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Climate City Contract

2030 Climate Neutrality Action Plan

2030 Climate Neutrality Action Plan of the City of Istanbul

ISTANBUL METROPOLITAN MUNICIPALITY

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Abbreviations and Acronyms

Abbreviations and acronyms	Definition
AFOLU	Agriculture, Forestry and Other Land Use
BAU	Business-as-Usual
BEP-TR	Building Energy Performance - Türkiye Regulation
BIMTAS	Boğaziçi Landscape Construction Consultancy Technical Services Industry and Trade Inc.
CAP	Climate Action Plan
CCC	Climate City Contract
CO_2e	Carbon Dioxide Equivalent
COVID-19	Coronavirus Disease 2019
C40	C40 Cities Climate Leadership Group
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
ICE	Internal Combustion Engine
ICCP	Istanbul Climate Change Action Plan
IETT	İstanbul Electric Tram and Tunnel Company
IMM	Istanbul Metropolitan Municipality
IPPU	Industrial Processes and Product Use
IPCC	Intergovernmental Panel on Climate Change
ISBAK	Istanbul IT and Smart City Technologies Inc.
ISKI	Istanbul Water and Sewerage Administration
ISPARK	Istanbul Parking Lot Enterprises Trade Inc.
KIPTAS	Kiptaş İstanbul Housing Development Plan Tourism Inc.
LPG	Liquefied Petroleum Gas
MENR	Ministry of Energy and Natural Resources
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MoTI	Ministry of Transport and Infrastructure
$MtCO_2e$	Million Metric Tons of CO_2 Equivalent
NDCs	Nationally Determined Contributions
NGO	Non-Governmental Organization
NZEB	Nearly Zero-Energy Building
OPEX	Operating Expenditure
PV	Photovoltaic
SECAP	Sustainable Energy and Climate Action Plan
SUMP	Sustainable Urban Mobility Plan
tCO_2e	Tonnes of CO_2 Equivalent
TEMA	The Turkish Foundation for Combating Erosion Reforestation and the Protection of Natural Habitats
TOKI	Housing Development Administration
UKOME	Transportation Coordination Center
USD	United States Dollar

Summary

Cities are at the forefront of the battle against climate change, given their dense populations, high energy consumption, and the concentration of networks and resources crucial for driving climate action. The European Green Deal's ambitious targets of reducing emissions by 55% by 2030 compared to 1990 concentrations and achieving climate neutrality by 2050 underscore the urgent need for cities to lead the charge. The EU Climate Neutral and Smart Cities Mission provides a transformative pathway for cities to achieve these goals.

Istanbul recognizes the critical importance of contributing to the European Green Deal and being part of the solution in addressing the escalating climate crisis. The city is committed to creating a fair and inclusive governance model, fostering collaboration across all sectors of society to achieve climate neutrality.

Istanbul's ambition to become carbon neutral by 2030 is a formidable challenge, considering its status as Türkiye's largest metropolis. However, the city's determination and potential to tackle climate change are driving forces behind this endeavour. The Climate City Contract Action Plan builds upon Istanbul's existing action plans and strategies, aligning them with the three core elements of the Climate City Contract. The progress made thus far in preparing this plan inspires confidence in finding even more creative, equitable, and inclusive solutions in the future.

We acknowledge that achieving climate neutrality requires going beyond the priority actions identified in the 2021 Istanbul Climate Change Action Plan (CAP). These actions, while highly impactful, must be complemented by a broader range of initiatives that contribute to the net-zero transition. The economic system's response to these actions will be dynamic, and not all outcomes may be favourable. Therefore, new actions will need to be developed to address any adverse effects.

Furthermore, we recognize the need for an ongoing process of developing new actions and adapting existing ones to meet the evolving needs of a dynamic socio-economic system.

Within this framework, the updated and improved priority strategies from the CAP, along with their corresponding carbon reduction quantities, will be presented.

The implementation of the outlined CCC actions is projected to achieve a substantial reduction around 80% in greenhouse gas emissions. However, a remaining 20% gap is anticipated. To address this gap, further efforts can be planned, focusing on areas such as enhancing carbon capture and storage technologies, promoting nature-based solutions, and exploring innovative approaches to decarbonization.

Istanbul is confident that its existing capacity, perspective, and ambition in addressing climate change will enable it to become a unique living laboratory in its pursuit of climate neutrality.

1 Introduction

Istanbul, a vibrant megacity straddling two continents, faces a dual challenge: managing rapid urbanization and economic growth while mitigating the impacts of climate change. The city's 2030 climate neutrality target encompasses its entire administrative territory, aiming to achieve an ambitious reduction in greenhouse gas emissions across all related sectors.

Key data underscores the scale of this undertaking. Istanbul's registered population of 16 million, coupled with its significant industrial and commercial activity, results in substantial emissions. The city's unique geographical location and its role as a major economic and tourism hub further amplify the complexities of achieving climate neutrality.

This Climate City Contract Action Plan builds upon Istanbul's existing climate policies and strategies, including the Istanbul CAP and the Sustainable Energy and Climate Action Plan (SECAP). In addition, Istanbul is developing its Green City Action Plan (GCAP) which defines the key environmental challenges and actions to overcome these. Climate City Contract Action Plan leverages these foundations to bridge the gap between current emissions reduction efforts and the 2030 climate neutrality target. Moreover, CCC study also focuses on the investment perspective of climate actions. Similarly, SECAP and GCAP studies also includes the required capital investment scale of actions. However, CCC study presents it as a separate report with more detail.

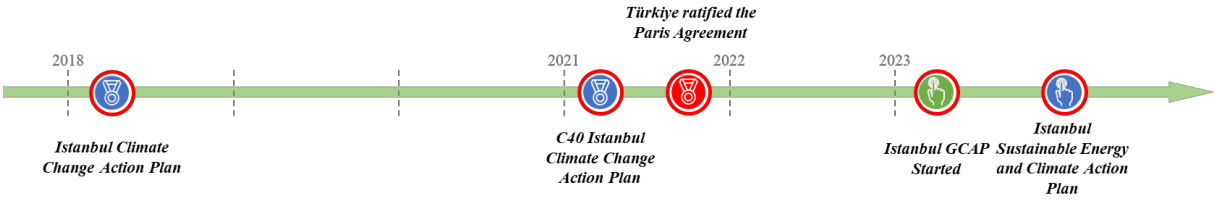

Figure 1: Climate Policies and Strategies of Istanbul

The development of this Action Plan has been a collaborative endeavour, involving extensive engagement with internal and external stakeholders. This participatory approach ensured that the plan reflects the diverse perspectives and priorities of the city's residents, businesses, and institutions.

In addition, IMM will work for the implementation of the CCC's strategic goals and actions in accordance with the co-creation approach with a wide range of stakeholders from district municipalities, public institutions and organisations, the private sector, academia, professional chambers and many NGOs.

At this point, the Istanbul Climate Platform (ICP) mentioned in the commitment document will be used and efforts will be made to carry out regular monitoring activities to keep the platform alive in order to accelerate the process and maintain communication among stakeholders.

The Action Plan focuses on the priority actions identified in the CAP, with additional measures required to achieve the accelerated 2030 target. The Istanbul CCC will be a living document that will be updated iteratively to achieve the 2030 target. Future iterations will delve deeper into sector-specific strategies, implementation plans, and financing mechanisms.

Istanbul recognizes that achieving climate neutrality requires a holistic approach, encompassing not only emissions reduction but also adaptation to the inevitable impacts of climate change. Besides, all sector-based barriers and opportunities are summarised under ‘Module 2.3 (A3) Systemic Barriers and Opportunities to 2030 Climate Neutrality’ Section. The Action Plan thus outlines a comprehensive roadmap, integrating mitigation and adaptation efforts across key sectors such as energy, buildings, transport, and waste management.

Section 5 of this report outlines the necessary steps for future implementation of the identified climate actions as follows:

- Preparation the implementation plans
- Stakeholder engagement
- Capacity building
- Work to find sufficient funding from multiple sources, including public and private investment, to support the implementation of the Action Plan.
- Encouraging innovation and experimentation to identify and scale up new solutions for climate neutrality.

The journey towards a climate-neutral Istanbul by 2030 is extremely ambitious, but the city is working with utmost dedication and effort to overcome the systemic barriers and seize the opportunities that lie ahead. By fostering collaboration, innovation, and a commitment to a just transition, Istanbul is capable of creating a sustainable and resilient future for all.

Table 1: (Table I-1.1) Climate Neutrality Target by 2030

Sectors	Scope 1	Scope 2	Scope 3
Stationary energy	Included	Included	Not applicable
Transport	Included	Included	Not applicable
Waste/wastewater	Included	Not applicable	Not applicable
IPPU	excluded	Not applicable	Not applicable
AFOLU	excluded	Not applicable	Not applicable
Geographical boundary	Same as city administrative boundary	Smaller than city administrative boundary	Larger than city administrative boundary
	✓		
Map			

The jurisdiction of the Istanbul Metropolitan Municipality was determined as the provincial administrative border in 2004 according to the Metropolitan Municipality Law No. 5216. With this provision, the jurisdiction of the Istanbul Metropolitan Municipality became 5460.85 km² (5343.22 km² land area + 117.63 km² lake area). The GHG inventory encompasses the entire geographical area of Istanbul (5460.85 km²), encompassing all 39 districts under the jurisdiction of the IMM.

2 (A) Current State of Climate Action

This section outlines the city's baseline in its journey towards achieving climate neutrality and provides an overview of the city's current environmental standing, detailing the commitments and strategies of key local businesses and stakeholders. By analysing the progress made so far and identifying existing gaps, this action plan sets the stage for understanding the necessary actions and pathways to accelerate climate action, driving the city closer to its goals.

2.1 (A-1) Greenhouse Gas Emissions Baseline Inventory

Istanbul, a metropolis bridging Europe and Asia, faces a formidable challenge: reconciling its rapid economic and population growth with the urgent need to combat climate change. The city's 2019 greenhouse gas (GHG) emissions inventory, calculated by the Istanbul Metropolitan Municipality team and validated by the C40 Cities network, reveals a sobering reality. The GHG inventory encompasses the entire geographical area of Istanbul, 5,460.85 km^2, encompassing all 39 districts under the jurisdiction of the IMM. This comprehensive scope ensures a holistic assessment of greenhouse gas emissions across the city. The 2019 Istanbul GHG inventory encompassed the calculation of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) greenhouse gas emissions, expressed in their carbon dioxide equivalent (tCO_2e) values. Total emissions reached approximately 50.9 million metric tons of CO_2 equivalent ($MtCO_2e$), translating to a per capita footprint of 3.3 tCO_2e.

2.1.1 Inventory Modelling Methodology

Overview: The modelling methodology followed the processes set out in the C40 Climate Action Planning Framework, using the supporting tools provided by C40. The process assesses the impact of climate mitigation strategies on cities such as Istanbul by using city, national and regional data to build up credible emissions reduction scenarios.

Tools: In order to produce the emissions pathways produced in this report an extensive modelling exercise was carried out in the Pathways tool - a customisation of The Climate action for URBan sustainability (CURB) tool that addresses the specific needs of C40's Climate Action Planning programme.

Process: The first stage of the modelling process is to develop a robust emissions inventory baseline. Prior to the 2021 Istanbul Climate Action Plan workstream, IMM prepared a baseline consistent with the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC) standard.

Table 2: City Greenhouse Gas Emissions Calculation Scope[1]

Sector		Scope 1	Scope 2	Scope 3 included in Basic/Basic+
Stationary Energy	Energy use (all I emissions except I.4.4)	Basic (B)	B	Basic+ (B+)
	Energy generation supplied to the grid	Territorial only	NA	NA

[1] Source: GPC GHG Protocol, 2021

Sector		Scope 1	Scope 2	Scope 3 included in Basic/Basic+
	(I.4.4)			
Transportation	All emissions	B	B	B+
Waste	Generated in the city (all III.X.1 and III.X.2)	B	NA	B
	Generated outside the city (all III.X.3)	Territorial only	NA	NA
IPPU	All IV emissions	B+	NA	NA
AFOLU	All V emissions	B+	NA	NA

Istanbul chose to adopt a 'Basic' inventory which requires reporting of Scope 1 and Scope 2. Furthermore, Istanbul will make an effort to calculate according to "GPC Basic +" inventory approach for the future. To produce the emissions, baseline an activity-based approach was mostly used, where the city energy activity across the key sectors of energy, buildings, transport, waste and wastewater were multiplied by proper city emissions factors, e.g. grid factor or IPCC-compliant emissions factors to calculate the associated emissions. In some cases, the total emissions for some sub-sectoral activities were already known due to ongoing reporting systems and were input as final values.

The greenhouse gas emission inventory of Istanbul has been calculated using the formula adapted from the Intergovernmental Panel on Climate Change (IPCC) "Tier-1" and "Tier-2" methodology within the Istanbul's city boundaries.

Carbon Dioxide Emissions (t CO_2) = ΣsΣf {fuel consumption sf (MWh) x CO_2 emission factor f}

(t CO_2e/MWh)

s = sector

f = energy carrier

The greenhouse gas emissions and global warming potentials included in the inventory are taken from the IPCC 5th Assessment Report (AR5). Emission factors used in the inventory are taken from IPCC Emission Factors, except for the national electricity grid emission factor calculated for Türkiye. The average emission factor from electricity is taken from the Primary Energy and Greenhouse Gas Emission Coefficients of Electricity.

This inventory, along with additional baseline data such as population, GDP, population growth, and GDP growth, is uploaded into the Pathways tool. The data was prepared in collaboration with IMM and the relevant city departments, including Environment, Transport, and Infrastructure.

2.1.2 GHG Emissions

The inventory paints a picture of a city grappling with the consequences of its energy choices and consumption patterns. The stationary energy sector, encompassing residential, commercial, and industrial buildings, emerges as the largest contributor, responsible for a substantial 63% of total emissions. This is closely followed by the transport sector, accounting for 28% of emissions, primarily driven by the reliance on diesel-fuelled private cars and buses. While the waste sector has the smallest share (9%) to the overall emissions, it represents an area where IMM has the potential to implement impactful actions in a timely manner, given its authority and capacity for action.

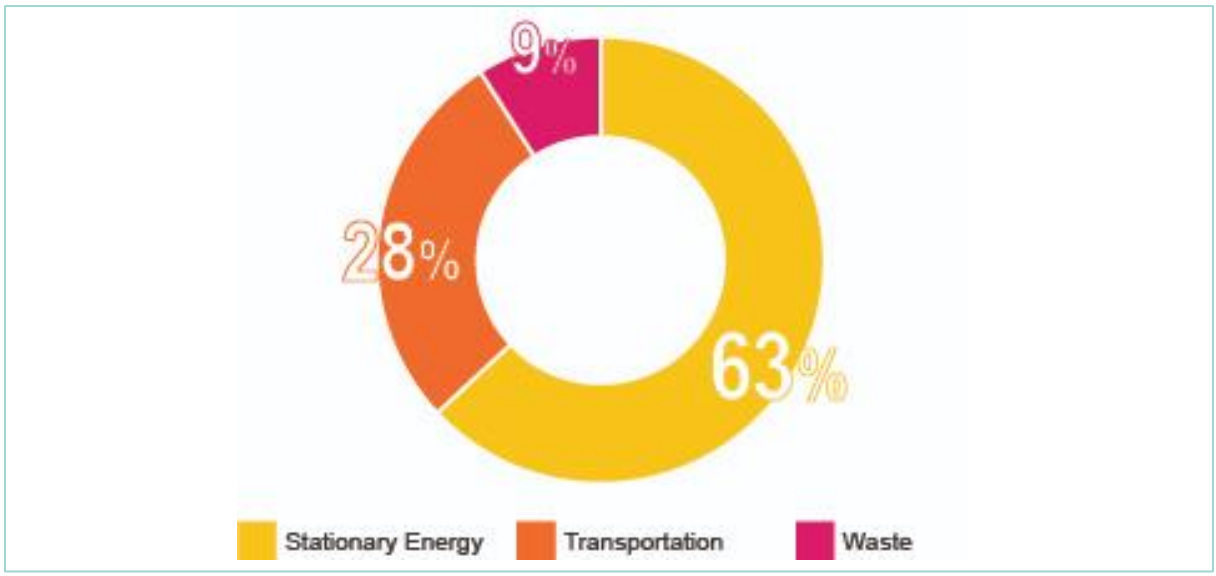

Figure 2: The Breakdown of the Sectoral Emissions

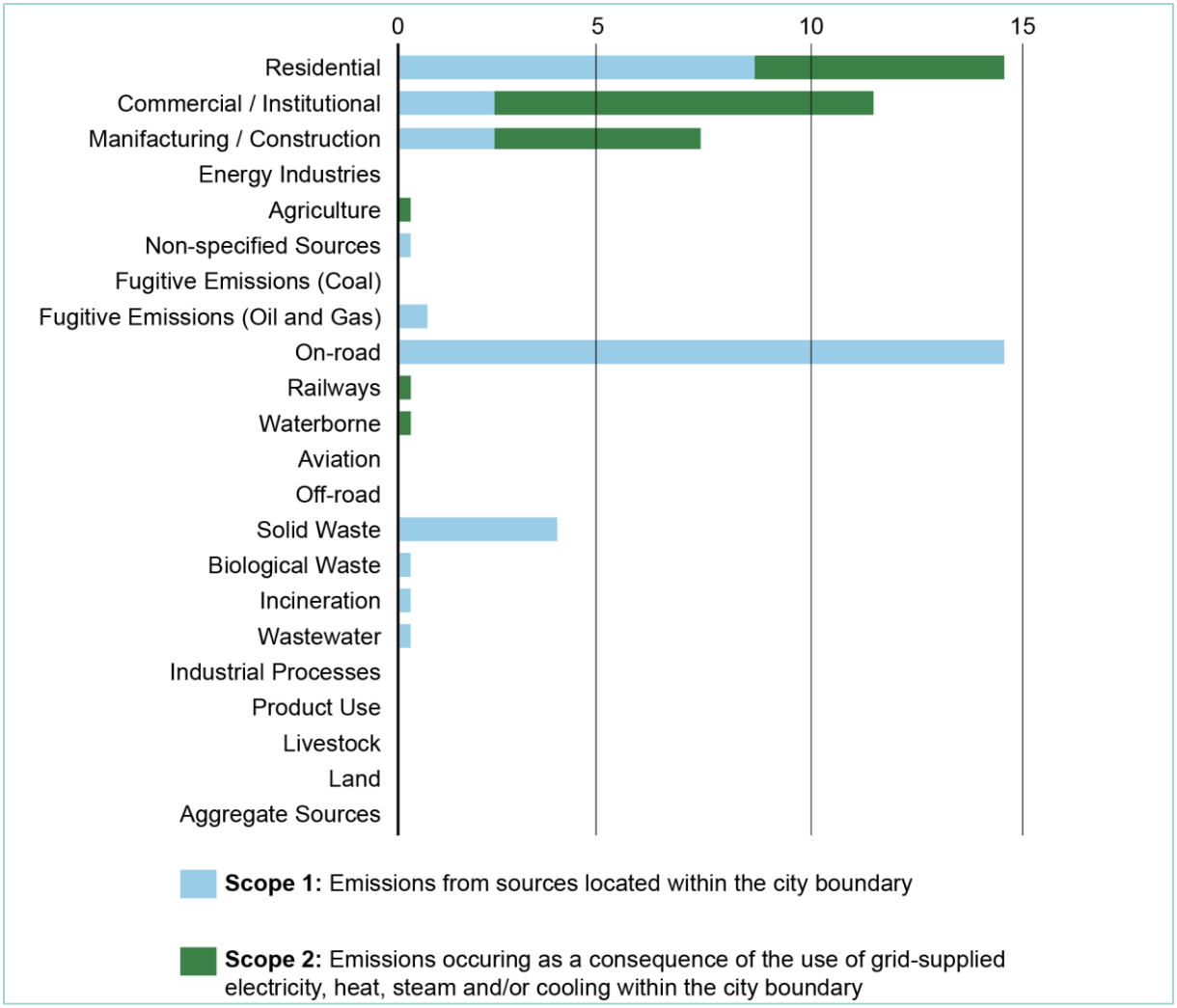

Figure 3: GHG Emissions ($MtCO_2e$)

The figure below shows that emissions in the **stationary energy** sector are split around 62% for 'Scope 1' (direct fuel combustion) and 38% for 'Scope 2' (electricity consumed). Emissions from electricity use are high in Istanbul due to the grid reliance on coal. Electricity use represents the majority portion of the emissions from commercial buildings and manufacturing industries, whereas Scope 1 fuel use represents the majority in residential buildings (8.4 $MtCO_2e$), predominantly due to natural gas use in homes for cooking, hot water and heating.

The transportation sector is responsible for 28% of total emissions and the sole most significant source, on-road transportation. Diesel oil is the dominant fuel source of emissions in road transportation (11.6 $MtCO_2e$) compared to gasoline (1.8 $MtCO_2e$) and LPG (830 $ktCO_2e$). This activity comes mostly from private cars and a significant number of buses. The 2019 inventory includes emissions from rail and water-borne navigation, but these represent less than 1% of total transportation emissions. This reflects the complexity and smaller policy influence over emissions in this sector held by the city.

Waste represents the remaining 9% of emissions in Istanbul, with the vast majority (89%) of these coming from solid waste disposal. The remaining 11% of waste emissions are allocated across wastewater treatment (5%), industrial incineration (3%) and composting (2%).

Basic	Scope 1 (tCO_2e)	Scope 2 (tCO_2e)	Scope 3 (tCO_2e)
Stationary	12,617,393	19,372,564	
Transportation	14,370,456	45,988	
Waste	4,482,252		0
IPPU			
AFOLU			
Other Scope 3			
Total	50,888,653		

Intensity Indicators	Per capita	Per unit land area (km^2)	Per unit GDP (tCO_2e)
Emissions	3.3	9,578	347

Figure 4: GHG Emissions according to the GPC BASIC Methodology

Greenhouse gas emission inventory calculations are reported to the CDP Cities (Carbon Disclosure Project) network, one of the official reporting platforms of GCoM.

Istanbul was awarded an “A” score as a result of the evaluations carried out by the network on the “Provincial Greenhouse Gas Emission Inventory for 2022 and the activities carried out by IMM in 2022 that contribute to combating climate change”, which was entered into the system in 2023. A List cities create climate momentum by taking 4 times more climate mitigation and adaptation measures than non-A List cities. In 2023, only 13% of the cities whose climate actions were scored by CDP were able to achieve an A score. For a city to achieve an A score, it must have a city-wide greenhouse gas emission inventory, publish a climate change action plan, complete a climate risk and vulnerability assessment, have climate change adaptation targets, and publicize them through the CDP Platform. Istanbul was included in the “CDP Cities A List” as one of the 119 cities with the highest score.

Istanbul's commitment to a sustainable future is evident in its existing and planned climate strategies. Through initiatives focused on energy efficiency, renewable energy adaption, and sustainable transport, the city aims to curb its emissions’ growth. However, the 2021 Climate Action Plan and subsequent analyses based on the C40 Pathways tool reveal a stark truth: these efforts alone were insufficient to meet the ambitious goal of carbon neutrality even by 2050. Despite the considerable challenges, IMM is committed to working with all key stakeholders who have a vital role to play in driving the city's transformation forward.

After completing Climate Action Plan in 2021, we continued to monitor the city-wide GHG emissions and published them in our Climate Monitoring Reports.

2.1.3 Istanbul’s Journey Towards Climate Neutrality

Recognizing the urgency of the climate crisis, Istanbul has set forth a bold ambition: to achieve carbon neutrality by 2030. This necessitates a paradigm shift, moving beyond incremental improvements to embrace transformative change across all sectors. The city's Sustainable Energy and Climate Action

Plan outlines measures for energy efficiency, renewable energy integration, and sustainable urban development. While crucial, these actions must be complemented by broader systemic changes to achieve the desired reductions. Initially aiming for a 52% emissions reduction by 2030, Istanbul has now raised its ambition through the Climate City Contract, targeting carbon neutrality by the same year. Finally, Istanbul has increased this target even further and increased our 2030 greenhouse gas reduction target to 80% compared to the base year 2019.However, a remaining 20% gap is expected.

This ambitious goal underscores the city's commitment to accelerating climate action and leading the way towards a sustainable and resilient future.

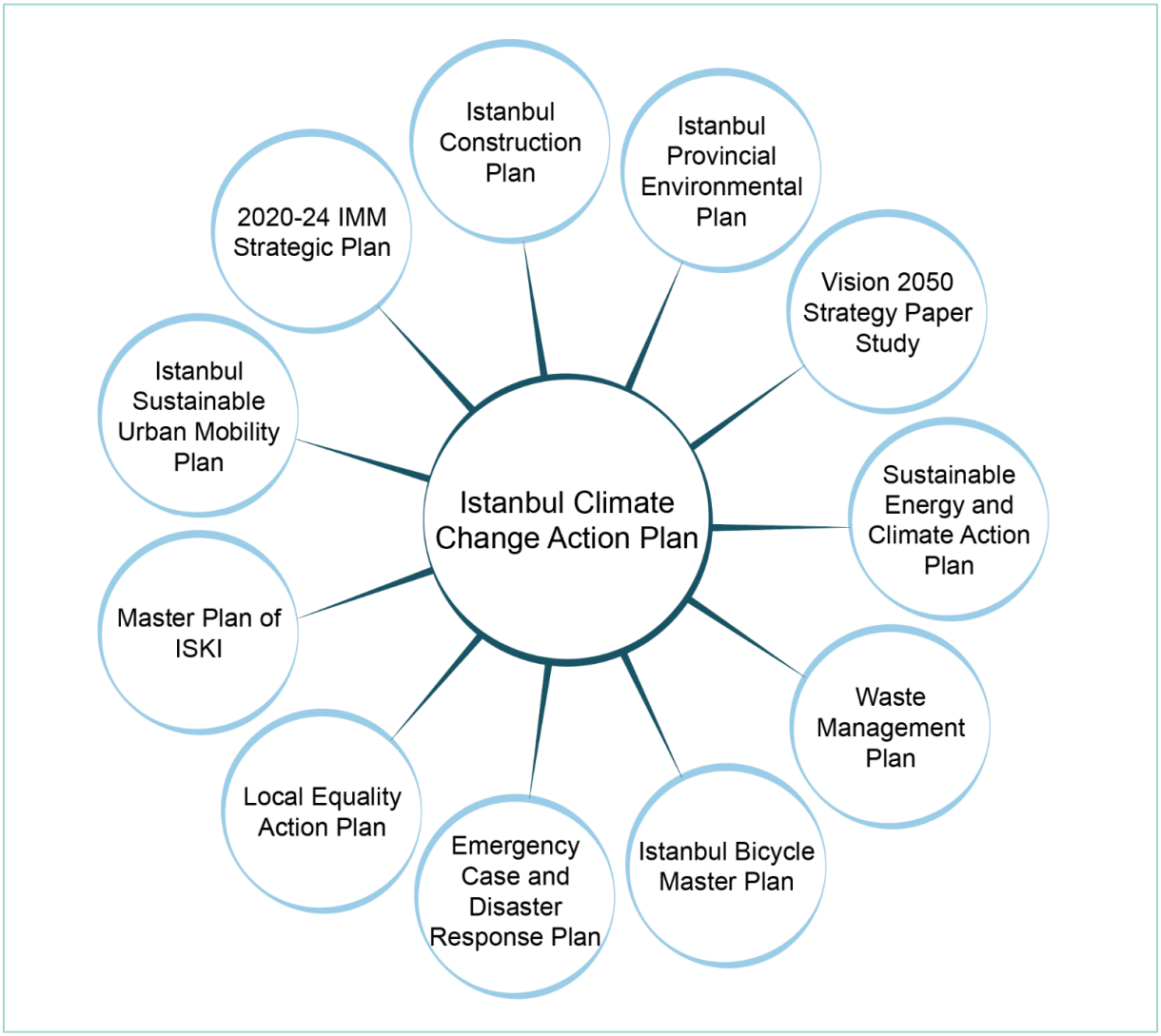

Figure 5: Istanbul Climate Action Plan and Related Other Policies

IMM Climate Change Directorate and other IMM departments carry out projects that support the city's climate neutrality. These projects, which are carried out in cooperation with various partners and stakeholders, play an active role in the dissemination of renewable energy and climate change issues throughout the city.

Istanbul applied to the Mission's call for pilot cities with the project 'Green and Carbon Neutral Building Transition Guide-Istanbul Model (Build4GreenIST)' and was selected as the first pilot city from Türkiye.

The motivating point of this highly inspiring project is to address the city's main problems, earthquake risk, and climate crisis, together. The project will provide a guide for this transformation towards a green and carbon neutral building concept that is resistant to climate change; while carrying out the inevitable urban transformation works in the city where earthquake risk and old buildings are too many. The aim is to highlight the positive impact that the addition of climate-friendly practices to the urban transformation works in the city will have in terms of climate change and renewable/efficient energy use during the transformation process, which is very necessary for the city. The studies will be carried out using a methodology that involves almost all the city's stakeholders in the field of building energy. The guide, which will be produced at the end of the project, is intended to provide effective benefits and awareness for the city's decarbonisation efforts.

The Build4GreenIST project will provide a guide to ensure that buildings renovated as part of urban regeneration are green and carbon neutral. It will also monitor energy consumption in buildings in a pilot area through sensors and encourage behavioural change of citizens towards energy efficiency. A mobile application called GreenIST is being developed for this purpose. In addition, the trainings and conferences organised under the project for a wide range of stakeholders such as citizens, practitioners, local government representatives are also contributing significantly to inclusive awareness efforts. The project will also include the development of business and finance models to bring a holistic approach to this opportunity for change.

Another project that is carried out by IMM Climate Change Directorate is The UP2030 Horizon Project. Within the scope of the UP2030 Project, the solar energy (PV) potential of building roofs in the Kadıköy district will be calculated, and the use of clean energy produced in the region within the building without storage and the transfer of the remaining energy to light electric vehicles in urban transportation will be modeled with digital twin technology. Within the scope of the project, attention will also be drawn to the fact that renewable energy systems can be used by citizens in their daily life activities with PV panel integrated urban furniture to be installed in a square/park with high human density in Kadıköy. Many workshops were established to be able to exchange views with relevant stakeholders on the basic prototypes of the project. Furthermore, many surveys were made in the pilot area for citizen engagements.

Apart from these, Procure and Neuthralpath projects (Horizon Projects), which are actively carried out by IMM Energy and Lighting Directorate, also refer to studies such as Positive Energy Zones.

The “Procurement of Innovative Solutions for 100% Renewable Energy Use in Buildings” (PROCURE) project, carried out in partnership with IMM and Özyeğin University in Istanbul, 9 partners in 7 countries (Slovenia, Spain, Germany, Portugal, Israel, Türkiye, Italy) under the main title of “Low Carbon Emission, Climate Resilient Future” and “Safe, Clean and Efficient Energy”. Within the scope of the project, it was aimed to meet the energy needs of the buildings with 100% renewable energy by applying innovative technologies and original solutions to existing public buildings selected from 6 different cities, including Istanbul. Within this scope, a bakery building from the 19th century Ottoman Empire was restored and transformed into a building using 100% renewable energy.

The Neuthralpath project, in which Istanbul is a partner, is paving the way towards climate neutral cities through the development of Positive and Clean Energy Districts (PCEDs) and the co-design of efficient, climate-friendly solutions. The partner cities of Istanbul, Ghent and Vantaa have expressed their commitment to work with Zaragoza and Dresden to support and share the process of decarbonisation (by 2030), while paving the way to achieve the same long-term goals.

Istanbul's journey towards climate neutrality is not without its challenges. Systemic barriers, ranging from institutional fragmentation and limited financial resources to public awareness and behavioural shifts, pose formidable obstacles. Yet, the city's rich history of resilience and innovation, coupled with a strong commitment to collaboration and stakeholder engagement, offers a beacon of hope. By fostering a green and just recovery from the COVID-19 pandemic, investing in sustainable infrastructure, and

empowering its citizens, Istanbul can chart a course towards a carbon-neutral and climate-resilient future. The path ahead is undoubtedly complex, but the stakes are too high to falter. The time for bold action is now, and Istanbul is poised to lead the way.

Table 3: (A-1.1) Final Energy Use, by Source Sectors

	Scope 1	Scope 2	Scope 3
Buildings (Stationary Energy)	128,101,248 MWh/year	39,424,913 MWh/year	
(Fuel type / energy used)	Natural gas, Coal, LPG, Fuel Oil, Crude Oil, LNG	Electricity	
Transport	53,843,597 MWh/year	93,589 MWh/year	53,937,187 MWh/year
(Fuel type / energy used)	CNG, LPG, Motor Gasoline, Diesel Oil	Electricity	CNG, LPG, Motor Gasoline, Diesel Oil, Electricity
Waste	494,482,956 tons/year		494,482,956 tons/year
			Base year: 2019

Table 4: (A-1.2) Activity, by Source Sectors

	Scope 1	Scope 2	Scope 3
Buildings	Residential Buildings, Commercial and Institutional Buildings and Facilities, Manufacturing Industries and Construction, Energy Industries, Agricultural Activities, Non-Specified Sources, Fugitive Emissions from Oil and Natural Gas Systems	Residential Buildings, Commercial and Institutional Buildings and Facilities, Manufacturing Industries and Construction, Agricultural Activities	
(Activity)	Natural gas, Coal, LPG, Fuel Oil, Crude Oil, LNG	Electricity	
Transport	On-Road Transportation, Railways, Waterborne Navigation	Railways	
(Activity)	CNG, LPG, Motor Gasoline, Diesel Oil	Electricity	
Waste	Solid Waste Disposal, Biological Treatment of Waste, Incineration, Wastewater Treatment and Discharge		
(Activity)	Uncategorised waste disposal sites, All Organic Waste, Waste Incineration, All Wastewater (Treatment Activity)		
Industrial Process and Product Use (IPPU)			
(Activity)			
Agricultural, Forestry and Land Use (AFOLU)			
(Activity)			
			Base year: 2019

Table 5: (A-1.3) Emission Factors Applied

Fuel Type or Activity	Unique Identifier	Type	GWP	Units	Convert to Tonnes	Emission Factor					
						CO_2	tCO_2e	CH4	CH4_ tCO_2e	N2O	N2O_ tCO_2e
Electricity	EF_Electricity (national)	GHG	5AR	kg/kWh	0.001	0.4871	4.87E-04	0.0000	1.83E-07	0.0000	4.1E-06
Diesel oil	EF_Diesel (normal)	GHG	5AR	kg/TJ	0.001	74,100	7.41E+01	3	8.40E-02	0.6	1.6E-01
Diesel oil	EF_Diesel (on-road)	GHG	5AR	kg/TJ	0.001	74,100	7.41E+01	3.9	1.09E-01	3.9	1.0E+00
Diesel oil	EF_Diesel (off-road)	GHG	5AR	kg/TJ	0.001	74,100	7.41E+01	4.15	1.16E-01	28.6	7.6E+00
Diesel oil	EF_Diesel (marine)	GHG	5AR	kg/TJ	0.001	74,100	7.41E+01	0	0.00E+00	0	0.0E+00
Diesel oil	EF_Diesel (rail)	GHG	5AR	kg/TJ	0.001	74,100	7.41E+01	4.15	1.16E-01	28.6	7.6E+00
Motor gasoline (petrol)	EF_Petrol (normal)	GHG	5AR	kg/TJ	0.001	69,300	6.93E+01	3	8.40E-02	0.6	1.59E-01
Motor gasoline (petrol)	EF_Petrol (on-road)	GHG	5AR	kg/TJ	0.001	69,300	6.93E+01	25	7.00E-01	8	2.12E+00
Motor gasoline (petrol)	EF_Petrol (marine)	GHG	5AR	kg/TJ	0.001	69,300	6.93E+01	0	0.00E+00	0	0.00E+00
Gas oil	EF_FuelOil (no 6)	GHG	5AR	kg/TJ	0.001	77,400	7.74E+01	3	8.40E-02	0.6	1.59E-01
Compressed Natural Gas (CNG)	EF_CNG	CO2e	5AR	kg/TJ	0.001	56,100	5.61E+01	7715	7.72E+00	101	1.01E-01
Liquefied Natural Gas (LNG)	EF_LNG	GHG	5AR	kg/TJ	0.001	64,200	6.42E+01	3	8.40E-02	0.6	1.59E-01
Landfill gas	EF_LandfillGas	GHG	5AR	kg/TJ	0.001	.	.	1	2.80E-02	0.1	2.65E-02
Liquefied Petroleum Gas (LPG)	EF_LPG (normal)	GHG	5AR	kg/TJ	0.001	63,100	6.31E+01	1	2.80E-02	0.1	2.65E-02
Liquefied Petroleum Gas (LPG)	EF_LPG (on-road)	GHG	5AR	kg/TJ	0.001	63,100	6.31E+01	62	1.74E+00	0.2	5.30E-02
Liquefied Petroleum Gas (LPG)	EF_LPG (marine)	GHG	5AR	kg/TJ	0.001	63,100	6.31E+01	0	0.00E+00	0	0.00E+00
Coal (Bituminous or black coal)	EF_Coal	GHG	5AR	kg/TJ	0.001	94,600	9.46E+01	10	2.80E-01	1.5	3.98E-01
Natural gas	EF_NaturalGas	GHG	5AR	kg/TJ	0.001	56,100	5.61E+01	1	2.80E-02	0.1	2.65E-02
Other biogas	EF_Compost (normal)	GHG	5AR	kg/kg	0.001	0	0.00E+00	10	2.80E-01	0.6	1.59E-01
Other biogas	EF_MedicalWaste (normal)	GHG	5AR	kg/kg	0.001	0	0.00E+00	0	0.00E+00	47	1.25E+01
Gas oil	EF_GasOil	GHG	5AR	kg/TJ	0.001	71,900	7.19E+01	3	8.40E-02	0.6	1.59E-01
Coke	EF_Lignite	GHG	5AR	kg/TJ	0.001	101,000	1.01E+02	1	2.80E-02	1.5	3.98E-01
Naphtha	EF_Naphtha	GHG	5AR	kg/TJ	0.001	73,300	7.33E+01	3	8.40E-02	0.6	1.59E-01
Sludge gas	EF_TreatmentPlant N2O	GHG	5AR	kg/kg	0.001	.	.	0.18	5.04E-03	0.005	1.33E-03

Fuel Type or Activity	Unique Identifier	Type	GWP	Units	Convert to Tonnes	Emission Factor					
						CO_2	tCO_2e	CH4	$CH4\_tCO_2e$	N2O	$N2O\_tCO_2e$
Jet kerosene	EF_JetKerosene	GHG	5AR	kg/TJ	0.001	71,500	7.15E +01	0.5	1.40E -02	2	5.30E -01
Aviation gasoline	EF_LTO (narrow)	GHG	5AR	kg/TJ	0.001	2,440	2.44E +00	0.06	1.68E -03	0.1	2.65E -02
Aviation gasoline	EF_LTO (wide)	GHG	5AR	kg/TJ	0.001	6,380	6.38E +00	0.39	1.09E -02	0.2	5.30E -02

Table 6: (A-1. 4) GHG Emissions, by Source Sectors

	Scope 1	Scope 2	TOTAL
Buildings (Stationary Energy)	12,617,393	19,372,564	31,989,957
Transport	14,370,456	45,988	14,416,444
Waste	4,482,252		4,482,252
TOTAL	31,470,101	19,418,552	50,888,653
			Base year: 2019
			Unit: tCO_2e/year

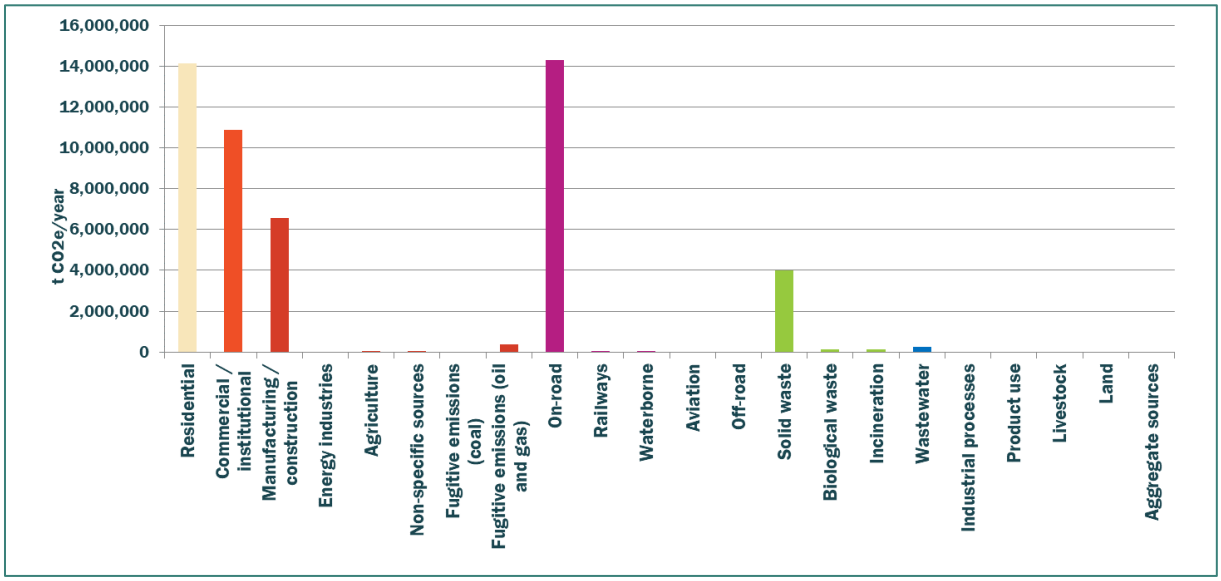

Figure 6: GHG Emissions, by Source Sectors

2.2 (A-2) Current Policies and Strategies Assessment

Table 7: (A-2.1) Description and Assessment of Policies, at National Level

Type	Name	Description	Relevance	Impact on Climate Neutrality Ambition
Law	Environmental Law (No: 2872)	The purpose of this Law is to ensure the protection of the environment, which is the common asset of all living beings, in line with the principles of sustainable environment and sustainable development.	• Comprehensive legal framework • Environmental impact assessment • Addresses climate change	• Promotion of renewable energy sources and clean technologies • Promotion of non-motorised or electric vehicles • Promotion of waste recovery and reuse of treated wastewater
Law	Environmental Law (No: 5627)	The purpose of this Law is to ensure efficient use of energy and prevent waste, to alleviate the burden of energy costs on the economy and to protect the environment Increasing energy resources and efficiency in the use of energy.	• Comprehensive legal framework • Public awareness by theoretical and practical knowledge on climate change and the importance of energy efficiency in environmental protection	• Energy audits • Implementation of energy efficiency measures help to reduce GHG emissions • Reference to use of renewable energy sources
Strategy / Action Plan	Energy Efficiency 2030 Strategy and 2nd National Energy Efficiency Action Plan (2024 – 2030)	This strategy and action plan will cover the period 2024-2030. Its purpose is twofold: firstly, to continue energy efficiency studies without slowing down and, secondly, to follow an energy policy compatible with national climate targets. The strategy encompasses a total of 61 actions across seven sectors, including buildings and services, energy, transportation, industry, agriculture, start-ups and digitalisation, as well as horizontal topics that span multiple sectors	As a key strategy in the fight against climate change, energy efficiency offers an efficient and effective means of cutting greenhouse gas emissions. By optimising energy use, it is possible to reduce final energy consumption and, consequently, greenhouse gas emissions. Furthermore, energy efficiency and demand management measures help to mitigate the vulnerability of the energy sector to the effects of climate change. Increased efficiency and reduced consumption enable more sustainable use of resources and greater security of energy supply.	The objective is to invest 20.2 billion USD in energy efficiency between 2024 and 2030 and to achieve a cumulative final energy saving of 37.1 MTOE. The achievement of this target, which corresponds to a 16% reduction in Türkiye's primary energy consumption between 2024 and 2030, will result in a reduction of 100 million tons of CO_2e equivalent greenhouse gases.
Strategy	Republic of Türkiye Updated First Nationally Determined Contribution	The Republic of Türkiye signed the Paris Agreement which was adopted at the UN Climate Change Conference (COP21) in 2016 and ratified in 2021 with committed to net zero target by 2053.	In April 2023, Türkiye issued its Updated Nationally Determined Contributions (NDCs), a document outlining climate actions.	Türkiye confirms to reduce its Greenhouse Gas (GHG) emissions by 41% through 2030 (695 Mt CO_2 eq in year 2030) compared to the Business-as-Usual (BAU) scenario given in Türkiye's first NDC considering 2012 as the base year (reference year). Türkiye's updated first NDC is economy-wide and includes comprehensive mitigation and adaptation actions as well as consideration of means of implementation. Türkiye intends to peak its emissions at the latest in the year 2038. Updated

Type	Name	Description	Relevance	Impact on Climate Neutrality Ambition
				NDC target is increased from “21% reduction in GHG emissions from the BAU level by 2030” to 41%.
Strategy	Republic of Türkiye Climate Change Strategy 2010 – 2023	The document outlines the vision, goals, adaptation and mitigation strategies for combating climate change at a national level.	The plan sets out objectives to be implemented in three phases: short-, medium-, and long-term. The plan considers several sectors such as energy, transportation, industry, waste and land use, agriculture and forestry on GHG emission control.	The overarching objective of these policies is to enhance the energy efficiency and renewable energy capacity of the country, implement an emission trading system and establish a robust GHG emissions monitoring system. This is in line with global net zero goals.
Action Plan	Republic of Türkiye Climate Change Action Plan 2011 - 2023	This document lists the purposes, objectives and actions for related sectors based on the vision and strategies outlined in Republic of Türkiye Climate Change Strategy 2010 – 2023.	This action plan includes but not limited to the following purposes for related sectors such as reducing energy intensity, increasing the share of clean energy, increasing energy efficiency, adopting sustainable transport principles, ensuring effective waste management, increasing the sink capacity of agriculture sector, reducing deforestation and forest damage.	This document adopts the strategies and principles defined in Republic of Türkiye Climate Change Strategy 2010 – 2023, and states out that Türkiye’s primary objective within the scope of global combat against climate change is to participate in global efforts to prevent climate change, which is a common concern of humanity.
Strategy / Action Plan	Climate Change Mitigation Strategy and Action Plan 2024 – 2030	This document aims to present a roadmap on climate response covering the period until 2030. It includes an overview of the relevant strategies and action plans in this regard. The plan is based on scientific principles and provides a comprehensive approach by integrating institutional policies, expert insights, and GHG reduction requirements. 49 strategies and 260 actions are identified for 7 main mitigation sectors and 2 cross-cutting thematic areas.	Strategies identified in this document includes but not be limited as follow, promoting energy efficiency across all sectors, maximising use of renewable energy, promoting circular economy and resource efficiency, promoting district heating and cooling systems, developing integrated transport systems, electrification of transport systems, establishing emissions trading system, achieving digitalisation in all sectors etc.	This new climate change strategy and action plan has been formulated with the consideration of 2053 Net Zero Emission Target, Twelfth Development Plan, Medium-Term Programme, and Türkiye’s NDC to set Türkiye’s climate response targets for the future and design activities to be undertaken in this context.
Strategy / Action Plan	Climate Change Adaptation Strategy and Action Plan 2024 - 2030	This document outlines the strategies and actions to be implemented by 2030, in line with the vision of a more resilient, sustainable and greener Türkiye in economic, social and ecological terms. The objective is to ensure the preparedness and adaptation of Türkiye's inhabitants and public and private sector institutions against the impacts of climate change.	The plan outlines a series of strategies and actions across a range of sectors, including urban development, water resources management, agriculture and food assurance, biodiversity and ecosystem services, public health, energy, industry, tourism and cultural heritage, transport and communication, and social development and disaster risk reduction. The plan comprises 11 sectors and a section on cross-cutting issues.	Following the announcement of our 2053 Net Zero Emission Target, the first Climate Council was convened with all relevant stakeholders to establish the fundamental elements of our Türkiye's long-term climate change strategy. Among the decisions of the Council, ‘Climate change impact, vulnerability and risk analyses should be made and adaptation actions of sectors at national, regional and local scales should be determined, implemented and monitored.’

Type	Name	Description	Relevance	Impact on Climate Neutrality Ambition
				formed the basis of the preparation of this document.
Action Plan	National Action Plan for Waste Management	This plan has been prepared within the framework of the responsibility of developing strategies and legislation considering international norms and national priorities in order to ensure the protection and development of natural resources and ecosystems and the creation of a healthy and liveable environment for current and future generations.	The objective of this plan is to identify sustainable waste management strategies on a national scale. This will be achieved by ensuring that waste is recycled and recovered for economic benefit, thereby preventing the rapid depletion of natural resources.	This plan includes strategies related with minimising wastes at source, classifying, collecting, transporting, temporary storage, recovering, disposing, reusing, treating, converting to energy and final storage of wastes, developing policies and strategies on minimising wastes at source, classifying, collecting, transporting, temporary storage, recovering, disposing, reusing, treating, converting to energy and final storage within the framework of the principle of sustainability.
Action Plan	Türkiye National Green Deal Action Plan	The Ministry of Trade's Green Deal Action Plan provides a strategic framework to facilitate a sustainable transformation in Türkiye. The primary objective of the Action Plan is to ensure that Türkiye is following the European Green Deal, as set out by the EU. The action plan comprises 32 objectives and 81 actions, organised into nine categories.	The Action Plan has been designed to align with the European Green Deal, with the objective of facilitating a transition to a more sustainable, resource-efficient, and green economy in Türkiye.	The main actions included in this Plan have been determined as: border carbon regulations, a green and circular economy, green financing, clean, economic, and secure energy supply, sustainable agriculture, sustainable smart transportation, combatting climate change, diplomacy, information, and awareness activities.

Table 8: (A-2.1) Description and Assessment of Policies, at Local Level

Type	Name	Description	Relevance	Impact on Climate Neutrality Ambition
Strategy	IMM Strategic Plan 2020 – 2024	Roadmap for the city for five years. The plan sets out vision, mission, objectives and targets.	The plan has eight themes and ten fundamental principles. Among these themes, “Improving Urban Transport within the Scope of Sustainable Mobility” and “Strengthening Sustainable Environment and Energy Management” themes are the ones that can be considered as directly related.	The plan sets targets for each indicator defined under objectives. Among these targets, renewable energy use, waste recovery and recycle, energy efficiency measures, increasing green spaces and awareness raising studies are contributing to climate neutrality ambition.
Action Plan	Istanbul Climate Change Action Plan	A sustainable and holistic approach by integrating the fight against climate change into different policy areas.	Baseline emissions inventory is prepared, and three scenarios presented on how to reach net zero targets.	By signing the Deadline 2020 Commitment at the C40 Mayors Summit in Copenhagen in 2019, Istanbul's goal of becoming a "carbon neutral" and "resilient city" by 2050 has been adopted. To meet the 2050 commitments, new policies and strategies that can be developed to reduce emissions have been defined. As an interim target for 2030, CAP provides a 52% reduction

Type	Name	Description	Relevance	Impact on Climate Neutrality Ambition
				in its extended ambitious scenario.
Action Plan	Istanbul Sustainable Energy and Climate Action Plan	SECAP defines the activities and measures to be put in place for the achievement of the 2030 target. The main target sectors are buildings, equipment/facilities, urban transport and waste for climate change mitigation.	Energy efficiency measures are targeted at the sectors with the greatest potential for energy savings, such as buildings, industry, transport and waste. Measures are defined for the institutional framework of IMM through SECAP.	Istanbul is a city that is acutely aware of its vulnerability to climate change, and as a signatory of the Global Covenant of Mayors (GCoM), IMM is committed to reducing greenhouse gas emissions by at least 40% by 2030 compared to 2019 levels, and to prepare and implement a Sustainable Energy and Climate Action Plan (SECAP) in this regard. The institutional GHG inventory of the IMM was calculated for the first time, the scope of SECAP.
Action Plan	Istanbul Green City Action Plan	A Green City Action Plan is a tailored strategy and action-based document to address and prioritise environmental challenges specific to a city.	The Istanbul GCAP has the objective of creating a thriving, sustainable future for the city and its residents by addressing environmental challenges. It outlines these challenges and proposes solutions to enhance resilience and adaptation to climate change through targeted projects and policy initiatives. By addressing these challenges, the GCAP sets a framework for sustainable urban development.	To enhance the local environment and reinforce the city's resilience to the effects of climate change, a series of targeted actions have been devised for specific topics or sectors.
Monitoring Report	IMM Climate Monitoring Report	It was decided that a Climate Change Action Plan Monitoring Report should be prepared in order to qualitatively and quantitatively review the processes implemented by the Istanbul Metropolitan Municipality over the course of the year in relation to climate change reduction and adaptation, and to identify areas of strength and weakness.	To guarantee the climate action plan remains a living document, to accelerate the attainment of defined goals and for organisational benchmarking purposes, progress monitoring is imperative.	IMM Climate Monitoring Report ensures organisation monitoring of the measures taken to combat the climate crisis.
Strategy	Istanbul Vision 2050	Istanbul's Vision for 2050 is defined as "Istanbul, the world city where life is vibrant and free with all its diversity, and everyone lives well". Being the most populated city in Türkiye and one of only a few metropolises worldwide, Istanbul's many strengths and unique characteristics present it with a number of local and global challenges. Therefore, this plan is prepared to provide	• This plan sets out seven themes as follow: • The climate adaptive city that protects the environment • Effective and inclusive mobility • Integrated and smart infrastructure systems • Vibrant and sensible spaces assuring good living for all • Transformative and resilient economy	This plan defines several goals and sets out related targets such as achieving net zero greenhouse gas emissions.

Type	Name	Description	Relevance	Impact on Climate Neutrality Ambition
		a good life for all its residents in many aspects.	• Accessible and fair urban amenities for all • Equal and free society	
Strategy	Istanbul Sustainable Urban Mobility Plan	This plan represents a new era in the city's transport development, placing people, accessibility and public engagement at the heart of the planning process. The aim is to enhance quality of life for all.	• This plan has three themes as follows: • Transition to Low Carbon • Seamless Transfer • Integration, Reducing Congestion.	This plan proposes projects related with decarbonisation of public transport, promoting active mobility and encouraging people to modal shift to more sustainable modes.

Table 9: (Table A2.1) ss

Comments													
	-1		-2		-3		-4		-5			-6	
	Baseline emissions 2019	BaU Scenario for 2030	Emissions Target 2030	Reduction	Emission reduction through other Action Plans		Emissions Gap		Emissions reduction through the CCC Action Plan to address the Gap			Residual emissions	
	tCO2e	tCO2e	tCO2e	(% reduction target from BaU)	tCO2e	(% absolute reduction compared to Baseline)	tCO2e	(% gap between existing CAP and CCC target)	tCO2e	(% reduction target from BaU)	(% absolute reduction compared to Baseline)	tCO2e	(% residual emissions from BaU)
Buildings (Stationary Energy)	31,989,957	53,130,613	43,972,330	83%	34,266,808	41.0%	9,705,522	22.1%	9,705,522	81.7%	69.7%	9,158,283	17.2%
Transport	14,416,444	16,224,664	10,971,755	68%	12,309,106	72.8%	0	0.0%	0	100.0%	100.0%	3,915,558	24.1%
Waste[2]	4,482,252	7,443,397	6,404,034	86%	6,120,606	70.5%	283,428	4.4%	283,428	96.2%	93.7%	1,039,363	14.0%
Total	50,888,653	76,798,674	61,348,119	80%	51,359,169	52.6%	9,988,950	16.3%	9,988,950	87.0%	80.4%	15,450,555	20.1%

[2] Includes wastewater

2.3 (A-3) Systemic Barriers and Opportunities to 2030 Climate Neutrality

Istanbul is the most populated city in Türkiye, an ancient city as well as an economic and artistic centre that grew organically rather than in a planned way. It is a trade centre connecting Europe and Asia as well as the Black Sea countries and the Mediterranean. Although traditionally a centre of industry, in recent decades its economy has become more dominated by the service and finance sectors. While the production facilities of companies are mostly out of town, the administrative centres remain. The city is home to a population of 16 million inhabitants and hosts over 16 million foreign tourists annually. The city is also estimated to host nearly 2,5 million undocumented refugees. Istanbul generates 30.4% of Türkiye's GDP.

Table 10: (A-3.1) Description of Urban Systems, Systemic Barriers, and Opportunities

Systems and Systematic Barriers and Opportunities	
Barriers	Under the title (2.3.1), the barriers are given under the sectors of : ● Transportation ● Energy ● Wastewater and Waste System
Opportunities	Under the title (2.3.2), the opportunities are given under below listed titles : ● Integrated low-carbon public transportation system ● District heating and cooling ● Renewable energy ● Energy efficient buildings ● Circular economy initiatives ● Vibrant social and entrepreneurship potential of the city

2.3.1 Systems and Systematic Barriers

The most critical domains relevant to the city's climate neutrality targets are buildings-energy, transportation, waste, and water-wastewater. The city is also home to the headquarters of many of the biggest companies in Türkiye, the mobilization of these companies, alongside the positive individual efforts of its vast population, can significantly contribute to achieving both the city's and the country's climate targets. For all mitigation projects, the scale and existing complex structure of Istanbul presents a challenge in finding and utilising data to enable smart solutions. Data availability, ownership, access rights and integrated protocols are bottlenecks. The monitoring of ongoing efforts often does not suffice, making the optimisation of interventions a challenge.

2.3.1.1 Transportation

The main stakeholders are IMM, UKOME (Transportation Coordination Center – consists of representatives from local government, central government and private operators), Ministry of Transport and Infrastructure (MoTI), Ministry of Environment, Urbanization and Climate Change (MoEUCC), IETT, Metro Istanbul Inc., City Lines Inc., Ispark Inc., Isbak Inc., Belbim Inc., and private public transport operators as well as citizens.

Physical barriers:

- Istanbul's rapid urban sprawl resulted in longer travel distances and increased car dependency. Although, car ownership in Istanbul is relatively at low levels compared to developed countries/cities, the high share of car use and traffic congestion are among the main challenges.

- The hilly geography of the city spread on both sides of the Bosphorus, narrow streets and even narrower pavements seems to discourage walking and cycling, yet the dense and mixed land use promotes active modes. However, due to poorly designed and several barriers on pavements, Istanbul's walkability is considered as low.

Institutional / regulatory barriers:

- Coordination and cooperation across metropolitan, regional, and national institutions are generally poor. Tasks and responsibilities regarding transportation decisions across central and local governments are highly fragmented and overlap.
- Traffic management and road safety are under central government control. However, IMM and Istanbul Provincial Police Department are in coordination.
- IMM does not have legislative and executive power on developing and implementing regulations and incentives on high-polluting vehicles and energy-efficient vehicles. These actions are carried out by central government and local bodies of central government in Istanbul. However, there are no emission-based restriction for the vehicles entering the city.

Infrastructural barriers:

- Due to insufficient surface area to be dedicated to rail transport, metro systems are the options left for widespread public transport projects. However, these systems are time consuming to plan and construct.
- Electrification of private vehicles will require increasing the capacity of the city's electricity infrastructure. Widespread vehicle charging infrastructure should also be developed in the city for widespread decarbonization of the private vehicles.
- Growing trend towards periphery areas has a negative impact on the capacity and service reliability of public transport

Financial barriers:

- Funding of large-scale transportation infrastructure projects requires careful allocation of existing financial instruments in a limited budget. It is not well coordinated and sustained at national, regional, and local levels.

Social and behavioural barriers:

- With the exception of Istanbul SUMP (Sustainable Urban Mobility Plan), previous transportation plans had a focus on traffic and didn't cover the needs of vulnerable groups.
- Gender-based violence and harassment stands as a significant threat on the use of public spaces and public transport.
- As public transport journeys often take at least as long as private car trips, people prefer to travel in the comfort of their cars instead of using the crowded public transport.
- The electrification agenda for public transport, marine transport, and energy reduction needs capacity building and financial incentives.

2.3.1.2 Energy

Energy systems that are relevant in the city's decarbonisation are production, transmission and consumption of energy for stationary uses. Electricity supply is heavily dominated by the national grid. Local distributed renewable energy production is nearly non-existent.

Space heating is mostly provided by natural gas and individual gas boilers. District heating is limited to a small number of social housings.

Institutional / regulatory barriers:

- Türkiye's climate targets require 41% reduction of GHGs from 2012 baseline, which is not as ambitious as IMM's targets that require carbon neutrality by 2030. The emissions from national electricity grid will be a barrier for the city's targets, particularly considering the increased electrification of the city's essential energy consumption such as space heating and transportation.
- Regulations and incentives for distributed renewable energy production are developed by MENR, and they lack the attractiveness needed by an ambitious target.
- Subsidized energy prices and policy framework causes longer payback periods than EU counterparts as energy prices in Türkiye are often lower in comparison to investment costs of renewable energy. The policy framework also presents challenges in creating revenue from renewable energy, deterring small investors.

Financial barriers:

- Funding of energy efficiency and renewable energy investments are only accessible to residents and companies that already has access to finance. Funding for residents and companies/institutions that don't already have access to finance should be developed.

Social and behavioural barriers:

- Rooftop PV systems are underutilised in Istanbul. Lack of public awareness and publicly available examples are a barrier for fast adoption of rooftop PV systems.

2.3.1.3 Wastewater and Waste System

Institutional / regulatory barriers:

- Distribution of responsibilities and authority between district municipalities and the metropolitan municipality for municipal waste collection reduces the efficiency and integration of waste collection services leading to inadequate waste reduction and recycling, as well as missing of opportunities.

Infrastructure barriers:

- Currently only 45% of the city's wastewater is treated in biological and advanced biological treatment plants. This barrier can be overcome by establishing advanced wastewater treatment plants to treat 100% of the city's wastewater.
- Capacity of biomethanisation and composting plants to treat organic fraction of the solid waste should be increased to cover 100% of the biodegradable waste generated in the city.
- Waste recycling in the city is very limited and should be increased to reduce the emissions of the existing incineration plant.

2.3.2 Systems and Systematic Opportunities

Integrated low-carbon public transportation system:

The city already has an extensive public transport system. However, this system has plenty of room to improve with regard to carbon emissions, coverage of rail transport, connectivity and comfort level. Further improvement on these aspects, supported by better walking and micromobility infrastructure, as

well as improvements on low carbon logistics services can help reduce transport related emissions significantly.

District heating and cooling:

Early estimations show Istanbul to have adequate low temperature geothermal resources to provide heat and cooling to cover the existing heating and cooling needs of the city. Development of district heating and cooling systems to cover the city can help mitigate natural gas related emissions of the city.

Renewable Energy:

Even though Istanbul is one of the lowest solar potential cities in the country, the current PV system investment costs and energy costs make rooftop (and other urban) PV systems economically attractive. Rough estimations show that the potential capacity of rooftop PVs can cover a significant portion of the city's current need for electricity. Encouraging and enabling the city's residents to invest in these systems through appropriate incentives can lead to very fast deployment, and the associated emission reductions.

Istanbul also is among the cities with highest wind potential in Türkiye considering land based and offshore potential. Capturing this potential would reduce the emissions of the city. However, environmental and social impacts of these plants should be evaluated carefully.

Energy efficient buildings:

Most of existing buildings in Istanbul have low efficiency and need to be either structurally renewed or strengthened for seismic risks anyway. During this renewal deep renovation with regard to energy efficiency can also be achieved in line with new BEP-TR standards, leading to significant improvement of energy performance of buildings. If the opportunity for enforcing NZEB standards in new buildings can be seized through incentives, much faster decarbonization can be achieved.

Circular economy initiatives:

- Promotion of circular economy through waste reduction, reuse and recycling programs have the potential to increase the added value services in the city as well as reduce GHG emissions.
- Wastewater reuse is very limited. Reuse of some of the wastewater and harvested rainwater would reduce the energy consumed to transfer water from catchment areas as far away as 200 km. This could be achieved by developing regulations to enforce the use of advanced treated wastewater for non-sanitary purposes (irrigation, industry, cooling etc) where reusable wastewater and harvested rainwater is available.

Vibrant social and entrepreneurship potential of the city:

The city has a vibrant population, with an entrepreneurial culture, which can be triggered to develop initiatives and businesses offering services and solutions to speed the decarbonisation of the city with an appropriate and well distributed incentive system.

Table 11: (A-3.2) Systems and Stakeholder Mapping

System Description	Stakeholders	Influence on the city´s climate neutrality ambition	Interest in the city´s climate neutrality ambition
POL	IPA (Istanbul Policy Agency)	Data collection and compilation, policy development	Supportive

System Description	Stakeholders	Influence on the city´s climate neutrality ambition	Interest in the city´s climate neutrality ambition
	MoEUCC (Ministry of Environment, Urbanization and Climate Change)	National policy development, administration of policies, legal and financial power	Collaborative and supportive
	District Municipalities	Local policy development, administration of policies	Collaborative
	TMMOB - Union of Chambers of Turkish Engineers and Architects	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	Marmara Union of Municipalities	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	C40	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	Covenant of Majors	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	NetZeroCities (NZC) Platform	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	Türkiye EU Delegation	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	B40- Balkan Cities Network	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	NGOs	In the profile of special expertise, possesses informational and organizational resources.	Supportive
	Citizens	In the profile of special expertise, possesses informational and organizational resources.	Supportive
Economic & Financial Systems	ITO (Istanbul Chamber of Trade)	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
	ISO (Istanbul Chamber of Industry)	In the profile of special expertise, possesses informational and organizational resources.	Collaborative and supportive
Transportation Systems	UKOME (Transportation Control Centre)	Local policy development, administration of policies, legal and financial power	Collaborative and supportive
	MoTI (Ministry of Transportation and Infrastructure)	National policy development, administration of policies, legal and financial power, operator of urban rail public transport	Collaborative and supportive
	MoEUCC	National policy development, administration of policies, legal and financial power	Collaborative and supportive
	IETT (Istanbul Electric Tram and Tunnel Company)	Administration of policies, operator of rubber tyred public transport	Collaborative
	Metro Istanbul Inc.	Operator of urban rail public transport	Collaborative
	City Lines Inc.	Operator of maritime public transport	Collaborative
	Ispark Inc. (Istanbul Parking Lot Operations Inc.)	Operator of parking services	Collaborative

System Description	Stakeholders	Influence on the city´s climate neutrality ambition	Interest in the city´s climate neutrality ambition
	Isbak Inc. (Istanbul Informatics and Smart City Technologies Inco.)	Provider of intelligent transport systems	Collaborative
	Belbim Inc. (Electronic Money and Payment Services Inc.)	Manager of electronic fee payment systems	Collaborative
	Private public transport operators	Operator of rubber tyred public transport (including buses, minibuses, dolmuş, and shuttles) or maritime public transport or taxi	Collaborative
Energy System	EMRA (Energy Markets Regulatory Administration)	National policy development, administration of policies, legal and financial power	Collaborative and supportive
	DNOs (AYEDAŞ and BEDAŞ)	Administration of policies	Collaborative
	IGDAS (Istanbul Gas Distribution Company)	Administration of policies	Collaborative
	MENR (Ministry of Energy and Natural Resources)	National policy development, administration of policies, legal and financial power	Collaborative and supportive
	Istanbul Energy Inc.	Renewable energy and eco-friendly technologies development	Collaborative
Waste Management System	MoEUCC	National policy development, administration of policies, legal and financial power	Collaborative and supportive
	Marmara Municipalities Union	Regional policy development	Collaborative
	DSI (State Water Authority)	Administration of policies	Collaborative
	Organised Industrial Zones	Administration of policies	Collaborative
	ISTAÇ (Istanbul Environmental Management Company)	Administration of policies	Collaborative
	ISKI (Istanbul Water and Wastewater Administration)	Administration of policies	Collaborative
	District Municipalities	Local policy development, administration of policies	Collaborative

3 (B) Pathways towards Climate Neutrality by 2030

The primary resource for outlining the steps towards carbon neutrality by 2030 is the Istanbul 2021 Climate Change Action Plan, developed within the C40 framework, and the Pathways model that underpins its calculations. Utilizing this model, the city's greenhouse gas emissions inventory was established, and a 'business as usual' scenario was projected for 2030, 2040, and 2050.

In addition to the 'business as usual' scenario, emission projections were made for various other scenarios leading to net-zero carbon emissions by 2050. These scenarios identified sectors where reductions are feasible and generated scenarios containing sector-specific targets for achieving these reductions. Subsequently, actions were defined to meet these targets, and priority actions were selected to complete the Action Plan. It is important to note that implementing solely the priority actions will not be sufficient to achieve the net-zero carbon target. It is crucial for various stakeholder groups, in addition to IMM, to modify their activities in alignment with this goal and/or adapt them to the impacts of climate change.

Within the scope of the Climate City Contract (CCC), scenarios were also generated, assuming that the targets defined in the existing CAP would be achieved earlier than initially planned, thereby aiming for net-zero carbon emissions by 2030. Moreover, the action development efforts within the CCC adhered to the framework of priority actions identified in the CAP.

Based on these assumptions, the Action Plan and Investment Plan documents under the CCC will present the priority actions outlined in the CAP, including information such as investment costs and additional benefits of these actions.

We are aware that solely relying on the priority actions defined in the CAP may not be sufficient to meet the revised targets for achieving net-zero carbon emissions.

It's important to remember that while the actions identified in the CAP are the most impactful ones for reaching net-zero, they need to be complemented by other actions that may have lower individual reduction impacts but still contribute to the overall net-zero transformation.

It is expected that the economic system will react to the implementation of each action, and not all of these reactions will necessarily be beneficial to the net-zero transition. Therefore, new actions will need to be developed to counteract any adverse effects of these responses.

Furthermore, it is crucial to recognize that the development of new actions and the modification of existing ones should be an ongoing process to respond to the needs of a dynamic socio-economic system.

Within the scope outlined above, carbon reduction quantities will be presented based on the updated priority targets in the CAP. Additionally, the reports will address other actions necessary to achieve the net-zero carbon goal by 2030.

3.1 (B-1) Climate Neutrality Scenarios and Impact Pathways

Table 12: (B-1.1) Impact Pathways

Field of Action	Systemic Levers	Early Changes (1-2 years)	Late Outcomes (3-4 years)	Direct Impacts (emission reductions)	Indirect Impacts (co-benefits)
Built Environment	Finance & Funding	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification	• Air quality • Mental & physical health • Income & poverty • Quality housing
	Governanc e & Policy	• Publishing or updating of relevant policy • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change	• Air quality • Mental & physical health • Income & poverty • Quality housing
	Learning & Capabilities	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• GHG reduction • Circular economy development • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change	• Skills & employment • Income & poverty • Quality housing
Climate Resilience & Social Infrastructure	Democracy / Participation	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Behavioural change • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Quality housing • Community representation & participation
	Finance & Funding	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing	• Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Quality housing
	Governanc e & Policy	• Publishing or updating of relevant policy • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Quality housing
	Learning & Capabilities	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Skills & employment • Quality housing
	Social Innovation	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Skills & employment • Quality housing • Community representation & participation

Field of Action	Systemic Levers	Early Changes (1-2 years)	Late Outcomes (3-4 years)	Direct Impacts (emission reductions)	Indirect Impacts (co-benefits)
	Technology & Innovation	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Quality housing
Energy Systems	Finance & Funding	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Improved / efficient infrastructure	• Air quality • Income & poverty • Quality housing • Accessible & affordable mobility
	Governance & Policy	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Improved / efficient infrastructure	• Air quality • Income & poverty • Quality housing • Accessible & affordable mobility
	Technology & Innovation	• Publishing or updating of relevant policy • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Improved / efficient infrastructure	• Air quality • Income & poverty • Quality housing • Accessible & affordable mobility
Green Infrastructure & Nature-Based Solutions	Democracy / Participation	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Behavioural change • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Public green spaces • Quality housing • Community representation & participation
	Finance & Funding	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing	• Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Public green spaces • Quality housing
	Governance & Policy	• Publishing or updating of relevant policy • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Public green spaces • Quality housing

Field of Action	Systemic Levers	Early Changes (1-2 years)	Late Outcomes (3-4 years)	Direct Impacts (emission reductions)	Indirect Impacts (co-benefits)
	Learning & Capabilities	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Behavioural change • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Skills & employment • Quality housing
	Social Innovation	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Skills & employment • Quality housing • Community representation & participation
	Technology & Innovation	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change • Improved / efficient infrastructure	• Mental & physical health • Biodiversity • Public green spaces • Skills & employment • Quality housing
Mobility & Transport	Democracy / Participation	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health • Accessible & affordable mobility • Community representation & participation
	Finance & Funding	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health • Accessible & affordable mobility
	Social Innovation	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits	• Improved energy efficiency • Fuel switch & electrification • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health • Skills & employment • Accessible & affordable mobility • Community representation & participation
Waste & Circular Economy	Democracy / Participation	• Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Circular economy development • Delivery of equitable co-benefits	• Improved energy efficiency • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health • Income & poverty • Community representation & participation

Field of Action	Systemic Levers	Early Changes (1-2 years)	Late Outcomes (3-4 years)	Direct Impacts (emission reductions)	Indirect Impacts (co-benefits)
	Finance & Funding	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction Circular economy development Delivery of equitable co-benefits	• Improved energy efficiency • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health
	Governance & Policy	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Circular economy development • Delivery of equitable co-benefits	• Improved energy efficiency • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health
	Social Innovation	• Publishing or updating of relevant policy • Development of solution delivery programme(s) • Public education and stakeholder engagement • Enabling governance actions and financing • Growth of technical skills and resource capacity	• GHG reduction • Increased adaptative capacity • Circular economy development • Delivery of equitable co-benefits	• Improved energy efficiency • Behavioural change • Improved / efficient infrastructure	• Air quality • Mental & physical health • Skills & employment • Income & poverty • Community representation & participation

To design the impact pathways, the categories below were longlisted for each impact pathway stage. This was to ensure consistency and comparability – where required – across different fields of action. The categories were chosen and defined to describe the potential outputs and outcomes of transformative climate action and investment; aligned with terminology and concepts used in existing IMM plans and policies such as the CAP, SECAP, and GCAP.

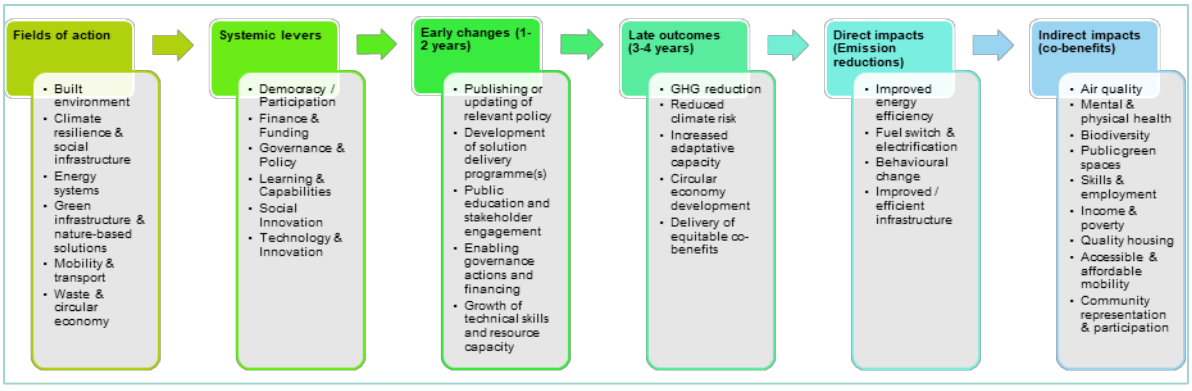

Figure 7: (B-1.2) Description of Impact Pathways

Starting with the fields of action – which are aligned to the sectoral categories used in the emissions modelling – the impact pathways for each field of action were defined with the following process:

1. Selection of *systemic levers* that are relevant to progress in the *field of action*;
2. Selection of *early changes* required to enable the systemic lever in the field of action; and

3. Based on the field of action and systemic lever, highlight the potential *late outcomes*, *direct impacts* related to emissions mitigation, and *indirect impacts* via co-benefits generated.

Across the impact pathways, the categories provide an understanding of the potential emissions reductions and other outcomes related to adaptation and circular economy, but also of the enabling governance actions needed to address the local sociopolitical context and systemic barriers. The categories listed under *systemic levers* and *early changes (1-2 years)* are particular indications of the current local context that actions need to consider and respond to; including the strategies, barriers and opportunities.

Finally, articulating the indirect impacts or co-benefits of the field of action and enacting the related systemic levers provide a sense of the less tangible results of climate action. This will support case-making for all actions to be implemented to create a more equitable municipality for all to live and work in.

In summary, the impact pathways at a high-level demonstrate the types of short- and long-term climate action priorities to ensure that specific climate actions are prioritised, resourced and implemented. The same categories and considerations – especially around *late outcomes (3-4 years)*, *direct impacts (emission reductions)*, and *indirect impacts (co-benefits)* – were used in the modelling, analysis and detailing of the actions to achieve IMM's 2030 Climate Neutrality Commitments. The same terminology is carried forward into the subsequent analyses and reporting across Modules B and C.

3.2 (B-2) Climate Neutrality Portfolio Design

As explained in the Section 3, CAP's prioritised actions are evaluated in CCC Action Plan and below table shows the list of actions under CAP's categories. Action cards also formulated with the same approach.

Table 13: (B-2.1) Description of Action Portfolios

Fields of action		Portfolio description	
	No	List of actions	Descriptions
Built environment	1	Net zero buildings	Implementation of Energy Efficiency Measures in IMM Administrative Buildings
	2		Provision of NZEB Temporary Social Housing Units
	3		Energy Efficiency Measures in Commercial Facilities
	4		Energy Efficiency Measures in Residential and Mixed Buildings
Energy systems	5	Increasing the use of renewable electricity	Establishment of Renewable Energy Plants to Meet IMM's Energy Consumption
	6		Promotion of Small-Scale Rooftop PV Systems for Private Buildings
	7		Conversion to Efficient Park Lighting Systems
	8		71% renewable electricity by 2030
Green infrastructure & nature-based solutions	9	Water use reduction	Application of sustainable rainwater solutions (rain gardens, use of permeable materials, storage, etc.)
	10	Water loss reduction	Managing the supply lines and drinking water network with smart systems
	11	Mitigate impact of increasing urban heat	Tree planting in public spaces
Mobility & transport	12	Reduced vehicle use	Congestion charges in certain areas
	13	Electrifying buses Replacement and conversion of IETT and private vehicle fleet	Decarbonisation of IETT Metrobus and Public Transport Bus Fleets
	14		Decarbonisation of City Lines Maritime Fleet
	15		Implementation of Practices that Support Active Mobility
	16		Extension of Urban Rail Network
	17		HIZRAY: New Generation Express Metro
	18		Charging Infrastructure Feasibility Study and Pilot Applications
	19		Car and truck - fuel switching - switch vehicles to hybrid engines
	20		Electric and hybrid municipal vehicles (trash collection trucks, municipal cars, etc.)
	21	Increase bicycle use	Making existing roads suitable for cyclists, and creating new separated bicycle paths
	22	More public transport use	Park and Ride expansion
Waste & circular economy	23	Food and Yard waste recycling	Develop programs to reduce or completely avoid any discarded food substance
	24		Establishment of Biomethanisation Plants
	25	Using more efficient tools	Optimize waste collection operations (routes, pickup schedules) to reduce environmental impacts and total GHG emissions
Water	26	Wastewater reuse	Supporting wastewater recovery and reuse

Fields of action		Portfolio description	
	No	List of actions	Descriptions
	27		Improvement of Existing Wastewater Treatment Plants and Development of New Advanced Biological Wastewater Treatment Plants
	28	Water loss reduction	Reduction of Loss and Leakage in Drinking Water Network

Table 14: (B-2.2) Action 1 – Net Zero Buildings

Action outline	Action name	Net zero buildings – Implementation of Energy Efficiency Measures in IMM Administrative Buildings
	Action type	Mitigation
	Action description	Total GHG emissions of IMM in 2019 were 1,544,908 $ktCO_2e$. This is approximately 3% of the total emissions of Istanbul, which is estimated at about 50.89 $MtCO_2e$. The majority of corporate emissions from IMM come from commercial and institutional buildings and facilities of IMM affiliated companies and subsidiaries (54.13%). This action proposes the implementation of various energy efficiency measures for 19 administrative buildings of IMM and its affiliates. The affiliates that will benefit from this action are IETT, ISKI, ISFALT, ISTAC, ISTON, IHE, and Metro Istanbul buildings identified in the SECAP. The measures encompass a wide array of interventions, mainly on the following areas: • Thermal insulation of buildings • LED transformation • Building Automation Systems (BAS) • Pump, motor, and HVAC equipment replacement • Energy monitoring system • Adaptation to ISO 50001 energy management system • Energy efficient pumps, motors, dryers, blowers • Energy audits • New production lines and heavy machinery • Improving energy efficiency of steam generators • Burner optimization
Reference to impact pathway	Field of action	Built environment
	Systemic lever	• Finance & Funding • Governance & Policy • Learning & Capabilities
	Outcome (according to module B-1.1)	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (District Municipalities) • Non-profit organisations (TMMOB)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil

	GHG emissions reduction estimate (total) per emission source sector	28,800
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	51,500,000
	Costs by CO_2e unit (EUR/tCO_2e)	1,788

Table 15: (B-2.2) Action 2 – Net Zero Buildings

Action outline	Action name	Net zero buildings – Provision of NZEB temporary social housing units
	Action type	Mitigation
	Action description	Istanbul is highly vulnerable to earthquakes and rapid scanning work on its building stock has identified a large number of high risk buildings. Their evacuation and retrofit or reconstruction for seismic safety is a pressing issue on the city's agenda with the highest urgency. Studies held in 2023 reveal that 207.000 buildings in Istanbul are prone to devastating damage in the case of a probable earthquake. This action is proposed as a pilot one to support both the urban transformation and the energy efficiency. This pilot project specifically targets demonstrating the benefits of green building while addressing the need for temporary housing. The two main pillars of this action, seismic resilience and high-performance sustainable buildings, shall be demonstrated in a holistic manner in project design. The sites must be selected outside of the natural assets, green sites, and vulnerable water basins of Istanbul and provide more quality public spaces to the city. The housing units must be: • Seismically robust, • Energy efficient (at nZEB rates), • Resource, water, and carbon efficient, • Climate and extreme weather resilient, • Smart, easy to operate and cost effective, • Livable and socially enriching, • Mixed use, providing facilities and commercial areas, • Accessible and inclusive, • Providing high indoor environmental quality, • In harmony with the urban ecosystem, biodiversity, and microclimate, • Prioritizing renewable energy and without fossil fuel, ready to be integrated to district heating systems in the future, • In line with the criteria of relevant certification systems (YeS-TR, B.E.S.T. Konut, LEED, BREEAM, WELL etc.)
Reference to impact pathway	Field of action	Built environment
	Systemic lever	• Finance & Funding • Governance & Policy • Learning & Capabilities
	Outcome (according to module B-1.1)	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits

Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (District Municipalities) • Non-profit organisations (TMMOB)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	31,000
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	1,370,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	44,194

Table 16: (B-2.2) Action 3 – Net Zero Buildings

Action outline	Action name	Net zero buildings – Energy efficiency measures in commercial facilities
	Action type	Mitigation
	Action description	The stationary energy use in buildings (residential, commercial, and industrial), manufacturing, and construction constitutes 63% of the total GHG emissions and has the largest ratio with a total of 32 $MtCO_2e$. The interventions proposed in Action 1 should be evaluated based on the energy audits to be conducted for commercial buildings.
Reference to impact pathway	Field of action	Built environment
	Systemic lever	• Finance & Funding • Governance & Policy • Learning & Capabilities
	Outcome (according to module B-1.1)	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (District Municipalities) • Non-profit organisations (TMMOB)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social • Legal and Corporate

Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	15,636,673
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	93,820,035,600
	Costs by CO_2e unit (EUR/tCO_2e)	6,000

Table 17: (B-2.2) Action 4 – Net Zero Buildings

Action outline	Action name	Net zero buildings – Energy Efficiency Measures in Residential and Mixed Buildings
	Action type	Mitigation
	Action description	The stationary energy use in buildings (residential, commercial, and industrial), manufacturing, and construction constitutes 63% of the total GHG emissions and has the largest ratio with a total of 32 $MtCO_2e$. The interventions proposed in Action 1 should be evaluated based on the energy audits to be conducted for residential and mixed buildings.
Reference to impact pathway	Field of action	Built environment
	Systemic lever	• Finance & Funding • Governance & Policy • Learning & Capabilities
	Outcome (according to module B-1.1)	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (District Municipalities) • Non-profit organisations (TMMOB)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	10,424,448
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	62,546,690,100
	Costs by CO_2e unit (EUR/tCO_2e)	6,000

Table 18: (B-2.2) Action 5 – Increasing the Use of Renewable Electricity

Action outline	Action name	Increasing the use of renewable electricity – Establishment of Renewable Energy Plants to Meet IMM's Energy Consumption
	Action type	Mitigation
	Action description	IMM has committed to increasing the share of renewable energy within the scope of the 2050 net zero emissions target. According to the regulation amendments made in 2019, December 2020, and August 2022, institutions and individuals are allowed to install renewable power plants to meet their consumption needs at any location in the country. IMM and its affiliates have already started investing in solar PV power plants. This action aims to increase the total installed capacity of renewable energy power plants of IMM and its facilities to meet IMM's set targets of 100% renewable energy use. This action will also support the city during the transition to net zero and it aligns with IMM CAP and SECAP targets.
Reference to impact pathway	Field of action	Energy systems
	Systemic lever	• Finance & Funding • Governance & Policy • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Energy and Natural Resources Ministry; Ministry of Environment, Urbanization and Climate Change) • Local government (ISTAC, District Municipalities, Istanbul Energy Co) • Businesses (Electricity distribution companies) • Non-profit organisations (Universities)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	387,300
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	280,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	723

Table 19: (B-2.2) Action 6 – Increasing the Use of Renewable Electricity

Action outline	Action name	Increasing the use of renewable electricity – Promotion of Small-Scale Rooftop PV Systems for Private Buildings

	Action type	Mitigation
	Action description	Rooftop solar PV systems in Istanbul are gaining traction for commercial buildings, but their adoption is still evolving. There are very few installations in private structures. The total capacity is negligibly small. The city's potential for solar energy is good due to its geographical location. According to the high-level analysis, the estimated potential for rooftop solar PV systems is around 26.5 GW, which may approximately produce 29,000 GWh per year. This action aims to increase public awareness and the installation percentage of rooftop PV systems in private buildings. In addition, building integrated generation offers benefits such as: • By decentralizing energy production, the system can reduce the impact of grid failures and improve overall system reliability • Lower transmission and distribution costs, along with potential savings on energy bills for consumers • Communities and individuals can generate their own power, reducing dependence on centralized energy sources • Offer training programmes specifically designed for women on the installation and maintenance of these systems
Reference to impact pathway	Field of action	Energy systems
	Systemic lever	• Finance & Funding • Governance & Policy • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Natural Resources Ministry) • Local government (District Municipalities) • Relevant sectoral agencies (TOKI) • Businesses (Energy AS) • Non-profit organisations (Professional Chambers, Union of Chambers of Turkish Engineers and Architects)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic
Impact & cost	Generated renewable energy (if applicable)	35 TWh of distributed renewables
	Removed/substituted energy, volume, or fuel type	Transitioning from coal and natural gas to renewable energy (solar, wind, hydro, geothermal)
	GHG emissions reduction estimate (total) per emission source sector	2,850
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	600,000
	Costs by CO_2e unit (EUR/tCO_2e)	211

Table 20: (B-2.2) Action 7 – Increasing the Use of Renewable Electricity

Action outline	Action name	Increasing the use of renewable electricity – Conversion to Efficient Park Lighting Systems
	Action type	Mitigation
	Action description	The percentage of efficient lighting systems, LED lighting fixtures, and related infrastructure, including light sources, lighting-related infrastructure, control systems, and fixtures, reached 50% in 2023. IMM measures the improvement of lighting in percentages annually. Since 2020, the department has achieved improvements in LED fixture replacement of almost 25%. The overall upgrade target of IMM is to reach 100% by 2030. The action aims to complete the transformation from old types of high consumption light source fittings to high efficiency LED light source fittings with integrated lighting automation system solutions in green areas.
Reference to impact pathway	Field of action	Energy systems
	Systemic lever	• Finance & Funding • Governance & Policy • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Natural Resources Ministry) • Local government (District Municipalities) • Relevant sectoral agencies (TOKI) • Businesses (Energy AS) • Non-profit organisations (Professional Chambers, Union of Chambers of Turkish Engineers and Architects)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic
Impact & cost	Generated renewable energy (if applicable)	Conversion to Efficient Park Lighting Systems
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	1,140
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	500,000
	Costs by CO_2e unit (EUR/tCO_2e)	439

Table 21: (B-2.2) Action 8 – Increasing the Use of Renewable Electricity

Action outline	Action name	Increasing the use of renewable electricity – 71% renewable electricity by 2030
	Action type	Mitigation

	Action description	This action aims to increase the share of renewable sources in the energy mix of Istanbul. Action 5 and Action 6 will contribute this action's aims. However, to achieve the target, government's policies will be decisive.
Reference to impact pathway	Field of action	Energy systems
	Systemic lever	• Finance & Funding • Governance & Policy • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Natural Resources Ministry) • Local government (District Municipalities) • Relevant sectoral agencies (TOKI) • Businesses (Energy AS) • Non-profit organisations (Professional Chambers, Union of Chambers of Turkish Engineers and Architects)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic
Impact & cost	Generated renewable energy (if applicable)	35 TWh of distributed renewables
	Removed/substituted energy, volume, or fuel type	Transitioning from coal and natural gas to renewable energy (solar, wind, hydro, geothermal)
	GHG emissions reduction estimate (total) per emission source sector	17,460,119
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	23,632,723,896
	Costs by CO_2e unit (EUR/tCO_2e)	1,354

Table 22: (B-2.2) Action 9 – Water Use Reduction

Action outline	Action name	Water use reduction – Application of sustainable rainwater solutions (rain gardens, use of permeable materials, storage, etc.)
	Action type	Mitigation
	Action description	This action aims to apply sustainable rainwater solutions within the city to decrease the water use from current sources. To monitor this action the following indicators should be observed: • Stormwater Storage Data • Amount of Stormwater Tanks • Roof Gardens • Amount of Permeable Material Used • Continuous Monitoring of Groundwater Levels
Reference to impact pathway	Field of action	Green infrastructure & nature-based solutions
	Systemic lever	• Democracy / Participation

		• Finance & Funding • Governance & Policy • Learning & Capabilities • Social Innovation • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	ISKI (Istanbul Water and Sewerage Administration)
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Energy and Natural Resources Ministry, State Hydraulic Works, Forest management) • Local government (ISKI, District Municipalities) • Relevant sectoral agencies (TOKI)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Not available
	Total costs and costs by CO_2e unit (calculated at the overall Field of Action level)	Not available due to lack of disaggregated emissions reduction for this action

Table 23: (B-2.2) Action 10 – Water Loss Reduction

Action outline	Action name	Water loss reduction – Managing the supply lines and drinking water network with smart systems
	Action type	Mitigation
	Action description	The water distribution system in Istanbul suffers from water losses and inefficiencies in energy consumption as a result of the unbalanced distribution of water resources and population density, as well as the steep topography and drinking water network construction. As a consequence of recent work, the drinking water network's loss and leakage rate has been reduced to 18.94%. This figure is lower than Türkiye's average and lower than the loss and leakage rates in several European countries. However, given the magnitude of the city's population, it appears that lower numbers should be pursued. Currently, approximately 76% of ISKI's energy is used for water supply. In this sense, this action aims to improve the management of supply lines and drinking water network with the implications of smart systems. To monitor this action the following indicators should be observed: • Loss-Leakage Ratio • Amount of Consumption; Amount of Changed System • Using the Digital Tracking System

		• Number of Intelligent Systems/Devices • Amount of Water Passing Through Intelligent Systems • Number of Remote Sensing Systems
Reference to impact pathway	Field of action	Green infrastructure & nature-based solutions
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Learning & Capabilities • Social Innovation • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	ISKI (Istanbul Water and Sewerage Administration)
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, State Hydraulic Works, Ministry of Agriculture and Forestry, Ministry of Industry and Technology) • Local government (ISKI) • Non-profit organisations (Professional Chambers)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs and costs by CO_2e unit (calculated at the overall Field of Action level)	Not available due to lack of disaggregated emissions reduction for this action

Table 24: (B-2.2) Action 11 – Mitigate Impact of Increasing Urban Heat

Action outline	Action name	Mitigate impact of increasing urban heat – Tree planting in public spaces
	Action type	Adaptation
	Action description	Due to climate change adverse effects, cities are facing with extreme weather events such as extreme heat and depending on this heat island effect. To reduce the heat island effect, this action proposes to plant trees within the city and increase the amount of green spaces. To monitor this action the following indicators should be observed: • Number of Planted and Growing Tree • Emission Measurements • Heat Map • Amount of Afforestation • Number of Persons Applying to the Hospital due to Extreme Heat

Reference to impact pathway	Field of action	Green infrastructure & nature-based solutions
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Learning & Capabilities • Social Innovation • Technology & Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Reduced climate risk • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Agriculture and Forestry, Ministry of Environment, Urbanization and Climate Change) • Businesses (Agac AS) • Non-profit organisations (TEMA, NGOs)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Not available
	Total costs and costs by CO_2e unit (calculated at the overall Field of Action level)	Not available due to lack of disaggregated emissions reduction for this action

Table 25: (B-2.2) Action 12 – Reduced Vehicle Use

Action outline	Action name	Reduced vehicle use – Congestion charges in certain areas
	Action type	Mitigation
	Action description	Congestion charging requires private car drivers to pay to enter specific regions. Its primary goal is to reduce congestion caused by significant private car traffic, particularly in central regions, create more liveable places, and improve inhabitants' quality of life. Congestion charging is not only a deterrent, but it also provides additional revenue that may be used to improve air quality and the public transportation system. Putting active transportation arrangements in place will boost the success of this intervention. This action proposes the pilot implementation of this intervention in line with Istanbul Sustainable Urban Mobility Plan. This pilot implementation will serve as a test bed for various pricing applications that may be introduced in other areas of Istanbul in the coming years. To monitor this action the following indicators should be observed: • GHG Emissions • Change in Traffic Density

		• Collected Fee • Survey Results from Local People, Pedestrians and Drivers
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Ministry of Transport and Infrastructure, General Directorate of Highways) • Local government (Governorship, ISPARK, District Municipalities) • Businesses (Istanbul Transportation AS)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	55,556
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	15,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	301

Table 26: (B-2.2) Action 13 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying buses Replacement and conversion of IETT and private vehicle fleet – Decarbonisation of IETT Metrobus and Public Transport Bus Fleets
	Action type	Mitigation
	Action description	The current fleet of rubber-tyred public transport services in Istanbul is highly dependent on fossil fuels. This action proposes the decarbonisation of the public transport bus fleet and the metrobus system in line with the city's environmental policies. This action includes the use of electric buses in the IETT's bus fleet and metrobuses (Bus Rapid Transit) operating on separated lanes along a 52 km route on the D100 Highway. Current practices that support this action include IETT's diesel to electric bus conversion project, testing of a new electric metrobus vehicle with a capacity of 420 passengers, and future prospects for the purchase of electric vehicles (EVs).
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation

		• Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IETT, IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Electric Vehicle Companies)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	153,000
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	1,090,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	7,124

Table 27: (B-2.2) Action 14 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying buses Replacement and conversion of IETT and private vehicle fleet – Decarbonisation of City Lines Maritime Fleet
	Action type	Mitigation
	Action description	The Istanbul Sustainable Urban Mobility Plan (SUMP) aimed to increase urban sea transport capacity and develop new routes and piers. Additionally, “Istanbul SUMP-II: Implementation Projects” has two specific pilot projects that concern sea transport. While developing urban sea transport, it is also important that it becomes a more environmentally friendly mode of transport. Currently, City Lines owns 30 vessels, all are diesel powered, and half are over the age of 35. This action proposes the decarbonisation of the City Lines fleet by the procurement of new-build and retrofitted vessels which are powered by green methanol. This action will promote environmentally friendly technologies in maritime vessels and contribute to Istanbul’s net zero target.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits

Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Electric Vehicle Companies)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	86,240
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	507,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	5,879

Table 28: (B-2.2) Action 15 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying buses Replacement and conversion of IETT and private vehicle fleet – Implementation of Practices that Support Active Mobility
	Action type	Mitigation
	Action description	Historically, urban transport policies in Istanbul have prioritized motorized transport over other active transport modes (e.g., walking and cycling). On the other hand, the city's rapid expansion has made it challenging to allocate space for pedestrian walkways and dedicated cycling lanes. These resulted in inadequate facilities for pedestrians and cyclists. This action proposes the implementation of active mobility interventions that are defined in Istanbul SUMP-II: Implementation Projects.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Istanbul Transportation AS)

	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	40,450
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	30,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	742

Table 29: (B-2.2) Action 16 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying buses Replacement and conversion of IETT and private vehicle fleet – Extension of Urban Rail Network
	Action type	Mitigation
	Action description	Despite IMM's budget limitations, Istanbul's rail network is gradually being shaped and is planned to be extended to reach a length of 740 km in the long run. As a result, the share of rail in the modal split is increasing rapidly. This action will help to reduce GHG emissions by encouraging a shift from cars and buses to rail. This action proposes the completion of rail projects under construction and ready to be implemented until the end of 2030.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Istanbul Transportation AS)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	403,700

	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	3,450,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	8,546

Table 30: (B-2.2) Action 17 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying buses Replacement and conversion of IETT and private vehicle fleet – HIZRAY: New Generation Express Metro
	Action type	Mitigation
	Action description	Istanbul's transport network consists of three tiers of modes. In the first tier, slow modes such as walking, cycling and e-mobility feed second tier public transport systems such as dolmuş, minibuses, buses and trams. These second tier public transport systems, in turn, feed higher-capacity third tier public transport systems such as metro and metrobus. HIZRAY is a fourth tier high level express metro line that will form the main transport corridor of Istanbul fed by all these systems. The HIZRAY project represents a new approach to the rail system network, offering a new generation of express metro service. It comprises a high-speed 74.5 km rail line with 13 underground stations. The design speed of HIZRAY has been set at 140 km/h, and the anticipated average speed will be 90 km/h. This will enable the longest distance on the line, Beylikdüzü - Sabiha Gökçen, to be completed in approximately 55 minutes. HIZRAY is expected to carry 1.5 million passengers per day, with an estimated 550 million passengers per year. HIZRAY will be the main transport corridor of Istanbul and will have positive effect on reducing the GHG emissions.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Istanbul Transportation AS)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil

	GHG emissions reduction estimate (total) per emission source sector	332,780
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	4,000,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	12,020

Table 31: (B-2.2) Action 18 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying buses Replacement and conversion of IETT and private vehicle fleet – Charging Infrastructure Feasibility Study and Pilot Applications
	Action type	Mitigation
	Action description	TurkSTAT data indicates that there are 114,156 electric cars in Türkiye as of May 2024. A review of the situation in Istanbul reveals that the number of electric cars in the city is 46,677 as of 2023. According to the Electric Vehicle and Charging Infrastructure Projection published by EMRA, the total number of electric vehicles in Türkiye is expected to be between 200,000 and 360,000 in 2025, between 775,000 and 1,700,000 in 2030 and between 1,800,000 and 4,200,000 in 2035. Meanwhile, the total number of charging points is projected to reach between 35,000 and 62,000 in 2025, 83,000 and 180,000 in 2030, and 145,000 and 350,000 in 2035. In light of these projections and the current situation, it can be reasonably assumed that the electric vehicle (EV) sector in Türkiye will experience significant growth over the next decade. This action proposes a feasibility study to ascertain the roles that IMM can undertake in parallel with the development of the electric vehicle sector. The objective of this study is to identify the areas in which IMM and its subsidiaries can contribute. Moreover, this action proposes a pilot implementation in a selected metro station.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Istanbul Transportation AS)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable

	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	900
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	1,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	1,111

Table 32: (B-2.2) Action 19 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet – Car and truck - fuel switching - switch vehicles to hybrid engines
	Action type	Mitigation
	Action description	The transportation sector is responsible for 28% of total emissions and the single most significant source, on-road transportation. Diesel oil is the dominant fuel source of emissions in road transportation (11.6 $MtCO_2e$) compared to gasoline (1.8 $MtCO_2e$) and LPG (830 $ktCO_2e$). This activity comes mostly from private cars and a significant number of buses. The 2019 inventory includes emissions from rail and water-borne navigation, but these represent less than 1% of total transportation emissions. For this reason, it is significantly important to encourage fuel switch of private transport modes such as cars and trucks to support the achieve City's net zero targets. Even though IMM has limited power on affecting people's and institutions travel choices, IMM can positively influence the fuel switch by increasing the awareness and developing incentive mechanisms.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (IETT, UKOME) • Businesses (Istanbul Transportation AS)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil

	GHG emissions reduction estimate (total) per emission source sector	7,787,316
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	69,506,775,029
	Costs by CO_2e unit (EUR/tCO_2e)	8,926

Table 33: (B-2.2) Action 20 – Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet

Action outline	Action name	Electrifying Buses Replacement and Conversion of IETT and Private Vehicle Fleet – Electric and hybrid municipal vehicles (trash collection trucks, municipal cars, etc.)
	Action type	Mitigation
	Action description	According to SECAP study, on-road municipal vehicle fleet (including affiliates) is responsible for the 29.1% of the GHG emissions caused by IMM's corporate activities. In this sense, this action proposes the decarbonisation municipal service vehicles to support the City's climate neutrality targets.
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Energy and Natural Resources Ministry, Ministry of Environment, Urbanization and Climate Change, General Directorate of Highways) • Local government (Governorship, ISTAC, District Municipalities) • Businesses (Istanbul Transportation AS)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Political and Social • Legal and Corporate
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	409,859
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	3,658,251,317
	Costs by CO_2e unit (EUR/tCO_2e)	8,926

Table 34: (B-2.2) Action 21 – Increase Bicycle Use

Action outline	Action name	Increase bicycle use –

		Making existing roads suitable for cyclists, and creating new separated bicycle paths
	Action type	Mitigation
	Action description	Historically, urban transport policies in Istanbul have prioritized motorized transport over other active transport modes (e.g., walking and cycling). On the other hand, the city's rapid expansion has made it challenging to allocate space for pedestrian walkways and dedicated cycling lanes. These resulted in inadequate facilities for pedestrians and cyclists. This action proposes the expansion of cycle lanes within the city. To monitor this action the following indicators should be observed: • Shared Cycle Path Length • Non-Shared Cycle Path Length • Number of Bicycle Users • Number of Bicycles Sold • Number of Bicycle Stations • Share of Cycling Journeys in Typical Distribution • Ratio of Bicycle Path Length to Motor Vehicle Road Length • Number of Public Transport Stations with Sheltered Bicycle Parking Facilities • Number of Serious Accidents Categorized by Significance of Accidents Engaged by Cyclists
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Transport and Infrastructure, Turkish Cycling Federation)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social • Legal and Corporate • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	1,057,510
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	318,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	301

Table 35: (B-2.2) Action 22 – More Public Transport Use

Action outline	Action name	More public transport use – Park and Ride expansion
	Action type	Mitigation
	Action description	Currently Park and Ride car parks are widely used in Istanbul. However, in line with other ongoing public transport investments such as rail network extension, IMM is planning to expand the park and ride facilities within Istanbul. One of the main benefits of constituting Park and Ride facilities is to reduce GHG emissions. Among the objectives of this action, the below list can be presented: • Promoting public transport • Reduced fuel usage • Reduced road use • Improved air circulation in on-street parking lots • Time savings • Reducing traffic-related stress
Reference to impact pathway	Field of action	Mobility & transport
	Systemic lever	• Democracy / Participation • Finance & Funding • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Ministry of Transport and Infrastructure, General Directorate of Highways) • Local government (IETT, ISPARK, District Municipalities)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Political and Social • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	644,444
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	174,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	301

Table 36: (B-2.2) Action 23 – Food and Yard Waste Recycling

Action outline	Action name	Food and Yard waste recycling – Develop programs to reduce or completely avoid any discarded food substance
	Action type	Mitigation

	Action description	Responsibilities about municipal waste collection are distributed between IMM and district municipalities. Commercial companies are also allowed to sell their waste to licensed recycling companies directly. However, food waste, due to its quickly decomposable nature, costly processing requirements, and low secondary revenue, is not an attractive waste type for recycling companies, and often remains in the municipal waste mix, contaminating other wastes while quickly decomposing. IMM is currently running a programme of collecting food wastes from commercial sources such as hotels, restaurants, ready meal companies and weekly street markets with mutual agreements with district municipalities and the company itself. IMM is looking into ways to extend this operation to a wider base of food-waste producers and streamline it to reduce operation costs. In this sense, this action proposes the development of programs to deal with existing problems.
Reference to impact pathway	Field of action	Waste & circular economy
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Circular economy development
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (ISTAC, District Municipalities)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	207,745
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	68,048,850
	Costs by CO_2e unit (EUR/tCO_2e)	328

Table 37: (B-2.2) Action 24 – Food and Yard Waste Recycling

Action outline	Action name	Food and Yard waste recycling – Establishment of Biomethanisation Plants
	Action type	Mitigation
	Action description	In Istanbul, 17,600 tonnes of solid waste reaches disposal facilities every day. IMM is responsible for transporting municipal wastes from transfer stations to recovery and disposal facilities and carrying out related services. The organic waste should be prevented from mixing with other municipal waste and becoming contaminated, so that

		biomethanisation process can run at high efficiency. When separation at source is not guaranteed, it is important to establish Mechanical Separation units as a pre-treatment for biomethane plants to separate non-biodegradable wastes from the organic fraction. Ensuring waste separation at source at the desired level increases the effectiveness and efficiency of Mechanical Separation and Biomethanisation facilities. In this sense, IMM is willing to increase the existing biomethanisation capacity and this action proposes the implementation of current plans.
Reference to impact pathway	Field of action	Waste & circular economy
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Circular economy development
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (ISTAC, District Municipalities)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	40,150
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	58,951,150
	Costs by CO_2e unit (EUR/tCO_2e)	1,468

Table 38: (B-2.2) Action 25 – Using More Efficient Tools

Action outline	Action name	Using more efficient tools – Optimize waste collection operations (routes, pickup schedules) to reduce environmental impacts and total GHG emissions
	Action type	Mitigation
	Action description	Waste collection is under the authority of district municipalities while waste disposal is the responsibility of IMM. District municipalities are bringing the collected waste to transfer centres of IMM and IMM conducts the necessary disposal activities. In this process, IMM operates large number of vehicles and to support the City's net zero targets, the renewal of these vehicles and overall operations are required. This action proposes to optimize the whole process by using more efficient methods and vehicles. To monitor this action the following indicators should be observed: • Number of Vehicle Tracking Systems

		• Number of Waste Collection Vehicles • Fuel Consumption of Waste Collection Vehicles • Amount of Emissions from Waste Collection Vehicles • Planning and Monitoring of Electrification Transformation in Waste Collection Vehicles with Climate Actions
Reference to impact pathway	Field of action	Waste & circular economy
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity • Circular economy development • Delivery of equitable co-benefits
Implementation	Responsible bodies/person for implementation	IMM
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change) • Local government (ISTAC, District Municipalities)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	146,980
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	75,300,000
	Costs by CO_2e unit (EUR/tCO_2e)	512

Table 39: (B-2.2) Action 26 – Wastewater Reuse

Action outline	Action name	Wastewater reuse – Supporting wastewater recovery and reuse
	Action type	Mitigation
	Action description	This action proposes the reuse and recovery of wastewater. In this sense, interventions such as the use of grey water can be expanded within the city. This action also includes the reuse of recovered wastewater in multiple nature-based adaptation activities as well as replacing water supply for low quality needs. To monitor the following indicators should be observed: • Ratio of Recycled Wastewater to Total Treated Wastewater • Biological Treatment Rate • Recovery and Utilization Rates of Wastewater • Amount of Recovery Water Usage in Green Areas • Change in the Amount of Sea Discharge • Amount of Green Areas Using Recycled Wastewater

		• Frequency of Analysis of Soil Parameters at Certain Periods in the Cases of Treating Wastewater and Used for Irrigation • Monitoring of Groundwater Levels and Quality
Reference to impact pathway	Field of action	Waste & circular economy
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity
Implementation	Responsible bodies/person for implementation	ISKI
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Ministry of Education, Ministry of Agriculture and Forestry, State Hydraulic Works) • Local government (ISKI, District Municipalities, All Municipalities in the Marmara Region) • Non-profit organisations (Professional Chambers, Organized Industrial Zones) • Citizens (Industrialists)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	6,039,899
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	1,959,240,000
	Costs by CO_2e unit (EUR/tCO_2e)	324

Table 40: (B-2.2) Action 27 – Wastewater Reuse

Action outline	Action name	Wastewater reuse – Improvement of Existing Wastewater Treatment Plants and Development of New Advanced Biological Wastewater Treatment Plants
	Action type	Mitigation
	Action description	Istanbul Water and Sewerage Administration (ISKI) plans to increase the number of advanced biological treatment plants to strengthen water management infrastructure and improve surface water quality. These facilities will focus on effectively removing nutrients like organic matter, nitrogen, and phosphorus, as well as microbial pollutants. They will incorporate processes such as nitrification and denitrification in addition to conventional treatment techniques. According to the master plan report by ISKI, there are plans to upgrade 62 existing wastewater treatment plants and construct 71 new ones, particularly along the Bosphorus and Marmara coasts.

		This action proposes to be in line with ISKI's current plans and the outcomes of this action will help the reduction of GHG emissions.
Reference to impact pathway	Field of action	Waste & circular economy
	Systemic lever	• Democracy / Participation • Finance & Funding • Governance & Policy • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity
Implementation	Responsible bodies/person for implementation	ISKI
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Ministry of Education, Ministry of Agriculture and Forestry, State Hydraulic Works) • Local government (ISKI, District Municipalities, All Municipalities in the Marmara Region) • Non-profit organisations (Professional Chambers, Organized Industrial Zones) • Citizens (Industrialists)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	184,369
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	455,760,000
	Costs by CO_2e unit (EUR/tCO_2e)	2,472

Table 41: (B-2.2) Action 28 – Water Loss Reduction

Action outline	Action name	Water loss reduction – Reduction of Loss and Leakage in Drinking Water Network
	Action type	Mitigation
	Action description	The water distribution system in Istanbul suffers from water losses and inefficiencies in energy consumption as a result of the unbalanced distribution of water resources and population density, as well as the steep topography and drinking water network construction. As a consequence of recent work, the drinking water network's loss and leakage rate has been reduced to 18.94%. This figure is lower than Türkiye's average and lower than the loss and leakage rates in several European countries. However, given the magnitude of the city's population, it appears that lower numbers should be pursued. In this sense, this action proposes to support the ongoing activities and make necessary improvements over the system.
Reference to impact pathway	Field of action	Waste & circular economy
	Systemic lever	• Democracy / Participation

		• Finance & Funding • Governance & Policy • Social Innovation
	Outcome (according to module B-1.1)	• GHG reduction • Increased adaptative capacity
Implementation	Responsible bodies/person for implementation	ISKI
	Involved stakeholders	• National government (Ministry of Environment, Urbanization and Climate Change, Ministry of Education, Ministry of Agriculture and Forestry, State Hydraulic Works) • Local government (ISKI, District Municipalities, All Municipalities in the Marmara Region) • Non-profit organisations (Professional Chambers, Organized Industrial Zones) • Citizens (Industrialists)
	Comments on implementation – consider mentioning resources, timelines, milestones	• Financial and Economic • Practical and Technological
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Nil
	GHG emissions reduction estimate (total) per emission source sector	5,390
	GHG emissions compensated (natural or technological sinks)	Nil
	Total costs (EUR)	15,000,000
	Costs by CO_2e unit (EUR/tCO_2e)	2,783

The actions were modelled using the C40 Cities' Pathways tool, which was also used in the modelling for the emissions scenarios and targets (for 2030, 2040 and 2050) in the CAP. For the CCC Action and Investment Plans, an iteration of the model was used: accelerating the ambition of actions to achieve net zero emissions in 2030. The target of net zero emissions in 2030 was defined as 80% absolute emissions reductions compared to the 2019 base year emissions.

Actions modelled include the priority actions listed in Tables B-2.1 and B-2.2, as well as additional actions to encompass ambitious and transformative climate action across the energy, buildings, industry, transport, waste and water sectors. These all contribute to the achievement of net zero emissions in 2030:

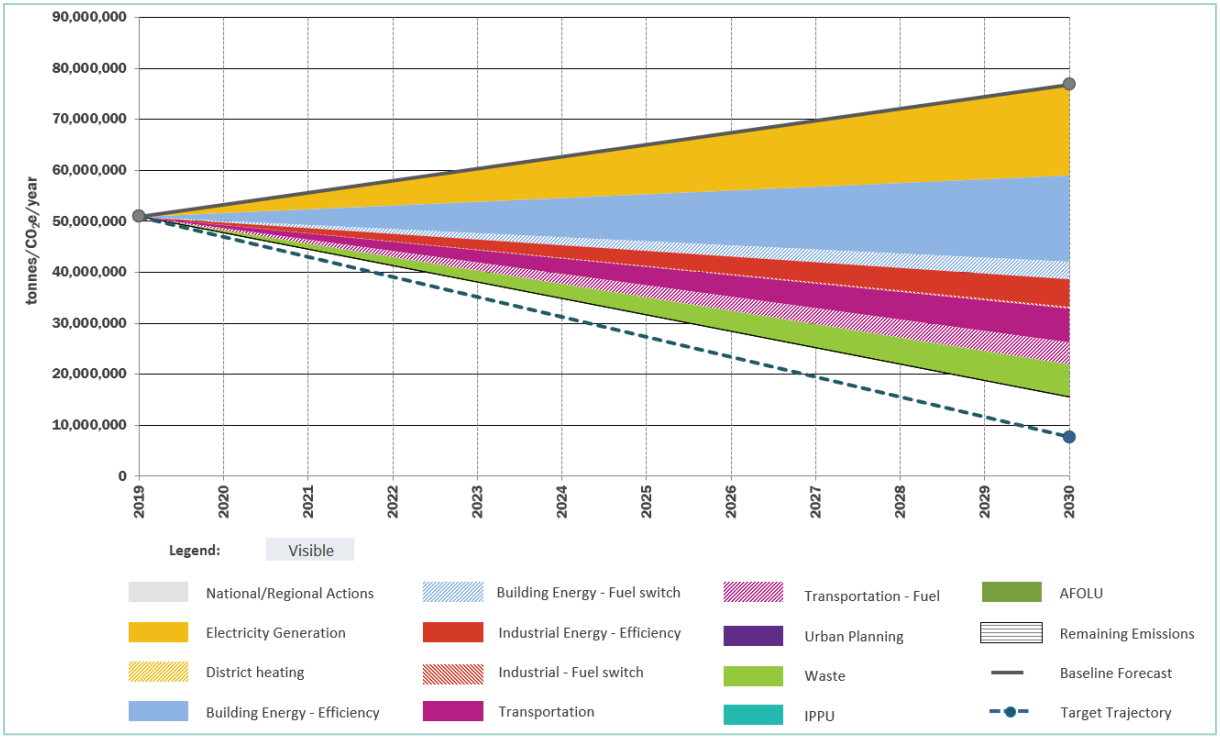

Figure 8: 2030 Net Zero Reduction Scenario

Table 42: 2030 Net Zero Reduction Scenario

Metric	2019	2025	2027	2030
Baseline Forecast (tCO_2e/year)	50,888,653	65,023,277	69,733,435	76,798,674
Achieved w/ Actions (tCO_2e/year)		8,427,575	11,236,767	15,450,554
% reduction relative to 2019 baseline		43.6%	58.1%	79.9%

The residual emissions after all the actions (as well as actions in other IMM plans and policies such as the CAP, GCAP and SECAP) exist across all emissions sectors. The modelling completed for the CCC's 2030 net zero target shows the major remaining emissions below, detailed at the sub-sectoral level.

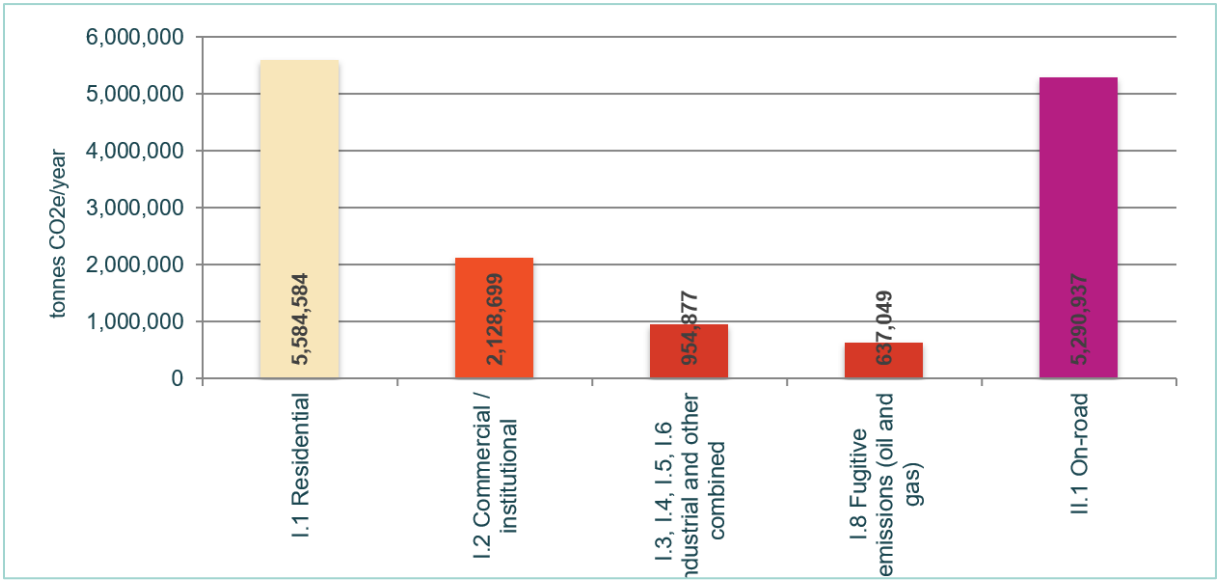

Figure 9: Major Remaining Emissions

The residual emissions resulting from socioeconomic activity related to the built environment is mainly due to the Scope 2 emissions generated by non-renewable sources of grid electricity. Whilst most of the grid electricity in 2030 will be generated via renewables and nuclear, 19% of grid mix will still be attributed to natural gas according to national strategies. This is to be expected in many cities and even mandated by some national governments to ensure that energy generation has redundancies given that some renewable energy sources could be intermittent depending on meteorological conditions.

This means that despite actions to electrify and improve the energy efficiency of fixtures and appliances across residential, commercial, institutional, industrial and other buildings in Istanbul, there will still be emissions occurring in emissions categories I.1-6. For the same reasons as above, there will continue to be emissions resulting from rail transit (II.2) since it utilises grid energy for operations. Due to the continued use of natural gas, there will also continue to be fugitive emissions at the energy generation stage (I.8). Some of these residual emissions could be addressed by further policies and programmes at the municipal and national level to ensure that energy generation via natural gas is as efficient as possible.

While the CCC actions and modelled mode- and fuel-shifts are highly ambitious, there will still be some private passenger and public transit vehicles using internal combustion engines (ICE) that use petrol or diesel in the local fleet. This is to be expected not only due to practical and technological reasons, but also to ensure that there is a just climate transition that considers local needs and existing socioeconomic interdependencies in an equitable way. In addition, the electrification of local fleets still requires grid energy consumption, which as described before is not fully decarbonised in 2030.

Some of these residual emissions could be addressed by further policies and programmes at the municipal and national level to encourage further mode-shift to electric public transit and active mobility, as well as actions to ensure that the energy sources for electric public transit is decarbonised.

3.3 (B-3) Indicators for Monitoring, Evaluation and Learning

Some of these residual emissions could be addressed by further policies and programmes at the municipal and national level to encourage further mode-shift to electric public transit and active mobility, as well as actions to ensure that the energy sources for electric public transit is decarbonised.

Table 43: (B-3.1) Impact Pathways

Outcomes / impacts addressed	Indicator No. (unique identified)	Indicator name	Unit	2019 baseline	Target values		
					2025	2027	2030
GHG reduction	01	Annual amount of greenhouse gas	tCO_2e/y	50,892,800	31,560,666	25,116,621	15,450,554
GHG reduction	02	Annual energy consumption	MWh/y	85,539,176	55,027,513	44,856,958	29,601,127
GHG reduction	03	Annual energy intensity	MWh/m^2	0	0	0	0
GHG reduction	04	Installed (distributed) photovoltaic solar power capacity	GWp	-	1,276	1,701	2,339
GHG reduction	05	Annual (distributed) photovoltaic solar energy production	GWh/y	-	7,353,011	9,804,014	13,480,520
GHG reduction	06	(Distributed) photovoltaic solar-induced greenhouse gas reduction	tCO_2e/y	-	6,011,317	8,015,089	11,020,747
GHG reduction	07	Percentage of total photovoltaic solar installations covering the municipality's electrical energy consumption	%	-	3	4	6
GHG reduction	08	Annual CO_2 emissions per unit of GDP	€ / GDP per capita				
GHG reduction	09	The ratio of covering the city's energy demand by renewable energy	%	1,935	1,126	735	452
GHG reduction	10	Proportion of fleet that is electrified	%	-	55	73	100
GHG reduction	11	Annual CO_2 equivalent emissions per capita	CO_2e/ca	-	3.3	2	1.6
GHG reduction	12	Road length dedicated to public transport per 100,000 capita	km	1.84	2.80	2.87	3.67
GHG reduction	13	The length of bicycle path per 100,000 capita	km	2	3	3	4
Co-benefits	14	The ratio of population having access to public transport within 15 min by foot	%	67	82	88	97

Table 44: (B-3.2) Indicator Metadata 1 – Annual amount of Greenhouse Gas

Indicator Name	Annual amount of greenhouse gas
Indicator Unit	tCO_2e/y

Definition	The total amount of greenhouse gases across all sectors that result from Istanbul's socioeconomic activity
Calculation	The relevant fuel type or energy quantity multiplied by the emission factor for the fuel
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Air quality Skills & employment Quality housing Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Every 4 years
Suggested collection interval	Every 4 years
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 45: (B-3.2) Indicator Metadata 2 – Annual Energy Consumption

Indicator Name	**Annual energy consumption**
Indicator Unit	MWh/y
Definition	The total energy consumed by residential, commercial and municipal buildings in Istanbul across a 12-month period
Calculation	The total energy consumption made up of fuel consumption multiplied by the emission factor for the fuel, and the metered electricity consumed
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes

If yes, which co-benefit does it measure?	Mental & physical health Skills & employment Income & poverty Quality housing Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 46: (B-3.2) Indicator Metadata 3 – Annual Energy Intensity

Indicator Name	**Annual energy intensity**
Indicator Unit	MWh/m²
Definition	The total energy consumed by residential, commercial and municipal buildings in Istanbul across a 12-month period, normalised for the total floor area of all buildings monitored in Istanbul
Calculation	The total energy consumption made up of fuel consumption multiplied by the emission factor for the fuel, and the metered electricity consumed; this is then normalised by the total floor area of all buildings monitored in Istanbul
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Mental & physical health Skills & employment Income & poverty Quality housing Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	

Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 47: (B-3.2) Indicator Metadata 4 – Installed (Distributed) Photovoltaic Solar Power Capacity

Indicator Name	**Installed (distributed) photovoltaic solar power capacity**
Indicator Unit	GWp
Definition	The total and maximum capacity of all photovoltaic solar panels installed across the Istanbul geographical area
Calculation	Totalling the maximum rated capacity of all photovoltaic solar panels installed across the Istanbul geographical area
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment
Does the indicator measure indirect impacts (i.e., co-benefits)?	Energy systems
If yes, which co-benefit does it measure?	Mobility & transport
Is the indicator useful for monitoring the output/impact of action(s)?	Waste & circular economy
If yes, which action and impact pathway is it relevant for?	Yes
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Mental & physical health
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 48: (B-3.2) Indicator Metadata 5 – Annual (Distributed) Photovoltaic Solar Energy Production

Indicator Name	Annual (distributed) photovoltaic solar energy production
Indicator Unit	GWh/y
Definition	Total renewable energy produced by the distributed and grid-tied photovoltaic power system
Calculation	Metered energy supplied to grid at solar inverter AC output

Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Mental & physical health Skills & employment Income & poverty Quality housing Accessible & affordable mobility
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 49: (B-3.2) Indicator Metadata 6 – (Distributed) Photovoltaic Solar-Induced Greenhouse Gas Reduction

Indicator Name	(Distributed) photovoltaic solar-induced greenhouse gas reduction
Indicator Unit	tCO2e/y
Definition	The total greenhouse gas emissions avoided by replacing fuel-based energy generation (from the grid or locally) with distributed solar photovoltaic installations
Calculation	Metered energy supplied to grid or local system at solar inverter AC output, multiplied by the emission factor of the national electricity grid
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Mental & physical health Skills & employment

	Income & poverty Quality housing Accessible & affordable mobility
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 50: (B-3.2) Indicator Metadata 7 – Percentage of Total Photovoltaic Solar Installations Covering the Municipality's Electrical Energy Consumption

Indicator Name	**Percentage of total photovoltaic solar installations covering the municipality's electrical energy consumption**
Indicator Unit	%
Definition	The proportion of municipal electricity consumption being supplied by distributed and utility photovoltaic solar installations
Calculation	Metered electricity supplied to grid or local system at point of grid connection, as a fraction of the municipality's electrical energy consumption
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Mental & physical health Skills & employment Income & poverty Quality housing Accessible & affordable mobility
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data	IMM

source	
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 51: (B-3.2) Indicator Metadata 8 – Annual CO_2e emissions per unit of GDP

Indicator Name	**Annual CO_2e emissions per unit of GDP**
Indicator Unit	€ / GDP per capita
Definition	The total amount of greenhouse gases across all sectors that result from Istanbul's socioeconomic activity, normalised by GDP per capita
Calculation	The relevant fuel type or energy quantity multiplied by the emission factor for the fuel, normalised by the year's known or projected GDP per capita
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Air quality Mental & physical health Skills & employment Income & poverty Quality housing Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Every 4 years
Suggested collection interval	Every 4 years
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 52: (B-3.2) Indicator Metadata 9 – The Ratio of Covering the City's Energy Demand by Renewable Energy

Indicator Name	**The ratio of covering the city's energy demand by renewable energy**
Indicator Unit	%
Definition	The proportion of municipal energy consumption being supplied by distributed and utility photovoltaic solar installations
Calculation	Metered energy supplied to grid or local system at point of grid connection, as a fraction of the municipality's total local stationary fuel and grid electricity consumption
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Green infrastructure & nature-based solutions Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Air quality Income & poverty Accessible & affordable mobility Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Annually
Suggested collection interval	Annually
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 53: (B-3.2) Indicator Metadata 10 – Annual CO_2 Equivalent Emissions per Capita

Indicator Name	**Annual CO_2 equivalent emissions per capita**
Indicator Unit	CO_2e/ca
Definition	The total amount of greenhouse gases across all sectors that result from Istanbul's socioeconomic activity, normalised by the municipality's population size
Calculation	The relevant fuel type or energy quantity multiplied by the emission factor for the fuel, normalised by the municipality's known or projected population size for the year
Indicator Context	

Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Climate resilience & social infrastructure Energy systems Green infrastructure & nature-based solutions Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Air quality Biodiversity Skills & employment Income & poverty Accessible & affordable mobility Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Every 4 years
Suggested collection interval	Every 4 years
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 54: (B-3.2) Indicator Metadata 11 – Road Length Dedicated to Public Transport per 100,000 Capita

Indicator Name	**Road length dedicated to public transport per 100,000 capita**
Indicator Unit	km
Definition	The physical length of road designated for public transport per 100 thousand inhabitants
Calculation	
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Mental & physical health Skills & employment Income & poverty

	Quality housing Accessible & affordable mobility
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Upon the completion of specific projects
Suggested collection interval	Upon the completion of specific projects
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 55: (B-3.2) Indicator Metadata 12 – The Length of Bicycle Path per 100,000 Capita

Indicator Name	**The length of bicycle path per 100,000 capita**
Indicator Unit	km/100,000
Definition	Measures greenhouse gas reduction by increasing the length of cycle paths per 100 thousand inhabitants
Calculation	
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Air quality Accessible & affordable mobility
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Upon the completion of specific projects
Suggested collection interval	Upon the completion of specific projects
References	

Deliverables describing the indicator	
Other indicator systems using this indicator	

Table 56: (B-3.2) Indicator Metadata 13 – The Ratio of Population Having Access to Public Transport within 15 min by Foot

Indicator Name	The ratio of population having access to public transport within 15 min by foot
Indicator Unit	%
Definition	Proportion of residents within the municipal area that live within 15 minutes' walk from the nearest public transit (e.g. bus/BRT stop, subway / light rail / commuter rail station, etc.)
Calculation	
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Built environment Energy systems Mobility & transport Waste & circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	Yes
If yes, which co-benefit does it measure?	Air quality Mental & physical health Skills & employment Income & poverty Quality housing Community representation & participation
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathways according to Module B-1
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	IMM
Is the data source local or regional/national?	Local
Expected availability	Upon the completion of specific projects
Suggested collection interval	Upon the completion of specific projects
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

4 (C) Enabling Climate Neutrality by 2030

4.1 (C-1) Governance Innovation Interventions

Istanbul is vast in population, diversity and complexity. Reconciling climate neutrality efforts with the multiple layers of urban issues in this context requires the commitment of many stakeholders at various levels. Interventions to the city's governance structure need to be targeted, assigning specific roles to focus on climate related actions and establish relations with relevant units.

Description or visualisation of the participatory governance model for climate neutrality

Progressing towards climate neutrality is prominent in multiple levels of policy that impact Istanbul: from national legislation to alignment with EU acquis, on to sectoral targets and the shared ambition of multiple cities in Türkiye. Even so, Istanbul comes forward with an even more ambitious commitment on this path as signatory to climate initiatives including this Climate City Contract.

The main IMM Climate Governance Model is illustrated in the chart below. This structure defines the responsibilities and relationships between the units of IMM and the goal of the plan is to enhance it with a clear focus on climate neutrality. Units carry extended efforts for citizen participation and engaging civil society, which are not illustrated here. It is also worth noting that the first three levels of this diagram run governance processes with the central government, adopt national policies and communicate investment priorities from the local level.

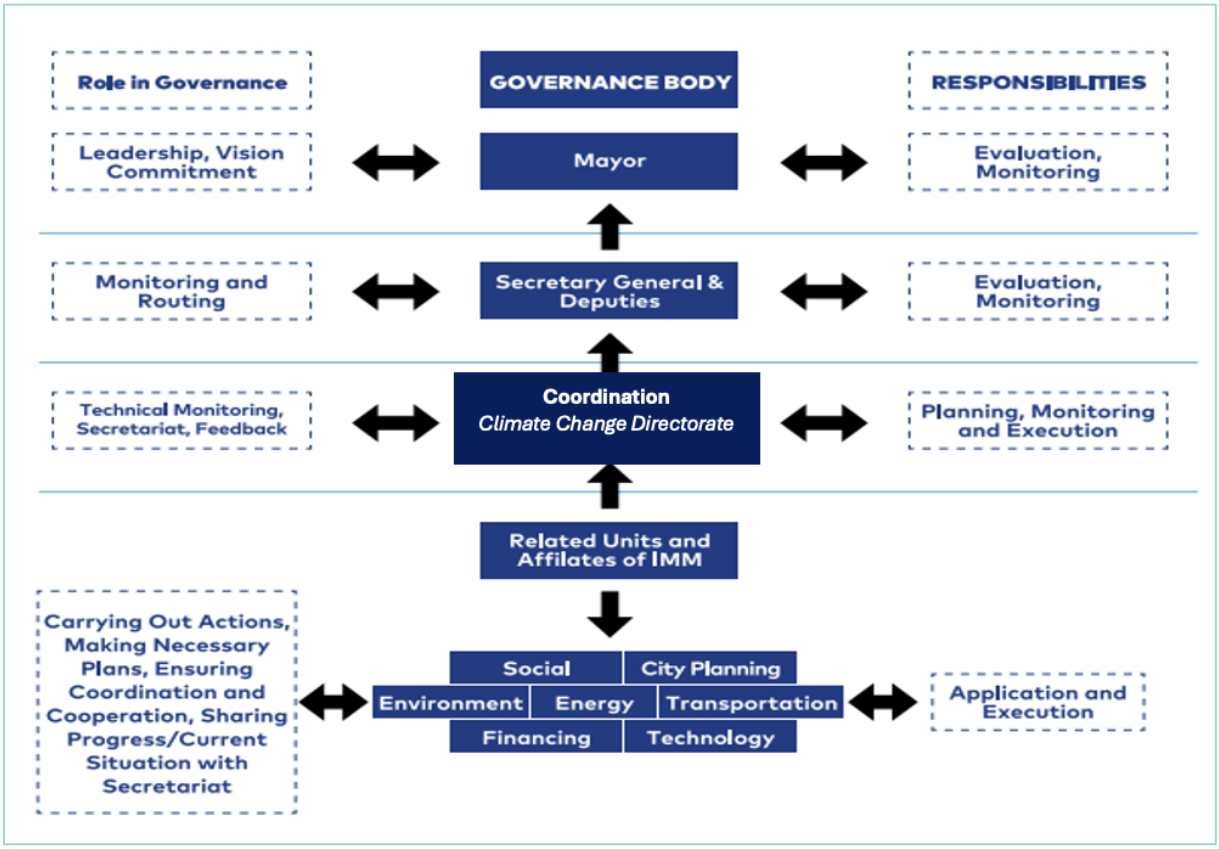

Figure 10: IMM Climate Governance Models

While IMM is committed to its climate goals, and a trackable governance model exists, improvements can accelerate the implementation of actions. The participatory processes of IMM can benefit from targeted actions specifically for climate. The authorities responsible for sectors related to climate actions can benefit from focused, trained staff to oversee the adoption of actions. Communication and decision-making processes can be improved.

The governance interventions needed to realize this target should establish clear routes in the complex agenda of the city, partnering with the right authorities and delivering solutions in the right fields. To do this, the governance policy should strengthen the capacity and ownership of relevant entities on the path to climate change, deliver technical excellence in implementing actions and establish a participatory, interdisciplinary and multi-level platform for dialogue to guide this process. We define our interventions under these thematic areas.

Ownership interventions:

The ownership of actions should be organised in a structured manner so that they are diligently tracked and pushed within the hectic agenda of the city. This structure should be able to organise and bring all the climate related actors together, for establishing this structure IMM planning to reorganise a structure called the Istanbul Climate Platform (ICP). ICP should include all relevant actors including IMM, relevant ministries, district municipalities, universities, professional chambers, NGOs, private sectors etc.

Istanbul Climate Platform:

On 5 November 2021, IMM announced the Climate Vision and the Climate Change Action Plan for Istanbul. The plan, which constitutes Istanbul's roadmap for the combat against the climate crisis, underlines once more the goal of becoming a carbon neutral and climate resilient city by 2050. In this announcement, it has been pointed out, that a "Climate Platform" has been established under the roof of the Vision 2050 Office which is part of the IPA. Establishment of this platform was served as a compass for all the steps to be taken in line with the goals. Climate Platform is a guarantor for the processes' sustainability, monitorability and success.

The purpose of the Istanbul Climate Platform (ICP):

- Develop, in an exchange of ideas, proposals that strengthen the combat against the climate crisis in the world, in Türkiye but first of all in Istanbul.
- Contribute to the development of proposals on how to implement the combat against the climate crisis in Istanbul.
- Monitor in a transparent and participative way the climate crisis-related activities of the IMM and all relevant institutions.
- Support effective defensive processes in the combat against the climate crisis on a local, national and global level.
- Ensure transparent generation and sharing of information on the combat against climate crisis.
- Ensure that the young generation and vulnerable communities are heard in the combat against climate crisis.
- Ensure that the discussion about climate change is put on the agenda of society, and thus to contribute to awareness building on climate change and practical measures.

Different actors who share concerns about the climate crisis as their common denominator communicate on the platform in a transparent and equal fashion. The platform was provided a common ground for

online face-to-face meetings, workshops and events that promote common understanding, cooperation and project development.

The IPA Vision 2050 Office managed the platform's secretariat. The ICP was comprised 5 different working groups. Their areas of expertise were:

- Emission reduction
- Climate monitoring and transparency
- Training, awareness and citizen participation
- Economy, finance and green transition
- Climate adaptation and climate justice

ICP was included activists from different sectors who work on various fields related to the climate crisis. The Climate Change Directorate, a section of IMM's Environmental Protection and Development Department, was a natural member of the platform and acted as intermediary between the sectors. The platform's correspondence address is: iklimplatformu@ipa.Istanbul [3]. This platform will be reorganised and adapted to CCC by the Climate Change Directorate.

Figure 11: First Meeting of the Istanbul Climate Platform with 120 Participants on 19th of February, 2022[4]

- The aim of the reorganized ICP shall be as follows:
- Collecting information about the city
- Conducting demand, need and impact analysis
- Creating a future vision by developing policy recommendations
- To ensure inter-institutional coordination
- To engage with universities and NGOs
- To ensure public participation and bring decision makers together through workshops, organizing events etc.

IMM already has an action that is implemented to define climate responsibles in its units and subsidiaries. The climate responsibles will be the main actors within IMM and will own the climate

[3] https://cevre.ibb.Istanbul/wp-content/uploads/2023/04/2022-iklim-izleme-raporu-eng-1.pdf

[4] https://ipa.Istanbul/iklim-platformu-ilk-toplantisini-gerceklestirdi/

neutrality goal in their subject areas, facilitating the Climate Change Directorate of the Department of Environmental Protection and Control within IMM to monitor all studies on a regular basis.

This structure will be strengthened with the ICP and provided with capacity building workshops, trainings on the CCC actions and new duties assigned to implement the CCC. Meanwhile, knowledge transfer among the climate responsibles and monitoring and evaluation of their efforts will be carried through regular collateral meetings. This will enable the climate responsible community to seek support where their capacity falls short of the ambitious goals presented in this CCC, where additional champions may join the team if needed and peer support can be found among champions.

Additionally, channels of dialogue will be established between the ICP and the many universities of Istanbul. There is a wealth of student organisations in the areas of urbanism, public policy and urban life related concepts, and climate. Assigning direct contacts for these organisations to reach out and organise joint events and dialogue opportunities shall enable more efficient participatory processes from the young population of the city.

It is also important to note that existing climate responsibles are assigned with the units and subsidiaries of IMM. Any actions within the CCC that need to be followed up by external actors will be assigned to specific roles within them, who will be invited to collaborate within the ICP. The same approach shall be utilized to create open discussions and invitations to involve citizens. Having climate responsibles as competent facilitators of dialogue regarding their sectors will help build a shared understanding and buy-in of the climate agenda and its co-benefits.

The Climate Platform, which will be reactivated under the leadership of the Climate Change Branch Directorate throughout Istanbul, will be a multi-layered and collaborative structure aiming to ensure effective strategic decision-making and implementation by ensuring broad stakeholder participation. This model will consist of three main components covering processes such as strategy formulation, implementation, monitoring and evaluation. First, the Steering Committee will serve as the highest decision-making body of the platform and will be responsible for setting strategic objectives, approving annual action plans and ensuring coordination between stakeholders. The committee will include representatives of IBB, district municipalities, relevant public institutions, the private sector, civil society organizations, academia, neighbourhood representatives and international organizations. This structure will shape the long-term vision of the platform and oversee the effective use of resources. Working Groups, the second component, will focus on thematic areas such as energy, transportation, building and urban planning, nature-based solutions and climate justice, and will develop concrete projects for the actions in the climate city agreement and play an active role in the implementation of these projects. Each group will be composed of representatives who are experts in their field and will ensure that the projects are implemented both technically and operationally. The third component, the Secretariat, will ensure the day-to-day functioning of the platform and act as a bridge between the Steering Committee and the Working Groups, managing information flow and coordination. The Secretariat will also manage the platform's digital systems, ensuring the collection and analysis of data and reporting regularly on all activities. Alongside these structures, an Audit and Evaluation Mechanism will be established to transparently assess the progress of the platform. This mechanism, which will be composed of independent auditors and experts, will annually evaluate the performance of the platform, the progress of the climate city agreement and the compliance of projects with the targets, and present the results to both the Steering Committee and the public. Finally, it will develop a Citizen Engagement and Feedback Mechanism to ensure the active participation of citizens in the platform. Citizens will be able to provide feedback through the digital platform, neighbourhood representatives and mobile applications, as well as share their views and suggestions through face-to-face meetings and workshops. Thus, all processes of the Climate Platform will be transparent and managed in a sustainable manner by taking into account the suggestions of the public. This governance model will strengthen Istanbul's fight against climate change and ensure the successful implementation of sustainable projects in cooperation with stakeholders.

Technical coordination and implementation interventions

The accelerated ambition of this report covers Istanbul's ongoing climate actions calls for technical excellence. It is important to identify governance bottlenecks that will enable the technical coordination and implementation of actions that require the cooperation of authorities with specific duties regarding infrastructure and services.

The following key intervention is to utilize the ICP to bring together IMM subsidiaries with a focus on climate efforts. IETT, ISFALT, ISKI, ISTAC, IHE, ISTON, Metro Istanbul are assigned with tasks within the SECAP. Capacity building within these entities to realize their actions might be one of the key factors.

Platforms of dialogue

To enhance governance through peer dialogue, we propose to push climate specific agenda through inter-municipality institutions IMM is part of. These are mainly the Türkiye Municipalities Union and Marmara Municipalities Union (MMU).

MMU is the first and the largest regional local government association in Türkiye with 192 members from the Marmara Region. MMU's key role is the formation of a culture of agreement and collaboration among mayors and council members elected from different political parties, the development of coordination and cooperation between municipalities, increasing the authority and resources of municipalities, and representing municipalities at the international arena.

MMU has a Sustainability and Climate Change Centre (SCC) that provides guidance and support to members and conducts studies regarding sustainability and climate change. Its core fields are transportation, energy and buildings, land use and biodiversity, water and wastewater, waste, agriculture and food. It also considers the relationship to governance, finance and digitalization. Istanbul may leverage this existing structure to create channels of dialogue, experience and knowledge transfer.

Furthermore, dialogue with civil society, and citizens directly, are at the core of participatory approaches. These routes exist in the individual networks and processes of institutions mentioned in this document, such as MMU that organizes panel discussions and participatory events or IMM that has citizen councils. However, the CCC will add specific routes to this including the ICP cooperation with universities.

Table 57: (C-1.2) Relations between Governance Innovations, Systems, and Impact Pathways

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
Ownership of international commitments and its communication to the governance processes of the city	Istanbul is a signatory of GCoM. It is connected to ICLEI and has several signed ambitions. To own these, the Climate Change Directorate was founded within IMM. The directorate will also serve as an advocate the prioritize climate goals in the city's broader actions.	Institutional/ regulatory barriers, core ownership of climate action	IMM Climate Change Directorate	Accountability and direct ownership of climate actions enables their monitoring and implementation	Having a direct correspondent related to climate action for any other actor
Istanbul Climate Platform	Owner of the actions needs to be organised in a structured manner, diligently tracked and pushed	Individual ownership and follow up of actions	IMM and climate responsibles, relevant ministries, district municipalities, universities, professional chambers,	- Collecting information about the city - Conducting demand, need and impact analysis - Creating a future vision by developing policy recommendations	Building a shared understanding

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
			NGOs, private sectors etc.	- To ensure inter-institutional coordination - To ensure public participation and bring decision makers together through workshops, organizing events etc.	
UN Climate Pioneers	Climate Pioneers leads the youth climate movement in Türkiye and organizes global climate actions and strikes. They organise the Local Conference of Youth (LCOY) Türkiye and reach decision makers including the Mayor of Istanbul.	Representing youth and UN agenda	Climate Pioneers	Creating pressure for progress, monitoring and participation in decision making processes	Enhancing civil society and UN dialogue
Inter-municipality dialogue	Inter-municipality platforms at the national and regional level assist cities in transferring know how and cooperating for climate goals. Sustainability and Climate Change Centre (SCC) of MMU specifically targets this effort.	Cooperation between cities	Türkiye Municipalities Union, Marmara Municipalities Union	Knowledge transfer	Community building
Cooperation with central government	Central institutions such as ministries are the main investors of sectors such as transport. The channels of dialogue and prioritization between local and central governments exist, however, it is IMM's commitment to structure requests from the central government in a way that focuses on the commitments of the CCC.	Budget	Central government	Investment prioritization	Empowering local governments
IMM Open Data Platform	Making data available to actors and establishing a platform to share data they generate to make decision making processes more efficient.	Transparency, data collection, reliability and monitoring of impact	IMM Open Data Platform and all contributors	Smart and data driven decision making	Smart cities and public access to data
IMM subsidiaries' commitment to SECAP	Subsidiaries that were assigned with actions in the SECAP	Technical excellence and implementation	IETT, ISFALT, ISKI, ISTAC, IHE, ISTON, Metro Istanbul	Technical capacity building	Adaptation of municipal services to climate change
Supporting IMM departments	Supporting the departments of IMM that take part in climate actions to be involved in governance processes and develop technical capacities to implement actions	Cooperation	IMM Directorate of Environmental Protection and Control, climate responsibles from IMM units and subsidiaries	Technical capacity building	Adaptation of municipal services to climate change

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
B40 Balkan Cities Network	Enabling knowledge transfer and policy assessments among cities on smart cities and digital transformation, climate action and relevant issues	Know how building	IMM and peer cities	Capacity building and networking for smart city practices	Networking for further policies and cooperations
Multi-Level Governance Platform (MLGP)	MLGP is a platform within the EU4 Energy Transition initiative that targets empowering municipalities across the Western Balkans and Türkiye. The platform provides guidance for SECAPs for the GCoM as well.	Know-how and SECAP cooperation	IMM, GCoM	Support for mutual actions with SECAP and relevant policies	Inter municipality networking and knowledge transfer
IMM Istanbul Industry and Trade Platform	The industry and trade platform brings private sector stakeholders and civil society together on themes including green transformation. It is mobilized by the Istanbul Planning Agency(IPA).	Sectoral linkages	IMM and industry and trade actors	Inform and mobilize a wide range of stakeholders for the development and implementation of actors.	Elevate the commercial environment of Istanbul via participatory and better policy.
IMM Istanbul Tourism Platform	Also mobilized by IPA, it is a platform that links tourism sector actors to IMM for timely awareness of relevant issues, including climate risk and environmental deterioration, from a tourism perspective. Stakeholders of the platform range from civil society to other cities' municipalities, tourism agencies to service providers.	Sectoral linkages and economic sustainability	IMM and tourism sector stakeholders	Bridging market links with policy	Strenghtening tourism sector
Partnerships with Istanbul's universities	Istanbul is home to several universities, which also have clubs such as the Urbanism Club at Istanbul Technical University. Istanbul Climate Platform will assign a contact point to organise series of participatory events, discussions and communications with university students to enable dialogue and governance.	Participatory processes	ICP, Universities	Enabling access to policy development processes for young people	Strengthening Universities' creative capacity

Stakeholder Activities

On 2 May 2023, the first event of Istanbul Climate City Contract as NZC EU Missions Climate Neutral and Smart Cities Conference was held with the participation of both national and international experts and stakeholders. The number of participants was approximately 150, including NZC consultants. The roadmap drawn within the scope of the mission was evaluated in that event. Moreover, IMM's work on climate change, existing 2030 and 2050 targets as well as the additional steps to be taken to realise new 2030 target were discussed.

The second event of Istanbul Climate City Contract was held on 7-8 May 2024 as a workshop with the participation of NZC Programme Director, NZC city consultants and relevant experts. Additionally, related heads of departments, managers of subsidiaries and climate champions were also participated to the workshop.

The third event of Istanbul Climate City Contract was held on 16 August 2024 as an internal and external workshop with over 120 participants from internal and external stakeholders and key target groups out of 176 that have responded to the invitation and registered. Participants from IMM and its subsidiaries, international IFIs and initiatives related to climate change, universities, district municipalities and local governments reflected on the ambition of the Climate City Contract following presentations by the project team.

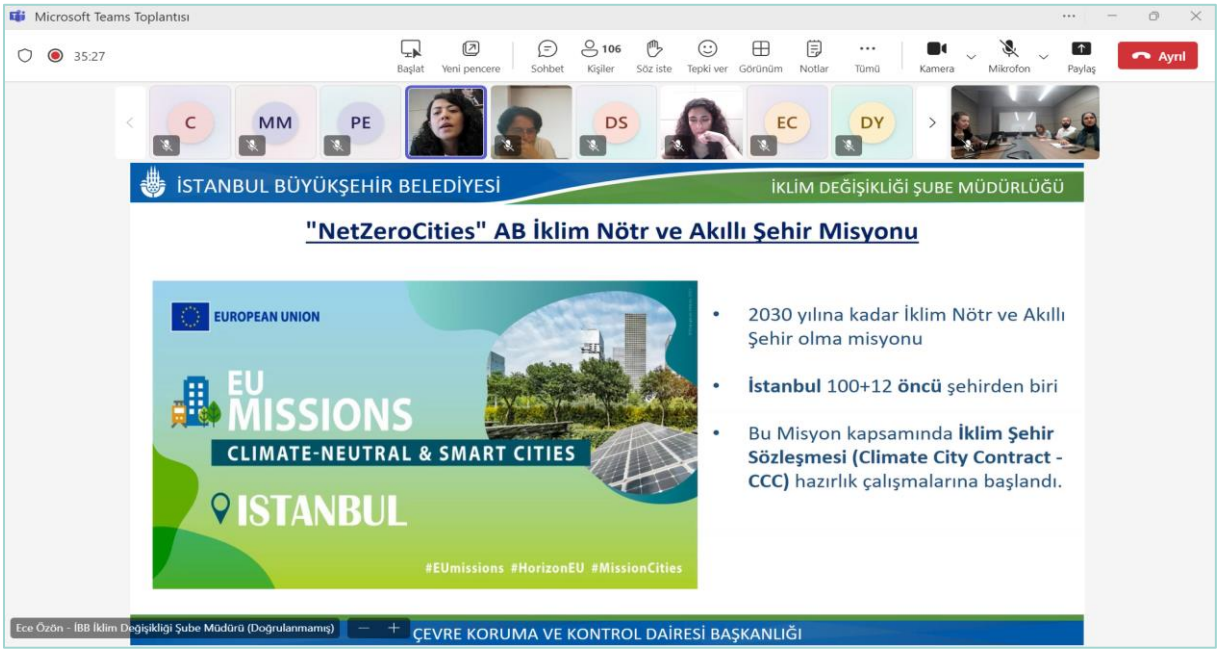

Figure 12: Internal and External Stakeholder Workshop on Istanbul Climate City Contract Works

The workshop started with a presentation includes the previous work of IMM on climate change, and explanations and outputs of Climate City Contract studies. In discussions, participants raised that they find all intervention areas very significant and transformations in the energy and buildings sectors as urgent. They exemplified works held by their own institutions.

Finally, a survey was shared with participants and displayed to be explained to participants. With the survey, participants were asked:

- Their institution
- The sectors they find Istanbul to be strong at on the path to carbon neutrality
- The sectors they find to be challenging for Istanbul on the path to carbon neutrality
- Top 5 most applicable actions for Istanbul from their point of view out of 15 priority mitigation actions presented
- Comments

82 participants responded to the survey. Within comments, participants particularly pointed at the necessity of collaborations among institutions and other local governments. Some participants reflected

on the scale of the needed interventions and discussed that substantial change needs to be achieved with large scale interventions, while some pointed at the key role of awareness and dissemination. New business models and access to finance were indicated as key challenges.

Participants from the Ministries, the Governor's Office, district municipalities, NGOs, universities and the private sector attended the workshop. Distribution of participants based on their institutions who responded to the survey is given the below figure.

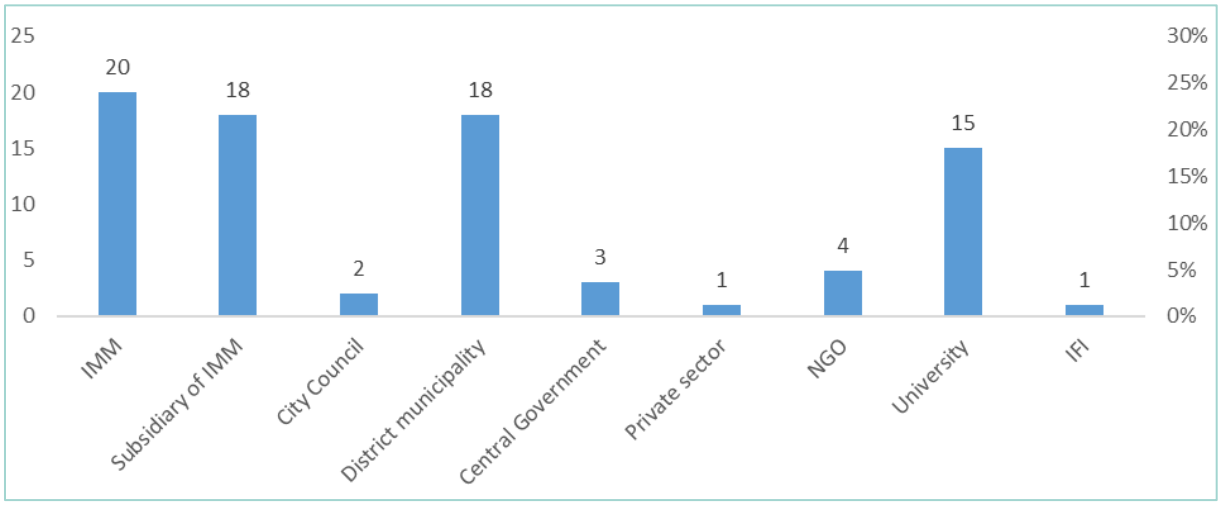

Figure 13: Distribution of Survey Participants based on Institution Type

The survey results, as shown in below figure, indicate that the transport sector is perceived by respondents as the area where Istanbul holds the greatest potential for achieving its carbon neutrality goals. This suggests a strong belief in the city's capacity to implement effective sustainable transportation solutions. While energy, buildings, waste, and water sectors are also recognized as crucial components of a comprehensive strategy, transport emerges as the sector where respondents see the most promising opportunities for Istanbul to make significant strides towards a carbon-neutral future.

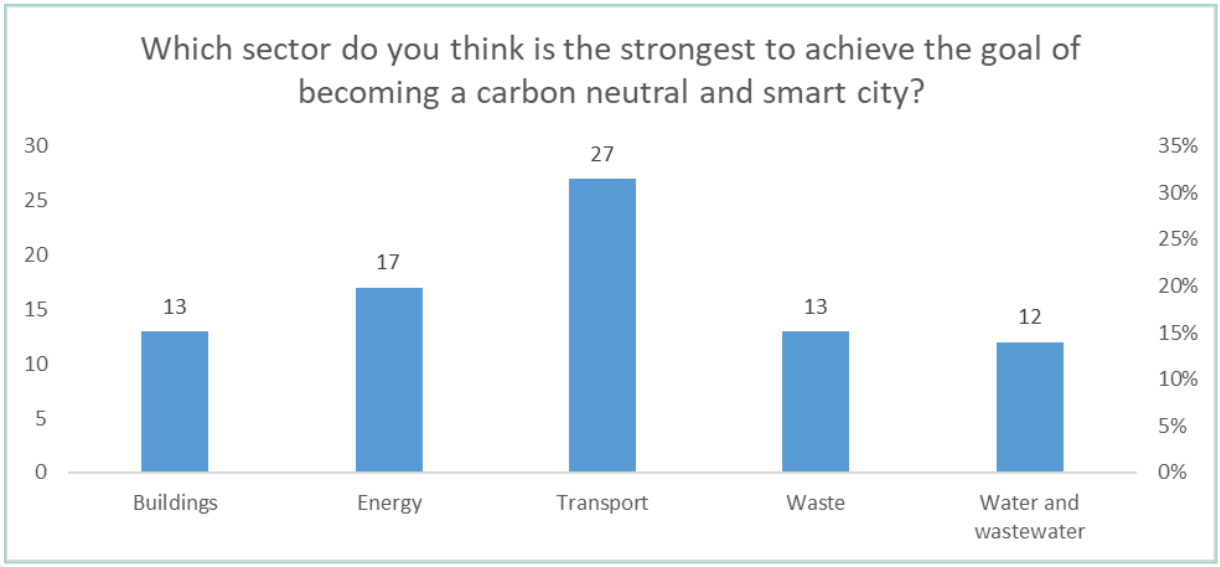

Figure 14: Strongest Sectors

The results below, participants perceive the "Buildings" sector as the most challenging for Istanbul to achieve carbon neutrality. This perception stems from the difficulties associated with transforming the existing building stock and implementing energy-efficient practices in new constructions. The "Transport" sector follows closely as a major challenge, reflecting the complexities of managing traffic congestion and promoting sustainable mobility in a densely populated city. "Waste" and "Water and Wastewater" also received notable percentages, indicating perceived challenges in those areas. Interestingly, the "Energy" industry was resulted as less difficult, probably due to confidence in ongoing efforts or a perception of fewer challenges than other sectors. Overall, the survey highlights that while there is optimism in certain areas, significant hurdles are anticipated in the building and transport sectors.

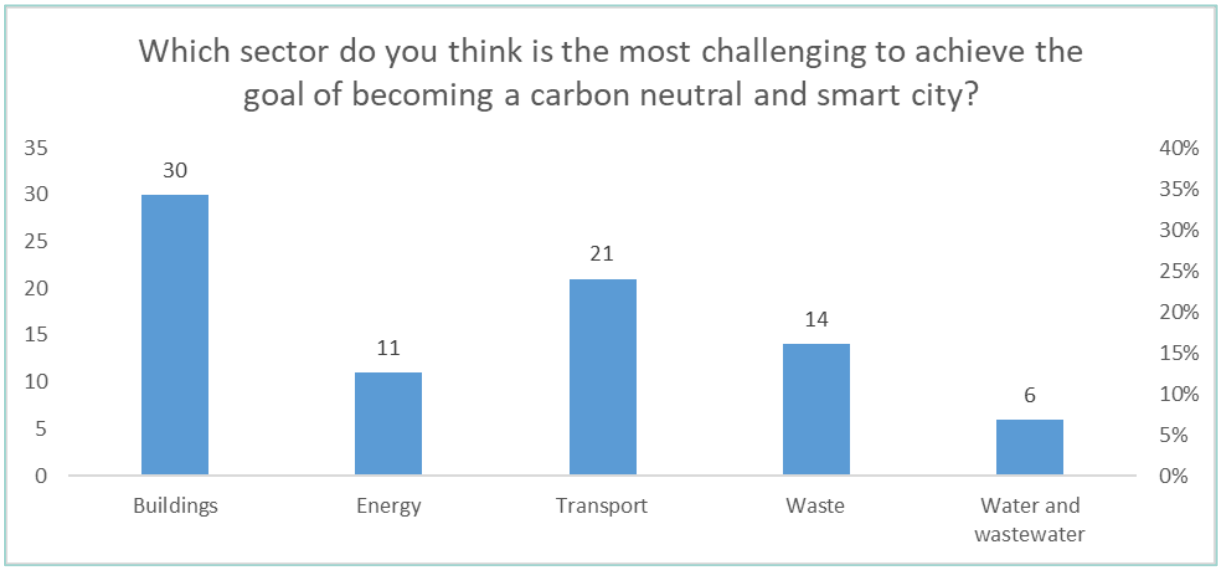

Figure 15: Challenging Sectors

The responses to the questionnaire show a clear preference among participants for activities connected to energy efficiency and renewable energy adoption as the most relevant for Istanbul's carbon neutrality. The top-ranked actions primarily focus on enhancing energy efficiency in buildings and promoting renewable energy generation.

Also, the electrification of public transport and landfill gas capture for energy generation also garnered significant support, highlighting a focus on sustainable transportation and waste management practices.

Actions related to water management and waste reduction, while still considered important, received comparatively lower rankings. This suggests that participants may perceive certain challenges or complexities in implementing these measures effectively.

Table 58: Priority Mitigation Actions

Priority Action	# of Votes	Rank	Percentage
Promoting measures to improve energy efficiency in all buildings	40	2	49%
District-scale new clean energy development (heating, cooling, power) - microgrid (PV, hydrogen, fuel cell, other)	20	10	24%
Taking additional measures towards renewable energy generation, energy and water saving in the projects planned by KIPTAS and BIMTAS	44	1	54%
Purchase of new electric buses so that all buses can be electrified	39	3	48%

Priority Action	# of Votes	Rank	Percentage
Making existing roads suitable for cyclists, and creating new separated bicycle paths	19	11	23%
Congestion charges in certain areas	18	13	22%
Expansion of Park and Ride areas	25	7	30%
Develop programs to reduce or completely avoid any discarded food substance during the processing, handling, storage, sale, preparation, cooking and serving of foods	9	15	11%
Capture landfill gas and use it as a fuel source to generate electricity, heating, or transportation, to avoid direct methane emissions to the atmosphere	39	4	48%
Optimize waste collection operations (routes, pickup schedules) to reduce environmental impacts and total GHG emissions	19	12	23%
Divert discarded materials from landfills by recovering and repurposing them into new products	25	8	30%
Supporting wastewater recovery and reuse	27	6	33%
Management of supply lines and drinking water network with smart systems	13	14	16%
Review building and municipal codes to encourage water use reduction, on-site reuse and recycling	25	9	30%
Application of sustainable rainwater solutions (rain gardens, use of permeable materials, storage, etc.)	36	5	44%

In addition to CCC-specific stakeholder engagement activities, we also have other institutional practices to engage citizens in decision-making processes. For example, the Istanbul Senin application offers surveys to gather the public's views on various city-related issues. These surveys collect citizens' opinions on issues such as climate change, energy efficiency and sustainability, and allow the city government to use this information in policy development processes. 2024-2029 Strategic Plan was prepared with citizen participation through the application. In addition to the application, IMM gives citizens a direct say in how a portion of the city budget is spent through participatory budgeting practices. In 2023, selected projects include the conversion of the propulsion systems of buses with outdated internal combustion engines to electric motors and the Istanbul Prepares for Climate Change Training Program. Another platform where citizens participate in the processes is the City Councils. These advisory bodies operate at the local level and are platforms where various community representatives and civil society organizations come together. City councils make recommendations on social, economic and environmental problems in the city and contribute to decision-making processes. The Council's working area groups include the Environment Group and the Climate Crisis working group.

4.2 (C-2) Social Innovation Interventions

Table 59: (C-2.1) Relations between Social Innovations, Systems, and Impact Pathways

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
Istanbul Climate Platform (ICP)	Reorganization of this platform is serving as a compass for all the steps to be taken in line with the goals. Climate Platform is a guarantor for the processes' sustainability, monitorability and success.	Existence of a climate focused platform with a wide reach. ICP includes activists from different sectors who work on various fields related to the climate crisis. IMM's Climate Change Directorate is a natural member of the platform and acts as intermediary between the platform and other IMM units.	The platform provides a common ground for online face-to-face meetings, workshops and events that promote common understanding, cooperation and project development.	Raise awareness to climate change and ease the adaptation of the targets	Istanbul Climate Platform
Engaging civil society in social innovation in line with climate actions	IPA serves as a platform to guide and engage civil society, while presenting a platform for their participation in decision making.	Bilateral dialogue between civil society and decision makers	IPA, NGO's such as Nature Society, Nature Conservation Association, IMECE, professional chambers etc.	Enables civil society to be part of the implementation of actions while communicating their own interests.	Engaging civil society in social innovation in line with climate actions
Citizen engagement via mobile app	Istanbul Senin is an app developed by IMM that provides an interface for citizens to access, find and use IMM services. The app covers urban lifestyle events on sports, entertainment and community building in addition to day to day services such as transport. This app also provides surveys for citizens to participate in urban decision making processes.	Citizens' knowledge of and access to municipality services and urban lifestyle benefits, collecting citizen inputs	IMM and linked organisations	Access to information	Enriching urban life
Linking IMM with community requests through digital mediaİBB Çözüm	İBB Çözüm is a service that links IMM with citizen requests through accessible media such as social media, the web and mobile interfaces.	Citizens' ability to seek help through the right channels and direct their requests	IMM	Facilitating citizen engagement	Participatory governance
Bütçem SeninParticipatory budget management	Bütçem Senin is IMM's participatory platform to get citizens' opinions on the allocation of city budget and receipt of citizen projects for funding. This intervention will serve	Participatory and creative barriers, financial tools	IMM and citizens	Allows citizens to directly address gaps they see with won projects through budget allocations.	Improves participatory planning

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
	to link the action plan witjh citizen initiatives.				
Accessible financial assistance İBB Askıda Fatura	İBB Askıda Fatura is a web interface where IMM links financial help with those in need through the payment of bills and other life expenses.	Social collaboration facilitation	IMM and citizens	Creating a platform for philantrophy and social cohesion	Fostering access to prosperity
Disaster response assistance AKOM Acil Durumlarda Vatandaş Bilgilendirmeleri	« AKOM Acil Durumlarda Vatandaş Bilgilendirmeleri » is a tool IMM uses to inform citizens of disaster related issues, response actions and warnings.	Awareness and information access	IMM and disaster risk related institutions	Disaster awareness and access to public assistance	Disaster risk management
Neighborhood contact points	IMM plans to utilize the existing neighborhood administration structure with « Muhtar » as the representative, combined with the Istanbul Senin app, to mobilize working groups and awareness sessions regarding Istanbul's climate commitments. Climate volunteers shall be determined for the 961 neighborhoods of Istanbul and trained for climate change awareness, and three of them made members of the ICP.	Reaching every locality of Istanbul	Neighborhood Muhtars and IMM	Awareness and volunteering	Higher resolution of participation

Interventions based on social innovation are crucial for developing creative solutions for the complex problems that cities currently confront. Through the development of more resilient, inclusive, and sustainable solutions, these initiatives aim to raise the standard of living for communities. Such interventions in urban areas typically involve collaborations between the public and private sectors, with the aim of transforming the planning and management of cities.

The main social innovation projects in Istanbul will be covered in this section, with special attention paid to the contributions made to the city's improvement by the Istanbul Climate Platform and the Istanbul Planning Agency.

Istanbul Planning Agency (IPA)

IPA has prepared the **Istanbul Vision 2050 Strategy Document** with a holistic strategic approach to the long-term and multi-dimensional development dynamics of the city. It defines the basic objectives to be achieved by 2050 in many areas.

One of the seven themes addressed in the Istanbul Vision 2050 Strategy Document is protection of the environment and adaptation to a changing climate. It defines the objectives and goals to transform Istanbul into a city which respects nature and lives in harmony with it, that is resilient, has a low carbon footprint, supports a circular and green economy, has adopted climate justice as a principle and whose citizens are highly aware people by 2050.

Figure 16: Istanbul Vision 2050, by IPA

This document presents a roadmap that contains concrete projects and practical applications and defines both the risks that may lie ahead in the foreseeable future but also the potentials. In the future the world, Türkiye and Istanbul will face five basic challenges which may from time to time turn into crises. The below actions will be taken to counter those challenges:

- The environment and ecology,
- The urban built environment, infrastructure and transport,
- Social welfare and justice,
- Democracy and governance, and finally
- The economy and development.

In line with the objectives and goals of the strategy document, visionary, holistic and concrete actions will be taken to counter those challenges.

Beyond IPA's formal efforts and participatory processes, social engagement for innovative processes will be an evolving concept. This will grow particularly via applications mentioned in the following document. Applications are a modern, direct and convenient way to engage with citizens and these tools exist within IMM, already reaching their target groups. Their iterations will be developed to cover climate related specifics in their fields.

5 Outlook and next steps

The Istanbul Climate City Contract Action Plan marks a significant step forward in the city's journey towards climate neutrality. By building upon existing plans and strategies, fostering collaboration across sectors, and prioritizing transformative actions, Istanbul is laying the groundwork for a sustainable and resilient future.

However, the path to 2030 climate neutrality is not without its challenges. The ambitious targets necessitate ongoing efforts to overcome systemic barriers, secure adequate financing, and engage all stakeholders in the transition.

In the coming years, Istanbul will focus on refining and implementing the actions outlined in this Action Plan. This will involve:

- **Detailed Implementation Plans:** Developing comprehensive implementation plans for each priority action, specifying timelines, responsibilities, and resource requirements.
- **Monitoring and Evaluation:** Establishing robust monitoring and evaluation systems to track progress, measure impact, and identify areas for improvement.
- **Stakeholder Engagement:** Continuing to foster collaboration and dialogue with all stakeholders, ensuring their active participation in the implementation process.
- **Capacity Building:** Strengthening the technical and institutional capacity of relevant departments and agencies to effectively implement climate actions.
- **Financing:** Securing adequate financing from diverse sources, including public and private investments, to support the implementation of the Action Plan.
- **Innovation:** Encouraging innovation and experimentation to identify and scale up new solutions for climate neutrality.

IMM is currently preparing Climate Monitoring Reports on a regular basis. These reports will form the basis for reviewing and updating the measures and actions to be taken against the impacts of climate change identified in action plans such as CAP, SECAP and GCAP, including the CCC study in the future. Therefore, Istanbul is committed to regularly updating and refining its Climate City Contract Action Plan, incorporating lessons learned and adapting to evolving circumstances. The city recognizes that the transition to climate neutrality is an ongoing process, requiring continuous effort and collaboration.

In the coming period, we plan to reach out to citizens through elected neighbourhood representatives (Mukhtar). In cooperation with the IMM Department of Mukhtar Affairs, we will organize surveys to provide regular feedback on climate actions and sustainability efforts to neighbourhood residents through neighbourhood mukhtars and Istanbul is Yours (Istanbul Senin) Application. Climate Change Trainings will be given to Climate volunteers to be determined from 961 neighbourhoods in Istanbul. Three people to be selected from these climate volunteers will be included in the Climate Platform to be established.

Through its unwavering dedication to climate action, Istanbul aims to inspire other cities and contribute to a global movement towards a sustainable and equitable future.

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of the City of İstanbul

ISTANBUL METROPOLITAN MUNICIPALITY

Table of Contents

Abbreviations and Acronyms

The list of abbreviations and acronyms **identifies the abbreviations** (a shortened form of a word used in place of the full word) **and acronyms** (a word formed from the first letters of each of the words in a phrase of name) used in the CCC Action Plan.

Abbreviations and Acronyms	Definition
ÇEDBİK	Turkish Green Building Council
EU	European Union
GCoM	Global Covenant of Mayors for Climate and Energy
ICP	İstanbul Climate Platform
İETT	İstanbul Electric Tramway and Tunnel Establishments
IMM	İstanbul Metropolitan Municipality
ISKI	İstanbul Water and Sewage Administration
İGDAŞ	İstanbul Gas Distribution Industry and Trade Inc.
İHE	İstanbul People's Bread Inc.
İSETAŞ	İstanbul Electricity Supply Inc
İSFALT	İstanbul Asphalt Factories Industry and Trade Inc.
İSPARK	İstanbul Parking Lot Operation Inc.
İSPER	İstanbul Personnel Management Inc.
İSTAÇ	İstanbul Waste Management Industry and Trade Inc.
İSTGÜVEN	İstanbul Security Inc.
İstanbul AĞAÇ AŞ.	İstanbul Tree and Landscape Inc.
İSTGÜVEN	İstanbul Security Inc.
İSTON	İstanbul Concrete Elements and Ready Mixed Concrete Factories Inc.
İSTTELKOM	İstanbul Electronic Telecommunication and Infrastructure Inc.
İSYÖN	İstanbul Management Renewal Inc.
IPCC	Intergovernmental Panel on Climate Change
ODTÜ GÜNAM	Middle East Technical University Center for Solar Research and Application
SECAP	Sustainable Energy and Climate Action Plan
SUMP	Sustainable Urban Mobility Plan
UTM	Urban Transition Mission

1 Introduction

With a population exceeding 16 million, İstanbul is not only Türkiye's largest city but also the country's economic powerhouse. The city contributes approximately 30% to the nation's GDP and is a leader in sectors such as information, finance, and professional services, while also serving as a major international trade hub. Its diverse economy encompasses various industries including textiles, metal production, machinery, and more, fostering innovation through organized industrial zones and technology development centres. The service sector is the primary employer in İstanbul, followed by industry.

İstanbul has positioned itself as a pioneering model for being a green, just and creative city.

Recognized as a global city due to its advantageous geographic position, strong economy, and diverse cultural heritage, İstanbul nonetheless faces challenges related to rapid population growth and environmental issues, which require focused attention for sustainable development. The city is already experiencing the impacts of climate change, with rising temperatures, altered precipitation patterns, and the risk of sea-level rise. These changes present significant threats to İstanbul's infrastructure, the well-being of its residents, and its overall sustainability.

The city's size and population density also necessitate comprehensive planning to reduce carbon emissions, particularly in the transportation sector. To this end, the city has been working to strengthen public transport, expand metro lines, and increase the use of electric vehicles, as outlined in strategic plans like the İstanbul Sustainable Urban Mobility Plan (SUMP), and its Phase 2 Implementation Plan. In fact, in line with this commitment to sustainable transport, the İstanbul Metropolitan Municipality (IMM) is currently building 10 new metro lines simultaneously, setting a global record for metro line construction.

Recognizing the urgency of the climate crisis, the IMM has been actively developing robust strategies and policies aimed at mitigating the impacts of climate change. This includes the creation of a Climate Action Plan aligned with C40 and Paris Agreement goals. Energy efficiency is a critical component of these efforts, as the city seeks to reduce both energy consumption and carbon emissions. Initiatives include retrofitting existing buildings to improve energy efficiency, designing new buildings to meet stringent energy standards, and increasing the use of renewable energy sources like solar, wind, and biomass. The city's Sustainable Energy and Climate Action Plan (SECAP) further details these measures.

İstanbul is also taking significant steps in waste management, recognizing the challenge of sustainably managing the increasing amount of waste generated by its large population and intensive economic activities. In this regard, the collection of waste is under the responsibility of district municipalities, while IMM is responsible for its removal and disposal. IMM is developing waste management and circular economy strategies, such as the İstanbul Waste Management Plan, to address this challenge and contribute to the city's climate neutrality goals, as outlined in strategic documents like the İstanbul Zero Waste Management System Plan and the Provincial Environmental Status Report. The use of waste for biogas and compost production is an important step towards adopting circular economy principles in waste management, contributing both to waste reduction and renewable energy production.

IMM is a voluntary member of the Global Covenant of Mayors for Climate and Energy (GCoM), which is dedicated to reducing greenhouse gas emissions and fostering resilient cities. Within this framework, the first İstanbul Climate Change Action Plan was published in 2018, establishing reduction targets of 33% by 2030 and 35% by 2050.

Recognizing the unique circumstances of Türkiye and İstanbul, IMM, with contributions from thousands of individuals, developed the İstanbul Vision 2050 Strategy Document. This document addresses the

city's economic, ecological, social, and spatial challenges, safeguards its distinctive values, defines its long-term global role by leveraging its local potential and historical legacy, and allocates resources in alignment with citizen-determined priorities. The document focuses on five key crisis areas: Governance and Democracy, Economy and Development, Ecology and Environment, Urban Built Environment, Transport and Infrastructure, and Public Welfare and Justice. To counteract these challenges, the document outlines goals and targets under seven themes, ensuring İstanbul achieves its rightful place by 2050 and guarantees social justice and prosperity for all its residents. These themes encompass: Protecting the Environment and Adapting to a Changing Climate, Effective and Inclusive Mobility, Integrated and Intelligent Infrastructure Systems, Vibrant and Responsive Places Providing Good Living, Transformative and Resilient Economy, Accessible and Equitable Urban Amenities for All, and an Equal and Free Society.

Furthermore, IMM holds the distinction of being the first and sole C40 member municipality in Türkiye. Mayor Ekrem İmamoğlu, during the C40 Mayors Summit in Copenhagen in October 2019, signed the Deadline 2020 Commitment, pledging to transform İstanbul into a carbon-neutral and resilient city by 2050. This new target prompted the need to revise the 2018 Climate Change Action Plan, leading to the publication of the updated İstanbul Climate Action Plan (CAP) in 2021.

The CAP report is a comprehensive roadmap outlining the city's strategies to reduce greenhouse gas emissions, enhance energy efficiency, invest in renewable energy sources, and adapt to the unavoidable impacts of climate change. This plan represents a significant milestone in İstanbul's journey towards achieving climate neutrality and resilience. It encompasses a wide range of sectors and strategies to address the multifaceted challenges posed by climate change, reflecting the city's determination to create a sustainable and resilient future for its residents. The EU Climate Neutral and Smart Cities Mission will serve as a catalyst for İstanbul to expand and accelerate its existing climate action, providing technical assistance, and expertise for high-cost initiatives such as large infrastructure projects, renewable energy investments, and the integration of smart city technologies.

In May 2021, İstanbul also joined the EBRD's Green Cities Programme, initiating the İstanbul Green City Action Plan (GCAP) studies in May 2023. The GCAP aims to identify measures to address the impacts of climate change and other environmental challenges, thereby strengthening İstanbul's resilience. The city's location in a seismically active region, with its inherent earthquake risk, further underscores the importance of the GCAP. The plan's implementation will enable the construction of more robust infrastructure and the development of smarter urban planning strategies, mitigating potential damage. The GCAP is scheduled for publication at the end of 2024, translating the city's commitments and goals into concrete actions.

IMM believes that public participation and awareness are crucial to achieving İstanbul's sustainability and climate resilience goals. Through participatory processes like the Participatory Budget Project, citizens are well informed and actively involved in shaping the city's future, which is implemented by IMM. As part of this project, the "İstanbul is Preparing for Climate Change" training programme was implemented in 2023. The projects developed under the Mission will also provide opportunities to increase public participation and raise awareness of climate change, further strengthening public support for climate neutrality goals.

As İstanbul, to make our intentions clearer on this issue, we are presenting our dedication to becoming carbon neutral by 2030. In line with this goal, we plan to rapidly reduce the city's energy consumption and carbon emissions. We believe that the mission can act as a catalyst for İstanbul to develop innovative technologies and solutions in the field of urban sustainability. This will enable us to adopt new approaches in areas such as smart city applications, energy efficiency technologies, water management systems, and waste management. The networks and cooperation opportunities provided by the Mission will allow for faster and more effective implementation of such technologies.

İstanbul is also committed to ensuring its resilience to the risks posed by climate change. In this context, the city continues to increase its infrastructure investments to mitigate the impact of floods, heat waves, and other extreme weather events. The development of the Drinking Water and Wastewater Master Plan 2023-2053 is a testament to this commitment.

As part of the Climate Neutral and Smart Cities Mission, İstanbul Metropolitan Municipality applied to the NetZeroCities Pilot Cities Programme, launched to help the city achieve carbon neutrality by 2030 and to test innovative approaches, with the “Green and Carbon Neutral Building Transition Guide – İstanbul Model (Build4GreenIST)” project and became the first pilot city from Türkiye to be selected.

İstanbul applied to the Mission’s call for pilot cities with the project “Green and Carbon Neutral Building Transition Guide – İstanbul Model (Build4GreenIST)” and was selected as the first pilot city from Türkiye. The motivating point of this highly inspiring project is to address the city's main problems, earthquake risk and climate crisis, together. The project will provide a guide for this transformation towards a green and carbon neutral building concept that is resistant to climate change; while carrying out the inevitable urban transformation works in the city where earthquake risk and old buildings are too many. The aim is to highlight the positive impact that the addition of climate-friendly practices to the urban transformation works in the city will have in terms of climate change and renewable/efficient energy use during the transformation process, which is very necessary for the city. The studies will be carried out using a methodology that involves almost all the city's stakeholders in the field of building energy. The guide, which will be produced at the end of the project, is intended to provide effective benefits and awareness for the city's decarbonisation efforts.

The Build4GreenIST project will provide a guide to ensure that buildings renovated as part of urban regeneration are green and carbon neutral. It will also monitor energy consumption in buildings in a pilot area through sensors and encourage behavioural change of citizens towards energy efficiency. A mobile application called GreenIST is being developed for this purpose. In addition, the trainings and conferences organised under the project for a wide range of stakeholders such as citizens, practitioners, local government representatives are also contributing significantly to inclusive awareness efforts. The project will also include the development of business and finance models to bring a holistic approach to this opportunity for change.

Through these comprehensive efforts and the support of the EU Mission, Istanbul is dedicated to achieving its ambitious climate neutrality goal by 2030 and creating a more sustainable and resilient future for its residents and the world.

2 Goal: Climate Neutrality by 2030

IMM is committed to achieving climate neutrality by 2030, aligning with the ambitious targets set forth in the EU Mission. As a local government, IMM recognizes its responsibility to lead by example and is prioritizing efforts to accelerate climate neutrality within its municipal buildings and operations, as outlined in its Mission Expression of Interest. The city also aims to leverage its influence to mobilize key stakeholders and expedite the implementation of actions identified in the İstanbul Climate Action Plan, fostering a collaborative approach to achieving city-wide climate neutrality.

We – as IMM, have demonstrated our commitment to achieving climate neutrality by 2050 in the CAP report published in 2021. In line with this commitment, we set an interim target of 52% reduction in greenhouse gas emissions by 2030 compared to the base year 2019 in CAP. In this study, we have increased this target even further and increased our 2030 greenhouse gas reduction target to 80% compared to the base year 2019.

İstanbul's 2030 climate neutrality target is comprehensive, encompassing all sectors within its city-wide boundary. The city is committed to exploring all possible avenues to address challenges and will continue to refine its strategies as part of its ongoing commitment to climate action.

İstanbul's pursuit of climate neutrality is further supported by its proactive development of strategies, action plans, and policies aimed at ensuring a sustainable and climate-resilient future. As mentioned before, key initiatives include the İstanbul Climate Change Action Plan prepared in accordance with the C40 net zero target by 2050, the İstanbul Sustainable Urban Mobility Plan (SUMP), the İstanbul SUMP: Phase 2 Implementation Plan, and the Sustainable Energy and Climate Action Plan (SECAP), and İstanbul Waste Management Plan. These plans outline concrete steps the city is taking to reduce carbon emissions, improve energy efficiency, promote sustainable transportation, and enhance waste management practices. Additionally, İstanbul Green City Action Plan is being developed and will be published at the end of the year. This plan outlines the environmental challenges proposes solutions to enhance resilience and adaptation to climate change through targeted investment projects and policy initiatives.

In addition, the commitment to the EU Climate Neutral and Smart Cities Mission reflects İstanbul's recognition of the urgent need to address climate change and its pioneering mission to serve as a model for other cities in Türkiye and beyond. By prioritizing climate action within its own sphere of influence and actively engaging with stakeholders across various sectors, İstanbul aims to make significant strides towards a sustainable and climate-resilient future. The city's dedication to reducing greenhouse gas emissions, enhancing energy efficiency, and promoting sustainable practices will not only benefit its residents but also contribute to global efforts to combat climate change.

Through these comprehensive efforts and the support of the EU Mission, İstanbul is dedicated to achieving its ambitious climate neutrality goal by 2030 and creating a more sustainable and resilient future for its residents and the world. The city also actively participates in other communities that support the Cities Mission, such as the EU Adaptation Mission and the Urban Transition Mission (UTM), further demonstrating its commitment to a holistic approach to sustainability and climate action.

3 Strategic Priorities

In line with the European Union's Climate Neutral and Smart Cities Mission, İstanbul is dedicated to achieving climate neutrality by 2030. The city acknowledges the urgent need to mitigate greenhouse gas emissions and foster a sustainable urban environment that benefits both present and future generations. To realize this ambitious goal, we – as İstanbul City- outlined five strategic priorities that will serve as the foundation for our efforts to combat climate change and enhance resilience as follows:

1. **Clean Transportation:** This priority focuses on significantly reducing greenhouse gas emissions from the transport sector. It involves promoting sustainable modes of transport, such as public transport, cycling, and walking, and transitioning to cleaner vehicle technologies, including electric buses and cars. The city aims to create a more efficient, accessible, and environmentally friendly transportation system that reduces traffic congestion, improves air quality, and enhances the overall quality of life for its residents. In that sense, IMM prepared Türkiye's first Sustainable Urban Mobility Plan. This plan is shaped around three themes and "Transition to Low Carbon" theme of SUMP is directly related with carbon neutrality targets. Moreover, IMM is currently conducting the second phase SUMP which focuses on the development of an activity-based city-wide transport model and preparation of design projects.

2. **Renewable Energy Transition:** This priority centres on shifting İstanbul's energy supply towards renewable sources, such as solar, wind, and biomass. It includes expanding renewable energy capacity, promoting energy efficiency measures, and developing district heating and cooling systems powered by renewable sources such as low temperature geothermal energy. The goal is to reduce the city's reliance on fossil fuels, decrease greenhouse gas emissions, and create a more sustainable and resilient energy system.

3. **Enhancing Building Efficiency:** This priority focuses on improving the energy performance of İstanbul's building stock, both existing and new. It encompasses retrofitting existing buildings with energy-efficient technologies, establishing and enforcing stringent energy efficiency standards for new construction projects, and promoting the use of renewable energy sources in buildings. By enhancing building efficiency, İstanbul aims to significantly reduce energy consumption and greenhouse gas emissions from the building sector.

4. **Circular Economy and Sustainable Consumption**: This priority emphasizes the importance of transitioning to a circular economy model that minimizes waste and maximizes resource efficiency. It involves promoting waste reduction, recycling, and the adoption of circular economy principles across various sectors, including waste management, production, and consumption. By embracing a circular economy approach, İstanbul aims to reduce its environmental impact, conserve resources, and create a more sustainable and resilient city.

5. **Strategic Water Management:** Recognizing the critical importance of water resources in a climate-resilient future, İstanbul prioritizes strategic water management. This encompasses enhancing water efficiency, promoting sustainable water use practices, and investing in resilient water infrastructure. The city is committed to ensuring a secure and sustainable water supply for its residents while safeguarding against the potential impacts of climate change, such as droughts and floods. The recently completed İstanbul Water Master Plan provides a comprehensive framework for achieving these objectives through integrated water resource management and innovative solutions.

These 5 priority strategies are addressed together in the action plans developed by IMM such as CAP, SECAP, SUMP, etc. and in city-wide activities. These priority strategies complement each other and form the fundamental milestones towards IMM's goals.

İstanbul is also actively demonstrating its commitment to climate action through tangible initiatives that go beyond policy and planning. The city has achieved significant milestones, such as manufacturing its own tram for the first time, introducing electric/hybrid-powered sea taxis, and generating energy from waste to meet household needs. These projects, detailed on the IMM website[1], exemplify İstanbul's dedication to innovation and sustainable practices across various sectors. They underscore the city's proactive approach to addressing climate challenges and its determination to lead by example in the transition towards a greener future.

[1] https://www.ibb.istanbul/gundem/icraatlar/

4 Process and Principles

İstanbul's commitment to achieving climate neutrality by 2030 is guided by a robust framework of principles and a dynamic, iterative process that fosters collaboration, innovation, and accountability.

4.1 Systemic Work Process

Our systemic work process towards climate neutrality is anchored in a holistic approach that recognizes the interconnectedness of urban systems. We will adopt a "nexus approach", integrating climate action across key sectors such as energy-buildings, transport, water-wastewater, and waste management as well as information technologies. This approach will ensure that interventions in one sector complement and reinforce efforts in others, maximizing the overall impact of climate action. Moreover, these climate actions will have several co-benefits such as improved air quality, public health, new green and just recovery jobs created, increased accessibility, etc.

To facilitate this approach, İstanbul aims to establish a platform which can be named as İstanbul Climate Platform (ICP), comprising representatives from relevant municipal departments, agencies, and external stakeholders such as central government provincial directorates, chamber of industry, chamber of commerce, organised industrial zones, universities, and NGOs.

This platform was established in 2021 and it consisted mostly of academics. However, with IMM's new target, the Platform will be reorganized and serve as a central platform for coordinating climate action, aligning policies and programs, and monitoring progress toward the city's climate goals.

The systemic work process will also involve the development of detailed action plans for each priority sector. These plans will outline specific targets, timelines, and responsibilities, ensuring a clear roadmap for implementation. The plans will be regularly reviewed and updated based on the latest scientific evidence, technological advancements, and stakeholder input, ensuring a dynamic and adaptive approach to climate action.

4.2 Monitoring and Updating the CCC

We are committed to transparently monitoring and reporting on our progress towards climate neutrality. The city will establish a comprehensive monitoring and evaluation system that tracks key indicators related to greenhouse gas emissions, energy consumption, renewable energy generation, and other relevant metrics.

We will continue to publish annually and enable continuous improvement. Climate Monitoring Reports that provide a detailed assessment of the city's performance against its climate targets. These reports are publicly available, allowing for transparency and accountability. Furthermore, these reports will also include an analysis of lessons learned and challenges encountered, informing future decision-making.

We have already taken the initiative to designate Climate Responsible within various IMM units and subsidiaries. These responsibles will be responsible for driving the climate neutrality goal within their respective areas and will facilitate regular monitoring of all related studies by the IMM Directorate of Climate Change. In addition, to facilitate efficient communication and streamlined coordination throughout the execution of the Cities Mission activities, an email group comprising the Heads of the relevant internal Departments/Directorates within IMM has been established.

To further enhance the Climate Responsibles, IMM planning to involve this structure in the reorganized İstanbul Climate Platform (the ICP). This platform will be working to provide capacity-building workshops, training on Climate City Contract (CCC) actions, and assign new responsibilities to ensure effective implementation of the CCC. The Climate Responsibles community will benefit from knowledge

transfer and regular meetings for monitoring and evaluation, allowing them to seek support when needed and foster peer-to-peer collaboration.

The platform is established to create the vision of İstanbul 2050 with a common mind. It is a platform that brings together citizens, NGOs, academics, sector representatives to communicate and contribute on climate issue. The main purpose of the platform is to give voice to people from different people groups and seek solutions on issues like emission reduction, climate monitoring, awareness, green transformation, adaptation and climate justice etc. People meet regularly physically or through social platforms (zoom etc) to exchange ideas and voice their opinions.

ICP will play an important role in overseeing the monitoring and evaluation process. The council will regularly review the data and analysis, identify areas for improvement, and recommend adjustments to the Climate City Contract as needed. This iterative process will ensure that the CCC remains a living document that adapts to the evolving needs and challenges of the city. The council will also facilitate collaboration and knowledge sharing among stakeholders, fostering a collective effort to achieve İstanbul's climate goals.

While the existing climate responsibles are assigned within IMM, the ICP will extend its reach to external actors. Actions within the CCC that require follow-up from external entities will be assigned to specific individuals within those organizations, who will be invited to collaborate within the ICP. This collaborative approach will also be used to engage citizens in open discussions, with climate responsible acting as facilitators to build a shared understanding and support for the climate agenda and its benefits.

In addition to the annual Climate Monitoring Report, through our Climate Change Directorate, data related to greenhouse gas inventory and mitigation and adaptation efforts carried out by İstanbul are regularly submitted each year to CDP. These voluntary annual reporting efforts demonstrate the city's commitment to transparency and its willingness to benchmark its performance against global standards. The feedback and insights gained from these initiatives, along with the preparation of monitoring reports, will further inform İstanbul's climate strategies and actions, ensuring that the city remains at the forefront of the global fight against climate change. These efforts also contribute significantly to the city's risk management and strategy development by enabling the identification and assessment of climate-related risks and the formulation of effective adaptation strategies. By comparing emissions data year on year, İstanbul can analyse climate risks and develop long-term sustainability and adaptation strategies, ensuring the city's resilience in the face of climate change.

4.3 Guiding Principles

As emphasized by our Mayor, the overarching objective of the IMM is to collaboratively plan and create an İstanbul that is liveable, respectful of nature, protective of its cultural heritage, environmentally harmonious, equipped with comprehensive infrastructure, and where decisions about its future are made through collaboration.

In line with this, "Green, Just, and Creative İstanbul" serves as our fundamental institutional vision.

İstanbul's climate action is guided by a set of core principles that inform its decision-making and actions:

1. **Equity and Social Inclusion:** İstanbul recognizes that climate change disproportionately affects vulnerable communities. The city is committed to ensuring that its climate actions are equitable and inclusive, prioritizing the needs of marginalized groups and promoting social justice. For this reason, IMM chooses pilot areas where vulnerable groups live in particular in its projects and studies. For example, the Bayrampaşa district, where mostly immigrants and low-income people live, was chosen for the “Green and Carbon Neutral Building Transition Guide-İstanbul Model (Build4GreenIST)” Project, and the Kadıköy district, where people from many ethnic backgrounds

and religions live and which is a transportation hub, was chosen for the Urban Planning and design ready for 2030 (UP2030) Project.

2. **Scientifically Informed Decision-Making:** İstanbul's climate policies and actions are based on the best available scientific evidence. The city is engaged with experts and researchers to ensure that its decisions are informed by the latest scientific understanding of climate change and its impacts. CAP, SECAP, SUMP, etc, reports were prepared with this approach.
3. **Collaboration and Partnership:** İstanbul believes that achieving climate neutrality requires collaboration across all sectors of society. The city actively engages with businesses, civil society organizations, academic institutions, and other stakeholders to develop and implement effective climate solutions. Most of the examples are mentioned in the Action Plan of the İstanbul CCC.
4. **Local Ownership and Empowerment:** İstanbul recognizes the importance of local ownership and empowerment in driving climate action. The city empowers local communities to participate in decision-making processes, implement climate solutions, and benefit from the transition to a climate-neutral future.

By adhering to these principles and adopting a systemic and iterative approach, İstanbul is confident in its ability to achieve its ambitious climate neutrality goal by 2030 and create a more sustainable, resilient, and equitable city for all.

5 Signatories

IMM plans to carry out the initiatives outlined in the CCC Action Plan and Investment Plan with the full participation and commitment of all other relevant partners. IMM's previously completed CAP and SECAP, as well as the GCAP that is soon to be finalized, highlight IMM's comprehensive approach to climate change and the institutional cooperation it has developed. Furthermore, IMM designation of climate responsibles within IMM and affiliates' units and providing regular training to climate responsibles from the Climate Change Directorate demonstrates the institutional capacity development within IMM. In addition, Climate Change Directorate also conducts awareness-raising activities through various events, particularly during World Climate Week, which shows IMM's commitment to climate action. Moreover, IMM's plans on reorganizing and providing active participation to the Istanbul Climate Platform is expected to have a positive impact on overall climate action. In this sense, IMM has gathered signatures from several district municipalities, affiliates, universities, NGOs and SMEs as a starter. The table below enlists the signatories who are committing to this CCC, and thereby to help the city achieve its goal to reach climate neutrality by 2030. Specific agreements that articulate the details of the climate action(s) between the municipality and signatories are added to the individual contracts in Section 6. The number and relevance of signatories' commitments is likely to increase over time.

Name of the Signatory (Organisation)	Sector / Domain / Level of Operation	Legal Form	Name of the Responsible Person	Position of the Responsible Person
İstanbul Metropolitan Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Ekrem İmamoğlu	Mayor of İstanbul Metropolitan Municipality
Çatalca District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Erhan Güzel	Mayor of Çatalca Municipality
Şişli District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Resul Emrah Şahan	Mayor of Şişli Municipality
Üsküdar District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Sinem Dedetaş	Mayor of Üsküdar Municipality
Tuzla District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Eren Ali Bingöl	Mayor of Tuzla Municipality

Name of the Signatory (Organisation)	Sector / Domain / Level of Operation	Legal Form	Name of the Responsible Person	Position of the Responsible Person
Şile District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Özgür Kabadayı	Mayor of Şile Municipality
Silivri District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Bora Balcıoğlu	Mayor of Silivri Municipality
Sancaktepe District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Alper Yeğin	Mayor of Sancaktepe Municipality
Maltepe District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Esin Köymen	Mayor of Maltepe Municipality
Kartal District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Gökhan Yüksel	Mayor of Kartal Municipality
Kadıköy District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Mesut Kösedağı	Mayor of Kadıköy Municipality
Gaziosmanpaşa District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Hakan Bahçetepe	Mayor of Gaziosmanpaşa Municipality
Esenyurt District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	İbrahim Halil Çalış	Deputy Mayor of Esenyurt Municipality
Çekmeköy District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Orhan Çerkez	Mayor of Çekmeköy Municipality
Büyükçekmece District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Dr. Hasan Akgün	Mayor of Büyükçekmece Municipality
Beylikdüzü District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Mehmet Murat Çalık	Mayor of Beylikdüzü Municipality

Name of the Signatory (Organisation)	Sector / Domain / Level of Operation	Legal Form	Name of the Responsible Person	Position of the Responsible Person
Bayrampaşa District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Hasan Mutlu	Mayor of Bayrampaşa Municipality
Bakırköy District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Doc. Dr. Ayşegül Özdemir Ovalıoğlu	Mayor of Bakırköy
Beşiktaş District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Rıza Akpolat	Mayor of Beşiktaş
Avcılar District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Utku Caner Çaykara	Mayor of Avcılar Municipality
Ataşehir District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Onursal Adıgüzel	Mayor of Ataşehir Municipality
Beyoğlu District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	İnan Güney	Mayor of Beyoğlu Municipality
Adalar District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Ali Ercan Akpolat	Mayor of Adalar Municipality
Sarıyer District Municipality	Policy and Governance, Social and Cultural Systems, Urban Planning and Infrastructure, Waste Management System, Energy System, Transportation System, Economic and Financial Systems	Public	Mustafa Oktay Aksu	Mayor of Sarıyer Municipality
İstanbul Development Agency	Policy and Governance Urban Planning and Infrastructure Waste Management System Economic and Financial Systems	Public	Dr. Ziya Taşkent	Secretary General of İstanbul Development Agency
Union of Municipalities of Türkiye	Social and Cultural Systems	Civil Initiative	Suat Yıldız	Secretary General of Union of Municipalities of Türkiye
İstanbul Citizens' Assembly	Policy and Governance Social and Cultural Systems	Civil Initiative	Tülin Hadi	Chair of İstanbul Citizens' Assembly

Name of the Signatory (Organisation)	Sector / Domain / Level of Operation	Legal Form	Name of the Responsible Person	Position of the Responsible Person
İETT (İstanbul Electric Tramway and Tunnel Establishments)	Transportation System	Public (Affiliate Company of IMM)	İrfan Demet	General Manager of İETT
İSKİ (İstanbul Water and Sewerage Administrative)	Water and Wastewater Management	Public (Affiliate Company of IMM)	Assoc. Prof. Şafak Başa	General Manager of İstanbul Water and Sewerage Administrative
İSTAÇ İstanbul Çevre Yönetimi Sanayi ve Ticaret A.Ş	Waste Management System	Public (Subsidiary Company of IMM)	Ziya Gökmen Togay	General Manager of İSTAÇ İstanbul Çevre Yönetimi Sanayi ve Ticaret A.Ş
İstanbul Enerji Inc.	Energy System, Urban Planning and Infrastructure	Public (Subsidiary Company of IMM)	Dr. Yüksel Yalçın	General Manager of İstanbul Energy Inc.
İstanbul Ulaşım AŞ	Transportation System	Public (Subsidiary Company of IMM)	Tarık Safi	General Manager of İstanbul Ulaşım AŞ
İstanbul Şehir Hatları	Transportation System	Public (Subsidiary Company of IMM)	Güçlü Şeneler	General Manager of Şehir Hatları A.Ş
İstanbul Halk Ekmek (İHE)	Industry, Food Production	Public (Subsidiary Company of IMM)	Derya Atacan	General Manager of İstanbul Halk Ekmek
UGETAM	Energy System	Public (Subsidiary Company of IMM)	Sema Akça Oflas	General Manager of UGETAM

Name of the Signatory (Organisation)	Sector / Domain / Level of Operation	Legal Form	Name of the Responsible Person	Position of the Responsible Person
Metro İstanbul	Transportation System	Public (Subsidiary Company of IMM)	Özhan Şenol	Acting General Manager of Metro İstanbul
İSYÖN	Public food and aquaculture products	Public (Subsidiary Company of IMM)	Hamdi Arpa	General Manager of İSYÖN
İSTON	Industry, Urban Planning	Public (Subsidiary Company of IMM)	Alp Atar	General Manager of İSTON
İSTGÜVEN	Security, Human Resources	Public (Subsidiary Company of IMM)	Murat Emrah Yıldırım	General Manager of İstGüven
İSPARK	Transportation System	Public (Subsidiary Company of IMM)	Ali Arzuman	General Manager of İSPARK
İSFALT	Industry, Urban Planning and Infrastructure	Public (Subsidiary Company of IMM)	Burak Korzay	General Manager of İSFALT
İSETAŞ	Energy System, Electricity Supply	Public (Subsidiary Company of IMM)	Yüksel Yalçın	General Manager of İsetaş
İSBAK	Smart Urban Systems	Public (Subsidiary Company of IMM)	Ender Deniz	Deputy General Manager of İSBAK
İGDAŞ	Energy System, Gas Distribution	Public (Subsidiary	Ender Çolak	General Manager of İGDAŞ

Name of the Signatory (Organisation)	Sector / Domain / Level of Operation	Legal Form	Name of the Responsible Person	Position of the Responsible Person
		Company of IMM)		
Hamidiye Water	Industry, Drinking Water Production	Public (Subsidiary Company of IMM)	Hüseyin Çağlar	General Manager of Hamidiye
İSTTELKOM	Information technologies, infrastructure	Public (Subsidiary Company of IMM)	Nihat Narin	General Manager of İSTTELKOM
Istanbul University,Faculty of Architecture,Department of City and Regional Plannig	Education and Research	Academia	Ayşe Direk DARBY	Head of Department
Marmara University Urban Problems and Local Government Research Center	Policy and Governance, Social and Cultural Systems	Academia	Dr. Betül Hande Gürsoy Haksevenler	Marmara University Urban Problems and Local Government Research Center
Özyeğin University	Education and Research	Academia	Prof. Dr. Barış Tan	Rector of Özyeğin University
Kültür University	Education and Research	Academia	Prof. Dr. Fadime Yüksektepe	Rector of Kültür University
İstinye University	Education and Research	Academia	Prof. Dr. Erkan İbiş	Rector of Istinye University
Işık University	Education and Research	Academia	Prof. Dr. Hasan Bülent Kahraman	Rector of Işık University
ODTÜ GÜNAM (Middle East Technical University Center for Solar Research and Application)	Energy System, Urban Planning and Infrastructure	Academia	Şebnem Doğan	President of ODTÜ GÜNAM
ÇEDBİK (Turkish Green Building Council)	Building, Urban Planning and Infrastructure	NGO	Mehmet Sami Kılıç	President of Turkish Green Building Council (ÇEDBİK)
DE Sürdürülebilir Enerji ve İnşaat San. Tic. Ltd. Şti (Demir Energy)	Energy System, Modelling	sMe	Caner Demir	General Manager of DE Sürdürülebilir Enerji ve İnşaat San. Tic. Ltd. Şti
FLORAWISE	Energy System, Data Analysis	sMe	Melih Ballıkaya	General Manager of FLORAWISE