NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Action Plan

2030 Climate Neutrality Action Plan

of the City of Košice

Annex No 1

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Summary

An abstract **summarizes the content** of the 2030 Climate Neutrality Action Plan (CCC Action Plan) that is developed jointly by local authorities, local businesses, and other stakeholders.

In 2022, Košice was selected by the European Commission as one of 100 climate-neutral and smart cities. This membership represents another step in the city's so far short journey towards climate neutrality. The support from NetZeroCities, for which we are grateful, and the preparation of the Climate City Contract mean many opportunities for the city, which we are trying to translate into concrete actions.

During the preparation of the Climate City Contract, we identified many barriers that we sought interventions and partners to overcome. The preparation of the action plan started with informal and individual interviews with departments in the city office. It continued with briefings and discussions with local partners who see the issue as socially relevant. Efforts to involve government institutions in the process have not met with the response the City expected. However, at the local level, with each successive discussion, an ecosystem of partners began to form, out of which emerged clear support and a strong mandate for the City to build climate neutrality. This support is perceived by the City as a desired change that has committed the City to expanding its collaboration and current ecosystem of partners so that each is an advocate for building a climate neutral City to its other partners, customers, and residents.

The portfolio of interlinked interventions proposed in this action plan builds on the city's existing emissions data, with an emphasis on the sectors that are the largest GHG emitters (buildings, transport), existing collaborations, upcoming and new projects and activities that are needed to provide a pathway that will lead the city to the desired change.
In developing the pathway, the recommendations of the mission have been accepted within the scope of the city's current capacities and taking into account the readiness for such work. In order to work across the city and with all target groups, including vulnerable groups, all sectors, academic, private and third sector, were involved in the development of the action plan.

To accelerate the climate transformation, four main priorities have been defined (1. Energy efficiency and the transition to renewable energy, 2. sustainable mobility, 3. Sustainable urban development and 4. Progress through dialogue and cooperation), which will be implemented through 14 key activities. To strengthen the transition, changes in governance, working with citizens to raise awareness on climate change and delivering solutions through social innovation will be implemented simultaneously.

An important part of the effort to reduce energy consumption and greenhouse gas emissions has been to see what it can do for us beyond these headline targets. For this reason, all of the proposed activities were also discussed in terms of additional benefits that go far beyond energy savings and emissions reductions - co-benefits that will promote energy independence for residents, financial savings, higher asset valuations, cleaner air, better quality public space, better health, and more, resulting in a better quality of life for residents in our city.

The design of the action plan has been influenced by the existence of many barriers (lack of dates, finance, time, competences, structural but also behavioural), which we perceive as present and which we believe will also be removed in the near future through the Climate City Contract, allowing us to meet all the objectives of the mission.
We see the emissions reduction target, which we are able to achieve under current conditions, as one of the milestones on the path to climate neutrality. We feel that participation in this EU Mission and the implementation of the Climate City Contract will create space for improvements beyond the current action plan. And it is this fact that will create a better starting point for any future update of the Action Plan and support for the city's ambition to achieve climate neutrality.

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Abbreviations and acronyms

Abbreviations and acronyms	Definition
AFOLU	Agricultural, Forestry, and Land Use
AP	Action Plan
BAU 2030	Business as Usual 2030 (BAU 2030) scenario.
BEI	Basic Emissions Inventory
CO2	Carbon Dioxide
EOI	Expression of Interest
ETS	Missions Tranding System
EU	European Union
GHG	Greenhouse gas
GIS	Geographic Information System
IPCC	Integrovernmental Panel on Climate Change
IPPU	Industrial Process and Product Use
SECAP	Sustainable Energy and Climate Action Plan
SUMP	Sustainable Urban Mobility Plan

1 Introduction

Introduction

Košice is the metropolis of Eastern Slovakia and with 229 040 inhabitants (2021), the second most populous city in Slovakia. With proximity to neighbouring countries (20 km to Hungary, 80 km to Poland, 90 km to Ukraine) the city is a natural regional social and cultural centre, as well as a centre for industry, business, and education (seats of three universities). The city plays a role in the East-West transport link, forming a connection between Eastern and Central Europe. The topography of the city is diverse. Its shape is formed by the Hornád river valley that it occupies. The hilly north is surrounded by massive city-owned municipal forests, while the south opens towards low-lying flatlands.

The development and growth of the city was steady for centuries, but since the early 1960s the city grew rapidly, from less than 100 000 inhabitants up to almost a quarter of a million in the late 1980s. A massive metallurgic plant (current US Steel) was built beyond the southern border of the city, and it was the main driving force behind the growth of the city, which was the fastest-growing city in the former Czechoslovakia. The present shape and form of the city is a result of urban planning from the second half of the 20th century - the old medieval town surrounded by a mixture of old and new industrial areas, massive collective housing estate areas and former villages, which were overgrown by the expanding central city and an infrastructure heavily favoring individual car transport.

The city started a new process of transformation in the early 2000s - from a heavy industry-dependent town into a more diverse and cleaner metropolis with a mix of services, culture and education supplementing the remaining heavy industry. The systematic decrease of workforce in heavy industries is substituted by a corresponding systematic increase of workforce in IT (10.000 employees), culture and creative and soft industries. This change in the local mindset was rewarded by achieving the prestigious title of European Capital of Culture in 2013 and becoming a member of Unesco Creative City of Media Arts in 2017. The innovation potential of Košice is also significant due to the presence of a strong academic and research environment, as well as the entrepreneurial background of international companies.

Another great opportunity for the city is the arrival of large investments, which create new job opportunities and emphasize sustainable development. One of the largest investments in Košice and its surroundings is the Volvo car company, which is building its factory on the southern border of the city of Košice. Given that Volvo Car Košice will be 100% climate neutral from day one and will produce fully electric vehicles, we see this as a significant potential to support the city's transformation towards climate neutrality not only in the field of industry, but as an inspiration for other companies and the residents themselves.

The city has been facing a decline in population over the last decade, which is caused not only by a lack of job opportunities, but also by strong suburbanization. The daily population is estimated at 300 thousand inhabitants. This creates strong pressure to address mobility.

In addition to the decline in population, the city's problems are vulnerable groups of residents. On the one hand, it is the increasing number of elderly residents (aging population), on the other hand, it is the large group of marginalized residents in the city. In addition to the localities where such people are concentrated, there are also 12 illegal settlements in the territory of the city, where 184 families, i.e., 988 persons, including 550 children under the age of 15, were living at the end of 2020. The City of Košice, in cooperation with the third sector, actively addresses the issue of people in need. It was the first in Slovakia to develop the successful "Housing first" concept and is currently participating in the European Homeless Census.To ensure a just transition, the city, together with all interested partners, will have to look for solutions that will bring the socio-economic benefits of the green transition to all its inhabitants and enable access to energy for all groups of the population.

Košice has acknowledged the importance of transformation to an environmentally sustainable city; thus, has proactively started to work on areas of development. Košice participates in international initiatives as Covenant of Mayors for Climate & Energy (2019), Green City Accord (2021) and Basque Declaration (2020) and projects as European Commission's Urban Innovative Actions (UIA) - Košice 2.0 project (2020), URBACT IV Programme - Cities for Sustainability Governance (2023, Interreg Danube Region Programme – HARMONMISSIONS, Harmonisation of Missions in the Danube region (2024) and CLIMAAX (2024). Through these projects, it not only addresses the change of governance of the city in favour of sustainable development, but also works with other sectors and residents to find solutions to climate change. It also seeks solutions for specific situations of concern to its inhabitants, such as the possible slide into energy poverty. It is precisely the answers to prevent this threat that the city, together with the third sector, will be looking for in the implementation of the Building Power project (2024), supported by the Pilot Cities Programme.

In addition, the city has developed initial plans to reduce CO2 emissions. Over the last 8 years, the city has started to see the need for a climate transformation more intensively and existing policies such as the Sustainable Mobility Plan (2015, update 2022) have been updated. Subsequently, the first GHG inventory (Baseline Emissions Inventory, 2018) and climate strategies such as the City's Climate Change Adaptation Plan (2022), the Climate and Sustainable Energy Action Plan (SECAP, 2022), the City's updated Master Plan 2022-2027 and others have been developed. Together with the forthcoming new spatial plan, these documents not only assess the current situation, but also define the city's steps towards its further transformation. At the same time, the city is also starting to work more intensively with its citizens through various campaigns such as the Earth Day, the European Mobility Week, the Car Free Day, etc. The city's efforts are supported by various initiatives from the academic, private, and civic sectors, which are not only directly involved in the city's activities but are also implementing their own projects to help citizens better understand the impact of climate change.

At the same time, it supports the decarbonisation of large enterprises, such as US Steel Košice, which is one of the largest air polluters in Europe, but also one of the largest employers in the city. The city, from the point of view of its competences and opportunities (spatial plan, membership of many boards), is actively addressing the needs of these companies in their decarbonisation process. Another major project that has come back to life after 30 years and is strongly advocated from the city level is the introduction of geothermal energy into the central heating system of Košice, which supplies 75% of the households in Košice with heat.

Several interesting projects related to the production and use of hydrogen are planned in Košice, e.g. a factory for the production of green hydrogen should be established, which will use waste, U.S. Steel Košice steelworks are planning to produce hydrogen with a new technology that includes electrolysis of water and steam reforming of methane, or the deployment of hydrogen buses for regional and suburban transport is being considered.

As can be seen, the city is working hard to tackle climate change. The city has the ambition to move towards climate neutrality, while trying to take advantage of all the opportunities available to the city and its partners. As the city's journey towards climate neutrality is still very short, we see an opportunity to acquire the necessary resources (knowledge, finance) by being part of the EU mission 100 Climate Neutral and Smart Cities, of which the city is a member since 2022. Even if we are not currently able to meet the desired objectives of the mission and achieve climate neutrality, there is a strong internal motivation in the actions of the city and other actors to deal with the many obstacles that stand in the way of achieving climate neutrality.

The participation in Cities Mission has opened the door to new support and collaborations to accelerate the transformation of the city. However, working towards climate neutrality is a long path that requires implementation of a series of transformative actions that require not only the involvement and cooperation of residents and key partners in the city, but also sufficient time for preparation, implementation, and extensive financial resources. Such an example is the large-scale geothermal energy project for the city's central heating, which is starting these days and its complete completion will be far beyond 2030.

The presented Climate Treaty of the City of Košice represents a tool that has connected the existing strategies and plans of the city, leverage and, together with the efforts of other partners of the city, represents a joint and more intensive effort to transform the city in the climate field. The preparation and implementation of the Climate City contract is a great challenge for the city and the partners who have entered this process with us precisely because they are aware of the need to jointly find solutions in this urgent social issue. Together, we have the opportunity to overcome barriers more effectively and make better use of opportunities on the way to climate neutrality, thus building a success story that can be an example not only for Slovak cities, but also an inspiration for cities beyond our borders.

Work Process

The preparation of the Climate City Contract was managed by the city's strategic development department. As this department covers the preparation and monitoring of the city's key climate policies, the preparation of the Climate City Contract began by leveraging existing experience and partnerships that expanded as the Action Plan took shape.

Our great ambition was to involve the state in the process, where we proposed defining and enforcing specific policies to promote climate neutrality at the city level and identifying and launching effective support mechanisms. However, this effort remained without much response.

In November 2023, a workshop was organized with advisors from NetZeroCities, where the work process and the creation of the transition team were discussed.

A Core Team is made up of representatives of the strategic development department. The Core Team intensified its work towards the end of 2023. Work on the Climate City Contract began with an assessment of the existing policies and goals that the city has committed to so far. After a thorough analysis, the preparation of a participatory process began, the aim of which was to identify actions for the upcoming Action Plan. The participatory process for preparation of the Climate City Contract was carried out through individual Interviews and group discussions at several levels.
First, these were interviews and discussions with relevant departments in the city and businesses and organizations that are established by the city. Not only organizations that operate directly in the sectors were invited to the discussion, but also organizations that work with private sector, residents at the urban or community level, whether through various cultural or educational events. This was followed by a process in search of solutions with stakeholders through individual discussions as well as Urbact's local climate group workshops, which identified further potential partnerships and actions. We see the Climate City Contract as a continuous process that is also open to other stakeholders operating in the city.

Together, we have developed an action plan that reflects on relevant emissions domains, fields of action and explored all systematic levers in the context of our current data and capabilities and setting the stage for better future iterations.

The ecosystem that has been created consists of 13 signatory partners and other partners based on existing collaborations that have been formalised through memoranda of cooperation, etc. However, discussions have been held with dozens of other partners who, although they have not legitimised their support at the moment, are partners with whom we will continue to work closely. Based on the partners' agreement, the whole ecosystem will be further managed from the city level (by the Core Team) and relevant information and opportunities will be regularly shared among the actors according to their affiliation to each priority. In order to further develop this ecosystem, meetings of all signatories will be organized at least 1 x quarterly. All further interactions between partners will be done on an individual basis.

Table 1 shows the remaining emissions that represent the City's target values for the year 2030 (2040) by sectors. They are compiled from data currently available to the city. Any missing data will be subject to completion in the next iteration.

Table 1

Table I-1.1: Climate Neutrality Target by 2030 (2040) – GHG emissions by sectors (ktCO2) – BAU 2030 projections			
Sectors	**Scope 1**	**Scope 2**	**Scope 3**
Stationary energy	63 kt CO_2 (reductions 49%)	164 kt CO_2 (reductions 71%)	N/A
Transport	36 kt CO_2 (reductions 70%) *Excluded - air transport (EOI)*	N/A	N/A
Waste/wastewater	N/A	N/A	19 kt CO_2 (reduction -11%)
IPPU	Excluded – due to *registration under the EU Emissions Trading Scheme (EU ETS, EOI)*	N/A	N/A
	hydro fluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3)	N/A	N/A
AFOLU	N/A	N/A	N/A
Other	7 kt CO_2 (reduction 80%)	N/A	N/A
Geographical boundary	**Same as city administrative boundary**	**Smaller than city administrative boundary**	**Larger than city administrative boundary**
(Tick correct option)	X	N/A	N/A
Specify excluded/additional areas	N/A	N/A	N/A

Map

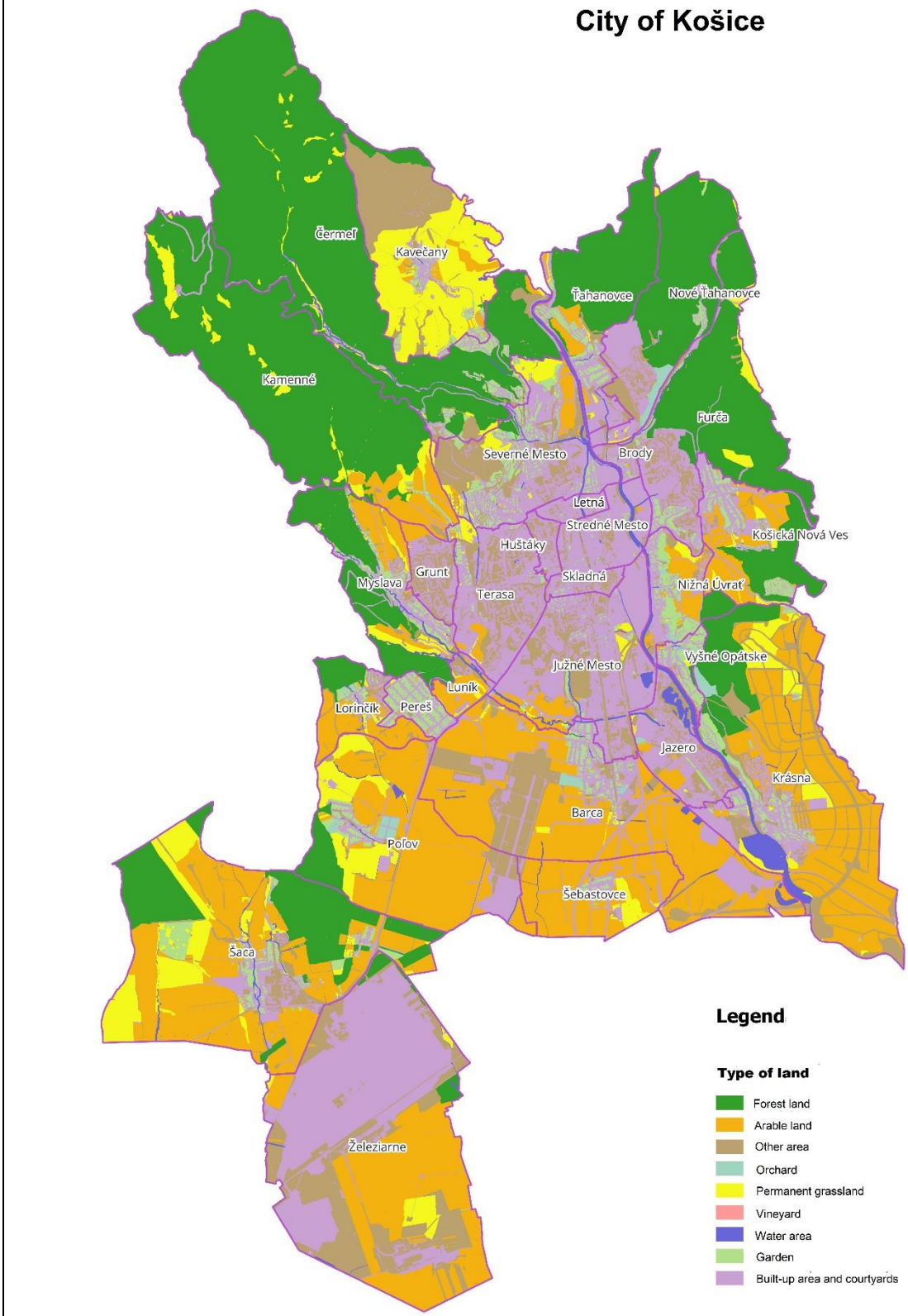


Figure 1 Map of the City of Košice

1 Part A – Current State of Climate Action

1.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

GhG Emissions Baseline inventory

The first more comprehensive data in the field of emissions were processed by the City of Košice for the year 2018 in the form of the "Basic Emission Inventory". The data focused mainly on key sectors such as buildings, transport, energy production and partly waste. Another emission inventory was processed for the year 2020 for the purpose of the SECAP document. Again, the buildings, energy generation, transport and waste sectors were addressed without a breakdown by individual SCOPE. Data from the IPPU and AFOLU sectors from the city level were not addressed, therefore one of the first actions for future iterations of the Climate City Contract will be to complete the full data analysis. The unavailability of data and working with it presents a major barrier that the city must overcome. Since both data analyses for the City were done by outside contractors who were unwilling to share primary data and know-how with the City, we struggled with differing interpretations when processing the data into the Climate City Contract, which may result in minor deviations from the data presented. An area that has not been addressed at all from the level is residual emissions. As well as missing sectors and SCOPEs, data for residual emissions will be surveyed in the next iteration of the Climate City Contract.

City of Košice has reported the GHG emission inventory in MyCovenant Tracker. Last report was based on the year 2020 (This year was set as an ongoing monitoring year in SECAP processing). Due to the possibility of distortion of the data collected for the year 2020 as a covid year, 2018 was chosen as the accounting year for the base line for the City Climate Contract.

Due to the unavailability of all data, some data is used from the outputs of the Business as Usual (BAU) 2030 economic model. https://netzerocities.app/group-capabilitybuildingprogrammebuildingastrongeconomiccase

Emission inventories and other assessments will be carried out within the geographical boundaries of the City of Košice.

The emission inventory in 2018 (Table 2, 3, 4) shows that most energy is consumed, and most emissions are produced in the buildings sector. The second sector is the transport sector. Even though the city is surrounded by forests and has a large area of agricultural land, these sectors have not been addressed in terms of emissions production and sinks. In the case of industry, the largest number of emissions from the production of industrial products is generated by companies that are part of the ETS scheme and have therefore been omitted from the emissions inventory. As it was assumed that other industry in the city produces a very small share of emissions from industry, these emissions were not surveyed. Both sectors (IPPU, AFOLU) will be surveyed in the next reassessment.

Table 2

A-1.1: Final energy use by source sectors			
Base year	2018		
Unit	MWh		
	Scope 1	Scope 2	Scope 3**
Buildings	**1 441 003**	**1 344 163**	**N/A**
(Fuel type/ energy used)	Natural gas 283 272 Coal 1 130 232 Biomass	Electrical energy 588 912 Central heating 755 251	N/A

	19 444 Biogas 770 Other minor fuels (local heating-lignite, coke) 354		
Transport	**347 280**	**54 354**	N/A
(Fuel type/ energy used)	Diesel + Petrol* 335 171 CNG 12 109	Electrical energy 54 354	N/A
Waste	**N/A**	**N/A**	**136 546*****
(Fuel type/ energy used)	N/A	N/A	136 546
Industrial Process and Product Use (IPPU)	N/A**	N/A	N/A
(Fuel type/ energy used)	N/A	N/A	N/A
Agricultural, Forestry and Land Use (AFOLU)	N/A**	N/A	N/A
(Fuel type/ energy used)	N/A	N/A	N/A

*The BEI document does not offer clear information on how much diesel and petrol is used in individual car transport, thus making imposible at this moment to determin amount of enegry used separately for diesel and petrol.
**All date for Scope 3, IPPU and AFOLU sectors were not available for the moment. All missing data will be addressed in future iterations.
*** Includes Scope 1 Waste emissions (produced and processed in the city) and Scope 3 (produced by the city but processed outside the city border) - solid waste only; wastewater falls under "Other" sector

Table 3

A-1.2: Emission factors applied

(Please specify for primary energy type and GHG emission factor according to methodology used).

For calculation in t or MWh of primary energy

(Please indicate method used, e.g., GPC, IPCC, CRF, national etc.), **IPCC, 2006**

Primary energy/ energy source	Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	F-gases (hydrofluorocarbons and perfluorocarbons)	Sulphur hexafluoride (SF_6)	Nitrogen trifluoride (NF_3)
Electrical energy	0,240	N/A	N/A	N/A	N/A	N/A
Natural gas	0,202	N/A	N/A	N/A	N/A	N/A
Coal	0,354	N/A	N/A	N/A	N/A	N/A
Biomass (Fuel wood)	0,403	N/A	N/A	N/A	N/A	N/A
Biogas	0,197	N/A	N/A	N/A	N/A	N/A
CHP	0,240	N/A	N/A	N/A	N/A	N/A
Diesel	0,267	N/A	N/A	N/A	N/A	N/A

Petrol	0,249	N/A	N/A	N/A	N/A	N/A
CNG	0,231	N/A	N/A	N/A	N/A	N/A

The BEI document does not provide any information on other GHGs as they were not addressed in this inventory. Any missing data will be addressed in the next iteration of the document.

Table 4

A-1.3a: GHG Emissions by Source Sector - Baseline Year					
Base Year	2018				
Unit	t CO_2 /year				
	Scope 1	**Scope 2**	**Scope 3**	**Total**	**% of Total**
Transport	83725			83725	9%
Buildings & Heating	602682			602682	65%
Electricity		157305		157305	17%
Waste*			53410	53410	6%
Other (incl. IPPU & AFOLU)	36184			36184	4%
Total	722591	157305	53410	933306	100%

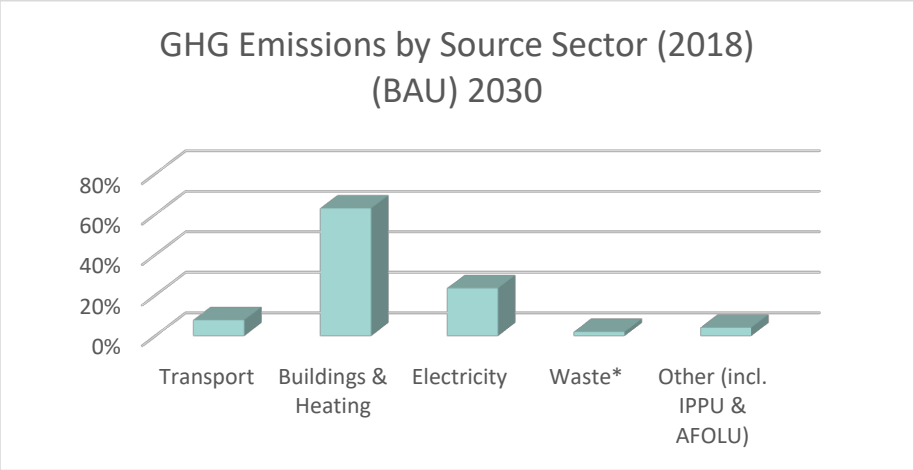
** Includes Scope 1 Waste emissions (produced and processed in the city) and Scope 3 (produced by the city but processed outside the city border) - solid waste only; wastewater falls under "Other" sector*

Table 5

A-1.3b: GHG Emissions by Source Sector 2018 according to Business as Usual (BAU) 2030					
Base Year	BAU 2030				
Unit	t CO_2 equivalent/year				
	Scope 1	**Scope 2**	**Scope 3**	**Total**	**% of Total**
Transport	69734			69734	8%
Buildings & Heating	565628			565628	63%
Electricity		210924		210924	23%
Waste*			17271	17271	2%
Other (incl. IPPU & AFOLU)	36184			36184	4%
Total	671547	210924	17271	899743	100%

* Includes Scope 1 Waste emissions (produced and processed in the city) and Scope 3 (produced by the city but processed outside the city border) - solid waste only; wastewater falls under "Other" sector

Figure 2 GHG Emissions by Source Sector (2018)



As the above data on energy consumption and emissions show, buildings are the largest emitters in the city. Therefore, the main priority of the city will be to address the reduction of energy consumption in buildings and to switch energy production to RES production. The second largest emitter, and therefore a priority, is to address transport, in the context of reducing the need for car transport and reducing the consumption of fossil fuels in transport.

The inputs for the economic model for the baseline (Table 6.) were used from available strategies (SUMP), national and European level estimates and internal documents.

Table 6

A-1.4: Activity by Source Sector (from economic model data inputs)			
Base Year		**2018**	
	Scope 1	**Scope 2**	**Scope 3**
Transport			
Transport need - passenger cars + motorcycles (M km/year)	373		
Transport need - buses (M km/year)	7		
Transport need - trains/metro (M km/year)	2		
Transport need - light duty trucks (<3.5 t) (M tkm/year)	22		
Transport need - heavy duty trucks (>3.5 t) (M tkm/year)	112		
Buildings & Heating			
Heating demand (space heating + domestic hot water)(GWh/year)	2287		
Electricity			

	Electricity demand within city boundaries (GWh/year)		625	
	Waste			
	Collected waste within city boundaries (tonnes)			96747
	Other (incl. IPPU & AFOLU)			

1.2 Module A-2 Current Policies and Strategies Assessment

A-2.1: Description & assessment of policies

Although strategies are adopted at national, regional or local level that aim to adapt the territory to climate change and reduce emissions, most strategies do not have specific targets for the amount of CO2 reduced, which is why we have chosen not to take them into account when setting the emission gap. However, they can support the creation of tools that can support the implementation of solutions at the local level.

At the national level, several policies and strategies and laws are approved that have an impact on tackling climate change. The Act on Climate Change and Low-Carbon Transformation of Slovakia has not yet been adopted. The most relevant document at the national level isThe Integrated National Energy and Climate Plan (NECP) for the Slovak Republic 2021-2030. Slovakia's Integrated National Energy and Climate Plan (NECP) is scheduled for revision to align with the 'REPowerEU' and 'Fit for 55' packages. However, the European Commission reproached it for not being ambitious enough and returned it to the Slovak Republic for refinement. Slovakia missed the June 30, 2024, submission deadline to the European Commission (EC) and had not begun the required public consultations by July 2024. Its resubmission is planned for autumn 2024. For this reason, it was not taken into account when defining the emission gap.

A number of strategies are adopted at regional level to promote adaptation to climate change and reduce adverse climate change activities. However, they are mostly adopted without specific targets for the amount of greenhouse gases reduced. These are the Regional PUM, the Hydrogen Strategy, the Adaptation Strategy and the Low-Carbon Strategy of Organizations in the Founding Competence of the Košice Region, which has a determined % of reductions, but monitors different reference years for different sectors. In order to avoid misinterpretation, the objectives of this Low-Carbon Strategy will not be considered when defining the emissions gap.

At the local level, several documents have been adopted that support the reduction of greenhouse gases in the city. However, only the SECAP document, adopted in 2022, has a specific goal, which declares the city's interest in reducing CO2 production by 40% by 2030 compared to 2005, where the interim monitoring year is 2020. To avoid any misunderstandings in interpretation (as the baseline for the Climate City Contract is 2018), we will not consider this commitment when determining the emissions gap. However, the measures from SECAP are adapted into the draft Action Plan the Climate City Contract.

A list of relevant policies, strategies and regulations is given in Table 7.

Table 7

List of relevant policies, strategies and regulations				
Type	Level	Name and/or title	Description	Relevance
Policy	European	Paris Agreement	Agreement to combat climate change and achieve a sustainable low emission future	Limiting the global temperature increase to below 2°C, recommending that it be kept below 1.5°C to avoid irreversible consequences, and that each country should contribute to these reductions in terms of emission reductions.
Mission	European	100 Cities Mission	Commitment to solve important societal problem	Support and assistance is given to 100 European cities on their way to climate neutrality by 2030.
Strategy	European	European Green Pact	Growth strategy for the EU	Reducing the Union's net GHG emissions by 55% by

				2030 compared to 1990 levels.
Policy	European	Covenant of Mayors for Climate and Energy	Commitment to implement climate and energy targets	Supporting the achievement of the 40% GHG reduction target by 2030 and adoption of a common approach to boost climate change adaptation and mitigation.
Strategy	European	The EU Strategy on Adaptation to Climate Change	Commitment to become climate resilient by 2050	To make adaptation smarter, swifter and more systemic, and to step up international action on adaptation to climate change.
Action plan	National	The Integrated National Energy and Climate Plan (NECP) for the Slovak Republic 2021-2030 - In 2024, Slovakia's Integrated National Energy and Climate Plan (NECP) is scheduled for revision to align with the 'REPowerEU' and 'Fit for 55' packages. Slovakia missed the June 30, 2024, submission deadline to the European Commission (EC) and had not begun the required public consultations by July 2024.	The plan focuses on several dimensions, including decarbonization, energy efficiency, energy security, internal energy market, and research and innovation.	Relevant for all priority areas defined in the Climate City Contract.
Strategy	National	Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050	Defines emission targets, describes projections and formulates basic tools for achieving them (without indicators and a more specific form).	Relevant for following priorities defined in the Climate City Contract: 1. Energy efficiency and the transition to renewable energy, 2. sustainable mobility, 3. Sustainable urban development
Action Plan	National	Waste Management Programme of the Slovak Republic for 2021-2025	The Waste Prevention Program of the Slovak Republic is a strategic document aimed at reducing the amount of waste and promoting the reuse of materials.	The main objective of the programme is to increase the rate of separate collection of municipal waste to 60% by 2025 and the rates of preparation for reuse and recycling of municipal waste to 55%. Relevant for the priority defined in the Climate City

				Contract: 3. Sustainable urban development
Strategy	Regional	Adaptation Strategy to the Consequences of Climate Change in the Košice Region	The strategy focuses on measures and activities that are aimed at reducing sensitivity, vulnerability and and increasing climate change adaptation capacity at regional and local level.	Relevant objectives of the strategy - reducing the sensitivity of the urban landscape, reducing the sensitivity of transport infrastructure; increasing the adaptation capacity of the local economy; adaptation of the population by increasing their awareness. Relevant for the priority defined in the Climate City Contract: 3. Sustainable urban development (green & blue infrastructure).
Action plan	Regional	Sustainable Mobility Plan of the Košice Self-Governing Region	SUPM concerns transport infrastructure and transport organization. It includes all modes of transport (motorized, non-motorized, public, individual, bicycle, freight).	Regional SUMP includes major interventions for Sustainable transport system of the region and its integratation with city public transport. Relevant for the priority defined in the Climate City Contract: 2. Sustainable mobility
Strategy	Regional	Hydrogen Strategy of the Košice Region	It is an information document describing the current state of hydrogen technologies and partially identifying potentials for the Košice Region without a strategic and implementation part.	Potential for future expansion of the Action Plan
Strategy	Regional	Low-Carbon Strategy of Organizations in the Founding Competence of the Košice Region	The strategy focuses exclusively on its own organizations and in no way on stimulating the decarbonization of the region as a whole	Relevant for following priorities defined in the Climate City Contract: 1. Energy efficiency and the transition to renewable energy, 2. sustainable mobility, 3. Sustainable urban development
Regulation	Local	Spatial plan of the city of Košice. A new spatial plan is currently being prepared.	Commitment to support the principles of sustainable development	Regulations for the organization of the territory of the Košice economic and residential agglomeration.

				Relevant for following priorities defined in the Climate City Contract: 1. Energy efficiency and the transition to renewable energy, 2. sustainable mobility, 3. Sustainable urban development
Action plan	Local	Sustainable Energy and Climate Action Plans (SECAP) / Framework for combating climate change by promoting sustainable energy production and consumption in the city of Košice	Key actions to support the implementation of Europe's 40% GHG reduction target by 2030 compared to 2005	Relevant for all priority areas defined in the Climate City Contract.
Action plan	Local	Concept of the development of the city of Košice in the field of thermal energy (heating)	Commitment to the development of the city's thermal energy	Design of the system of thermal facilities and future heat supply, as well as conclusions and recommendations for the development of the city's thermal energy. Relevant for following priority defined in the Climate City Contract: 1. Energy efficiency and the transition to renewable energy,
Strategy	Local	Climate Change Adaptation Strategy of the City of Košice 2022-2030	Commitment to improve preparedness for negative consequences of climate change	Identification of the vulnerability of the city of Košice in terms of the negative and defined measures in the areas of governance, participation, and infrastructure to increase the resilience of the city area impact of the climate. Relevant for all priority areas defined in the Climate City Contract.
Startegy + Action plan	Local	Programme of Economic Development and Social Development of the City of Košice and its Functional Area	A medium-term development document that considers the sustainable development goals	Commitment to achieve the Sustainable Development Goals defined in the 2030 Agenda through 4 development themes - green development with respect to

		2022 – 2027, Action Plan 2022 - 2027	defined in the 2030 Agenda.	climate change, social development, economic development, and governance. Relevant for all priority areas defined in the Climate City Contract.
Strategy	Local	Sustainable Mobility Plan of the City of Košice	The document defined goals and measures for the sustainable development of transport in the city in the 2020, 2030 and 2040 horizons.	The document focuses on the promotion of systematic management and development of public passenger transport, calming traffic in the city, developing a comprehensive cycling network and filling in the missing pedestrian links. Relevant for the priority defined in the Climate City Contract: 2. Sustainable mobility.
Strategy	Local	Concept for the Development of Waste Management of the City of Košice until 2035	The document defines the need to create conditions for the fulfilment of new waste management targets.	The document defines measures to increase the preparation for reuse and recycling of municipal waste to at least 60% by 2030. Commitment to reduce the amount of municipal waste, increase the recycling rate to 60% by 2030. Relevant for the priority defined in the Climate City Contract: 3. Sustainable Urban Development

Table 8 (below) / Table A-2.1 is carried over projection from the BaU 2030 economic model. For information, it is supplemented with data from the Basic Emission Inventory (BEI) of the city from 2018.

The table calculates the emission gap by sector. The electricity consumption of the transport and lighting sectors is shown in the "Electricity" sector. The data in the "Others" sector is only addressed in the BAU (2030) projection. The city does not currently have data in the IPPU and AFOLU sectors. Both sectors will be addressed in the next iteration.

Similarly, for residual emissions, the city has not yet addressed this data. All these missing data will be addressed in the next iteration. The residual emissions data in Table 8 are from the BaU 2030 projection.

Since the SECAP document sets targets against 2005-2030, where the interim monitoring year is 2020 and for the purposes of the Climate City Contract the baseline year considered is 2018, we have decided not to consider the SECAP targets for the time being to avoid making a mistake. The same will be done for other strategies.

To ensure accuracy and completeness, any missing data will be detected in the next iteration.

Table 8

A-2.1: Emissions Gap (kt CO2e)											
	Baseline Emissions (BEI)	**Baseline Emissions (BAU 2030)**	**Emissions Reduction Resulting from AP**		**Remaining Emissions**		**Residual Emissions Offsetting[1]**		**Emission reductions from other strategies considered**	**Emissions Gap (amount necessary to achieve net-zero)**	
	(Absolute value)	(Absolute value)	(Absolute value)	(% of BAU 2030)	(Absolute value)	(% of BAU 2030)	(Absolute value)	(% of BAU 2030)	%	(Absolute value)	(% of BAU 2030)
Transport	91	70	34	49%	36	51%	14	20%	0%	22	31%
Buildings & Heating	639	566	402	71%	164	29%	113	20%	0%	51	9%
Electricity	159	211	148	70%	63	30%	42	20%	0%	21	10%
Waste	45	17	-2	-11%	19	111%	3	20%	0%	16	91%
Other (incl. IPPU & AFOLU)[2]	N/A	36	29	80%	7	20%	7	20%	0%	0	0%
Total	933	900	611	68%	289	32%	180	20%	0%	109	12%

1 Residual emission consist of those emissions which can't be reduced through climate action and are being offset. Residual emissions may amount to a maximum of 20 % as stated by the Mission Info Kit.

2 Emissions reduction target percentage for "Other" sector is assumed to be the same as for the other 4 main sectors unless updated by city. Activities and commitments to reduce these emissions are documented in the Climate Neutrality Action Plan.

According to the BAU 2030 scenario, according to the submitted Action Plan, a reduction of 68% is possible for all sectors combined. Emission gap **to achieve net-zero** is 109 ktCO2.

Figure 3 Emission gap

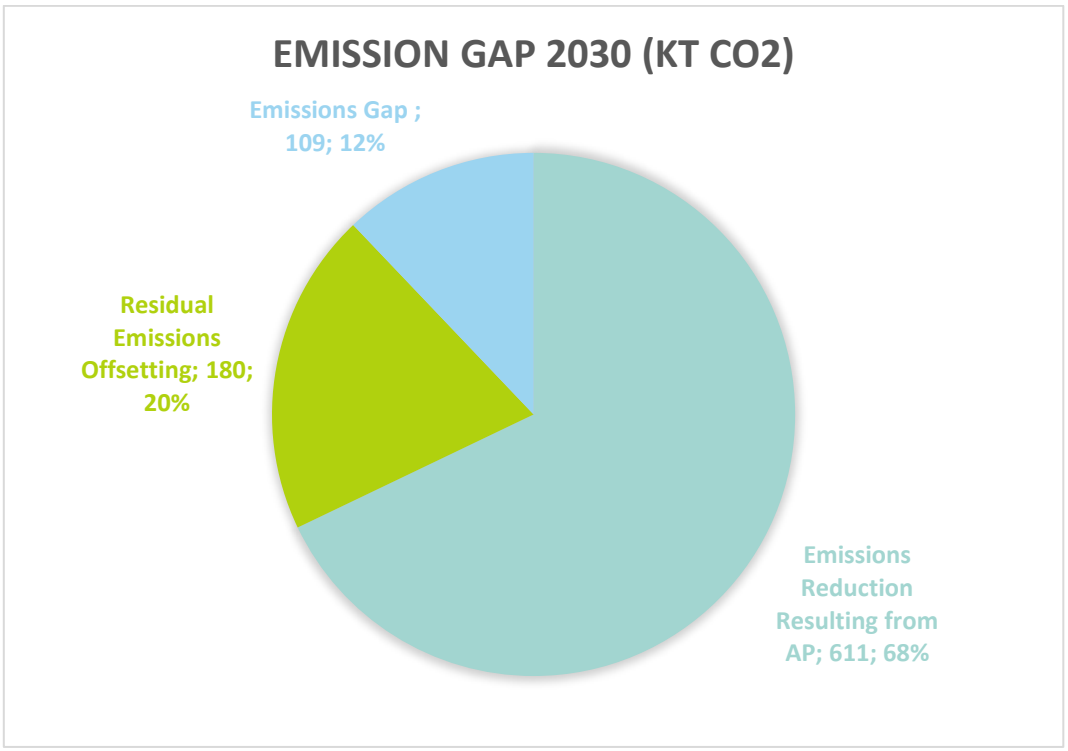
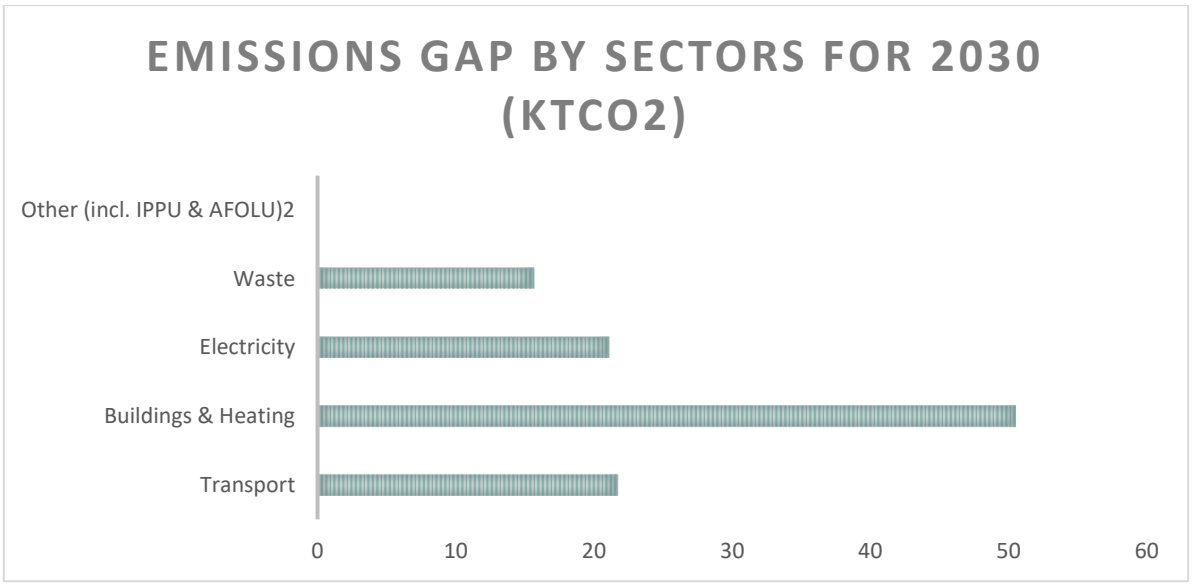


Figure 4 Emission gap by sectors



1.3 Module A-3 Systemic Barriers and Opportunities to 2030 Climate Neutrality

A-3.1: Description of urban systems, systemic barriers, and opportunities

Based on the outputs from the implemented mappings, in order to achieve climate neutrality of the City of Košice, it is essential to intensify efforts, especially in the field of energy systems, with an emphasis on the use of renewable energy sources and the reduction of energy consumption, and on building sustainable urban development of the city based on ecological and attractive transport and the adoption of a circular way of life in various spheres. No less important for the inhabitants of the city is the public space, which should be designed to serve all residents and support their quality of life. The most important systems that have been considered for the relevant areas include the technological/infrastructural system, the institutional/regulatory system, organizational systems, behavioral systems, social system and the financial system.

The ecosystem of stakeholders in the city were laid by the European Capital of Culture project in 2013, which started the transformation of the city from the point of view of the perception of culture and its place in the lives of residents and the economic development of the city. The initiated initiatives were followed by other large projects that brought new perspectives and ways to work with actors and residents, connect topics, correctly identify needs, barriers and propose solutions for a good life in the city. These were mainly the Košice 2.0 project implemented within the UIA, or the currently implemented CSG – Cities for Sustainable Development (Urbact IV) project, which brought together actors in the city looking for solutions to increase the climate resilience of the city from the academic environment, local government, the private sector and the non-profit sector (such as the Urbact local group).
In the preparation of the City Climate Contract, the knowledge gained from all interactions that took place in the city was put to good use, whether in strategic planning (creation of strategic documents and plans), finding solutions to specific problems (workshops, living labs, design sprints on topics related to solving climate change), discussions on opportunities that led to formalized cooperation (signing of memoranda and cooperation agreements).

Many discussions were carried out internally and specific changes in the management of some sectors (mobility, energy) had already been implemented at the time of the preparation of the CCC. In the process of preparing the CCC, a basic team was formed in the city, which established close cooperation with the relevant departments in the city and municipal enterprises.

Table 9

A-3.2: Systems & stakeholder mapping			
System	Stakeholders	Influence on the city´s climate neutrality ambition	Interest in the city´s climate neutrality ambition
Energy system			
Technological / infrastructural	Heating company (Teplárenský holding, a.s. owned by the Ministry of Economy of the Slovak Republic) and heat supply company (Tepelné hospodárstvo Košice owned by the city)	Production and distribution of heat and hot water in the city	Ensuring the supply of heat and hot water to the city using local sources (reducing dependence on imports) with an emphasis on RES
Regulatory	Municipality	Regulations in construction activities and energy supply	Directing planning and construction activities in the city

Social / Behavioral	Municipality, Civil organisations (ETP Slovakia; Energia pre Slovensko/; Energy for Slovakia)	Active work with vulnerable groups of people and owners of apartments and houses	Fighting energy poverty and energy efficiency in housing
Technological / infrastructural	Privat companies (Energy of buildings), civic organisation Energia pre Slovensko/; Energy for Slovakia, Economic faculty of Technical University (DECA)	Supporting the establishment of energy communities	Increasing the share of RES in local energy production
Transport & Mobility			
Technological / infrastructural	Municipality, City public transport company (DPMK), National motorway company	Construction of transport infrastructure (tram transport, road transport, non-motorised transport) and composition of public transport fleets	Make transport more efficient, reduce infrastructure operating costs
Organizational	Municipality, Public transport companies (DPMK) , Public transport integration company (IDS Východ)	Transport coordination	Preference for public transport, increasing attractiveness and offer of public transport, including integration with suburban transport
Regulatory	Municipality	Introduction of regulatory measures for car transport	Promoting sustainable types of mobility
Behavioral	Municipality, City public transport company (DPMK), Public transport integration company (IDS Východ), civic associations (Cykloplatforma)	Public awareness and information	Promoting sustainable types of mobility
Built environment			
Technological / infrastructural	Municipality, Privat entities (Energy of buildings), Owners of apartments and houses, Managers of residential and tertiary sector buildings (P.J.Šafárik University),	Modernization of buildings and construction of new green buildings	Increasing the energy efficiency of buildings and equipment
Organizational	Municipality	Management of city buildings and facilities	Introduction of energy management in buildings owned by the city
Regulatory	Municipality	Regulations in planning and construction activities (buildings, public space, etc.)	Promoting sustainable urban development, fostering a market for green services and technologies within the city
Behavioral	Citizens, City employees	Energy consumption	Change in consumption behaviour
Technological / infrastructural	Municipality, Municipal greenery company	Management of green infrastructure in the city	Expansion of green areas, revitalization of unused areas, planting trees
Waste & Circular economy			
Technological / infrastructural	Municipality, Municipal greenery company	Recycling of green waste	Recycling - processing of material (compost) for own

			activities and for the activities of residents
Technological / Behavioral	Universities (P.J.Šafárik University, Faculty of Economics in Technical University in Košice; Faculty of Civil Engineering in Technical University in Košice), Business Košice, n.o.	Recycling in production processes, and use of recycled materials for other activities (construction)	Conducting research for the reuse of materials, Increasing the interest of companies in circularity in production processes
Behavioral	Citizens, Municipality, City cultural and creative organisations – Creative Industry Košice, K-13, Civic organisation – ETP Slovakia)	Reducing waste production	Establishment of the Reuse Center, Raising awareness of the circular way of life,
Social	Municipality, Civil organisations (Creative industry Košice, ETP Slovakia)	Active work with vulnerable groups of people	Improving communication, and targeted social assistance
Green infrastructure & nature-based solutions			
Technological / infrastructural	Municipality, Municipal greenery company, Privat companies	Advances in planting and renaturation techniques, transformation of unused areas	Establishment, progress and maintenance of green infrastructure
Social	Municipality, Municipal greenery company, Civic organisation Creative Industry Košice	Creation of biodiversity spots and space for relax and meetings of communities	Development of ecosystem services as services to nature and inhabitants

Table 10

Barries, Gaps and Opportunities

	Main barries and gaps	**Main opportunities**
Infrastructure	▪ High initial capital costs are required because of high modernisation debt on all types of infrastructure ; ▪ Time-consuming preparation and implementation of projects ▪ Fragmented ownership relationships, which influences the planning and preparation of investments ; ▪ The existence of technical standards that do not contribute to climate change solutions ; ▪ Unpredictable price increases represent a risk for the implementation of planned projects ;	▪ High fuel and energy prices intensify the need for major infrastructure upgrades ; ▪ Presence of unused geothermal resources ; ▪ The need to reduce dependence on imported energy and fuels increased interest in local energy sources ;

	▪ Lack of available information on opportunities and return on investment; ▪ Lack of technology (e.g. in the electrification of trucks)	
Capacities	▪ Lack of capacities across all sectors - significant 'brain drain'; ▪ Lack of knowledge and awareness across all sectors; , resulting in resistance to climate actions ; ▪ Habitual behavior. ▪ Limited awareness and integration of climate change mitigation into wider city activities	▪ A supportive local research environment ; ▪ An opportunity to work with European cities ; ▪ Available EU resources for capacity building ;
Processes	▪ Siloed and fragmented responsibilities divided between state, region and city ; ▪ Two-level self-government of the city of Košice - the city of Košice has a two-level self-government with 22 city districts and fragmented responsibilities ; ▪ Lack of competence of cities (Lack of regulatory power for cities to mandate reduction action by the private sector and citizens) ; ▪ Decision-making without data (feeling-is-for-doing approach), ▪ Complicated public procurement rules that often slow down the process of modernization and construction ; ▪ Limited support from the state for climate actions; ▪ Unclear and insufficient national legislation ; ▪ Slow behavioural transformation, including cultural barriers ▪ Possible changes in city government´s commitments due to potential shifts in the political level caused by a 4-year election cycle ▪ Lack of data, CO2 savings are not assessed in projects ; Partners' reluctance to share data ;	▪ Digitalisation and and implementation of smart solutions ; ▪ In connection with the preparation of the new zoning plan, regulations are proposed in favour of addressing climate change; ▪ The presence of research institutions and projects also in the field of designing new models for data acquisition; ▪ Basic tools for data presentation (GIS, open data platform) introduced at the city level; ▪ Possibility to apply for EU funding for behaviour change projects; ▪ Higher interest of the municipality in participatory processes ;

	▪ High bureaucracy ▪ Insufficient attention to energy poverty	
Alliances	▪ Limited past engagement with the private sector that can be leveraged to build cooperation on green topics ; ▪ Insufficient communication, information sharing and data transfer between different levels of the administration and stakeholders;	▪ Establishment of a municipal organization for cooperation with the private sector (Business Košice, n.o.) ; ▪ Higher interest in applied research on the part of manufacturing companies
Funds	▪ High financial demands of infrastructure and technologies ; ▪ Strong depandance on the external financial resources due to limited city budget- traditionally on EU funding; ▪ Lack of business models and financing and distrust in new financial models; ▪ Insufficient city budget ▪ Lack of financial capacity to directly support decarbonization actions; ▪ Lack of profitability of some climate neutrality projects;	▪ Urgent need to identify available funding models

2 Part B – Pathways towards Climate Neutrality by 2030

2.1 Module B-1 Climate Neutrality Scenarios and Impact Pathways

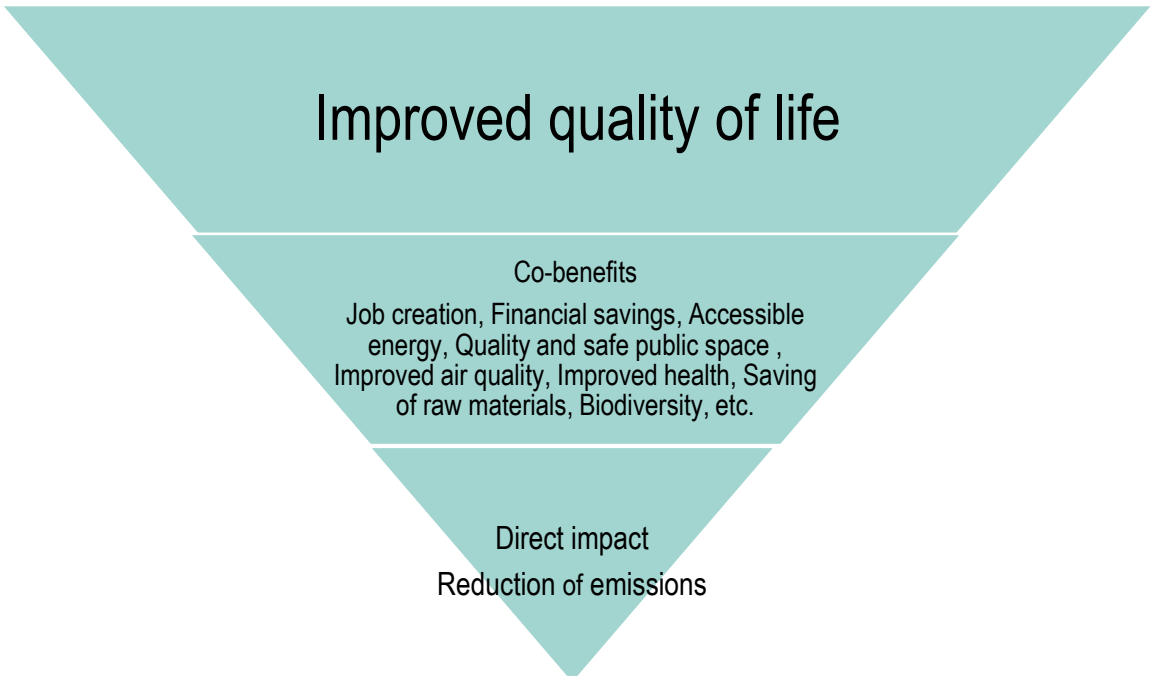


Figure 5 Impact pathways

Table 11

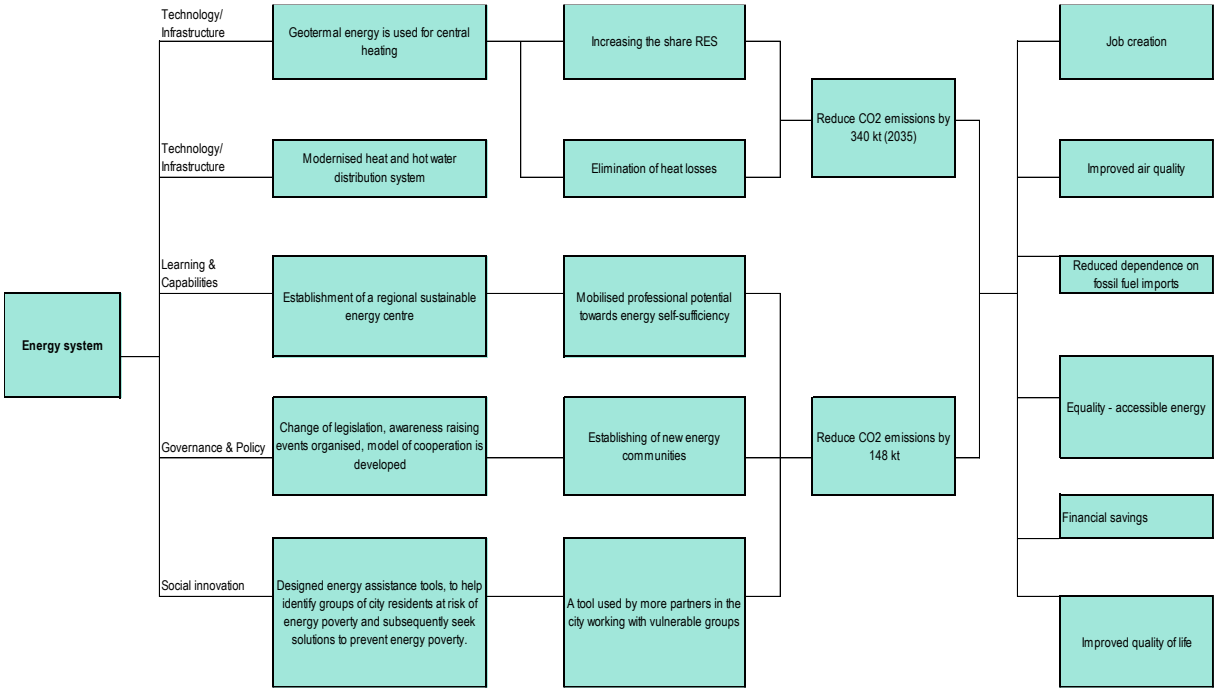
B-1.1: Impact Pathways					
Fields of action	Systemic levers	Early changes (1-2 years)	Late outcomes (3-4 years)	Direct impacts (Year 2030 Emission Reductions - kt CO2e) BAU 2030 scenario	Indirect impacts (co-benefits)
Energy systems	Technology/ Infrastructure	Geothermal energy is used for central heating	Increasing the share of RES	340 (2035)	Job creation Improved air quality Reduced dependence on fossil fuel imports;
		Modernised heat and hot water distribution system	Elimination of heat losses		
	Learning & Capabilities	Establishment of a regional sustainable energy centre	Mobilised professional potential towards energy self-sufficiency	148	

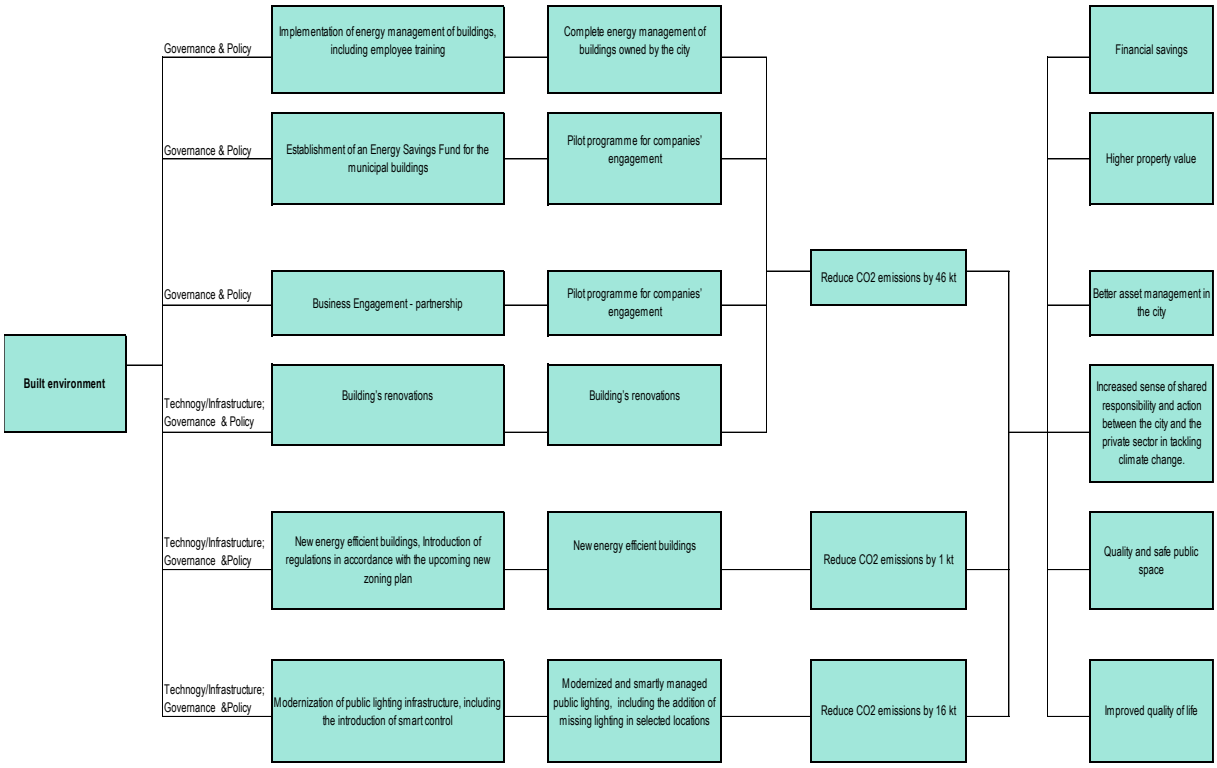
	Governance & Policy	Change of legislation, awareness raising events organised, model of cooperation is developed	Establishing of new energy communities		Equality - accessible energy Financial savings Improved quality of life
	Social innovation	Designed energy assistance tools, to help identify groups of city residents at risk of energy poverty and subsequently seek solutions to prevent energy poverty.	A tool used by more partners in the city working with vulnerable groups		
Built environment	Governance & Policy	Implementation of energy management of buildings, including employee training	Complete energy management of buildings owned by the city	46	Financial savings Higher property value Better asset management in the city; Reduced energy need in building Improved comfort and functionality of buildings; Increased sense of shared responsibility and action between the city and the private sector in tackling climate change. Quality and safe public space Improved quality of life
		Establishment of an Energy Savings Fund for the municipal buildings	New projects supported by the Fund		
		Business Engagement - partnership	Pilot programme for companies' engagement		
	Technology/ Infrastructure	Building's renovations;	Building's renovations		
		New energy efficient buildings, Introduction of regulations in accordance with the upcoming new zoning plan	New energy efficient buildings	1	
	Governance & Policy	Modernization of public lighting infrastructure, including the introduction of smart control	Modernized and smartly managed public lighting, including the addition of missing lighting in selected locations	16	
Mobility & transport	Technology/ Infrastructure	Part of the public transport fleet has been modernized and charging infrastructure has been built; Preparations for the construction of a new depot for electric buses have begun,	Better conditions for the operation of electric buses, Ongoing electrification of public transport	5	Improved air quality Reduction of traffic Quality and safe public space Improved health associated with better air quality
		Part of tram tracks are upgraded, renewal of the tram fleet Modernization of trams (and purchase of new trams	Modernized and attractive public transport that uses more passengers,	6	

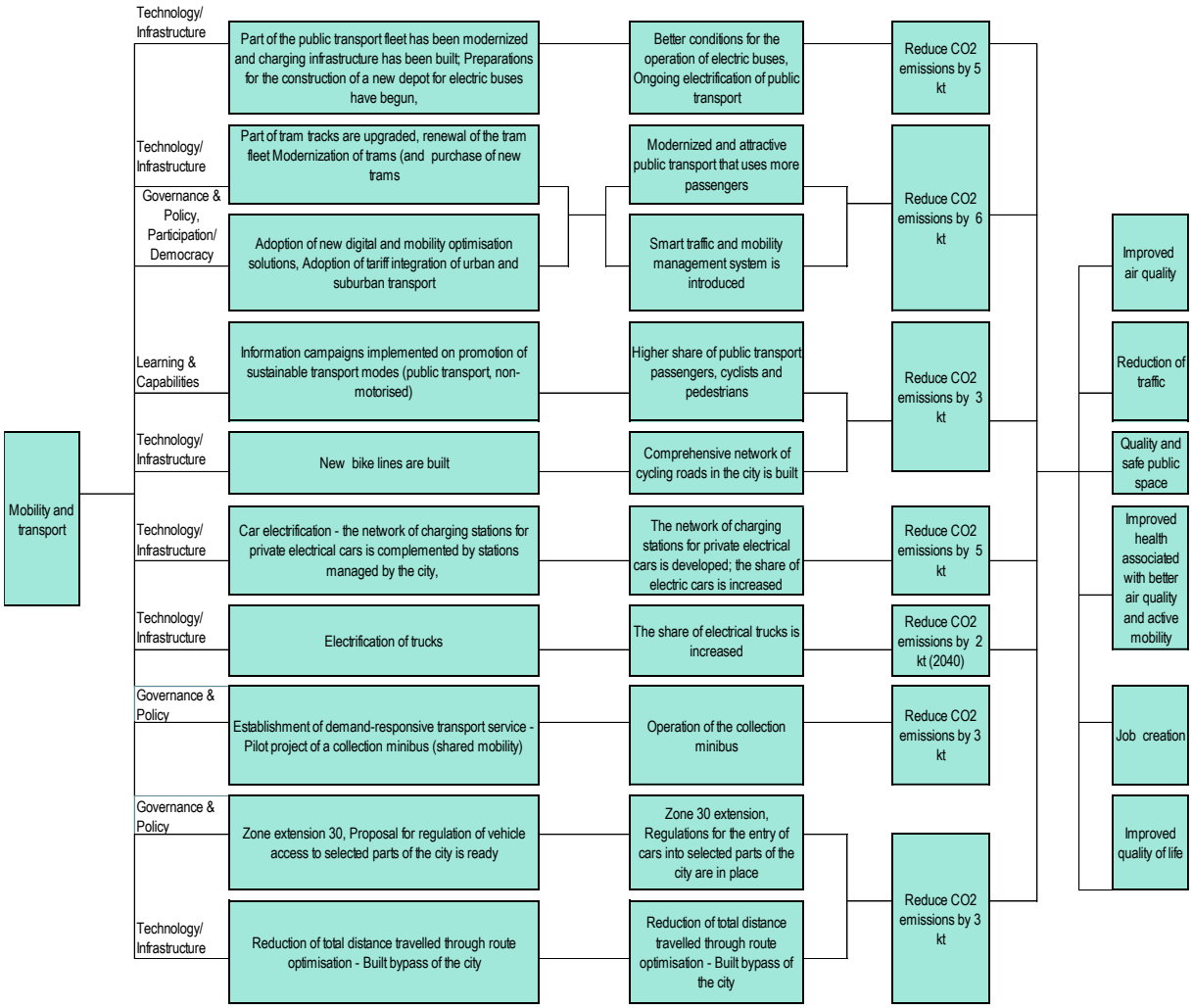
	Governance & Policy, Participation/ Democracy	Adoption of new digital and mobility optimisation solutions, Adoption of tariff integration of urban and suburban transport	Smart traffic and mobility management system is introduced		and active mobility Job creation associated with electrification of public transport Improved quality of life
	Learning & Capabilities;	Information campaigns implemented on promotion of sustainable transport modes (public transport, non-motorised)	Higher share of public transport passengers, cyclists and pedestrians	3	
	Technology/ Infrastructure	New bike lines are built	Comprehensive network of cycling roads in the city is built		
	Technology/ Infrastructure	Car electrification - the network of charging stations for private electrical cars is complemented by stations managed by the city,	The network of charging stations for private electrical cars is developed; the share of electric cars is increased	5 (2040)	
		Electrification of trucks	The share of electrical trucks is increased	2 (2040)	
	Governance & Policy	Establishment of demand-responsive transport service - Pilot project of a collection minibus (shared mobility)	Operation of the collection minibus	3	
	Governance & Policy	Zone extension 30, Proposal for regulation of vehicle access to selected parts of the city is ready	Zone 30 extension, Regulations for the entry of cars into selected parts of the city are in place	11	
	Technology/ Infrastructure	Reduction of total distance travelled through route optimisation - Built bypass of the city	Reduction of total distance travelled through route optimisation - Built bypass of the city		

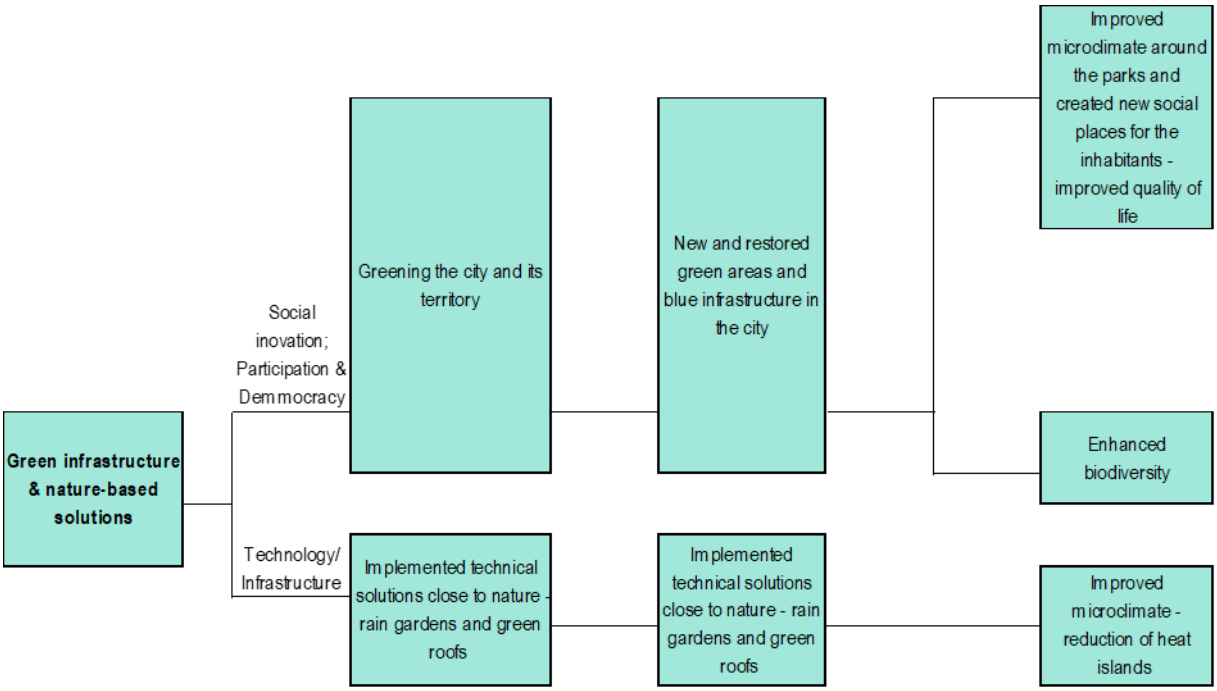
Waste & circular economy	Technology/ Infrastructure	Modernised composting plant with higher capacity for processing green waste	Increasing the recycling rate of green waste; higher production of raw material (compost) used for green areas of the city	(2)	Saving of raw materials Reducing the cost of living of people from vulnerable groups Cleaner environment and public space Improved quality of life Financial savings
	Social Innovation	A re-use centre built - a physical space and online system for supply and demand management	Reducing waste production; Increased re-use of goods		
	Learning & Capabilities	Developed and tested new solutions for building insulations, new insulation material and new product based on re-use of raw materials policies	Increased re-use of materials		
		Implementation of a comprehensive training programme for the Circular Transition Accelerator programme.	Adopting ways of circular lifestyle		
		Promoting the adoption of the circular economy in industry - Circular Transition Toolkit for SMEs	Increased recycling rate		
Green infrastructure & nature-based solutions	Social Innovation Participation & Democracy	Greening the city and its territory	New and restored green areas and blue infrastructure in the city		Enhanced biodiversity, Improved microclimate around the parks and created new social places for the inhabitants - improved quality of life
	Technology/ Infrastructure	Implemented technical solutions close to nature - rain gardens and green roofs	Implemented technical solutions close to nature - rain gardens and green roofs		Improved microclimate - reduction of heat islands

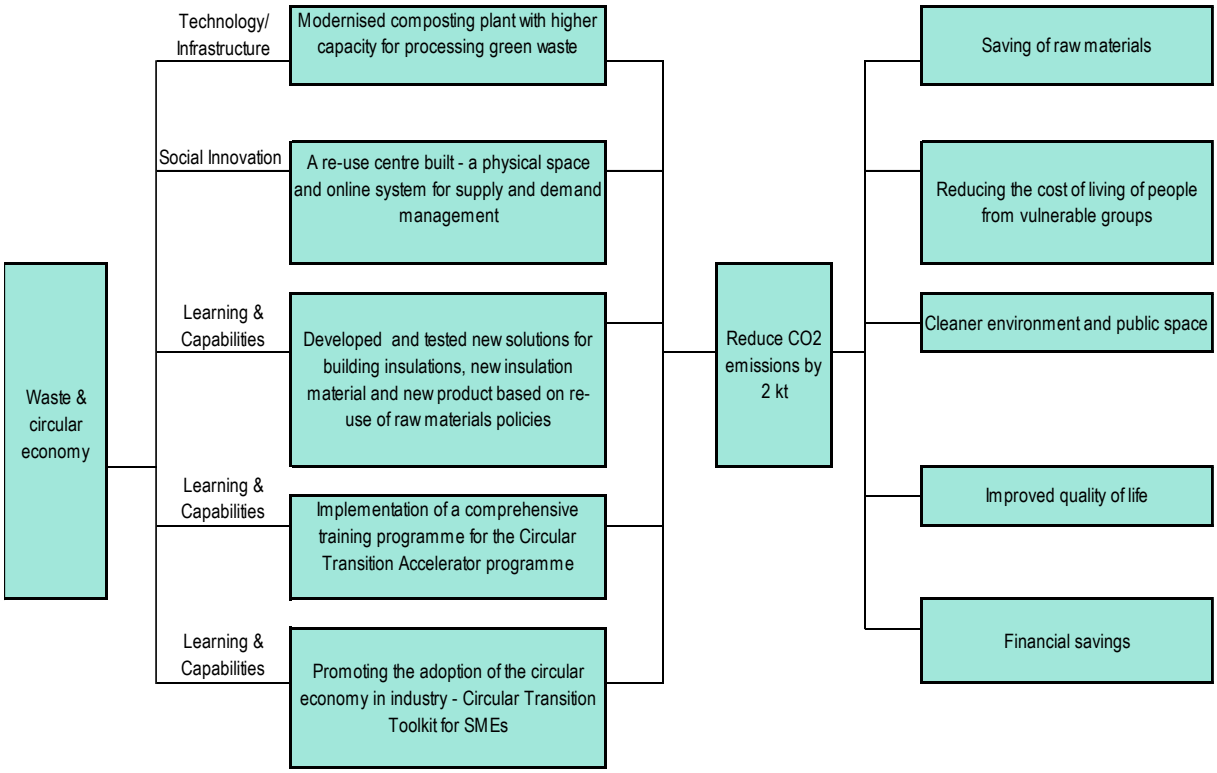
Figure 6 Pathway Graphics by Areas






Mobility and transport
Technology/ Infrastructure
Part of the public transport fleet has been modernized and charging infrastructure has been built; Preparations for the construction of a new depot for electric buses have begun,
Better conditions for the operation of electric buses, Ongoing electrification of public transport
Reduce CO2 emissions by 5 kt
Technology/ Infrastructure
Part of tram tracks are upgraded, renewal of the tram fleet Modernization of trams (and purchase of new trams
Modernized and attractive public transport that uses more passengers
Governance & Policy, Participation/ Democracy
Adoption of new digital and mobility optimisation solutions, Adoption of tariff integration of urban and suburban transport
Smart traffic and mobility management system is introduced
Reduce CO2 emissions by 6 kt
Learning & Capabilities
Information campaigns implemented on promotion of sustainable transport modes (public transport, non-motorised)
Higher share of public transport passengers, cyclists and pedestrians
Technology/ Infrastructure
New bike lines are built
Comprehensive network of cycling roads in the city is built
Reduce CO2 emissions by 3 kt
Technology/ Infrastructure
Car electrification - the network of charging stations for private electrical cars is complemented by stations managed by the city,
The network of charging stations for private electrical cars is developed; the share of electric cars is increased
Reduce CO2 emissions by 5 kt
Technology/ Infrastructure
Electrification of trucks
The share of electrical trucks is increased
Reduce CO2 emissions by 2 kt (2040)
Governance & Policy
Establishment of demand-responsive transport service - Pilot project of a collection minibus (shared mobility)
Operation of the collection minibus
Reduce CO2 emissions by 3 kt
Governance & Policy
Zone extension 30, Proposal for regulation of vehicle access to selected parts of the city is ready
Zone 30 extension, Regulations for the entry of cars into selected parts of the city are in place
Technology/ Infrastructure
Reduction of total distance travelled through route optimisation - Built bypass of the city
Reduction of total distance travelled through route optimisation - Built bypass of the city
Reduce CO2 emissions by 3 kt
Improved air quality
Reduction of traffic
Quality and safe public space
Improved health associated with better air quality and active mobility
Job creation
Improved quality of life


Green infrastructure & nature-based solutions
Social inovation; Participation & Dem mocracy
Technology/ Infrastructure
Greening the city and its territory
Implemented technical solutions close to nature - rain gardens and green roofs
New and restored green areas and blue infrastructure in the city
Implemented technical solutions close to nature - rain gardens and green roofs
Improved microclimate around the parks and created new social places for the inhabitants - improved quality of life
Enhanced biodiversity
Improved microclimate - reduction of heat islands


Waste & circular economy
Technology/ Infrastructure
Modernised composting plant with higher capacity for processing green waste
Social Innovation
A re-use centre built - a physical space and online system for supply and demand management
Learning & Capabilities
Developed and tested new solutions for building insulations, new insulation material and new product based on re-use of raw materials policies
Learning & Capabilities
Implementation of a comprehensive training programme for the Circular Transition Accelerator programme
Learning & Capabilities
Promoting the adoption of the circular economy in industry - Circular Transition Toolkit for SMEs
Reduce CO2 emissions by 2 kt
Saving of raw materials
Reducing the cost of living of people from vulnerable groups
Cleaner environment and public space
Improved quality of life
Financial savings

B-1.2: Description of impact pathways
Reflecting on our starting points, barriers, and opportunities, we have defined 4 strategic priorities to be fulfilled in order to intensify our transition to climate neutrality: 1. **Energy efficiency and the transition to renewable energy (**Energy system & Built environment) The first priority of the city is to ensure the availability of energy to all its inhabitants with the maximum possible use of local resources and the management of energy in an efficient way in all sectors. 2. **Sustainable mobility** (Mobility & Transport) The support of mobility will focus mainly on increasing the greening of all transport, increasing the attractiveness and efficiency of public transport and non-motorized transport. 3. **Sustainable urban development** (Green infrastructure, Natured based solutions; Waste & Circular economy) The priority of sustainable urban development focuses on creating a quality environment for residents and adopting a circular way of life in everyday life, management, but also production processes. By focusing on saving natural resources and creating an opportunity to "give goods a second chance". 4. **Progress through dialogue and cooperation** (Cross sector) The fourth key priority for change in the city, which also overlaps with other priorities, is active cooperation and constructive dialogue between stakeholders such as citizens, entrepreneurs, research and educational institutions, the private sector to highlight the need to address climate change across all sectors, areas, levels and levers. All proposed activities not only have the potential to significantly reduce the production of greenhouse gases in the city of Košice, but also create opportunities for all residents, including vulnerable ones, whether it is the availability of clean energy, mobility or green areas in the city, in the form of services, new job opportunities or a quality environment that will lead to a **improved quality of life of residents** in our city.

2.2 Module B-2 Climate Neutrality Portfolio Design

Our portfolio consists of 14 main activities, which are further divided into sub-activities. These are planned activities or activities that will be further expanded based on good experience.

Table 12

	B-2.1: Description of action portfolios			
Priority	Fields of action	Portfolio description		
		No	List of actions	Descriptions
1. Energy efficiency and the transition to renewable energy	Energy systems	1.	Geothermal energy for the central heating	Exploiting the potential of geothermal energy in the Košice basin and bring heat from geothermal wells (near the village of Ďurkov, about 15 km) to the hot-water network of central heat supply in the city of Košice.
			Modernisation of heat distribution system	Reconstruction and modernisation of heat transfer stations and installation of solar collectors.
		2.	Sustainable energy centre	Establishing of county energy center including the city of Košice (Capacities for Regions project), whose aim will be to mobilise professional potential towards energy self-sufficiency of the regions.
			Community energy	Support for building local energy communities within the city. Making energy communities more attractive for private and public sectors and residential buildings.

			Preventing energy poverty	Design and testing of energy assistance tools, to help identify groups of city residents at risk of energy poverty.
	Built environment	3.	Effective energy management system of city-owned buildings and facilities	Introduction of energy management in the city of Košice
			Business Engagement - partnership	Pilot programme for companies' engagement
			Buildings renovations	Renovation of public and private sector buildings, including residential buildings
			Energy Savings Fund for municipal buildings	Establishment of an Energy Savings Fund to provide a stable source of funding for the modernisation of urban buildings
		4.	New energy efficient buildings	Construction of new buildings in accordance with standards for energy efficient buildings, directing construction by regulations within the prepared spatial plan
		5.	Modernized public lighting	Modernization of public lighting infrastructure, including the introduction of smart control
2. Sustainable mobility	Mobility & transport	6.	Modernisation and electrification of public transport	Modernisation and electrification of public transport, including the modernisation of public transport infrastructure (tram tracks)
			Effective mobility management of public transport	Smart traffic management, Optimisation of the public transport line, public transport integration with regional transport
		7.	Promotion of sustainable transport modes	Communication campaigns tu support of use public transport, walking and cycling ; Making available information on air pollution from transport in selected locations
			Comprehensive network of cycling roads in the city	Building cycling infrastructure - incerasing of bike lines
		8.	Support for vehicle electrification	Car electrification - electric recharging network for electric vehicles - building a new recharging network provided by the city, which will complement the network of private partner charging stations
		9.	Establishment of demand-responsive transport service (shared mobility)	Implementation of a pilot project of a collection minibus
		10.	Trafffic calming by regulation	Vehicle access regulation - Charging zones / Zero, Low emission zone, speed reduction - extension of zone 30, residential zones and in the form of shared space.
			Traffic calming by rerouting	Building a bypass of the city
3. Sustainable urban develepment	Waste & circular economy	11.	Modernisation of waste treatment infrastructure	Modernization of the city composting plant - Increasing compost production
		12.	Re-use of goods	A participatory approach to initiate re-use of local spaces for circular offers. Setting up a re-use centre also as a social service - pilot project
			Circular lifestyle	Working with communities and promoting circular
		13.	Re-use of materials	Developing and testing new solutions for building insulations
			Supporting SMEs in the transition to a circular economy	Promoting the adoption of the circular economy in industry by consumers and businesses, Creating innovation networks.

	Green infrastructure & nature-based solutions	14.	Urban green and blue infrastructure	New parklands and revitalisation of green space; Programme for building new urban parks - a green ring around the city
			Nature based technical solutions	Green roofs for public buildings programme
4. Progress through dialogue and cooperation	Cross sector	Governance innovations	Climate planning and implementation of strategies	Preparing a New Spatial Plan and other strategis related to climate change topic - water, biodiversity
			Data governance, data gathering	Expansion of the data platform and GIS of the city ; Design of new assessment tools
			Capacity building	Capacity building and climate awareness programs for city employees
			Expansion of stakeholder esosystem	Further expansion of the ecosystem of stakeholders for the implementation of climate policies
			Innovation (green) public procurement	Introduction of an innovative procurement method
		Social innovation	Awareness raising	Science Park, Awareness-raising campaigns
			Working with the community and for the community	Community gardening, Winter maintenance program of sidewalks in the city "Adopt a sidewalk".
			Climatic gardens	Using the land for climate solutions and raising awareness

Individual actions

B-2.2: Individual action outlines		
Priority 1: Energy efficiency and the transition to renewable energy, Action No. 1.		
Action outline	Action name	**1.1 Geothermal energy for the central heating ;** **1.2 Modernisation of heat distribution system**
	Action type	Technical Intervention
	Action description	**1.1 Geothermal energy for the central heating** The main goal of this for the city key project is to use the potential of geothermal energy in the Košice basin and bring heat from geothermal wells (Svinica - Ďurkov, about 15 km) to the hot-water network of central heat supply in the city of Košice. The plan is to completely phase out hard coal during 2024, which should first be replaced by natural gas and then geothermal energy. The project will be implemented in 3 phases. The first phase begins in the present. The supply of geothermal energy is planned from 2026. Phase 1 is planned to be completed by 2030. If successful, the project will continue with the second phase, which should be completed by the end of 2035. The implementation of the 3rd phase is expected by 2050. The total installed heat capacity, after future expansion, can be up to 90 MWt. **1.2 Modernisation of heat distribution system** The heat supply of the residential and non-residential stock of Košice for the purposes of central heating, hot water preparation and for other technological purposes is provided by the municipal company TEHO. Modernization of thermal equipment to increase the efficiency of heat supply and reduce losses in transformation and distribution, including the installation of RES.
Reference to impact pathway	Field of action	Energy system
	Systemic lever	Technology/ Infrastructure
	Outcome (according to module B-1.1)	Increasing the share of RES. Elimination of heat losses
Implementation	Responsible bodies/person for implementation	1.1 MH Teplárenský holding, a.s.(state heating company), GEOTERM KOŠICE, a.s. (privat company) 1.2 TEHO (city company)
	Action scale & addressed entities	Districts of Košice, approximately 170,000 inhabitants connected to this system, public services, administrative buildings - 300 schools and school facilities, 9 medical facilities as well as business galleries, business centres and sports and cultural facilities
	Involved stakeholders	City of Košice, municipalities in touch with the territory where the source is located and where it is led to the city of Košice
	Comments on implementation – consider mentioning resources, timelines, milestones	1.1 Completion of Phase 1 – 2030: EU-funded – Just Transition Fund Completion of Phase 2 – 2035: Further funding is not secured Completion of Phase 3 – 2050: Further funding is not secured. Main barrier: Lack of financial resources for Phases 2 and 3. 1.2 Estimated funds for modernisation: 20 mil €, partly covered by company budget. Main barier : Lack of financial resources
Impact & cost	Generated renewable energy (if applicable)	1.1 According to the project description: Phase 1: 174 GWh Phase 2: 327 GWh Phase 3: 390 GWh
	Removed/substituted energy, volume, or fuel type	According to the project description: Phase 1: natural gas 19 311 tis. m3 Phase 2: natural gas 33 547 tis. m3 Phase 3: 41 986 tis m3

	GHG emissions reduction estimate (total) per emission source sector	1.1 According to the project description: Phase 1: 37,5 kt CO2 / year Phase 2: 65,3 kt CO2 / year Phase 3: 81,7 kt CO2 /year According to SECAP: Reduction of emission estimated on 58 764 tCO2 / year. 1.2 : N/A 1.1 & 1.2 According to BAU 2030 potential for reduction 340 kt CO2e (2035)
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	1.1 Total cost Phase 1: 87 727 000 € ; 2 340 €/t CO2 Estimated cost Phase 2 : 70 mil. € Estimated cost Phase 3. :100 mil. € 1.2 Est. cost : 20 mil. €

B-2.2: Individual action outlines		
Priority 1: Energy efficiency and the transition to renewable energy , Action No. 2.		
Action outline	Action name	**2.1 Sustainable energy centre** **2.2 Community energy** **2.3 Energy poverty tools**
	Action type	Other intervention
	Action description	**2.1 Sustainable energy centre** Within Slovakia it is planned to establish county energy centres including the city of Košice (Capacities for Regions project, 23 centres will be built), whose aim will be to mobilise professional potential towards energy self-sufficiency of the regions, respect for the limits of the natural environment and the needs of vulnerable social groups, and towards carbon neutrality. **2.2 Community energy** Despite the fact that Slovakia has adopted legislation that allows the creation of energy communities and communities producing energy from renewable sources, its application is difficult from the point of view of the functioning of the communities. It is therefore important to address both the legislation and to promote community energy independence, climate neutrality and community prosperity by supporting the development and implementation of decentralised renewable energy systems. Communities using RES can be established in residential locations, on public and private buildings and areas. One of the projects that are being implemented in this area is the DECA project. **2.3 Energy poverty tools** Design and testing of energy assistance tools, to help identify groups of city residents at risk of energy poverty. Implemented through the Building Power project from the Pilot Cities programme.
Reference to impact pathway	Field of action	Energy system
	Systemic lever	Learning & Capabilities, Governance & Policy
	Outcome (according to module B-1.1)	Mobilised professional potential towards energy self-sufficiency Establishing of new energy communities

		A tool used by more partners in the city working with vulnerable groups
Implementation	Responsible bodies/person for implementation	State agency, Univeristies, Civic associations, Public and Private companies
	Action scale & addressed entities	Urban scale, Citizens, Public and Privat sector
	Involved stakeholders	Municipality, Municipal enterprises, Universities
	Comments on implementation – consider mentioning resources, timelines, milestones	2.1 Implemented within the national project : Capacities for Regions, funded by the EU, till 2026 (Total amount per project : € 35 mil.) 2.2 Project DECA – Danube Energy Communities Accelerator, 2023-2026, funded by the EU, € 0,19 mil Main barriers : Low awareness of the possibilities, unclear legislation 2.3 Implemented within Pilot cities programme, till 2026, Cost : 0,1 mil€
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	Natural gas
	GHG emissions reduction estimate (total) per emission source sector	According to BAU 2030: 148 kt CO2e
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	Est. cost: 2 mil. €

B-2.2: Individual action outlines		
Priority 1: Energy efficiency and the transition to renewable energy, Action No. 3.		
Action outline	Action name	**3.1 Effective energy management system of city-owned buildings and facilities** **3.2 Business Engagement – partnership** **3.3 Buildings renovations** **3.4 Energy Savings Fund for municipal buildings**
	Action type	Technical Intervention, Other Intervention
	Action description	**3.1 Effective energy management system of city-owned buildings and facilities** Cities owns 200 buildings, which are managed by various municipal organisations. At present, there is no central management in the management of buildings and often no cooperation and communication. Planned actions within the project is to set technological management and data governanance, internal governance, to implement capacity building programmes in energy efficiency (employees). It will also include the preparation of an investment plan for the city's buildings. The result of the activity will be the introduction of comprehensive energy management of buildings owned by the city and preparation for reconstruction and modernisation of city buildings. According to SECAP, the CO2 saving potential from the management of the municipality building is 1 292 tCO2 per year. **3.2 Business Engagement – partnership** The aim of the activity is to establish a Pilot programme for companies' engagement. with which the city wants to motivate the private sector to increase the energy efficiency of the buildings in their property. Activity also implemented through Business Košice within the

		Innovation Partnerships program. Est cost of a prepared program is 2 mil.€ **3.3 Buildings renovations** Our goal is to increase the renovation rate from 1.5% to 3% for all types of buildings, through medium and deep renovation. Municipal buildings The city owns 200 buildings of various nature - school buildings, administrative, cultural (including historical buildings) sports and buildings for the provision of social and health services. Most buildings are classified in lower energy classes. The need for funds of €60 million was estimated (in 2022) for the renovation of building envelopes, roofs by insulation, replacement of windows, heat generation equipment and regulation of heating systems. Priority is given to school buildings, which account for more than half of all buildings and which, due to insufficient funds, focus on small-scale maintenance and renovations. The city is intensively looking for funds, especially from external sources, for the preparation and renovation of its buildings. According to SECAP, the CO2 saving potential from the municipality building is 928 tCO2 per year. Tertiary building sector There are 3 universities in Košice. Košice universities are planning significant investments in the comprehensive modernization of buildings and dormitories of public and state universities. For example, P.J. Šafárik University plans to carry out 20 modernizations by 2030, including the modernization of the greenhouse in the Botanical Garden. The estimated cost is €43.7 million. Tertiary building sector, especially state and regional institution searching for external sources. The university is actively involved in solving green topics also through the "Race to Zero – Green University" program According to SECAP, the CO2 saving potential from the tertiary building sector is 928 tCO2 per year. Residential buildings The City of Košice has no direct managerial influence on the implementation of measures in residential buildings. In Slovakia, there are several financial support schemes for the renovation of residential and family houses, such as the State Housing Development Fund, subsidies from the Ministry of Transport and Construction, European Bank programs, the Recovery and Resilience Plan and EU resources. From the city level, raising awareness of the possibilities of support and presenting examples of good practice will be ensured. According to SECAP, the CO2 saving potential from the residential building sector is 5 739 tCO2 per year. **3.4 Energy Savings Fund for municipal buildings**

		Establishment of an Energy Savings Fund to provide a stable source of funding for the modernisation of urban buildings (by 2030).
Reference to impact pathway	Field of action	Energy system
	Systemic lever	Technology/ Infrastructure, Learning & Capabilities, Governance & Policy
	Outcome (according to module B-1.1)	Complete energy management of buildings owned by the city; New projects supported by the Fund. Pilot programme for companies' engagement. Building's renovations.
Implementation	Responsible bodies/person for implementation	Municipality, Building Owners & Managers, Citizens
	Action scale & addressed entities	Urban scale, Citizens
	Involved stakeholders	Buildings companies, State organisations, Municipality districts, Citizens
	Comments on implementation – consider mentioning resources, timelines, milestones	3.1 – Program Pilot cities, 2026 3.2 – 2026 3.3 – Public, EU, private funds Main barrier: Lack of funds, Luck of financial models
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	According to BAU 2030 potential for reduction 46 kt CO2e at 3% rate of renovation According SECAP : 7 595 tCO2/year
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	3.1 500 000 € / 387 tCO2 3.2 Est. cost of the program: 2 mil.€ 3.3 Est.cost for the municipality and P.J.Šafárik university : 104 mil. € 3.4 Costs need to be defined

B-2.2: Individual action outlines		
Priority 1: Energy efficiency and the transition to renewable energy, Action No. 4.		
Action outline	Action name	**New energy efficient buildings**
	Action type	Technical Intervention, Other Intervention (regulation)
	Action description	Construction of new buildings in accordance with standards for energy efficient buildings, directing construction by regulations within the prepared spatial plan. The city of Košice is preparing the construction of new buildings, especially school infrastructure (currently 2). The construction of new buildings is being prepared in accordance with the highest energy standards and measures to mitigate the effects of climate change (green roofs). For the sector of tertiary and residential buildings, there will be clear communication from the city about climate regulations and measures defined in the upcoming new spatial plan.
	Field of action	Energy system

Reference to impact pathway	Systemic lever	Technology/ Infrastructure, Governance & Policy
	Outcome (according to module B-1.1)	New energy efficient buildings
Implementation	Responsible bodies/person for implementation	Municipality, Citizens, Public and private sector
	Action scale & addressed entities	Urban area, Citizens, Public and private sector
	Involved stakeholders	Buildings companies
	Comments on implementation – consider mentioning resources, timelines, milestones	Completion of the processing of the new spatial plan: 2025
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	According to BAU 2030 potential for reduction 1 kt CO2e
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	N/A

B-2.2: Individual action outlines		
Priority 1: Energy efficiency and the transition to renewable energy, Action No. 5.		
Action outline	Action name	**Modernized public lighting**
	Action type	Technical Intervention, Other Intervention
	Action description	The city of Košice owns more than 18 thousand light points, which it is gradually replacing with LED alternatives, switchgear included. At the same time, it is gradually introducing a smart control compact system for public lighting.
Reference to impact pathway	Field of action	Energy system
	Systemic lever	Technology/ Infrastructure
	Outcome (according to module B-1.1)	Modernized and smartly managed public lighting, including the addition of missing lighting in selected locations
Implementation	Responsible bodies/person for implementation	Municipality
	Action scale & addressed entities	Urban area, Citizens
	Involved stakeholders	City districts
	Comments on implementation – consider mentioning resources, timelines, milestones	Replacement of 100 switchboards and comprehensive renovation of public lighting in 4 locations, comprehensive smart management introduced by 2026, cost of €5 million from a bank loan. Complete modernization of public lighting planned by 2030. The need for funds for a complete renovation is €60 million.
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	According to SECAP, the energy saving potential from the modernized public lighting is 1 933 MWh/ per year
	GHG emissions reduction estimate (total) per emission source sector	According to SECAP, the CO2 saving potential from the modernized public lighting is 446 tCO2 per year. According to BAU 2030 potencial for reduction 16 kt CO2e

	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	60 000 000 €; 3 750 € /tCO2

B-2.2: Individual action outlines		
Priority 2 : Sustainable transport , Action No. 6.		
Action outline	Action name	**6.1 Modernisation and electrification of public transport** **6.2 Effective mobility management of public transport**
	Action type	Technical Intervention, Other intervention
	Action description	**6.1 Modernisation and electrification of public transport** *Bus electrification* Public transport in Košice is provided by bus and tram transport. Percentage of transport public transport performance measured in vehicle-kilometres in an environmentally friendly traction on the overall transport performance of public transport Company in 2022 was at the level of 25%. For the needs of civil protection, it is necessary to keep 52 diesel buses in the fleet. There are currently 23 electric buses in the fleet. For the electrification of bus transport, 109 buses (diesel and CNG) need to be replaced. By 2026, the replacement of diesel buses is planned at the level of 25%. By 2026, it is planned to replace diesel buses at the level of 25%, including the necessary charging infrastructure. €30 million has been allocated from EU funds for this purchase. At the current price of €975,000 for 1 electric bus, the electrification of the fleet will require financing of more than €80 million, which the city does not currently have available. To ensure the operation of electric buses, it is necessary to build a charging infrastructure and a new depot for electric buses, the construction cost of which is estimated at €16.2 million. *Modernization of tram infrastructure* Tram transport is an important component of public transport in the city of Košice, as it can be considered as an emission-free environmentally friendly type of transport. Fleet status as infrastructure is unsatisfactory for many sections and its improvement would be significant. It has contributed to more efficient transport in the city. The age of the vehicles exceeds 30 years and is technologically obsolete, as well as a large part of the line infrastructure. Total length of the tram public transport network operated is 33.7 km. There are currently 53 tram stops on this network. In 2016-2018, half of the length of tram lines was modernised. The modernization of the remaining tram tracks is ready for the project. The estimated cost of the modernization is €235 million. These funds are not available. At the same time, the modernization and purchase of new trams in the estimated amount of €15 million, which the city has available from EU funds, is being prepared. An extensive reconstruction of the tram depot, which is financed from EU funds, is currently underway.

		6.2 Effective mobility management of public transport For the effective management of public transport, several projects and measures are being prepared from the city level as a smart traffic management - concept of preference of public transport vehicles through intersections, a concept of interfacing with dispatching centers, equipping buses with intersection detection equipment, gradual implementation of preference at intersections. Further , an important part will be the optimization of the line line (a new transport service plan needs to be prepared), the collection of data on passenger movement and the modernization of central traffic dispatching of public transport. An important element of effective public transport management is integration with suburban transport, which should be in operation from 2026. The aim of the integration is to offer residents from the surrounding area commuting to Košice on a daily basis an alternative for sustainable transport. This integration should result in more connections, better continuity, cheaper travel on coordination of several carriers and better information for passengers. All of the above measures (with the exception of the electrification of buses) should make public passenger transport more attractive and reduce the need for motorized passenger transport
Reference to impact pathway	Field of action	Transport & Mobility
	Systemic lever	Technology/ Infrastructure, Governance & Policy, Participation & Democracy
	Outcome (according to module B-1.1)	Better conditions for the operation of electric buses, Ongoing electrification of public transport ; Modernized and attractive public transport that uses more passengers, ; Smart traffic and mobility management system is introduced
Implementation	Responsible bodies/person for implementation	Municipality, Public transport Company (owned by the city), Integrated transport system (company established by regions)
	Action scale & addressed entities	Urban area and its surroundings, Citizens
	Involved stakeholders	Universities, Suburban transport carriers
	Comments on implementation – consider mentioning resources, timelines, milestones	By 2026, the replacement of diesel buses by e-buses is planned at the level of 25%. By 2026 modernized part of the tram tracks, modernized part of the trams and purchased new trams is planned. Smart solutions for public transport will be set out by 2027, including a new transport service plan. The city has EU funds available for some of these activities (Just Transition Fund, Programme Slovakia). However, for most of these investments, the city does not have the necessary financial resources available. Main barrier: lack of funds, Difficult preparation of infrastructure projects, lack of human resources
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	Diesel

	GHG emissions reduction estimate (total) per emission source sector	**6.1** According to SECAP, the CO2 potential for reduction from the electrification of buses is 2,841 ktCO2 per year. According to BAU 2030 scenario potential for reduction from bus electrification is 5 kt CO2e. **6.2** According to BAU 2030 scenario potential for reduction from publicc transport modernisation and smart control is 6 kt CO2e.
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	**6.1** € 126,200 mil., 25 240 €/ktCO2

B-2.2: Individual action outlines		
Priority 2 : Sustainable transport , Action No. 7.		
Action outline	Action name	**7.1 Promotion of sustainable transport modes** **7.2 Comprehensive network of cycling roads in the city**
	Action type	Technical Intervention, Other intervention
	Action description	**7.1 Promotion of sustainable transport modes** The support of public and non-motorized transport is one of the key priorities of the SUMP of the city of Košice. The City of Košice is aware of the importance of supporting non-motorized transport and its integration with other modes of transport. It is already involved in various campaigns to support cycling (e.g., the national campaign "Bike to Work"), monitors and evaluates the movement of cyclists. To support bicycle transport and its integration with public transport, the public transport company provides bicycle transport in the city, but also on selected lines to recreational locations. The support will be directed to creating a positive image of public and nom-motorised transport. **7.2 Comprehensive network of cycling roads in the city** the aim of the activity is to create a comprehensive network of cycling paths, including parkin places and other equipment, ensure connection with the outskirts of the city and, connection to recreational cycling. The city of Košice is currently preparing the construction of 25 km of bicycle roads. For larger-scale investments, the city mainly uses EU resources.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Learning & Capabilities , Technology / Infrastructure,
	Outcome (according to module B-1.1)	Higher share of public transport passengers, cyclists and pedestrians. Comprehensive network of cycling roads in the city is built.
Implementation	Responsible bodies/person for implementation	Municipality, Public transport company
	Action scale & addressed entities	Urban area and its surrounding, Citizens
	Involved stakeholders	Civic organisations
	Comments on implementation – consider mentioning resources, timelines, milestones	The cost of construction for 1 km of bicycle road in the city, including the preparation of the area and additional infrastructure, is estimated at €600 thousand. This price

		is also influenced by the requirements of Slovak technical standards. The estimated cost of the entire project is €15 million, which the city does not currently have available. For larger-scale investments, the city mainly uses EU resources. By 2026, the city plans to implement 5 km of bicycle roads. Main barriers: complicated preparation, lack of human resources, lack of funds
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	According to SECAP, the savings potential is estimated at 10,211 MWh/year.
	GHG emissions reduction estimate (total) per emission source sector	According to SECAP, the potential of reduction is estimated at 2,662 ktCO2/year. According to BAU 2030 scenario: 3 kt CO2e.
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	7.1 Costs need to be defined. 7.2: Est. cost:15 mil. € / 5000 €/tCO2

B-2.2: Individual action outlines		
Priority 2 : Sustainable transport , Action No. 8		
Action outline	Action name	**Support for vehicle electrification**
	Action type	Technical Intervention
	Action description	Car elecrification - the project will support the building of the SMART city of Košice by building intelligent ICT solutions in transport. In accordance with this, the City of Košice will start building 20 "slow" charging stations (AC) till 2026 and could subsequently build and operate a total of at least 40 "slow" charging stations (AC) till 2030 on the land where the infrastructure is ready to connect to electricity sources. Their construction will double the number of charging stations in the city and make these stations available directly in residential locations. Truck electrification – due to the unavailability of technologies that will ensure the required range of 1000 km and the high purchase price of trucks, a reduction in production of 2 ktCO2 defined in the economic model can be considered by 2040.
Reference to impact pathway	Field of action	Transport & Mobility
	Systemic lever	Technology / Infrastructure
	Outcome (according to module B-1.1)	The network of charging stations for private electrical cars is developed; the share of electric cars is increased The share of electrical trucks is increased
Implementation	Responsible bodies/person for implementation	Municipality, Privat transport and delivery companies
	Action scale & addressed entities	Urban area, Citizens, Privat companies
	Involved stakeholders	Housing developers (private and public)
	Comments on implementation – consider mentioning resources, timelines, milestones	Partially reimbursed through a call to support the construction of charging infrastructure (EU funds)

		for electric vehicles for local governments and organizations set up by them. The cost of building 20 stations is estimated at €166,8k.
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	According to SECAP the potential of reduction is estimated at 6,543 ktCO2/year. According to BAU 2030 scenario for electrification of cars + motorcycles: 5 kt CO2e; truck electrification : 2ktCO2e by 2040.
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	Electrification of cars + motorcycles – charging stations stations: € 400k; 80 €/tCO2 Further costs need to be defined

B-2.2: Individual action outlines		
Priority 2 : Sustainable transport , Action No. 9.		
Action outline	Action name	**Establishment of demand-responsive transport service (shared mobility)**
	Action type	Other intervention
	Action description	The aim of the activity is to offer an alternative solution for serving areas of the city with substandard access to public transport. The activity will be implemented through the transformation of selected public transport lines into the on-call mode (introduction of collection buses as needed) in parts of the city where public transport is not available.
Reference to impact pathway	Field of action	Transport & Mobility
	Systemic lever	Governance & Policy, Social innovation
	Outcome (according to module B-1.1)	Operation of the collection minibus
Implementation	Responsible bodies/person for implementation	Municipality, public transport company
	Action scale & addressed entities	Urban area a its surrounding, Citizens
	Involved stakeholders	Municipality districts
	Comments on implementation – consider mentioning resources, timelines, milestones	The costs of the establishment have not yet been quantified. According to the SUMP, the implementation of the pilot project is planned until 2026.
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	According to BAU 2030 scenario: 3 kt CO2e.
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	Costs need to be defined

B-2.2: Individual action outlines		
Priority 2 : Sustainable transport , Action No. 10.		
Action outline	Action name	**10.1 Traffic calming by regulation** **10.2 Traffic calming by rerouting**

	Action type	Technical intervention, Other Intervention
	Action description	**10.1 Traffic calming by regulation.** The SUMP defines the introduction of the following measures for traffic calming: Traffic calming in the form of zones 30 (establishment on service roads especially in residential areas, establishment of school zones, especially at kindergartens and primary schools), traffic calming in the form of residential zones (in the city centre and in areas with a residential function) and establishing of charging zone or zero/low emissions zone. In 2023, a zone with a maximum speed limit of 30 kilometres per hour (km/h) has already been established on 27 streets in Košice. The introduction of other zones will be carried out based on the requirements of residents and city districts. The calculations were not implemented. This will be the subject of further iterations. **10.2 Traffic calming by rerouting** The city bypasses under construction (total length 14,2 km) will help divert transit traffic from the city in the east-west direction. The road connection is being built in accordance with the Strategic Plan for the Development of Infrastructure of the Slovak Republic until 2030 – Masterplan – Transport Strategy of the Slovak Republic. Currently is building the southeastern part of the city bypass, which should be completed in 2025. At the same time, the construction of the southwestern part of the bypass is being prepared. According to the SUMP, the southeastern part of the city bypass will divert 10% of traffic from the city after completion.
Reference to impact pathway	Field of action	Transport & Mobility
	Systemic lever	Technology / Infrastructure, Governance & Policy
	Outcome (according to module B-1.1)	Zone 30 extension; Regulations for the entry of cars into selected parts of the city are in place. Reduction of total distance travelled through route optimisation - Built bypass of the city
Implementation	Responsible bodies/person for implementation	Municipality National Motorway Company
	Action scale & addressed entities	Urban area, surroundings, Citizens, Public and Privat companies
	Involved stakeholders	Municipality districts
	Comments on implementation – consider mentioning resources, timelines, milestones	The costs of setting up regulations will be assessed individually. Estimated cost for southwestern part of bypass: 140 mil. €
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	According to BAU 2030 scenario: 11 ktCO2e.
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	10.1 Costs need to be defined 10.2 Est. cost 140 mil. €

B-2.2: Individual action outlines		
Priority 3: Sustainable urban development, Action No. 11		
Action outline	Action name	**Modernisation of waste treatment infrastructure**
	Action type	Technical Intervention
	Action description	The modernization of the municipal composting plant is carried out with the aim of increasing compost production, expanding the scope of activity to the neighbouring urban area and reducing the energy consumption of technological equipment and machinery.
Reference to impact pathway	Field of action	Waste & Circular economy
	Systemic lever	Technology / Infrastructure
	Outcome (according to module B-1.1)	Increasing the recycling rate of green waste; higher production of raw material (compost) used for green areas of the city
Implementation	Responsible bodies/person for implementation	Municipality, City company (Urban Greenery Management)
	Action scale & addressed entities	Urban area, Citizens, Public and private companies
	Involved stakeholders	Horticultural companies, park and green space managers
	Comments on implementation – consider mentioning resources, timelines, milestones	The modernization should be completed by 2027. The cost is estimated at €3.1 million and will be financed from EU funds
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	The calculations were not implemented. This will be the subject of further iterations
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations
	Total costs and costs by CO2e unit	Total: 3,1 mil. €

B-2.2: Individual action outlines		
Priority 3: Sustainable urban development, Action No. 12		
Action outline	Action name	**12.1 Re-use of goods** **12.2 Circular lifestyle**
	Action type	Other intervention
	Action description	**12.1 Re-use of goods** The search for specific approaches for re-use of goods in our conditions and the opening of new topics is addressed by several international projects. Specific pilot approaches on a topic: A participatory approach to initiate re-use of local spaces for circular offers. Setting up a re-use centre also as a social service (NiCE). **12.2 Circular lifestyle** The project will address working with communities and promoting circular lifestyles through activities such as the implementation of a virtual exhibition for inspiring examples of how a sustainable lifestyle has been established in urban centers, Solution Box – based on the experience from pilot projects, to bring information on how to reuse spaces for circular offers, how to activate civic engagement, guides for communities with a focus on connecting online commerce and circular offers additional.
Reference to impact pathway	Field of action	Other Intervention
	Systemic lever	Social Innovation, Learning & Capabilities;

	Outcome (according to module B-1.1)	A re-use centre built - a physical space and online system for supply and demand management, Increased re-use of goods,
Implementation	Responsible bodies/person for implementation	Creative Industry Košice (municipal non-profit organisation)
	Action scale & addressed entities	Urban scale, Citizens, NGO, Public & Privat companies
	Involved stakeholders	Municipality, Civic association Creative Industry Košice, Public and private companies
	Comments on implementation – consider mentioning resources, timelines, milestones	Project Niche to centre (NiCE) - City centres as places of circular lifestyle, 2023-2026, funded by the EU
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	The calculations were not implemented. This will be the subject of further iterations
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations.
	Total costs and costs by CO2e unit	Costs need to be defined

B-2.2: Individual action outlines		
Priority 3: Sustainable urban development, Action No. 13		
Action outline	Action name	**13.1 Re-use of materials** **13.2 Supporting SMEs in the transition to a circular economy**
	Action type	Other Intervention – Research and Innovations
	Action description	**13.1 Re-use of materials** The project CI HUB accelerating the circular transition by adopting Industry 4.0 technologies and promoting circular principles like reduce, reuse, and recycle. It targets sectors such as plastic and metal processing and the construction industry, providing a real-world test environment for innovative approaches. **13.2 Supporting SMEs in the transition to a circular economy.** Promoting the adoption of the circular economy in industry by consumers and businesses by several projects . Project Circotronic develops solutions for multiple circulars in electronics manufacturing Project CI-HUB addresses the problem of insufficient acceptance of the circular economy in industry by consumers and businesses, with a focus on the plastics and metal processing and construction sectors. Understanding European value chains and strengthening the ecosystem for better implementation of circular behaviour is addressed by the project LABEL4FUTURE. At the same time, innovation partnerships will be built across all sectors through a program implemented by Business Košice, n.o.
Reference to impact pathway	Field of action	Waste & Circular economy
	Systemic lever	Learning & Capabilities
	Outcome (according to module B-1.1)	Increased re-use of materials Adopting ways of circular lifestyle Increased recycling rate
Implementation	Responsible bodies/person for implementation	Universities, Privat companies, Civic organisations, Business Košice, n.o.

	Action scale & addressed entities	Urban scale, Private companies
	Involved stakeholders	Faculty of Civil Engineering, Facukta of Economics, Technical Unoversity I Košice, Business Košice
	Comments on implementation – consider mentioning resources, timelines, milestones	Project Circotronic, 2023-2026, funded by the EU, € 345 000 Project LABEL4FUTURE, 2024-2026 funded by the EU, € Project CI-HUB, 2024-2026, EU funds € 219 000
Impact & cost	Generated renewable energy (if applicable)	N/A
	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	The calculations were not implemented. This will be the subject of further iterations
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations.
	Total costs and costs by CO2e unit	Cost need to be defined.

B-2.2: Individual action outlines		
Priority 3: Sustainable urban development, Action No. 14.		
Action outline	Action name	**14.1 Urban green and blue infrastructure** **14.2 Nature based technical solutions**
	Action type	Technological Intervention
	Action description	**14.1 Urban green and blue infrastructure** Construction of new parklands and parks on neglected areas covering an area of 10 hectares ; continuous care of existing parklands. Launch of the programme of 10 new parks around the city with a climatic effect (green ring) - cooling the city with a total area of 559.7 hectares. Rainwater harvesting in the city - building rain gardens and installing technical installations for harvesting. **14.2 Nature based technical solutions.** Introduction of green roofs in the reconstruction of buildings owned by the city, if the technical parameters allow. By 2026, green roofs should be implemented on 2.5% of city buildings.
Reference to impact pathway	Field of action	Green infrastructure & nature-based solutions
	Systemic lever	Technical Intervention
	Outcome (according to module B-1.1)	New and restored green areas and blue infrastructure in the city selected measures are implemented Implemented technical solutions close to nature - rain gardens, green roofs and walls.
Implementation	Responsible bodies/person for implementation	Municipality, City company (Urban Greenery Management)
	Action scale & addressed entities	Technical Intervention
	Involved stakeholders	Citizens, Public and private companies.
	Comments on implementation – consider mentioning resources, timelines, milestones	Green and blue infrastructure is being built with EU funds, which are not sufficient.
Impact & cost	Generated renewable energy (if applicable)	N/A

	Removed/substituted energy, volume, or fuel type	N/A
	GHG emissions reduction estimate (total) per emission source sector	According to BAU 2030 scenario: 29 ktCO2e.
	GHG emissions compensated (natural or technological sinks)	The calculations were not implemented. This will be the subject of further iterations.
	Total costs and costs by CO2e unit	Est. cost € 15 mil. / 517 €/ tCO2

B-2.3: Summary strategy for residual emissions

Calculations of residual emissions from the city level were not carried out. For the purposes of the City Climate Contracts, 20% is considered, which is the maximum value according to the instructions of the Info Kit. These data are presented only in Table 8/ A.2-1 Emission Gap.. Residual emissions calculations will be addressed in subsequent iterations.

Generally, the potential for residual emissions can be identified in the vast forest areas that surround the city, the ever-expanding green spaces in the city and the planting of trees, and the Hornád River, which forms the backbone of the city.

Urban Forrests

Urban forests are key in terms of residual emissions for the City of Košice. These forests, which are among the largest urban forest assets in Central Europe, cover an area of 19 432 hectares. Their importance lies in several key areas, namely carbon capture and biodiversity protection, and a source of drinking water. For the preservation of urban forests, artificial regeneration and education of protective forests and forests for special purposes is continuous.

Green Spaces & Planting trees

In addition to building large parks that will form a "ring" around the city, the city is continuously working with green areas in the city, which are created mainly by the reclamation of unused areas or paved areas. Since 2019, a total of more than 3500 trees have been planted in our city. Several hundred trees are planted annually.

River Hornád

The Hornád River represents the backbone of the city of Košice. It flows from north to south. Originally a rugged river with side branches and islets, it gave way to the developing city. A significant remnant of the original meander of the Hornád River (with its own history) is the Mill Race (Mlynský náhon), where mills were built from the 14th century, which later burned down. At present, the Mill Race represents a poorly evaluated and only limited area accessible to the public. The city of Košice, together with non-profit organizations, has prepared a project of deep revitalisation of the watercourse "Mlynský náhon" and its surrounding. Resources of €13 million are needed for its implementation.

2.3 Module B-3 Indicators for Monitoring, Evaluation and Learning

B-3.1: Impact Pathways							
Outcomes/ impacts addressed	Action/ project	**Indicator No.** (unique identified)	Indicator name		Target values		
					2025	2027	2030
(List early changes/ late outcomes and impacts to be evaluated by indicator)	(List action/ pilot project if applicable)	(Indicate unique identifier)	(Insert indicator name)		(List one value per indicator)	(List one value per indicator)	(List one value per indicator)
The main indicator of the Climate City Contract							
Reduction of GHG emissions (2018 baseline)	All actions in the Action plan	KSC – I1	GHG reduction (CO2 e, %)		30%	50%	68%
Energy system							
Increasing the share of RES Elimination of heat losses	No.1	KSC – I2	Share of RES in district heating (%)		13%	42%	56% (2035)
Mobilised professional potential towards energy self-sufficiency	No.2	KSC -I3	Local renewable electrical energy production (kWh in %)		30%	35%	40%
Establishing of new energy communities Preventing energy poverty		KSC -I4	Households with assistance in energy use (number)		2	8	15
Built environment							
Complete energy management of buildings owned by the city New projects supported by the Fund Pilot programme for companies' engagement Building's renovations	No. 3 – N.o 4	KSC -I5	Change in the total energy consumption by buldings per year (%)		10%	25%	45%
New energy efficient buildings		KSC – I6	Companies´engagement (Number)		5	10	15
Modernized and smartly managed public lighting, including the addition of missing	No.5	KSC – I7	Efective public lighting equipment (%)		25%	75%	100%

lighting in selected locations							
Mobility & Transport							
Better conditions for the operation of electric buses, Ongoing electrification of public transport	No.6.1	KSC -I8	Share of electric buses in the public transport fleet (%)		25%	50%	100%
Modernized and attractive public transport that uses more passengers,	No. 6.2 – No.7	KSC – I9	Shift of the population from individual passenger transport use to public and non-motorized transport (%)		3%	6%	10%
Smart traffic and mobility management system is introduced							
Higher share of public transport passengers, cyclists and pedestrians							
Comprehensive network of cycling roads in the city is built							
The network of charging stations for private electrical cars is developed; the share of electric cars is increased	No. 8	KSC -I10	Share of electric passenger cars in registered vehicles (%)		2%	5%	18% (2040)
The share of electrical trucks is increased	No. 8	KSC – I11	Share of electric trukcs in registered vehicles (%)		1%	2%	10% (2040)
Operation of the collection minibus	No.9 – No.10	KSC – I12	Implemented measures to reduce the need for motor transport in the city (number)		3	6	10
Zone 30 extension, Regulations for the entry of cars into selected parts of the city are in place							
Reduction of total distance travelled through route optimisation - Built bypass of the city							
Waste & Circular economy							
Increasing the recycling rate of green waste; higher production of raw material (compost) used for	No.11-12-13	KSC -I13	Amount of waste recycled (%)		40%	55%	60%

green areas of the city							
Reducing waste production; Increased re-use of goods							
Increased re-use of materials		KSC -I14	Implemented activities/projects to promote circularity in the city		5	10	15
Adopting ways of circular lifestyle							
Green infrastructure & nature-based solutions							
New and restored green areas and blue infrastructure in the city	No. 14	KSC -I15	Area of new or revitalised green infrastructure (ha)		1	5	12
Implemented technical solutions close to nature - rain gardens and green roofs		KSC-I16	Implemented projects of technical solutions close to nature in the city (number)		5	10	15
Cross sector							
Governance & Social Innovations		KSC-I17	Events for residents communicating climate change as a serious social topic (number)		12	18	24

B-3.2: Indicator Metadata	
	KSC – I1
Indicator Name	**GHG reduction**
Indicator Unit	%
Definition	Measurement of a progress in reducing greenhouse gas (GHG)
Calculation	The Covenant of Mayors for Climate and Energy initiative methodology for reducing GHG emissions.
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	All Fields A-1
Does the indicator measure indirect impacts (i.e., co-benefits)?	No
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Total
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Local date
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Reduced production of GHG emissions
Other indicator systems using this indicator	Other global systems

B-3.2: Indicator Metadata	
	KSC – I2
Indicator Name	**Share of RES in district heating (%)**
Indicator Unit	%
Definition	The indicator defines the representation of RES used in the production of heat for central district heating in Košice
Calculation	Calculated by the heating companies
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Energy system, Buildings
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy efficiency and the transition to renewable energy: Geothermal energy for the central heating Modernisation of heat distribution system
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Internal data of the heating companies
Is the data source local or regional/national?	Local
Expected availability	Internal data of the heating companies
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Increased share of RES in energy production
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC -I3
Indicator Name	**Local renewable electrical energy production (kWh in %)**
Indicator Unit	%
Definition	This indicator assesses the amount of renewable energy generated within the renewable energy community and other sources (hydroenergy). It quantifies the proportion of energy consumption that is met through locally produced renewable sources.
Calculation	The percentage of local renewable energy production is calculated as the share of renewable energy generated locally compared to the total energy consumption of the city.
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Energy system, Buildings
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes

If yes, which action and impact pathway is it relevant for?	Energy efficiency and the transition to renewable energy: Sustainable energy centre, Community energy
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Local date - Data from the renewable energy communities' proprieties, energy supply companies, community, local energy providers and utilities, renewable energy facilities, energy regulators, energy production records, grid operators, renewable energy certificates
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Increasing the use of energy from local sources
Other indicator systems using this indicator	yes

B-3.2: Indicator Metadata	
	KSC – I4
Indicator Name	**Households with assistance in energy use**
Indicator Unit	Number
Definition	Number of households granted energy assistance
Calculation	N/A
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	yes
If yes, which co-benefit does it measure?	Available energy
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy efficiency and the transition to renewable energy: Preventing energy poverty
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Organisations working with vulnerable groups
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Provide energy for all residents and teach them how to use energy economically
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC – I5
Indicator Name	**Change in the total energy consumption by buldings per year**
Indicator Unit	%

Definition	The amount of energy consumed in buildings in the city (public, private - tertiary sector, residential
Calculation	Calculation on primary data
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Built environment, Buildings, Electricity
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy efficiency and the transition to renewable energy: Complete energy management of buildings owned by the city New projects supported by the Fund Building's renovations New energy efficient buildings
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	From Electricity Supply Organizations, City data
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Economy and efficiency of energy resources
Other indicator systems using this indicator	Yes

B-3.2: Indicator Metadata	
	KSC – I6
Indicator Name	**Companies´engagement**
Indicator Unit	Number
Definition	Number of companies that have decided to reduce the energy intensity of their operations
Calculation	N/A
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	no
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy efficiency and the transition to renewable energy: Pilot programme for companies' engagement
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	From cooperating networks, companies
Is the data source local or regional/national?	Local
Expected availability	Data collection

Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Expanding responsibility towards energy use
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC – I7
Indicator Name	**Efective public lighting equipment (%)**
Indicator Unit	%
Definition	Energy-efficient public lighting that is installed in all necessary locations.
Calculation	Own calculation
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/a
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy efficiency and the transition to renewable energy Modernized and smartly managed public lighting, including the addition of missing lighting in selected locations
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Internal data of the City
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Energy-efficient lighting that also increases safety in the city
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC -I8
Indicator Name	**Share of electric buses in the public transport fleet**
Indicator Unit	%
Definition	Share of electric buses in the public transport fleet of the City public transport company. The number does not include buses, which are also reserved for the needs of civil protection of the city's residents. A city public transport company is the subject of economic mobilization in the event of a natural disaster.
Calculation	Own calculation
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Transport & mobility
Does the indicator measure indirect impacts (i.e., co-benefits)?	N/A

If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable transport: Modernisation and electrification of public transport
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Public transport company
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Reducing the consumption of fossil fuels in transport
Other indicator systems using this indicator	yes

B-3.2: Indicator Metadata	
	KSC -I9
Indicator Name	**Shift of the population from individual passenger transport use to public and non-motorized transport**
Indicator Unit	%
Definition	The indicator determines the proportion of users of individual car transport who have chosen to use public transport and non-motorised transport
Calculation	To be specified
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Transport & Mobility
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable transport: Effective mobility management of public transport, Promotion of sustainable transport modes, Comprehensive network of cycling roads in the city
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Through surveys, data from transport companies, municipality, civic organisation
Is the data source local or regional/national?	Local
Expected availability	Own surveys
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Reducing the number of cars on the road
Other indicator systems using this indicator	yes

B-3.2: Indicator Metadata	
	KSC -I10
Indicator Name	**Share of electric passenger cars in registered vehicles**
Indicator Unit	%
Definition	Share of fully electric cars in the total share of registered cars in the city, Including light trucks up to 3.5 t.
Calculation	Own calculation according to data from registers
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Mobility & Transport
Does the indicator measure indirect impacts (i.e., co-benefits)?	No
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	no
If yes, which action and impact pathway is it relevant for?	Sustainable mobility: Support for vehicle electrification
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	Registers of state organisations
Is the data source local or regional/national?	National
Expected availability	Publicly available data
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Reducing the amount of fossil fuels consumed in transport
Other indicator systems using this indicator	yes

B-3.2: Indicator Metadata	
	KSC -I11
Indicator Name	**Share of electric trukcs in registered vehicles (%)**
Indicator Unit	%
Definition	Share of fully electric cars – heavy trucks to 3.5 t in the total share of registered cars in the city,
Calculation	Own calculation according to data from registers
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Mobility & Transport
Does the indicator measure indirect impacts (i.e., co- benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	no
If yes, which action and impact pathway is it relevant for?	Sustainable mobility: Support for vehicle electrification
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Registers of state organisations

Is the data source local or regional/national?	National
Expected availability	Publicly available data, Data gathering
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Reducing the amount of fossil fuels consumed in transport
Other indicator systems using this indicator	yes

B-3.2: Indicator Metadata	
	KSC – I12
Indicator Name	**Implemented measures to reduce the need for motor transport in the city**
Indicator Unit	Number
Definition	The calculation of the indicator includes all measures of various nature (regulatory, infrastructural, informational, etc.) implemented by the city and its partners.
Calculation	N/A
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co- benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable mobility: Establisment of demand-responsive transport services (shared mobility), Traffic calming by regulation and by rerouting
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	From the municipality, transport companies, etc.
Is the data source local or regional/national?	Local
Expected availability	Data collection, gathering
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Reduction of the number of cars and the need for individual transport, reduction of total travel distance in the city
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC – I13
Indicator Name	**Amount of waste recycled**
Indicator Unit	%
Definition	The indicator includes the amount of waste that is recycled in the city, recycling rate.
Calculation	Calculated as the ratio of mixed waste to waste destined for further use/treatment. It does not include the amount of waste that is recovered in terms of energy.
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes

If yes, which emission source sectors does it measure?	Waste & Circular economy
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable urban development: Modernisation of waste treatment infrastructure, Re-use of goods, Re-use of materials
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Internal data, data of waste companies, statistical registries
Is the data source local or regional/national?	Local, national
Expected availability	Data collection, gathering
Suggested collection interval	2 year interval
References	
Deliverables describing the indicator	Reducing the amount of waste produced and increasing the recycling rate
Other indicator systems using this indicator	yes

B-3.2: Indicator Metadata	
	KSC – I14
Indicator Name	**Implemented activities/projects to promote circularity in the city**
Indicator Unit	Number
Definition	The indicator tracks initiatives implemented to promote a circular way of life (projects, events, innovation networks, etc.).
Calculation	N/A
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable urban development: Circular lifestyle, Supporting SMEs in transition circular economy
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Partners from public, private, academy and third sector
Is the data source local or regional/national?	Local
Expected availability	Data collection and gathering
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Wider involvement of residents and companies in the circular economy and way of life
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC – I15
Indicator Name	**Area of new or revitalised green infrastructure**
Indicator Unit	ha
Definition	Areas implemented by the public or private sector, if data is available. Only the area that previously did not serve as an official park area is included in the revitalized area. The area does not include roadside greenery.
Calculation	Area in ha
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable urban development: Urban green & blue infrastructure
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Provided by the public and private sectors, suerveys, tec.
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Increasing the area of green spaces in the city to improve the microclimate and create social space for residents
Other indicator systems using this indicator	Yes

B-3.2: Indicator Metadata	
	KSC – I16
Indicator Name	**Implemented projects of technical solutions close to nature in the city**
Indicator Unit	Number
Definition	The indicator defines the number of implemented projects by the public, private and third sectors according to availability
Calculation	N/A
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Sustainable urban development: Nature based solutions
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no

Data requirements	
Expected data source	Data provided by the public, private and third sectors
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 years interval
References	
Deliverables describing the indicator	Increasing the share of greenery in the city
Other indicator systems using this indicator	N/A

B-3.2: Indicator Metadata	
	KSC – I17
Indicator Name	**Events for residents communicating climate change as a serious social topic**
Indicator Unit	Number
Definition	The number of different events and projects carried out by different entities that are intended for the inhabitants of the city and are related to raising awareness of the climate crisis.
Calculation	N/A
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it measure?	N/A
Does the indicator measure indirect impacts (i.e., co-benefits)?	no
If yes, which co-benefit does it measure?	N/A
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Cross sector: Governance & Social Innovations
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Data provided by the public, private and third sectors
Is the data source local or regional/national?	Local
Expected availability	Data collection
Suggested collection interval	2 yeas interval
References	
Deliverables describing the indicator	Involving as many people as possible in finding solutions to combat climate change.
Other indicator systems using this indicator	N/A

3 Part C – Enabling Climate Neutrality by 2030

3.1 Module C-1 Governance Innovation Interventions

C-1.1: Description or visualisation of the participatory governance model for climate neutrality

The fourth key priority for change in the city "Progress through dialogue and cooperation" (Cross sector). It is crucial not only for expanding the ecosystem, but for working with all sectors and residents. So that the desired change is achieved at all levels.

Solving the climate agenda in the city very much removes isolated solutions and helps to bring procedures that require deeper cooperation at the level of individual departments and municipal enterprises.
The main bearer of the climate agenda (the core team) in the city is the Strategic Development Department, which incorporates several key units for solving climate change. These are the Strategic Development Unit, the EU Project Implementation Unit, the Mobility Strategy Unit and the Data Policy and Analysis Unit. Other close cooperation is with the Department of the Chief Architect, the Department of Construction, Transport and Environment, the Department of Education and the Department of Social Affairs. Since 1.7.2024 (with the support of the project from the Pilot Cities - Building Power Program), the energy department has been operating in the city.

The city uses several tools to communicate with stakeholders (on a horizontal level) and strengthen the local ecosystem. First of all, it is the municipal organization Business Košice, whose task is to work with the private sector. At the same time, the existing ad-hoc cooperation within the CSG - Cities for Sustainable Governance (Network Action Planning, Urbact IV) project began to create a Local Urbact Group with a focus on climate transformation, which will form the basis of the stakeholder ecosystem composed of representatives of the academic sector, the private sector, civil society and residents. Cooperation and often communication at the vertical level remain problematic, which is mainly influenced by fragmented responsibilities divided between the state, the region and the city. In terms of layout, the city of Košice has a two-level self-government with 22 city districts, where isolated solutions are also often implemented. We want to overcome all these barriers by strengthening the ecosystem and working with actors to address climate change.

As part of the Harmonmissions project (2024-2026, Danube region programme), in which the city of Košice is also involved, a new governance structure is implemented, based on the cooperation of a group of adaptation and mitigation advisors and the Steering Committee, whose task is to look for ways to implement both missions more effectively and make recommendations to their regional and national governments. We also plan to use this project to strengthen cooperation at the vertical level in the field of solving climate change.

Greater involvement of residents in the development of the city is implemented through various projects such as UrbCitizenPower: Empower citizens for agency as driver for change in cities, where residents will be involved in planning in the field of green infrastructure.

In this work, we will also use the experience we have gained in solving joint projects within the framework of integrated territorial investments (ITI) or implementation of a project as Košice 2.0 implemented within UIA.

C.1.2: Relations between governance innovations, systems, and impact pathways					
Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
	(Describe the substance of the intervention)	(Refer to barriers and opportunities identified in Module A-3)	(List leaders and all stakeholder involved and affected, referring to the stakeholders mapped in Module A3)	(Describe how intervention enables climate neutrality)	(Indicate how intervention helps achieve the impact listed in Module B-1)
Climate planning and implementation of strategies	SECAP update, including adding data for missing SCOPEs and sectors; Developing strategies that are directly related to climate change (water, biodiversity) and incorporating climate objectives into revised strategies. Approval of the new zoning plan and establishment of regulations	Siloed and fragmented responsibilities; Limited past engagement with private sector, universities and civic organisation	Municipality, Univeristies, Public & Privat Sector, Civic oragnisations	A baseline will be established for planning in all relevant sectors and their coordination with each other	Improvement quality of environment (air, public spaces) and life
Data governance, data gathering	Making climate data available, introducing new assesment tools, using data more efficiently for decision-making	Decision-making without data (feeling-is-for-doing approach), Lack of date, Partners' reluctance to share data / The presence of research institutions and projects also in the field of designing new models for data acquisition ; Basic tools for data presentation (GIS, open data platform) introduced at the city level	Municipality, CIKE (Well-being institut), Univeristies, Privat sector	By making relevant data available, the prerequisites for more intensive work with climate data for decision-making, other activities and projects will be created	Financial savings, Elimination of externalities
Capacity building	Capacity building and climate awareness	Lack of knowledge and awareness ,	Minicipality, Municipal enterprises, Privat companies	It will change the way employees behave	Financial savings Improved quality of enviroment (air, spaces ...)

	programs for city employees	Habitual behaviour, Limited awareness and integration of climate change mitigation into wider city activities			
Expansion of stakeholder esosystem	Further expansion of the ecosystem of stakeholders for the implementation of climate policies	Limited past engagement among other sectors and levels of governance; Insufficent communication, information and transfer of knowledge	Municipality, Business Košice ; all sectors, all governance levels	Space will be created for regular communication, e.g. through the created Urban local group	Creating a wider space for participation
Green public procurement	Preparation of internal legislation for the application of elements of green public procurement	Including "green criteria" in the public procurement process and breaking the habit of judging bidders only on the basis of price	Municipality, Municipal enterprises, Suppliers	Environmental and climate impacts will be more taken into account in shopping and construction	Improved quality of enviroment (air, spaces, ..)

3.2 Module C-2 Social Innovation Interventions

C.2.1 Sample Table: Relations between social innovations, systems, and impact pathways					
Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
(Indicate name of intervention)	(Describe the substance of the intervention)	(Refer to barriers and opportunities identified in Module A-3)	(List leaders and all stakeholder involved and affected, referring to the stakeholders mapped in Module A3)	(Describe how intervention enables climate neutrality)	(Indicate how intervention helps achieve the impact listed in Module B-1)
Science Park	For children's education, the "Steel Park" exhibition will be expanded, the aim of which will be to educate children in green topics, such as the possibilities of using residual energy, in a fun way. A council of experts from the scientific sphere and universities in Košice is working on the preparation of the new exhibition.	Behaviour change, using the potential of universities in this direction as well, interest in supporting educational activities from the steel giant	Municipal company – K13 Košice Cultural Centers, US Steel Košice, Universities	Supports behavioural change and innovative thinking at an early age	Creating a quality environment and quality of life
Collaborative Efforts	Connecting actors from different sectors and from the population to propose specific solutions, such as Winter maintenance program "Adopt a sidewalk".	Behaviour change	Municipal company – K13 Košice Cultural Centers,	Supports behavioural change	Creating a quality environment and quality of life
Awareness raising - Working with the community and for the community	As part of the ECoC 2013 project, the city transformed old heat exchanger stations into community centers "Výmenníky-exchangers" for local residents, where various community events are organized, which will also include events on the consequences of climate change and solutions to mitigate these consequences on a regular basis. Expand community gardens in "Exchangers", which will	Behaviour change	Municipal company – K13 Košice Cultural Centers,	Supports behavioural change	Creating a quality environment and quality of life Reduction of car use

	not only be a place to grow healthy vegetables and fruits, but also a space for the community to meet.				
Fighting energy poverty	Design and testing of energy assistance tools, to help identify groups of city residents at risk of energy poverty and subsequently seek solutions to prevent energy poverty (Roma communities, single parent households, Ukrainian refugees, and senior citizens)	Limited access to energy in the case of vulnerable groups of the population	ETP Slovakia, Municipality, civic organisation	Ensuring access to energy for all residents by preventing situations that could result in them being denied.	Improved quality of life
Climatic gardens	Transformation of school land for climatic gardens	Changing children's behaviour in primary schools	Primary schools, civic organisations	The transformation of school land will create more climate-friendly conditions in schools and will have a positive effect on changing the behaviour of pupils	Creating a quality environment and quality of life
Clean air around schools	Determining the impact of transport on air quality in the vicinity of primary schools, bringing this situation closer to parents, teachers and children, and proposing measures to improve	Changing Parental Behavior	Municipality, primary school	It limits passenger car transport and promotes the use of sustainable types of mobility.	The intervention will affect the way pupils and parents change their behaviour in terms of transport preference

C-2.2: Description of social innovation interventions

Social innovation plays a crucial role in addressing climate change in urban areas. The city plans to address these through community-led activities, a greater collaborative effort a targeted solutions to residents who are already or may fall into energy poverty. In addition, it will seek to make use of existing infrastructure, such as Science park - Steel park to bring the topics of climate change closer to her.

Community-led activities

The main obstacle we need to overcome on the way to climate neutrality is behavioural change. It is planned to get closer to the city's inhabitants and effectively communicate the topic of climate change through tools that were created during the ECoC 2013. “Exchangers / Výmenníky” (unused heat exchange stations), which were created in the city's housing estates during the ECoC, have become an integral part of the life of local communities. We plan to use this space, where communities meet at joint events, in community gardens, or during informal discussions about life in their locality, to raise awareness of the fight against climate change. Currently, about 5000 events are held annually in 7 such “Exchangers” in the 5 largest housing estates in Košice, which create a unique opportunity to get closer to the city's residents. The exchanger administrator (K-13 Košice Cultural Centers), who is our partner in the Climate City Contract, will direct part of the program to topics about climate change, which will be presented through art, creative industries, or volunteer activities.

Collaborative Efforts

Effort to collaborate between social innovators, businesses, and governments is another important part on the road to climate neutrality.. These collaborations will focus on increasing resilience and seizing opportunities in the fight against climate change, especially through the city and already established organizations such as Creative Industry, K-13 Košice Cultural Centers and other organizations, such as Business Košice, whose task is to build networks across the entire ecosystem in the city. The result should be various programs, such as the Winter Sidewalk Maintenance Program of the city "Adopt Your Sidewalk", which is implemented by the city in cooperation with residents.

Energy poverty

Energy poverty is a particular concern in Kosice's region of Eastern Slovakia, that is one of the 20 poorest in the EU, with a GDP that is 51% of the EU average. Together with the Central Slovakia region, Eastern Slovakia is identified by the European Commission as being at medium risk of migration, brain and talent drain of younger residents (15 to 39-year-olds). And residents are aging rapidly: three Kosice districts rank in the top eight nationally for expected increase in the percentage of residents of retirement age by 2030 (Slovak Academy of Science, 2023). The city and region also have the highest ethnic and linguistic heterogeneity in the country and are experiencing an increasing economic disparity vs. the rest of the country. These factors contribute to a relatively high rate of energy poverty in the city and region, relative to other EU countries. The partner ETP Slovakia, together with Municipality and other civil organisation will develop a set of tools to help residents in vulnerable groups to mitigate the effects of energy crisis and reduce energy poverty risk (Project Building Power, Pilot city programme). These tools will address the needs of specific vulnerable groups living in Kosice. And so it will make it possible to prevent a situation that would prevent them from accessing energy.

4 Outlook and next steps

Plans for next CCC and CCC Action Plan iteration

We see this initial proposal for an urban climate agreement as the beginning of a process by which we initiated the beginning of a certain change. We consider this document to be a living document that will be updated in 2 years interval. To improve the quality of the Action Plan and the defined pathways for achieving climate neutrality, the following steps will be implemented by the city and its partners:

- **Improvement and expansion of the economic model and provision of relevant inputs**: For the needs of the correct use of the economic model, it is necessary to provide all relevant data for all sectors and scopes, residual emission including. At the same time, it is necessary to adopt methodologies for assessing CO2 emission reductions for all implemented and prepared activities.

- **Expand the ecosystem of partners for the implementation of activities that are not detailed in the plan**. In an effort to respond to the need for input into the economic model, some activities were designed on a general level with goals defined on the basis of qualified estimates of experts, but without securing specific stakeholders (for example, in the case of electrification of freight transport). At the same time, financial planning will need to be resolved.

- **Strengthening the defined pathways and expanding the ecosystem of partners** : Furthermore, it is necessary to expand activities to strengthen planned pathways in all sectors, areas and systems, e.g. how to deal with the modernization of historic buildings in buildings, to deal with air transport and the IPPU and AFOLU sectors, etc.

- **Financial planning:** Intensively seek together with our partners the financing of the activities defined in the action plan to secure their implementation. Most of the activities implemented at the level of the city and our partners

	are financed from EU funds in the 2021-2027 programming period, which are not insufficient to cover the defined activities. Securing the necessary funding will be crucial for this and future Action Plan as well.

5 Annexes

The annexes contain any textual or **visual material** to the 2030 Climate Neutrality Action Plan as necessary.

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of the City of Košice

KOŠICE

The content of this document reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains.

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Table of contents

1 Introduction

In 2022, Košice was selected from 377 European cities to be part of the Mission EU 100 Climate Neutral and Smart Cities. The city has been honoured to be part of an ambitious initiative that makes the selected cities experimental hubs for innovation with the aim of achieving climate neutrality by 2030 and thus becoming an example for other European cities.

The implementation plan for this Mission envisages that each of the 100 + 12 selected cities will develop a Climate City Contract that does not represent a legalistic commitment but sends a clear political signal to the citizens and actors operating in the city, in the region, the state and EU. In developing the Climate City Contract, each city will draw on its own reality and, through a process of co-creation and in close collaboration with the whole of civil society and citizens, will develop a strategy that will not only create the conditions for its own transformation, but will serve as an inspiration for other European cities to become climate neutral by 2050.

In this way, this document meets the requirements of the European Cities Mission. It has been developed by the city with the participation of other public and private stakeholders, some of whom have joined the initiative as signatories, and sets out plans to achieve climate neutrality throughout the defined framework, although refinements and additions will be needed in some places. Its ambition is to deliver solutions for all its citizens, including vulnerable groups. To make the contribution to climate neutrality as effective as possible, this Climate City Contract will be expanded and updated.

The document is divided into 3 parts: one concerning the City's commitment and strategic priorities, which are presented in this section, the Climate Action Plan (CAP, Annex 1), which defines the pathway for achieving the objectives, and the Climate Investment Plan (CIP, Annex 2).

The city of Košice and its journey

The city of Košice has undergone several transformations in its history. After the completion of the steel giant (now US Steel) in the 1980s, Košice became one of the fastest growing cities in the former Czechoslovakia. By the beginning of the new millennium, Košice began to transform from a city dependent on heavy industry to a more diverse and cleaner metropolis with a mix of services, culture and education to complement the remaining heavy industry. The systematic decline of the heavy industry workforce has been replaced by a corresponding systematic increase in the IT (10,000 employees), culture and creative and soft industries workforces. The title of European Capital of Culture, which the city became in 2013, has strengthened the development of these sectors and brought a new culture of cooperation between sectors and a more intensive cooperation with the third sector and especially with the citizens to the city.

The transformation of the city from heavy industry to clean industry already at the beginning of the new millennium seemed to foreshadow the path Košice should follow. As the city intensively seeks opportunities to build its climate resilience and neutrality, joining the EU's Mission 100 Climate Neutral and Smart Cities by 2030 represents a key milestone on this journey. It is the preparation of the Climate City Contract that allows to link past experiences with new plans and bring together actors who have not actively cooperated until now.

Košice recognises the importance of transforming into an environmentally sustainable city and with the arrival of the current leadership (2018) has started to actively work on relevant areas of development. The City of Košice made its first climate commitment to reduce its emissions by 40% in 2019, which it has sought to not only meet but also increase with each subsequent activity. The steps that the City of Košice has taken towards building a climate friendly city are presented in Figure 1.

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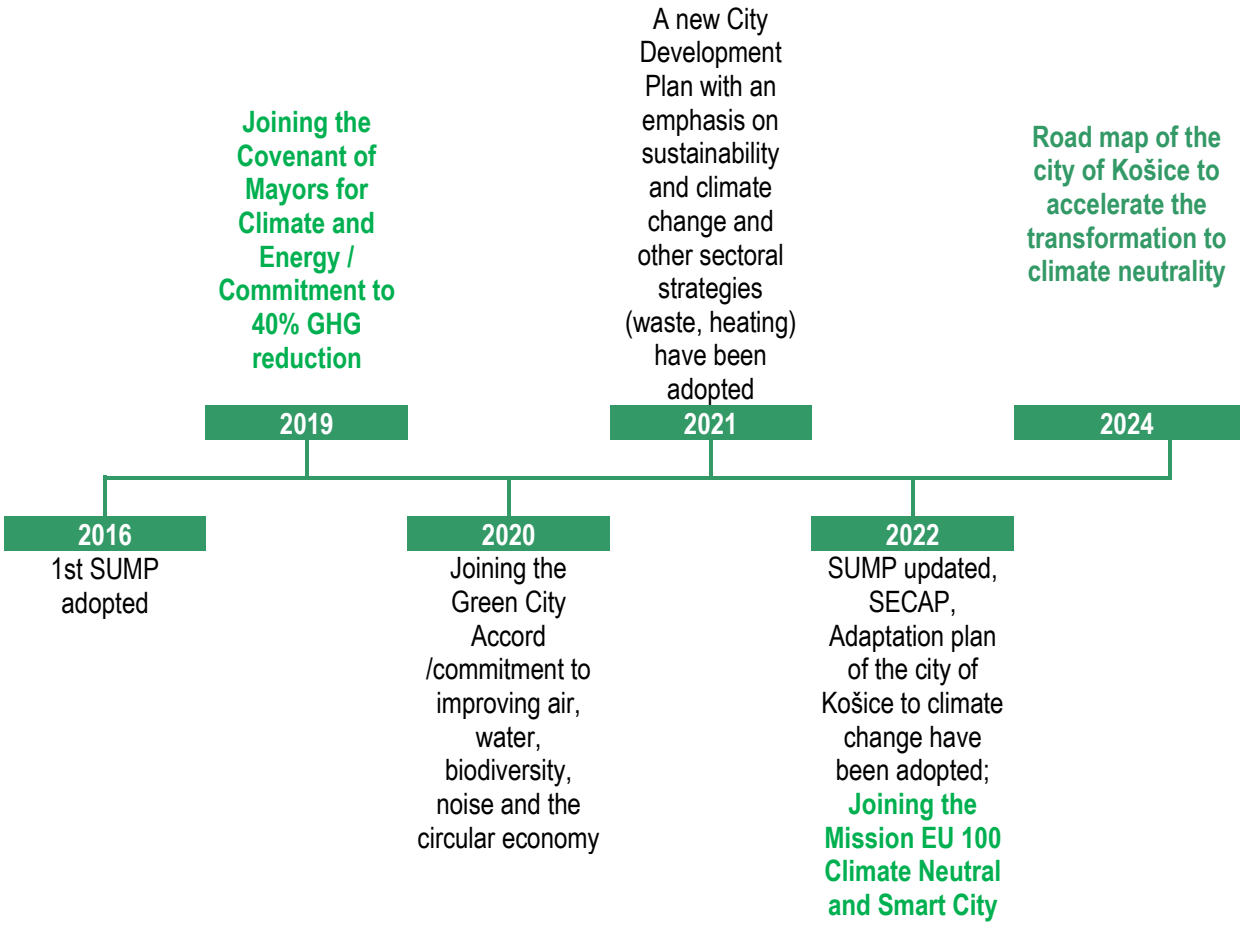
Figure 1: Evolution of initiatives carried out by the City of Košice



In addition, the city began to engage in major development projects to increase the quality of life in the city, civic engagement in cultural, social and economic activities and improving the city's services.

One such project that further developed the ideas of ECoC 2013 was the Košice 2.0 project implemented within Urban Innovative Actions (UIA). This project used innovative approaches to connect city administration, entrepreneurs and residents on current social issues, including addressing the climate crisis. Other projects are currently being implemented and in the pipeline that seek answers to effectively address the impacts of climate change in the city, including a number of infrastructure projects in the areas of energy efficiency of buildings and facilities, public passenger transport, non-motorised transport, green and blue infrastructure.

The city has been a strong advocate of supporting large decarbonisation projects, both public sector and private sector. One of these projects is the use of geothermal energy from the nearby Ďurkov area, which could be used as a source of energy for the central heating supply (2021, Memorandum of Cooperation on the use of the energy potential of geothermal boreholes in the Ďurkov area with the Ministry of Economy and SPP infrastructure). It also expressed support for planned decarbonisation projects to one of the largest steels (and greenhouse gas)

producers in Europe, U.S. Steel Košice (2022, Memorandum of Understanding on planned support for decarbonisation projects). The city also supports the arrival of strategic investors in the city who are responsible for climate change, such as the Swedish car company Volvo, which is building a climate-neutral plant near Košice. This can have a significant positive impact on changing the behaviour of the city's inhabitants.

The city of Košice is currently preparing a new spatial plan after 50 years. This presents a key opportunity for defining climate-friendly measures in the form of various land use regulations, sustainable transport and energy solutions, and planning rules for transformation and new development areas, for example, the preparation of a new and the first carbon-neutral urban district "New Urban Centre Hornád" (2055) has started.

However, the pursuit of climate neutrality is a long journey that requires the implementation of a series of transformative measures that can only be realised with the involvement and close collaboration of citizens and key industry, academic and government actors. For the city, this presents another major challenge in which it must learn how to work with an ever-expanding ecosystem of partners.

The city's involvement in the EU Mission has brought new opportunities for the city to collaborate, gain knowledge and exchange experiences, and also directly support innovation in the city. The preparation of the City Climate Contract has created an official space for the direct involvement of other actors in addressing climate change, their interconnection and the opportunity to act within one large ecosystem, which is the city itself.

2 Goal: Climate neutrality by 2030

Achieving climate neutrality in a city that is home to one of the largest emitters in Europe is a very big challenge. For this reason, the city of Košice did not set a specific goal for achieving climate neutrality in the city's Mission Expression of Interest. It was important for the city to start this process of change and to look for all other opportunities to accelerate this change. Even at the cost of not fulfilling pre-defined frameworks and conditions. All the achievements that are made on an ongoing basis are important for the city because they are milestones on the way to the bigger goal, which in our case is climate neutrality.

The key sectors that the city has to deal with in terms of emissions are buildings and transport. But it does not neglect other relevant sectors such as waste, AFOLU or IPPU, which are important for a balanced and sustainable development of the city.

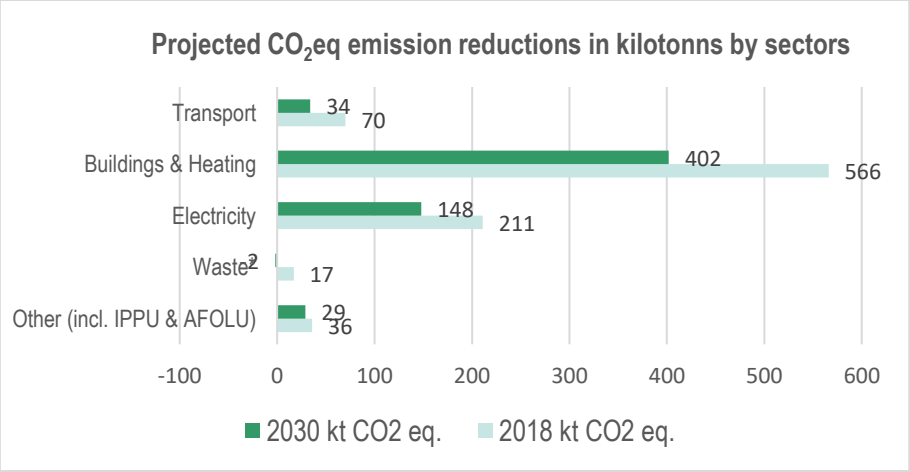


Figure 2: Projected CO_2eq emission reductions in kilotons by sectors (BaU 2030)

It is estimated that these four sectors together can reduce 68% of total emissions. Based on the economic case developed for the city under this Contract, the actions planned in the city, primarily targeting these four sectors, would result in an annual reduction of 611 000 tonnes of carbon dioxide emissions by 2030+. This is our intermediate milestone that we have the ambition to move towards climate neutrality during the implementation of the Climate City Contract. Figure 2 shows projected CO_2eq emission reduction in kilotons by sectors (according to the BAU 2030 economic model).

The commitments and objectives of the Climate City Contract are addressed for the area of the city bounded by its administrative boundaries.

Fulfilling the primary objective of this Mission will also bring a number of other co-benefits to the city that will benefit the city's residents, such as increased independence from fuel imports, savings in energy costs, new jobs, promotion of biodiversity in the city, as well as better and safer public spaces, better air quality, which will have a positive impact on the health of the residents, and a better quality of life for the residents in the city.

The city has decided to exclude Industrial Processes and Product Use (IPPU) sector from the scope of its climate neutrality target. This decision was taken due to the fact that even though the Košice´s main large scale industrial facility (U. S. Steel Košice, s.r.o) together with some of the smaller plants are located within the city´s boundary, they are registered under the EU Emissions Trading Scheme (EU ETS), and are therefore exempt from the Mission. Additionally, due to the very small number of daily flights to and from Košice´s airport, also air transport will be excluded from the scope. This is because these flights make an imperceptible contribution to the city´s emissions so the efforts for this source´s measurement and management could be better utilized somewhere else. Despite this fact, the City will continue to work with large polluters and inspire other industries (including air transport) to actively support the City to meet its climate and energy goals.

3 Strategic priorities

Participation in the Mission EU 100 Climate Neutral and Smart Cities is another milestone for the City of Košice, which will accelerate its transformation into a green city, ensure that the city's ambitions on its path to climate neutrality are fulfilled, and inspire other cities in the region.

Reflecting on our starting points, barriers and opportunities, we have defined 4 strategic priorities to be fulfilled in order to intensify our transition to climate neutrality:

1. ENERGY EFFICIENCY AND THE TRANSITION TO RENEWABLE ENERGY

Up to 82% of the city's greenhouse gas emissions are generated by energy production and consumption in city buildings. More sustainable energy production and consumption is therefore crucial for the city, which we can achieve in particular through improving the energy efficiency of buildings and switching to renewable energy sources. Košice sees a great opportunity to replace fossil fuels for heating with renewable sources, using the energy potential of geothermal resources from the nearby Ďurkov area. At the same time, given the large number of vulnerable groups, it is important for the city to ensure that energy is available to all its inhabitants.

2. SUSTAINABLE MOBILITY

Transport within the city produces 9% of greenhouse gas emissions. Efforts in the transportation sector will continue through further encouragement towards environmental friendliness, traffic calming in the city, active and alternative modes of mobility such as cycling, walking, public transport and shared mobility. All these measures will also lead

to ensuring accessible and safe mobility for all residents, including vulnerable groups. This should also have a positive impact on improving air quality and human health.

3. SUSTAINABLE URBAN DEVELOPMENT

Košice aims to develop into a city that uses urban greenery to support urban ecosystems, open and quality public spaces for citizens, and integrates nature-based climate change adaptation solutions into the city. At the same time, the planned expansion and improvement of green spaces will play a key role in creating a social, creative and active environment in which citizens can thrive.

Reducing the consumption of goods and materials is another key priority for the sustainable development of the city. Therefore, the city will focus on promoting the adoption of a circular way of life, which is expected to reduce waste production and increase recycling rates, not only in terms of material use, but also in terms of improving the living conditions of vulnerable groups of the population.

4. PROGRESS THROUGH DIALOGUE AND COOPERATION

The fourth key priority for bringing about change in the city is active cooperation and constructive dialogue between stakeholders such as citizens, entrepreneurs, research and educational institutions, the private sector, etc. This is not only to achieve synergistic effects of the activities of the different actors, but also to be self-aware of what each individual in our city can do and achieve for this transformation. This is what the city wants to achieve through active communication, the promotion of community activities and the creation of various opportunities for the discovery and self-realisation of its inhabitants.

All of these activities will generate changes that together will bring about a huge reduction in the production of greenhouse gases in the city of Košice. In order to translate these priorities into reality, an ecosystem of actors has begun to be built, in which each actor will make an individual effort to implement activities that will contribute to accelerating the city's transformation towards climate neutrality. At the same time, crucially, they ensure a just transition for all groups of the population, including vulnerable groups such as low-income groups, the elderly and children.

4 Process and principles

The main driver of the climate agenda (core team) in the city, and also the vehicle for implementing the City's Climate Contract, is the Strategic Development Department, which includes several key departments for addressing climate change. These are the Strategic Development Unit, the EU Project Implementation Unit, the Mobility Strategy Unit and the Policy and Data Analysis Unit. Further close cooperation will be necessary with the Department of the Chief Architect, the Department of Construction, Transport and Environment, the Department of Education and the Department of Social Affairs. Since 1 July 2024 (with the support of the Pilot Cities - Energy for Buildings programme), the Energy Department has been operating in the city.

The city will use several tools to communicate with stakeholders (at horizontal level) and strengthen the local ecosystem. First of all, there is the city's Business Košice organisation (established in 2023), whose role is to work with the private sector. Through this organisation, a network of partners will be built, with an emphasis on promoting climate-neutral solutions, including raising resources to support the market uptake of emerging solutions. At the same time, within the framework of the existing ad-hoc cooperation within the CSG - Cities for Sustainable Governance (Networked Action Planning, Urbact IV. project, a Local Urbact Group with a focus on climate transformation has started to form the basis of an ecosystem of stakeholders composed of representatives from the academic sector, private sector, civil society and citizens.

When identifying partners, it built on already existing cooperation and reached out to other partners whose activities could contribute to intensifying the path towards climate neutrality.

The challenge for us remains to improve communication and cooperation at the vertical level (state - region - city - urban districts). This is mainly influenced by divergent opinions, the change of which requires showing concrete implemented actions, which the city hope to achieve in the implementation of the prepared Climate Action Plan.

For effective and beneficial implementation of the Climate City Contract the City of Košice and its partners will be guided by the following principles:

- **Openness to new approaches** - Willingness to search, support and apply new approaches to address the defined priorities more effectively.
- **Co-creation** - Involving a wide range of partners in the search for effective solutions.
- **Inclusive partnerships** - Applying collaborative efforts that bring together diverse stakeholders to achieve common goal.
- **Transparency and Accountability** - Ensuring that all parties involved in the fulfilment of the objectives of this mission approach the implementation of planned activities responsibly and that the results of everyone's work are communicated in a transparent manner.
- **Leaving no one behind** - ensuring that all citizens, especially the most vulnerable and marginalized, benefit from these efforts.
- **Monitoring and mutual learning** - Regular monitoring and evaluation of the Climate City Contract implementation and mutual learning through shared experiences and knowledge exchange.

The implementation of the Climate City Contract will be monitored and evaluated by the City of Košice in cooperation with the actors involved. The City of Košice will be directly responsible for monitoring. The implementation of the objectives and the measurement of progress will be carried out at two-yearly intervals. In the process of preparing the Climate City Contract, a number of gaps have been identified that the city needs to address if it is to successfully implement the Contract and demonstrate its progress. We consider the implementation of this contract to be a continuous process and an open-ended process that will confront the city with the realities of a constantly evolving city and that will bring the city to the desired goal of climate neutrality.

5 Signatories

A list of stakeholder signatories is provided in Table 1. An overview of the existing partnerships that contribute to the priorities and activities defined in the Climate City Contract is provided in Table 2.

Table 1: The list of signatories' partners

Name of the signatory (organisation)	Sector / Domain / Level of operation[1]	Legal form	Name of the responsible person	Position of the responsible person
The City of Košice	Public sector /Municipality	Public Authority	Jaroslav Polaček	Mayor
TEPELNÉ HOSPODÁRSTVO spoločnosť s ručením obmedzeným Košice / Heat management Košice	Public heating provider / Local	Legal subject under public law	Jaroslav Tkáč	Manager
Energia budov s.r.o. / Energy of buildings, privat company	Energy / Buildings / National	Legal subject under public law	Peter Tauš	Director
Dopravný podnik mesta Košice / Public transport Company	Public transport provider /Local	Legal subject under public law	Roman Danko	Director
Správa mestskej zelene Košice / Urban Greenery Management	Public greenery management provider /Local	Legal subject under public law	Marta Popríková	Director

[1] Please mention if the organisation is active at local, regional, national, or international level.

Creative Industry Košice (municipal non-profit organisation)	Community and culture development /Local	Nonprofit Organization	Michal Hlladký	Director
The Faculty of Civil Engineering, Technical University of Košice	Education	Higher educational public Institution	Dušan Katunský	Dean
The Faculty of Economics, Technical University of Košice	Education	Higher educational public Institution	Michal Šoltés	Dean
Pavol Jozef Šafárik University in Košice	Education	Higher educational public Institution	Daniel Pella	Rector
Business Košice, n.o.	Public company /Local	Nonprofit Organization	Martin Mudrák	Director
K13 - Košické kultúrne centrá / K13-Košice Cultural Centers	Community and culture development	Legal subject under public law	Martin Dani	Director
ETP Slovakia – Centre for Sustainable Development	Housing, work in communities and education in socially excluded communities	Civil association	Veronika Poklembová	Director
Energia pre Slovensko, občianske združenie / Energy for Slovakia, civic association	Green energy / Buildings / National	Civic association	Peter Tauš	Director
IDS Východ s.r.o.	Public transport / Regional	Legal subject under public law	Radovan Hužvík	Director

Table 2: List of existing partnerships

Name of the contract / support	Name of the partner	Sector / Domain / Level of operation[2]	Established
Memorandum regarding cooperation in the field of utilizing the energy potential of geothermal wells in the Ďurkov location for the needs of the heat supply of the City of Košice	Ministry of Economy of the Slovak Republic	Government /National	2021
Memorandum regarding cooperation in the field of utilizing the energy potential of geothermal wells in the Ďurkov location for the needs of the heat supply of the City of Košice	SPP Infrastructure, a.s.	National electricity and gas provider /National	2021
Letter of support for engaging with the EU Mission /	Ministry of Economy of the Slovak Republic	Government /National	2023
Memorandum of understanding on the planned support of decarbonization projects	US Steel Košice, s.r.o	Private sector	2022
Memorandum on the establishment of the Climate Resistance Mission of the city of Košice	Faculty of Economics Technical University of Košice	Education	2023
Memorandum of cooperation	Institute of Climate Neutrality	Civic association /National	2021
Memorandum on partnership cooperation in the development of bicycle transport, bicycle tourism and recreational cycling in the city of Košice	Cykloplatforma Slovenska, o.z.	Civic association /National	2020

[2] Please mention if the organisation is active at local, regional, national, or international level.