



KONYA METROPOLITAN MUNICIPALITY

KONYA SUSTAINABLE ENERGY AND CLIMATE ACTION PLAN



2024

SECAP

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2024



KONYA
METROPOLITAN
MUNICIPALITY



PREFACE OF THE MAYOR



Climate change is one of the most significant and complex environmental issues of our time, and its effects are being felt on a worldwide scale. This global problem has profound and long-term effects on human communities as well as on ecosystems and natural processes. Cities are the places where the most obvious and dramatic consequences of these changes can be observed. Cities have become both the main drivers of climate change and the most affected places to live due to the rapid pace of modern urbanization, rising carbon emissions since the industrial revolution and unsustainable consumption patterns.

Cities are the main drivers of climate change. But they are also in an important position as centers with the potential to cope with its effects. Although cities are major consumers of energy and the main source of greenhouse gas emissions, they can also act as hubs for innovative solutions and sustainable practices. Cities need to adopt comprehensive and integrated approaches to be successful in combating climate change. The management of these changes is a concerted effort on the part of individuals, communities, governments and international organizations.

We need innovative, nature-friendly technological applications rather than any application that is man-made and harmful to nature in this so-called human age. The scientific world is making a great effort to achieve this goal. All developed and developing countries in the world are focusing on these issues, and each country is allocating resources to studies on emission reduction and adaptation.

The Paris Climate Agreement, which aims to make a joint global effort to limit global warming, combat the effects of climate change and reduce greenhouse gas emissions, was signed by 196 countries and the European Union and ratified by 190 countries. This international agreement came into force in 2016. Our country has announced that it will reduce its emissions by 41 per cent by 2030 and reach net-zero emissions by 2053.

As local governments, we are working to protect our cities from the profound effects of climate change. We want to leave a much better world for future generations. We are defining our steps, our strategies and the road map to be taken in the fight against climate change.

We see Konya as a trust to be left to future generations and we are moving towards the future in peace with our nature.

Uğur İbrahim Altay

Mayor of Konya Metropolitan Municipality



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ABBREVIATIONS

Abbreviation	Explanation
AFAD	Disaster and Emergency Management Presidency
C	Celsius (Celcius)
CoM	Covenant of Mayors
EMRA	Energy Market Regulatory Authority
SPP	Solar Power Plant
GHG	Greenhouse gas
GPC	Global Protocol for Community
KWh	Kilo Watt hours
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
MILES	Kilometer
LPG	Liquefied Petroleum Gas
GDM	General Directorate of Meteorology
MW	Megawatt
OECD	Organization for Economic Co-operation and Development
OIZ	Organized Industrial Zone
RCP	Representative Concentration Pathway
WPP	Wind Power Plant
SEGE	Socio-Economic Development Index
SECAP	Sustainable Energy and Climate Action Plan
NGO	Non-Governmental Organization
SUMP	Sustainable Urban Mobility Plan
TURKSTAT	Turkish Statistical Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization

INTRODUCTION





1. INTRODUCTION

Climate change is one of the most significant global issues facing humanity today. It's caused by the overuse of fossil fuels, changes in land use and deforestation since the industrial revolution. It is causing a range of impacts on ecosystems, economic sectors and human health around the world. The IPCC report emphasizes that even if greenhouse gas emissions could be minimized today, we would be facing the inevitable impacts of climate change for a long time to come.

It is well known that global warming can be prevented by acting together to combat climate change, and this requires action by every individual, every community, and every country. Cities, which often set more ambitious targets than national governments, are seen as the drivers of sustainable development. Until recently, cities have focused much of their climate efforts on reducing greenhouse gas emissions. However, the increasing frequency of meteorological disasters suggests that cities will be dealing with the adverse effects of climate change for a long time to come.

Designed as a voluntary commitment by local governments to go beyond the European Union's climate and energy goals, the Covenant of Mayors was created to encourage cities and towns to reduce greenhouse gas emissions, improve energy efficiency, and increase the use of renewable energy. It identifies the impacts of climate change on cities and provides a roadmap for local governments.

CLIMATE CHANGE EFFECTS IN KONYA

Konya is the largest agricultural city in Türkiye. It is also one of the provinces most affected by climate change. Konya, which plays an important role in agriculture, is threatened by desertification due to climate change and irresponsible water use. Agricultural activities, which are characterized by excessive use of groundwater, have a negative impact on surface and groundwater resources in addition to the arid climate. This situation leads to a decrease in soil fertility, loss of biodiversity and increased risks such as sinkholes.

Scenarios of declining wellbeing of those dependent on agriculture will become a complex problem affecting different socio-economic strata as the effects of climate change intensify. Climate projections and analyses show that climate change will bring hazards such as drought, decreased precipitation and increased heat waves to Konya province. All districts of Konya are different from each other due to different social, economic and environmental conditions.

Konya Metropolitan Municipality signed the Mayors' Agreement on October 14, 2022. The aim of the agreement is to determine the appropriate mitigation and adaptation strategies for the region in the fight against climate change and to implement measures. With this contract, studies will be carried out on the strategies that Konya Metropolitan Municipality aims to achieve by 2030 under the headings of climate change, greenhouse gas management and adaptation to climate change. Konya Metropolitan Municipality aims to develop different greenhouse gas reduction strategies in the context of climate change. These strategies aim to implement sustainable policies and practices at the local level, control emissions, and strengthen climate change and adaptation processes. These studies represent an important step in contributing to the general well-being of society by promoting environmental sustainability. In this context, an integrated approach has been adopted in line with the fight against climate change and the objectives of sustainable development, with the aim of contributing to the development of local policies.



The contribution of not only central governments, but also regional public administrations and local authorities directly affected by climate change (agricultural drought, water scarcity, food crisis) has become indispensable in the context of climate change risk management.

This report consists of 5 sections;

In the first part, the SECAP methodology is explained,

2.Konya Province Greenhouse Gas Emission Inventory in the Department information,

3.The section includes mitigation actions and targets based on the results in the Inventory report,

4.In the episode, the city encounters climate change. Problems Compliance actions to find solutions and strategies;

5.In the section, Konya Metropolitan Municipality Exemplary projects for greenhouse gas emission migration actions and climate change adaptation actions are presented.

1.1 Sustainable Energy and Climate Action Plan (SECAP) Methodology

The SECAP (Sustainable Energy and Climate Action Plan) process has several stages. First, there has been a decision of the Metropolitan Municipality of Konya on the start of the SECAP project. Then, the Greenhouse Gas Emission Inventory was prepared and the actions needed to be taken to reduce GHG emissions were identified. A risk and vulnerability assessment was carried out. Finally, the report was completed with the monitoring and reporting process.

Preparation of Greenhouse Gas Inventory: Greenhouse gas resource consumption data in Konya Province in 2022 Collection and determination of most greenhouse gas emission sources of the city

Establishment of Greenhouse Gas Reduction Actions: This is the establishment of actions in the greenhouse gas reduction section of the Sustainable Energy and Climate Action Plan prepared for Konya in the areas of buildings and energy, transportation, waste and wastewater management, and agriculture.

Risk and vulnerability assessment: This is the assessment of the risks and impacts of hot and cold waves, excessive precipitation, flooding, landslides, water shortage and aridity, wildfires and contagious diseases for Konya Province.

Design and implementation of actions: It is the identification of climate adaptation actions according to the risk and vulnerability assessment and the implementation of studies in priority order.

Monitoring and Reporting: It is the monitoring and reporting of the changes in the greenhouse gas resources and energy consumption and the results of the adaptation studies according to the defined base year.



1.2 About Konya

Konya is a historically and culturally rich city in the Central Anatolian region of Türkiye. Konya, one of the oldest settlements in Anatolia, has been the home of the Hittites, Phrygians, Roman and Byzantine, Great Seljuk and Anatolian Seljuk states throughout history. There are traces of history in every part of the city as it was the capital of the Anatolian Seljuk State for many years.

Konya Metropolitan Municipality, which was founded in 1875, was given the status of a metropolitan municipality by Law No. 3399 of 1987, and the boundaries of the metropolitan municipality became the boundaries of the province by Law No. 6360 of 2014.

Konya is the largest province of the country with an area of approximately 41,000 sq. km. Konya, which is located between the 36° 41' and 39° 16' north parallels and the 31° 14' and 34° 26' east meridians in terms of its geographical coordinates, has a length of approximately 281 km in the east-west direction. Konya is surrounded by Ankara from the north, Isparta, Afyonkarahisar, Eskişehir from the west, İçel, Karaman, Antalya from the south, Niğde and Aksaray from the east and has an average altitude of 1,016 meters. The economic and socio-cultural effects of Konya's strategic geographical location are significant.

Konya has a population of 2,296,347. This is 2.7% of the total population of Türkiye. Its population density is 59 people per square meter, and it ranks 6th among the 81 provinces of Turkey. The per capita gross domestic product of the province is 140,328 TL (\$8,467). There are more people living in Turkey than in more than 50 countries of the world.

There are 3 central districts and 28 provincial districts. Selçuklu, which is the central region, is the largest region in terms of population and Yalıhüyük is the smallest region. The number of males living in the province is 1,141,206 and the number of females is 1,155,141. The central districts of Karatay, Meram and Selçuklu are among the main districts which are prominent in the administrative structure of Konya.

Figure 1 Map of Konya Province

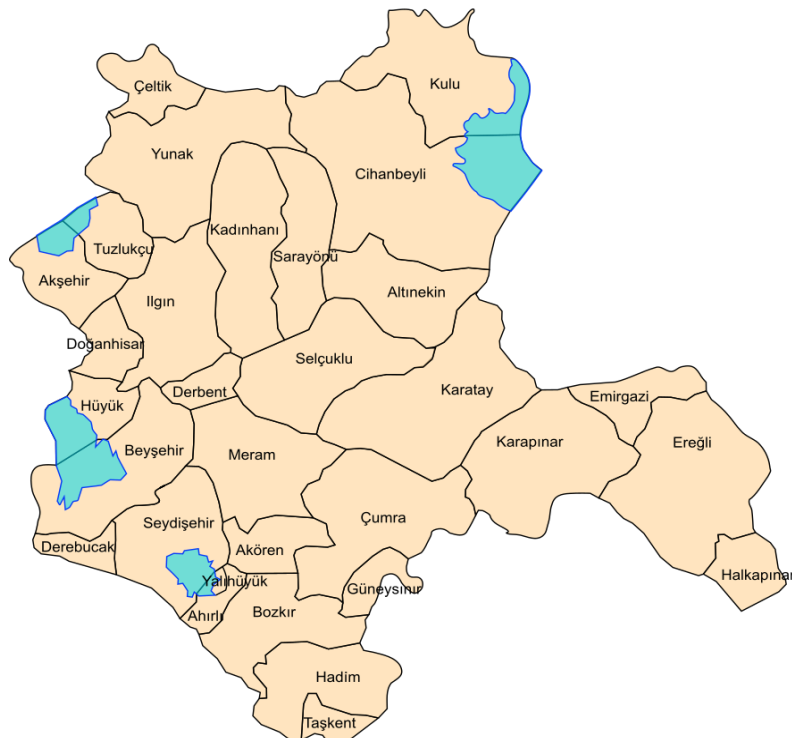
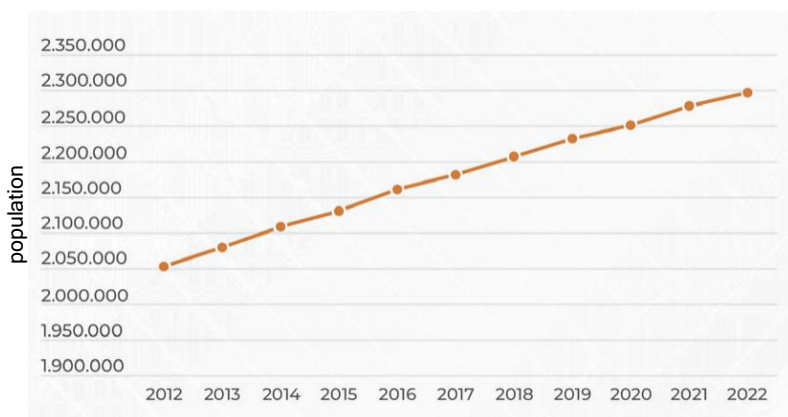


Table 1 Population of Konya Province by Districts

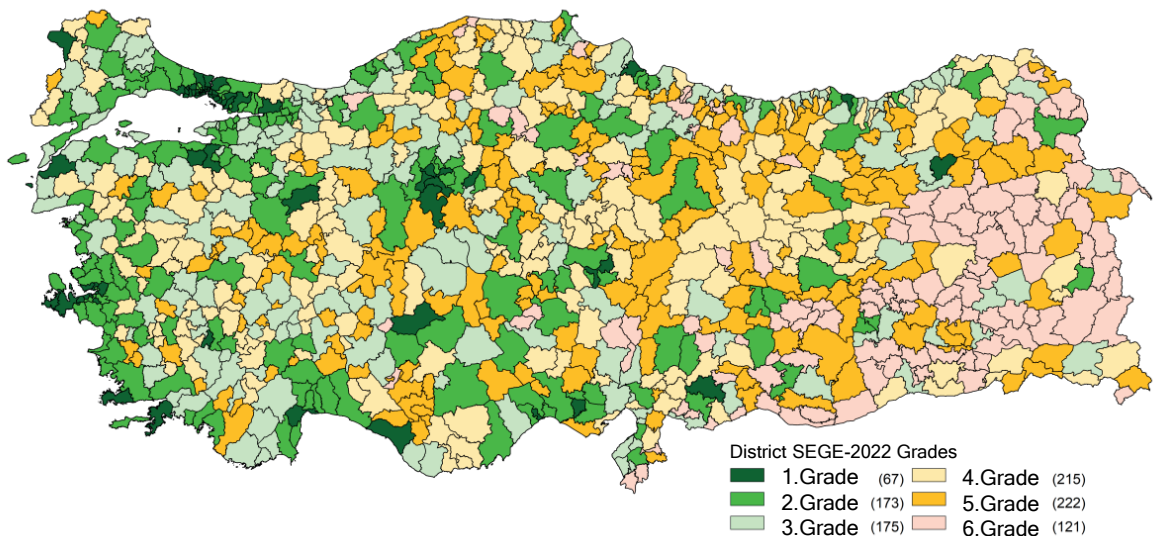
Konya Population in 2022		
Sequence No	District Name	Population (Person)
1	Selçuklu	690.667
2	Karatay	370.927
3	Meram	348.325
4	Ereğli	150.978
5	Akşehir	93.965
6	Beyşehir	77.690
7	Çumra	67.690
8	Seydişehir	65.465
9	Ilgın	53.489
10	Kulu	51.612
12	Karapınar	50.323
11	Cihanbeyli	50.677
13	Kadınhanı	31.206
14	Sarayönü	27.771
15	Bozkır	25.307
16	Yunak	20.991
17	Hüyük	15.144
19	Altınekin	14.289
18	Doğanhisar	14.812
20	Hadim	10.999
21	Çeltik	9.429
22	Güneysınır	9.266
23	Emirgazi	7.724
27	Taşkent	5.690
24	Tuzlukçu	6.062
26	Akören	5.768
25	Derebucak	5.836
28	Ahırlı	4.574
30	Halkapınar	3.909
29	Derbent	4.052
31	Yalıhüyük	1.710
	Total	2.296.347

Figure 2: Population of Konya by Years (2012-2022)

The results of the Socio-Economic Development Ranking Surveys (SEGE) are presented in the table. It's an analytical study carried out to monitor the socio-economic development of our country, to improve the quality of life, to provide access to all segments and to measure the impact of the activities carried out within the framework of achieving the goal of balanced development.

Table 2 Konya Province Socio-Economic Development Index

KONYA SOCIO-ECONOMIC DEVELOPMENT INDEX RESULTS			
District Name	Overall Ranking	Score	Level
Selçuklu	21	2,562	1
Karatay	82	1,481	2
Meram	124	1,053	2
Ereğli	230	0,453	2
Akşehir	243	0,372	3
Beyşehir	244	0,369	3
Seydişehir	271	0,228	3
Ilgın	383	-0,121	3
Kulu	385	-0,125	3
Cihanbeyli	404	-0,159	3
Karapınar	405	-0,161	3
Çumra	455	-0,233	4
Sarayönü	543	-0,386	4
Hüyük	637	-0,506	5
Kadınhanı	655	-0,526	5
Çeltik	675	-0,544	5
Yunak	680	-0,559	5
Bozkır	692	-0,574	5
Doğanhisar	729	-0,616	5
Derebucak	733	-0,621	5
Güneysinir	735	-0,621	5
Altnekin	751	-0,641	5
Akören	766	-0,672	5
Hadim	771	-0,681	5
Yalıhüyük	772	-0,682	5
Tuzlukçu	774	-0,686	5
Taşkent	787	-0,71	5
Emirgazi	803	-0,733	5
Halkapınar	819	-0,765	5
Ahırli	881	-0,907	6
Derbent	891	-0,936	6

Figure 3 District SEGE-2022 Grades

Climate

Konya, which is under the influence of a continental climate with dry and hot summers and cold and snowy winters, has been under the influence of a continental climate for many years. Its average temperature is 11.9 °C, with an average high of 18.3 °C and an average low of 6 °C.

Table 3 Konya Province Climate

KONYA	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL
Average Temperature (°C)	-0,3	1,3	6,0	10,9	15,9	20,5	24,1	24,0	19,4	13,4	6,2	1,5	11,9
Average Maximum Temperature (°C)	4,6	6,9	12,5	17,6	22,8	27,4	31,0	30,9	26,7	20,4	12,7	6,3	18,3
Average Minimum Temperature (°C)	3,9	3,3	0,2	4,4	9,0	13,6	17,1	17,2	12,3	7,0	0,8	2,2	6,0
Average Sunshine Time (hours)	3,4	4,9	6,3	7,2	8,7	10,3	11,1	10,8	9,7	7,6	5,3	3,3	7,4
Average Number of Rainy Days (°C)	10,70	8,53	8,80	9,53	11,23	7,17	2,33	1,90	3,80	6,30	6,37	9,87	85,90
Average Monthly Total Rainfall (mm)	35,9	23,1	27,4	34,2	38,2	27,8	6,5	6,5	15,9	29,7	34,5	45,6	325,3

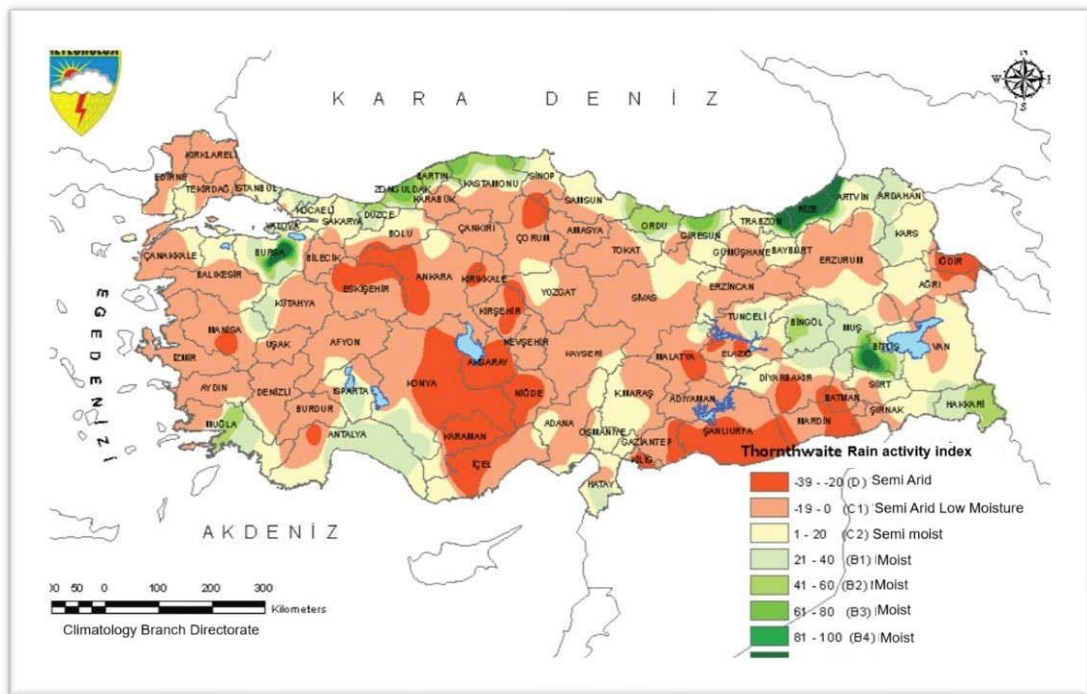


Table 4 Konya Climate Classification

Aydeniz Climate Classification

Drought coefficient 1,81 Climate Type Very Dry

Eriç Climate Classification

Precipitation activity index 17,45 Climate Type Semi Arid

DeMartonne Climate Classification

Drought coefficient 8,28 Climate Type Semi Arid

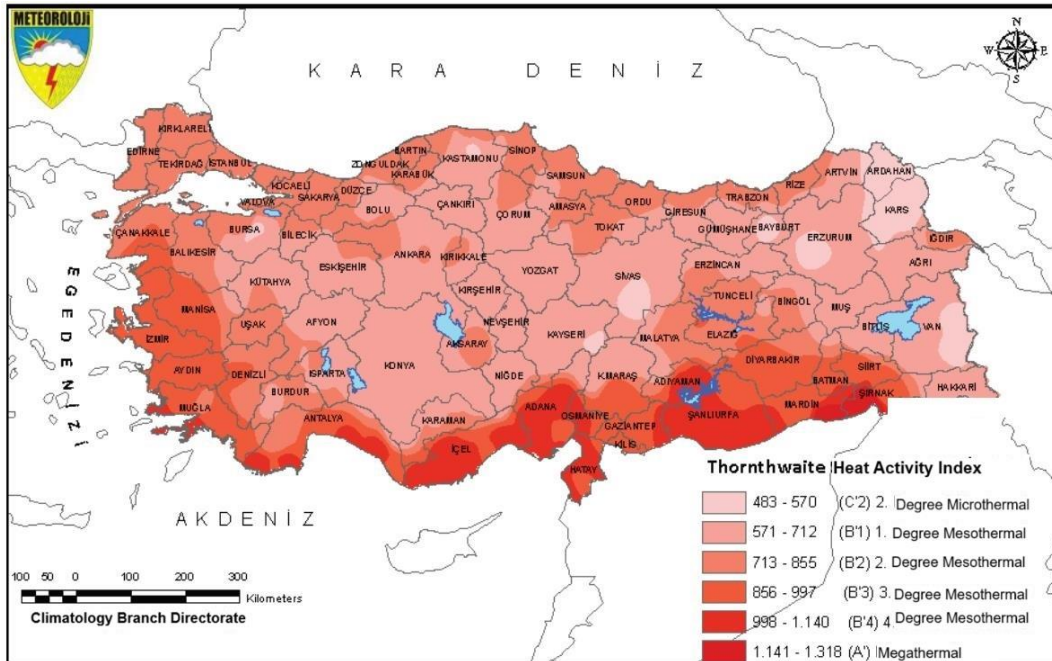
Trewartha Climate Classification (According to the universal temperature scale)

Winter season climate type 8,28 Cold winter, (-0,4) Summer season climate Type Hot summer (23,50)

Thornthwaite Climate Classification

Climate Classification D,B'1,d,b'2 D: Semi Arid 17,45 B'1: 1.Degree mesothermal d: not much or little water b'2: Summer evaporation rate : % 56,5

Figure 5 Temperature Efficiency Index



Education

Konya will have 507 kindergartens, 717 primary schools, 565 secondary schools and 371 high schools by 2022. There are 162,049 students in primary education, 153,862 students in secondary education, 192,095 students in higher education, 73,233 students in secondary education and the number of students per classroom is 23 in primary education, 21 in secondary education and 18 in vocational and technical secondary education. There are a total of 5 higher education institutions, 3 of which are state. There are 120,829 students in higher education. According to the data of 2022, Konya is in the eighth place in Türkiye with the number of 282,237 graduates of universities and faculties. It is in the sixth place with 36,669 graduates of M.A. degree and in the fourth place with 6,467 graduates of Ph.D. degree.

Agriculture and Livestock

Konya, which is considered as agricultural capital of our country, has large area of agricultural land, where wheat, barley, sugar beet, red bean, potato, sunflower, poppy, maize are produced. Konya area with the most of our country-wide terrain presence 2022 In On an area of 1,870,100 hectares agriculture has been done. Konya's agricultural area is Türkiye's sum of agricultural area %7.84's It is constituted. Barley production %30'u, pea production %43, sugar beet production %32, carrot production %60, tulip production %99'u, sum of grain production %14,1is made in Konya.

Türkiye's sheep and cattle animal fowl meat with, milk and eggs Significant contributions to the output of Konya, which has It is wide meadows and vegetative productive land with It makes significant contributions to the development of animal husbandry. Bovine animal in Türkiye first Ovine animal in the number of is the second is in the location. Türkiye's egg chicken's %8meets the. Animal The importance of production A sub-branch one in the beekeeping sector, honey production in Türkiye 23. Order hive in the presence of 20. Next, beekeeping made by in the number of enterprises is 24. Order location has received.

Industry

Konya; has 13 organized industrial zones, 9 of which are active, 17 small industrial zones supported by the Ministry, 28 small industrial zones in the districts of Konya province and 67 small and private industrial zones in the city center, which carries the employment and industrial burden of the Turkish economy. It is one of the provinces.



The most important industries in the industrial zone are; automobile spare parts industry, machinery industry, agricultural machinery and equipment industry, plastics industry, furniture and wood industry, metal industry, foundry industry, food industry, construction materials, packaging industry. While 187,294 people were employed in Konya Industries There are 20,469 active workplaces. Konya is exporting to more than 180 countries, especially to Russia, Iraq, Germany, USA and Italy.

Culture and Tourism

Konya has an important place in the history of the world. It has been the cradle of many different civilizations from different cultures. There are also important centers of Christianity in Konya, which is home to one of the oldest settlements in the world.



Konya, which is one of the most important centers of religious tourism, is an important tourist point. It has world famous personalities such as Hz. Mevlana and Nasrettin Hodja. There is a capacity of more than 14,000 beds in 166 hotels, 8 of which are 5-star hotels in our city. In addition, there are 172 tourist travel agencies with Tourism Business Certificate. There are the Regional Manuscript Library and Yusufaga Manuscript Library as manuscript libraries that preserve our national culture. There are a total of 91,621 books in these libraries, of which 18,118 are manuscripts and 73,503 are printed books. Çatalhöyük, a neo-cultural city located within the borders of Konya, has been included in the UNESCO list of World Cultural Heritage Sites. In turn, 5 centers within the borders of Konya province (Eşrefoğlu Mosque, Konya - the capital of the Seljuk Turks, Anatolian Seljuk Madrasahs, Eflatunpınar: Hittite Water Monument and the Salt Lake Special Environmental Protection Area) are on the Tentative List of the World Cultural Heritage Sites.

Mining

Our province is one of the important provinces of the Central Anatolia Region in terms of mineral resources and is considered rich in mineral deposits. Türkiye's richest bauxite deposits are near Seydişehir. Our city is the leader in salt production. In addition, mercury, magnesite, lignite and barite are also important minerals. Türkiye's richest bauxite reserves and the only aluminum factory are located in Seydişehir district. In addition, there are rich marble deposits in Akşehir and Beyşehir regions, and the marble deposits in Beyşehir district offer an important potential.



Energy

Konya province is one of the leading provinces in Türkiye in terms of electricity generation. It is at the forefront of unlicensed electricity generation and installed power. With an installed capacity of 644.13 MWh of unlicensed electricity generation, 7.46% of the capacity in Türkiye is in Konya. With 1,109,329.09 MWh of unlicensed electricity generation, 9.05% of the capacity in Türkiye is in Konya. The installed capacity of licensed electricity generation is 1598.58 MWh and the licensed electricity generation amount is 3,188.44 GWh. In total, the amount of electricity generation in 2022 is 4,297,769.09 MW. Konya's total electricity consumption is 7,798,063.15MW. The ratio of total electricity consumption in Konya from renewable energy sources was 55.11%



GREENHOUSE GAS EMISSION INVENTORY



2. GREENHOUSE GAS EMISSION INVENTORY

2.1 Greenhouse Gas Emission Inventory Calculation Methodology

The GHG Protocol allows local governments to measure and report their greenhouse gas emissions in a systematic way and is the most widely accepted international framework for greenhouse gas inventories. In addition, the Covenant of Mayors allows local governments to develop mitigation action plans tailored to their specific circumstances. Municipalities that have successfully implemented energy and climate change policies in the past will have the opportunity to develop more effective mitigation strategies as part of this process. The Metropolitan Municipality of Konya has prepared a comprehensive greenhouse gas inventory based on the data for the year 2022 to achieve the targets it has committed to within the framework of the Covenant of Mayors. This inventory has been prepared with detailed analyses of energy consumption and emission sources. It contributes to the evaluation of the effectiveness of the municipality's climate policy and strategic decisions for sustainable development goals.

This document plays an important role in policy development by providing an understanding of the environmental impact of the city's energy consumption and sustainable energy.

The base year should be determined to explain the city's current situation regarding energy and climate change. The Base Year is the starting point from which the SECAP process gets started. The base year is the starting point for the SECAP process, which aims to clearly show 'where we are', to establish targets, to develop a suitable action plan and to proceed to monitoring. The Metropolitan Municipality of Konya has chosen the year 2022 as the base year.

Scope

Inventory studies of GHG emissions in sectors such as residential/building, industry, agriculture, aviation, transportation, waste and wastewater have been conducted within the boundaries of Konya Metropolitan Municipality. These inventory studies include standard and generally accepted definitions of greenhouse gases and their formation processes. GHG inventory boundaries include two main components: organizational and operational boundaries.

The organizational boundary includes a definition of the area that is part of an organization. This helps an organization to determine which areas are to be included in the greenhouse gas inventory and which areas are to be excluded from the inventory. Operational boundaries ensure that all GHG emissions controlled by an organization and resulting from its operational activities are accounted for. This policy guides the process of monitoring and reporting GHG emissions from the organization's activities, enabling the organization to make strategic decisions to minimize GHG emissions and achieve its sustainability goals.

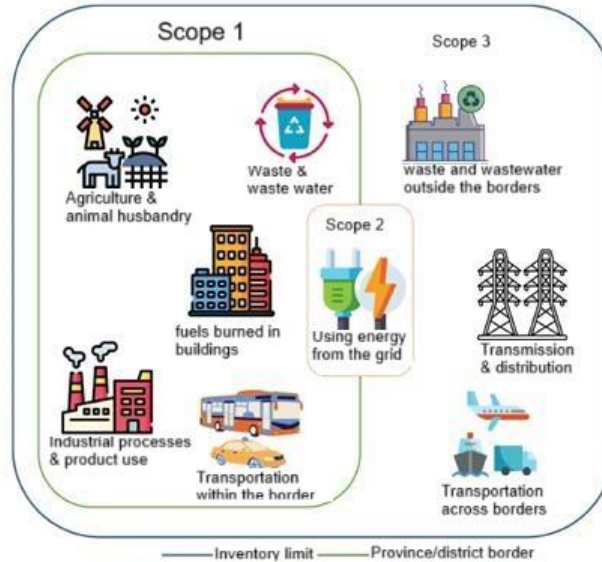
Data collection is an important step in GHG inventory studies. It requires resources and methodology. As part of this process, it is necessary to collect and analyze the required data from a variety of sources. The collected data is used to calculate greenhouse gas emissions. This is done by associating the data with the identified emission factors. Emission factors refer to the amount of greenhouse gases that will be released into the atmosphere because of a particular activity or process. These factors are typically numerical values that represent the amount of gas released per unit. Therefore, the determination of the emission factors that are associated with the collected data is critical to make accurate and reliable emissions calculations. Finally, the collected data and determined emission factors are used in a manner consistent with the applied emissions calculation methodology to determine the amount of emissions.

This process is important for creating accurate and reliable GHG inventories and provides an effective basis for organizations to monitor, report and reduce their emissions. As a result, organizations can achieve their sustainability goals by making strategic decisions and taking action to reduce greenhouse gas emissions.

Setting Boundaries

The boundaries of the inventory, which includes Scope 1 and Scope 2 emissions within the jurisdiction and responsibility of Konya Metropolitan Municipality and within the administrative boundaries of Konya Province, have been defined. Scope 1 and Scope 2 emissions are described with the following definitions.

Figure 6 Greenhouse Gas Emission Scopes



Scope 1 covers greenhouse gas emissions from sources that are located within the borders of the province.

Scope 2 includes greenhouse gas emissions generated within the provincial boundaries because of using grid-supplied electricity, heat, steam and/or cooling services.

Scope 3 covers all other greenhouse gas emissions that occur outside the city limits because of activities within the city limits. These Scopes and Boundaries are summarized and illustrated in Figure 3.

The calculation of the city's greenhouse gas emissions includes greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Greenhouse gases such as hydrofluorocarbons (HF), perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆), nitrogen trifluoride (NF₃) may also be included in certain situations. However, the main emissions are usually CO₂, CH₄ and N₂O. For this reason, the calculations in this study have been made for these three types of greenhouse gases.

In accordance with the guidelines of the SECAP Preparation Guide, the amount of greenhouse gas emissions of the energy using sectors and the non-energy using sectors have been evaluated separately. The computation methods used were those used in the National Greenhouse Gas Emission Inventory Report of Türkiye.

Table 5 List of Greenhouse Gas Sources and Emissions

SECTORS CONTAINING ENERGY		
Sources of Greenhouse Gas	Greenhouse Gas Emission	Scope
Buildings/Residences	Natural Gas, Coal	Scope 1
Buildings/Residences	Electricity	Scope 2
Commercial / Public	Natural Gas	Scope 1
Commercial / Public	Electricity	Scope 2
Manufacturing Industry & Construction	Natural Gas, Fuel Oil, LPG, Gas Oil	Scope 1
Manufacturing Industry & Construction	Electricity	Scope 2
Agriculture, Forestry and Livestock Activities	Electricity	Scope 2
Transportation	Diesel, Gasoline, LPG	Scope 1
NON ENERGY SECTORS		
Agriculture, Forestry and Livestock Activities	Use of Fertilizers in Agriculture and from livestock activities Sourced Fertilizer Fermentation Emissions	Scope 1
Waste and Wastewater	-	Scope 1

The data presented in Türkiye's 2023 national greenhouse gas inventory 1990-2021, which was sent to the United Nations Framework Convention on Climate Change in 2020, were used.

2.2 Greenhouse Gas Emission Activities and Calculation Procedures

The total greenhouse gas emissions of Konya for the year 2022 have been calculated to be 11,957,156 tons of CO₂e.

The sum of energy emissions is 10,399,378 tons CO₂e, and the sum of non-energy emissions is 1,557,779 tons CO₂e. Of the total emissions, 65% (7,833,705 tons of CO₂e) are direct emissions and 35% (4,123,451 tons of CO₂e) are indirect emissions.

The transportation sector is the largest emission source with 27% of the total emissions in the GHG inventory of Konya Province in 2022. The transportation sector is followed by the residential sector, which accounts for 21%, and the manufacturing and construction sector, which accounts for 19%.

The population of Konya Province in 2022 is 2,296,347. Greenhouse gas emissions per capita were calculated as 5.21 tCO₂e in this study



Table 6 Konya Province Greenhouse Gas Emission Inventory Results

Emissions/Divisions	Scope-1 Greenhouse	Scope-2 Greenhouse Gas Emissions	Total Greenhouse Gases Emissions
	(t CO ₂ e)	(t CO ₂ e)	(t CO ₂ e)
SECTORS RELATED TO ENERGY			
Houses	1.869.655	682.858	2.552.513
Commercial and Public	515.062	885.049	1.400.111
Goods at Industry and Construction	664.373	1.655.135	2.319.508
Agricultural Activities Electricity Consumption	-	900.409	900.409
Transport	3.226.837	-	3.226.837
TOTAL	6.275.927	4.123.451	10.399.378
ENERGY-FREE EMISSIONS			
Livestock and Fertilizer Use	547.624	-	547.624
Domestic Waste	722.232	-	722.232
Wastewater	287.922	-	287.922
TOTAL	1.557.779	0,00	1.557.779
GRAND TOTAL	7.833.705	4.123.451	11.957.157

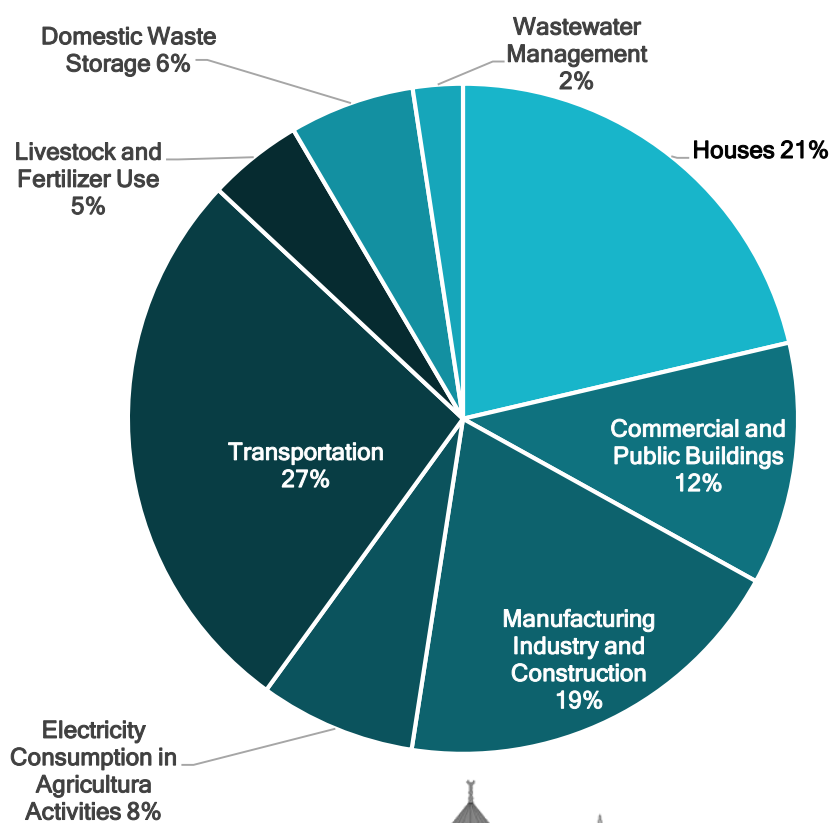
Figure 7 Total Emissions of Konya Province

Figure 8 Distribution of Total Emission

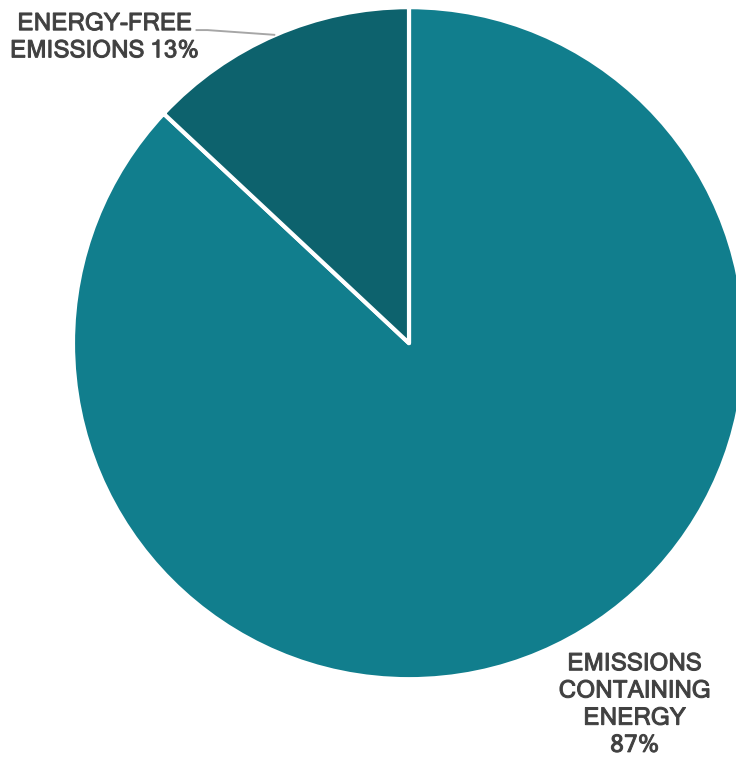
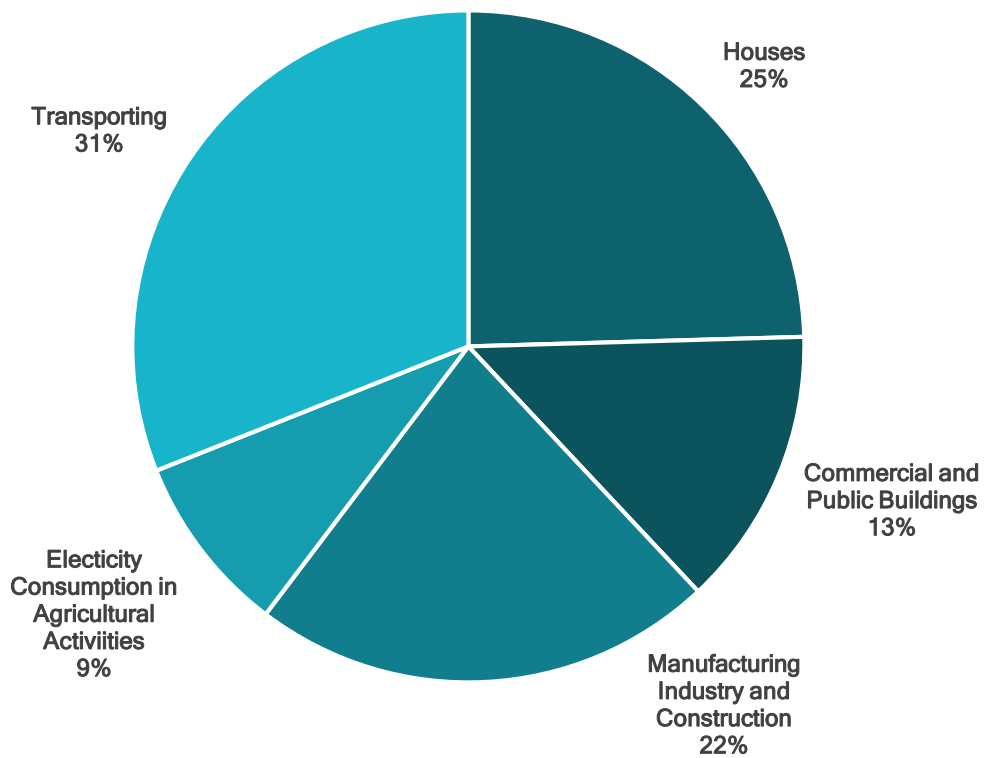


Figure 9 Energy Containing Emissions



Energy Related Emissions

Greenhouse Gases Caused by Using Fossil Fuels and Electricity Consumed by Residential Buildings Across the Province

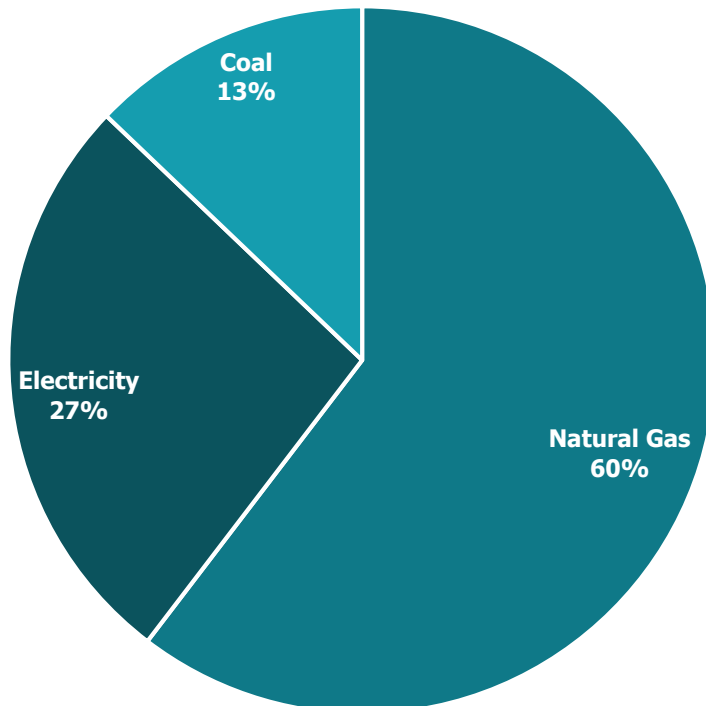
The amount of greenhouse gas emissions is explained in more detail with the help of visual tools such as Table 7 and Figure 10.

The data on the consumption of natural gas and electricity are taken from the annual sector reports prepared by the Energy Market Regulatory Authority for the year 2022. These reports provide consumption values for the calendar year 2022. These values are specific to Konya Province. The Konya Provincial Directorate of Environment, Urbanization and Climate Change provided the coal consumption data.

Table 7 Consumption Amounts and Greenhouse Gas Emissions in Residences

Fuel Type	Activity Data	Greenhouses Gas Emissions Quantity (tCO ₂ e)
Natural gas (m ³)	625.068.271	1.541.269
Electricity Consumption (MWH)	1.425.591	682.858
Coal (tons)	470.015	328.386
Scope 1 Emission Amounts(tCO ₂ e)		1.869.656
Scope 2 Emission Quantities(tCO ₂ e)		682.858
TOTAL EMISSIONS (tCO₂e)		2.552.513

Figure 10 Greenhouse Gas Emissions from Residential Buildings



Commercial Buildings and Public Buildings

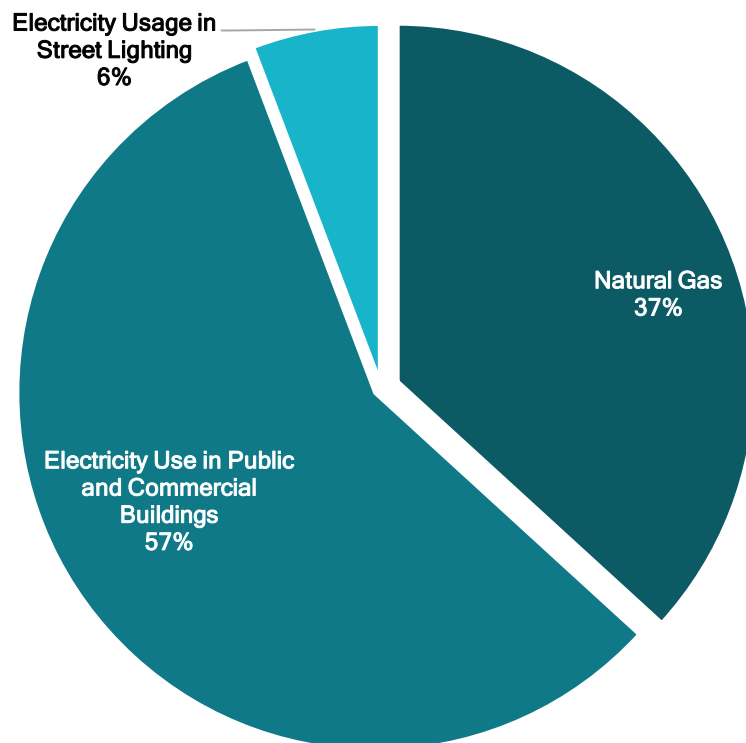
This category details the amount of GHG emissions from fossil fuel use and electricity consumption in commercial and public buildings across the state, using visual tools such as Table 8 and Figure 11.

Natural gas and electricity consumption data are from the Energy Regulatory Authority's 2022 annual sector reports.

Table 8 Activity Data and Greenhouse Gas Emissions from Commercial and Public Buildings

Fuel Type	Activity Data	Greenhouse Gas Emission Amount (tCO ₂ e)
Natural gas (m ³)	208.885.798	515.062
Electricity in Buildings (MWH)	1.679.101	804.289
Electricity in street lighting (MWH)	168.602	80.760
Scope 1 Emissions (tCO ₂ e)		515.062
Scope 2 Emissions (tCO ₂ e)		885.049
TOTAL EMISSIONS (tCO ₂ e)		1.400.111

Figure 11 Greenhouse Gas Emissions from Commercial and Public Buildings



Manufacturing Industry & Construction

In this category, the amount of greenhouse gas emissions resulting from the use of fossil fuels and electricity consumption in manufacturing and construction activities throughout the province is explained in detail with visual tools such as Table 9 and Figure 12.

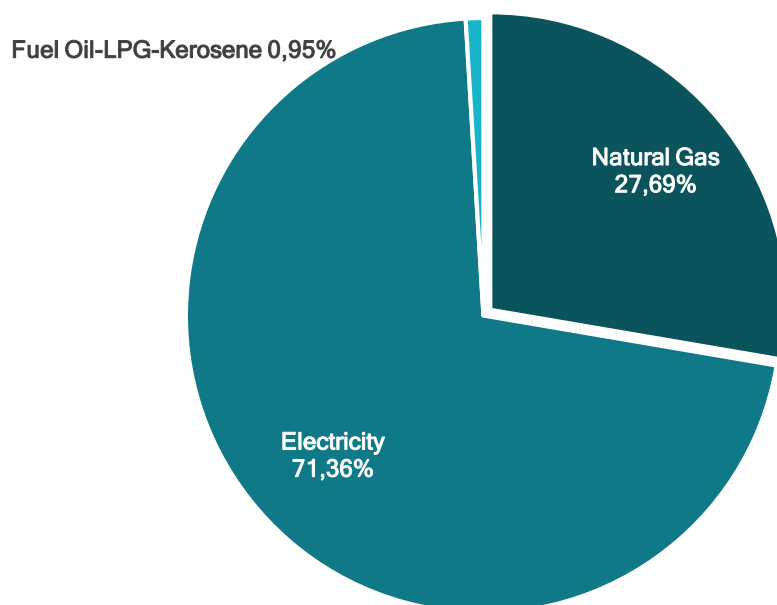
The data on the consumption of natural gas, electricity, fuel oil, gas oil and liquefied petroleum gas by the Energy Market Regulatory Authority for the year 2022 are taken from the annual sector reports prepared for that year.

The values of the annual sectoral report of EMRA on the consumption of natural gas in Konya Province "transformation/cycle sector, power sector, industrial sector and other consumption" are collected and included in this section.

Table 9 Greenhouse Gas Emissions of Manufacturing Industry and Construction

Fuel Type	Activity Data	Greenhouse Gas Emission Amount (Tco2e)
Natural gas (m3)	260.457.386,61	642.226
Electricity consumption (MWH)	2.404.832	1.655.135
Fuel Oil (Ton)	5.224	18.601
LPG (Ton)	918	2.743
Gas Oil (Ton)	257	803
Scope 1 Emissions (tCO2e)		664.373
Scope 2 Emissions (tCO2e)		1.655.135
TOTAL EMISSIONS (tCO2e)		2.319.508

Figure 12 Manufacturing Industry and Construction Greenhouse



Energy in Agricultural Activities

In this category, the consumption of electricity used for agricultural activities throughout the province is caused by the emission amounts are explained in detail as in Table 10.

Electricity consumption data are taken from the annual sector reports prepared by the Energy Market Regulatory Board for 2022.

Table 10 Greenhouse Gas Emissions from Agricultural Activities

Fuel Type	Activity Data	Greenhouse Gas Emission Amount (tCO ₂ e)
Electricity Consumption (MWH)	1.879.770	900.409
Scope 2 Emissions (tCO ₂ e)		900.409

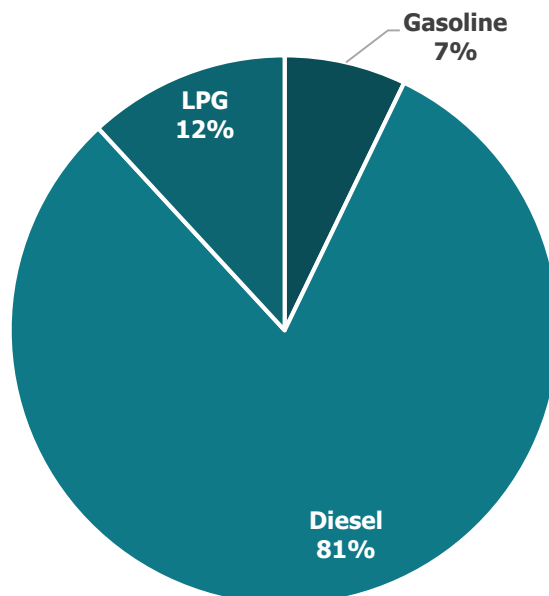
Transportation

In this section, the amount of GHGs emitted from the use of fossil fuels in transportation throughout the province is illustrated with visual tools like Table 11 and Chart 13. The data on the consumption of gasoline, diesel and liquefied petroleum gas are taken from the annual sector reports prepared by the Energy Market Regulatory Board for the year 2022. It was assumed that all fuel sold within the borders of Konya Province would be used in Konya.

Table 11 Greenhouse Gas Emissions from Transportation

Fuel Type	Activity Data	Greenhouse Gas Emission (tCO ₂ e)
Gasoline (ton)	66.465	231.017
Diesel (ton)	831.319	2.613.239
LPG (ton)	127.818	382.580
Scope 1 Emissions (tCO ₂ e)		3.226.837

Figure 13 Greenhouse Gas Emissions from Transportation



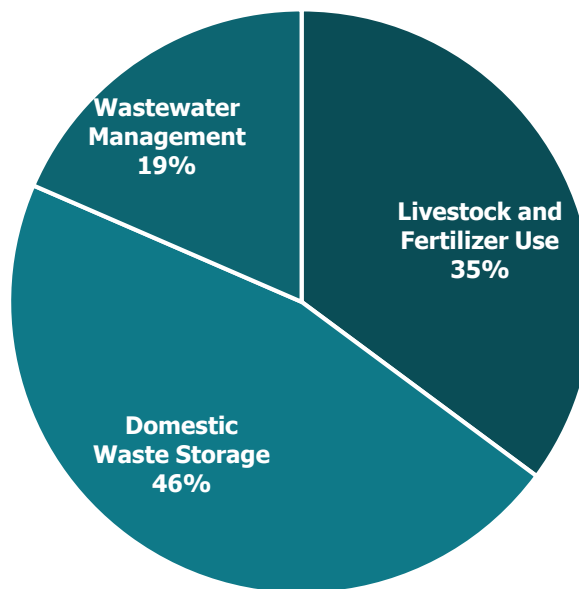
Railway Transportation



This category includes the amount of emissions from rail transportation. In Konya, there are rail systems that are used as public transportation, and the investment and operation of all of them belong to Konya Metropolitan Municipality. The calculation of the electricity consumption of the rail systems is included in the section of the public and private services sector and other sectors to avoid double counting. It is also discussed in the table of municipal emissions.

Non-Energy Emissions

Figure 14 Non-Energy Emissions



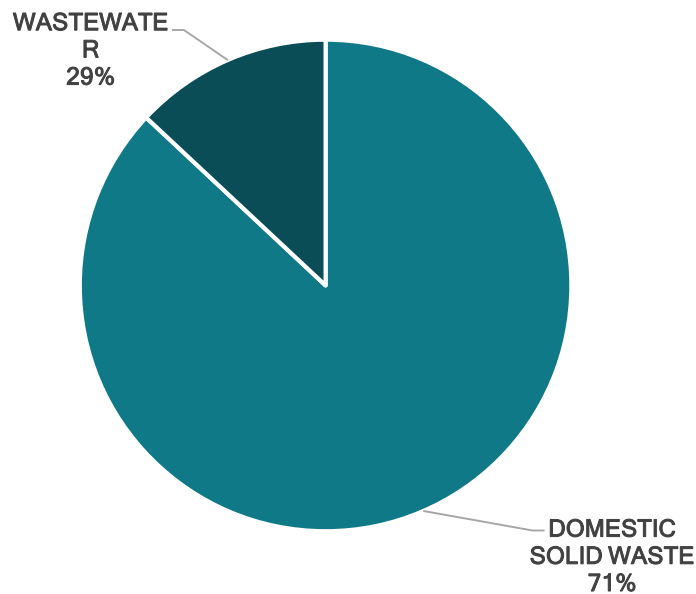
Waste and Wastewater

In this category, the amount of greenhouse gas emissions resulting from waste disposal and wastewater treatment activities throughout the province is explained in detail with visual tools such as Table 12 and Figure 14 Figure 15. Konya Metropolitan Municipality operates/controls 4 solid waste disposal facilities and 44 wastewater treatment facilities, 26 of which have biological treatment systems.

The data in this category were obtained from Konya Metropolitan Municipality and Konya Water and Sewerage Administration General Directorate and calculated with the National Greenhouse Gas Inventory Greenhouse Gas Emission Calculation.

Table 12 Waste and Wastewater Greenhouse Gas Emissions

Type of Activity	Activity Data	Greenhouse Gas Emission (tCO ₂ e)
Domestic Solid Waste (tons)	Domestic Solid Waste (landfill)	601.742
	Domestic Solid Waste (Irregular Storage)	353.998
Wastewater (m ³)	96.831.488	287.922
Scope 1 Emission Amounts (tCO ₂ e)	1.010.155	

Figure 15 Waste and Wastewater Greenhouse Gas Emissions

Livestock, Fertilizer and Land Use

In this category, the amount of greenhouse gas emissions resulting from the fermentation of manure and the consumption of fertilizers from livestock activities is reported, and information on the categories of land use is provided. Table 13, Table 14, and Figure 16 are explained in more detail.

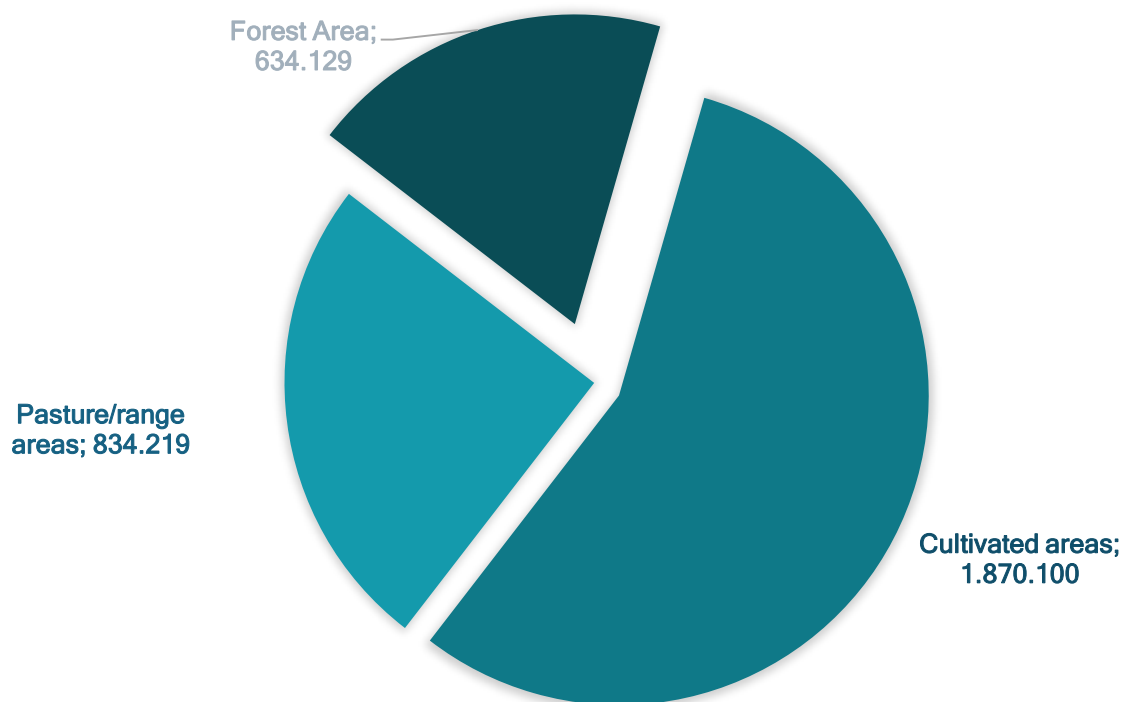
Table 13 Konya Province Livestock, Fertilizer and Land Use Emission Amount

Fuel Type	Activity Data	Greenhouse Gas Emissions Amount (tCO ₂ e)
Livestock (pcs)	Cattle (Cultured) 717,866 Cattle (Hybrid) 193.144 Cattle (Indigenous) 18,935 Buffalo 800 Sheep (Indigenous) 2,374,785 Sheep (Merino) 396.195 Goat (Bristle) 273,595 Goat (Mohair) 1,894	546.765
Urea (tons)	153.868	858
Scope 1 Emission Amounts (tCO ₂ e)	547.624	

Table 14 Land Use Categories and Area Covered by Land Types within the Borders of Konya Province

Land Use Categories	2022
Cultivated areas	1.870.100 ha
Meadow/pasture areas	834.219 ha
Woodland	634.129 ha

Figure 16 Land Use Categories 2022



2.3 Excluded Greenhouse Gas Emissions

In this section, the emission categories that are not included in GPC Basic and the results of emission calculations in relation to these categories are presented. Table 15 shows the greenhouse gas emissions calculated in accordance with the amounts of electricity losses within the borders of Konya province in 2022. The amount of electricity loss from transmission lines is 1.86% and the amount of electricity consumption from distribution lines is 6.17% for Konya according to the information in the 2022 Market Development Report of the Energy Market Regulatory Authority.

Table 15 Electricity Transmission and Distribution Line Loss and Emission Data

Type of Activity	Greenhouse Gas Emission
Electricity consumption in residential buildings (loss of electricity in the distribution line)	42.132,344 ton
Electricity consumption in commercial buildings (loss of electricity in the distribution line)	49.624,655 ton
The use of electricity in street lighting (loss of electricity in the distribution line)	4.982,914 ton
Electricity consumption in industry (loss of electricity in the distribution line)	71.073,126 ton
Use of electricity in agricultural irrigation (loss of electricity in the distribution line)	55.555,287 ton
Electricity consumption in industry (electricity used from the transmission line)	31.048,756 ton
TOTAL	254.417,082 ton

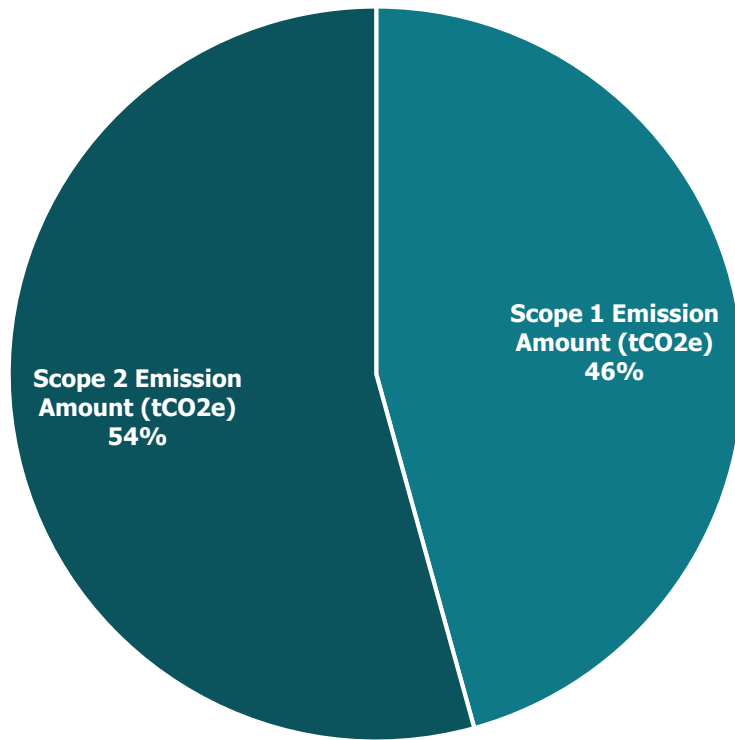
2.4 Greenhouse Gas Emission Amount of Konya Metropolitan Municipality

The amount of greenhouse gas emissions resulting from the activities of Konya Metropolitan Municipality is 198,460 tCO₂e, detailed in Table 16, Figure 17 and Figure 18 below.

Table 16 Greenhouse Gas Emission Amount of Konya Metropolitan Municipality

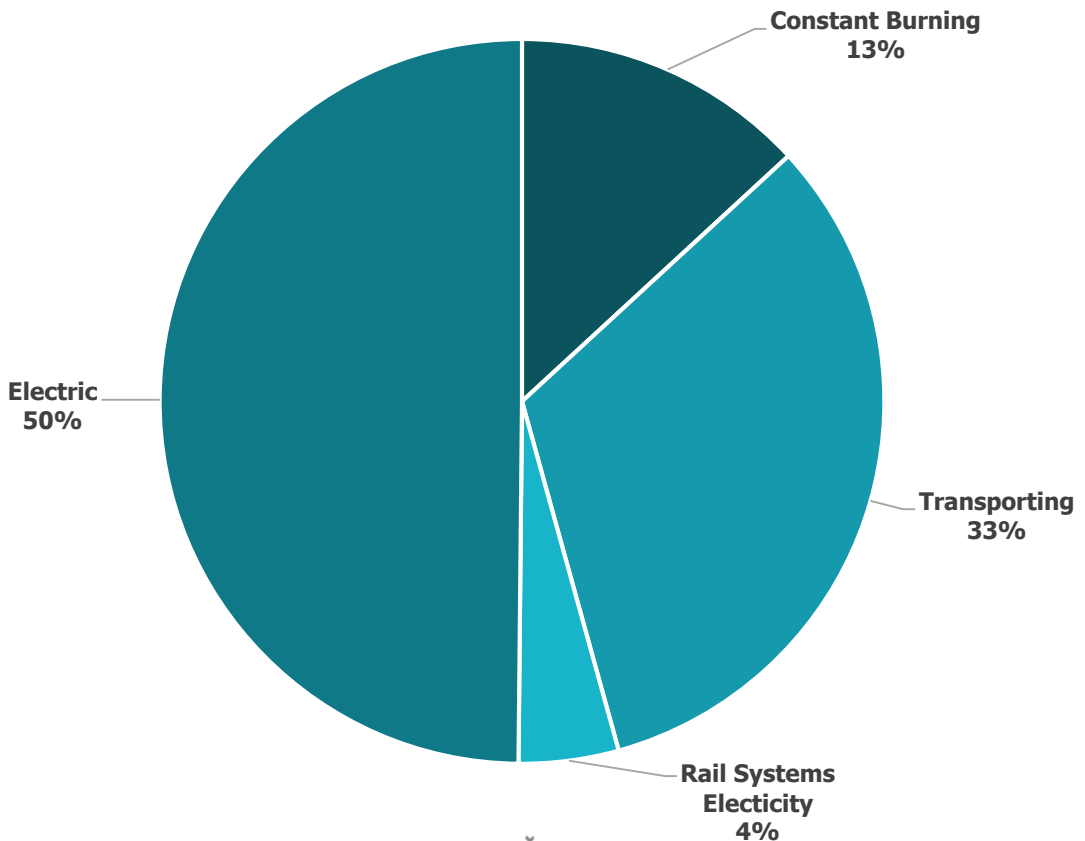
Type of Activity	Activity Data	Greenhouse Gas Emission (tCO ₂ e)
Amount of Electricity (Rail Systems) MW	18.456	8.840
Amount of Electricity (Buildings) MW	206.522	98.924
Transportation Fuel Amount (Diesel) ton	11.716	34.750
Transportation Fuel Amount (Gasoline) ton	182	2.713
Transportation Fuel Amount (LPG) ton	7	22
Transportation Fuel Amount (Natural Gas) m ³	13.340.957	27.102
Constant Combustion (Natural Gas) m ³	10.588.475	26.109
Scope 1 Emission Amount(tCO ₂ e)	90.696	
Scope 2 Emission Amount(tCO ₂ e)	107.764	
TOTAL EMISSION AMOUNT (tCO₂e)	198.460	

Figure 17 Emissions of Konya Metropolitan Municipality



The emission amount resulting from the activities of Konya Metropolitan Municipality is 1.65% of the emission amount of Konya Province, as the total emission amount of Konya Province is 11,957,156 tCO2e.

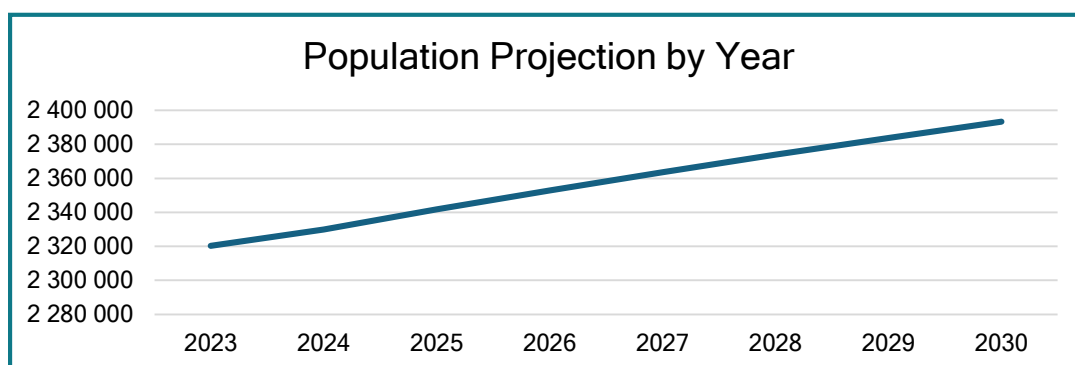
Figure 18 Emissions of Konya Metropolitan Municipality



2.5 Greenhouse Gas Emission Reduction Actions

Appropriate reduction measures have been prepared for Konya Province to achieve the target of reducing per capita emissions by 40% in 2030. With the preparation of the measures, the current situation of the sectors has been analyzed and strategies for the reduction of the sources of greenhouse gas emissions have been developed. These strategies have been rigorously studied to be consistent with other plans at the local and national levels, and the necessary policies and measures have been designed using the guidelines and methodologies published by the Covenant of Mayors (CoM).

Table 17 TurkStat Population Projection by Years



The population of Konya province will be 2,393,327 people in 2030, according to TurkStat. The reduction target for 2030 has been set at 40% per capita. This information is shown in Table 17.

Policy measures: New laws or policies in place for the implementation of more environmentally friendly actions

Behavioral: Interventions that attempt to change the behavior of a community in a specifically targeted direction (e.g., to make more people use public transportation). Actions in this category focus specifically on behavior change, such as organizing awareness campaigns, although there is a behavioral component to policy actions.

Training: Actions aimed at building capacity through the exchange of information.

Enforcement and enforcement: Compliance with policies and regulations through monitoring and potential penalties to drive improvement.

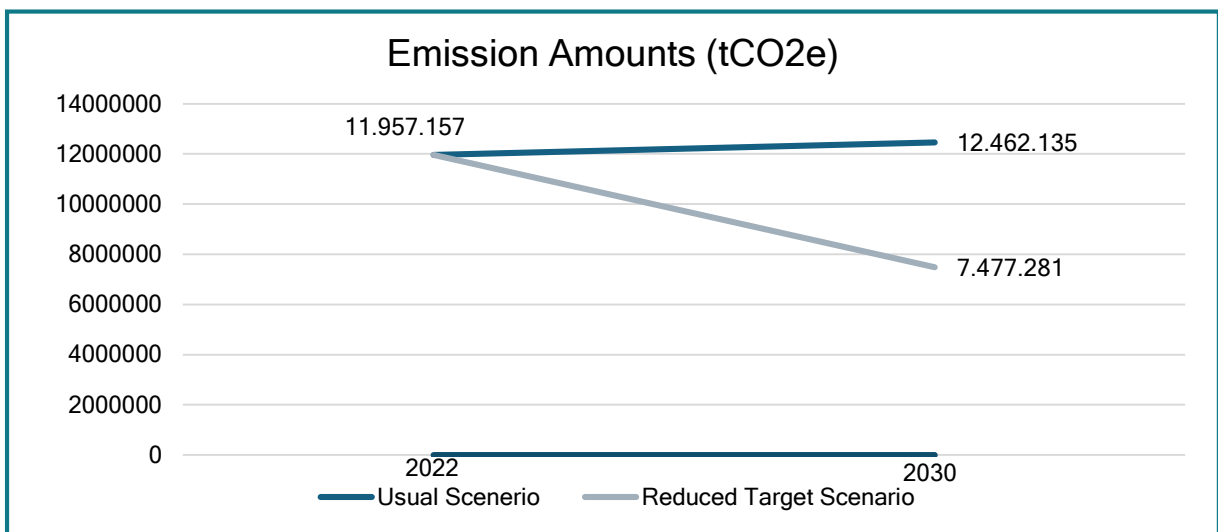
Investment projects: Konya Metropolitan Municipality either by using its own resources or by using its own resources infrastructure investments to be undertaken with the support of donor organizations.



2.5.1 Mitigation Targets

The population projection of Konya Province for 2030 was determined as 2,393,327 people. This is according to TurkStat data. As a result of this inventory study which was carried out in the year 2022, the amount of greenhouse gas emissions per capita in the city has been calculated as 5.21 tCO₂e. Konya's target to reduce the total amount of GHG emissions was set at 40% per capita. Based on these data, the goal is to reduce the amount of GHG emissions per capita to 3.12 tCO₂e equivalent by 2030. To achieve this target, it is necessary to reduce the projected value of 12,462,135 tCO₂e in the business-as-usual scenario to 7,477,281 tCO₂e in 2030. The total reduction target is 4,984,854 tCO₂e. A total of 30 mitigation actions were identified and the mitigation target scenarios are shown in Figure 19.

Figure 19 Reduction Targets Emission Amounts



SECTORS CONTAINING ENERGY

Residences

The amount of emissions from residential buildings is 2,552,513 tCO₂e, which is 21% of the total emissions. As a result of the prepared reduction measures, the amount of emissions from the residential category is to be reduced to 1,596,187 tCO₂e in 2030. Figure 20 illustrates the target scenarios. The mitigation targets for the residential sector are shown in Table 18.

Figure 20 Residential Emission Amounts

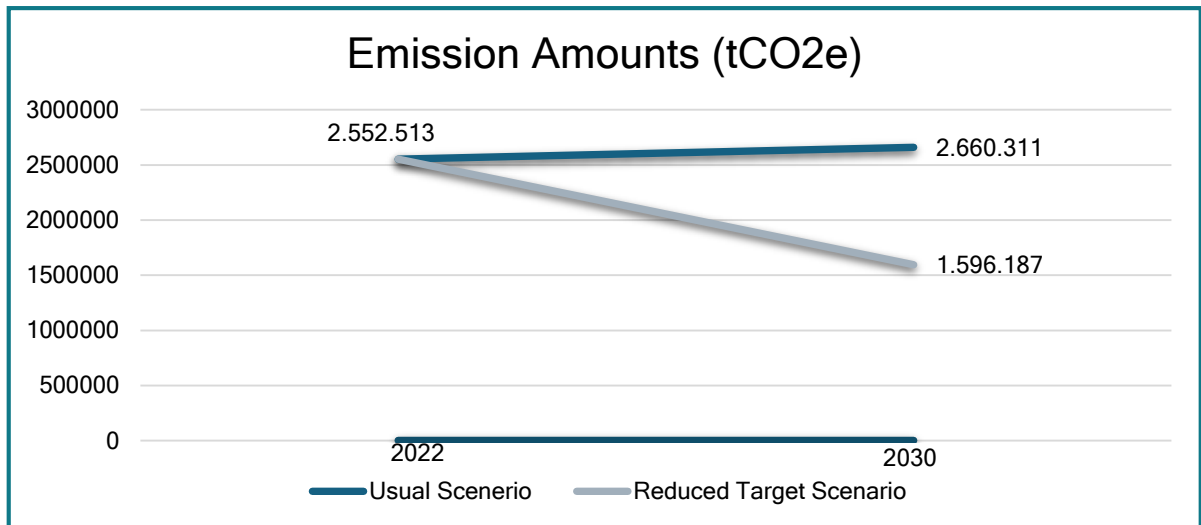


Table 18 Mitigation Actions for Residences

Action No	Action Name	Purpose of Action	Action Contribution
1	Switching from solid fuel to natural gas in residential buildings	Transition of houses using solid fuels to natural gas with municipal support	Reduction of the share of solid fuel in the relevant category, which is 13%
2	Energy efficiency for residential buildings Obligation to obtain the certificate	Saving energy by making it mandatory to obtain an energy certificate, which is the energy efficiency rating of buildings.	Provides energy savings. Reduced emissions as a result
3	Promotion of collective heating systems in dwellings with individual heating	Since energy savings cannot be fully achieved in buildings that provide individual heating, encouraging the transition of such buildings to the collective heating-heat cost allocator system	Reduction of emissions because of energy savings
4	Incentives for insulation in residential buildings Conducting campaigns	Saving energy in residential buildings	Provided energy savings Reduction of emissions as a result
5	Conducting training activities on energy efficiency in heating and cooling in residences	Saving energy in residential buildings	Reduction of emissions because of energy savings
6	Coordination with institutions in terms of encouraging the use of products with low carbon footprint in the selection of insulation materials in buildings.	Using materials with a low carbon footprint in the selection of sound-heat insulation materials in old-new buildings.	Orientation towards production processes with less carbon emissions.

Commercial and Public Buildings

Emissions from commercial and public buildings account for 1,400,111 tCO₂e of total emissions. It represents 12%. As a result of the prepared reduction measures, the emissions from the category of commercial and public buildings are to be reduced to 875,544 tCO₂e in 2030. Figure 21 shows the reduced target scenario. Table 19 shows the reduction measures.

Figure 21 Commercial and Public Buildings Emissions

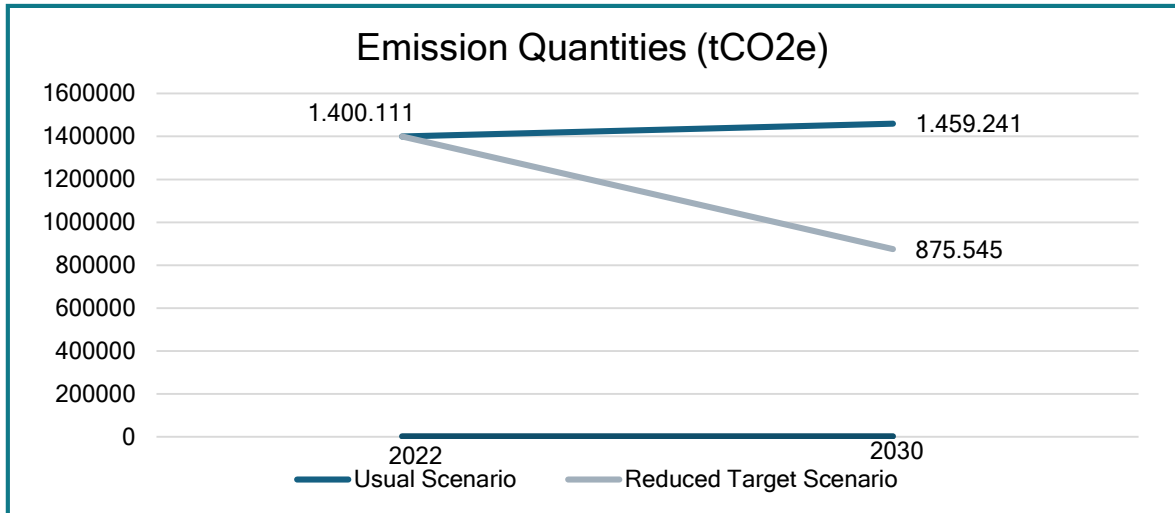


Table 20 Manufacturing Industry and Construction Mitigation Actions

Action No	Action Name	Purpose of Action	Action Contribution
1	Saving 30% electricity in public buildings	By 2030, in all public institutions designated by presidential circular 30% electricity savings	Reduce electricity consumption in this category by 57%.
2	Supplying the Metropolitan Municipality of Konya with electricity from renewable energy sources	Zero emissions from municipal electricity usage by 2030	Reduce emissions from 98,924 tCO ₂ e to zero by 2030
3	Obtaining YES-TR certificate for new buildings to be built by the municipality	Implementation of YES-TR, known as the Green Building Certificate, in the new buildings to be constructed by our Metropolitan Municipality, focusing on energy saving buildings from the design stage.	Reduce emissions by increasing energy savings in building operations
4	Disable the first three floors of the elevator system in public buildings.	Reduce energy consumption caused by unnecessary use.	Reduce carbon footprint by reducing the amount of electricity purchased from the grid.

Manufacturing Industry & Construction

The amount of emissions from the manufacturing industry and construction accounts for 19% of the total emissions with 2,319,508 tCO₂e. As a result of the prepared mitigation actions, the number of emissions from the Manufacturing and Construction category is expected to be reduced to 1,450,480 tCO₂e in 2030. Figure 22 shows the target scenarios. Table 20 presents the mitigation actions.

Figure 22 Manufacturing Industry and Construction Emission Amounts

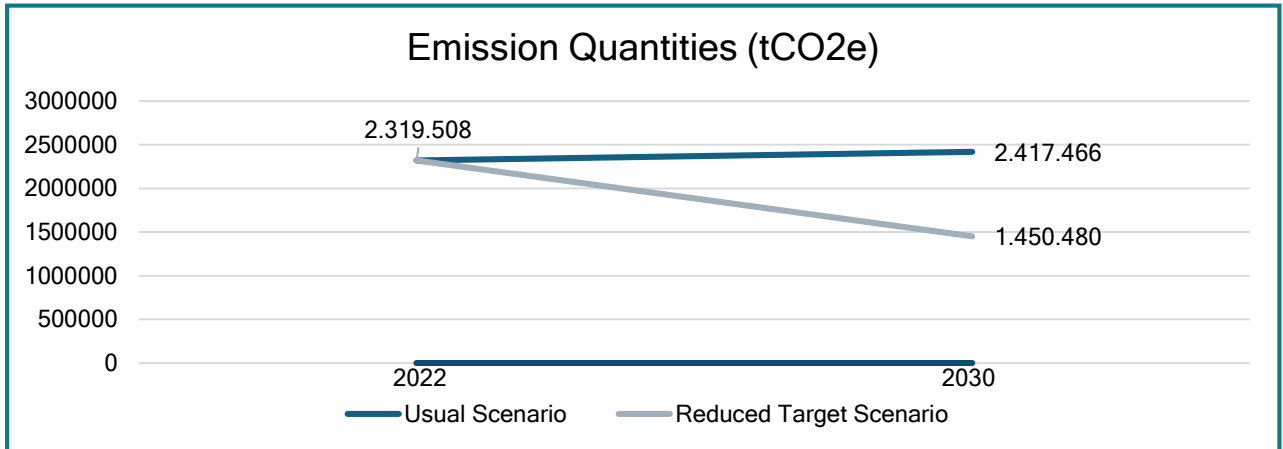


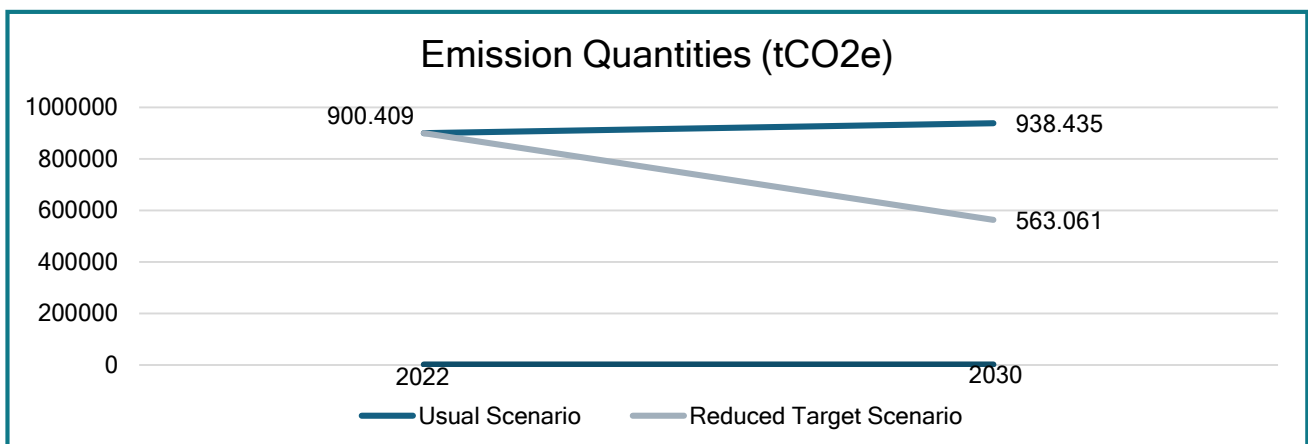
Table 20 Manufacturing Industry and Construction Mitigation Actions

Action No	Action Name	Purpose of Action	Action Contribution
1	Strengthening Renewable Energy Systems	Provide a portion of the electricity used by industry from renewable sources	Reduce electricity consumption, which accounts for 71% of emissions in the sector
2	Provide public transportation discounts to employees of companies that reduce their carbon footprint as part of ISO14064.	Reducing carbon emissions.	Reducing industrial emissions.

Use of Electricity in Agricultural Activities

The amount of emissions from electricity used in agricultural activities represents 8% of the total emissions with 900,409 tCO₂e. The emissions from the transport category are expected to be reduced to 563,061 tCO₂e in 2030 because of the prepared reduction measures. The target scenarios are shown in Figure 23. Table 21 shows the reduction measures.

Figure 23 Amounts of Electricity Use in Agricultural Activities



Tablo 21 Tarımsal Faaliyetlerde Elektrik Kullanımı Eylemleri

Action No	Action Name	Purpose of Action	Action Contribution
1	Changing the variety of crops used in agriculture	Reduce water and electricity consumption by choosing plants that use less water rather than those that use more.	Saving electrical energy
2	Creation of artificial ponds for agricultural use	Creation of artificial ponds to reduce electricity consumption in agriculture	Saving electrical energy
3	Government Subsidized Irrigation Project Development	Reduce the amount of water used and the amount of electricity used to extract water by developing joint irrigation projects.	From electrical energy Saving money
4	Digital irrigation Installation of systems	By monitoring the moisture level in the soil, determining the amount of water needed to irrigate the plants and ensuring that it is done as needed.	Saving electrical energy

Transportation

The amount of emissions from transportation is 3,226,836 tCO₂e, which is 27% of the total emissions. As a result of the mitigation actions prepared, the amount of emissions from the category of electricity use in agricultural activities is targeted to be reduced to 2,017,868 tCO₂e in 2030. Figure 24 shows the target scenarios. Table 22 shows the mitigation actions.

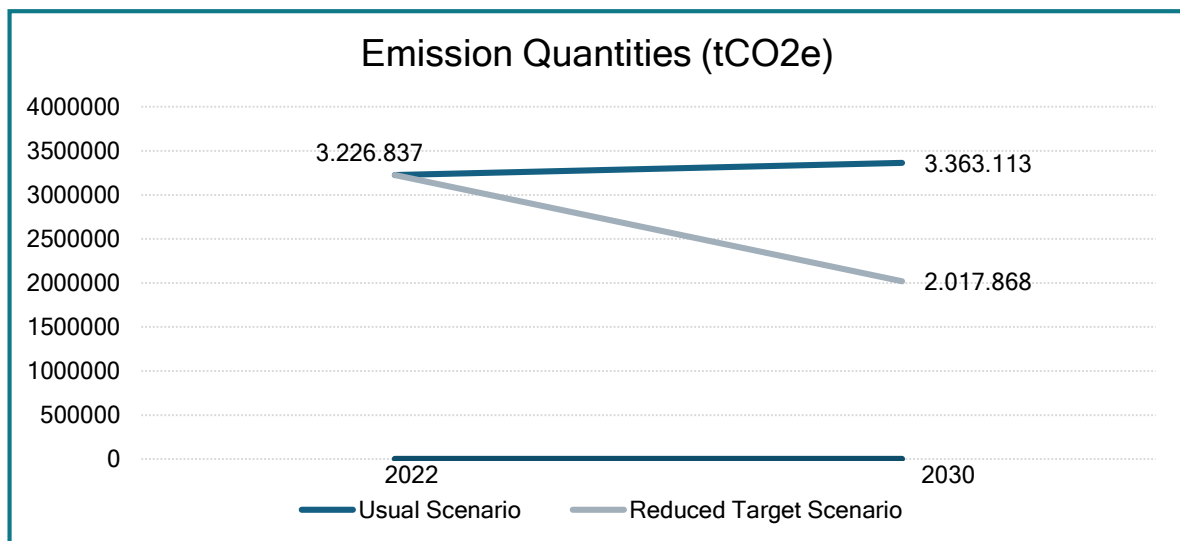
Figure 24 Transportation Emission Amounts

Table 22 Transport Actions

Action No	Action Name	Purpose of Action	Action Contribution
1	Construction of new rail system lines	Reducing the use of fossil fuel vehicles in public transport	Reducing emissions by reducing the use of fossil fuel vehicles
2	Sourcing electrical energy used in rail systems from renewable sources	Sourcing all electricity used by light rail systems from renewable sources	Zero emissions, which amounted to 8,840 tCO ₂ e in 2022, and the emissions that will occur with the commissioning of the new rail systems in 2030.
3	Reduce vehicle waiting times at public transit stops	Reducing the fuel consumption of buses by reducing the waiting time of buses at the stops with the applications to be made.	Reducing emissions by reducing the fuel use of buses
4	Increasing the number of smart intersections	Reduce fuel consumption by reducing vehicle waiting times by increasing the number of intelligent intersections that allow traffic to flow according to traffic density at signalized intersection.	Reducing emissions by reducing fuel consumption
5	Construction of intersections with bridges	Construction of intersections with bridges in areas of high traffic density and applicable	No waiting in traffic or stop-and-go Reduce emissions from
6	Promote shared bike applications	Dissemination of shared bike applications launched by the municipality	Reduce the amount of emissions as a result of the widespread use of bicycles in society and the decrease in the use of fossil fuel and electric vehicles
7	Increasing bicycle lanes	Increase the number and length of bike lanes built by the municipality, increase the use of bicycles by building continuous bike lanes.	Reduce the amount of emissions because of the widespread use of bicycles in society and the decrease in the use of fossil fuel and electric vehicles.
8	Start of shared electric vehicle application	Private sector of shared electric vehicles Initiation by	Reduce emissions by reducing both traffic density and the use of fossil fuel vehicles
9	Increase the number of electric vehicle charging stations	Increasing the number of charging stations to promote electric vehicles	Reduce emissions by reducing the use of fossil fuel vehicles



ENERGY-FREE SECTORS

Livestock and Fertilizer Use

The amount of emissions from livestock and fertilizer use represents 5% of total emissions with 547,624 tCO₂e. As a result of the prepared mitigation actions, the amount of emissions from the livestock and fertilizer use category shall be reduced to 342,451 tCO₂e in 2030. Figure 25 shows the target scenarios. Table 23 shows the mitigation actions.

Figure 25 Livestock and Fertilizer Use Emission Amounts

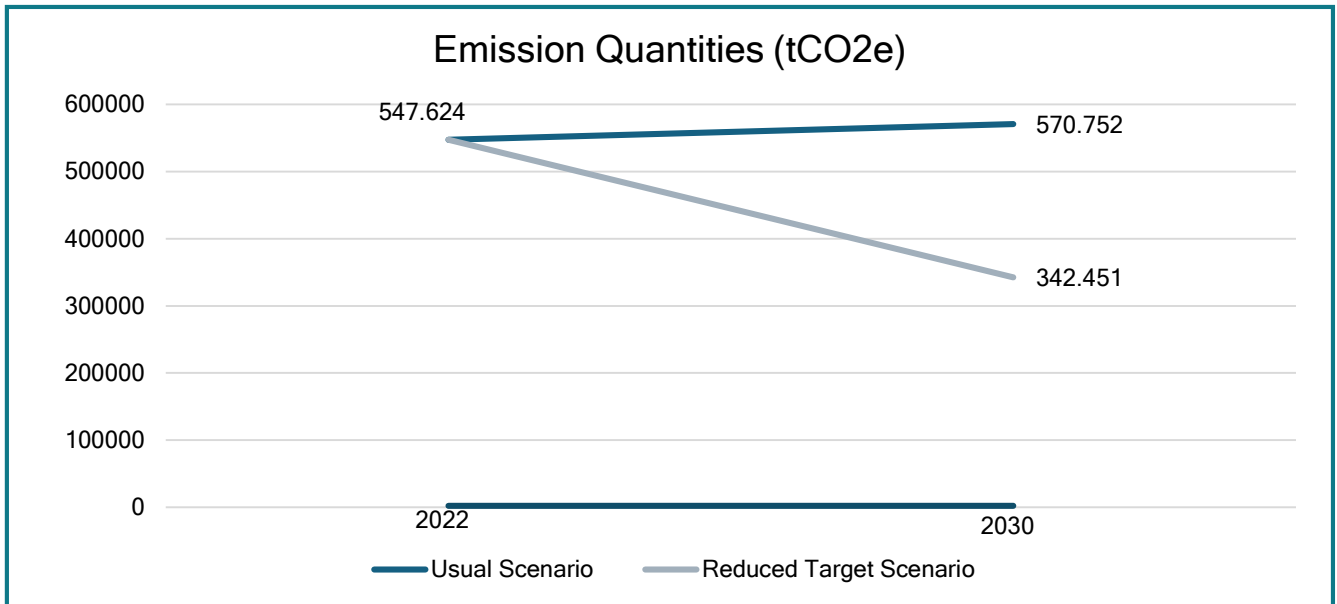


Table 23 Livestock and Fertilizer Use Action

Action No	Action Name	Purpose of Action	Action Contribution
1	Livestock manure stabilization in airless systems and closed reactors	Evaluation of animal manure in biogas plants	Reduce emissions from manure digestion

Solid Waste and Wastewater Management

Emissions from solid waste and wastewater management account for 1,010,154 tCO₂e of total emissions. It represents 8%. As a result of the prepared mitigation actions, it is aimed to reduce the amount of emissions from the solid waste and wastewater management category to 631,689 tCO₂e in 2030. Figure 26 shows the reduction target scenarios. Table 24 shows the mitigation actions.

Figure 26 Solid Waste and Wastewater Management Emission Amounts

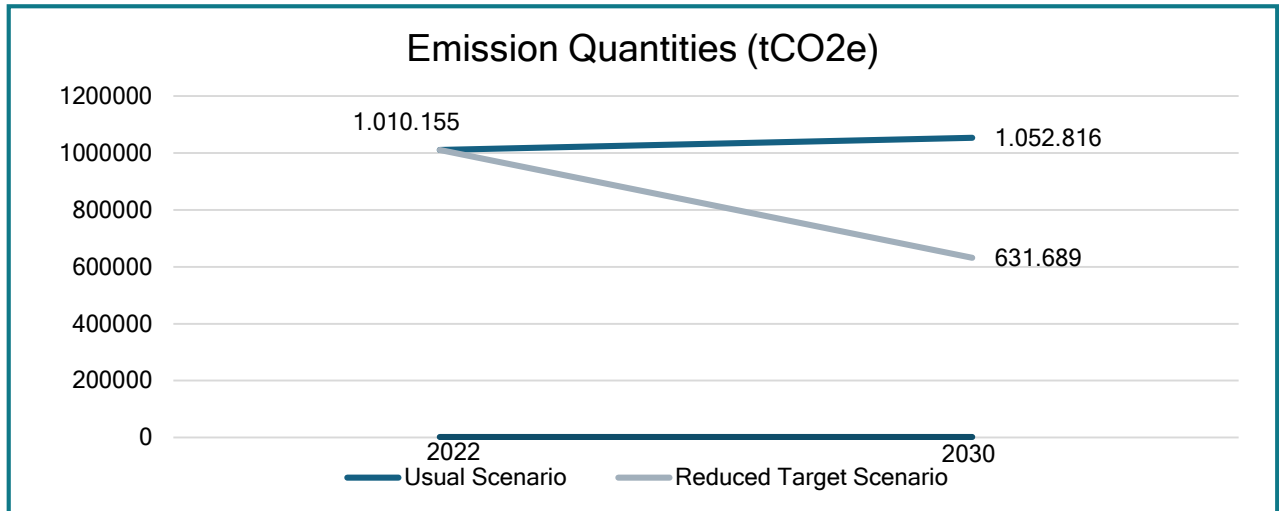


Table 24 Solid Waste and Wastewater Management Actions

Action No	Action Name	Purpose of Action	Action Contribution
1	Utilization of all solid wastes in landfills	Utilization of all solid wastes originating from the city in landfills and increasing the production of biogas and electrical energy	Reduction of emissions caused by non-processing of solid waste
2	Construction of wastewater treatment plants	Treatment of wastewater from the city	Reduction of emissions in the category related to wastewater treatment
3	Increasing the recycling and recovery rate of wastes	Separation of wastes and evaluation of biodegradable wastes in landfills and recyclable wastes in recycling centers	Increasing the efficiency of landfills and reducing emissions by separating wastes
4	Compost systems Dissemination	By utilizing biodegradable waste in composting systems, both organic fertilizer is produced and the amount of waste going to landfills is reduced.	Increase efficiency and reduce emissions by reducing the amount of waste sent to landfills

KONYA CLIMATE ADAPTATION STRATEGY AND RISK ASSESSMENT



3. KONYA CLIMATE ADAPTATION STRATEGY AND RISK ASSESSMENT

3.1 Key Findings

The beneficiary institution is the Ministry of Environment, Urbanization and Climate Change, and the executive institution is the United Nations Development Program. The four pilot projects were carried out within the framework of the "Strengthening Climate Change Adaptation Action in Türkiye Project", co-financed by the European Union and the Republic of Türkiye. In Konya, one of the provinces, the expected future impacts of climate change show an increasing change in average temperatures towards the end of the century according to the RCP4.5 and RCP8.5 emission scenarios.

According to the RCP4.5 scenario, which is defined as the optimistic scenario, the average temperature change over Konya is expected to increase to 2 °C by the end of the century, while this change is estimated to exceed 8.5 °C in the pessimistic scenario, RCP4. Although the trend of both scenarios differs in the annual total precipitation changes, in the optimistic scenario, a negative change of up to 40% in the total precipitation amount is predicted at the end of the century, while in the pessimistic scenario, the most severe decrease in total precipitation is Beyşehir in the 2081-2100 period, it will be around 40% at the southern end of Seydişehir and Konya.

Climate projections and analyses show that the hazards that climate change will bring to Konya Province are drought, decrease in precipitation and increase in heat waves. In the face of these hazards, all districts of Konya Province have different levels of exposure, sensitivity, adaptive capacity, vulnerability and risk depending on their socio-economic and environmental conditions. These variables, which indicate the situation of being damaged by hazards, can be treated separately in 10 different sectors such as urban, water infrastructure, agriculture, ecosystem, health, energy, tourism, industry, transportation and social development and risk analysis can be made for the districts of Konya. The province and districts of Konya are affected by climate change, but some sectors are likely to be more affected due to their higher vulnerability or lower adaptive capacity.

The risk status of a particular sector in the face of climate change is a result of its exposed components, its vulnerable infrastructure and its adaptive capacity. Identifying sensitive sectors and risk situations for Konya is important for prioritizing and focusing adaptation efforts.

Figure 27 Vulnerability and Risk Analysis Management

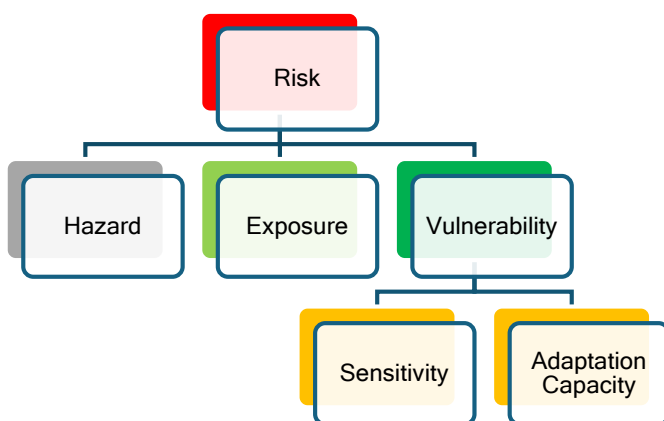
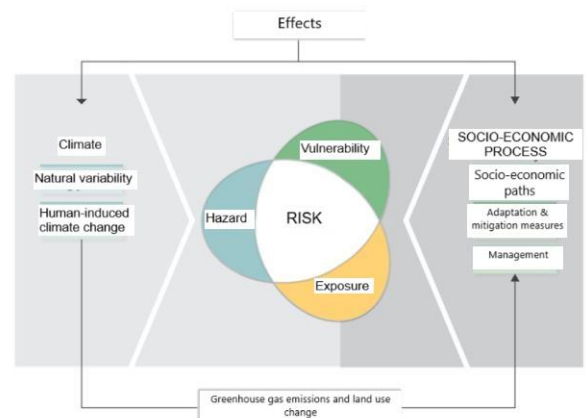


Figure 28 Vulnerability and Risk Analysis Proses



As part of the vulnerability and risk analysis, the hazard component was studied by conducting drought, heavy rain, heat wave, forest fire, cold wave, and strong wind analyses.

Drought

When the drought intensity values calculated for the current period of 1990-2019 were examined, it was found that the intensity increased towards the northeast of Konya. Considering the changes in the meteorological drought intensity in the coming period, it is predicted that the intensity will increase towards the end of the century. According to the RCP4.5 scenario, while the drought intensity increased by 10% in the first period, it is estimated that it will increase up to 30% in the last period. According to the RCP8.5 scenario, it is predicted that the intensity of meteorological drought, which is gradually increasing in severity in the coming period, will increase by 50% in the period 2081-2100. Considering both scenarios and all future periods, it is estimated that the intensity of meteorological drought will increase more, especially in Halkapınar and then in Selçuklu and Meram districts.

Heavy Rainfall

According to the RCP4.5 scenario, it is estimated that the change of heavy rainfall, which tends to decrease in Konya in general and especially in Ereğli district and southwest of Konya, will tend to increase in general in other future periods in the 2021-2040 and 2061-2080 future periods. According to the RCP8.5 scenario, an upward trend of 20% is observed in the 2021-2040 period, while heavy rainfall is expected to occur in Konya on average in the following periods.

It is predicted to decrease by 30%. For the RCP8.5 scenario, the most severe decrease is expected to be around 60% in the districts of Hüyük, Beyşehir, Seydişehir, Hadim, Taşkent and Derebucak in the last period of the future. Looking at the two scenarios in general, a decrease in the total amount of heavy rainfall is expected in the southwestern part of Konya, while an increase in the total amount of heavy rainfall is estimated in the northern and eastern parts of Konya.

Heat Wave

In the future, both emission scenarios will correspond to the temperature increases of heatwaves experienced in the 21st century. It indicates that it will be experienced in the last 20 years of the century. The change in the frequency of heat waves is expected at most in the RCP8.5 scenario; it is estimated that it will increase almost 3 times in the last period of the century compared to the first period. It is predicted that the number of heat waves in Konya will increase by a total of 30 days in the 2081-2100 period of the RCP4.5 scenario compared to the reference period. According to the RCP8.5 scenario, this increase is estimated to be more than 80 days in the same period. The highest increase in the frequency of heat wave is expected in Seydişehir and Halkapınar districts, especially according to the RCP8.5 scenario, and the amount of increase has been determined to exceed 90 days. The lowest increase in the frequency of heat wave is estimated to be a maximum of 10 days in the 2041-2060 period of the RCP4.5 scenario.

Wildfire

According to the RCP4.5 scenario, it is predicted that the weather conditions that pose a fire risk in Konya will generally increase by about 15%. According to the RCP8.5 scenario, it is estimated that the weather conditions that pose a fire risk in Konya will decrease by 5% in the next period of 2021-2040 and will gradually increase in the other periods of the future. Especially in the 2081-2100 future period, it is expected that the FWI index values will increase by 25% according to the RCP8.5 scenario and will take the highest values.

It is estimated that in the last period of the RCP8.5 scenario, the fire risk in the west of Konya, which was in the low-risk class in the reference period, will enter the high-risk group.

Cold Wave

In the 2021-2040 period, the cold wave event is predicted to occur a total of 6 days less per year than the reference period for both scenarios. It is estimated that the cold wave event, which is gradually decreasing in the following periods, will decrease even more, especially according to the RCP8.5 scenario. In the last period of the next period, the frequency change is predicted to decrease by 10 days corresponding to the RCP4.5 scenario, while it will decrease by 16 days according to the RCP8.5 scenario. It is estimated that Halkapınar will be the district where the cold wave frequency over Konya will have the least change for both scenarios.



High Wind

According to the RCP4.5 scenario, the change in the number of extremely windy days in Konya is estimated to decrease by an average of 20% and by a maximum of 80% in the period 2061-2080, especially in the districts of Tashkent and Hadim. In addition, according to the RCP4.5 scenario, the number of days with strong winds is predicted to increase by 20% in the period 2041-2060 in Konya province over the districts of Yunak, Cihanbeyli, Karatay and Karapınar. According to the RCP8.5 scenario, it is estimated that the changes in the direction of decrease and increase will be more severe than in the RCP4.5 scenario. Especially in the period 2041-2060, it is predicted that the increase values will reach 40% in the districts of Yunak, Kadınhanı, Karatay and Karapınar. In the period 2061-2080, it is estimated that the change in the direction of decrease will exceed 80% in Hadim and Taşkent districts.



Workshop in Konya within the framework of the project "Strengthening Adaptation Measures to Climate Change in Türkiye".

3.1.1 Adaptation Strategy and Action Plan

3.1.1.1 City

Table 25 Urban Adaptation Actions

Action No.	Action	Application Period
URB1	Mitigate the urban heat island effect	2024-2030
URB2	Prevention of urban sprawl and non-intended land uses	2024-2030
URB3	Develop a climate-resilient urban design guide by creating urban risk maps and transforming high-risk areas.	2024-2026
URB4	Conducting exemplary neighborhood pilots that are compatible with climate change	2024-2029
URB5	Implementing the 15-minute neighborhood model	2024-2030
URB6	Preparation and implementation of afforestation master plan in urban areas	2024-2030
URB7	Evaluation of existing urban spaces, areas that have lost their functions, and spaces that will be created to replace functions that will be moved out of the city, as green spaces or facilities.	2024-2030
URB8	Create and implement a green network plan and greening program that includes arrangements such as ecological corridors and urban gardens in urban areas.	2024-2030
URB9	Installation of water retention and storage systems in urban areas and buildings	2024-2030
URB10	Protect water resources in and around urban areas and impose water use restrictions	2024-2030
URB11	Improvement of water infrastructure in the built-up areas of downtown Konya center and other districts	2024-2030
URB12	Organize trainings and workshops to create an ecosystem for public, private sector and CSO representatives in Konya on issues such as zero carbon buildings, thermal comfort of urban spaces, urban sprawl and off-plan land use.	2024-2030

3.1.1.2 Water Resources Management

Table 26 Water Resources Management Adaptation Actions

Action No.	Action	Application Period
WTR1	Strengthening the watershed approach to water management	2024-2030
WTR2	Preparation of Konya Province Agricultural Drought Action Plan	2024-2026
WTR3	Development of water monitoring and information systems, inventory of surface and groundwater resources	2024-2030
WTR4	Conducting Basin Protection Studies on Water Resources (Bağbaşı and Altınapa Dam)	2024-2030
WTR5	Construction and improvement of wastewater treatment systems, increasing the reuse rate of treated wastewater to 15% by 2030	2024-2030
WTR6	Conservation studies for Beyşehir Lake and Basin, Salt Lake Special Environmental Protection Area and Akşehir Eber Lakes	2024-2030
WTR7	Preparation of water budgets for Lake Beyşehir and Lake Akşehir from which water is withdrawn for sectoral purposes, monitoring of water quality and water levels.	2024-2030
WTR8	Identify, restore and rehabilitate degraded wetlands, create ponds, artificial lakes and wetlands using natural resources.	2024-2030
WTR9	Reduce the rate of water loss in municipalities in accordance with the provisions of the relevant regulation.	2024-2030
WTR10	Expanding the use of alternative water sources in cities, increasing access to safe drinking water networks	2024-2030
WTR11	Dissemination of productivity-enhancing practices in agricultural irrigation	2024-2030
WTR12	Monitoring and recording surface and groundwater use in industrial zones and sites, ensuring reuse of used water in industry and mining	2024-2030
WTR13	Development and implementation of flood control systems (e.g. nature-based solutions, early warning systems, capacity improvement, soil conservation, upstream flood protection)	2024-2030

3.1.1.3 Agriculture and Food Security

Table 27 Agriculture and Food Security Adaptation Actions

Action No.	Action	Application Period
AGR1	Protect agricultural land and water resources, strengthen measures against land degradation and desertification, especially in Karapınar district.	2024-2030
AGR2	Disseminate early warning systems for resilience to climate disasters, diseases and pest	2024-2030
AGR3	Protection, promotion and dissemination of highly adaptable plant species and local breeds	2024-2030
AGR4	Facilitate and disseminate access to new technologies, especially infrastructure and information technologies.	2024-2030
AGR5	Determine plant and animal species, breeds and varieties, and product patterns suitable for expected future climatic conditions, update the agricultural calendar, and create a list of rotation recommendations.	2024-2028
AGR6	Explore and increase conservation agriculture supports and practices and provide support to protect biodiversity and biological/natural reserves.	2024-2030
AGR7	Develop special support instruments for women farmers, women agricultural workers, women-oriented production cooperatives, prioritize women farmers and workers in support and harmonize with additional support.	2024-2030
AGR8	Identifying practices that threaten natural resources and agricultural sustainability and acting under relevant legislation	2024-2028
AGR9	Increase the rate of agricultural insurance, strengthen the compensation of farmers' losses in TARSİM and work to increase income guarantees.	2024-2030
AGR10	Intensification of beekeeping adaptation studies in districts where beekeeping is widespread (Bozkır, Meram, Beyşehir, Akşehir, Hadim, Ereğli, Seydişehir).	2024-2030
AGR11	Disseminate fisheries adaptation studies in districts where fishing is common (especially in Beyşehir).	2024-2030
AGR12	Establish an up-to-date and dynamic information and communication network for farmers and organize training programs on climate-smart agriculture.	2024-2030
AGR13	As part of climate change adaptation studies, identify villages that are lagging in education, health, and economic development indicators and prioritize investments.	2024-2025
AGR14	Identifying and supporting disadvantaged stakeholders in the agricultural sector, especially farmers	2024-2030

3.1.1.4 Biodiversity and Ecosystem Services

Table 28 Biodiversity and Ecosystem Services Adaptation Actions

Action No.	Action	Application Period
BiO1	Establish a working group that brings together researchers working on climate change adaptation, biodiversity and ecosystem services at universities and other research institutions in Konya.	2024-2030
BiO2	Update management and development plans for protected areas throughout the province to include climate change adaptation.	2024-2030
BiO3	Including measures to protect biodiversity and ecosystem services in the renewal of the Konya Plain Project (KOP) Regional Development Program Action Plan (2019-2023) and the Konya Closed Basin Sectoral Water Allocation Action Plan (2019-2024).	2024-2030
BiO4	Updating the Konya Provincial Disaster Risk Reduction Plan and the Konya Basin Flood Management Plan by adding ecosystem-based disaster risk reduction (Eco-ARA) and measures to prevent species and ecosystems from being affected by extreme weather events	2024-2030
BiO5	Identification of endemic and threatened species belonging to all living groups in Konya province and preparation of species conservation action plans for these species, including adaptation to climate change	2024-2030
BiO6	Identify, map, and monitor the services provided by important ecosystems such as Salt Lake and Beyşehir Lake, and create an inventory of the beneficiaries of these services.	2024-2028
BiO7	Identification of areas where critical species are concentrated but not protected (such as Derebucak Stream), remnants and natural old forests, natural steppes, and taking some of these areas under protection.	2024-2025
BiO8	Establish a system to monitor species (such as the flamingo population in the Salt Lake) and water levels in important wetlands such as the Salt Lake, Beyşehir Lake, Meke Maar, Kızören Sinkhole, Akşehir-Eber and Samsam Lakes, identify the lakes and streams from which water will be taken to prevent water levels from dropping, establish an ecological water replenishment plan, and increase inspections against threats such as hunting.	2024-2030
BiO9	Identify and mitigate pressures such as pollution (air, water, soil, noise, light), bio trafficking, poaching, invasive alien species that threaten biodiversity throughout the province.	2024-2030
BiO10	Examine the fragmentation of protected areas and important habitats and create ecological corridors or fish passages to connect fragmented habitats and facilitate species migration.	2024-2030
BiO11	Promoting nature-based solutions to climate change	2024-2030

3.1.1.5 Public Health

Table 29 Public Health Adaptation Actions

Action No.	Action	Application Period
HTH1	Preparation of Konya health and climate change profile	2024-2025
HTH2	Preparation of "Konya Health and Climate Adaptation Plan" by Konya Provincial Health Directorate at provincial and district levels with interdisciplinary and intersectoral cooperation.	2024-2026
HTH3	Raising the awareness of sectors, city residents and health workers about the relationship between climate change and health, the protection of health from the effects of climate change and the role of other sectors than the health sector in Konya.	2024-2030
HTH4	The protection of Konya's health from the negative effects of climate change is carried out by Konya Public Council. Making an agenda item by the Board of Sanitation and providing revisions	2024-2030
HTH5	Identify and categorize the health effects of climate change alerts in Konya, integrate them into the existing early warning system, and make them accessible to the city's residents.	2024-2026
HTH6	Identification, monitoring and assessment of human health impacts and possible risks according to current and future climate scenarios at the district level in Konya.	2024-2030
HTH7	Preparation of the list of climate-sensitive diseases of Konya and its districts (until ICD 11 integration is completed)	2024-2027

3.1.1.6 Energy

Table 30 Energy Adaptation Actions

Action No.	Action	Application Period
ENR1	Conducting studies to expand the use of renewable energy in buildings (e.g., technical assistance, financing options), installing solar energy infrastructure to meet common area needs in new housing, creating low-density residential areas suitable for solar house projects in new development areas.	2024-2030
ENR2	Renovating all municipal buildings for the use of solar energy and taking the lead in this regard	2024-2026
ENR3	Organize information campaigns to promote and disseminate energy efficient building design (e.g. solar cooling and heating), establish building design criteria according to Konya's heating and cooling strategies, and integrate them into building permit/license processes.	2024-2026
ENR4	Developing a regional energy strategy, primarily in Selçuklu district, establishing an energy production facility that will provide neighborhood-based heating and cooling (20,000 houses)	2024-2030
ENR5	Establish and disseminate energy production facilities from alternative sources (SPP, WPP, biogas, landfill gas) and increase the share of energy production from renewable sources, regularly conduct vulnerability and risk analysis for the established facilities.	2024-2030
ENR6	Training of agricultural and industrial representatives on alternative energy sources, energy efficiency and responsible consumption	2024-2030
ENR7	Create a plan to provide heating and cooling for all and reduce energy poverty.	2024-2026
ENR8	Generate local climate data (including hazards and risks) to guide the operation of energy facilities in the province.	2024-2026

3.1.1.7 Tourism and Cultural Heritage

Table 31 Tourism and Cultural Heritage Adaptation Actions

Action No.	Action	Application Period
TUR1	Preparation of a place-based sustainable tourism strategy and action plan for Konya Province that considers the effects of climate change and integrates tourism activities to be carried out in the city center and the countryside.	2023-2025
TUR2	Establish sustainable tourism strategy and action plan implementation groups throughout the province.	2025-2030
TUR3	Increase the knowledge and awareness of human resources and local people in the tourism value chain on issues such as climate change impacts, sustainable tourism practices, climate change adaptation measures, collaborative action and community-based tourism entrepreneurship.	2024-2028
TUR4	Promoting sustainable tourism practices and certification in existing and newly established tourism facilities throughout Konya	2023-2030
TUR5	Strengthen alternative transportation infrastructure by creating exploration routes and stops in the city and countryside and optimizing travel with intelligent systems.	2023-2026
TUR6	Establishment and support of civil society and destination management organization in the sector	2024-2030
TUR7	Identification of conservation measures, implementation and control studies to reduce the vulnerability of cultural heritage sites spread throughout the province to climatic hazards and to prevent construction around them.	2024-2030
TUR8	Identifying and registering natural assets, local products, tangible and intangible cultural heritage at risk of being lost due to climate hazards and risks and ensuring their sustainability by transforming them into tourism products.	2024- 2028
TUR9	Preparation of technical and scientific reports and feasibility studies considering climate hazards for investments to be made in regions declared as Culture and Tourism Protection and Development Regions and Tourism Centers, especially in Aladağ.	2024-2027
TUR10	Implementation of practices that allow visitors to the province to engage in tourism activities with a responsible tourism approach (planned tour packages, promotional activities, membership in networks, etc.).	2024-2030

3.1.1.8 Industry

Table 32 Industry Adaptation Actions

Action No.	Action	Application Period
IND1	Expanding the reuse of water in industry	2024-2027
IND2	Changes in labor, labor productivity, and occupational safety due to climate hazards in the province by subsector Monitoring	2024-2030
IND3	With suppliers and other business partners of companies operating in the region with voluntary reporting practices. Incorporate climate adaptation elements into monitoring systems through collaboration	2024-2030
IND4	Climate change adaptation planning from the establishment stage for the facilities located in the OIZs, especially for the companies that will operate in the Konya Technology Industrial Zone.	2024-2030
IND5	Assessing the risks of technological accidents due to the dangers of climate change, especially those facilities with a high risk of industrial accidents within the scope of BEKRA legislation and taking the necessary precautions.	2024-2025

3.1.1.9 Transportation & Communication

Table 33 Transport and Communications Compliance Actions

Action No.	Action	Application Period
TRP1	In urban transportation, discharge pumps at multilevel intersections and underpasses where needed, and increase infrastructure resilience with culverts;	2024-2030
TRP2	Construction of forested and protected roads, ditches and windbreaks on pedestrian and bicycle paths	2024-2030
TRP3	Implementation of infrastructure measures to increase the resilience of the Konya light rail system	2024-2028
TRP4	Increase resiliency of communications infrastructure, especially fiber optic infrastructure and data centers	2024-2030
TRP5	Replacement or improvement of private and public buses and minibuses used in inter-county passenger and urban transportation, if necessary, in terms of air conditioning systems and heat-resistant paints,	2024-2030
TRP6	Establishment of a central zone including Mevlana Street and declaring it a low emission and low speed zone; creation of continuous bicycle lanes; conversion of part of parking lots into green infrastructure; use of highly permeable coating materials on hard pavements of sidewalks, squares and parking lots; testing of cool-cooling,	2024-2030
TRP7	Incorporate green infrastructure into transportation infrastructure (such as green roofs at public transit stops and green permeable strips along tram lines) to increase permeable surface area and reduce heat wave effects across the province.	2024-2028
TRP8	Identification of river and stream beds that have been closed and converted into vehicular roads in the urban area of Konya; making these water beds visible again with pilot projects and bringing them to Konya as green/blue infrastructure areas.	2024-2030
TRP9	Continue to enrich the diversity of urban transportation in Konya by allocating bus routes and bus lanes; plan for the expansion of the bicycle path network, inter-species integration and improvement of transfer facilities in accordance with BISUAP.	2024-2030
TRP10	Dissemination of rail system lines; implementation of the rail system / suburban line planned primarily in the OSB corridor	2024-2030
TRP11	Revision of Konya Transportation Master Plan (UAP) and BISUAP in line with climate change adaptation strategies; Integration of UAP, BISUAP and Konya SUMP plans	2024-2026
TRP12	Preparation of Konya Urban Transportation Communication and Climate Change Emergency Action Plan	2024-2028

3.1.1.10 Social Development

Table 34 Social Development Adaptation Actions

Action No.	Action	Application Period
SDL1	Review relevant key policy and planning documents at the provincial/district level, including society's vulnerability to climate change and risk management approach.	2024-2026
SDL2	Inventory of urban infrastructure to be renewed by metropolitan and district municipalities on a neighborhood basis.	2024-2026
SDL3	Updating the demographic data of social assistance at the provincial and district level, conducting spatial distribution analysis, conducting a case study that coincides with climate hazards using GIS applications	2024-2026
SDL4	Generate new data that can be used as an indicator to measure society's resilience and adaptation to climate hazards.	2024-2029
SDL5	Align the province's existing social assistance services with climate change adaptation effort and establish a local technical commission that will bring together local institutions.	2024-2025
SDL6	Establish link between provincial-level Spatial Address Registration System studies and demographic data	2024-2026
SDL7	Conduct a pilot study at the district level to link heat wave and drought hazard data produced by climate models in Konya with social data such as poverty, disability, and unemployment,	2024-2027
SDL8	Conducting comprehensive research to analyze the impact of climate change on Konya's internal migration potential, preparing internal migration statistics at the district level within this framework, analyzing infrastructure adequacy, and analyzing disaster risk in districts with high migration.	2024-2026
SDL9	Konya Provincial Directorate Community Benefit Program (CBP) Selection of Participants from the Groups Requiring Special Policies	2024-2026
SDL10	Establish horizontal governance structures that involve all segments of society in climate change adaptation processes and strengthen the functioning of existing institutions (such as city councils) in this area.	2024-2027

3.1.1.11 Disaster Risk Reduction

Table 35 Disaster Risk Reduction Adaptation Actions

Action No.	Action	Application Period
DRR1	Ensure high level of ownership and institutional capacity building for climate and disaster resilience in Konya	2024-2028
DRR2	Comprehensive Climate Change Disaster Risk Assessment and Planning in Konya	2024 - 2028
DRR3	Supporting innovative climate and disaster risk data collection and sharing and making them available to the public in real time	2024-2029
DRR4	Improving climate risk governance in Konya and developing it in a participation-based manner	2024 - 2025
DRR5	Mapping and awareness-raising of vulnerable populations against heat wave (Beşşehir, Derebucak, Seydişehir, Taşkent and Halkapınar, Karatay, Iğın, Seydişehir and Ereğli priority) and cold wave (Çeltik, Yunak, Halkapınar priority) hazards in Konya city center and districts, preparation of hot-cold wave action plans.	2024 - 2030
DRR6	Ensure participation of children/youth in Konya's resilience building efforts	2024- 2030
DRR7	Design and implementation of substantial structural and non-structural sinkhole protection measures in the most affected districts of Konya, namely Karapınar, Altınekin, Cumra and Kadınhanı.	2024 - 2030
DRR8	Conducting studies to protect people in areas most vulnerable to wind and dust storms from these hazards.	2024 - 2030
DRR9	Design and implementation of hail protection methods for agricultural lands and private properties in Konya	2026-2030
DRR10	Ensuring the resilience of the private sector, business community and professional organizations to climate hazards, occupational health and safety, and business continuity in Konya	2024 - 2030
DRR11	Restoring the resilience of public facilities to climate change-related disasters in Konya	2025- 2030

3.1.1.12 Horizontal Cutting Actions

Table 36 Horizontal Cutting Adaptation Actions

Action No.	Action	Application Period
HCT1	Determine the focal points, roles and responsibilities of institutions to follow the mitigation and adaptation studies to climate change, identify, establish coordination bodies, increase their capacities on a general and sectoral basis.	2024-2026
HCT2	Establishment of monitoring and evaluation system/structure within the framework of Konya Climate Change Adaptation Strategy and Action Plan	2024 – 2026
HCT3	Increase the resilience of Konya's infrastructure by prioritizing it regionally according to climate change hazards (waste, wastewater, water management, transportation, communication, energy, etc.).	2024-2028
HCT4	Increasing the capacity of the institution's staff to access different financial resources (project writing, information about different national-international programs, etc.).	2024-2030
HCT5	Development of community-based risk management programs (trainings, workshops, events, etc.) that will raise awareness of Konya's citizens on climate change and emerging risks under the headings of agriculture, tourism, urban, transportation, social structure, water, industry, energy, health, disasters and ecosystems.	2024-2030
HCT6	Provide capacity building training to communities, public institutions, professional associations and NGOs on climate change adaptation, risk management and biodiversity.	2024-2030
HCT7	Identifying the need for technical and financial support against the effects of climate change and providing insurance opportunities for micro and small enterprises.	2024-2026

3.2 Becoming a Sustainable City in 2030

In today's rapidly changing world, increasing population, accelerating urbanization and the risk of depletion of natural resources make it imperative for cities to be more resilient, livable and environmentally friendly. A sustainable city not only meets today's needs, but also aims to leave a livable environment for future generations.

We will start/continue our work with the goal of becoming a sustainable city by 2030. We are starting to reduce emissions, starting with the categories with the highest emissions, and activating adaptation measures to minimize the damage from the effects of climate change. Below, we have summarized some of the work we have done to make Konya greener, cleaner and more livable.

Bicycle Road Network



At present, Konya has a total of 580 km of defined bicycle road network, 310 km for transportation purposes and 50 km for recreational purposes in the three central districts. The aim of the project is to construct approximately 239 km of planned and proposed bicycle lanes in the three central districts of Konya and to construct an additional 7.4 km of intersection connections.

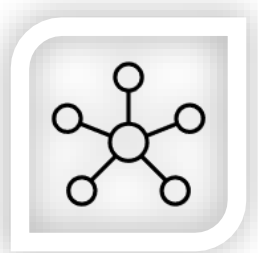
The proposal includes the bicycle road network, the elimination of interruptions in the existing bicycle road network, the repair of pavements in sections with damaged pavements, the improvement of access to the road network and the arrangement of horizontal and vertical markings. The fact that the topographical structure of the city of Konya is suitable for bicycle use and that there is a bicycle culture emphasizes this practice.

Sustainable Transportation Master Plan



The prepared Sustainable Transportation Master Plan (STMP) will present public transportation solutions for every point of the city. These solutions include interconnected rail lines on new routes, park and ride applications, etc. This will create services for the purposes of the Sustainable Urban Mobility Plan.

Micromobility Sharing System



A micromobility sharing system is a bicycle rental system with stations that eliminates the responsibilities of bicycle ownership, integrates with the public transportation network, and offers alternative payment methods. It is planned to increase the current service of 700 bicycles to 1,000 bicycles and to provide 115 different stations with a capacity of 1,500 bicycles. In addition, it is planned to include different types of bicycles in the sharing system, such as tandem bicycles, electric bicycles, electric cargo bicycles, bicycles for the disabled.

Increasing the use of scooter sharing systems and integrating them into public transport is also part of the measure. Increasing the use of micromobility sharing systems and integrating them into public transport offers the opportunity to reduce the use of private cars for both short and long-distance journeys. Due to the large young population, the trend towards micromobility is expected to increase.

Pedestrian Zones and Slow Down Projects

The aim is to increase sustainable mobility and reduce emissions through pedestrianization and traffic deceleration applications to reduce the level of emissions in downtown Konya and at the regional level. According to the pedestrianization programs, after the measurement of the walkability of the areas where pedestrianization will take place, the mapping of the mobility patterns, the determination of the road connections, the number of connections and the creation of micro-models, the pedestrianization programs aim at increasing the accessibility of the pedestrians, the social dialogue and the economic mobility. At the same time, the pedestrianization works aim to increase the accessibility of public spaces and make them more usable for disadvantaged groups. In the context of the slowdown projects, the aim is to determine the most heavily used crossings by counting pedestrians, to measure the level of service at the crossings and to determine the volume, and to design and implement the pedestrian platform, which will contribute to discouraging private vehicles, especially on busy streets, and to increasing the accessibility of pedestrian crossings for disadvantaged groups.



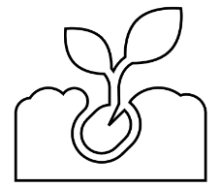
Expansion of Low Emission and Electric Vehicles

As a result of climate change practices, energy efficiency studies are being conducted to reduce both air pollution and emissions. This measure aims to reduce fossil fuel consumption and thus ensure energy efficiency by expanding the use of low-emission and electric vehicles, both in public transportation and based on private vehicles. Electric vehicle applications to be implemented on public transport routes, analysis of the environmental, social and economic impacts provided by existing electric public transport vehicles, increasing the number of charging stations for both private vehicles and public transport vehicles based on electric vehicles and the installation of charging stations based on renewable energy, apart from electric vehicles, the establishment of car, bicycle and scooter sharing systems throughout the city. Energy with steps to reduce the use of vehicles efficiency It is aimed to be provided. After all these steps, it is aimed to reduce noise pollution by reducing traffic and switching to electric motors, apart from air pollution.



Creation of a Low Emission Zone

Low Emission Zones (DEB) are areas where various vehicles with high emissions are not allowed to enter. To pave the way for the measures to be implemented and to prepare the infrastructure, it is necessary to cooperate with the central administration to implement the legal regulations. The next steps will be to determine the fee ranges according to fuel type, vehicle occupancy, emission criteria, and tonnage of the vehicles that will enter the area where the application will be made, and to create exemptions for vehicles such as security vehicles, fire trucks, and ambulances. Incentive plans will be created for low emission and electric vehicles that will enter the area, and in addition to these applications, pedestrian zones will be positioned within the low emission zones. The aim of the Low Emission Zone application is to reduce the greenhouse gas effect, air and noise pollution and to protect public health in the designated areas.



SECAP ROADMAP & COMPLIANCE MONITORING STUDY



4. SECAP READMAP-COMPLIANCE MONITORING STUDY

Konya's adaptation and mitigation studies related to climate change will be monitored regularly on a long-term basis and current situation studies will be carried out periodically. Based on the data obtained from the monitoring activities, the planned adaptation and mitigation measures may need to be updated. In this process, it is important to make observations and collect data in cooperation with stakeholder institutions.

The indicators identified in the Energy and Climate Action Plan for Cities and Regions (SECAP) project under the Presidential Memorandum of Understanding (CoM) can guide Konya's climate change adaptation process. The indicators of monitoring activities presented in Table 37 will help to create a roadmap for Konya's monitoring activities. In addition, other indicators that are appropriate in terms of data access will be developed and used.

Table 37 Monitoring Activities Indicators

Sector	Indicator	Display Unit
Buildings	Number or percentage of buildings damaged by extreme weather/events (public/residential/tertiary)	Annual/for a certain period of time
Transportation, Energy, Water, Waste, IT	Number or percentage of transport/energy/water/waste/ICT infrastructure damaged by extreme weather/events	Annual/for a certain period of time
Land Use Planning	Percentage of grey/blue/green areas affected by extreme weather/events (e.g. Heat Island Effect, Floods, Rockfalls and/or Landslides, Forest/Land Fire)	%
Transportation, Energy, Water, Waste, Civil Protection and Emergency	Number of days of public service interruption (e.g., energy/water supply, health/civil protection/emergency services, waste)	Number
Transportation, Energy, Water, Waste, Civil Protection and Emergency	Average length of public service outages (in hours) (e.g., energy/water supply, public transport traffic, health/civil protection/emergency services)	Number
Health	Number of people injured/evacuated/displaced due to extreme weather event(s) (e.g., heat or cold waves)	Annual/for a certain period of time
Health	Number of deaths due to extreme weather event(s) (e.g., heat or cold waves)	Annual/for a certain period of time
Civil Protection and Emergency	Average response time for police/fire/emergency services in extreme weather events (min. as)	Minute
Health	Number of water quality warnings issued	%
Health	Number of air quality warnings issued	Number
Environment and biodiversity	Percentage of areas affected by soil erosion/soil quality degradation	%
Environment and biodiversity	Percentage of habitat losses due to extreme weather events	%
Environment and biodiversity	Percent change in the number of native species	%
Environment and biodiversity	Native (animal/plant) affected by diseases associated with extreme weather conditions/events percentage of species	%
Agriculture and Forestry	from extreme weather conditions/events (e.g. drought/water shortage, soil erosion) Percentage of agricultural losses caused by	%
Agriculture and Forestry	Percentage of livestock losses due to extreme weather conditions	%
Agriculture and Forestry	Percent change in crop yield / evolution of annual pasture productivity	%
Agriculture and Forestry	Percentage of livestock losses due to pests/pathogens	%
Agriculture and Forestry	Percentage of timber losses due to pests/pathogens	%
Agriculture and Forestry	% Change in forest composition	%
Agriculture and Forestry	% Change in draught	%
Tourism	Percentage change in tourist flow / tourism activities	%
Other	Annual direct economic losses due to extreme weather event(s) (e.g., in commercial/agricultural/industrial/tourist sectors)	€/year
Other	The amount of annual compensation received (e.g., insurance)	€/year

CONCLUSION & EVALUATION



5. CONCLUSION AND EVALUATION

This report, which has been prepared to make the city of Konya more sensitive, environmentally friendly, less polluting and in harmony with nature by 2030, tries to contribute to the global effects of climate change at the local level. With the implementation of the mitigation and adaptation action plans, which will be prepared separately according to the sectors and considering the regional conditions, Konya, which is a city of history, will be made ready for the future. By achieving the mitigation and adaptation targets by 2030, Konya will be one of the cities that can combat the effects of climate change. Although the public is the leader in determining the policies, the importance of the city residents in these actions is very great. Therefore, human-oriented studies and green transformation practices will help Konya achieve its vision.

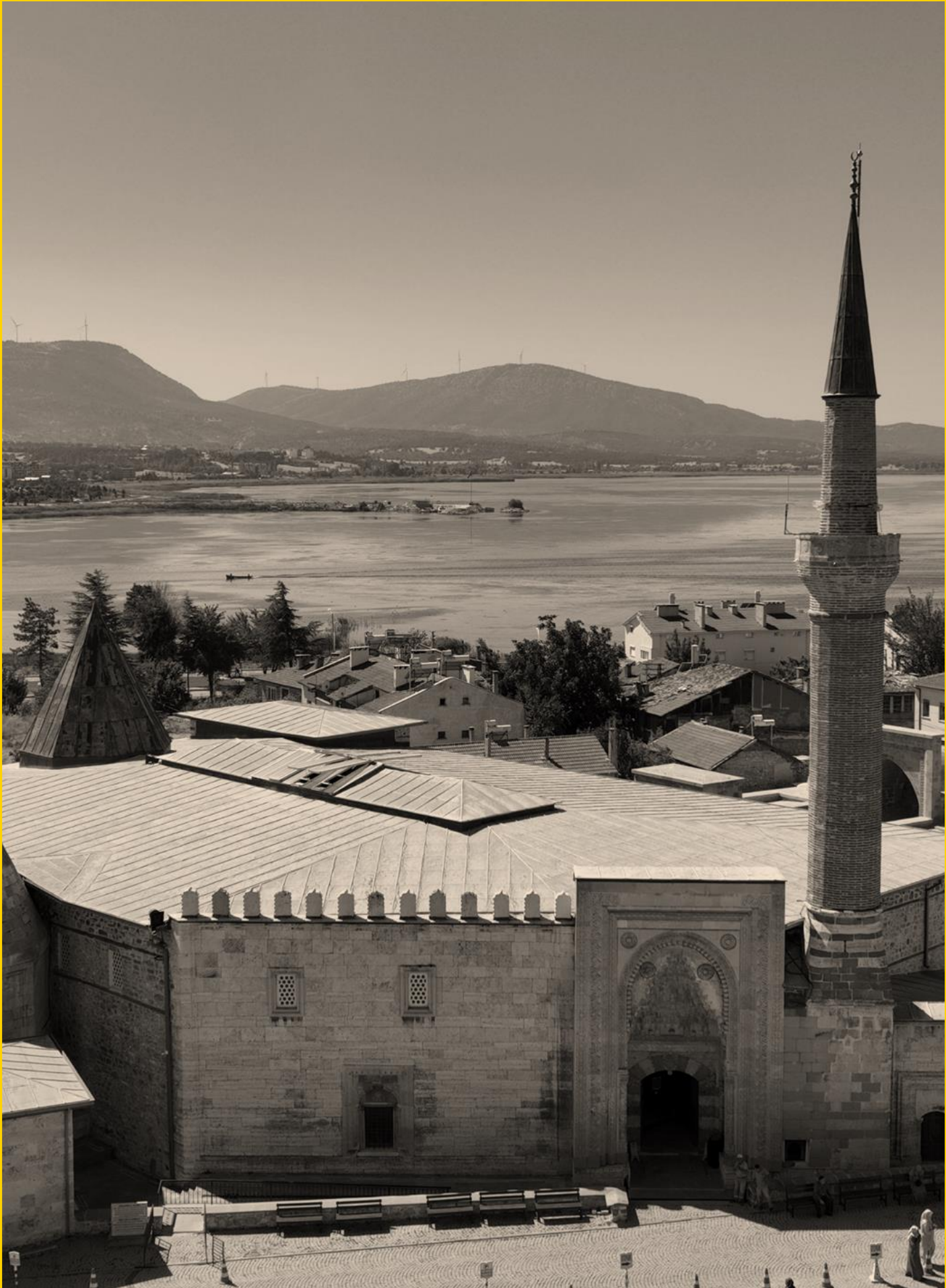
The post-project monitoring process will make it possible to measure progress towards the targets set as part of the Covenant of Mayors commitments. It will ensure the continuity of the process by reporting on the implementation rates of compliance and mitigation actions with monitoring plans and will ensure that best practices are shared by exchanging ideas with municipalities of similar size.

Public awareness and social engagement in the SECAP project play an important role in successful climate action. Behavior change and education activities contribute to reducing energy consumption by integrating them with policies that promote energy efficiency and conservation. These methods are integrated with measures aimed at increasing public awareness of behavioral changes in energy use.

Within the scope of the project, the greenhouse gas emission value of Konya Province calculated in 2022 is 11,957,157 tCO₂e. The amount of GHG emitted per capita is calculated to amount to 5.21 tCO₂e. A reduction target of 40% has been set for the year 2030 from the per capita emission amount, and reduction measures have been created to reduce the per capita greenhouse gas emission amount to 3.12 tCO₂e. Our goal is to reduce greenhouse gas emissions to 7,477,281 tCO₂e in 2030. To achieve this goal, 30 mitigation actions and 120 adaptation action plans have been prepared to protect the city of Konya from the negative effects of climate change.



RESOURCES



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