Urbanization and Climate Change was restructured as the Ministry of Environment, Urbanization and Climate Change with the Presidential Decree on Amendments to Certain Presidential Decrees (Decree Number: 85), which was published in the Official Gazette dated 29 October 2021 and numbered 31643 and entered into force.

In this context, the duties of "combating desertification and erosion" were added to the organization, duties and authorities of the Ministry of Environment, Urbanization and Climate Change, the *General Directorate of Combating Desertification and Erosion* was included among the central units of the Ministry, and the *Directorate of Climate Change,* which was established with the same Decree as the General Directorate of Meteorology, was included among the institutions affiliated to the Ministry.

Department of Urban Transformation; With the Presidential Decree on Amendments to Certain Presidential Decrees (Decree Number: 153), which was published in the Official Gazette dated 16 October 2023 and numbered 32341, in order to renew the building stock and make Türkiye stronger against disasters, one of the main service units, the General Directorate of Infrastructure and Urban Transformation Services, was restructured as an organization affiliated to the Ministry under the name of the Urban Transformation Presidency.

H.2. Environmental Legislation

H.2.1. Laws

Environmental Law No. 2872

Cultural and Natural Heritage Protection Law No. 2863

Coastal Law No. 3621

Development Law No. 3194

Law No. 5312 on Emergency Response and Damage Compensation in Pollution of Marine Environment by Oil and Other Harmful Substances

Decree Law No. 644 on the Organization and Duties of the Ministry of Environment, Urbanization and Climate Change

Decree Law No. 648 on the Organization and Duties of the Ministry of Environment, Urbanization and Climate Change and on Amendments to Certain Laws and Decree Laws

Decree Law No. 383 on the Establishment of the Special Environmental Protection Agency

H.2.2. By-laws

Environmental Compliance Chain

By-law on Environmental Impact Assessment

By-law on Environmental Permit and License

By-law on Control of Major Industrial Accidents

Environmental Audit By-law

By-law on Strategic Environmental Assessment

Environmental Competence

By-law on Environmental Management Services

By-law on Environment Label

By-law on Environmental Measurement and Analysis Laboratories Competence

Environmental Inventory

By-Law on Pollutant Release and Transfer Registration (PRTR)

Zero Waste Applications

By-law on Zero Waste

Circular Economy and Waste Management

By-law on the control of packaging waste

By-law on Management of Waste Electrical and Electronic Equipment

By-law on Restriction of Use of Certain Harmful Substances in Electrical and Electronic Equipment

By-law on Control of Waste Batteries and Accumulators

By-law on Management of Waste Oils

By-law on Landfill of Waste

By-law on Incineration of Waste

By-law on Control of Vegetable Waste Oils

By-law on Recycling Participation Share

By-law on Control of Excavated Soil, Construction and Demolition Wastes

By-law on Restoration of Lands Degraded by Mining Activities to Nature

By-law on Waste Management

By-law on Control of End-of-Life Vehicles

By-law on Control of End-of-Life Tires

By-law on Control of Polychlorinated Biphenyls and Polychlorinated Terphenyls

By-law on Control of Medical Waste

By-law on Mining Waste

Marine and Coastal Management

By-law on Waste Collection from Ships and Control of Waste

By-law on Management of Bathing Water Quality

By-law on Environmental Management of Dredging Material

Implementation By-law of the Law on Emergency Response and Compensation for Impacts in Pollution of the Marine Environment by Oil and Other Harmful Substances

By-law on Procurement of Goods and Services within the Scope of the Law on Emergency Response and Compensation for Impacts in Pollution of the Marine Environment by Oil and Other Harmful Substances

Air Management

By-law on the Reduction of Sulphur Content in Certain Types of Fuel Oil

By-law on the Control of Volatile Organic Compound Emissions from the Storage and Distribution of Gasoline and Naphtha

By-law on Large Combustion Plants

By-law on the control of Environmental Noise

By-law on the Control of Exhaust Gas Emissions

By-law on Air Quality Assessment and Management

By-law on the Control of Air Pollution from Heating

By-law on the Measures to be Taken to Protect the Environment and Public Health from the Adverse Effects of Non-Ionizing Radiation

By-law on the Control of odorous Emissions

By-law on the Control of Air Pollution from Industrial Sources

Chemicals Management

By-Law on Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

By-law on the Inventory and Control of Chemicals

By-law on Test Methods to be Applied in Determining the Physico-Chemical, Toxicological and Eco toxicological Properties of Substances and Mixtures

By-law on Classification, Labelling and Packaging of Substances and Mixtures

By-law on the Preparation and Distribution of Safety Data Sheets for Hazardous Substances and Preparations

By-law on the Restriction and Prohibition of Hazardous Substances and Mixtures

Water and Soil Management

By-law on the Procedures and Principles to be Followed in Determining Tariffs for Wastewater Infrastructure and Domestic Solid Waste Disposal Facilities

By-law on the Procedures and Principles to be Followed in Benefiting from Incentive Measures for Wastewater Treatment Facilities in Accordance with Article 29 of the Environmental Law

By-law on the Use of Domestic and Urban Treatment Sludge in Soil

By-law on Urban Wastewater Treatment

By-law on Control of Extraction and Operation of Sand, Gravel and Similar Substances

By-law on Control of Water Pollution

By-law on Control of Pollution Caused by Dangerous Substances in Water and Its Environment

By-law on Control of Soil Pollution and areas contaminated by point sources

By-law on the Protection of Groundwater Against Pollution and Deterioration

By-law on Amendment of Surface Water Quality Management By-law

By-law on the supply of Drinking Water and Control of Water Losses in Distribution Systems-By-law on Monitoring of Surface Waters and Groundwater

By-law on the protection and improvement of waters being habitat for trout and carp (salmonid and cyprinid) species

By-law on Protection of Water Basins and Preparation of Management Plans

By-law on Surface Water Quality Management

Measurement and Monitoring

By-law on Measurement and Monitoring Environmental Measurement and Analysis Laboratories Qualification

Climate Change

By-law on the Reduction of Substances that Deplete the Ozone Layer

By-law on Fluorinated Greenhouse Gases

By-law on Monitoring Greenhouse Gas Emissions

Protection of Natural Assets

By-law on Transport Vehicles to Operate in Köyceğiz Lake and Dalyan Channels

By-law on the Establishment and Working Procedures and Principles of Natural Assets Protection Commissions

By-law on Plans to be Made in Protected Areas

By-law on the Procedures and Principles Regarding the Determination, Registration and Approval of Protected Areas

By-law on the Administration of Natural Assets, Natural Protected Areas and Places under the State's Jurisdiction and Disposition in Special Environmental Protection Zones

Planned Areas Type Zoning By-law

By-law on the Replacement of Immovable Properties with Treasury Immovable Properties Remaining in Natural Assets, Natural Protected Areas and Special Environmental Protection Zones

Other

By-law on Monitoring and Collection of Environmental Revenues and Use of the Allowance Envisaged for Collection

By-law on Detection of Violations, Imposition of Penalties and Collection of Administrative Fines to be Given According to the Environmental Law

By-law on Working Principles and Procedures of the Supreme Environmental Board and Local Environmental Boards

By-law on Revolving Fund Operation of the Ministry of Environment, Urbanization and Climate Change

H.2.3. Communiqués

Waste Management

Waste Intermediate Storage Facilities Communiqué

Waste Transportation on Roads Communiqué

Recycling of Certain Non-Hazardous Wastes Communiqué

Technical Procedures for Storage, Purification, Dismantling and Processing of End-of-Life Vehicles Communiqué

Tanker Cleaning Facilities Communiqué

Waste Derived Fuel, Additional Fuel and Alternative Raw Material Communiqué

Compost Communiqué

Marine and Coastal Management

Communiqué on Administrative and Technical By-laws to be Applied to Waste Collection Vessels

Communiqué on Fees and Principles to be Applied within the Framework of the By-law on Waste Collection and Control of Wastes from Ships (2009/3)

Communiqué on Fees and Principles (2009/3)

Communiqué on Determination of Closed Bay and Gulf Areas with Sensitive Area Characteristics where Fish Farms Cannot Be Established in the Seas

Communiqué on Monitoring of Fish Farming Facilities Established in the Seas

Communiqué on Quality Standards Regarding Waters Where Shellfish Products Are Grown (2008/29)

Communiqué on Tariff and Instructions for Compulsory Liability Insurance for Coastal Facilities Marine Pollution

Climate Change

Voluntary Carbon Market Project Registration Communiqué

Communiqué on Verification of Greenhouse Gas Emission Reports and Authorization of Verification Organizations

Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions

Communiqué on Certification of Natural and Legal Persons Interfering with Equipment Containing Fluorinated Greenhouse Gases or Relying on These Gases

Water and Soil Management

Wastewater Treatment Plants Technical Procedures Communiqué

Urban Wastewater Treatment By-law Sensitive and Less Sensitive Water Areas Communiqué

Water Pollution Control By-law Administrative Procedures Communiqué

Water Pollution Control By-law Sampling and Analysis Methods Communiqué

Water Pollution Control By-law Notification on the Repeal of the Notification on Hazardous and Harmful Substances in Water

Notification on Integrated Pollution Prevention and Control in the Textile Sector

Notification on the Protection of Stagnant Surface Inland Waters Against Eutrophication

By-law on the Control of Water Losses in Drinking Water Supply and Distribution Systems Notification on Technical Procedures

Notification on the Protection of Stagnant Surface Inland Waters Against Eutrophication

Notification on the Basin Management Board's Establishment, Duties, Working Principles and Procedures

Notification on the Basin Management Board's Establishment, Duties, Working Principles and Procedures

Notification on Technical Personnel Working in Wastewater Treatment Plants

Measurement and Monitoring

Continuous Wastewater Monitoring Systems Communiqué

Continuous Emission Measurement Systems Communiqué

Environmental Compliance Chain

Notification on Internal Emergency Plan to be Prepared for Major Industrial Accidents

Notification on Administrative Fines to be Imposed in Accordance with the Environmental Law No. 2872 (No: 2015/1) (Official Gazette 28.12.2014/29219)

Environmental Competence

Communiqué on Minimum Qualifications of Institutions and Organizations that Will Prepare Risk Assessment and Emergency Response Plans Regarding Pollution of Marine Environment by Oil and Other Harmful Substances

Communiqué on Verification of Greenhouse Gas Emission Reports and Authorization of Verification Organizations

Communiqué on Certificate of Competence for Control of Soil Pollution and Cleaning of Point Source Contaminated Areas

Communiqué on EIA Certificate of Competence

H.2.4. Circulars

Circular Economy and Waste Management

Procedures and Principles Regarding the Establishment and Operation of Waste Collection Centers and Zero Waste Applications (Decree No. 2595501 dated 31.12.2021)

Waste Collectors (2022/6)

Waste Processing

Circular on the By-law on Landfilling of Wastes (2010/16)

Circular on the Preparation of Landfill Facility Implementation Projects (2014/13)

Landfill Facility Inspection Instructions (2011/13)

Integrated Waste Management Plan Circular (2010/09)

Circular on the Prevention of Unnecessary Use of Stationery (2012/13)

Excavation Soil, Construction and Demolition Waste Authority Delegation (2008/6)

Excavation Soil, Construction and Demolition Waste Control (2004/5)

Circular on Solid Waste Disposal Facilities Work Deadline Plan (2006/14)

Circular on Solid Waste Disposal and Pre-treatment Facilities Project Approval (2011/12)

Solid Waste Circular (2004/7)

Solid Waste Circular (2003/8)

Solid Waste Characterization and Solid Waste Disposal Facilities Information Update (2007/10)

Circular on Permits to be Granted to Solid Waste Disposal and Landfill Facilities in Areas Deemed

to be Forests (2011/10)

2020/12 Circular on Covid-19 Measures in the Management of Personal Hygiene Material Waste, Such as Disposable Masks and Gloves (2020/12)

Circular on Medical Waste Year-End Reports (2006/25)

Circular on Disposal of Medical Waste (2010/17)

Safe Disposal of Medical Waste (2008/9)

Circular on Training Programs of Medical Waste Control By-law (2018/8)

Circular on Sterilization of Medical Waste (2006/7)

Circular on Applications Exempted from the Restriction of the Use of Certain Harmful Substances in Electrical and Electronic Equipment

Mass Balance Notifications Circular (2022/4)

Marine and Coastal Management

Circular on Maritime Waste Application (2020/21)

Circular on Marine Pollution Control Personnel to be Assigned to Control Marine Pollution Originating from Ships and the Training to be Given to These Personnel (2010/8)

Circular on Delegation of Authority (Illegal Discharge) (2011/9)

Circular on Preparation and Implementation of Provincial Action Plans for Marine Litter (2019/09)

Circular on Implementation and Delegation of Authority for Dredging and Discharge Activities

Circular on Deep Sea Discharge Monitoring

Circular on Wastewater Treatment / Deep Sea Discharge Facility Project Approval

Circular on Delegation of Authority (Fish Farms)

Circular on Coastal Facility Risk Assessment and Emergency Response Plan Approval Procedure (2009/6)

Air Management

Air Quality Assessment and Management Circular (2013/37)

Air Pollution Control and Prevention Circular (2010/14)

Imported Solid Fuels Circular (201¼)

Imported Solid Fuels Circular (2015/02)

Imported Solid Fuels Circular (2021/19)

Cleaner Production Practices in the Textile Sector

Circular on Fuel and Combustion System Change Requests

Water and Soil Management

Circular on the Cancellation of the Solid Waste and Wastewater Management Circular No. 2004/12 (2013/11)

Wastewater Treatment / Deep Sea Discharge Facility Project Approval Circular (2018/14)

Restriction on Discharge Standards in the Ergene River (2019/17)

Wastewater Treatment Facility Identity Document Circular (2015/6)

Circular on Technical Matters to be Complied with in the Management of Wastewater Generated in Olive Oil Facilities (2015/10)

Measurement and Monitoring

Continuous Emission Measurement Systems (CEMS) Online Monitoring Circular (2014/12)

Circular on Real-Time Monitoring of Wastewater Treatment Plants in the Marmara Region (2021/14)

Climate Change

Climate Change and Air Management Coordination Board Circular (2013/11)

Import and Use of Substances that Deplete the Ozone Layer Circular (2016/01)

Halon Circular (2007/4)

Environmental Qualification

Procedures and Principles for Determining the Qualifications of Vehicle Tracking Service Providers (ATSS)

Protection of Natural Assets

Circular on the Procedures and Principles of Zoning Plan Proposals to be Made in Protected Areas (2017/1)

TVK Commission Studies Circular (2017/02)

Circular on the Implementation of Mesne profit Procedures (2018/03)

H.3. Foreign Relations and International Environmental Conventions, Agreements and Protocols to which we are a Party

H.3.1.Foreign Relations

The Ministry of Environment, Urbanization and Climate Change (MoEUCC) carries out relations with the United Nations (UN), the Organization for Economic Co-operation and Development (OECD) and the Group of 20 Developing Countries (G-20).

The Republic of Türkiye directs the environmental, urbanization and climate change policies that it will implement in line with the decisions taken by the United Nations (UN). The United Nations Environment Program (UNEP) is a program of the United Nations that operates globally in the field of environment. UNEP United Nations Environment Assembly (UNEA) focuses on air pollution, environmental law, financing of green economy and supporting the environmental dimension of sustainable development. In addition, it is aimed to integrate all dimensions of sustainable development in order to protect the environment and promote social and economic development in harmony with nature.

Türkiye-UNEP relations are carried out smoothly. The Group of 20 Countries (G-20) was established to ensure greater representation of major developed countries and emerging economies in global economic decision-making processes in the international system and to provide a more stable structure to the international financial system. The G-20 is a platform formed by the participation of 19 countries, the European Union and the African Union. It is one of the most important platforms focusing on international cooperation, economy and finance.

Türkiye supports the inclusion of issues such as development, trade, energy, climate change, food security, poverty and the fight against corruption, which are closely linked to the global economy, in the G-20 agenda. MoEUCC represents Türkiye on international platforms by participating in meetings, workshops and activities held abroad on the environment and climate change.

H.3.2.International Environmental Conventions, Agreements, Protocols to Which We are a Party

Convention on Long-Range Transboundary Air Pollution and EMEP Protocol

The United Nations (UN) Convention on Long-Range Transboundary Air Pollution (UNSCAP) entered into force on 13.11.1979 and Türkiye became a party to the convention on 18/04/1983. There are 51 countries party to the convention and its secretariat is carried out by the United Nations Economic Commission for Europe (UNECE).

The convention has 8 protocols, and the only protocol to which Türkiye became a party on 20.12.1985 is the Long-Term Financing of the Cooperative Programme for Monitoring and Evaluation of Long-Range Transport of Air Pollutants in Europe (EMEP) Protocol.

Within the scope of EMEP Protocol, annual air pollutant emission inventory reporting has been carried out by MoEUCC since 2012. Within the scope of the guide prepared by EMEP/European Environment Agency, emission totals for selected air pollutants are calculated in kilotons (ktons) as PM10, PM2,5, NOx, SO_2, NMVOC, NH_3, CO, selected heavy metals within the scope of the guide prepared by EMEP/European Environment Agency. Our reporting was deemed worthy of an award by the Emission Inventory and Projections Task Force (TFEIP) in 2013 and 2015.

Under the abovementioned Convention and Protocol, each year the "National Air Pollutant Emissions Inventory" report is submitted to the UN Secretariat and the European Environment Agency. Since 2016, the emission calculations for indirect greenhouse gases—classified among the air pollutants reported by the Ministry of Environment and Urbanization—have been used in the greenhouse gas reporting coordinated by TÜİK in compliance with the United Nations Framework Convention on Climate Change.

The emission inventory reported each year is also used as an estimation tool in the annual, monthly and daily air quality concentrations of the countries. With air quality modeling, the emission inventory calculated as this estimate can be visualized based on the country's sectoral activity data and the photochemical reactions and the results of these reactions can be visualized according to numerical values together with meteorological conditions. Thus, technical and scientific studies that will allow for certain improvements when necessary can be carried out and the need for legislation can be revealed.

Minamata Convention

The "Minamata Convention on Mercury" was prepared under the leadership of the United Nations Environment Program (UNEP) in order to contribute to the efforts to prevent environmental pollution caused by mercury on a global scale.

The Minamata Convention includes some control and reduction measures for products, processes and industries that use, release or emit mercury and their mercury-containing wastes. Within the scope of the Convention, countries are required to ban the production, import and export of certain products containing mercury and effectively dispose of their wastes, to develop strategies to reduce the amount of mercury used and its releases, and to use the Best Available Technologies in new facilities to be opened within certain periods of time to reduce emissions and releases from large industrial facilities, and to reduce their emissions within a certain plan for existing facilities.

Türkiye signed the Minamata Convention in 2014 and successfully submitted its ratification document on October 4, 2022, becoming the 138th Party to the Minamata Convention on Mercury.

Preparations for the Draft Mercury By-law for the implementation of the Minamata Convention at the national level are ongoing. Türkiye has been taking steps on Mercury Management at the national level since the 1980s.

Paris Agreement

The Paris Agreement is based primarily on the United Nations Framework Convention on Climate Change and aims to regulate the climate change regime after 2020, the expiration date of the Kyoto Protocol.

The Paris Agreement aims to strengthen global socioeconomic resilience against the threat of climate change in the post-2020 period. The long-term goal of the agreement is to keep the global temperature increase as low as possible below 2°C (if possible, at 1.5°C) compared to the pre-industrial period. This goal should be achieved by gradually reducing the use of fossil fuels (oil, coal) and shifting towards renewable energy.

"Law on Approval of Ratification of the Paris Agreement" was published in the Official Gazette dated 7 October 2021 and numbered 31621. The Ratification Document and our National Declaration regarding the Paris Agreement were deposited with the Secretary-General of the United Nations, which is the Depositary of the Agreement, on 11 October 2021. Türkiye signed the Paris Agreement in 2016.

Barcelona Convention

The decision to include the protection of the Mediterranean among the priority targets within the scope of the "Regional Seas Program" established by the United Nations (UN) Environment Program (UNEP) in 1974 resulted in the establishment of the Mediterranean Action Plan (MAP) in 1975 with the participation of the countries bordering the Mediterranean and the EU. The "Convention for the Protection of the Mediterranean Against Pollution (Barcelona Convention)"

prepared to form the legal basis of the activities to be carried out within the framework of MAP was adopted in Barcelona in 1976 and entered into force in 1978.

In 2004, the name of the Convention was changed to "Convention for the Protection of the Marine Environment and Coastal Zone of the Mediterranean" and Türkiye ratified the re-arranged Barcelona Convention in 2002.

Within the scope of the Barcelona Convention studies, Türkiye hosted the 22nd Meeting of the Parties (COP22) of the convention, of which it holds the term presidency, in Antalya in December 2021. At COP22, the roadmap for the 2022-2027 period of the Medium Term Strategy Plan was determined and a decision was made to declare the Mediterranean Sulphur Emission Control Area (SECA). A very important decision was made to reduce the sulphur content of fuel of ships sailing in the Mediterranean from five parts per thousand to one parts per thousand by January 1, 2025. In addition, important decisions were made on biodiversity, invasive species and the protection of existing riches.

At the Barcelona Convention Mediterranean Action Plan (MAP) Focal Points Meeting hosted by Türkiye in Istanbul in September 2023, among other decisions, the draft decision on the proposed Regional Action Center on climate change (CC/RAC) to be established hosted by Türkiye was discussed and the decision was unanimously adopted at the 23rd Conference of the Parties held in Slovenia on 5-8 December 2023.

The presidency of the Convention, which was held by Türkiye between 2022 and 2023, was handed over to Slovenia at the 23rd Meeting of the Parties (COP23) held in Slovenia in December 2023.

There are 7 protocols to the Barcelona Convention:

- Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at the Sea;
- The Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (Türkiye became a party to the UN Convention on the Law of the Sea by making a declaration reflecting Türkiye's views on it);
- Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities;
- Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea;
- Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean;
- The Protocol on Integrated Coastal Zone Management in the Mediterranean, (ICZM Protocol)
- The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from the Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil.

H.4. Environmental Impact Assessment and Strategic Environmental Assessment Activities

H.4.1. Environmental Impact Assessment (EIA) Activities

Environmental Impact Assessment studies have been put into practice in Türkiye with the publication of the "Environmental Impact Assessment By-law" in the Official Gazette dated 7 February 1993 and numbered 21489, based on Article 10 of the Environmental Law No. 2872. The By-law has been updated from time to time both to resolve the problems encountered in practice and due to the EU harmonization process, and the latest Environmental Impact Assessment By-law (EIAL) in force was published in the Official Gazette dated 29/07/2022 and numbered 31907.

Table 99 2020 - 2023 Number of EIA Decisions Issued by the Ministry of Environment, Urbanization and Climate Change Number of EIA Decisions

YEAR	EIA POSITIVE	EIA NEGATIVE	NO EIA REQUIRED	EIA REQUIRED	EIA PROCESS CANCELLED RETURNED
2020	390	6	2,822	58	514
2021	371	3	3,224	87	590
2022	437	4	4,025	82	745
2023	511	10	4,224	55	780

Within the scope of EIAL, the EIA Positive or Negative Decision for the projects in the Annex-1 List is given by the MoEUCC, and the EIA Required or Not Required Decision for the projects in the Annex-2 List is given by the Provincial Directorates of Environment, Urbanization and Climate Change.

H.4.2. Strategic Environmental Assessment Activities

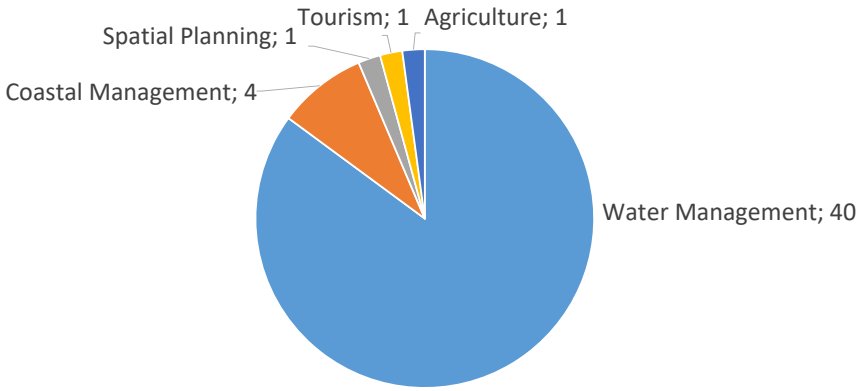
The Strategic Environmental Assessment (SEA) By-law was published in the Official Gazette numbered 30032 on April 8, 2017 and started to be implemented. The By-law covers the administrative and technical procedures and principles regarding the conduct of Strategic Environmental Assessment, having it conducted, monitoring and providing training for the plans/programs that constitute the framework for the projects included in the Annex-1 and Annex-2 lists of the Environmental Impact Assessment By-law, prepared for the waste management, fisheries, energy, coastal management, spatial planning, forestry, industry, water management, agriculture, telecommunications, tourism and transportation sectors and published in the Official Gazette numbered 31907 dated 29.07.2022.

Transition of the By-law to implementation according to sectors;

- For plans/programs subject to SEA prepared in coastal management, spatial planning, water management, agriculture and tourism sectors, it started from the date of publication of the By-law,
- For plans/programs subject to SEA prepared in fisheries and forestry sectors, it started from 01/01 /2020,
- For plans/programs subject to SEA prepared in waste management, energy, industry, telecommunications and transportation sectors, it started from 01/01 /2023.

Plans for which Strategic Environmental Assessment Process has been Carried Out: Within the framework of the SEA By-law, SEA has been/is being carried out for 40 (forty) planning processes prepared in the spatial planning, coastal management, tourism, agriculture and water management sectors.

Graph 61 Sectoral Breakdown of Plans for which SEA was Conducted between 2017-2023 (MoEUCC, 2024)



Within the scope of the SEA Process, Scope Determination Report, SEA Report, SEA Monitoring Report were prepared for each plan and Scope Determination Meeting and Consultation Meeting were held to receive the opinions of institutions and organizations related to environment and health. The said reports and announcements are published on the website of the Ministry of Environment, Urbanization and Climate Change [http://scd.csb.gov.tr]. SEA Notifications were published by the Ministry of Environment, Urbanization and Climate Change to be integrated into the plans whose SEA process was completed and forwarded to the Authorized Institutions.

Plans whose SEA process is ongoing and completed within the scope of the SEA By-law, from the date of publication of the By-law until the end of 2023, are given below.

PLANS WITH COMPLETED SEA PROCESS;

1. North Aegean River Basin Management Plan
2. Gediz River Basin Management Plan
3. Küçük Menderes River Basin Management Plan
4. Burdur River Basin Management Plan
5. Ordu-Giresun-Trabzon Provinces Integrated Coastal Areas Plan
6. Kocaeli-Sakarya-Düzce Integrated Coastal Areas Plan
7. Zonguldak-Bartın-Kastamonu Provinces Integrated Coastal Areas Plan
8. Van Lake Basin Flood Management Plan
9. Konya Closed Basin Flood Management Plan
10. Asi Basin Flood Management Plan
11. Seyhan Basin Flood Management Plan
12. Akarçay River Basin Management Plan
13. Yeşılırmak River Basin Management Plan
14. Western Mediterranean River Basin Management Plan
15. Edirne Tekirdağ Kırklareli Integrated Coastal Areas Management Plan
16. Northern Aegean Basin Nitrate Action Plan
17. Çoruh Basin Flood Management Plan
18. Eastern Black Sea Basin Flood Management Plan

19. Marmara Basin Flood Management Plan
20. Akarçay Basin Drought Management Plan
21. Yeşılırmak Basin Drought Management Plan
22. Western Black Sea Basin Drought Management Plan
23. Sakarya Basin Drought Management Plan
24. Susurluk Basin Drought Management Plan
25. Konya Basin Drought Management Plan
26. Eastern Black Sea Basin Drought Management Plan
27. Kızılırmak Basin Drought Management Plan
28. Sakarya River Basin Management Plan
29. Marmara Basin Drought Management Plan
30. Meriç-Ergene Basin Drought Management Plan

PLANS WITH ONGOING SEA PROCESS;

1. Türkiye Spatial Strategy Plan
2. Istanbul Drinking Water and Sewage Master Plan
3. Izmir Cesme Culture and Tourism Protection and Development Region 1/100,000 Scale Environmental Plan Amendment Proposal
4. Ankara Province Drinking Water, Wastewater and Rainwater Management Master Plan
5. Susurluk Basin Flood Management Plan Update Project
6. Duzce Province 1/50,000 Scale Environmental Plan
7. Aras Basin Drought Management Plan Preparation Project
8. Çoruh Basin Drought Management Plan Preparation Project
9. Meriç-Ergene Basin Flood Management Plan
10. Sakarya Basin Flood Management Plan

H.5. Permitting and License Studies

The purpose of environmental permits and licensing processes in the world is to reduce the environmental impacts of industrial activities and to carry out activities in accordance with technological innovations and environmental requirements. Protecting the environment and human health is the main purpose of environmental permits, which are transparent legal bindings for the purpose of controlling resources with significant environmental impacts.

Within the framework of the holistic approach strategy in Türkiye, the application of a single environmental permit started with the "By-law on Permits and Licenses to be Obtained by the Environmental Law" which entered into force on 01 April 2010, and the "By-law on Environmental Permits and Licenses" entered into force on 01 November 2014.

According to Article 5 of the Environmental Permit and License By-law, in order for the businesses listed in Annex-1 and Annex-2 of the same By-law to operate, they must first obtain a Temporary Activity Certificate (GFB) and then an environmental permit or environmental permit and license certificate within 1 year from the date of the GFB. For businesses listed in Annex-1, the MoEUCC, and for businesses listed in Annex-2, the Provincial Directorates of Environment, Urbanization and Climate Change (DEUCC) have been determined as the competent authorities.

GFB applications are made with the information, documents and reports specified in Annex-3A and Annex-3B of the By-law, and environmental permit or environmental permit and license

applications are made with the information, documents and reports specified in Annex-3C, and a 5-year environmental permit or environmental permit and license document is issued to businesses that fulfill their obligations in the relevant legislation.

The work on the implementation of the By-law in electronic environment is known as the "Online Environmental Permits Project". Online Environmental Permits (e-permit) is an application that carries the stages of online application, evaluation and approval for all permits and licenses from a single point to an electronic environment.

Thanks to the Environmental Permit and License By-law and the applications it brings, a comprehensive and holistic approach has been brought to environmental permit systems. However, with the changing and developing technology, there has been a need for an update in the By-law, and as the outputs of the "Improvement of Environmental Permit and License Application" Project, which was completed in 2022, an inventory study was conducted for the businesses within the scope of ÇİLY, and a revision of the By-law was made, including the By-laws regarding the business processes of the By-law and the documents requested during the application, and important changes in the Annex-1 and Annex-2 lists, which include the businesses obliged to obtain environmental permits and licenses.

In addition, sectoral guides containing detailed process information and explanations for each scope item in the ÇİLY Annex-1 and Annex-2 lists have been prepared and are published at https://ced.csb.gov.tr/cevre-izin-ve-lisans-uygulamalarina-iliskin-sektorel-kilavuzlar.

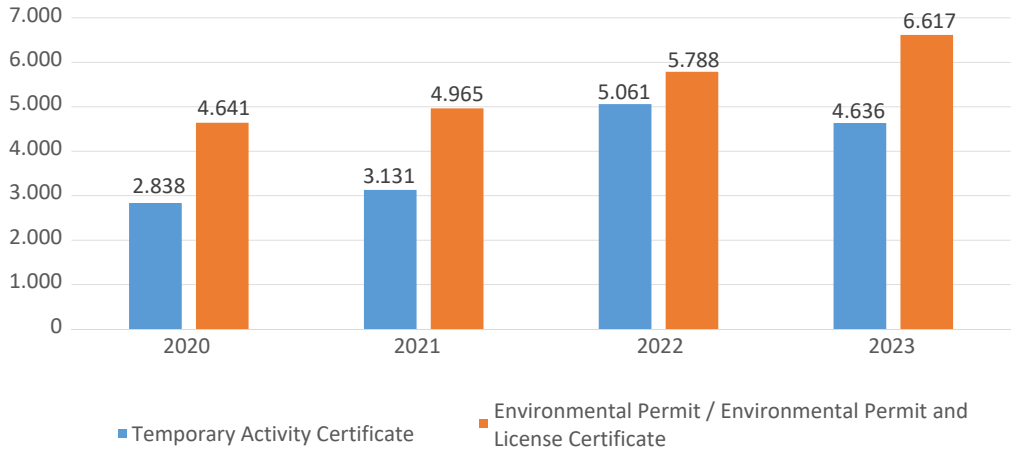
On the other hand, revision studies have been initiated for the e-permit system, where environmental permit and license processes are carried out online, and a part of its infrastructure has been established by conducting analyses. The revised e-permit system aims to obtain the documents requested in environmental permit and license applications directly from the relevant institutions, reduce bureaucracy, prevent paper waste, and establish a fast and effective system that allows for all kinds of reporting inquiries and changes. In addition, it is aimed to benefit from the data obtained from waste processing facilities, generated and recycled wastes, in terms of recording wastes, monitoring and auditing activities, and in the preparation of legislation and the development of strategies for waste management, which is the primary goal of protecting the environment throughout the country.

A total of 15,666 Temporary Activity Certificates (GFB), 22,011 Environmental Permits or Environmental Permits and Licenses have been issued by the central and provincial organizations of the Ministry since 2020. Data on Temporary Activity Certificates (GFB) and Environmental Permits/FCCs on a yearly basis are provided in Table 99.

Table 100 Number of Certificates issued within the scope of Environmental Permit and Licence By-law by Years (MoEUCC, 2024)

	Temporary Activity Certificate	Environmental Permit / Environmental Permit and License Certificate
2020	2,838	4,641
2021	3,131	4,965
2022	5,061	5,788
2023	4,636	6,617
TOTAL	**15,666**	**22,011**

Graph 62 Distribution by years of the number of GFB, Environmental Permit Certificates or Environmental Permit and Licence Certificates issued under the By-Law on Environmental Permit and Licence (MoEUCC, 2024)



H.5.1. Import and Export Authorisations

Within the scope of the Environmental Law No. 2872, the works and transactions related to the import of certain fuels, substances, wastes, hazardous chemicals and goods containing such chemicals are carried out within the scope of the Communiqués published by the Ministry of Trade.

The Ministry of Environment, Urbanization and Climate Change issues a Metal Scrap Importer Certificate for metal scrap imports, a Waste Importer Registration Certificate for waste imports, and a Solid Fuel Importer Registration Certificate for solid fuel imports. At the same time, petroleum coke usage permits and petroleum coke allocations are issued to cement and lime factories, and petroleum coke usage is monitored by the Ministry.

In addition, within the scope of the Waste Management By-law and the Basel Convention to which we are a party, hazardous waste and non-hazardous waste exports are carried out with the permission of the Ministry. In addition, battery and accumulator import pre-permits are provided and battery and accumulator imports are made in accordance with the Waste Batteries and Accumulators Control By-law.

By the Central Organization of the Ministry of Environment, Urbanization and Climate Change;

- Metal Scrap Importer Certificate,
- Solid Fuel Importer Registration Certificate,
- Waste Importer Registration Certificate,
- Solid Fuel Import Exemption Permit,
- Hazardous Waste Export Permit,
- Non-Hazardous Waste Export Permit

By the Provincial Directorates of Environment, Urbanization and Climate Change;

- Waste Import Conformity Letter
- Waste Import Exclusion Letter
- Solid Fuel Import Conformity Certificate

Permits and documents are carried out through the "Environmental Import and Export Permits Application", which is integrated with the Single Window System of the Ministry of Trade and was put into effect on 01.11.2018. In addition, within the scope of the MoEUCC Waste Import Application Circular numbered 2019/18, which was put into effect as of 2020, the Waste Importer Registration Certificate and quota form have begun to be issued.

As of 2020, the number of import and export documents issued by the Ministry of Environment, Urbanization and Climate Change is listed in Table 101 and the waste import amounts are listed in Table 102.

Table 101 Import and Export Authorisations (MoEUCC, 2024)

NOTIFICATION-REGULATION-CONTRACT NAME	ISSUED DOCUMENT NAME	Number of Documents 2020	Number of Documents 2021	Number of Documents 2022	Number of Documents 2023
Circular on Import Control of Metal Scraps Kept Under Control for Environmental Protection	Metal Scrap Importer Certificate	104	108	144	120
Basel Convention and By-law on Control of End-of-Life Tyres	Transit Permit	2	1	1	38
Communiqué on Import Controls of Batteries and Accumulators published within the scope of the By-law on Control of Waste Batteries and Accumulators	Battery and Accumulator Import Pre-authorization Approval	1,198	1,347	1,308	1,516
Communiqué on Import Control of Solid Fuels Controlled for Environmental Protection	Solid Fuel Importer Registration Certificate	110	122	148	154
Communiqué on Import Control of Solid Fuels Controlled for Environmental Protection	Solid Fuel Importer Exemption Permit	12	12	16	10
Imported Solid Fuels Circulars No. 2011/4, 2015/2	Petroleum coke use permit	27	20	19	31
Imported Solid Fuels Circulars No. 2011/4, 2015/2	High Sulphur Petroleum Coke Allocation	59	53	57	59
Imported Solid Fuels Circulars No. 2011/4, 2015/2	High Sulphur Hard Coal Allocation	7	11	15	13
Imported Solid Fuels Circular No. 2015/2	High Volatile Coal Allocation	6	6	8	8
Letter dated 09/06/2016 and numbered 40160356-125.01- E.7551	Domestic Petroleum Coke Certificate of Conformity	21	21	17	22
Waste Management By-law and Basel Convention	Hazardous Waste Export Permit	3	4	6	6
	Hazardous Waste Export Permit Customs Approval	1	6	6	0
	Non-Hazardous Waste Export Permit	1,134	1,158	1,605	1,370
Waste Import Circular	Waste Importer Registration Certificate	463	249	337	327

Table 102 Waste Import Amounts (tonnes) (MoEUCC, 2024)

WASTE TYPE	2020	2021	2022	2023
Plastic	775,342	685,443	687,000	626,517
Paper	1,520,000	1,192,921	1,358,618	1,173,502
Glass	72,653	54,584	57,808	35,750
Printed Circuit Board	439	-	-	-
Waste Battery	115	46	194	612
Textile Waste	-	25,120	54,314	42,113
Galvanized Mat	12,897	20,554	18,737	16,697
TOTAL	**2,381,446**	**1,978,668**	**2,176,671**	**1,895,191**

H.6. Environmental Inspection Activities

H.6.1. Environmental Inspections

Within the scope of the Environmental Law No. 2872, the compliance of activities with Environmental Legislation is audited by the audit personnel assigned to MoEUCC EIA, Permit and Inspection General Directorate and 81 Provincial Directorates.

Inspections are carried out as environment-based or combined environmental inspections depending on their scope. In environment-based inspections, facilities or activities are inspected in terms of compliance with one or more of the legislations related to air, water, soil environments, waste, chemicals and noise. In combined environmental inspections, facilities or activities are inspected within the scope of all Environmental Legislation.

Table 103 Distribution of the Number of Environmental Inspections Carried Out by MoEUCC by Years (MoEUCC, 2024)

	2020	2021	2022	2023
Ministry Headquarter	201	289	416	136
Provincial Directorates	40,935	56,733	68,996	53,646
TOTAL	**41,136**	**57,022**	**69,412**	**53,782**

Table 104 Institutions Authorised by MoEUCC for Inspection and Enforcement and Subject Headings (MoEUCC, 2024)

RELATED By-law	CIRCULAR NO	INSTITUTIONS TO WHICH AUTHORITY IS DELEGATED	NUMBER
By-law on Control of Waste Vegetable Oils	2872-12 mad.	9 Metropolitan Municipalities, 93 Municipalities	**102**
Excavation Soil, Construction and Demolition Waste	2008/6	Istanbul, Kocaeli, Sakarya, Gaziantep, Bursa, Ordu, Ankara, Trabzon, Antalya, Diyarbakir Metropolitan Municipalities	**10**
By-law on Control of Air Pollution Caused by Heating	2006/19	17 Metropolitan Municipalities, 147 Municipalities	**164**

RELATED By-law	CIRCULAR NO	INSTITUTIONS TO WHICH AUTHORITY IS DELEGATED	NUMBER
By-law on Assessment and Management of Environmental Noise	2006/16	20 Metropolitan Municipalities, 92 Municipalities, Coast Guard Command Traffic Control Teams	**114**
Fish Farms to be Established in the Seas	2010/11	Coast Guard Command	**1**
Marine Pollution from Ships	2011/9	Turkish Environment Agency (Authorized by circular no. 2023/3 dated 23.012023 and numbered 5603190) Coast Guard Command Repealed Undersecretaries of Maritime Affairs (Ministry of Transport and Infrastructure) Mersin, Antalya Metropolitan Municipalities Istanbul, Kocaeli Metropolitan Municipalities (Authorization transfer was canceled by circular no. 2023/3 dated 23.012023 and numbered 5603190)	**5**

H.6.2. Administrative Sanctions Imposed

2872 Administrative sanctions applied by MoEUCC in case of non-fulfilment of obligations stipulated in the Environmental Law No. 2872 and related By-laws are given in the tables below.

Table 105 Total Amount of Administrative Sanctions Imposed by MoEUCC by Years Pursuant to the Environmental Law (TRY) (MoEUCC, 2024)

	Ministry Headquarters	Provincial Directorates of Environment, Urbanization and Climate Change	TOTAL
2020	14,298,182	225,976,478	240,274,660
2021	25,837,498	324,277,595	350,115,093
2022	53,789,948	477,543,232	531,333,180
2023	83,186,352	1,073,276,324	1,156,462,676

Table 106 Distribution of the Number of Activity Suspension Decisions by MoEUCC by Years (MoEUCC, 2024)

	Ministry Headquarters	Provincial Directorates of Environment, Urbanization and Climate Change	TOTAL
2020	18	280	**306**
2021	26	380	**406**
2022	10	374	**384**
2023	10	376	**386**

H.6.3. Market Surveillance and Inspection Activities

Avrupa The "Product Safety and Technical By-laws Law" No. 7223, which established the legal infrastructure for the establishment of a system parallel to the European Union's market surveillance and control system in Türkiye and has been in force since March 12, 2021, obliges manu-

facturers to place only safe products on the market, while also authorizing public institutions to regulate and implement product-specific legislation.

Market surveillance and inspection (PGD) was prepared as one of the opening criteria of the "Free Movement of Goods" chapter in the EU membership negotiations. The products for which the General Directorate of EIA, Permit and Inspection is responsible are solid fuels, as per the "National Market Surveillance and Inspection Strategy", which was prepared by taking the opinions of producer and consumer organizations as well as PGD institutions and was accepted by the Market Surveillance and Inspection Coordination Board (PGDKK) upon the recommendation of the Market Surveillance and Inspection Coordination Board (PGDKK).

Solid fuel inspections, which are the responsibility of the Ministry of Environment, Urbanization and Climate Change and the institutions/organizations to which authority has been transferred, are carried out within the scope of the Environmental Law No. 2872 and the secondary legislation published based on this Law. Data on the market surveillance and inspection activities of solid fuels carried out by the Provincial Directorates of Environment, Urbanization and Climate Change and the institutions/organizations to which authority has been delegated are presented in Table 107.

Table 107 Distribution of Market Surveillance and Inspections by Year (MoEUCC, 2024)

	2018	2019	2020	2021	2022	2023
PGD Number (Pieces)	19,233	13,967	11,943	19,475	16,313	15,974
Enforced Fines Amount (TRY)	134,788	309,776	212,686	1,182,742	2,665,066	1,837,540

H.6.4. Reduction of Major Industrial Accident Risks (BEKRA) Activities

Major industrial accidents include incidents such as fire, explosion and toxic emissions that cause serious environmental, social and economic adverse consequences. The "EU Council Directive on the control of major-accident hazards involving dangerous substances/Seveso III Directive", which is currently implemented in the EU regarding the control of major industrial accidents, has been harmonized with the Turkish legislation and the "By-law on the Prevention and Reduction of the Effects of Major Industrial Accidents" was published in the Official Gazette dated March 2, 2019 and numbered 30702 and entered into force.

The By-law, which is jointly implemented by the Ministry of Environment, Urbanization and Climate Change, the Ministry of Labor and Social Security (ÇSGB) and the Ministry of Internal Affairs/Disaster and Emergency Management Presidency, determines the procedures and principles regarding the measures to be taken to ensure high-level, effective and continuous protection in order to prevent major industrial accidents in establishments that use hazardous substances and to minimize the damages of possible accidents to people and the environment.

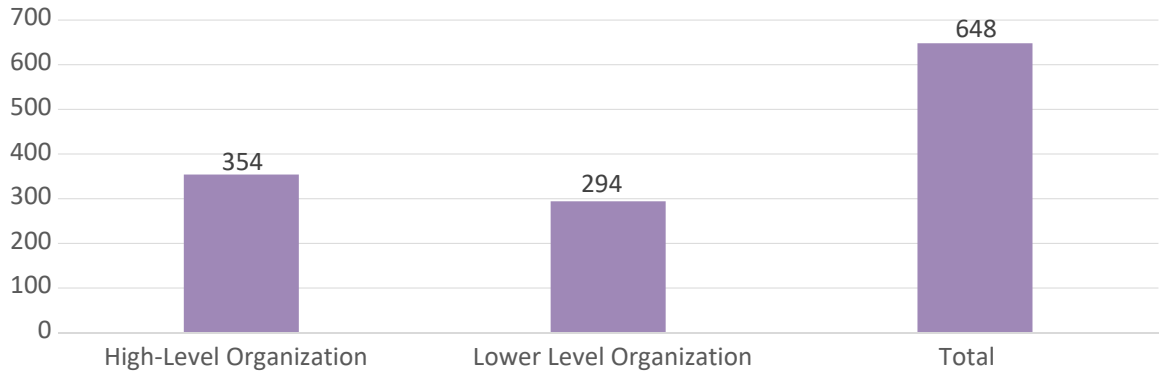
The By-laws, studies and changes made by the European Union (EU) on the subject are constantly being followed, and within the scope of the areas of responsibility for the implementation of the By-law, the "Communiqué on the Safety Report to be Prepared Regarding Major Industrial Accidents" and the "Communiqué on the Major Accident Prevention Policy Document" in the Official Gazette dated 19 April 2019 and numbered 30750, and the "Communiqué on the Major Accident Scenario Document to be Prepared Regarding Major Industrial Accidents" in the Official Gazette dated 30.06.2020 and numbered 31171 were published by the Ministry of Labour and Social Security and entered into force.

Regarding the internal emergency plans under the responsibility of the Ministry of Environment, Urbanization and Climate Change, the "Communiqué on Internal Emergency Plans to be Implemented in Major Industrial Accidents" was published in the Official Gazette dated August 15, 2020 and numbered 31214 and entered into force. Organizations containing hazardous substances are primarily obliged to notify the BEKRA Notification System established under the In-

tegrated Environmental Information System of the Ministry of Environment, Urbanization and Climate Change. As a result of these notifications, the organizations in the scope and their inventories are kept at lower and upper levels.

As of March 2024, according to the BEKRA Notification System, 648 BEKRA organizations have made notifications, 354 of which are upper-level and 294 are lower-level.

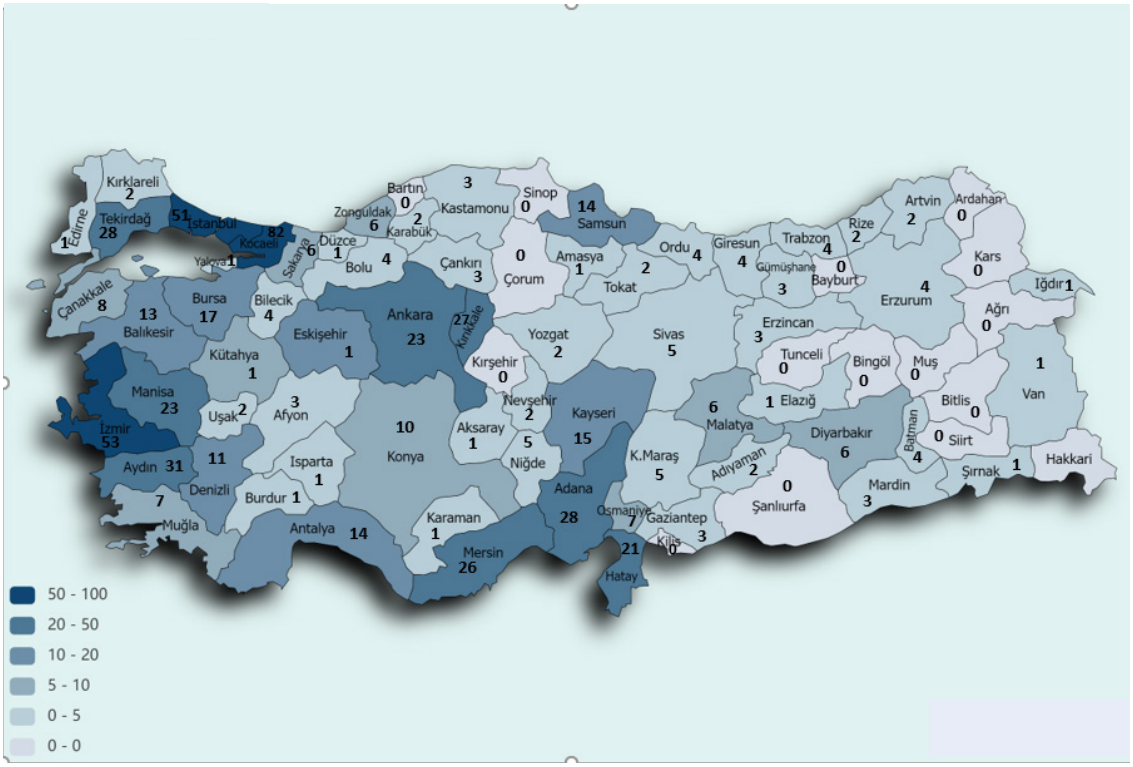
Graph 63 2024 BEKRA Notification System Data as of March (MoEUCC, 2024)



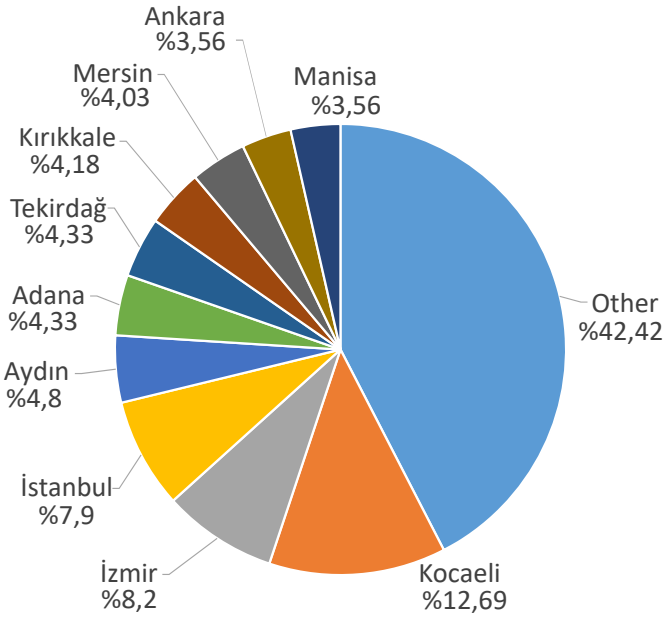
In order to ensure that BEKRA inspections can be carried out in a standard and more effective manner by all MoEUCC Provincial Directorates, the "BEKRA Inspections Implementation Guide" and Checklists for Environmental Inspectors were prepared using the outputs of the "BEKRA Internal Emergency Plans Capacity Development Project" carried out by MoEUCC in 2019 and distributed to all MoEUCC Provincial Directorates.

BEKRA audits started in 2022, and 809 BEKRA audits were carried out, 500 in 2022 and 309 in 2023.

Map 32 2024 Geographical Distribution of BEKRA Organizations in Türkiye as of March (MoEUCC, 2024)



Graph 64 Provinces with the Highest Number of BEKRA Organizations in Türkiye as of March 2024 (MoEUCC, 2024)



H.7. Environmental Qualification Activities

H.7.1. EIA Qualification Activities

Within the scope of the EIA Qualification Certificate Communiqué, the Ministry of Environment, Urbanization and Climate Change examines the EIA Qualification Certificate requests made by institutions/organizations in order to prepare the EIA Report, EIA Application File, Project Introduction File and Project Progress Report, and certification procedures are carried out for those that comply with the legislation. In addition, monitoring and auditing activities are carried out for institutions that have the certificate within the scope of the Communiqué.

Table 108 Distribution of the number of EIA Qualification Companies by years (MoEUCC, 2024)

Years	Number of Companies Receiving Certificates
Before 2019	327
2019	16
2020	8
2021	10
2022	15
2023	9
TOTAL	**385**

H.7.2. Qualification Status of Environmental Engineers/Certified Persons, Environmental Management Units and Environmental Consultancy Firms

In order to ensure that facilities/activities carry out a more effective process to prevent environmental pollution and to increase professionalism and efficiency in compliance with environmental legislation, the concepts of “Environmental Officer”, “Environmental Consultancy Firms” and “Environmental Management Units” have been developed, and it is aimed that

environmental officers contribute to the protection of the environment by ensuring that institutions, organizations and businesses that will cause environmental pollution or harm the environment as a result of their activities take the necessary precautions to prevent environmental pollution.

The legal framework of the issue was determined by the amendment made to the Environmental Law No. 2872 with the Law No. 5491 in 2006, and with the Additional Article 2 of the Law, institutions, organizations and businesses that will cause environmental pollution or harm the environment as a result of their activities are obliged to establish an environmental management unit, employ environmental officers or purchase services from authorized institutions and organizations.

On the other hand, according to Article 4 of the Law on Amendments to the Environmental Law and Certain Laws, published in the Official Gazette dated 15/6/2022 and numbered 31867, the definition of "Environmental management unit/Environmental officer" in the first paragraph of Article 2 of the Environmental Law dated 9/8/1983 and numbered 2872 has been changed to "Environmental management service", and with this change, the expression "environmental officer" has been abolished. With the new definition, environmental management service and those who will provide this service have been explained.

"Environmental management service (Amended definition: 10/6/2022-7410/4 art.): This refers to the service provided by environmental engineers, environmental management units, environmental consultancy firms or persons determined by the Ministry with the relevant By-law, in which the compliance of facilities and businesses with the legislation is evaluated in accordance with this Law and the By-laws put into effect according to the Law and whether the measures taken are effectively implemented

(Additional definition: 10/6/2022-7410/4 art.) Environmental management unit: It refers to the unit established within the facility or enterprise to provide environmental management services.

(Additional definition: 10/6/2022-7410/4 art.) Environmental consultancy firm: It refers to the legal entity authorized by the Ministry to provide environmental management services."

The new "By-law on Environmental Management Services", which was prepared with the aim of reflecting the changes made in the Law to the By-law, carrying out the works and transactions more effectively in order to protect the environment and prevent environmental pollution, eliminating the problems experienced in the current practice and completing the deficiencies, and increasing the quality of environmental management services, was published in the Official Gazette dated 1/11 /2022 and numbered 32000 and entered into force.

Within the scope of the By-law, the definition of "environmental officer" has been abolished, but individuals who have an "Environmental Management Service Competency Certificate" before the By-law are referred to as "environmental engineers" if they are environmental engineering graduates, and as "authorized persons" if they are engineering or science faculty graduates other than environmental engineering departments.

Within the scope of the said By-law, the works and procedures related to the certification, suspension and cancellation of certificates and auditing of environmental engineers/authorized persons, environmental management units and environmental consultancy firms are carried out electronically by MoEUCC through the "E-Competency Application", which is a sub-application of the "Integrated Environmental Information System".

The number of active Environmental Engineers/Authorized Persons, Environmental Management Units and Environmental Consultancy Companies certified as of 2023 are given in Table 109.

Table 109 Number of Active Environmental Engineers/Authorised Person, Environmental Management Units and Environmental Consultancy Firms by 2023. (MoEUCC, 2023)

	2023
Environmental Management Service Certificate of Competence Granted Environmental Engineer/Authorized Person	12,531
Environmental Consultancy Firm Certificate of Competence Granted Environmental Consultancy Firm	675
Environmental Management Unit Certificate of Competence Granted Environmental Management Unit	403

On the other hand, environmental consultancy firms with a Certificate of Competence are inspected by the MoEUCC headquarters and the Provincial Directorates of Environment, Urbanization and Climate Change within the scope of Article 11 of the By-law on Environmental Management Services. The number of inspections of the firms is given in Table 110.

Table 110 Number of Inspections of Environmental Consultancy Firms Carried Out by the Central Directorate of MoEUCC and Provincial Directorates of Environment, Urbanization and Climate Change between 2019-2023 (MoEUCC, 2023)

	2019	2020	2021	2022	2023
Number of Environmental Consulting Firm Audits	322	228	358	463	319

H.7.3. Authorised Laboratories and Central Laboratory Determination System for Environmental Measurement

Since 2004, private and public laboratories operating within the scope of Environmental Legislation that meet the conditions determined by MoEUCC have been granted the "Environmental Measurement and Analysis Competence Certificate". The By-law on Competence of Environmental Measurement and Analysis Laboratories, which entered into force upon publication in the Official Gazette dated 05.09.2008 and numbered 26988, was revised in line with the needs encountered in practice upon publication in the Official Gazette dated 25 December 2013 and numbered 28862. Laboratories that will perform measurement and analysis activities within the framework of Environmental Legislation are authorized by MoEUCC in accordance with the By-law on Competence of Environmental Measurement and Analysis Laboratories.

The number of laboratories authorized by the Environmental Reference Laboratory to conduct measurements/analysis within the scope of the Environmental Legislation between 2016 and 2023 is given in Table 111.

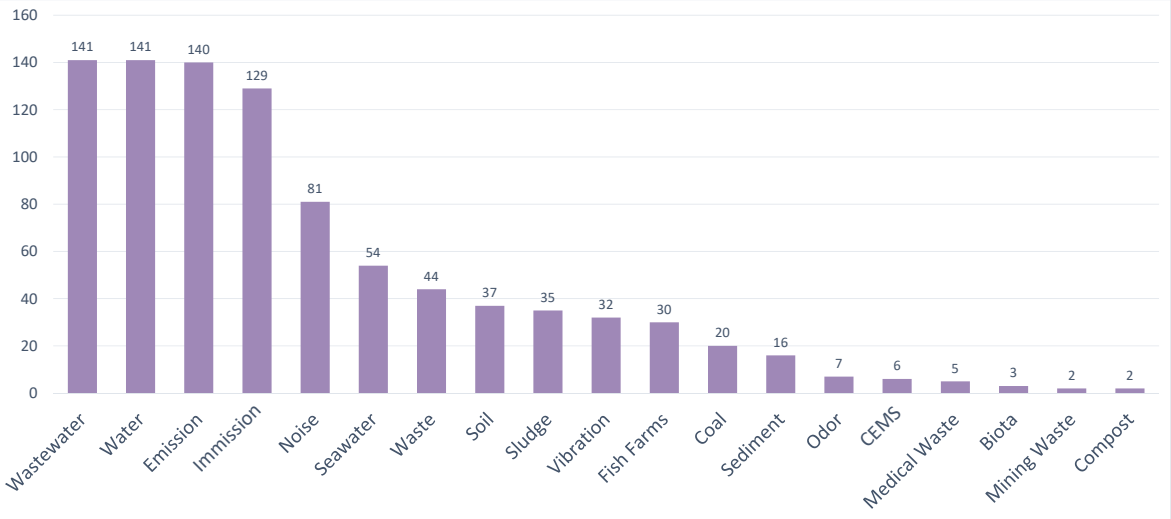
Table 111 Changes in Laboratories Authorised to Perform Measurement/Analyses within the Scope of Environmental Legislation by Years (MoEUCC, 2023)

NUMBER OF AUTHORIZED LABORATORIES			
YEARS	PUBLIC	PRIVATE	TOTAL
2012	51	102	**153**
2013	46	113	**159**
2014	41	115	**156**
2015	42	118	**160**
2016	42	129	**171**
2017	45	135	**180**

NUMBER OF AUTHORIZED LABORATORIES			
YEARS	PUBLIC	PRIVATE	TOTAL
2018	46	156	**202**
2019	50	165	**215**
2020	41	187	**228**
2021	41	190	**231**
2022	40	192	**232**
2023	39	194	**233**

All authorization processes are carried out digitally using the "Laboratory Authorization Application" software. Laboratories send documents and information to MoEUCC from the Ministry's official website and access this information. The number of laboratories authorized by MoEUCC within the scope of the Environmental Measurement and Analysis Laboratories Competency By-law has reached 233.

Graph 65 Scope Distribution of Laboratories Authorised to Perform Measurement/Analyses within the Scope of Environmental Legislation



Within the scope of the "Environmental Measurement and Analysis Laboratories Competence By-law", the authorization, inspection, auditing etc. works and processes of the Laboratories continue.

- As of 2023, a total of 233 laboratories are authorized.
- A total of 340 documents were issued and 116 laboratories were inspected between 2020 and 2023.

Table 112 Distribution of Environmental Measurement and Analyses Qualification Certificates issued between 2020-2023 within the scope of Environmental Legislation by Application Type (MoEUCC, 2024)

Application Type	Number
Qualification Application	18
Document Renewal Application	164
Scope Expansion/Reduction Application	142
Address Change Application	16
TOTAL	**340**

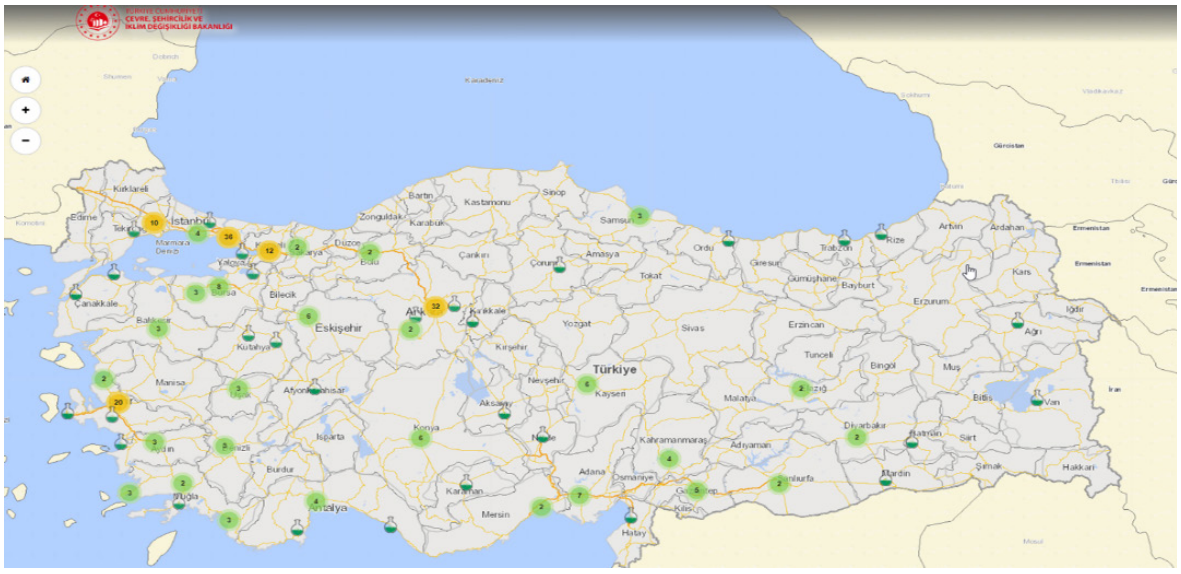
The Central Laboratory Determination System (MELBES) has been established, which will distribute the measurement and analysis works of industrial facilities to authorized laboratories in a transparent, objective and fair way, away from human intervention, and will select the authorized laboratory suitable for the needs of the enterprises, and the system in question has started to be used as of 16.02.2019 with the Ministry Approval on the Implementation of the Central Laboratory Determination System (MELBES) dated 13 February 2019.

With the MELBES System, which has been carried out since 16.02.2019, the measurement and analysis needs of the facilities operating in Türkiye continue to be met by the measurement and analysis facilities of the laboratories authorized by MoEUCC for many By-laws.

Table 113 Distribution of the requests made through the MELBES System between 2020-2023 by the scopes (MoEUCC, 2024)

Scope	Requests
Emission / Immission	50,264
Wastewater / Water	35,594
Waste / Sewage Sludge / Soil / Sediment	2,544
Noise / Vibration	1,823
CEMS	1,945
Odor	840
TOTAL	**93,010**

Map 33 Distribution of Environmental Measurement and Analysis Laboratories (MoEUCC, 2023)



H.7.3.1. Environmental Reference Laboratory

The Environmental Reference Laboratory is a public laboratory operating under the Laboratory Measurement and Monitoring Department of the Ministry of Environment, Urbanization and Climate Change, established to carry out plans and projects regarding the protection, development and cleaning of the environment, and to conduct and have conducted research, examination and laboratory studies related to the environment (Image 10).

Image 10 Environmental Reference Laboratory

In the Environmental Reference Laboratory, measurements and analyses that form the basis for all kinds of permits, monitoring and inspections regarding environmental pollution are carried out, private or public institution and organization laboratories are authorized, and air and water quality monitoring studies are carried out.

All work in the Environmental Reference Laboratory is carried out within the scope of TS EN ISO/IEC 17025: General Requirements for the Competence of Testing and Calibration Laboratories.

More than 1,200 parameters, 655 of which are accredited, are analyzed in water, wastewater, seawater, soil, waste, treatment sludge, waste oil, insulation fluid, sediment, flue gas, coal, pomace and fuel-oil samples.

In accordance with the principle that the sampling process, which is the most important step of laboratory analysis, should be carried out by people with certain technical training, "Sampling Trainings for Water, Wastewater, Soil, Sewage Sludge, Solid Waste, Waste Oil and Insulation Liquids" are provided to private and public environmental laboratories and Sampling Personnel Identity Cards are issued to participants who are successful in the exam. As a result of the trainings organized since 2010, over 4,600 personnel have been authorized to take samples.

H.7.3.2. Industrial Pollution Monitoring Branch Emission and Immission Trainings

The Industrial Pollution Monitoring Branch, operating under the Laboratory Measurement and Monitoring Department of the Ministry of Environment, Urbanization and Climate Change, continuously monitors stacks with high pollutant loads within the scope of the Continuous Emission Measurement Systems Communiqué. It also houses a mobile emission laboratory.

Training has been provided to measurement and sampling personnel of laboratories authorized by MoEUCC that perform flue gas emission measurement and ambient air (immission) measurement since 2015, and to reporting personnel since 2018. Personnel who pass the exam as a result of these trainings are certified. As of the end of 2023, 2,420 personnel have been granted Emission and Immission Measurements, Measurement and Sampling certificates, and 1,138 personnel have been granted Emission and Immission Measurements Reporting Personnel certificates.

H.7.4. Waste Tracking Service Providers

Within the scope of the Communiqué on the Transportation of Waste on the Highways, which was published in the Official Gazette dated 20.03.2015 and numbered 29301 and entered into force, the procedures and principles regarding the determination of the qualifications of Waste Tracking Service Providers (ATSS) have been determined. It has been revised and updated with the approval of the Minister dated 24/07/2020 and numbered 157295. The purpose of these procedures and principles is to control the transportation of wastes specified in the relevant legislation from the waste producer to the disposal facility. It is to prevent the wastes from being dumped indiscriminately by controlling the transportation of wastes received from the waste producer by licensed companies to the waste disposal facility without loss. Within the scope of the procedures and principles regarding the determination of the qualifications of Waste Tracking Service Providers, 4 (four) companies have been granted qualification certificates.

H.7.5. Cleaning of Soil Pollution

"By-law on Control of Soil Pollution and Point Source Contaminated Areas" was published in the Official Gazette dated 08.06.2010 and numbered 27605 and entered into force. Based on Article 34 of the said By-law, "Communiqué on Certificate of Competence for Control of Soil Pollution and Cleaning of Point Source Contaminated Areas" was published in the Official Gazette dated 17.06.2011 and numbered 27967 and entered into force. The communiqué covers the conditions to be sought in institutions/organizations, working procedures and principles, evaluation and inspection of applications. However, the obligations of the companies that receive the certificate within the scope of the communiqué started as of 08.06.2015. There are a total of 14 (fourteen) institutions/organizations operating within the scope of this document as of December 2023.

H.7.6. Risk Assessment for Prevention of Pollution of Marine Environment

Pursuant to the "Implementation By-law of the Law on Emergency Response and Damage Compensation in Pollution of the Marine Environment by Oil and Other Harmful Substances" published in the Official Gazette dated 21/10/2006 and numbered 26326, the "Communiqué on the Authorization of Institutions and Organizations that will Prepare Risk Assessment and Emergency Response Plans for Pollution of the Marine Environment by Oil and Other Harmful Substances" was published in the Official Gazette dated 12.12.2014 and numbered 29203 and entered into force. The communiqué covers the conditions to be sought in institutions/organizations that will prepare risk assessment and emergency response plans, working procedures and principles, and issues related to the evaluation and inspection of applications. The applica-

tions of institutions/organizations that apply for a certificate are evaluated and finalized by the MoEUCC. In this context, as of December 2023, the applications of a total of 10 (ten) institutions/organizations were finalized and a "Certificate of Competence" was issued within the scope of the Communiqué.

H.7.7. Environment Labelling Implimentations

The Turkish Eco-label System, which was established on a voluntary basis to promote products and services with Environment Labels in order to ensure that accurate, non-misleading and scientifically based information is provided to consumers about the environmental status of products and services and was prepared in accordance with the EU Eco-Label By-law, was put into practice in Türkiye with the Environment Label By-law published on 19.10.2018.

The aim of the Turkish Environment Label system is to create a system that helps distinguish between environmentally harmful products and environmentally friendly products, and to enable products to be preferred in the domestic market, and to encourage appropriate methods for the promotion of products and services that receive the Environment Label and to increase their international market share, as well as awareness-raising activities for consumers, producers, manufacturers, wholesalers, service providers, public procurement, merchants, retailers and the public, with the label being accepted at national and international levels.

Türkiye Environmental Label Logo

The Turkish Environment Label System is a system that evaluates the environmental impacts of a product/service in all its life cycle processes according to certain limit values, and it is very important because it is a mechanism that prevents greenwashing by standardizing according to the international ISO 14024 system and verifying with a third party. Since international organizations and all supply chains prefer sustainable products that have a positive impact on the environment and human health, have a low carbon footprint, and are compatible with circular economy principles, the Environment Label is a touchstone in this respect.

How the Turkish Environment Label System Works.

The Turkish Environment Label System is carried out under the management and coordination of MoEUCC together with all relevant stakeholders. The Ministry, Environment Label Board, Technical Review Commission established specifically for the product or service, other public and private institutions/organizations, non-governmental organizations, Environment Label users, consumer organizations and other participants to be invited on a specific subject are involved in the development process of Environment Label criteria for products and services.

The validity period of the Environment Label document is 4 years, and companies with Environment Labels are inspected annually to ensure that they continue to comply with the criteria. With the adoption of the Turkish Environment Label System, which is based on a voluntary basis, it is expected that the market shares of the products and the competitiveness of the companies operating in the sector will increase, as well as environmental gains.

In sectors where the criteria are published, producers, manufacturers, exporters, importers, service providers, wholesalers and retailers can apply for the Environment Label.

The Turkish Environment Label System is defined in the ISO 14024 standards called Type I and includes evaluations based on many criteria. Type I eco-labels are known as eco-labels given to products with high environmental performance and sensitivity to human health as a result of common sense, science-based, transparent and independent, verified evaluations.

The products evaluated in the Turkish Environment Label System are examined by taking into consideration many issues that may cause environmental problems in the product life cycle, such as chemical use, energy and water consumption, and emission limitations. In addition, Environment Label criteria are a reliable criterion for products and services.

With Environment Label applications, it is aimed to support sustainable consumption and production practices by encouraging businesses that follow a process that is sensitive to the environment and human health by taking into account areas such as low carbon emission, waste prevention, energy efficiency, water saving, and not using harmful chemicals in their products/services. In this direction, the Turkish Environment Label System is a mechanism that has a positive impact on the environment and human health.

EU countries are a close and familiar market for Turkish exporters. Considering that the importance of EU countries, which have become traditional markets for Türkiye, in exports may continue, the Environment Label will allow producers to both gain an advantage in exports and to have their products preferred in the domestic market.

The Environment Label mechanism is a process designed in accordance with the circular economy strategy goals. Circular Economy is one of the main methodologies in reducing greenhouse gases that cause climate change. The Turkish Environment Label System is a system under the main heading of "Reduction" within the framework of combating climate change.

The Turkish Environment Label System is among the targets of the Green Deal Action Plan carried out under the coordination of the Ministry of Trade. Within the scope of the plan, the efforts to disseminate the Turkish Environment Label System and to investigate international cooperation opportunities will be accelerated.

In addition, under the main heading of environmental protection in the 12th Development Plan of the Presidency, there is a goal to expand the Environment Label system and increase the competitiveness of environmentally friendly products and services.

Currently, as a result of the studies carried out within the scope of dissemination of the Turkish Environment Label System, criteria have been determined and published for 12 product/service groups, including textile, ceramic coating, cleaning paper, tourist accommodation services, hand dishwashing detergents, personal care products, glass products, washing machine detergents, dishwasher detergents, hard surface cleaners, natural stone and bedding.

Within the scope of International Cooperation Studies, the Turkish Environment Label System became an associate member of the Global Ecolabelling Network (GEN), a non-profit international organization established in 1994 with the aim of supporting, developing and promoting eco-labeled products/services, in 2020 and gained full membership as a result of the audit carried out on October 18, 2022. Thus, the international validity and recognition of the Turkish Environment Label System has been registered.

Global Eco-Label Network (GEN) Certificate

As of the end of 2023, 12 companies in 5 product groups, including textiles, ceramics, hand-washing dishwashing detergent, cleaning paper and hard surface cleaners, have been granted the "Environment Label Certificate". Current information can be accessed from the MoEUCC website https://cevreetiketi.csb.gov.tr/.

The Turkish Environment Label System aims to publish Environment Label criteria in 27 product/service groups by 2028. It is also aimed to increase the recognition of the Turkish Environment Label System at the international level.

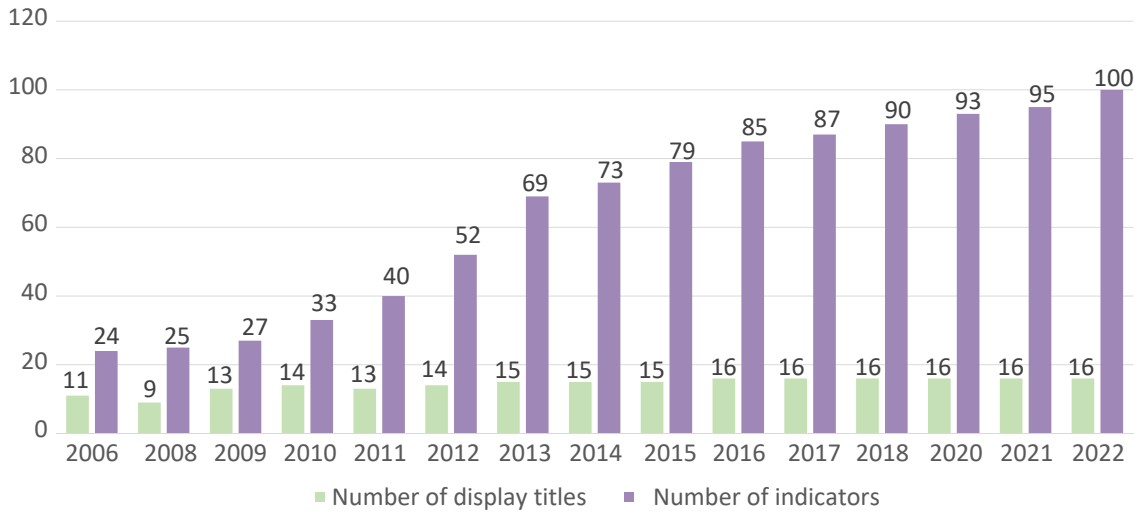
In this process, although other eco-label systems and other sustainability documents that have proven their international validity create pressure on the spread of our national eco-label system, Türkiye's geopolitically strategic location in the supply chain and the promotion and media organizations we have made through international funds to promote our national eco-label system pave the way for the spread of the Turkish Environment Label System.

H.8. Environmental Inventory Studies

H.8.1. Environmental Indicators

The Environmental Indicators booklet is prepared every year in Turkish and English in order to reflect the relationship between the environment and sectors, to ensure that some activities with environmental impacts can be observed in time series, to monitor the results of the implemented environmental policies, to assist in determining the plans, programs and policies to be made, and to prepare legislation and to provide information.

Graph 66 Number of Published Environmental Indicators by Subject Headings by Year



* The years indicated in the graph refer to the year in which the data contained in the booklet is represented.

First, "Environmental Indicators 2006" was prepared and published in collaboration with the Turkish Statistical Institute. While this booklet consisted of 11 headings and 24 indicators, the booklets were renewed and developed over time, and the "Environmental Indicators 2023" booklet was prepared to include 16 headings and 100 indicators. The Environmental Indicators Booklet can be accessed in Turkish and English at http://cevreselgostergeler.csb.gov.tr/.

H.8.2. Publications

The following publications are prepared by the Ministry of Environment, Urbanization and Climate Change and are published in the "Publications" section on the website of the General Directorate of EIA, Permit and Inspection (https://ced.csb.gov.tr/).

- General Directorate of Environmental Impact Assessment, Permit and Inspection Technical Activity Report
- Environmental Inspection Statistics Bulletin
- Waste Statistics Bulletin

- Medical Waste Statistics
- Environmental Problems and Priorities Report
- Provincial State of the Environment Reports
- State of the Environment Reports of Türkiye
- State of the Environment Report Province Summary
- Environmental Indicators Booklet
- Marmara Sea Basin Environmental Indicators

H.9. European Union Environmental Investments

For the Environment Operational Program IPA-I period, which covers the programming years 2007-2013 and whose implementation period was completed by the end of 2017, the repealed Ministry of Environment, Urbanization and Climate Change applied to the European Commission for 39 environmental infrastructure projects with a total budget of approximately 981 million Euros. Of these, 30 infrastructure projects, 3 of which are solid waste and 27 are water and wastewater projects, with a total budget of approximately 700 million Euros, and 7 technical assistance projects (preparation of project preparation documents, training, visibility, increase in institutional capacity, etc.) were implemented. Of these 27 water projects, 4 are drinking water, 16 are wastewater, and 7 are integrated water projects covering both drinking water and wastewater. The list of projects is given below.

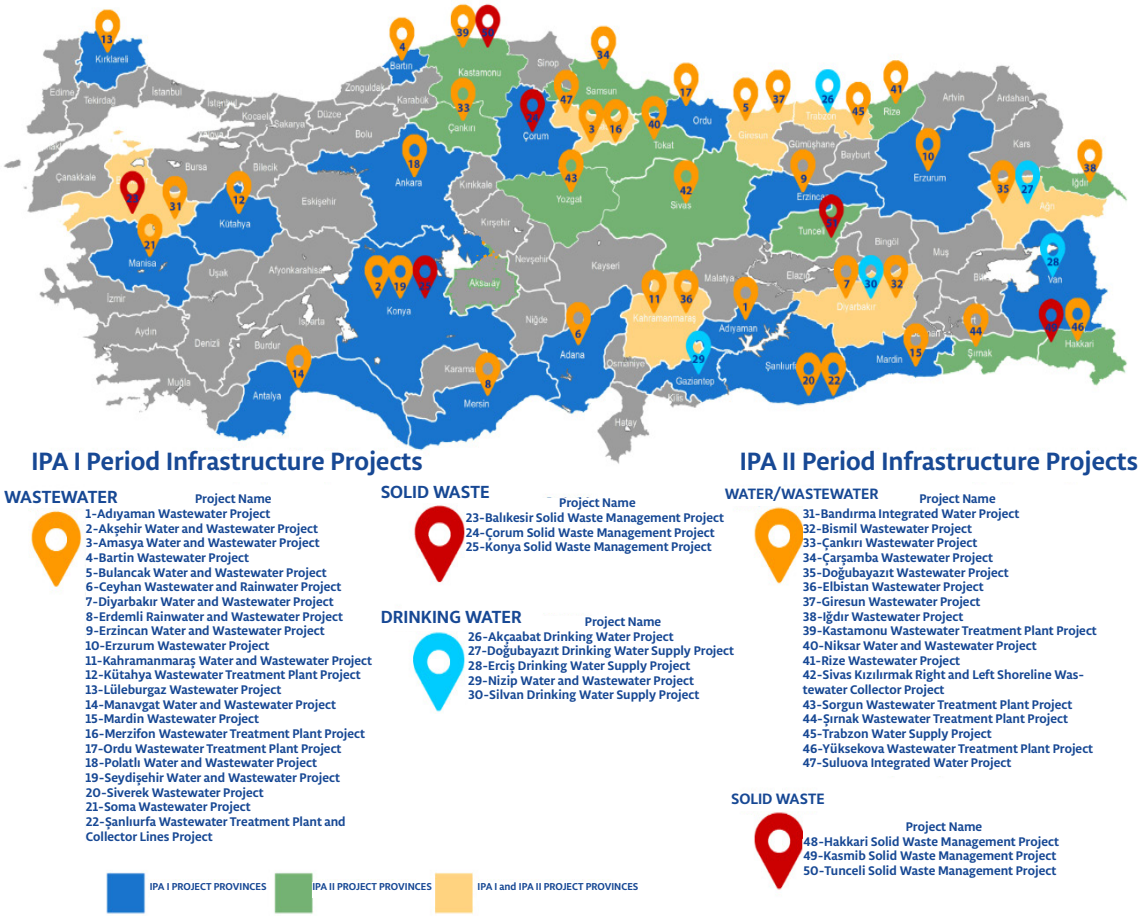
In the IPA-II period of the Environment and Climate Change Sector Operational Program covering the 2014-2020 Programming Years, there are 29 service procurement contracts, 12 works contracts, 2 direct grant/grant programs and 4 supply contracts, totaling 47 contracts in the implementation process. The implementation of 6 service procurement and 17 works contracts has been completed. Within the scope of the "Development of Adaptation Action in Türkiye Project" grant sub-component, grant agreements for 29 projects have been signed.

Table 114 Infrastructure projects realized during IPA I and IPA II (MoEUCC, 2024)

NO	PROJECT NAME
1	Adıyaman Project
2	Akçaabat Water and Wastewater Project
3	Akşehir Water and Wastewater Project
4	Amasya Water and Wastewater Investment Project
5	Balıkesir Solid Waste Management Project
6	Bartın Wastewater Project
7	Bulancak Water and Wastewater Project
8	Ceyhan Wastewater and Rainwater Project
9	Çorum Solid Waste Management Project
10	Diyarbakır Water and Wastewater Project
11	Doğubayazıt Drinking Water Supply Project
12	Erciş Drinking Water Supply Project
13	Erdemli Rainwater and Wastewater Project

NO	PROJECT NAME
14	Erzincan Water and Wastewater Project
15	Erzurum Wastewater Project
16	Kahramanmaraş Water and Wastewater Project
17	Konya Solid Waste Management Project
18	Kütahya Wastewater Treatment Plant Project
19	Lüleburgaz Wastewater Project
20	Manavgat Water and Wastewater Project
21	Mardin Wastewater Project
22	Merzifon Wastewater Treatment Plant Project
23	Nizip Water and Wastewater Project
24	Ordu Wastewater Treatment Plant Project
25	Polatlı Wastewater Project
26	Seydişehir Wastewater Project
27	Silvan Wastewater Project
28	Siverek Wastewater Project
29	Soma Wastewater Project
30	Şanlıurfa Wastewater Treatment Plant and Collector Lines Project
31	Kastamonu Wastewater Treatment Plant Project
32	Şırnak Wastewater Treatment Plant Project
33	Elbistan Wastewater Project
34	Trabzon Water Supply Project
35	Bismil Wastewater Project
36	Kastamonu Solid Waste Management Project
37	Çarşamba Wastewater Project
38	Niksar Water and Wastewater Project
39	Iğdır Wastewater Project
40	Sivas Kızılırmak Right and Left Bank Collector Line Project
41	Sorgun Wastewater Treatment Plant Project
42	Rize Wastewater Project
43	Çankırı Wastewater Project
44	Doğubayazıt Wastewater Project
45	Giresun Wastewater Project
46	Suluova Wastewater and Rainwater Project
47	Tunceli Solid Waste Management Project
48	Bandırma Wastewater Project
49	Suluova Wastewater Project
50	Hakkari Solid Waste Management Project

Map 34 Regional Breakdown of Projects Realized under IPA I and IPA II (MoEUCC, 2024)



H.10. ILBANK Projects and Activities

The data and information produced between 2019 and 2024 regarding the issues within the duties, authority and responsibility of İller Bankası Joint Stock Company (ILBANK) are presented below in tabular form.

Table 115 ILBANK Activities for 2019-2024 (İLBANK, 2024)

PROJECT SECTOR		2020 COMPLETED PROJECTS/ WORKS	2021 COMPLETED PROJECTS/ WORKS	2022 COMPLETED PROJECTS/ WORKS	2023 COMPLETED PROJECTS/ WORKS	2024 COMPLETED	2024 ONGOING PROJECTS/ WORKS
Wastewater Project Sector	Network	44	43	21	32		28
	Treatment	34	28	30			37
Drinking Water Project Sector	Network	42	61	42	52	2	56
	Treatment	9	14	8	13		9

PROJECT SECTOR		2020 COMPLETED PROJECTS/ WORKS	2021 COMPLETED PROJECTS/ WORKS	2022 COMPLETED PROJECTS/ WORKS	2023 COMPLETED PROJECTS/ WORKS	2024 COMPLETED	2024 ONGOING PROJECTS/ WORKS
Drinking Water Research and Drilling Application Sector	Drinking Water Drilling	2	9	14	7		10
	Drinking Water Survey	8	26	22	12		36
	Geophysical Survey	0	0	0	8		0
Solid Waste and Deep Sea Discharge Sector	Deep Sea Discharge	0	3				1
	Solid Waste	10	5	5			16
Superstructure Project Sector	Superstructure	7	10	8	14		15
	Street Rehabilitation	66	34	16	8		21
	Bicycle and Green Walkway	12	19	9	-		10
	Bicycle Path	16	8	3	1		18
	Green Walkway	2	3	1	-		-
	Environmentally Friendly Street	2	1	-	1		-
	Noise Barrier	4	1	3	-		5
Renewable Energy and Climate Change Sector	Project - Feasibility	5	3	-	-		-
	Pre-Feasibility and Technical Assessment Report	142	116	98	4		15
TOTAL		**405**	**384**	**280**	**152**	**2**	**277**

H.11. European Environment Agency (EEA) Studies

The European Environment Agency (EEA), officially established in 1990 with Council By-law 1210/90, began its operations in Copenhagen in 1994. The EEA is the European Union (EU) institution responsible for providing sound, independent information on the environment. The current 32 members are 27 EU Member States, Iceland, Liechtenstein, Norway, Switzerland and Türkiye. Türkiye became a member of the EEA on 01 May 2003 with the "Agreement on the Participation of the Republic of Türkiye in the European Environment Agency and the European Information and Observation Network" published in the Official Gazette dated 18.03.2003 and numbered 25052.

H.11.1. Studies Participated in Abroad

EEA Workshops and meetings are organized by the EEA on a regular basis each year on topics determined in line with the EEA 5-Year Strategy. In addition, EEA also organizes online webinar meetings on various topics. Primary Focal Points, representatives of relevant institutions and the National Focal Point participated in these meetings and webinars.

Meetings, Workshops and Webinars: Many meetings and webinars were held by the EEA between 2019 and 2023. Due to the pandemic, all meetings were held online between the end of 2019

and 2022. Between 2019 and 2023, 215 webinars and 38 face-to-face meetings were attended by Türkiye representatives.

EEA Board of Directors Meetings: The EEA Board of Directors meets three times a year and makes decisions in accordance with the report and agenda presented by the Executive Director. Member countries are represented by the highest executive with decision-making authority on the EEA Board of Directors. Türkiye participated in 15 meetings between 2019 and 2023.

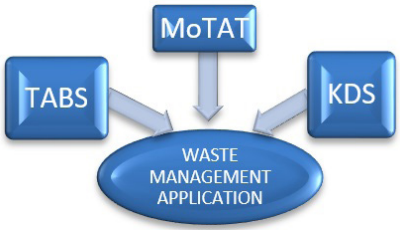
EEA National Focal Point Meetings: The European Environment Agency organizes three meetings a year with the participation of focal points from member countries. In these meetings, up-to-date information on EEA work is provided and problems faced by member countries are addressed and solution proposals are discussed. 15 meetings were attended between 2019 and 2023.

More detailed information about EEA studies is available on the website https://aca.csb.gov.tr/.

H.12. Implementation Innovations in the Environmental Field

H.12.1. Waste Management Implementation

Waste Management Application (ATYÖN) is an online application prepared to track the process of waste generated in Türkiye from its source to the Waste Processing Facilities online and is located under the Integrated Environmental Information System of the Ministry of Environment, Urbanization and Climate Change. The application provides service through the e-government portal at https://ecbs.cevre.gov.tr/.

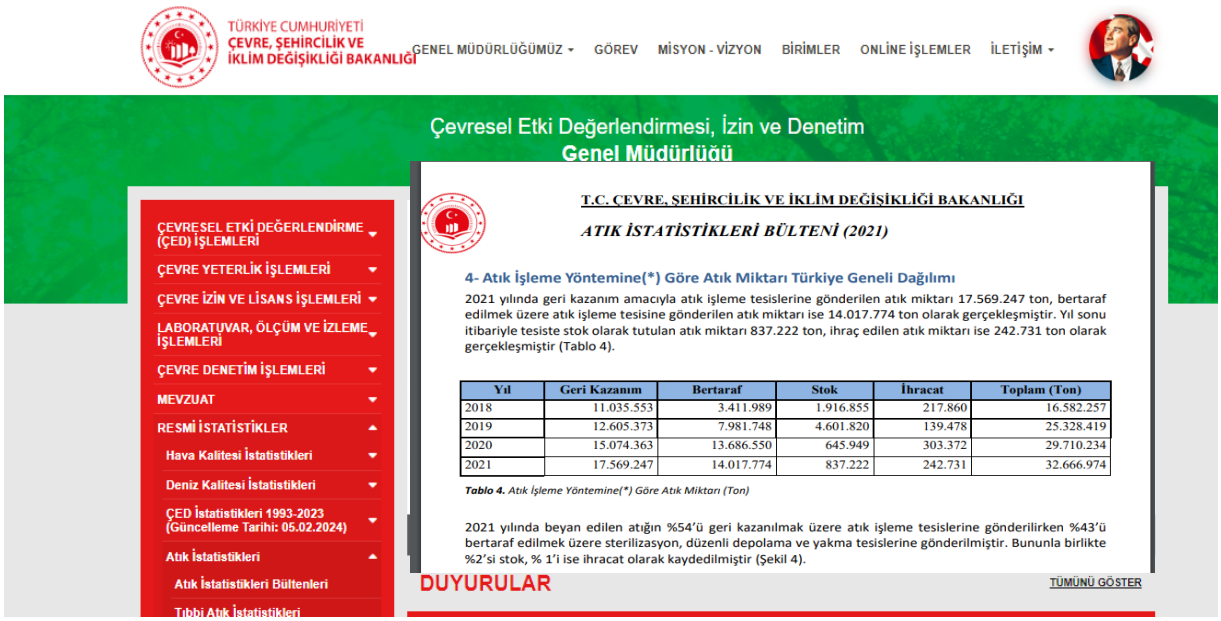


Waste Management Implementation Scheme

ATYÖN includes the Waste Declaration System (TABS), Mobile Waste Tracking System (MoTAT) and Mass Balance System (KDS). TABS is the system in which waste producers declare the waste generated in their facilities and sent to waste processing facilities annually within the scope of the Waste Management By-law. These declarations represent the declaration of the waste generated in the year before the declaration year and include information on the status of these wastes as of the end of the year (stock, sending for off-site recovery/disposal, export). Waste declarations are made by waste producers in different NACE sectors at different economic scales, primarily in the sectors of industry, service (market, restaurant, hotel, bank, etc.), health (hospital, clinic, dental clinic, family health centre), public, etc.

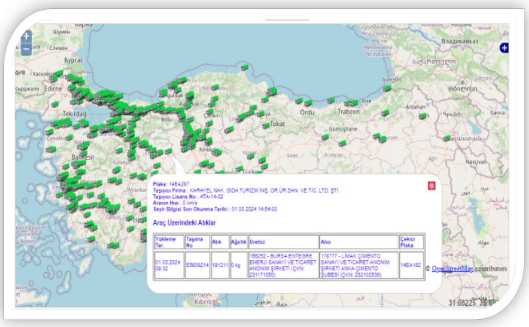
The Waste Statistics Bulletin and the Medical Waste Statistics Bulletin are prepared using data obtained from TABS. The bulletins are published on the official website of the Ministry of Environment, Urbanization and Climate Change https://ced.csb.gov.tr/. In addition, TABS waste data is presented to users via the dynamic reporting screen at the same address.

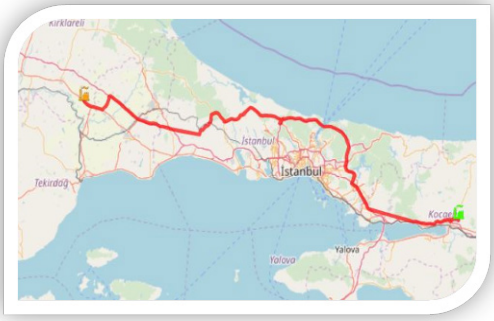
Figure 3 Waste Statistics Bulletin (MoEUCC, 2024)



MoTAT is an online system prepared for the purpose of recording information on each waste transportation process of wastes within the scope of the Communiqué on the Transportation of Waste on Roads and imported plastic waste at the source, monitoring waste-loaded vehicles while they are in motion and effectively supervising waste transportation processes.

Map 35 MoTAT Road Transport Maps





The mobile devices on waste transport vehicles enable monitoring of waste-loaded vehicles while they are in motion and effective control of waste transport operations. The waste tracking process begins with the waste producer filling in the electronic waste transport form on MoTAT. In each waste transport, the transport route, waste loading and unloading points, coordinates and timestamp are recorded in the database with a distinctive transport number.

Considering that the waste producer is responsible for the waste during the transportation of the waste and until the recovery/final disposal, MoTAT, which effectively supports the implementation of waste management legislation, constitutes an example for the application of geographic information systems in environmental management. With this system, hazardous waste is recorded online via mobile devices in vehicles and monitored on maps. In addition, as of 2020, plastic waste imported within the scope of the Waste Import Circular (waste codes 120105, 150102, 200139, 191204 and 070213) has also been included in the MoTAT Application. In this context, 18 million tons of hazardous waste since 2018 and 1 million tons of imported plastic

waste since 2020 have been transported through the MoTAT Application and their tracking has been ensured in this way.

KDS is used by waste processing facilities. It is the system in which the recovery/disposal activities to which the wastes accepted to the facility within the scope of their licenses are subjected are processed. It includes the product produced by the facility from the waste it processes and the remaining waste information. The mass-balance information including the stocks of waste processing facilities and the products produced as a result of recovery activities are monitored by the Ministry with KDS. Mass balance notifications are carried out within the scope of the "Mass Balance Notifications" Circular published dated 03.03.2022 and numbered 2022/4.

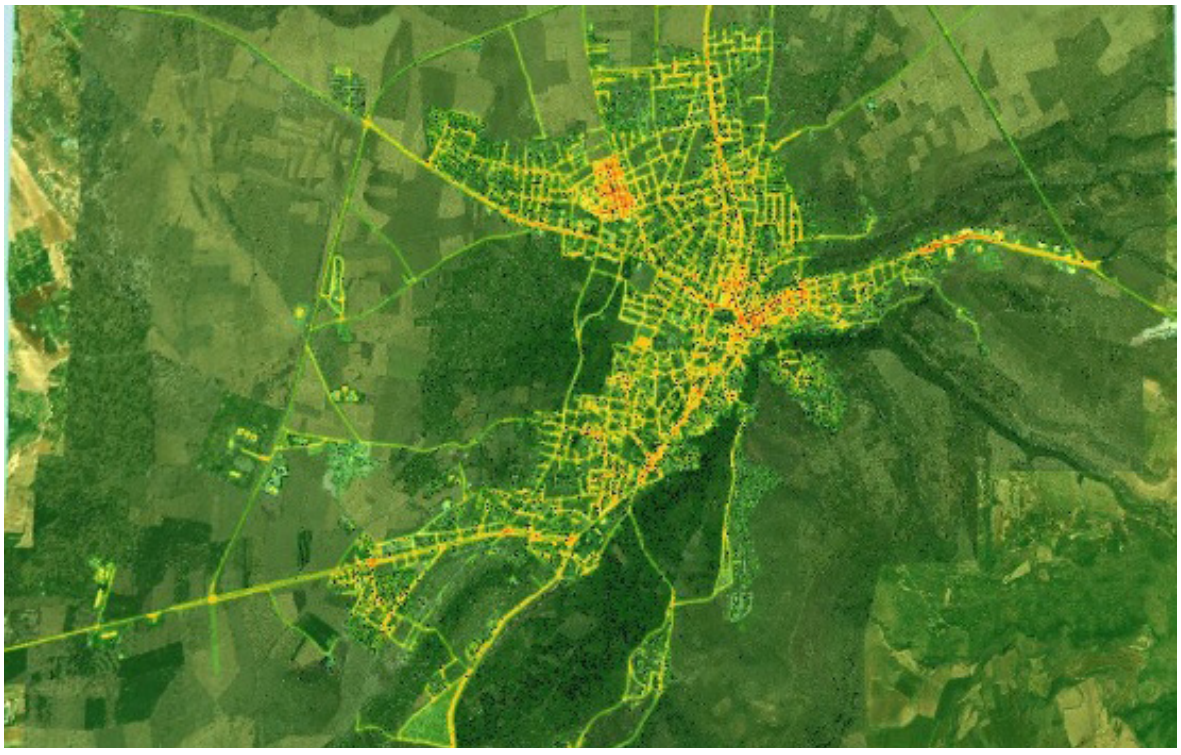
Thanks to the Waste Management Application, it is aimed to monitor the waste data cycle (waste generation-transportation-recovery/disposal), develop strategies for the Ministry's waste management and create a waste inventory that is open to the use of all stakeholders.

H.12.2. Electronic Applications and Software in Air Quality Management

The Ministry of Environment, Urbanization and Climate Change follows technological developments in air quality management studies and uses them effectively. Air pollutants are recorded with the Air Emission Management (HEY) Portal, and the amounts of pollutants originating from industrial facility chimneys, fuels used in domestic heating and land/sea/air/rail transportation are calculated separately. Strategic air quality maps are prepared on a kilometre scale for 150 different pollutant parameters with air quality modelling.

With our local and national software NEFES, air quality values are determined in a 3D environment on the digital twins of cities by considering many factors such as strategic air quality maps, 3D building models, city atlas, topography, traffic density, intersections, fuel type of buildings.

Map 36 Kayseri province Develi district 24 September 2021 NEFES Software Output (MoEUCC, 2024)



HEY Portal and NEFES software contribute to the processes of information sharing and prioritization of air quality policies for the central and provincial organizations as well as local governments by producing data for the decision support mechanism.

The software in question has the ability to instantly perceive all inputs and produce outputs, and is an example for similar studies conducted worldwide. With NEFES, 84 million of our citizens will be able to instantly see the air pollution status on the route they will use in their city before leaving home in the morning and will have the opportunity to make a route choice. Currently, air quality levels have been determined in a 3D environment for a total of 667 districts of our 59 provinces. The example of Kayseri province is included in Map 35 from our sample 3D maps.

H.12.3. Environmental Inspection (E-Inspection) and Mobile Inspection Application

E-inspection software, which enables the entire environmental audit process to be carried out in a digital and web-supported environment, has been used since 2015. In the e-inspection system, it is possible to carry out environmental audits under the guidance of checklists, to prepare and record minutes, audit reports and administrative investment decision minutes, and to follow up administrative sanctions and relevant litigation processes, if any, through the system.

The frequency and effectiveness of inspections can be monitored on a basin basis, and it is also possible to track how many inspections were made in which sector, how many administrative sanctions were applied, and many other inspection queries can be made and monitored through statistical data and graphics. Since it is mandatory to enter coordinate information in each inspection, the geographical distribution of inspections can be followed on the map. Since the 10th month of 2018, environmental inspection data has been received instantly via e-inspection.

In 2022, the re-software of e-inspection has been completed with the "Environmental Inspection Application Software Development" project numbered 2022K10-183741 in the DKH-Social-Environment Sector of the Investment Program, which will be in line with the developments in new information technologies, capable of carrying the current and future user and data load, compatible with various data sharing structures, flexible in terms of legislative developments, and will work more efficiently integrated with the mobile environmental inspection application currently in the development process, and testing studies are ongoing.

Within the scope of the Mobile Environmental Inspection Application Software Development Project in 2022, the mobile inspection application, which will work integrated with the environmental e-inspection software where the environmental inspection processes carried out by the MoEUCC central and provincial organization are carried out and will ensure that environmental inspection reports are kept online in the field, has been completed. In this context, 300 tablets provided were distributed to the Ministry's Central and 81 MoEUCC Provincial Directorates. Environmental inspection reports can be kept online with tablets in the field and can be followed by the Ministry's headquarters. Developments are ongoing. Its use is being expanded throughout the country.

H.12.4. Project on Planning of Environmental Inspections

The Environmental Audit Planning Project, which was started in 2011 to ensure that environmental audits are planned based on environmental risk analysis, was completed on April 18, 2013. An audit plan was prepared specifically for Samsun province using the developed integrated risk assessment method. The application developed after Samsun province was also expanded to other provinces. As of 2019, an audit plan was prepared using the Risk Assessment Method for 58 DEUCCs.

In 2020, Ankara, Bolu, Kırıkkale and Kırşehir were included in the project scope and the 2021 inspection plans of the provinces in question were prepared.

In 2021, due to the Covid-19 pandemic, training could not be provided to the remaining provinces. Currently, 2022 Inspection Plans of 62 DEUCCs have been prepared.

19 DEUCCs, which could not be trained in 2021 due to the COVID-19 outbreak, were trained in 2022 within the scope of the Environmental Inspection Planning and Development project using Risk Assessment Methodology in Environmental Inspections with Sakarya University Environmental Engineering Department. 81 DEUCCs have prepared their Inspection Plans for 2023.

H.12.5. Strengthening the Capacity of Environmental Inspection in Marmara Sea Basin

In order to increase the effectiveness of environmental inspections in the Marmara Sea Basin, improve the inspector capacity and strengthen the implementation of Environmental Legislation, the "Marmara Sea Basin Environmental Inspection Capacity Strengthening Project" was launched by MoEUCC on 21/10/2021 with MoEUCC and Istanbul Technical University. The project was completed on 30.11.2022.

During the project studies in question, studies were carried out to revise the environmental audit practices carried out in accordance with our legislation in line with the conditions of Türkiye, current good practices in the world and the needs that emerged in the practice, for this purpose, General Control Lists and Sectoral Guide Control Lists were created to be used in inspections and the existing lists in the e-inspection system were revised with the contributions of our provincial directorates in a way that they can be integrated into the e-inspection and mobile environmental inspection application based on our current legislation. Project outputs are used by the inspection personnel of the MoEUCC central and provincial organization.

H.12.6. Pollutant Release and Transfer Register

The Pollutant Release and Transfer Register (PRTR) By-law, which was prepared within the framework of harmonization with the European Union legislation, taking into account the By-law (AT) No. 166/2006 of the European Parliament and of the Council dated 18/1 /2006 on the establishment of the European Pollutant Release and Transfer Register, was published in the Official Gazette dated 4 December 2021 and numbered 31679.

PRTR is the international definition of the inventory that includes information on the release of pollutants originating from industrial facilities to the receiving environments such as air, water, soil and the transportation of pollutants and wastes for purification, processing etc. activities and is reported at regular intervals.

The By-law is being implemented gradually for 9 different sectors. On the date of publication of the By-law, the energy and metal sector, one year later the mining and chemical sector, two years later the waste and wastewater management and paper and wood sector, three years later intensive animal husbandry and aquaculture, food and beverage sector animal and plant products and other activities facilities performing industrial activities under the title are included in the Pollutant Release and Transport Recording System and carry out their annual reporting gradually.

Following the publication of the PRTR By-law, the PRTR Guide and its annexes were updated in order to avoid confusion in the implementation for facilities, consultancy firms and DEUCC Provincial Directorates, the Provincial Directorates Data Quality Control Working Procedure was

created, seven announcements were prepared on general issues or specific to sectors, an online information meeting was held for environmental consultancy firms, environmental management units and relevant persons, and an answer list for all questions in the meeting attended by more than 600 people was created and shared on the National PRTR website http://www.kstk.gov.tr/.

The numbers related to the registration applications to the PRTR System of 65 industrial activities classified under 9 Sectors in the List of Activities in Annex-1 of the PRTR By-law are shared below.

Table 116 Number of PRTR System Registration Processes (MoEUCC, 2024)

Sector	Number of Facilities Accessed by PRTR*	Number of Registered Facilities
Energy	95 (as of December 4, 2021)	74
Metal	691 (as of December 4, 2021)	619
Mineral	710 (as of December 4, 2022)	Registration approval process is ongoing.
Chemical	410 (as of December 4, 2022)	Registration approval process is ongoing.
Waste and Wastewater Management	15 (as of December 4, 2023, will last for 6 months. - Ongoing.)	-
Paper and Wood	6 (as of December 4, 2023, will last for 6 months. - Ongoing.)	-
Intensive Livestock and Aquaculture	Applications will be accepted after December 4, 2024.	-
Food and Beverage	Applications will be accepted after December 4, 2024.	-
Other Activities (Textiles, Leather Tanning, Shipyard)	Applications will be accepted after December 4, 2024.	-
Total	**1927**	**693**

*If it is determined that the facilities to which access is provided are not subject to the PRTR By-law, access to these facilities is closed.

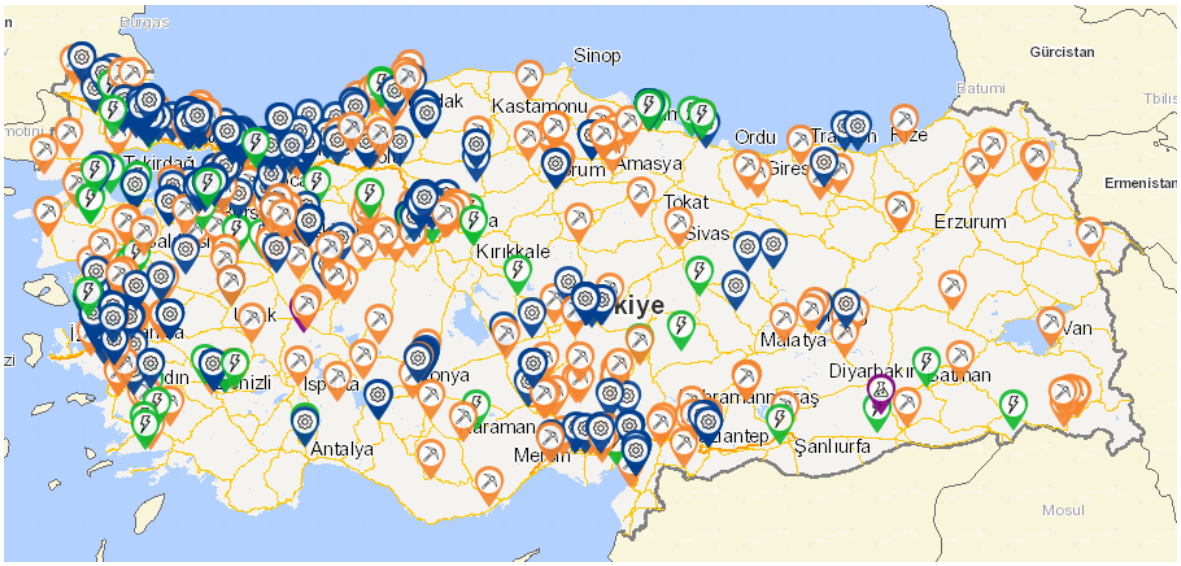
The number of activities carried out for the PRTR System in the approximately 2-year period between December 4, 2021 and December 31, 2023 is given in the table below.

Table 117 Number of PRTR System Activities (2021-2023) (MoEUCC, 2024)

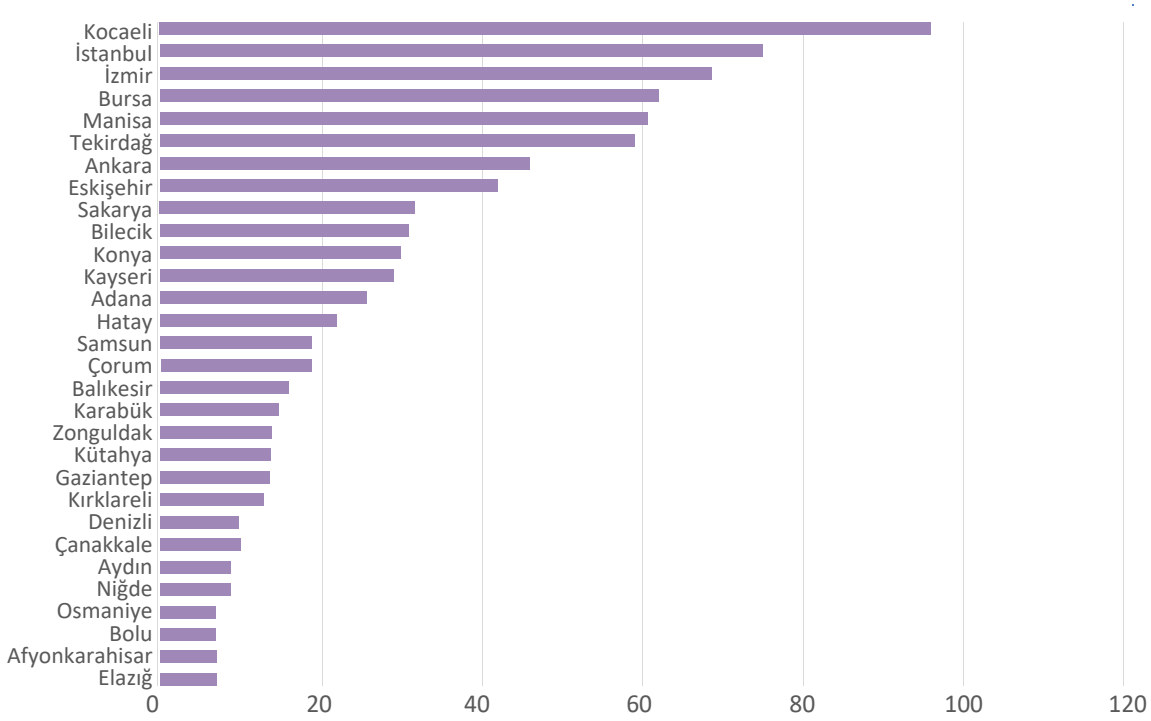
1.	Number of users registered in the PRTR System	**2,354**
2.	Number of facilities notified of decision by official letter or e-mail	**709**
3.	Number of questions answered via e-mail address kstk@csb.gov.tr	**1,864**

The geographical distribution of the facilities whose registration process to the PRTR System has been completed, as well as their distribution by province, industrial activities and sectors, are shown in the pictures and graphs below.

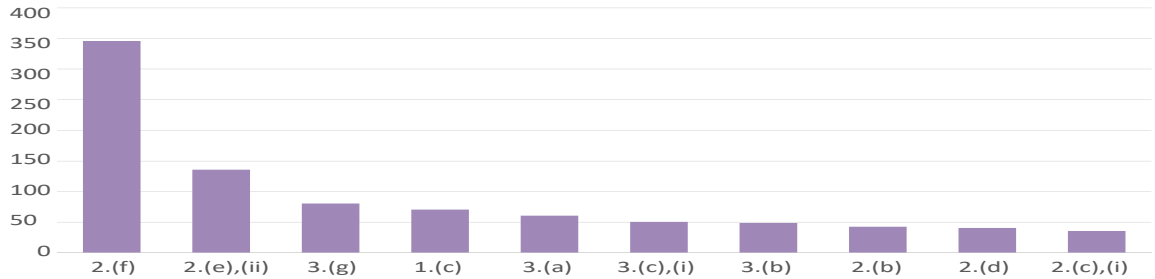
Map 37 Geographical Distribution of PRTR Facilities (MoEUCC, sim.csb.gov.tr, 2024)



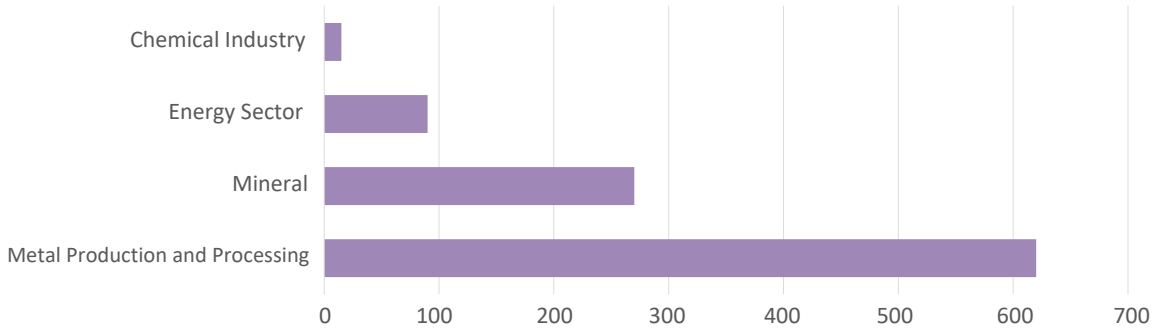
Graph 67 Distribution of PRTR Facilities by Provinces (MoEUCC, sim.csb.gov.tr, 2024)



Graph 68 Distribution of PRTR Facilities according to Industrial Activities (MoEUCC, sim.csb.gov.tr, 2024)



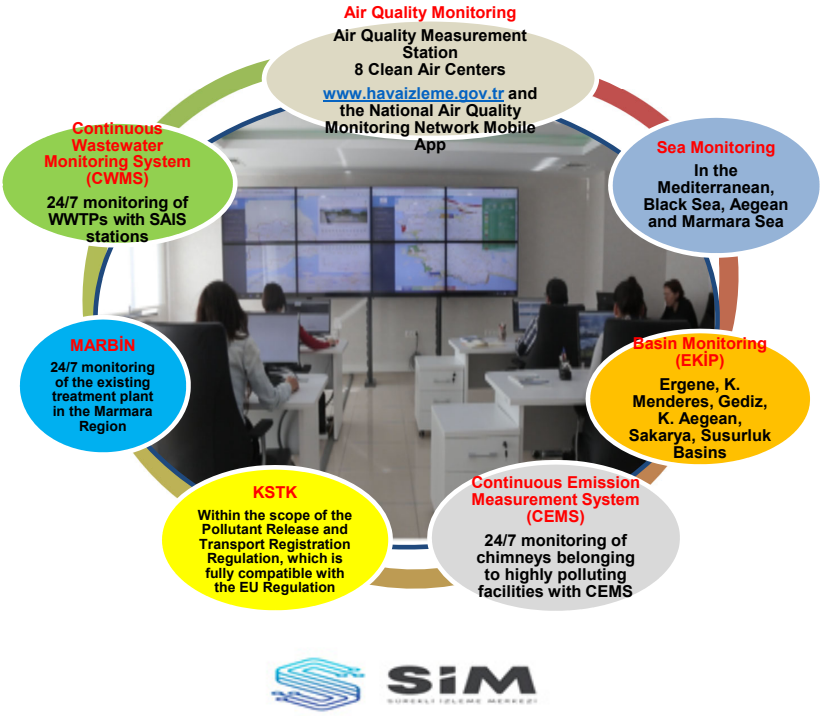
Graph 69 Sectoral Distribution of PRTR Facilities (MoEUCC, sim.csb.gov.tr, 2024)



H.12.7. Continuous Monitoring Centre

In order to ensure effective management of the receiving media monitoring data for basin, sea and air, and of the environmental monitoring data obtained from "Continuous Wastewater Monitoring Systems" (CWMS) and "Continuous Emission Measurement Systems" (CEMS), to establish early warning systems, to develop effective control mechanisms, to produce policies based on data obtained with appropriate reporting and evaluation tools, and to guide the decision-making mechanisms, financial support and incentives, a Continuous Monitoring Center was established in MoEUCC Gölbaşı Campus in 2018, and the https://sim.csb.gov.tr/ web page was created..

Figure 4 Continuous Monitoring Centre (SIM) (MoEUCC, sim.csb.gov.tr, 2024)



SİM Emission values of more than 720 stacks belonging to more than 360 industrial facilities are monitored instantly via CEMS stations, more than 480 wastewater treatment plants are monitored via CWMS stations, and air quality is monitored instantly via the National Air Quality Monitoring Network at more than 350 stations in 81 provinces. In addition, studies on pollution

detection and monitoring in basins are effectively managed with the Domestic and Industrial Pollution Monitoring Program EKİP, and data from the SİM platform is regularly reported to the relevant authorities. All our seas are monitored regularly at more than 450 stations with the Integrated Pollution Monitoring Program DEN-İZ in the Seas, and reported via SİM. The PRTR System, which includes information in accordance with the Pollutant Release and Transfer Register By-law, has been integrated with SİM. SİM, which converts data from facilities into inspection reports, enables the use of these reports in facility inspections.

Within the scope of data security and verification in SİM, SİS Web Service Platform, AEA Data Preparation and Reporting, SİS Data Verification Software and Data Verification Task Management Software, and SİM Data Bank modules have also been developed.

These data, which are included in SİM in the form of mapping and graphic applications, are presented to visitors as basin, sea, air quality, CWMS and CEMS reports with over 700 screens via sim.csb.gov.tr.

Interpolation, National air quality report, data comparison, data analysis, heatmap, wind reports, limit exceedance reports, statistical reports, dynamic graphics, regression analysis, histogram graphics, map query can be made via SİM, and reports can be received in various formats.

Image 11 Continuous Monitoring Center Web Page (MoEUCC, sim.csb.gov.tr, 2024)

SİM With SİM, the status of the receiving environments and facilities can be instantly queried, reports can be received based on province, district, basin, region and national basis, and pollution can be evaluated in an integrated manner. With at least 1,200 visitor entries per day, SİM platform currently manages 13,000 sensors, analyzers and devices, and offers a large database with the management of 50 billion data.

With SİM, effective, integrated and sustainable data management is provided, and effective environmental planning is guided by contributing to public and private sector reports, programs and projects such as sea, coastal, air and basin management plans, strategic plans, EIA Reports and Strategic Environmental Assessment Reports.

By meeting the reporting needs of Türkiye in the execution of international collaborations, the

obligations of the agreements and protocols to which Türkiye is a party are fulfilled. With early warning and remote triggering systems, access to control and monitoring activities that cannot be achieved even by assigning personnel to each facility is provided, and environmental legislation violations are detected instantly with 24/7 technological control. Mobile applications enable our citizens to access environmental data instantly wherever and whenever they are.

MoEUCC is working diligently to diagnose environmental problems with high-quality and reliable findings today and in the future, to share them with the public, and to determine environmental policies based on science and data using new generation information processing technologies.

H.12.8. Marmara Sea Integrated Modelling System (MARMOD PHASE II PROJECT)

Within the scope of the protocol signed with METU Institute of Marine Sciences on 02.04.2021, MARMOD PHASE II Project activities have been initiated. This project aims to transform the one-dimensional model developed in the first phase into a three-dimensional model with new data and observations and to set gradual reduction targets in land-based nutrient loads that will enable the good quality marine ecosystem to develop again in Marmara.

MARMOD Digital Twin

This three-dimensional hydrodynamic circulation-ecosystem model, which will analyze the entire Marmara Sea, will include the Straits and the Gulf of Izmit as open borders, and will be combined with a biogeochemistry model simulating primary production, oxygen consumption, nitrogen and phosphorus cycles, and then the sediment oxygen, nitrogen and phosphorus model will be integrated into the water column model and combined with the upper trophic level. In addition, a first version of the Marmara Sea Digital Twin was created in this context, including data, model results and scenarios. The project was completed by the end of 2023, and the project results were shared with stakeholders at the Project Closing Workshop held on December 13, 2023 at the METU Ankara Campus.

Studies have been initiated for MARMOD PHASE-III, which will cover the years 2024 and 2025, for the continuity of Digital Twin studies, which will be a decision support tool for different user groups.

H.12.9 Zero Waste Information System

Zero waste information system has been created to enter data, create inventory, monitor ongoing work, reduce paper waste, prepare reports, and carry out the zero waste document process. The users of the Zero Waste Information System are local governments, public institutions, educational institutions, health institutions, tourism facilities, ports, terminals, airports, fuel stations, chain markets, business centres and industrialists.

- Basic level certification interfaces have been created in the software and as of January 12, 2020, the certification process is carried out through the software system.
- Zero waste application data is obtained from the software system.

Legislative Studies: By-law on the Zero Waste, which was published in the Official Gazette dated July 12, 2019 and numbered 30829, includes By-laws regarding the establishment and implementation of the zero waste management system, what needs to be done to monitor the system, the conditions of the zero waste certificate and the document criteria. In this context, the Procedures and Principles Regarding the Establishment and Operation of Waste Bringing Centers and Zero Waste Applications were published on December 31, 2021.

The Waste Collectors Circular No. 2022/6 has been published regarding citizens who collect recyclable waste such as plastic, paper and metal, known to the public as "paper collectors" and who are not affiliated with any business. The Circular on "Waste Collectors" authorizes those who collect waste independently by registering them with the "Zero Waste Information System" and regulates their working system.

Preparation of Provincial Zero Waste Management System Plan

Zero Waste Management Plans for 81 Provinces have been prepared in order to determine the plans, programs, policies and targets regarding the Zero Waste Management System to be implemented by local administrations, buildings and campuses at the provincial level and to ensure that the established waste management processes are integrated within a strategic integrity at the local and national scale and are efficient and sustainable.

Municipal Zero Waste Studies

Many municipalities continue their efforts to establish a zero-waste management system in their service areas. In order to establish a zero waste management system in the municipality service area, at least two separate collection systems are established for the separate collection of plastic/paper/glass/metal and other wastes in the streets and avenues, waste centres are established where citizens can take their batteries, vegetable waste oil, textiles, medicines, electrical and electronic devices, and large-volume waste, and education awareness activities are carried out, and a document application is made through the zero waste information system.

In order to popularize zero waste practices and achieve our recycling goals, it is planned to reach more citizens and recycle more waste by establishing zero waste centres (such as Zero Waste Market, Zero Waste Point, Zero Waste Vehicle) in municipalities. In this direction, it is aimed to increase the Zero Waste Points by providing grants and technical support to municipalities.

Education Awareness Studies

Zero waste consultation meetings and in-service training were organized for our 81 provinces in order to inform the employees of our Provincial Directorates about zero waste implementation within the framework of the By-law, to share good practices, to provide guidance, to find regional solutions to problems and to monitor performance indicators.

Within the scope of the protocol signed with the collaboration of MoEUCC, Ministry of National Education and TEMA Foundation, the "Zero Waste Education Project" was launched and the aim of the project was to protect natural resources, to gain environmentally friendly consumption habits and to raise awareness of children on issues related to waste management.

Within the framework of the zero-waste By-law, trainings were organized for public institutions and organizations such as local administrations, educational institutions, etc. in order to popularize the zero-waste movement, to gain sustainable production and consumption and environmentally friendly consumption habits, and to create awareness. In addition, sector-based trainings were organized within the scope of cooperation with TOBB.

In addition, a cooperation protocol was signed with the Ministry of National Defense. Within the framework of the protocol, it is planned to organize a zero-waste training program aimed at more efficient use of resources and prevention of waste generation in line with sustainable development goals in order to inform and increase awareness of the personnel/privates/non-commissioned officers of the Ministry of National Defence.

Increasing Zero Waste Awareness and Consciousness

In order to achieve success in the dissemination of the zero-waste management approach, not only legislative studies but also the participation and education of different segments of society are very important. For this reason, our training and awareness studies continue intensively by MoEUCC for many segments of society and public institutions/organizations, especially municipalities, universities, educational institutions, accommodation facilities, muhtars, women, industrialists, etc. by MoEUCC. The trainings given by the target audiences are entered into the zero-waste information system.

WEBSITE and Social Media Studies

In order to popularize the Zero Waste practice and ensure that every segment of our people can be a part of this vision, informative, guiding and awareness-raising websites and social media posts should be created.

- Materials to be published on the Zero Waste Website have been prepared.
- Zero Waste Good Practice Examples implemented by municipalities are shared on the website.
- Posts are prepared and published daily on social media accounts to keep the project on the agenda, to be taken as an example, to become a standard of living and to convey information.

March 30 International Zero Waste Day

The Resolution No. 77/161 prepared by Türkiye at the Second Committee Meeting of the 77th Session of the UN General Assembly on promoting zero waste approaches to advance the 2030 Agenda for Sustainable Development was approved with the support of 105 countries. The resolution included matters regarding the declaration of the United Nations March 30 International "Zero Waste Day" and its celebration with activities aimed at raising awareness.

On the occasion of March 30 International Zero Waste Day, Mrs. Emine Erdoğan attended the Zero Waste Special Session at the UN General Assembly as a special guest of the United Nations (UN) Secretary General. In her speech, Emine Erdoğan mentioned the need for a just system based on the principle of fair distribution in climate and environmental issues in the world, and together with UN Secretary General Antonio Guterres, she addressed the participants at the

high-level event organized by the President of the 77th UN General Assembly on "zero waste", which was attended by 105 co-hosts.

Zero Waste Advisory Board

The promotion of a zero-waste approach within the scope of the 2030 Agenda for Sustainable Development has been decided by the United Nations (UN) General Assembly. In order to promote local and national zero-waste initiatives through sharing best practices and success stories, the UN Environment Programme and the UN Human Settlements Programme (UN-Habitat) discussed and decided to establish an advisory board consisting of distinguished individuals based on voluntary contributions, knowledge, experience and expertise, in consultation with member countries for a period of 3 years, taking into account gender balance and equitable geographical representation. The Zero Waste Advisory Board, established as of 12 April 2023, will be chaired by Mrs. Emine Erdoğan. UN Under-Secretary-General Guy Bernard Ryder has been appointed as responsible for policy.

The Advisory Board, consisting of distinguished people in sustainability and waste management, will share the stories of successful national and local zero waste initiatives, and governments will be able to save money within the scope of zero waste targets and the circular economy model, and global collaborations will be established for this purpose. The fact that Mrs. Emine Erdoğan will be the pioneer in transforming the Zero Waste Movement, which has made a great impact locally, into a global awareness, is an important breakthrough for both Türkiye, which has made significant progress in establishing the Zero Waste System, and the world in general, which is facing a difficult test in the fight against climate change.

Zero Waste in G20

Within the scope of the G20 meetings, of which India is the presidency, the Resolution No. UN77/161 on the promotion of zero waste initiatives was referred to in the final document of the G20 Environment and Climate Ministers Meeting and was unanimously accepted by all countries. Zero Waste was emphasized by our President Recep Tayyip Erdoğan in his statements after the G20 Leaders Summit held in New Delhi, the capital of India, in September 2023.

Zero Waste at the 78th UN General Assembly

President Recep Tayyip Erdoğan touched upon the Zero Waste Movement in his speech at the 78th United Nations (UN) General Assembly in New York, USA. Stating that the Zero Waste Movement initiated in Türkiye has been taken to a global level with the decision accepted by 105 countries in the United Nations, President Erdoğan signed the Global Zero Waste Goodwill Declaration at the Türkiye. Stating that our Zero Waste targets will make significant contributions to the fight against climate change and sustainable development efforts, President Erdoğan invited all countries, international institutions and civil society organizations to support the Zero Waste Movement.

October 31st World Cities Day

Celebrated in a different city every year by the United Nations Human Settlements Programme UN-Habitat, this year's celebrations were hosted by Türkiye and the "World Cities Day" program was organized in Istanbul. The event was attended by the wife of our President Recep Tayyip Erdoğan, Mrs. Emine Erdoğan, UN Habitat Executive Director Maimunah Mohd Sharif, Minister of

CCI, high-level representatives from Türkiye and other countries, representatives of civil society organizations and business people.

The event featured a series of panels and conferences addressing topics such as zero waste, urban transformation, reducing the effects of climate change, sustainable transportation and infrastructure, as well as various events to raise awareness about zero waste.

The First Official Meeting of the UN Zero Waste Advisory Board

The first official meeting of the UN Zero Waste Advisory Board, established by the United Nations (UN) General Assembly to promote local and national zero waste initiatives through the sharing of best practices and success stories, was held in Istanbul on November 1, 2023.

The UN Zero Waste Advisory Board, chaired by President Recep Tayyip Erdoğan's wife, Mrs. Emine Erdoğan, met for the first official face-to-face meeting at the Vahdettin Mansion following its first online meeting on July 27. The meeting was moderated by Maimunah Mohd Sharif, Executive Director of the UN Human Settlements Program (UN-Habitat). At the meeting, the board members signed the "Global Zero Waste Goodwill Declaration", which was opened to international individual signatures to ensure participation in the Global Zero Waste Movement led by Mrs. Emine Erdoğan.

References

Ministry of Environment, Urbanization and Climate Change

I. ENVIRONMENTAL PROTECTION EXPENDITURES AND LIABILITY INSURANCE

I.1. Environmental Protection Expenditures

Environmental protection expenditures increased by 111.4% in 2022 compared to the previous year, reaching a total of 140.3 billion TL. 70.3% of environmental protection expenditures were made by financial and non-financial companies, 26.1% by non-profit organizations serving the general government and households, and 3.6% by households.

60.9% of environmental protection expenditures were waste management services, 25.3% by wastewater management services, 4.2% by protection of ambient air and climate, 4% by protection of biodiversity and landscape, 2.4% by protection and improvement of quality of soil, groundwater and surface water, and 3.3% by other environmental protection issues.

84.7% of environmental protection investment expenditures totaling 32.7 billion TRY were made by financial and non-financial companies, and 15.3% by non-profit organizations serving the general government and households.

The ratio of environmental protection expenditures to gross domestic product was 0.91% in 2021 and 0.93% in 2022.

Table 118 Environmental Protection expenditures (2019-2023) (TURKSTAT, 2024)

Year	Total Expenditure (billion TRY)	Change Compared to the Previous Year (%)	Investment Expenditure (billion TRY)	Share of Investment Expenditure in Total Expenditure (%)
2019(r)	38,293(r)	1.2	6.4	13.6
2020(r)	41,842	8.9	7.8	14.5
2021(r)	66,361	59.2	13.6	14.9
2022	140,256	111.4	32.7	15.3

(r) Revised.

I.2. Liability Insurance in the Field of Environment

According to Article 13 of the Environmental Law, those who are involved in the production, sale, storage, use and transportation of hazardous chemicals and the collection, transportation, temporary and interim storage, recovery, reuse and disposal of hazardous waste are required to have hazardous chemical and hazardous waste liability insurance against damages that may be incurred to third parties due to an accident that may occur due to their professional activities. The concept of risk also brings with it the concept of insurance, which requires the assurance of risk. In this sense, environmental liability insurance is used today as a tool in the management of environmental risks. Organizations with the potential to pollute the environment can insure their possible environmental risks and the damages that third parties may suffer due to damage to the environment.

Within the scope of environmental legislation, Coastal Facilities Marine Pollution Compulsory Liability Insurance General Conditions entered into force on 01 July 2007, Hazardous Substances and Hazardous Waste Compulsory Liability Insurance General Conditions entered into force on 11 March 2010, and Environmental Pollution Liability Insurance General Conditions entered into force on 01 September 2011.

With the Coastal Facilities Marine Pollution Compulsory Liability Insurance, the cleaning costs caused by pollution or pollution risk in the maritime jurisdiction areas consisting of Türkiye's inland waters, territorial waters, continental shelf and exclusive economic zone as a result of an incident originating from coastal facilities, the costs to be incurred for the transportation of collected waste, damages resulting from injuries and deaths of third parties and damages to private property are compensated. The number of policies issued for the said insurance in 2023 was 458 and the premium production was realized as 16,977,637 TRY.

Table 119 Coastal Facilities Marine Pollution Compulsory Financial Liability Insurance (Insurance and Private Pension Regulation and Supervision Authority, 2024)

	2020	2021	2022	2023
Number of Policies	512	411	429	458
Premium Amount (TRY)	8,812,852	9,976,566	15,226,110	16,977,637

With Environmental Pollution Liability Insurance, compensation claims that the insured is legally obliged to pay due to sudden and unexpected pollution or pollution risk in one, several or all of the soil, underground waters, inland waters, seas and air, depending on the scope of the contract, are secured within the framework of environmental legislation. The number of policies issued for the said insurance in 2023 was 2,481 and the premium production was 21,883,984 TRY.

Table 120 Environmental Pollution Liability Insurance (Insurance and Private Pension Regulation and Supervision Authority, 2024)

	2020	2021	2022	2023
Number of Policies	87	89	173	2.481
Premium Amount (TRY)	2,000,032	3,316,343	19,629,567	21,883,984

Hazardous Materials and Hazardous Waste Compulsory Liability Insurance covers bodily harm and property damage that may result from professional activities involving hazardous materials. In 2023, 117,908 policies were issued for this insurance, with premium production totaling 287,968,733 TL.

Table 121 Compulsory Liability Insurance for Hazardous Materials and Hazardous Waste (Insurance and Private Pension Regulation and Supervision Authority, 2024)

	2020	2021	2022	2023
Number of Policies	82,084	99,399	105,029	117,908
Premium Amount (TRY)	86,071,665	93,939,621	135,818,113	287,968,733

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Turkish Statistical Institute

Insurance and Private Pension Regulation and Supervision Authority

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Environmental Inventory and Information Management Department

State of Environment Reporting Branch Directorate

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