



Karşıyaka Municipality

Sustainable Energy and Climate Action Plan

2021





Karşıyaka Municipality Sustainable Energy and Climate Action Plan 2021

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Especially in the last 100-150 years, we all feel a vital threat brought by industrialization in production and consumption-oriented urbanization. No matter how big mistakes we make, nature, which we hope to repair itself, is going through a state of extinction, pollution and imbalance, which will not be able to contain millions of living species together with us humans, and will cause our extinction. We seem to forget that we are a part of nature. It does not seem long-term that the damage we have created reaches an irreversible point.

Global warming caused by humans and climate change created by this warming are the biggest problems of all of us today. We have to take urgent measures. While raising awareness in our society, we must make decisions on an urban scale and act decisively and disciplined in achieving our goals. For sure, determining the targets correctly and taking concrete steps in their solution makes interdisciplinary collaborations inevitable. Karşıyaka Municipality sees itself as a natural part of every work that has been or will be done for this cause, especially the work of our İzmir Metropolitan Municipality, takes responsibility and creates cooperation.

We are in an intense activity with all our units, from the awareness activities we carry out in our district, to our solution-oriented attitude in our infrastructure and superstructure investments, and finally to giving a special place in our Strategic Plan. While increasing our renewable energy investments, we are taking concrete steps in reducing our carbon footprint and in many areas within our jurisdiction, such as encouraging the use of bicycles, collecting waste by separating it at the source, efficient use of old public buildings, environmentally friendly planning in our new buildings, and offering them to the public service. Our aim is to make our city resistant and reliable to the negative reflections of climate change, to reduce our greenhouse gas emissions effectively, and to ensure that our "Sustainable Energy and Climate Action Plan" finds a response in individual and social areas.

I would like to remind you that overcoming the problems which we are experiencing is through providing that local governments take initiative on the issue, produce policies and strategies, and ensure that all parties participate effectively with a holistic perspective. We need to see the climate crisis as a grave social justice issue at the same time. I hope that the study we have presented will provide sufficient information about the concrete steps, which we have taken and will take in this context. I would like to thank our Science Board, our Professional Chambers, especially our Chamber of Environmental Engineers for their contribution and sharing their valuable opinions and thoughts with us and our Deputy Mayor Saadet Çağlın and all my colleagues from Karşıyaka Municipality for their efforts.

Our greatest assurance and support is the contemporary and sensitive people of Karşıyaka, and we derive the strength and courage from them to work for a more livable city and country, a beautiful world and a future in harmony with nature.

Sincerely Yours

Dr. Cemil TUGAY

Mayor of Karşıyaka Municipality

**KARŞIYAKA MUNICIPALITY
SUSTAINABLE
ENERGY AND CLIMATE
ACTION PLAN
2021**



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ABBREVIATIONS

AFOLU:	Agriculture, Forestry and Other Land Use
BAU:	Business as Usual
BM:	United Nations
BMİDÇS:	UNFCCC - United Nations Framework Convention on Climate Change
C40:	Cities Climate Leadership Group
CoM:	Covenant of Mayors
COP7:	7 th Conference of the Parties
ÇŞB:	Environment, Urbanization and Climate Change Ministry
EPDK:	Energy Market Regulatory Board
ESDEM:	Health Support Center at Home
EU ETS:	European Union Emissions Trading System
FOD:	First Order Decay
GEPA:	Solar Energy Potential Atlas
GCoM:	Global Covenant of Mayors
GPC:	The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
FISU:	International University Sports Federation International University Sports Federation
IE:	Included Elsewhere
IPCC:	Intergovernmental Panel on Climate Change
IPCC:	AR5: IPCC Fifth Assessment Report
IRENA:	International Renewable Energy Agency
IMM:	Izmir Metropolitan Municipality

ICLEI:	Local Governments for Sustainability
İDEP:	Climate Change National Action Plan
İDES:	National Climate Change Strategy Document
İDKK:	Climate Change Coordination Board
İDHYKK:	Climate Change and Air Management Coordination Board
iklimİN:	Supporting Project of Joint Efforts in the Field of Climate Change
KAME:	Karşıyaka Disaster Response Teams
KARBEL:	Karşıyaka Municipality
KF:	Capacity Factor
MRV:	Measurement, Reporting and Verification
NE:	Not Estimated
NO:	Not Occurring
OECD:	Organisation for Economic Co-operation and Development
ÖDA:	Important Nature Area
PAD:	Landscape Research Association
PDSI:	Palmer Drought Severity Index
PHDI:	Palmer Hydrological Drought Index
PVGIS:	European Commission – Joint Research Center Photovoltaic Geographical Information System
REPA:	Wind Energy Potential Atlas
SEAP:	Sustainable Energy Action Plan
SECAP:	Sustainable Energy and Climate Action Plan
SGE:	Greenhouse Gas Emissions
SPI:	Standard Precipitation Index
TÜİK:	Turkish Statistical Institute
UPI:	Transportation Master Plan
WRI:	World Resources Institute
YŞEP:	Izmir Green City Action Plan

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Murat AR / Turkish Healthy Cities Association

Union of Chambers of Engineers and Architects of Turkey İzmir Provincial Coordination

Board Representatives

EXTERNAL STAKEHOLDERS

•TR Ministry of Environment, Urbanization and Climate Change İzmir Provincial Directorate

•TR Ministry of Health Karşıyaka District Directorate

•TR Ministry of Agriculture and Forestry Karşıyaka District Directorate

•İzmir Governorship AFAD Disaster and Emergency Management Presidency

•İzmir Governorship Regional Directorate of Meteorology

•TCDD State Railways

•DSI State Hydraulic Works 2nd Regional Directorate

•IMM Climate Change and Environmental Protection Control Department

•IMM Transportation Department

•IMM Waste Management Department

•IMM Department of Community Health

•IMM Department of Reconstruction and Urban Transformation

•IMM Parks and Gardens Department

•IMM Agricultural Services Department

•IMM Foreign Relations and Tourism

Department

•IMM Disaster and Risk Management Branch Office

•IMM Department of Earthquake and Soil Investigation

•IMM Clean Energy Branch Directorate

•İZSU Relevant Departments

•ESHOT Relevant Departments

•METRO A.Ş.

•İZBAN A.Ş.

•İZULAŞ A.Ş.

•İZDENİZ A.Ş.

•İZMİRGAZ A.Ş.

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•UCTEA Chamber of Food Engineers

•UCTEA Chamber of Interior Architects

•UCTEA Chamber of Chemical Engineers

•UCTEA Chamber of Architects

•UCTEA Chamber of Forest Engineers

•UCTEA Chamber of Landscape Architects

•UCTEA Chamber of City Planners

•UCTEA Chamber of Agricultural Engineers

Aegean Forest Foundation

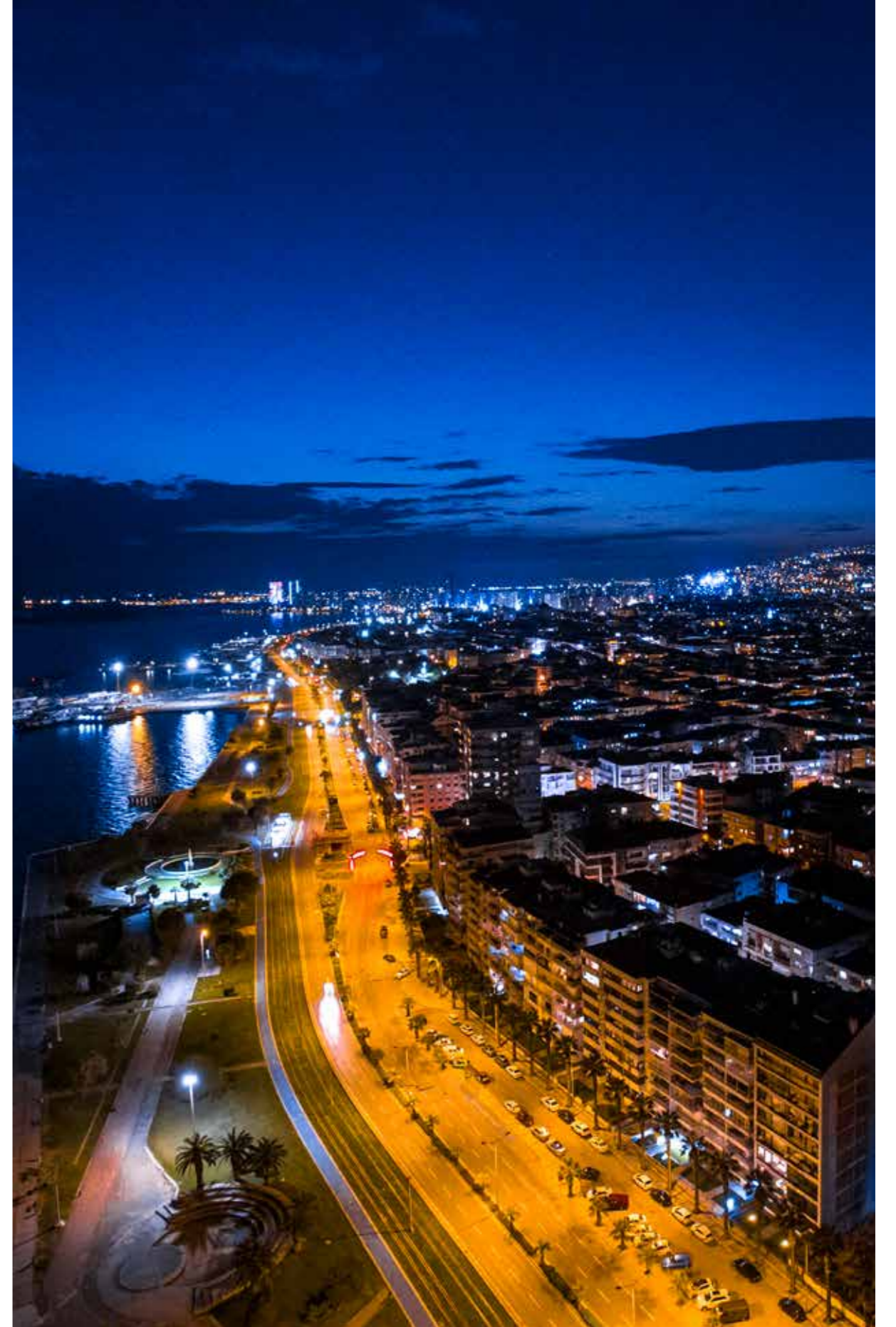
•Environmental Energy Association

•İzmir Agriculture Group

INTERNAL STAKEHOLDERS

- Directorates Affiliated to Karşıyaka Municipality
- Environmental Protection and Control Directorate
- Transportation Services Directorate
- Construction Affairs Directorate
- Directorate of Zoning and Urbanization
- TCDD State Railways
- DSI State Hydraulic Works 2nd Regional Directorate
- Etude Project Directorate
- Plan Project Directorate
- Urban Design Directorate

- Urban Renewal Directorate
- Cleaning Affairs Directorate
- Parks and Gardens Directorate
- Support Services Directorate
- Directorate of Business and Affiliates
- Directorate of Health Affairs
- Veterinary Services Directorate
- Directorate of Social Aid Affairs
- IT Department
- Sports Affairs Directorate
- Facilities Directorate
- Directorate of Culture
- KENT A.Ş.
- Karşıyaka Municipality City Council



1. EXECUTIVE SUMMARY

Cities, where a significant part of the world's population live, are one of the most important causes of climate change, with population growth, the land cover turning into housing and infrastructure, and the rapid consumption of energy and natural resources, causing an increase in greenhouse gas emissions.

Cities are primarily and mostly affected by the risks caused by extreme weather events such as an increase in temperatures caused by climate change, an increase in the number of hot days, more intense precipitation in a shorter period of time, and disasters such as floods, droughts, and rise in sea level. The "Climate Urbanization" process, in which cities affect climate change and climate change also affects cities, requires the evaluation of many issues from the perspective of climate change, from spatial planning of cities to administrative decisions.

While Karşıyaka Municipality's Sustainable Energy and Climate Action Plan is being prepared, a healthy world for the future, being a nature friendly city and resistant to climate change, as well as sustainability of social justice has been determined as the main target.

1.1 Purpose of Study

The main purpose and basis of the study of Karşıyaka Municipality Sustainable Energy and Climate Action Plan, in relation to the global climate crisis, which is caused by human influence and whose severity is increasing day by day, within the scope of the chain of responsibilities that starts from the individual and includes institutions, local governments, country governments and finally international associations, reveals the current situation of Karşıyaka Municipality regarding climate change, its plan for future actions and monitoring indicators.

In order to begin by emphasizing the importance of the subject, it has been deemed appropriate to share the most up-to-date scientific findings on the climate crisis:

The first part of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) was published in August 2021 to reveal the physical science basis of climate change. In the summary report prepared for the decision makers, the striking findings given below are put forward, and it is emphasized without hesitation and unequivocally that the root cause of the climate crisis is human activities and that the only key necessary to slow down the effects of this crisis is in the hands of the people.

The highlights of the current state of the climate in the first part of the summary report are as follows:

- The warming of the atmosphere, oceans and terrestrial areas due to human activities is beyond doubt. Widespread and rapid changes have occurred in the atmosphere, oceans, cryosphere and biosphere.
- The degree of recent changes in the climate system considered as a whole and the current state of many aspects of the climate system are unprecedented for centuries and even millennia.

Man-made climate change is already causing many extraordinary weather and climate events in every region of the world. Evidence for changes observed in extreme events such as heat waves, heavy rains, droughts and tropical cyclones, and in particular attributing these events to human influence, has strengthened since the Fifth Assessment Report (AR5). According to advanced knowledge of climate processes, past climate evidence, and increasing radiative forcing of the climate system, the reaction of its sensitivity is narrower compared to AR5, which is formed in the range of 1.5-4.5 °C at the end of the century. It will stabilize in the range of 2.5-4 °C, with the best estimate at 30C. envisaged In the second part, the following determinations are made regarding the possible future of the climate:

- Under all emission scenarios considered, global surface temperature will continue to rise until at least the middle of the century. If deep reductions in CO₂ and other greenhouse gas emissions do not occur over the next decade, the global warming threshold of 1.50C and 20C will be exceeded.

- Many changes in the climate system become larger and more effective due to the direct relationship with increasing global warming. These include decreases in Arctic sea ice, snow cover and permafrost, as well as increases in the frequency and intensity of extreme heat, marine heat waves, extreme precipitation, agricultural and ecological droughts in some regions, and the rate of severe tropical cyclones.

- It is predicted that the ongoing global warming will intensify the global water cycle, especially in terms of the variability of the water cycle, the intensity of global monsoon rains and precipitation and drought events.

- According to scenarios related to increased CO₂ emissions, it is predicted that carbon sinks in the ocean and land will be less effective in slowing the accumulation of CO₂ in the atmosphere.

- Many changes due to past and future greenhouse gas emissions, particularly changes in the oceans, ice sheets and global sea level, are irreversible over centuries or even millennia. Many changes due to past and future greenhouse gas emissions, particularly changes in the oceans, ice sheets and global sea level, are irreversible over centuries or even millennia.

These striking findings clearly emphasize that the steps to be taken regarding the climate crisis should be swift and decisive. In addition, it is now a vital issue for all stakeholders, big or small, to take ownership and fulfill all the responsibilities that need to be undertaken.

From this point of view, Karşıyaka Municipality continues on its way resolutely in order to carry forward the works it has been carrying out since 2011 and to draw a concrete and traceable road map, both to integrate the works of the Izmir Metropolitan Municipality throughout the province



and to fulfill its responsibilities within the scope of national and international obligations.

Karşıyaka Municipality is the first local government from Turkey signed the Agreement of Mayors on January 3, 2011, and is therefore the first municipality to offer SEAP. Karşıyaka took the year 2009 as a reference in the 1st SEAP and the plan was presented in 2012 (KARŞIYAKA MUNICIPALITY SEAP 2012). In the first plan, Karşıyaka district consists of 23 neighborhoods and has a population of 304.507 in 2009, and a 35% greenhouse gas reduction is targeted for 2020.

In 2018, SECAP was prepared with reference to 2012 (KARŞIYAKA MUNICIPALITY 2018). The change in greenhouse gas emissions between 2009 and 2015 is also reported in this plan. In the second plan, Karşıyaka district consists of 27 neighborhoods and has a population of 315.294 people and a 20% greenhouse gas reduction is targeted for 2020.

The KARBEL SECAP 2021 process, which started in November 2020 under the leadership of the executive committee consisting of the representatives of Karşıyaka Municipality, UCTEA Chamber of Environmental Engineers and SolarMENA, was carried out with the active participation and contribution of internal and external stakeholders, in accordance with the CoM methodology. It is aimed to develop adaptation strategies that will implement a significant reduction in greenhouse gas emissions by 2030 by improving the studies carried out by Karşıyaka Municipality and to transform these into rational policies and implement them with concrete targets and monitoring indicators.

1.2 Summery of Study

The most important feature of the KARŞIYAKA MUNICIPALITY SECAP 2021 study is that it is inclusive of all relevant parties and produces a collective result with effective stakeholder participation. Thus, it is aimed to strengthen the institutional capacity of Karşıyaka Municipality within the scope of adaptation to climate change. For this purpose, Municipality representatives took an active part in the whole process from the preparation stage to the reporting stage in order to set concrete, effective, achievable and traceable targets. Totally, 33 Executive Board meetings were held between November 2020 and July 2021.

Within the scope of the study, an Advisory Board consisting of academicians and technical experts working in the field of climate was formed in order to consult their opinions and suggestions. At the same time, stakeholder lists including the institutions whose information and opinions will

be consulted throughout the entire process, from data collection to determination of mitigation and adaptation actions, were determined, and these stakeholder institutions were also allowed to participate and contribute to the meetings at necessary stages. In this context, totally nine stakeholder meetings were held throughout the study. Municipal units have been determined as Internal stakeholders while İzmir Metropolitan Municipality and its affiliates, directorates and departments, official institutions, UCTEA İzmir Provincial Coordination Board, İzmir Medical Chamber, professional chambers and universities have been determined as external stakeholders.

Since Karşıyaka district is a part of İzmir province, care has been taken to ensure that the study is compatible with İzmir Sustainable Energy and Climate Action Plan (IMM SECAP 2020) published in 2020. In addition, the project named "A Framework for Climate Change Resistant Cities: Green-Focused Adaptation" (2019) implemented with the participation of IMM and Landscape Research Association (PAD) and the European Union funded "Urban GREENUP Project" (2019), of which IMM is one of the parties. outputs and various literature sources were used. Within the scope of the study, it was tried to establish a connection with other supporting reports and plans related to İzmir as much as possible. Maximum effort has been made to align with the scope and actions of IMM SECAP 2020 in the assessment of climate change scenarios for Karşıyaka, risks and vulnerabilities throughout the province, and the determination of KARŞIYAKA MUNICIPALITY SECAP 2021 actions. In this way, it contributes to the applicability and traceability of the IMM reduction and adaptation targets in Karşıyaka district.

The first stage of the study is to create a greenhouse gas inventory and make comparisons with previous studies. In order to make these comparisons, historical data sources and sources and scopes included in the calculation were examined, and recalculations were applied for previous period data when necessary, depending on the principles of "completeness", "consistency" and "suitability" that the inventory should provide. In addition, unlike previous periods, for the first time, the corporate greenhouse gas inventory of Karşıyaka Municipality arising from its own operational activities has been calculated. In this way, the reduction possibilities that can be directly controlled were more clearly demonstrated and it was aimed to increase the participation and awareness of the public by disseminating institutional practices and setting an example in public spaces.

Along with the evaluation of the numerical greenhouse gas inventory data and revealing the mitigation possibilities, studies to identify the elements of urban sectors that may be affected by the climate crisis and to reveal their adaptation capacities were carried out simultaneously. In this context, totally nine sectors were evaluated throughout the district:

- Energy
- Buildings and Urban Renewal
- Transportation
- Waste Management
- Water and Wastewater Management
- Green Spaces, Land Use, Green Corridors, Biodiversity and Urban Heat Islands
- Disaster Management
- Public Health
- Other (Safe Food, Agriculture, Industry and Tourism)

As a result of all the evaluations, reduction and adaptation actions classified according to sectors were revealed. Care has been taken to ensure that the actions are concrete, realistic, traceable and accessible, and future targets and monitoring indicators have also been determined where appropriate. In addition, in all actions, harmonization relations are defined with both IMM SECAP 2020 actions and Karşıyaka Municipality 2020-2024 Strategic Plan.

Finally, within the scope of Karşıyaka SECAP 2021 study, a roadmap has been defined that can be taken as a basis both in the preparation of the current (year 2021) inventory and action plan, and in the follow-up studies to be carried out in the future. In this context, information was given about the studies that can be followed in the future on data management, performance monitoring process, administrative organization and coordination, stakeholder participation and public awareness.

1.3. Results of Study

The greenhouse gas emission of the city of Karşıyaka in 2018 base year is 1.362.243,7 tCO₂e/year in total, which includes the greenhouse gas emissions arising from the corporate activities of Karşıyaka Municipality. The amount of greenhouse gas emissions per person was calculated as 3.96 tCO₂e/person-year. Karşıyaka is one of the districts of İzmir with the highest level of economic welfare. Parameters such as Intensive energy use, high vehicle ownership, daily waste production amount etc. affect the amount of greenhouse gas emissions considerably. The total amount of greenhouse gas emissions is shown below as a percentage on the basis of main sectors and scopes.

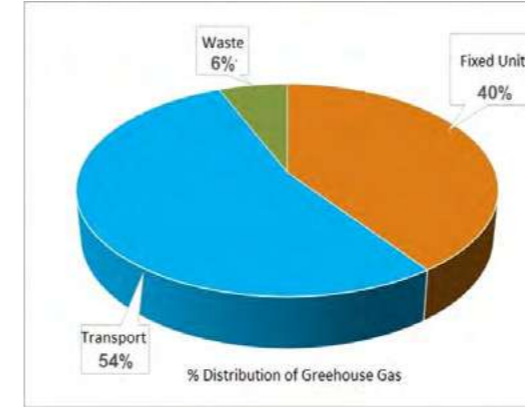


Figure 1.1 Karşıyaka Municipality Urban Greenhouse Gas Inventory (2018) Distribution by Sectors

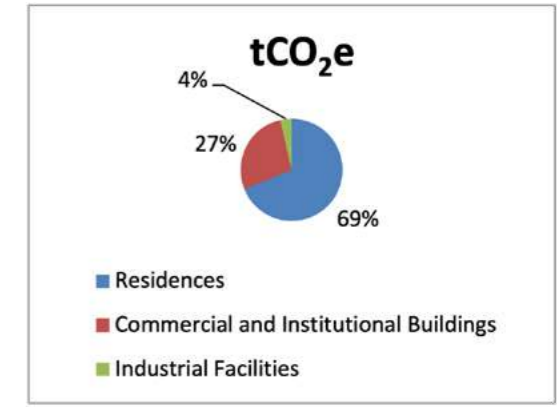


Figure 1.2 Distribution of Fixed Units by Purpose of Use

Within the scope of **KARŞIYAKA MUNICIPALITY SECAP 2021** studies, the corporate greenhouse gas inventory, which is calculated for the first time and takes into account the municipality's own operational activities, has been created to include the years 2018, 2019 and 2020 and it is planned to consider 2018 data as the base year both in this study and in future studies.

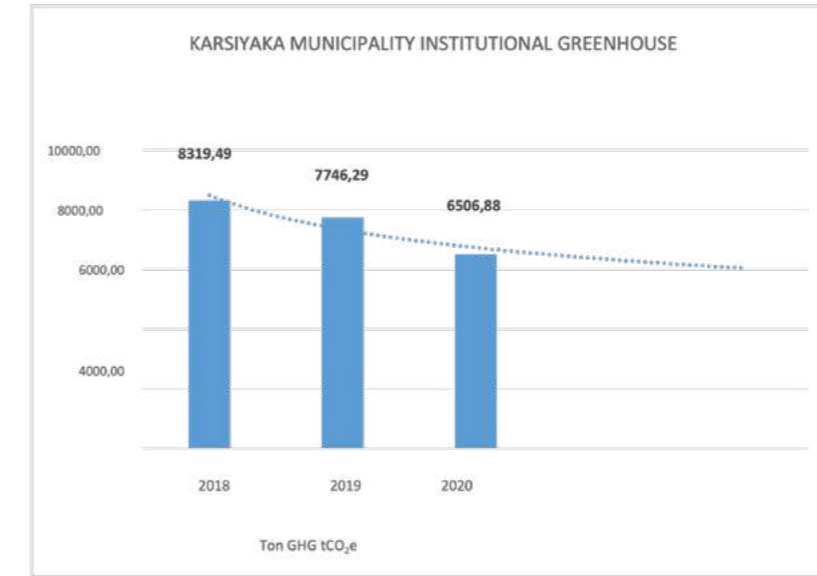


Figure 1.3 Karşıyaka Municipality Institutional Greenhouse Gas Inventory

As a result of stakeholder meetings and participatory studies, it has been decided to reduce the amount of emissions per person in the 2018 base year by at least 40% until 2030. In this context, it is aimed to reduce the emission amount of 3,96 tCO₂e/person in 2018 to 2,37 tCO₂e/person in 2030. In 2030, it is predicted that the absolute amount of greenhouse gases will decrease from 1.643.013 tCO₂e to 933.647 tCO₂e. In the light of the information obtained as a result of internationally accepted methods and workshops, a total of 709.366 tCO₂e reduction potential was calculated with the reduction actions determined in the plan.



Karşıyaka Municipality, which commissioned 493.185 kWp land type photovoltaic solar energy systems in 2014 and 1.140.48 kWp land type photovoltaic solar energy systems at the end of 2020, reached the total installed to 1,63 kWp power of GES. It is the district with the largest installed capacity within the borders of İzmir Metropolitan Municipality and currently meets approximately 24% of the corporate electrical energy need with SPP generation. In 2030, it is aimed to increase this rate to 100% with the installation of 5.5 MWp additional photovoltaic SPP. In this way, it is aimed that KARBEL will become a Carbon Neutral Municipality in 2030, with a total installed power of 7,13 MWp, within the scope of corporate electrical energy consumption.

Mitigation and Adaptation Actions

It is aimed to reduce the 3,96 tCO₂e/person emission amount determined by Karşıyaka Municipality according to the 2018 Base Year to 2,37 tCO₂e/person in 2030. In line with this target, 32 actions were determined on the basis of sectors.

While determining the Buildings, Transportation, Energy and Waste sectors for reduction of source of greenhouse gas, Water Resources, Public Health, Disaster Management, Sustainable Agriculture, Green Spaces-Land Use, Protected Areas and Food Security are determined as sectors that are adversely affected by the consequences of climate change and whose adaptation capacity needs to be improved.

18 of the actions created are effective on reduction, 9 on adaptation, and 5 actions have both mitigation and adaptation effects. In the figures below, the number and types of actions determined by sectors can be examined. GHG reduction amounts by sectors can be examined in the figure below.

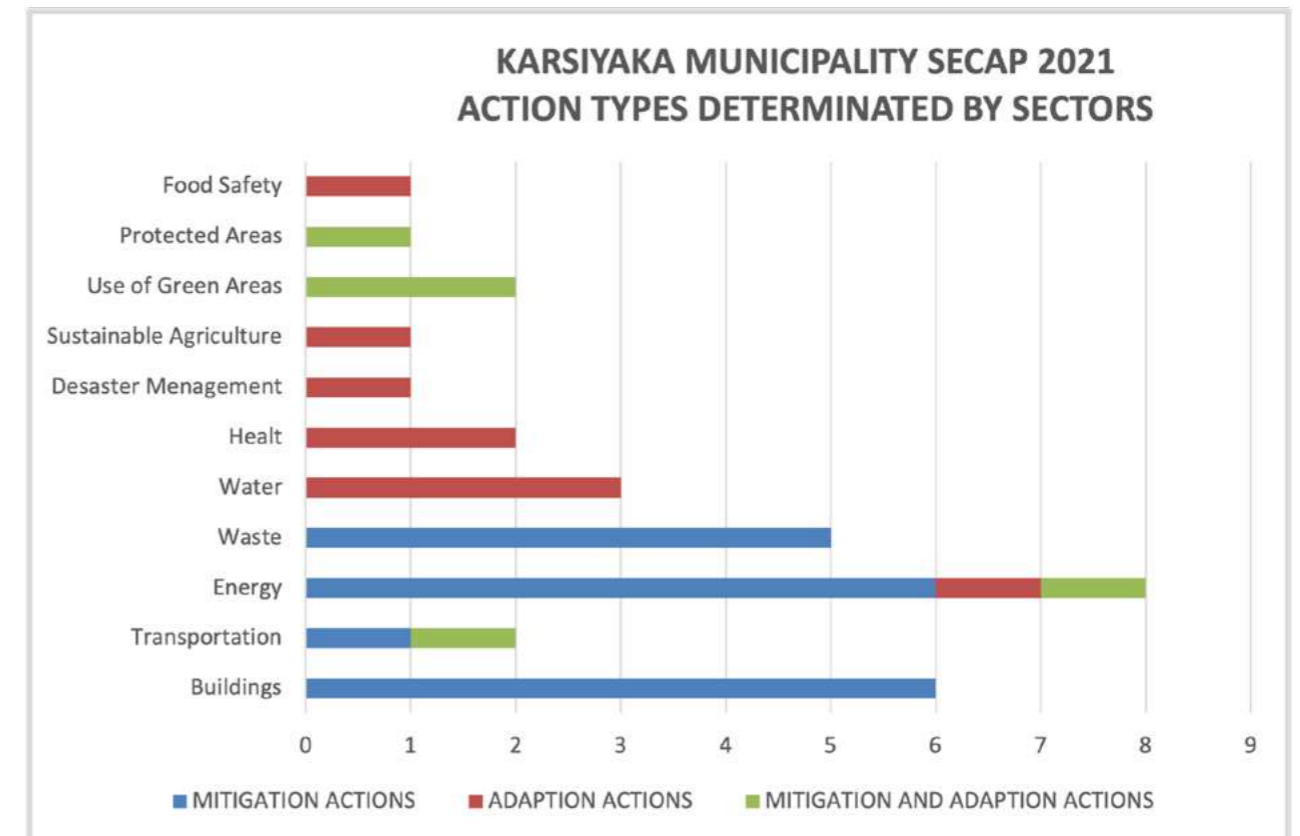


Figure 1.4 Karşıyaka Municipality SECAP 2021 Action Types Determined by Sector

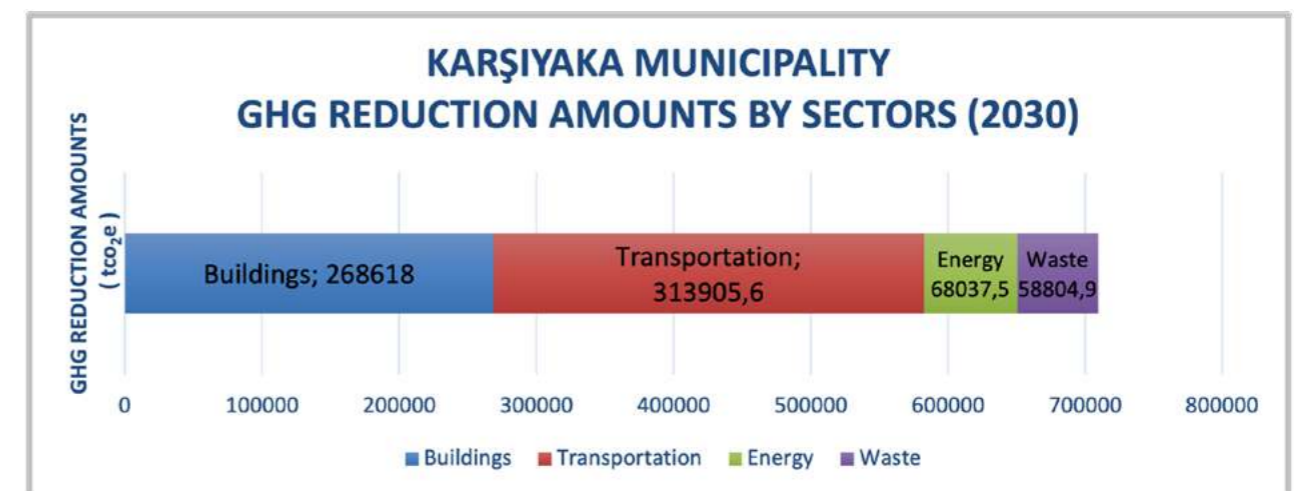


Figure 1.5 Karşıyaka Municipality SECAP 2021 GHG Reduction Amount by Sectors (2030)

\$8.470.000 of the \$10.180.600 budget is for reduction, \$910.000 is for adaptation and \$810.600 is for both mitigation and adaptation actions. Unforeseen costs are not included in this budget.

The identified reduction and adaptation actions benefit from the provincial targets and actions of the Izmir Metropolitan Municipality, especially since the district Municipality's area of responsibility is limited for the energy, transportation and waste sectors. The 2021 Sustainable Energy and Climate Action Plan will be the main roadmap for Karşıyaka to achieve its goal of being a city compatible with nature and resistant to climate crisis.



GLOBAL CLIMATE CHANGE: POLICY AND ACTIONS



2.1 NATIONAL CLIMATE CHANGE POLICIES AND ACTIVITIES

2.1.1 Climate Negotiations and Turkey's Position

Turkey has a special position in the Climate Change negotiations. In the 1990s, when the negotiations began, struggle against greenhouse gas emissions was determined as a responsibility of the member states of the Organization for Economic Cooperation and Development (OECD). Turkey as being a member of the OECD, is both in Annex-I List (countries with emission reduction obligations) and Annex-II List (countries that will provide technology transfer and financial support) of **the United Nations Framework Convention on Climate Change** (UNFCCC), which was accepted in 1992 and opened for signature at the United Nations (UN) Conference on Environment and Development held in Rio de Janeiro with developed countries. Developed countries within the scope of the Convention and other parties included in Annex-I are obliged to reduce their greenhouse gas emissions; developed countries and other parties included in Annex-II are obliged to provide financial support to other countries. Since Turkey, a developing country, did not want to take on this financial obligation, upon its own application, it was accepted that it was in a different position (transition country) from the other parties in the Annex-I List of the Convention at the 7th Conference of the Parties (COP7) held in 2001. It has been removed from the Annex-II List by remaining on the Annex-I. Following this decision, Law No. 4990 stating that it was appropriate for us to join the UNFCCC was accepted in the General Assembly of the Turkish Grand National Assembly on October 21, 2003 and Turkey became a party to the Convention on May 24, 2004.

The Kyoto Protocol, which was created as an international framework by the UNFCCC to combat climate change, basically requires countries to reduce the amount of carbon they emitted to the atmosphere to the year 1990 levels. The Kyoto Protocol was adopted in 1997 and entered into force in 2005. In the protocol, quantified emission reduction targets are specified for Annex-I parties. Turkey became a party to the Kyoto Protocol on August 26, 2009 with the presentation of the accession tool to the UN, after the adoption of the Law No. 5386 by the Turkish Grand National Assembly on February 5, 2009 and the Council of Ministers Decision dated 13 May 2009 and numbered 2009/14979. Although Turkey, which was not a party to the UNFCCC when the Kyoto Protocol was adopted, was an Annex-I country, there was no quantified emission reduction commitment within the scope of the Protocol.

Republic of Turkey by being published in the Official Gazette dated 07.10.2021 and dated 31621. It has become a party to the Paris Agreement. On 11.10.2021, the name of TR Ministry of

Environment and Urbanization was changed and TR Environment, It is the Ministry of Urbanization and Climate Change, and with this change, the Climate Change Presidency was established. In addition, the General Directorate of Meteorology under the Ministry of Agriculture and Forestry of the Republic of Turkey and General Directorate of Combating Desertification and Erosion are subordinated to TR Ministry of Environment, Urbanism and Climate Change.

2.1.2 National Framework for Climate Policies

Ministry of Environment, Urbanism and Climate Change (MoEU) is responsible for the creation and implementation of climate policies in Turkey. Ministry of Environment, Urbanism and Climate Change is Turkey's UNFCCC focal point. However, before Turkey became a party to the UNFCCC, institutional structuring was carried out and the Climate Change Coordination Board (IDKK) was established with the Prime Ministry Circular No. 2001/2. IDKK was restructured in 2013 and renamed as Climate Change and Air Management Coordination Board (IDHYKK). The Board, within the framework of the United Nations Framework Convention on Climate Change and the United Nations European Economic Commission Long-Range Transboundary Air Pollution Convention and the protocols attached to these agreements, is responsible for taking necessary measures to combat climate change and preventing air pollution and coordinating the work of determining appropriate domestic and foreign policies, taking into account the local conditions of the country.

2.1.3 National Strategy and Action Plan

There are three main strategic documents that frame Turkey's national policy on climate change. These strategies and action plans, which constitute the basic building blocks of Turkey's climate policy, are of critical importance in terms of revealing the climate policy will, vision and goals of both national and local actors.

2.1.3.1 National Climate Change Strategy (2010-2020)

The most fundamental policy document on climate change is the National Climate Change Strategy Document (IDES), which was prepared with the participation of public institutions, private sector representatives, non-governmental organizations and universities and covers the years 2010-2020. The strategy was approved by the High Planning Council in May 2010. In the Strategy Document, which will guide the actions to be taken in the fight against climate change, there are mitigation, adaptation, financing and technology policies that Turkey will implement within the framework of the "common but differentiated responsibilities" principle of the UNFCCC, within the framework of Turkey's national opportunities and the availability of international financing and grants.



The strategy defines Turkey's vision for tackling climate change:

"Turkey's national vision within the scope of climate change, integrated climate change policies with development policies, expanded energy efficiency, increased the use of clean and renewable energy sources, actively participated in the fight against climate change within the framework of its special conditions, and being a country providing high quality of life and welfare to all its citizens with low carbon intensity"

In this way, the strategy sets national targets on climate change. In addition, short, medium and long-term strategies have been determined in the fields of energy, transportation, industry, waste and land use, agriculture and forestry, adaptation to climate change, technology transfer, financing and capacity building. The strategy includes a set of targets to be implemented in the short term (within one year), medium term (within 1 to 3 years) and long term (to be launched within the next 10 years) related to transport, industry, buildings, waste and agriculture. Some key measures in the strategy are:

- Cogeneration and district heating
- Use of local renewable energy sources alongside local coal
- Increasing the efficiency of buildings

2.1.3.2 National Climate Change Action Plan (2011-2023)

The National Climate Change Strategy and the "National Climate Change Action Plan" (CCAP), which was envisaged to be prepared in the 9th Development Plan, was prepared with the participation of the relevant parties with the aim of revealing the policies and measures for greenhouse gas emission reduction and adaptation to climate change. CCAP was prepared with a large stakeholder group together with IDKK members, institutions and organizations, and was accepted in May 2011.

Goals and targets have been defined for greenhouse gas reduction in the energy, building, industry, transportation, waste, agriculture and land use and forestry sectors and on issues that cut horizontally across sectors. In order to achieve these goals, actions with specific institutions, duration, side benefits, outputs and performance indicators have been established. In addition to mitigation actions, objectives, targets and actions are listed for issues such as water resources management and food safety related to adaptation.

This plan consists of two main action plans: (1) Greenhouse Gas Emission Control Action Plan and (2) Climate Change Adaptation Action Plan. Within the scope of CCAP; Actions related to

institutional structuring and policy making, technology development and transfer, financing and economic instruments, data and information systems, training and capacity building, and CCAP monitoring and evaluation mechanisms have been brought together.

CCAP presents sub-actions for the targets included in the National Climate Change Strategy and defines the responsible institutions/organizations and timing for their implementation.

2.1.3.3 National Climate Change Adaptation Strategy and Action Plan (2011-2023)

Purposes, targets and actions have been defined for common horizontal issues in the fields of water resources management, agriculture sector and food security, ecosystem services, biodiversity and forestry, natural disaster risk management, human health and adaptation to climate change. Responsible institutions, deadlines, outputs and performance indicators have been determined for the actions.

The fight against climate change is supported by national strategies and action plans, strategic plans of ministries, and thematic strategies, action plans and programs developed by ministries.

Some of these are:

- 10th Development Plan (2014-2018)
- Information Society Strategy and Action Plan (2015-2018)
- Integrated Urban Development Strategy and Action Plan (2010-2023)
- National Strategy and Action Plan for Combating Desertification (2015-2023)
- Industrial Strategy (2015-2018)
- National Energy Efficiency Action Plan (2017-2023)
- National Basin Management Strategy and Action Plan (2014-2023)
- National Drought Management Strategy Document and Action Plan (2017-2023)

2.1.4 Paris Agreement – Turkey's Statement of National Contribution (2015)

The Paris Agreement, which is basically based on the UNFCCC, aims to regulate the post-2020 climate change regime, which is the expiration date of the Kyoto Protocol. Our country submitted its Statement of National Contribution for the Paris Agreement to the Convention Secretariat on 30 September 2015. In Turkey's Statement of National Contribution, it is foreseen that greenhouse gas emissions will be reduced from an increase of up to 21% in 2030, according to the reference scenario (BAU) (Figure 2-1).

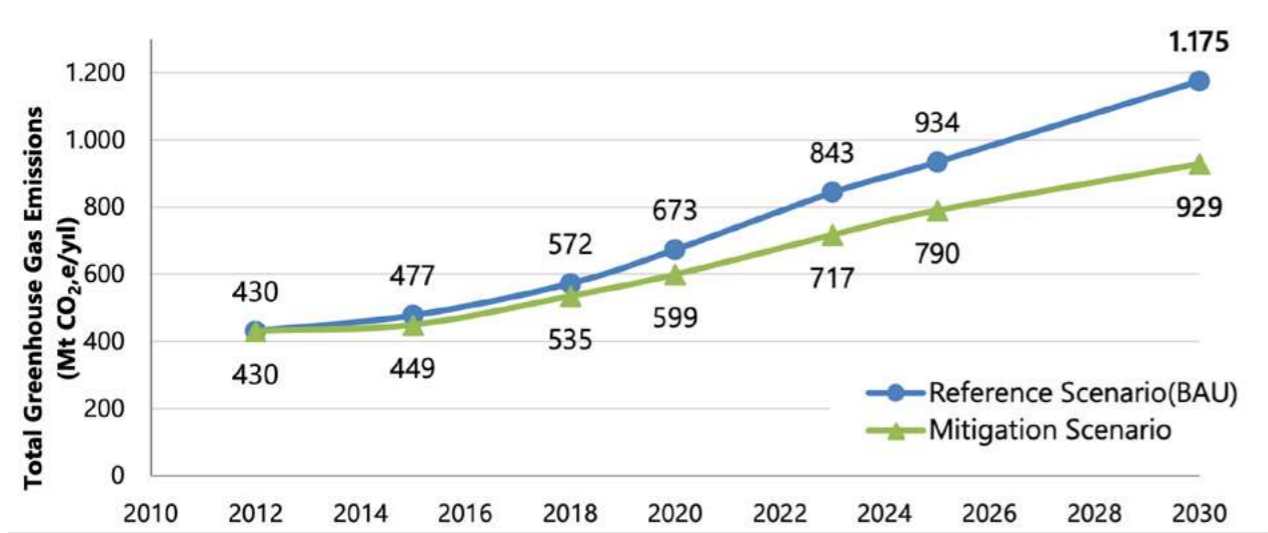


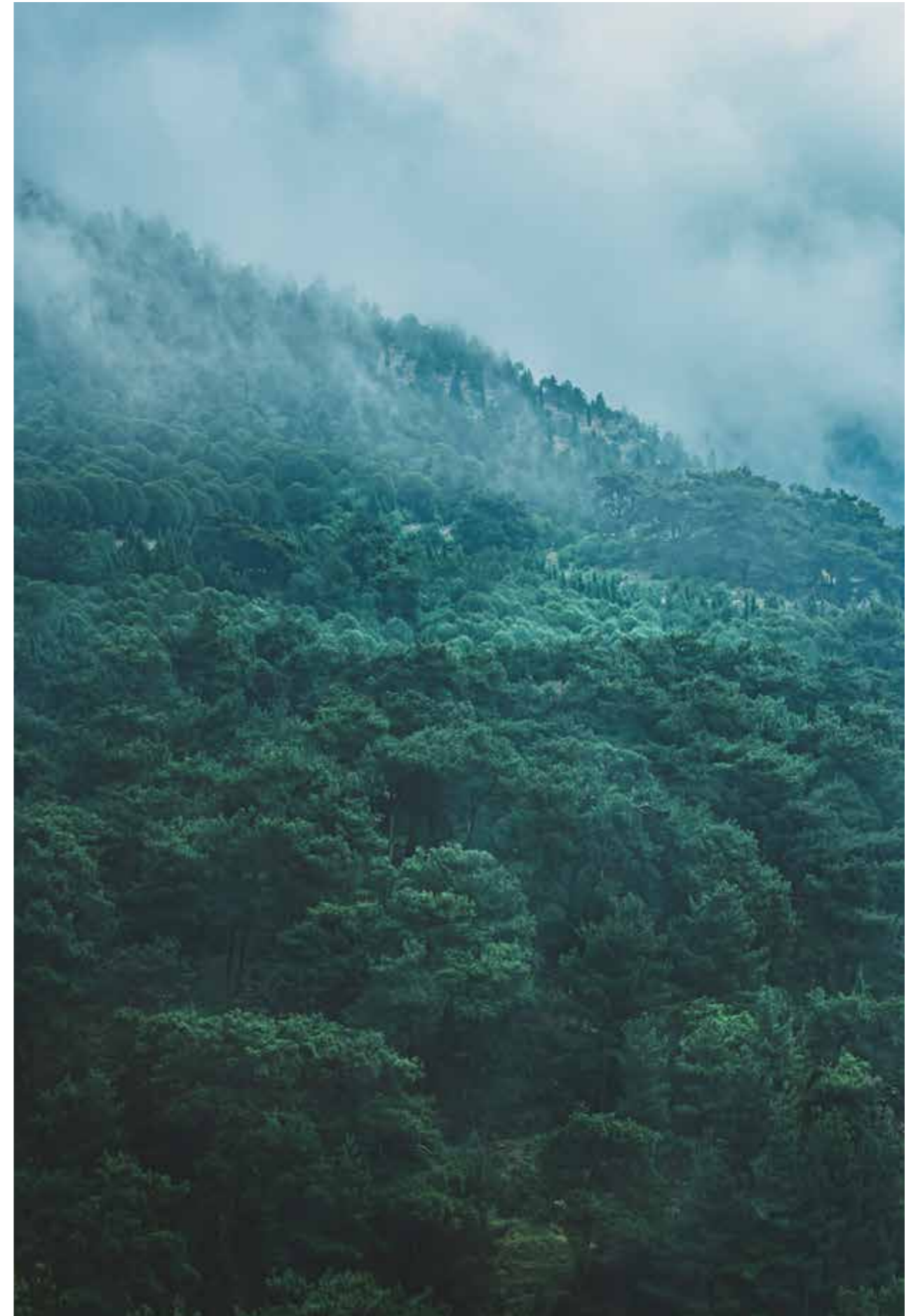
Figure 2.1 Total Greenhouse Gas Emissions in Turkey – Reference and Reduction Scenario

The plans and policies envisaged to be carried out in different sectors with the intended national contribution are given below.

Energy

- Solar electricity generation to reach 10 GW capacity by 2030
- Wind power generation to reach 16 GW capacity by 2030
- Utilizing all possible hydraulic capacity
- Commissioning of 1 nuclear power plant by 2030
- Reducing the loss rate in electricity generation and network to 15% in 2030
- Rehabilitation studies in public power generation plants
- Expanding on-site generation, cogeneration and microcogeneration systems in electricity

generation



Industry

- Reducing energy intensity with the implementation of the Energy Efficiency Strategy Document and Action Plan
- Implementation of energy efficiency practices in industrial facilities and providing financial support to productivity-enhancing projects
- Carrying out studies to increase the use of wastes as alternative fuels in appropriate sectors.

Transportation

- Increasing the share of railways and seaways by reducing the share of highways in freight and passenger transportation
- Development of combined transport
- Implementation of sustainable transportation planning approach in cities
- Increasing the use of alternative fuels and clean vehicles
- Reducing fuel consumption and emissions from road transportation in the National Intelligent Transportation Systems Strategy Document (2014-2023) and its annexed Action Plan (2014-2016)
- Realization of high speed railway projects
- Increasing urban rail system lines
- Saving fuel as a result of tunnel construction works
- Withdrawal of old model vehicles from traffic
- Implementation of green port and green airport projects for energy efficiency
- SCT-free fuel application in sea transportation

Buildings

- Energy efficient construction of newly constructed residential and service buildings in accordance with the Energy Performance Regulation in Buildings
- By creating an Energy Performance Certificate of new and existing buildings, keeping energy consumption and greenhouse gas emissions under control and reducing square meter consumption over the years
- Development of incentive channels for the use of design, technological devices, building materials, renewable energy resources that will reduce the consumption of primary energy resources to be applied in new and existing buildings (credit, tax reduction, etc.)
- Ensuring that energy is produced where it is consumed by minimizing the energy need by disseminating green building, passive energy, zero-energy house designs

Agriculture

- Saving fuel as a result of consolidation of agricultural lands
- Conducting pasture improvement works
- Controlled use of fertilizers and good agricultural practices
- Supporting minimum tillage methods.

Wastes

- Sending solid wastes to landfills
- Wastes; recovered by reuse, recycling and other processes to obtain secondary raw materials, being used as an energy source or to be disposed of
- Ensuring energy recovery from waste by subjecting the wastes to processes such as material recovery, bio-drying, biomethanization, compost, advanced heat treatments or incineration.
- Realization of methane recovery from landfill gas originating from regular and irregular landfills
- The industrial symbiosis approach, which enables the wastes from industry to be used as alternative raw materials or fuel in another sector, and the waste from one sector to be the raw material of another sector.
- Carrying out appropriate studies for the evaluation of wastes from livestock and poultry farms.
- Rehabilitation of irregular landfills and disposal of wastes in landfills.

Sink Areas (Forest Areas)

- Increasing sink areas and preventing land degradation
- Implementation of Forest Rehabilitation Action Plan and Afforestation Mobilization

2.1.5 National Legislation

There are two laws indirectly related to climate change in Turkey. (1) The Law on the Use of Renewable Energy Resources for the Purpose of Electricity Generation (18.05.2005/25819) (2) The Energy Efficiency Law (2.05.2007/26510).

Legislation directly related to climate change; at the level of regulations, communiqués and circulars. Some of these are given below:

- Regulation on the Monitoring of Greenhouse Gas Emissions (17.05.2014/29003, 25.04.2012/28274)
- Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions (22.07.2014/29068)
- Communiqué on Verification of Greenhouse Gas Emission Reports and Accreditation of

Verifying Bodies (02.12.2017/30258, 02.04.215/29314)

- Communiqué on Continuous Emission Measurement Systems (12.10.2011/28082)
- Voluntary Carbon Market Project Registration Communiqué (09.10.2013/28790)
- Green Certificate Regulation for Buildings and Settlements (23.12.2017/30279)
- Regulation on Certification of Sustainable Green Buildings and Sustainable Settlements

(08.12.2014/29199)

- Communiqué on National Calculation Method of Energy Performance in Buildings

(07.12.2010/27778)

- Regulation on Energy Performance in Buildings (05.12.2008/27075)
- Regulation on Increasing Efficiency in Use of Energy Resources and Energy

(27.10.2011/28097)

- Communiqué on Energy Efficiency Training and Certification Activities (18.09.2012/28415)
- Communiqué on Granting Authorization Certificates to Institutions and Organizations to

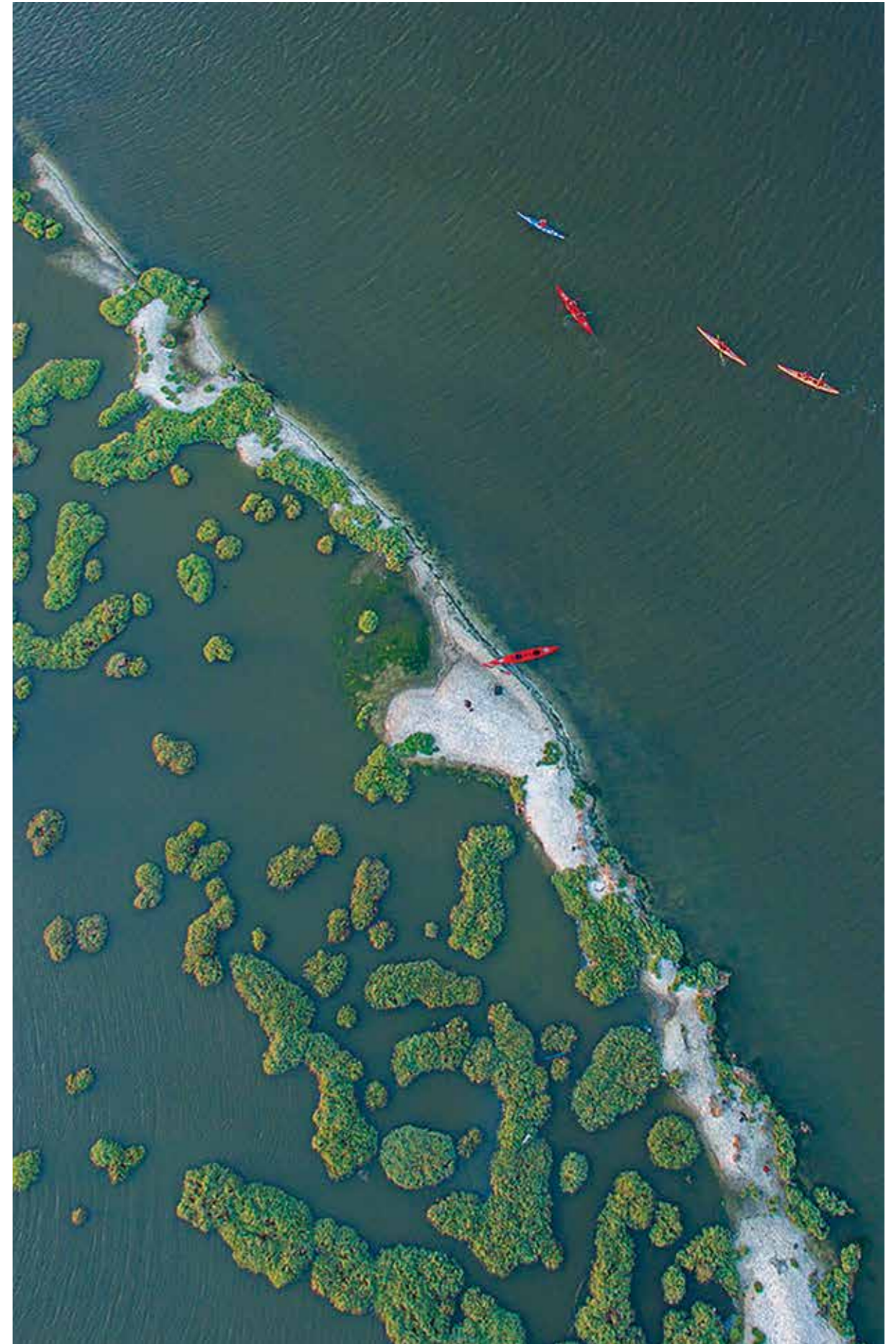
Carry out Energy Efficiency Services (25.07.2012/28364)

2.2 Local Climate Change Policies and Activities

2.2.1 Summary of IMM SECAP and Other Studies

Izmir Metropolitan Municipality (IMM) joined the Agreement of Mayors (CoM) in 2015, and in the 2015 Sustainable Energy Action Plan (IBB SEAP 2015), which it prepared based on 2014, it set a target to reduce greenhouse gas emissions by 20% until 2020. In 2020, it updated its report as Sustainable Energy and Climate Action Plan (IMM SECAP 2020) and set the target of reducing greenhouse gas emissions per person by 40% by 2030. The new Metropolitan Municipality Law No. 6360 enacted in 2012 came into force after the local elections in March 2014. With this Law, the administrative borders of the Metropolitan Municipalities were extended to the provincial borders, the villages were abolished and transformed into city neighborhoods, and the Metropolitan Municipalities were made responsible for the entire provincial administrative border. Therefore, in the updated IMM SECAP 2020 report, the base year has been replaced with 2018, the most appropriate year for which comprehensive and reliable data is available¹

IMM SECAP 2020, within the scope of calculation; buildings, transport, waste and Sewage facilities, agricultural soil (fertilizers) and livestock (enteric fermentation, animal manure management) sectors are taken into consideration. Due to the complexity of calculations and data requirements, emissions related to agricultural products and residues are not included in the inventory. Greenhouse gas emissions originating from the industry sector have been calculated but not included in the 2018 emission inventory as they are not under the jurisdiction of IMM²



The remarkable calculations in IMM SECAP 2020 are as follows³:

- For 2018, city-scale greenhouse gas emissions, including all energy carriers and emission sources within its geographical and administrative borders, have been calculated as 25.062.569 tCO₂e. The highest share belongs to the industrial sector with 31,4%. Emissions from transportation take the second place with 23%. Emissions from residences account for 14,3% of all emissions (including heating and electricity), while 9.2% of total emissions originate from non-residential buildings. While agriculture and livestock constitute 8,2% of total emissions; waste and wastewater emissions have a share of 2,8% in total.

- Only 0,8% of urban greenhouse gas emissions for 2018 belong to IMM institutionally. The biggest source of corporate greenhouse gas emissions of the municipality is transportation with 61%, and approximately 50,7% of IMM corporate greenhouse gas emissions belong to public transportation vehicles. Municipal buildings and facilities are the second largest source of greenhouse gas emissions with 35,2%.

- İzmir province's greenhouse gas emissions in 2018 increased by 14,6% compared to 2014. The highest increase (+93,23%) was seen in the area of fuel consumption for electricity generation. Greenhouse gas emissions increased by 66,52% in the field of agriculture, livestock and fertilizer management, and by 34,14% in the transportation sector. Private vehicle ownership has grown by 25% over the past four years, much higher than the average annual population growth of 1,3%.

- The Presidents' Covenant reduction commitment is mainly associated with the energy consumption of sectors over which local government can have influence (housing, services and urban transport). It excludes sectors outside the control of local government, such as industry and transport (eg highways). With this approach, IMM decided to exclude emissions from industry and civil aviation and calculated the total emissions for the reference year 2018 as 14,319,706 tCO₂e. Buildings accounted for approximately 42% of all emissions. The transportation sector is the second largest source of emissions with a share of 37,4%. While the total waste and wastewater emissions accounted for 4,9%, the share of agriculture, animal husbandry, fertilizer management and irrigation was calculated as 15,8% in total.

- According to the scenario where everything continues in its usual course (BAU), İzmir's total urban greenhouse gas emissions will be 17.691.125 tCO₂e annually in 2030. If everything continues as usual (BAU), emissions per person from 3,31 tCO₂e/person-year in 2018 will increase by 6% to 3,51tCO₂e/person-year in 2030. If the proposed mitigation actions are implemented, a 40% reduction will be achieved and greenhouse gas emissions will be 9.973.640 tCO₂e/year (excluding industry and civil aviation) and 1,98 tCO₂e/person-year per person greenhouse gas emissions in 2030. (Figure 2.2)

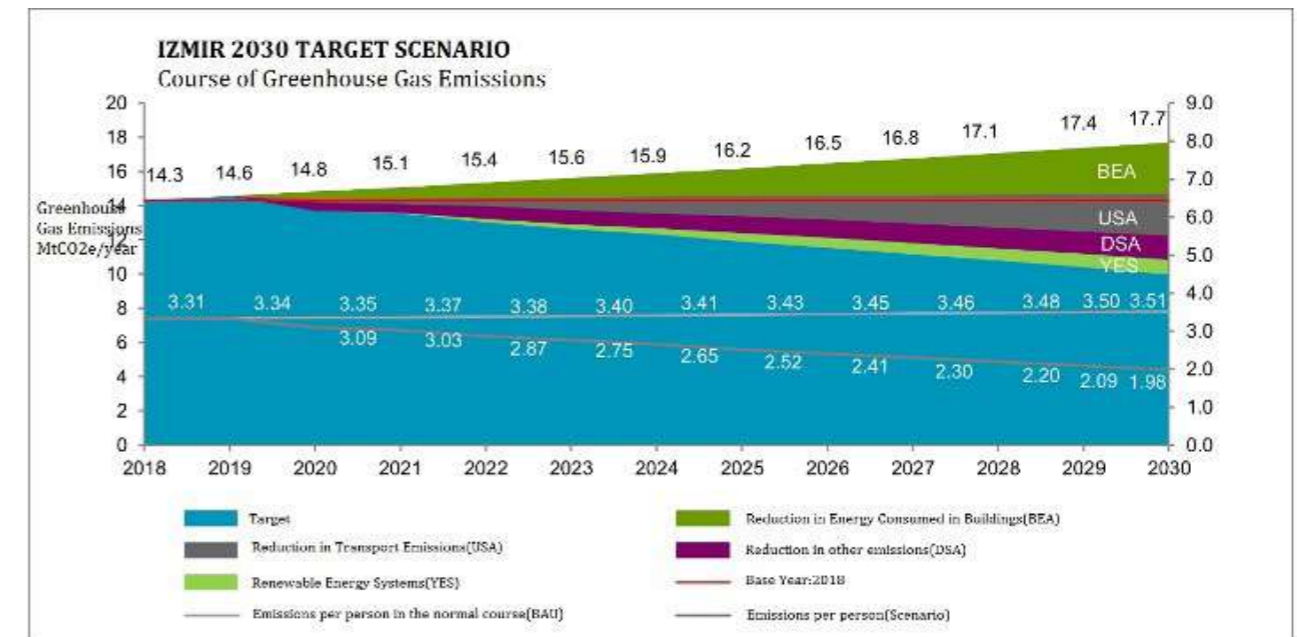


Figure 2.2 IMM SECAP 2020 Target Scenario⁴

- The total number of adaptation and mitigation actions envisaged within the scope of IMM SECAP 2020 is 58. 14 of these actions are specific to SECAP, 44 of them are also included in the İzmir Green City Action Plan (YŞEP). The 6 suggested actions are about both mitigation and adaptation. 28 actions are about reduction and 24 actions are about adaptation. The distribution of mitigation actions by sectors is shown in Table 2.1.

Table 2.1 Distribution of IMM SECAP 2020 mitigation actions by main sectors⁵

	MWh Reduction in 2030	Tons of CO ₂ e Reduction by 2030
Reduction in Emissions from Buildings	7.860.496	3.019.384
Reduction in Emissions from Transportation	14.507.438	2.432.813
Reduction in Other Emissions	97.592	1.390.206
Renewable Energy Systems	1.726.000	875.082
Totally	24.191.526	7.717.485

(4) IMM SECAP 2020 , (5) IMM SECAP 2020.

(1) IMM SECAP 2020, (2) IMM SECAP 2020, (3) IMM SECAP 2020

While preparing IMM SECAP 2020, its compatibility with the 2020-2024 IMM Strategic Plan and Izmir Green City Action Plan (YŞEP) actions were taken into consideration. From the outputs of the project named "A Framework for Resilient Cities: Green-Focused Adaptation" (2019) implemented with the participation of IMM and Landscape Research Association (PAD) and the European Union funded "Urban GREENUP Project" (2019), of which IMM is one of the parties, and various literature resources have been used.

Within the scope of KARSIYAKA MUNICIPALITY SECAP 2021 actions, since Karşıyaka district is a part of İzmir province, maximum effort has been made in compliance with IMM SECAP 2020 actions. In this way, great importance is attached to the applicability and traceability of the IMM reduction and harmonization targets in Karşıyaka district.

2.2.2 Karşıyaka Municipality Activities and CoM Process

Karşıyaka Municipality is the first local government from Turkey to sign the Agreement of Mayors on January 3, 2011, and is therefore the first municipality to offer SEAP. Karşıyaka took 2009 as a reference in the 1st SEAP and the plan was presented in 2012 (KARSIYAKA MUNICIPALITY SEAP 2012). In the first plan, Karşıyaka district consists of 23 neighborhoods and has a population of 304.507 in 2009, and a 35% greenhouse gas reduction is targeted for 2020.

In 2018, SECAP was prepared with reference to 2012 (KARSIYAKA MUNICIPALITY SECAP 2018). The change in greenhouse gas emissions between 2009 and 2015 is also reported in this plan. In the second plan, Karşıyaka district consists of 27 neighborhoods and has a population of 315.294 people and a 20% greenhouse gas reduction is targeted for 2020.

Calculations that stand out in KARSIYAKA MUNICIPALITY SEAP 2012 and KARSIYAKA MUNICIPALITY SECAP 2018 are as follows⁶⁻⁷

- In Karşıyaka Municipality SEAP 2012, a total of 590 ktCO₂e/year greenhouse gas emissions were calculated for the 2009 reference year. In this report, transportation-road, fixed units-residential, commercial and other public buildings and park/street lighting sectors are taken into account. It is understood that this first report did not reach a consistent conclusion due to the inability to provide all data and the failure to take into account some relevant sub-sectors.

- In Karşıyaka Municipality SECAP 2018, a recalculation was made for 2009, taking into account emissions from wastewater, and a total of 1.216 ktCO₂e/year greenhouse gas emissions were calculated, and the distribution to sub-sectors is as follows: Fixed units-houses 745 ktCO₂e/

year, transport-road 288 ktCO₂e/year, commercial and other public buildings 9 ktCO₂e/year, wastewater 174 ktCO₂e/year.

- It is noteworthy that there has been an increase of approximately 7.1% from 2012, which was referenced in Karşıyaka Municipality SECAP 2018, to the end of 2015. When the emissions of 2009 and 2015 are compared, there has been an increase of approximately 28,6%. The share of emissions from transportation, which was 24% in 2009, increased to 37% in 2015. (Due to the increase in road transportation, the footprint of the transportation sector has increased a lot. Especially the footprint of diesel fueled vehicles has increased from 54% to 76% in the transportation sector). It has been reported that emissions from fixed units, which had a share of 62% in 2009, decreased to 50% in 2015. (It has been stated that the increase in the use of natural gas instead of coal reduces the coal-based footprint. It has been emphasized that the transition from coal to natural gas is predominantly in residences). In addition, in the comparison of 2009 and 2015 emissions, it was calculated that the share of electricity and waste sectors did not change much.

- Institutional greenhouse gas emission calculations were not made within the scope of Karşıyaka Municipality SEAP 2012 and Karşıyaka Municipality SECAP 2018.

The most important roadmap in Karşıyaka Municipality's future vision is Karşıyaka Municipality 2020-2024 Strategic Plan. The following 4 of the 5 objectives outlined in this plan, are directly related to SECAP efforts⁸

- A1 - To increase the quality of service by offering participatory, transparent, modern and reliable methods with a constantly developing management approach.
- A2 - To produce services with a sustainable and healthy environmental understanding that increases the quality of life.
- A3 - To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.
- A4 - To produce services that will create a strong, healthy and safe social structure with all its elements.

10 of the 17 targets listed in the Strategic Plan are directly related to SECAP studies⁹

- H1.1 - Improving all aspects of management and service processes by being more efficient, flexible and open to development
- H1.3 - Increasing the variety and quality of the services we offer through studies that adapt to changing and developing technology
- H1.5 - Increasing corporate recognition, maintaining activities that will represent the city at national and international level

(6) Karşıyaka Municipality Sustainable Energy Action Plan, 2012.

(7) Karşıyaka Municipality Greenhouse Gas Inventory and Climate Change Roadmap – SECAP 2018.

(8) Karşıyaka Municipality Strategic Plan 2020-2024.

(9) Karşıyaka Municipality Strategic Plan 2020-2024.



- H2.1 - Protecting existing green areas and increasing the amount of green areas per person
- H2.2 - Protection of the environment by increasing the awareness of nature and environment in the society, development of a zero waste management system
- H2.3 - Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city
- H2.4 - Increasing service quality and capacity in order to create a cleaner city by protecting environmental health
- H3.1 - Ensuring a planned and healthy urban development
- H3.2 - Making necessary arrangements and new facilities in line with the needs, working to ensure economic harmony between regions by developing cooperation
- H4.2 - Carrying out studies to develop the needed health services and increase their quality

The actions planned at KARSIYAKA MUNICIPALITY SECAP 2021 will also contribute to the following performance indicators determined in the Strategic Plan¹⁰

- Number of trainings organized for the personnel of the institution (H1.1).
- Number of organizations that will improve internal communication (H1.1).
- Number of service buildings maintained and repaired (H1.1).
- Urban Information System completion rate (H1.3).
- Number of cities in which international project partnerships have been initiated (H1.5).
- The amount of green space per capita (m2) (H2.1).
- Number of new parks completed (H2.1).
- Number of renewed parks (H2.1).
- Number of climate shelters to be built throughout the city (H2.1).
- Completion rate of zero waste management system (H2.2).
- Number of studies organized with the aim of raising environmental awareness (H2.2).
- Completion rate of the climate action plan (H2.2).
- Number of completed solar power plants (H2.3).
- Number of service buildings benefiting from alternative energy sources (H2.3).
- Number of parks switched to solar panel lighting system (H2.3).
- Number of water gardens created (H2.3).
- Daily amount of garbage and debris collected (tonnes) (H2.4)
- Number of aboveground garbage containers (H2.4).
- Number of underground garbage containers (H2.4).
- The rate of preparation of 1/1000 scaled revision zoning plan for urban renewal throughout Karşıyaka district (H3.1).

- Number of completed parking lots (H3.2).
- Completion rate of the Fine Arts Park arrangement (H3.2).
- Number of bicycle repair stations to be installed (H3.2).
- Number of cooperation projects developed with local governments (H3.2).
- Road area (m2) (H3.2) under construction, maintenance and repair.

The relationship of each action created within the scope of KARBEL SECAP 2021 with Karşıyaka Municipality 2020-2024 Strategic Plan has been defined (See Chapter 5)

Stratejik planda bulunmamakla birlikte değişen şartlar, halktan gelen talepler ve Covid 19 pandemisinin yarattığı hassasiyet ile enerji verimliliği ve iklim krizinin etkilerini azaltan farklı alanlarda, KARBEL kapsamında projeler geliştirilmeye devam etmektedir.

Although not in the strategic plan, projects continue to be developed within the scope of KARBEL in different fields that reduce the effects of energy efficiency and climate crisis with the changing conditions, demands from the public and the sensitivity created by the Covid 19 pandemic.

2.2.3 National and International Associations and Networks of which Karşıyaka Municipality is a member

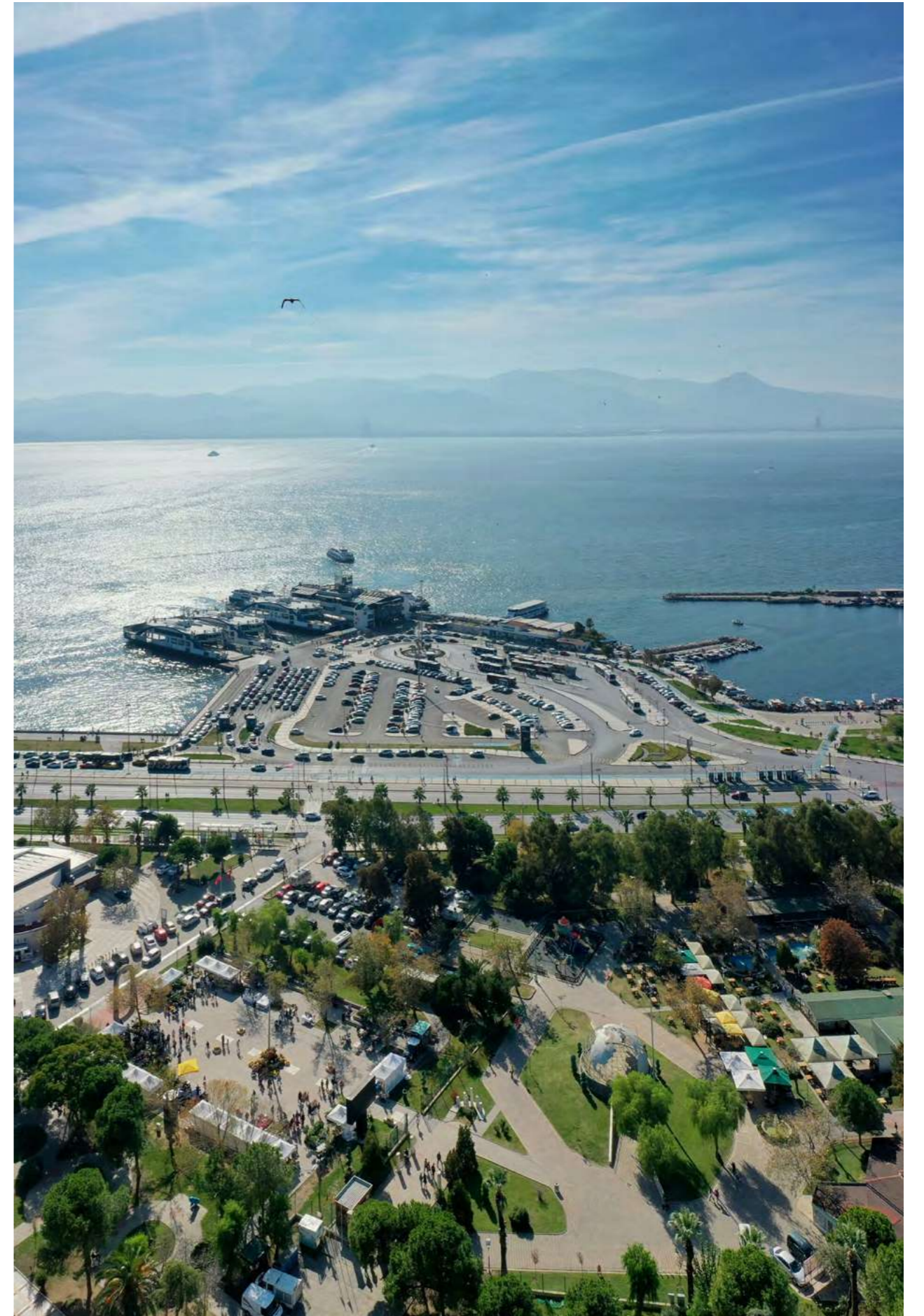
Karşıyaka Municipality is aware of the importance of making decisions together, managing together and taking responsibility, with the awareness that it is a part of a whole in solving all kinds of global, national and local problems that require cooperation and solidarity on a national and international scale. It cares about the strategies and plans of the unions and networks it is a member of, from the perspective of the healthy future of the world and sustainable natural resources.

In January 2020, ICLEI, and on May 20, 2021, the World Health Organization Healthy Cities Network Phase 7 membership was accepted.

- Association of Social Democratic Municipalities (SODEM)
- Association of Turkey Healthy Towns (SKB)
- Union of Municipalities of Turkey (TBB)
- Union of Coastal Aegean Municipalities
- Union of Aegean Municipalities
- Association of Historical Towns

(10) Karşıyaka Municipality Strategic Plan 2020-2024.

- Covenant of Mayors.Energy Cities
- European Healthy Cities Network (WHO)
- The Association For International Sports for All (TAFISA)
- European Association for Local Democracy (ALDA)
- International Council of Local Enviromental Initiatives (ICLEI)
- Euromed Cities Network (EUROMED)



KARŞIYAKA AND CLIMATE CHANGE



3. KARŞIYAKA AND CLIMATE CHANGE

3.1 Physical and Social Characteristics of Karşıyaka District

Karşıyaka district is located in the north of İzmir Bay and between the skirts of Yamanlar Mountain and the sea. Its surface area is 5462 hectares, and its height from sea level varies between 1-700 meters. There is Bayraklı district in the east, Çiğli district in the west, İzmir Bay in the south and Yamanlar Mountain in the north of Karşıyaka. Karşıyaka, which is the central district, is important with its commercial areas, residential areas and urban functions. Karşıyaka district has important national road and railway connections. On the urban scale, it is a region where public transportation axes such as buses, İZBAN, tram and sea routes are concentrated, as well as highway connections, and it is developed in terms of transportation.

Consumption and service units are concentrated in the district and Karşıyaka Bazaar, which is one of the bazaars where trade is concentrated in the city center of İzmir, has an important place among the shopping venues of the city. There are also shopping centers in the Mavişehir region. There are 8 cultural centers and 6 museums in total, both open and closed, in the district. In Karşıyaka, there is the Karşıyaka Arena Sports Hall, an olympic indoor sports complex built in accordance with the standards of the International Universities Sports Federation with a capacity of 5 thousand spectators and established on a total area of 11.650 m². There is also a military shipyard within the borders of Karşıyaka.

In the 1/25000 scale Environmental Plan, the district consists of 32% forest, 10% afforested area, 6% nature park, 7% scrub and heath, 3.5% agriculture and 40% housing, trade. and the administrative center; military area, pasture areas, Bostanlı Dam and Regional and Nature Park, urban sports and university and hospital area were proposed as a large-scale land use decision in the north of the district, and Fisherman's Shelter and Marina, close to Mavişehir, in the south. The distribution of Karşıyaka district according to land use types determined by 1/25000 scale plans is given in Table 3.1 below.



Table 3.1 Karsiyaka District 1/25000 Plan Land Use Distribution¹

KARŞIYAKA LAND USE TABLE			
LAND USE TYPE	AREA (hectare)	% IN LAND USE TYPE	% IN TOTAL AREA
URBAN SETTLEMENTS			
URBAN RESIDENTIAL AREAS	1232.1	90.4	24.2
URBAN DEVELOPMENT AREAS	131.0	9.6	2.6
PREFERRED USE AREAS			
TOTAL URBAN HOUSING	1363.1	100.0	26.8
RURAL HOUSING AREAS			
RURAL SETTLEMENTS	11.4	100.0	0.2
TOTAL RURAL HOUSING	11.4	100.0	0.2
TRADE AND MANAGEMENT CENTERS			
CENTRAL BUSINESS AREAS			
2.3 rd CENTERS	107.3	100.0	2.1
AGRICULTURAL TRADE			
NON-RESIDENCE URBAN WORK AREAS			
LARGE AREA, PUBLIC AREA			
TOTAL	107.3	100.0	2.1
INDUSTRIAL ZONES			
ORGANIZED INDUSTRIAL ZONE			
AGRICULTURAL INDUSTRY			
SMALL CRAFTS (INDUSTRIAL SITES)	32.6	100.0	0.6
MINE EXTRACTING AREAS (TUZLA)			
STORAGE			
INDUSTRY AND STORAGE			
FREE ZONE AND DEVELOPMENT AREA			
SHIPYARD			
BOAT - YACHT MANUFACTURING AREA			
TOTAL	32.6	100.0	0.6
TOURISM AREAS			
TOURISM CENTER AREA			
TOURISM FACILITIES AREAS			
CAMPING			
GOLF FACILITY AREAS			
DAILY FACILITIES AREAS			
TOTAL			
LARGE AND OPEN AREAS USES			
REGIONAL PARK /LARGE URBAN GREEN AREA	270.9	51.6	5.3
NATURE PARK	189.0	36.0	3.7
ECOLOGY PARK			
FAIR/FESTIVAL AREA			
BOTANICAL GARDEN (ARBORETUM)			
URBAN AND REGIONAL MAJOR SPORTS	11.4	2.2	0.2
UNIVERSITY CAMPUS AREAS	32.6	6.2	0.6
HEALTH FACILITIES	21.2	4.0	0.4
CULTURAL FACILITY AREA			
URBAN SOCIAL INFRASTRUCTURE AREAS			
EDUCATIONAL SITES			
TOTAL	525.1	100.0	10.3
FARMING AREAS			
AREAS TO BE CONSERVED AGRICULTURAL QUALITY	184.1	83.3	3.6
PASTURE AREA	36.9	16.7	0.7
ORGANIZED FLORIST REGION			
REGIONAL HUSBANDRY SPECIALIZATION			
REGIONAL AGRICULTURE SPECIALIZATION			
TOTAL	221.0	100.0	4.3
FOREST AREAS			
FOREST AREA	1376.3	100.0	27.0
TOTAL	1376.3	100.0	27.0
AREAS TO BE AFFORESTED - NATURAL AND WOOD CHARACTERISTIC AREA TO BE PROTECTED			
AREAS TO BE FORESTED	711.8	61.8	14.0
MAQUIS - HEATH - SHRUBBERY	257.1	22.3	5.1
BEACH-SANDS			
NATURAL AND WOOD CHARACTERISTIC AREA TO BE PROTECTED	183.7	15.9	3.6
REEDS-SWAMP			
TOTAL	1152.6	100.0	22.7
OTHER LAND USE DECISIONS			
MILITARY AREAS	65.1	62.2	1.3
CEMETERIES	31.5	30.1	0.6
ARCHAEOLOGICAL SITE AREAS	8.0	7.6	0.2
SPECIAL ENVIRONMENTAL PROTECTION AREAS			
TOTAL	104.6	100.0	2.1
INFRASTRUCTURE			
DISCHARGE AND WASTE PLACES	8.5	4.4	0.2
WASTE COLLECTION, DEVELOPMENT AND LIQUIDATION LOCATIONS			
SLAG STORAGE AND SLAG RECYCLING			
PORT AND BACK PORT SERVICE AREA			
PIERS - FISHERMANS SHELTERS - FERRY			
AIRPORTS			
TERMINAL			
ARTICULATED LORRY PARK, TRUCK GARAGE, GARAGES			
DAMS - PODS - DREAMS	21.1	10.9	0.4
CURRENT ENERGY GENERATION AREA			
SUBSTATIONS			
HIGHWAYS, EXPRESS ROADS ETC.	184.3	84.7	3.2
TOTAL	193.9	100.0	3.8
TOTAL	5088.6	100.0	100.0

(1) SECAP2020_ Plan and Project Management Report

There are Yamanlar Mountain Nature Park, Karagöl Nature Park and Örnekköy Nature Park within the boundaries of Karşıyaka district. Karagöl Wetland has the status of Nature Park.

İzmir is the 3rd most densely populated city in Turkey with an estimated population of 366 people per km² in 2020. According to TÜİK (Turkish Statistical Institute) data, the population of İzmir in 2020 is 4.394.694 and the population of Karşıyaka is 350.100. According to the population projections, the population growth rate of Karşıyaka district has been determined as 1.2%. The ratio of the population over 65 years of age in Karşıyaka District to the total population is approximately 16%, which is above the 12% rate calculated for İzmir in general.²

When the socioeconomic status distribution is examined, it is seen that the ratio of middle and upper income groups is 64% and the ratio of lower income groups is 36%.

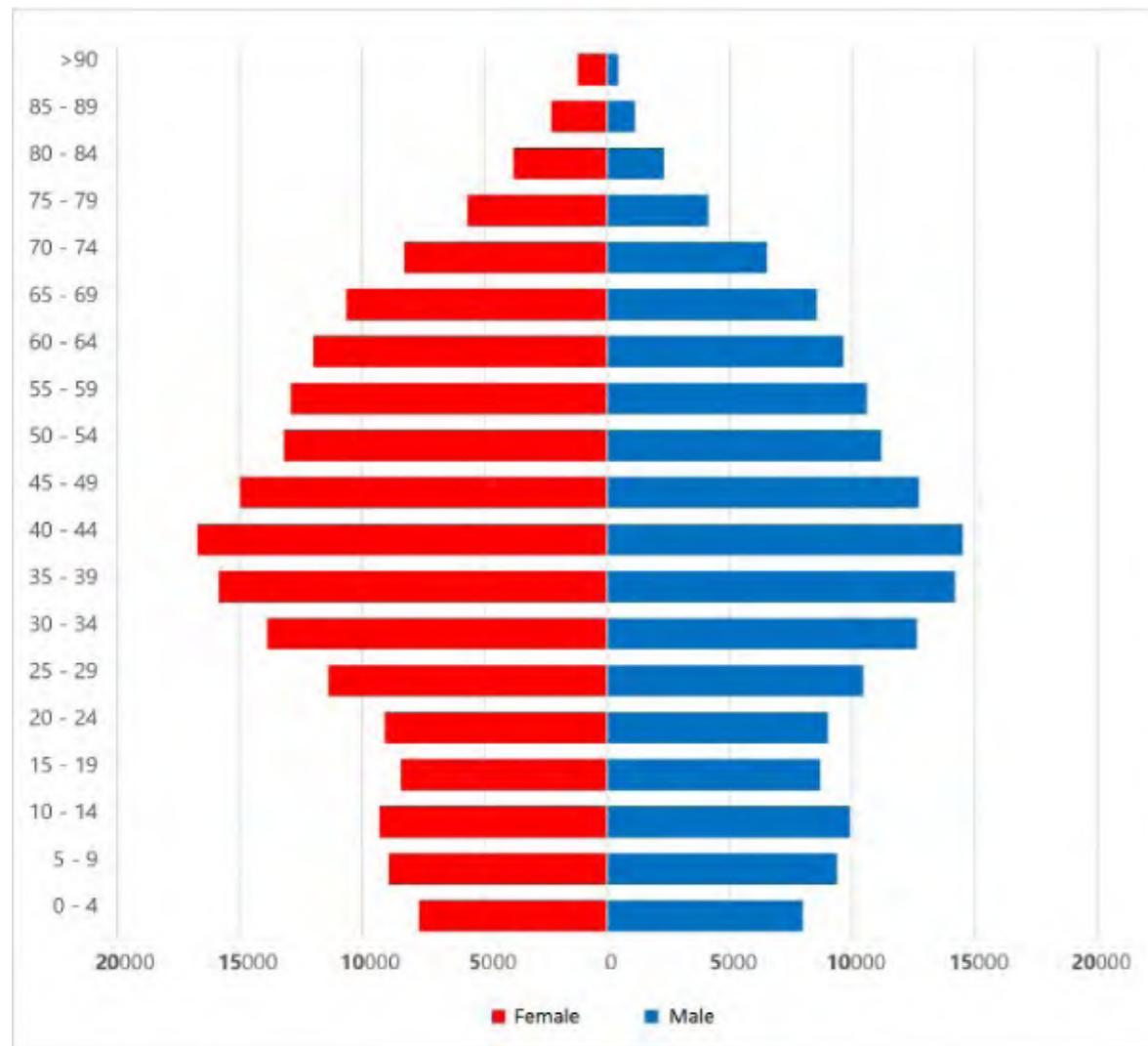


Figure 3.1 Population Distribution of Karşıyaka District by Age and Gender

3.2 Climate Change Scenarios for İzmir

For the forecast data on climate change, İzmir Metropolitan Municipality Sustainable Energy and Climate Action Plan, A Framework for Climate Change-Resilient Cities: Green Oriented Adaptation Guide (2019) and other national publications were used.

3.2.1 Increasing Temperatures and Drought

Mediterranean climate character is dominant in İzmir province, because it is located in the Middle Latitude zone and is a coastal city. Summers are hot and dry, winters are warm and rainy, and spring months are transitional. According to the data of the Turkish Meteorology General Directorate, the highest temperature recorded in İzmir between 1938-2020 was 43°C in August, and the temperature remains above 25°C on average from June to the end of August.

Table 3.2 Current climatic conditions in İzmir (1938-2020)³

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Yearly
Average Temperature (°C)	8.8	9.6	11.7	15.8	20.7	25.3	27.9	27.6	23.7	18.9	14.2	10.5	17.9
Average Maximum Temperature (°C)	12.4	13.6	16.3	20.9	26.1	30.7	33.2	32.9	29.2	24.0	18.6	14.0	22.7
Average Lowest Temperature (°C)	5.7	6.2	7.7	11.1	15.4	19.8	22.4	22.3	18.7	14.6	10.7	7.5	13.5

Due to these climatic conditions, extreme temperatures, forest fires and especially water shortage / drought periods are among the dangers that have been identified for a long time. In a study conducted in 2018, the water potential per basin in the Küçük Menderes, North Aegean and Gediz Basins, which are the three water basins in which the İzmir province is located, was examined and it was observed that there was an absolute water shortage in the Küçük Menderes Basin, which also includes the Karşıyaka district.⁴

According to a report examining temperature trends in Turkey until 2100; It is estimated that while precipitation decreases especially in summer months, average and maximum temperatures will increase significantly, consecutive dry days will increase, frost days will decrease, and the number of warm days and nights will increase.

(2) <https://data.tuik.gov.tr/Bulten/Index?p=Adrese-Dayali-Nufus-Kayit-Sistemi-Sonuclari-2020-37210>

(3) <https://www.endeksa.com/tr/analiz/izmir/karsiyaka/demografi>

(4) İzmir Metropolitan Municipality SECAP 2020.

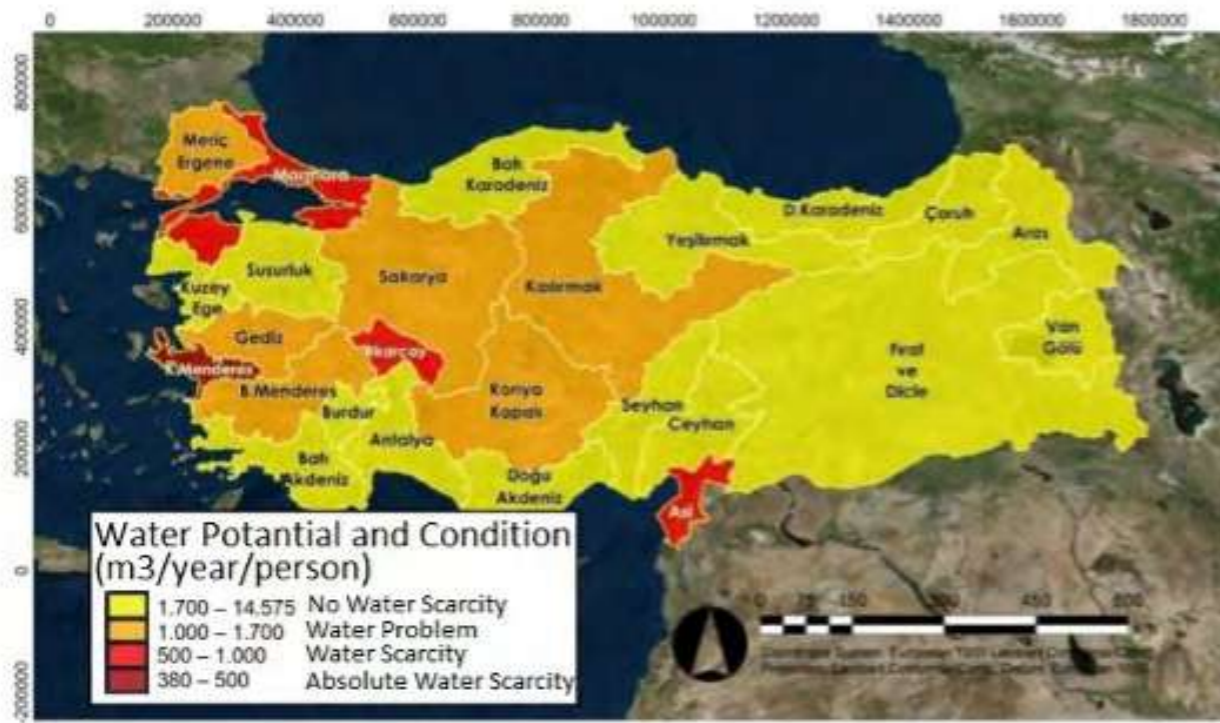


Figure 3.2 Turkey's water potential per Basin (m³/year/capita)

Maximum temperature projections for İzmir are given in IMM SECAP and 17, as a result of the spatiotemporal study on the effect of the temperature trends of the urban heat island effect in İzmir, the map which is in Figure 3.4 showing the size of the artificial surfaces throughout the province was prepared.⁵

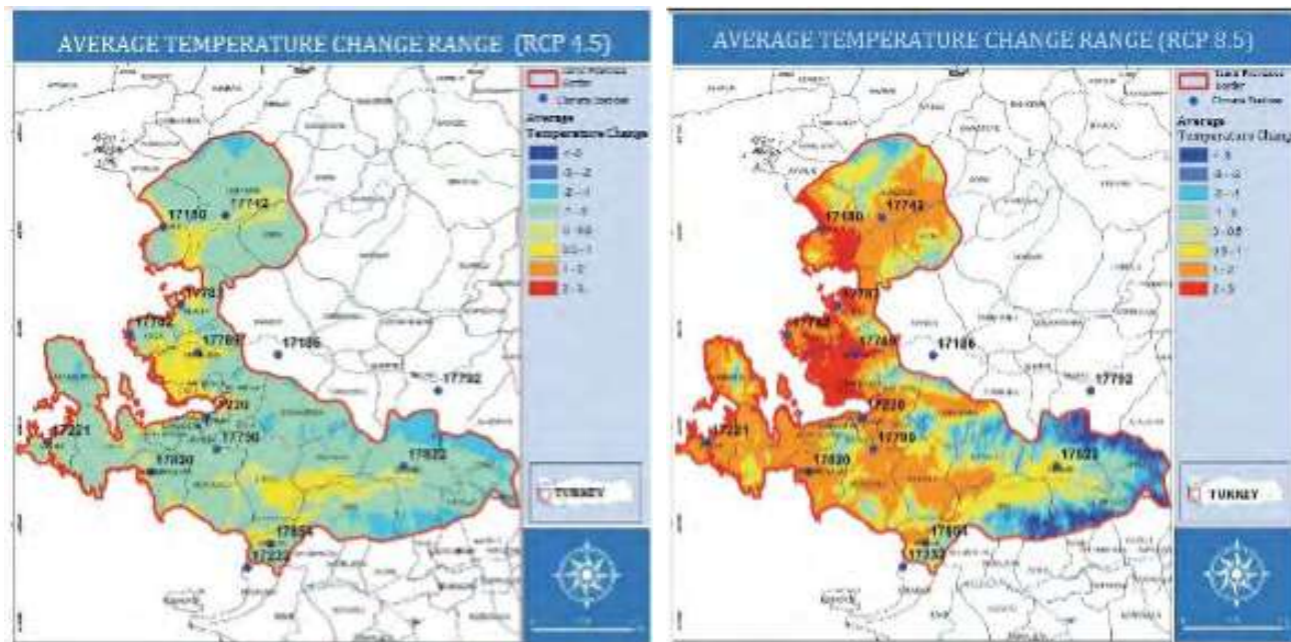


Figure 3.3 Total Maximum Temperature in İzmir (annual trend) for Long Years Between 1971-2000 and 2050-2100(The RCP8.5 and RCP4.5 scenario)

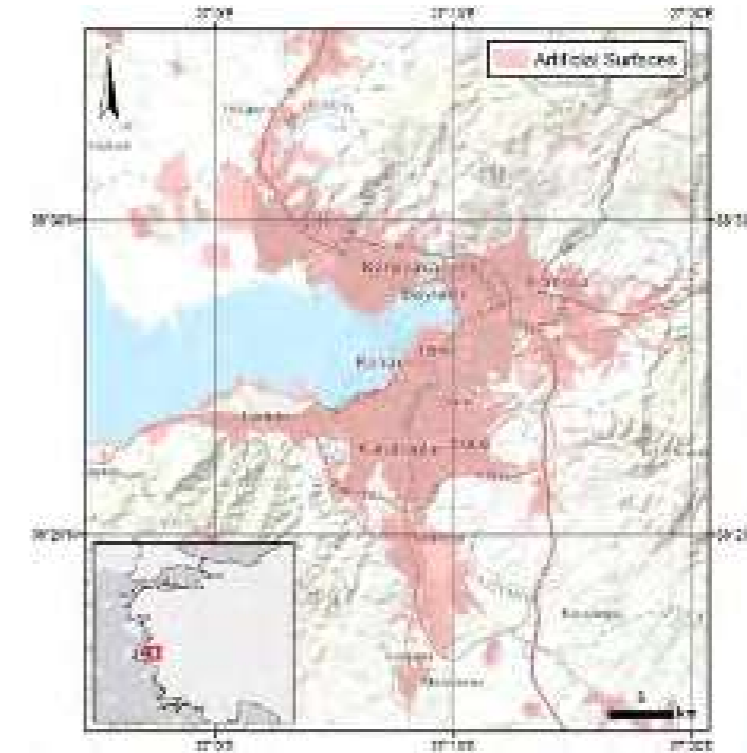


Figure 3.4 Artificial surface area of İzmir⁶

When the inadequacy of green infrastructure in central areas throughout the city of İzmir is combined with artificial surfaces, it causes an increase in the urban heat island effect. It is predicted that the urban heat island effect will be felt at a significant level in Karşıyaka district when the impermeable surfaces, reinforced concrete structures, building type, their characteristics and their ages, and the distribution of green areas are considered together.

Green areas play an important role in reducing the severity of the urban heat island effect. The rate of green area per capita targeted in Karşıyaka Municipality Strategic Plan has been determined as 5,15 m² for 2021 and 5,66 m² for 2024.

88,7% of the total area of Karşıyaka district is located in the Küçük Menderes Basin; 11,3% is located in the Gediz Basin. 12-month drought risk maps were prepared within the scope of Küçük Menderes Basin Drought Management Plan published by the Ministry of Forestry and Water Affairs, General Directorate of Water Management. According to the Standard Precipitation Index (SPI) Risk Map, the probability of being slightly arid in the İzmir Bay sub-basin where Karşıyaka is located; According to the Palmer Drought Severity Index (PDSI) Risk Map, the probability of mild to moderate drought; According to the Palmer Hydrological Drought Index (PHDI) Risk Map, it was seen that the highest value was given to the probability of mild and moderate drought.

(5) İzmir Metropolitan Municipality SECAP 2020.

(6) Doğukan Doğu Yavaşlı. Spatiotemporal Trends of Urban Heat Island and Surface Temperature in İzmir Turkey. American Journal of Remote Sensing. Vol. 5, No. 3, 2017, pp. 24-29. doi: 10.11648/j.ajrs.20170503.11

In the study, HadGEM2-ES, MPI-ESM-MR and CNRM-CM5.1 models and RegCM4.3 regional climate model (with RCP4.5 and RCP8.5 emission scenarios) were run. According to the RCP8.5 scenario, monthly average temperatures in the İzmir-Gulf Sub-Basin increase compared to all models, it was observed that the monthly total precipitation tended to decrease compared to the MPI-ESM model.

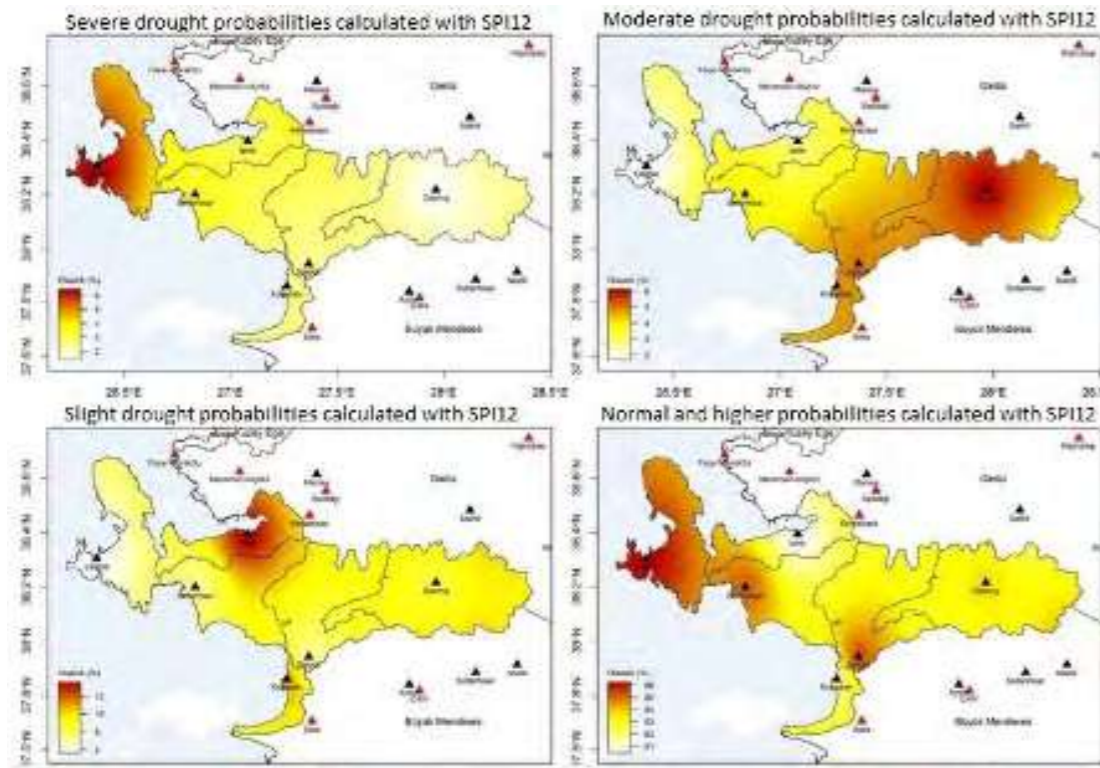


Figure 3.5 SPI 12-Month - Drought Probability Spatial Distribution Map⁷

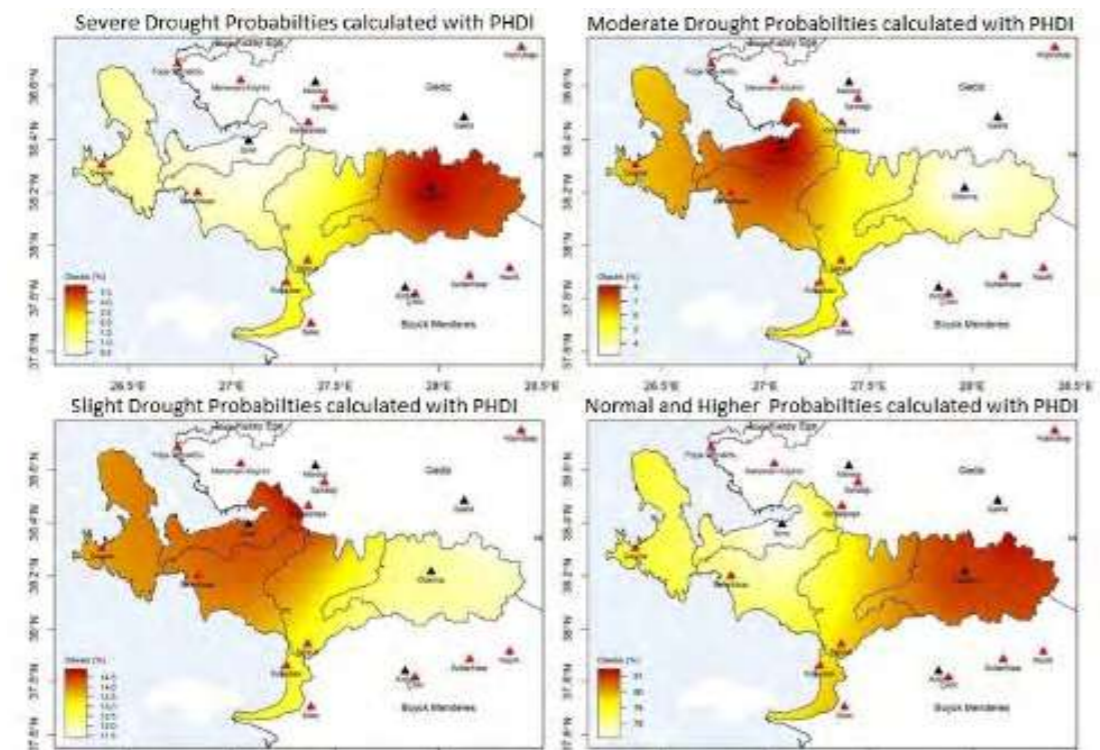


Figure 3.6 PDSI – Spatial Distribution Map of Drought Probability⁸

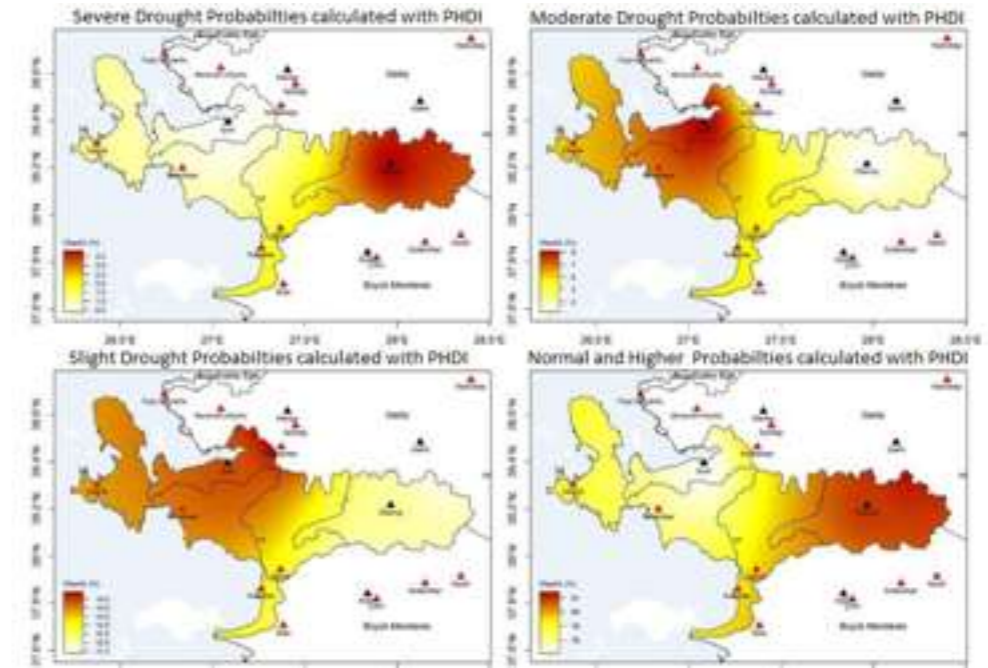


Figure 3.7 PHDI – Spatial Distribution Map of Drought Probability⁹

Sectoral vulnerability analyzes were conducted within the scope of the Drought Management Plan. It has been observed that the agriculture sector of the İzmir-Gulf Sub-Basin has the lowest vulnerability for the health sector. In the evaluation made for the industrial sector, it has been revealed that it is necessary to take precautions against drought or water shortage events as a priority. Due to the lack of industrial facilities in Karşıyaka district, it is considered that these measures will be prioritized for other parts of the sub-basin. For the tourism sector, a high degree of vulnerability was determined on the basis of the basin. It has been observed that the degree of vulnerability for drinking and utility water and ecosystem sectors is higher than other sub-basins. İzmir-Gulf Sub-Basin has the highest vulnerability in terms of energy sector.

3.1.2 Sea Level Rise

Table 3.3 shows the projected rise in global sea level by 2100 under the RCP8.5 high emission scenario in the IPCC AR5 relative to the increase in average temperature.

Table 3.3 Historical and projected rise in sea level¹⁰

Variable	<2100
Total SLR (mm)	520 – 980mm

(9) Küçük Menderes Basin Drought Management Plan, Volume 1
 (10) Church, J.A., Clark, P.U. (2018). IPCC AR5 Chapter 13: Sea level rise

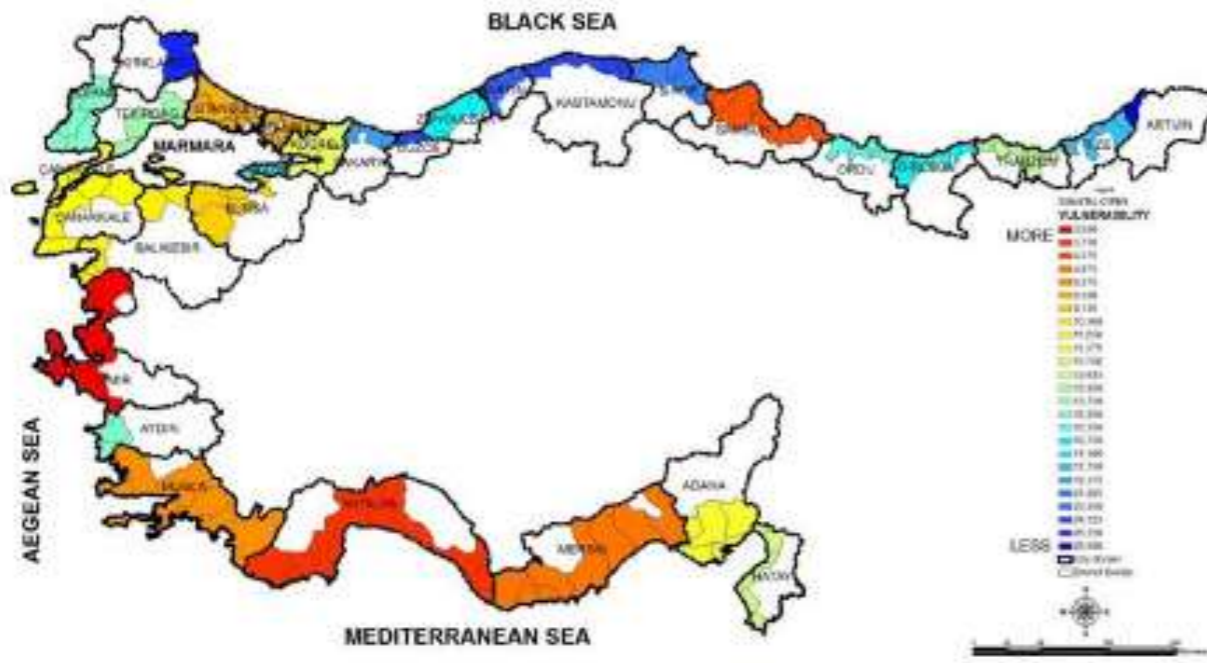


Figure 3.8 Map of vulnerability of coastal cities in Turkey¹¹

In a risk assessment made in 2010, taking into account location, population growth rate, share from the national budget, agricultural production rate, built-up settlements and population living in low altitude areas, İzmir was seen as the second most risky province after Antalya.

According to the fragility assessment in a study published in 2016, according to the parameters of urban area size, built-up area ratio in low-altitude coastal areas, parks, coastline, access to infrastructure services and distance from the sea, it is seen that Kocaeli is the most fragile city on the Turkish coast. İzmir, on the other hand, is in the 5th place in this evaluation.

Very High	High	Moderate	Low	Very Low
Kocaeli	Çanakkale	Antalya	Mersin	Zonguldak
		Samsun	Yalova	Rize
		İzmir	Ordu	Sinop
			İstanbul	Trabzon
			Giresun	
			Tekirdağ	

Table 3.4 Coastal cities by morphological vulnerability types¹²

Karşıyaka district has a 12 km coastline. The lowest altitude is 1 m. Tram line and highway are located on the coastline along with recreation areas. There are also two ferry piers used for sea transportation. Bus stops are located near the piers. There are residential and commercial spaces close to the coastline.

There are frequent floods in Mavişehir, especially in the winter months as a result of the rise of the sea and residential areas close to the coast are affected by flooding. “Mavişehir Coastal Rehabilitation Project” has been prepared by İzmir Metropolitan Municipality in order to prevent flooding in the region. Within the scope of the “Urban Green Up-Nature Based Solutions” project by the İzmir Metropolitan Municipality, an “uninterrupted ecological corridor” has been created on the coastal part of the Peynircioğlu Stream and the Halk Park and the following route in Mavişehir. Both flood control was provided in the creek and a green area was provided to the city that would reduce the urban heat island and carbon emissions by nature-friendly practices without using an impermeable surface.

Considering the existing transportation infrastructure and the proximity of buildings to the coast, it is predicted that the rise in sea level may affect the entire coastline in the medium and long term.



3.1.3 Excessive Rainfall and Weather Events

According to the 1938-2020 climate data published by the General Directorate of Meteorology, the average annual precipitation is 689.0 mm in İzmir for many years. The highest 24-hour precipitation was recorded as 145.3 mm on 29.09.2006. in İzmir.

Table 3.5 Current climate in İzmir – Precipitation (1938-2020)¹³

	Jan.	Feb.	Mar.	Apr.	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Yearly
Average Number of Rainy Days	14.0	11.7	10.7	9.1	7.0	3.5	0.7	0.9	2.7	6.6	10.1	14.4	91.4
Average Monthly Total Rainfall (mm)	135.0	101.9	75.4	46.1	31.8	12.0	4.1	5.6	15.5	44.8	92.6	145.7	710.5

(13) <https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=undefined&m=IZMIR>

(11) İzmir Province Sustainable Energy and Climate Action Plan, 2020
 (12) Determination of Morphological Vulnerability Levels of Coastal Cities Against the Threat of Rising Sea Level, Emine Duygu Kahraman , M.Burcu Silaydin Aydın, TÜCAUM International Geography Symposium 2016

According to the climate projections included in Turkey's National Communication to the UNFCCC, it is expected that the annual total precipitation will decrease with the increase in extreme precipitation and storm events. According to the projections in a Framework for Cities that are Resistant to Climate Change: Green Focused Adaptation Guide, it is predicted that the precipitation patterns in the İzmir region will change and the precipitation will intensify in certain periods. Thus, it is predicted that flood and overflow events will increase in İzmir and Karşıyaka.

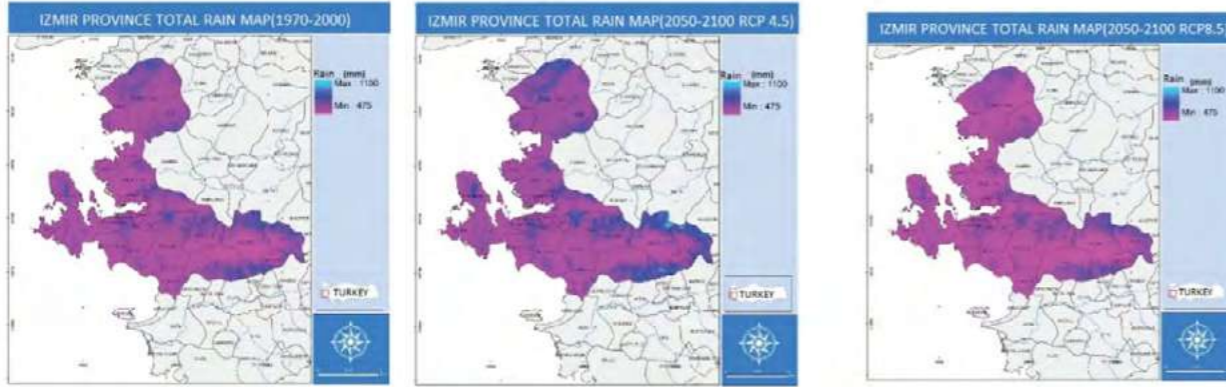


Figure 3.9 Total precipitation maps for many years in İzmir province between 1971-2000 and 2050-2100¹⁴



According to the Meteorological Disasters Evaluation Reports of the General Directorate of Meteorology, the highest rainfall/flood disaster occurred in İzmir in 2019. 16 of 332 flood disasters were experienced in İzmir. Of the 257 storm disasters that occurred in 2019, 8 were experienced in İzmir. According to the data obtained during 2020 in our country, 7 of the 262 storm disasters occurred in İzmir. Eight of the 297 flood disasters that occurred throughout the country were experienced in İzmir.

In Karşıyaka district, there are Bostanlı, Yamanlar, Soğukkuyu İlca, Karşıyaka İlca, Kartalkaya, Kocadere, Yamanlar and Serinkuyu streams; the maintenance and cleaning works of the streams are carried out by the General Directorate of İZSU (General Directorate of İzmir Water and Sewage Administration). In addition, a study on "İzmir Metropolitan Area Wastewater-Stormwater and Streams Master Plan" is carried out by the General Directorate of İZSU.

According to the data included in the Küçük Menderes Basin Flood Management Plan prepared by the Ministry of Agriculture and Forestry General Directorate of Water Management, 38 of the historical floods that occurred between 1955 and 2018 were experienced in İzmir.

The biggest disaster related to the floods was in November 1995, which was effective in 9 districts including Karşıyaka; there was a flood that killed 61 people, destroyed 322 buildings and damaged more than 10 thousand buildings. In the flood that occurred in 2001, some houses near Bostanlı Creek were submerged.

After the rainfall in İzmir on February 2, 2021, the flood in Karşıyaka İlca Creek caused Anadolu Caddesi, Soğukkuyu, Bahçelievler, Alaybey, Tersane and Tuna Neighborhoods to be flooded.

In the Küçük Menderes Basin Flood Management Plan, the causes of the floods occurring in the basin are summarized as follows; Inadequate cross-sections of the art structures on the streams, obstruction of the flow by the artifacts due to sediment and wastes thrown into the streams, construction in the stream beds due to unplanned urbanization, deterioration of the morphological structure and flow regime of the stream beds with the purchase of materials, emptying of the material into the stream beds, failure to provide the downstream condition and the occurrence of sudden rains.

The flood control facilities in Karşıyaka district are listed as Yamanlar (İlca) Stream, Soğukkuyu and Bostanlı (Ahırkuyu) Stream Improvement.

(14) A Framework for Climate-Resilient Cities: A Green-Focused Adaptation Guide, 2019.

According to the Küçük Menderes Basin Settlement Evaluation and Risk Table included in the Küçük Menderes Basin Flood Management Plan, Karşıyaka district center has been taken as “risky”. In addition, one of the 11 points where landslides occur in İzmir is Cumhuriyet Mahallesi, which is located within the borders of Karşıyaka district. Zoning plan studies were initiated for the region, which was declared as a risky area in 2013.

In Cumhuriyet, İnönü and Örnekköy Neighborhoods, where the building stock is in poor condition, where the zoning plans in force before the project could not ensure the balanced and healthy development of urban social and technical infrastructure areas, and which do not coincide with today’s modern urbanism and contemporary planning understanding, resilient, sustainable, accessible, livable, healthy and has prepared a zoning plan study for urban renewal in order to establish the legal infrastructure of a safe urban space.

3.1.4 Air Quality

The change in air quality throughout Turkey is monitored by the “Air Quality Assessment and Management Regulation” prepared by The Ministry of Environment, Urbanization and Climate Change. Within the scope of this regulation, various pollutant parameters are measured with air quality measurement devices located in various places in Turkey and İzmir and can be followed live on the internet. In this context, 5 different parameters (NO₂ (nitrogen dioxide), SO₂ (sulphur dioxide), CO (carbon monoxide), PM₁₀ (particulate matter), O³ (ozone)) are measured at 9 measurement stations in İzmir. On the other hand, the World Health Organization and the European Union foresee the necessity of measuring and evaluating pollutants such as lead, benzene, arsenic, cadmium, nickel and benzo(a)pyrene. However, the presence of measurement stations that can measure only some parameters in some regions of the city constitutes an obstacle to a healthy air quality assessment for İzmir.

Considering the cultural, historical, climatic, geographical and ecological factors as well as its high population, İzmir is one of the most important and sensitive cities of Turkey. The air quality of İzmir is adversely affected due to industrial activities, dense construction in the city, fuel consumption for domestic heating in winter, heavy traffic. In addition to these and similar human-made pollutants, particulate matter that comes from long-range sandstorms also affects the air pollution of the city.

There is 1 measurement station affiliated to İzmir Metropolitan Municipality in Çamlık Forestry Regional Directorate in Karşıyaka district and only SO₂ and PM10 values are monitored. As of

September 2021, PM₁₀, CO, NO₂ and NO_x parameters are measured at Karşıyaka Station, which was established under the Aegean Clean Air Regional Directorate.

Table 3.6 Karşıyaka Measurement Station (IMM) Air Quality Values for the Year (PM₁₀ ve SO₂) (µg/m³)¹⁵

01.01.2018 - 31.12.2018		01.01.2019 - 31.12.2019		01.01.2020 - 31.12.2020	
Average	Max	Average	Max	Average	Max
PM ₁₀	SO ₂	PM ₁₀	SO ₂	PM ₁₀	SO ₂
28,74	14,71	123,18	47,73	26,46	11,18
134,50	43,13	29,46	10,59	111,51	36,59

* While the annual national limit value for PM₁₀ was 44 µg/m³ in 2018, it was adjusted to 40 µg/m³ in 2019 and 2020.

* The annual national limit value for SO₂ is 20 µg/m³

According to the values measured in Karşıyaka; The number of the limit values exceeded were 35 in 2018, 33 in 2019, and 49 in 2020. Although the average PM₁₀ and SO₂ values were measured close to each other in 3 years, the number of PM₁₀ limit value exceeded in 2020 increased by 50% compared to previous years.

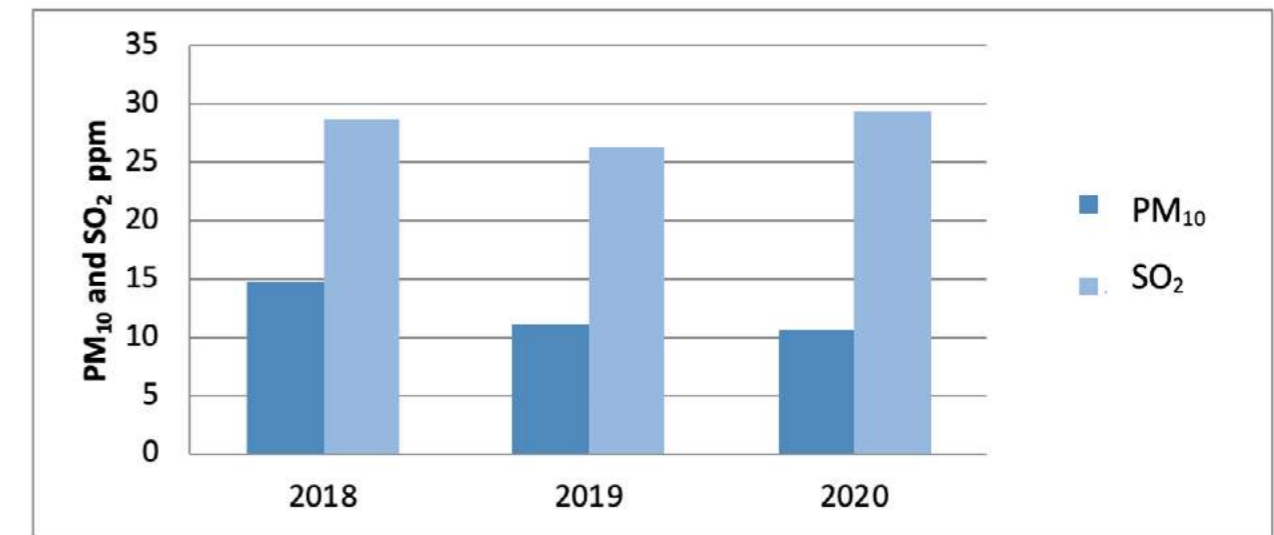


Figure 3.10 Karsiyaka Measurement Station (IMM) Annual PM₁₀ and SO₂ Change (ppm-µg/m³) Although the air quality levels measured in the city center generally provide annual limit values, it is observed that the limit values are exceeded especially in winter months. Therefore, an effective air quality management plan should be prepared to improve air quality levels. In order to establish a good air quality management in İzmir, first of all, it is necessary to determine the pollutant sources by making an emission inventory, and it is necessary to determine the effects of pollutant types and amounts formed in these sources on air quality levels.

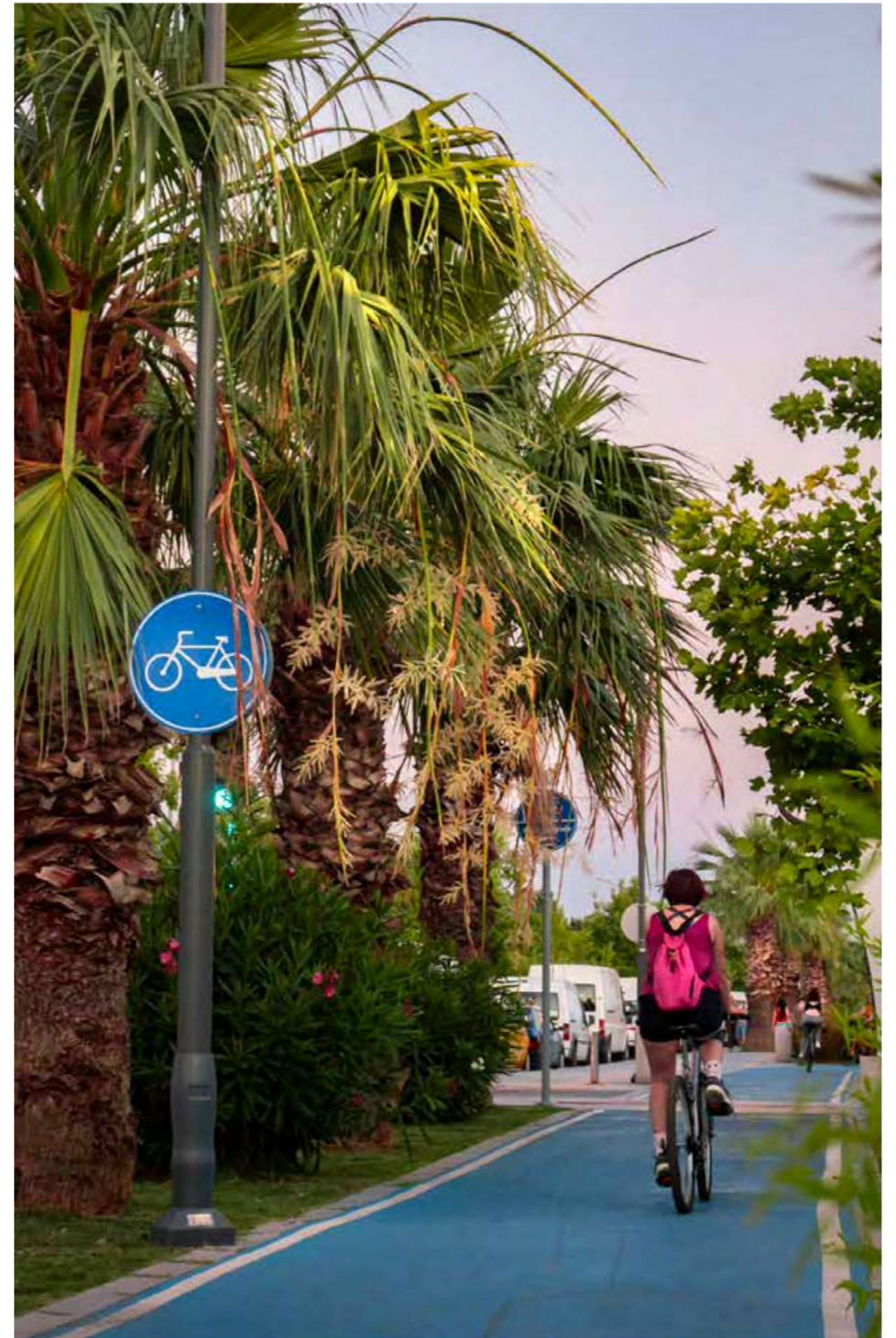
(15) İzmir 2021 Environmental Status Report-TMMOB(Union of Chambers of Turkish Engineers and Architects) Chamber of Environmental Engineers İzmir Branch

Limiting the quality of fuel used in domestic heating and industry in the city and inspections on fuels played an important role in the improvement of air quality data. Switching to natural gas in industrial and domestic heating in the city is also one of the important factors. An improvement in air quality is expected with the increase in the use of natural gas and the implementation of renewable energy alternatives in Karşıyaka district.

Zoning plans should be prepared by taking into account the fact that tall buildings and adjacent structures eliminate air corridors in the city, and urban transformation processes should be carried out in this direction.

Actions such as expanding public transportation and increasing bicycle and pedestrian paths will both reduce emissions from transportation and contribute to the improvement of air quality.

Karşıyaka Municipality aims to monitor CO, O³, NO_x, NO₂, SO₂, PM₁₀ and PM_{2.5} parameters by procuring a mobile measuring device.

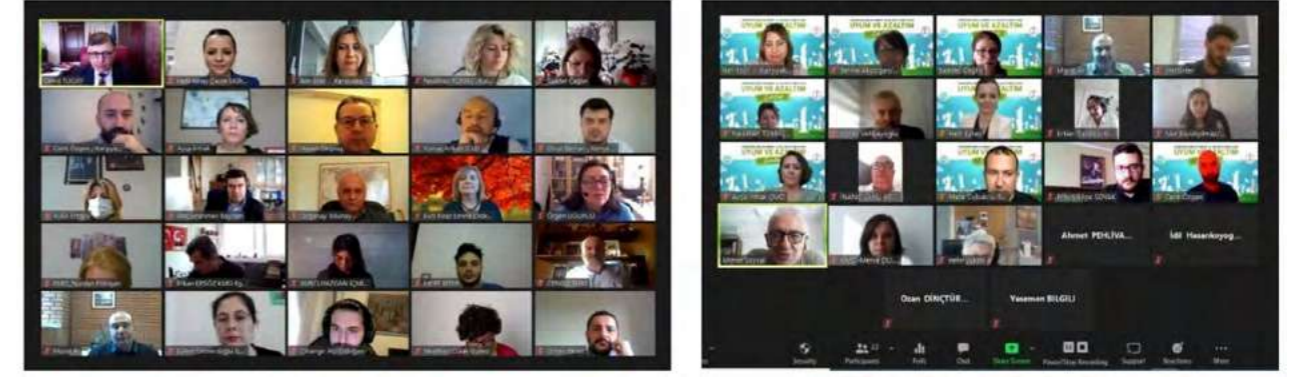


3.2 Current Situation Assessment of Climate Change in Karşıyaka on the Basis of Sectors

3.2.1 Study Methodology and Stakeholder Engagement

Karşıyaka SECAP process started in November 2020 with the preparation of the SECAP GANTT Plan by the executive committee consisting of representatives of the Municipality, the Chamber of Environmental Engineers and SolarMENA and was carried out in accordance with the methodology of the Agreement of Mayors(CoM). Karsiyaka Municipality aims to achieve a significant reduction in greenhouse gas emissions by 2030 as a result of the development of studies and adaptation strategies and their implementation by transforming them into rational policies. Municipality representatives took part in the process from the preparation stage to the reporting stage in order to strengthen the institutional capacity and set effective and achievable targets. 33 Executive Board meetings were held between November 2020 and July 2021. All meetings and events held within the scope of the measures taken due to the Covid-19 epidemic were held online.

An Advisory Board, which is consisting of academicians and technical experts working in the field of climate, has been established in order to consult their opinions and suggestions within the scope of an effective SECAP preparation, where awareness and applicability are ensured with all components of Karşıyaka. At the same time, stakeholder lists have been prepared including the institutions whose information and opinions will be sought in the whole process, which is from the provision of data to the determination of mitigation and adaptation actions. While municipal units are determined as internal stakeholders, İzmir Metropolitan Municipality and its affiliates, directorates and departments, official institutions, Union of Chambers of Turkish Engineers and Architects İzmir Provincial Coordination Board, İzmir Medical Chamber, professional chambers and universities are determined as external stakeholders. An online Data Collection Workshop was held on 15.12.2020 with the participation of 11 external and 17 internal stakeholders. The first Advisory Board Meeting was held on 25 December 2020, and the last Science Advisory Board Meeting was held online on 10 November 2021.



Advisory Board Meeting and Adaptation and Mitigation Workshop Screenshots

Stakeholder meetings were held concurrently with the Executive Board Meetings in order to obtain information about the evaluation of the data and the works carried out in the city, and to exchange views on mitigation and adaptation studies. In addition to the internal and external stakeholders, the members of the Advisory Board related to the subject were also attended to the meetings. In all workshops and stakeholder meetings, representatives of the Provincial Directorate of Environment, Urbanization and Climate Change of the Republic of Turkey, and the Climate Change and Environmental Protection Control Department, which takes part in the scope of the İzmir Metropolitan Municipality Sustainable Energy and Climate Action Plan, were invited and their contributions and opinions were received.

Table 3.7 Stakeholder Meeting List

No	Subject	Date
1	Transportation	29.12.2020
2	Waste and wastewater	12.01.2021
3	Energy	19.01.2021
4	Water consumption and water resources management	26.01.2021
5	Green areas, greenways and biodiversity	02.02.2021
6	Karsiyaka Municipality projects	23.02.2021
7	Urban Green Up Resilient Cities Presentation	02.03.2021
8	Energy efficiency and urban transformation (sustainable urban texture) activities in buildings within the scope of SECAP activities in Karşıyaka District	05.05.2021
9	Disaster management in cities, Public health	20.05.2021



In parallel with the stakeholder meetings, an urban and institutional greenhouse gas inventory was prepared with the collection of necessary data. The methodology for the preparation of the inventory is detailed in Chapter 4.

Adaptation and Mitigation Workshop was held on 8-9 June in order to convey the studies carried out together with the greenhouse gas inventory and to evaluate the mitigation and adaptation measures that can be applied in Karşıyaka together with the members of the Advisory Board and the representatives of the stakeholder institutions.

It is aimed to ensure the effective participation of municipality employees in the mitigation, adaptation and monitoring processes by informing them about the SECAP process; and trainings were organized for the participants determined by the municipality on Greenhouse Gas Emissions (GHG) Inventory Scope, Data Needs, GHG Monitoring Principles, "Good Practice Examples". A training on "Greenhouse Gas Emissions Inventory and Action Plans" for the personnel of the institution and the result evaluations were made on 26.08.2021.



Karşıyaka Municipality Sustainable Energy and Climate Action Plan was brought to the agenda of the August Municipal Assembly Meeting with the preparation of the Greenhouse Gas Inventory, the determination of the targets and the creation of the necessary reduction and adaptation actions to reach these targets. It was decided to be discussed by the Environment and Health Commission at the assembly meeting, The Secap Executive

Board informed the Environment and Health Commission for each stage of the plan. On 26 August 2021, the presentation of the entire plan was submitted to the commission in the presence of all relevant directorates. The Environment and Health Commission, which includes the representatives of the parties with a group in the parliament, took the decision to approve the Plan unanimously and the Commission Decision, which came to the agenda of the Assembly Meeting dated 01.09.2021, was unanimously accepted in the Karşıyaka Municipal Assembly.

3.2.2 Vulnerabilities and Risk Assessment

The risk assessment study conducted in IMM SECAP 2020 was taken as a basis in determining the risks associated with climate change. The reason for this is that Karşıyaka District is located in the same geography as İzmir City and similar actions with İzmir should be implemented for climate adaptation in Karşıyaka SECAP.

In IMM SECAP 2020, the current risk level of 9 basic hazards in the CoM methodology was determined based on the climate events that occurred in the past in İzmir. It is stated that 6 out of 9 identified hazards are at 'high', 2 at 'moderate' and 1 at 'low' risk level. These are summarized in Table 3.8 below.¹⁶

Table 3.8 Primary Climate Hazards and current risk level identified

Climate Hazards	Current Level of Risk
Extreme heat	High
Extreme cold	Low
Excessive precipitation	High
Floods (stream and urban)	High
Sea level rise	Modarete
Drought	High
Storms (strong wind)	Modarete
Landslides	High
Forest fires	High

(16) İzmir Province Sustainable Energy and Climate Action Plan, 2020



The evaluation specific to Karşıyaka district was made by utilizing the impact paths determined in IMM SECAP2020 on the determination of the impact routes of the identified hazards.

The fragility assessment prepared within the scope of IMM SECAP2020 was used to determine the vulnerabilities specific to Karşıyaka district. In addition, the socio-economic and physical characteristics of the district, the events experienced and the studies carried out so far were taken into consideration.

Karşıyaka is the fourth most populous district of İzmir and the population continues to increase. Yalı, Bostanlı, Şemikler, Bahçelievler and Örnekköy neighborhoods are the neighborhoods with the largest population, respectively. Zübeyde Hanım Mahallesi, which started to develop after 2000 and whose population increased rapidly with the constructions in the form of mass housing, became the sixth most crowded neighborhood of the district.

The ratio of the population over the age of 65 in Karşıyaka District to the total population is approximately 16% and this ratio is above the 12% calculated for İzmir in general. The ratio of the population under the age of 4 to the total population of the district is around 4%. The ratio of lower income groups in the distribution of socioeconomic status is 36%. According to the data obtained from the İzmir Provincial Directorate of the Ministry of Family and Social Services, the number of disabled individuals in 2020 is 583.

When the population age distribution, disabled individuals and socio-economic status are considered together, the presence of vulnerable groups increases the vulnerability. Studies and actions for vulnerable groups should be developed within the scope of adaptation to climate change by updating health data as well as data on immigrants and the homeless.

Areas at risk against floods, overflows and flooding in İzmir were determined in the study titled "Identification of Regions at Risk against Climate Change in terms of Spatial Structure Characteristics, İzmir",

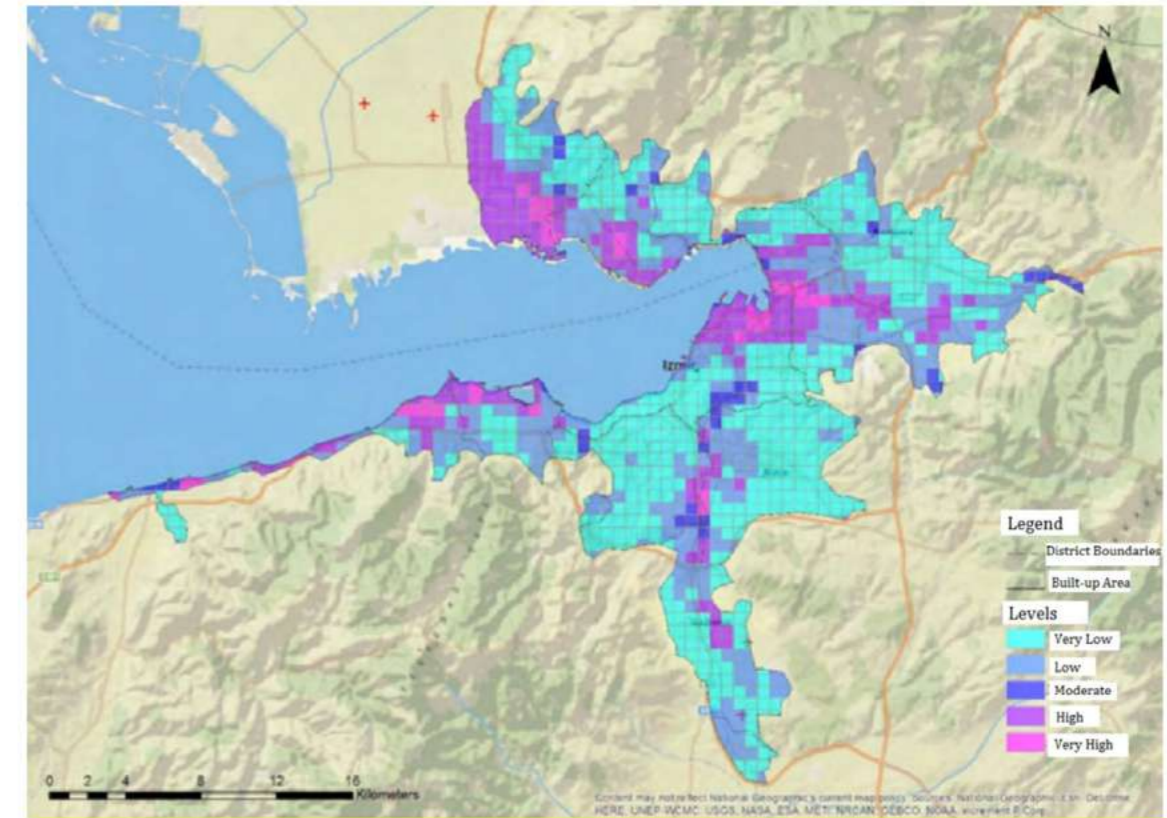


Figure 3.11 Regions with Risk in Terms of Their Physical Characteristics and Risk Levels

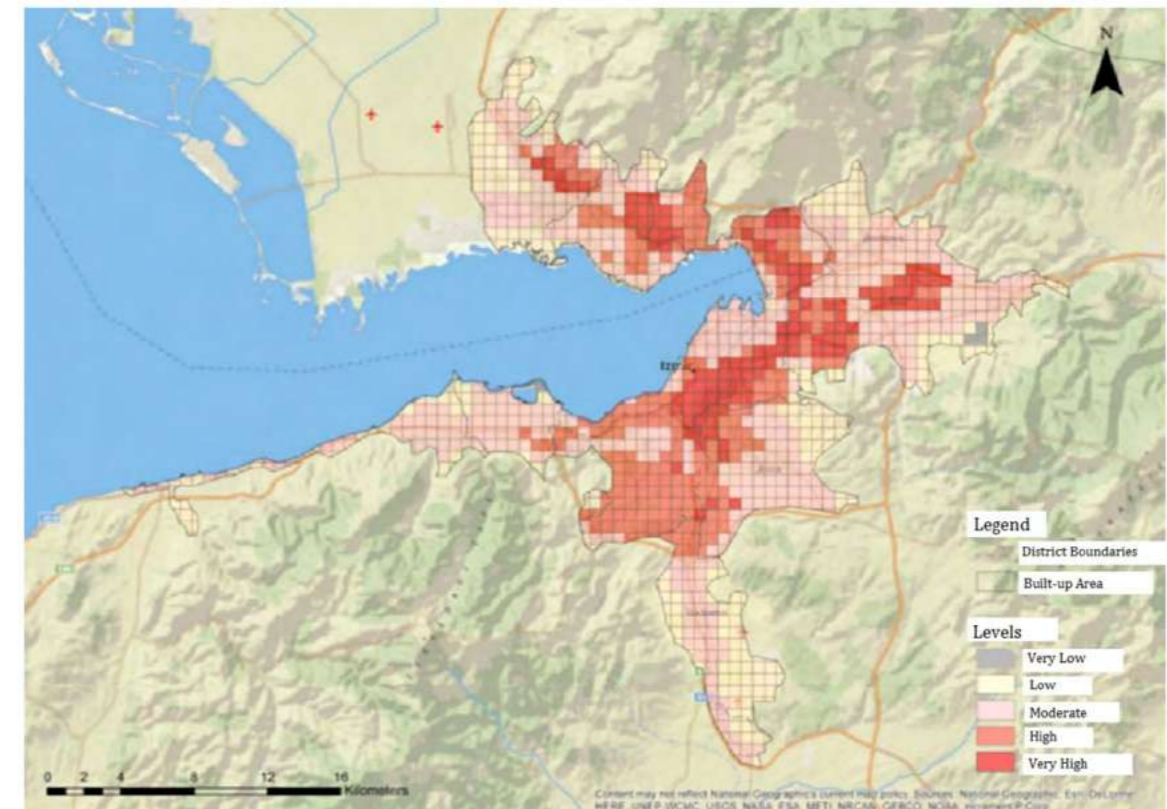


Figure 3.12 Regions That Are at Risk Due to Construction Features and their levels

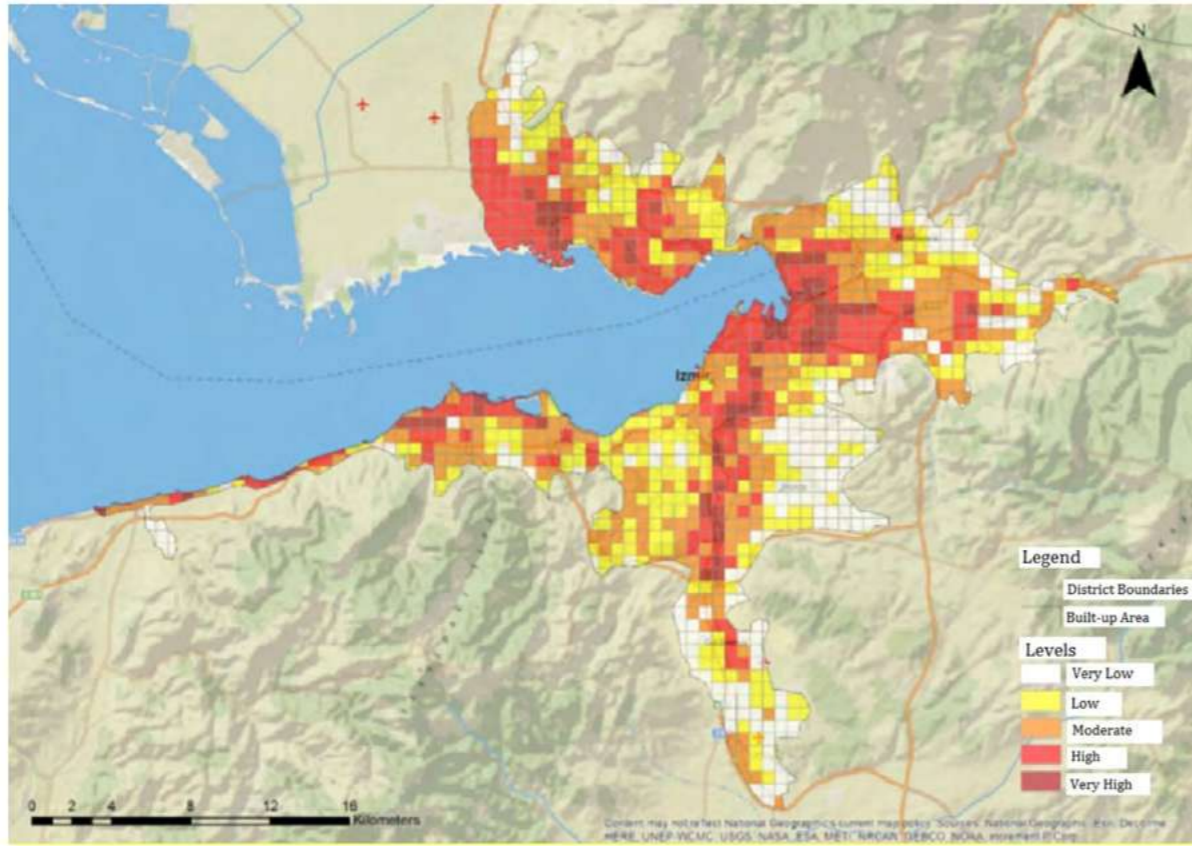


Figure 3.13 Areas of the city of İzmir with spatial risk.

The physical characteristics of the areas where İzmir's settled texture is located have been examined and it is seen that the coastal areas in Karşıyaka district carry a risk against disasters due to low altitude and climate change. There are regions that are located right behind the coastal settlements of the city and mainly formed by urban areas that developed unplanned during the rapid urbanization process of the city of İzmir. These regions are the regions with the highest risk in terms of construction. Figure 3.13 shows the distribution of spatially risky regions created by evaluating the physical and structural features together. The study reveals that land use preferences and structural features can make physically unsafe or low-risk areas risky.

Karşıyaka district is located in Küçük Menderes Basin and has a 12 km coastline. The lowest altitude in the district is 1 m and it is open to river and coastal floods. The presence of transportation infrastructure, residential and commercial spaces close to the coastline and stream beds increases the vulnerability to floods. The presence of impermeable artificial surfaces and limited green areas, as in the general of İzmir metropolitan districts, limits the rainwater management capacity. On the other hand, the density of artificial surfaces and reinforced concrete structures increases the urban heat island effect and increases vulnerability to rising temperatures as well. Sectoral assessments are given in section 3.2.3 under sub-headings.

SECAP 2021 Science Advisory Board Member and Eskişehir Technical University Ecology Department Head Prof. Dr. Cengiz TÜRE conducted a study about the Climate Change Vulnerability Assessment of İzmir and Karşıyaka between 2015 and 2016. The study is presented in Figure 3.14 and Figure 3.15. Within the scope of the study, the evaluation result for İzmir province was determined as "UNDER RISK", and the evaluation result for Karşıyaka was determined as "FLEXIBLE". The Healthy Cities Network has started the same work for 2021. Results will be shared in 2022.

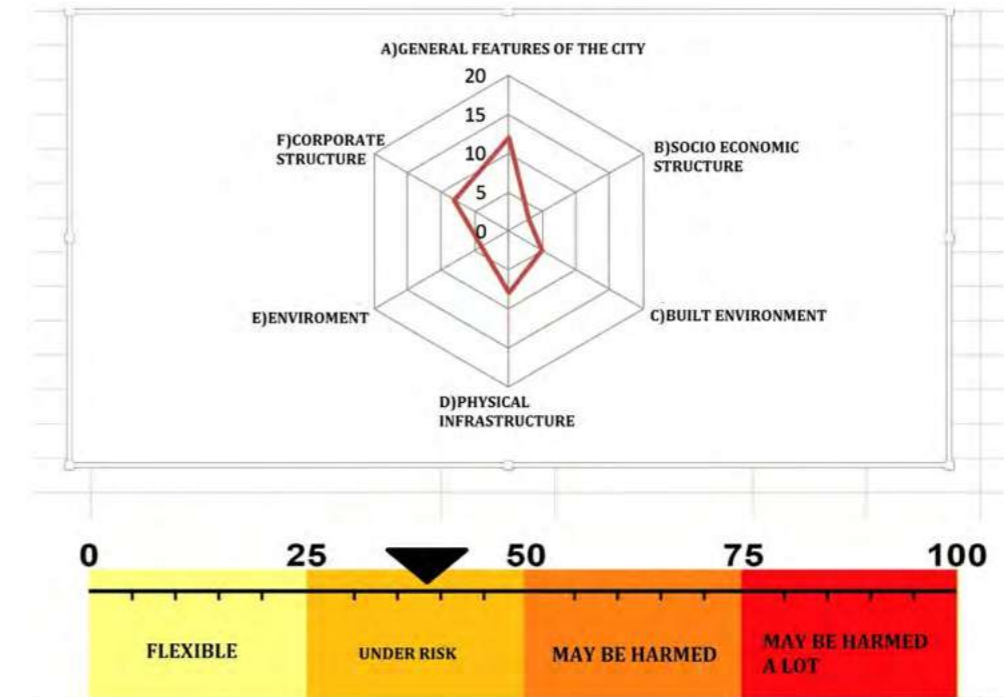


Figure 3.14 İzmir Climate Change Vulnerability Assessment

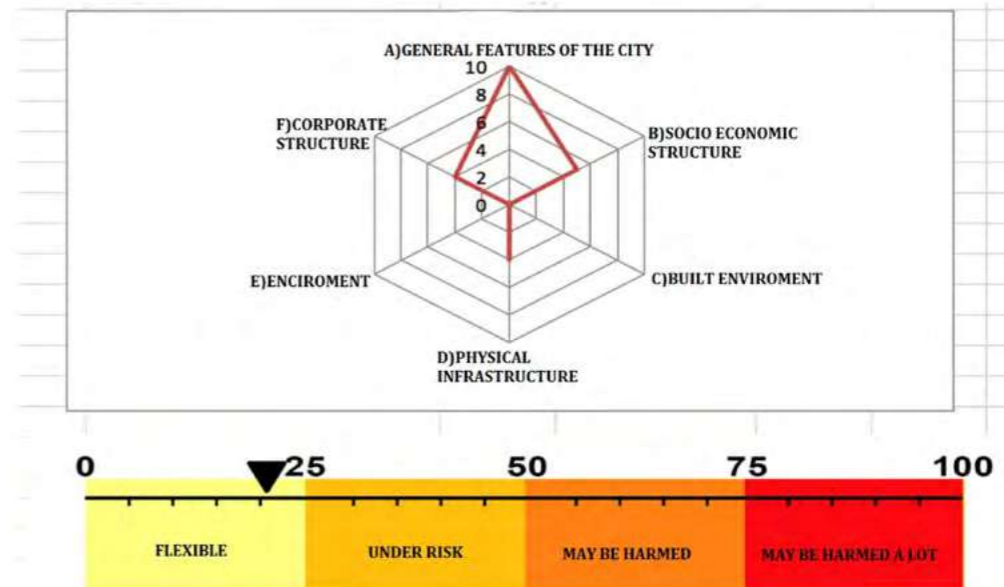


Figure 3.15 Karşıyaka Climate Change Vulnerability Assessment

3.2.3 Urban Sectors, Affected Factors ve Adaptation Capacities

3.2.3.1 Energy

According to the Intergovernmental Panel on Climate Change (IPCC), about 67-76% of global energy demand comes from cities, and the amount of global carbon emissions associated with energy used in cities ranges from 71-76%. Thus, city centers play a key role in addressing current climate problems. More importantly, cities have great potential to reduce emissions of any kind by 2050, and one of the most critical parts of this reduction is how energy needs are met. By 2050, cities are expected to have 2/3 of the world's population. Therefore, cities need to review their existing energy infrastructures and increase the share of renewable energy sources in energy supply for carbon reduction. Growing and decentralized energy production with the spread of renewable energy sources and digital technologies will reshape the dynamics between consumers, public service providers and energy systems in cities.

In the last decade, there has been a significant increase in the number of cities that have increased the use of renewable energy and realized the importance of digitalization tools in their energy systems. According to data from the International Renewable Energy Agency (IRENA), 671 cities globally have clear targets to increase their share of renewable energy. About these cities.

Although 82% are in Europe and North America, where economically developed countries are located, the interest of cities in Asia and Africa in renewable energy applications is also increasing.¹⁷

İzmir is one of the fortunate cities in terms of diversity and potential in renewable energy sources. The "Strong Economy" development axis of the 2014-2023 İzmir Regional Plan, which was prepared by the İzmir Development Agency, has the goal of "Energy efficiency practices and the use of renewable energy will be expanded in all sectors, renewable energy production will be increased" under the strategic priority of "Sustainable Production and Service Delivery". When this target title in the İzmir Regional Plan is examined in detail, "Measures will be taken to save electricity in public and private buildings". It is also mentioned that "the use of solar energy in the region will be widespread and solar energy technologies will be produced".

İzmir province constitutes approximately 5,3% of the country's population and is the third largest city in Turkey in socio-economic and development rankings. Contrary to the last year, İzmir's population growth is 0,63%, which is above the Turkey average of 0,55%. The number of people per square kilometer is 366 as of 2020, which is well above the Turkey average. Total

electricity consumption per capita is approximately 50% above Turkey's average.¹⁸ The city, which also hosts many international companies, has 9,3% of industrial production and 6% of employment in Turkey. According to Brookings Institution data, it is among the top 10 fastest growing metropolitan cities in the world.

İzmir is a prominent city in terms of the use and sustainability of renewable energy resources, especially solar energy, with its development in agriculture and industry sector, geographical and climatic conditions. The increase in energy use in line with the growth of the country's economy shows an average of 9% increase in energy demand per year.

According to the Energy Market Regulatory Authority June 2021 Sector Analysis Report, Turkey's installed electrical power capacity has reached a total of 98.162,35 MW, of which 90.994,98 MW is licensed and 7.167,37 MW is unlicensed. The electrical power capacity installed in İzmir is as follows: Licensed: 5.393,19 MW, Unlicensed: 327,09 MW, Total: 5.720,28 MW. In other words, approximately 5,8% of the total installed power capacity of the country is in İzmir. The distribution of unlicensed electricity installed power in İzmir by resources is as follows: Solar: 294,61 MW, Natural Gas: 27,61 MW, Wind: 4,52 MW and Biomass: 0,35 MW. In the light of these data, considering the serious potential of İzmir in renewable energy sources such as wind, solar, biomass and geothermal, it is understood that the electrical energy production capacity is not used sufficiently.

The annual electricity and natural gas consumptions of Karşıyaka district on a neighborhood basis are shown in Table 3.9.

Table 3.9 Annual electricity and natural gas consumption by neighborhood

Neighbourhood	Electricity consumption (MWh/year)	Natural Gas Consumption (Sm ³ /year)
Aksoy	30.467,4	3.077.960,5
Alaybey	16.503,2	1.199.746,1
Atakent	15.827,0	2.319.191,5
Bahariye	27.115,4	2.340.634,4
Bahçelievler	49.540,5	5.371.899,0
Bahriye Üçok	33.739,1	2.998.299,5
Bostanlı	90.465,2	9.592.213,7
Cumhuriyet	26.829,6	65.295,0

(18) <https://www.izto.org.tr/tr/tg/izmir-ekonomisi>, 2021.

(17) IRENA (2020), Rise of renewables in cities: Energy solutions for the urban future, International Renewable Energy Agency, Abu Dhabi, ISBN 978 - 92 - 9260 - 271 - 0.



Dedebaşı	34.774,9	4.017.004,0
Demirköprü	13.339,9	1.263.989,6
Donanmacı	42.680,4	2.743.020,9
Fikri Altay	15.484,5	1.371.552,1
Goncalar	21.726,1	1.912.185,8
İmbatlı	16.529,9	2.764.125,0
İnönü	16.828,0	1.047.239,4
Latife Hanım	6.846,7	184.678,5
Mavişehir	29.740,9	7.117.614,5
Mustafa Kemal	16.140,7	2.599.474,9
Nergiz	16.435,7	1.626.548,7
Örnekköy	41.838,0	3.181.050,2
Sancaklı	5.012,2	-
Şemikler	55.949,2	4.338.744,7
Tersane	14.142,9	1.128.441,1
Tuna	32.310,2	1.172.104,8
Yalı	89.767,7	10.524.667,0
Yamanlar	26.966,4	-
Zübeyde Hanım	26.134,7	2.912.165,0



Considering the fact that Karşıyaka district is an important part of İzmir province, the use of renewable energy potential for both the district and the metropolitan city is very important in terms of SECAP actions and targets. In addition, in accordance with the relevant renewable energy source unlicensed electricity generation legislation, subscriptions in Karşıyaka district can be offset by associating with installations to be made in other areas within the boundaries of the relevant distribution company's (GDZ Company) region. Thus, within the scope of KARSİYAKA MUNICIPALITY SECAP 2021, renewable electricity energy actions are to be carried out within the Karşıyaka district as much as possible. However, in order to achieve the targets, the option of associating electricity consumption subscribers in Karşıyaka by investing in generation plants located in the same distribution region has also been considered. Therefore, it is important to evaluate the renewable electricity generation potential of both Karşıyaka district and İzmir province within the scope of KARSİYAKA MUNICIPALITY SECAP 2021 energy actions.

It is also worth mentioning an important project activity of Karşıyaka Municipality for young people in the field of renewable energy: Within the scope of the Fifth Term of the European Union's Civil Society Dialogue Grant Programme, the Lifelong Learning, Vocational Education and Development Association (HBODER), the Aegean Forest Foundation, the German RENAC gGmbH organization and the participant Karşıyaka Municipality came together as project partners. Thanks to their union, they established a Zero Carbon Point (ZCP) Training Center in Karşıyaka. This training center is a carbon neutral building with units that generate electrical energy from solar, wind and kinetic energy and generates its own energy. The project partners take this collaboration to a new level with the second project, which was accepted under the title "Continued Dialogue, Closer to Europe". With this new project, a complementary digital information provision platform is created, which includes sustainability-based creative and innovative educational materials for youth on renewable energy and environmental issues.

WIND ENERGY IN İZMİR:

In wind energy systems, the most important climate data to be considered in the design is the wind speed (m/s) values. These values can be reached by using the Wind Energy Potential Atlas (REPA) offered under the auspices of the General Directorate of Energy Affairs. The annual average wind speed distribution of İzmir at an altitude of 100 m is presented in Figure 3.16.

The wind speed is variable and the wind turbine does not operate at rated power for one year (8,760 hours). Therefore, how efficiently a wind farm in any area can operate is explained by this parameter called the Capacity Factor (KF), which is calculated by the ratio of the total energy

produced by the power plant in a certain period to the energy it can produce at full capacity. KF distribution of İzmir province at an altitude of 100 m is presented in Figure 3.17. Figure 3.18 shows the wind power density distribution at the same height.

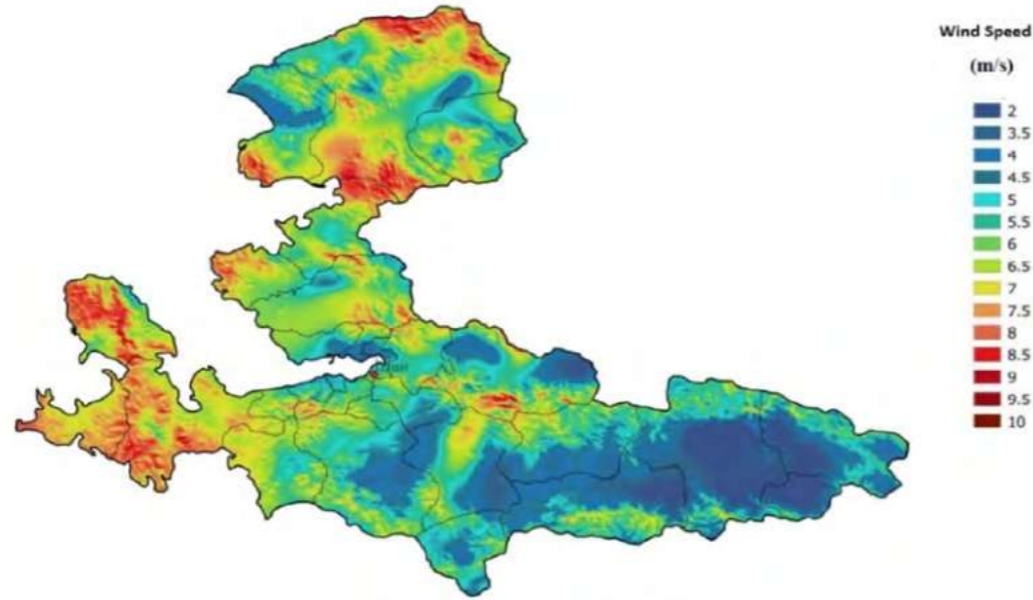


Figure 3.16 Annual average wind speed distribution of İzmir province at an altitude of 100 m.¹⁹

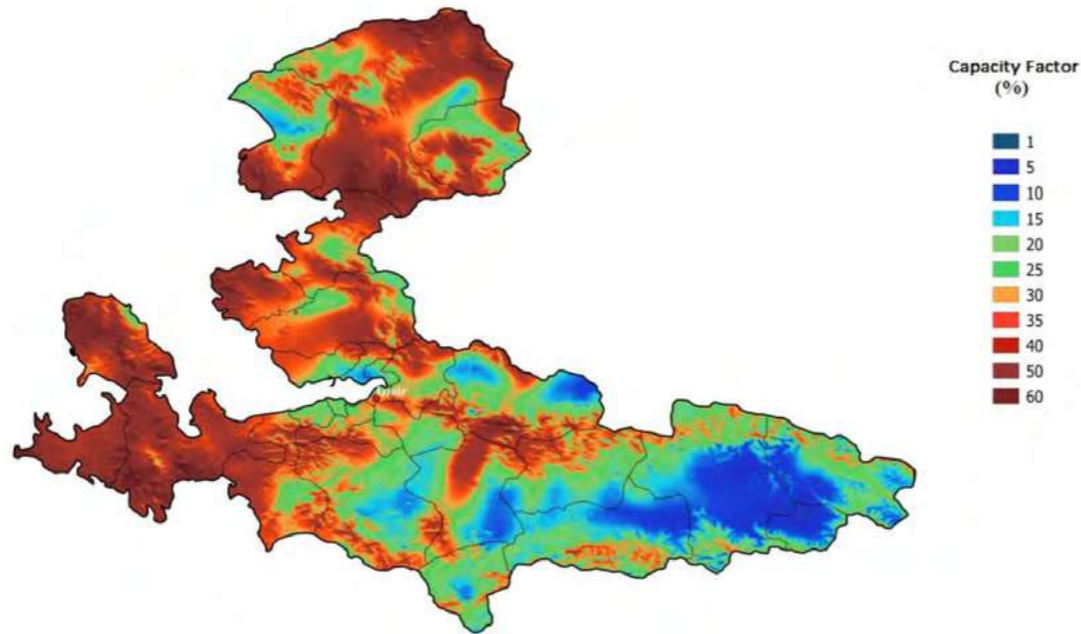


Figure 3.17 Capacity Factor distribution of İzmir province at an altitude of 100 m (Capacity factor distribution map has been prepared by considering the technical values of a wind turbine with a 3 MW power)²³

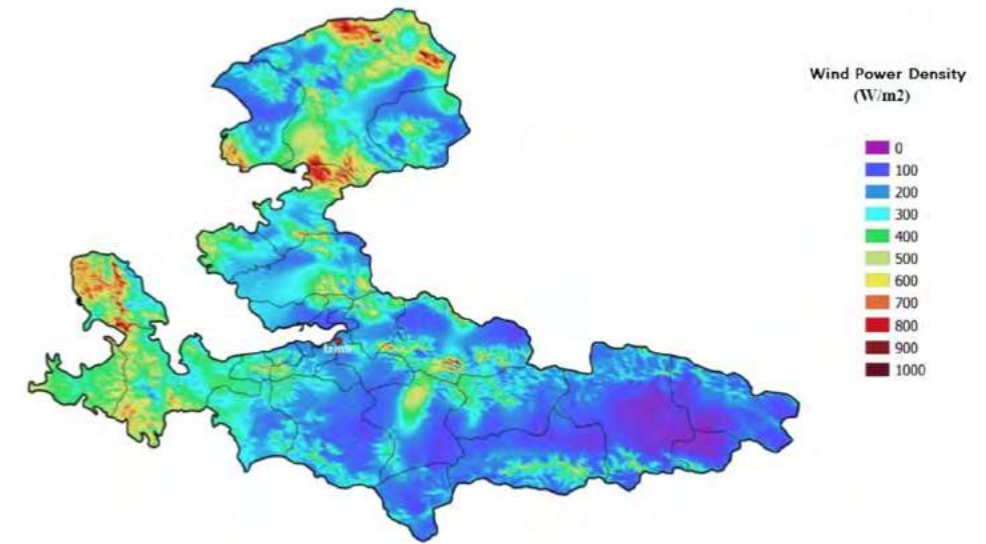


Figure 3.18 Annual average wind power density distribution of İzmir province at an altitude of 100 m.²⁰

REPA reports 5,66 m/s average wind speed, 277,17 W/m² average wind power density and 30,4% average capacity factor data for İzmir province at 100 m altitude. When Figure 3.13, Figure 3.14 and Figure 3.15 are examined, it is understood that districts such as Çeşme, Urla, Karaburun, Bergama and Aliağa have the highest wind energy potential. Since, primarily in these districts, a significant scale wind power plant has been established in İzmir as well.

According to the current June 2021 Sector Report data published by the Energy Market Regulatory Authority (EMRA), the wind power plant installed in Turkey has reached a total of 9.818,74 MW, of which 9.747,85 MW is licensed and 70,89 MW is unlicensed. Approximately one fifth of this capacity is installed in İzmir. Only 4,52 MW of the wind power plants in İzmir are in the unlicensed class, while the others have been established under license.

On the other hand, the fact that some of the wind power plants established in İzmir were established close to the settlements caused a serious discomfort in the local people. In the case of Karşıyaka, a wind energy-based renewable energy dissemination policy has not been proposed within the KARSİYAKA MUNICIPALITY SECAP 2021 actions, since it is a central and population-dense metropolitan district, although there is a wind energy potential above the province average in the northern slope regions.

(19) <https://repa.enerji.gov.tr/REPA/>

(20) <https://repa.enerji.gov.tr/REPA/>

SOLAR ENERGY IN IZMIR:

Due to its location, İzmir has high solar radiation, sunshine duration reaching 12 hours in summer and an annual average of 1.500 -1.600 kWh/m² in the horizontal plane. For these reasons, it has a remarkable potential with its high solar power generation potential and fast return on investment. The most important climate data in the photovoltaic solar energy system design is the solar radiation (kWh/m²) data of the area to be installed. In Figure 3.16, annual solar radiation information which is presented in the Solar Energy Potential Atlas (GEPA) under the auspices of the General Directorate of Energy Affairs, on the horizontal module plane of İzmir province is given.

At the optimum module inclination angle (33°) oriented to the south, the amount of radiation increases further and reaches an annual value of 2.000-2.100 kWh/m², and photovoltaic solar power plants operate with an annual energy harvest of approximately 1.600-1.700 kWh/kWp. At south-facing roof pitch angles of 5-10°, this annual energy generation harvest is in the range of 1.450-1.500 kWh/kWp. According to GEPA data, the sunshine durations of İzmir province are shown in Figure 3.17. In summary, all these presented data prove that there is a high solar energy potential in the whole of İzmir. Karşıyaka ilçesi, İzmir ilinin ortalama değerlerinin de üstünde bir potansiyele sahiptir. Karşıyaka district has a potential above the average values of İzmir province.

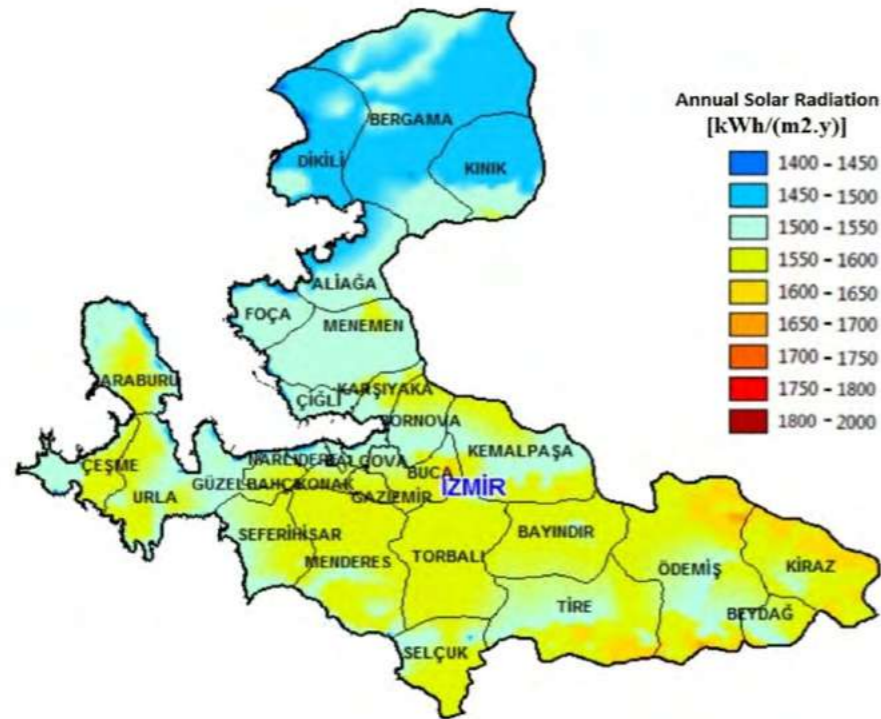


Figure 3.19 Annual solar radiation values of İzmir (kWh/m².y) .

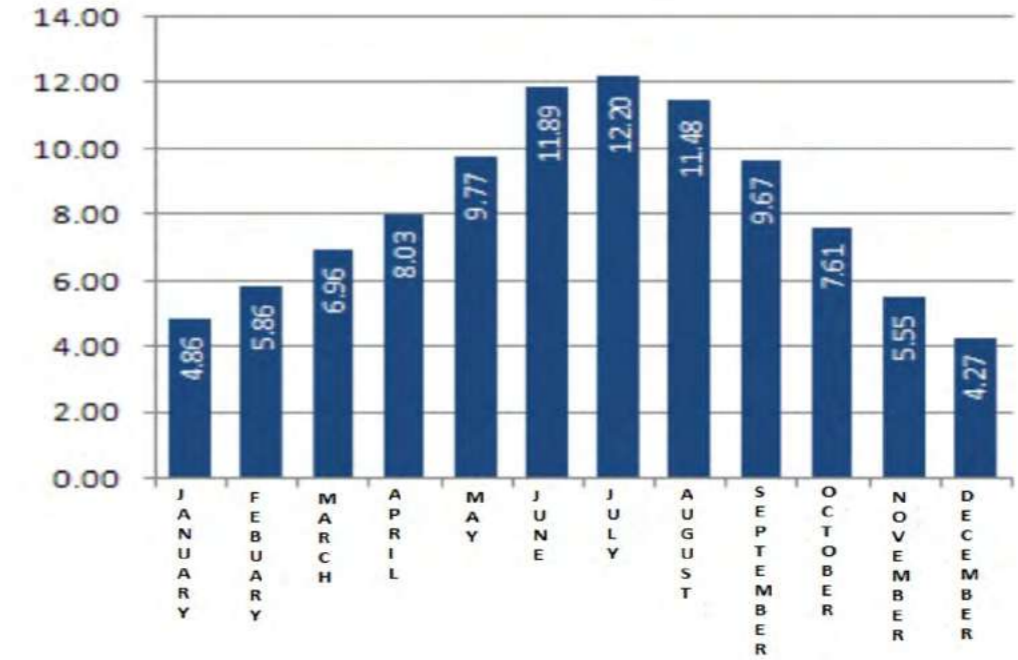


Figure 3.20 Average daily sunshine duration (hours) of İzmir province according to months. ²⁴

Karşıyaka ilçesi ve İzmir ili, Türkiye ortalamasının da üstünde yüksek bir güneş enerjisi potansiyeline olmasına karşın, Although Karşıyaka district and İzmir province have a high solar energy potential above Turkey's average, they have a very small part of the total installed photovoltaic solar energy potential in Turkey. According to the latest Energy Market Regulatory Authority (EMRA) Sector Analysis Report data, as of the end of June 2021, the installed solar power plant power in Turkey has reached a total of 7.219,73 MW, with 647,4 MW licensed and 6.572,33 MW unlicensed. A very small part of this capacity (294,61 MW, that is, approximately 4,1% of the total) is in İzmir. It is clear that these data are far below the potential of İzmir.

GEOHERMAL AND BIOMASS ENERGY IN IZMIR:

İzmir is a province with the richest geothermal field in Turkey and the Aegean Region. Especially Balçova, Seferihisar, Çeşme, Dikili, Bergama, Aliğa and Bayındır districts are important geothermal fields.. It is known that the products to be obtained from biomass energy systems (eg, biogas, biodiesel, bioethanol, biohydrogen, fermented fertilizer, glycerine, etc.) will also contribute to different sectors such as electricity, fuel oil, agriculture and chemical industry. It is foreseen that this sector will develop faster with awareness studies to be started in both industrial and rural areas in İzmir, where agricultural production is intense. It is seen that shifting the use of biomass energy potential to modern methods and primarily evaluating waste will greatly support sustainability and development in economic, environmental and sociological terms.

According to EMRA June 2021 Sector Analysis Report data, the installed geothermal sourced power plant power in Turkey is 1.650,17 MW. There is no geothermal licensed or unlicensed electrical power plant in İzmir. Existing geothermal applications are used in residential or greenhouse heating and thermal tourism. The biomass-based electrical power plant has reached a total of 1.352,45 MW, of which 1.266,54 MW is licensed and 85,91 MW is unlicensed. The unlicensed biomass power plant installed in İzmir has been reported as 0,35 MW.

KARSIYAKA MUNICIPALITY SECAP 2021 ENERGY ACTIONS:

Within the scope of KARSIYAKA MUNICIPALITY SECAP 2021, a total of eight (E.1-E.8) actions related to the energy sector have been determined.

In the light of the data summarized above, a strategy focused on solar energy has been developed while determining the actions. IMM SECAP 2020 aims to increase its capacity with the aim of installing solar energy in 850 MW buildings and 45 MW agricultural irrigation in İzmir province by 2030 . Considering the increase in energy consumption due to population density and welfare level of Karşıyaka district within the scope of KARSIYAKA MUNICIPALITY SECAP 2021, it is aimed to add an additional 5,5 MWp to the existing 1,63 MWp installed SPP potential of KARSIYAKA MUNICIPALITY SECAP until 2030. In addition, it is aimed to provide an additional 80 MWp SPP installation, which is offset by the subscription consumption within the district. (E.1 ve E.2 actions). In Karşıyaka district, it is planned to install photovoltaic SPP power plants with roof application as much as possible. However, in order to achieve the targeted capacity, it is foreseen that the roofs and lands outside the district borders but in the same distribution region can be used when necessary. As mentioned before, the relevant legislation allows this. KARSIYAKA MUNICIPALITY SECAP commissioned land type photovoltaic solar energy systems with a power of 493.185 kWp in 2014 and 1.140,48 kWp at the end of 2020, bringing the total installed power of SPP to 1,63 MWp. With this capacity, it is the district with the largest installed capacity within the borders of Izmir Metropolitan Municipality and currently meets approximately 24% of the corporate electrical energy need with SPP generation. In 2030, it is aimed to increase this rate to 100% with the installation of 5,5 MWp additional photovoltaic SPP. In this way, it is aimed that KARSIYAKA MUNICIPALITY SECAP will become a Carbon Neutral Municipality in 2030, with a total installed power of 7,13 MWp, within the scope of corporate electrical energy consumption.

It is specifically planned that the action (E.3 action) determined regarding the geothermal field within the scope of KARSIYAKA MUNICIPALITY SECAP SECAP 2021 is compatible with IMM SECAP 2020 actions and carried out under the main responsibility of IMM. It will be possible to act under

the leadership of IMM in the field of biomass energy. Because it is clear that IMM will have a say in the implementation of these actions due to its jurisdiction. Similarly, it is aimed to implement an environmental labeling program for private businesses in cooperation and harmony with IMM. (E.7).

It is also predicted that the need for digitalization in planning, production, distribution-transmission and operation processes will increase with the increase in renewable energy based installation capacities. Specific to this issue, "E.4 action", which prioritizes cooperation with relevant institutions, and "E.6 action", which aims to increase cooperation with cities that have experience in energy reduction actions in SECAP processes, are planned.

Ensuring the transition of coal consumers to more renewable and/or cleaner energy sources within Karşıyaka is also planned as an important action (action E.5). Replacing park and street lighting with LED (action E.8) will also make a significant contribution in terms of efficient use of electrical energy and reduction of consumption.

3.2.3.2 Buildings and Urban Transformation

As in the whole world, the share of greenhouse gas emissions originating from buildings in our country is quite high on a national scale. This situation affects the climate in a very negative way in the sectoral sense. In terms of urban density, a significant part of the population preferred to settle in the provinces in the western regions, especially in parallel with the development difference between regions. While the population density increases in the western and coastal parts of the country, it decreases in the eastern and inner parts. Therefore, it is expected that the rate of urbanization, the urban population and the ratio within the total population will continue to increase rapidly in the Aegean Region. This will also increase construction and energy consumption. For this reason, it is extremely important for both İzmir and Karşıyaka to construct buildings with high energy efficiency in new areas to be built. In this regard, the concept of buildings with almost zero energy and buildings with almost net zero energy has started to be discussed in our country. It has also started to be implemented in the public sector, albeit to a lesser extent. Studies have revealed that approximately 80% of the more than 8.5 million buildings in our country are either uninsulated or inadequately insulated. If the residences, which constitute a significant part of the existing building stock, are insulated in accordance with the standards, at least 2 billion TL will be saved annually from heating and cooling energy, excluding value added tax. It has been calculated that 1.3 billion USD can be contributed to the country's foreign trade

balance to reduce imports due to the reduction in natural gas and oil consumption. . From the consumer's point of view, it is possible to provide multi-faceted benefits such as providing better comfort conditions, reviving the construction sector and increasing employment, along with an average of 40% reduction in the energy expenditure of households with thermal insulation. The main legal regulations supporting energy efficiency in buildings are given below:

- TS 825 Standard for Thermal Insulation Rules in Buildings,
- Law on Building Inspection,
- Regulation on Increasing the Efficiency of Energy Resources and Energy Use,
- Energy Performance Regulation in Buildings etc.

There are 25.897 buildings, 189.580 independent sections and 146.177 residential independent sections in total in Karşıyaka district. The percentage distribution of the building stock according to the intended use is shown in Figure 3.21.

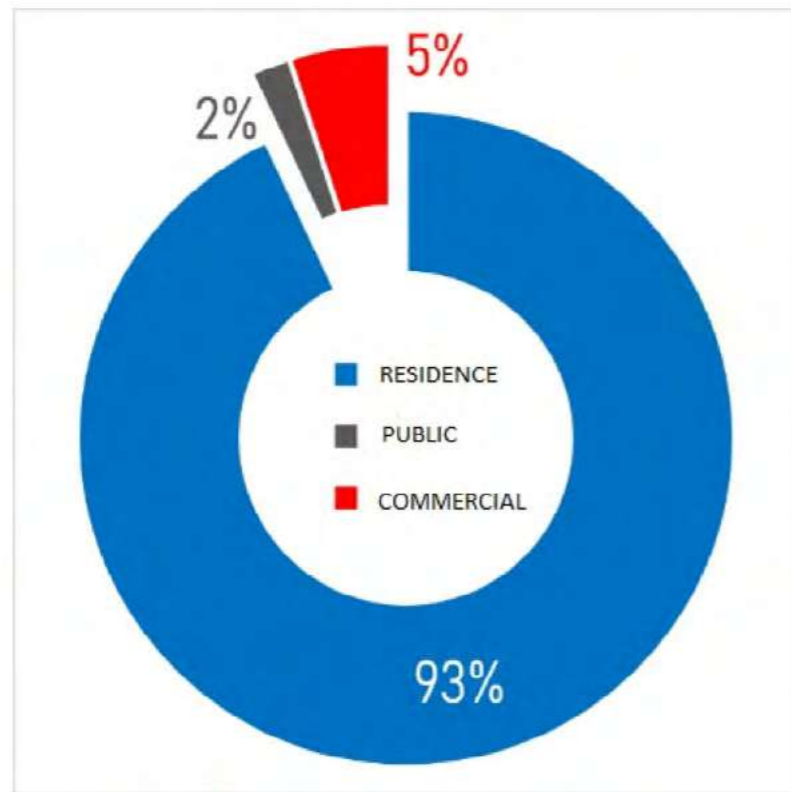


Figure 3.21 Percentage distribution of buildings according to their intended use

As can be seen in Figure 3.21, there is a very high 93% housing stock in the district. In addition, when the energy consumption data of building types in 2018 are analyzed as a percentage, it is seen that residences have a share of 74%. In Figure 3.22, it is noteworthy that the energy consumption of commercial buildings is also high.

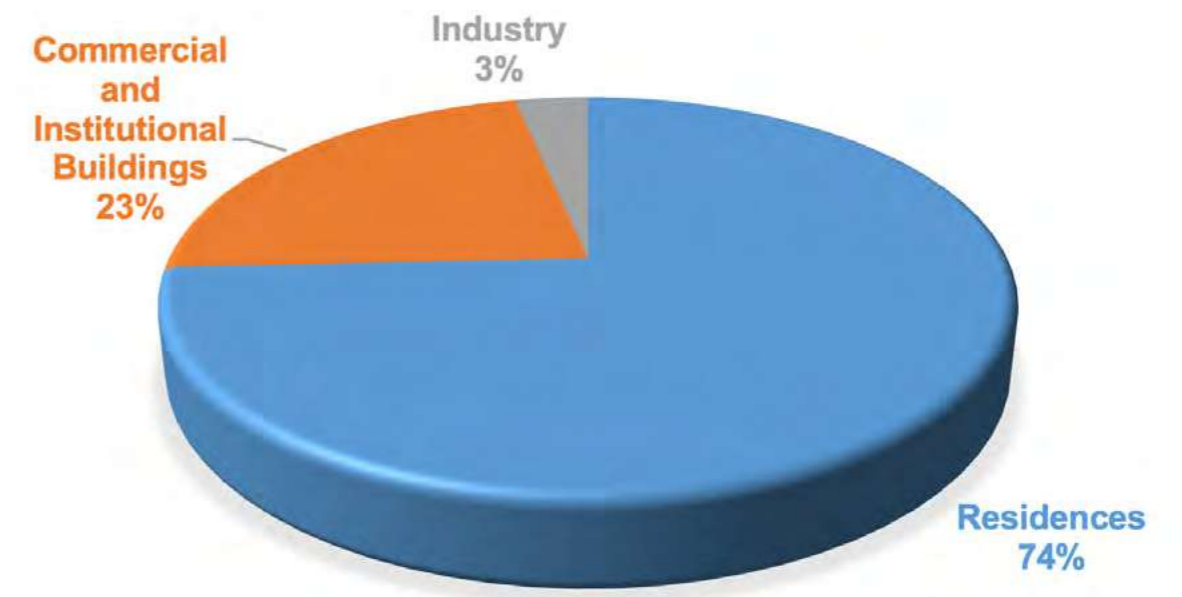


Figure 3.22 Percentage distribution of energy consumption by building types, 2018

Within the scope of SECAP, the amount of greenhouse gas emissions based on energy use on a neighborhood basis was evaluated in terms of urban transformation projects to be realized in the district and living spaces that can be opened for new construction. When evaluations are made on the basis of neighborhoods, information is obtained about the energy density and the type of fossil fuel used. This information helps to get a basic idea about the heating/cooling types. In Table 3.10 below, absolute greenhouse gas emissions and per capita emissions are given in alphabetical order.



Table 3.10 Greenhouse gas emissions by neighborhood, 2018 Figure 3.23 Total Amount of

Neighbourhood	Greenhouse Gas Emission (tCO ₂ e/year)			Greenhouse Gas Emissions per capita (tCO ₂ e/person•year)
	Electricity Consumption Sourced	Natural Gas Consumption Sourced	Total	
Aksoy	14.986,9	5.893,6	20.880,5	1,8
Alaybey	8.117,9	2.297,2	10.415,2	1,4
Atakent	7.785,3	4.440,7	12.226,0	1,7
Bahariye	13.338,0	4.481,8	17.819,8	1,4
Bahçelievler	24.369,0	10.286,0	34.655,0	1,3
Bahriye Üçök	16.596,3	5.741,1	22.337,3	1,7
Bostanlı	44.499,8	18.366,9	62.866,8	2,0
Cumhuriyet	13.197,5	125,0	13.322,5	1,0
Dedebaşı	17.105,8	7.691,7	24.797,4	1,3
Demirköprü	6.561,9	2.420,3	8.982,2	1,4
Donanmacı	20.994,5	5.252,3	26.246,8	2,3
Fikri Altay	7.616,8	2.626,2	10.243,1	1,3
Goncalar	10.687,1	3.661,4	14.348,5	1,5
İmbatlı	8.131,1	5.292,7	13.423,8	2,1
İnönü	8.277,7	2.005,2	10.282,9	1,3
Latife Hanım	3.367,9	353,6	3.721,5	1,8
Mavişehir	14.629,5	13.628,6	28.258,2	2,0
Mustafa Kemal	7.939,6	4.977,4	12.917,0	1,3
Nergiz	8.084,7	3.114,5	11.199,2	1,3
Örnekköy	20.580,1	6.091,0	26.671,1	1,2
Sancaklı	2.465,5	-	2.465,5	14,9
Şemikler	27.521,4	8.307,7	35.829,1	1,3
Tersane	6.956,9	2.160,7	9.117,6	1,3
Tuna	15.893,4	2.244,3	18.137,7	3,1
Yalı	44.156,7	20.152,4	64.309,1	1,7
Yamanlar	13.264,8	-	13.264,8	82,9
Zübeyde Hanım	12.855,6	5.576,1	18.431,8	1,1

Figure 3.23 and **Figure 3.24**, the amount of greenhouse gas emissions realized on a neighborhood basis is given in order from highest to lowest.

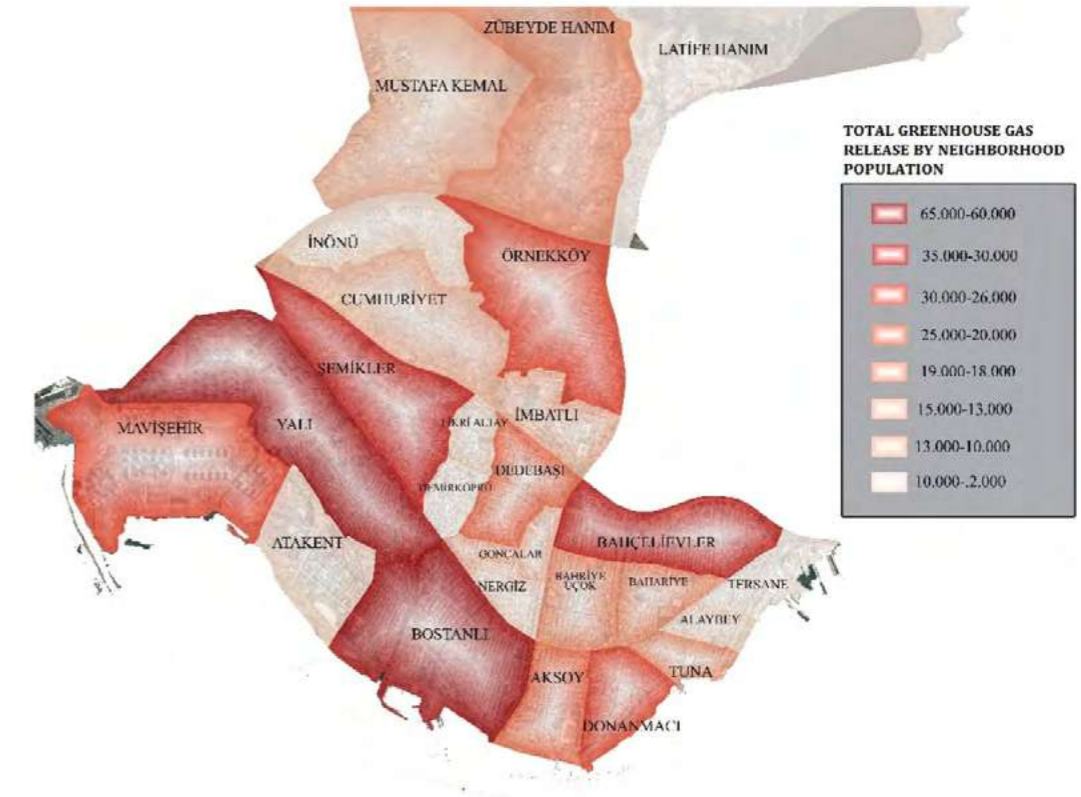


Figure 3.23 Total Amount of Greenhouse Gas Emitted by Neighborhood Populations (tCO₂e/year)

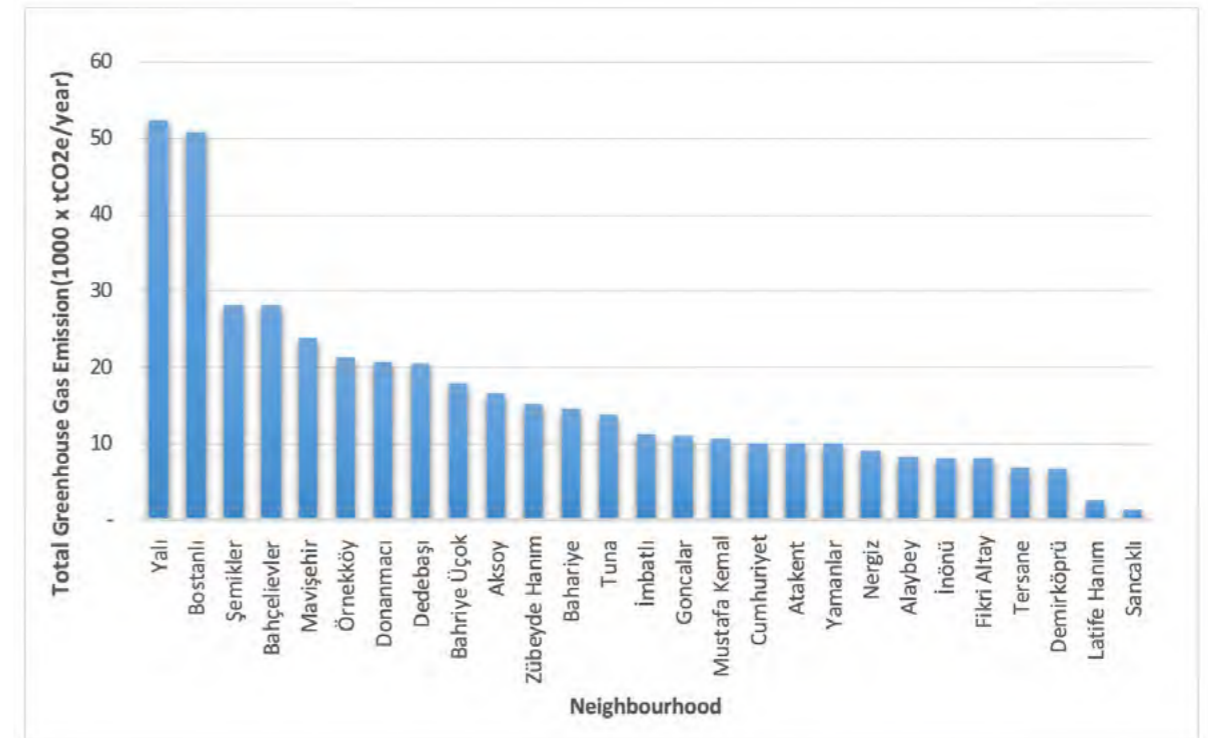


Figure 3.24 Greenhouse gas emissions from highest to lowest by neighborhood, 2018

It can be said that neighborhoods with high greenhouse gas emissions have a high population density. The top five neighborhoods with the highest greenhouse gas emissions are respectively; Yalı, Bostanlı, Şemikler, Bahçelievler and Mavişehir . The neighborhoods with the lowest greenhouse gas emissions are Fikri Altay, Tersane, Demirköprü, Latife Hanım and Sancaklı, respectively.

When the district is examined in terms of land use decisions determined by upper-scale plans, with the 1/100000 scale Environmental Plan in effect, 45% of its surface area is allocated for Forest, 10% for Agriculture, 10% for Afforestation, and 35% for Residential uses is seen. Again, in the 1/25000 scale Environmental Plan it was decided to be designated as, 32% of the district is Forest, 10% is Forest, 6% is Nature Park, 7% is Shrub and Shrub, 3,5% is Agriculture, and 40% is the Housing, Trade and Management Center. 1/5000 scaled plans that shape the spatial development and urbanization processes of Karşıyaka are under the authority and responsibility of İzmir Metropolitan Municipality. There are a total of 21 1/5000 scale master development plans approved and in force between 1996-2019.

Considering the current plans and development dynamics in Karşıyaka District, "Karşıyaka District Implementation Development Plans" have been decided to be reconsidered in stages. Within the scope of the related plan studies, housing, trade (daily trade areas, furniture, fuel, building materials, etc.), service (banks, offices, cargo companies), manufacturing (printing, textile, etc.), technical infrastructure (transformer, water tank, etc.), such as administration (Mukhtarship, etc.), health, education, social and cultural facilities (nursing home, association, foundation) areas, on-site determination of the physical features of the building blocks and the location of the buildings (Adjacent-Separate-Block Ordinance; TAKS-KAKS, etc.) work has been initiated. For example, the 1st Phase study covers the neighborhoods of Alaybey, Tuna, Tersane, Denizci, Aksoy, Bahçelievler, Bahariye, Bahriye Üçok and Bostanlı. The area of approximately 400,6 hectares includes the city center and the dense population. In this context, in order to create a database for the zoning plan studies, the physical properties of the buildings will be revealed by processing the information obtained from the relevant institutions, field studies and survey studies in line with the Zoning Law and the Spatial Plans Construction Regulation. Again, as a similar 2nd stage work, it has been planned on an area of approximately 505 hectares in Mavişehir, Yalı, Atakent, Şemikler, Fikri Altay, Demirköprü, Dedebaşı, Goncalar, Nergiz, and Bostanlı Neighborhoods.

Urban transformation is a very important opportunity in terms of both earthquake and climate change, if correct and modern planning is made. Inclusive practices that allow the use of energy

efficient and renewable energy in urban transformation areas are important. Redesigning these applications in areas with existing structures is more difficult and costly than in new areas. For this reason, urban transformation works are planned in three neighborhoods in Karşıyaka. These neighborhoods are Cumhuriyet, Örnekköy and İnönü neighborhoods. In this context, a zoning plan for urban renewal has been prepared in order to establish the legal infrastructure of a climate-resistant, sustainable, accessible, livable, healthy and safe urban space. Prior to these studies, as a result of the surveys conducted to determine the demands of the citizens regarding their living spaces, the demands of creating regular and healthy living spaces, increasing green space and recreational facilities, and a fair and equitable planning approach were brought to the agenda and taken into consideration. The following strategies have been produced; Producing cheap housing at the level of neighborhood units, reducing greenhouse gas emissions on public health and climate crisis, improving human health and quality of life, focusing on the protection and recovery of water resources and ecosystem services, encouraging the use of sustainable and renewable materials, promoting social equality, environmental justice. In the urban renewal process, protecting the natural environment and ensuring sustainability, protection of existing trees, afforestation on parcel basis, implementation of rainwater harvesting systems, creation of domestic waste separation systems for waste management, arrangement of settlement texture and buildings to benefit from air flow, evaporation increasing elements. preventing the use of shading elements, reducing the heating effect of the Sun, etc. applications are secured with plan notes.

3.2.3.3 Transportation

While greenhouse gas emissions from transportation increase day by day, it also negatively affects the air quality in that Region. Transportation field is important by acting as a bridge between the main sectors such as health, energy, industry, tourism and agriculture etc . In addition to all these, energy transformation should be taken into account and planning should be made to integrate buildings and transportation modes in order to create low-carbon and sustainable cities of the future. In line with the İzmir Transportation Master Plan - UPI prepared by IMM for the years 2017-2030, the public transportation networks, bicycle and pedestrian roads of Karşıyaka district have been considered as a reduction and adaptation option. Again, the replacement of the vehicles that Karşıyaka Municipality owns with its own vehicle fleet and leased vehicles with vehicles with lower greenhouse gas emissions; It is also in harmony with İzmir on a regional scale. In terms of reduction, it is aimed to expand public transportation as it is on a global scale and to have high energy efficiency in all modes of transportation.

Transportation has the largest share in the greenhouse gas inventory made for the city of Karşıyaka. When greenhouse gas emissions originating from transportation are examined, a high increase is observed both in İzmir and in Karşıyaka district. One of the biggest reasons for this situation is that the private vehicle ownership in Karşıyaka has been above the İzmir average in the last ten years. There are no official or rental hybrid or fully electric vehicles in the municipality. Currently, within the scope of the municipality's own corporate activities, it is aimed to take the following measures in order to save fuel consumption and reduce greenhouse gas emissions from transportation:

- Providing economic driving trainings to municipal personnel.
- Encouraging the purchase/rental of vehicles with low greenhouse gas emissions.
- Preventing the excessive use of vehicles in transportation by alternately using vehicles rented between units under the coordination of the Administrative Affairs Unit in municipal subsidiaries.

In Karşıyaka, there are recreational coastal embankments separated from the urban area by the coastal road, social, cultural and sports facilities, ferry piers, fishermen's shelters, yacht dock and Alaybey military shipyard. For Karşıyaka, data on the determination of urban values and dynamics throughout the district, which will be enriched in the process, have begun to be collected, and the process for the whole city in spatial terms has been initiated with the strategic planning approach. It is aimed to develop various projects in order to Plan the mobility behind the coast in harmony with the coastal uses and activities, design the urban coast for recreational, cultural and tourism purposes; coastal road, railway, etc. and provide unlimited access to the coast in the sub-regions where the thresholds cut the city-coastal relationship.

The basic criteria for the projects planned to be implemented within the scope of the "Karşıyaka Sustainable Urban Mobility Plan Preparatory Study" carried out by Karşıyaka Municipality Planning and Project Directorate are as follows:

- Pedestrianization of the city center, checking that access is provided,
 - Street parking controls; resident permits, hourly wages to others,
 - Parking lots where drivers can park their cars cheaply and go to the city center,
- Implementation of the Park/Drive system,
- By reallocating road space on main roads, shifting the relevant area from parked and moving cars to pedestrians, cyclists and public transportation,

- Planning of new cycling routes,
- Improvement of public transport (rail systems),
- Electric mobility is at the forefront,
- Improvement of air quality,
- Improving accessibility on a small scale, facilitating the use of public transport for disabled citizens.

Within the scope of "Preparation of Action Plans for İzmir Transportation Master Plan (UPİ 2030) Proposals - Bicycle and Pedestrian Transportation Action Plan Study - Development of Bicycle and Pedestrian Master Plan Suggestions" reported for IMM in February 2019, in Karşıyaka district, a preliminary project of approximately 14.4 km of bicycle paths has been studied in 4 corridors on the east and west axis and 4 corridors on the north and south axis in an integrated manner with the rail system stations, bus stops, transfer centers and the existing bicycle network. The corridors where the study was carried out are as follows: Cemal Gürsel Street, 1794. Street, Nebil Susup Street and Fazıl Bey Street, 1671., 1775/3. and Latife Hanım Sokak, Atatürk Boulevard, Hidayet Erzeybek Caddesi and Şht. Asım Aksoy Street, Gün Sazak Boulevard, Assoc. Bahriye Üçok Boulevard, 1743. Street, Girne Boulevard, Composer Yusuf Nalkesen Street (Figure 3.21). Karşıyaka Belediyesi, İBB ile yakın iletişim içinde hem bu ön etüt çalışmalarının hem de raporda bahsedilen yayalaştırma önerilerinin nihai uygulama projelerinin hazırlanması ve yapım süreçlerinin tamamlanmasında takipçi olacaktır. Karşıyaka Municipality, in close communication with IMM, will follow up on both these preliminary studies and the final implementation projects of the pedestrianization proposals mentioned in the report and the completion of the construction processes.



Figure 3.25 Karsiyaka Region Bicycle Path Preliminary Projects

In the Urban Mobility Plan, the infrastructure of which was prepared by Karşıyaka Municipality Plan Project Directorate, a number of studies are carried out under Anadolu Caddesi, covering bicycle and pedestrian transportation types.



Figure 3.26 Karşıyaka Anadolu Street Pedestrian and Bicycle Path Preparation Project

In this project, it is aimed to encourage and support pedestrian-oriented practices, to carry out studies to develop and increase pedestrian areas, and to adopt urban walking as a life culture in the eyes of the society.

A motto has been developed within the scope of the relevant plan for pedestrian access, which is one of the most important and cheapest modes of urban mobility; "Walk on the sidewalk where you are happy". While developing this motto, the following principles were taken into consideration by Karşıyaka Municipality:

- Designing attractive streets that are actively used, ensuring that commerce and all urban services and services are safe, away from traffic and integrated with local transportation vehicles and can be accessed on foot,
- Reducing motor vehicle traffic in the city center in urban plans and practices,
- More afforestation of all avenues, streets, squares, pavements and parks,
- Encouraging pedestrians to walk for safer travel and instilling this awareness in everyone,

- Bringing public spaces to a level that protects and improves the physical and mental health of all individuals, enables easy social relations, and observes pedestrian safety.
- Instead of isolated areas, pedestrians have accessible areas compatible with the layout of the city,
- By giving a significant share to bicycles as well as pedestrians in the traffic flow, increasing the incentives for bicycle use by creating newly added bicycle paths, more accessible bicycle parking areas and space for bicycles in public transportation, and making Karşıyaka a bicycle-friendly city.
- By arranging more extensive pedestrian areas, transforming the city center into an area that can only be accessed by public transportation and not passed through by cars, It is in the form of combating both air pollution and noise pollution while reducing the amount of carbon emissions of the city.



Figure 3.27 Karşıyaka central parking lot, traffic circulation and geometric arrangement, bicycle road network planning

As seen in Figure 3.27, the study area covers the central neighborhoods of Karşıyaka between Anadolu Caddesi in the north, Girne Boulevard in the west and Cemal Gürsel Avenue in the south. Within the scope of the study, the preparation of the traffic circulation plan of Karşıyaka center, the arrangement of the pedestrian and pavement areas, and the geometric arrangements of the general, multi-storey and on-road parking areas were made. In addition, 23,5 km of newly separated bicycle paths and 13 km of bicycle lane road routes are planned. In addition, a

separate bicycle path project has been prepared, which is passing through the Bostanlı stream and Cengiz Topel park. Technical exploration was carried out in the area with the Parks and Gardens Directorate. In line with the said study, implementations are carried out by the relevant Directorates and have been completed at a rate of 80%.

T3-Çiğli Tram extension, T4-Girne Tram and M4-Menemen-Çiğli-Karşıyaka-Bayraklı-Bornova Northern HRS Line projects mentioned in İzmir UPI 2030 Transportation Master Plan pass through the borders of Karşıyaka district. The construction of the Çiğli Tram extension is ongoing. Tender for the application project for the Girne Tram has been made. Within the scope of monitoring KARŞIYAKA MUNICIPALITY SECAP 2021 transportation actions, these rail projects should also be followed closely.

It is tried to be included in the planning studies as factors that increase the quality of life. These activities can be counted as in general; arrangement along the school roads, on the route where the children live, so that other children can safely join them and walk to school en masse; announcement of car-free days on weekends or every Sunday and closure of main streets to cars; citizens' walking, riding horse, biking, etc.

3.3.3.4 Waste Management

The main reason for the climate crisis is that human activities, especially consumption trends, are not cyclical, but linear, contrary to the workings of nature. People who consume much more resources than they need, they leave them under the name of "waste" when the life of these resources are exhausted, and in a way that does not comply with the cyclicity of nature. As a result of this wrong application, both natural resources are depleted rapidly and the pollution created by wastes in the soil, water and air shakes the balance of nature. Therefore, the climate crisis continues to grow as a result of these and similar environmental footprints. Thus, within the framework of proper waste management, it is vital to approach waste not as an externality, but as a very valuable resource that needs to be recovered. For this, priority should be given to prevention, reduction, reuse, recovery and energy recovery practices at the source, respectively; It should not be forgotten that correct waste management is the most important component of the circular economy.

It is clear that local governments have a great role and responsibility in waste management, but when the responsibility of all relevant parties is revealed, individuals who are in the position of waste producers have a key role. As can be seen in Figure 3.28, individual awareness is the most

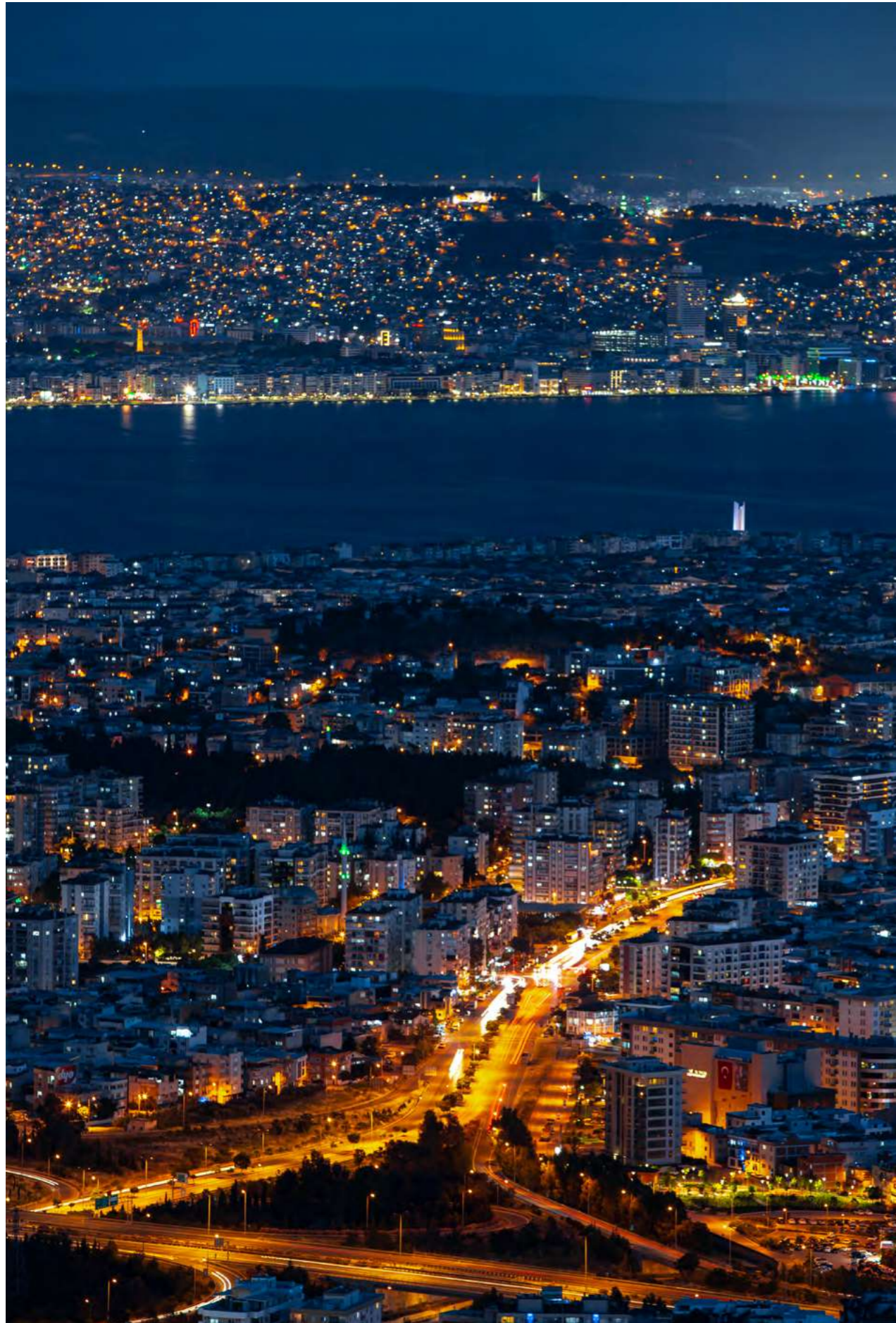
important condition for a successful/sustainable waste management. For this reason, increasing individual awareness, setting an example to the public with institutional practices, ensuring public participation and awareness-raising activities are the biggest success factors in waste management, as in all climate adaptation actions.



Figure 3.28 The Importance of Individual Awareness in Waste Management

According to the results of TUIK's 2018 Municipal Waste Statistics Survey, it was determined that 1.395 of 1.399 municipalities provided waste services. It has been determined that municipalities providing waste services collect 32 million 209 thousand tons of waste. Based on this total figure, the average daily amount of waste collected per capita for Turkey has been calculated as 1,16 kg. 67,2% of the collected waste is sent to landfills, and 20,2% to municipal garbage. 12,3% of it is sent to the recycling facilities and brought to the economy.

In Karşıyaka, domestic solid wastes are collected under the responsibility of Karşıyaka Municipality. Separately collected and recyclable wastes are brought to the economy, while other wastes are disposed of in the Harmandalı Regular Solid Waste Storage Area in Çiğli district. This regular storage area, which has been in operation since 1992, is a solid waste operation that generates energy from landfill (methane) gas with a capacity of 16 MW as of October 2019, with the completion of the EMRA acceptance process. The power generation capacity of the facility with an installed capacity of 16 megawatts was increased to 32 megawatts in 1,5 years. The facility, which currently disposes of approximately 162 million cubic meters of methane gas per year, also produces 323 million kilowatt-hours of electrical energy. This amount corresponds to the annual energy use of 190 thousand households. Approximately 5,000 tons of waste is



disposed of per day. Rehabilitation works continue in stages, and approximately 60 acres of land has been planted and closed so far. Pre-separation work is carried out in order to separate the wastes within the enterprise and to bring the recyclable wastes into the economy. In addition to this storage area, Izmir Metropolitan Municipality's Integrated Solid Waste Operation Facility projects based on mechanical separation and biomethanization are continuing in four different regions of the city.

The amount of waste collected in Karşıyaka district and the waste characterization are given in Table 3.11 and Table 3.12

Table 3.11 Waste Amounts in Karşıyaka District (2020)

Waste Data	Annual Value (kg)	Average Value Per Capita Per Day (kg)	Ratio (%)
The amount of waste collected under the responsibility of the municipality (kg)	142.440.426	1,115	100
Amount of domestic waste transported to Harmandalı Regular Solid Waste Storage Area (kg)	121.789.000	0,953	85,5
Amount of mixed packaging waste collected separately and sent for recycling (kg)	20.651.426	0,162	14,5

Table 3.12 Waste Characterization of Karşıyaka District

Waste Component	WINTER %				SUMMER %			
	LOW	HIGH	ÇARŞI	AVERAGE	LOW	HIGH	ÇARŞI	AVERAGE
Paper-Cardboard	4,60	8,27	4,80	5,89	3,66	5,00	13,30	7,32
Glass	8,49	8,04	5,17	7,38	2,21	9,56	11,79	7,85
Pet	0,75	1,33	1,25	1,11	0,56	0,91	1,55	1,01
Pochette	7,20	6,29	7,45	6,98	7,02	7,01	8,64	7,56
Other Plastic	3,64	3,05	2,42	3,04	3,47	4,06	4,63	4,14
Metal	0,30	1,79	1,01	1,04	0,43	1,41	0,78	0,88
Organik Waste	43,09	35,81	44,91	41,27	55,91	44,83	31,34	44,03
Park Garden Waste.	0,00	0,00	0,43	0,14	0,00	0,00	0,75	0,25
Elekt. Waste	0,00	0,00	0,15	0,05	0,00	0,23	0,46	0,23
Dangerous waste	2,11	1,70	0,85	1,56	1,40	0,73	2,95	1,69
Composite	1,15	0,97	0,71	0,95	1,05	0,78	0,92	0,92
textile	3,26	0,60	1,43	1,76	1,53	3,68	7,76	4,29
Diapers	3,55	3,24	7,32	4,7	6,56	6,65	2,27	5,16
Other Combustible	21,41	28,16	22,1	23,89	15,09	15,14	12,49	14,39
Other Non-Combustible	0,00	0,74	0,00	0,25	0,84	0,00	0,00	0,28
TOTAL	100	100	100	100	100	100	100	100

Waste Collection and Separation of Recyclable Wastes at Source:

The collection of packaging wastes within the boundaries of the district continues with a licensed company in accordance with the 5 (five) year contract signed by the Municipality on 07.05.2018. Following the publication of the Zero Waste Regulation, the waste collection capacity of the district was monitored. The scope and objectives required by the responsibilities and obligations defined by the regulation for the Municipality have been determined. In order to achieve these goals, the Municipality has been included in the recyclable waste collection system with its own vehicles, equipment and personnel after February 2021.

Karşıyaka Municipality is a district with a population of 350.100 people living in 2020 figures in a settlement area of approximately 50 km², with dense and old settlements as well as new modern urbanization examples and unplanned areas that have received immigration. Neighborhood-to-neighborhood differences require different practices in waste management. For these reasons, wastes are collected from the sites due to the housing development in some neighborhoods, from the front of the gates on the specified days and hours in some neighborhoods, and from the containers located in the remaining areas.

Packaging wastes, which are formed in the market places within the borders of the district and which went to landfill in previous years, are collected separately by establishing a dual system and recycled. In addition, piggy banks were placed in the parks for metal, glass and plastic wastes in different designs.

In 2020, 7.378 tons/year glass waste, 7.013 tons/year plastic waste, 4.680 tons/year paper waste and 787 tons/year metal waste were brought into the economy under the responsibility of Karşıyaka Municipality. With the dissemination of the above-mentioned practices, it is aimed to increase these values over the years and to bring all of the recyclable waste into the economy.

Karşıyaka Municipality received the Zero Waste Certificate on 17.05.2021 in accordance with the Zero Waste Regulation for the district in general. Zero waste management plan in the district is tried to be strengthened by implementing it with the support of many national and international projects. With the digital application in the action content, it is expected that the public awareness and collection volume will increase. With the digital application, which is a software product developed for smart cities, it is aimed to strengthen the recycling infrastructure of Karşıyaka Municipality, increase the waste collection capacity, and ensure public participation in the Zero Waste approach. Thanks to the software product mobile application and web panel, the resources that produce the recyclable wastes in homes and businesses and the recycling tools that collect these wastes are combined.

In addition, studies are carried out to reduce greenhouse gas emissions arising from waste collection and transportation activities in the district. Due to the low capacity of the galvanized garbage container (770 L), the work continues to increase the number of new system underground (5.000 L) and aboveground (2.600 L) garbage containers to replace them. With the withdrawal of the 770 liter galvanized container from the region, it is aimed to reduce greenhouse gas emissions by reducing the number of waste collection vehicle trips. Acquisitions and positionings continue with this goal. In this process, 3 waste collection trucks were withdrawn from the region, and 1 multi-purpose waste collection truck with a larger chamber was put into service. As of October 2021, there are 4.860 domestic waste collection containers in Karşıyaka district, including 181, 5,000 liter underground, 229, 2.600 liter surface and 4.450 770 liter galvanized standard garbage containers.



Another emission-reducing improvement related to waste collection and transportation activities is route planning according to container occupancy. In this way, efficient operation of collection vehicles and fuel savings are ensured.

Utilization of organic wastes

On average, 43% of the waste collected by the Municipality in Karşıyaka consists of domestic organic wastes, wastes from parks and gardens, and wastes generated in market places. The recycling of these wastes into compost is a good waste management practice that serves the circular economy. Currently, domestic organic wastes and park and garden wastes are sent to landfill as non-recyclable waste. Undoubtedly, the prevention of these wastes at the source is the most important step. For this reason, priority is given to spreading awareness about food waste and practices related to prevention of waste at source.

Pilot-scale studies have been started for the production of compost fertilizer from organic wastes, park and garden pruning and lawn mowing wastes from Domestic, Food Businesses

and Marketplaces. The amount of park and garden waste collected by the Parks and Gardens Directorate in 2020 is 47.291 tons. In addition to the markets established at ten different points every week throughout Karşıyaka, regular-irregular markets such as the Organic market, the producer's market and the flower market can be established. Most of the organic wastes generated in these areas will be evaluated in the compost facilities of different capacities to be established within Karşıyaka Municipality and IMM. IMM has plans to establish a compost facility for these wastes throughout Izmir.

3.3.3.5 Water and Wastewater Management

Changes in temperature and precipitation regime due to climate change directly affect the quality and quantity of water resources. According to climate projections, an increase in drought probability and precipitation variability is expected, which will directly affect the availability of water resources.

According to the results of the climate models included in the Final Report of the Impact of Climate Change on Water Resources Project, it is predicted that high temperature increases in the Gediz Basin will generally lead to decreases in total precipitation in almost the entire basin, Accordingly, it is predicted that the water potential will remain significantly below the total water requirement values during the entire projection period in terms of hydrology. According to the results obtained from the Küçük Menderes Basin climate projections, it is expected that the temperatures will increase during the projection period, and the precipitation will show positive until the middle of the century, and then exhibit negative anomalies. This causes the water potential in the basin to decrease and the water deficit to become evident throughout the projection period.

Changes in temperatures affect the rate of evapotranspiration, soil moisture, storm intensity, and snowfall and melting regimes. Changes in precipitation cause changes in the time and severity of flood and drought events, surface flow regime, and the amount of water seeping underground. Heavy rains increase the risk of flooding, and may adversely affect residential and commercial areas, as well as agricultural areas, surface and groundwater quality. Droughts and variations in precipitation can cause water stress, pollution of water resources and salinization in the soil. According to the projections and risk assessments published in different sources, it is predicted that the drought will increase with the increase in temperature for the Aegean Region and Izmir, the precipitation will decrease in general, but excessive precipitation and flood events may occur frequently.

According to the evaluations in IMM SECAP 2020; In the short term, it is predicted that there will be temperature increases and drought periods that increase water scarcity, deteriorate the quality of water and reduce the regeneration rate of groundwater. It is seen that extreme weather events are likely to increase. This will lead to increased demand for wastewater and stormwater infrastructure, causing damage to infrastructure and straining infrastructure utilization capacity, resulting in floods and increased maintenance costs.

According to the Küçük Menderes Basin Settlement Evaluation and Risk Table included in the Küçük Menderes Basin Flood Management Plan, Karşıyaka district center is considered as "risky". İZSU(Izmir Water and Sewage Administration General Directorate) is the competent authority for the supply and distribution of drinking and utility water, the management of used water and rainwater, and wastewater treatment services within the boundaries of IMM. District municipalities do not have operational authority and responsibility for water and wastewater management. It is aimed to carry out studies that will support climate adaptation related to the water sector within the jurisdiction of Karşıyaka Municipality.

In line with the integration of Izmir's Green Infrastructure Strategy, Urban Green UP program and İZSU Strategic Plan and Izmir SECAP actions; Rainwater management techniques will be implemented for a city that is resistant to floods and floods, studies will be carried out for efficient use of water, reduction of losses and reuse. There are Bostanlı, Yamanlar, Soğukkuyu Ilica, Karşıyaka Ilica, Kartalkaya, Kocadere, Yamanlar and Serinkuyu streams in Karşıyaka district, and the maintenance and cleaning works of the streams are carried out by the Izmir Water and Sewage Administration General Directorate. In addition, a study titled "Izmir Metropolitan Area Wastewater-Stormwater and Streams Master Plan" is being carried out by the General Directorate of Izmir Water and Sewage Administration General Directorate. Studies continue within the scope of the preparation of the Provincial Disaster Risk Reduction Plan by the Provincial Disaster and Emergency Directorate. A road map for the determination of the flood risk of the district will be created in parallel with the completion of the said studies. According to the Report of Water Losses in Drinking Water Supply and Distribution Systems for the Year 2020 of the General Directorate of Water Management of the Ministry of Agriculture and Forestry, the amount and rates of losses for Izmir are given in Table 3.12.

Table 3.13 Water Losses in Drinking Water Supply and Distribution Systems in İzmir Province

	2018	2019	2020
Sisteme Giren Su (m ³ /yıl)	292.411.099	291.984.950	306.382.851
İdari Kayıplar (m ³ /yıl)	40.877	293.072	3.292.627
Fiziki Kayıplar (m ³ /yıl)	92.441.393	89.327.520	89.121.626
Toplam Nüfus	3.726.338	4.104.355	4.332.048
Gelir Getirmeyen Su (m ³ /yıl)	94.445.254	94.579.006	95.465.406
Su Kaybı (m ³ /yıl)	92.481.700	89.622.692	92.550.427
Gelir Getirmeyen Su (%)	32,30	32,39	31,11
Su Kaybı (%)	31,63	30,69	30,16

By reducing the water loss rate from 30,16% in 2020 to 25%, which is the target of 2028 and determined in the Regulation, the water gain will be 15.842.214 m³/year. This amount currently meets the city's water needs of approximately 18 days. Administrative losses are below the reasonable level of 5% in line with regulatory targets, but physical losses are above the reasonable level of 20%. When the physical loss rate from 29% is reduced to 20% and the energy and treatment costs required for 27.755.056 m³/year water intake and promotion are taken into account, the possible financial savings to be obtained is approximately 26 million TL. Per capita water use is 105 lt/day in residences, which is below the Turkey average of 106 lt/capita/day.

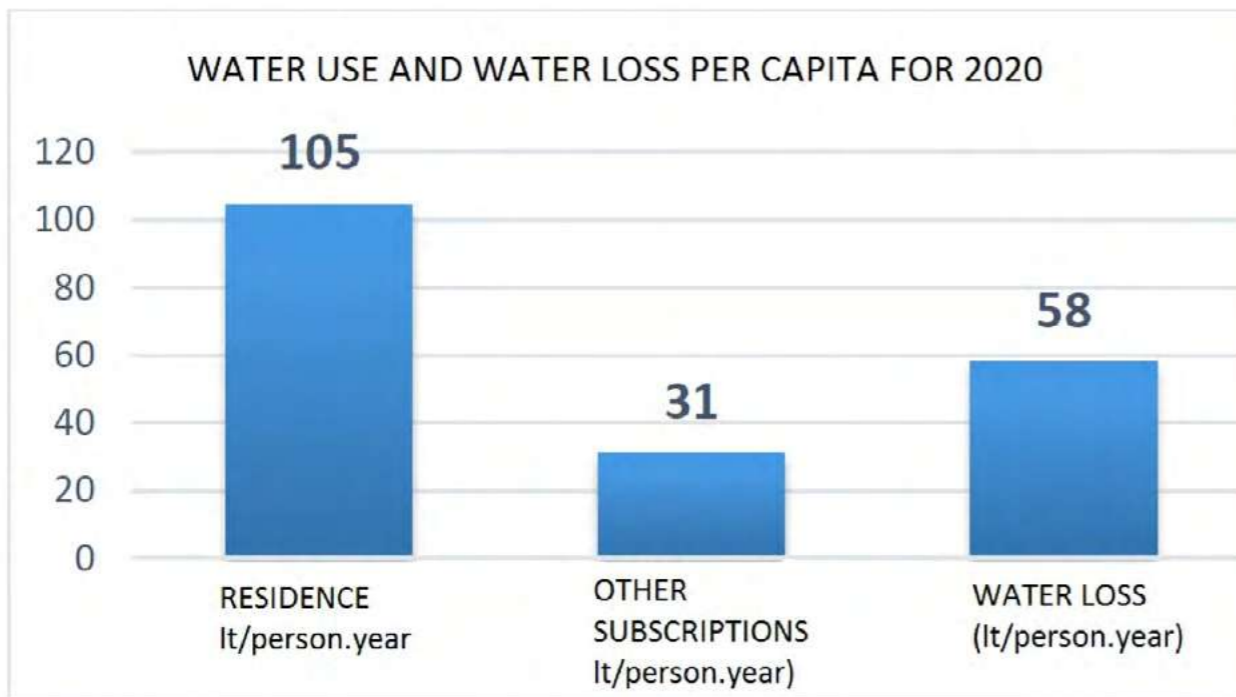


Figure 3.29 Water Use and Water Loss per Capita in 2020

Karşıyaka Municipality is in the Metropolitan Districts group and the loss and leaking use rate in 2020 is 28,6%. Actions have been defined within Karsiyaka Municipality SECAP primarily to reduce our corporate consumption. In order to lower the loss and leakage.

Water consumption resulting from the institutional activities of Karşıyaka Municipality is monitored every month. Saving measures and investments are planned according to current data, with priority being given to ten establishments/units with the highest water consumption. When the sources and amounts of consumption for 2020 are examined;

The water consumption for the January 2020–December 2020 period is 356.526 m³. The monetary equivalent of this water consumption is 2.308.967 TL. 217,282 m³ of this water consumption was used for green field irrigation. Green field irrigation is 61% of the total consumption. In summer, this rate rises to 75%. The results show that the improvement of irrigation methods is an important field of study for water saving.

With the photocell faucet application aimed at saving in administrative units, a savings rate of 30% has been reached in the municipality in general, and the renovation works are continuing. The creation of operation and maintenance programs for all systems used is planned according to the feedback from each building's own responsible person.

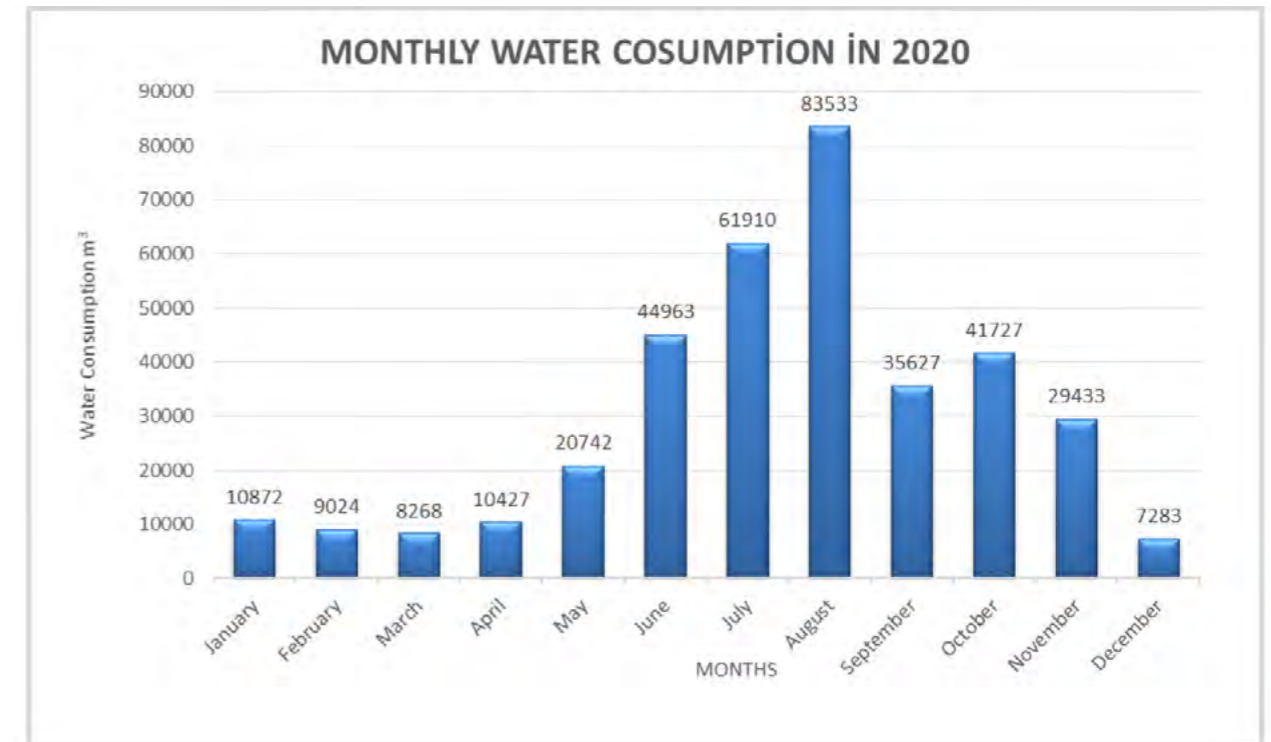


Figure 3.30 Karsiyaka Municipality Monthly Water Consumption

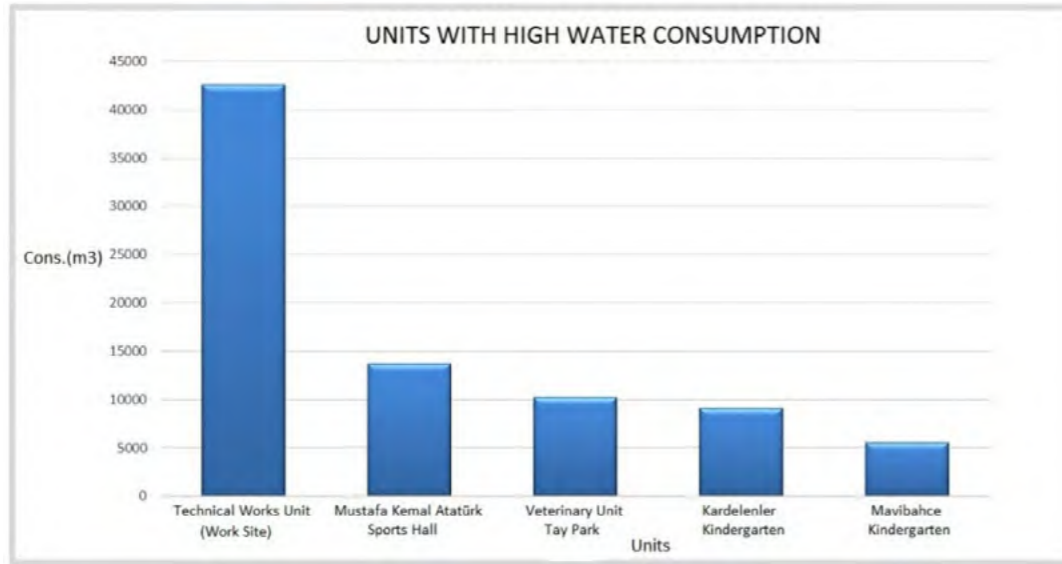


Figure 3.31 Distribution of Water Consumption by Karsiyaka Municipality Units

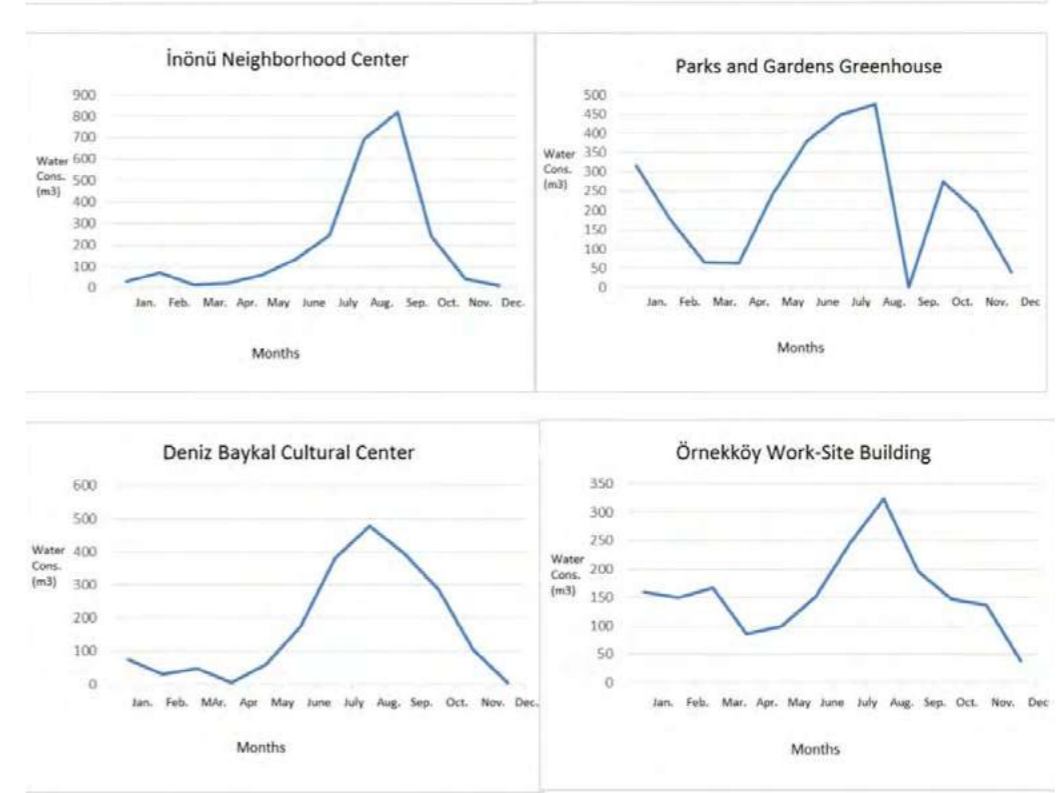
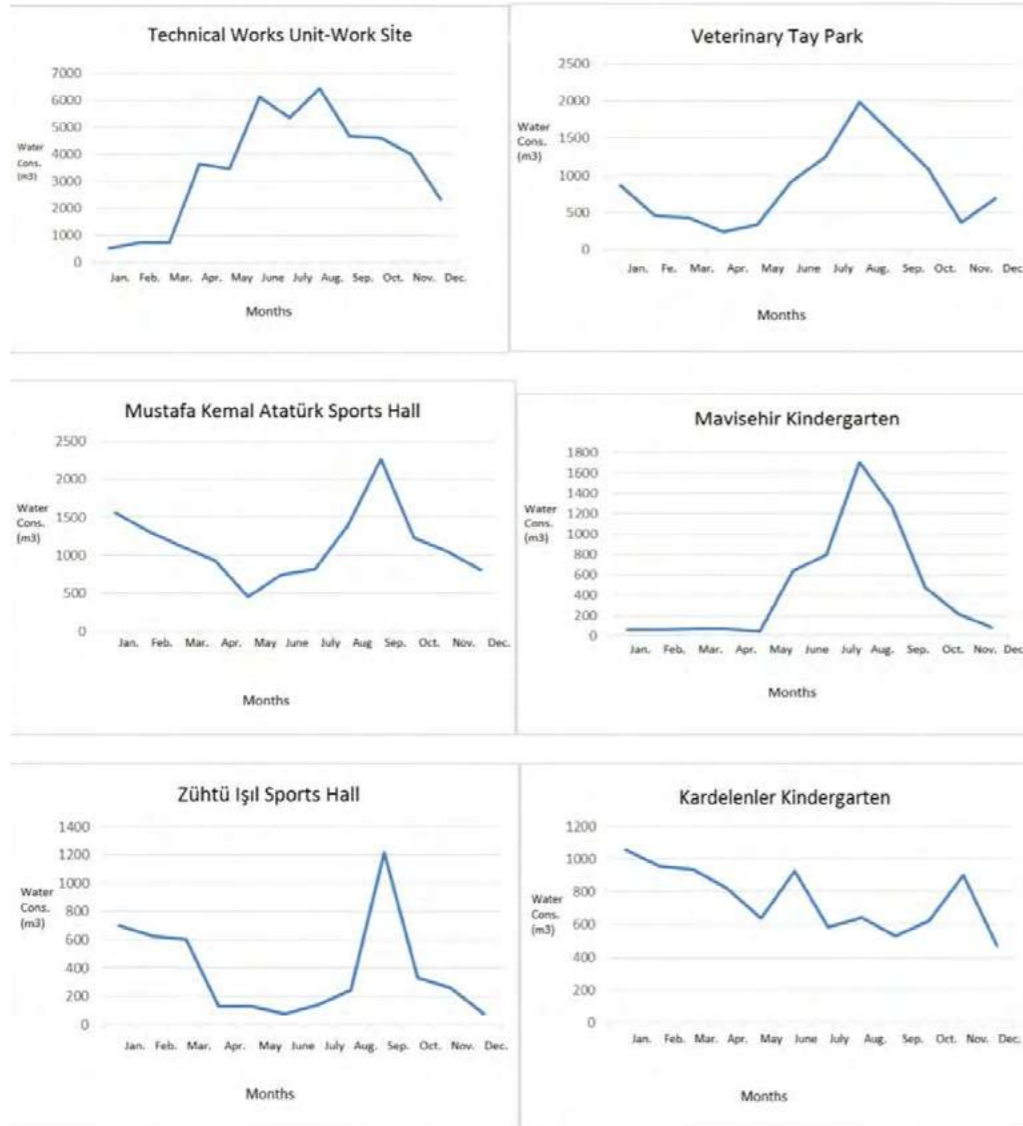


Figure 3.32 10 Enterprises/units with the highest water consumption

Efficient use of water in corporate buildings and subsidiaries, prevention of losses and leaks, and water savings will both reduce the water-related expenses of the municipality and contribute to the reduction of the energy consumed for the supply and removal of water. It is aimed to save water throughout the district with awareness-raising activities for citizens on the subject.

On the other hand, it is aimed to reduce the need for utility water with the studies on the recovery of rain water and to provide flood control by preventing surface flow. Actions taken for the prevention and control of floods in the water and wastewater sector are directly related to the amount and use of green areas. Stormwater flow and floods will be controlled with the increase in green areas. The amount of green space available and the targets are given in detail in the relevant section.

Projects which are related to places such as kindergartens, ecological parks, parks and marketplaces, where rain water will be collected and used for irrigation purposes, are ongoing. In these projects, besides the use of rain water, the application of permeable surfaces and the selection of plant species with low water consumption in landscaping are aimed.

A summary of the projects carried out by Karşıyaka Municipality to contribute to water and wastewater management is given below.

1-Zübeyde Hanım Kindergarten Project

A nature-friendly kindergarten project has been prepared in Karşıyaka Zübeyde Hanım Mahallesi, with an open area of approximately 3.000 m² and an area of 4.000 m², that can represent our country on a world scale by providing engineering and architectural solutions in accordance with internationally accepted standards in the fight against climate change and pandemic. The facility is integrating the open space and the education ecosystem and designed to be environmentally friendly, sustainable, production-oriented, flexible and functional. According to the rain water management techniques to be applied in the facility; rain water will be collected and used for irrigation of landscape areas and permeable hard surfaces will be applied. Plant species with low water needs were selected in landscaping.

2- Yalı District Ecological Park Project

It is a project built on a total area of 200 m², 130 m² of which is closed. The building in the project consists of straw panels and mud brick walls. There is a solar panel on the roof of the building that can generate 10 kWh of energy. In addition, there is a 10 m³ rain water tank to be used in garden irrigation. There are 2 workshops in the building to explain the importance of the environment and natural life. For now, the target audience has been determined as housewives and students.



3-Bahçelievler Marketplace Roof Farm Project

A roof garden with a large field will be created on the roof of the Katlı Pazaryeri located in the Bahçelievler District of İzmir Karşıyaka district. Organic farming methods will be used in the roof field, which will be spread over an area of approximately 4,000 square meters. Irrigation of plant areas will be provided by rainwater collection.

4- Ali Çelenay Park

Ali Çelenay Park, built on 6215 Street in Şemikler Mahallesi and on an area of 1.640 square meters, includes a 150-meter walking path, sitting areas with pergolas, a new generation playgroup for the ages of 4-12, cat houses, bicycle parking, underground containers and ramps for the disabled people. In the landscape of the park, which was designed and built with a nature-friendly approach, xeric plants, which stand out with their minimum water requirement, were used. The irrigation period is extended with the rain garden, which collects rain water and ensures its passage to the soil in a controlled manner and in maximum time. In addition, redbud, sweetgum, tamarisk, mimosa, oleander and ash trees were planted in the park.

5- Şemikler District 6297 Street Park Project

The Ecological Park project, which is located in the dense urban texture of the Şemikler district, was designed on an area of approximately 3.300 m². The basic approach in the park project is to increase the resilience of our cities against climate change by starting with open public areas. In line with this approach, solar panels and renewable energy sources were used in the energy consumption of the park, and it was aimed to minimize water consumption thanks to the xeric landscape design in vegetative design and the rainwater storage area designed underground.

3.2.3.4 Green Spaces, Green Corridors, Biodiversity and Urban Heat Islands

As it is known, cities are the actors that cause climate change with their natural resource consumption, energy use and greenhouse gas emissions and are also the most affected actors. Residential and commercial areas, industrial facilities, energy and infrastructure facilities created by intense urbanization put pressure on the ecosystem and green areas. The effects of extreme weather events on urban infrastructure, residences, industry and agriculture are also manifested in natural disasters such as floods and storms that occur frequently in our country. On the other hand, the increase in temperatures continues to threaten the health of the urban population with the urban heat island effect. Unless measures are taken, it is expected that diseases related to the climate crisis will increase, difficulties in water and food supply will occur, loss of life and material damage will increase in disasters caused by sudden weather events.

When the evaluations on land use in IMM SECAP 2020 are interpreted specifically for Karşıyaka; It is seen that the probability of experiencing surface floods that cause flooding of urban areas in the short term and temperature increases and long drought periods that cause forest/rural area fires by drying the lands is high. In the long run, it is estimated that residential areas and recreational areas will be affected by the rise in sea level.

According to the assessments on environment and biodiversity in IMM SECAP 2020, extreme climate events which cause ecosystem degradation, loss of habitat and biodiversity, damage the natural environment and/or destroy the environment, reduce the water levels of rivers and other freshwater resources in İzmir Bay. It is expected that natural environments will decrease their capacity to manage wastewater and surface runoff pollution, and long-term drought periods that cause habitat and species loss and eutrophication will be experienced in the short term.

Regulatory ecosystem services provided by ecosystems play an important role in reducing the effects of climate change in cities and increasing the resilience of cities against these effects. Green areas have many functions such as air cooling, reducing the heat island effect, carbon sequestration and storage, cleaning the air by removing pollutants, enriching the soil with organic materials, providing food and shelter for wildlife, supporting biodiversity, preventing the surface flow of precipitation waters, feeding underground and surface water resources, reducing wind and precipitation erosion, filtering noise, reducing energy consumption, providing recreational opportunities.

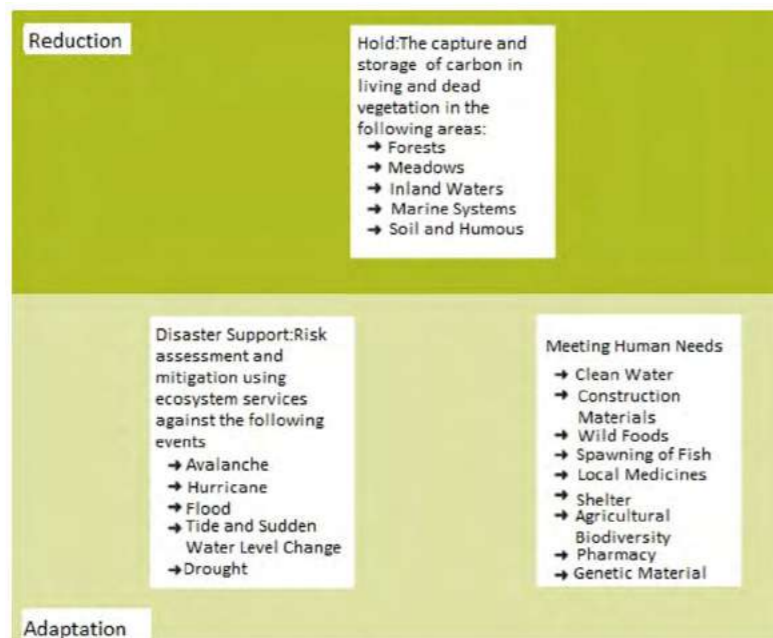


Figure 3.33 Key Benefits of Protected Areas

In the study titled "Detection of Risky Regions Against Climate Change in terms of Spatial Structure Characteristics, İzmir", risky areas were determined based on the flood, overflow and flooding problems caused by the threats of excessive precipitation and sea level rise in the city of İzmir. In this context; It is seen that a large part of Karşıyaka district is among the risky regions in terms of spatial. In the study; It is reported that the risk levels start to increase of some urban areas with low due to incorrect spatial development strategies and land use planning. Evaluations show that the impact of land use preferences is important in increasing the resilience of cities against climate change risks and ensuring adaptation. Ensuring the sustainability of green areas along with protected areas in urban planning is of great importance for adaptation to climate change.

As stated in Karsiyaka Municipality Strategic Plan 2020-2024, Karsiyaka Municipality aims to create a livable city that increases the quality of life, produces services with a sustainable and healthy environmental understanding, is safe, planned, responds to the needs of the citizens with its infrastructure and superstructure. In this context; integrative spatial development, which includes the rural areas of the whole of Karşıyaka District, is together with planning approaches in stages, green and sustainable planning approach are gaining importance.

Within the scope of the zoning planning studies carried out; to reduce the damage to the environment on an urban scale, to increase the quality of life, to implement smart growth and planned urbanization strategies, to ensure energy and water efficiency, to increase the amount of green space and open space for public use with a compact and walkable design approach, natural habitat, wetland-water resources and not harming the habitat are the main principles. Within the scope of the 1/25000 scale Environmental Plan, 1.376,3 hectare of Forest, 189 hectare of Nature Park, 711,8 hectare of Afforestation Area, 36,9 hectare of Pasture Area, 257,1 hectare of Maquis and Heather, 183,7 of natural and woody characteristics will be determined as protected areas. Military Area, Pasture Areas, Bostanlı Dam and Regional and Nature Park, Urban Sports and



University and Hospital area are recommended as a large-scale land use decision in the north of the district, and Fisherman's Shelter and Marina, close to Mavişehir, in the south. The Gediz Delta is a large coastal wetland consisting of salt and fresh water marshes, bays, salt flats and lagoons at the place where the Gediz River used to flow into the sea. It is an Important Natural Area and an Important Bird Area on a world scale. About ten percent of the world population of flamingos live in the Gediz Delta of Izmir. It is one of the rare areas where the endangered crested pelican, Mediterranean monk seal and Caretta caretta sea turtle live together. It is one of the most important fish breeding and feeding areas in the entire Aegean Sea, and about one-third of Turkey's salt production takes place here. Although the delta is protected by national and international laws, it is among the 422 most endangered bird areas in the world. The biodiversity of the region, which is the only wetland in the world, located in a metropolis like İzmir with a population of more than four million, is protected by national and international legislation. The Gediz Delta was designated as a Ramsar Site in 1998. When the Gediz Delta Wetland Protection Zones determined by the Ministry of Agriculture and Forestry are examined, 30 hectares of the area determined as the Wetland Buffer Zone, 4 hectares of which is the Controlled Use Zone, is located within the boundaries of the district.

Within the boundaries of the district, there is the Yamanlar Mountain Nature Park, which was declared a "Nature Park" with the approval of the Ministry of Forestry and Water Affairs, dated 11.07.2011 and numbered 903. Area is important for plants, mammals, birds, reptiles and amphibians, and inland fish. There are species that meet Important Natural Area criteria in the area. The promenade in Karagöl is heavily visited by daily visitors. Due to its proximity to the city, necessary measures should be taken in order to prevent possible deteriorations that will change the existing ecosystem and landscape character in the region, which is under construction pressure, create excessive use pressure and cause the area to lose its natural resource values.

In the Ornekkoy Nature Park, which is located within the borders of Karşıyaka district and has a size of 199 hectare; 112 plant species were identified based on 2011 data of the Provincial Directorate of Environment and Forestry. Moreover; there are certain species such as wolf, jackal, wild boar and bird species such as falcon, black chicken, owl, partridge, wood pigeon. In the area where Ornekkoy Nature Park is located, there are eucalyptus and pine pine forests, which were created as a result of afforestation, and it is an area suitable for recreation. There are species such as İzmir thyme and labdanum in certain parts. Bostanlı Dam Area and its Basin are intended to provide drinking and utility water to İzmir settlement and to prevent floods. The 1/5000 scale Master Development Plans of the region were approved on 03.10.2017 and took its current form.

It is necessary to prevent all kinds of pollution that may arise from residential areas, industrial activities, agriculture and animal husbandry activities and to make the best use of the natural potential of the water basin. In addition to ensuring the sustainability of protected areas, efforts to increase the amount and quality of green areas in the city will both improve the quality of life of the citizens and strengthen climate adaptation.

There are 372 parks in Karşıyaka, and as of 2020, the amount of green space per capita is 4,75 m². The rate of green area per person targeted in Karşıyaka Municipality 2019-2024 Strategic Plan has been determined as 5,15 m² for 2021 and 5,66 m² for 2024. The target for 2030 has been determined as 8 m². within the scope of SECAP. Construction of 33 new parks and rehabilitation of 48 parks are targeted. Three places have been determined as afforestation areas in the city. In one of these areas, approximately 300 wooded groves were realized in 2020. Afforestation of other areas will be completed in 2021 and 2022.

There is an Urban Heat Island Effect preliminary report prepared by Karşıyaka Municipality and studied with satellite images. This preliminary report is taken into account in the green reinforcement areas that have been realized and designed. The Summer Season Heat Map of Karşıyaka District, which was prepared within the scope of the study, is given below.

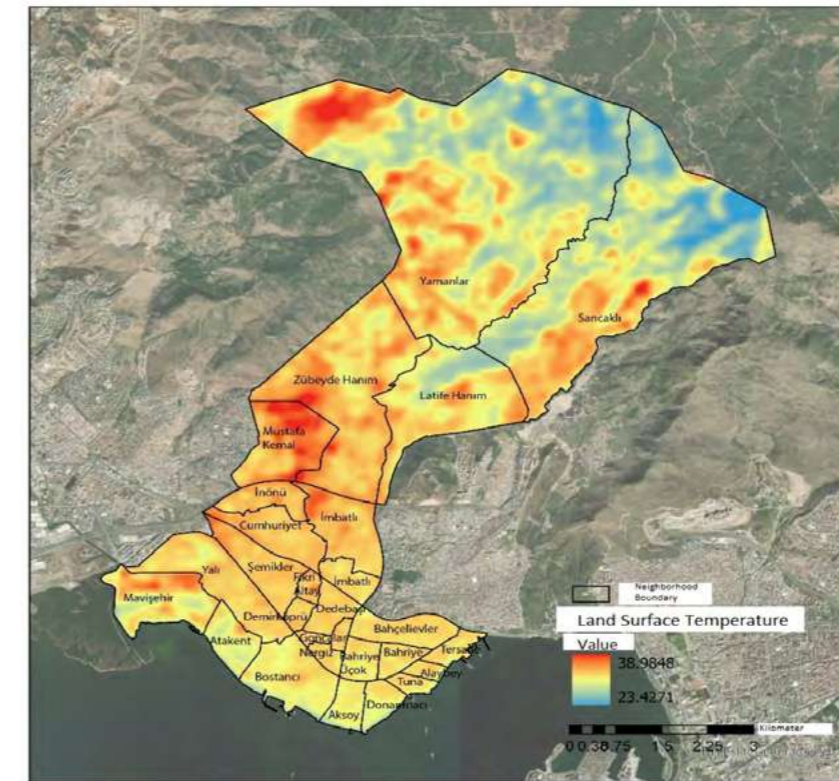


Figure 3.34 Karşıyaka District Summer Heat Map

Karşıyaka Municipality made an application to the Climate Adaptation call of The Ministry of Environment, Urbanization and Climate Change with a project titled “Recommendations for the Creation of a Resilient City to Climate Change; Pilot Regions Integrated for Innovative Ecosystem-Based Solutions in Karşıyaka” in December 2019. The application has not been finalized yet. The project start date is foreseen as 2022. An Urban Heat Island Impact Report will be prepared, surface and air temperatures will be monitored, heat island risks will be identified and urban vulnerabilities will be mapped within the scope of this Project. In the regions where the highest health and environmental risk is determined on the map, activities that will reduce the heat island effect such as an ecological park that produces its own energy and water, rainwater collection and storage, cold ground applications, increasing permeable surfaces, planting suitable for arid climate, green roof and green facade applications will be carried out.

Karşıyaka Municipality Plan Project Directorate is making the 1st Stage Revision Zoning Plans. With these plans, it is aimed to determine the vacancy-occupancy ratio of the buildings in island forms, to protect the existing zoning rights of the citizens with the annexes of the plan note and plan provision, and to increase the green areas and common areas where ground permeability is ensured by reducing the floor areas by 30%-40%.

An “uninterrupted ecological corridor” has been created on the coastal part of the Peynircioğlu Stream and Halk Park and the following route in Mavişehir within the scope of the “Urban Green Up-Nature Based Solutions” project by IMM. With nature-friendly practices without using an impermeable surface, both flood control was provided in the creek and a green area was provided to the city that would reduce the urban heat island effect and carbon emissions.

3.2.3.5 Disaster Management

The United Nations (UN) has defined natural disasters as follows: They are natural events that can not be dealt with with local opportunities, which significantly disrupt the socio-economic and socio-cultural activities of the society and cause loss of life and property. Accordingly, geological, biological and meteorological disasters are among natural disasters and the types of disasters are in interaction with each other.

The classification of natural hazards and disasters is given in Table 3.14 Disasters caused by extreme weather events also trigger hydrological disasters and excessive precipitation can lead to floods and floods to landslides. Drought, heat wave, forest fires, desertification, famine and the invasion of pests are among the events that trigger and affect each other.

Table 3.14 Classification of natural hazards and disasters.

NATURAL(HAZARDS) DISASTERS			
Biological	Geological	Hydrological	Meteorological
<ul style="list-style-type: none"> • Epidemic <ul style="list-style-type: none"> • Viral infection epidemic • Bacterial infection epidemic • Parasitic infection epidemic • Insect Infection • Mass Animal Mortality 	<ul style="list-style-type: none"> • Earthquake • Volcano • Mass Movements(dry) <ul style="list-style-type: none"> • Rockfall • Landslide • Snowslide • Subsidence 	<ul style="list-style-type: none"> • Flood <ul style="list-style-type: none"> • General Flood • Sudden Flood • Storm Surge/ Coastal flood • Mass Movements (wet) <ul style="list-style-type: none"> • Rockfall • Landslide • Snowslide • Subsidence 	<ul style="list-style-type: none"> • Storm <ul style="list-style-type: none"> • Tropical Cyclone • Extra-Tropical Cyclone • Local Storms
			<ul style="list-style-type: none"> • Hydro-Meteorological • Climatological <ul style="list-style-type: none"> • Extreme Temperatures <ul style="list-style-type: none"> • Heat Wave • Cold Wave • Extreme winter conditions • Drought • Fire <ul style="list-style-type: none"> • Forest fire • Fire

The negative effects of climate change are seen with extreme heat, cold, drought, changes in precipitation regime, increases in the number and type of disasters, damage and losses. While changes in air temperatures affect water resources, drought and desertification and water deprivation are experienced. On the one hand, its effects on agriculture, product pattern and quality are food safety problems. When we look at the table, it is seen that the temperatures have increased from the past to the present, the precipitation has decreased, the incoming precipitation is not of sufficient quality and quality to feed the resources, and short and long-term heavy rains turn into floods and floods.

In the evaluations made by the General Directorate of Meteorology; It is stated that in 2020, 332 of the disasters occurred as floods and precipitation, and 2019 was recorded as the year with the most hail disasters. The most heavy rainfall/flood disasters occurred in İzmir, Balıkesir, Muğla, Ordu and Zonguldak. There has been an increase in flood events in Turkey since the 2000s. In the last 10 years, approximately 100 or more floods have occurred each year.

According to the Meteorological Disasters Evaluation Reports of the General Directorate of Meteorology, the most heavy rainfall/flood disaster occurred in İzmir in 2019. 16 of 332 flood disasters were experienced in İzmir. Of the 257 storm disasters that occurred in 2019, 8 were

experienced in İzmir. According to the data obtained during 2020 in our country, 7 of the 262 storm disasters occurred in İzmir. Eight of the 297 flood disasters that occurred throughout the country were experienced in İzmir.

According to the data included in the Küçük Menderes Basin Flood Management Plan prepared by the Ministry of Agriculture and Forestry General Directorate of Water Management, 38 of the 39 historical floods that occurred between 1955 and 2019 were also effective in İzmir.

The biggest disaster related to floods was the flood in November, 1995, which killed 61 people, destroyed 322 buildings, and damaged more than 10 thousand buildings in 9 districts including Karşıyaka. In the flood that occurred in 2001, some houses near Bostanlı Creek were submerged. Finally, on February 2, 2021, the flood experienced in Karşıyaka Ilica Stream after the rainfall across İzmir caused Anadolu Caddesi, Soğukkuyu, Bahçelievler, Alaybey, Tersane and Tuna Neighborhoods to be flooded.

According to the Küçük Menderes Basin Settlement Evaluation and Risk Table included in the Küçük Menderes Basin Flood Management Plan, Karşıyaka district center is considered as “risky”. There are Bostanlı, Yamanlar, Soğukkuyu Ilica, Karşıyaka Ilica, Kartalkaya, Kocadere, Yamanlar and Serinkuyu streams in Karşıyaka district, and the maintenance and cleaning works of the streams are carried out by the İzmir Water and Sewage Administration General Directorate (IZSU)

Bostanlı Dam, which is planned to be built by the İzmir Water and Sewage Administration General Directorate (IZSU), is on the Bostanlı Stream, 1,2 km northeast of the Örnekköy cemetery, within the borders of Karşıyaka District of İzmir Province. The purpose of the Bostanlı dam is both to provide drinking water and to provide additional flood safety to the settlements in Karşıyaka district by controlling the flood waters of the Bostanlı Stream, which caused floods in the past.

In addition, a study on “İzmir Metropolitan Area Wastewater-Stormwater and Streams Master Plan” is carried out by the General Directorate of the İzmir Water and Sewage Administration General Directorate (IZSU). Studies continue within the scope of the preparation of the Provincial Disaster Risk Reduction Plan by the Provincial Disaster and Emergency Directorate. Studies for updating the disaster management plans by determining the disaster risk areas of the district should be continued in parallel with the mentioned studies of the relevant institutions.

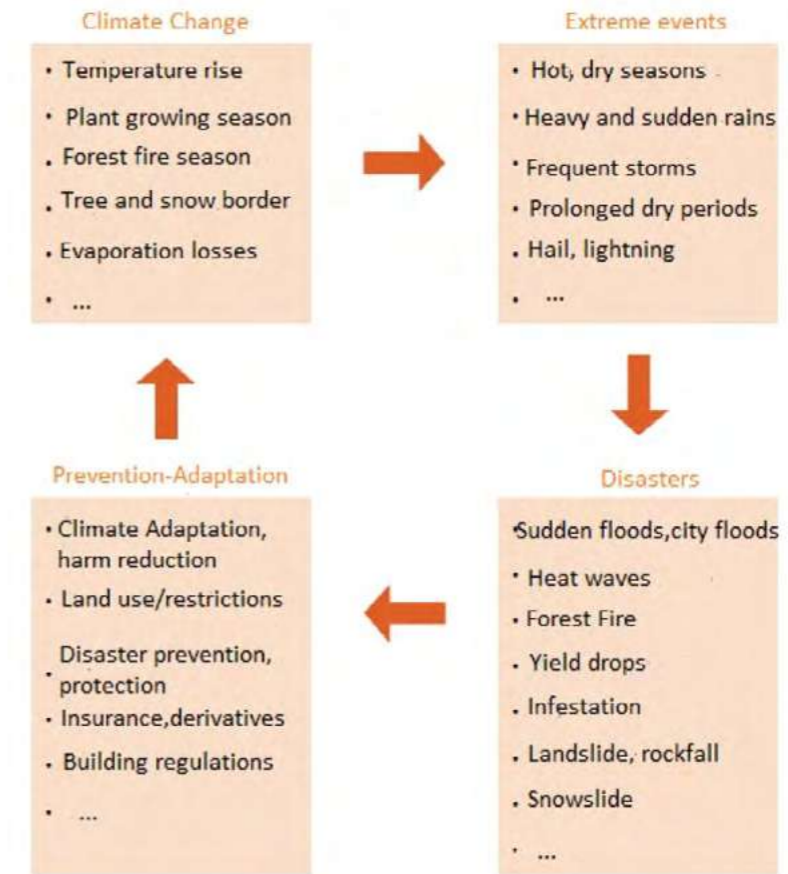


Figure 3.35 Schematic representation of the relationships between global climate change, disasters and adaptation to climate change and disaster risk reduction/prevention efforts.

As shown in Figure 3.28, there is a cyclical relationship between climate change adaptation studies and disaster risk reduction/prevention studies, and climate change adaptation and disaster risk reduction studies should be considered together.

While planning the necessary measures for disasters due to climate change, earthquake risk should also be taken into account, and disaster gathering areas and shelter areas and disaster management plans should be prepared accordingly.

The work done so far and the current situation are summarized below:

One of the 11 points where landslides occur in İzmir is Cumhuriyet Mahallesi, which is located within the borders of Karşıyaka district. In the area where the old stone quarry is located in Karşıyaka Cumhuriyet Mahallesi, there was a landslide in 2012 due to excessive rainfall. The Ministry of Environment, Urbanization and Climate Change declared the area of 26 thousand square meters as a risky area in 2013 and gave the planning authority to Karşıyaka Municipality. The building stock of Cumhuriyet, İnönü and Örnekköy Neighborhoods is in poor condition, the

zoning plans in force before the project could not provide a balanced and healthy development of urban social and technical infrastructure areas, they do not coincide with today's modern urbanism and contemporary planning understanding. Therefore, Karsiyaka Municipality has prepared a zoning plan study for urban renewal in order to establish the legal infrastructure of a livable, healthy and safe urban space.

The entire Karşıyaka district is located in the 1st Degree Earthquake Zone according to the Turkey Earthquake Zones map, which came into force with the decision of the Council of Ministers numbered 18.04.1996. When analyzing the studies of the Urban Transformation Directorate; It has been observed that the earthquake, which took place on 30.10.2020 off the Aegean Sea and was effective in the district, made many buildings in the district vulnerable to earthquakes.

Damage assessment analyzes of all buildings within the borders of the district were carried out by the technical teams established within The Ministry of Environment, Urbanization and Climate Change due to the effect of the earthquake. There are 27 buildings with severe damage and 89 buildings with moderate damage within the borders of the district. Heavily damaged buildings, primarily, these buildings were taken into operation within the scope of urban transformation in line with the request of their owners, and the process has begun.

18 of the heavily damaged buildings were demolished within the scope of urban transformation. Since the moderately damaged buildings have a one-year right from the law numbered 7269 in terms of transformation, the processes continue to be evaluated within the scope of urban transformation or to have them prepared as a healthy building again by having reinforcement projects prepared.

Since the transfer of authority on January 1, 2021, applications have been made within the scope of the Urban Transformation law for 178 buildings, and 72 buildings have been demolished within this scope by making the processes coming from the law and controlling the buildings.

Urban transformation works which has been carried out in the whole district have started on a large scale and continue to gain momentum. In order to ensure the sustainability and continuity of field and parcel-based works, and to prevent the formation of building piles that need to be re-transformed in the future, evaluations within the scope of nature-friendly buildings for environmentally friendly and livable cities in all applications, healthy planning principles and the legal process of urban design goals with a holistic point of view must be made mandatory.

Studies are carried out through the commission formed by the District Governorship-Municipality-Gendarmerie-Policemanship-National Education and Headman's Office regarding the earthquake disaster. 115 Gathering Areas have been determined within the borders of Karşıyaka District. Rehabilitation of disaster gathering areas is the joint responsibility of IMM and Karsiyaka Municipality. A total of 181 neighborhood volunteers were identified through social media announcements.

Gathering areas can be reached with the Emergency İzmir application via e-government. Karsiyaka Municipality continues to work on affixing the information stickers, which shows the data matrix application, which includes the transportation information to the existing assembly areas, to all buildings.

Karşıyaka Disaster Response Teams (KAME)

In our country, where natural and man-made disasters are frequently experienced, with the aim of creating and developing the ability and opportunity to respond to disasters on a voluntary basis and at local scale. KAME (Karşıyaka Disaster Response Teams) was established with the decision of Karşıyaka Municipality Council on 05.03.2021.

It is a part of a structure that can provide first aid in a disaster until the professional teams arrive, support the neighbors and other neighborhood residents, and support them after the professional teams arrive, facilitating the delivery of necessary assistance to the disaster victims as soon as possible.

KAME Volunteer duties are listed in Table 3.15 Continuing on its way with 181 Volunteers, KAME (Karşıyaka Disaster Response Teams) introduced five Training and Projects until June 2021.



Table 3.15 KAME Volunteer Duties

Within the scope of Pre-Disaster Preparedness Studies;	Within the Scope of Disaster Response Studies;
<p>1-) To take responsibility for the activities and organizations to be carried out by Karşıyaka Municipality in order to increase and disseminate disaster awareness,</p> <p>2-) Being a volunteer of Karşıyaka Municipality, Karşıyaka Disaster Response Teams (KAME) and contributing to the dissemination of the project in its neighborhood,</p> <p>3-) To take an active part in all the studies stated below within the scope of disseminating Basic Disaster Awareness and risk analysis at the Neighborhood Scale.</p> <p>4-) Participating in disaster awareness trainings to be held in the neighborhood,</p> <p>5-) To prepare the resource inventory (bakeries, pharmacies, etc.) that will be needed in disasters in the neighborhood,</p> <p>6-) Contributing to the determination of alternative assembly areas,</p> <p>7-) Identifying the disadvantaged individuals residing in the neighborhood and creating support persons within the scope of the project</p>	<p>1-) To take part in damage assessment studies in the neighborhood and to deliver the recorded data to Karşıyaka Municipality,</p> <p>2-) To ensure that the residents of the neighborhood are directed to the assembly areas and to ensure that the general order is established in the assembly areas until the personnel assigned in the District Disaster Plan arrive,</p> <p>3-) Performing Light Search and Rescue works in the neighborhood</p> <p>4-) To carry out and record all the work until the professional help arrives,</p> <p>5-) If there are disadvantaged individuals registered in the neighborhood before, helping them to evacuate,</p> <p>6-) Notifying the authorities of the transportation information so that the help to be provided from outside can reach the neighborhood, suggesting alternative routes, helping the closed roads to be reopened for transportation,</p> <p>7-) Providing support to the authorities in the distribution of aid materials reaching the neighborhood to those in need.</p>

School Education

Practical trainings are given on what to do before and after natural disasters in schools located within the borders of Karşıyaka District. As Karşıyaka Municipality, applied training on what to do before and after natural disasters was given to 332 schools, 90.627 students and 6.441 teachers between 2013 and 2020.

3.2.3.6 Public Health

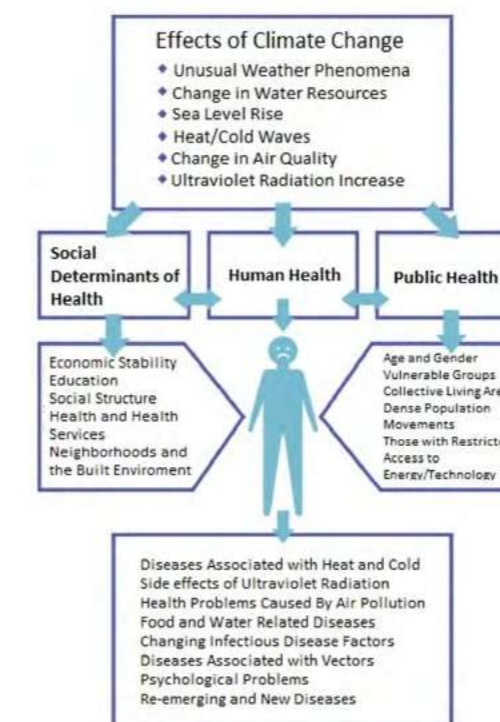
Climate change can affect human health directly and indirectly. Direct health effects include the

psychological effects of exposure to high temperatures, non-communicable diseases such as respiratory and cardiovascular diseases and injuries, and extreme weather events such as droughts, floods, heat waves, storms and forest fires that lead to death. Climate change indirectly affects health through ecological changes such as food and water insecurity, the spread of climate-sensitive infectious diseases, as well as societal responses to climate change such as displaced populations and reduced access to health care services.

In Figure 3.29, the effects of climate change on human health are shown multidimensionally. In the training module on the Effects of Climate Change on Human Health, prepared within the scope of Supporting Joint Efforts in the Field of Climate Change (iklimiN), evaluations were made on possible effects and risk groups in the light of theoretical studies and observations on climate change and health effects. As suggested in the said study, there is a need for studies in which short, medium and long-term projections will be created by evaluating field observations, case reports and climate effects by health institutions and related institutions.

In order to prevent and reduce possible health effects and to ensure adaptation, it is important to identify groups sensitive to climate impacts. Depending on the population data in Karşıyaka district, age, gender and socio-economic status distributions can be reached. However, there will be studies that will diversify the said data according to possible risk groups, establish the distribution of risk groups at the neighborhood scale, and strengthen the adaptation and support mechanisms.

Figure 3.36 An Overview of the Health Effects of Climate Change



The ratio of the population over the age of 65 in Karşıyaka District to the total population is approximately 16%, which is above the 12% rate calculated for İzmir in general. The ratio of the population under the age of 4 to the total population of the district is around 4%. In the socioeconomic status distribution, the ratio of lower income groups is 36%. According to a study conducted by Karşıyaka Municipality in 2014, the disabled population in 2014 was stated as 1,800 people.

In order to control the effects of hot and cold weather and air pollution, the risk groups to which early warning should be reached are as follows; the elderly, those who are bedridden, those with cardiovascular, lung, kidney disease, housing conditions, those with insufficient socio-economic conditions, addicts, children, , diabetics, pregnant women, people with disability and functional impairment, outdoor workers, athletes, overweight, street children and the homeless.

Within the scope of studies for the detection and monitoring of vulnerable groups, studies and actions for adaptation to climate change should be developed by updating the data for the groups that need to be reached as a priority.

Due to the fact that the rate of the elderly population is higher than the rates of Turkey and İzmir provinces, Kriyaka Municipality has realized many projects and investments that support active aging. Bilge Çınarlar Healthy Aging Center, where people of Karşıyaka over the age of 60 have the opportunity to socialize, spend quality time and realize their always postponed hobbies, has been in operation since 2009 and has 2.450 members. ESDEM (Home Health Support Center) has been operating since 2016. ESDEM, which carries out general examination, dressing, wound care, blood pressure and sugar follow-ups of needy, disabled and elderly patients who cannot leave their homes, served 1137 people in 2020.

At the assembly meeting in May 2021, the "Committee for the Elderly" and the "Advanced Age Services Unit" were established under the Social Services Directorate. This unit is preparing the "Advanced Age Action Plan" with the Science Advisory Board Members.

Existing studies continue and new activities are added within the framework of the Advanced Age Action Plan. These activities are as follows;

As of 30 May 2021;

- A technical team was formed to meet the needs of citizens over the age of 65 for minor repairs and alterations in their homes. 185 citizens have been served so far.

- For digital literacy, which is one of the most important needs of the period; In classrooms of 12 students, 6 volunteer university students gave practical trainings on e-pulse, e-government, internet banking and social media to citizens over the age of 60. The first 5-week training started in Mavişehir as the pilot district.

- District tours for 30-40 people started to be organized for citizens over 65 years old in all neighborhoods. Our citizens went to Ödemiş and Birgi with the first tour and to Tire with the second tour to visit historical cultural places, natural areas and market places. Visiting to Selçuk Şirince, Ephesus Ancient City and Virgin Mary, Bergama Ancient City, Dikili Çandarlı Castle and districts on the coastline are planned.

- Mental and physical activities (Bocce, Bagminton, morning sports) are held every Monday, Wednesday and Friday at 8:30 in the morning with groups of 6-7 people.

Karşıyaka Municipality also supports active aging with the practices and investments it has made or will make; It aims to be a city in accordance with the concept of "age-friendly city" defined by the World Health Organization in 2005. It is planned to develop the works carried out by Karşıyaka Municipality to increase the quality of life of the elderly population together with the studies to be carried out on the effects of climate change and ensuring adaptation.

3.2.3.7 Safe Food, Agriculture, Industry and Tourism

Studies on the impact of climate change on agricultural production and food security show that the impacts should be addressed in different dimensions such as product pattern, quantity and quality, access and sustainability of production. Areas suitable for food production and water resources required for irrigation are affected by climate change.

As a result of drought and water scarcity, the decrease in the amount and quality of irrigation water of plants, the inability of rainfall to meet the plant's water needs, the proliferation of harmful insects and soil erosion reduce the crop production efficiency; the climatic conditions brought by the drought, the increase in temperature and the decreasing precipitation affect the animal production efficiency.

In the Hunger and Climatic Vulnerability Index map given in a study examining the effects of climate risk on food security at the national level, Turkey is shown among the countries in the medium vulnerability class.

According to the evaluations on agriculture and forestry in IMM SECAP 2020, river and surface

water floods cause the inundation of agricultural lands at low altitudes, damage and loss of crops and animals. Forest fires, which damage and destroy agricultural and forest areas as well as animals, have a high risk of occurring in the short term. However; there is no risk of coastal flooding due to the fact that the agricultural lands in the district are located at high elevations compared to the sea level.

The total agricultural area of Karşıyaka is 446 hectares. 38,1% of the agricultural land is used as olive field. The ratio of arable land to agricultural land is 50,9%. Almost half of all vegetables produced in Karşıyaka are tomatoes. Fruit production is also carried out in the district. In terms of the number of fruit trees, there are mostly pear, plum and tangerine trees. A total of 195 cattle, 3250 small cattle and 168 poultry are registered in Sancaklı and Yamanlar Districts in Karşıyaka district. The number of registered beekeeping enterprises is 25.

There are two village settlements in Karşıyaka district. The population of Yamanlar Village is 154 people according to 2020 TUIK (Turkish Statistical Institute) data. In the village, which is known for its local variety is Yamanlar Tomato, agriculture, animal husbandry, olive cultivation and beekeeping are their livelihoods. Karşıyaka Municipality grew 6.000 Yamanlar tomato saplings in 2019 and distributed them to the producers. Studies have been initiated to obtain the geographical indication of the Yamanlar tomato. The Senatorium area, which is located in the forest area of the village, among the centuries-old plane trees and giant pine trees, will be rehabilitated and opened to agrotourism and health tourism and will be brought to the public benefit.

Sancaklı Village is located in the south of Yamanlar Mountain and its population is 169 according to 2020 TUIK(Turkish Statistical Institute) data. There is a castle thought to have been built in the 5th century BC. They earn their living by olive growing and animal husbandry activities. In 2018, the Aegean Forest Foundation, in cooperation with Karsiyaka Municipality, aimed to become a brand in honey production with the grant it received from IZKA(Izmir Development Agency), as it is equidistant to the beekeepers in and around İzmir, and the village is engaged in beekeeping. It established a honey packaging facility with the brand Balköy.

In 2020, in cooperation with Karşıyaka Municipality and İzmir Education Cooperative, Beekeeping Trainings were given to producers for the dissemination of beekeeping in the village, scientific production technology and safe honey production Beekeeping materials such as 120 bee hives, 60 bee hives, empty frames, masks and bellows were distributed to 30 producers within the

scope of supporting the income-generating activities of the İzmir Metropolitan Municipality in rural areas. In 2021, works to establish a honey forest with flowering trees in summer and winter within the borders of Sancaklı village have started. A Sancaklı Producer Cooperative was established in the village.

Karşıyaka Municipality is aware of the value of agricultural production areas within the boundaries of the district; here, it will increase its investments in the region both to increase production, to bring safe food to the people of the city and to increase the socio-economic welfare of the producer. The target for the future is to increase the rural population and to protect the resources, beauty and healthy environment of the region by this population.

The deterioration of the natural structure and habitat loss due to climate change and changes in the quantity and quality of water resources are factors that will adversely affect the tourism sector.

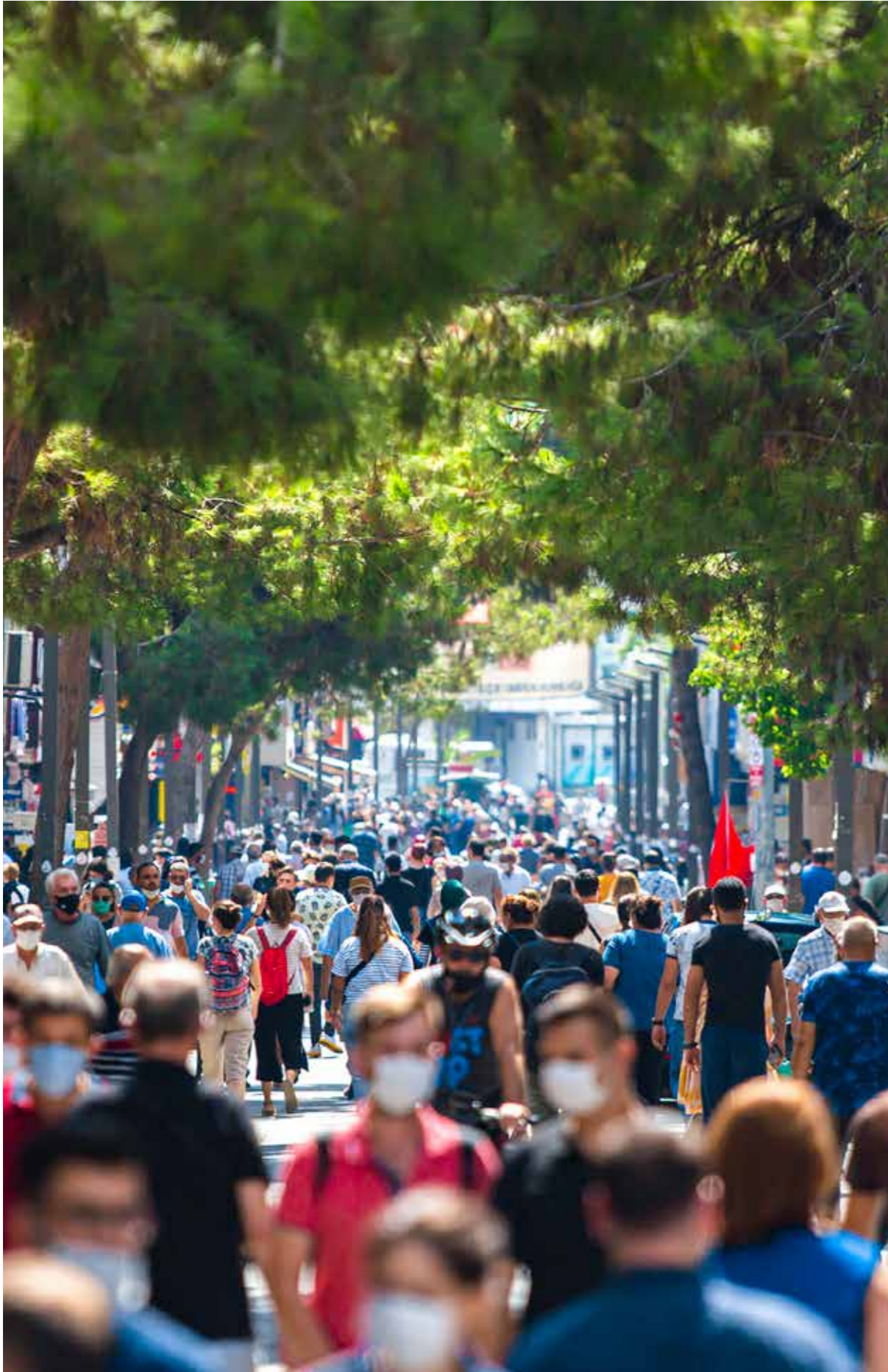
Touristic facilities and areas in Karşıyaka district are limited in number. Karşıyaka Bazaar, Yamanlar and Ornekkoy Nature Parks are the most important sightseeing spots, along with the historical mansions in the district. Recreation areas on the coastline are the areas used by the people living in the city for sports, walking and entertainment purposes. The preservation and recognition of historical buildings and nature parks is important in terms of tourism potential.

The Project of "Analysis, Synthesis and Possible Spatial Development and Creation of Scenarios, which will be the basis for the studies to develop the Çarşı District of İzmir Karşıyaka District" carried out by Karsiyaka Municipality with Dokuz Eylül University has been completed. In line with the strategies envisaged within the scope of this study, Urban Design Projects will be prepared in the areas determined in the bazaar. In this regard, Karsiyaka Advisory Board, which includes the professional disciplines of Architecture, Urban and Regional Planning and Landscape Architecture, has been established. It was decided that the first stage of the study would start as a summer school to be held in the form of student work, and the second stage would be determined according to the results of student studies.

In Karşıyaka district, small-scale workshops, shopping centers and commercial establishments operate. There is no industrial establishment. For this reason, no evaluation was made for the industrial sector within the scope of SECAP.

GREENHOUSE GAS INVENTORY





4.1 Urban Inventory

One of the most important steps in the fight against climate change by Karşıyaka Municipality, which is the first local government to sign the Covenants of Mayors in Turkey, is the preparation of an accurate and high quality greenhouse gas inventory.

The methodology of the study and the results obtained regarding the process of preparing the greenhouse gas inventory of Karşıyaka District are explained in detail in the following sections. 2018 was taken as the base year within the scope of the study. The population of Karşıyaka district in 2018 is 344.140

4.1.1 Methodology of the Study

The methodology and calculation approach chosen in the inventory should allow cities to make comparisons among themselves, which is also used globally. In this context, the "Global Protocol for Local Greenhouse Gas Emissions (GPC)", which was prepared and released to the market in 2014 by the Cities Climate Leadership Group (C40), World Resources Institute (WRI) and the Sustainable Cities Association (ICLEI), is widely used by cities all over the world. .

Karşıyaka Municipality SECAP 2021 has been prepared in accordance with the accounting approaches developed by the GPC and IPCC in 2006 and updated periodically thereafter.

4.1.1.1 Data Analysis and Reporting Principles

The data analysis and reporting principles accepted by the GPC in accordance with the IPCC are given below and the data collection and greenhouse gas inventory calculation process was carried out in line with the relevant principles.

- **Relevance:** It should be compatible with the activities taking place within the geographical boundary of the city. The relevant principle should be taken into account in the determination of data sources and data improvements by local governments.

- **Transparency:** The activity data, emission sources, emission factors and assumptions used in the development of the GHG inventory should be adequately disclosed. While using the relevant parameters, another person is expected to achieve the same results.

- **Accuracy:** The estimated greenhouse gas amount should not be too high or too low the actual greenhouse gas amount. Report results should provide a reliable information integrity to decision makers and the public.

- **Consistency:** Greenhouse gas emission calculation approaches, methodologies and inventory limit should be consistent. Thanks to the consistent methodologies adopted by the IPCC and GPC used in the calculations, it will be possible to compare with other cities.

- **Integrity:** All emission sources within the specified inventory limit should be considered. Excluded emission source should be explained with justification and display keys should be used.

4.1.1.2 Inventory Limit

The inventory, prepared at the scale of the city and the institution, covers the greenhouse gas emission sources within the geographical boundary of Karşıyaka district and the operational activities carried out within the authority of the municipality. In addition, all emission sources have been evaluated according to the principle of "integrity (completeness)". Accordingly, emission sources where greenhouse gas emissions occur outside the boundaries of the district are also taken into account, while the source of greenhouse gas emission remains within the boundaries of the district.

4.1.1.3 Base Year

In two different plans, which were prepared by Karşıyaka Municipality in 2012 and 2018, the years 2009 and 2012 were determined as the base year and greenhouse gas inventories were developed. Considering the data analysis and reporting principles in line with the IPCC and GPC approaches (See 4.1.1), it was seen that the inventory developed in 2009 did not meet the "Integrity" principle and the inventory prepared in 2012 did not comply with the "Accuracy and Relevance" principles. Within the scope of this plan, 2018, when Karşıyaka has the most reliable

and quality data, has been determined as the base year. All major emissions sources in the city are included for the base year 2018. In addition, choosing 2018 as the base year will also be beneficial in achieving compliance with IMM SECAP 2020, which has been prepared and implemented by IMM on a regional scale.

4.1.1.4 Greenhouse Gas

In the study, three main greenhouse gases, namely CO₂, CH₄ and N₂O, were taken into account. The amounts of CH₄ and N₂O which are expressed in CO₂ gas equivalent (CO₂e) multiplied by the global warming potentials included in the IPCC 5th Assessment Report (AR5). (See 4.2.1)

4.1.1.5 Scopes

According to the GPC guide, the definitions of the terms Scope 1, 2 and 3, which are given in the figure below, are also made. Scope 3 emission sources are included in accordance with the principle of "integrity" to the extent that reliable and reliable data can be accessed.

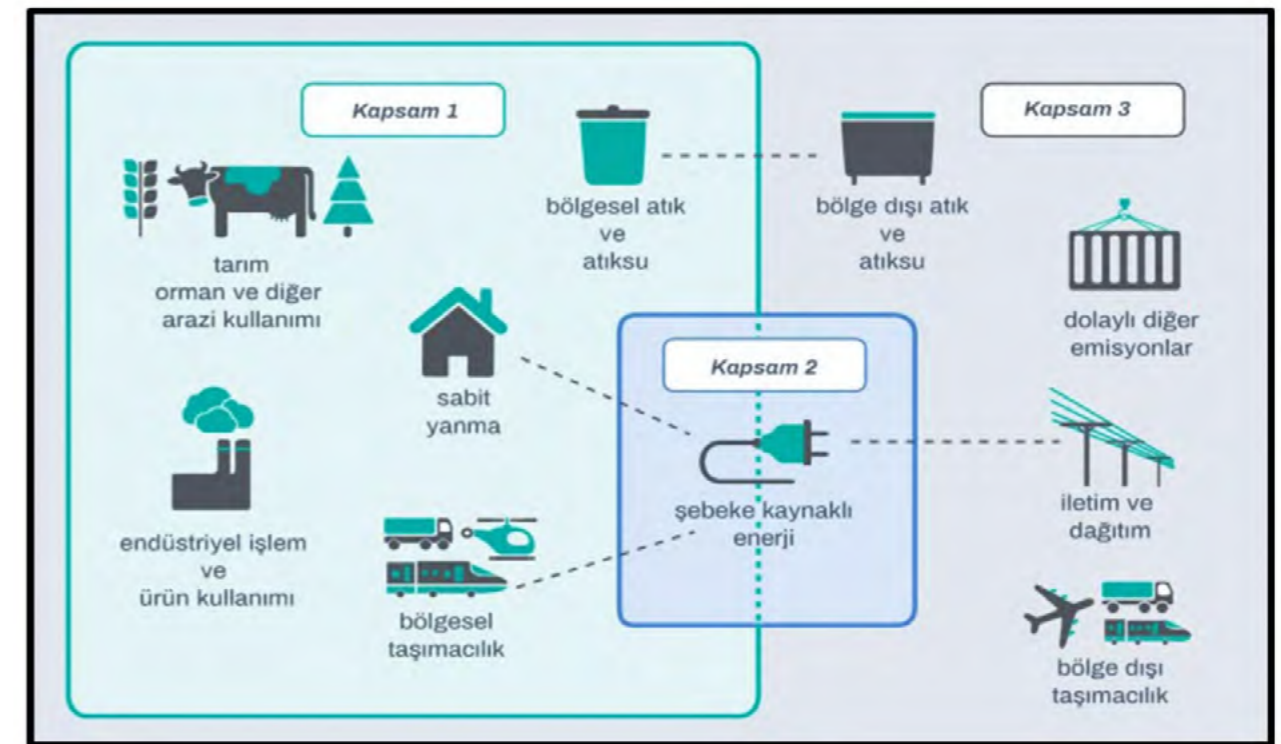


Figure 4.1 Classification by Scopes

Scope 1: Greenhouse gas emission resulting from activities occurring within the city boundary,
Scope 2: Greenhouse gas emission generated from the energy used from the grid and produced within the city boundary,

Scope 3: All other greenhouse gas emissions released outside the city boundary as a result of activities taking place within the city boundary.

4.1.1.6 GPC Display Keys

They are abbreviations also adopted by the IPCC to describe the status of greenhouse gas emission sources. The explanations of the abbreviations for the relevant notation keys are given below:

- IE – Included Elsewhere: Greenhouse gas emissions from the related activity are included in another sector or sub-sector. In such cases, the IE display key should be used.
- NE – Not Estimated: This notation key should be used where greenhouse gas emissions from the activity are present and not calculated or excluded. The reason why it is not calculated or reported must be stated.
- NO – Not Occurring: In cases where there is no activity that causes greenhouse gas emissions, the relevant display key should be used.

4.1.1.7 Quality of Data and Emission Factor

Depending on the data of each source of greenhouse gas emissions and the quality of the emission factor, the three classifications by GPC are as follows.

- Low (D): International default values are used. It is preferred in cases where national or local data are not available.
- Medium (O): Nationally produced values are used.
- High (Y): More detailed regional or local data are used.

All activity data used in the greenhouse gas inventory calculation were obtained from regional and local institutions within the “High” classification. Emission factors are determined on the basis of national values in accordance with the “Middle” classification. (See Annex-1 and Annex-2).

4.1.1.8 Data Availability

In Table 4.1, the status of greenhouse gas emission sources according to the GPC guideline is listed with display keys. A very large part of the emissions that occur in the city are included in the study. Analyses were made regarding the collected data, the institutions from which the data were obtained and reference sources are given in Annex-1.

Table 4.1 GPC Greenhouse Gas Emission Sources Data Status

GPC No	Scope	Emission Sources	Including	Display- Reason
I.1.1	1	Residences	Yes	
I.1.2	2	Residences	Yes	

I.2.1	1	Commercial and Institutional Buildings	Yes	
I.2.2	2	Commercial and Institutional Buildings	Yes	
I.3.1	1	Industrial Facilities	Yes	
I.3.2	2	Industrial Facilities	Yes	
I.4.1	1	Energy Production Facilities	No	NO
I.4.2	2	Energy Production Facilities	No	NO
I.5.1	1	Agriculture/Forestry/Fishing activities	No	NO
I.5.2	2	Agriculture/Forestry/Fishing activities	No	NO
I.6.1	1	Unspecified sources	No	NE – lack of data
I.6.2	2	Unspecified sources	No	NE – lack of data
I.7.1	1	Fugitive emissions from coal mining	No	NO
I.7.2	1	Fugitive emissions from oil and gas systems	No	NE – lack of data
II.1.1	1	Highway	Yes	
II.2.1	1	Railway	Yes	
II.3.1	1	Railway	Yes	
II.4.1	1	Airline	No	NO
II.5.1	1	All-terrain vehicles (off-road)	Yes	Included in IE – II.1.1
III.1.1	3	solid waste disposal	Yes	
III.2.1	3	Biological treatment of waste	No	NO
III.3.1	3	waste incineration	No	NO
III.4.1	3	Waste water treatment and discharge	Yes	
IV.1	1	industrial processes	No	NO
IV.2	1	Product use	No	NE – lack of data
V.1	1	Animal Husbandry	Yes	
V.2	1	Land use change	No	NE – lack of data
V.3	1	Collective resources on land	No	NE – lack of data



4.1.2 Urban Greenhouse Gas Inventory Results

A very large part of the data on greenhouse gas emission sources specified in the GPC guide has been reached. In the “GPC Basic” reporting standard, fixed units, transportation and waste main sectors must be calculated within the scope of the inventory. There is no obligation for the main sectors other than this and it is left to preference. In this context, fixed units, transportation, waste and livestock sectors for greenhouse gas emissions arising from activities, which is originating within the city border of Karşıyaka, have been included in the inventory. The livestock sub-sector is referred to as “basic plus” in the GPC reporting format. When analyzed in terms of scopes, fixed units, transportation and livestock are calculated within Scope 1 and 2 based emissions; the waste sector is included in the calculation as Scope 3. The disposal and treatment facilities for solid waste and wastewater management in Karşıyaka district are located within the boundaries of Çiğli District, and these studies are carried out by İzmir Metropolitan Municipality. Therefore, the main waste sector was evaluated on the basis of Scope 3. Urban greenhouse gas inventory results, sectors and scopes for the base year 2018 are given in Table 4.2 in GPC reporting format.

Table 4.2 Greenhouse Gas Inventory for Base Year (2018).

Sector	Greenhouse Gas Emission (tCO ₂ e/year)			
	Scope 1	Scope 2	Scope 3	Total
Fixed Units				
Residences	135.269,0	241.155,0		376.424,0
Commercial and Institutional Buildings (Including Lighting and Agricultural irrigation)	11.612,0	138.655,6		150.267,6
Industry	3.965,7	15.790,3		19.756,0
<i>Fixed Units Subtotal</i>	<i>150.846,7</i>	<i>395.600,9</i>		<i>546.447,6</i>
Transportation				
Highway	721.279,0	0,1		721.279,1
Railway		4.380,0		4.380,0
Seaway	4.885,0			4.885,0
<i>Transportation Subtotal</i>	<i>726.164,0</i>	<i>4.380,1</i>		<i>730.544,1</i>
Waste				
Solid Waste Disposal			71.898,0	71.898,0
Waste water treatment and discharge			12.263,0	12.263,0
<i>Waste Subtotal</i>			<i>84.161,0</i>	<i>84.161,0</i>
Agriculture, Forestry and Other Land Use (AFOLU)				
Animal Husbandry	1.091,0			1.091,0
<i>AFOLU Subtotal</i>	<i>1.091,0</i>			<i>1.091,0</i>
Grand total	878.101,7	399.981,0	84.161,0	1.362.243,7

The greenhouse gas emission of Karşıyaka city in 2018 base year is 1.362.243,7 tCO₂e/year in total. This total includes greenhouse gas emissions arising from the corporate activities of Karşıyaka Municipality. The amount of greenhouse gas emissions per capita is calculated as 3,96 tCO₂e/capita-year. To avoid double calculation, emissions from rail and road electricity consumption are deducted from commercial-corporate buildings. Karşıyaka is one of the districts of İzmir with the highest level of economic welfare. Parameters such as intensive energy use, high vehicle ownership, daily waste generation affect the amount of greenhouse gas emissions. The total amount of greenhouse gas emissions is shown in Figure 4.1 and Figure 4.2 as a percentage on the basis of main sectors and scopes.

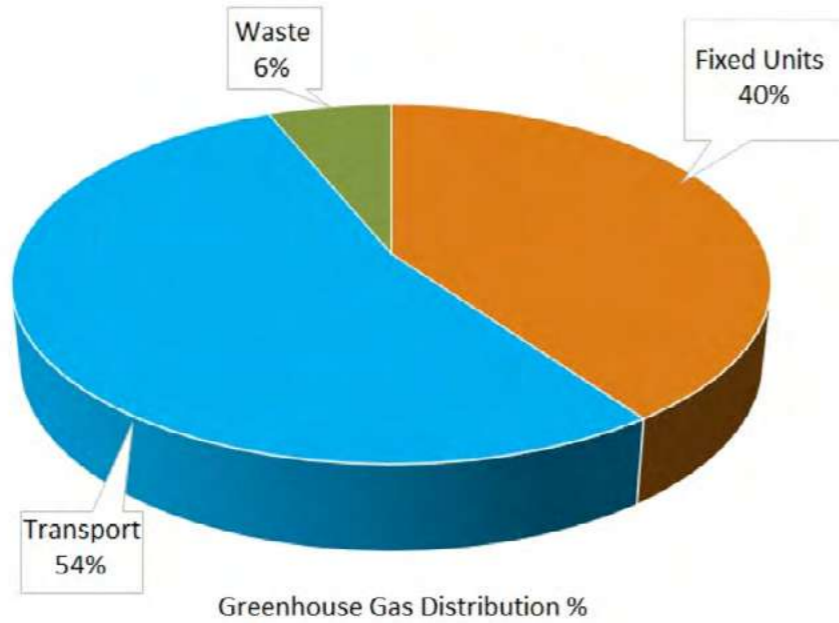


Figure 4.2 Percentage Distribution of Total Greenhouse Gas Emissions by Main Sectors.

As it is seen in Figure 4.2, the amount of greenhouse gas originating from transportation is the highest with a share of 54%; fixed units take the second place with a rate of 40%, while this value is 6% in the waste sector. When Figure 4.3 is evaluated; the share of greenhouse gas emissions produced within the city border, defined as Scope 1, is in the first place with 65%. The share of greenhouse gas emissions arising from the grid electricity used within the city border, defined as Scope 2, is 29%. It is observed that the greenhouse gas emission value from waste, defined as Scope 3, does not change by 6%.

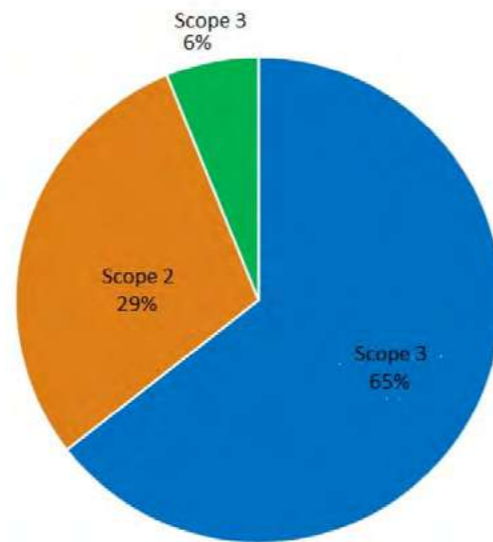


Figure 4.3 Percentage Distribution of Main Sectors by Scope.

A general analysis of the greenhouse gas inventory given in Table 4.2 and the assumptions made for the inaccessible data are presented below.

Fixed Units

In the main sector of fixed units/resources; residential, commercial and institutional buildings, greenhouse gas emissions originating from industry have been calculated. Emissions from the sub-sectors that make up the fixed units are given in Table 4.3. The amount of greenhouse gas emissions originating from the fixed unit main sector is 546.447,6 tCO₂e. The acceptance and method used in the calculation made on the basis of this main sector are presented below:

- The domestic lignite consumption amount included in the 2018 Environmental Status Report of the Province of İzmir was given as 137.701 tons. As a result of the evaluations made within the scope of the study; it has been determined that the values given in the past years and the natural gas subscription that has increased in recent years do not accurately reflect the relevant lignite consumption, and this value has been taken into account as 50.090 tons,
- In 2017, in Karşıyaka, the same rate of decrease in domestic coal consumption was achieved as the 14% increase in the number of residential natural gas subscribers, and a value of 50.090 tons was achieved. Population scaling method was used for greenhouse gas emissions from coal consumption in houses,
- It has been assumed that the number of residences providing heating with vehicles such as electric heaters and air conditioners is fixed,
- Coal consumption data used in commercial and institutional buildings could not be reached. The relevant data is also not included in the İzmir Province 2018 Environmental Status Report. As a result of the evaluations made; it has been concluded that the rate of natural gas infrastructure realized within the borders of Karşıyaka District in the last 5 years is quite high and accordingly, coal consumption in commercial and institutional buildings is negligibly low,
- It has been accepted that natural gas is used in the entire sector, since more food is produced in the industrial sub-sector.

Table 4.3 Greenhouse Gas Emissions From Fixed Units.

Sub-Sector	Scope 1	Scope 2	Scope 3	Total Emission (tCO ₂ e)
Residences	135.269,0	241.155,0		376.424,0
Commercial and Institutional Buildings	11.612,0	138.655,6		150.267,6
Industry	3.965,7	15.790,3		19.756,0
Total	150.846,7	395.600,9		546.447,6

The sector with the largest greenhouse gas emission among the fixed units, which constitutes 40% of the total greenhouse gas emission, is seen as residences. While the greenhouse gas emission amount of the residences is calculated as 376.424 tCO₂e, it is shown in table 4.3 that the greenhouse gas emission amount of the commercial and institutional buildings is 150.267,6 tCO₂e. The fact that the greenhouse gas emission amount of commercial and institutional buildings is quite high also shows the development of the service sector located in Karşıyaka. The industrial sector, on the other hand, consists of a small number of facilities that produce and manufacture food for the small-scale light industry branch. Percentage representations of the greenhouse gas emission amounts of the three related sub-sectors are given in Figure 4.3 and Figure 4.4.

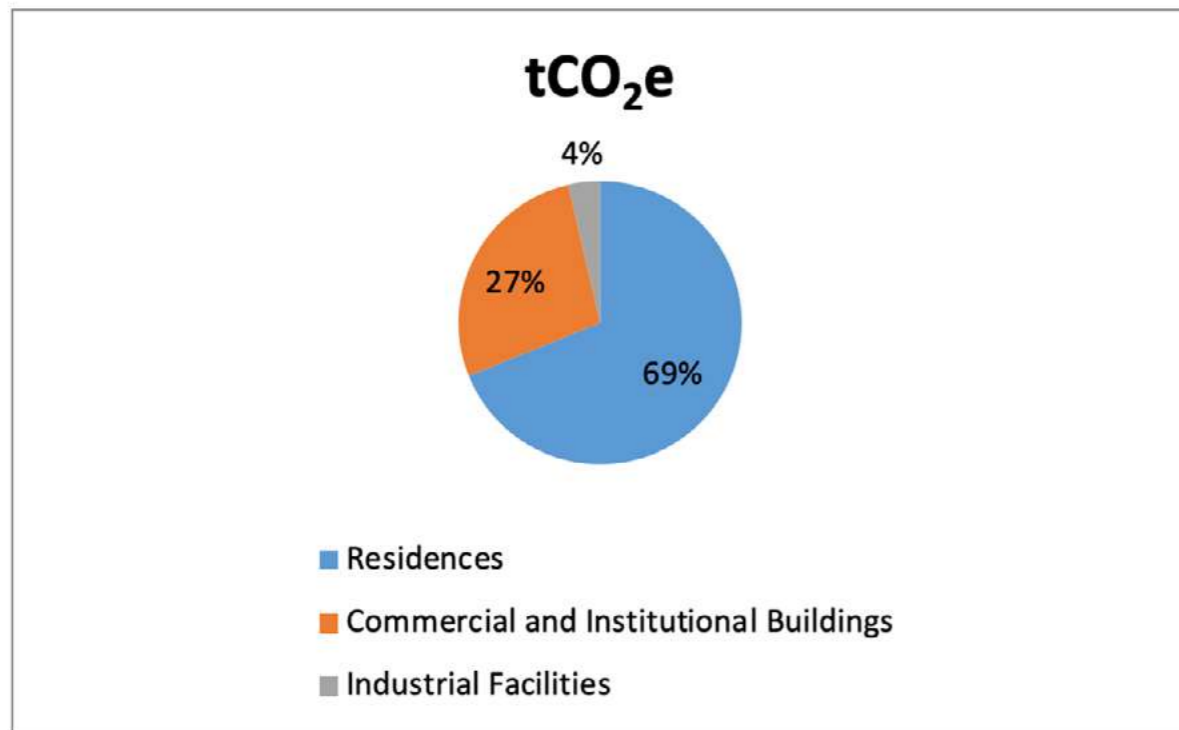


Figure 4.4 Percentage Distribution of The Greenhouse Gas Amount of The Three Sub-Sectors

Residences cause the highest greenhouse gas emissions with a share of 69% among fixed units. It is seen in Figure 4.3 that commercial and institutional buildings also cause a serious greenhouse gas emission with a share of 27%. Greenhouse gas emissions originating from the facilities under the name of small-scale industry, on the other hand, constitute 4% of the fixed units. The percentage of greenhouse gas emissions of fixed units on the basis of Scope 1 and Scope 2 is given in Figure 4.4.

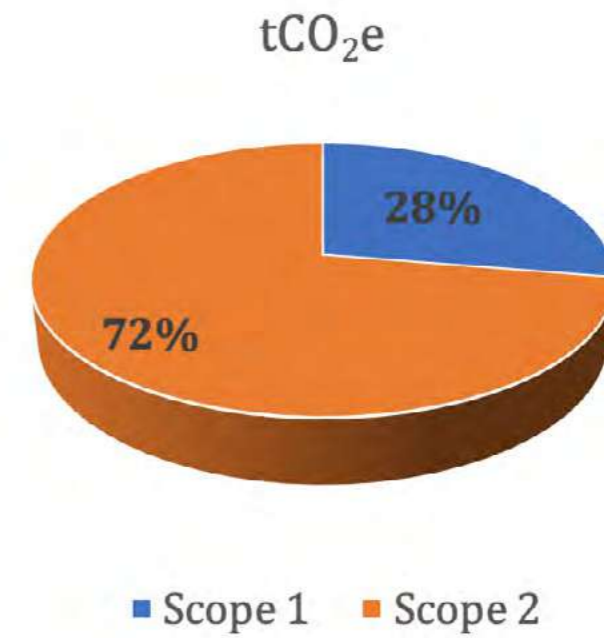


Figure 4.5 Percentage Distribution of Greenhouse Gas Emissions of Fixed Units by Scopes.

While the share of direct emissions (Scope 1) from fixed units within the city boundary is 28%, the share of indirect emissions (Scope 2) from electricity consumption from the national grid is 72%. Transportation

Under the name of the main transportation sector, road, railway and seaway sub-sectors are included in the calculation for the city of Karşıyaka. For the relevant sub-sectors, the area within the city boundary has been taken into account. In other words, Scope 1 and Scope 2 emissions are taken into account for the transportation main sector. All public transportation vehicles operating under the IMM and serving in Karşıyaka have been included in the calculation. In terms of seaway, Bostanlı and Karşıyaka sea piers are heavily used in the region. The total amount of greenhouse gas emissions originating from the transportation main sector has been calculated as 730.544,1 tCO₂e. Fuel sales statistics were used as the calculation approach. Since it is very difficult to reach fuel sales amounts on a district basis, calculations were made with the following accepted and applied methods:

- For greenhouse gas emissions from the other/special vehicles sub-sector of the highway sector, while calculating the percentage change in the number of vehicles in Karşıyaka and İzmir, the urban greenhouse gas inventory of İzmir for the years 2014 and 2018 and the EMRA annual sector reports, which are the main determinants of fuel sales in İzmir, were used. In Karşıyaka, since there is no data according to the fuel type of the vehicles, the ratios of the number of vehicles and the average increase in the number of vehicles were used.

- Since the data on the number of vehicles by vehicle type in Karşıyaka obtained from TUIK covers the 2007-2017 periods, an estimate of the number of vehicles was made for 2018 as well. When the data covering the ten-year period is analyzed, there is an average annual increase of 7,57% in Karşıyaka.

- For sea vehicles, the total fuel consumption data of IMM-affiliated ships throughout İzmir is taken as basis. Since data on the number of people using the two piers in Karşıyaka could not be obtained, the number of active piers in İzmir throughout the year was taken into account. The amount of greenhouse gas emissions originating from the seaway for İzmir in general, the emission amount determined as 2/8 due to the two piers serving in Karşıyaka, constituted the greenhouse gas emissions caused by Karşıyaka's seaway use.

- In the railway sub-sector, it was not included in the study due to the inaccessibility of the data of the railway vehicles operating under TCDD.

In Table 4.4, the amount of greenhouse gas emissions originating from the transportation sub-sectors is given. The amount of greenhouse gas emissions caused by the highway sub-sector has been calculated as 721.279,1 tCO₂e/year. The largest share in this value belongs to private vehicles.

Table 4.4 Amount of Greenhouse Gas Emissions From Transportation.

Sub-Sector	Scope 1	Scope 2	Scope 3	Total Emission (tCO ₂ e)
Highway	721.279,0	0,1		721.279,1
Railway		4.380,0		4.380,0
Seaway	4.885,0			4.885,0
Total	726.164,0	4.380,1		730.544,1

It is even more clearly seen with the percentage distribution that the highway causes higher greenhouse gas emissions compared to other transportation modes. The amount of greenhouse gas emissions from highways constitutes 98,7% of the total amount of greenhouse gas emissions originating from the main transportation sector.

Waste

Greenhouse gas emissions arising from solid waste disposal and wastewater treatment-discharge processes within the scope of the main waste sector have been calculated. Authorization regarding waste management issues such as waste disposal and waste water treatment is under the responsibility of IMM and The processes of solid waste and wastewater produced by Karşıyaka district are managed within the boundaries of Çiğli district. Therefore, the relevant emissions are

considered as Scope 3. For the calculation of greenhouse gas emissions from solid waste, the First Order Decay (FOD) method recommended by the IPCC was used. Thus, methane emissions caused by the solid wastes that Karşıyaka produced in the past were also taken into account. Emissions from waste are given in Table 4.5.

Table 4.5 Emissions From Waste (2018)

Sub-Sector	Scope 3	Total Emission (tCO ₂ e/y)
Solid Waste	71.898	71.898
Waste water	12.263	12.263
Total	84.161	84.161

Greenhouse gas emissions from solid waste disposal are 71.898 tCO₂e/year (2018); emissions from waste water treatment – discharge, on the other hand, were calculated as 12.263 tCO₂e/year.

Animal Husbandry – Enteric Fermentation

Emissions from livestock, which is one of the sub-sectors in the main sector of Agriculture, Forestry and Other Land Use (AFOLU), have been calculated. Data for other sub-sectors could not be reached. In Karşıyaka, animal husbandry activities are carried out only in two neighborhoods, Sancaklı and Yamanlar. Raised animals are few in number, including cattle, sheep and goats. On the basis of Scope 1, the amount of greenhouse gas emissions arising from livestock activities has been calculated as 1.091 tCO₂e/year.

Comparison of Results for 2012, 2015 and 2018 Inventory Years

Absolute emissions for the years 2012 and 2015 were calculated and their changes compared to the 2018 base year were examined in general within the scope of the urban greenhouse gas inventory study carried out by Karşıyaka Municipality in the past years. In Figure 4.6, the total greenhouse gas emissions for three years are given in ktCO₂e.



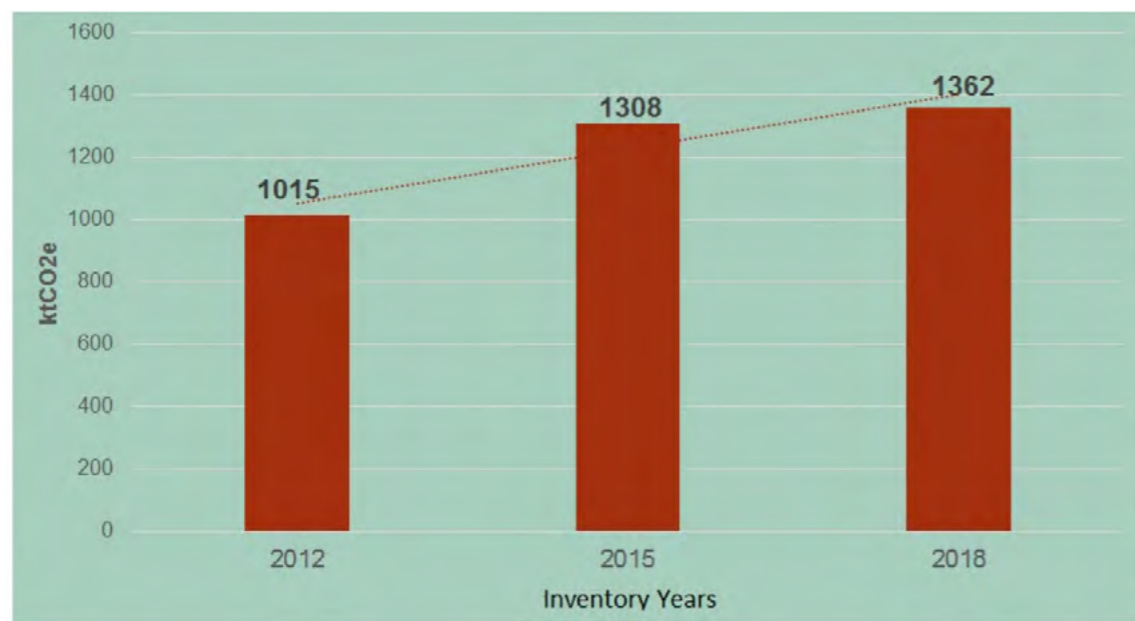


Figure 4.6 Total Greenhouse Gas Emissions (ktCO₂e) for The Years 2012-2015-2018

Increase of 29% in 2015; in the base year of 2018, an increase of 34% are observed according to the amount of greenhouse gas emitted in 2012. Between 2012 and 2018, there was a significant increase in emissions, especially from transportation. This situation is the same for İzmir in general, especially private vehicle ownership has increased at a very high rate. There is an increase of approximately 4% in greenhouse gas emissions between 2015 and 2018. It is seen that this increase is parallel to the population growth. (Annual population growth rate is 1,2%). While looked at the amount of greenhouse gas emissions per capita, this value, which was 3,22 tCO₂e/capita in 2012, increased to 3,96 tCO₂e/capita in the base year of 2018. There was a 23% increase in per capita emissions between the two inventory years. Figure 4.7 shows the change in emissions per capita between these two years.



Figure 4.7 Greenhouse Gas Emissions Per Capita and Change in 2012 and 2018

4.2 Institutional Inventory

Karsiyaka Municipality is the first local government from Turkey to sign Covenant of Mayors. Within the scope of Karşıyaka Municipality SECAP 2021 studies aimed at 2030 targets, a corporate greenhouse gas inventory was created that takes into account the municipality's own operational activities in order to continuously improve its work on the subject. This inventory is being created for the first time to include the years 2018, 2019 and 2020, and it is planned to consider 2018 data as the base year both in this study and in future studies. The aim of the study is to evaluate the activities within the scope of the service provided by Karşıyaka Municipality and under its control in terms of greenhouse gas emissions and to reveal the reduction possibilities. Although institutional greenhouse gas emissions have a small share next to the urban greenhouse gas inventory, which includes all urban activities within the boundaries of the district, it is important to evaluate them for two reasons: The first is that the local government should be the decision maker in studies to reduce emissions and that reduction projects can be implemented more easily. Secondly and more importantly, the municipality's efforts to prioritize this issue in its own activities and to increase the level of public participation and awareness by setting an example for both the public and other interested parties. In this way, it becomes easier to reach the expected level of awareness and demand for reducing urban emissions and adapting to the climate crisis.

4.2.1 Scope and Methodology of the Study

Karsiyaka Municipality's corporate greenhouse gas inventory, as seen in Figure 4.8, has taken into account both fixed and mobile emission sources for corporate activities and subsidiaries of the municipality. These sources have been prepared with the content of 'Scope 1-direct emissions', 'Scope 2-energy indirect emissions' and, depending on data availability, 'Scope 3-other indirect emissions'. The principles of accuracy, transparency, relevance, consistency and completeness are taken into account in the creation of the inventory.

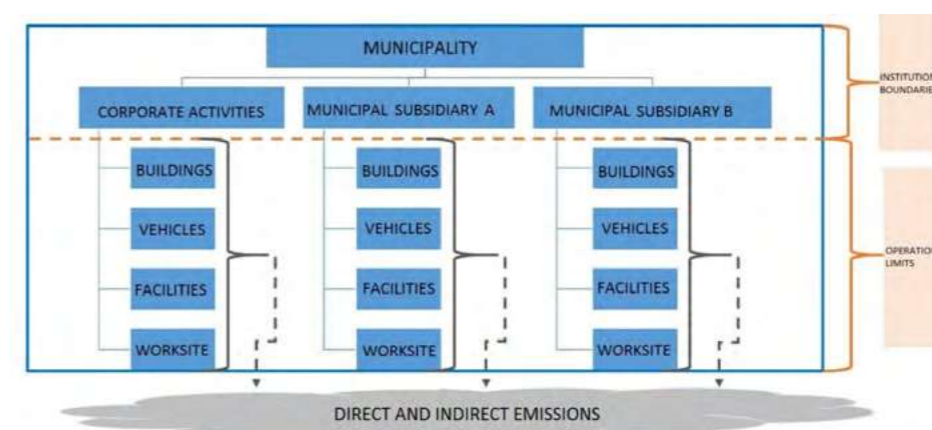


Figure 4.8 Institutional GHG Inventory – Boundaries

The emission sources expected to be included in the institutional inventory are summarized in Figure 4.9. Due to the fact that the study is being conducted for the first time for Karşıyaka Municipality, there were problems in obtaining some small-scale data. However, natural gas, electricity consumption, which has the most important share of emissions, fuel consumption of official and rental vehicles, construction equipment, and all other fuel consumptions are included in the inventory. Which data could not be included and their reasons were determined and submitted to the Municipality in detailed reporting. Accordingly, the quality of the inventory can be improved and a data management systematic can be developed in the future in accordance with the principle of 'completeness'.

A computational method was used for the corporate greenhouse gas inventory of Karşıyaka Municipality. Activity data is mainly provided as the amount of fuel consumed in stationary and mobile sources, and the amounts of electricity used in buildings and facilities. Fuel activity data are provided by volume or mass depending on the fuel type. For the calculation factors (net calorific values, emission factors and, if necessary, fuel density data), national values, which are accepted as "Tier 2" and have lower uncertainty and higher accuracy than international "Tier 1" values, were used. These calculation factors are the net calorific value and emission factors obtained from the Turkish National Greenhouse Gas Inventory 2020 report used for fuel and it is the national emission factor determined by using the same report and national energy statistics for electricity. Information sources for all calculation factors are given in Annex-2. Activity data has been collected from units, buildings, facilities and construction sites as much as possible. In this way, a more detailed evaluation opportunity was provided for comparison and reduction opportunities. Detailed reporting specific to units, buildings, facilities and construction sites has been submitted to the Municipality for benchmarking and prioritization studies. The greenhouse gases carbon dioxide, methane and nitrous oxide caused by all source flows were calculated by using separate emission factors. The global warming potential values used to calculate the total emission as equivalent carbon dioxide are given in the table below (Table 4.6).

Table 4.6 Institutional Inventory Greenhouse Gases Global Warming Potentials

Greenhouse Gas	CO ₂ Equivalent / Global Warming Potential (100 years)	Reference
1 ton CO ₂	1 ton of CO ₂ equivalent	IPCC Fifth Assessment Report, 2014 (AR5) (www.ipcc.ch) / GHG Protocol
1 ton CH ₄	28 ton CO ₂ equivalent	IPCC Fifth Assessment Report, 2014 (AR5) (www.ipcc.ch) / GHG Protocol
1 ton N ₂ O	265 ton CO ₂ equivalent	IPCC Fifth Assessment Report, 2014 (AR5) (www.ipcc.ch) / GHG Protocol

4.2.2 Institutional Inventory Results

The corporate greenhouse gas inventory, which is calculated for the first time in line with Karşıyaka Municipality SECAP 2030 targets and aims to reveal the greenhouse gases arising from corporate activities, is evaluated in the tables below, separately for the years 2018, 2019 and 2020.

Table 4.7 2018 Institutional Inventory Results

KARŞIYAKA MUNICIPALITY CORPORATE GREENHOUSE GAS EMISSIONS 2018 (tCO ₂ e)				
Sector / Activity	Scope 1	Scope 2	Scope 3	TOTAL
Natural gas burning	330,81			330,81
Electricity consumption		5.385,94		5.385,94
Electricity generation (SPP) (for information purposes only, not excluded from the total)		-217,43		-217,43
Generator etc. other fixed burning	94,63			94,63
FIXED UNITS (TOTAL)	425,44	5.385,94		5.811,38
Owned vehicles	649,86			649,86
Rented vehicles			1570,54	1.570,54
Owned business machines	167,82			167,82
Rented machinery			119,89	119,89
FLEXIBLE UNITS (TOTAL)	817,68		1.690,43	2.508,11
TOPLAM	1.243,11	5.385,94	1.690,43	8.319,49

Table 4.8 2019 Institutional Inventory Results

KARŞIYAKA MUNICIPALITY CORPORATE GREENHOUSE GAS EMISSIONS 2019 (tCO ₂ e)				
Sector / Activity	Scope 1	Scope 2	Scope 3	TOTAL
Natural gas burning	337,93			337,93
Electricity consumption		4.933,32		4.933,32
Electricity generation (SPP) (for information purposes only, not excluded from the total)		-287,05		-287,05
Generator etc. other fixed burning	44,94			44,94

FIXED UNITS (TOTAL)	382,87	4.933,32		5.316,20
Owned vehicles	655,88			655,88
Rented vehicles			1.425,79	1.425,79
Owned business machines	189,05			189,05
Rented machinery			159,38	159,38
FLEXIBLE UNITS (TOTAL)	844,92		1.585,17	2.430,10
TOPLAM	1.227,79	4.933,32	1.585,17	7.746,29

Table 4.9 2020 Institutional Inventory Results

KARŞIYAKA MUNICIPALITY CORPORATE GREENHOUSE GAS EMISSIONS 2020 (tCO₂e)				
Sector / Activity	Scope 1	Scope 2	Scope 3	TOTAL
Natural gas burning	282,95			282,95
Electricity consumption		3.539,28		3.539,28
Electricity generation (SPP) (for information purposes only, not excluded from the total)		-306,57		-306,57
Generator etc. other fixed burning	56,15			56,15
FIXED UNITS (TOTAL)	339,10	3.539,28		3.878,38
Owned vehicles	698,33			698,33
Rented vehicles			1.486,59	1.486,59
Owned business machines	232,02			232,02
Rented machinery			211,56	211,56
FLEXIBLE UNITS (TOTAL)	930,35		1.698,15	2.628,50
TOPLAM	1.269,45	3.539,28	1.698,15	6.506,88

Since there is no corporate inventory data calculated in previous years, 2018 was chosen as the base year for comparison and tracking targets. The comparison chart of total corporate greenhouse gases for three years is presented in the figure below

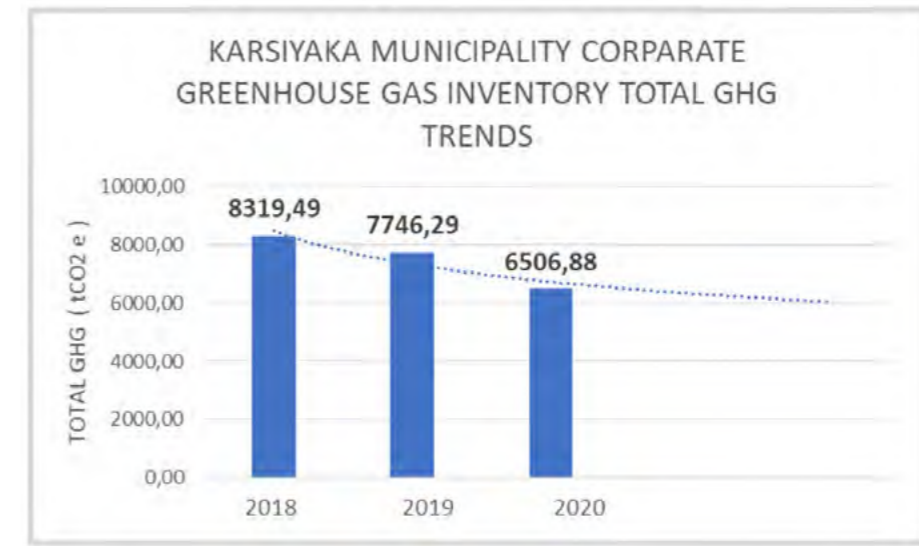


Figure 4.9 Institutional GHG Inventory – 2018, 2019, 2020 Comparison

A decrease of 6,89% from 2018 to 2019 and 21,79% from 2018 to 2020 is observed in greenhouse gases arising from corporate activities. Due to the extraordinary situation created by the pandemic conditions that started to be experienced in 2020, there have been significant changes in working hours and the use of buildings and facilities, which has eliminated the possibility of objective comparison and evaluation.

The greenhouse gas reduction amounts provided by the solar power plant operated by Karşıyaka Municipality are also given in the tables above. The graphs showing their share in total emissions are given in the figure below.



Figure 4.10 Share of GHG Prevented Emissions by Years in Institutional Greenhouse Gas Inventory

Comparison graphs on the basis of years according to the scopes calculated in the corporate greenhouse gas inventory of Karşıyaka Municipality can be examined in Figures



Figure 4.11 Share of Scope 1, 2 and 3 Emissions in Institutional Greenhouse Gas Inventory by Years

As seen in the figure, scope 1 direct emissions and scope 3 other indirect emissions do not differ greatly in three years. Indirect emissions from scope 2 energy use have decreased. Scope 2 emissions, which were 5.385,94 tCO₂e in 2018, were calculated as 4.933,32 tCO₂e in 2019 and 3.539,28 tCO₂e in 2020. Thus, the share of scope 2 emissions in total emissions has also decreased. However, due to the pandemic in 2020, business conditions and use of buildings and facilities have changed. Therefore, the decrease in electricity consumption cannot be evaluated as a result of an improvement study. The most definite conclusion to be drawn from these graphs is that indirect greenhouse gas emissions from electricity consumption which has an average of %65 share have the highest share in the corporate greenhouse gas emissions of Karşıyaka Municipality.

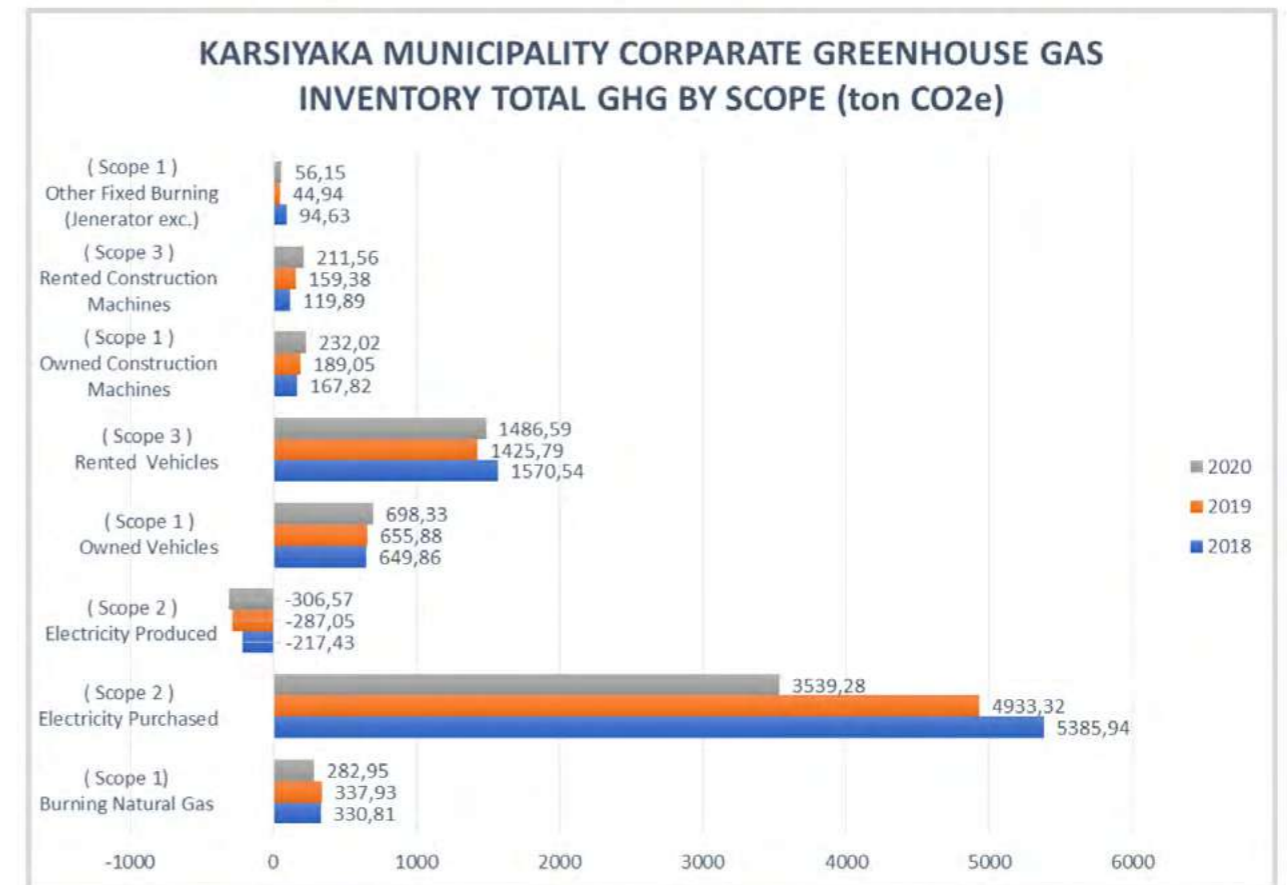


Figure 4.12 Institutional Inventory Overview - Comparison Results of Classified Scope 1, 2 and 3 Emissions

In the bar graph given in the figure, the summary results of the institutional inventory on the basis of scopes, emission sources and years can be examined comparatively. It can be easily seen that the emission sources that should be focused on within the institutional emissions of the municipality are electricity consumption, transportation and vehicles used for transportation purposes.

Solid waste collection and transportation vehicles, which have a significant share in emissions related to vehicles, are also taken into account in this context. There is no disposal or recovery of these wastes within the operational responsibility of Karşıyaka Municipality; only collection and transport activities are within operational limits. However, thanks to the performance indicators to be monitored in studies such as increasing the recyclable waste collected separately at the source or obtaining compost from organic wastes within the scope of actions related to waste management, it will be possible to monitor the progress in corporate waste management and greenhouse gas reductions.

4.3 Mitigation Targets and Scenarios

The Global Climate and Energy Convention of Mayors (GCoM) which includes the formation of the European Convention of Mayors (CoM) has begun to appeal to a much wider audience. In this context, one of the most important commitments requested by the relevant network is to set a greenhouse gas reduction target in line with the national or regional government. Karşıyaka district has chosen to proceed in the same direction as İzmir and it is aimed to reduce the amount of greenhouse gas emissions per capita (tCO₂e / capita) by at least 40% until 2030. This situation has been examined under two sub-headings which are the process scenario where everything continues as usual and the reduction scenario.

4.3.1 Business as Usual - BAU

Assumptions and assumptions regarding the greenhouse gas and energy consumption that will be reached in 2030 if everything continues as usual are given below. While making the relevant assumptions, the population growth rate in the last ten years, energy consumption data in the past years, service sector growth rates, national policies, etc. parameters are taken into account.

- Population growth; The arithmetic average of the population growth rates of the last ten years of Karşıyaka has been taken and a growth of 1.2% is predicted. According to this figure, the population of the district, which had a population of 344.140 in 2018, is expected to be 394.455 in 2030,

Fixed units; For residential, commercial and institutional buildings and industrial facilities

- Residences; It is foreseen that the population growth rate in the city will be proportional to the energy consumption and this increase will be 1,2%,

- Commercial and institutional buildings; The energy consumption data for the period of 2015-2020, including the buildings of the commercial companies and the municipality serving in the district, were examined. Accordingly, while an increase of 3% is predicted in electricity consumption; an increase of 2% is foreseen in natural gas consumption,

- Industrial facilities; It has been determined that companies operating in the small-scale industry branch have increased in the district since 2016. In the light of the energy consumption data examined for the years 2016-2020, a 2% increase in electricity consumption and a 3% increase in natural gas are predicted,

- Transportation; Transportation vehicles and planning of public transportation are under the responsibility of IMM. Therefore, private vehicles and the municipality's own vehicles have been taken into account as sources that will cause greenhouse gas emissions. In addition, since the transportation planning of the city of İzmir belongs to IMM, the IMM SECAP 2020 report has also been taken into account. An increase of 1,5% is envisaged for diesel and gasoline vehicles, it

has been emphasized that the number of vehicles with LPG will also remain constant,

- Since the greenhouse gas emissions of the solid waste and wastewater sub-sectors are directly proportional to the population, it is assumed that they will increase at a population growth rate of 1,2%,

- When the data on agriculture/ animal husbandry in Karşıyaka for the period of 2016-2020 are analyzed, a decrease was determined by years. It has been accepted that there will be no increase in emissions related to this sub-sector due to very little animal husbandry.

According to the assumption and assumption parameters listed above, it is predicted that the greenhouse gas emission amount of Karşıyaka city will be 1.643.013 tCO₂e in 2030 and the total energy consumption will be 5.177.441 MWh. Figure 4.13 shows that greenhouse gas emissions per capita will increase from 3,96 tCO₂e to 4,17 tCO₂e and per capita energy consumption will increase from 12,51 MWh to 13,13 MWh. In addition, it is calculated that greenhouse gas emissions per capita in 2018 will increase by 5,3% in 2030.

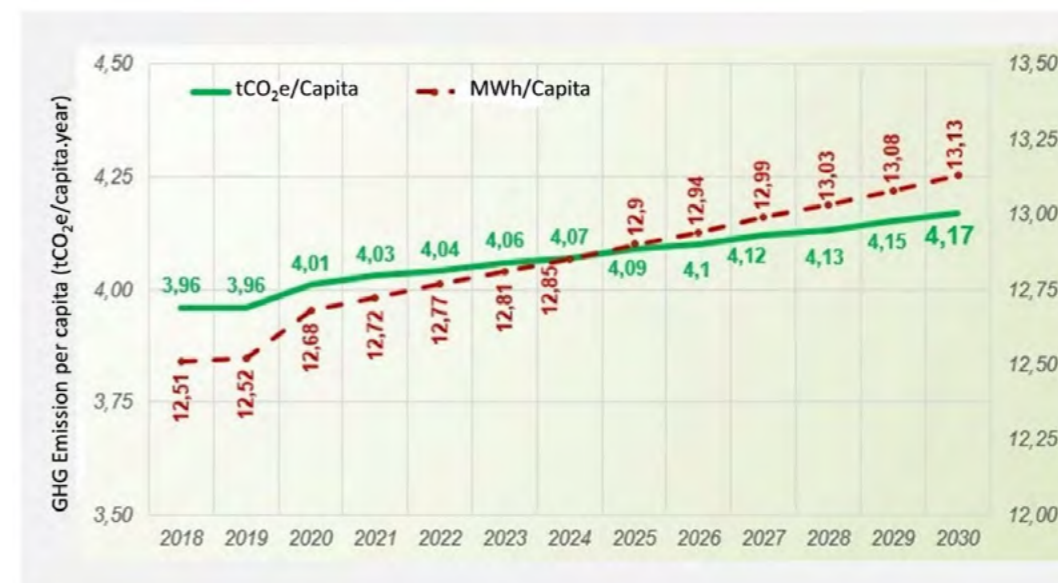


Figure 4.13 Karşıyaka Forecast of greenhouse gas emissions and energy consumption per capita in 2030

4.3.2 Mitigation Target and Scenario

As a result of stakeholder meetings and participatory studies, it has been decided to reduce the amount of emissions per person in the 2018 base year by at least 40% until 2030. In this context, it is aimed to reduce the emission amount of 3,96 tCO₂e/person in 2018 to 2,37 tCO₂e/person in 2030. In 2030, it is predicted that the absolute amount of greenhouse gases will decrease from 1,643.013 tCO₂e to 933.647 tCO₂e. In the light of the information obtained as a result of

internationally accepted methods and workshops, a total of 709.366 tCO₂e reduction potential has been calculated.

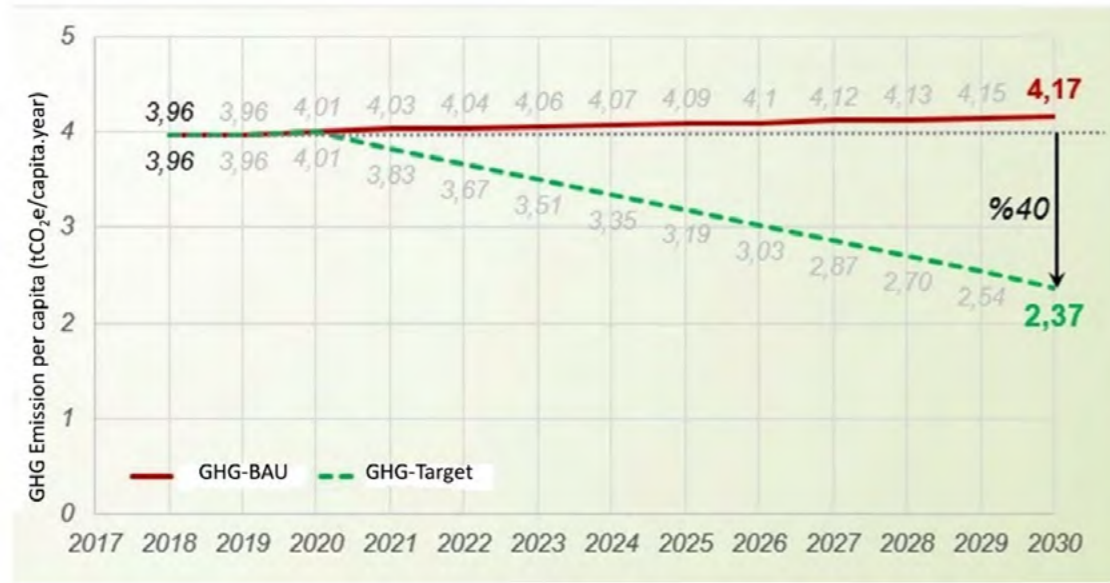


Figure 4.14 Mitigation target and scenario per capita

In Figure 4.14, the reduction target for 2030 and the reduction projections for years are given as emissions per capita (tCO₂e/person). In order to reach the reduction target per capita in 2030, reduction potentials are calculated on the basis of main sectors in Karşıyaka in Table 4.6 Emission reductions to be achieved as a result of actions related to greenhouse gas emission sources calculated within the scope of the institutional inventory are also included in the reduction potentials in the relevant sectors. Below 4.14 in the figure, information about these reductions is given as a note.

Table 4.10 Mitigation potentials of the main sectors (2030)

Sektor	tCO ₂ e Reduction Amount	MWh Reduction Amount
Emission Reduction from Fixed Units	268.618,0	756.869,6
Transportation Emission Reduction	314.442,7	1.181.956,3
Waste	58.267,8	16.954,0
Energy	68.037,5	137.812,0
Total	709.366,0	2.093.591,9

Bottom Note to the Table:

1. Emission reduction from fixed units includes the reduction of 2.143,6 tCO₂e to be achieved

through energy efficiency practices in municipal buildings. (See B.1)

2. Emission reduction from transportation includes 537.1 tCO₂e emission reduction that will be achieved as a result of reducing the fuel consumption of municipal solid waste collection and transportation vehicles, and 351,1 tCO₂e emission reductions that will be achieved as a result of reduction of emissions from municipal corporate transportation and transportation. (See action A.5 and U.1)

3. Within the scope of the emission reduction from solid waste disposal, 38 tCO₂e emission reductions to be achieved as a result of the activities of the separate collection of packaging waste at the source and the reduction of the amount of waste sent to landfill, which are being improved within the scope of the Municipality's institutional activities, are included. (See action A.1 and A.2)

4. In the energy title, 5.287,5 tCO₂e emission reduction to be achieved as a result of the use of solar energy in the municipal corporate buildings or facilities is included among the renewable energy sources. (See action E.1)

With the actions B.1, U.1, A.5 and E.1, which are the actions that will allow reduction in the corporate greenhouse gas inventory, it is predicted that the corporate greenhouse gas emissions, which were 8.319,49 tCO₂e in 2018, will approach zero in 2030. Thus, it is planned that Karşıyaka Municipality will continue to serve as a "Carbon Neutral Municipality" in 2030.



KARŞIYAKA SECAP ACTIONS



5. KARŞIYAKA SECAP ACTIONS

In this part of Karşıyaka Municipality SECAP, following the analysis of the available information, there are actions planned in different sectors to reduce greenhouse gas emissions and increase resilience.

It is aimed to reduce the 3.96 tCO₂e/person emission amount determined according to the 2018 Base Year to 2.37 tCO₂e/person in 2030. In line with this target, 32 actions were determined on the basis of sectors.

While the Buildings, Transportation, Energy and Waste sectors are determined for reduction as a source of greenhouse gas, the sectors that are adversely affected by the consequences of climate change and that need to be adapted to be improved are Water Resources, Public Health, Disaster Management, Sustainable Agriculture, Green Spaces-Land Use, Protected Areas and Food safety determined.

17 of the actions created are effective in mitigation, 9 of them are effective on adaptation, and 6 actions have both mitigation and adaptation effects.

KARŞIYAKA MUNICIPALITY SECAP Actions are in line with Karşıyaka Municipality 2020-2024 Strategic Plan, İzmir Metropolitan Municipality Sustainable Energy and Climate Action Plan. The associated goals and objectives are explained in each Action title.

Although it is possible to implement some of these actions in a short time, many actions need detailed feasibility studies, financing or obtaining legal approvals before their implementation.

Action Types

Actions under KARŞIYAKA MUNICIPALITY SECAP are divided into the following categories.

Investment Projects: These are the system, infrastructure and superstructure projects that Karşıyaka Municipality will undertake by using its own resources or national or international funds. (for example GES Power Plants, bicycle and pedestrian paths, Ecological Living Center, Alzheimer Information Center.)

Policy Measures: These are the policies, plans and strategies to be followed in order to become a nature friendly, climate change resistant city. (for example Energy and Climate Action Plan, City




Guide, Advanced Age Action Plan, Near Zero Energy Policy)

Education and Awareness Projects: These are training and information activities aimed at changing the current behavior and consumption habits of corporate and households. (For example, emission-free transportation, separation of waste at source.)

Increasing Institutional Capacity: Increasing information and informatics capacity with national and international collaborations. (for example, taking city inventories, using geographic information system in very different subjects, participating in city twinning programs.)

Mitigation, Adaptation, Common Tag of Both Mitigation and Adaptation Actions

SECTOR	ABBREVIATION
BUILDINGS	B
TRANSPORTATION	U
ENERGY	E
WASTE MANAGEMENT	A
WATER MANAGEMENT	S
HEALTH	SA
DISASTER MANAGEMENT	AF
SUSTAINABLE AGRICULTURE	ST
LAND USE-GREEN AREAS	YA
PROTECTED AREAS	KA
FOOD SAFETY	GG




ACTION NO	ACTION TITLE	
B.1	Conducting and Implementation of Energy Efficiency Studies in Municipality Buildings	
SDG - 2030	  	
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION <input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY <input type="checkbox"/>	
ACTION DEFINITION		
In line with the developments experienced on a global scale, it will be a good example for individuals living in the city that the public first reduces greenhouse gas emissions arising from energy consumption for their existing buildings under their responsibility. In this context, it is aimed to set an example for the society and to raise awareness about energy efficiency.		
REASON		
One of the most important greenhouse gas emission sources in the corporate greenhouse gas inventory of the municipality is the service buildings. The buildings that consume the most energy were determined as sports halls, main service building, construction site and marketplaces.		
<ul style="list-style-type: none"> As a result of energy efficiency studies, the amount of energy consumed per person and per m² will decrease. While activities with the same service quality continue, energy consumption will be reduced. By reducing the amount of energy consumed, greenhouse gas emissions from the municipality's own buildings will be reduced to a certain extent. The municipality will pay less energy bills with the implementation of this action, It will be ensured that municipality employees provide services in climate-friendly and environmentally friendly buildings. 		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
B1.3	Reviewing and updating the planning regulations and guides regarding the future zoning works of the municipality in terms of energy efficiency.	
SECAP B2	Energy efficiency in municipal buildings	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
RESPONSIBLE		STAKEHOLDERS
Karsiyaka Municipality		Izmir Metropolitan Municipality, Energy Efficiency Consulting Companies, NGOs, Union of Chambers of Turkish Engineers and Architects, Universities, Building Material Manufacturers
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST(\$)
2022	2030	5.000.000
FINANCE OPTIONS		
Municipal budget, Grant Support, National and International Funds		
2030 ENERGY REDUCTION (MWh)		2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)
4.774,6		2.143,6
EXPLANATION ON GREENHOUSE GAS REDUCTION		
Currently, energy consumption data for the last three years have been analyzed. In line with the 2030 target and the available data, a 40% reduction in greenhouse gas emissions is foreseen for all buildings, with priority being given to the 5 buildings with the highest energy consumption.		
IMPLEMENTATION STEPS		
<ul style="list-style-type: none"> Establishing a team of relevant staff from multidisciplinary fields. Identification of service buildings and social facilities that consume the most energy. Making cost estimates by performing energy studies and analysis for these buildings. Replacing the lighting devices used in all designated service buildings or in all existing buildings with energy efficient luminaires and applying insulation techniques. Researching all national and international funds and loans for the budget to be issued in different items. 		
Giving information about the work done from the beginning to the end of the project in a way to raise awareness in the public domain and sharing the key output of the project.		
MONITORING INDICATORS		
<ul style="list-style-type: none"> I1: Annual energy consumption (MWh/year) and greenhouse gas emission value (tCO₂e/year) of each municipal building/social facility I2: Energy density for each building/social facility on a monthly / annual basis (MWh/m²). 		

NOTES

Among the corporate buildings and facilities of Karşıyaka Municipality, the first five buildings and facilities with the highest greenhouse gas emissions due to electricity consumption can be listed as follows:

FACILITY	2018 tCO ₂ e	2019 tCO ₂ e	2020 tCO ₂ e
MUSTAFA KEMAL ATATÜRK KARŞIYAKA GYM	652,92	532,38	423,64
BAHÇELİEVLER MULTI-STOREY MARKETPLACE	502,75	436,58	275,16
MUNICIPALITY SITE FACILITIES	475,19	480,19	452,48
MUNICIPALITY MAIN SERVICE BUILDING	372,13	347,18	315,15
ZÜHTÜ İŞİL INDOOR SPORTS HALL	285,08	289,83	187,73




The decrease in emissions in 2020 was due to the closure of businesses as part of the COVID 19 pandemic measures.

ACTION NO	ACTION TITLE	
B.2	Increasing the Detail Level of Geographic Information System for Building Inventory	
SDG - 2030	  	
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION <input type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>	
ACTION DEFINITION		
It is aimed to make energy analysis more effectively in both residences and municipal buildings and to create the necessary infrastructure for digital twin energy modeling and monitoring of the city.		
REASON		
It is not possible to display two-dimensional (spatial) data on the building stock, such as building height, number of floors, floor height, building roof type, building facade cladding, required for energy analysis in buildings. It is aimed to develop the 3D city model with CityGML to display the data of the building stock and to increase the detail levels of the urban data, which includes only the roof areas of the buildings at the LoD1 detail level. Information such as building roof types at LoD2 detail level, photos of building facades, balconies of buildings at LoD3 detail level, wall details will be added to the 3B city model. Thus, there will be an infrastructure preparation for the "Smart Cities" guide published by the Ministry of Environment Urbanization and Climate Change. In addition, this situation should turn into one of the biggest steps in revealing the energy inventory of the city. On the other hand, it will contribute to the studies on the determination of the flood risk by associating the physical conditions of the buildings with the ground level they are located.		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
SECAP B2	Energy efficiency in municipal buildings	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
RESPONSIBLE		STAKEHOLDERS
Karsiyaka Municipality		Izmir Metropolitan Municipality, ÇİŞ Firms, Universities
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2022	2030	20.000
FINANCE OPTIONS		
Municipal equity, international financial institutions, EU related programs, national and international funds.		
EXPLANATION ON GREENHOUSE GAS REDUCTION		
Since energy and water consumption of both residential and municipal buildings will be saved in the future, there will naturally be a net reduction in greenhouse gas emissions.		


IMPLEMENTATION STEPS
<ul style="list-style-type: none"> ■ Establishment of a team to collect and analyze data under the responsibility of the IT Department. ■ Listing the different data needed from the considered parameters in the current GIS system. ■ Processing of data such as in which year and according to which regulation the buildings were built, whether they are insulated, what the building orientations are, heating/cooling type, lighting option into GIS ■ Setting targets for increasing the level of detail of the GIS system.
MONITORING INDICATORS
<ul style="list-style-type: none"> ■ I1: Analyzing and monitoring GIS detail level every year, ■ I2: Number of buildings to be processed in GIS
NOTES
<p>Opportunities: Adaptation to the digitalization process and branding</p> <p>Obstacles: Lack of budget for work.</p>

ACTION NO	ACTION TITLE
B.3	Developing Near Zero Energy Policy and Strategy for New Town Halls
SDG – 2030	  
SECAP CONTRIBUTION OF THE ACTION	
GREENHOUSE GAS EMISSION REDUCTION	DEVELOPING CLIMATE ADAPTATION CAPACITY
<input checked="" type="checkbox"/>	<input type="checkbox"/>
ACTION DEFINITION	
The municipality will set an example for the society and encourage other segments with the minimum energy consumption and maximum use of renewable energy in the new buildings that it can directly control.	
REASON	
When the institutional greenhouse gas inventory of the municipality is examined, we see that the sector with the largest greenhouse gas emissions is energy consumption in buildings. In terms of general fuels in energy at the national level, foreign dependency is high; it is known that foreign dependency is very high in natural gas used in heating and electricity production. It will contribute to both supporting mitigation and adaptation in terms of climate impact and reducing foreign dependency on related issues.	
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP	
B1.6	The municipality commits to net zero energy consumption in all new municipally controlled buildings by 2030.
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN	
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.
RESPONSIBLE	STAKEHOLDERS
Karsiyaka Municipality	İzmir Metropolitan Municipality, Energy Efficiency Consulting Companies, NGOs, Union of Chambers of Turkish Engineers and Architects, Universities, Building Material Manufacturers, Financial Institutions, Turkey Sustainable Energy Financing Program
IMPLEMENTATION START	IMPLEMENTATION END
2022	2030
FINANCE OPTIONS	
Municipal equity, international financial institutions, EU related programs, national and international funds.	
EXPLANATION ON GREENHOUSE GAS REDUCTION	
It is very difficult to make a reduction estimate due to the lack of data for future buildings. However, greenhouse gas emission values will decrease considerably for buildings such as passive houses and carbon neutral buildings.	
IMPLEMENTATION STEPS	
<ul style="list-style-type: none"> ■ Establishment of a team that will research new climate resistant building standards such as net zero emissions, nearly (near) zero energy, passive houses, and manage energy consumption and energy efficiency studies in existing buildings. ■ Evaluation of designs and feasibility of currently planned (2021-2024) buildings. ■ Carrying out a prioritization study for buildings with high visibility and awareness. ■ Making feasibility and cost analyzes for priority buildings. ■ Researching grants, loans and financial support in different fields in addition to the municipal budget. ■ Implementation of the project and development of goals. 	

MONITORING INDICATORS
<ul style="list-style-type: none"> ■ I1: Determining and following up quantitative targets on clean energy and energy efficiency in priority buildings to be constructed
NOTES
<p>Opportunities: Gaining prestige by setting an example to the society and branding, Infrastructure preparation for the EU Building Energy Efficiency Directive.</p> <p>Obstacles: Lack of budget for work and lack of competent human resources to carry out studies on related issues.</p>

ACTION NO	ACTION TITLE
B.4	Determination of Reference Buildings for Taking Energy Inventory of the District and Implementation of Energy Efficiency Improvement Steps
SDG - 2030	  
SECAP CONTRIBUTION OF THE ACTION	
SECAP CONTRIBUTION OF THE ACTION	DEVELOPING CLIMATE ADAPTATION CAPACITY
<input checked="" type="checkbox"/>	<input type="checkbox"/>
ACTION DEFINITION	
Monitoring and analyzing energy consumption of residential and non-residential buildings (excluding the municipality's own buildings). It is aimed to develop the method of determining reference buildings for residences and non-residential buildings and establish an energy inventory that provides a district-specific basic idea by conducting energy studies.	
REASON	
While the housing stock constitutes 93% of the district in percentage, it has a share of approximately 75% in terms of energy consumption. Summary information on non-residential buildings is given in actions B7 and B8. Due to the non-residential and high number of residential buildings, it is not possible to analyze buildings one by one. For this reason, it is necessary to determine some technical parameters in the selection of reference buildings to represent each stock. This process will also contribute to the municipality's GIS-supported building inventory infrastructure.	
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP	
SECAP B1	Insulation of non-residential buildings.
SECAP B3	Energy efficient lighting replacement in non-residential buildings.
SECAP B4	Advice and promotion of thermal insulation in existing residences.
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN	
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.
H3.1	Ensuring a planned and healthy urban development.
RESPONSIBLE	STAKEHOLDERS
Karsiyaka Municipality	İzmir Metropolitan Municipality, neighborhoods headmens, site administrators, NGOs, Union of Chambers of Turkish Engineers and Architects
IMPLEMENTATION START	IMPLEMENTATION END
2022	2030
FINANCE OPTIONS	
Municipal equity, national and international funds.	
EXPLANATION ON GREENHOUSE GAS REDUCTION	
Since it is a method that will draw the energy map of the district, it is foreseen that a serious greenhouse gas reduction will be achieved with the policies and practices to be carried out afterwards.	
IMPLEMENTATION STEPS	
<ul style="list-style-type: none"> ■ Establishment of a reconnaissance and investigation team that will go to the field. ■ Evaluation of the properties of the available building stock data. ■ Determining the technical parameters needed for each building stock. ■ After the selection of parameters such as insulated/non-insulated building envelope, in which year and according to which regulation, going down to the site and making analysis. ■ Storing and processing data on the evaluation of related analysis into GIS. ■ Conducting this study with neighborhood headmen, site managers and non-residential representatives and getting their support. 	

NOTES	
Opportunities: More successful policy and decision-making processes will be ensured.	
Obstacles: Since it will be a multi-layered process, it may be difficult to change habits and there may be a resistance.	

ACTION NO	ACTION TITLE
B.5, B.6	B.5 – Suggesting and Promoting Thermal Insulation in Existing Residences B.6 – Recommending and Encouraging the Use of Energy Efficient Lighting Devices in Existing Residences
SDG – 2030	  
SECAP CONTRIBUTION OF THE ACTION	
GREENHOUSE GAS EMISSION REDUCTION <input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY <input type="checkbox"/>

ACTION DEFINITION
It is the residences that cause the highest energy consumption and greenhouse gas emissions among fixed units or structures in Karşıyaka. It was found that the amount of natural gas consumption per capita in existing residences in the base year is 34% higher than electricity consumption. It is aimed to reduce greenhouse gas emissions of residences and to reduce the energy bills of citizens by carrying out energy efficiency studies for existing residences..

REASON
The greenhouse gas share of the existing residences in the district within the fixed units is around 68%. It is known that the natural gas infrastructure in Karşıyaka has reached a high rate of 88%. Therefore, most of the spatial heating, hot water and kitchen activities are provided with natural gas. It has been accepted that cooling is done with air conditioners that consume electricity. For this reason, the benefits of thermal insulation that can only be made in the building envelope can be seen in both directions.

- As a result of energy efficiency studies, the amount of energy consumed per capita and the amount of energy per m² will decrease.
- The amount of greenhouse gas emissions from existing residences will decrease.
- Invoices that become a burden on the citizens will also decrease.
- The urban heat island effect, which is felt intensely in summers, will be alleviated and the quality of life of citizens will improve.
- Since less fossil fuels will be used, it will also have an indirect positive effect on air quality.
- The awareness of the city will increase as a result of energy efficiency trainings and studies.

THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY AND SECAP	
SECAP B4	Advice and promotion of thermal insulation in existing residences.
SECAP B5	Recommending and promoting energy efficient lighting systems (LED etc.) in existing residences.

THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN	
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.
H3.1	Ensuring a planned and healthy urban development.

RESPONSIBLE	STAKEHOLDERS
Karşıyaka Municipality	Local citizen (Building owners, landlords), Environment, Urbanization and Climate Change Ministry, İzmir Metropolitan Municipality, NGOs, Manufacturers, Financial Institutions, Union of Chambers of Turkish Engineers and Architects
IMPLEMENTATION START	IMPLEMENTATION END
2022	2030

FINANCE OPTIONS	
Municipal equity, international funds, EU grants, private sector, İzmir Development Agency (İZKA)	
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)
534.720	173.742

EXPLANATION ON GREENHOUSE GAS REDUCTION
Thanks to awareness campaigns, thermal insulation and lighting issues will attract attention and cause a significant amount of greenhouse gas reduction.

IMPLEMENTATION STEPS

- B.4 The involvement of a technical team that can take an active role in the field as well as in the action.
- B.4 Making thermal insulation feasibility for reference buildings whose action and result are determined.
- Organizing campaigns to encourage and support thermal insulation in existing residences at certain time intervals.

- B.4 Conducting feasibility and awareness-raising trainings for replacing the classical lightings for buildings whose action output is a reference, with energy efficient luminaires.
- Investigating tax cuts, incentive packages and protocols that will trigger the local economy at the city scale for the buildings with which cooperation is established.

MONITORING INDICATORS

- I1: Reporting and holistically updating the energy consumption per capita and the amount of energy use per m² (energy density) for each building.
- I2: Number of residential buildings with thermal insulation, energy saving and greenhouse gas reduction amount.
- I3: The number of buildings where energy efficient lighting is carried out, the number of efficient luminaire replacements, the amount of energy savings and greenhouse gas reduction.

NOTES
The people of Karşıyaka are aware of the importance of energy efficiency and savings investments. The realization of this action will be quick due to its financial contribution to the home economy. The realization of these actions will bring the vulnerability level of our neighborhoods, which may suffer from energy poverty in the future and whose economic structure is lower than the others, to better conditions.

ACTION NO	ACTION TITLE
B.7, B.8	B.7 - Insulation of Commercial and Other Institutional Buildings B.8 – Use of Energy Efficient Lighting Devices in Commercial and Other Institutional Buildings
SDG - 2030	  
SECAP CONTRIBUTION OF THE ACTION	
GREENHOUSE GAS EMISSION REDUCTION <input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY <input type="checkbox"/>

ACTION DEFINITION
It is aimed to revitalize the city's economy and raise awareness on this issue by carrying out energy efficiency studies on other public buildings and especially commercial buildings with remarkable energy consumption in Karşıyaka district.

REASON
Approximately 5% of the building stock within the borders of Karşıyaka district consists of commercial buildings and 2% of institutional buildings. From an urban perspective, it has been calculated that approximately 25% of energy consumption (electricity + natural gas) belongs to non-residential (commercial and institutional) buildings. The energy consumption of non-residential buildings, which is quite low compared to the housing distribution, is very remarkable and corresponds to almost ¼ of all buildings in the city.

In commercial and institutional buildings within the district boundary, continuous lighting loads with heating and especially cooling in summer cause high energy consumption.

As a result of the heating, cooling and lighting studies and applications to be made in non-residential buildings, it is expected to provide a significant energy saving, greenhouse gas reduction and a reduction in fuel costs.

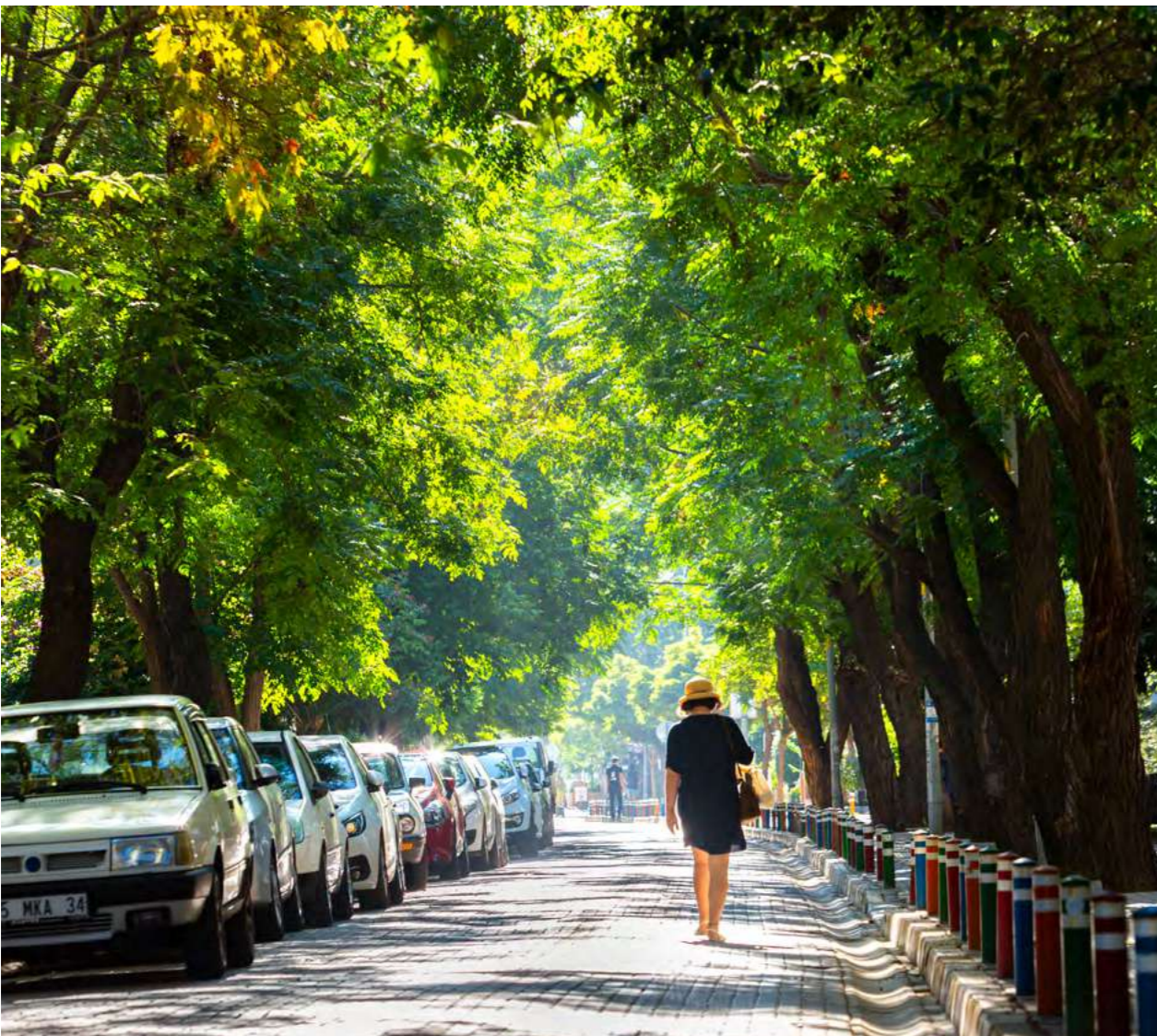
THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY AND SECAP	
SECAP B1	Insulation of non-residential buildings.
SECAP B3	Energy efficient lighting replacement in non-residential buildings.



THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN	
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.
H3.1	Ensuring a planned and healthy urban development.




RESPONSIBLE	STAKEHOLDERS
Karşıyaka Municipality	Related Ministries, Public and Private Institutions, Financial Institutions, İzmir Metropolitan Municipality, Energy Efficiency Sector
IMPLEMENTATION START	IMPLEMENTATION END
2022	2030





FINANCE OPTIONS	
National and International Financial Institutions and Funds	
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)
217.375	92.732,4

EXPLANATION ON GREENHOUSE GAS REDUCTION	
Based on the energy consumption data of the last 5 years, an assumption has been made. In all fuel breakdowns, a 40% greenhouse gas reduction potential is foreseen in 2030. The greenhouse gas reduction potential of the municipality's own buildings has been deducted from this total.	
IMPLEMENTATION STEPS	
<ul style="list-style-type: none"> Meeting with representatives of non-residential buildings to get suggestions and ideas on energy efficiency and explain the current situation. Establishment of a large-scale team including representatives of various NGOs, banks, provincial directorates of ministries, non-residential buildings. Establishment of a platform to monitor and analyze the energy consumption of non-residential buildings. Investigating mechanisms such as incentives and tax reductions that the municipality can develop within its authority. Establishing and determining the infrastructure of transition to natural gas for non-residential buildings that currently provide space heating with coal and petroleum-derived fuels. Implementation of air source heat pumps with high energy efficiency for commercial buildings, preparing and analyzing their feasibility, determining the number of commercial buildings suitable for this. Current situation assessment for replacing traditional lighting fixtures with LED devices. Organizing awareness trainings and festivals. 	
MONITORING INDICATORS	
<ul style="list-style-type: none"> I1: Once a year, assessment of the current situation with representatives of non-residential buildings and energy managers I2: Number of commercial and institutional buildings included in the work. I3: Making the system to be developed for monitoring and analysis of energy consumption usable. I4: The name, number and outputs of the buildings whose projects have been completed in certain periods. 	
NOTES	
Opportunities: Implementing an inclusive energy efficiency policy throughout the city, raising awareness.	



ACTION NO		ACTION TITLE	
U.1		Energy Efficiency in Municipal Vehicle Fleet and Rented Vehicles	
SDG - 2030	 		
SECAP CONTRIBUTION OF THE ACTION			
GREENHOUSE GAS EMISSION REDUCTION		DEVELOPING CLIMATE ADAPTATION CAPACITY	
		<input checked="" type="checkbox"/>	
ACTION DEFINITION			
It is aimed to renew its own vehicle fleet, which causes the most greenhouse gas emissions after municipal activities and buildings, with vehicles with lower greenhouse gas emissions and to encourage the companies that it receives (rented) services about energy efficient vehicles.			
REASON			
When the institutional greenhouse gas inventory is examined, it is seen that the biggest greenhouse gas emission after the greenhouse gas emission originating from the fixed facilities of the municipality is in the transportation sector. The transportation fleet of the municipality can be grouped into three groups: vehicles owned, rented and owned by subsidiaries. It can renew its vehicle fleet, which it can directly control, with hybrid and electric vehicles. It can prepare an ecological vehicle strategy document that will encourage counterparties to purchase energy efficient vehicles for the vehicles used by leasing or service procurement.			
RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP			
T1.5	Municipal vehicle fleet and utility vehicles: Electric and low carbon vehicles.		
T1.1.3	Encourage the purchase of private / municipal low-emission vehicles.		
RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN			
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.		
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.		
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.		
RESPONSIBLE		STAKEHOLDERS	
Karsiyaka Municipality		Rental Car Suppliers	
IMPLEMENTATION START		IMPLEMENTATION END	
2022		2030	
FINANCE OPTINONS			
Municipal equity, international financial institutions, private sector cooperation			
2030 ENERGY REDUCTION (MWh)		2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)	
1.328,9		351,1	
EXPLANATION ON GREENHOUSE GAS REDUCTION			
In the reduction scenario, transportation was evaluated within the main sector target.			
IMPLEMENTATION STEPS			
<ul style="list-style-type: none"> Determining the annual target for the replacement of the municipality's own vehicle fleet with electric and hybrid vehicles. Determination of charging station installation areas for hybrid and all-electric vehicles, evaluation of grid capacity Preparing the feasibility of installed power, annual energy production and initial investment cost to benefit from SPPs rather than grid electricity. Determining the need for low-emission vehicles by examining the fuel consumption and greenhouse gas emission analysis of existing service procurement vehicles. Developing policies such as ecological vehicle strategy paper or green vehicle standards for service procurement vehicles and aligning them with tender legislation, researching and developing. 			
MONITORING INDICATORS			
<ul style="list-style-type: none"> I1: Number and ratio of electric and hybrid vehicles in the vehicle fleet. I2: Fuel savings and greenhouse gas reduction to be achieved as a result of activities. 			
NOTES			
<p>Research by transportation experts shows that there is a potential for reduction in consumption through economic driving training. In the studies carried out within the scope of the EU's ECOWILL (Ecodriving - Widespread Implementation for Learner and Licensed Drivers) project, it has been found that economic driving has positive effects such as:</p> <ul style="list-style-type: none"> 5-15% average reduction in fuel consumption and CO₂ emissions. Reduced noise (due to lower revs). Positive effects on traffic safety: up to 40% less accidents. Lower maintenance costs (eg brakes, tyres). Increased comfort (fewer shifting, less braking, less stress). Contributes to EU CO₂ emission targets. <p>The EU's Smart Energy Europe Program shows that Eco-driving course participants consume 5-10% less fuel.</p>			

ACTION NO	ACTION TITLE	
U.2	More Sustainable Urban Mobility: Public Transport and Local Mobility	
SDG - 2030		 
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>
ACTION DEFINITION		
Providing additional rail system network, bicycle path and pedestrianized road construction; developing emission-free transportation infrastructure with regulations such as Karşıyaka Walking Plan, Karşıyaka Running Plan (Beach) and other activity plans, bicycle paths, limited car entry, parking policy; To regulate traffic to reach public spaces, natural, cultural and social areas of the city, and to ensure the acquisition of urban and public spaces while making walking easier.		
REASON		
To improve accessibility within the borders of Karşıyaka district, to provide high-quality and sustainable mobility and transport; to apply sustainable urban mobility plans with a holistic and change-oriented approach based on National and International conventions and agreements (Human rights, Pedestrian rights, laws and regulations); Supporting shared roads and pedestrian-oriented applications to work on the development of pedestrian areas and making ity walk as a life culture on a Social scale		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
T1.7	More sustainable urban mobility: public transport and local mobility.	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
H3.1	Ensuring a planned and healthy urban development	
RESPONSIBLE		STAKEHOLDERS
Karsiyaka Municipality, Izmir Metropolitan Municipality		Izmir Metropolitan Municipality, Union of Chambers of Turkish Engineers and Architects, Relevant non-governmental organizations (Active Life Association, Pedestrian Association, Our Street Association, etc.)
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2022	2030	500.000
FINANCE OPTIONS		
Izmir Metropolitan Municipality, Municipal equity, international financial institutions, EU, World Bank and related programs		
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)	
1.178.595,8	313.554,5	
EXPLANATION ON GREENHOUSE GAS REDUCTION		
In the SECAP (2021) report of the Izmir Metropolitan Municipality, the overall Izmir sector target for reduction is given as 36%. SECAP T1.3, T1.1.3 and I.B monitoring, which are all mitigation actions planned for this. It is expected that the reduction in transportation will naturally reflect on Karşıyaka. Data on dense traffic intersections will be obtained from the IMM Department of Transportation in 2022, and it will be monitored whether the density decrease to be realized within the scope of IMM and Karşıyaka reaches the determined target.		
IMPLEMENTATION STEPS		
<ul style="list-style-type: none"> Relevant Directorates' action programs, Karşıyaka Strategic Plan Studies, Plan decisions within the scope of Zoning Plan Revisions, follow-up of IMM SECAP actions. Constructing bike paths, creating traffic-free areas, Accessible City Day and Street Your activities, etc. to be done. Procurement of equipment for monitoring the traffic density according to the vehicle type, and its installation at the points where the traffic density is experienced. Organizing campaigns to increase the use of bicycles 		
MONITORING INDICATORS AND GOALS		
Monitoring Indicator	2030 GOAL	
■ I1: Traffic density rate at designated points	% 20 Reduction	
■ I2: Citizen's bicycle ownership	1/10 Person	
■ I3: Bike roads and bike lane roads	23,5 km, 13 km	

ACTION NO	ACTION TITLE	
E.1	Expanding the Use of Solar Energy in Municipal Assets and Lands such as Municipal Buildings, Marketplaces	
SDG - 2030		  
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION		
Energy use for heating, cooling and lighting are the main components of Karşıyaka Municipality's corporate energy consumption. Cultural centers, sports halls and marketplaces are the buildings with the highest consumption. With this action, it is aimed to meet 100% of corporate electrical energy consumption from solar energy in 2030.		
REASON		
At the national and regional level, the demand for energy is increasing rapidly due to economic and population growth. The central government aims to increase the share of renewable energy to 30% by 2023.		
This target is in line with the National Renewable Energy Action Plan and other national strategic plans and Izmir Metropolitan Municipality SECAP goals. One of the primary goals of Karşıyaka Municipality is to move away from large, import-based fossil energy sources and to reduce greenhouse gas thanks to our national economy and our geography suitable for using solar energy.		
Photovoltaic solar energy (SPP) investment is one of the most attractive among renewable energy investments, considering the high solar energy potential of Karşıyaka district. SPP investments with an economic life of 25 years pay for itself in the 4th year and are economically viable for investors with high energy consumption.		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
ES1.4	Examination of local renewable energy options.	
ES1.5	Expanding the use of solar energy in municipal lands and assets such as municipal buildings, road-separated areas, bus stops.	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
H3.2	Making necessary arrangements and new facilities in line with the needs, working to ensure economic harmony between regions by developing cooperation.	
RESPONSIBLE		STAKEHOLDERS
Karsiyaka Municipality		Photovoltaic solar installation (EPC) companies, Manufacturers, Financial institutions.
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2022	2030	2.750.000
FINANCE OPTIONS		FINANCE RETURN TIME (YEAR)
Municipal budget, Ilbank, Financial Institutions, Public-Private partnerships		5
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)	
10.575	5.287,5	
EXPLANATION ON GREENHOUSE GAS REDUCTION		
The photovoltaic power system installation will increase to 7,13 MWp with an additional 5,5 MWp installation. Therefore, a reduction in greenhouse gas emissions of 1.300 tCO ₂ e will be achieved with an annual energy production of 2.600 MWh from the current 1,63 MWp photovoltaic solar power plant. It will reach a value of 5.287,5 tCO ₂ e with a total energy production of 10.575 MWh by the support of additional power plants		
IMPLEMENTATION STEPS		
<ol style="list-style-type: none"> Appointment of the project team that will carry out the feasibility study (appointment of consultants and relevant municipality employees). Investigation of photovoltaic solar energy potential of municipal assets and lands. Investigation of possible financing methods. Making the Call Letter application for the subscriptions planned to be installed in the SPP. 		

5. Inclusion of the implementation plan in the Strategic Plan periods.
6. SSP installations and commissioning.

MONITORING INDICATORS				
No	Indicator	Current Situation	2025 Goal	2030 Goal
I1	Installed photovoltaic solar power capacity (MWp) in operation	1,63 (The total power of the land type photovoltaic solar energy systems with a power of 493,185 kWp commissioned in 2014 and 1,140.48 kWp commissioned at the end of 2020 is 1,633.7 kWp.)	4,13	7,13
I2	Annual energy production of photovoltaic solar installations in the business (MWh) and greenhouse gas reduction amount (tCO ₂ e)	During 2021, 1.63 MWp SPP power plant is expected to annually produce 2,600 MWh of Energy and reduce 1.300 tCO ₂ e of greenhouse gases.	6.225 MWh 3.112,5 tCO ₂ e	10.575 MWh 5.287,5 tCO ₂ e
I3	Percentage of total photovoltaic solar installations meeting the municipality's electrical energy consumption (%).	% 8 (2020) % 24 (2021)	% 60	% 100
I4	Percentage of total photovoltaic solar installations covering the total energy consumption of the municipality (%).	% 4,4 (2020) % 15,6 (2021)	% 37,5	% 65

NOTES

The total institutional greenhouse gas emissions of Karşıyaka Municipality are as follows: 8.319.49 tCO₂e (2018), 7.746,29 tCO₂e (2019) and 6.506,88 tCO₂e (2020). Among these total emissions, emissions from electrical energy consumption are as follows: 5.385,94 tCO₂e (2018), 4.933,32 tCO₂e (2019) and 3.539,28 tCO₂e (2020).

A decrease of 6,89% from 2018 to 2019 and 21,79% from 2018 to 2020 is observed in greenhouse gases arising from corporate activities. Due to the extraordinary situation created by the pandemic conditions that started to be experienced in 2020, there have been significant changes in working hours and the use of buildings and facilities. This situation has eliminated the possibility of objective comparison and evaluation.

In terms of increasing the share of renewable energy, it would be more accurate to consider high institutional energy consumption data (2018 reference data) for an appropriate forecast.

The municipality's SPP capacity, which has reached 1,63 MWp, enables an annual energy production of 2.600 MWh and a greenhouse gas reduction of 1.300 tCO₂e.




In this way, SPP production, which has an 8% share in electrical energy consumption by 2020, will be reached to 24% in 2021.



It will be possible to meet 100% of electrical energy consumption and 65% of total energy consumption from photovoltaic solar energy on an institutional scale with the addition of 5,5 MWp in 2030.



ACTION NO	ACTION TITLE			
E.2	Ensuring the Expansion of Solar Energy Facilities			
SDG - 2030	17 PARTNERSHIPS FOR THE GOALS	13 CLIMATE ACTION	7 AFFORDABLE AND CLEAN ENERGY	11 SUSTAINABLE CITIES AND COMMUNITIES
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION			DEVELOPING CLIMATE ADAPTATION CAPACITY	
			☑	






ACTION DEFINITION		
Apart from its own institutional investments, the municipality will inform/direct the electricity subscribers in the city limits of Karşıyaka district about installing photovoltaic solar power plants. Investments that Izmir Metropolitan Municipality is considering for Karşıyaka Municipality in line with the 2030 SECAP goal are included in this action.		
REASON		
Izmir Metropolitan Municipality SECAP aims to install a new solar energy system of 850 MW in total buildings in Izmir province by 2030. Karşıyaka district aims to direct approximately 10% of this target for subscriptions within the borders of the district, considering its greenhouse gas footprint and population density. For this reason, the Municipality aims to implement an additional 80 MWp photovoltaic solar energy installation in effective communication with IMM, apart from its own institutional investments.		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
SECAP ES1.14	Initiation of a municipally funded subsidy program to promote the expansion of solar power plants.	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
H3.2	Making necessary arrangements and new facilities in line with the needs, working to ensure economic harmony between regions by developing cooperation.	
RESPONSIBLE		STAKEHOLDERS
Karşıyaka Municipality		Izmir Metropolitan Municipality, Public-private organizations with high energy consumption, Photovoltaic solar installation (EPC) companies, Financial Institutions.
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2022	2030	40.000.000 (IMM and Other Institutions)
FINANCE OPTIONS		FINANCE RETURN TIME (YEAR)
Equity of public-private organizations with high energy consumption, Subsidies committed under IMM SECAP, Financial Institutions.		4
2030 ENERGY REDUCTION (MWh)		2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)
116.000		58.000
EXPLANATION ON GREENHOUSE GAS REDUCTION		
An 80 MWp SPP installation will generate different amounts of energy depending on the angle of placement and orientation, and there will be variations in the greenhouse gas reduction rate. Considering that there will be installation on the roof surfaces, it is taken into account that there will be a slightly less energy production (1450.-kWh/y) compared to the land type installation. The greenhouse reduction of SPP investments within the borders of Karşıyaka, which is targeted by Izmir Metropolitan Municipality in 2020 SECAP, is also included.		
IMPLEMENTATION STEPS		
<ol style="list-style-type: none"> 1. Appointment and preliminary training of relevant municipal employees for this action. 2. Detection of subscriptions with high energy consumption and meeting planning for preliminary information on the technical-economic feasibility of photovoltaic solar energy investment. 3. Investors who are interested in SPP investment should make feasibility studies specific to their project locations and characteristics. 4. Investigation of possible financing methods. 5. Making a Call Letter application for the subscriptions planned to be installed in the SPP. 6. SPP installations and commissioning. 7. On the municipal side, monitoring the energy production and greenhouse gas reduction effects of new SPP installations. 		
MONITORING INDICATORS		
<ul style="list-style-type: none"> ■ I1: The number of subscribers with high energy consumption that are contacted and directed. ■ I2: Installed power capacity of new photovoltaic solar energy put into operation. ■ I3: Annual energy production (MWh) and greenhouse gas reduction amount (tCO₂e) of newly commissioned and total photovoltaic solar installations. ■ I4: The percentage of the updated total photovoltaic solar energy installations covering the electrical energy and total energy consumption of Karşıyaka district (%). 		
NOTES		
The Municipality has a 1.63 MWp grid-connected SPP investment within the borders of Karşıyaka district. By contacting subscribers with high energy consumption, they will be encouraged to invest in photovoltaic solar energy and make energy efficiency improvements. The SPP investments to be made by the Izmir Metropolitan Municipality within the borders of our district are also included in this action.		








ACTION NO	ACTION TITLE	
E.3	Conducting Feasibility Studies for Geothermal Energy Potential and Preparation of Action Plan	
SDG – 2030		 
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION		
Technical and economic determination of geothermal energy use potential within the borders of Karşıyaka district.		
REASON		
A successful example of the use of geothermal energy for residential and greenhouse heating purposes is in İzmir. The use of geothermal energy resources in the district and their replacement with fossil fuel consumptions make positive contributions to greenhouse gas reduction. On the other hand, the location of the geothermal resources investigated within the borders of Karşıyaka district and their environmental impacts during operation should be evaluated if they do not involve any environmental risk. In appropriate conditions, the use of the resource for residential heating purposes is a priority due to the high public interest. It is also possible to evaluate greenhouse-tourism sectors.		
THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY AND SECAP		
ES1.1	Conducting feasibility studies on linking up public sector and/or industrial structures to geothermal heating grids.	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
RESPONSIBLE		STAKEHOLDERS
Karşıyaka Municipality		İzmir Metropolitan Municipality, İzmir Geothermal Inc., Geothermal Energy Companies, Financial Institutions, Technical Experts, Consultants and Academics, Union of Chambers of Turkish Engineers and Architects
IMPLEMENTATION START	IMPLEMENTATION END	
2022	2025	
FINANCE OPTIONS		
İzmir Metropolitan Municipality, Karşıyaka Municipality, National and International Funds		
EXPLANATION ON GREENHOUSE GAS REDUCTION		
If heating is used primarily, it will make significant contributions to greenhouse gas reduction.		
IMPLEMENTATION STEPS		
1. Establishment of the project team (including Municipality, İBB, consultants and contractor company employees) 2. Determination of feasibility scope. 3. Preparation of feasibility report (Includes analysis of geothermal grid for capacity, sizing and investment needs). 4. Preparation of action plan according to feasibility results. 5. Meeting with relevant stakeholders and preparing and monitoring the evaluation report.		
MONITORING INDICATORS		
■ I1: Feasibility report. ■ I2: Action Plan ■ I3: Number of relevant stakeholders with preliminary information.		
NOTES		
This action will be continued in close communication with IMM in line with the IMM SECAP 2030 goals. First of all, the Environmental Impact Assessment Report preparation processes must be completed.		

ACTION NO	ACTION TITLE	
E.4	Ensuring Cooperation in Transition to Renewable Energy Sourced Electricity System, Energy Supply and Monitoring, Establishment of Digitalization Infrastructure	
SDG - 2030		
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION		
Establishing the smart grid infrastructure and ensuring digitalization in order to fully monitor the increasing share and impact of renewable energy in the electricity grid.		
REASON		
Increasing the share of renewable energy in the electricity grid requires the monitoring of energy supply and monitoring processes in transmission and distribution lines with a smart digital infrastructure.		
THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY AND SECAP		
ES1.12	Working with infrastructure companies to understand existing renewable energy capacity and to enable the transition to renewable energy sourced electricity.	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
H1.3	Increasing the variety and quality of the services we offer through studies that adapt to changing and developing technology.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
RESPONSIBLE		STAKEHOLDERS
Energy Distribution Company		Equity of relevant stakeholders, Financial institutions.
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2023	2030	100.000
EXPLANATION ON GREENHOUSE GAS REDUCTION		
Thanks to digitization, monitoring of energy production/consumption processes and IoT, machine learning etc., it will be possible to carry out effective estimation/planning studies and to calculate the greenhouse gas reduction effects.		
IMPLEMENTATION STEPS		
1. Establishment of a team consisting of the main company providing electricity network service, subsidiary companies, authorized public institutions (TEİAŞ, TEDAŞ, ETKB), IMM, Union of Chambers of Turkish Engineers and Architects, academics and municipal employees. 2. Investigation of obstacles to smart grid and digitalization, determination of needs and reporting (Preparation of Current Situation Analysis Report). 3. Preparation of an action plan for the establishment of the necessary infrastructure (The steps of realization of digitalization with percentages will be defined). 4. Monitoring the implementation results of the action plan.		
MONITORING INDICATORS		
■ I1: Current situation analysis report. ■ I2: Action Plan ■ I3: Percentage of realized digitization (%)		
NOTES		
In the municipality's buildings and facilities, electricity bills are tracked with a digital energy monitoring system. In addition, the energy production in the existing 1.63 MWp SPP power plant can be monitored digitally. With this action, it is aimed for the Municipality to monitor the amount of renewable energy supplied to the grid within the boundaries of the district, in cooperation with the power generation and distribution companies and to increase the ability to monitor carbon emissions and also to benefit from artificial intelligence opportunities in planning processes. Karşıyaka Municipality applied to the grant program of the "ERA-NET Smart Energy Systems" call in 2021 with the theme "Digital Transformation for the Green Energy Transition" with the project named "Urban SECAP Pathfinder" to achieve this goal.		

ACTION NO	ACTION TITLE	
E.5	Encouraging and Facilitating the Transition of Coal Consumers to More Renewable and/or Cleaner Energy Sources	
SDG - 2030		
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION		
Ensuring that consumers, who currently meet their heating needs by consuming coal, use alternative renewable energy sources. Analyzing the expansion of natural gas infrastructure in case other renewable resources are not available or not available to citizens...		
REASON		
While coal has negative effects on public health, it is also the most polluted fuel in all respects. It is important to provide a suitable environment for coal users to move to cleaner sources.		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
SECAP ES 1.2	Switching to more renewable energy sources (geothermal, electricity) instead of coal in residential areas	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
RESPONSIBLE	STAKEHOLDERS	
Karşıyaka Municipality	IMM, Citizens, Contractors of Transformation Area Projects, İzmirgaz, Financial Institutions	
IMPLEMENTATION START	IMPLEMENTATION END	
2022	2030	
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)	
8.737	3.500	
IMPLEMENTATION STEPS		
1. Identification of coal consumers by surveys and GIS mapping (Preparation of Baseline Analysis Report). 2. Determining the conversion potential from coal to geothermal and/or renewable sources to electricity and preparing an action plan. 3. Analyzing the expansion of natural gas infrastructure in case other renewable resources are not available or not available to citizens. 4. Raising awareness about the benefits of other energy sources among citizens using coal.		
MONITORING INDICATORS		
<ul style="list-style-type: none"> ■ I1: Current situation analysis report. ■ I2: Action Plan ■ I3: Number of households using coal for heating ■ I4: Number of households switching to more renewable and/or clean energy sources instead of coal. ■ I5: The amount of greenhouse gas reduction (tCO₂e) achieved through the transition. 		
NOTES		
According to the data obtained from Karşıyaka Municipality IT Directorate, there are 26.000 buildings in Karşıyaka district. There is an average of 2,64 people per household, and according to non-household-based information, there are 10,000 license registrations after 2007. 3.490 buildings with natural gas system, 3.873 buildings with electricity and 2.172 buildings with stoves appear in data processing records...		
According to the records obtained from the IT Department and after 2007; The number of independent households using natural gas is 90.434, the number of households heated by electricity is 62.112, and the number of households heated by stoves is 36.509.		
The information given by İzmirgaz on 13.07.2021 is as follows: Number of Households in Karşıyaka: 101.093, number of subscribers using it for heating: 57.397 (combi-central heating-radiant heating). It is predicted that 80% of the 43.696 households, which emerged as a difference, have air conditioners etc. <u>vehicles</u> use electric heating, while the remaining 20% (approximately 8.740 households) uses coal.		
In the İBB SECAP 2030 plan, it has been calculated that more than 210.000 households in İzmir use coal for heating and in these households, in case of switching to more renewable energy sources (geothermal, electricity) instead of coal, there will be 83.331 tCO ₂ e greenhouse gas reduction. With the prediction that the number of subscribers using coal in Karşıyaka is approximately 8.740 households, it can be predicted that a greenhouse gas reduction of approximately 3.500 tCO ₂ e can be achieved in the case of switching to more renewable energy sources instead of coal in Karşıyaka district.		
Some of the Cumhuriyet, Örnekköy and İnönü neighborhoods within the borders of Karşıyaka district are still unplanned areas. Citizens' preference in these areas is primarily to be a natural gas subscriber. Applications are available at İzmirgaz. Field's lack of planning slows the transition from coal to natural gas, the transition from coal to natural gas will accelerate in these neighborhoods with the elimination of this unplanned problem		

ACTION NO	ACTION TITLE	
E.6	Participating in Twinning Programs with Cities and Organizing Joint Events	
SDG - 2030		
		
		
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION		DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>
EYLEM TANIMI		
Ensuring joint matching with cities that have gained practical experience in the field and comparable with the population and urban structure of Karşıyaka district, and organizing activities for information transfer.		
REASON		
It is aimed to benefit from international grant programs and to ensure the flow of information.		
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
H3.1	Ensuring a planned and healthy urban development.	
H3.2	Making necessary arrangements and new facilities in line with the needs, working to ensure economic harmony between regions by developing cooperation.	
RESPONSIBLE	STAKEHOLDERS	
Karşıyaka Municipality	International Organizations, Universities	
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2020	2030	Grant Support
FINANCE OPTIONS		
International Funding Sources, Financial Institutions.		
IMPLEMENTATION STEPS		
1. Research and communication of cities with twinning potential. 2. Following international grant calls and making project applications. 3. Providing city twinning. 4. To organize joint experience transfer and knowledge sharing activities. 5. Reporting the results of collaborative work.		
MONITORING INDICATORS		
<ul style="list-style-type: none"> ■ I1: Number of project calls applied for. ■ I2: Number of projects accepted and implemented. ■ I3: Number of cities that have been matched. ■ I4: Number of jointly organized activities. ■ I5: Number of reports 		
NOTLAR		
Karşıyaka Municipality currently benefits from 2 different programs to participate in twinning programs with European cities and to organize joint events. Karşıyaka Municipality develops strategies to take measures against the harmful effects of climate change, which threatens the future of the world, and to reduce its carbon footprint. It also attaches importance to national and international cooperation and transfer of good practices in its work in this field. For this purpose, it was accepted into the "Interreg MED Efficient Building" project, with the funding provided by "Energy Cities" and "Interreg MED", to ensure energy efficiency in public buildings, and matched with the City of Mostar. At the same time, it applied for the "Covenant of Mayors" city twinning program in order to increase its staff and institutional capacity working in the field of climate and energy and was accepted. All local governments accepted to the program will take part in the process as both a mentee and a mentor. In the first phase of the project, Karşıyaka Municipality will receive mentoring services from Bucharest, Romania, and Prague, Czech Republic, for one year. In this context, preparatory meetings, study visits, monitoring and evaluation activities will be carried out. The municipality will use the gains it has made at the end of a year to guide another city this time in this context, Karşıyaka Municipality will guide the Portuguese city of Setubal on adaptation and mitigation issues for a year. In both twinning schemes, all activities are funded by the granting institutions.		





ACTION NO	ACTION TITLE	
E.7	Implementation of an Environmental Labeling Program for Private Businesses in the City	
SDG – 2030		   
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>
ACTION DEFINITION		
Including private enterprises in a determined environmental labeling program in order to increase their awareness on climate change and energy consumption ve providing information about the environmental impact of production/service processes in the enterprise.		
REASON		
It is recommended to encourage private enterprises to participate in clean energy and green infrastructure efforts. This labeling program will be made by informing private businesses that being green and environmentally friendly will provide many advantages in service and product marketing processes.		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
ES1.11	Implementation of an environmental labeling program for companies in Izmir.	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
H3.1	Ensuring a planned and healthy urban development.	
RESPONSIBLE		STAKEHOLDERS
Karsiyaka Municipality		Private sector companies, IMM, Cooperatives, NGOs, Financial Institutions.
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2022	2030	Design and Development Cost: 10.000 Operating Cost: 600
FINANCE OPTIONS		
Municipal Budget (design and development cost), Relevant private sector (operating cost)		
EXPLANATION ON GREENHOUSE GAS REDUCTION		
The prepared certificate program aims to reduce greenhouse gas emissions from all directions. The operating cost of this program is closely related to the economic situation of the country. The impact will be significant as the number of participating businesses increases.		
IMPLEMENTATION STEPS		
<ol style="list-style-type: none"> 1. Assignment of the project team (appointment of consultants and relevant municipal employees). 2. Determining the scope of the environmental labeling program and marketing campaign in communication with IMM. 3. Creation of the application program. 4. Providing information by contacting private enterprises. 5. Labeling for interested private businesses. 6. Monitoring the development and success of the implementation plan. 		
MONITORING STEPS		
<ul style="list-style-type: none"> ■ I1: Number of businesses contacted and referred. ■ I2: Number of businesses included in the labeling program. ■ I3: Monitoring and interpretation of annual energy consumption (MWh) and greenhouse gas emissions (tCO₂e) of enterprises included in the labeling program. 		
NOTES		
Implementation of an environmental labeling program for private businesses in the city is in the project drafting stage. It is planned as an annex to the Urban Design Guide. The Environmentally Friendly Business Certificate will include different categories and classes, and will provide some exemptions during the license phase and during the operation. Cooperation with financial institutions will ensure that this certificate will have a positive effect on the financial support applications of the enterprise. In-scope and out-of-scope parameters will determine the class of the certificate. The following features are some of the elements to be considered in the evaluation list. These elements will be updated in parallel with technological and legislative changes.		

During the construction phase;

Evaluation of the environmental impact during the construction phase.
The use of green certified materials and/or the materials which do not contain hazardous chemicals.
Being possible to recycle/recover all the materials used.
Existence of garbage chutes, waste chutes and recycling waste collection areas.
It includes green roof, vertical garden, xerophytic planting applications.
Having a class A energy efficiency certificate.
Use of Renewable Energy Source.
Use of smart and reportable systems in heating and lighting.
Use of presence sensitive sensors in heating, lighting and water use, in all luminaires.
Use of permeable floors and reflective surfaces.
Using natural lighting and ventilation techniques.

During the operation phase;

Participation in Volunteering activities that raise awareness in Conservation of Natural Resources.
Use of gray water.
Not using disposable plastic material.
Rainwater storage and use in public areas
Separating waste at its source, accumulating and recycling it by giving it to the municipality's waste collection system.
Emissions and discharges are kept under control and the parameters are below the determined limits.
It does not create noise and sound pollution, it does not create sound pollution below the determined decibel.
Does not cause light and visual pollution.

ACTION NO	ACTION TITLE	
E.8	Replacing Park/Garden and Street Lighting with LED	
SDG - 2030		  
SECAP CONTRIBUTION OF THE ACTION		
GREENHOUSE GAS EMISSION REDUCTION	<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION		
Replacing park and street lighting within the borders of Karşıyaka district with LED.		
REASON		
In Karşıyaka district, energy consumption for lighting purposes is 16.857 MWh/y according to 2018 reference year data. The greenhouse gas footprint of this consumption is 8.292 tCO ₂ e. Energy consumption and greenhouse gas footprints will be reduced by replacing both park and street lighting with LED.		
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP		
ES1.7	Replacing all street lighting owned/operated by the municipality with LED	
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN		
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.	
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.	
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.	
H2.4	Increasing the service quality and capacity in order to create a cleaner city by protecting environmental health.	
RESPONSIBLE		STAKEHOLDERS
Karsiyaka Municipality, Izmir Metropolitan Municipality		Ministry of Transport and Infrastructure, Regional Directorate of Highways, Manufacturers, Founding Firms, Financial Institutions, Citizens as Users
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2021	2030	200.000
FINANCE OPTIONS		
Municipality budget, IMM budget, public-private partnerships, international financial institutions, ilbank.		
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)	
2.500	1.250	
EXPLANATION ON GREENHOUSE GAS REDUCTION		
Compared to the 2018 reference year, it is predicted that the current lighting energy consumption and greenhouse gas footprint will be reduced by approximately 15%.		

IMPLEMENTATION STEPS
<ol style="list-style-type: none"> 1. Making energy consumption analysis of lighting zones (Current Situation Analysis Report). 2. Preparation of feasibility report for LED installation. 3. Exploring financing options. 4. Creating an action plan. 5. Implementation of replacing park and street lighting with LED. 6. Monitoring the effects of lighting equipment change on energy production and greenhouse gas reduction
MONITORING INDICATORS
<ul style="list-style-type: none"> ■ I1: Current situation analysis report. ■ I2: Action plan. ■ I3: Percentage of illumination that has been replaced (%). ■ I4: Annual energy consumption (MWh) and greenhouse gas reduction amount (tCO₂e) achieved due to change.



ACTION NO	ACTION TITLE			
A.1	Expanding the Practices of Separate Collection of Packaging Waste at Source			
SDG - 2030	17 PARTNERSHIPS FOR THE GOALS	13 CLIMATE ACTION	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION		<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY	
ACTION DEFINITION				
It is obvious that waste should be considered as an important value in Karşıyaka district and the recyclable wastes should be collected separately at the source without contamination. Separate collection of recyclable waste, including packaging waste, needs to be developed in order to significantly reduce the amount of final solid waste sent to landfill. It is aimed to disseminate the pilot scale applications throughout the district, to establish the collection systematic and to ensure the active participation of all relevant parties.				
REASON				
In the waste characterization study carried out in Izmir in 2018, it was determined that recyclable packaging wastes have the largest share (~19%) in urban solid waste. Therefore, mandatory separate collection of clean recyclable materials; The amount of waste to be disposed of (to be sent to the solid waste landfill) (according to the Zero Waste Regulation, the waste sent to disposal must be reduced by at least 15%) and, in this way, it will reduce the capacity required for final disposal (the space requirement for waste storage). It will contribute to the economy by creating resources. It will be beneficial for the sustainable ecosystem due to the conservation of natural resources. Public participation and adoption of the project will be ensured with some incentive practices and exemplary studies, and awareness of the climate crisis and the importance of adaptation will be increased.				
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP				
SW 1.3	Mandatory separate collection of recyclable dry materials by setting policies at district municipality level			
SW 1.6	Partnering and/or cooperating with relevant institutions that can act in accordance with the Zero Waste Regulation in order to invest in the necessary recycling infrastructures (trash cans, trucks, routes, etc.)			
SW 1.4	Based on Izmir Integrated Solid Waste Management Plan (2018) Supporting and accelerating investments in Waste separation (dry recyclable wastes and organic wastes) and clean material recovery infrastructure and composting facilities			
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN				
A2, H2.2	Protecting the environment and developing a zero waste management system by increasing the awareness of nature and environment in the society.			
RESPONSIBLE		STAKEHOLDERS		
Karşıyaka Municipality		IMM, Public Institutions, Waste Collection and Separation Contractors, People of Karşıyaka, Shopping Mall Managements, Commercial Enterprises, Union of Chambers of Turkish Engineers and Architects		
IMPLEMENTATION START		IMPLEMENTATION END	ESTIMATED COST (\$)	
2019		CONTINUALLY	200.000	
FINANCE OPTIONS		FINANCE RETURN TIME (YEAR)		
Municipal budget, Grant Supports, National and International Funds		INCLUDED IN BASIC SERVICE		
2030 ENERGY REDUCTION (MWh)		2030 GREENHOUSE GAS EMISSION REDUCTION (tCO ₂ e)		
-		The urban waste sector is included in the calculation of the greenhouse gas reduction		
EXPLANATION ON GREENHOUSE GAS REDUCTION				
As the separate collection and recovery of packaging waste at the source increases, the amount of domestic solid waste transported to the landfill will decrease in 2030. (See monitoring indicators: I2).The amount of greenhouse gas reduction is calculated as the reduction of methane gas emissions from this landfill.				
IMPLEMENTATION STEPS				
Provision of special collection areas and equipment so that packaging waste can be collected separately in all neighborhoods and streets. Establishment of waste delivery points, especially in areas such as marketplaces and marketplaces, development of incentive practices according to the amount of waste delivery by working with IMM. Increasing the number of mobile waste collection centers.				
Expanding the electric bicycle application, which collects waste from shops, stores and businesses, both in the marketplace and in other business-intensive places.				
MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025 Goal	2030 Goal
I1	Annual amount of mixed packaging waste collected separately (kg/year)	20.651.426	32.830.326	43.818.595

I1-1	Annual amount of recycled paper-cardboard-composite packaging waste (kg/year)	4.680.427	7.091.350	9.464.817
I1-2	Annual amount of other recycled plastic packaging waste (kg/year)	7.013.124	10.341.553	13.802.857
I1-3	Annual amount of recycled glass packaging waste (kg/year)	7.378.265	10.932.498	14.591.592
I1-4	Annual amount of recycled metal packaging waste (kg/year)	786.899	1.181.892	1.577.469
I2	Annual amount of domestic waste transported from Karşıyaka district to the sanitary landfill (kg/year)	121.789.000	109.882.690	109.652.179
I3	Annual household waste per person transported from Karşıyaka district to the sanitary landfill (kg/person-year)	347.869	295.688	277.984
I4	The number of packaging waste collection containers-piggy banks within the boundaries of the district (unit)	491	800	1750
I5	Number of Mobile Waste Retrieval Centers within the boundaries of the district (unit)	4	15	25

NOTES





Karşıyaka Population:

2020: 350.100 person Turkish Statistical Institute
 2025: 371.616 person (With an annual population growth rate of 1.2%)
 2030: 394.455 person (With an annual population growth rate of 1.2%)

Waste classification and recycled amount information has been determined according to the records of the licensed institution in the packaging waste system. The waste rate that cannot be recycled from the collected mixed packaging waste is accepted as 10%. (2025-2030)

According to the 2018 Municipal Waste Statistics applied to all municipalities in our country by Turkish Statistical Institute, the average daily waste collected per person for Turkey is calculated as 1.16 kg. In the same context, the total amount of waste (recycled packaging waste + waste transported to landfill) collected under the responsibility of Karşıyaka Municipality for 2020 is 1,115 kg per person.

The emission reduction effect of the recycling and recovery of wastes collected separately at the source will be evaluated in detail over the waste types in the upcoming monitoring periods.

ACTION NO	ACTION TITLE			
A.2	Developing a Program for Separate Collection and Composting of Domestic Organic Wastes, Marketplace Wastes and Park and Garden Wastes			
SDG – 2030				
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION		<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY	
ACTION DEFINITION				
It is seen as an important value in Karşıyaka district and these valuable wastes should be collected separately at the source. In order to significantly reduce the amount of solid waste per person transported to storage areas, it is aimed to develop practices for the separate collection of domestic organic waste, marketplaces and garden waste, to establish a systematic collection and to ensure the active participation of all relevant parties.				
REASON				
Separate collection/separation of domestic organic waste, marketplaces and garden wastes will reduce the amount of waste to be disposed of (to be sent to the solid waste landfill). In this way, the capacity (area for regular storage) of solid waste disposal facility / facilities will also decrease. By using the produced compost in agricultural production and horticulture, sustainable and smart agricultural practices will be supported and soil quality will be improved. The use of artificial fertilizers will be reduced and thus the risk of soil and groundwater pollution will be prevented. The energy, fuel consumption and greenhouse gas emissions, which result from the waste collection and transportation activities of Karşıyaka Municipality will decrease.				

Public participation and adoption of the project will be ensured with some incentive practices and exemplary studies. Awareness of the importance of climate crisis and adaptation will increase. Awareness will be raised about the prevention of waste at its source with the dissemination of waste management principles and it will contribute to the prevention of food waste.

THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY AND SECAP

SW 1.16	Examination of the possibility of providing special waste collection services to the artisans working in the restaurants and food sector in accordance with the management infrastructure and technology.
SW 1.1	Organizing city-wide social awareness campaigns (eg in schools) to reduce the amount of waste in households and segregate waste
SW 1.4	Supporting and accelerating investments in waste separation (dry recyclable wastes and organic wastes) and clean material recovery infrastructure and composting facilities based on the Izmir Integrated Solid Waste Management Plan (2018)

THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN

A2, H2.2:	Protecting the environment and developing a zero waste management system by increasing the awareness of nature and environment in the society.
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RESPONSIBLE	STAKEHOLDERS	
Karşıyaka Municipality	İzmir Metropolitan Municipality, Union of Chambers of Turkish Engineers and Architects, People of Karşıyaka, Food businesses, Restaurant and cafe businesses, Compost facility investors	
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2021	2025	60.000
FINANCE OPTIONS	FINANCE RETURN TIME (YEAR)	
Municipal budget, Grant loans	It is not an income generating activity.	
2030 ENERGY REDUCTION(MWh)	2030 GREENHOUSE GAS EMISSION REDUCTION (tCO2e)	
	The urban waste sector is included in the calculation of the greenhouse gas reduction	

EXPLANATION ON GREENHOUSE GAS REDUCTION

As the separate collection of organic wastes to be composted at the source increases, there will be a decrease in the amount of domestic solid waste transported to the landfill in 2030. (See Monitoring indicators: I1, I2, I3) The amount of greenhouse gas reduction is calculated as the reduction of methane gas emissions from this landfill.

IMPLEMENTATION STEPS

Developing a special system for the separate collection of food-derived organic waste for households, food industry businesses, restaurants and cafes, cooperation with Professional Chambers and Non-Governmental Organizations
 Establishment of a special collection system so that organic household waste can be collected separately in all neighborhoods and streets.
 Making the necessary planning for the collection of municipal park and garden waste, marketplace waste and their use in compost production.
 Training of relevant human resources consisting of waste collectors and compost producers
 Carrying out awareness and participation activities in households and businesses
 Planning the waste raw material input of the compost process
 Creating a storage and application plan of soil improver and/or fertilizer obtained as a result of compost process

MONITORING INDICATORS

No	Indicator	Current Situation (2020)	2030 Goal
I1	Annual amount of domestic organic waste collected separately at the source (kg/year)	0	10.965.000
I2	Annual amount of marketplace organic waste collected separately at the source (kg/year)	500.000	550.000
I3	Annual amount of park and garden waste collected separately at the source (kg/year)	47.291.000	50.000.000
I4	Ratio of organic waste in household waste (%)	42,65	32,65
I5	Reduction target of park and garden wastes going to landfill (%)	-	70
I6	Reduction target of domestic organic wastes going to landfill (%)	-	10
I7	Reduction target of marketplace waste going to landfill (%)	-	50

NOTLAR

Karşıyaka Population:

2020: 350.100 kişi (Turkish Statistical Institute)
 2030: 394.455 kişi (With an annual population growth rate of 1.2%,)



The marketplace organic waste generated in 2020 has been accepted as approximately 500 tons. The projected amount for 2030 is 550 tons. The compost target to be obtained from these wastes has been taken as 50%. Since the animal producers from the surrounding villages collect some of the market waste, 100 tons of vegetable waste is allocated for agricultural activity support. The activities of using 100 tons of the waste as animal feed will continue. This amount is not included within the 50% compost target. In other words, market waste that is expected to be used as both compost and animal feed in 2030 is 375 tons. It is envisaged that all of the domestic organic waste collected separately at the source will be used as compost. It is envisaged that 70% of the park and garden waste collected separately at the source (35,000 tons for 2030) will be used as compost.



ACTION NO		ACTION TITLE	
A.3		Preventing Marine Pollution by Improving Waste Management Practices	
SDG – 2030	17 PARTNERSHIPS FOR THE GOALS	13 CLIMATE ACTION	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
SECAP CONTRIBUTION OF THE ACTION			
GREENHOUSE GAS EMISSION REDUCTION		<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION			
Recognizing the importance of separating the wastes at the source in households, hotels, motels, restaurants, cafeterias and entertainment places under the title of 'Preventing Marine Pollution' in order to prevent marine pollution caused by wastes that can mix into the gulf from the coast and coastline, streams and establishing a procedure for more comprehensive separation of especially plastic waste within the standard waste collection activity			
REASON			
The mixing of disposable packaging waste, especially plastic waste, into the sea increases the pressure on the marine ecosystem. In order to reduce this pressure, which may also have negative effects in the Izmir Bay, the practices of preventing waste at its source, reducing, collecting separately and bringing it into the economy will be improved. (It should be evaluated together with action no. A.1). It will be emphasized that correct waste management practices prevent not only soil, groundwater and air pollution, but also surface water and sea pollution to a large extent. The use of marine vessels and special-purpose equipment to collect waste at stream mouths and on the beach will be expanded.			
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY			
SW 1.1	Organizing city-wide social awareness campaigns (eg. in schools) to reduce the amount of waste in households and segregate waste		
SW 1.3	Mandatory separate collection of recyclable dry materials by setting policies at district municipality level		
SW 1.10	The municipality commits to ban the use of single-use plastics in municipal buildings, thereby encouraging local businesses to implement the same ban		
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN			
A2, H2.2	Protection of the environment by increasing the awareness of nature and environment in the society, development of a zero waste management system		
RESPONSIBLE		STAKEHOLDERS	
Karsiyaka Municipality		International organizations, IMM, relevant waste collection-separation-recycling sector stakeholders, People of Karşıyaka, tourism operators	
IMPLEMENTATION START		IMPLEMENTATION END	ESTIMATED COST(\$)
2022		2025	50.000
FINANCE OPTIONS			
Municipal budget, Grant Support, National and International Funding Sources			
2030 ENERGY REDUCTION (MWh)		2030 GREENHOUSE GAS EMISSION REDUCTION (tCO2e)	
-		The Urban Waste Sector is included in the Greenhouse Gas Reduction calculation.	
EXPLANATION ON GREENHOUSE GAS REDUCTION			
More systematic waste separation from tourism and entertainment venues, which produce a high amount of packaging waste besides households will be ensured and the collection of wastes thrown into streams and beaches will significantly increase the amount of mixed packaging waste collected. The waste collection capacity targeted by this project is included in the action no. A.1.			
IMPLEMENTATION STEPS			
Information and equipment support for a healthy separation of waste in tourism and entertainment venues. Informing households about the separation of waste at source and the use of waste collection equipment Buying and placing special design waste collection equipment where households will put their wastes (defined in action no. A.1). Use of marine vessels and special-purpose equipment to collect garbage at creek mouths and on the beach Separation of packaging materials from wastes collected by sea vehicles (Metal-glass-plastic) Contributing to the cleanliness of the Izmir Bay, the Aegean Sea, and therefore the Mediterranean			

MONITORING INDICATORS			
No	Indicator	Current Situation (2020)	2030 Goal
I1	Recyclable waste collected from beaches and streams (kg/year)	0	20.000
NOTES			



Karşıyaka District has a 464 km coastline and 12 km coastline in the inner gulf region of Izmir Bay. Green areas, restaurants and cafeterias along the coastline and Karşıyaka Çarşı are intense social and commercial areas. Especially packaging waste production is high. Separating these wastes at the source and recycling them, besides all the other benefits, is also very important for the prevention of marine pollution.

Karşıyaka district is directly and indirectly related to four creeks in total, including the Peynircioğlu and Ahırkapı-Bostanlı creeks, one creek at the Çiğli district border, and another creek that passes through Karşıyaka and reaches the bay from the Bayraklı border. The packaging wastes that can be transported by these streams pollute the Izmir Bay-Aegean Sea-Mediterranean Sea. The collection of packaging wastes in these streams is important in terms of reducing sea pollution.



ACTION NO		ACTION TITLE	
A.4		Implementation of the Smart Waste Collection System Digital Application	
SDG - 2030			
SECAP CONTRIBUTION OF THE ACTION			
GREENHOUSE GAS EMISSION REDUCTION		<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION			
<p>It is aimed to strengthen the recycling infrastructure of Karşıyaka Municipality, to increase the waste collection capacity, and to ensure the participation of the public in the 'Zero Waste' approach with the digital application, which is a software product developed for smart cities. Thanks to the software product mobile application and web panel, the resources that produce the recyclable wastes in homes and businesses and the recycling tools that collect these wastes are combined.</p>			
REASON			
<p>Due to the increasing population and population density (urbanization), industrialization and increasing living standards in cities, the existing infrastructures of the cities are insufficient. Smart digital technologies, which enable public services to be performed more efficiently at less cost, will be the key to sustainable life in cities.</p> <p>Solid waste disposal facilities, which are established at more distant points in each new planning due to cities growing both spatially and vertically, increasing environmental pressures, difficulty in finding areas compatible with land cover (forest, agriculture, etc.) and existing land uses (settlement, industry, site and protection, etc.) for solid waste facilities, social reactions, have made the transportation of solid waste the most difficult and costly stage of solid waste management.</p> <p>Hourly, daily, seasonal and local (from one container to another) fluctuations in solid waste generation make the establishment and operation of the solid waste collection system technically difficult. For this reason, the capacity, number and location of waste collection containers and the collection route and collection frequency of waste collection vehicles are important issues that need to be optimized between public health in the city and the satisfaction of the public with municipal services and the cost of collection services. While more frequent waste collection creates a positive situation in terms of human health and public satisfaction, it increases the cost of waste collection service.</p>			
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY			
SW 1.6	Partnering and/or cooperating with relevant institutions that can act together in accordance with the Zero Waste Regulation in order to invest in the necessary recycling infrastructures (garbage containers, trucks, routes, etc.)		
SW 1.17	Evaluation of waste collection infrastructure (collection service, collection rate, garbage cans/containers, vehicles), smart collection systems and route optimization software in cooperation with district municipalities.		
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN			
A2, H2.2	Protecting the environment by increasing the awareness of nature and the environment in the society, developing a zero waste management system		
RESPONSIBLE		STAKEHOLDERS	
Karşıyaka Municipality		Software companies, waste collection and separation contractor, Karşıyaka people, private and public institutions, tradesmen, businesses, Union of Chambers of Turkish Engineers and Architects	
IMPLEMENTATION START		IMPLEMENTATION END	ESTIMATED COST (\$)
2022		Continuous	120.000 (cost until 2030)
FINANCE OPTIONS			
Municipal budget, Funds, Grants			
2030 ENERGY REDUCTION (MWh)		2030 GREENHOUSE GAS EMISSION. REDUCTION (tCO2e)	
The Urban Waste Sector is included in the Greenhouse Gas Reduction calculation.			
EXPLANATION ON GREENHOUSE GAS REDUCTION			
Since the efficiency of the waste collection system will increase the waste collected for the fuel consumed by the vehicles, greenhouse gas emissions will decrease due to both the increase in the separately collected and recycled wastes and the reduced fuel consumption.			
IMPLEMENTATION STEPS			
<p>Attaching/sticking level sensors/barcodes to containers and waste collection points in the field Yazılım ve uygulama ile ilgili çalışmaların tamamlanması</p> <p>Informing citizens who apartment management and site management who separate their wastes at the source, about using the application.</p> <p>Consolidation of collection vehicles and waste generators on one platform thanks to sensors/barcodes</p> <p>Dynamically creating vehicle routes according to waste producer notification and sensor occupancy signal</p> <p>Implementation of incentive practices such as earning money points and giving gifts related to the amount of wastes given to the system.</p>			
MONITORING INDICATORS			
No	Indicator	Current Situation (2020)	2030 Goal
11	Number of waste producers / users using the application	0	3.000

12	Number of containers with sensors monitored in the field	0	500
NOTES			
The 'Smart Waste Collection System' digital application defined in this action and the 'Route and Vehicle Fleet Optimization for Waste Collection and Transportation' projects defined in action no. A.5 will jointly serve to reduce corporate greenhouse gas emissions resulting from waste transportation fuel consumption.			

ACTION NO		ACTION TITLE	
A.5		Reducing Greenhouse Gas Emissions from Waste Collection/Transport within the Scope of Institutional Greenhouse Gas Inventory	
SDG - 2030			
SECAP CONTRIBUTION OF THE ACTION			
GREENHOUSE GAS EMISSION REDUCTION		<input checked="" type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY
ACTION DEFINITION			
<p>The purpose of this action is to replace the 770 liter galvanized garbage container on-site and replace the 5000 liter and 2600 liter above-ground garbage container and set the collection points and to create efficiency and fuel savings in waste collection activities with the sensor monitoring system of the recycled garbage containers. In addition, it is aimed to explore possibilities and develop applications to increase the number of electric and hybrid vehicles powered by renewable energy sources in the waste transportation fleet.</p>			
REASON			
<p>the most important emission source after electricity consumption is mobile resources used for transportation and transportation purposes within the scope of Karşıyaka Municipality's corporate greenhouse gas inventory,.Among these, the biggest greenhouse gas emission occurs as a result of the waste collection activities carried out within the boundaries of the district and the transportation of these wastes to the landfill. Therefore, minimizing greenhouse gas emissions from waste collection/transportation is very important.</p> <p>Within the scope of the smart waste collection system planned to be established, first of all, transition from galvanized sheet metal containers with a capacity of 770 liters above ground to large containers with a capacity of 5000 liters underground and 2600 liters above ground will be provided as much as possible. Then, resource planning will be efficient thanks to the monitoring of the occupancy rates of these underground and aboveground (except for the 770 lt galvanized sheet) containers with sensors, the waste producers sending real-time notifications using digital applications, and the optimization of the collection route accordingly. The number of garbage collection vehicles will be reduced. In addition, reduction in urban traffic and fuel consumption of waste vehicles will be achieved. In addition, opportunities will be explored to increase the number of electric and hybrid vehicles powered by renewable energy sources in the waste transport fleet, and if the vehicle fleet is improved in this direction, the total fuel consumption will continue to decrease. As the number of such tools increases, awareness in the society will increase and institutional practices will be implemented.</p> <p>Due to the system to be installed, garbage overflows and loss of waste containers will be prevented, and the negative consequences of small above-ground containers that can cause environmental visual pollution, odor pollution and the presence of pests will be reduced. Healthier and more hygienic environmental conditions will be provided..</p> <p>In addition to increasing the efficiency in route planning of vehicles, the fulfillment of tasks and productivity will be monitored. Moreover, the location and maintenance of assets will be tracked. The location of the vehicles will be monitored. In this way, driver performance analysis and fuel management will be provided. Thanks to digital applications, public participation and communication with employees will be simplified and it will be possible to monitor performance periodically.</p>			
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP			
SW 1.6	Partnering and/or cooperating with relevant institutions that can act together and in accordance with the Zero Waste Regulation in order to invest in the necessary recycling infrastructures (trash cans, trucks, routes, etc.)		
SW 1.17	Evaluation of waste collection infrastructure (collection service, collection rate, garbage cans/containers, vehicles) in cooperation with District Municipalities, including smart collection systems and route optimization software		
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN			
A2, H2.2	Protecting the environment by increasing the awareness of nature and the environment in the society, developing a zero waste management system		
A2, H2.3	In order to create a sustainable city, climate change and Carrying out studies within the scope of protection from the effects		
RESPONSIBLE		STAKEHOLDERS	
Karşıyaka Municipality		IMM, Container Manufacturers, Software Companies, People of Karşıyaka	

IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)		
2022	Continuous	70.000		
FINANCE OPTIONS				
Municipal budget, Funds, Grants				
2030 ENERGY REDUCTION (MWh)	2030 GREENHOUSE GAS EMISSION. REDUCTION (tCO ₂ e)			
2.031,6	537,1			
EXPLANATION ON GREENHOUSE GAS REDUCTION				
The digitization of the waste collection system, the conversion of above-ground containers to underground and large-volume above-ground containers will reduce the collection point and increase the amount of the waste collected in return for the fuel consumed by the vehicles. Thus, corporate greenhouse gas emissions will decrease due to reduced fuel consumption in total. A 20% reduction in fuel consumption is targeted until 2025 and an additional 20% reduction until 2030.				
IMPLEMENTATION STEPS				
Development of waste collection infrastructure (collection service, collection rate, garbage containers) including smart collection systems and route optimization software, Efforts to increase the number of new system underground (5000 liters) and aboveground (2600 liters) garbage containers with higher dimensions instead of the lower capacity galvanized garbage containers (770 liters) and thus reducing the number of vehicles, Increasing the number of electric and hybrid vehicles fed from renewable energy sources in the waste transport fleet, developing applications for their use and solving feasibility problems.				
MONITORING INDICATORS				
No	Indicators	Current Situation(2020)	2025 Goal	2030 Goal
I1	Fuel consumption of solid waste vehicle fleet of Directorate of Cleaning (lt)	562.916	450.333 (20% Reduction)	360.266 (20% Reduction)
I2	Number of electric and hybrid vehicles powered by renewable energy sources in the waste transport fleet (pieces)	2 Vacuum Cleaners (100% electric)	3 Vacuum Cleaners (100% electric) 1 Hybrid Hydraulic Compression Garbage Collection Truck	4 Vacuum Cleaners (100% electric) 2 Hybrid Hydraulic Compression Garbage Collection Truck
I3	Number of underground and aboveground large-volume containers	325 in total	525 in total	725 in total
NOTES				
The greenhouse gas emissions resulting from the solid waste vehicle fleet fuel consumption of the Cleaning Works Department are calculated as follows: 2020 1491,79 tCO ₂ e 2025 1193,43 tCO ₂ e 2030 954,74 tCO ₂ e				



ACTION NO	ACTION TITLE			
S.1	Making Regulations on Water Management for the Prevention of Floods			
SDG - 2030	17 PARTNERSHIPS FOR THE GOALS	13 CLIMATE ACTION	6 CLEAN WATER AND SANITATION	11 SUSTAINABLE CITIES AND COMMUNITIES
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION		<input type="checkbox"/>	DEVELOPING CLIMATE ADAPTATION CAPACITY	
			<input checked="" type="checkbox"/>	
ACTION DEFINITION				
In line with İzmir's Green Infrastructure Strategy, Urban Green UP program and İzmir Water and Sewerage Administration General Directorate Strategic Plan integration and İzmir SECAP actions, the following storm water management techniques will be applied for a city that is resistant to floods and overflows. <ul style="list-style-type: none"> • Installing smart water storage systems such as collection tanks, reservoirs or damping basins in and around municipal buildings and sites • Construction of rainwater storage tanks in suitable areas • Applications for the reuse of rainwater • Green roof applications that will ensure the absorption of rain water in buildings • Green Areas • Use of permeable materials on pavements and roads • Creating permeable areas on pavements and roadsides that can absorb rainwater • Implementation of the principles of Water Sensitive Urban Design and Sustainable Urban Drainage System in new buildings 				
REASON				
Impermeable surfaces increase the rainwater runoff rate. The fact that the current network capacity cannot meet the high precipitation flow increases the risk of flood and overflow. On the other hand, the transportation of urban pollution to the network and wastewater treatment systems with high precipitation negatively affects the capacity and efficiency of the existing systems. Applications such as collecting rain water for reuse before it is given to the network, connecting it to the network by absorbing it from permeable surfaces or feeding groundwater will increase the resilience of the city.				
THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY AND SECAP				
WCM1.4	Establishment of rainwater storage systems at building level, underground, in connection with green areas in municipal or municipally operated buildings and infrastructure			
WCM1.5	Integration of storm water management techniques with the green areas of the city, for example the application of sponge city principles			
WCM1.9	Within the scope of green infrastructure, the implementation of sustainable urban drainage and water-sensitive urban design principles in all planned green areas and buildings of the municipality.			
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGİC PLAN				
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.			
H2.1	Protecting existing green areas and increasing the amount of green areas per person			
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city			
A3	To create a safe, planned, livable city that can meet the needs of the citizens with its infrastructure and superstructure.			
H3.1	Ensuring a planned and healthy urban development			
RESPONSIBLE		STAKEHOLDERS		
Karsiyaka Municipality		İMM, İzmir Water and Sewerage Administration General Directorate, Ministry of Environment, Urbanisation and Climate Change, General Directorate of Nature Conservation and National Parks, Union of Chambers of Turkish Engineers and Architects, Provincial Disaster and Emergency Directorate, Universities		
IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)		
2022	Continuous	300.000		
FINANCE OPTIONS				
Municipal budget, National and International Funds				
IMPLEMENTATION STEPS				
<ol style="list-style-type: none"> 1. Identifying areas at risk of flooding and marking them on maps 2. Identifying critical infrastructure and superstructure in risky areas and marking them on maps 3. Not allowing construction in risky areas, removing illegal construction and canceling the parts of licensed buildings below the flood level 4. Identification of potential absorbent areas and surfaces to collect rainwater around areas at risk and at elevations appropriate to the downstream 5. Design and application of rainwater dampers according to the type of damping areas 6. Use of permeable materials to ensure the flow of rain water on pavements and roads 7. Increasing the amount of green space in urban planning 8. Utilizing rainwater tanks for irrigation of green areas 				

9. Use of plant species that are resistant to climate change and require less irrigation in green areas
10. Green roof applications in corporate buildings
11. Establishment of rainwater storage systems in municipal buildings and areas and reuse of stored water in areas such as irrigation, toilet flushing.
12. Establishment of incentive mechanisms for buildings that do not have rainwater harvesting and green roof requirements within the scope of IMM Zoning Regulation
13. Monitoring

MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025 Goal	2030 Goal
I1:	Amount of green area	4,75 m ²	6 m ²	8 m ²
I2:	Number of pavements and roads containing permeable material	-	2000 m ²	4000 m ²
I3:	Number of Green Roof Licensed Building	0	5	20
I4:	Stormwater Harvesting Projects and Applications	1	10	20
I5:	Amount of Water Used in Green Field Irrigation	217.282 m ³	% 10 Reduction	% 30 Reduction

NOTES






There are Bostanlı, Yamanlar, Soğukkuyu Ilica, Karşıyaka Ilica, Kartalkaya, Kocadere, Yamanlar and Serinkuyu streams in Karşıyaka district, and the maintenance and cleaning works of the streams are carried out by Izmir Water and Sewerage Administration General Directorate. In addition, a study on "Izmir Metropolitan Area Wastewater-Stormwater and Streams Master Plan" is carried out by Izmir Water and Sewerage General Directorate. Studies continue within the scope of the preparation of the Provincial Disaster Risk Reduction Plan by the Provincial Disaster and Emergency Directorate. The road map for the determination of the flood risk of the district will be created in parallel with the completion of the existing studies.

According to the Küçük Menderes Basin Settlement Evaluation and Risk Table included in the Küçük Menderes Basin Flood Management Plan, Karşıyaka district center is considered as "risky".

There are 372 parks in Karşıyaka, and the total amount of green area created in Karşıyaka is 1,244,409 m². 414,719 m² are the areas under the responsibility of Izmir Metropolitan Municipality and passive green space.

Projects such as kindergarten, ecological park, park, marketplace, where rainwater will be collected and used for irrigation are ongoing. In addition, project application areas are determined for the pilot study projects that Izmir Metropolitan Municipality plans to implement in the Yalı neighborhood of Karşıyaka District.

In these projects, besides the use of rain water, the application of permeable surfaces and the selection of plant species with low water consumption in landscaping are aimed.

ACTION NO	ACTION TITLE				
S.2	Efficient Use of Water and Actions to Save Water				
SDG - 2030					
SECAP CONTRIBUTION OF THE ACTION					
GREENHOUSE GAS EMISSION REDUCTION			DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>		
ACTION DEFINITION					
Sustainable water cycle management will be carried out in corporate buildings and subsidiaries in order to reduce the demand for drinking-use water and the amount of wastewater given to the sewer system.					
<ul style="list-style-type: none"> • Efforts to save water in corporate buildings and subsidiaries • Studies on rainwater storage and reuse in corporate buildings and subsidiaries • Studies on water saving used in public green areas • Studies on gray water treatment and reuse in corporate buildings and subsidiaries 					
REASON					
In the 11th Development Plan (2019-2023), it was emphasized that increasing water quality, the effects of climate change on water resources research, protection of the aquatic ecosystem, ensuring water efficiency in production and consumption, sustainable access to water will be taken as a basis.					
Alternative methods can be applied for sustainable water management. The amount of water consumed will be reduced by the use of economical fixtures and devices. Also, an alternative water source will be created by harvesting rainwater and reusing waste water instead of the city network. Therefore the amount of water to be drawn from the network will be reduced.					

THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP	
WCM1.11	Use of sustainable water practices and design in municipal buildings and open areas under municipal control through renovation and renovation work.

THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN	
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.

H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.
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RESPONSIBLE	STAKEHOLDERS
Karşıyaka Municipality	Izmir Water and Sewerage Administration General Directorate, Union of Chambers of Turkish Engineers and Architects, Universities

IMPLEMENTATION START	IMPLEMENTATION END	ESTIMATED COST (\$)
2020	Continuous	200.000

FINANCE OPTIONS

Municipal budget, National and International Funds

- IMPLEMENTATION STEPS**
1. Recording and monitoring of water usage amounts in institutional buildings and subsidiaries
 2. Recording and monitoring the amount of water use in public green areas
 3. Determining the current water usage areas starting from the ones which have the highest usage rate (green area, kitchen, toilet, bathroom, sink, etc.)
 4. Gathering information about the existing plumbing features, starting with the ones which have the highest usage rate (tank, pump, pipe, armature, etc.)
 5. Renewal of existing installation with water efficient installations and materials
 6. Revising public green space irrigation methods on the basis of less water use
 7. Investigation of gray water and storm water usage possibilities
 8. Implementation of gray water and storm water systems in suitable buildings and subsidiaries
 9. Creation of operation and maintenance programs for all systems used
 10. Follow-up of plumbing malfunctions and water leaks, not losing time in repairing

MONITORING INDICATORS				
No	Indicator	Current Situation	2025 Goal	2030 Goal
I1:	Applications for Gray Water Use	-	5	10
I2:	Rainwater Harvesting Projects and Applications	1	10	20
I3:	Change Rates in Installations	%30	%45	%60
I4:	The amount and change of water use in the institutional building and its participants	356.526 m ³	% 10 Reduction	% 30 Reduction
I5:	The amount and change of water use in green areas	217.282 m ³	% 10 Reduction	% 30 Reduction

NOTES

In-house bill payments are tracked every month via business and subscriber numbers. Green area and park irrigation constitute 61% of the annual consumption. This study is referenced for improvement points. The photocell faucet application has reached 30% of the municipality and the renovation works are continuing.

ACTION NO	ACTION TITLE				
S.3	Awareness Raising Studies on Water Use				
SDG - 2030					

SECAP CONTRIBUTION OF THE ACTION	
GREENHOUSE GAS EMISSION REDUCTION	DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>

ACTION DEFINITION

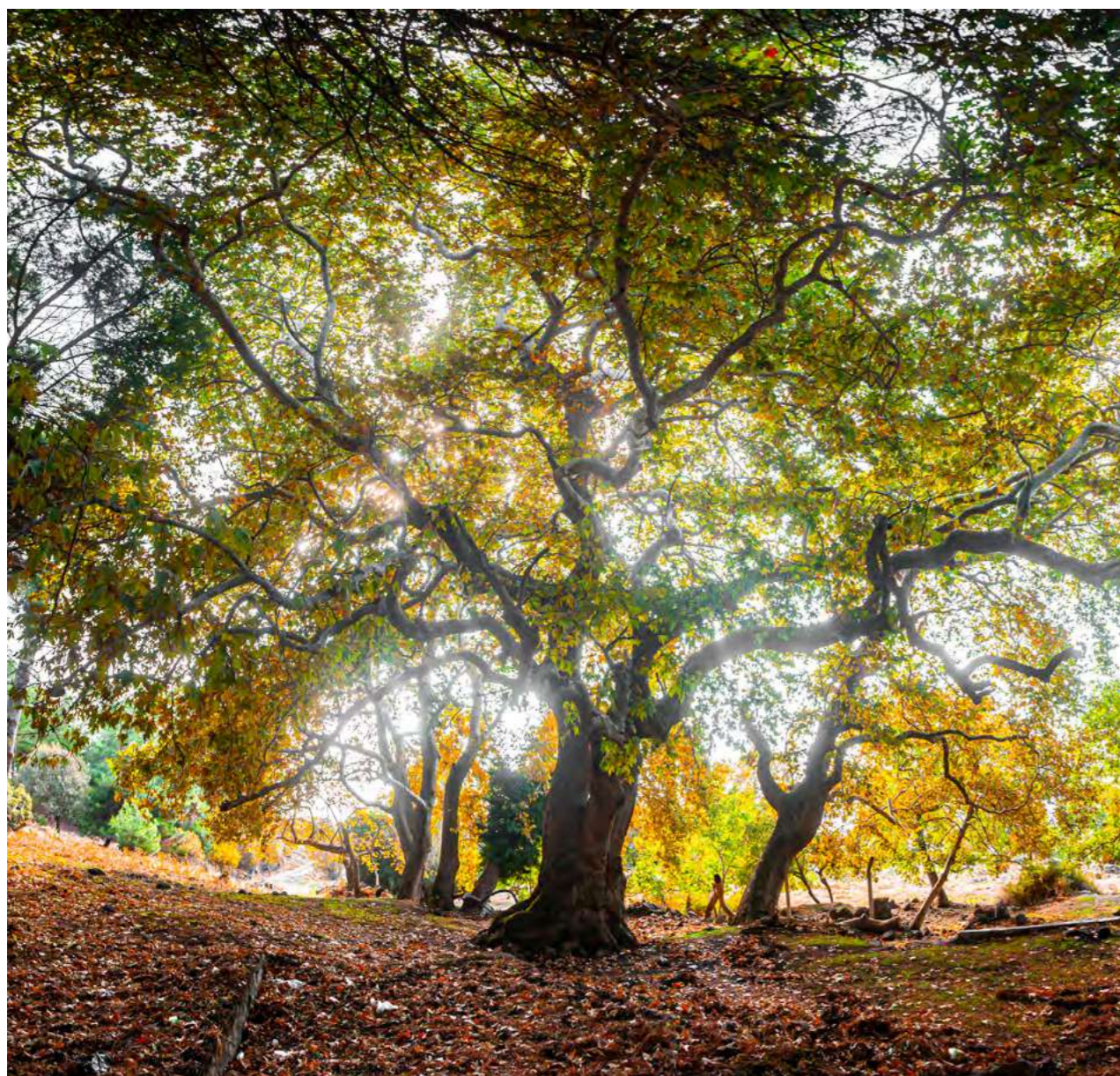
It is a fact that the negative effects of climate change on the quantity, quality and safety of water resources are important risks for public health. Therefore, it is necessary to raise awareness at institutional and urban scale for the implementation and follow-up of actions for the water sector.

REASON

Increasing awareness of the institution personnel and all sections of the city living on the vital importance of protecting our water resources and using them economically will contribute to the implementation of the measures to be taken.


THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN	
A2	To produce services with a sustainable and healthy environmental understanding that increases the quality of life.
H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.

H2.4	Protection of the environment by increasing the awareness of nature and environment in the society, zero development of waste management system			
RESPONSIBLE		STAKEHOLDERS		
Karsiyaka Municipality		Union of Chambers of Turkish Engineers and Architects, Civil Society, Universities, Citizens		
IMPLEMENTATION START		IMPLEMENTATION END		
2021		Continuous		
FINANCE OPTIONS				
Municipal budget, National and International Funds				
IMPLEMENTATION STEPS				
<ol style="list-style-type: none"> 1. Identifying internal and external stakeholders for awareness raising activities on climate change and water management 2. Preparation of information materials for water sector actions determined in institutional buildings 3. Preparation of information materials on climate change and efficient use of water at urban scale 4. Conducting in-house training and information activities 5. Determining the target profile for education and information activities at the city scale (child, student, housewife..etc) 6. Conducting city-wide education and information activities 				
MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025 Goal	2030 Goal
I1:	Survey etc. assessment tools	0	2	4
I2:	Training and number of participants	2	5	10






ACTION NO	ACTION TITLE			
SA.1	İklim Değişikliğinin Halk Sağlığına Etkilerinin Tespit Edilmesi ve Koruyucu Önlemlerin Alınması			
SDG - 2030				
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION			DEVELOPING CLIMATE ADAPTATION CAPACITY	
			<input checked="" type="checkbox"/>	
ACTION DEFINITION				
Considering the population, health and socioeconomic factors throughout the district, it is aimed to initiate a study to identify vulnerable groups, to adapt the identified groups to the Early Warning Systems to be prepared in accordance with the World Health Organization's Health Local Action Plans, to increase their rapid response capacity, and to gain the skills to start life again in a healthy and safe way when adverse conditions pass. For this purpose, it is envisaged to carry out information and awareness studies and to develop support mechanisms.				
REASON				
Policies that make the earth sick and cause global climate change, and over-unequal production and consumption also create a toxic environment that increases the likelihood of chronic disease. The chronic diseases of individuals who are malnourished, do not move, cannot breathe healthy air, cannot consume healthy water, live under stress and live in crowded cities, occur simultaneously with the climate problem of the earth. Depending on climate change; heat and cold-related diseases, side effects of ultraviolet radiation, health problems caused by air pollution, food and water-related diseases, changing infectious disease agents, vector-related diseases, mental problems, and the risk of re-emerging and new diseases are increasing.				
It is important that the limited resources against extreme weather events due to climate change are used correctly and equally so that they can meet the needs of vulnerable groups. It is known that the group that will be most affected by the problems related to malnutrition and access to quality water is children under 5 years old. By the detection and monitoring studies to be carried out, the needs of the groups that do not have access to standard resources will be determined and necessary support mechanisms will be developed. The disabled, the elderly and children under the age of 5 will be evaluated primarily in line with their needs.				
It is foreseen that these groups will be informed about the access and use of existing resources through awareness and awareness activities, and as a result, their fragility will decrease.				
It should be monitored, taking into account the significant impact of air quality on public health.				
THE RELATION BETWEEN İZMİR METROPOLITAN MUNICIPALITY				
PH.1.3,	Organizing awareness raising activities on the effects of climate change on human health.			
SECAP H.1	Regular collection and monitoring of data by establishing a monitoring board to address climate and health impacts			
SECAP H.2	Identifying disadvantaged groups in terms of the effects of climate change on public health and implementing empowerment strategies for these groups.			
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN				
A2, H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city.			
A4, H4.3	Carrying out studies to ensure public health, welfare and peace			
RESPONSIBLE		STAKEHOLDERS		
Karsiyaka Municipality		TR. Ministry of Health, IMM, Chamber of Physicians, Universities, Union of Chambers of Turkish Engineers and Architects, Turkish Medical Association		
IMPLEMENTATION STEPS		IMPLEMENTATION END		
2022		Continuous		
FINANCE OPTIONS				
Municipal budget, Funds, Grants				
IMPLEMENTATION STEPS				
<ol style="list-style-type: none"> 1. Establishing an institutional structure for the detection and monitoring of climate and public health impacts and taking measures. 2. Carrying out studies to identify and monitor vulnerable groups. 3. Creation and monitoring of climate and health impact data. 4. Carrying out awareness studies on Climate Change and its health effects. 5. Monitoring Air Quality, increasing monitoring parameters. 6. Establishment of a climate-based Early Warning System. 7. Periodic Climate Change Vulnerability and Risk Analysis. 				






MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025	2030
I1	Population data (including age groups and distribution)	%100	It is aimed that all data on monitoring indicators will be completed in 2022 and updated every 2 years.	%100
I2	Disabled population and distribution	It is the 2014 research of the municipality and it is inconsistent with the data of the Ministry. See. Current Situation and Notes		
I3	Population distribution with chronic diseases (blood pressure, heart etc.)			
I4	Population income distribution	Middle and Upper Income Group 64% Lower Income Group 36%		
I5	Data on the migrant population			
I6	Data on the homeless			
I7	Follow-up of climate-related health complaints			
I8	Monitoring air quality, increasing monitoring parameters by providing mobile measuring device	PM ₁₀ and SO ₂ are monitored from Karşıyaka IMM station		

ACTION NO	ACTION TITLE			
SA.2	Taking Protective Measures for Reducing the Effects of Climate Change on Advanced Age Public Health			
SDG – 2030				
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION			DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>	
ACTION DEFINITION				
It is planned to take preventive measures to prevent/reduce health problems that may occur due to climate change, such as changes in air temperatures and air pollution, for the elderly, who are among the vulnerable groups to the effects of climate change.				
REASON				
One of the vulnerable groups to the health effects of climate change is the elderly. It can have negative consequences on the health of the elderly, with direct effects such as heat and cold air waves and extreme weather events, or indirect effects due to changes in the environment in which they live.				
Sensitivity to climate change in the elderly is determined by three factors: the degree of exposure to the developing climate event, the level of sensitivity and the ability to adapt to the effects. The level of influence of the elderly may show individual differences depending on their chronic diseases, functional abilities, psychosocial support and economic conditions.				
As a result of global warming, heat waves that can create a "heat island" may occur, especially in cities, and depending on these heat islands, heart attacks, strokes and peripheral vascular diseases and even death may occur in the elderly. Elderly people who are insufficient adaptive response to hot weather may also experience fluid loss and related metabolic health problems in the summer when temperatures reach very high levels. Increasing rates of particulate matter in industrial areas where air pollution is intense may result in disease exacerbations and lower respiratory tract infections in the elderly with chronic respiratory disease. It is also accepted that climate change has deep psychosocial effects and will continue to increase.				
It is planned to inform the elderly living in the city against the effects, to take preventive measures to prevent climate-related disorders and to monitor their health status.				
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP				
PH.1.3,	Organizing awareness raising activities on the effects of climate change on human health.			
SECAP H.1	Regular collection and monitoring of data by establishing a monitoring board to address climate and health impacts			
SECAP H.2	Identifying disadvantaged groups in terms of the effects of climate change on public health and implementing empowerment strategies for these groups.			
THE RELATION BETWEEN KARSIYAKA MUNICIPALITY AND STRATEGIC PLAN				
A4, H4.3	Carrying out studies to ensure public health, welfare and peace			
RESPONSIBLE		STAKEHOLDERS		
Karşıyaka Municipality		TR. Ministry of Health, IMM, Chamber of Physicians, Universities, Turkish Medical Association		
IMPLEMENTATION START		IMPLEMENTATION END		ESTIMATED COST (\$)
2022		Continuous		300.000

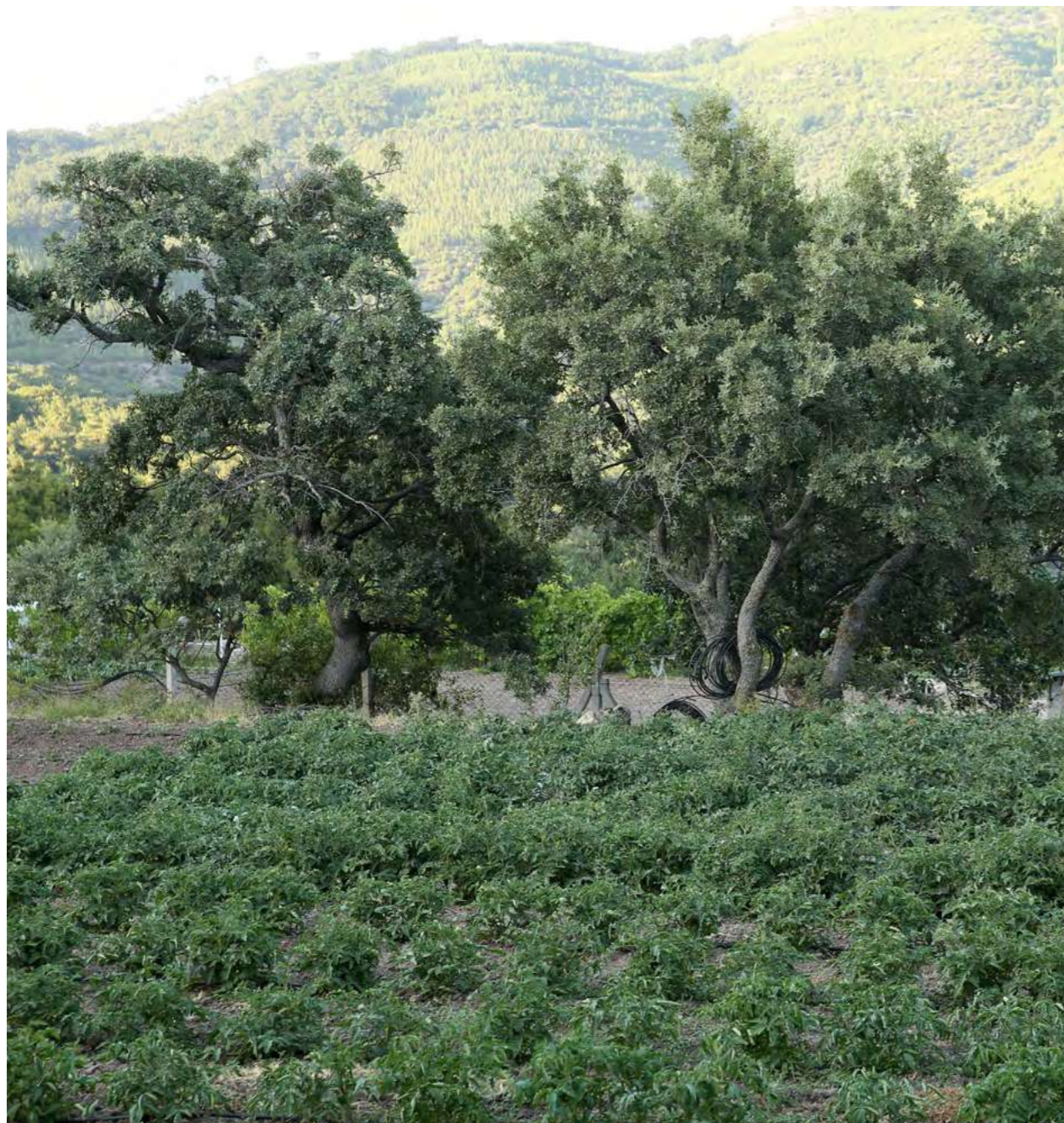
FINANCE OPTIONS				
Municipal budget, Funds, Grants				
IMPLEMENTATION STEPS				
1. Establishing an institutional structure to identify and monitor the effects of climate change on elderly public health and to take precautions. 2. Conducting awareness studies on the effects of Climate Change on health for the elderly population and their families. 3. Increasing the health services that will improve the health and welfare of the elderly in the municipality. 4. In cooperation with the Chamber of Physicians and Non-Governmental Organizations, to follow up-to-date needs and develop services and activities in order to protect the elderly public health from the negative effects of climate change. 5. Increasing physical and mental activity areas by making cool and shaded climate shelters in parks and green areas 6. Building an Alzheimer's Counseling and Solidarity House				
MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025 Goal	2030
I1	Elderly population data	%100	%100 It is aimed that all data on monitoring indicators will be completed in 2022 and updated every 2 years.	%100
I2	Follow-up of climate-related health complaints	0		
I3	Activities and investments that facilitate the life of the elderly and create comfort in health and care services	ESDEM(Home Health Support Center), Bilge Çınarlar Healthy Aging Center		
NOTES				
Due to the fact that the rate of the elderly population is higher than the rates of Turkey and İzmir, Karşıyaka Municipality has realized many projects and investments that support active aging with the practices and investments that it has made or will make. Bilge Çınarlar Healthy Aging Center, where people of Karşıyaka over the age of 60 have the opportunity to socialize, spend quality time and realize their hobbies, has been operating since 2009 and has 2450 members. ESDEM (Home Health Support Center) has been operating since 2016. ESDEM, which carries out general examination, dressing, wound care, blood pressure and sugar follow-ups of needy, disabled and elderly patients who cannot leave their homes, served 1137 people in 2020.				
At the assembly meeting in May 2021, the "Committee for the Elderly" and the "Advanced Age Services Unit" were established under the Social Services Directorate. This unit is preparing the "Advanced Age Action Plan" with the Science Advisory Board Members.				
Karşıyaka Municipality also supports active aging by its practices and investments; It aims to be a city in accordance with the concept of "age-friendly city" defined by the World Health Organization in 2005. It is planned to develop the works carried out to increase the quality of life of the elderly population, together with the studies to be carried out on the effects of climate change and ensuring adaptation.				



ACTION NO	ACTION TITLE			
AF	Establishing a Climate Change Resistant Disaster Management System			
SDG – 2030				
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION		DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>		
ACTION DEFINITION				
Considering the effects of climate change, it is aimed to revise the disaster management plans prepared throughout the district, and to identify and improve the existing assembly and shelter areas. In addition, it is aimed to determine new areas and to carry out activities for the active participation and informing of citizens within the scope of the studies.				
REASON				
Most of the studies on disaster management in our country are planned by taking the earthquake as a priority. In recent years, studies have also been carried out on disasters that may occur due to climate change. It is important to make disaster management plans and implementation areas resistant to earthquakes and extreme weather events caused by climate change.				
<ul style="list-style-type: none"> Possible damages will be prevented by determining the measures to be taken together with the identification of disaster risk areas. It is very important to ensure citizen participation and neighborhood-scale organization in disaster management planning and practice stages. It will be easier to provide the necessary order and organization for intervention in possible disasters. The infrastructure will be prepared to meet the necessary needs such as water, food and health after possible disasters with the arrangement of assembly and shelter areas. 				
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP				
AOS1.1	Determining the necessary tools and mechanisms for the implementation of climate change adaptation strategies			
THE RELATION BETWEEN KARSIYAKA MUNICIPALITY AND STRATEGIC PLAN				
A2, H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city			
A3, H3.1	Ensuring a planned and healthy urban development			
A4, H4.3	Carrying out studies to ensure public health, welfare and peace			
RESPONSIBLE		STAKEHOLDERS		
Karsiyaka Municipality		Provincial Disaster and Emergency Directorate, National International Organizations, Search and Rescue Teams, IMM, Izmir Water and Sewerage Administration General Directorate, Union of Chambers of Turkish Engineers and Architects		
IMPLEMENTATION START		IMPLEMENTATION END		
2020		2025		
FINANCE OPTIONS				
Municipal budget, National and International Funds				
IMPLEMENTATION STEPS				
<ol style="list-style-type: none"> 1. Identification of disaster risk areas 2. Creation of disaster management plans 3. Determination and evaluation of the suitability of assembly and accommodation areas 4. Rehabilitation of disaster assembly areas 5. Identification and preparation of new areas, if necessary 6. Ensuring organization on the basis of neighborhoods while preparing the plans 7. Developing software and training applications for citizen participation for the Disaster Management Plan and assembly areas 				
MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025 Goal	2030 Goal
I1	Collection of Disaster Assembly Area Data (with number, area and physical characteristics)	115-The size and physical characteristics of the assembly area have been reported.	120 - Recovery in 30% of those with limited area size	120 - Improvement in 50% of those with limited area size
I2	Number of volunteers of KARSIYAKA DISASTER RESPONSE TEAMS	181	300	500
I3	Number of training given to volunteers	5	10	20
NOTES				
<p>Studies are carried out through the commission formed by the District Governorship-Municipality-Gendarmerie-Policemanship-National Education and Headman's Office regarding the earthquake disaster.</p> <p>115 Gathering Areas have been determined within the borders of Karsiyaka District.</p> <p>Rehabilitation of disaster assembly areas is the joint responsibility of IMM and Municipality.</p> <p>The m² and physical characteristics of the assembly areas per person and the physical characteristics of the temporary accommodation areas were submitted to the parliament for approval with the two parliamentary proposals submitted by the Environment and Health Commission in March and April 2020. These reference reports include improvement needs in assembly and temporary accommodation areas.</p> <p>A total of 181 Disaster Response neighborhood volunteers were identified through social media announcements.</p> <p>Meeting areas can be reached via e-government and Emergency Izmir application. Our municipality continues to work on sticking the labels showing the data matrix application to all buildings in order to reach the existing assembly areas.</p>				

ST	Supporting Sustainable Agriculture with Climate Friendly Agricultural Techniques, Preserving Local Product Patterns				
SDG - 2030					
SECAP CONTRIBUTION OF THE ACTION					
GREENHOUSE GAS EMISSION REDUCTION			DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>		
ACTION DEFINITION					
Supporting the producer in the village settlements where agricultural activities are carried out within the boundaries of the district, increasing production capacity and diversity, promotion of conservation of local and indigenous varieties, increasing the welfare level of the producer by creating added value from the production pattern, reaching fresh and safe food by bringing together the rural production with the urban without intermediaries and improving the economic conditions of the producer, rural population growth					
REASON					
To reduce greenhouse gas emissions coming from agriculture and livestock, By combining physical, economic and cultural plans for the management of urban and rural areas,					
<ul style="list-style-type: none"> To ensure the penetration of nature into the city To ensure the penetration of urban people into rural areas and their harmony with nature. Strengthening the bonds between urban and rural cultures, Supporting Producer Cooperatives To ensure the sustainability of agricultural production in rural areas Protecting agricultural and forest areas Protecting pasture areas Spreading Organic Agriculture Supporting local seeds Reducing greenhouse gas emissions with the management of animal waste in rural areas and the conscious use of fertilizers. 					
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP					
I 1.1& 1 1.2,	Supporting low-carbon farming techniques and climate-friendly smart farming practices throughout the province.				
THE RELATION BETWEEN KARSIYAKA MUNICIPALITY AND STRATEGIC PLAN					
A2, H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city				
A2, H2.5	Protecting animals and improving their quality of life				
A4, H4.3	Carrying out studies to ensure public health, welfare and peace				
RESPONSIBLE		STAKEHOLDERS			
Karsiyaka Municipality		TR Provincial Directorate of Agriculture and Forestry, IMM, Union of Chambers of Turkish Engineers and Architects, Cooperatives, Farmers			
IMPLEMENTATION START		IMPLEMENTATION END		ESTIMATED COST (\$)	
2022		Continuous		100.000	
FINANCE OPTIONS					
Municipal budget, funds, grants					
IMPLEMENTATION STEPS					
<ul style="list-style-type: none"> Supporting producers for the protection and dissemination of local and indigenous varieties in rural areas. Raising awareness and informing the producer of the effects of animal production on climate change. Providing technical support to provide climate sensitive plant and animal production conditions. Designing and arranging a training program for practices such as transition to drought-resistant plants, conscious use of fertilizers, biological and mechanical control in agricultural control, and reduction of groundwater use. Bringing the plant-animal production in the district and nearby rural areas to the consumers with the principle of local production and local consumption, establishment of producer markets. Establishment of urban agricultural production areas 					
MONITORING INDICATORS					
No	Indicator	Current Situation (2020)	2025 Goal	2030	
I1	Non-residential green areas (Forest and agricultural areas, recreation areas)	Agricultural Lands 221.0 hectare Forest areas 1.376.3 hectare Area to be Afforested 711.8 hectare	100 Acres of Afforestation	200 Acres of Afforestation	
I2	Number of Rural Population	319	-	-	
I3	Supported economic activity in the countryside	3	10	20	
I4	Urban Agricultural Activity Area	0	4 Acres	8 Acres	
I5	Climate Crisis and Circular Economy Awareness Activities	0	5	10	

GOALS
<p>Karşıyaka Municipality is aware of the value of agricultural production areas within the boundaries of the district. It will increase its investments in the region both to increase production, to bring safe food to the people of the city and to increase the socio-economic welfare of the producer. The target for the future is to increase the rural population and to protect the resources, beauty and healthy environment of the region by this population.</p> <ul style="list-style-type: none"> To protect agricultural and forest areas from fire and construction and to ensure their controlled use. To protect the biodiversity of the region, to increase the economic value Increasing the economic and social welfare of agricultural and forest villagers Increasing population of agricultural and forest villagers, reaching more services to rural areas
NOTES
<p>Karşıyaka Municipality is based on being a metropolitan city for a sustainable environment and has defined its priority areas in the circular economy model for sustainable agriculture. It can be summarized as our model in our district, which is on the consumer and market side of agricultural production.</p> <ul style="list-style-type: none"> Increasing urban agricultural activities Preserving local crop patterns and Ancestral Seeds Supporting Producer Cooperatives Preventing food waste Conversion of organic waste



YA.1, YA.2	YA.1 Conducting Studies on Reducing the Urban Heat Island Effect, YA.2 Rehabilitation and Increase of Green Areas and Afforestation Works			
SDG - 2030	17 PARTNERSHIPS FOR THE GOALS	3 GOOD HEALTH AND WELL-BEING	13 CLIMATE ACTION	11 SUSTAINABLE CITIES AND COMMUNITIES
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION		DEVELOPING CLIMATE ADAPTATION CAPACITY		
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
ACTION DEFINITION				
<p>In order to reduce the urban heat island effect, it is planned to take necessary measures with nature-based solutions, starting from the areas where the impact is high, by carrying out studies to determine the current situation. Along with green areas, it is envisaged to increase the number of trees and plants, to ensure the connection of green areas with each other, to use green roofs, to use reflective and permeable materials on pavements and roads.</p>				
REASON				
<p>The urban heat island effect, which is caused by impermeable artificial materials used in urban areas, is expected to increase due to climate change if no measures are taken. This situation will not only make urban life uncomfortable, but also cause negative effects in terms of public health.</p> <p>The urban heat island effect will decrease by the adoption and application of green infrastructure principles in urban design, the preference of permeable surfaces instead of artificial surfaces, and the increase in green space and vegetation.</p> <p>Accordingly, the energy demand and greenhouse gas emissions required for cooling will decrease.</p> <p>The amount of greenhouse gas will also decrease with the increase in sink areas.</p>				
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP				
LU1.7	Identifying and applying techniques to mitigate the urban heat island effect			
THE RELATION BETWEEN KARSIYAKA MUNICIPALITY AND STRATEGIC PLAN				
A2, H2.1	Protecting existing green areas and increasing the amount of green areas per person			
A2, H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city			
A4, H4.3	Carrying out studies to ensure public health, welfare and peace			
RESPONSIBLE		STAKEHOLDERS		
IMM, Karşıyaka Municipality		Central Administration, IMM, Universities, Union of Chambers of Turkish Engineers and Architects, NGOs, People		
IMPLEMENTATION START		IMPLEMENTATION	ESTIMATED COST (\$)	
2022		2030	300.000	
FINANCE OPTIONS				
Municipal budget, National and International Funds				
IMPLEMENTATION STEPS				
<ol style="list-style-type: none"> Carrying out Modeling Studies to Determine the Urban Heat Island Effect Determination of priority areas according to modeling results Identification and evaluation of practices to reduce the Urban Heat Island Effect Development of green infrastructure and blue infrastructure strategies. Determining the sink capacity and making determinations to increase it Rehabilitation of existing parks and construction of new parks Determination of afforestation areas and afforestation 				
MONITORING INDICATORS				
No	Indicator	Current Situation (2020)	2025 Goal	2030
I1	Green space per person	4,75 m ²	6,00 m ²	8,00 m ²
I2	Surface Temperature Measurements	0	10	20
I3	Green Roof Licensed Building Amount	0	5	10
I4	Permeable, reflective surface area	No Detection	5% Increase	% 10 Increase
I5	Newly built park and green space	5	33	40
I6	Rehabilitation-renewed park and green space	19	37	50
I7	Afforestation area	711,8 hectare available area	100 acres	200 acres

KA	Sustaining Forest Presence, Protection of Wetlands, Researching Sustainable Production Models with High Added Value within the scope of Forest Products			
SDG - 2030				
SECAP CONTRIBUTION OF THE ACTION				
GREENHOUSE GAS EMISSION REDUCTION <input checked="" type="checkbox"/>		DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>		
ACTION DEFINITION				
It is vital to protect and increase all the protected areas within the borders of Karşıyaka Municipality, especially the forest existence, natural parks and the neighboring Ramsar Wetland, due to the fact that they are sink areas that reduce carbon emissions in our district, and the contain rich biodiversity.				
REASON				
Climate change negatively affects terrestrial and marine ecosystems. If these ecosystems left unprotected, it will result in less availability of water and food, more frequent natural disasters, threatening human health, species extinction, and the disappearance or degradation of ecosystems. Ecosystems and species in protected areas in Karşıyaka District will not be excluded from these effects.				
<ul style="list-style-type: none"> In protected areas and protected area systems, the protection of biodiversity and people's livelihoods contributes significantly to climate change adaptation/mitigation strategies. The most economical way to reduce carbon emissions is to reduce deforestation. 				
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP				
SECAP AF 2	Establishing a management strategy for forest fires			
LU 1.18, LU 1.19	Further development of green and blue infrastructure strategies			
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN				
A2, H2.1	Protecting existing green areas and increasing the amount of green space per person			
A3, H3.1	Ensuring a planned and healthy urban development			
A3, H3.2	Making necessary arrangements and new facilities in line with the needs, and working to ensure interregional economic harmony by developing cooperation.			
RESPONSIBLE		STAKEHOLDERS		
IMM, Karşıyaka Municipality		TR Provincial Directorate of Agriculture and Forestry, IMM, Cooperatives, Farmers		
IMPLEMENTATION START		IMPLEMENTATION END		
2022		Continuous		
FINANCE OPTIONS				
Municipal budget, National and International Funds				
IMPLEMENTATION STEPS				
<ul style="list-style-type: none"> Preparing an action plan for the Protection of Existing Forest Areas and Wetlands Inventory and feasibility study to create added value from forest products, Ensuring the use of recreational areas in forests according to the protection-use balance ve management of forest areas with less harmful methods To protect forest areas and National Parks from fire and construction and to ensure their controlled use. To protect the biodiversity of the region at its source and to increase the economic value Increasing the economic and social welfare of agricultural and forest villagers Increasing population of agricultural and forest villagers and reaching more services to rural areas 				
MONITORING INDICATORS				
No	Indicator	Current Situation(2020)	2025 Goal	2030 Goal
I1	Awareness studies on the emission-reducing effect of protected areas	0	5	10
I2	Activities for the protection of Protected Areas	3	5	10

GG	Reducing the Negative Effects of Climate Change on Food Security and Security				
SDG - 2030					
SECAP CONTRIBUTION OF THE ACTION					
GREENHOUSE GAS EMISSION REDUCTION			DEVELOPING CLIMATE ADAPTATION CAPACITY <input checked="" type="checkbox"/>		
ACTION DEFINITION					
To ensure the continuity of the district people's access to safe food, taking into account the effects of the food supply, which is adversely affected by climate change, on a balanced and economic diet, to be in coordination and cooperation with the food producers in the immediate vicinity, and to bring the public and the producer together.					
REASON					
Climate change, heat waves, extreme weather and climate events such as floods and droughts, and increases in disasters are expected to disrupt the stability of food supply. The world's food availability is affected by changes in the arable land and amount of agricultural produce. Changes in food production, along with other relevant factors, are expected to affect food prices in the future and limit poor families and communities' access to adequate and quality food.					
THE RELATION BETWEEN IZMIR METROPOLITAN MUNICIPALITY AND SECAP					
I1.1, I1.2	Supporting low-carbon farming techniques and climate-friendly smart farming practices throughout the province.				
THE RELATION BETWEEN KARŞIYAKA MUNICIPALITY AND STRATEGIC PLAN					
A2, H2.3	Carrying out studies within the scope of protection from climate change and its effects in order to create a sustainable city				
A4, H4.3	Carrying out studies to ensure public health, welfare and peace				
RESPONSIBLE			STAKEHOLDERS		
Karşıyaka Municipality			TR Provincial Directorate of Agriculture and Forestry, IMM, Union of Chambers of Turkish Engineers and Architects, Cooperatives, Farmers		
IMPLEMENTATION START			IMPLEMENTATION END		
2022			2030		
FINANCE OPTIONS					
Municipal Budget					
IMPLEMENTATION STEPS					
<ul style="list-style-type: none"> Supporting the producer for the protection and dissemination of local and indigenous varieties in rural areas, Raising awareness and informing the producer of the effects of animal production on climate change, Providing technical support to provide climate sensitive plant and animal production conditions, Bringing the plant-animal production in the district and nearby rural areas to the consumers with the principle of local production and local consumption, establishment of producer markets, Collaborating with Public Institutions, Professional Chambers and Non-Governmental Organizations in order to reach safe food and prevent food waste. Supporting Producer Cooperatives To ensure the sustainability of agricultural production in rural areas Protecting pasture areas Spreading Organic Agriculture Supporting local seeds Opening producer markets, inspecting marketplaces Ensuring the continuity of inspection at food producers and sales points Providing basic food aid to the people in economic distress 					
MONITORING INDICATORS					
No	Indicator	Current Situation (2020)	2025 Goal	2030 Goal	
I1	Activities supporting agricultural production	4	10	20	
I2	Increasing awareness of safe food	0	5	10	
I3	Working to prevent food waste	4	8	15	

Table 5.1 Mitigation and Adaptation Actions, Greenhouse Gas Reductions and Approximate Cost Table

MITIGATION AND ADAPTATION ACTIONS GREENHOUSE GAS REDUCTIONS AND APPROXIMATE COST TABLE					
NO	SEKTOR	CODE	ACTION TITLE	2030 GREENHOUSE GAS EMISSION. REDUCTION (tCO ₂ e)	ESTIMATED COST (\$)
1	Buildings	B.1	Conducting and Implementation of Energy Efficiency Studies in Municipal Buildings	2.143,60	5.000.000
2		B.2	Increasing the Detail Level of Geographic Information System for Building Inventory		20.000
3		B.3	Near Zero Energy Policy and Strategy Development for New Town Halls		
4		B.4	Determination of Reference Buildings for Taking Energy Inventory of the District and Implementation of Energy Efficiency Improvement Steps		
5		B.5	Suggesting and Promoting Thermal Insulation in Existing Residences	173.742,00	
		B.6	Recommending and Encouraging the Use of Energy Efficient Lighting Devices in Existing Residences		
6		B.7	Insulation of Commercial and Other Institutional Buildings	92.732,40	
		B.8	Use of Energy Efficient Lighting Devices in Commercial and Other Institutional Buildings		
7	Transportation	U.1	Energy Efficiency in Vehicles in the Municipality Vehicle Fleet and Rented	351,1	
8		U.2	More Sustainable Urban Mobility: Public Transport and Local Mobility	313.554,50	500.000
9	Energy	E.1	Expanding the Use of Solar Energy in Municipal Facilities and Lands such as Municipal Buildings, Marketplaces	5.287,50	2.750.000
10		E.2	Ensuring the Expansion of Solar Energy Facilities (IMM and Other Institutions and Campuses)	58.000,00	
11		E.3	Conducting Feasibility Studies for Geothermal Energy Potential and Preparation of Action Plan		
12		E.4	Ensuring Cooperation in Establishing a Digitalization Infrastructure in Transition to Renewable Energy Sourced Electricity System, Energy Supply and Monitoring		
13		E.5	Encouraging and Facilitating the Transition of Coal Consumers to More Renewable and/or Cleaner Energy Sources	3.500,00	
14		E.6	Participating in Twinning Programs with Cities and Organizing Joint Events	-	
15		E.7	Implementation of an Environmental Labeling Program for Private Businesses in the City	-	10.600
16		E.8	Replacing Park/Garden and Street Lighting with LED	1.250,00	200.000

17	Waste	A1	Expanding the Practices of Separate Collection of Packaging Waste at Source	58.267,80	200.000
18		A2	Developing a Program for Separate Collection and Composting of Domestic Organic Wastes, Marketplace Wastes and Park and Garden Wastes		60.000
19		A.3	Preventing Marine Pollution by Improving Waste Management Practices		50.000
20		A.4	Implementation of the Smart Waste Collection System Digital Application		120.000
21		A.5	Reducing Greenhouse Gas Emissions from Waste Collection/Transport within the Scope of Institutional Greenhouse Gas Inventory	537,1	70.000
22	Water	S.1	Making Regulations on Water Management for the Prevention of Floods and Floods		300.000
23		S.2	Efficient Use of Water and Actions to Save Water		200.000
24		S.3	Awareness Studies on Water Use		
25	Health	SA.1	Determining the Effects of Climate Change on Public Health and Taking Protective Measures		
26		SA.2	Taking Protective Measures to Reduce the Effects of Climate Change on Advanced Age Public Health		300.000
27	Disaster Management	AF	Establishing a Climate Change Resistant Disaster Management System		
28	Sustainable Agriculture	ST	Supporting Sustainable Agriculture with Climate Friendly Agricultural Techniques, Preserving Local Product Patterns		100.000
29	Green Areas Land Use	YA.1	Conducting Studies on Reducing the Urban Heat Island Effect		
30		YA.2	Rehabilitation and Increase of Green Areas and Afforestation Studies		300.000
31	Protected Areas	KA	Sustaining Forest Existence, Protecting Wetlands, Researching Sustainable Production Models of Forest Products with High Value Added		
32	Food Safety	GG	Reducing the Negative Impacts of Climate Change on Food Safety and Security		
Total Energy and Greenhouse Gas Reduction Amount and Estimated Cost				709.366,00	10.180.600

ROADMAP FOR LOCAL GOVERNMENT



6. ROADMAP FOR LOCAL GOVERNMENT

6.1 Data Collection and Management

6.1.1 Data Collection in the SECAP process

The essential requirement for preparing Sustainable Energy and Climate Action is the current situation information that reveals the greenhouse gas emissions and energy and climate-related risks in the city, and future projections such as population structure, energy supply and energy consumption. These data, which form the main framework of a SECAP process, can be obtained from different municipality units at the city scale, from various departments and institutions such as electricity distribution company, natural gas distribution company, water and sewerage administration, railway administration and statistical institutions. In this respect, data collection is an integral part of developing a SECAP (preparing greenhouse gas inventory and determining mitigation and climate adaptation actions) and updating the prepared sustainable energy and climate action plan in the following years (Figure 6-1). The accuracy and timeliness of the collected data largely determine the accuracy of the entire process, from calculations of greenhouse gas emissions to future actions and targets.



Figure 6-1 SECAP Process and Data Collection Phase

From this point of view, a data collection approach has been developed and implemented, which can be the basis for both the current (the year 2021) inventory and action plan, and the

monitoring process to be carried out in the future. The developed data collection methods and tools are explained in the following sections.

6.1.2 Collection of Activity Data

The steps of the process to collect activity data are summarized below.

(1) Determination of data source units and institutions: The data sources for the institutional GHG inventory and the urban GHG inventory were identified as municipal units (internal stakeholders) such as Support Services, Cleaning Works, Survey Project, Health Affairs, Parks and Gardens Directorates etc. and institutions (external stakeholders) such as Gediz, İZMİRGAZ, ESHOT, İZULAŞ, İZDENİZ, TCDD, İBB Waste Management Department, İZSU Water Transmission and Distribution Department, İZSU Wastewater Department. The list of all units, institutions and organizations that provided data in the SECAP 2021 study is given in Annex 7-1.

(2) Preparation of electronic data entry forms(Excel): Electronic data entry forms specific to each unit/institution with different fields of activity have been prepared to provide current and past (2012 – 2020) and accurate, consistent and complete (in the desired geographical scope, necessary technical details) data. Firstly, the form is given the need and scope of data collection in the Karşıyaka SECAP process. An introductory page is designed to request the person's information in the unit/institution regarding data supply (Figure 6-2).

KARŞIYAKA
SUSTAINABLE ENERGY AND CLIMATE ACTION PLAN
Greenhouse Gas Inventory Data Collection Form

Karşıyaka Municipality is the first municipality from Turkey to sign the Covenant of Mayors on January 3, 2011. In Karşıyaka, we are taking the work done so far further and targeting a significant reduction in greenhouse gas emissions by 2030. In parallel, we are carrying out intensive studies for the preparation of an effective Sustainable Energy and Climate Action Plan (SECAP). In this context, it is very important that the data you provide for the Greenhouse Gas Emission Inventory is within the scope and direction we aim for. Thank you for your support.

SolarMENA
Karşıyaka Municipality
Chamber of Environmental Engineers
İzmir branch
SolarMENA

Data contact person
Name/Surname :
Phone :
E-mail :
DATA ENTRY

Contact person : Mert Biter +90.537.725.0263

Figure 6-2 Karşıyaka SECAP Excel Data Entry Form – Data Login Page

Excel data entry forms are designed specifically for the desired data breakdowns (according to years, neighbourhoods or months), and the cells other than data entry are locked. Example pages of data entry forms are given in Figure 6-3.

KARŞIYAKA SUSTAINABLE ENERGY AND CLIMATE ADAPTATION ACTION PLAN - GREENHOUSE GAS INVENTORY - Data Entry Form

Karşıyaka-Electricity Consumption on a Monthly Basis

Months	CONSUMPTION (MWh/month)				
	2016	2017	2018	2019	2020
Ocak					
Şubat					
Mart					
Nisan					
Mayıs					
Haziran					
Temmuz					
Ağustos					
Eylül					
Ekim					
Kasım					
Aralık					

KARŞIYAKA SUSTAINABLE ENERGY AND CLIMATE ADAPTATION ACTION PLAN - GREENHOUSE GAS INVENTORY - Data Entry Form

Annual Total Electrical Energy Consumption on a Neighborhood Basis

Neighborhoods	CONSUMPTION (MWh/year)				
	2016	2017	2018	2019	2020
Aksoy					
Alaybey					
Atakent					
Bahariye					
Bahçelievler					
Bahriye Üçok					
Bostanlı					
Cumhuriyet					
Dedebaşı					
Demirköprü					
Donanmacı					
Fıkrı Altay					
Goncalar					

Figure 6-3 Karşıyaka SECAP -Excel Data Entry Form – Sample Data Entry Pages.



(3) Determination of unit/institution responsible: A unit/institution responsible must be determined at internal meetings for municipal units and stakeholder meetings for external institutions. Thanks to the determination of the unit/institution responsible during the data collection process, it will also form the committee's basis for the SECAP monitoring process in the period following the SECAP process.

(4) Filling and collecting data entry forms: Forms explicitly prepared for the unit/institution were forwarded to the relevant unit/institution responsible, and data entry was ensured. The data entry forms provided were used as the essential input for the greenhouse gas inventory within the scope of SECAP. In this context, data were obtained from 17 external stakeholders for the urban inventory and 32 units, one external stakeholder, for the institutional inventory.

6.1.3 Emission Factors

The emission factors were taken from the National Inventory Report (NIR, 2020) specific to Turkey to calculate the greenhouse gas emissions related to each activity.

6.1.4 Data Management

Data management systems are critical to the development and regular updating of greenhouse gas inventories, which form the basis of greenhouse gas reduction efforts. In a study conducted by the World Resource Institute specific to 10 countries, it was stated that in greenhouse gas inventory, the use of Excel-based systems as a data collection system and Excel-based systems and customized software together is the most widely used data collection methods. Only Germany uses special software in this regard (WRI)., 2015).

Electronic data entry forms developed for Karşıyaka SECAP 2021 provided data accuracy, data transmission speed, and ease of calculations. This method is a management process equivalent to

good practice examples in the world. However, it is thought that better data management can be achieved by developing web-based data entry forms and a web-based data management system to make data collection more institutional and dynamic in the SECAP monitoring process. In this way, the data, the assumptions in the inventory, and the calculation results can be systematically stored in the data management system for many years and securely. Such a management system will enable comparing the old inventory results with the new developments in the following periods during the SECAP monitoring process. The reporting will be made more accessible.

6.1.5 SECAP Implementation and SECAP Monitoring Process

SECAP is a living process. It means that the SECAP process should evolve as progress is made; In other words, as new information, technological opportunities and financing opportunities arise, they should be included in the process.

Although it is a relatively difficult task to monitor and report the progress towards sustainable energy and climate adaptation process, this study, which considers the monitoring and reporting process as an essential step in the integrated management cycle necessary for the effective development of the city in the context of climate/energy, aims to ensure the longevity of the monitoring process. It has been put forward to understand that good planning should be done to ensure that it will be successful at a sufficient level in the future.

The monitoring and reporting process designed to measure the progress towards the targets set in KARŞIYAKA MUNICIPALITY SECAP 2021 and the effects of the actions included in the plan, the actual results in terms of energy saving, renewable energy production, reducing greenhouse gas emissions and increasing resilience to the effects of climate change, and the forecast in the planning. Will allow comparison of results. This study addresses the SECAP monitoring phase with the following features:

- Evaluation of the implementation status and effects (performances) of the actions,
- Planning corrective measures in case the actions fail to achieve the expected result,
- Identifying obstacles to the implementation of an action plan,
- Revealing the reasons for choosing not to implement specific actions,
- Identifying new action opportunities,
- Evaluation of the side benefits resulting from the implementation of the actions.

6.1.6 Administrative Organization and Coordination

Mitigation and adaptation actions planned in a SECAP implementation are not carried out by

a single unit. On the contrary, since the actions determined for greenhouse gas reduction and adaptation to climate change are issues that concern all residents of the city and all institutions and organizations, Karşıyaka requires severe cooperation and coordination between municipal units and public/private sector institutions and organizations within the scope of SECAP 2021.

In Karşıyaka SECAP implementation and monitoring process, as in the planning process, it is necessary to ensure that all parties participate in the process and work together, from energy companies such as Gediz Elektrik and İzmir Gaz to Karşıyaka Municipality units such as İZSU and Support Services Directorate, which is responsible for water and wastewater services. In the SECAP implementation and monitoring process, it is critical that the local government also ensure that it works in harmony with the central government and other public institutions. One of the most widely used administrative structures globally is that local governments create an independent unit with the highest support in combating and adapting to climate change.

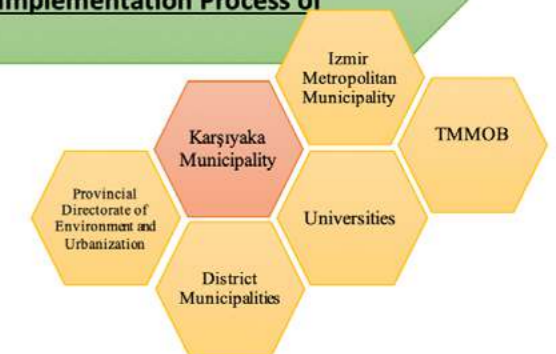
The Vice Mayor of Karşıyaka, who is responsible for Environmental Protection and Control Directorate, has been designated as the Chairperson of the SECAP Coordination Board to coordinate the Karşıyaka SECAP implementation and monitoring . To ensure and coordinate this cooperation and for the Karşıyaka SECAP implementation and monitoring process, a “Coordination Board for Combating Climate Change” will be established with the participation of Planning and Project Directorate, Directorate of Science Affairs, Directorate of Zoning and Urbanization, Directorate of Building Control, Directorate of Cleaning Works, Directorate of Support Services, Directorate of Parks and Gardens, Directorate of Transportation Services, Directorate of Facilities and Directorate of Information Processing.

The roadmap for administrative organization and coordination is explained below under sub-headings.

STEP 1

Establishing the Tools and Mechanisms Required for the Implementation Process of Climate Change Adaptation Strategies

In this step, the crucial stakeholders of Karşıyaka Municipality can be listed as İzmir Metropolitan Municipality, District Municipalities, Provincial Directorate of Environment, Urbanization and Climate Change, UCTEA and Universities.



1.1) Development of physical tools

- Considering the use of local materials and the ecological footprint it creates in the selection of urban furniture in public open spaces and recreation areas, creating application guides on issues that will affect climate change such as social compliance, transportation, infrastructure, urban heat island effect at the design stage.
- While planning social use areas in city centres, taking into account the increasing population and migration, the separation and creation of green areas
- Use of renewable energy sources in municipal and corporate buildings and duplication of green building systems; encourage private properties in this regard.
- Storage and efficient use of rain water

1.2) Establishing a district-wide organization by providing institutional cooperation

- Updating SECAP periodically;
- Ensuring the organization for the development of projects put into practice within the municipality can set an example (energy practices in municipal buildings, preparation and implementation of renewable energy feasibility, taking energy efficiency measures, taking the measures mentioned above in transportation... etc.)
- Carrying out studies on partnering with projects to be developed by external stakeholders in line with the Action Plan, bringing various stakeholders together, creating incentives and financing opportunities.
- Monitoring and evaluation of the results of mitigation measures implemented in the city
- Conducting communication and dissemination activities to raise awareness with good practice examples
- Taking necessary coordination decisions so that the results of the climate adaptation strategy can be included in operational programs and added to corporate action plans
- Contributing to the formation of a culture of working together in the strategic plans to be formed by institutions such as İZSU, İzmir Metropolitan Municipality, DSİ, provincial municipalities on climate change and water management.
- Establishment of the management organization of the climate adaptation plan on behalf of the relevant institutions and the city
- Ensuring the integration of the climate adaptation strategy with the Disaster and Emergency Plans
- Organizing inter-institutional meetings regularly, monitoring the progress of ongoing process.

1.3) Development of legal - administrative applications

- Ensuring public participation in local government regulations to be created for climate adaptation
- Turning the construction conditions and implementation tools into a set of criteria for climate adaptation strategies and turning them into a construction condition in tenders
- Establishing legislative infrastructure/compliance by determining the rules in terms of incentive tools/penal sanctions for climate adaptation

STEP 2
Creation of Climate Adaptation Dashboard (Geren Dashboard), Emergency Warning System

In this step, the crucial stakeholders of Karşıyaka Municipality can be listed as İzmir Metropolitan Municipality, District Municipalities, Provincial Directorate of Environment, Urbanization and Climate Change, AFAD, Regional Directorate of Meteorology, DSİ, İZSU, Provincial Directorate of Agriculture and Forestry.

2.1) Development of monitoring methods and tools

- Realization of effective monitoring with a climate adaptation dashboard, a system with separate interfaces shared with citizens, decision-makers, and researchers in data collection and monitoring.
- Doing good practices to enable impact measurement; Implementing pilot applications (in the areas of a heat island effect, energy efficiency, etc.). (These can be started with an easy-to-implement and easy-to-follow field such as benefit analysis for waste management in public institutions)
- Elimination of the lack of interface where the results can be followed in areas where measurement and monitoring are made, especially air quality and water quality.

2.2) Evaluation and management of collected data

- Real-time collection, modelling and reporting of critical data.
- Mapping and evaluating ecosystem services; determining the studies that need to be done for the data to form a basis for planning and management.
- Compilation of information that the user and admin panels may contain.

In this step, the crucial stakeholders of Karşıyaka Municipality can be listed as İzmir Metropolitan Municipality, Provincial Directorate of Environment, Urbanization and Climate Change, UCTEA.



STEP 3

Increasing the Environmental, Social and Economic Benefits of Climate Change Adaptation Strategies

3.1) Preparation of integrated strategies

• Preparation of integrated strategies that can work in harmony with the Climate Adaptation Strategy.

• Universities, Foundations, Associations and NGO's and greywater/rainwater, solar panel applications etc. Carrying out potential development activities on green infrastructure applications in areas defined as "Green Jobs."

3.2) Establishment of the coordination board for effective management

• Immediate determination of the implementation methods for the implementation of the strategies.

• "Combating Climate Change Coordination Committee" be established by determining the structure.

• Prioritizing disaster and local resource use (green procurement procedure) in these boards; ensuring that the purchasing stages in these studies are "green" with the specification.

• Developing a different implementing structure so that the prepared strategies are not left to the initiative of institutions/persons and do not change from period to period.

• Increasing awareness by providing pieces of training on climate change and green strategies to municipal units

6.2.3 Data Sources and Data Collection

The data to be collected in the following monitoring process will be determined in general, as in SECAP 2021. However, the data collection sources will be reviewed at the beginning of each new monitoring according to the changes in the sources related to greenhouse gas emissions in Karşıyaka.

To provide complete data in SECAP monitoring process, the need for data was conveyed to these institutions in detail. Cooperation was ensured to produce data in this detail in the following periods. Collaborations will be continued for monitoring process to deliver data in this detail.

Excel-based data collection method developed and successfully implemented for SECAP 2021 will be used for data collection – until a web-based data management system is developed.

6.2.4 Monitoring Frequency and Monitoring Indicators

It has been decided that Karşıyaka SECAP monitoring will be carried out every two years in line with the CoM and GCoM commitments.

To ensure that the harmonization process is both practical and sustainable over time, it is essential to evaluate the progress of the planned and implemented actions regularly and to check the achieved results by comparing them with the targets set in the Karşıyaka Strategic Plan.

However, editing, adding or removing specific actions should be considered based on monitoring results, and it is vital to recognize any incompatible apps/undesirable side effects that may have arisen.

Essential components of the monitoring and evaluation process include the selection of appropriate indicators and an internal method for collecting and evaluating data to inform action.

6.3 Stakeholder Participation, Awareness Raising and Public Awareness

Public participation, the contribution of all stakeholders, and individual awareness play a key role in achieving the targets set by Karşıyaka Municipality within the scope of climate action for 2030 and beyond. In climate actions that require multidimensional efforts, it is imperative that both the people of the district and all institutions and organizations operating in the community develop cooperation with practical methods and contribute to the foundations of a carbon-neutral future. In addition, participation and contribution mechanisms must be open for Karşıyaka Municipality to determine its strategy in this regard by observing social justice and respecting the rights of all parties involved.

Some basic methods that can be beneficial for the participation of the public and other interested parties can be listed as follows¹

1. Negotiation Activities: Decisions to be taken, plans to be implemented, and improvement activities on a vital and everyone-related issue such as the climate crisis should be negotiated with all parties, and a road map should be followed, which is agreed upon and therefore adopted by all the people of the district.

2. Participatory Budgeting: How the resources owned by the people will be allocated to become a climate-resilient city should also be an essential topic of discussion. It is significant for the transparent management of the process to receive the opinions and contributions of

the public and relevant stakeholders when determining which projects that reduce carbon emissions and increase adaptation capacity will be prioritized and when planning resource allocation. Thanks to such a right of participation and preference, the execution of the projects will be facilitated, and an outstanding contribution will be made to individual awareness.

3. Constructive Dialogue Environment: For a systemic change against the climate crisis, all relevant parties must agree and exist, and potential resistances must be transformed into contributions. For this, it is essential to create constructive dialogue environments at every opportunity and to share the positive results of this reconciliation.

Thanks to these basic methods, as the plurality of voices and equal participation are ensured, two critical dimensions that will bring Karşıyaka closer to the concept of “climate justice” will come to the fore: equal representation and equal distribution. To the extent that this path is successful, a more inclusive and less divisive policy for climate action will be established.

Karşıyaka Municipality’s efforts to raise public awareness on greenhouse gas reduction and adaptation to climate change gained momentum with its inclusion in the COM process in 2011. There are awareness activities for every sector in KARBEL SECAP 2021 Actions.

With the awareness that no action can be successful without the public’s participation, support, and contribution, it has been adopted as a fundamental principle to present every action and application to the public’s knowledge and to carry it out with their suggestions.

The activities planned and proposed to be carried out in the light of the primary methods listed for the participation of the public and other stakeholders can be listed as follows:

- Awareness-raising activities on the scientific basis of the climate crisis and the monitoring and interpretation of changes in the climate system; Increasing the number and efficiency of awareness activities

- Preparation of billboards, posters and brochures to raise awareness about climate change.

¹<https://medium.com./viable-cities/five-ways-of-meaningfully-involving-citizens-in-climate-action-2023949a253>

- Strategies developed by National and International Unions, Networks, TR Ministry of Environment, Urbanization and Climate Change on adaptation to climate change can be published by local media organs, theatre plays, short films, etc. individuals and enterprises to efficiently transfer by

- Individual measures that can be taken to reduce the carbon footprint can be used in

social media and other visual media environments such as films, animations, posters, etc. announcement by means

- Sharing the results of monitoring of environmental management parameters monitored in the district, such as air quality, water and energy consumption, waste generation and recycling rates, with the public and relevant parties

- Sharing the per capita value of the urban greenhouse gas emissions in the district and the targeted values over the years, updating them on a yearly or monthly basis and announcing them in areas where the population is concentrated

- Explaining the economic and environmental benefits of green building systems in urban transformation applications to developers and users, distributing them widely as a handbook

- Organizing seminars and workshops to inform individuals and institutions within the scope of the Urban Climate Adaptation Strategy

- Ensuring the participation of the citizens through surveys, meetings and workshops in the decisions to be taken to become a city resistant to the changing climate;

- Periodically measuring the feasibility of Emergency Action Plans (testing, monitoring, revising) and sharing the results with the relevant institutions

- Regular monitoring of planned climate actions and sharing the results with all relevant parties

- Carrying out awareness-raising activities by experts on global warming and climate change, especially starting from primary schools.

- Adding the subject of adaptation to climate change in daily life to school education under the coordination of local governments.

In the preparatory work of KARŞIYAKA MUNICIPALITY SECAP 2021, the active participation of internal and external stakeholders in all processes was attempted. Both the participation and contribution of internal and external stakeholders have been at a high level. This work provided endless collaborations. It is aimed that these collaborations will continue in the implementation and monitoring processes of KARŞIYAKA MUNICIPALITY SECAP 2021 actions and that stakeholders will also provide effective participation and contribution in the process.

The activities planned and proposed to be carried out in the light of the primary methods listed for the participation of the public and other stakeholders can be listed as follows:



Table 6 - 1 Indicator of Actions

CODE	ACTION TITLE	INDICATORS	R/H
B1	Conducting and Implementing Energy Efficiency in Municipal Buildings	I1: Annual energy consumption (MWh/year) and greenhouse gas emission value (tCO ₂ e/year) of each building belonging to the municipality. I2: Energy intensity (MWh/m ²) for each building monthly / annual basis.	▼
B.2	Raising the GIS Detail Level for Building Inventory	I1: Analyzing and monitoring GIS detail level every year, I2: Number of buildings to be processed into GIS	▼
B.3	Near Zero Energy Policy and Strategy Development for New Town Halls	I1: Determining and following up the quantitative targets on clean energy and energy efficiency in priority buildings to be constructed	▼
B4	Determination of Reference Buildings and Implementation of Energy Efficiency Improvement Steps for Taking Energy Inventory of the District	I1: Monitoring the energy consumption and greenhouse gases of each building determined by the reference building method. I2: Updating per capita energy consumption and energy usage amounts per m2 (energy density) specific to each building and holistically. I3: Number of buildings whose feasibility has been completed for the project I4: Reference building number.	▼
B5	Suggesting and Promoting Thermal Insulation in Existing Residences	I1: Reporting and holistically updating the energy consumption per capita and the amount of energy use per m2 (energy density) for each building. I2: Number of residential buildings with thermal insulation, energy-saving and greenhouse gas reduction amount.	▼
B6	Recommending and Encouraging the Use of Energy Efficient Lighting Devices in Existing Residences	I3: The number of buildings where energy-efficient lighting is carried out, the number of efficient luminaire replacements, the amount of energy savings and greenhouse gas reduction.	▼
B7	Insulation of Commercial and Other Institutional Buildings	I1: Annual assessment of the current situation with representatives of non-residential buildings, energy managers. I2: Number of commercial and institutional buildings included in the study.	▼
B8	Use of Energy Efficient Lighting Devices in Commercial and Other Institutional Buildings	I3: Making the system to be developed for monitoring and analysis of energy consumption usable I4: Name, number and printouts of buildings whose projects have been completed in specific periods.	▼
U1	Energy Efficiency in Municipal Vehicle Fleet and Rented Vehicles	I1: Number and ratio of electric and hybrid vehicles in the vehicle fleet. I2: Fuel savings and greenhouse gas reduction to be achieved as a result of activities.	▼
U2	More Sustainable Urban Mobility: Public Transport and Local Mobility	I1: Traffic density ratio at designated points I2: Citizen's bicycle ownership I3: Constructed bike lanes and roads with bike lanes	▼ ●
E1	Expanding the Use of Solar Energy in Municipal Assets and Lands such as Municipal Buildings, Marketplaces	I1: Installed photovoltaic solar power capacity in the enterprise (MWp) I2: Annual energy production (MWh) and greenhouse gas reduction amount (tCO ₂ e) of photovoltaic solar installations in operation. I3: Percentage of total photovoltaic solar installations covering the municipality's electrical energy consumption (%) I4: Percentage of total photovoltaic solar installations covering the total energy consumption of the municipality (%).	▼
E2	Ensuring the Expansion of Solar Energy Facilities	I1: The number of subscribers with high energy consumption that are contacted and directed. I2: Installed power capacity of new photovoltaic solar energy put into operation. I3: Annual energy production (MWh) and greenhouse gas reduction (tCO ₂ e) of newly commissioned and total photovoltaic solar installations. I4: The percentage of the updated total photovoltaic solar energy installations covering the electrical energy and total energy consumption of Karşıyaka district (%).	▼
E3	Conducting Feasibility for Geothermal Energy Potential and Preparation of Action Plan	I1: Feasibility report. I2: Action plan. I3: Number of relevant stakeholders with preliminary information	▼
E4	Ensuring Cooperation in Establishing a Digitalization Infrastructure in Transition to Renewable Energy Sourced Electricity System, Energy Supply and Monitoring	I1: Baseline analysis report. I2: Action plan. I3: Percentage of digitization realized (%).	▼
E5	Encouraging and Facilitating the Transition of Coal Consumers to More Renewable and/or Cleaner Energy Sources	I1: Baseline analysis report. I2: Action plan. I3: Number of families using coal for heating I4: Number of households switching to more renewable and/or cleaner energy sources instead of coal. I5: The amount of greenhouse gas reduction achieved through the transition (tCO ₂ e).	▼

E6	Participating in Twinning Programs with Cities and Organizing Joint Events	I1: Number of the project calls applied for. Number of projects accepted and implemented. Number of cities that have been matched. Number of jointly organized activities. Number of reports	I2: I3: I4: I5:	▼
E7	Implementation of an Environmental Labeling Program for Private Businesses in the City	I1: Number of businesses contacted and referred. Number of businesses included in the labelling program. Monitoring and interpretation of annual energy consumption (MWh) and greenhouse gas emissions (tCO ₂ e) of enterprises included in the labelling program.	I2: I3:	▼ ●
E8	Replacing Park/Garden and Street Lighting with LED	I1: Baseline analysis report. Action plan. Percentage of illumination that has been replaced (%). I4: Annual energy consumption (MWh) and greenhouse gas reduction (tCO ₂ e) achieved due to change.	I2: I3:	▼
A1	Expanding the Practices of Separate Collection of Packaging Waste at Source	I1: Annual amount of mixed packaging waste collected separately (kg/year) I1-1: Annual amount of recycled paper-cardboard-composite packaging waste (kg/year) I1-2: Annual amount of recycled plastic packaging waste (kg/year) I1-3: Annual amount of recycled glass packaging waste (kg/year) I1-4: Annual amount of recycled different metal packaging waste (kg/year) I2: Annual amount of domestic waste transported from Karşıyaka district to the sanitary landfill (kg/year) I3: Annual household waste per person transported from Karşıyaka district to the sanitary landfill (kg/person-year) I4: Number of packaging waste collection container-piggy banks within the boundaries of the neighbourhood (pieces) I5: Number of Mobile Waste Retrieval Centers within the edges of the district (unit)		▼
A2	Developing a Program for Separate Collection and Composting of Domestic Organic Wastes, Marketplace Wastes and Park and Garden Wastes	I1: Annual amount of domestic organic waste collected separately at the source (kg/year) I2: Annual amount of marketplace organic waste collected separately at the source (kg/year) I3: Annual amount of park and garden waste collected separately at the source (kg/year) I4: Ratio of organic waste in household waste (%) I5: Reduction target of park and garden waste going to landfill (%) I6: Reduction target of domestic organic wastes going to landfill (%) I7: Reduction target of marketplace waste going to landfill (%)		▼
A3	Preventing Marine Pollution by Improving Waste Management Practices	I1: Recyclable waste collected from beaches and streams (kg/year)		▼
A4	Implementation of the Smart Waste Collection System Digital Application	I1: Number of waste producers/users using the application (units) I2: Number of containers with sensors monitored in the field (pieces)		▼
A5	Reducing Greenhouse Gas Emissions from Waste Collection/Transport within the Scope of Institutional Greenhouse Gas Inventory	I1: Directorate of Cleaning Affairs solid waste vehicle fleet fuel consumption (lt) I2: Number of electric and hybrid vehicles powered by renewable energy sources in the waste transport fleet (units) I3: Number of underground and aboveground bulk containers		▼
S1	Making Regulations on Water Management for the Prevention of Floods and Floods	I1: Amount of green area I2: Amount of pavement and road using permeable material I3: Amount of Green Roof Licensed Buildings I4: Stormwater Harvesting Projects and Applications I5: Amount of Water Used in Green Field Irrigation		●
S2	Efficient Use of Water and Actions to Save Water	I1: Applications for Gray Water Use I2: Stormwater Harvesting Projects and Applications I3: Change Rates in Installations I4: The amount and change of water use in the corporate building and its participants I5: The amount and change of water use in green areas		●
S3	Awareness and Awareness Activities on Water Use	I1: Survey etc. assessment tools I2: Training and number of participants		●

SA1	Determining the Effects of Climate Change on Public Health and Taking Protective Measures	I1: Population data (including age groups and distribution) I2: Disabled population and distribution I3: Population distribution with chronic diseases (blood pressure, heart, etc.) I4: Population income distribution I5: Data on the migrant population I6: Data on the homeless I7: Follow-up of climate-related health complaints I8: Monitoring air quality, increasing parameters, providing mobile measuring device		●
SA2	Taking Protective Measures for Reducing the Effects of Climate Change on Advanced Age Public Health	I1: Elderly population data I2: Follow-up of climate-related health complaints I3: Activities and investments that facilitate the life of the elderly and create comfort in health and care services		●
AF	Establishing a Climate Change Resistant Disaster Management System	I1: Collection of Disaster Assembly Area Data (with the number, area and physical characteristics) I2: Number of KAME Volunteers I3: Number of training given to volunteers		●
ST	Supporting Sustainable Agriculture with Climate Friendly Agricultural Techniques, Preserving Local Product Patterns	I1: Non-residential green areas (Forest and agricultural areas, recreation areas) I2: Number of Rural Population I3: Supported economic activity in rural areas I4: Urban Agricultural Activity Area I5: Climate Crisis and circular economy awareness activities		●
YA1	Reducing the Urban Heat Island Effect	I1: Green space per capita I2: Surface Temperature measurements I3: Amount of Green Roof Licensed Buildings Permeable, reflective surface area I4:		▼ ●
YA2	Rehabilitation and Increase of Green Areas and Afforestation Works	I5: Newly built park and green space I6: Rehabilitation-renewed park and green space I7: Afforestation area		▼ ●
KA	Sustaining Forest Existence, Protecting Wetlands, Researching Forest Products and Sustainable Production Models with High Value Added	I1: Awareness raising on the emission reduction effect of protected areas. I2: Activities for the protection of Protected Areas		▼ ●
GG	Reducing the Negative Impacts of Climate Change on Food Safety and Security	I1: Activities supporting agricultural production I2: Increasing awareness of safe food I3: Doing activities to prevent food waste.		●
▼ Reduction ● Harmony				

ANNEX



ANNEX

Annex-1 Urban Greenhouse Gas Inventory Data Sources

Source Flow	Data Source
Natural Gas(Fixed Burning)	General Directorate of İzmir Natural Gas Inc.
Lignite(Coal)	İzmir Province Environmental Status Reports, Chart A4-A5
Diesel(Transport)	<ul style="list-style-type: none"> Private Vehicles: Energy Market Regulatory Authority,Petroleum Market Annual Sector Reports, 2018 Public Transportation/Highway: Izmir Metropolitan Municipality(IMM) Eshot General Directorate Public Transportation/Seaway: :Izmir Metropolitan Municipality(IMM) İzdeniz inc.
Gasoline(Transport)	Energy Market Regulatory Authority,Petroleum Market Annual Sector Reports, 2018
LPG(Transport)	Energy Market Regulatory Authority,LPG Market Annual Sector Reports, 2018
Electricity	General Directorate of Gediz Electricity Distribution Inc. Public Transportation/Railway: IMM Rail Systems Department and Metro inc.
Enteric Fermentation and Fertilizer Management (Husbandry)	İzmir Provincial Directorate of Agriculture and Forestry
Solid Waste	IMM Waste Management Department
Waste Water	IMM Izmir Water and Sewerage Administration General Directorate

Annex-2 Reference Sources on Calculation Factors Used in Urban and Institutional Greenhouse Gas Inventory (2018)

Source Flow	Data Source: Net Calorific Value (NKD) and Emission Factor (EF)
NATURAL GAS	NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels EF: tur-2020-crf-13apr20 Table1.A(a)s4(2018 emission factor is used.)
DIESEL (FIXED BURNING)	DENSITY: Energy Market Regulatory Authority(EPDK) Web Site Petroleum Market Notification System - Explanations on Filling Notification Forms - 11th version NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels CO2 EF: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Table 3.7 CO2 emission factors of fuels (2018 emission factor is used.) CH4, N2O EF: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3 Country Specific Carbon Content Determination and Emission Factors / CH4 and N2O Emission Factors (Sector 1A4a)

GASOLINE(FIXED BURNING)	DENSITY: Energy Market Regulatory Authority(EPDK) Web Site Petroleum Market Notification System - Explanations on Filling Notification Forms - 11th version NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels CO2 EF: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Table 3.7 CO2 emission factors of fuels (2018 emission factor is used.) CH4, N2O EF: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3 Country Specific Carbon Content Determination and Emission Factors / CH4 and N2O Emission Factors (Sector 1A4a)
LPG (FIXED BURNING)	NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels CO2 EF: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Table 3.7 CO2 emission factors of fuels (2018 emission factor is used.) CH4, N2O EF: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3 Country Specific Carbon Content Determination and Emission Factors / CH4 and N2O Emission Factors (Sector 1A4a)
LIGNITE(COAL)	NKD: NCV of Fuels 2018 Unit, Ref: NIR TURKEY 2020 Annex 3: Country Specific Carbon Content Determination and Emission Factors EF: NIR 2020 Table 3.7 CO2 emission factors of fuels Table 3.49 N2O and CH4 emission factors of fuels used in others sector (1A4) Annex 3: Country Specific Carbon Content Determination and Emission Factors
DIESEL (TRANSPORT)	DENSITY: Energy Market Regulatory Authority (EPDK) Web Site Petroleum Market Notification System - Explanations on Filling Notification Forms - 11th version NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels EF: tur-2020-crf-13apr20 Table1.A(a)s3 (2018 emission factor is used.)
GASOLINE (TRANSPORT)	DENSITY: Energy Market Regulatory Authority (EPDK) Web Site Petroleum Market Notification System - Explanations on Filling Notification Forms - 11th version NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels EF: tur-2020-crf-13apr20 Table1.A(a)s3 (2018 emission factor is used.)

LPG (TRANSPORT)	NKD: NIR TURKEY 2020 Annex 3: Country Specific Carbon Content Determination and Emission Factors. EF: NIR (National Inventory Report), Table1.A(a)s3, Transport/Road
DIESEL(CONSTRUCTION MACHINES - TRANSPORT)	DENSITY: Energy Market Regulatory Authority(EPDK) Web Site Petroleum Market Notification System - Explanations on Filling Notification Forms - 11th version NKD: TURKEY NATIONAL INVENTORY REPORT (NIR 2020) Annex 3: Country Specific Carbon Content Determination and Emission Factors / NCV of Fuels EF: tur-2020-crf-13apr20 Table1.A(a)s4 (2018 emission factor is used.)
ELECTRICITY PURCHASED	Turkish National GHG Inventory (NIR) 2020 Public electricity and heat production (Category 1.A.1.a) Table 3.16 TEİAŞ Web Page https://www.teias.gov.tr/tr-TR/turkiye-elektrik-uretim-iletim-istatistikleri
ENTERIC FERMENTATION AND FERTILIZER MANAGEMENT (HUSBANDRY)	ENTERIC FERMENTATION: NIR (National Inventory Report), Enteric Fermentation, Table 3.As1 FERTILIZER MANAGEMENT: NIR (National Inventory Report), CH4 emissions from manure management - Table 3.B(a)s1 and N2O emissions from manure management - Table 3.B(b)
SOLID WASTE	NIR, ANNEX 3: Emission Factors Used for Waste Sector NIR – Solid Waste Disposal – Table5.A
WASTE WATER	NIR - Wastewater treatment and discharge – Table5.D

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- IPCC Fifth Assessment Report, 2014 (AR5) (www.ipcc.ch),
- The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard
- Turkish Statistical Institute 2018 Municipal Waste Statistics Survey

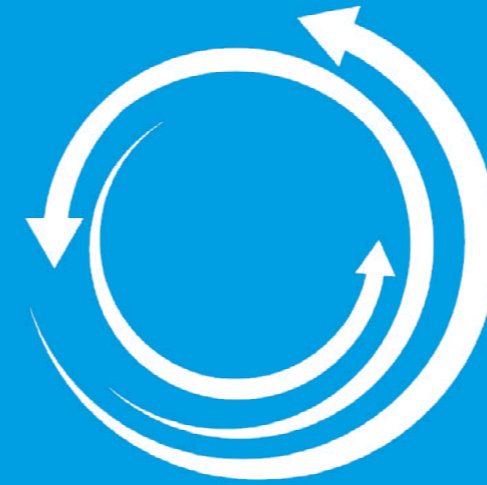
SUSTAINABLE DEVELOPMENT GOALS



SUSTAINABLE
DEVELOPMENT
GOALS



It is for electronic version.



Karşıyaka Sustainable Energy and Climate Action Plan 2021

