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LOCAL CLIMATE ACTION PLANNING AND PRACTICES IN TURKEY

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LOCAL CLIMATE ACTION PLANNING AND PRACTICES IN TURKEY

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LOCAL CLIMATE ACTION PLANNING AND PRACTICES IN TURKEY

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ABBREVIATIONS

AFD	Agence Française de Développement
BUSECAP	Bursa Energy and Climate Change Adaptation Plan
C40	C40 Cities Climate Leadership Group
CAP	Climate Action Plan
CCAP	Climate Change Action Plan
CCFLA	Cities Climate Finance Leadership Alliance
CDP	Carbon Disclosure Project
CESA	U.S. Clean Energy States Alliance
CH_4	Methane
CIRIS	City Inventory Reporting and Information System
ComM	Compact of Mayors (USA)
COMs	Covenant of Mayors (EU)
COP	Conference of Parties
CO_2	Carbon Dioxide
CPI	Climate Policy Initiative
EIA	Environmental Impact Assessment
EBRD	European Bank for Reconstruction and Development
EC JRC	European Commission Joint Research Center
EEA	European Environment Agency
EU	European Union
EU COMs	EU Covenant of Mayors
FMDV	International Alliance of Local Governments
GEF	Global Environmental Fund
GHG	Greenhouse Gases
GPC	Global Protocol for Community - Scale Greenhouse Gas Emission Inventories
GRI	Global Reporting Initiative
HPP	Hydroelectric Power Plant
HFC's	Hydroflorocarbons
ICLEI	Local Governments for Sustainability
ICLEI-CCP	Local Governments for Sustainability-Councils for Climate Protection
İDEP	Climate Change National Action Plan
İDHKK	Climate Change and Air Management Coordination Board
İİDEP	İstanbul Climate Change Action Plan
IEAP	International Local Government Greenhouse Gas Emissions Analysis Protocol
INDC	Intended Nationally Determined Contributions
IPA	Instrument for Pre- Accession Assistance
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
İSTAÇ	Istanbul Environment Management Industry and Trade Company
İTÜ	İstanbul Technical University
İZUM	İzmir Transportation Center
KKTC	Northern Cyprus Turkish Republic
KENTGES	Urban Development Strategy and Action Plan

LGCR	Local Government Climate Roadmap
LGMA	Local Government Management Association
MRV	Monitoring, Reporting and Verification
N_20	Dinitrogen Monoxide
OECD	Organization for Economic Co-operation and Development
PFC's	Perflourocarbons
REC	Regional Environment Center Turkey
RCP	Representative Concentration Pathways
SÇD	Strategic Environmental Assessment
SEAP	Sustainable Energy Action Plan
SECAP	Sustainable Energy and Climate Action Plan
SEEP	Sustainable Energy Action Plan
SEI	Stockholm Environment Institute
SF_6	Sulphur Hexafloride
SDG	Sustainable Development Goal
NGO	Non-Governmental Organization
TBMM	Turkish Grand National Assembly
TÇV	Turkish Environmental Foundation
TEMA	Turkish Foundation for Anti-Erosion, Forestation and Protection of Natural Assets
TMMOB	Turkish Union of Chambers of Engineers and Architects
TOKİ	Public Housing Administration
TÜİK	Turkish Statistics Agency
UAST	Urban Adaptation Support Tool
UCLG	United Cities and Local Governments
UCLG-MEWA	United Cities and Local Governments Middle East and West Asia Section
UKCIP	United Kingdom Climate Impact Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nationas Development Programme
UNEP	United Nations Environment Programme
UN-HABITAT	United Nations Human Settlements Programme
WBCSD	World Sustainable Development Business Council
WMCCC	World Mayors Council on Climate Change
WRI	World Resources Institute
WWF	World Wildlife Fund
YEÇEP	Local Environmental Action Plan



EXECUTIVE SUMMARY

Cities are the settlements which cause rapid and more consumption of energy and natural resources as per their living standards, therefore are responsible from the increase in the amount of greenhouse gases in the atmosphere. One of the elements of cities that has important contribution in climate change is the change experienced in the land cover caused by the urban enlargement. Urban enlargement (increase in the population and settlement area) and dissemination cause the rise in greenhouse emissions and the negative impacts of unplanned urbanisation are gradually increasing.

Another reality in the cities relates to their vulnerability against climate change. Extreme weather events and risks that occur/could possibly occur as a result of climate change significantly threaten the existence of urban systems. Problems carried by climate change to the cities are various and many problems such as heat change, change of precipitation regime, drought – flood, rise of sea level, population movements (migration caused by climate change) have started to be closely related with cities.

These problems should be dealt with by a comprehensive and integrated approach with characteristics that need to be handled also from economic and social aspects, let aside the environmental point of view.

These conditions demonstrate that there is more need than ever in handling the economic, social and ecologic elements related to systems that constitute the cities and the urban adobes that these shape in the policies and **planning** decisions towards future within the context of ensuring *adaptation* of greenhouse gas emissions in cities to mitigation and **climate change** impacts. Because, urban planning decisions affect the climate and climate change affects the cities.

For that reason, city planning decisions and climate change parameters (scientific models, data etc.) should be in interaction. These conditions which bring together a different strategic planning understanding and need in the process of urbanisation, appear before us with a brand new urban planning agenda wherein both mitigation strategies could be implemented and climate resilience and sustainable urban development dynamics could be highlighted.

Today many city administration in the world have allocated a significant part of their local service policies for struggling against climate change and have started to prepare and implement their **local climate change action plans**. There has been many studies in the international community since the past that show the way in methodological terms for main policy intervention areas such as mitigation and adaptation for supporting the preparation of local climate action plans, and these activities are developed to continue to shed light on the urban administrations of countries.

Based on the reality that the resilient against the sources of greenhouse gas emissions and the impact of climate change demonstrate differences at local/ regional scales from the point of floods, overflows, drought, hot air waves etc., there is no prescription of local climate action planning as a template for all cities. For that reason, while evaluating the capacities of cities to resist against climate change, the development level, spatial, environmental, economic and social factors in urbanisation are specifically determined and climate action planning is designed accordingly.

1. NEED FOR LOCAL CLIMATE ACTION PLANNING

As in the case of global and national levels, the struggle against climate change at local level has been under the domain of mitigation policies and applications in this direction at the beginning. Taking into account that the cities have a significant share in greenhouse gas emission amounts that cause climate change, this situation is normal and it is apparent that other components that are supplementary in struggling against climate change are ignored. The leading of these components are the activities and elements related to adaptation to the impacts of climate change.

It could be seen that the fact the emission mitigation is encircled with macro policies such as economic opportunity, green growth etc. caused adaptation to remain as a marginal concern. Yet, adaptation to the impacts of climate change in the cities brings together the need for s strategic planning that integrates all planning elements, including at the top the spatial planning, this issue has an inevitable place within local climate action planning.

Whereas the results of mitigation actions could not be immediately received, these are the practices that provide for global benefit. The results of adaptation activities could be seen in both short and long run and could provide direct benefits at the local level. This situation appears before us as a local policy preference that should be taken into account in the integration of climate struggles. As a matter of fact, today's local climate change strategies not only involve action plans in certain sectors towards emission mitigation such as energy, transportation and waste, but also the adaptation action planning with the same weight.

1.1. Spatial Dynamics in Local Climate Action Planning

The theoretical foundations of urbanisation are question on the axis of cities being resilient against climate change, and the management of critical sectors that feed the city within the context of climate change, including at the top the energy, construction, transportation and waste sectors, and the urban planning practices are developed in this direction.

Precipitation estimations are included in physical plan decisions through meteorological modellings and various implementation strategies, the sustainable energy infrastructure is being strengthened, innovative urban infrastructure systems – green, blue-green infrastructures – and early warning technologies are being used,[1] [2] and green cover, open and permeable areas are increased with ecological activities, preparing the cities to become climate-smart (Smart Cities, 2016).

Climate-smart urbanisation approach means reflecting the climate change data to all planning decisions at different scales in the cities as a potential determinant, and includes putting into life a series of activities including but not limited to preparing city physical plans as climate sensitive in planning, providing overall the city with smart and sustainable transportation options, implementing innovative designs based on climate in city architecture (at the scale of building and landscape), constructing bicycle paths and park areas, including vehicles with low carbon emission in the vehicle flees and increasing the amount of green areas.

[1] Green area cover created by natural, semi-natural and cultural areas connected to one another that protect the ecosystem values and functions in cities.

[2] Protection of water areas and ecosystem values in lakes, rivers etc. and other water areas with an integrated planning, see https://www.ekoyapidergisi.org/1057-sehirler-icin-mavi-yesil-altyapilar.html

In all these processes which require whole revision of the existing local planning elements according to climate change for various sectoral and thematic areas, the local climate action plants are accepted as an important planning tool and also an unignorable part of the planning (spatial and other) processes. Local climate action plans are particularly guiding in directing the land use decisions in the future in countries where the urbanisation process is ongoing.

Works which aim at creating living environments resilient to the impacts of climate change in spatial terms in the cities start first by determining the regions bearing risk in terms of climate change and the spatial plans are directed accordingly. Accordingly, in the process of planning business centers, hospital regions and other social areas in the cities, regions with low risk level are planned together with constructions related to houses and public activities. Recreational areas, open and green areas and parks could be planned in more risky regions. Besides, planning is performed by widely benefitting from the Urban Climate Maps (Climate Analysis Maps and Urban Climatic Recommendation Maps[3]) as a means of physical planning in cities. (Moradi & Görer-Tamer, 2017). Also when taken into account from the point of the construction sector, not only energy and resource efficiency is ensured in the buildings, but also the existing structures are renewed and reinforced to make resilient to extreme weather conditions.

Issues of struggling against climate change have also brought to the agenda the inquiry of urban development forms, and today the fact that the city forms are frayed (Horizontal City) or compact is evaluated from the point of view of climate actions. Compact City form is accepted as climate-friendly in terms of saving from the energy as the in-city transportation distances have become shorter. Taking into account that the urban transformation applications are more in a compact form, it is foreseen that transformation plans would be more successful in terms of struggling against climate change if they include both mitigation and adaptation measures.

In cities that are frayed (such as spread of city to outer peripheries), it is calculated that the water grid costs and the energy consumed for pumping the clean water in the urban infrastructure network and collecting the waste water is much higher, and thus there are opinions that the frayed models should be avoided in the city form (Suzuki et al, 2010).

The only important point here is that the swallow areas which have the function to sequester the carbon dioxide , such as open green areas, city forests, wetland areas if any etc. in the cities, have the roles to reset the emission gap in the cities. Although it is not possible to reach to the "Zero Emission Gap" with the current efforts in the climate struggle, all these services in fact are inevitable elements of an integrating policy planning and constitute the skeleton of the urban climate action plans (UNEP, 2018).

1.2. Emission Mitigation in Local Climate Planning

Electric production and consumption, illumination, heating-cooling, waste disposal and in-city transportation activities of households and small industrial sites and other various enterprises at local level are energy intensive and these elements lead to significant amount of greenhouse gas emission in the cities.

The transportation, building (construction) and waste sectors, which are preceded by the energy, are to be highlighted within the framework of

[3] Eng. *Urban Climatic Recommendation Maps*.

mitigation policies of the cities. In many local climate action plans prepared, mostly the actions of mitigating emissions from greenhouse gas of these sectors are included and technical, administrative and financial solutions are foreseen towards these actions.

One of the most important solutions to be applied to mitigate the emissions in the energy sector in the cities is to ensure energy efficiency in almost all areas of urban services. While energy efficiency is inevitable for struggling against climate change, it is also necessary for decreasing the energy costs in cities.

It is important for the climate struggle to develop public transportation system for energy efficiency in city transportation, renew the public transportation vehicles according to energy efficiency, use the bicycle as in-city transportation vehicle and urban mobility plans for pedestrian friendly urban life.

The efficiency measures to be taken within the framework of urban waste management provides contribution in combating climate change. Also it is necessary to use standards that are in compliance with energy efficiency in the neighborhoods to be newly established and buildings to be newly constructed in order to mitigate greenhouse gas emission within the framework of house sector services.

The following Table includes some activities that the local administrations could perform in cities in order to mitigate greenhouse gas emissions, as well as some examples next to these activities.

40% of the energy consumption of a city arises generally from the buildings and 49% of the greenhouse gas emissions equivalent to carbon dioxide is released to the atmosphere by means of the buildings (EEA, 2017).

Table 1: *Emission Mitigation Activities of Local Administrations (McCarney et al, 2012)*

Greenhouse Gas Resource	Examples for Greenhouse Gas Emission Mitigation Activities of Local Administrations
Electricity usage	▪ Energy saving in municipality buildings and facilities (including water supply and waste water treatment plants). ▪ Renewal of the technology in traffic signs and street illuminations (LED lamps, use of photocells etc.) ▪ Use of alternative energy sources in electricity production (solar, wind), and encouraging their use ▪ Bringing rules related to insulation and illumination for the new constructions and increasing the energy efficiency of buildings, renewal of these systems in the old structures. ***Side Benefits:*** o Increase of air quality o Creating local business opportunities with investments to be made for improving energy efficiency and vitalizing the local economy

Greenhouse Gas Resource	Examples for Greenhous Gas Emission Mitigation Activities of Local Administrations
Fuel use in relation to heating and cooling	▪ Energy saving activities in the existing buildings and facilities (including water supply and waste water treatment plants). ▪ Determining the standards related to building insulation and inspection of the practice ▪ Construction of urban design and green buildings ▪ Land planning taking into account the heating and cooling need in buildings with due consideration to structuring form, intensity and connection with green areas. ▪ Increasing energy efficiency in buildings and ensuring that the electricity prices are lowered.
Fuel use in transportation	▪ Improving the opportunities and network of public transportation ▪ Determining the characteristics (amount of fuel consumption, maintenance etc.) and usage amount of municipality vehicle fleet ▪ Planning climate friendly transportation for the city ▪ Land planning that takes into account the urban function areas, number of passenger and the distance ▪ City administrations investing in alternative in-city transportation services and public transportation system such as bicycle paths and taking encouraging measures for the use of these systems. ▪ Inclusion by the municipalities of vehicles operating with alternative fuels(including public transportation vehicles) in its own fleet ▪ Examining the vehicles used in-city transportation in terms of need and efficiency.
Waste Management	▪ Reduction of waste amount, encouraging recycling and reuse ▪ Using the methane gas which occurs in solid waste storage processes for heating and energy acquiring purposes. ▪ Using the methane gas which occurs in solid waste storage sites for energy purposes ***Side Benefits:*** o Improving the air quality with the increase of public transportation and alternative transportation practices o Providing solution to traffic jam by the enhancement of public transportation and alternative transportation practices
Emissions related to non-legal activities	▪ Implementing inspections and sanctions at periodic intervals
Emissions that occur due to the weakness of awareness of the individual	▪ Carrying out training activities towards awareness rising and informing ▪ Implementing inspections and sanctions at periodic intervals ▪ Taking encouraging measures

1.3. Increasing Importance of Adaptation into Local Climate Action Planning

Whereas it is relatively new that the local administrations started to reinforce the emission mitigation measures with the adaptation policies created towards the impacts of climate change, adaptation plans have been implemented in many cities of developed countries. For example, according to the Climate Adaptation Strategy of Rotterdam (Holland), it was projected that 80% of the investments to make Rotterdam 100% climate resilient in 2025 would be undertaken by the municipality and that the cost of this target would be around 4-5 billion Euros. Within the framework of this strategy, it was calculated that a total of 3140 additional jobs would be created every year until 2025, as side benefit with the implementation of climate friendly water policies in Rotterdam (World Bank & Korea Green Growth Trust Fund, 2018). As it could be seen, the adaptation actions carried out in cities for climate resilience, bring together a series of comprehensive benefits in various fields, providing

common benefits in social, environmental and economic areas (e.g. health, air quality, employment, equality areas).

In the following table, the fundamental problematic areas experienced in the cities are identified with the impact of climate change.

Table 2: *Negative Impacts of Climate Change on Cities (Prasad et al., 2007; McCarney et al., 2012)*

Climate Change	Impacts
Temperature Change	▪ Urban heat island ▪ Increase of need for cooling and scarcity of energy ▪ Worsening in air quality in cities ▪ Water quality problem and increase in water need ▪ Increase in rates of death connected with temperature (in particular among middle ages). ▪ Decrease of life standard for those who do not have suitable housing conditions
Change in Precipitation Regime (Increasing Precipitation Amount and Frequency)	▪ Decrease in surface and underground water quality ▪ Pollution in water resources ▪ Water borne diseases ▪ Problem of storage of solid wastes ▪ Increase in diseases, injuries and deaths ▪ Many activities such as transportation, accommodation and trade as well as social activities being hindered due to flood
Change in Precipitation Regime (Drought)	▪ Decrease in surface and underground water quality ▪ Pollution in water resources ▪ Water borne diseases ▪ Problems in solid waste storage ▪ Increase in diseases, injuries and deahts ▪ Many city administration and social activities such as accommodation, trade being hindered due to extreme and irregular precipitation, floods, overflows etc. ▪ Large scaled migrations and need to resettle ▪ Financial and economic losses ▪ Food and water scarcity ▪ Increase in the number of migrants to cities due to climate change (climate refugees)
Increase in Wind Magnitude, Cyclones, Hurricanes etc.	▪ Continuous electricity interruption ▪ Destruction in water supply networks ▪ Increase in death and injury risk, post-traumatic psychological diseases ▪ Problem of removing sensitive regions from the scope of private insurance ▪ Forced migrations ▪ Tangible loss and damages
Change in Sea Level	▪ Economic risk and increasing cost in coastal cities ▪ Decrease in the amount of fresh water due to salty water ingress ▪ Increasing in risk of death and injury due to flood ▪ Erosion and soil collapse ▪ Increase in the cost of planning for coastal protection and land use ▪ Replacement of the population at coastal settlements, strengthening the infrastructure systems ▪ Salination at river mouths and coastal aquifers ▪ Seaside barriers being damaged ▪ Locations under sea level remaining under water ▪ Infrastructure in coastal cities being destroyed ▪ Negative impact on economic development in the long run

Today, many local administrations include the adaptation policies in their urban climate change action plans, or directly prepare *urban climate adaptation action plans*. Within this framework, impacts of climate change on cities, vulnerability areas, risks and benefits are determined respectively and the most suitable service is put into life.

While making these determinations, the sectoral and thematic areas included in the following Table are taken into account as general and minimum.

Table 3: *Some Fundamental Sectors and Thematic Areas Handled In the Vulnerability Assessment in Urban Climate Adaptation Action Plans (UN-HABITAT, 2015).*

Sector	Thematic Area [4]
Energy	Urban Planning
Industry	Nature protection
Building (Construction)	Disaster risk management
Transportation	Public health
Service (infrastructure, tourism etc.)	Food safety
Water	Migration
Finance (including insurance)	Society (social services, house safety, access to clean drinking water etc.)

Adaptation in Cities in 1.5°C Report of IPCC:

Together with Paris Agreement, adaptation actions as well as mitigation actions at national and local levels have acquired the due importance. Within this framework, international community and relevant science communities included the issue of adaptation for the impacts of climate change with the same weight with mitigation in their climate action plan works, developed new methodologies for the local administrations to fulfill their adaptation services, and prepared various guides on this issue. IPCC has attached special importance on this issue in its evaluation reports in the last period.

In the IPCC Special Report, Global Warming of 1.5°C[5], which is one of the up to date scientific studies of IPCC which foresees that limiting the global surface temperature increase by 1.5°C will significantly decrease the impacts and risks of climate change, there are some important determinations in relation to resilience of cities against climate change. (Urge-Vorsatz, 2018).

1.5°C report indicates that in terms of the impacts of climate change, heat stress, [6] land and coast floods, new diseases vectors, air pollution and water scarcity will be lived together and for that reason it is very important to adapt to impacts in the cities. For this reason, the following should be emphasized for the cities;

- establishment of early warning systems for flood and drought;
- improvement of water storage and utilization;

[4] There is a connection between thematic areas and the sectors identified. For example, water sector has positive/ negative interaction with public health.
[5] See https://www.ipcc.ch/sr15/
[6] The fact of heat stress means heat that is received excessively in the body more than it could tolerate without physiologic distortion.

- mitigating and managing health risks that occur due to temperature and climate events that are extreme and start slowly.

The report emphasizes that the regions that are most effected from the climate change are the mega cities (cities with population of 10 million and above), coastal areas and high mountain series, including as the first the small islands, and underlined that the cities have a special importance in global climate struggle. The data of the report demonstrated that 70 million new city dwellers will be affected annually by mid-21st century due to global heating and among those who will be most negatively affected are the poor city dwellers and in particular those living in the cities of Africa Continent.

According to other findings of the report, the negative and destructive impacts of climate change will hit low and middle income countries more and small and medium scaled cities will encounter danger in these countries.

Findings demonstrate that the number of mega cities which are under heat stress at 1.5°C would increase by two folds and that more than 350 million people will be exposed to this by the year 2050. It is expected that city poor will be particularly affected from the heat stress. Deaths related to ozone increase in cities where heating increases. The report indicated that the North African cities have 5 folds stronger night heat islands compared to global average. It is estimated in the report that increase of population and city size within the context of hotter climate, will also bring together the Urban Heat Island/UHI increase.

Taking into account that covering the city surface with impermeable materials has negative effect on the volume and speed of surface waters and floods, designs are made and implemented in the city to direct the surface waters, ensure that underground waters are filled and to increase the water quality. Despite these precautions, according to the evaluations in the report, it is expected that city floods will increase in case of a warming of 1.5°C and these risks affect and will unproportionally affect city poor and the women.

In the 1.5°C Report, the risks which are expected to decrease in case of 0.5°C warming of the glove (stopping at 1.5°C) are summarized below:

- Health risks arising from Heat Island Effect (diseases and deaths connected with extreme temperatures) will largely decrease with 0.5°C less warming of the globe.
- If the ozone estimated emission remain at the same rate, risks of death associated with ozone will decrease.
- Risks that increased for vector borne diseases such as malaria and dang fever will decrease
- Combined flood (combined risk of flood coming from several sources) has significantly increased in major coastal cities. At 1.5°C limit, protection will be ensured against the rise of sea level with the rising of the existing bends in the cities.

The Report also emphasized that these risks could change depending on vulnerability at regions (coastal and central regions), urban settlements and infrastructure sectors (energy, water, waste water and transportation).

It was emphasized in 1.5°C report that adaptation to climate risks will bring certain opportunities in the cities and some determinations were included in the Report in this direction:

- Financially strengthening of the metropoles (population of metropoles is between 1-10 million) and mega cities, increase of smart cities, green cities and sustainable cities, will

accelerate adaptation to climate change in cities.

- Discussion of issues connected with struggling against climate change such as cost-effectiveness, urban development, job creation and inclusiveness will constitute another opportunity for the development of participatory processes in the city.
- Expanding the network of cities that share their experiences in struggling with climate change and obtaining economic and development benefits from climate change reactions also represent an institutional innovation that has occurred recently.
- Resilient infrastructure will affect the capacity of urban land use to be exposed to risk and to adapt. For that reason, a well-designed land use planning will contribute in mitigating the effects of emissions and adapting to the impacts.
- Climate Adaptation City Action Plans could mitigate the status of exposure of the city to flood risk, heat stress, fire risk and sea level rise.
- Adaptation measures in cities will create opportunities for sustainable urban development. Limiting the global heating at 1.5°C instead of 2°C will facilitate the sustainability of the cities. For example, sustainable management of water resources in cities is among the important elements of adaptation to the impacts of climate change. The sustainable water resource management and water services in the cities will mitigate the climate change impacts through various means such as waste water recycling and rain water derivation and support adaptation and development.
- City disasters will be reduced when the extreme weather conditions are taken into account in spatial planning policies, spatial settlement patterns and urban design practices.
- Urban Heat Island effect will be mitigated through various measures such as using reflective surfaces, green infrastructure and smart land use, methods for mitigating mechanical cooling needs and effective implementation of construction rules.

The following Table included in 1.5°C Report demonstrates which opportunities could arise in the field of adaptation and also mitigation in combating climate change in a city with strong green infrastructure and protected ecologic systems.

Table 4: *Opportunities of a City With Protected Green Area Systems (UNFCCC, 2019)*

	Green Infrastructure	Benefits of Adaptation	Benefits of Mitigation
Opportunities are created in cities for adaptation with green urban infrastructure	Urban forestation, city parks	Mitigated city heat island effect, psychological benefit	Less cement, less A/C
	Permeable surfaces	Water filling/filling of dams	Less cement in the city, some sort of bio sequestration, less water pumping
Practices that are carried out by handling together the green areas, ecosystem assets and ecosystem services (Ecosystem services: Rain water sequestration; carbon sequestration potential, air cleaning capacity etc.) provides the opportunity to increase the options of the city to be resilient	Deforestation and protection of urban agricultural lands	Healthy lifestyles, prevention of floods	Decrease in air pollution
	River side buffer zones	Qualified job opportunities at local level	Saving from energy used in water treatment
	Living areas with abundant biodiversity in the cities	Psychological benefits, regional recreation areas	Carbon sequestration and storage [7]

[7] Ecosystems have the potential to simultaneously produce benefits such as carbon sequestration as well as water production, soil protection and micro-climate regulation. Within this framework, low or high carbon capturing could be realized depending on the existence and continuity of the green texture in any type of land use with carbon capturing and storage.



2. BENEFITS AND OPPORTUNITIES IN LOCAL CLIMATE ACTION PLANNING

Mitigating the greenhouse gas emissions in cities and adaptation to the impacts of climate change could create important opportunities. In the processes of struggling against climate change, the fact that a city is a "green city" has direct benefit towards reaching sustainable urbanisation targets. For example, within the framework of precautions for mitigating greenhouse gas emissions in cities, measures could be taken to support struggling against climate change, such as re-locating the areas with high rises and business intensity, increasing accessibility to public transportation and increasing investments in this sector. These measures could mitigate emissions in the short term at urban scale, and also provide emission saving at higher rates in the long run.

When looked from the point of ensuring the integration of all social, economic and environmental elements, it is known that hundreds of cities around the world, which have completed their urban development, have prepared and are preparing their local climate action plans (which cities are generally the small and medium scaled cities of the developing countries) Being at the commencement stage could provide opportunities that will more rapidly multiply the activities related to adaptation to impacts and mitigation of urban emissions.

'Green City' Index

Green City Index relies on some 30 indicators such as CO_2 emission, energy, building, land use, transportation, water and health, waste management, air quality and environmental governance. Almost half of these indicators are quantitative (for example, per capita CO_2 emission, per capita water consumption, recycling rates, concentration of air pollutants etc.) and generally obtained from the information resources of the public, and the remaining is determined as a qualitative assessment of the environmental policies of that city (for example, commitment of the city for using more renewable energy, policies related to mitigating the traffic problem, air quality rules etc.) There could be differences between the indexes depending on the specific characteristics of geographical regions. For example, in African cities, Green City Index relies on different indicators such as access to electricity and potable water, and the rate of population living in information locations such as shanty houses, and these elements are highlighted.

See https://www.smartcitiesdive.com/ex/sustainablecitiescollective/what-best-way-measure-sustainability-cities/243106/

Opportunities which local administrations will acquire by presenting services for **mitigation of emissions arising from greenhouse gas** in cities could be listed as follows:

- They can mitigate emissions in their own institutional organizations;
- They could mitigate their emissions by developing public transport, non-motor vehicle transportation, bicycle use, transportation with electric energy, pedestrianization practices.
- With the urban greenhouse gas emission inventory, the emission budget of the city could be prepared and swallow area balance could be protected.
- It may set greenhouse gas reduction target at the urban scale.
- They could provide services for encouraging renewable energy in the building construction processes.

Opportunities which could be acquired by local administration by providing services for adaptation to the impact of climate change could be listed as follows:

- They can select the wide green areas of the city as priority intervention areas and thus increase the resilience of the city;
- They could determine the existing and potential spatial areas/ elements which increase resilience against extreme precipitation and sea level rise (for the coastal cities) and take precautions accordingly;
- They can make priority emergency condition planning for urban infrastructure that has critical importance and mitigate the damages of meteorological disasters

Having the struggle with climate change take route within the framework of a planning could create opportunities in city economies. When considered from the point of urbanisation dynamics, what is seen and implemented in every country overall the world is that rapid urbanisation and a built environment are an investment means. This situation verifies that cities are one of the macro-economic growth elements. The purpose is that **creating a climate economy at local level** should be a target. For example, services related to efficient use of energy in cities will enable on one hand mitigation of greenhouse gas emissions, and on the other hand reducing the increasing energy costs. Along the same lines, local economy could be revives with renewable energy services and technologies in the cities and new job opportunities could be created and the small and medium scaled enterprises could be strengthened.

Following Paris Agreement, it could be seen that the role of local administrations in climate struggle has significantly increased. In this direction, positive developments have taken place in terms of providing the financing resources which local administrations need for the purposes of struggling against climate change. It is important in terms of the applicability of climate action plans to determine for which reasons the local administrations need climate financing (prepare urban climate action plan, determine local policies, create awareness, develop capacity etc.) and which type of resources they need (international, national, grant, loan, short term, long term etc.). For this reason it is recommended that the local administrators follow a planned road with a strategic view on the issue of climate financing.

2.1. Climate Action Opportunities of Local Administrations

Struggle against climate change progresses towards a ground of collaboration at an unprecedent pace between non-state actors defined as other management stages, private sector, civil society organizations etc., let aside the collaboration between states. Local administrations are considered within sub-state and/or non-state actor class[8], and special importance is attributed to municipality administrations as they are personally responsible from the implementation.

City administrations have significant potentials in terms of contributing to the implementation of policy targets defined in national and international arena in struggling against climate change. With the authorities they have on the issues of energy supply and management, transportation, reconstruction planning and waste management and social services, they have positive contributions directly or indirectly towards controlling/ mitigating urban greenhouse gas emissions and adapting to climate change (McKinsey & Company, 2009) From the point of view of these services, in addition to the fact that energy and climate crisis constitute significant

[8] OECD classified local/ regional administrations as Non-Party Stakeholders.

threat areas in mega cities, they are also considered as the implementation focus in combating climate change and strong catalysts for the climate action.

There is a need management efficiency (early alert systems, comprehensive risk assessment on events which lead to irrevocable permanent damage and loss, risk insurance etc.) and constructing resilient infrastructure to the impacts of climate change. These needs force local administrations to have a city vision which could struggle against short and long term impacts of climate change, manage the risks, and integrate all services related to sectors such as energy, transportation, house and land planning and waste management. **This vision, which focuses the development dynamics on low carbon city economies**, brings together the renewal and change of urban planning philosophy that has been used for years.

Whereas there is no single definition for low carbon city, a **low carbon city** could be explained as a city model where creative technologies are implemented for the purpose of mitigating carbon emission and which could adapt the impacts of climate change, has the technologies to manage the force of the nature and where the ecologic integrity has not been distorted. Low carbon cities are the placed where the air quality is good, which are resilient to the change of meteorological precipitation orders, ecological integrity of which has not been distorted, where the surface area of green areas (parks, gardens) is more compared to settlement areas, there occurs no water scarcity, which have less emission amount in carbon dioxide (and equivalent) calculations, in-city transportation services are provided with a sustainable understanding, where there is no air pollution connected with fossil fuels, electricity and food are cheap, brown infrastructures (waste water and solid waste disposal etc.) are renewed at modern norms, health of people living in the city is protected and the city economy is strengthened with low carbon economies (renewable energy economies etc.) Besides, all opportunities that will be created for establishing low carbon cities will also help the cities have low carbon life style.

2.2. Management Tools That Will Facilitate Local Climate Action

When the services related to the struggle against climate change and ensuring the resistance of cities are considered from the point of view of tasks and authorities of local administrations, it is known that in many countries the cities do not have a direct regulation for determining and implementing the local climate policy.

Local administrations use various management tools in order to put into life the climate actions they target within their existing legal and institutional responsibilities.

Initially, one of the planning tools of local administrations is naturally the laws. Authorities and tasks granted to the administrators of the cities under the laws constitute a significant background for the local climate actions. Regulatory instruments are equipped with provisions that point out putting into life many local services related to struggling against climate change though not directly focused on struggling against climate change.

What is expected from local administrations here is to have an integrated approach within the scope of local policies they will create taking into account the national climate policies under such services as urban infrastructure (waste, waste water management), air pollution, water pollution, green areas (green infrastructure) in-city transportation, public transportation, parks- open green areas, food safety, physical planning, house, disaster management, emergency preparedness, urban

health, social assistance services etc. with municipality/environmental laws.

Another local administration tool in struggling against climate change is the planning authority of local administrations; here, the planning does not imply only spatial planning, but also includes a planning approach that shapes and gradually increases the life quality of people – and all living things – with economic, ecologic and social opportunities. In case that such a service understanding is harmonized with the requirements of local climate policy, the planning in question becomes one of the most effective implementation tools of local administrations in climate actions.

Another important management tool is to mainstream the democratization practices in the cities within the climate struggle. This situation in fact is the mirror of the ways the local administrators use their powers and authorities.

The fact that the local administrations prepare the foundation for a pluralist and equitable climate management model in the cities and establish new structures to develop multi-actor participation and consultation practices in local decision making processes – or facilitate this process – will define the problems in the area of climate change, which is a multifaceted area , in a correct and meaningful manner, diversity the solutions and also accelerate the practices. The first requirement of a successful local climate planning is considered as joint work with all sections. This is the most important democratic piece of climate planning dynamics and it is recommended to act together with all local stakeholders in every step from technical issues to budget planning.

The metropolitan – district connection is a must in administration for struggling against climate change (Alber and Kern, 2009: 171). In fact, the method of struggling against climate change particularly in big cities has two important dimensions, namely "local administration/municipality" and "multi-level governance". The success of horizontal collaborations and cooperation points out a well designed climate plant management by creating the theme of mutual collaboration and cooperation in metropolitan regions and district municipality network-connections. If there is no such collaboration in the metropolitan regions, conflict arises between the authority areas of local administrations in managerial and spatial terms, which has a negative impact on the climate action planning processes (Alber and Kern, 2009).

It will be beneficial to drive attention at this point to some issues/ recommendations which the local administrations should take into account in their internal managerial structures for preparations and implementation of climate action plans considering all these managerial tools. These issues/ recommendations are as follows:

- An institutional mechanism should be created which will examine the climate change impacts of planned municipality services/ investments (within the context of mitigation and adaptation)

- Problems and solutions related to climate change shall not be approached only from within the municipality borders, but at provincial and regional scales.

- A continuous climate working group/ unit shall be created within the internal corporate structure of the municipality.

- Tangible responsibilities shall be assigned to different directorates and side institutions of the municipality on the issues of mitigation and adaptation.

- Development of municipalities in relation to priority sectors and other issues within the context of climate actions should be supported.

- It shall be ensured that the climate action plan and the investment program which includes the wholistic policies of the municipality (strategic plans, budgeting etc.) are interconnected and in harmony.

- Grounds should be established to ensure that other actors than the municipality (civil society organizations, universities, professional chambers, private sector etc.) contribute and participate actively in the climate action plan.

Below is information on participatory budget practice of the City Council in Baltimore, which is the biggest city of Maryland State of the USA for struggling against climate change.

Information Box: Baltimore (Maryland State, USA) Example On How the Budget Allocations of Climate Action Plan of a City are Done Through Democratic Processes

Baltimore-Dwellers Determine the Priorities for Spending the Money of the City for Climate Action in Baltimore!
Baltimore Town Hall Minutes of Meeting 26 June 2012

In its meeting held on 26 June 2012, Baltimore Town Hall created an agenda for ensuring the information of "Baltimore Sustainability Commission" and the public and their inclusion in the Plan decision concerning the measures/ targets foreseen to be included in Baltimore Climate Action Plan (Baltimore CAP) draft of which was prepared by the city. Within the framework of this agenda, the people of Baltimore were informed by a team (Counselling Committee) comprising experts representing the civil society organizations, workplaces and government institutions on why Baltimore should struggle against climate change, how the Plan was developed and what sort of measures were proposed in relation to the climate change in Baltimore. The draft developed with the works of the Counselling Committee and the greenhouse gas emissions mitigation measures of the city were presented below. The Town Hall Meeting in question also included a separate session for the responding of questions asked by the public to the Baltimore Sustainability Commission.

The focus was put on whether all important issues related to the city were included in the proposed draft CAP and more importantly whether the measures recommended were seen as applicable or not, and the CAP measures were developed with the questions asked and comments made by the public, and the public recommendations were integrated into CAP. The following stages in the meeting included voting and budgeting processes. Within the framework of these processes, opinions were received from the public on measures which they believe to take priority in spending and should be included in the CAP. In the "Voting Process", the participant group from which each Town Hall member is responsible was asked to select the "measures which they liked the most" by sticking labels on the posters that demonstrate all the measures (for example to the teacher, artisan or university student) Five topics which received the highest votes in the results and five measures/ targets related to these issues are indicated below in the same order:

1. Growing a Green City 3.A: Increase the number of trees planted
2. Land Use & Transportation 1.A: Create high-quality pedestrian- and transit-oriented neighborhoods
3. Energy Savings & Supply 2.C: Lobby state to increase Renewable Portfolio Standard requirement to 33 percent by 2022
4. Energy Savings & Supply 1.C: Require energy audits and retro-commissioning for city, commercial, industrial, and institutional buildings over 10,000 square feet
5. Growing a Green City 1.C: Compost organic material

The budget exercise provided each Town Hall participant with $400 worth of CAP money and asked, "*With a limited budget, where do you suggest the city spend money to create a more sustainable Baltimore?*" Each participant placed the CAP money in the box or boxes to indicate which strategies they wished the city to invest A total of $24,000 of CAP money was allocated by the public as follows:

1. Street tree and community gardens $6,600 (28%)
2. Energy efficiency retrofits $6,100 (25%)
3. Pedestrian and bicycle infrastructure $4,600 (19%)
4. Renewable energy installments $3,400 (14%)
5. Food waste composting facilities $2,800 (11%)
6. Electric vehicle infrastructure $500 (2%)

The preferences expressed through these exercises at the Town Hall meeting affirm that tree planting, energy efficiency and pedestrian/bicycle infrastructure improvement measures are strongly supported by the public. Benefits of these measures include reduced utility bills, shadier and cooler sidewalks and access to more walkable and bike-friendly options to get around the city.



3. LOCAL CLIMATE ACTION FOR EMISSION MITIGATION AND ADAPTATION TO IMPACTS

Management Systematic for Local Climate Action Plans – Administrative units related to climate change, energy and transportation services at various levels of local institutions are operating for the preparation, implementation and following up the local climate action plans in various cities today. The following Table includes systematic approaches guiding in the struggle against climate change for city administrations.

Table 5: *Systematic Approaches That Guide Local Administrations in The Struggle Against Climate Change*

Approach	Policies and Mechanisms	Advantages and Restrictions
Within Institution	Management of public buildings, facilities and transportation fleets within the city	A significant number of immovable assets/ vehicles etc. are under direct control of the city administration, improvement of these is a further opportunity to create a "model" in climate struggle of the administrations. However, these improvements constitute only a small part of greenhouse gas emissions and vulnerabilities of the whole city.
Public Supply	Approaches of developing the climate friendly infrastructure systems in the city by the public and service provision by the public	The potential to significantly mitigate emissions and vulnerabilities is a significant advantage. However, cities may not have responsibility on services related to certain key sectors (such as energy), for that reason, the municipalities may not want to undertake the financial risk, have sufficient capital or encounter with unexpected challenges.
Public – Private supply	Approaches of developing the climate friendly infrastructure systems in the city by the private sector and service provision by the private sector	Participation of the private sector could improve provision of certain services by providing contribution in knowledge, financial resource or other inputs. However, such approaches will need a more efficient management in order to ensure that public interests are fulfilled. Besides, additional costs could come to the agenda in transferring the risk to private sectors.
Regulations and incentives	Land use and building (construction) regulations; financial instruments such as taxes and subventions, planning of incentives for certificated green buildings (for example, permitting more surface area rate).	This is a promising approach for affecting and encouraging private investments. However, application of certain intervals could be politically difficult, there could be challenges in retrospective implementation and it could be also challenging when the capacities are limited.
Activation and support	Demo projects for encouraging contribution of stakeholders, awareness rising and information provision, support to the society for climate struggle (such as legal, financial supports).	Working together with local stakeholders such as civil society organizations, universities etc., and taking their successful initiatives into account are important. However, it should be kept in mind that community activities are performed on the basis of volunteerism and depends on civil-society or society based leadership.
Institution – society managed	Climate actions which are in compliance with the objectives of the city and which are performed by other city stakeholders than the municipality.	The cost of these precautions for the city management is almost none. There are increasing number of private sector and society managed initiatives for the climate struggle in the cities and these have the potential to provide significant benefits in the implementation of climate action plans. City administrators could expand the scales of these initiatives by means of activation and support.

4. TYPES OF LOCAL CLIMATE ACTION PLANS

Local climate action plans are prepared as single documents or sets comprising a series of documents that demonstrate the realization responsibilities related to struggle against climate change of city managements. Today, local climate action plans are prepared in different types and the most well known and implemented are summarized below.

4.1. Sustainable Energy Action Plan

Sustainable Energy Action Plans (SEAP) are prepared towards mitigating the amount of fossil fuel and electricity consumed for municipality services such as heating, lighting, transportation etc. in the city. Emissions by other activities than the energy consumption are not handled in these plans and thus the scope of SEAPs are limited. These plans are preferred for acquiring experience before the preparation of a more comprehensive climate action plan by the municipalities.

Main climate actions included under the sustainable energy action plans of municipalities are given in the following Table.

Table 6: *Main Climate Actions Included in Sustainable Energy Plans of Municipalities*

Main Emission Mitigation Actions of Municipalities In Sustainable Energy Action Plans
Calculation of natural gas emissions for electricity and heating purposes in municipality service buildings and parks
Calculation of carbon dioxide emissions arising from fuel consumption of municipality vehicles
Encouraging use of public transportation, electrical vehicle and bicycles
Increasing areas purified from motor vehicles
Ensuring heat insulation of buildings
Encouraging production of energy in buildings using sun and wind
Gradual mitigation or total stopping of fossil fuels
Cities preferring renewable energy sources for their electricity requirements
Reviewing the energy consumptions of the existing industrial facilities
Taking into account energy efficiency in the industrial facilities to be newly established
Improvement of solid waste management



4.2. Mitigation Action Plan

In order for putting applicable targets in mitigating greenhouse gas emissions in a city, it is necessary to calculate the emissions of various sectors in that city. For that, it is fundamental to analyze the greenhouse gas emission mitigation potential, evaluate the mitigation performance and to prepare emission inventory for this purpose. Mitigation action plans are prepared on the basis of greenhouse gas inventory reports of cities and in particular serve to the purpose of mitigating the emissions of activities in the city. Energy consumptions are handled in the mitigation action plans and emissions are calculated. Emissions related to other sectors and thematic areas than the energy sector in the city are also included in these plans (agriculture, stockbreeding, waste management, deforestation, changes in land use, certain industrial activities in the city etc.) Thus the sectors that have priority for emissions in the city are determined and emission mitigating measures are identified.

4.3. Adaptation Action Plan

Action Plans on Climate Change Adaptation are prepared on the basis of data related to past (certain time slices) and projections towards future in connection with climate change. In the city adaptation action plans, the impacts of that change on that city and the vulnerabilities/ sensitivities against these impacts are determined (by classifying the sectors and thematic areas), risks are identified and various actions towards mitigating these risks are put on a time plan. The success of such qualitative adaptation action planning efforts may change depending on the consistency of the risk assessment methodology selected, how healthy the climate vulnerability is evaluated and how the actions are prioritized.

Urban Adaptation Support Tool (UAST), which is one of the methodologies that show the path in the preparation of urban adaptation action plans is among the guides that are frequently used by the local administrations (Climate ADAPT, t.y.) UAST points out the things to be done in the process of determining the action plans for the city administrations step by step. The urban adaptation action plan preparation process of UAST in 6 steps cover the following:

1. Commencement
2. Vulnerability against climate change and risk assessment
3. Determining the adaptation options
4. Prioritizing the adaptation options
5. Implementation
6. Monitoring and Evaluation

Whereas UEAST has been directly developed for the purpose of adaptation to the impacts of climate change, it is known that this methodology is also being used for mitigation action plans in some cities.

Methodologies that are specific to the countries are used in the preparation of urban climate adaptation action plans. One of these is the United Kingdom Climate Impact Program (UKCIP).[9]

UKCIP is a more simple model compared with UAST, responding to the internal administrative practices of the municipalities and guiding the way for decision making processes. 5 steps (stages) have been defined in UKCIP methodology:

1. Commencement
2. Current Climate Vulnerability
3. Future Climate Vulnerability
4. Adaptation Measures
5. Monitoring and Review

[9] See https://www.ukcip.org.uk/

UKCIP process starts by determining the direct and/ or indirect effect of climate change and possible disasters on the city, continuing with the definition of emergency plans in order to ensure fulfillment of municipality services against these impacts, long term projects for future, actions and new settlement areas if and when required.

In both of the methodologies (UAST and UKCIP), it is indicated that it is necessary to prepare scenarios, models, projections in order to identify the fragilities at **regional** scale against the impacts of climate change and produce data required in this direction and that only this way the climate adaptation plan of the cities could be implementable. No city climate adaptation plan wherein no regional modelling is made could be successful.

There are other methodologies prepared by the international organizations such as the World Bank, ICLEI for urban climate adaptation action plans. Almost all of these methodologies demonstrate similarities in general and could be used either singly or together, and this situation changes depending on the structures of the municipalities.

4.4. Integrated Mitigation and Adaptation Local Action Plan

The success of struggle against climate change in the cities is possible not only with the action plans of certain sectors (energy, transportation etc.) focused on mitigating the emissions, but also with including the adaptation actions into these plans. Combating climate change at local level has been accepted as an integrated policy planning at the beginning of 2000s and in this direction, integrated local/ city climate action plans that take into account the adaptation activities against impact were placed in the agenda towards making cities/ settlements more resilient against the impacts of climate change.

Many cities, which are the signatories of the Covenant of Mayors (COMs, 2008) that previously addressed the mitigations of greenhouse gas only in the energy sector[10] started to prepare their sustainable energy action plans. In 2015, COMs, Global Covenant of Mayors for Climate and Energy, which was renewed at the global scale,[11] and the Covenant of Mayors for Climate and Energy constituted an important joint step towards not only mitigating the emissions in cities, but also covering the requirement to adapt to the impacts of climate change. This scope, which is expanded with an integrated vision on being low carbon and climate resilient, has directed the city administrators who signed the Covenant to prepare their "Sustainable Energy and Climate Action Plans (SECAP)" with this new title which they will put into life by the year 2030 so as to involve mitigation and adaptation works. SECAPs have 3 fundamental targets (Chatelet, 2018):

1. Mitigation (accelerating the transition to low carbon in the region), mitigating the CO_2 emissions by minimum 40% by 2030 with the renewable energy and energy efficiency measures
2. Adaptation (increasing the capacity of adaptation towards inevitable impacts of climate change), being prepared against the

[10] EU Covenant of Mayors, which has been in force in European Union countries for long time (EU Convenant of Mayors)" is based on the "European Union Climate and Energy Package" which was adopted in 2008.

[11] The Global Covenant of Mayors for Climate and Energy was established as a single coalition with the merger of EU Covenant of Mayors and the Compact of Mayors in the USA(2014) (Global Covenant of Mayors for Climate and Energy = Compact of Mayors/ComM + EU Covenant of Mayors) As of today, Global Covenant of Mayors for Climate and Energy is the most comprehensive urban climate and energy initiative at the global scale. Cities which have undersigned this Covenant, undertake to mitigate the CO_2 emissions at least by 40% by the year 2030, and adopt an integrated approach for adaptation to climate change. As of January 2019, around ten thousand cities representing 800.000.000 people covering 10.50% of the global population are parties to the Covenant (see. https://www.globalcovenantofmayors.org/).

change that will be brought by global warming and creating a resilient structure.

3. Sustainable Energy (energy efficiency and renewable energy), developing cooperation with other local administrations in the region for access to reliable and suitably priced energy.

Within the framework of SECAP, local administrations issue Baseline Emission Inventory and perform Risk and Vulnerability Assessment for adaptation undertakings. In this direction, objectives and targets clearly defined for both intervention areas (mitigation and adaptation) time frames, responsible institutions and possible impacts are classified in SECAP together with the actions planned. Here naturally it is expected that SECAPs will include sectors and thematic areas connected with the emission inventory and risk and vulnerability assessment. It is highly important to determine the sectors that ensure resilience of a city against climate in SECAPs. For that reason, a strong and comprehensive urban climate adaptation strategy means the evaluation of the adaptation of municipality services affected by climate change together with all of its elements. Some of the fundamental sectors that could strengthen resilience of cities are as follows:

- Infrastructure
- Public Services
- Land Use Planning
- Environment and Biodiversity
- Agriculture and Forestry
- Economy

Climate action plans, which jointly involve the mitigation and adaptation interventions by being handled with an integrative approach, constitute the most comprehensive type of action in the climate struggle of the cities. On one hand such type of action plans define the emission mitigating measures, while on the other hand these identify the measures to prepare the city to the changing climate. When looked from this perspective, the strategies for these types of plans required a cross cutting approach that integrates many sectors and thematic areas in the cities. The following tables show the examples for integrated climate actions for cities in sectoral and thematic areas in the same order (UN-HABITAT, 2015):

Table 7: *Climate Action Examples for Cities in Sectoral Areas*

SECTOR	ACTION
Building (Construction)	Mitigating the energy and water consumption in new and existing houses and public buildings; incentives for green buildings; resilience to extreme weather events (like heat and flood)
Energy	Demand management (residential and commercial); renewable energy production; distributed energy systems; resistance of the infrastructure; emergency plans for supply problem
Transportation	Public transportation options; cleaner fuels; active/ non-engine transportation (pedestrian and bicycle paths); climate resilience transportation infrastructure; traffic jam pricing and different/ other demand management methods for private vehicles
Waste	Waste mitigation, reuse and recycling; from waste to energy; resilience of regular landfill facilities against natural disasters
Water	Demand management (residential and commercial); reuse and recycling of water; infrastructure resistance; energy efficient water treatment, emergency plans for supply problem
Health	Mitigating short life climate pollutants that cause air pollution in cities and improving air quality; health action plans related to sudden hot and cold air waves; prevention of diseases caused by climate change

Table 8: *Climate Action Examples for Cities in Thematic Areas (Cross-Sectors/ Cross-Cutting)*

THEMATIC AREA	ACTION
Land Usage	Intense, transit oriented, mixed used urban land development; legal regulations based on the flood risks reflecting the estimated impacts of climate change in addition to the existing risks.
Jobs and Livelihoods	Measures and education encouraging the green economy industries; green supply policies
Energy Efficiency	Actions for various sectors (waste, building, transportation etc.) including the buildings and fundamental urban services
Consumption	Incentives for more sustainable packaging; handling the emissions depending on city supply chains including food, cement and construction materials, green supply; handling the fragilities of key supply chains
Natural Environment	Solutions involving the protection, recycling and development of the green and blue infrastructure; ecosystem based approaches for adaptation; directing the impacts of climate change on native and invading species
Natural Hazards	Public and private sector investments preparedness to disasters in various sectors, other priority applicable at city level as determined in Sendai Disaster Risk Mitigation Framework (2015 – 2030).

In the integrated climate action plans for cities, actions towards mitigation and adaptation are considered together, revealing the contradictions and synergy potential between these. Here it is also important to make a priority order for the concrete actions. Since it is necessary to have different actions to be carried out by different institutions to be in harmony and integrative in such types of plans, the need for cooperation and collaboration among stakeholders in the city is far more important.

An integrated climate plan for the cities is strategically considered with 3 dimensions:

1) Horizontal Integration (Sectoral): Horizontal integration means that the city service sectors should be integrated with the climate actions. These services are the ones for which the municipalities are directly responsible, such as waste water treatment, waste management, in-city transportation, water supply and reconstruction plans.

2) Vertical Integration (Cross-Sectoral): Horizontal integration means adding the climate change struggle elements into the multi-sectoral policy plans which have been prepared in different sectoral and thematic areas for the development of the city (for example municipality strategic plan, city waste management plan, city transportation macro plan, natural disaster struggle plan, city clean air action plan, city drought plan, city economy and investment program).

3) Mitigation – Adaptation Integration: The strategic dimension of an integrated climate action plan in cities is the "mitigation – adaptation integration". Here it is important that the municipalities establish relationship between adaptation and mitigation activities (services) and put these into life. The fact that the municipality services are directed towards both mitigation and adaptation with an integrated point of view is very effective in transforming the negative impacts of climate change into benefit. In cities, actions that provide for both mitigation and adaptation benefits could be preferred consecutively and/ or concurrently. One of the most important issues that should be taken into account in these processes is to see that the maladaptation practices decrease the climate resilience of the cities [12].

Which of the climate action plan types specified above will be carried out is identified in line with the needs and resources of local administrations. For example, many municipalities who have relatively small and limited resources prepare sustainable energy and mitigation action plans and create a greenhouse gas inventory in this direction. Cities that do not have high emissions but are located in geographies that are climate vulnerable, prefer the adaptation action plans more. The most suitable type of plan for a city which is located in a region that both has high emission and bears high climate risks is an integrated action plan which involves both mitigation and adaptation actions.

[12] Maladaptation, is the change which inadvertently increases the level of being affected from climate change or exposed to climate change by ignoring the effects of climate change.



5. LOCAL CLIMATE ACTION PLANNING PROCESS IN THE WORLD

Policy planning works which directly handle the struggle against climate change at the local level have been ongoing in many countries for long years and since the beginning of 90s, city administrations across the world have been producing and implementing various strategies, policies, programs and plans within their authority and responsibility framework in relation to climate change, including at the beginning the mitigation of greenhouse gas emissions. Initially this process was lead more by North American and European cities.

Local climate action plan experiences were mostly seen in the USA states. At the end of 20th century and from the beginning of 2000s, in many states, cities that have population of more than 500.000 prepared their climate action plans. These plans which are also defined as *first generation city climate action plans*, have paved the way for the start of emission measurements in cities, institutionalization of local administrations in this area and increasing the public awareness for struggling as individuals against climate change. Almost all of these plans handle the issue of greenhouse gas emission mitigation targets and actions, and did not include the issues of adaptation to the impacts of climate change.

Afterwards, *second generation city climate action plans* are revealed which took into account the adaptation policies in cities and enabled for the integration of mitigation and adaptation interventions. Here the scientific grounds is that even if the greenhouse gas emissions are continued to be mitigated and the emission increase is totally stopped today, the negative impacts of climate change will continue by increasing.

5.1. Some Successful Examples in the Past

In 90s, one of the cities that could be listed among the good examples that highlighted energy saving potential in buildings owned by the municipality in the climate struggle is Portland (USA, Oregon State) **Portland** has prepared its climate action plan in 1993, and in the plan in question, it was targeted to reach carbon dioxide emission mitigation of 115.000 tons in 10 years in Portland, thus ensuring an energy saving of 9.6 million USD for the city (City of Portland, t.y.).

In Europe, **Freiburg** (Germany) has been one of the greenest cities of Europe in 1996 with its clean energy policies and practices. Within this framework, the city administration has halved the share of nuclear electricity since 1996 and it was ensured that the heating and electricity requirement of 50% of the city was covered from combined heat and electricity plants. Today, Freiburg has the target to mitigate its greenhouse gas emissions by 40% until the year 2030 (Hoppe et al, t.y.) Freiburg also launched an innovative initiative titled "CO_2 Diet Programme" in order to raise awareness among the public in relation to struggling against climate change.

With the "Kyoto Movement" which was launched under the leadership of City of Seattle in the USA (USA, State of Washington), almost a thousand of cities have signed USA Mayors Climate Protection Covenant and have put the emission mitigation targets required by Kyoto Protocol in their own regions, creating a pressure for the mobilization of federal government. During this process, the cities have established USA Mayors Climate Protection Center and have been guiding for shifting to renewable energy resources such as wind and sun in all buildings, starting from the buildings of the municipalities, as well as climate programs, energy saving practices, green transportation opportunities,

green and economic buildings for all local administrations.[13]

In that period, city climate action plan was prepared by the City of Seattle and in this scope, such actions as green taxy, 40% fuel saving at city centers with electric vehicles, establishing "Green Building Special Team" for ensuring 20% energy efficiency in buildings etc. have been put into force. The basic objective of Seattle Climate Action Plan was to reduce the greenhouse gas emissions of the city by 7% in 2012 compared to 1990, and this target was exceeded in 2005 before reaching 2012 (Uysal-Oğuz, 2010; Hayes et al., 2006)

Nowadays Seattle is maintaining its commitment in climate struggle. In year 2011, the Mayor of Seattle and the City Hall has put an ambitious and long term target for enabling the public to have zero-carbon life style by the year 2050 and the Seattle Climate Action Plan (2013), which was prepared in 2013 for realizing this target, set out a strategy for mitigating greenhouse gas emissions in the city and ensuring adaptation to climate impacts so as to include social policies. An important part of the targets included in Seattle Climate Action Plan was put into life in 2015.

As a reaction to the initiative of the US President Donald Trump to withdraw from Paris Climate Agreement in 2016, Seattle Town Hall consecutively confirmed the commitment of City of Seattle to the targets specified in Paris Agreement and instructed Seattle Sustainability and Environment Office to contribute in the actions to limit global warming at 1.5 degrees Celsius and to determine the activities which are based on construction and transportation systems as priority for a future that is cleaned off fossil fuels. These developments could be considered as a political breaking point in the transition of *Seattle to a zero emission future*.

"In 2017, when President Trump removed the U.S. from the Paris Agreement, the City committed to upholding the emission reduction targets in the Agreement. We know that we are already seeing the impacts of climate change, from wildfires that choke our air to more intense storms that flood our streets. And we know that these impacts are not experienced equally. Around the world, and right here in Seattle, communities of color and lower income communities disproportionately experience climate change."

Jenny A. Durkan, Mayor of Seattle, April 2018

5.2. Local Climate Action Planning Process in United Nations Climate Summits

In the UN Climate Negotiation processes, the first decision at global level concerning local climate action planning was adopted in the 13th Conference of Parties (COP13, Bali) of United Nations Framework Convention on Climate Change (BMIDCS) in 2007. This decision which is titled as Local Government Climate Roadmap, is the first official UNFCCC document which gives responsibility to the states within the framework of mitigation and adaptation activities and calls for planning on this issue (WMCCC, 2010). One of the important messages of Local Administrations Climate Roadmap is that the local climate actions should be an extension of national climate policies.

National Communications, which are among the international commitment documents of central administrations, draw comprehensively the general framework of activities of struggling against climate

[13] Adopted from the "Best Examples and Strategies Guide" prepared by the USA Mayors Climate Protection Center in that period.

change in the countries, and it was seen that these communications did not reflect the existing practices to a desired extent in terms of putting the national policies into life at the local level. In many countries, National Communications are prepared without sufficiently taking into account the roles of local administrations in struggle against climate change. Yet, activities for struggling against climate change at the local level and local solutions have an important place in the implementation of national policies and plans.

Policies and practices developed by local administrations over time have been started to be taken into account towards developing the national policies of the states. This approach was further strengthened in the 15th Conference of Parties in 2009 (COP15, Copenhagen) and the inevitability of local administrations in combating climate change has become a significant international climate negotiation policy. Local administrations (in particular those in metropolitan and mega cities) have started to take their places as significant actors which fight against the negative impacts of climate change (disasters and other), revive the mitigation and adaptation policies and strengthen their local economies in this context (energy efficiency, energy saving). In particular, in the Conference of Parties which took place in all stages of Paris Climate Agreement process, local administrations have started to highlight their policies and be represented singly and with increasing numbers under the umbrella of various international institutional structures.

5.3. Contribution of United Nations HABITAT Program in Local Climate Action Planning

HABITAT I (1976)
World Urban Population: %37,9
&
HABITAT II (1996)
World Urban Population: %45,1
&
HABITAT III (2016)
World Urban Population: %54,5

Within the faramework of UN-HABITAT Conferences, which are convened every twenty years under the umbrella of the United Nations (UN), the first of which was held in 1976 in Vancouver (Canada), the secod of awhich are the platforms which aim at implementing sustainable human settlement criteria at global scale, was held in İstanbul (Turkey) in 1996 and the third was held in 2016 in Quito (Ecuador).[14]

The UN HABITAT III held in Quito (United Nations Conference on Housing and Sustainable Urban Development) has special importance from the point of struggling against climate change. This importance arises from the fact that UN-HABITAT III Conference coincides temporally just the aftermath of the opening of Paris Agreement to signature. This situation has enabled the reflection of global climate change targets to planning policies related to settlement areas, and the issues of struggling against climate change in cities found a great account in the decisions of HABITAT III.

Within this framework, the Quito Declaration on Sustainable Cities and Human Settlements for All contained in the New Urban Agenda adopted as the resolution documents of HABITAT III, and the Quito Implementation Plan for New Urban Agenda handled the issue of struggle against climate change in a comprehensive way in the planning, management and implementation stages for making

[14] UN HABITAT III Conference, 17-20 October 2016, Quito, Ecuador

the human settlements and in particular the cities sustainable and resilient in environmental terms and the countries have declared a series of commitments on this issue.

Issues related to "Quito Declaration on Sustainable Cities and Human Settlements for All"

- "We completely take note of our commitments *under Paris Agreement related to climate change.*
- *We commit ourselves to promoting international, national, subnational and local climate action, including climate change adaptation and mitigation, and to supporting the efforts of cities and human settlements, their inhabitants and all local stakeholders as important implementers We further commit ourselves to supporting building resilience and reducing emissions of greenhouse gases from all relevant sectors.*
- *We commit ourselves to supporting the medium- to long-term adaptation planning process, as well as city-level assessments of climate vulnerability and impact, to inform adaptation plans, policies, programmes and actions that build the resilience of urban inhabitants, including through the use of ecosystem-based adaptation.*

Resolutions that are directly related to the climate action planning in cities under the New Urban Agenda of HABITAT III, which is expected to guide the policies and practices related to world cities and open the path for innovative approaches under the year 2036 (when UN-HABITAT IV Conference will be organized), are indicated below (with paragraph numbers in the original text (UN HABITAT, 2012):

"79. We commit ourselves to promoting international, national, subnational and local climate action, including climate change adaptation and mitigation, and to supporting the efforts of cities and human settlements, their inhabitants and all local stakeholders as important implementers. We further commit ourselves to supporting building resilience and reducing emissions of greenhouse gases from all relevant sectors. Such measures should be consistent with the goals of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change, including holding the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels.

80. We commit ourselves to supporting the medium- to long-term adaptation planning process, as well as city-level assessments of climate vulnerability and impact, to inform adaptation plans, policies, programmes and actions that build the resilience of urban inhabitants, including through the use of ecosystem-based adaptation.

101. We will integrate disaster risk reduction and climate change adaptation and mitigation considerations and measures into age- and gender-responsive urban and territorial development and planning processes, including greenhouse gas emissions, resilience-based and climate-effective design of spaces, buildings and construction, services and infrastructure, and nature-based solutions. We will promote cooperation and coordination across sectors and build the capacities of local authorities to develop and implement disaster risk reduction and response plans, such as risk assessments concerning the location of current and future public facilities, and to formulate adequate contingency and evacuation procedures.

115. We will take measures to develop mechanisms and common frameworks at the national, subnational and local levels to evaluate the wider benefits of urban and metropolitan transport schemes,

including impacts on the environment, the economy, social cohesion, quality of life, accessibility, road safety, public health and action on climate change, among other things.

119. We will promote adequate investments in protective, accessible and sustainable infrastructure and service provision systems for water, sanitation and hygiene, sewage, solid waste management, urban drainage, reduction of air pollution and storm water management, in order to improve safety in the event of water-related disasters, improve health, ensure universal and equitable access to safe and affordable drinking water for all, as well as access to adequate and equitable sanitation and hygiene for all and end open defecation, with special attention to the needs and safety of women and girls and those in vulnerable situations. We will seek to ensure that this infrastructure is climate resilient and forms part of integrated urban and territorial development plans, including housing and mobility, among other things, and is implemented in a participatory manner, considering innovative, resource-efficient, accessible, context-specific and culturally sensitive sustainable solutions.

143. We support access to different multilateral funds, including the Green Climate Fund, the Global Environment Facility, the Adaptation Fund and the Climate Investment Funds, among others, to secure resources for climate change adaptation and mitigation plans, policies, programmes and actions for subnational and local governments, within the framework of agreed procedures. We will collaborate with subnational and local financial institutions, as appropriate, to develop climate finance infrastructure solutions and to create appropriate mechanisms for identifying catalytic financial instruments, consistent with any national framework in place to ensure fiscal and debt sustainability at all levels of government."

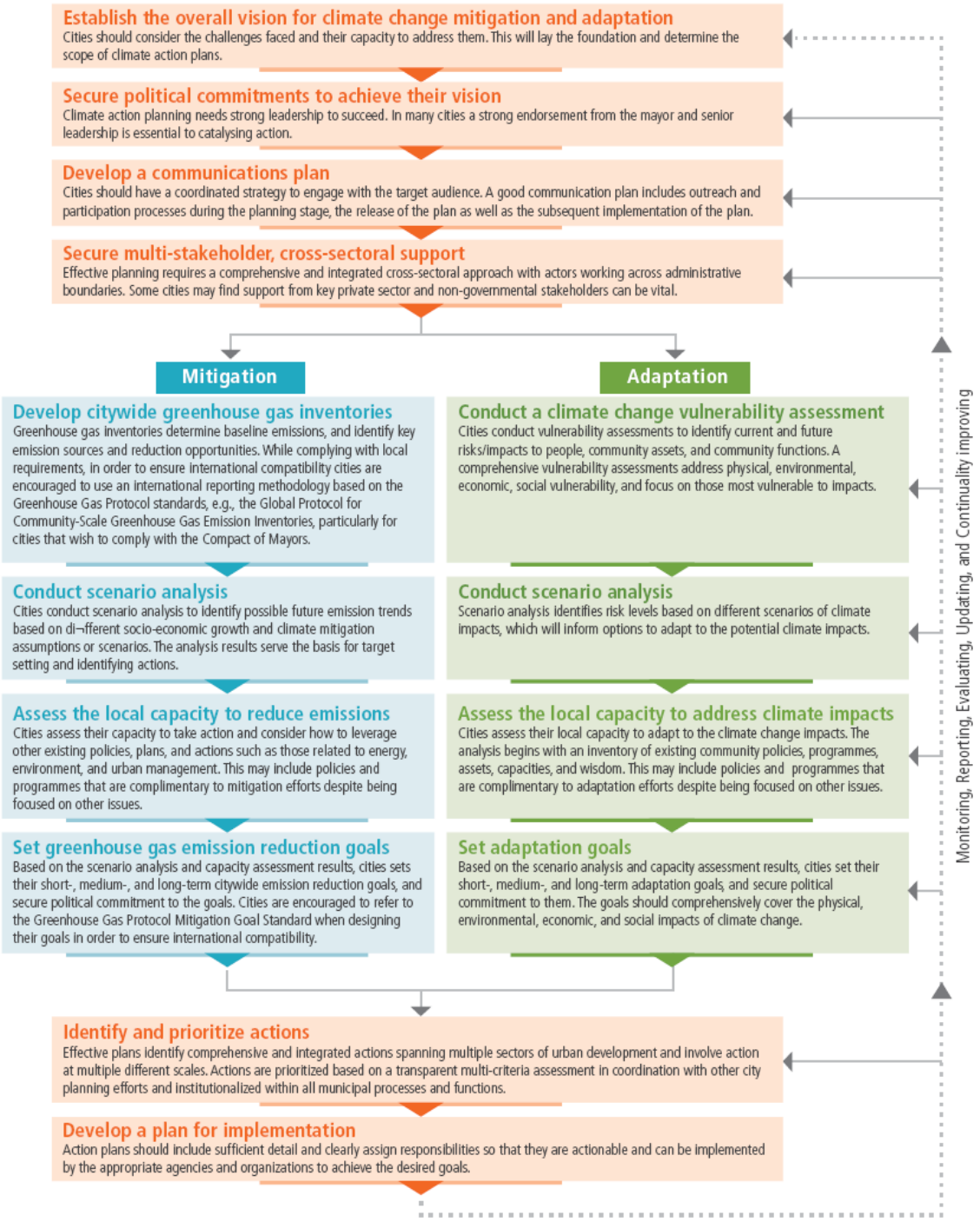
UN HABITAT has adopted some guiding principles for the city administrations to make climate action planning taking into account their commitments set out above in the Paris Agreement process (UN-HABITAT, 2015). These principles are summarized in the following Table:

Table 9: *Guiding Principles for City Climate Action Planning*

City climate action planning should be (1)			
Ambitious	**Inclusive**	**Fair**	**Comprehensive and integrated**
Setting goals and implementing actions that evolve iteratively towards an ambitious vision	Involving multiple city government departments, stakeholders and communities (wht particular attention to marginalized groups) in all phases of planning and implementation	Setting solutions that equitably address the risks of climate change and shar ecosts and benefits of action accross the city	Coherently undertaking adaptation and mitigation actions across a range of sectors within the city, as well as supporting broader regional initiatives and the realization of priorities of higher levels of government when possible and appropriate
City climate action planning should be (2)			
Relevant	**Actionable**	**Evidence Based**	**Transparent and verifiable**
Delivering local benefits and supporting local development priorities	Proposing cost-effective actions that can realistically be implemented by the actors involved, given local mandates, finances and caapcities	Reflecting scientific knowlesge and local understanding, and using assessments of vulnerability and emissions and ohter emprical inputs to inform decision-making	Following an open deicsion making process and setting goals that can be measured, reported, independently verified and evaluated

"Typical City Climate Action Planning Process", which was prepared for guiding the local administrations by UN HABIAT, is shown in the following Table 10 (ibid).

Table 10: *Typical City Climate Action Planning Process*



5.4. Contribution of the European Union to Integrated Local Climate Action Planning

Strategic steps (Stages) determined by the European Union (EU) for guiding the city administrators to develop integrated climate action plans are given in the following Table for constituting an example for the city administrations.

Table 11: *EU- Local Climate Integrated Action Plan Development Stages (EEA, t.y.)*

Stage 1: Basic Framework
• Selection of climate program/ programs / preparatory works • Determining the existing and future climatic fragilities/ vulnerabilities • Preparing greenhouse gas inventory
Stage 2: Determining priority areas and targets
• Setting emission mitigation targets • Evaluating adaptation capacity • Determining adaptation targets • Identifying basic risks and priority areas
Stage 3: Developing integrated action plan
• Putting concrete actions on time plan • Implementing the actions • Establishing resilient urban structure
Stage 4: Monitoring and reporting
• Evaluating adaptation capacity and preparation level • Evaluating emission mitigations
Stage 5: Review and revision
• Reviewing the existing actions • Developing new actions



6. ROLE OF TRANSNATIONAL LOCAL ADMINISTRATION NETWORKS IN LOCAL CLIMATE ACTION PLANNING

In the struggle against global climate change, in addition to the states, there are also transnational local authorities networks and alliance formations at remarkable number and capacity in this field. These global organizations which bring together local authorities with different levels of development from different geographies of the world, provide guidance for urban authorities to put their climate change actions into life. In this direction, they had and currently have significant supports for the municipalities on the issues of policy planning, motivation and increasing collective responsibilities in struggling against climate change. In recent period, there has been significant increase in the number of transnational networks, covenants between municipalities and local authority declarations towards climate change between local authorities.

Local/Regional Transnational Networks and Climate Alliance

- Local Governments for Sustainability/ICLEI
- United Cities and Local Governments/UCLG
- Cities Alliance, Almanya, 1990
- The Cities Act
- One Planet Cities, WWF
- Climate Policy Initiative/CPI
- Cities for Climate Protection
- UN-Habitat, Cities and Climate Change Initiative
- Compact of Mayors/ComMEU Covenant of Mayors/COMs
- Global Covenant of Mayors for Climate and Energy
- C40 Cities Climate Leadership Group/C40
- Carbon Disclosure Project/CDP
- Local Government Management Association/LGMA
- Council of European Municipalities and Regions/CEMR
- Eurocities Network
- Cities Climate Finance Leadership Alliance/CCFLA
- International Alliance of Local Governments/FMDV
- Global Alliance for Buildings and Constructions
- EU Covenant of Mayors Initiative on Adaptation to Climate Change
- EU Mayors/ADAPT Initiative
- European Green Capital
- Citta Slow
- Rockefeller Foundation Climate Change Initiative
- World Mayors Council on Climate Change/WMCCC
- The Mexico City Pact/Global Cities Covenant on Climate
- U.S. Clean Energy States Alliance/CESA
- U.S. Mayors Climate Protection Agreement, 2005
- Regional Climate Initiatives in the U.S. and Canada
- Energy Cities
- Cities for Climate Protection Campaign/CCP Campaign
- Climate Mayors, USA, 2014

6.1. Guidance of ICLEI for Local Climate Action Planning

ICLEI, in which more than 10.000 municipality authorities are members, has been working since 90s for the cities to reach sustainable criteria. ICLEI has particularly focused on the issues of struggling against climate change in cities, and transfers know-how to municipalities on how they will prepare their climate action plans. These include various areas such as energy saving plans in municipality and city-wide transportation, climate-friendly legal and institutional regulations in electricity, heating/ cooling, public transportation and transportation services which are energy consumption areas, implementation experiences (country/ municipality examples where the use of solar energy in the buildings is a legal obligation etc.), clean energy local action plans, dissemination of photo-voltaic solar panels in the cities, investment conditions, provision at a cheaper price etc.

The "Climate Friendly Cities Campaign", which was launched by ICLEI at global level in 2009, has been an initiative that created effective results in many cities of the countries. Cities which took place in this campaign in that period started to renew their sustainable energy, transportation, housing and land planning and waste management policies taking into account the struggle against climate change. Within the framework of Climate Friendly Cities Campaign, many important local services have been designed and implemented such as i)supporting energy efficiency, disseminating clean and renewable energy; ii) more green areas and a healthier urbanisation with land use planning; iii) recycling with solid waste management, waste mitigation, compost and methane gas utilization infrastructure, and iv)more effective public transportation with transportation planning, and infrastructure requirements for more effective mass transportation, passenger and bicycle transportation.

Initial Steps Taken with ICLEI for Local Climate Action Planning **-** Preparation of emission inventories under the guidance of ICLEI and calculation by local administrations of corporate greenhouse gas emissions have been the initial steps taken for local climate action plans in the cities and during the process, greenhouse emission inventories have been started to be prepared in many cities with the registered data of activities such as energy use and waste production. With these inventories, important and detailed data has been obtained for climate actions from generators operated with diesel fuel or motor vehicles operated with gasoline owned by the municipalities, to emissions that occur as a result of waste transportation services etc. Following the setting of inventory, the municipalities prepared action plans for priority sectors affected from climate change in the cities and started to launch the implementation. Municipalities also prepare inventory for the whole city in addition to corporate inventory.

ICLEI also shows the path for the local administrators on a series of issues such as disaster risk management, water management in order to decrease the contribution of cities in climate change, manage climate risks and adapt to the impacts of climate change. It should be noted there that the steps to be taken for priority sectors and themes for each city could be specific to that city.

Studies supported by ICLEA are reported at the global scale. Global Reporting Initiative (GRI), which works together with ICLEI, shows the path to public sector organizations in this direction and specifies the degrees of responsibility for the local administrations in relation to greenhouse gas emissions, reports and publishes these (de Moncuit, 2014). ICLEI publishes the carbon footprint reports of cities periodically every year.

5 Mile Stones for Local Climate Action Plans With ICLEI - According to the road map drawn by ICLE in relation to how the activities related to local climate action planning will be handled by City authorities for the world cities since the beginning of 2000s, basically 5 mile stones have been determined and these issues are summarized below in stages:

*1- Preparing greenhouse gas **emission inventory** for the purpose of analyzing the greenhouse gas emission mitigation potential in the city and evaluating the mitigation performance.*

Local authorities are required to calculate their emissions in order to put objectives that could be applied for mitigating the emissions of greenhouse gases. These calculations are based on Measurable, Reportable, Verifiable/MRV data. For that, ICLEI has developed and standardized over the process the method of creating greenhouse gas inventory (particularly in the cities) and made this official with certain protocols.[15]

Local Governments for Sustainability/ICLEI[16] standardized the greenhouse gas inventory preparation methods and emission mitigation methodologies at local level in order to provide guidance on the preparation of mitigation action plans for the local authorities and officialized the local authorities with certain protocols for the realization of these activities. Within this scope, the first version of the Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories – Version 1.1 was published in 2010 with ICLEI with the partnership of California Air Resources Board, California Climate Action Registry and The Climate Registry (California Air Resources Board, California Climate Action Registry, ICLEI and The Climate Registry, 2010).

Thereafter, ICLEI developed International Local Government GHG Emissions Analysis Protocol/IEAP in its form adopted from Greenhouse Gas Protocol published in 2009 by World Resources Institution (WRI) and World Business Council of Sustainable Development (WBCSD) and brought new standard approaches for the municipalities to make their emission analysis in a more realistic manner. All calculations in these processes rely on Measurable, Reportable, Verifiable (MRV) data.[17]

In 2014, in order that the emission inventory calculations and results of the cities prepared together by ICLEI, WRI and Cities Climate Leadership Group (C40)[18] be comparable and acceptable at global scale, Global Protocol for Community – Scale Greenhouse Gas Emission Inventories (GPC), which is currently used in a widespread manner for the local administrations, were published. This protocol was prepared based on the IPCC Guidelines for National Greenhouse Gas Inventories which was published by IPCC in 2006 and updated at certain time intervals (IPCC, 2019). Besides, in order to support the local administrations to prepare the greenhouse gas emission inventories in a practical manner and to catch a certain standard in preparing the inventory, a tool for preparing an inventory titled City Inventory Reporting and Information System/CIRIS

[15] See the "Types of Local Climate Action Plans" section of the report specified.

[16] ICLEI was established in 1990 with the title of "International Council of Local Environmental Initiatives", and then turned into "Union of Sustainable Cities".

[17] In the international negotiation processes, there was an agreement on the official foundation on the fact that struggle against climate change shall rely on MRV data after 2012.

[18] Cities Climate Leadership Group/C40 is a common platform that brings together the big cities in the world. C40 Group, which was created in 2005, has been acting in accordance with The Clinton Climate Initiative which has been helping the reduction of greenhouse gas emissions by large cities since 2006. Around 100 megacities where more than 600 million people live and which represent more than one fourth of global economy, are members of this network. C40 network provides technical assistance and information service in various sectors in local climate policies (planning, energy, transportation, adaptation, mitigation etc.).

was created in 2017 based on GPC. CIRIS was prepared in accordance with emission resources categories of IPCC towards the municipalities.

Within the framework of these protocols, the local authorities were required to put into inventory their greenhouse gas emissions arising on one hand from their institutional administration (municipality buildings, vehicles etc.) and on the other hand from their services for the city (in-city transportation, infrastructure, waste management, air pollution etc.). Local authorities usually put the priority on mitigating emissions arising from their own administration and other periphery public services (provincial directorates etc.) at the beginning since it is much easier to concentrate.

These protocols have been pioneering in the calculation of greenhouse gas emission inventory at the city scale with methods different from the greenhouse gas emission inventory at country scale and in a more comprehensive manner. Initiatives of ICLEI on this issue are further supported by ISO 14064 Standard, which is determined by International Standards Organization and which relates to greenhouse gas emissions. Under the ISO 14064 Standard, which is known as the standard by which the institutions calculate, report, monitor and verify their greenhouse gas emissis, it is a principle that 6 greenhuse gasess[19] specified in UNFCCC and Kyotoro Protocol shall be documented single by single. Countries which are parties to UNFCCC are required to report their emissions related to these six greenhouse gases. For the sake of easiness and understandability, emissions are generally expressed as carbon dioxide equivalent CO_2-equivalent. Local authorities generally indicate their total emissions in their reports as "…tons CO_2-equivalent". However, it is necessary to individually report 6 greenhouse gases in order to fully fulfill the ISO 14064 Standard conditions.

The main sources of emissions arising from the administrative structures and facilities of local authorities in their managerial limits are listed below (California Air Resources Board, California Climate Action Registry, ICLEI and The Climate Registry, 2010: 23):

- Fixed facilities that burn fossil for electricity, heating-cooling and energy generation
- Transportation vehicles operating with fossil fuel (cars, buses, trucks, sea vehicles, work machines used in agriculture, forestry and construction works)
- Process emissions arising from industrial production (cement, aluminum, ammonium production etc.)
- Leakage gases: Gases which arise voluntarily and non-voluntarily during the operations such as production, process, storage, packaging etc. and which could not be controlled (e.g. HFCs arising from refrigerator leakages, SF_6 arising from electric energy distribution and CH4 arising from solid waste storage areas etc.)

Targeting the mitigation of emissions arising from all sectoral activities of the city and performing this within a gradual plan are relatively more difficult. Because, the local authorities are dependent on country policies in the calculation of inventory of emissions arising from energy produced outside the borders of the city and consumed in the city. Here, there is a need to harmonize the greenhouse gas emission data – energy, waste, land use, buildings, transportation, industry etc.- pertinent to various sectors at the national scale declared at certain time intervals by the central administrations of countries

[19] These gases: CO_2 – Carbon Dioxide , CH4 – Methane , N_20 – Dinitrogen Monoxide, PFCs – Perflorocarbons, HFCs – Hydroflorocarbons and SF_6 – Sulphur Hexafloride.

to UNFCCC Secretariat – this data is not given at local level – with the local data. Since both levels cause the need to harmonize greenhouse gas emission data at both levels (national and local/city scale), it was brought to the agenda to perform and develop scientific studies with various modellings.

*2-Determining the greenhouse gas emission **mitigation target** of the city*

Following the stage of calculation of emission inventory, the local authorities will be required to select a reference year for the objectives foreseen in relation to the future (local election period year could be selected, a year could be selected according to technical and financial capacity etc.) and determine the emission mitigation objectives over the emission amount for which inventory is issued. Determining an absolute and digitized emission mitigation target is a legal and administratively non-binding initiative for the local administrations in many countries, and it is known that many times the local authorities are not responsible or authorities as much as the central administrations in the sector activities that constitute the greenhouse gas emissions. This situation is rather a condition that reflects the appetite of local administrations in the struggle against climate change. Here it is necessary for the central administrations to undertake responsibility and for the local administrations to develop various administrative tools that facilitate climate actions such as new laws, institutional arrangements, financing resources etc. ICLEI provides guidance to the central governments on these issues (Regional Environment Center – REC, Turkey, 2011).

*3-Preparation of "**Local Climate Action Plan**" of the City*

Preparation of the local climate action plan of a city requires the authorities of that city to demonstrate a strategic approach from various aspects (economic, social and environmental) in struggling against climate change. In the action plans which are foreseen to be prepared in an environment where all relevant stakeholders are included and have a right to say a word, using which activities and under the responsibility of which organizations the targeted emission mitigation amount will be realized, should be detailed. This also means the active partnership of any type of stakeholders with one another.

Indicators in Local Climate Action Planning

Every city and neighborhood should have an indicator specific to it.
&
Measurable, significant and usable indicators should be designated
&
Indicators should be determined based on the reference year for the targets foreseen.
&
Indicators should be determined taking into account the time interval (short, medium and long term).
&
Fairness and justice elements should be handled in the indicators.

In principle, preparation of the local climate action plans with a collective mind is principally a requirement of the Paris Agreement. ICLEI has started to put this understanding into life in more than 40 countries as of 2018, and the formation of "ICLEI Cities and Regions Talanoa Dialogue" was mobilized in the cities of these countries with the "Global Covenant of Mayors for Climate and Energy" practices and the support of international organizations such as UN-HABITAT. Talanoa is a traditional word used in the Pacific Island, meaning the making of decisions towards a joint objective within the framework of a transparent, comprehensive and active – participatory dialogue. In 2017, Talanoa Dialogue was a global platform which reinforces the partnership with all stakeholders in decision and actions to be taken for climate policies of UNFCCC Parties. ICLEI carried

this partnership structure to local level, leading to the dissemination of "Cities and Regions Talanoe Dialogue" platforms. The success of implementation of this new initiative has been designed on the promises of including almost all stakeholders in the local climate actions in the cities.

4- A strong local authority institutionalization

In order for the local authorities to demonstrate climate struggle in the cities with a sustainable approach, it is particularly important to strengthen their institutional capacities particularly in technical and financial aspects. This need is much more relevant for medium – small scaled municipalities than the Metropolitan Municipalities. When the processes which start by issuing the inventory of greenhouse gas emission amount and forces the realization of many activities that go further to reaching emission mitigation targets on sectoral basis, it could be seen that there is a need for trainings that are continued and diverse for a comprehensive climate action planning at local level. In particular, capacity increasing trainings are important in particular for the institutional renewal activities of local administrations and their performance of climate actions.

5-Monitoring/supervision, measurement and evaluation in the implementation process

Monitoring and evaluation activities which are carried out concurrently with the climate action plan implementation process of a city, is a process that need to be continued in a systematic manner for the purpose of seeing to which extent the emission mitigation amount target is reached in the plan, to control the implementation of prioritized actions, measure the results over the indicators determined and make comparisons over years. These studies also require collection of qualitative and quantitative information and evaluating these.

6.2. Contribution of CDP in Local Climate Policies

Within the scope of CDP City Program which is one of the sub-functions of Carbon Disclose Project/ Programme-CDP, which has been functioning since the year 2000,[20] data needed by other stakeholders, including the private sector, is collected and distributed for the climate change struggle in the cities.

In a research conducted by CDP City Program on the local climate action plans as of October 2016, it was determined that the number of cities which have climate change adaptation plans overall the world at global level has significantly increased. According to this, 533 cities in 89 countries in the world have integrated climate action plan that handles the impacts of climate change in addition to emission mitigation. When the regional classification is considered, 126 cities in 32 countries of Europe, 46 cities in 22 countries of Africa, 94 cities in 18 countries in Asia and Oceania, 131 cities in 2 countries of North America and 136 cities in 15 countries of Latin America have prepared and are preparing climate change adaptation plans. [21]

In this research, the local adaptation actions towards climate disasters are handled under 5 categories:

- Crisis management involving early alert and evacuation systems
- Community participation and training
- Flood mapping
- Forestation and creating green areas;

[20] CDP City Program is the first global platform that guides for strategies towards adaptation to climate change risks and mitigation greenhouse gas emissions for the municipal governments around the world.

[21] Introduction to CDP's Cities Program.

- Setting policies and targeting projects in the most fragile areas (extreme temperatures, moist, water scarcity, diseases, diseases due to insects and microorganisms etc.) (CDP, 2016 and 2017).

6.3. Impact of C40 Group in Local Climate Action Planning Process

C40 Group, activity field of which is directly the climate change policies of major cities, is a global formation that leads the local administrations in order to increase life quality through sustainable socio-economic and environmental practices in the cities in struggling against climate change for a period of more than ten years. The most important difference of C40 from other programs is that its studies are focused on major cities and have a global scale. Today C40 directs the struggle actions against climate change which respond one fourth of the global economy in the biggest 96 cities- corresponding to a population over 700 million.

C40 group generally handles the works on the issue of climate change of cities in 7 steps. These steps are listed below (Stockholm Environment Institute, 2014):

1. Adaptation and management of water resources
2. Energy
3. Financing and economic development
4. Measurement and planning
5. Solid waste management
6. Transportation
7. Regional planning and development.

C40 continues its encouraging actions in order to let the cities take precautions before the year 2020 in order to reach the global temperature increase targets agreed under Paris Agreement. The guiding works of C40 Group which direct the climate policies of big cities in the Post-Paris Period and showing the path for local climate action plans, are totally in harmony with the decisions of Paris Agreement.

Within the framework of New Climate Regime, mayors of 60 cities in Europe, North America and Australia, who are members of C40, have committed to keep the global temperature as 1.5°C and be `0` (zero) emission as of 2050, which are the important targets of Paris Agreement, to be implemented at the local level. These cities make ambitious local climate action plans from this point of view based on their 2030 targets for limiting the global surface temperature at 1.5°C and not to increase their emissions as of the year 2020.

C40 has declared that the biggest 27 metropolitans of the world, which have urban population of more than 54 million and gross national product of 6 million USD among the 60 cities in question[22] had the highest peak in their greenhouse gas emissions before 2012. However, up to date analysis demonstrate that these emission degrees have been decreasing in the last 5 years and that there was a fall of minimum 10% (C40 Cities, 2018). While the cities are reducing their emissions, they could also grow their economies despite the increasing populations in the city. These 27 cities continued to mitigate their emissions at a rate of 2% per year since their reaching to the highest stage in emission increase, yet their populations increase by 1.4% in a year and their economies grow by 3% (ibid)
C40 member cities have accomplished more than 10 thousand actions that mitigate carbon emissions that lead to climate change or increase resilient capacityto the inevitable impacts of climate change

[22] Barcelona, Basel, Berlin, Boston, Chicago, Copenhagen, Heidelberg, London, Los Angeles, Madrid, Melbourne, Milan, Montréal, New Orleans, New York City, Oslo, Paris, Philadelphia, Portland, Rome, San Francisco, Stockholm, Sydney, Toronto, Vancouver, Warsaw, Washington D.C.

within the last 5 years. There are different formations such as City Solutions Platform within the scope of C40. These organizations apply various programs and further support the local administrations on such issues as financing, communication with other cities, monitoring and reporting greenhouse gas emissions, and preparation of climate action plans.

C40 Climate Action Planning Framework 2018:

For the fulfillment of the requirements of Paris Agreement, there is a need to make systematic changes to design the climate action planning in the cities with more ambitious and concrete targets than the current practice. In particular, the big cities need to sit on a fast and ambitious emission mitigation trajectory (including making the peek at mitigation) in order to reach the targets of purification from emissions and reaching the targets of being climate resilient by the year 2050.

In this direction, Climate Action Planning Framework /CAP Framework has been developed as a result of a two-year (2017-2018) work in order to support that the metropolitan and mega cities prepare/ develop their climate action plans under the leadership of C40 Group (C40 Cities, 2019). Climate Action Planning Framework was prepared in collaboration with some C40 cities included in "C40 Climate Action Planning Pilot Program" (Boston, Durban, Londra, Los Angeles, Melbourne, Mexico City, New York City and Paris). Cities in the Pilot Program updated their climate action plans in this process in accordance with the Framework.

Climate Action Planning is designed in a more flexible manner taking into account the diversity, different and unique context of the cities (their own characteristics), and in this regard it should be considered as a climate action plan format that is specified and to be literally applied for each city.

Elements of struggling against climate change do not have the features that local authorities could plan and implement for one time. It should be well recognized that all actions, whether mitigation or adaptation, in every relevant field is an integrated part of the city services. Therefore, this cycle should have a rationality so as to continuously need new planning, applications and revisions. In this direction, the principles of C40 Climate Action Planning Framework were determined so as to give the opportunity for the implementation of innovations in local climate action plans. Here, the fact that the climate action planning in cities will evolve as a cyclical structure is taken into consideration and "Monitoring and Evaluation" is included as a must condition in almost all of city climate action plan methodologies. The following Table 12 explains the principles of a local climate action plan components in C40 Climate Action Planning Framework (C40 Cities Climate Leadership Group, 2018). In this direction, C40 Group handled in detail the response to the question of how the definition, structure, scope and basic elements of climate action plan of a city should be (C40 Cities, 2019).

Table 12: *C40 – Principles of Local Climate Action Plan Components*

PRINCIPLES	EXPLANATION
1-Commitment and Collaboration ▪ Vision, undertaking and responsibility ▪ Coordination with relevant institutions and initiatives ▪ Targets and objectives for mitigation and adaptation ▪ Human and financial resources ▪ Communication, support program and advocacy	It is necessary to include the society and business world in the process and to be in contact with them during the development and implementation stages of the Plan as well as management and coordination of the Plan (collaboration of national and local authorities).
2-Challenges and Opportunities ▪ City scope/ limits ▪ City administration and authorities ▪ Greenhouse gas emissions inventory ▪ Greenhouse gas emissions route ▪ Climate risk assessment	The plan takes into account the finding/ database and the current conditions of the city; these are the commencement emissions of the city, 2050 emission route, climate risk and socio-economic priorities
3-Acceleration and Implementation ▪ Mitigation and adaptation actions ▪ Coping with challenges ▪ Residual emissions ▪ Comprehensive climate action ▪ Monitoring, evaluation, reporting and revision	The plan defines transformation action and implementation plan; this includes the development and prioritization of actions, as well as monitoring, evaluation, reporting and revision processes

The following responds given to the question of "what should be expected from the climate action plan of a city" are further guiding for the municipality administrations in C40 Climate Action Planning Framework.

- A path should be identified for realizing an emission-neutral city by 2050 the latest, and an assertive interim target and/or carbon budget should be prepared.
- It should be shown in the current and future climate change scenarios of the city how the city would adapt to climate threats that could affect it and how it will increase itsresilience.
- It shall explain the social, environmental and economic benefits expected from the implementation of the plan and ensure that these benefits are distributed to the city dwellers in a fair manner.
- An evidence based, participatory and realizable plan should be prepared.
- The administration, authorities and partners of the city who are required to participate in the process in order to accelerate the realization of resilience targets and the objectives of mitigation of negative results of the city, should be demonstrated in a detailed manner.
- Updating of the plan should be done by creating a transparent process.

C40 Group explains the planning of climate actions in cities with 4 key (fundamental) components:

Table 13: *C40 – Fundamental Components of Local Climate Action Plan Components*

KEY (FUNDEMENTAL) COMPONENTS OF CLIMATE ACTION PLANNING	
KEY COMPONENTS	**EXPLANATION**
1. Purification from Emission	Developing a roadmap to have an emission free city by the year 2050 at the latest, and determining an assertive interim objective and/ or carbon budget.
2. Resilient to Climate Hazards	Demonstrating how the resilience of the city will be adapted and improved against the climate hazards that could affect the city now and in the climate change scenarios in the future
3. Inclusiveness and Benefits	Summarizing the social, environmental and economic benefits expected from the implementation of the plan and indicating the improvements to be brought by fair distribution of these benefits to the population of the city.
4. Management and Collaboration	Determining the city management, power centers and partners who are required to participate in the activity in order for the city to reach mitigation targets and resilient objectives.

1. Emission Purification

With an ambitious interim target, determining a path for accelerating the realization of a city that is neutral in terms of emissions by the year 2050.

In order to reach the targets of Paris Agreement, the cities are required to draw a path that is consistent with the carbon budget to be determined and reach to emission neutrality level by the year 2050 at the latest. Carbon target/ budget should rely on the emission inventory and modelling o the city, and demonstrate an accelerate mitigation (fall or reaching to peek point) in total emission neutrality by the year 2050.

An *emission* neutral city should bear the following characteristics:

- Net zero greenhouse gas emissions arising from fuel use in buildings, transportation and industry.
- Net zero greenhouse gas emissions arising from the use of energy provided from the grid
- Net "0" (zero) greenhouse gas emissions arising from the purification of wastes produced within the borders of the city
- Greenhouse gas emissions connected with emissions that occur outside the borders of the city as result of the flow of goods and services by the residents, enterprises and decision making authorities in the city reduced to minimum level under any condition

In order to overcome the challenges before the realization of neutrality in the sectors related to the emissions in question, the plan should include a methodology towards prioritization and acceleration of the actions to realize the transformational policies.

Participation of other stakeholders (government, business world and civil society organizations etc.) in the development of transformational action plans is important for ensuring fairness and accessibility in the field of designing and realizing the urban climate policies, programs and services. This situation will also ensure that the wider benefits of climate actions are distributed fairly to the extent possible. It is necessary to prioritize the transformational actions within the earliest period in order to be implemented when the plan is approved.

An emission neutral city will be required to measure any type of residual emission by the year 2050. The amount of residual emissions will possibly decrease over time with the transformation of the city and the appearance of new technologies. C40 Group works towards creating a carbon neutrality protocol towards the cities in collaboration with C40 countries in order to provide information on the best implementation methods in relation to the measurement, monitoring and mitigation of residual emissions.

2. Resilience to Climate Hazards

Demonstrating in the current and future climate change scenarios of the city how the city would adapt to climate dangers that could affect it and how it will increase its resilience.

The plan will explain the actions taken by the city administration for preparing, adapting and taking measures against the disasters which are expected to be more frequent and/ or hazardous according to the scientific estimations related to the climate changes that currently affect the city and the climate change scenarios in the future. Risk scenarios should be based on the existing standard local methodologies or an emergency emission scenario (RCP 4.5). The actions shall be based on climate risk assessment taking into account the frequency, magnitude and scope of extreme weather conditions in the city.

3. Inclusiveness and Benefits

Explaining the social, environmental and economic benefits expected from the implementation of the plan and sharing these benefits in a fairer manner to the city dwellers.

The plan will explain the benefits (qualitative or quantitative) benefits of climate actions related to the city such as alleviating poverty, energy, health and air quality, job opportunities, expense savings and increasing access to economic competition. Sustainable Development Goals (SDGs) provide beneficial indicators for the cities on this issue. C40 Climate Action Planning Framework has classified the benefits in question for the support of this process. It should be demonstrated that the actions recommended in the plan will distribute the social, environmental and economic benefits to communities working and living in the cities in a more accessible and fairer way.

4. Management and Cooperation

Determination by the city administration and authorities of the partners that need to participate in the process for reaching the targets of alleviating the negative results for the city and reaching resilience targets within a shorter period.

Implementation of any city climate plan in a successful manner relies on the management authorities which the mayor (or the elected city leader) and other local authorities have. In order to ensure harmony with Paris Agreement, the commitments at national or sub-national (regional, state, province, district etc.) and the responsibilities lead/ to be lead by the non-state stakeholders and the business world. It will be indicated at which points the collaboration and advocacy will be required while determining the priorities of adaptation opportunities and alleviating the negative results that have the highest potential.

The following issues shall be taken into account in order to ensure that the actions towards transformation in the city action plan are realized in the shortest period.

a) Identifying mutual interactions for handling the adaptation and mitigation in an integrated way,

maximizing the efficiencies and minimizing the investment risk.

For long period, governments, enterprises and civil society organizations have traditionally approach towards mitigation of emissions and adaptation to the impacts of climate change as two separate agendas. However, while the way is taken towards the ambitious purposes of Paris Agreement, it is necessary to strategically use the city resources and budgets for the realization of both agendas together and thus to maximize the efficiencies and minimize the investment risk. For that reason, synergies between mitigation and adaptation will be determined in the Plan for benefiting in the most effective manner from the interaction between the actions.

b) Creating an evidence based, participatory and realizable plan towards realizing mitigation and adaptation that is based on the understanding of the authorities of the city and the broader scope

The actions should be created in an evidence based manner including an emission inventory, scenario modelling and climate risk assessment. The actions should be prioritized taking into account the capabilities such as impact, realizing the objectives of the city and the participatory benefits. In order for the actions to be realizable, they need to be determined with the participation of the society and prospective partners and short term details and long term directions should be demonstrated on how they will be realized. It should be shown in the plan that gradual actions towards mitigation of emissions will provide for verifiable deductions in emission required for reaching the turning points specifies in the path of emission neutrality and that the actions for adaptation to climate impacts will be sufficient for decreasing the local climate risk and increasing over time the resilience of the city. The cities should determine the financing and human resources required for the implementation of mitigation and adaptation actions.

c) Realization of climate action planning in line with the management and notification systems, creating a transparent process for communicating and updating the progress recorded

Long term undertakings included in the plan should be demonstrated with a transparent process towards notifying the progress recorded and evaluation of the impacts. Changes to be made in the plan should be in accordance with the existing management and notification systems and be based on impact assessment in order to ensure that the city acts in accordance with interim and 2050 targets. Notification of the climate actions of the cities to a joint global platform could also assist in announcing the contributions made towards the realization of Paris Agreement. The efficiency and scope of the Plan should be supported with comprehensive communication, access and advocacy programs that target at stakeholders within the body of and outside the city administration. This situation will also ensure that all stakeholders have trust for their roles.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7. PRACTICES OF LOCAL CLIMATE ACTION PLANNING IN TURKEY

The fact of urbanisation in Turkey, which has 30 metropolitan cities, 51 provincial and 1399 district municipalities, with a total population of 82 million 3 thousand 882, has gradually been directed towards metropolitan cities at a higher rate and the rate of those residing at provincial and district centers is 92.5% (TUIK, 2019). The rate of Metropolitan Municipalities to total municipality population is above 80%.

Table 14: *Municipalities in Turkey (TUIK, 2019)*

Status	Number:
Metropolitan Municipality	30
Provincial Municipality	51
Metropolitan District Municipality	519
District Municipality	403
Town Municipality	396
TOTAL	**1399**

When this situation is considered from the point of struggling against climate change, the importance of mitigating the greenhouse gas emissions of metropolitan cities and strengthening the adaptation capacity to the impacts of climate change, are clear.

7.1. Past Studies to Shed Light On Local Climate Action Plans

When the studies conducted recently in relation to the climate change in cities are examined, it will not be misleading to say that this issue is rather handled within the framework of urban environmental management policies and practices. These studies could be considered as the starting stages of policy plans characterized as to be a basis for the local climate action planning activities.

7.1.1. Climate Change Actions Practices in Urban Environmental Management Plans

In the multi-country project (Bulgaria, Romania, **Turkey** Croatia) titled "Strengthening the Capacities of Environmental Authorities at Local and Regional Level for Implementing EU Environmental Acquis", the practices for preparation of "Urban Environmental Management Plans" were made in Samsun and Erzurum provinces of Turkey between 2006 – 2008. Within the scope of the project, institutional capacity development trainings were given to the urban administrative units (governor's offices and municipalities) and the urban environmental management plans of both provinces were prepared (IRMO, 2016). While preparing these plans, the main elements of EU Urban Environmental Thematic Strategy, namely;

- sustainable city administration
- sustainable urban transportation
- sustainable urban design
- sustainable urban construction

were handled and these elements were associated with **climate change** issues.

In these studies, which are based on the urban environmental management plan model of the EU, issues related to climate change are included in the section where "Eco Budget/Green Budget" calculations of the cities are made. These calculations made for energy and water saving in the city structures are the important issues in the climate change struggle of the cities today.

Besides, among the European Foundation Urban Sustainability Indicators, which were used in the project, were the air quality, waste management, urban mobility, clean transportation, citizen participation, energy and water sectors as well as "**global climate change**" (Habitat, 2007).

All these issues which require a strategic and systematic management approach in relation to climate change have not been sufficiently studied in the Urban Environmental Management Plans of Samsun and Erzurum. The basic reason or this is that the urban problems in the country mainly focus on water supply, waste water and waste management sectors and the EU grant funds were mainly allocated for the development of these sectors in that period.

On the Way to Climate Planning,
Aarhus Municipality Practices on Environmental Management Plan

In the "Urban Environmental Management Plans" model practice of the EU, Aarhus (Denmark) Municipality was among the cities that came to front as good example practices at the beginning of 2000s (2006). In line with the energy use indicators of Aarhus, namely the calculations of ;

i) electricity and heat consumption in municipality building
ii) CO_2 that is released in municipality buildings and the companies and greenhouse gas that is released from use in Aarhus city area.

It could be seen that Aarhus has launched planning studies for struggling against climate change long years ago. In addition to the energy use by the municipality within the scope of the plan, targets and actions were determined in line with in-city traffic, water use, surface water and natural / biological diversity indicators. Aarhus Environmental Management Plan involves various sector plans. While the environmental management plan of Aarhus municipality was being prepared, a system was created in relation to the water management and energy consumption management, which were among the important problem areas in the struggle in cities against climate change. According to this, while determining the targets in relation to water quality in the rivers and the values of water discharged to Aarhus bay in the case of Aarhus example under the water resources sub-plan, waste water treatment sector – costs of scenario towards prevention of overflood of sewage systems under high precipitation – and the "Aarhus river water sector plan – was taken into account in the environmental management of the city and the financial budgets were calculated according to these sectors.

Today Aarhus is a city which has been implementing climate action plan for long period based on its past experiences and which targets to be "Carbon-Neutral City" in 2030.

7.1.2. Climate Change Action Plan Experiences in City Councils

Climate change struggle policies were also included among the policy axis for the development of the city included in the City Action Plan prepared under the leadership of Çanakkale City Council in 2009, and a separate section titled "Çanakkale Climate Change Action Plan" was included in the Master Plan. Çanakkale Climate Change Action Plan is the first climate action plan of Turkey at local level (Çanakkale Municipality, 2019). The Plan identified policies, projects, agencies in charge and targets almost in every sector and thematic area spoken about today in the climate struggle in Çanakkale (transportation, energy, waste, emission mitigation in building sectors, renewable energy, precautions for the impacts of climate change, protection of ecologic media, water management, agriculture and food safety, reduction of consumption etc.) Shortcomings that are highlighted in Çanakkale Climate Change Action Plan are that there is no cost estimation for the actions defined in the Plan for the realization of the targets and the Plan lacks the monitoring and evaluation mechanisms.

7.1.3. Local Environmental Action Plans (YEÇEPs) and Climate Change Actions

Another study conducted in the past that could shed light in Turkey on plans for struggling against climate change in the cities is the Local Environmental Action Plans (YEÇEPs) prepared for cities selected under the coordination of the Ministry of Environment and Forestry. YEÇEPs, which were first commenced in Ankara, Yalova and Gaziantep at the first stage with the support of EU funds (EU Capacity Development in Environment Project, 2005) were prepared as pilot in 3 provinces including Mardin, Trabzon and Aksaray (Regional Environmental Center/REC, Turkey, 2011).

YEÇEPs, which provide support to the implementation of national policies in the field of environment at local level and environmental institutionalization at local, have been the models that are implemented mostly in Central and Eastern European countries in those periods. Since YEÇEPs provide support to the societies for the implementation of national policies related to environment and fulfillment of legal requirements, the preparation of YEÇEPS in some of regional countries in question was adopted as a legal obligation. In Turkey, this issue could not pass beyond the signing by relevant municipality authorities to sign voluntary letters of intention including YEÇEP commitments.

In the YEÇEP of Mardin, the issue of climate change was handled in the "Mardin's Green Agenda" section. Here the climate change projections made in Euphrates Basin were evaluated separately for Mardin and the increasing temperature values of the city were determined.

7.1.4. Approach to Struggle Against Climate Change in Integrated Urban Development Strategy and Action Plan (KENTGES)

Integrated Urban Development Strategy and Action Plan (KENTGES/2010-2023) could be considered as an important step in Turkey in terms of guiding the path in a participatory approach to sustainable urbanisation policies in 2010 and handling the issues of climate change in cities within a wide scope as the first time (KENTGES, 2010).

Issues which are handled within the scope of urban planning in the context of climate change in KENTGES have been the transportation, spatial planning, green areas, energy efficiency and renewable energies, infrastructure and waste management. KENTGES also covered broadly the targets of improving efficiency in urban water and

energy use particularly in metropolitan cities, forestation in urban areas and thus increasing the green cover in open, permeable areas, preventing the distortion in air quality and mitigating the greenhouse gas emission amounts.

KENTGES Target 14: (Creating Environmentally Sensitive and Livable Cities); Under the scope of 14.1 and in planning of settlements, approaches will be adopted that take into account sustainable use of natural resources, protection of ecologic balance, preventing the pollution, supporting energy efficiency and environmental sensitivity.

KENTGES Action 14.1.4: Call was made for "Energy Efficient, Energy Effectiveand Climate-Sensitive Settlement Strategies will be prepared". According to this action, adaptation and mitigation strategies will be developed towards climate change in settlement areas and principles and procedures will be determined towards planning and building (Realization period, 2010-2023).

7.2. Turkey's Climate Change Action Plan and Local Climate Action Planning

Climate Change National Action Plan (IDEP) included policies for struggling against climate change at local level. According to this, the section of IDEP which foresees that the climate actions shall be disseminated overall the country, namely "*In order for more efficient struggle against climate change at local level and strengthen adaptation capacity, it is highly important that the local authorities integrate this issue into their own strategic plans and programs and prepare Climate Change Local Action Plans*" is highly important, and attention was driven to two issues here (Republic of Turkey, Ministry of Environment and Urbanisation, 2011: 2).

The first is that the local climate action plans are an important capacity development tools for local administrations; and the second is that the climate change should be included in corporate strategic plans. Although pursuant to IDEP targets there is a section titled "Works Conducted Within the Framework of Climate Change Action Plan" in some of the institutional strategy plans of some municipalities, this section is left blank, or, insufficient expressions were seen such as "No information could be acquired in relation to works conducted within the framework of Climate Change Action Plan". Here, following the Local Elections on 31 March 2019, the municipalities in Turkey (with a population above 500.000) are required to prepare their strategic plans within six months and officialize this though city council decision pursuant to the relevant provisions of Public Financial Management and Control Law No. 5018. It could be considered that the municipalities evaluate their strategic plans as legal and financial basis in the implementation of local climate action plans.

7.3. Climate Change and Local Planning Elements in Habitat III National Report of the Republic of Turkey

The topics included in the "Habitat III Turkey National Report" which was prepared in 2014 by the Ministry of Environment and Urbanisation for the United Nations House and Sustainable Urban Development Third Conference (UN-Habitat III)[23] [24] are urban demography, land and city planning, environment and urbanisation, urban governance

[23] Third United Nations Conference on Housing and Sustainable Urban Development (UN-HABITAT III), 7-20 Ekim 2016, Quito, Ekvador.

[24] For the Turkish and English version of Turkey Habitat III National Report, see:http://www.csb.gov.tr/gm/mpgm/index.php?Sayfa=sayfa&Tur=webmenu&Id=13937

and regulations, city economy, house and fundamental services, and the issue of climate change was examined as a separate section than the elements of new urban agenda in the field of environment and urbanisation in the Report.

When Habitat III Turkey National Report is examined, it could be seen that its foundations are constituted by the principles of Turkey Integrated Urban Development Strategy and Action Plan (KENTGES/2010-2023) and includes many elements included in the New Urban Agenda. Issues related to climate change included in the National Report are indicated below: The report indicated the following:

- The necessity to change the consumption patterns and use of new technologies for struggling against climate change in the cities and ensuring energy efficiency. In addition, a series of targets were included on efficient and effective use of energy in buildings and using renewable energy resources.
- It was emphasized that problems were encountered at the stage of harmonization of measures to be taken in Turkey in relation to climate change in cities with economic sustainability and that there were problems in supporting these issues with national incentive mechanisms.
- "In the long run, there is the necessity to get rid of the pollutant cities and transform them into green cities. Green building and green city actions should be encouraged with the development of green technologies (Republic of Turkey, Ministry of Environment and Urbanisation, 2014: 24).
- Some innovative standards (e.g. Ecologic Settlement Unit) were brought to the agenda in order to ensure that urban transformation areas are resilient to the impacts of climate change and the climate disasters and to ensure mitigation of carbon emissions. It was foreseen by the Ministry of environment and Urbanisation to support the activities related to climate struggle in the cities in line with the determination of "Ecologic Settlement Unit" Standard in 2016, and it was planned to accelerate the works by selecting a pilot settlement. In this scope, it is known that pilot implementation project is being carried out by the University on Reserve Construction Area specified by the Ministry in Eskisehir Province, Odunpazarı District, Kocakır Location (Republic of Turkey, Ministry of Environment and Urbanisation 2015).
- In particular, the fact of migration from rural to urban has been emphasized due to the droughts caused by climate change in the rural and the negative impacts on agricultural sector.
- The loss of life and property in cities caused by the meteorological disasters experienced and for that reason the inevitable importance of cities in the struggle against climate change were emphasized. Within this framework, emphasis was put on the need to update the existing disaster law so as to functionalize the concepts such as hazard mitigation, conservation planning and risk management so as to include the disasters related to climate change and technologic disasters.
- The interaction between in-city transportation and climate change policies was further elaborated and it was indicated that the smart transportation systems applied in the cities in this regard mitigated the carbon dioxide emission arising from traffic (metro-bus practice in İstanbul). Besides, attention was driven to the presence of transportation planning in urban transformation applications which is not sustainable, has high cost, pollutes the environment and also is unsafe.

These issues which are included in Turkey's Habitat III National Report are a direct part of the elements of struggling against climate change in cities, and

these are the issues to be included in the local climate action plan.

7.4. Local Climate Action Planning in the Decisions of Environment and Urbanisation Council (2017).

There are some important decisions in the Environment and Urbanisation Council met in 2017 with the theme of "New Vision in Urbanisation" that have a guiding character in the preparation of local climate action plans in cities and there are recommendations in almost all of the Council Commission Reports which could be directly / indirectly beneficial in struggling against climate change in the cities (Republic of Turkey, Ministry of Environment and Urbanisation, 2017).

Discussions were held in the Council on the fact that the cities will be more vulnerable due to the increase in extreme air events due to climate change in Turkey and evaluations were made in relation to climate adaptation actions at local level within the framework of UN-HABITAT III/ New Urban Agenda.

"There is a need to discuss the benefits of technology and the efficiency of the resources to be spent with multiple stakeholders in the new urbanisation vision of Turkey, and to create a capacity on this issue. It should not be forgotten that a line of development to be provided in this area will have the potential to create a significant value for Turkey. In particular, the resilient *cities, technologies in the field of climate change, disaster management, urban infrastructure, transportation planning, energy and governance could have significant contributions in the new urbanisation vision."*

"In particular, whether the data in the plans which have been newly prepared, such as Provincial Environmental Order Plan, is healthy or not, causes doubts. Besides, in the current status, taking into account many new data types from carbon foot print to climate change data in the planning studies for the new data type has become a significant requirement."

"Use of tools such as urban pollution maps and city climate maps as the ecologic basis in the environmental order plan and master plan is critically important in terms of the sustainability of the natural systems in the city. Despite the fact that Turkey has Climate Change Adaptation Strategy and Action Plan, it has no climate change plan prepared on basis of the provinces. The most recent initiative on this issue was the actions performed in order to plan the first Local Climate Action Plan in Turkey in 2010 between Gaziantep Metropolitan Municipality and French Development Agency (AFD). One of the outputs of the project was the design of the eco-city, which recommended to city planning to be designed according to climate change."

"Green Network/Infrastructure, Nature-Based Solutions: It is expected that the urbanisation rate in the world will reach to 75% by the year 2050. Taking into account that the urban areas will also expand in our country, the increase of pressure of urbanisation on the climate system will be started to be perceived as a big environmental problem. Cities will become more fragile as a result of increase in the extreme condition as a result of climate change. In this regard, parks and recreational areas will appear as "critical infrastructures" in the variable city environment of today".

Under the light of the foregoing evaluations, the recommendations of the Council taken by "Identity, Planning, Design in Our Cities Commission" in relation to local climate adaptation actions are given in the following Table (ibid. p. 69).

Table 15: *Environment and Urbanisation Council 2017, "Identity, Planning, Design in our Cities Commission" Recommendation on Local Climate Change Planning*

Environment and Urbanisation Council 2017, Identity, Planning, Design in our Cities Commission						
Problem Area	**Recommendation No**	**Recommendation**	**Explanation of the Recommendation**	**Organization in charge**	**Related Agencies / Institutions**	**Realization Period**
2.1. Natural – Ecologic Values Dimension	2.1.3	In the name of establishing the green infrastructure networks and developing relevant nature based design solutions, national and local policies should be established to guide planning and design	Control of more carbon dioxide in the natural ecosystem by ensuring carbon sequestration and storage, Increase of biodiversity and preservation of wild life, decrease in maintenance and repair costs as a result of water and energy saving high air quality, will bring together the increase of natural life environment and the recreational areas. For that reason, ***climate change adaptation plans of the cities should be prepared and integrated into the existing strategies***	Ministry of Environment and Urbanisation	Local Administrations, Ministry of Development, Ministry of Forestry and Water Affairs, Ministry of Energy and Natural Resources, Universities, Housing Development Administration of Turkey (TOKİ), relevant NGOs	Long Term[25]
	2.1.4	Eco-smart city solutions should be developed and quality control tools such as certification should be put into life.	Mitigation of urban heat island effect, green building/ neighborhood certification systems, smart city applications should be made widespread	Ministry of Environment and Urbanisation	Ministry of Development, Ministry of Forestry and Water Affairs, Ministry of Energy and Natural Resources, Universities, TOKİ	Short Term[26]

[25] Here the "long term" is defined as 15 years or more involving the macro targets.
[26] Here the "short term" is defined as a year.

Republic of Turkey, Ministry of Environment and Urbanisation Strategic Plan (2018 – 2022).

Axis 1. Environment
Purpose 1. Protection of Environment and Nature, **Struggling Against Climate Change**
TARGET 1.2 Air Quality and Noise Control, **Struggling Against Climate Change**, Protection of Ozone Layer; Performance Indicators (number of metropolitan municipalities that completed **local climate change action plan**/cumulative)

7.5. Ministry of Environment and Urbanisation Strategic Plan and Local Climate Action Planning

The first official initiative towards the preparation of local climate action plans of Turkish cities, was handled in the Strategic Plan of the Ministry of Environment and Urbanisation (2018-2022). According to this, it was foreseen that 30 Metropolitan cities will prepare climate change action plans at the first stage by 2022, and according to the calendar, 10 metropolitans were held responsible in 2020, and 20 in 2021.

The strategy also emphasizes that municipalities in other scales (province, district) should increase the number of their climate action plans. In the Strategic Plan in question, there was the target of enacting a regulation on local climate change action plans. The units of the Ministry related to climate change are continuing to receive stakeholder opinions for this new regulation.

It is not yet clear whether this legal regulation initiative will be a subject of changes to be made in the fundamental laws related to municipalities or the Environmental Law that governs the main policies as an environmental law. This issue could be handled within the framework of municipality laws and relevant municipality regulations. Within the scope of the existing regulations, laws that are directly related to the municipalities (Law No. 5393, Law No. 5216, Law No. 6360) did not grant the local administrations any responsibility in relation to creating and implementing climate change policy. There is no direct legal regulation as of today in relation to the obligation of local administrations to prepare and implement climate action plan. When seen from this point, what the superior law norm of the regulation planned to be issued will be is very important.

Local administrations that have 'public legal entity' in Turkey are the provincial special administrations, municipalities and metropolitan municipalities and the municipalities are the administrations to be highlighted in terms of combating climate change issues. In this classification and according to REC-Turkey Municipality Survey results, 65% of the municipalities which have relatively limited authorities and economic powers do not provide serviced in relation to climate change works and do not consider this issue in their own area of responsibility (Regional Environmental Center/ REC Turkey t.y (a)). Although there are some targets for the transformation of the cities in Turkey's national climate strategy, policies and action plans, it could be said that there has not occurred yet any real agenda on the issue of climate action planning in the cities. However, in the recent period, the number of municipality administrations which consider the climate change policies as a reflection of social policy understanding and voluntary services, has been increasing.

When the legal regulations related to the issue in some countries are examined, it could be seen that in the UK, with the planning act (2008) the municipality councils were granted with the task of including the climate change in the development plans of the cities for the sake of integration with urban sustainability strategies. It is also known that pilot projects are implemented under ICLEI-CCP Program in relation to Councils for Climate Protection at the local level. In addition to the UK, France and Denmark are among the countries which have made it a legal obligation for the municipalities to prepare and implement local climate change strategies and action plans.

7.6. Local Climate Action Planning Emphasis in International Commitment Documents

In the international policy commitment documents of Turkey related to climate change (Republic of Turkey, National Communications, INDC Turkey and others) actions related to local climate action planning could be included more compared to today. In the up to date context, some projects are mentioned in the "Settlements and Tourism" section of the 6th National Communication in relation to adaptation to the impacts of climate at local level. In the 7th National Communication, information was included about some projects related to climate change and local climate action plans of the municipalities which are the members of Local Governments for Sustainability (ICLEI) and EU Covenant of Mayors (COMs). 235-236 and 263-265).



8. LOCAL CLIMATE ACTION PLANS OF TURKEY

The initial steps in Turkey in relation to climate change combating were taken with the "ICLEI-Climate Friendly Cities Campaign" which is coordinated by REC-Turkey in 2009. 14 Municipalities participated in the campaign, including Alanya, Beyoğlu, Bodrum, Çankaya, Halkapınar, Kadıköy, Karadeniz Ereğli, Keçiören, Muğla, Nevşehir, Nilüfer, Sivas, Şişli, Yalova cities. Municipalities which undersigned the campaign declared their intention to reflect the activities related to climate change in the city services and realized certain projects within this scope. These works have mostly been on waste management, energy efficiency and awareness rising.

In recent period, climate change works has been launched in Turkey by some of the metropolitan municipalities and provinces and district municipalities by being included in the transnational networks.

Membership of Municipalities in Turkey to Transnational Local Administration Climate Networks

The municipality administrations in Turkey has stated to develop their activities in the field by becoming members to transnational local administration networks related to climate change. Among the leading of these institutions are EU Covenant of Mayors (COMs), the renewed "Global Covenant of Mayors for Climate and Energy", C40, ICLEI and Eurocities Network. Konya Metropolitan Municipality is a first in this subject and has become a member of World Mayors Council on Climate Change (WMCCC) in 2007 and has taken leading steps in local climate action planning. Another transnational formation that works for ensuring that European cities reach to sustainability norms is "Eurocities Network". Since Turkey is not an EU member, it is not included in the Eurocities Network with the status of "full member", however it could participate in two different status that are defined. For example, İstanbul, İzmir, Bursa and Şanlıurfa are "associate members" of Eurocities Network; Beyoğlu and Bakırkoy are "associate participants" and Sampas Smart Cities IT and Communication Company, which is a Turkish IT company in the municipality sector, is a Eurocities Network member with "associate business participant" status.

This mobility accelerated in Paris Agreement process. The number of local climate action plans has been increasing in recent period. It is seen that the policies of greenhouse gas emission mitigation are a the focused in the local climate change action plans prepared and the plans mostly include targets on the energy sector, in-city transportation and waste sector.

8.1. Guidance for the Beginning

The first study that provides guidance to the municipalities in local climate action planning processes is conducted by REC Turkey and guidance was provided within this framework to the issuance of corporate greenhouse gas inventory of municipalities.

Another guide is the study named: "How Should Climate Change Be Responded at Local Level: A Guide for Turkish Cities" (Krellenberg & Turhan, 2017). This study presented to the attention of local administrations a planned and integrated approach on various issues related to climate change that need to be handled in cities in climate struggle.

Çankaya Municipality (Ankara) prepared a document titled "Climate Change: Life Problem Guide" in that period for increasing public awareness in 2010. The guide included a series of recommendations on less energy consumption, heat insulation, efficient use of electrical house appliances, water saving methods, increasing green areas, developing public transportation systems.

Under the scope of "Capacity Development Pilot Program for Preparation of Resilient City Strategies

and Actions Plans Adaptable to Climate Change/ Bursa-2013/2014", which was prepared for Bursa Metropolitan Municipality under the coordination of Ministry of Environment and Urbanisation, a guide titled "Cities Adaptation Support Package/ CASP" was prepared in order to support the planning of adaptation actions (Republic of Turkey, Ministry of Environment and Urbanisation, RICARDO-AEA, 2014).

Guides which were planned to be prepared under the scope of "Sustainable Urbanisation Project Under The Scope of Struggling Against Climate Change/ Turquoise Cities Program", which has been carried out in collaboration between the Ministry of Environment and Urbanisation and Yildirim Bayezit University between 2016-2018[27] included also a separate guide on Local Climate Action Plans. It is known that the purpose of the Turquoise Cities Program, which has a budget of 3.8 million TL and covers 13 cities of Turkey (Adana, Ankara, Antalya, Bursa, Çanakkale, Hatay, İstanbul, Kayseri, Kocaeli, Konya, Sakarya, Samsun and Trabzon) and Nicosia from Northern Cyprus, it to create the infrastructure for implementation in all cities for the national climate change policies, including first the metropolitans.

8.2. Sustainable Energy Action Plan Experiences of Municipalities

Greenhouse gas emissions in Turkey mostly originate from urban sources. The existing spatial expansion styles in Turkey, and the increasing urban population and consumer behaviors, continue to be greenhouse gas emission source in the cities. In Turkey, the municipalities perceive the struggle against climate change rather as interventions focused on energy sector and they prefer making sustainable energy action plans rather than preparing integrated (including mitigation and adaptation together) and comprehensive local climate action plans. This situation has been the basis for the development of an increasing cooperative atmosphere in the preparation of local climate action plans among municipalities and energy consultancy companies.

Municipalities that are signatories to EU Covenant of Mayors (signatories) have prepared greenhouse gas emission inventories and sustainable energy plans within the framework of climate action planning and some of them also indicated greenhouse gas emission mitigation target year. For example, Antalya, İzmir Büyükşehir, Kadıköy, Bornova, Karşıyaka, Maltepe, Seferihisar, Çankaya, Nilüfer (mitigation + adaptation) and Tepebaşı municipalities have undetaken that they will mitigate their emissions by 20-30% until 2020. For Çankaya Municipality (Ankara), this rate was determined as 25% in 2020 (Çankaya Municipality, t.y.). Besides, İstanbul, Kadiköy, Nevşehir and Yalova are the cities which published their carbon footprint reports every year.

Municipalities Working on Climate Action Planning at District Scale in Turkey

Beşiktaş, Kadıköy[28], Maltepe Şişli and Pendik Districts in İstanbul; Bornova, Bayındır, Karşıyaka, and Seferihisar Districts in İzmir; Nilüfer District in Bursa; Tepebaşı and Odunpazarı Districts Eskişehir ; Çankaya district in Ankara (Çankaya Municipality, t.y.).

[27] Preparation of the guides for the parameters and indicator of "Local Climate Action Plans, MRV and Sustainable Cities", which are included in Turquoise Cities Program, is included in the terms of reference of the project.

[28] Kadikoy Municipality has completed its sustainable energy action plan in 2010, and the Municipality has a project titled "Integrated and Participatory Climate Action which it has implemented in 2018.

8.3. Local Adaptation Action Planning Experiences of Municipalities

The importance of local adaptation strategies and adaptation actions has been increasing for improving the resilience of cities to the impacts of climate change, and what is expected from the local climate action plans at the point of ensuring a balance between anthropogenic (induced by human) emissions and swallow capacity in the cities is to develop targets towards protecting this balance and thus obtaining "0" Emission Gap at the city scale.

In Turkey, local authorities do not take into account the measures for adaptation to climate change as much as they do the measures for mitigating emissions. One of the past works that has foreseen to handle the adaptation actions in cities against the impacts of climate change is the "Project for Developing Awareness on Impacts of Climate Change and Adaptation", which was carried out by the Ministry of Environment and Urbanisation, and completed in 2017, and which aimed at increasing awareness in public on adaptation, and determining the existing capacity in cities related to the preparation of local climate action plans. Under the scope of the project in question, training was provided to teachers and students (including university) in 8 pilot provinces selected, namely Edirne, Bursa, Konya, Kayseri, Trabzon, Samsun, İzmir and Muğla from Black Sea, Aegean, Marmara and Central Anatolian Regions.

Antalya Metropolitan Municipality carried out works towards evaluation of regional and sectoral fragilities against climate change so as to support the policies of adaptation to the impacts of climate change between 2012 – 2013. Within this framework, an EU project was carried out titled "Expansion of Resilient Cities to Climate Change" and under the scope of the project, activities were carried out in the coastal cities of Turkey for the strengthening of sustainable urban development policies for risk management and cities resilient to the impacts of climate change.

The first step taken under the coordination of the Ministry of Environment and Urbanisation for climate adaptation action planning at the local level was the study under the scope of "Pilot Program for Capacity Development for Preparation of Climate Change Adapted Resilient City Strategies and Action Plans (2013-2014)". In the Project, the corporate capacity of Bursa Metropolitan Municipality and its administrative organization for the adaptation activities, were strengthened. In collaboration with ICLEI, the project outputs in the process wherein the experiences obtained in the preparation of climate change adaptation strategies in many cities of Europe were transferred to Bursa, have been guiding not only for Bursa but also for other municipalities. No other municipality than Bursa Metropolitan Municipality has any local climate adaptation action plan in Turkey.

It is known that there are works related to climate adaptation action planning under the guidance of European Climate – ADAPT Program in Bağcılar, Pendik and Şişli districts of İstanbul, Bayındır district of İzmir, Nilüfer district of Bursa (Republic of Turkey, Ministry of Environment and Urbanisation, 2018: 235). The municipalities are the municipalities that are members to 2030 Climate - ADAPT Program, which is the European Climate Adaptation Program within the scope of "2030 Climate and Energy Framework" of EU.

8.4. Local Climate Action Plan Experiences of Municipalities

Among the 30 metropolitan municipalities, today 7 metropolitans (İstanbul, Bursa, Antalya, Muğla, İzmir, Gaziantep, Kocaeli, Denizli) are the cities that have taken steps in the climate action planning processes

(issuing greenhouse gas inventory, setting the strategy, determination of impacts, target year and other). Works have been launched in this area in Kahramanmaraş, Manisa, Mersin, Hatay and Erzurum Metropolitan Municipalities. Ankara Metropolitan Municipality has no action directly related with the climate action planning. Following are the summaries of local climate action plans of some metropolitan municipalities:

Gaziantep Climate Change Action Plan

The first metropolitan authority that prepared Climate Change Action Plan in Turkey is Gaziantep Metropolitan Municipality. This Plan which covers the time period between 2009-2011 basically focused on the energy sector and it is an example initiative at local level under Turkey's Climate Change Strategy Document and Climate Change National Action Plan, setting out the systematic steps of carbon management in the city (Gaziantep Metropolitan Municipality, 2011). The 15% mitigation target of the Plan, which is declared for Gaziantep for year 2023, has been the first mitigation target set in Turkey at the local level. Plan targets include establishing climate change institution in Gaziantep, taking innovative managerial steps for encouraging and supporting the technologies with low carbon intensity in various economic sectors, and Gaziantep Climate Change Action Plan has policies and implications that target at the sustainability of the city as revealed as a result of broad analysis of adaptation policies against possible climate change impacts and greenhouse gas emissions. The plan was renewed in 2016.

İstanbul Climate Change "Integrated" Action Plan

İstanbul Metropolitan Municipality is a member of and/ or at active participant statue in some transnational local administrations climate networks related to climate change. These are Mega Cities Climate Leadership Group (C40), Compact of Mayors, Covenant of Mayors, Mexico City Impact and UCLG-MEWA Environmental Committee.

Works in İstanbul for struggling against climate change trace back to ten years earlier. There is the target of setting a carbon exchange program for İstanbul in the İstanbul International Finance Center Strategy and Action Plan, which was prepared in 2009. For reaching this target, there have been actions in the Plan for İstanbul Metropolitan Municipality to implement low emission projects and providing contribution to the occurrence of a local carbon market (Republic of Turkey, Prime Ministry State Planning Organization, 2009). İstanbul Metropolitan Municipality issued its greenhouse gas inventory in 2010.

The metropolitan authorities explained the carbon emission amount in accordance with international standards in April 2013 as the first time. İstanbul Metropolitan Municipality renewed the greenhouse inventory for electricity, transportation, natural gas, waste and other fuels in 2015 and took the steps in the new process for "İstanbul Climate Change Action Plan/ İİDEP (2015-2018) (İstanbul Metropolitan Municipality, and İSTAÇ, 2015). The basic elements of the Plan were completed, which could assess the risks and opportunities related to climate, and support the participation of stakeholders and capacity increasing activities taking into account the adaptation and mitigation options within the context of climate change, in collaboration between İstanbul Metropolitan Municipality and İSTAÇ (İstanbul Environment Management Industry and Trade Inc.). In İstanbul Integrated Climate Action Plan, UAST and UKCIP methodologies were taken together to create a unique methodology for the city and the Plan was prepared within this framework. In this process, İstanbul Metropolitan Municipality has engaged with a 7-stage integrated work at İstanbul scale so as to

include both mitigation and adaptation targets. These 7 stages are: Preparation of the Roadmap; Preparation of Greenhouse Gas Inventory; Preparation of Climate Scenarios; Determining the Risk, Opportunities and Vulnerabilities; Organizing Stakeholder Meetings; Creating Action Plan and Awareness Raising and Capacity Development. It is expected that the Plan will include detailed actions on the issues of how it could mitigate the climatic fragilities of İstanbul in the long run in concrete terms and on how the emissions of the city could be mitigated. In the process, significant studies were conducted that have been the basis of İstanbul's climate action plan and source for the main plan, and the fundamental ones are;

i) "New Climate Regime and İstanbul Climate Change Action Plan (İİDEP) Methodology, Climate Scenarios (Part 1)" and
ii) "İstanbul Climate Change Action Plan (İİDEP), Climate Change Risk, Opportunities and Fragilities Analysis Report".

Bursa Energy and Climate Change Adaptation Plan

The plan of Bursa related to climate change is "Bursa Energy and Climate Change Adaptation Plan /BUSECAP" BUESCAP resembles an integrated climate action plan model as it involves the adaptation strategies and actions for climate change in addition to sustainable energy strategies, and in this form it is the only one in Turkey. The climate adaptation part of the Plan was prepared with the guidance support of European Environmental Agency. In the Plan, vulnerability analysis was conducted at Bursa city scale so as to cover various thematic issues (Urban Heat İsland Effect; in-city water areas; public health; green areas, biodiversity, green corridors and climate resilience in physical planning), and the strategies and actions were determined accordingly (Bursa Metropolitan Municipality, 2017).

İzmir Sustainable Energy Action Plan

As a signatory to EU Covenant of Mayors, İzmir Metropolitan Municipality has determined and started to implement greenhouse gas emissions in various sectors that are operating in the city in order to fulfill its responsibility to mitigate carbon emission by 20% as it has undertaken until 2020. İzmir Metropolitan Municipality has put into life the smart traffic system İZUM (İzmir Transportation Center) within the framework of "Sustainable Energy Action Plan" and with this system which collects the waiting and crossing data at the crossroads at a single center, it was targeted to mitigate 251 thousand tons of carbon emission until the year 2020 (HaberTürk, 2019).

İzmir Metropolitan Municipality has been continuing its practices to shift to electrical and rail systems from tires in public transportation and as a first in Turkey, 20 electric buses (green engine, low base) have been actively used as a fleet for in-city transportation in İzmir. In order to provide the energy for electric busses that are in the traffic, the roof of workshops of ESHOT (Electric Water Gas Bus and Trolleybus / the bus operator of İzmir Metropolitan Municipality) was coated with solar panels. There are also 15 newly built passenger ships and three car ferries service in maritime transportation, which are made of carbon composite and are nature friendly.

Researches are ongoing in order to ensure resilieince of İzmir against climate change and creating scientific foundation for the climate adaptation action plan planned in the future. Within this scope, an urban infrastructure system mapping was performed for İzmir/ Balçova district, which was selected as pilot for the realization of "Green Re – vision: A Framework for the Resilient Cities Project",

which was prepared with the EU grant fund between 2017 -2018 (EU Climate Program), and land use and change models were prepared Under the scope of this study wherein the urban ecosystem services were mapped, plan decisions were included that provide guidance in order to adapt to the impacts of climate change in İzmir.

Kocaeli Greenhouse Gas Inventory and Climate Change Action Plan

Within the scope of a project that is financed by EU grant funds, the "Kocaeli Greenhouse Gas Inventory and Climate Change Action Plan", which was completed in September 2018 with the support of REC-Turkey, was based on the 2 basic outputs summarized in the following table (Regional Environmental Center/ REC Türkiye, t.y. (b) and 2018; İklimIN, t.y.)

Table 16: *Kocaeli Greenhouse Gas Inventory and Climate Change Action Plan Basic Outputs*

Kocaeli Greenhouse Gas Inventory and Climate Change Action Plan	
Output 1: Kocaeli Greenhouse Gas Inventory	**Output 2: Kocaeli Climate Change Action Plan**
Inventory of the greenhouse gas emissions that occur at municipality borders was prepared and mitigation target was determined by making projections for future. Stakeholder analysis was made and the current status was demonstrated. IPCC National Greenhouse Gas Inventory Guides developed in 2006 by the Intergovernmental Panel on Climate Change (IPCC) were used in the preparation of Greenhouse Gas Inventory and also the Global Protocol for Local Greenhouse Gas Emissions prepared by International Sustainable Cities Union (ICLEI) in 2014 which is widely used overall the world by local administrations was taken into account.	The Plan was prepared with focus on emission mitigation The final mitigation target and actions determined which constituted a foundation for the greenhouse gas inventory action plan, which will be the first basic output of the project, were prepared based on the outputs of the inventory. The Action Plan was basically prepared in accordance with the "Sustainable Energy and Climate Action Plan Guide" prepared in 2016 by the European Commission Joint Research Center (EC JRC) and Global Covenant of Mayors for Climate and Energy. While the plan was being prepared, a sectoral approach was followed and measures and actions required to be taken by different sectoral stakeholders were reported. Various strategic plans made by the municipality beforehand were taken into account in reporting. Sector and thematic areas identified in the Action plan are buildings, transportation, waste/ waste water, energy, industry and land use.



9. EVALUATION NOTES FOR THE SUCCESS OF IMPLEMENTATION OF LOCAL CLIMATE ACTION PLANS IN TURKEY

- The sector and areas which could best represent the mitigation - adaptation synergy in combating climate change in the cities are the energy, building, waste and transportation sectors as well as food safety, management of green areas and water resources. The local administrations will have included the struggle against climate change into their self-governance processes if they integrate these issues to the services they currently provide.

- In addition to contributing in the implementation of national climate policies at local with local climate action plans, the local administrations could play role in the development of basic policies at national level. It is possible to see this potential in the local climate action plans that have been gradually increasing in number it different scales (metropolitan municipality, province, district) in recent periods.

- Adapting to the impacts of climate change has not yet been the subject of urban planning process and applications in Turkey. Let aside the need for making climate change adaptation action plans at local level, in order to make the cities resilient to the impacts of climate change, it is necessary to focus on issues related to site selection, intensity and land use pattern, urban risk regions etc. in the city planning process.

- The importance of collective work in struggling against climate change at the local is apparent. This means that neither of the stakeholders (municipalities, civil society organizations, professional organizations, peripheral bodies of central administration, local universities, business community, women organizations, youngsters, trade unions etc.) should be left behind at any stage from strategy to implementation. However, the fact of climate change is not perceived yet has a social policy area in Turkey. One of the important shortcomings that is to be highlighted in the existing local climate action plans is that the collective meeting with relevant actors of the community is weak within the plan targets. Accountability and data sharing problems also depend on these issues.

- Municipalities have the obligation to prepare institutional strategic plans that contain their holistic policies within the framework of an investment programming within six months following the election process. The legislation that force the municipalities towards strategic planning are as follows:

    - Public Financial Administration and Control Law No. 5018
    - Metropolitan Municipality Law No. 5216
    - Municipality Law No. 5393
    - Provincial Special Administration Law No. 5302
    - Regulation on Principles and Procedures Related to Strategic Planning in Public Administrations
    - Regulation on Performance Programs to be Prepared by Public Administrations
    - Regulation on Activity Reports to be Prepared by Public Administrations
    - Regulation on Working Principles and Procedures of Strategy Development Units
    - Public Internal Control Standards Communique

As it could be seen, Strategic Plan has a strong regulation infrastructure and is a plan which all local administrations with a population of more than fifty thousand should necessarily prepare – renew the existing one - after the local elections. Inclusion of direct actions and implementation tools for struggling against climate change in the strategic plans in question is important in terms of integrating the targets of the local climate action plans if necessary. It is a requirement of the provisions of municipality law (Municipality Law No. 5393, Article 41) that the opinions of masses that represent the public and of stakeholders related to the city should be obtained in the strategic planning preparation and implementation processes. This situation is an opportunity that will also strengthen the multi-actor decision making approaches of local climate action plans.

- Combating climate change includes actions in a very broad range from the increase of awareness and managerial capacities to the renewal of urban infrastructures and to low carbon investments in the in-city transportation. In the struggle given against climate change by the local administrations, it should be determined at the beginning at which issues collaboration will be made with the stakeholders at each stage and in all processes (preparation, implementation, monitoring).

- The local climate plans do not have any financial strategy and detailed budget. The actions do not have any budget and cost correspondence. It should not be ignored that the equities of the municipalities are the resources of potential climate financing. A rational and systematic strategy should be followed on which type of financing the local administrations will need in climate action planning (credit, grant, national, local, foreign resource and other)

- The contribution of climate action plan practices on local sustainability is almost none. This situation has two basic reasons. The first is that the elements of struggling against climate change are not taken into account in all planning processes at the local level, and the second is the ignorance of climate change impacts adaptation strategies in climate action planning. In the existing local climate action plans, monitoring and evaluation mechanisms are either not well designed or non-existent. The sustainability of the plans is also discussed for this reason.

- Analyzing the climate change in cities and in this context generating many data on the climatic characteristics of cities, land uses, green areas and plan decisions, are the starting point for the implementation of local climate action planning decisions. Within this framework, it is necessary to improve scientific knowledge at local level on science-policy-implementation links, to generate/ collect systematic knowledge and to proceed with climate planning by evaluating these. The scientific researches, data, risk assessment etc. in Turkey that will be the basis for urban climate action plans are very few, and it is apparent that these should be increased.

- The scientific studies conducted recently have demonstrated that rapid urbanisation has impacts on local and regional climate. Urbanisation lead to change in local land cover and utilization and this situation is an important element that affects the local climate parameters. In this regard, the relationship between land cover/ use change and the local climate change has been analyzed by many

researchers over the temperature and other climate parameters, population increase, population intensity relationships. The negative impacts of urbanisation and increase of urban population accelerate the climate change, causing the distortion of global cycles.

- It should not be forgotten that physical (spatial) planning decisions affect the climate and therefore planning is an important tool in developing the cities according to climate change sensitivity. Because, an important indicator of urban climate change is the change that occurs on land cover caused by the urban growth. In principle, the most important local regulatory tool is the spatial planning.

- It was determined that there are little number of researches in Turkey in the literature analysis related to urbanisation and climate change in Turkey, and it was seen that the issue has been handled within a narrow framework and from a single point of view in the existing ones. More importantly, researches on the relationship between urban growth and local climate change within the context of spatial planning are very few if not none. This situation points out the fact that the approach towards areas related to climate change in the urban planning practice that has been ongoing is quite weak. Integrated policies are required for emission mitigation for mass construction increasingly implemented in the cities and for the adaptation to the impacts of climate change.

- Local climate action plans could be used as a basic path indicator for directing the future land use decisions in our cities where the urbanisation process is ongoing (within the context of mitigation, adaptation and integration). Thus, it could be possible to create living environments that are climate resilient in spatial terms and to direct the urban dweller to a low carbon life style. Besides, relationships between energy, climate and urban design could be focused in particular in the local climate action planning process. City architecture and spatial design applications could be shaped accordingly.

- It is among the important steps to be taken to evaluate the local climate action plans as part of in-city transportation planning process in order to develop a sustainable and climate-resilient urban development. Within this framework, it will be beneficial without loosing any time to construct relevant physical infrastructure as required within the framework of policies to be developed in relation to the use of bicycle as a mainstream traffic vehicle in city transportation planning.

- It is important in the existing physical planning regulation how and to what extent the issue of climate change is included in the regulation. It is stated under Article 8 of the Reconstruction Law No. 3194 that "Plans and projects that are sensitive against climate and have ecological character could be prepared" Spatial Plans Construction Regulation (2014), which is one of the implementation regulations of the Reconstruction Law, includes some provisions that should be taken into account in local climate action planning processes.

  Under Article 7 titled "General Planning Principles" of the Spatial Plans Construction Regulation (2014), it is stated that *"…f) It is a principle that the balance between protection and utilization of natural, historical and cultural values are protected. g) plans shall include decisions related to required reinforcement for increasing the quality of buildings and environment. ğ) the disaster, geologic and natural data shall be taken as basis in the plans."* Within this scope, at the research and analysis

stage, the following statement is indicated "*studies such as urban risk analysis could be done towards problem and needs analysis*" and "*for settlements where disaster and other urban risks are high or for the constructed urban environment, risk analysis or conservation planning works are conducted if deemed necessary. Risk mitigating measures taken for disasters and other urban risks are taken as basis in the plans*". The expressions stated point out a framework that could be interpreted within the scope of urban risk analysis, rather than being a basic directing element in relation to climate change.

Similarly, Article 17 related to Data Structure Analysis included under Section 5 titled "Principles Related to Spatial Strategy Plans" of this regulation mentions "climate change" as a hazard and it is described within the data to be obtained from institutions and organizations and surveys and analysis to be made within the scope of this data. Whereas the concept and scope of climate change started to find a place for itself though limited with various definitions and expressions in the planning regulation, it could be seen that the scope related to implementation is not yet at sufficient level.

Besides, according to Spatial Plans Construction Regulation, preparation of urban technical infrastructure impact assessment reports has been formulated as a law. This condition is important for the climate disasters experienced in the cities.

Besides, the fact that the regulation includes provisions that foreseen shortening the transportation distances in the cities bring to the agenda the evaluation of in-city transportation practices which always have a place in local climate action planning.

- Legal, administrative, managerial and financial tools should be mobilized in order to convert **urban transformation** practices into an opportunity in combating climate change and direct the investments within this framework.

  In a research conducted by the Ministry of Environment and Urbanisation in 2014, it was indicated that it is possible to decrease high amount of greenhouse gas emission by climate change struggle measures to be taken within the scope of urban transformation projects (Republic of Turkey, Ministry of Environment and Urbanisation, 2018). According to this, reconstruction of 6.5 million houses is planned together with urban transformation and it is foreseen that 30% of the existing building stock will be renewed by the year 2023. Through the insulation constructed in the new houses, an energy saving of approximately 40% is planned and thus it is foreseen that the mitigation of total greenhouse gas emissions as a result of urban transformation activities between 2012-2023 will be 42.7 million tons carbon dioxide equivalent. According to the new roadmap of the urban transformation, urban transformation will be targeted to complete in 20 years overall the country. According to this, it is planned to transform 300 thousand houses every year. In this framework, the statement made by the political will that "special urban transformation constitution" will be created for each city is important and it will be necessary to handle these regulations in accordance with climate action plans.

  The Ministry of Environment and Urbanisation put the emphasis on mitigating the greenhouse gases that cause climate change, ensuring energy efficiency, using renewable energy resources and increasing the swallow areas for greenhouse gas emission in the urban transformation plans. Within this framework,

"Green Building and Settlement Certification Systems" have been started in the cities as one of the innovative methods as example to the works, and such type of initiatives are an important solution tool for the struggle against climate change in the building sector which will absolutely be handled in the local climate action planning in almost every city. What is expected here is to develop the principles and methods of urban planning which has been implemented in Turkey for long taking into account the climate change policies and transform when required. The purpose of Green Certificate Regulation for Buildings and Residences, which was published in 2017 on Green Building and Settlement Certification Systems, is to regulate the principles and procedures related to creating assessment and certification systems for mitigating the negative impacts of buildings and settlements using natural resources and energy in an efficient manner, and determining the tasks, qualifications and responsibilities of those who will take role in the assessment and certification process. The Regulation covers the assessment and certification of environmental, social and economic performances of existing and new buildings taking into account their technical specifications and requirements.[29]

- The connection between metropolitan-districts and governor's offices/ municipalities is important in the management of municipalities for struggling against climate change. The success of horizontal collaborations and cooperation points out a well-designed climate plan management by creating the theme of mutual collaboration and cooperation in metropolitan regions and district municipality network -connections and peripheral authorities of central governments (governor's offices and their extensions). If there is no such collaboration in the metropolitan regions, conflict arises between the authority areas of local administrations in managerial and spatial terms, which has a negative impact on the climate action planning processes. The corporate network of the local climate action plans of 30 big cities that are foreseen to be prepared at the first stage by the Ministry of environment and Urbanisation (one of which is the mega city, İstanbul) should be established with this approach.

- It is well known that the Ministry of Environment and Urbanisation is in the process of preparing a regulation on the local climate change action plans. It is not yet clear whether this legal regulation initiative will be a subject of changes to be made in the fundamental laws related to municipalities or the Environmental Law that governs the main policies as an environmental law. As it could be remembered, a comprehensive change was made in the Environment Law in the recent period (October 2018), and despite the fact that some new provisions related to climate change is included in this change, there is no provision on the planning to be made within the scope of climate change at local level overall the country. This issue could be handled within the framework of municipality laws and relevant municipality regulations.

- It has recently been evaluated by the relevant authorities to establish a unit in charge of urban climate action plans and to struggle against climate change within the body of the municipality so as to support institutionalization at local level, and it could be suitable to handle such a law enactment within the framework of municipality laws.

[29] See Official gazette dated 23.12.2017 and No. 30279.

- Preparation of local climate action plans that are directly in compliance with superior policy documents for example the implementation of decisions related to local climate action planning as specified in the Strategic Plan of the Ministry of Environment and Urbanisation (2018-2022) is important. Decisions taken in 2017 Urbanisation Council in particular in relation to climate change are guiding for the local climate action planning overall the country.

- No mechanisms have yet been determined (physical, administrative, financial, participatory) on how the climate change policies at national scale will be transferred to local planning processes and how the collaboration between center – local would be ensured, have not yet been determined. For example, it should be determined to what extent the existing legal regulations are guiding and forcing in terms of climate resilience of the cities in the preparation of physical plans, and the shortcomings should be determined. Thus local climate action planning will be seated on a more rational foundation and the local administrations will be prevented from being limited to their own priorities and preferences.

- Inclusion of local administrations to the process of national climate change policy production/ development will ensure that climate actions are rationalized and put into life at local level. It could be ensured that mega cities (İstanbul) and metropolitan administrations are continuously represented in the Climate Change and Air Management Coordination Board (IDHKK) in line with the criteria to be determined (population, industry-intense, tourism-intense etc.) within the context of first steps to be taken for this approach. On the other hand, there is yet no formation that handles the issue of local administrations and climate struggle together within the Climate Change Technical Work Groups within the body of IDHKK.

- The role of central institutions in the local climate action planning is very important. When considered from the point of corporate responsibilities of the central authority, in the current status, the Climate Change Department and the newly established Climate Change Adaptation Department, which are the offices affiliated to the Environment Management General Directorate of the Ministry of Environment and Urbanisation, deal with the local climate action plans. The orientations in the Ministry in relation to local climate action plans are generally done by the units in question. It is also important that other general directorates in the Ministry are included actively to the local climate action planning policy and practices as per their working areas.

- The Local Administrations General Directorate affiliated to the Ministry of Interior were included as main service unit to the Ministry of Environment and Urbanisation under the name of Local Administrations General Directorate[30] with the Presidential Decree No.1. With this restructuring,[31] there is a shift from the tutorship oriented administrative supervision understanding, towards a sustainable city management understanding and practice that concentrate on strengthening technical and administrative capacities of local authorities, supporting and healthy fulfillment of local services including reconstruction and

[30] See Official gazette dated 10.07.2018 and No. 30474.

[31] The administrative tutor on local administration is held by the Ministry of Interior.

environment. With this restructuring, local administrations branches were established within the body of provincial environmental and urbanisation directorates. Thus, it is expected that local climate action planning policies and implementation foundation will be strengthened in Turkey.

- As a matter of fact, the circular titled "Climate Change and Disaster Measures" dated 22.01.2019, which is prepared with the technical support of units of the Ministry related to climate change within the administrative role of the Local Administrations General Directorate for the purposes of accelerating the struggle of local administrations against climate change, and was sent to all governor's offices and municipalities, is important in this aspect This Circular indicated that there were increases in the number and magnitude of the disasters in recent years including floods and overflows depending on global climate change and it was asked from the local administrations, which have the ability and responsibility to intervene to the problem on site and with urgency, to put into life the precautions to be taken immediately.

- For the purposes of avoiding similar problems, two prime ministry circulars, which have a similar content, namely the Circular dated 9 September 2006 titled "Brook Beds and Floods" and Circular dated 20 February 2010 titled "Refinement of River and Brook Beds", were send to correspondent units by the signature of H.E. Recep Tayyip Erdogan, the President, who was then the Prime Minister. The purpose of the Prime Ministry Circular 2010 directly relates to struggling against climate change, and included the following statement: "*Taking into account the differences that occur in the amount and magnitude of the precipitations in connection with global climate change and the flood disasters caused by overflows that have frequently hit our country in recent years, it is required to improve the river and basin beds within earliest convenience in order to struggle against any possible floods to occur in the future*".

- An important institutional structure is the Local Administration Policies Board which has been created within the scope of Presidential Government System, being an important institutional structure for strengthening the connection of local climate action plans with superior policies, and the field of duties of this board include urbanisation and local administration, migration and settlement, environment, forest, water and similar areas, urbanisation fed from the cultural heritage, smart urbanisation, public investment planning pursuant to Bosphorus Reconstruction Implementation programs and effective environmental management. The fact that the Board has a word to say in the development of local climate action planning will ensure that the basic policies of the government will be taken as basis within the scope of local climate struggle and the practices will be integrative.

- The patterns that mobilize the municipalities (elected authorities) in struggling against climate change are environmental and economic as well as political since these directly relate to the society. The service understanding of municipalities related to climate change is directly connected with the extent to which the political parties they are affiliated to put emphasis on climate change policies.


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