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CLIMATE CITY CONTRACT



Mirror Mission
Cities Hub Romania

*Inspired by the EU Mission for Climate-Neutral and Smart Cities
Aligned with the NetZeroCities approach*



2030-2035

CLIMATE CITY CONTRACT

CONSTANȚA MUNICIPALITY & METROPOLITAN AREA

DISCLAIMER

This document, which was developed through the Mirror Mission Cities Hub Romania, draws inspiration, both in its structure and content, from the methodology developed by the European Commission for elaborating the documents pertaining to the Climate City Contracts (the Climate Neutrality Action Plan, Investment Plan and Commitments) for the 112 cities which officially participate in the EU Mission for Climate-Neutral and Smart Cities.

By aligning the M100 Climate City Contract with the model set forth by the European Commission, we aim to ensure that this document is in line with European strategic priorities and directives regarding the transition towards climate neutrality.

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ACRONYMS

- **CCC** (Climate City Contract)
- **CNAP** (Climate Neutrality Action Plan)
- **CO₂** (Carbon Dioxide)
- **CSR** (Corporate Social Responsibility)
- **EBRD** (European Bank for Reconstruction and Development)
- **E.G.** (For example)
- **EIB** (European Investment Bank)
- **EV** (Electric Vehicles)
- **GHG** (Greenhouse Gas)
- **GUP** (General Urban Plan)
- **IDA** (Intercommunity Development Association)
- **I.E.** (Id est – that is)
- **IUDS** (Integrated Urban Development Strategy)
- **LAU** (Local Administrative Unit)
- **MA** (Metropolitan Area)
- **PPP** (Public-Private Partnership)
- **RDA** (Regional Development Agency)

- **RDI** (Research, Development and Innovation)
- **SDP** (Spatial Development Plan)
- **SE** (South-East)
- **SECAP** (Sustainable Energy and Climate Action Plan)
- **SUMP** (Sustainable Urban Mobility Plan)
- **WB** (World Bank)
- **WMO** (World Meteorological Organization)



I. COMMITMENTS

FORMAL AMBITION

Briefly present (in 2-3 pages) the following aspects:

- The local climate neutrality context, highlighting the strategic directions adopted at the local level.
- The significance and / or opportunities associated with developing this Climate Neutrality Action Plan, particularly in relation to the relevant European strategic priorities.
- The vision (and / or goal and / or objectives) and targets officially endorsed by the Climate Neutrality Action Plan for achieving climate neutrality, highlighting the planned reductions in CO₂ emissions.
- The key priorities delineated within the Climate Neutrality Action Plan.
- The overall direct impact expected from implementing the interventions outlined in the Action Plan, together with the total estimated budget.

Climate change is increasingly manifesting its significant impact on ecosystems, weather patterns, economies, and communities around the globe. The effects encompass a range of critical issues, including rising temperatures, extreme weather events, accelerating sea-level rise, loss of biodiversity, increasing water scarcity, major health risks, and countless social and economic challenges.

Since the onset of the Industrial Revolution in 1760, human activities have significantly influenced the climate, with scientific consensus indicating the global warming being caused by human-induced factors in a percentage of 99%. Early warnings regarding the impact on climate change were raised starting in 1896 when the Swedish scientist Savante Arrhenius firstly showed that burning fossil fuels causes global warming. However, it wasn't until the late 20th century, particularly after 1988, when intensive international efforts commenced, culminating in initiatives such as the Paris Agreement, which aims for global climate neutrality by the mid-21st century.

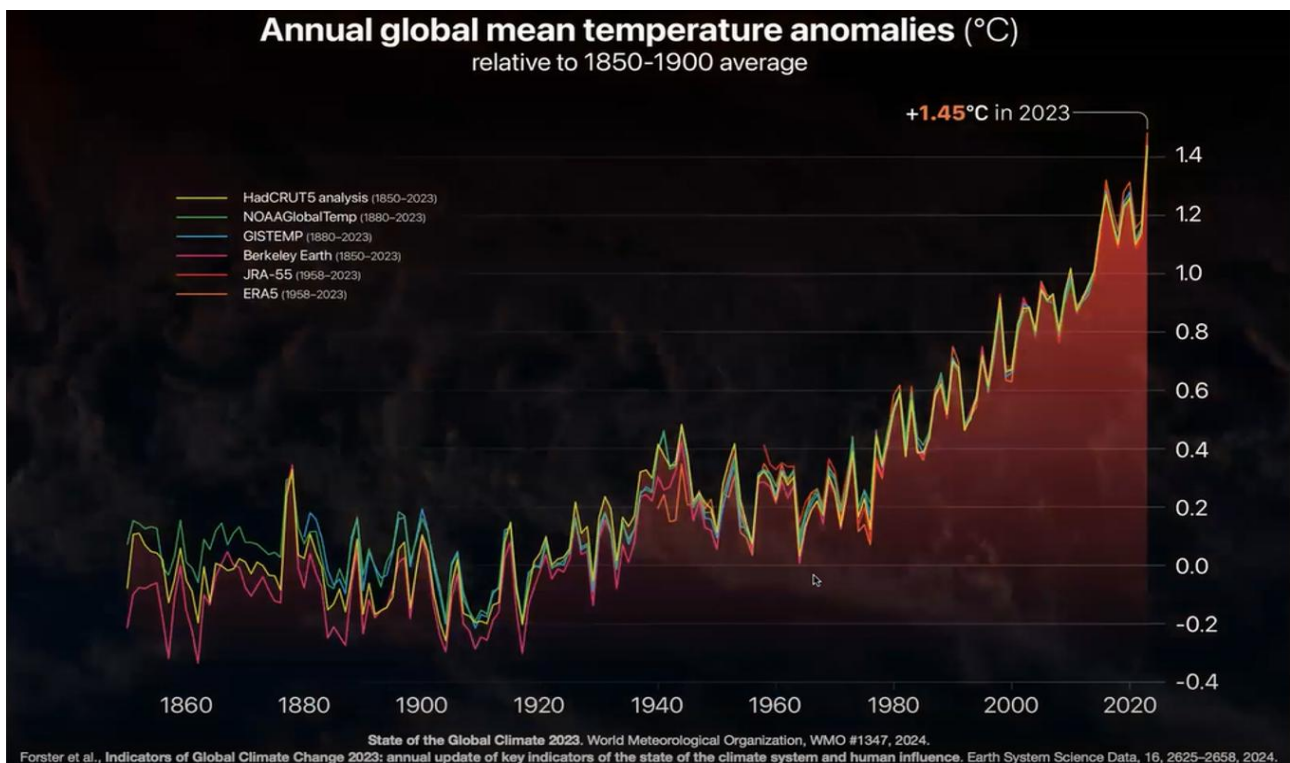
The World is experiencing unprecedented heat, with 2024 being the hottest year on record, global warming temporarily hitting 1.5 degree Celsius above the pre-industrial level, according to the World Meteorological Organization (WMO). The intensifying trend of global warming over the past 50 years poses an immense threat to our planet.

Currently, the reported increase in the global mean surface temperature is around 1.3 degree Celsius, according to the WMO, the warmest recorded temperature on Earth over the past 100,000 years. In 2024, annual average temperatures are nearing 1.5 degree Celsius. This acceleration in warming is particularly alarming, with data indicating a rate of increase of 0.18 degrees Celsius per decade from 1970 to 2010, followed by a marked increase of 0.26 degree Celsius from 2014 onwards.



The State of Climate presented in 2024 by the World Meteorological Organization transmits great concern for the entire world. Greenhouse gas concentrations continue to steadily rise, driving further long-term temperature increases. The last 10 years represent the warmest decade on record, and ocean heat content values continue an upward trend. The record-breaking rainfall and flooding, rapidly intensifying tropical cyclones, deadly heat, relentless drought and raging wildfires that have occurred in different parts of the world during this period are dangerously becoming the world's new reality.

FIGURE 1 ANNUAL GLOBAL MEAN TEMPERATURE ANOMALIES

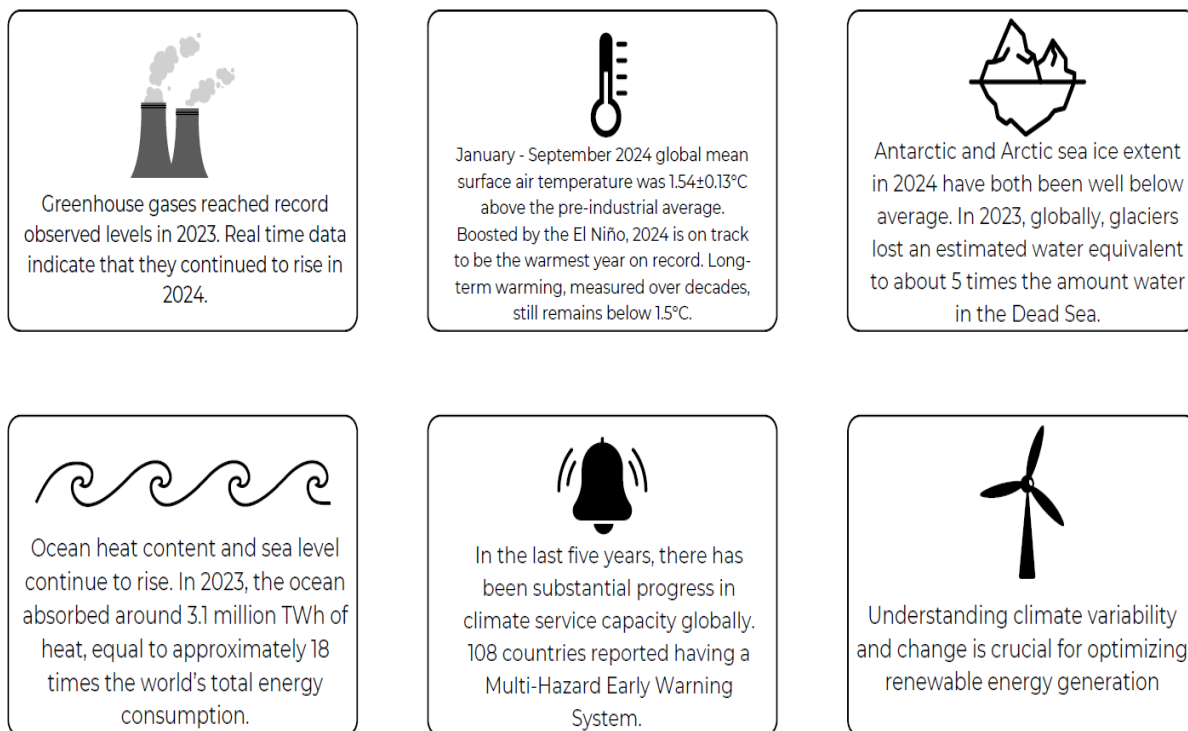


Source: World Meteorological Organization, 2024

Despite the daunting challenges presented by climate change, there still remains a strong potential for positive outcomes. A significant number of people demonstrate concerns for environmental issues and support sustainability efforts. Solutions to mitigate climate change are not only accessible, but are also being actively developed and implemented around the world. By embracing these strategies, we can work towards a healthier, more secure future, fostering economies that improve the quality of life for all inhabitants of the planet.



FIGURE 2 KEY MESSAGES OF THE STATE OF CLIMATE 2024



Source: State of Climate 2024

To effectively address the multifaceted challenges posed by climate change, a coordinated global effort is essential, complemented by immediate actions at local level. Global warming must be limited as much as possible and climate change adaptation must be supported through climate services and early warnings everywhere around the world.

Recognizing the profound challenges we face and the critical need for local action, Constanța Municipality, together with all the 16 territorial administrative units of the Constanța Metropolitan Area, have committed to achieving climate neutrality by 2030. Building on this milestone, Constanța aims to continue reducing the CO₂ emissions through to 2035, driving further progress at both the local and metropolitan levels, through collaborative actions.

Located along the Black Sea coast, Constanța faces significant environmental vulnerabilities, such as rising sea levels, coastal erosion, severe weather events, intensified by urban heat islands, and air pollution. Constanța's broader climate trends indicate rising temperatures, more frequent heavy rainfall, and extended dry periods, intensified by greenhouse gas emissions linked to transportation, waste management, and residential heating.

In 2021, a total of 1,022,065.79 metric tons of CO₂ emissions (equivalent to 3,941,657.70 MWh/year of energy) were generated locally, distributed as follows: 536,647.01 tons (52.51%) from buildings, 89,428.07 tons (8.75%) from transport, 105,161.48 tons (10.29%) from waste and wastewater, 290,441.59 tons (28.42%) from industrial processes and product use (IPPU) and 387.65 tons (0.04%) from agriculture, forestry and other land use.

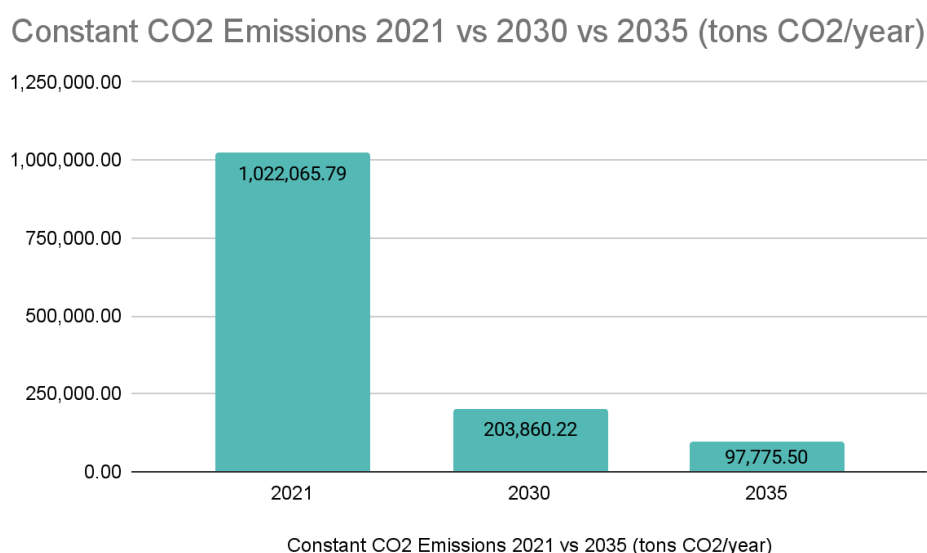


As a key player in the Black Sea region, with an immense significance for economic, cultural, and environmental matters, Constanța commits to advancing climate neutrality by addressing critical gaps and leveraging opportunities, while aligning with local, regional, and European strategies.

In 2024, Constanța applied and it was selected among the 10 Romanian cities to receive support through the M100 National Hub. It is included in the M100 Cohort, aiming to further accelerate its path to climate neutrality. The actions proposed in the Climate Neutrality Action Plan are expected to deliver a wide range of economic, social and environmental co-benefits for the local residents and for the organizations operating in the local and metropolitan territory, and also to contribute to the global climate neutrality agenda.

As such, by 2030, Constanța aims to reduce the greenhouse gas emissions by 80.05%, translating to a reduction of 818,205.57 tons of CO₂. Building on this progress, by 2035, Constanța will scale up its positive impact, targeting a 90.43% reduction in emissions (equivalent to 924,290.29 tons of CO₂).

FIGURE 3 CONSTANT CO₂ EMISSIONS 2021 VS 2030 VS 2035 (TONS CO₂/YEAR)



Source: authors' calculations

Constanța's transition towards a smart, climate-neutral, and resilient city is guided by its core strategic documents, the most important being: the 2023–2030 Integrated Urban Development Strategy, the Sustainable Energy and Climate Action Plan, the Sustainable Urban Mobility Plan, the Smart City Strategy, the Air Quality Plan, and the Waste Management Plan. This planning documentation, already developed and under implementation, directly supports the local environmental sustainability, while driving the city's transformation towards smart urban development for climate action.

Moreover, the city's energy policy promotes the nearly Zero Energy Buildings (nZEB) constructions, buildings electrifications, renewable energy, and the reduction of urban heat islands effect. The city's transport policy focuses on greener vehicles, electric infrastructure,



public transport, and a shift to walking and cycling. The waste management focuses on recycling, and waste reduction.

Constanța's Climate Neutrality Action Plan represents the city's commitment to achieving climate neutrality and to capitalizing on the available opportunities while ensuring the alignment with local, regional, national, and European strategic documents.

Constanța Municipality aligns its interventions with the New European Bauhaus, the New Leipzig Chapter, and Romania's Urban Policy. Specifically on climate changes, Constanța adopts the objectives of the Paris Agreement, and aligns with the European Green Deal, and the Covenant of Mayors framework for climate action. At the national level, the Action Plan integrates objectives from Romania's Long-Term Strategy for Greenhouse Gas Emission Reduction and the National Plan for Energy and Climate. These alignments ensure the plan's consistency with global climate neutrality goals and sustainable development principles.

The Climate Neutrality Action Plan outlines 7 key priorities, comprising 21 key actions across all the fields of action defined in the M100 CCC Methodology, in line with the framework developed by the EU Mission for Climate-Neutral and Smart Cities.

The fields of action identified for achieving climate neutrality include the energy systems, the built environment, mobility and transport, waste management and circular economy, green infrastructure and nature-based solutions, as well as organizational, governance, social, and other forms of innovation. Taken together, Constanța's commitment to climate neutrality reflects a comprehensive and integrated approach that actively targets all these areas. These proposed actions foresee consolidating an energy-efficient district heating system and enhancing the local renewable energy supplies, alongside modernizing the public lighting to reduce the energy consumption and implementing measures to improve the energy performance of both the public and residential buildings. To address the urban heat islands, urban renewal interventions are also planned. Additionally, traffic management and parking policies will be used to ease the urban congestion, complemented by investments in developing the green public transport and promoting non-motorized mobility. The integrated waste management will be also consolidated, to support the circular economy approach. The digitalization of the public services will further support the achievement of climate neutrality, complemented by the establishment and operationalization of a dedicated climate neutrality office. To ensure the effective implementation of the Climate Neutrality Action Plan, a Local NetZero coalition will also be created, maintained, and expanded. Various integrated approaches to climate mitigation and adaptation will be adopted, alongside initiatives for climate neutrality branding and the development of supporting regulations. Raising awareness and engaging the local ecosystems will also be prioritized, with art playing an important role in promoting these efforts and encouraging behavioral changes towards climate change mitigation. Lastly, an expanded network of green spaces will be developed to support carbon capture, while renaturation efforts will also be undertaken along the sea coast.



The actions proposed under the Climate Neutrality Action Plan will be implemented in a phased manner, prioritizing their interventions according to the established time horizon.

By 2030, Constanța will strategically leverage its internal resources, and attract external opportunities to advance the following key priorities for reducing the CO₂ emissions:

- Increasing the generation and consumption of clean energy, especially within the residential, private, and public buildings.
- Improving and innovating the district heating system and encouraging the residents to reconnect to it.
- Advancing the urban regeneration projects to mitigate the urban heat islands, sustainably re-functionalize the polluted areas, and support the development of climate-neutral neighborhoods.
- Enhancing the waste management system, by more effectively integrating the circular economy principles.
- Transitioning to green mobility, with the main investments being directed towards non-polluting public road and rail transport and expanding the use of electric vehicles for the individuals, public services, and commercial fleets.
- Supporting the soft interventions aimed at engaging the citizens and encouraging the private sector's participation and contribution.

Concurrently, the efforts to address the residual CO₂ emissions by 2030 will prioritise the deployment of a combination of conventional and innovative solutions across all the major polluting sectors (e.g., buildings, transport, waste, AFOLU, IPPU), as outlined in the chapter dedicated to the residual emissions strategy.

Subsequently, by 2035, the focus will expand to include the other actions outlined in the Climate Neutrality Action Plan, while also continuing the interventions prioritized by 2030 (particularly through replication, scaling, and, where possible, integration of new innovations). This approach will apply to both reducing the carbon emissions and furtherly enhancing the carbon capture and storage efforts.

The total investment required for the CCC's core actions is approximately € 2,6 billion.

In addition to the above actions, that have a primarily local focus, a series of 11 complementary actions, with a metropolitan scope, amounting to approximately 770.85 eur million, are also included.

For the upcoming 10 years, more than 42% of the climate neutrality budget will be sourced from internal revenues, primarily through income and property taxes. An annual allocation of €100 million is planned until 2035, focusing on public green infrastructure, waste management, public transportation, parking and traffic management, and public lighting. The National Recovery and Resilience Plan (NRRP) will add over 12% of the budget until 2026, while EU funding for the current



programming period (up until 2027 or more probably 2029 if the operational and regional programmes will be prolonged) will provide an additional 10%. Furthermore, the private sector is expected to contribute nearly 20% of the total budget.

The impact of the actions set up in the Climate Neutrality Action Plan will bring numerous economic, social, and environmental benefits.

The corresponding interventions will enhance public safety, create jobs, and stimulate economic diversification. Achieving energy independence and integrating renewable energy sources will decrease air pollution, improve public health, and reduce noise. The reduced heat loss and enhanced pollution control will contribute to lower energy bills, while the economies of scale and lower maintenance costs will lead to more predictable energy expenses. Additionally, the mitigation of urban heat islands, improved air quality, and the preservation of ecosystems will contribute to a better quality of life. The modernization of infrastructure and promotion of non-motorized mobility will foster energy independence, reduce the traffic congestion, and enhance the urban aesthetics. The digitalization of services and integration of smart city solutions will ensure efficient resource use and climate resilience. Collectively, these actions will strengthen collaboration, lead to social cohesion, improve mental health, and build a strong community identity while supporting climate neutrality and sustainable development.



CLIMATE NEUTRALITY ACTIONS

7 FIELDS OF ACTION - 21 ACTIONS

2.6 EUR BILLION

ENERGY SYSTEMS

- CONSOLIDATING THE ENERGY-EFFICIENCY OF THE DISTRICT HEATING SYSTEM
- ENHANCING THE LOCAL SUPPLY OF RENEWABLE ENERGY
- MODERNIZING THE PUBLIC LIGHTING TO REDUCE ENERGY CONSUMPTION

MOBILITY & TRANSPORT

- ENCOURAGING PUBLIC TRANSPORT
- PROMOTING NON-MOTORIZED MOBILITY
- USING TRAFFIC MANAGEMENT & THE PARKING POLICY AS A TOOL TO REDUCE TRAFFIC JAMS

GREEN INFRASTRUCTURE & NBS

- DEVELOPING AN EXTENDED NETWORK OF GREEN AREAS FOR CARBON CAPTURE
- RENATURATING THE SEA COAST

SOCIAL & OTHER INNOVATION

- RAISING AWARENESS AND ENGAGING THE LOCAL ECOSYSTEM TO ACHIEVE CLIMATE NEUTRALITY
- ART PROMOTING CLIMATE NEUTRALITY
- ENCOURAGING BEHAVIORAL CHANGES TOWARDS CLIMATE CHANGE MITIGATION

1

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7

BUILT ENVIRONMENT

- INCREASING THE ENERGY PERFORMANCE OF PUBLIC BUILDINGS ○
- INCREASING THE ENERGY PERFORMANCE OF RESIDENTIAL BUILDINGS ○
- MITIGATING THE URBAN HEAT ISLANDS THROUGH URBAN RENEWAL ○

WASTE & CIRCULAR ECONOMY

- CONSOLIDATING THE INTEGRATED WASTE MANAGEMENT FOR CIRCULAR ECONOMY ○

ORGANISATIONAL & GOVERNANCE INNOVATION

- DIGITIZING THE PUBLIC SERVICES FOR CLIMATE NEUTRALITY ○
- CLIMATE NEUTRALITY OFFICE ○
- LOCAL NETZERO COALITION ○
- JOINT CLIMATE MITIGATION - ADAPTATION APPROACHES ○
- CLIMATE NEUTRALITY BRANDING ○
- CLIMATE NEUTRALITY REGULATIONS ○

- Each intervention included in the 21 actions is specifically designed to either reduce the locally generated CO₂ emissions or facilitate their capture.
- In addition to the actions proposed for the local transition to climate neutrality, several supplementary actions are foreseen in order to expand the impact at the metropolitan level. They cover all areas of action and include multiple interventions, with a total investment of 770.9 eur million.



GUIDING PRINCIPLES

Provide a brief overview (1 page) of the principles that directed the Climate Neutrality Action Plan's design process, as well as those that will guide its implementation and monitoring within the designated time frame.

Constanța's Climate Neutrality Action is guided by a framework of principles that ensure its design, implementation, monitoring, and updates align with local, national, and European objectives while engaging all relevant stakeholders.

PRINCIPLES GUIDING THE DESIGN PROCESS

- 1. VISION FOR METROPOLITAN COLLABORATION:** The Plan envisions a climate-neutral future for the entire metropolitan area of Constanța, with the municipality as the focal point. This vision was drafted collaboratively by Constanța City Hall and Constanța Metropolitan Area Intercommunity Development Association (MA IDA), supported by technical analyses conducted with World Bank assistance.
- 2. STAKEHOLDER ENGAGEMENT AND SHARED RESPONSIBILITY:** Recognizing the limitations of public administration and MA IDA, the Plan emphasizes the role of local stakeholders—organizations, institutions, and individuals—in contributing resources, expertise, and efforts. This shared responsibility fosters a robust and sustainable pathway toward climate neutrality.
- 3. EVIDENCE-BASED AND SYSTEMIC PLANNING:** The design process was supported by a baseline GHG emissions inventory, assessments of local pollution data, and the mapping of barriers, risks, and gaps. This data-driven approach ensures targeted, effective, and scalable actions.
- 4. INTEGRATION AND ALIGNMENT:** The Plan integrates and aligns with critical local strategies, such as the Sustainable Energy and Climate Action Plan, Sustainable Urban Mobility Plan, and Air Quality Plan, as well as global frameworks, including the Paris Agreement, United Nations Framework Convention on Climate Change, New European Bauhaus, and New Leipzig Charter.
- 5. INNOVATION AND INCLUSIVITY:** The planning process embraced innovative solutions and participatory methodologies, ensuring diverse stakeholders are included through consultations, workshops, and online platforms.

PRINCIPLES GUIDING IMPLEMENTATION AND MONITORING

- 1. OPERATIONAL AND CONTINUOUS IMPROVEMENT:** Implementation and monitoring processes will prioritize efficiency, quality, and innovation. The operationalization of the Climate Neutrality Office within Constanța City Hall and the NetZero Coalition by MA IDA ensures dedicated teams to support progress, adapt to challenges, and incorporate learning from capacity-building activities.
- 2. EXTENSIVE MONITORING AND EVALUATION:** The Plan incorporates a comprehensive Monitoring and Evaluation framework. Monitoring reports for M&E indicators will be prepared every six months, while GHG emissions inventories will be updated biennially. Emphasis will be placed on understanding the impact of actions, including cost-effectiveness and the interplay of direct and indirect effects.
- 3. TRANSPARENCY AND PUBLIC COMMUNICATION:** Monitoring results and periodic updates will be publicly shared to ensure transparent communication with citizens, institutions,



businesses, and organizations. This approach fosters community engagement, ownership, and accountability among all stakeholders.

4. **PARTICIPATORY AND RECURRING UPDATES:** The Plan will be updated every two years, aligning with the GHG emissions inventory updates, or more frequently if significant changes arise. The update process will involve key stakeholders, particularly the signatories, ensuring a participatory and adaptive planning cycle.
5. **IMPACT-ORIENTED IMPLEMENTATION:** Resources and efforts are focused on high-priority actions, such as modernizing public transport, enhancing energy efficiency in buildings, expanding renewable energy, and developing sustainable urban infrastructure. These measures are designed to deliver maximum impact and contribute significantly to climate neutrality goals.

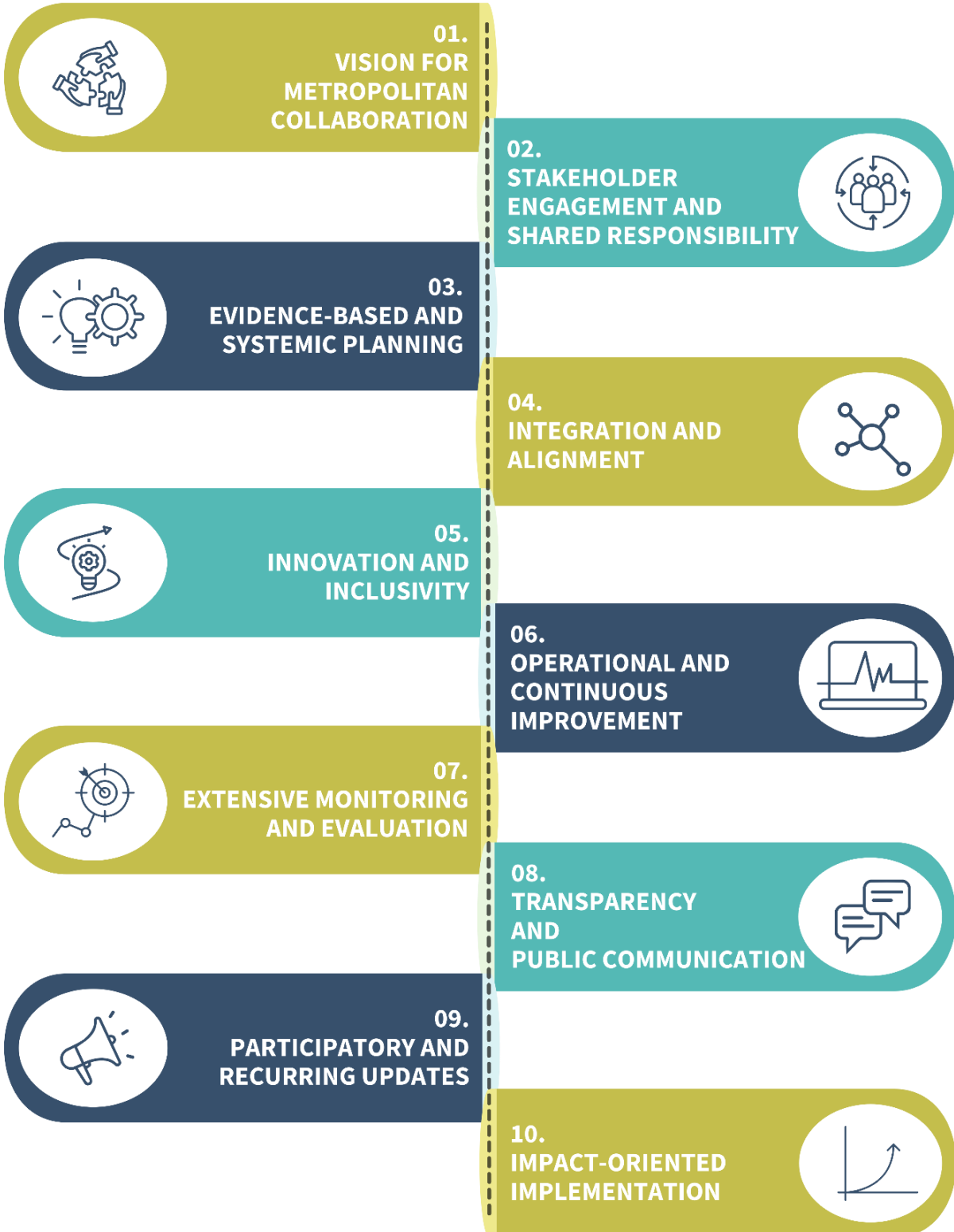
CONTINUITY AND LONG-TERM VISION

The Plan reflects a cyclical planning process, emphasizing continuous learning, periodic reviews, and adaptation to evolving challenges and opportunities. This ensures the plan remains dynamic, relevant, and effective in driving the metropolitan area of Constanța toward its climate neutrality goals.



CLIMATE NEUTRALITY ACTION PLAN

GUIDING PRINCIPLES



CONTINUITY AND LONG-TERM VISION



INTEGRATING THE KEY STAKEHOLDERS IN CONSTANTA'S CLIMATE TRANSITION JOURNEY



BUILD A STRONG MANDATE



Establishing a unified vision by aligning people, actions and investments to collectively achieve climate neutrality



UNDERSTAND THE SYSTEM



Gaining a comprehensive understanding of the climate challenges from various perspectives, while leveraging insights from past experiences



CO-DESIGN THE PORTFOLIO



Collaborating to create a tailored portfolio of interventions that drive the needed change through multiple levers



ACT



Strategically planning, implementing and monitoring the actions aimed at achieving the climate neutrality goals



LEARN & REFLECT



Developing shared knowledge and fostering capabilities to to accelerate and sustain the foreseen change



MAKE IT THE NEW NORMAL



Institutionalizing and sustaining best practices to ensure long-term impact

Structured approach, which empowers Constanta to navigate its climate transition journey with the support of a solid stakeholder ecosystem, promoting collaboration and sustained progress towards climate neutrality.

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ACRONYMS

- **CCC** (Climate City Contract)
- **CNAP** (Climate Neutrality Action Plan)
- **CO₂** (Carbon Dioxide)
- **CSR** (Corporate Social Responsibility)
- **EBRD** (European Bank for Reconstruction and Development)
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- **IUDS** (Integrated Urban Development Strategy)
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- **SDP** (Spatial Development Plan)
- **SE** (South-East)
- **SECAP** (Sustainable Energy and Climate Action Plan)
- **SUMP** (Sustainable Urban Mobility Plan)
- **WB** (World Bank)
- **WMO** (World Meteorological Organization)



III. INVESTMENT PLAN

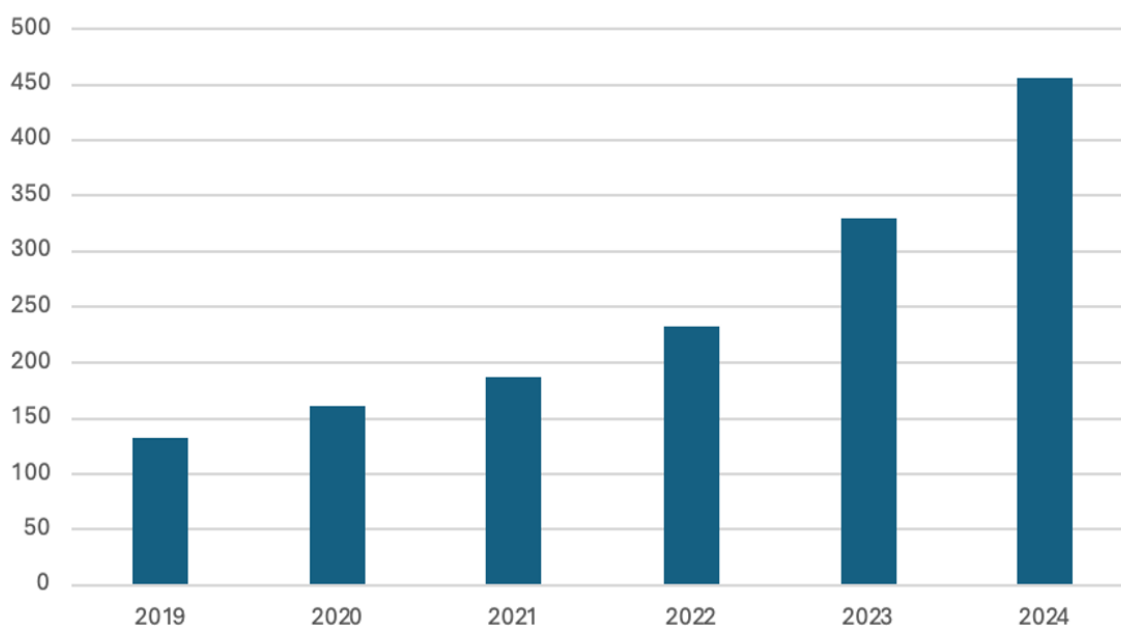
EXISTING FUNDING AND FINANCING

Outline, analyse and evaluate the past and current funding and financing allocated to climate-related initiatives across each field of action.

The capital flow table needs to also incorporate capital stock.

The Local Council of Constanța has approved a record-breaking budget of €456 million for 2024. Over the past two years, local financial resources have doubled and are nearly three times higher than in 2020. Key factors contributing to this budget growth include state subsidies and the successful absorption of EU funds, alongside improvements in local tax collection. Notably, income tax revenue has doubled over the last five years, reflecting the development of the local economy and rising salaries.

FIGURE 29 TOTAL REVENUES, 2019-2024 (EUR MILLION)



Source: authors' calculations

The local budget approved by the Municipality for 2024 allocates 56.5% of total municipal income for climate-neutral initiatives. The largest share of this funding is directed towards the district heating system, which accounts for 26.3%, followed by waste management at 9.6%, maintenance and modernization of green areas at 6.3%, and public transport at 5.5%. In contrast, the Municipality is investing less in energy rehabilitation of residential buildings, urban renewal efforts to combat urban heat islands (UHIs), and public lighting improvements.



TABLE 18 FUNDING ALLOCATION BY FIELD OF ACTION

FIELDS OF ACTION	SECTOR SUBSECTION	% CURRENT BUDGET ALLOCATION
TRANSPORTATION	Public transport	5.5
BUILT ENVIRONMENT	Energy renovation of public buildings	4.1
	Energy renovation of private residential buildings	0.9
	Urban renewal	1.9
ENERGY SYSTEMS	District heating	26.3
	Public lighting	1.9
GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS	Parks and green areas	6.3
WASTE AND CIRCULAR ECONOMY	Waste management	9.6

Source: authors' calculations



STRATEGIC FUNDING AND FINANCING

Assess the city's current financial policies, in order to illustrate how the public administration is allocating capital towards becoming climate neutral.

- This evaluation should encompass the existing strategies and resources available to the city to facilitate the transition.
- Identify the various forms of capital available for the city, particularly those specific to local climate neutrality targets.

The income tax typically serves as the primary source of funding for Constanta's local budget. However, the 2024 budget presents an unusual scenario where revenues from state subsidies are projected to surpass those from income tax, largely due to numerous projects financed under the National Recovery and Resilience Plan (NRRP). The actual budget performance for this year will reveal whether this forecast was overly optimistic, given the usual delays in project implementation. Additionally, property taxes and VAT remain significant and stable funding sources, while EU funds are becoming increasingly vital as the current programming period advances.

TABLE 19 INCOME SOURCES FOR THE CITY

INCOME CATEGORY	CITY INCOME	% OF CITY BUDGET
INCOME TAX	€ 136 mil.	29.8
PROPERTY TAX	€ 41 mil	9.0
GOODS AND SERVICES TAX (VAT, VEHICLES)	€ 45 mil	9.9
NON-FISCAL INCOME (RENTING OF PUBLIC GOODS, ADMINISTRATIVE TAXES AND PERMITS, FINES AND PENALTIES, SPECIAL TAXES)	€ 19 mil	4.2
INCOME FROM FINANCIAL OPERATIONS (REIMBURSEMENTS)	€ 32 mil	7.0
STATE SUBSIDIES (INCLUDING SUBSIDIES UNDER THE NRRP)	€ 147 mil	32.2
EU FUNDING	€ 36 mil	7.9
TOTAL INCOME	€ 456 mil	100%

Source: authors' calculations

For the upcoming decade, we project that more than 42% of the overall climate neutrality budget will be sourced from internal revenues, particularly through income and property taxes. We anticipate an annual budget allocation of approximately €100 million each year until 2035, targeting various areas such as public green infrastructure, waste management, public transportation, parking and traffic management, and public lighting. The National Recovery and Resilience Plan (NRRP) is expected to contribute significantly, accounting for over 12% of the budget until 2026, while EU funding for the current programming period will provide an additional 10%. Furthermore, the private sector is expected to contribute nearly 20% of the total budget,



particularly in relation to the Oil Terminal urban renewal project initiated by one of Romania's leading real estate developers.

TABLE 20 CAPITAL SOURCES FOR THE CITY

TYPE	SIZE RANGE (EUR MILLION)	LEVEL	DESCRIPTION
LOCAL BUDGET (OWN SOURCES OF INCOME)	1.100	Public	An estimated budget allocation of € 100 mil. / year for climate neutral interventions that are not eligible for external funding
NRRP	320	Public	Ongoing projects for a new source of heating, energy renovation of buildings, eco-island and voluntary collection centres for waste, purchase of electric fleet for public transport
MODERNIZATION FUND	110	Public	Ongoing project for the modernization of the thermal distribution network + future funding for the district heating system and renewable energy
ENVIRONMENTAL FUND (AFM)	50	Public	State funding for charging station and subsidies for the purchase of EVs, modernization of public lighting and other climate neutral interventions
EU FUNDING FOR THE 2021-2027 PROGRAMMING PERIOD	250	Public	Funding under the 2021-2027 South-East RP, Sustainable Development Programme and other national programmes for green infrastructure, public transport, district heating, urban renewal and the energy performance of buildings
EU FUNDING FOR THE POST-2027 PROGRAMMING PERIOD	200	Public	Funding under the programmes available for the post 2027 programming period for climate neutral public investment
LOANS	50	Public	Green bonds issued for the (co)financing of climate neutral interventions that are not eligible for EU funding
PRIVATE CAPITAL AND PPPS	500	Private	Private funding will play a significant role, particularly through the investments planned under the upcoming Oil Terminal urban renewal PPP project. Additionally, CSR campaigns, sponsorships, and other private financial contributions will generate capital to support the climate neutrality efforts. For instance, the local and metropolitan companies will contribute through their own projects aimed at reducing their carbon footprint, such as adopting green energy technologies, improving the energy efficiency of their operations, and transitioning to green vehicle fleets. Further private investments will come from the real estate developers, who will increasingly integrate climate change mitigation solutions into their projects. The citizens' participation will also drive private capital, with the residents / households adopting green energy supply and energy efficiency measures in their homes (both in the individual houses and multi-apartment residential blocks, the latter being facilitated especially through the Homeowners Associations). Moreover, the purchase of green vehicles and other green transportation means (such as electric bicycles) by the local and metropolitan population will also contribute to reducing emissions, while stimulating the green economy.

Source: authors' calculations



COST SCENARIOS AND CAPITAL PLANNING

Present the estimated costs and capital planning associated with the actions outlined in the Climate Neutrality Action Plan. These should ideally serve as targets to optimize towards.

- **Assess the anticipated financial implications for the city, both as implementation and ongoing operational costs, to inform adjustments to the city budget for their incorporation.**
- **Make sure that all the proposed actions are listed, including those pertaining to Governance Innovation and Social Innovation.**
- **Feel free to provide cost projections for the measures detailed in the Action Plan as appropriate.**
- **Outline the city's capital objectives and how you aim to achieve them, by leveraging various sources of capital.**



COSTS, CAPITAL PLANNING AND ECONOMIC INDICATORS BY ACTION

Make sure to list every one of the actions proposed in the previous chapter.

- If feasible, in the fifth column, divide the costs based on the mentioned funding sources and indicate the amount that can be secured from each source individually.

TABLE 21 COSTS, CAPITAL PLANNING AND ECONOMIC INDICATORS BY ACTION

FIELDS OF ACTION	ACTION	IMPLEMENTATION COSTS/ CAPEX	OPERATIONAL COSTS*	POSSIBLE SOURCES OF CAPITAL	% OF THE TOTAL CLIMATE NEUTRALITY BUDGET	2030 % OF THE TOTAL CO ₂ REDUCTION	2035 % OF THE TOTAL CO ₂ REDUCTION
ENERGY SYSTEMS	Consolidation of an energy-efficient district heating system	€344,602,557.00	20,000,000	NRRP Modernization Fund National Programmes (Termoficare) Loans	13.12%	12.32%	13.45%
	Enhancing the local supply of renewable energy	€9,100,000.00	450,000	Modernization Fund Private capital / PPP	0.35%	1.08%	1.03%
	Modernization of public lighting to reduce energy consumption	€15,230,237.00	467,289	National Programmes (AFM) Local budget Loans	0.58%	0.69%	0.69%
MOBILITY AND TRANSPORT	Encouraging public transport	€217,568,065.00	48,066,028.03	2021-2027 South-East RP Post-2027 EU funding NRRP Local budget	8.28%	1.46%	1.65%
	Promoting non-motorized mobility	€746,296,471.00	15,020,098.50	2021-2027 South-East RP Post-2027 EU funding Local budget Private funding / PPPs	28.41%	2.19%	2.13%



FIELDS OF ACTION	ACTION	IMPLEMENTATION COSTS/ CAPEX	OPERATIONAL COSTS*	POSSIBLE SOURCES OF CAPITAL	% OF THE TOTAL CLIMATE NEUTRALITY BUDGET	2030 % OF THE TOTAL CO ₂ REDUCTION	2035 % OF THE TOTAL CO ₂ REDUCTION
	Using traffic management and the parking policy as a tool to reduce traffic jams	€8,000,000.00	1,000,000	NRRP National Programmes (AFM, POIM) 2021-2027 South-East RP Horizon Europe CIVITAS Local budget	0.30%	0.84%	0.99%
WASTE AND CIRCULAR ECONOMY	Consolidating the integrated waste management for a circular economy	€31,309,035.00	2,415,451.75	NRRP Modernization Fund National Programmes (AFM, POIM) Horizon Europe RENEWFM Life Clean Energy Transition Built4People Local budget	1.19%	0.08%	0.13%
GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS	Developing an extended network of green areas for carbon capture	€65,936,349.00	3,496,817	2021-2027 South-East RP Post-2027 EU funding Local budget Private funding / PPPs	2.51%	12.80%	11.44%
	Renaturation of the sea coast	€40,000,000.00	800,000	2021-2027 South-East RP Post-2027 EU funding Other programmes	1.52%	3.61%	3.52%
BUILT ENVIRONMENT	Increasing the energy performance of public buildings	€286,532,823.00	7,000,000	2021-2027 South-East RP NRRP Post-2027 EU funding	10.91%	0.62%	0.69%
	Increasing the energy performance of residential buildings	€220,232,817.00	6,600,000	2021-2027 South-East RP NRRP Post-2027 EU funding Climate Social Fund	8.38%	10.28%	9.50%



FIELDS OF ACTION	ACTION	IMPLEMENTATION COSTS/ CAPEX	OPERATIONAL COSTS*	POSSIBLE SOURCES OF CAPITAL	% OF THE TOTAL CLIMATE NEUTRALITY BUDGET	2030 % OF THE TOTAL CO ₂ REDUCTION	2035 % OF THE TOTAL CO ₂ REDUCTION
	Mitigation of urban heat islands through urban renewal	€577,925,701.00	11,558,514.02	2021-2027 South-East RP NRRP Post-2027 EU funding Private capital / PPPs	22.00%	13.94%	12.96%
SOFT INTERVENTIONS (GOVERNANCE INNOVATION AND SOCIAL INNOVATION)	Digitalization of public services for climate neutrality	€37,559,208.00	1,877,960	2021-2027 South-East RP NRRP Post-2027 EU funding	1.43%	0.09%	0.18%
	Climate neutrality office development and operationalization	€2,250,000.00	113,157.50	Local budget Other programmes	0.09%	2.90%	3.10%
	Local netzero coalition establishment, maintenance and growth	€2,260,000.00	150,000	Local budget Other programmes	0.09%	5.50%	5.37%
	Joint climate mitigation - adaptation approaches	€1,100,000.00	510,000	NRRP Modernization Fund National Programmes (AFM,POIM) Horizon Europe Life Clean Energy Transition Local budget Other programmes	0.04%	1.33%	1.30%
	Climate neutrality branding	€500,000.00	50,000.00	Local budget Other programmes	0.02%	2.95%	2.92%
	Climate neutrality regulations	€800,000.00	80,000	Local budget Other programmes	0.03%	3.15%	2.84%



FIELDS OF ACTION	ACTION	IMPLEMENTATION COSTS/ CAPEX	OPERATIONAL COSTS*	POSSIBLE SOURCES OF CAPITAL	% OF THE TOTAL CLIMATE NEUTRALITY BUDGET	2030 % OF THE TOTAL CO ₂ REDUCTION	2035 % OF THE TOTAL CO ₂ REDUCTION
	Raising awareness and engaging local ecosystems to achieve climate neutrality	€14,915,712.00	2,869,427.20	NRRP Modernization Fund National Programmes (AFM) Horizon Europe RENEWFM Life Clean Energy Transition Built4People Local budget Other programmes Private funding / PPPs	0.57%	12.57%	14.13%
	Art promoting climate neutrality	€1,500,000.00	100,000	Local budget Other programmes Private funding / PPPs	0.06%	2.61%	2.81%
	Encouraging behavioral changes towards climate change mitigation	€3,000,000.00	300,000	Local budget Other programmes Private funding / PPPs	0.11%	8.99%	9.16%
TOTAL		€2,626,618,975.00	122,924,743	N/A	100.00%	100.00%	100.00%

Source: authors' calculations

Bayesian models were used to estimate the yearly operational costs for each project taking into consideration the projects names, budgets and online available information.



TABLE 22 SUMMARIZED COSTS AND CO₂ REDUCTIONS BY FIELD OF ACTION

FIELDS OF ACTION	TOTAL COSTS FOR ALL THE COVERED ACTIONS	% OF THE TOTAL BUDGET	2030 TOTAL CO ₂ REDUCTIONS FOR ALL THE COVERED ACTIONS	2030 % OF THE TOTAL CO ₂ REDUCTION	2035 TOTAL CO ₂ REDUCTIONS FOR ALL THE COVERED ACTIONS	2035 % OF THE TOTAL CO ₂ REDUCTION
ENERGY SYSTEMS	€368,932,794.00	14.21%	115,329.53	14.10%	140,263.69	15.18%
MOBILITY AND TRANSPORT	€971,864,536.00	37.25%	36,706.99	4.49%	44,109.92	4.77%
WASTE AND CIRCULAR ECONOMY	€31,309,035.00	0.55%	660.08	0.08%	1,204.54	0.13%
GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS	€105,936,349.00	4.08%	134,262.70	16.41%	138,297.03	14.96%
BUILT ENVIRONMENT	€1,084,691,341.00	41.79%	203,132.43	24.83%	213,915.90	23.14%
SOFT INTERVENTIONS (GOVERNANCE INNOVATION AND SOCIAL INNOVATION)	€63,884,920.00	2.11%	328,113.85	40.10%	386,499.21	41.82%
TOTAL	€2,626,618,975.00	100%	818,205.57	100.00%	924,290.29	100.00%

Source: authors' calculations



FINANCIAL INDICATORS FOR MONITORING, EVALUATION AND LEARNING

Briefly present the used monitoring indicators and explain them, if necessary.

TABLE 23 FINANCIAL INDICATORS BY FIELD OF ACTION

FIELDS OF ACTION	INDICATOR	INDICATOR VALUE AND UNIT
ENERGY SYSTEMS	Consolidation of an energy-efficient district heating system	0.36 kg CO ₂ /euro
	Enhancing the local supply of renewable energy	1.05 kg CO ₂ /euro
	Modernization of public lighting to reduce energy consumption	0.42 kg CO ₂ /euro
	TOTAL CO₂ REDUCTION / CAPITAL INVESTED	TONS CO₂ / FINANCIAL SUM 140,263.69 tons CO ₂ / €368,932,794.00
MOBILITY AND TRANSPORT	Encouraging public transport	0.07 kg CO ₂ /euro
	Promoting non-motorized mobility	0.03 kg CO ₂ /euro
	Using traffic management and the parking policy as a tool to reduce traffic jams	1.15 kg CO ₂ /euro
	TOTAL CO₂ REDUCTION / CAPITAL INVESTED	TONS CO₂ / FINANCIAL SUM 44,109.92 tons CO ₂ /€971,864,536.00
BUILT ENVIRONMENT	Increasing the energy performance of public buildings	0.02 kg CO ₂ /euro
	Increasing the energy performance of residential buildings	0.40 kg CO ₂ /euro
	Mitigation of urban heat islands through urban renewal	0.21 kg CO ₂ /euro
	TOTAL CO₂ REDUCTION / CAPITAL INVESTED	TONS CO₂ / FINANCIAL SUM 213,915.90 tons CO ₂ / €1,084,691,341.00



FIELDS OF ACTION	INDICATOR	INDICATOR VALUE AND UNIT
WASTE AND CIRCULAR ECONOMY	Consolidating the integrated waste management for a circular economy	0.04 kg CO ₂ /euro
	TOTAL CO₂ REDUCTION / CAPITAL INVESTED	TONS CO₂ / FINANCIAL SUM 1,204.54 tons CO ₂ / €31,309,035.00
GREEN INFRASTRUCTURE & NATURE-BASED SOLUTIONS	Developing an extended network of green areas for carbon capture	1.60 kg CO ₂ /euro
	Renaturation of the sea coast	0.81 kg CO ₂ /euro
	TOTAL CO₂ REDUCTION / CAPITAL INVESTED	TONS CO₂ / FINANCIAL SUM 138,297.03 tons CO ₂ / €105,936,349.00
SOFT INTERVENTIONS (GOVERNANCE INNOVATION AND SOCIAL INNOVATION)	Digitalization of public services for climate neutrality	0.04 kg CO ₂ /euro
	Climate neutrality office development and operationalization	12.75 kg CO ₂ /euro
	Local NetZero coalition establishment, maintenance and growth	21.95 kg CO ₂ /euro
	Joint climate mitigation - adaptation approaches	10.96 kg CO ₂ /euro
	Climate neutrality branding	53.99 kg CO ₂ /euro
	Climate neutrality regulations	32.82 kg CO ₂ /euro
	Raising awareness and engaging local ecosystems to achieve climate neutrality	8.75 kg CO ₂ /euro
	Art promoting climate neutrality	17.31 kg CO ₂ /euro
	Encouraging behavioral changes towards climate change mitigation	28.23 kg CO ₂ /euro
	TOTAL CO₂ REDUCTION / CAPITAL INVESTED	TONS CO₂ / FINANCIAL SUM 386,499.21 tons CO ₂ /€63,884,920.00

Source: authors' calculations



CLIMATE POLICIES FOR CAPITAL FORMATION AND DEPLOYMENT

Shortly describe the climate policies you will develop and use for capital accumulation and deployment.

While the municipality currently dedicates around 50% of its local budget to climate-related initiatives, there is still potential for enhancement. Innovative strategies like green budgeting, green procurement, green bonds, participatory budgeting, and crowdfunding for climate projects have not yet been adopted at the local level. These initiatives could facilitate capital formation, attract investors, and mobilize private funding within a framework that involves the entire community in the decision-making process.

TABLE 24 CLIMATE POLICIES TO ENABLE CAPITAL DEPLOYMENT

CLIMATE POLICY	DESCRIPTION OF POLICY	INTENDED OUTCOME FOR CAPITAL FORMATION
GREEN BUDGETING	Green budgeting aims to align public spending with environmental goals by assessing the environmental impact of budgetary items and policies. The process involves identifying and evaluating the contributions of each budget line to environmental outcomes using specific performance indicators.	This practice is essential for redirecting local public investment (projected at € 100 mil. per year until 2035) towards climate neutral interventions.
GREEN PROCUREMENT	This approach prioritizes eco-friendly products while also considering social equity and economic viability, ensuring that procurement decisions positively contribute to society and climate neutrality goals. Key strategies for effective green procurement include integrating environmental criteria into public procurement specifications, such as those prioritizing renewable resources or circular processes.	Prioritization of local public allocation for the purchase of goods and services that minimize negative environmental impacts throughout their lifecycle.



CLIMATE POLICY	DESCRIPTION OF POLICY	INTENDED OUTCOME FOR CAPITAL FORMATION
GREEN PARTICIPATORY BUDGETING	Green participatory budgeting is a specialized approach that focuses on allocating public funds for projects aimed at addressing climate neutrality. By engaging communities in decision-making processes, this process fosters a sense of ownership among residents, raises awareness about climate issues and encourages collective action towards achieving net-zero goals	Allocation of local financial resources for climate neutrality actions in which citizens have a direct say in how the spending is done.
GREEN BONDS	Municipal green bonds are a specialized type of municipal bond designed to finance environmentally sustainable projects. These bonds allow state and local governments to raise funds specifically for initiatives that promote clean energy, energy efficiency, and other climate neutrality measures. Other municipalities in Romania, such as Resita, have recently issued this type of bonds.	Green bonds provide essential capital for local governments to invest in infrastructure that supports sustainability goals. They also attract socially responsible investors and diversify the funding sources for local public investment.
URBAN RENEWAL PPPS	Public-Private Partnerships (PPPs) are vital mechanisms for urban renewal, enabling collaboration between public authorities and private entities to revitalize urban areas, such as the Oil Terminal. These partnerships are characterized by long-term contractual agreements that leverage the strengths of both sectors, facilitating efficient resource allocation and risk-sharing in urban development projects.	By combining public funding with private investment, PPPs can mitigate financial burdens on municipalities.
LOCAL CLIMATE NEUTRALITY FUND	The concept of a local climate fund revolves around the idea of providing financial resources directly to local stakeholders to address climate change challenges effectively. The idea of a specific fund is linked to other local initiatives, such as green bonds, green participatory budgeting or hackathons, the overall idea being to encourage a crowdfunding approach especially designated for small scale climate neutrality interventions. Significant CSR budgets of local companies are expected to be mobilized through this fund.	The local Climate Neutrality Fund can act as catalysts for attracting additional funding from public and private sources through crowdfunding.

Iceland
Liechtenstein
Norway grants



Norway grants

Developed within M100 HUB

CLIMATE CITY CONTRACT



Mirror Mission
Cities Hub Romania

*Inspired by the EU Mission for Climate-Neutral and Smart Cities
Aligned with the NetZeroCities approach*



2030-2035

CLIMATE CITY CONTRACT

CONSTANȚA MUNICIPALITY & METROPOLITAN AREA

DISCLAIMER

This document, which was developed through the Mirror Mission Cities Hub Romania, draws inspiration, both in its structure and content, from the methodology developed by the European Commission for elaborating the documents pertaining to the Climate City Contracts (the Climate Neutrality Action Plan, Investment Plan and Commitments) for the 112 cities which officially participate in the EU Mission for Climate-Neutral and Smart Cities.

By aligning the M100 Climate City Contract with the model set forth by the European Commission, we aim to ensure that this document is in line with European strategic priorities and directives regarding the transition towards climate neutrality.

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- **SDP** (Spatial Development Plan)
- **SE** (South-East)
- **SECAP** (Sustainable Energy and Climate Action Plan)
- **SUMP** (Sustainable Urban Mobility Plan)
- **WB** (World Bank)
- **WMO** (World Meteorological Organization)



II. ACTION PLAN

INTRODUCTION

Briefly describe (1-2 pages) the local context within which the Action Plan is being formulated and outline the general gap it aims to address, by taking into account relevant local strategies and policies, socio-economic development factors, environmental conditions and climate considerations etc.

The Action Plan under the M100 Climate City Contract is set within the unique socio-economic, environmental, and strategic framework of Constanța Municipality and its Metropolitan Area. Constanța, the oldest continuous settlement in Romania, a key urban center on the Black Sea coast and Romania's largest port city, is at a pivotal juncture in its pursuit of climate neutrality. The municipality and its surrounding metropolitan area face complex environmental, socio-economic, and infrastructural challenges that necessitate urgent and strategic action.

This Action Plan, developed under the M100 Climate City Contract framework, seeks to close the existing gaps and accelerate the transition to climate neutrality by 2030, while expanding the climate change mitigation measures through 2035. As such, it aligns with the European, national, and regional climate and sustainability goals, ensuring a coordinated and effective pathway towards a climate-friendly future.

LOCAL CONTEXT AND CHALLENGES

SOCIO-ECONOMIC FRAMEWORK

Constanța is the administrative and economic hub of southeastern Romania, home to a diverse population exceeding 280,000 residents, with a significant metropolitan area. The city's economy thrives on its strategic position as a major port city, supporting key sectors like maritime transport, logistics, tourism, and renewable energy. However, Constanța faces challenges such as demographic decline, aging infrastructure, and social inequalities. Addressing these issues requires integrated planning and sustainable investments to bridge the gap between economic demands and infrastructure capacity.

The Integrated Urban Development Strategy 2023-2030 outlines several key socio-economic factors that shape Constanța's sustainability landscape:

- **Demographics and urbanization:** with a declining population and an increasing proportion of aging residents, there is a need to ensure that climate policies are inclusive and supportive of social equity. The city also experiences seasonal population surges due to tourism, which puts additional pressure on local infrastructure and public services.
- **Economic development:** the city's economy is primarily driven by the maritime sector, tourism, logistics, and trade. The Port of Constanța, one of the largest in Europe, plays a crucial role in international commerce, but its activities contribute significantly to carbon emissions. Diversification of the local economy towards green industries and digital innovation is necessary to ensure long-term sustainability.



- **Energy and emissions:** buildings and transport are the largest contributors to local CO₂ emissions. The residential sector is characterized by outdated heating systems, leading to high energy consumption and pollution. Transitioning to nearly Zero Energy Buildings (nZEB), expanding renewable energy, and promoting green mobility are key priorities. Additionally, the industrial sector needs to adopt energy efficiency measures and cleaner production methods to reduce its environmental impact.
- **Public health and air quality:** high pollution levels from industrial and transport activities necessitate integrated measures to improve air quality and public health outcomes. The prevalence of respiratory diseases linked to air pollution highlights the urgent need for stricter emission controls and greener urban planning.
- **Infrastructure and mobility:** the city's transportation network is heavily reliant on private vehicles, contributing to congestion and emissions. Public transport infrastructure, though present, requires modernization and expansion to encourage higher usage. Developing multimodal transport solutions, expanding cycling lanes, and promoting pedestrian-friendly urban design are essential steps toward sustainable mobility.
- **Environmental risks:** Constanța is highly vulnerable to climate-induced hazards such as coastal erosion, extreme heat events, and flooding. Rising sea levels threaten critical infrastructure, including the port and waterfront developments. The city's green spaces are insufficient in mitigating these risks, necessitating enhanced urban greening efforts and ecosystem-based adaptation strategies.

ENVIRONMENTAL AND CLIMATIC CHALLENGES

Constanța's strategic location and economic profile significantly influence its environmental footprint. As a major port and industrial hub, the city experiences high levels of greenhouse gas emissions from maritime transport, logistics, and industrial activities. The urban environment is also affected by intense vehicular traffic, inefficient waste management practices, and an aging building stock with high energy consumption.

Constanța's coastal location brings unique environmental vulnerabilities, including rising sea levels, coastal erosion, and extreme weather events. These are compounded by urban heat islands and air pollution, making resilience planning a critical component of its sustainability efforts. Climate trends reveal rising temperatures, more frequent heavy rainfall events, and prolonged dry spells, exacerbated by greenhouse gas emissions from transport, waste, and residential heating.

ADDRESSING THE GAPS THROUGH STRATEGIC ACTION

LOCAL AND REGIONAL STRATEGIES

The Action Plan seeks to address these challenges through a holistic and integrated approach, leveraging existing strategies and policy frameworks. As such, the Action Plan is closely aligned with several local and regional strategic documents, including the Sustainable Energy and Climate Action Plan (SECAP), the Integrated Urban Development Strategy (IUDS) for 2023-2030, the Sustainable Urban Mobility Plan (SUMP), Waste Management Plan, and Air Quality Plan.

These plans emphasize priorities such as energy efficiency, renewable energy adoption, public transport modernization, and green infrastructure development. **Key interventions include:**



- **Insufficient renewable energy integration:** the city relies heavily on conventional energy sources, necessitating a greater emphasis on local solar and wind power projects.
- **Fragmented urban mobility systems:** while steps have been taken to modernize public transport, a shift toward electric mobility and enhanced non-motorized transport infrastructure is crucial.
- **Limited green infrastructure:** expanding urban green spaces and nature-based solutions is critical to mitigating climate change impacts and enhancing liveability.
- **Governance and stakeholder engagement:** strengthening multi-level governance and fostering collaboration with private sector actors, research institutions, and civil society organizations is necessary for successful implementation.

ALIGNMENT WITH BROADER CLIMATE POLICIES

EUROPEAN AND NATIONAL FRAMEWORKS

At the national level, the Action Plan integrates objectives from Romania's Long-Term Strategy for Greenhouse Gas Emission Reduction and the National Plan for Energy and Climate. At the European level, it aligns with the European Green Deal, the Paris Climate Agreement, and the Covenant of Mayors framework for climate action. The city also integrates principles from the New European Bauhaus and the New Leipzig Charter, ensuring a people-centred and sustainable urban transformation. These alignments ensure the plan's consistency with global climate neutrality goals and sustainable development principles.

By committing to this Climate Neutrality Action Plan, Constanța sets an ambitious course toward an energy-efficient, resilient, and competitive metropolitan area. Through targeted investments, technological innovation, and inclusive governance, the city aims to not only meet its climate goals but also enhance the quality of life for its residents and strengthen its role as a regional leader in sustainable urban development.



WORK PROCESS

Within the overarching context of the city's journey toward climate neutrality, outline the working steps involved in preparing the Action Plan, including both the completed stages and the future anticipated ones.

- Additionally, delineate the timeline and key milestones for the forthcoming iterations in the Action Plan's development.

OVERARCHING CONTEXT

The strategic orientation of Constanța and its metropolitan area towards sustainability and innovation through green and smart development is not a recent undertaking, but rather a deliberate path, embraced by the local public administration and Constanța Metropolitan Area Intercommunity Development Association (Constanța MA IDA) as a core direction for urban development. This approach is grounded, on one hand, in the strategic documents adopted at the local level — particularly the 2023–2030 Integrated Urban Development Strategy (IUDS), alongside sectoral plans such as the 2023 Sustainable Energy and Climate Action Plan (SECAP) and the Sustainable Urban Mobility Plan (SUMP). On the other hand, it is reflected in the investments, projects and programs implemented at both local and metropolitan levels, to advance the green development agenda across key sectors (built environment, transport and mobility, energy, waste management and circular economy etc.).

However, the transition to climate neutrality gained a stronger momentum with the launch of M100, the national platform designed to support the Romanian cities in their journey toward smart and climate-neutral urban development. The political commitment was further solidified through the launch of the M100 Selection Call, when an Expression of Interest was jointly prepared by Constanța City Hall and Constanța MA IDA. This collaborative effort led to the selection of Constanța and its metropolitan area among the 10 Romanian cities to receive support from the M100 National Hub for this transition.

Consequently, the current Climate Neutrality Action Plan serves as a strategic blueprint that formalizes the collaborative commitment and interjurisdictional cooperation needed to achieve climate neutrality in Constanța and its metropolitan area by 2030, while advancing these efforts further by 2035.

WORKING STEPS AND PRINCIPLES

The development and, implicitly, the future implementation of the Climate Neutrality Action Plan adhere closely to the process recommended by the M100 National Hub (process which is based on the methodology prepared by the European Commission through NetZeroCities for the EU Mission for Climate-Neutral and Smart Cities). Accordingly, the sequence of working steps undertaken thus far —and those to be carried forward by Constanța City Hall and Constanța MA IDA to substantiate and implement the transition to climate neutrality— is aligned with the framework outlined below.



COMPLETED STEPS

Setting the governance structure

Once with the preparation of the Expression of Interest for participating in the M100 Selection Call, the following steps have been undertaken:

- Forming an internal team within the City Hall, consisting of experts from the most relevant departments, to allocate a part of their daily responsibilities to the preparation of the required documentation.
- Collaborating with Constanța MA IDA team, to support the process by supplying the data and information required for the metropolitan dimension.

The same collaborative approach was maintained during the preparation of the CNAP. In terms of internal governance, multiple experts from various City Hall departments (including the Directorate of Strategies and European Funds, the Directorate of Urban Planning and Heritage, the Directorate of Public Services, and the Directorate of Logistics), all of whom report to the mayor, were involved in drafting the documentation, in line with their areas of expertise. Regarding the external governance, the interjurisdictional cooperation was further strengthened through the partnership between Constanța City Hall and Constanța MA IDA, which also designated several coordinators and experts to assist in preparing the CNAP, thereby making the process a co-design effort.

Additionally, several other key local stakeholders actively participated in the preparation of the CNAP, including the public district heating company and the public transport company, the Ovidius University and the Medgreen Innovation Cluster. Other relevant stakeholders, particularly the CCC signatories, were also consulted throughout the process, with their input and feedback being actively sought, in order to further reinforce the co-creation approach. This collaborative process aimed also to cultivate the mutual commitments needed for the successful implementation of such an ambitious endeavour.

Once the CNAP enters its implementation phase, several interventions across the Organizational, Governance, Social and Other Innovation fields of action will be carried out, to furtherly strengthen and even formalize these collaborative efforts, including:

- Establishing and operationalizing a Climate Neutrality Office within the City Hall, to oversee the implementation and monitoring of the CCC.
- Appointing an Energy Manager within the City Hall, to manage the energy-related tasks and initiatives (e.g., energy audits, projects, programs, strategies, policies).
- Designating a PPP Specialist within the City Hall, to coordinate and manage the public-private partnerships (PPPs) related to climate neutrality.
- Establishing, maintaining and growing a NetZero Coalition, to mobilize various stakeholders and consolidate resources and expertise from various entities.
- Formalizing Climate Neutrality Neighborhood Advisory Councils, to enhance the community's engagement and foster a solid collaboration on climate neutrality initiatives at the neighborhood level, under the coordination of Homeowners Associations.

All of these interventions were designed to create a sound governance structure that is both internally mandated by the City Hall and also multi-level, actively engaging the local stakeholders to ensure the successful implementation and long-term sustainability of the CNAP.



Defining the vision and setting the climate neutrality target based on the GHG emission baseline inventory assessment

The vision for the transition to climate neutrality encompasses the entire metropolitan area of Constanța, with Constanța Municipality representing the focal point. The vision was crafted through the close collaboration between Constanța City Hall and Constanța Metropolitan Area Intercommunity Development Association, being underpinned by a strong political commitment.

The vision was formally established following the calculation of the baseline inventory for the GHG emissions and the assessment of the current state, which included analysing local pollution data, identifying the existing barriers, risks and gaps and mapping the local stakeholders critical to supporting the journey towards climate neutrality.

All of this work was carried out with the support of the World Bank, which, under a Technical Assistance Agreement with Constanța City Hall, contributed to the technical analyses which underpin the CNAP: in particular, the preparation of the baseline GHG inventory to establish the starting point for the emission reductions, as well as the assessment of the targeted residual GHG emissions for 2030 and 2035, to determine the scale of the actions needed to achieve climate neutrality.

Furthermore, the objective of achieving climate neutrality by 2030, while continuing to advance towards enhanced direct impacts and associated co-benefits by 2035, is closely aligned with the existing strategic documents. This approach ensures planning coherence and unity across the local and metropolitan urban development initiatives. As such, the objectives of reducing the CO₂ emissions and capturing the residual ones are integrated into pre-existing climate action plans and strategic processes. The most important correlations in terms of strategic planning documentation are outlined below, for reference.

- The vision outlined in the **2023–2030 Integrated Urban Development Strategy** focuses on the sustainable development of the entire metropolitan area of Constanța. Among the IUDS' strategic priorities are green mobility, energy efficiency, environmental protection and resource conservation, the digitalization and adoption of smart city technologies and social inclusion. The Climate Neutrality Action Plan advances these priorities through greater detail, translating them into specific actions targeting the key emission sectors.
- The **2023 Sustainable Energy and Climate Action Plan** was developed to advance the sustainable development of Constanța Municipality by decoupling the economic growth from energy consumption, gradually reducing the GHG emissions to achieve climate neutrality by 2050, and enhancing the community's resilience to climate change. Building on this foundation, the Climate Neutrality Action Plan introduces a significantly more ambitious vision, aligning with the accelerated timelines of the EU Mission for Climate-Neutral and Smart Cities (2030) and the M100 National Hub (2035). It aims for the Municipality to achieve climate neutrality by 2030 and to continue advancing these efforts through 2035. To enable this accelerated transition, the CNAP outlines a comprehensive set of robust hard actions, complemented by soft ones, ensuring the sustained momentum required to reach this critical target.
- The **2015 Sustainable Urban Mobility Plan** aims to establish a sustainable, safe, integrated and universally accessible transport system, which connects the people and the places, while



supporting the economy, environment and quality of life within Constanța Growth Pole. Building on this vision of sustainable mobility, the Climate Neutrality Action Plan prioritizes the adoption of green transportation modes, proposing actions for promoting the use of public transport, encouraging the non-motorized mobility and leveraging traffic management and parking policies as tools to alleviate the congestion and enhance the urban mobility.

As such, building on the ongoing local climate investments and policies, and in line with the climate neutrality transition model promoted at the European level and adopted nationally, Constanța City Hall commits to reducing its CO₂ emissions by 818,205.57 tons by 2030. By 2035, the targeted CO₂ reduction will reach 924,290.29 tons. In partnership with the Constanța Metropolitan Area IDA, these efforts will also focus on scaling the impact of the CNAP across the entire metropolitan area within these timeframes.

The actions proposed in the CNAP for supporting this vision are also expected to deliver a wide range of economic, social and environmental co-benefits for the local residents and for the organizations operating in the local and metropolitan territory.

The development of the vision also considered the need for implementation through a structured and interconnected system of actions, which extend beyond the sole efforts of the public administration and the MA IDA. Acknowledging the limitations of their roles, the level of ambition for this vision was determined with the understanding that a portion of the efforts and resources will be contributed by the local stakeholders (organizations, institutions, individuals). Additionally, their relationships will be further harnessed to ensure the sustainability of this ambitious process.

Identifying the needed actions and designing their portfolios of interventions

Building on the vision outlined from the GHG emissions baseline inventory and considering the policies pursued at the local, national and European levels, the climate neutrality action planning focused on designing measurable, reportable and verifiable actions, targeting each key emission sector. The actions were organized into portfolios dedicated to each field of action defined by the EU Mission for Climate Neutral and Smart Cities methodology. Each action includes several specific interventions and is detailed in an individual sheet, which, during the implementation phase of the CNAP, will facilitate its execution.

The entire process of designing the actions to support the vision of achieving climate neutrality and thereby meeting the CO₂ emission reduction and abatement targets, followed the strategic Theory-of-Change approach developed by NetZeroCities. Specifically, the actions were designed within an Impact Pathways framework, which outlines the connections between the systemic levers activated based on the type of actions undertaken, along with their direct (CO₂ emission reduction/capture) and indirect (co-benefits) impacts, in the short, medium and long term. This framework essentially reflects the overall structure of the CNAP, illustrating the intervention logic which will be pursued for Constanța's transition into a smart city, which properly mitigates climate changes.



As previously mentioned, the actions were designed to actively engage a diverse range of local actors through a participatory model of implementation and monitoring, rather than isolating the community and local organizations from City Hall and the Metropolitan Area's IDA in their efforts to sustain such a challenging transition on their own.

FUTURE STEPS

Implementing and monitoring the Climate Neutrality Action Plan

Once the Climate Neutrality Action Plan is approved, it will proceed to the implementation, monitoring and evaluation phase, in line with the established vision, targets and Theory-of-Change. The teams from Constanța City Hall (via the operationalization of the Climate Neutrality Office) and Constanța Metropolitan Area Intercommunity Development Association (through the NetZero Coalition) will actively support the Plan's progress, while simultaneously engaging in ongoing learning, incorporating the insights gained from the undertaken work and the capacity-building activities conducted throughout the transition.

All the necessary processes, from the preparation of the actions to their effective implementation, will focus on ensuring efficiency and quality. Where possible, innovative methods will be employed, with the aim of fostering continuous improvement.

During the implementation phase, particular emphasis will be placed on monitoring the actions, in order to gain a deeper understanding of their impact (including the relationship between the direct and indirect effects and their associated costs / allocated funds). The monitoring process will be closely aligned with the MEL indicators developed for the actions outlined in the CNAP, which will also support the periodic updates and iterations of the Plan. Monitoring reports for the MEL indicators will be prepared every six months, except for the GHG emissions inventory, which will be updated biennially.

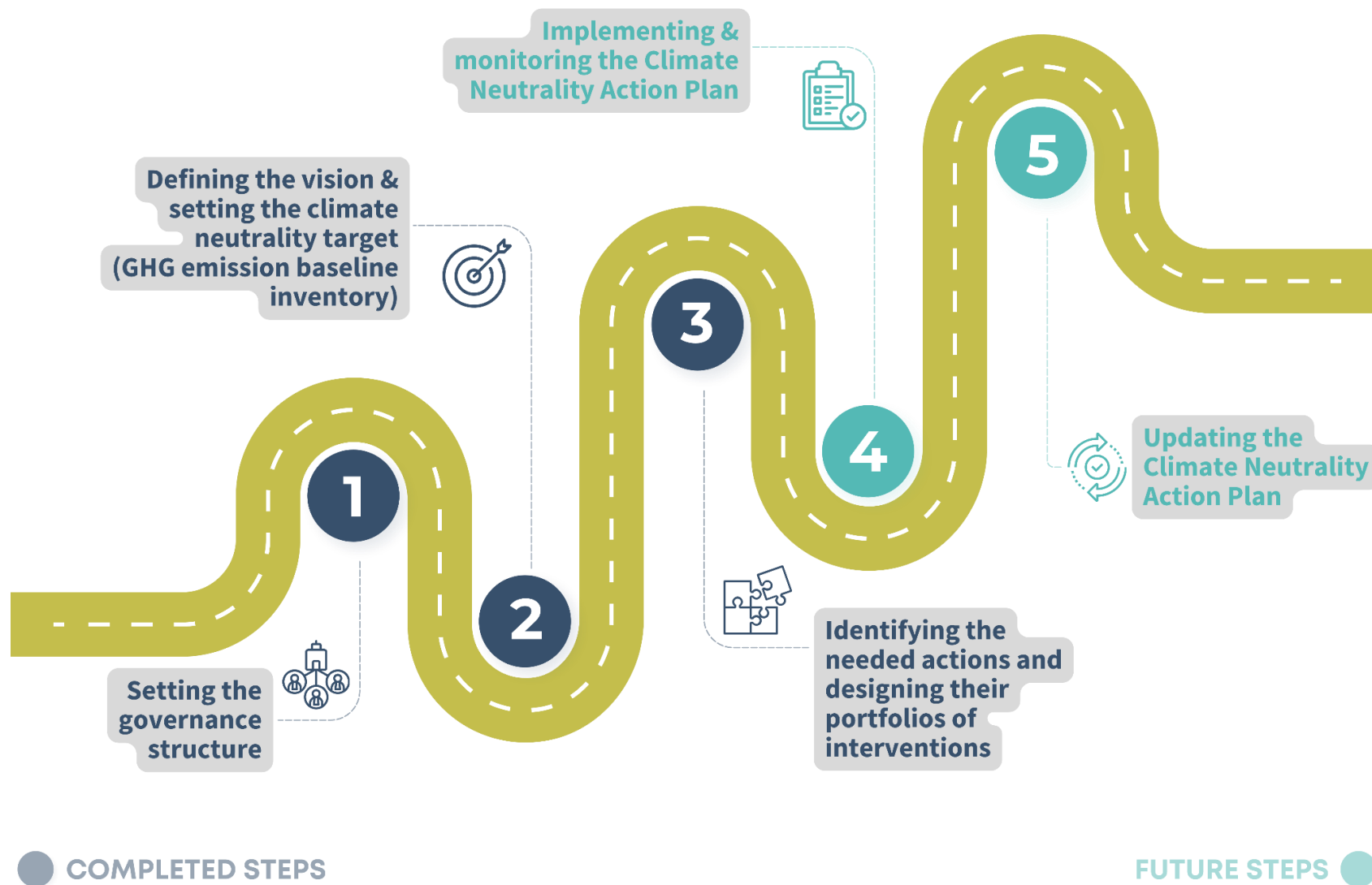
Additionally, there will be a strong focus on effectively communicating the entire journey, highlighting both the achieved successes and the encountered challenges; through this approach, the public administration will ensure that the community and the local ecosystem not only fully comprehend the process but also become proactively engaged in accelerating the achievement of climate neutrality. The monitoring results will also be made publicly available, in order to ensure a transparent communication with the final beneficiaries (citizens, institutions, businesses, organizations), while also fostering a clear sense of ownership and accountability among those responsible for implementing the CNAP.

Updating the Climate Neutrality Action Plan

The CNAP's updates will occur at least once every two years, in line with the updates of the GHG emissions inventory. However, it may be updated more frequently if needed, such as in cases where multiple new actions need to be introduced or where a significant number of the existing actions have been completed. The update process will also be highly participatory, by involving the key stakeholders - particularly the CNAP's signatories.



WORKING STEPS - DEVELOPMENT & IMPLEMENTATION





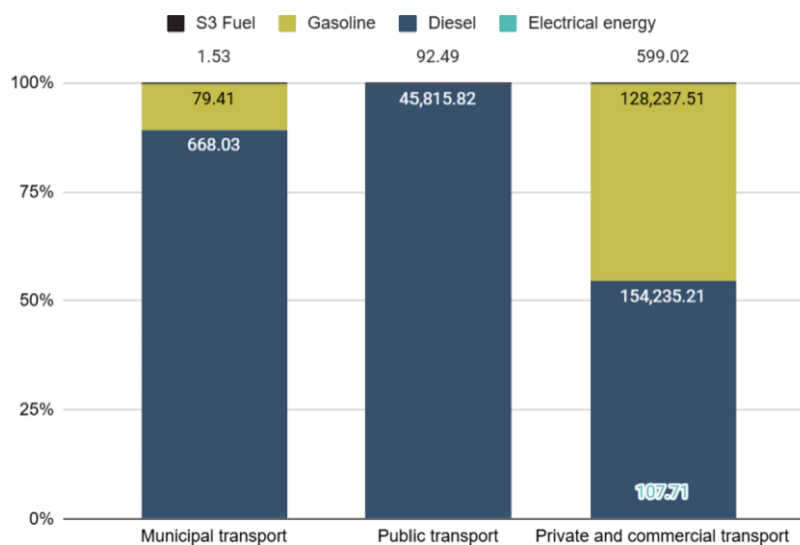
GREENHOUSE GAS EMISSIONS BASELINE INVENTORY

Describe and elaborate on the most recent greenhouse gas (GHG) inventory conducted by the city, in order to establish the baseline emissions and also to identify the emissions gap towards achieving climate neutrality.

- Make sure to also assess the greenhouse gas (GHG) baseline inventory - you can refer to: the sources of data collection and their rationale, the baseline emission conversion factors used, proposed measures for improving future data collection processes etc.

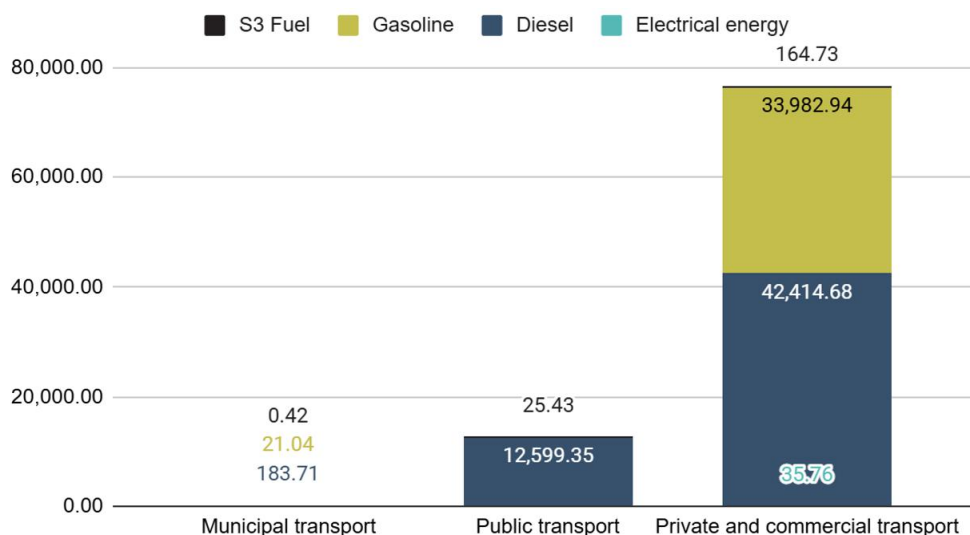
TRANSPORT: 329,836.73 MWh / year, equivalent with 89,428.07 tons CO₂ / year

FIGURE 4 TRANSPORT ENERGY TYPES 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 5 TRANSPORT CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)



Source: authors' calculations



The Transport sector is a significant contributor to emissions, responsible for 8.75% of Constanța's total CO₂ output. The energy demand and associated CO₂ emissions for various transport categories are detailed below. Emissions were allocated to Scope 1 for activities within the city boundaries and Scope 2 for emissions outside the city boundaries, linked to grid-supplied electricity used by electric vehicles. Totals for each subcategory were summarized under Scope 1 and Scope 2 emissions, while Scope 3 emissions were partially estimated based on the fuel consumption required for transporting fuel from refineries outside Constanța to local fuel stations. For a comprehensive breakdown of the calculations and methodology, please refer to *Annex 2*.

Estimating CO₂ emissions from the transport sector involved analysing energy consumption and emissions based on vehicle types and total distances travelled. The energy demand and emissions profile for Constanța's transport sector was derived using official vehicle registration data, public transport company reports, travel statistics, and standard conversion factors.

PRIVATE AND COMMERCIAL TRANSPORT - 283,179.46 MWH / YEAR ENERGY EQUIVALENT WITH 76,598.12 TONS CO₂ / YEAR

Emissions from private and commercial transport were estimated based on the distribution of private and commercial vehicles by type and power source. A request for information was submitted to General Directorate of Driving Permits and Registrations (DRPCIV) for the number of vehicles in the Municipality of Constanța, as information was publicly available only at county level.

In 2021, there were an estimated 139,567 cars in Constanța Municipality, with 53.41% running on gasoline, 44.37% on diesel, 0.17% being hybrids, and 0.19%% electric. Motorcycles and mopeds totalled 2,809 vehicles. Energy requirements and emissions were assessed for each category based on estimated distances travelled, fuel consumption rates and emission intensities specific to each fuel type.

For cars, an average distance of **2,040 km / year** was considered to be travelled within the city boundary per year. To estimate this, it was assumed that 40% of the 5,100 km average distance travelled by cars assumed in the *SECAP of Constanța* (page 77) is intra-urban. Fuel consumption (litres per year) was calculated based on the assumed fuel consumption rates provided by the *SECAP of Constanța*. These rates included 9 litres per 100 km for gasoline vehicles, 11 litres per 100 km for diesel vehicles, and 5 litres per 100 km for hybrid vehicles (both diesel and gasoline). For electric cars, an average consumption of 0.2 kWh per kilometre was assumed. The estimates were determined using these figures in conjunction with the total annual distance travelled by each category of cars, by power source:

→ **GASOLINE CARS:** based on an average consumption of 9 litres per 100 km, the annual fuel use for gasoline cars is 13,677,737.33 litres of fuel. The weight of this fuel was converted to tons using a factor of 0.00074 tons per litre, resulting in 10,121.53 tons of gasoline consumed. Multiplying this by the net calorific power of gasoline (12.3 MWh per tons) yields an energy requirement of 124,494.77 MWh per year. Applying a conversion factor of 0.265 tons per MWh (according to *SECAP Constanța*), gasoline cars emitted an estimated **32,991.11 CO₂e** in 2021.



- **DIESEL CARS:** with an average fuel consumption of 11 litres per 100 kilometres, diesel cars consumed 13,830,599.80 litres of fuel. Converting this volume to tons (using 0.00085 tons per litre) results in 11,756.01 tons of diesel consumed. The energy requirement for diesel vehicles, calculated using the net calorific value of diesel (11.9 MWh per tons), is about 139,896.52 MWh per year. Based on a conversion factor of 0.275 tons of CO₂ per MWh for diesel, these vehicles generated **38,471.54 t CO₂e** in 2021.
- **ELECTRIC CARS:** the assumed energy consumption was 0.2 KWh per kilometre (See *Annex 2*), resulting in a total energy requirement of 107.71 MWh. Using a conversion factor of 0.401 tons of CO₂ per MWh for electricity, these vehicles contributed **35.76 tons of CO₂e** to the total emissions.
- **HYBRID CARS:** based on the average fuel consumption of 5 litres per 100 kilometres, hybrid cars consumed 200,124.00 litres of gasoline in 2021 (148.09 t), and 23,868.00 litres of diesel (20.29 t). The corresponding energy requirement was 2062.95 MWh, and the resulting emissions were **549.1 t CO₂e**.

For **motorcycles and mopeds**, an average of 1,360 km / year was considered to be travelled within the city boundary per year. To estimate this, it was assumed that 40% of the 3,400 km average distance travelled by cars assumed in the SECAP of Constanța Municipality (page 77) is intra-urban. Assuming an average fuel consumption of 3.5 litres per 100 kilometres (SECAP Constanța), they required 133,708.40 litres of gasoline (98.94 t). The energy requirement for these vehicles was 1,217.01 MWh, leading to 322.51 tons of CO₂ emissions in 2021. The energy requirement and emissions were calculated only for gasoline motorcycles and mopeds, as they account for 99.1% of the fleet.

Finally, **private and commercial buses and minibuses** in Constanța were analysed. With a total of 843 vehicles (after subtracting the number of public transport fleet buses), the average distance travelled within the city boundary was assumed to be 40% of the average total amount of kilometres / year of 11,452 km per vehicle (source: SECAP Constanța). This corresponded to 4,580.80 kilometres per vehicle each year, totalling 3,861,614.40 km, 1,393,699.24 litres of diesel (1,184.64 t), 1,643.59 of gasoline (1.22 t). The total energy requirement of 14,112.23 MWh is equivalent with **3,880.71 t CO₂e**.

In addition to the total energy requirement and equivalent emissions, Scope 3 emissions associated with the energy required to transport of fuel from refineries to the city were calculated, amounting to **164.73 t CO₂e** (See *Scope 3 emissions* section).

PUBLIC TRANSPORT - 45,908.31 MWH / YEAR ENERGY EQUIVALENT WITH 12,624.78 TONS CO₂ / YEAR

Calculating the CO₂ emissions of Constanța's public transport system required data from municipal authorities and official reports. Based on data reported by Constanța City Hall, the public bus fleet travelled a total of 11,973,742.70 km and consisted of 211 buses (104 Diesel - Isuzu Citiport, 79 Diesel - MAZ, 18 Diesel - Mercedes Benz, and 10 Diesel - Ayats). Collectively, the bus fleet consumed 3,850.07 tons of diesel, equating to an energy demand of **45,815.82 MWh / year** by using the net calorific value of diesel (11.9 MWh per ton). This fuel consumption resulted in emissions of **12,599.35 t CO₂**, calculated using the standard conversion factor for diesel of 0.275.



To this amount, Scope 3 emissions associated with the energy required to transport fuel from refineries to the city of **25.43 t** were added.

While the updated SECAP indicates a lower energy requirement for public transport in 2021, data reported directly by Constanța City Hall on the distance travelled and fuel consumption for each category of bus was used for running the estimation.

MUNICIPAL TRANSPORT - 748.97 MWh / YEAR ENERGY EQUIVALENT WITH 205.17 TONS CO₂ / YEAR

To estimate the emissions associated with the municipal fleet of vehicles, a request for information was submitted to Constanța City Hall. Based on the number and type of vehicles (17 gasoline, 44 diesel) and their fuel consumption in 2021, the municipal fleet, including the local police fleet, is estimated to generate an equivalent of **204.75 t CO₂**. This amount was estimated by multiplying the fuel consumption (tons) with the calorific power of gasoline and diesel (net calorific values of 12.3 MWh and 11.9 MWh), which was then converted to CO₂e using the specific conversion factors for gasoline and diesel. In addition to the total energy requirement and equivalent emissions, Scope 3 emissions associated with the energy required to transport fuel from refineries to the city were calculated, amounting to **0.42 t CO₂e**.

SCOPE 3 EMISSIONS - 693.03 MWh / YEAR ENERGY EQUIVALENT WITH 190.58 TONS CO₂/YEAR

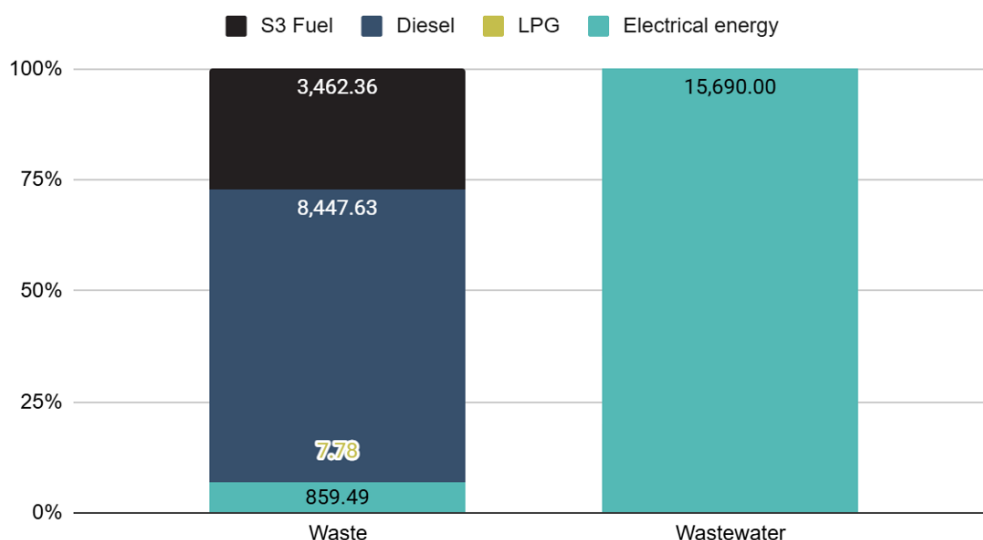
As highlighted under each transport sub-category, In addition to Scope 1 (diesel and gasoline, within city boundary) and Scope 2 emissions (electricity - within city boundary,) Scope 3 emissions (outside city boundary) were estimated based on the energy required for transporting the amount of fuel required in 2021 (from refineries to Constanța Municipality). This was calculated based on distances from refineries, tanker fuel consumption, and the number of tankers needed. Annually, an estimated 59,201.84 litres of diesel are required to transport fuel to stations. This results in an energy requirement of 693.03 MWh / year and equivalent emissions of **190.58 t CO₂e**. These Scope 3 emissions were distributed across municipal, public, and private transport based on their share of fuel consumption.

To enhance transport-related data collection, energy consumption for buses should be monitored annually. Additional data is needed to fully capture Scope 3 emissions, including commuting distances, vehicle types registered in the functional urban area (FUA), and grid energy losses for electric vehicles. A GIS-based transportation emissions model should be developed to integrate geospatial analysis, enabling identification of emission hotspots and supporting sustainable urban transport planning.



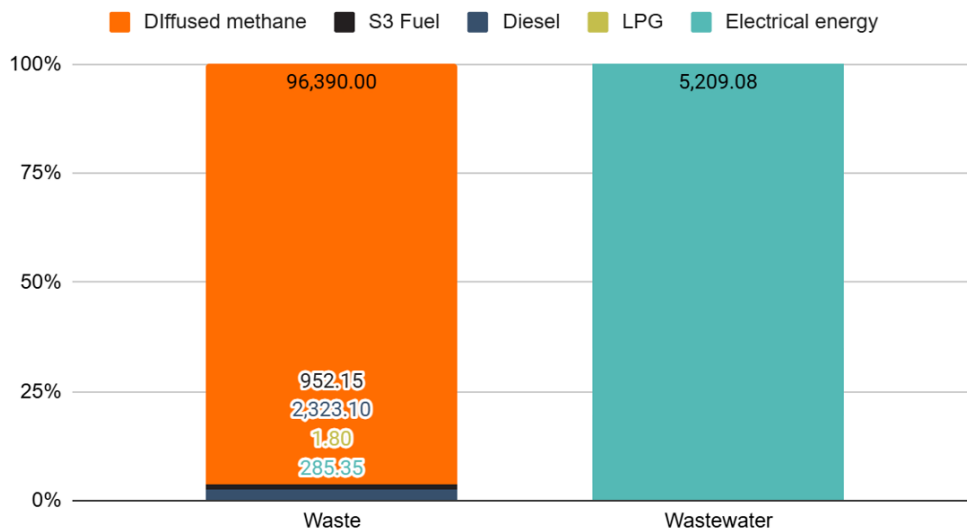
WASTE: 28,467.27 MWh / year and equivalent with 8,771.48 tons CO₂ / year and 96,390 t CO₂e (from landfill emissions)

FIGURE 6 WASTE ENERGY TYPES 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 7 WASTE CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)



Source: authors' calculations

The Waste sector accounts for 10.29% of the total CO₂ emissions in Constanța in 2021. Estimations include the energy requirements of waste collection, treatment, recycling, composting and landfilling processes, as well as landfill gas emissions. Specific energy requirements were assigned to Scope 1, Scope 2 or Scope 3 emissions. Scope 3 emissions consist of emissions from the waste generated within the city boundary but managed/sent to landfills outside the city boundary and were calculated based on the locations of the treatment of landfilling facilities). For all sources of data and detailed calculations, please see *Annex 3*.



WASTE MANAGEMENT - 12,777.27 MWh / YEAR ENERGY EQUIVALENT WITH 3562.4 TONS CO₂/YEAR

WASTE COLLECTION (DIESEL). The energy requirement for waste collection was calculated based on the total fuel consumption for the garbage trucks in 2021 of 825,448 litres (diesel), reported by the Constanța City Hall. This was required to collect a total quantity of waste of 154,524.31 tons, with an average capacity of garbage trucks in Constanța in 2021 of 7.5 tons, a consumption of 0.55 litres of diesel per km, and a total distance of 1,527,839 km / year. This resulted in an energy requirement of 8,447.63 MWh / year **(2,323.10 t CO₂, Scope 1)**.

WASTE SORTING (ELECTRICITY). In 2021, recyclable waste P.E.T., L.D.P.E. film, P.P.-H.D.P.E. plastic, other plastics, Paper, P.A.P. cardboard, Tetra pack, Non-ferrous waste) was sorted in a sorting station located in Constanța (Aurel Vlaicu Street 290A) and operated by S.C. MM RECYCLING S.R.L.. According to data reported by the Constanța City Hall, the total volume of sorted waste in 2021 was 1,764.52 t and the yearly energy consumption for the sorting facility was 665.71 MWh / year **(221 t CO₂e, Scope 2)**.

WASTE RECYCLING (ELECTRICITY). The sorting station owned by MM Recycling also owns a PET recycling facility. Based on the quantity of PET sorted of 338.13 tons reported by Constanța City Hall, the energy requirement associated with waste recycling (mechanical and physical technologies) was estimated using an average of 0.5 MWh/ton. This corresponds to 169.06 MWh **(56.13 t CO₂e, Scope 2)**. While recycling activities are associated with energy use, increasing recycling and composting rates is critical to reduce emissions associated with landfilling. Avoided emissions result from diverting waste from landfills through recycling and composting, reducing the need for new raw materials and preventing the release of greenhouse gases typically associated with landfilling.

WASTE LANDFILLING (DIESEL, ELECTRICITY, GPL). In 2021, residual waste was transported to the landfill in Ovidiu, operated by Tracon S.R.L., where it was spread, compacted, and covered. The spreading and compaction of waste are the most energy-intensive activities, but landfill operations also include leachate purification and administrative activities. As the landfill is located outside the city, associated emissions were accounted for under Scope 3. The quantity of landfilled municipal waste originating from Constanța Municipality (based on data reported by Constanța City Hall) was **153,373.42 tons**. This represents 59.5% of the total quantity of waste that entered the landfilling facility in 2021 from Constanța Municipality and several smaller municipalities (257,586.64 t), and this percentage was used to estimate the energy resources required for landfilling operations (See *Annex 3*): 24.72 MWh / year from electricity (8.21 t CO₂e), **3,462.36 MWh / year from diesel (952.15 t CO₂e)**, 7.78 MWh / year from GPL (1.79 t CO₂e). **The total is 962,15 t CO₂e (Scope 3).**

ADDITIONAL EMISSIONS FROM LANDFILL GAS (DIFFUSED METHANE) - 96,390 t CO₂e

To ensure a comprehensive estimation of emissions related to the Waste sector of Constanța Municipality, the estimated emissions from non-recovered methane were added to the total CO₂e emissions deriving from the energy requirement (See *Annex 3*). The methane released by landfilled waste generated by Constanța Municipality in 2021 corresponds to **96,390 t CO₂e (Scope 3)**. Note: This amount is based on estimated diffused methane of the Ovidiu landfill in



2022¹. To refine this estimation, the total quantity of diffused (non-recovered) methane emissions of the landfill for Cell 7 in 2021 (or estimated CO₂e) is required.

WASTEWATER TREATMENT - 15,690.00 MWH / YEAR ENERGY EQUIVALENT WITH 5,209.08 TONS CO₂/YEAR

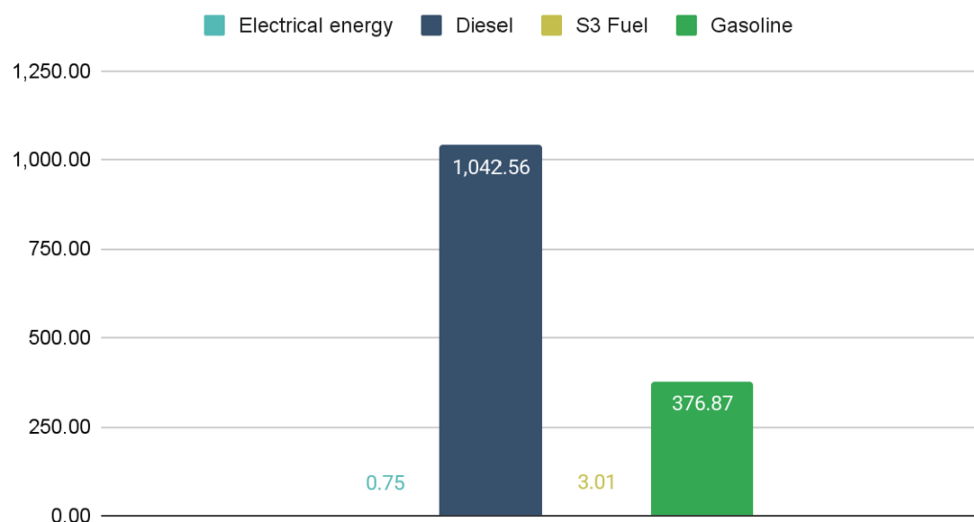
The main activities carried out by the Regional Operator RAJA S.A. include the collection of waste water in 37 municipalities in Constanța county, including the Municipality of Constanța. Wastewater treatment within the municipality is carried out through the two treatment plants (Constanța Sud and Constanța Nord). Considering their location within the city boundary, emissions associated with their activity and the fact that electricity is supplied from the grid, they were accounted for under Scope 2 emissions. According to RAJA S.A., the volume of wastewater billed in the Municipality of Constanța in 2021 was 22,164,193 cubic meters, and the electricity consumption related to the treatment process of the wastewater billed in the Municipality of Constanța in 2021 was 15,690 MWh. This is equivalent with **5.209,08 t CO₂e (Scope 2)**.

¹ Environmental Impact Report in order to obtain the environmental approval for the project: Extension of ecological landfill for household and industrial waste in Ovidiu, Constanța County - Cell VIII, 2022, page 127, available at: <https://apmct.anpm.ro/documents/840114/69092388/RIM++TRACON+SRL+celula+VIII+C-ta.pdf/8e4e991e-49a5-4a39-9a73-410ee41f708a>



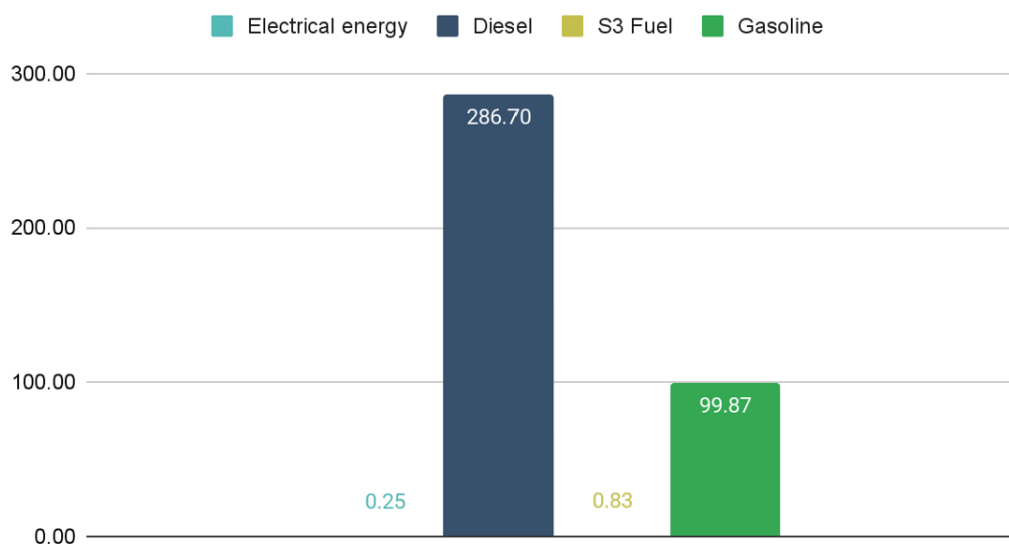
AFOLU - 1,423.19 MWH / YEAR EQUIVALENT WITH 387.65 TONS CO₂ / YEAR

FIGURE 8 AFOLU ENERGY TYPES 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 9 AFOLU CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)



Source: authors' calculations

GREEN SPACES 2021 - 1,356.71 MWH/YEAR ENERGY EQUIVALENT WITH 369.36 TONS CO₂/YEAR

According to SECAP (page 29), Constanta had a total of 579.23 hectares of green spaces in 2021. The municipality provided energy consumption estimates for maintaining these spaces in 2022. Two companies were contracted for maintenance, with energy requirements estimated as follows:

- The first company required 356.09 MWh of diesel, 129.04 MWh of gasoline, and 0.72 MWh of electricity.
- The second company required 979.12 MWh of diesel and 376.87 MWh of gasoline (refer to the table in Annex 5).



ARABLE LAND 2021 - 28.39 MWH/YEAR ENERGY EQUIVALENT WITH 7.8 TONS CO₂/YEAR

Annex 5 provides an overview of the municipality's arable land and cultivated crops. Based on energy consumption estimates from the Ministry of Agriculture, the total diesel equivalent required for agricultural activities in 2021 was 28.39 MWh, corresponding to 7.8 tons of CO₂ emissions.

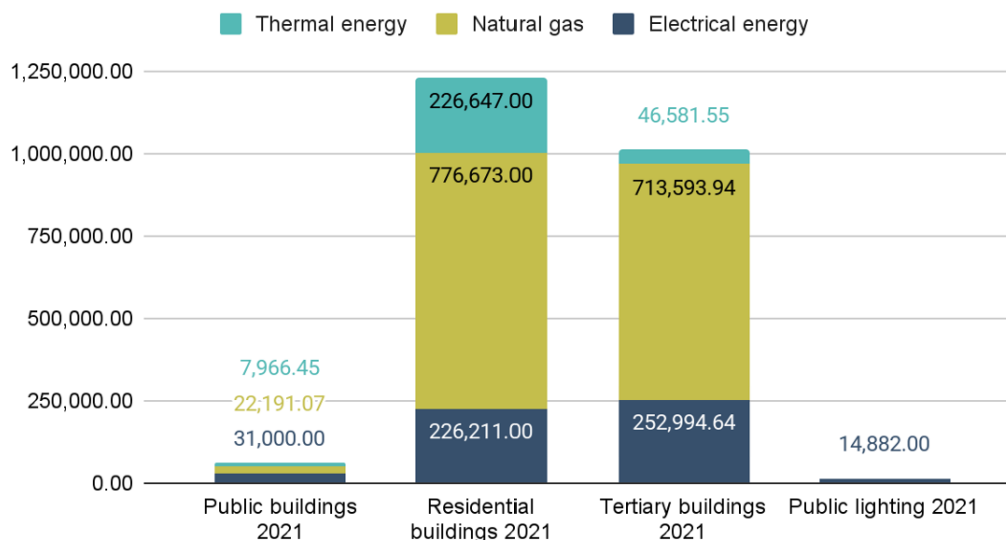
LIVESTOCK 2021 - 35.07 MWH/YEAR ENERGY EQUIVALENT WITH 9.64 TONS CO₂/YEAR

Annex 5 details the registered livestock within the municipality. The estimated energy consumption for livestock farming in 2021 was 35.05 MWh of diesel and 0.02 MWh of electricity, resulting in a total energy requirement of 35.07 MWh/year.



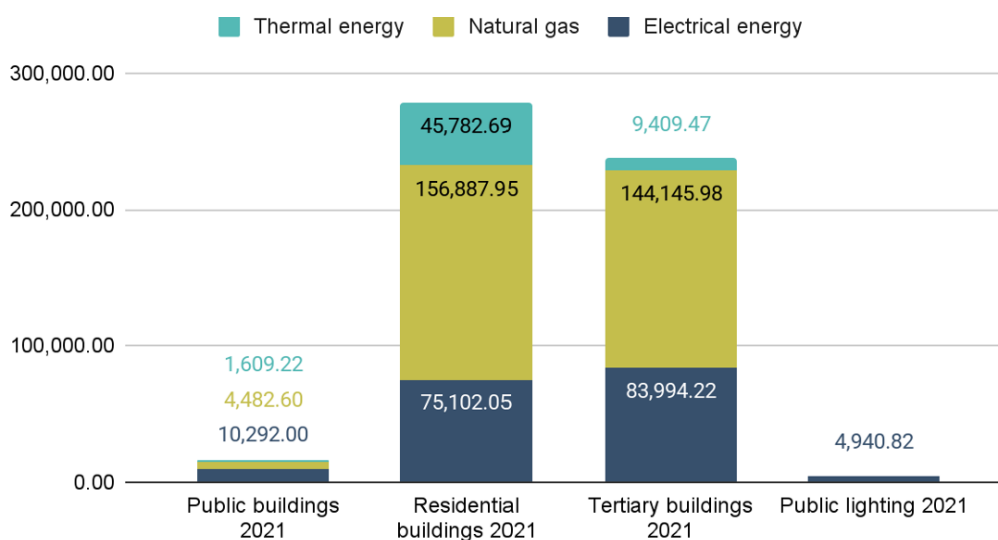
BUILDINGS - 2,318,740.65 MWH / YEAR EQUIVALENT WITH 536,647.01 TONS CO₂ / YEAR

FIGURE 10 BUILDINGS ENERGY TYPES 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 11 BUILDINGS CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)

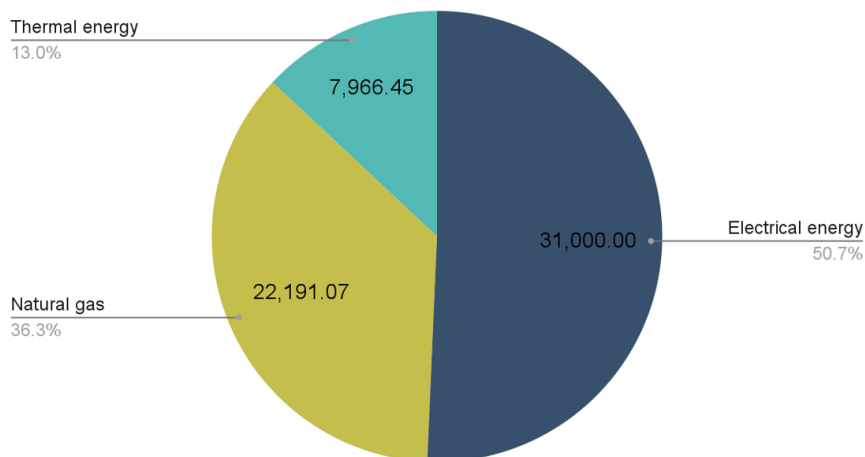


Source: authors' calculations



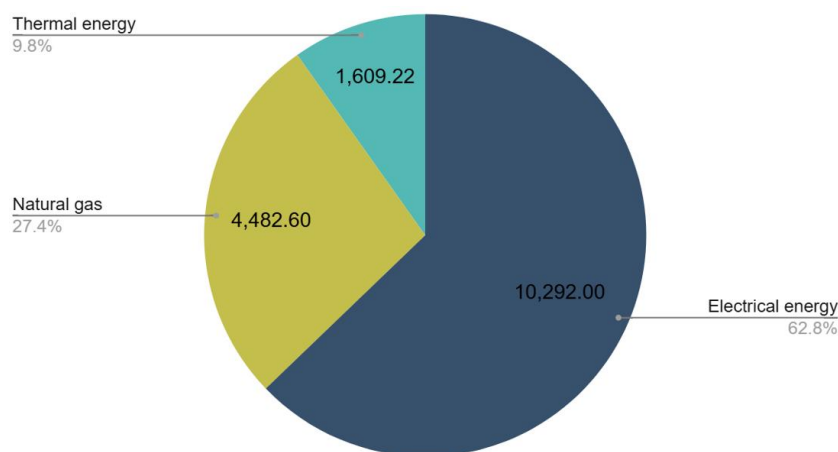
PUBLIC BUILDINGS 2021 - 61,157.52 MWH/YEAR ENERGY EQUIVALENT WITH 16,383.82 TONS CO₂/YEAR

FIGURE 12 PUBLIC BUILDINGS ENERGY REQUIREMENTS 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 13 PUBLIC BUILDINGS CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)



Source: authors' calculations

All public buildings in Constanța were systematically mapped using the list provided in the General Urban Plan of the Municipality of Constanța. Their total gross floor area was calculated, as detailed in *Annex 1*. This foundational data provided a basis for further analysis and energy demand estimations.

Subsequently, detailed studies were consulted to establish the average energy consumption per square meter for different building types. Adjustments were made using data from the SEAP 2022 (page 37) to ensure accuracy. By multiplying the total gross floor area of each building type by the corresponding energy consumption rate and the estimated annual energy requirement per square meter, the total energy demand was determined.

In 2021, public buildings in the Municipality of Constanța were estimated to have required approximately 31,000.00 MWh of electrical energy, which corresponds to 10,292.00 tons of CO₂ emissions annually. Additionally, 22,191.07 MWh of natural gas consumption in 2021 resulted in



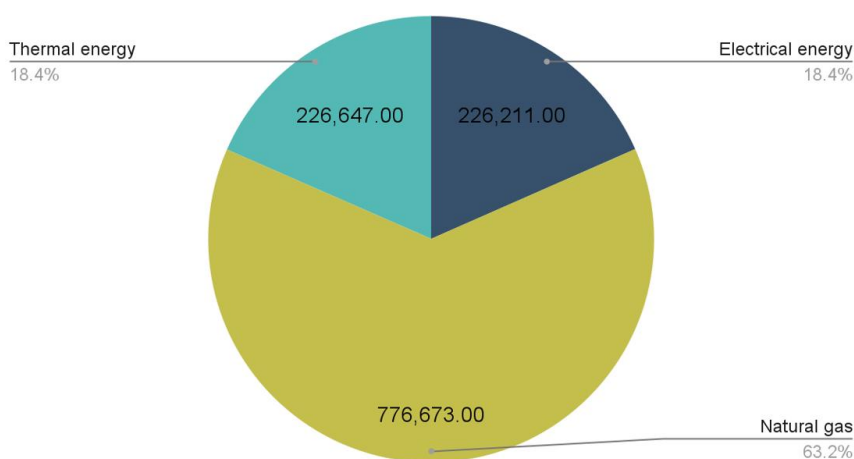
4,482.60 tons of CO₂ emissions per year, while 7,966.45 MWh of thermal energy consumption accounted for 1,609.22 tons of CO₂ emissions annually.

RESIDENTIAL BUILDINGS 2021 - 1,229,531.00 MWH/YEAR ENERGY EQUIVALENT WITH 277,772.69 TONS CO₂/YEAR

In 2021, residential buildings in Constanța were estimated to consume a total of 1,229,531.00 MWh of energy annually, corresponding to 277,772.69 tons of CO₂ emissions per year. This energy demand was distributed across three main sources.

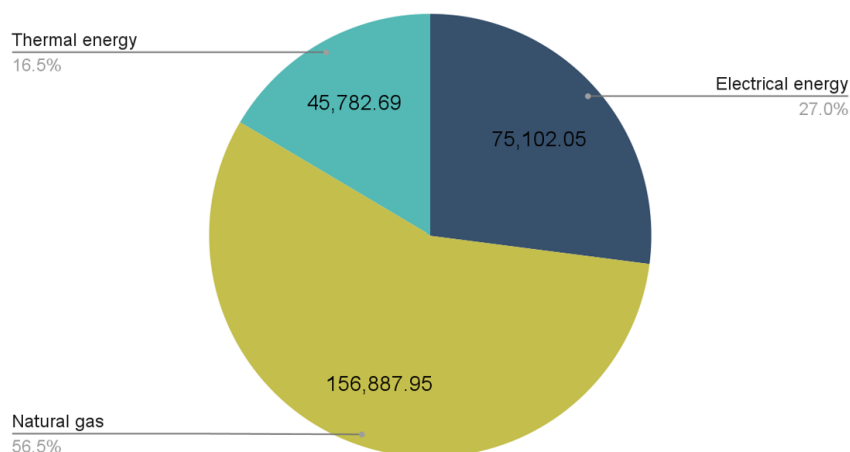
Firstly, electrical energy accounted for 226,211 MWh (as detailed in the SEAP, page 75), resulting in emissions of 75,102.05 tons of CO₂ annually. Secondly, natural gas consumption was estimated at 776,673 MWh (SEAP, page 76), which equates to 156,887.95 tons of CO₂ per year. Lastly, thermal energy use totalled 226,647 MWh, of which 191,160 MWh was used for heating and 35,487 MWh for hot water (SCTES, page 93), contributing an additional 45,782.69 tons of CO₂ emissions annually.

FIGURE 14 RESIDENTIAL BUILDINGS ENERGY REQUIREMENTS 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 15 RESIDENTIAL BUILDINGS CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)

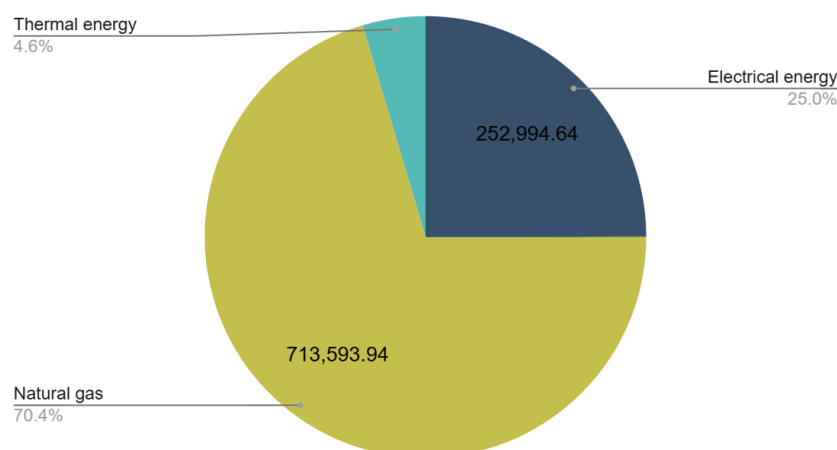


Source: authors' calculations



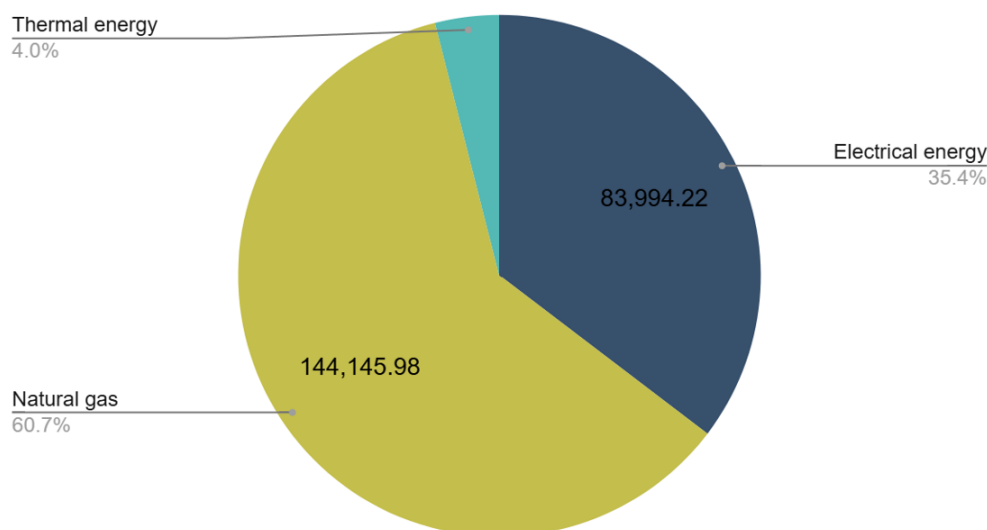
TERTIARY BUILDINGS 2021 - 1,013,170.13 MWH/YEAR ENERGY EQUIVALENT WITH 237,549.67 TONS CO₂/YEAR

FIGURE 16 TERTIARY BUILDINGS ENERGY REQUIREMENTS 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 17 TERTIARY BUILDINGS CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)



Source: authors' calculations

SEAP defines tertiary buildings as buildings in the service sector that are not owned or managed by the local authority, and include private offices, banks, small and medium-sized enterprises (SMEs), commercial activities, retail, and hospitals. At the same time, the documents consulted do not make it clear what economic agents fall into the tertiary buildings sector and what economic agents fall into the IPPU Non-ETS sector.

The Strategy for Centralized Thermal Energy Supply in the Municipality of Constanța (SCTES, page 102) estimates the total thermal energy delivered to economic agents and public institutions at approximately 54,548.00 MWh for 2021. After deducting the thermal energy required for public buildings, 46,581.55 MWh remains for tertiary buildings, corresponding to approximately 9,409.47 tons of CO₂ emissions annually. The same strategy estimates the total thermal energy delivered



in Constanța at 665,101 MWh. After accounting for residential buildings, public buildings, tertiary buildings, and network losses, 635 MWh of thermal energy remains unaccounted for.

SEAP, page 75, estimates the total electrical energy consumption for tertiary buildings at approximately 505,758 MWh electrical energy for the year 2021. SEAP, page 76, estimates the total natural gas requirements for tertiary and public buildings at 2,057,717 MWh natural gas out of which 806,716 MWh were estimated for CET Palas. After deducting the natural gas requirements for CET Palas and for public buildings, a total of 1,228,809.93 MWh of natural gas are left for tertiary buildings.

SEAP does not make it clear if Industry Non-ETS is included in the 2021 tertiary buildings energy requirements. However, by consulting SEAP 2016 and SEAP 2022, it is visible that for the year 2021 energy requirements for tertiary buildings and industry non-ETS were calculated together, and thus the following tables can be created:

TABLE 1 DATA ON ELECTRICAL ENERGY CONSUMPTION FROM DIFFERENT SOURCES

ELECTRICAL ENERGY (MWH)		
	YEAR 2014 (RETRIEVED FROM SEAP 2016)	YEAR 2021 (RETRIEVED FROM SEAP 2022)
PUBLIC BUILDINGS	15,701.00	31,000.00
RESIDENTIAL BUILDINGS	193,909.00	226,211.00
TERTIARY BUILDINGS	199,243.00	252,994.64
INDUSTRY NON-ETS	198,576.00	

Source: SEAP 2016 and SEAP 2022

TABLE 2 DATA ON NATURAL GAS CONSUMPTION FROM DIFFERENT SOURCES

NATURAL GAS (MWH)		
	YEAR 2014 (RETRIEVED FROM SEAP 2016)	YEAR 2021 (RETRIEVED FROM SEAP 2022)
PUBLIC BUILDINGS	38,340.00	22,191.07
RESIDENTIAL BUILDINGS	496,960.00	776,673.00
TERTIARY BUILDINGS	183,392.00	713,593.94
INDUSTRY NON-ETS	132,606.00	

Source: SEAP 2016 and SEAP 2022

Using the ratio from the 2014 calculations, it can be extrapolated that for the year 2021, Tertiary Buildings would have required a total of 252,994.64 **MWh electrical energy** corresponding to **83,994.22 tons CO₂** and **713,593.94 MWh natural gas** equivalent with **144,145.98 tons CO₂**.

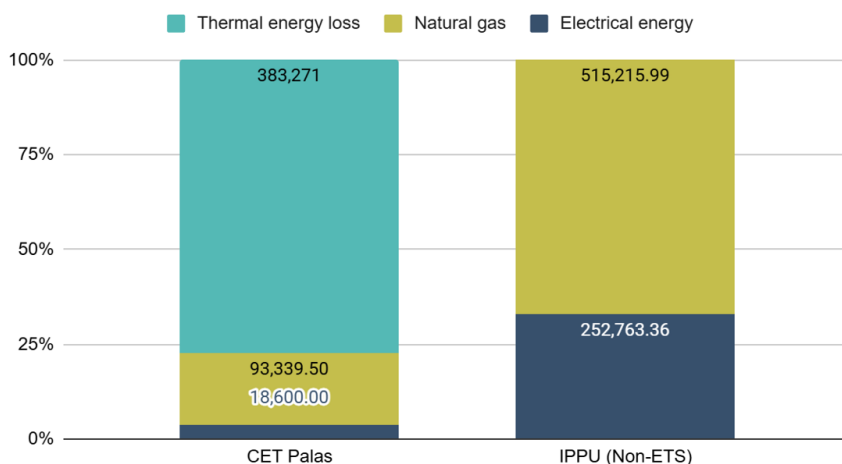
PUBLIC LIGHTING 2021 - 14,882.00 MWH/YEAR ENERGY EQUIVALENT WITH 4,940.82 TONS CO₂/YEAR

Additionally, the energy required by the public lighting system in Constanța was estimated in SEAP (page 75) at approximately 14,882 MWh per year, equivalent to 4,940.82 tons of CO₂ annually.



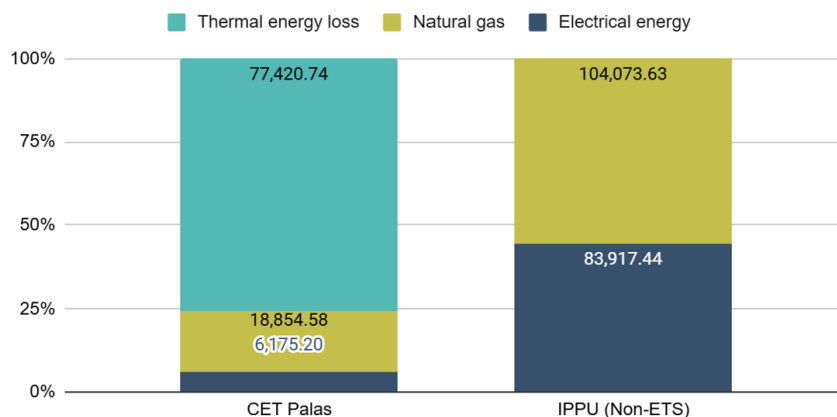
IPPU: 1,263,189.85 MWh / year, equivalent with 290,441.59 tons CO₂ / year

FIGURE 18 IPPU ENERGY TYPES 2021 (MWH/YEAR)



Source: authors' calculations

FIGURE 19 IPPU ENERGY CO₂ EMISSIONS 2021 (TONS CO₂/YEAR)



IPPU Energy CO₂ Emissions 2021 (tons CO₂/year)

Source: authors' calculations

The Industrial Processes and Product Use (IPPU) sector generates CO₂e emissions through various industrial activities and processes and accounts for 28.42% of the total emissions. With the exception of the Centralized Thermal Energy Supply System (SACET), the Climate Neutrality Action Plan accounts for the emissions generated from industrial activities that are not by the EU Emissions Trading System (EU ETS). The EU ETS regulates specific greenhouse gases from activities where emissions can be accurately measured, reported, and verified².

SACET (CET PALAS)

The Centralized Thermal Energy Supply System (SACET) consists of the source for producing both electrical and thermal energy: the Palas Thermal Power Plant (CET), which belongs to S.C.

² The EU ETS includes CO₂ emissions from electricity and heat generation, as well as energy-intensive industrial sectors such as oil refineries, steelworks, and the production of iron, aluminum, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids, and bulk organic chemicals, as well as aviation and maritime transport. For more information: https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/scope-eu-ets_en



Electrocentrale Constanța S.A., with the Romanian state as the shareholder through the Ministry of Energy. The provision of transportation, distribution, and supply of thermal energy in the centralized system in the city of Constanța has been entrusted for management to the S.C. Termoficare Constanța S.R.L. operator. In 2021, CET Palas operated on natural gas, which was supplied from the Distrigaz Sud Rețele Constanța distribution network.

As of August 1, 2023, the functional energy assets of the C.E.T. Palas plant were taken over by TERMOCENTRALE CONSTANȚA S.R.L., a company fully owned by Constanța Municipality, to continue the production of thermal energy for the SACET system. Additionally, the company will oversee the operation of the energy equipment within the investment project “Source of Useful Thermal and Electrical Energy Production through High-Efficiency Cogeneration in the Municipality of Constanța,” which is currently in the execution phase.

The emissions from the burned natural gas were accounted for in two sectors: the buildings sector (Scope 2 thermal energy), and IPPU (Scope 3 emissions from losses of thermal energy). It is important to note that CET Palas is the only installation in Constanța county falling within the scope of the EU Emissions Trading System (ETS) due to its industrial activities and significant greenhouse gas output. As part of the system, it reported 147,011 tons of CO₂ emissions, which reflects its verified annual emissions³. This means the facility is required to surrender an equivalent number of allowances⁴ or take other measures (such as purchasing additional allowances or reducing emissions) to comply with its obligations under the EU ETS framework. While CET Palas is covered by the EU ETS, the emissions were accounted for in the Climate Neutrality Action Plan to ensure a comprehensive overview of baseline emissions, and track the impact of interventions aimed at the consolidation of an energy-efficient district heating system (See *Action Portfolio*).

To determine the total energy content of natural gas consumed within the CET Palas facility (MWh / year) the volume of natural gas was multiplied with the Lower Calorific Value of 10.03 KWh / cubic meter, as follows: $(73,635,000 \text{ cubic metres} * 10.03 \text{ KWh} / \text{cubic meter}) / 1000 = 758,440.5 \text{ MWh} / \text{year}$. (See *Table 1*). According to the updated *Strategy for Centralized Thermal Energy Supply in the Municipality of Constanța* (page 176), the quantity of thermal energy produced for delivery in 2021 was 665.101 MWh (from 73,635,000 cubic meters of natural gas). The energy that was sold was 281,829.1 MWh, and losses of thermal energy amounted to 57.6% (383,271 MWh). In cubic meters, losses have increased from 651,205 cubic meters/year (in 2017) to 2,408,727 cubic meters/year (in 2021), indicating an advanced state of degradation of the circuits. As mentioned above, these thermal energy losses were accounted for under IPPU Scope 3 emissions and are equivalent with **77,420.74 t CO₂e** (0.202 conversion factor).

For the year 2021, the conversion factor for natural gas and the conversion factor for thermal energy was 0.202 for both, thus the difference between the total amount of natural gas utilised to produce thermal energy (758,440.5 MWh) and all the thermal energy produced (665,101 MWh) will

³ Verified emissions under the EU Emissions Trading System (EU ETS) refer to the annual greenhouse gas emissions reported by a facility or installation, which are independently checked and confirmed by an accredited verifier. This process ensures that the emissions data submitted by operators is accurate, reliable, and in compliance with EU ETS rules and is essential for determining the amount of carbon allowances an installation must surrender to match its actual emissions.

⁴ Each allowance corresponds to the right to emit one tonne of CO₂ (or its equivalent in other greenhouse gases).



be accounted for in the Scope 2 natural gas requirements. This leaves a total of 93,339.5 MWh of natural gas associated with CET Palas.

The electrical energy requirement to generate the thermal energy for 2021 was 18,600 MWh (according to the *Feasibility Study for the Rehabilitation of the District Heating Network*⁵, page 15). This is equivalent to **6,175.20 t CO₂ / year** (0.332 conversion factor).

⁵ <https://www.ziuaconstantia.ro/images/stories/2024/01/30/ordine%20suplimentara/fisier-47.pdf>, page 15



ENERGY REQUIREMENT AND EFFICIENCY OF THE SACET SYSTEM

TABLE 3 DATA ON PRIMARY ENERGY CONSUMPTION, THERMAL ENERGY PRODUCTION, DELIVERIES, LOSSES, AND PRODUCTION YIELDS FROM PREVIOUS YEARS

YEAR	PCI (LOWER HEATING VALUE - LHV): KWH/SM ³	PCS (HIGHER HEATING VALUE - HHV): KWH/SM ³	GN MII MC	MWH/YEAR AT PCI	MWH/YEAR AT PCS	GLOBAL CET EFFICIENCY RELATED TO PCI	THERMAL ENERGY PRODUCED FOR DELIVERY	THERMAL ENERGY DELIVERED (ENTERED IN THERMAL POINTS AND DIRECTLY TO CONSUMERS)	TOTAL THERMAL ENERGY LOSSES (PRIMARY + SECONDARY)	TOTAL THERMAL ENERGY LOSSES (%)	THERMAL ENERGY SOLD (PRIMARY + SECONDARY)	LOST FLUID (M ³ /YEAR)	GLOBAL SACET EFFICIENCY (SALES/PRODUCTION) - RELATED TO PCI
	kWh/Sm ³	kWh/Sm ³	mii mc	(MWh)	(MWh)	(%)	(MWh)	(MWh)	(MWh)	(%)	(MWh)	(mc/an)	(%)
2017	10,17	11,26	85.08	865.103	958.167	89%	770.041	467.853	302.188	39,2%	467.852,6	651205	54%
2018	10.22	11,32	80.921	826.713	916.264	88%	730.626	523.26	315.497	43,2%	415.128,6	866340	50%
2019	9.95	11,03	80.141	797.142	883.659	89%	709.535	457.242	350.848	49,4%	358.686,5	2.099.779	45%
2020	9.95	11,01	75.364	749.691	830.034	90%	677.01	419.672	360.793	53,3%	316.217,4	2.111.451	42%
2021	10,03	10,96	73.635	738.24	806.716	90%	665.101	379.212	383.271	57,6%	281.829.1	2.408.727	38%
2022	10,03	10,89	60653	608.35	660.511	91%	555.95	286.5	355.715	64,0%	200.235,4	2.684.530	33%

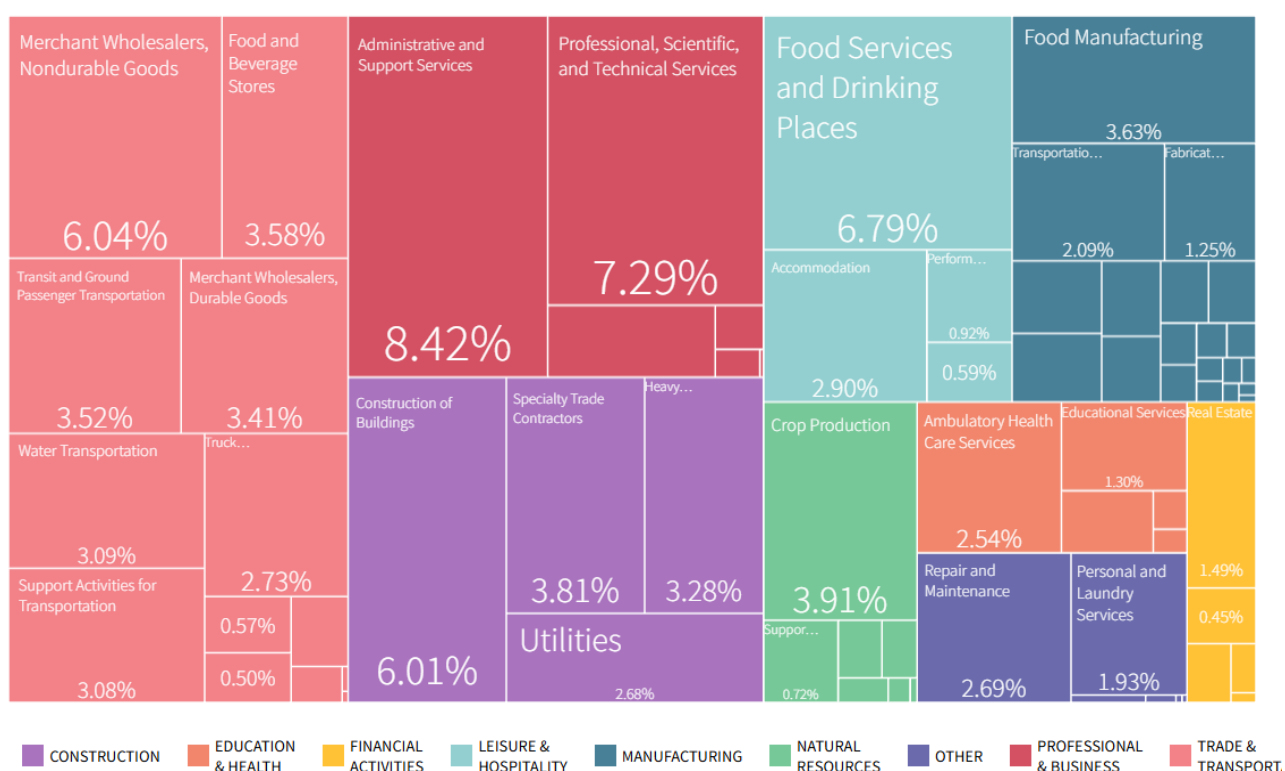
Source: <https://primaria-constantia.ro/wp-content/uploads/2024/10/Actualizarea-strategiei-de-alimentare-in-sistem-centralizat-cu-energie-termica-in-mun-Constanta.pdf>, page 176



IPPU - NON-ETS INDUSTRY

For the remaining consumption within IPPU, the estimation is based on the largest industries that are not covered by the EU European Trading Scheme. According to the IUDS, Constanța County's economy is shaped by key industries specific to its coastal location, such as shipbuilding, with shipyards in Constanța, Midia, and Mangalia providing vessel construction and repair services, as well as a diverse food industry (milling, bakery, dairy, meat processing, and canned goods), and a chemical and petrochemical sector processing significant quantities of crude oil, production of building building materials, as well as an important textile and clothing sector. Most enterprises in the county and its metropolitan area are active in commerce, followed by services, industry, and construction.

FIGURE 20 CONSTANȚA CITY'S ECONOMIC COMPOSITION



Source: Metroverse, 2024

At city level, the Metroverse database offers an insight into Constanța's economic structure, with the largest shares of employees attributed to administrative and support services (8.42%), professional, scientific, and technical services (7.29%), food services and drinking places (6.79%). Other significant sectors include construction (notably construction of buildings at 6.01%), food and beverage stores (3.58%), and transportation-related activities, including transit, water, and truck transport. The **manufacturing sector** adds up to about 11% of the city's employees, with the most significant activities being:

- **FOOD MANUFACTURING:** 3.63%
- **TRANSPORTATION EQUIPMENT MANUFACTURING:** 2.09%
- **FABRICATED METAL MANUFACTURING:** 1.25%



As previously mentioned, SEAP does not make it clear if Industry Non-ETS is included in the 2021 tertiary buildings energy requirements. By consulting SEAP 2016 and SEAP 2022, we can determine that for the year 2021, energy requirements for tertiary buildings and industry non-ETS were calculated together:

TABLE 4 DATA ON ELECTRICAL ENERGY CONSUMPTION FROM DIFFERENT SOURCES

ELECTRICAL ENERGY (MWH)		
	YEAR 2014 (RETRIEVED FROM SEAP 2016)	YEAR 2021 (RETRIEVED FROM SEAP 2022)
PUBLIC BUILDINGS	15,701.00	31,000.00
RESIDENTIAL BUILDINGS	193,909.00	226,211.00
TERTIARY BUILDINGS	199,243.00	252,994.64
INDUSTRY NON-ETS	198,576.00	

Source: SEAP 2014 and SEAP 2022

TABLE 5 DATA ON NATURAL GAS CONSUMPTION FROM DIFFERENT SOURCES

NATURAL GAS (MWH)		
	YEAR 2014 (RETRIEVED FROM SEAP 2016)	YEAR 2021 (RETRIEVED FROM SEAP 2022)
PUBLIC BUILDINGS	38,340.00	22,191.07
RESIDENTIAL BUILDINGS	496,960.00	776,673.00
TERTIARY BUILDINGS	183,392.00	713,593.94
INDUSTRY NON-ETS	132,606.00	

Source: SEAP 2014 and SEAP 2022

Using the ratio from the 2014 calculations, it can be extrapolated that for the year 2021, Industry Non-ETS would have required a total of **252,763.36 MWh electrical energy** corresponding to **83,917.44 tons CO₂** and **515,215.99 MWh natural gas** equivalent with **104,073.63 tons CO₂**.

FINAL ENERGY USE BY SOURCE SECTORS

- Indicate the base year: 2021
- Indicate the used unit: MWh/year

TABLE 6 FINAL ENERGY USE BY SOURCE SECTORS

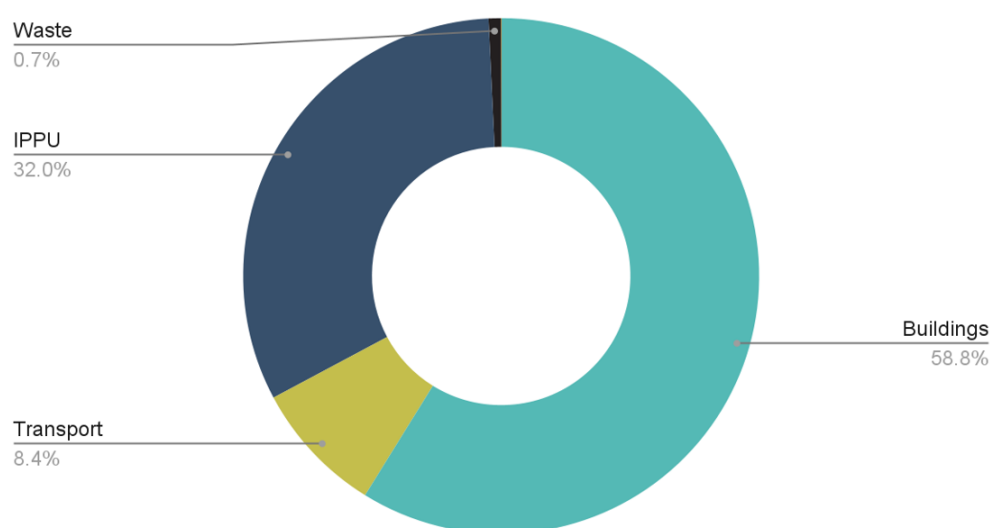
	SCOPE 1	SCOPE 2	SCOPE 3	TOTAL
BUILDINGS	0.00	2,318,740.65	0.00	2,318,740.65
FUEL TYPE / ENERGY USED		525,087.64 MWh electrical energy 1,512,458.02 MWh natural gas 281,195.00 MWh thermal energy		525,087.64 MWh electrical energy 1,512,458.02 MWh natural gas 281,195.00 MWh thermal energy
TRANSPORT	329,035.99	107.71	693.03	329,836.73
FUEL TYPE / ENERGY USED	200,719.06 MWh diesel 128,316.93 MWh gasoline	107.72 MWh electrical energy	693.04 MWh diesel	201,412.10 MWh diesel 128,316.93 MWh gasoline 107.72 MWh electrical energy
WASTE	8,455.42	16,524.77	3,487.08	28,467.27
FUEL TYPE / ENERGY USED	8,447.64 MWh diesel 7.79 MWh GPL	16,524.78 MWh electrical energy	24.72 MWh electrical energy 3,462.37 MWh diesel	16,549.50 MWh electrical energy 11,910.00 MWh diesel 7.79 MWh GPL



	SCOPE 1	SCOPE 2	SCOPE 3	TOTAL
INDUSTRIAL PROCESS AND PRODUCT USE (IPPU)	0.00	879,918.85	383,271.00	1,263,189.85
FUEL TYPE / ENERGY USED		271,363.36 MWh electrical energy 608,555.49 MWh natural gas	383,271.00 MWh thermal energy	271,363.36 MWh electrical energy 608,555.49 MWh natural gas 383,271.00 MWh thermal energy
AGRICULTURAL, FORESTRY, AND LAND USE (AFOLU)	1,419.43	0.75	3.01	1,423.19
FUEL TYPE / ENERGY USED	1,042.56 MWh diesel	0.76 MWh electrical energy	3.02 MWh diesel	0.76 MWh electrical energy 1,045.57 MWh diesel

Source: authors' calculations

FIGURE 21 ENERGY PERCENTAGE 2021



Source: authors' calculations

EMISSION FACTORS APPLIED

- Indicate the primary energy type and greenhouse gas (GHG) emission factor in accordance with the methodology used: CO₂
- Indicate the used method, e.g., GPC, IPCC, CRF, national etc.: IPCC

TABLE 7 EMISSION FACTORS APPLIED

PRIMARY ENERGY/ ENERGY SOURCE	CARBON DIOXIDE (CO ₂)	METHANE (CH ₄)	NITROUS OXIDE (N ₂ O)	F-GASES (HYDROFLUOROCARBONS AND PERFLUOROCARBONS)	SULPHUR HEXAFLUORIDE (SF ₆)	NITROGEN TRIFLUORIDE (NF ₃)
ELECTRICAL ENERGY	0.332	-	-	-	-	-
NATURAL GAS	0.202	-	-	-	-	-
DIESEL	0.275	-	-	-	-	-
GASOLINE	0.265	-	-	-	-	-
GPL	0.231	-	-	-	-	-
THERMAL ENERGY	0.202	-	-	-	-	-
GEO THERMAL ENERGY	0.0143	-	-	-	-	-
ELECTRICAL ENERGY 2030/2035	0.176	-	-	-	-	-



PRIMARY ENERGY/ ENERGY SOURCE	CARBON DIOXIDE (CO ₂)	METHANE (CH ₄)	NITROUS OXIDE (N ₂ O)	F-GASES (HYDROFLUOROCARBONS AND PERFLUOROCARBONS)	SULPHUR HEXAFLUORIDE (SF ₆)	NITROGEN TRIFLUORIDE (NF ₃)
RES ELECTRIC ENERGY	0	-	-	-	-	-
THERMAL ENERGY 2030/2035	0.1818	-	-	-	-	-

Source: authors' calculations

GHG EMISSIONS BY SOURCE SECTORS

→ Indicate the base year: 2021

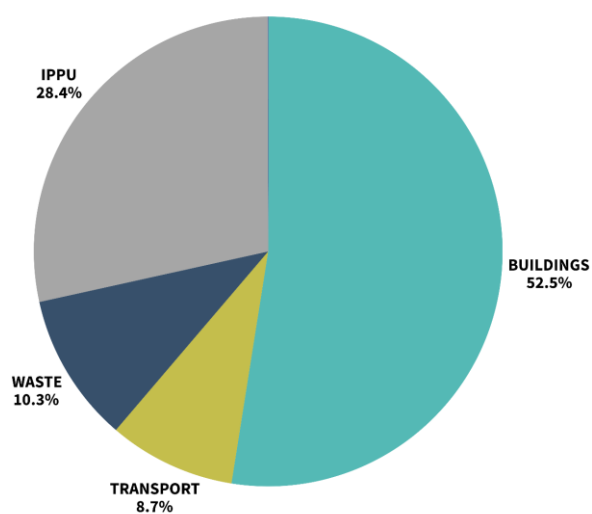
→ Indicate the unit: tons CO₂ / year

TABLE 8 CO₂ EMISSIONS 2021

	SCOPE 1	SCOPE 2	SCOPE 3	TOTAL
BUILDINGS	0.00	536,647.01	0.00	536,647.01
TRANSPORT	89,201.73	35.76	190.58	89,428.07
WASTE	2,324.90	5,486.22	960.36	105,161.48
INDUSTRIAL PROCESS AND PRODUCT USE (IPPU)	0.00	213,020.84	77,420.74	290,441.59
AGRICULTURAL, FORESTRY AND LAND USE (AFOLU)	386.57	0.25	0.83	387.65
TOTAL	91,913.20	755,190.08	78,572.51	1,022,065.79

Source: authors' calculations

FIGURE 22 CO₂ EMISSIONS PERCENTAGE 2021



Source: authors' calculations



PLANNED ACTIONS BY SOURCE SECTORS

The table categorizes emission reductions from each action, based on the scope they affect. For instance, if the covered actions aim to decrease CO₂ emissions linked to grid-supplied electricity, values will be assigned to Scope 2.

TABLE 9 CO₂ REDUCTION PER ACTIONS

	BASE YEAR: 2030			BASE YEAR: 2035		
	SCOPE 1	SCOPE 2	SCOPE 3	SCOPE 1	SCOPE 2	SCOPE 3
BUILDINGS	0.00	474,552.37	0.00	0.00	518,944.13	0.00
Consolidation of an energy-efficient district heating system	0.00	54,701.93	0.00	0.00	73,406.87	0.00
Enhancing the local supply of renewable energy	0.00	6,898.93	0.00	0.00	7,084.36	0.00
Modernization of public lighting to reduce energy consumption	0.00	4,791.26	0.00	0.00	4,961.39	0.00
Increasing the energy performance of public buildings	0.00	5,034.42	0.00	0.00	6,355.35	0.00
Increasing the energy performance of residential buildings	0.00	84,074.94	0.00	0.00	87,793.62	0.00
Mitigation of urban heat islands through urban renewal	0.00	71,799.41	0.00	0.00	75,442.50	0.00
Developing an extended network of green areas for carbon capture	0.00	60,733.08	0.00	0.00	61,312.81	0.00
Renaturation of the sea coast	0.00	17,436.59	0.00	0.00	19,210.57	0.00
Climate neutrality office development and operationalization	0.00	23,752.24	0.00	0.00	28,686.11	0.00
Local netzero coalition establishment, maintenance and growth	0.00	24,361.27	0.00	0.00	26,929.82	0.00
Joint climate mitigation - adaptation approaches	0.00	10,428.69	0.00	0.00	11,516.83	0.00
Climate neutrality branding	0.00	5,415.56	0.00	0.00	9,349.08	0.00
Climate neutrality regulations	0.00	24,430.97	0.00	0.00	24,644.27	0.00
Raising awareness and engaging local ecosystems to achieve climate neutrality	0.00	39,744.35	0.00	0.00	39,387.58	0.00
Art promoting climate neutrality	0.00	9,634.99	0.00	0.00	11,584.58	0.00



BASE YEAR: 2030				BASE YEAR: 2035		
Encouraging behavioral changes towards climate change mitigation	0.00	31,313.73	0.00	0.00	31,278.38	0.00
TRANSPORT	68,586.40	-1,188.56	143.70	80,686.98	-1,065.01	168.93
Enhancing the local supply of renewable energy	1,145.03	833.11	0.00	1,484.86	953.09	0.00
Modernization of public lighting to reduce energy consumption	892.02	0.00	1.91	1,427.23	0.00	3.05
Mitigation of urban heat islands through urban renewal	9,684.09	3.88	20.69	10,165.91	4.08	21.72
Encouraging public transport	13,939.44	-2,030.71	29.19	17,247.33	-2,027.49	36.29
Promoting non-motorized mobility	17,840.35	0.00	38.12	19,624.38	0.00	41.93
Using traffic management and the parking policy as a tool to reduce traffic jams	6,875.79	0.00	14.83	9,167.71	0.00	19.77
Developing an extended network of green areas for carbon capture	10,095.08	4.05	21.57	10,191.45	4.09	21.77
Renaturation of the sea coast	2,769.98	1.11	5.92	3,059.07	1.23	6.54
Digitalisation of public services for climate neutrality	763.98	0.00	1.65	1,680.75	0.00	3.62
Local netzero coalition establishment, maintenance and growth	611.18	0.00	1.32	672.30	0.00	1.45
Joint climate mitigation - adaptation approaches	458.39	0.00	0.99	534.78	0.00	1.15
Climate neutrality regulations	1,375.16	0.00	2.97	1,604.35	0.00	3.46
Raising awareness and engaging local ecosystems to achieve climate neutrality	800.97	0.00	1.71	1,156.96	0.00	2.47
Art promoting climate neutrality	533.98	0.00	1.14	889.97	0.00	1.90
Encouraging behavioral changes towards climate change mitigation	800.97	0.00	1.71	1,779.94	0.00	3.80
WASTE	587.71	5,237.08	80,409.23	610.31	5,931.67	88,562.04
Mitigation of urban heat islands through urban renewal	252.40	595.61	104.26	264.96	625.24	109.45
Consolidating the integrated waste management for a circular economy	0.00	493.61	166.46	0.00	894.60	309.94

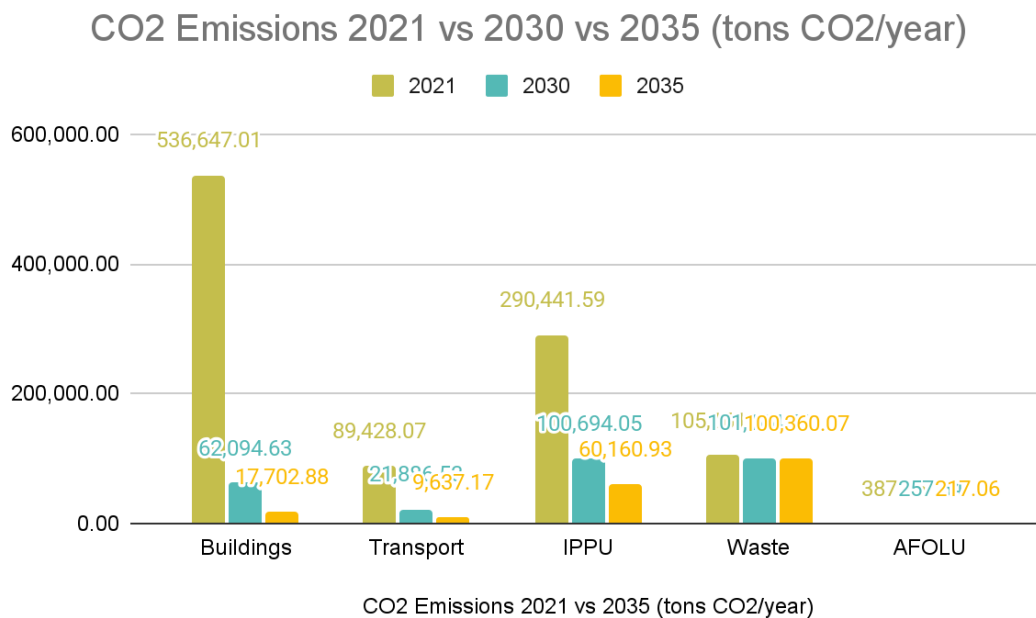


BASE YEAR: 2030				BASE YEAR: 2035		
Developing an extended network of green areas for carbon capture	263.11	620.88	108.68	265.62	626.81	109.72
Renaturation of the sea coast	72.20	170.36	29.82	79.73	188.14	32.93
Local netzero coalition establishment, maintenance and growth	0.00	0.00	20,000.00	0.00	0.00	22,000.00
Raising awareness and engaging local ecosystems to achieve climate neutrality	0.00	1,134.14	35,000.00	0.00	1,080.93	38,500.00
Art promoting climate neutrality	0.00	1,099.78	0.00	0.00	1,118.20	0.00
Encouraging behavioral changes towards climate change mitigation	0.00	1,122.69	25,000.00	0.00	1,397.75	27,500.00
INDUSTRIAL PROCESS AND PRODUCT USE (IPPU)	0.00	124,111.14	65,636.40	0.00	159,014.01	71,266.64
Consolidation of an energy-efficient district heating system	0.00	0.00	46,065.34	0.00	0.00	50,942.85
Mitigation of urban heat islands through urban renewal	0.00	23,126.38	8,405.10	0.00	24,277.00	8,823.28
Developing an extended network of green areas for carbon capture	0.00	24,107.86	8,761.81	0.00	24,337.99	8,845.45
Renaturation of the sea coast	0.00	6,614.93	2,404.15	0.00	7,305.31	2,655.06
Climate neutrality branding	0.00	18,686.69	0.00	0.00	17,644.40	0.00
Raising awareness and engaging local ecosystems to achieve climate neutrality	0.00	26,161.37	0.00	0.00	50,412.58	0.00
Art promoting climate neutrality	0.00	10,090.81	0.00	0.00	12,351.08	0.00
Encouraging behavioral changes towards climate change mitigation	0.00	15,323.09	0.00	0.00	22,685.66	0.00
AGRICULTURAL, FORESTRY AND LAND USE (AFOLU)	129.53	0.21	0.37	169.87	0.23	0.49
Mitigation of urban heat islands through urban renewal	31.13	0.03	0.09	32.67	0.03	0.09
Developing an extended network of green areas for carbon capture	32.45	0.03	0.09	32.76	0.03	0.09
Renaturation of the sea coast	8.90	0.01	0.03	9.83	0.01	0.03



	BASE YEAR: 2030			BASE YEAR: 2035		
Raising awareness and engaging local ecosystems to achieve climate neutrality	14.34	0.04	0.04	20.07	0.03	0.06
Art promoting climate neutrality	14.05	0.04	0.04	22.94	0.04	0.07
Encouraging behavioral changes towards climate change mitigation	28.67	0.07	0.08	51.61	0.09	0.15

FIGURE 23 CO₂ EMISSIONS 2021 VS 2030 VS 2035 (TONS CO₂/YEAR)



Source: authors' calculations



TABLE 10 EMISSIONS GAP 2030

	BASELINE EMISSIONS 2021		BASELINE EMISSIONS REDUCTION TARGET 2030		EMISSIONS REDUCTION FROM ACTION PLAN		RESIDUAL EMISSIONS (EMISSIONS 2030)		TARGET ACHIEVEMENT 2030
	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)	(absolute)
BUILDINGS	536,647.01	52.51%	429,317.60	80%	474,552.37	88.43%	62,094.63	30.46%	45,234.77
TRANSPORT	89,428.07	8.75%	71,542.46	80%	67,541.54	75.53%	21,886.53	10.74%	-4,000.92
WASTE	105,161.48	10.29%	84,129.18	80%	86,234.01	82.00%	18,927.47	9.28%	2,104.83
INDUSTRIAL PROCESS AND PRODUCT USE (IPPU)	290,441.59	28.42%	232,353.27	80%	189,747.53	65.33%	100,694.05	49.39%	-42,605.74
AGRICULTURE, FORESTRY AND LAND USE (AFOLU)	387.65	0.04%	310.12	80%	130.11	33.56%	257.54	0.13%	-180.01
TOTAL	1,022,065.79	100.00%	817,652.63	80%	818,205.57	80.05%	203,860.22	100.00%	552.93

Source: authors' calculation

Baseline emissions: Refer to the greenhouse gas (GHG) emissions recorded in 2021 for each sector, presented both in absolute terms (tons of CO₂ equivalent) and as a percentage of the city's total emissions.

Baseline emissions reduction target (2030): Denotes the level of emissions each sector must reduce by 2030 in order to meet the objective of an 80% reduction compared to 2021 levels.

Emissions reduction from the Action Plan until 2030: Reflects the anticipated volume of emissions reductions to be achieved by 2030 through the implementation of the measures outlined in the Climate Neutrality Action Plan.

Residual emissions (2030): Indicate the amount of emissions projected to remain in each sector in 2030 following the full execution of planned interventions.

Target achievement: Shows the gap between the actual emissions reduction achieved and the 80% target. A positive value signifies that the sector outperforms the target; a negative value indicates underperformance.

After implementing the actions proposed in this plan, the following conclusions can be drawn based on the updated data for the year 2030:



- **BUILDINGS:** The total reduction exceeds the 80% target by 45,234.77 tons CO₂, resulting in 62,094.63 tons CO₂ residual emissions for this sector.
- **TRANSPORT:** The total reduction falls short of the 80% target by 4,000.92 tons CO₂, resulting in 21,886.53 tons CO₂ residual emissions for this sector.
- **WASTE:** The total reduction exceeds the 80% target by 2,104.83 tons CO₂, resulting in 18,927.47 tons CO₂ residual emissions for this sector.
- **IPPU (INDUSTRIAL PROCESSES AND PRODUCT USE):** The total reduction falls short of the 80% target by 42,605.74 tons CO₂, resulting in 100,694.05 tons CO₂ residual emissions for this sector.
- **AFOLU (AGRICULTURE, FORESTRY, AND LAND USE):** The total reduction falls short of the 80% target by 180.01 tons CO₂, resulting in 257.54 tons CO₂ residual emissions for this sector.

OVERALL: All actions combined nearly meet the 80% target, exceeding it by 552.93 tons CO₂, resulting in 203,860.22 tons CO₂ residual emissions that remain to be addressed to achieve full net-zero status by 2030.

TABLE 11 EMISSIONS GAP 2035

	BASELINE EMISSIONS 2021		BASELINE EMISSIONS REDUCTION TARGET 2035		EMISSIONS REDUCTION FROM ACTION PLAN		RESIDUAL EMISSIONS (EMISSIONS 2035)		TARGET ACHIEVEMENT 2035
	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)	(absolute)
BUILDINGS	536,647.01	52.51%	482,982.30	90%	518,944.13	96.70%	17,702.88	18.11%	35,961.82
TRANSPORT	89,428.07	8.75%	80,485.26	90%	79,790.90	89.22%	9,637.17	9.86%	-694.36
WASTE	105,161.48	10.29%	94,645.33	90%	95,104.02	90.44%	10,057.46	10.29%	458.69
INDUSTRIAL PROCESS AND PRODUCT USE (IPPU)	290,441.59	28.42%	261,397.43	90%	230,280.65	79.29%	60,160.93	61.53%	-31,116.78
AGRICULTURE, FORESTRY AND LAND USE (AFOLU)	387.65	0.04%	348.89	90%	170.59	44.01%	217.06	0.22%	-178.29
TOTAL	1,022,065.79	100.00%	919,859.21	90.00%	924,290.29	90.43%	97,775.50	100.00%	4,431.08

Source: authors' calculations

Baseline emissions: Refer to the greenhouse gas (GHG) emissions recorded in 2021 for each sector, presented both in absolute terms (tons of CO₂ equivalent) and as a percentage of the city's total emissions.



Baseline emissions reduction target (2035): Denotes the level of emissions each sector must reduce by 2035 in order to meet the objective of a 90% reduction compared to 2021 levels.

Emissions reduction from the Action Plan until 2035: Reflects the anticipated volume of emissions reductions to be achieved by 2035 through the implementation of the measures outlined in the Climate Neutrality Action Plan.

Residual emissions (2035): Indicate the amount of emissions projected to remain in each sector in 2035 following the full execution of planned interventions.

Target achievement: Shows the gap between the actual emissions reduction achieved and the 90% target. A positive value signifies that the sector outperforms the target; a negative value indicates underperformance.

After implementing the actions proposed in this plan, the following conclusions can be drawn based on the updated data for the year 2035:

- The **Buildings** sector achieves a **96.70%** reduction, **exceeding** the 90% target by **35,961.82** tons of CO₂.
- The **Transport** sector achieves an **89.22%** reduction, **falling slightly short** of its target by **694.36** tons of CO₂.
- The **Waste** sector achieves a **90.44%** reduction, **exceeding** the target by **458.69** tons of CO₂.
- The **IPPU** sector achieves a **79.29%** reduction, **falling significantly short** by **31,116.78** tons of CO₂.
- The **AFOLU** sector achieves a **44.01%** reduction, with a **shortfall** of **178.29** tons of CO₂.

The total emissions reduction projected by 2035 is 924,290.29 tons CO₂, which represents a 90.43% reduction from the 2021 baseline. This exceeds the overall 90% target by 4,431.08 tons of CO₂. While the Climate Neutrality Action Plan is on track at the aggregate level, it is essential to address the shortfalls in the Transport, IPPU, and AFOLU sectors to ensure sectoral balance and long-term resilience in achieving full climate neutrality.



CURRENT POLICIES AND STRATEGIES

Provide a short contextual presentation and assessment of the policies, strategies, initiatives, and / or regulations at the local, regional and national levels which are relevant to the city's transition towards climate neutrality.

In developing the Climate Neutrality Action Plan, consideration was given to the strategic documentation currently followed at the local level, the main regional planning documents and the most relevant national strategies.

The anchoring within the local strategic planning pillar was undertaken in order to leverage the frameworks of the local strategies as foundational guiding principles for the CNAP. This approach aimed to ensure the alignment and complementarity of the proposed actions, fostering maximum synergy among them. Equally important, it sought to identify the critical gaps in terms of key emission sectors and fields of action associated with the transition to climate neutrality, with the goal of addressing these gaps through the actions outlined in the CNAP. Similarly, the alignment with the regional pillar was done by integrating the directions outlined in the regional planning documentation developed by the South-East Regional Development Agency. This correlation ensured the CNAP's consistency with the strategic objectives pursued at the regional level. Moreover, given that a large part of the non-reimbursable funds to be accessed for implementing the investments covered by the CNAP will be sourced from the South-East Regional Program, it was important to align the CNAP's actions with the Program's funding priorities.

Lastly, the alignment with the national pillar ensured a solid correlation with the national priorities, targets and objectives related to the green transition (including the carbon footprint reduction and environmental sustainability), digital transformation (encompassing the smart city and innovation priorities) and cohesive and integrated development.

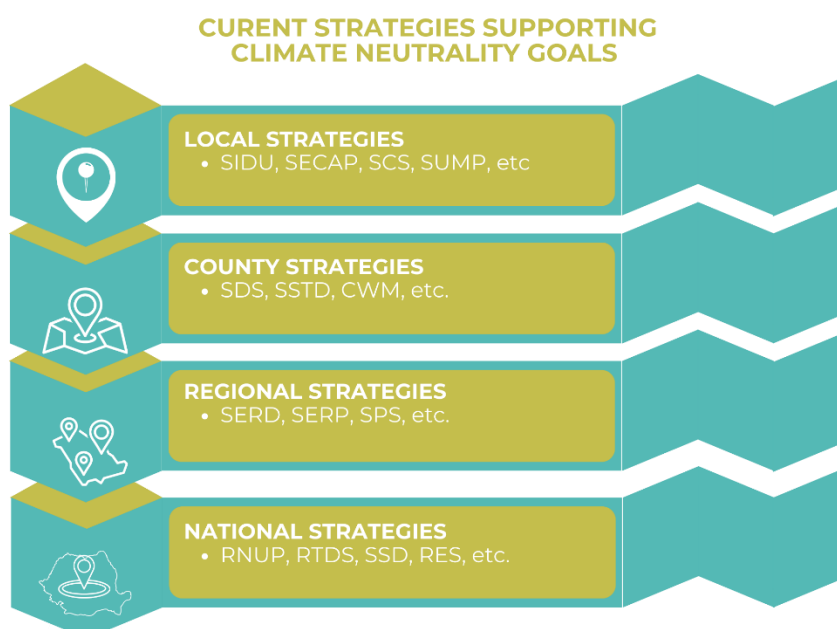




TABLE 12 RELEVANT POLICIES, STRATEGIES, INITIATIVES, REGULATIONS

TYPE	LEVEL	TITLE	DESCRIPTION	RELEVANCE	NEED FOR ACTION
Strategy	Local	<u>INTEGRATED URBAN DEVELOPMENT STRATEGY</u>	The Integrated Urban Development Strategy (IUDS) guides the city and its metropolitan area's development towards 2030. Its vision for 2030 is to become a dynamic, strong community in economic and social partnerships, with a high capacity to adapt to global changes, offering an attractive lifestyle, and development and innovation opportunities.	The IUDS highlights priorities such as connectivity and mobility, quality of life improvements, and climate change adaptation. It lays the groundwork for sustainable and resilient urban development.	Strengthen multi-sectoral coordination and enhance implementation to align with the climate-neutrality goals.
Strategy	Local	<u>2023 SUSTAINABLE ENERGY AND CLIMATE ACTION PLAN</u>	Focuses on reducing emissions, improving energy efficiency, and resilience against climate change impacts. Includes a baseline inventory and targeted measures for residential, public, and transportation sectors.	Critical for achieving Constanța's climate neutrality goals. Addresses high-emission sectors and sets reduction targets aligned with EU objectives.	Develop a comprehensive monitoring framework and prioritize deep renovations for residential and public buildings.
Strategy	Local	<u>2035 SMART CITY STRATEGY</u>	Details smart technologies for urban management, mobility, and energy efficiency by 2035. Promotes digital transformation and citizen engagement for sustainable living.	Key to integrating smart solutions in urban climate actions, enabling real-time monitoring, energy savings, and improved mobility solutions.	Invest in digital infrastructure and foster public-private partnerships for technology deployment.
Strategy	Local	<u>SUSTAINABLE URBAN MOBILITY PLAN</u>	Promotes sustainable transport systems, including electrified public transport, expanded cycling networks, and pedestrian-friendly initiatives.	Reduces transport-related emissions, a significant local GHG contributor. Enhances connectivity and accessibility across the metropolitan area.	Improve and expand the public transport system, including the refurbishment and adaptation of the public infrastructure in order to promote clean and efficient transport modes.
Strategy	Local	<u>2021- 2025 AIR QUALITY PLAN</u>	Focuses on reducing pollutants such as NO2, PM10, and PM2.5 from transport and industrial sources. Includes measures for transitioning to cleaner energy and vehicles.	Improves public health and environmental quality by targeting major pollution sources.	Strengthen enforcement mechanisms, expand air quality monitoring networks, and integrate policies with urban mobility strategies.
Strategy	Local	<u>STRATEGY FOR CENTRALIZED THERMAL ENERGY SUPPLY</u>	Aims to modernize and decarbonize the district heating system by incorporating renewable energy sources and improving energy efficiency.	Reduces dependency on fossil fuels and addresses high emissions from inefficient heating systems.	Invest in renewable energy solutions and high-efficiency cogeneration, while modernizing infrastructure for higher efficiency.
Strategy	Local	<u>2024 - 2028 YOUTH STRATEGY</u>	Aims to integrate youth as active participants in sustainable development through education, employment, and civic engagement.	Encourages youth involvement in climate action and urban development, building long-term resilience.	Develop youth-targeted programs and provide incentives for participation in green initiatives.
Strategy	Local	<u>2021 -2031 CONSTANTA</u>	Aims to integrate culture in the sustainable development of the city in order to create a more cohesive and aware	Promotes the improvement of the quality of life in Constanța through art and culture.	Improve and expand the cultural infrastructure and events, while also promoting them.



TYPE	LEVEL	TITLE	DESCRIPTION	RELEVANCE	NEED FOR ACTION
		<u>CULTURAL STRATEGY</u>	community, to increase the access to cultural infrastructure and events and to make Constanta a cultural landmark.		
Strategy	County	<u>2021-2027 SUSTAINABLE DEVELOPMENT STRATEGY OF CONSTANȚA COUNTY</u>	Determines the allocation of the available resources and the efforts of the public administration at the county level, in order to achieve measurable strategic objectives and development targets established through a consultative process.	Focuses on sustained economic growth, improved living conditions across the communities and a proactive institutional framework for sustainable development. By 2027, the county aims to be a high-performing economic hub with an enhanced quality of life, supported by the collaboration between the county administration and the stakeholders dedicated to the county's long-term and sustainable development.	Prioritizes economic growth through innovation and local potential use, improved living conditions, reduced disparities and tourism development by leveraging local resources. The key objectives include the transport infrastructure, the environmental quality, the renewable energy promotion and modernizing the public administration. Their successful implementation will impact the county's development quality and pace.
Strategy	County	<u>2020-2025 COUNTY WASTE MANAGEMENT PLAN</u>	Provides a framework for sustainable waste management, emphasizing recycling, circular economy practices, and waste-to-energy solutions.	Critical for reducing waste-related emissions and promoting sustainable resource use.	Expand waste collection infrastructure and strengthen public awareness campaigns on waste segregation and recycling.
Strategy	County	<u>2019-2028 INTEGRATED STRATEGY FOR SUSTAINABLE TOURISM DEVELOPMENT IN CONSTANȚA COUNTY</u>	Outlines a strategic tourism plan for Constanța County aimed at addressing the local issues and risks, while capitalizing on the available resources and opportunities. The goal is to develop the tourism sector based on competitiveness, diversity and sustainability.	Envisions that by 2028, Constanța County will become a competitive European tourist destination, developed on sustainable principles and attractive year-round. It will offer a diverse range of attractions and experiences, distributed evenly across the county. Tourism, as a key economic driver, will generate new employment opportunities and enhance the quality of life for the local population.	Emphasizes that the tourism development should help preserve a clean natural environment, with minimal negative impact from the tourism activities. It encourages the development of infrastructure and facilities which minimize the environmental harm, while promoting eco-friendly economic activities in tourism and the adoption of voluntary sustainable development schemes.
Strategy	Regional	<u>2021-2027 SOUTH-EAST REGIONAL DEVELOPMENT PLAN</u>	Guides sustainable development in the South-East region with a focus on economic growth, environmental protection, and social equity.	Provides a framework for integrating local actions into broader regional priorities, ensuring alignment with national and EU objectives.	Enhance funding mechanisms for local climate projects and foster inter-municipal cooperation for large-scale interventions.
Program	Regional	<u>2021-2027 SOUTH-EAST REGIONAL PROGRAM</u>	Offers financial and programmatic support for achieving development goals across the South-East region, emphasizing sustainability.	Facilitates access to EU and national funding streams for implementing climate action projects.	Align funding priorities with local climate-neutrality targets and streamline project approval processes.
Strategy	Regional	<u>2021-2027 SMART SPECIALIZATION STRATEGY RIS3</u>	Focuses on leveraging regional strengths in research, innovation, and technology to promote sustainable economic development.	Supports climate-friendly innovations and fosters knowledge-sharing for green solutions.	Strengthen collaboration between academia, industry, and local governments to scale sustainable technologies.
Strategy	National	<u>ROMANIA'S NATIONAL URBAN POLICY</u>	Transposes the New Leipzig Charter and promotes green, resilient, and inclusive urban areas. Encourages the development of green-blue infrastructure and climate-smart city planning.	Supports urban resilience through sustainable land use, energy efficiency, and transportation systems.	Enhance policy integration at local levels and encourage cities to adopt innovative urban planning practices.



TYPE	LEVEL	TITLE	DESCRIPTION	RELEVANCE	NEED FOR ACTION
Strategy	National	NATIONAL SPATIAL DEVELOPMENT PLAN	Created to ensure the balanced, coherent and sustainable development of the national territory. It serves as a framework for the local public administration authorities to align their decisions regarding the land use, while the state, through the public authorities, ensures the sustainable development and upholds the general interest through urban planning and territorial development, in accordance with the law.	Aims to ensure, among other objectives, the equitable and efficient use of land, the provision of adequate living conditions, high architectural quality, reduced energy consumption, the protection of the natural and built landscapes, the biodiversity's conservation, ecological continuity, public safety and sanitation and the rationalization of travel demand.	The spatial management of the national territory according to the objectives mentioned in the left column is a mandatory, ongoing and forward-looking process carried out in the interest of the communities which use it. At the local level, the public administration must ensure both the right of individuals and communities to equitable land use and their responsibility for its efficient use.
Strategy	National	ROMANIA'S TERRITORIAL DEVELOPMENT STRATEGY	Outlines the development vision of the national territory for the 2035 horizon and defines development objectives, measures, actions and concrete projects at the territorial level.	Outlines the vision and directions through which Romania will become, by 2035, a country with a functional, efficiently administered territory, which offers attractive living and housing conditions for its citizens, while playing a significant role in the development of south-eastern Europe.	Highlights multiple key points of interest, among which: → Adequate infrastructure and equipment across the territory → Enhanced quality of life for Romanian citizens by providing quality living spaces → Natural heritage protection → Strengthened role of functional urban areas as development hubs at the territorial level → Connection to the trans-European transport network and development of multimodal terminals → Framework for cooperation and coordination of sectoral strategies and policies, grounded in the national territorial dynamics
Strategy	National	2030 NATIONAL STRATEGY FOR SUSTAINABLE DEVELOPMENT	Guides the implementation of the 2030 Agenda across all the sectoral policies which can promote sustainable development at the national level.	Grounded in the idea that sustainable development offers a mindset which, once adopted by the citizens, will contribute to building a more equitable and sustainable society, equipped to tackle the challenges arising from global, regional and national issues.	By setting clear targets for each SDG related to the environment and the climate, it underscores the importance of environmental awareness and nature protection as shared responsibilities and, at the same time, as opportunities for citizens to unite in a noble cause.
Strategy	National	2022-2030 NATIONAL STRATEGY ON CLIMATE CHANGE ADAPTATION	Establishes a framework for adapting to climate change impacts nationwide. Prioritizes actions for sectors vulnerable to climate risks, including agriculture, energy, and urban planning.	Addresses climate risks specific to Romania while promoting regional cooperation for adaptation measures.	Develop detailed action plans for vulnerable sectors, integrate risk assessments, and secure funding for adaptive infrastructure projects.
Strategy	National	NATIONAL ACTION PLAN FOR THE IMPLEMENTATION OF THE NATIONAL STRATEGY ON CLIMATE CHANGE ADAPTATION	Proposes the necessary actions for the implementation of the 2023-2030 National Strategy for Climate Change Adaptation.	Proposes concrete measures to ensure the effective implementation of the objectives and action programs outlined in the 2023-2030 National Strategy for Climate Change Adaptation, while maintaining continuity with the actions set out in the previous Action Plan.	Addresses the following areas: water resources, forests, biodiversity and ecosystem services, population, public health and air quality, education and awareness, cultural heritage, urban systems, agriculture and rural development, energy, transport, tourism and recreation, industry, and insurance.



TYPE	LEVEL	TITLE	DESCRIPTION	RELEVANCE	NEED FOR ACTION
Strategy	National	<u>2050 NATIONAL LONG-TERM RENOVATION STRATEGY</u>	Supports the transformation of the national stock of residential and non-residential buildings (both public and private) into a real estate portfolio with high energy efficiency and decarbonization levels by 2050.	Aims to: → Enhance the energy performance of the existing buildings by reducing the energy consumption and carbon emissions and expanding the renewable energy use. → Improve the quality of life for all the users through better thermal comfort, hygiene, safety and air quality. → Reduce energy poverty and provide affordable heating for low-income families. → Streamline the financing mechanisms for building renovations. → Develop professional skills in energy efficiency and support innovation. → Improve the building quality by enhancing the safety and ensuring the architectural integration of renovation projects.	Follows, as key action directions: → Ensuring cost-effective renovation approaches → Incentivizing deep, cost-effective building renovations → Identifying the least energy-efficient buildings → Reducing the energy poverty → Implementing policies to address the market failures → Addressing the divergent motivations → Ensuring safety aspects → Renovating the public buildings
Strategy	National	<u>ROMANIA'S ENERGY STRATEGY 2016–2030, WITH PROJECTIONS TOWARDS 2050</u>	Details policies for achieving energy security, sustainability, and climate goals. Highlights the importance of renewable energy and energy efficiency in reducing greenhouse gas emissions.	Aligns national energy policies with EU directives, promoting a low-carbon economy. Supports the transition to renewable energy sources and increased energy efficiency.	Accelerate investments in renewable energy, phase out coal and natural gas, and promote energy-efficient technologies across all sectors.
Strategy	National	<u>2007–2026 MASTER PLAN FOR NATIONAL TOURISM IN ROMANIA</u>	Lays the groundwork for implementing a sustainable approach to tourism development in Romania.	Serves as a general framework of policies for the sustainable development and management of the tourism industry, focusing on the natural and cultural resources.	Aims to adopt the sustainable tourism development principles defined by the World Tourism Organization, focusing on meeting the current needs of tourists and tourist regions, while protecting and enhancing the future development opportunities: effective resource management and preservation of cultural integrity, ecological processes, biodiversity and bio-climate.



ACTION PORTOFOLIO

For each action aimed at achieving climate neutrality as outlined in this Plan, fill out a sheet using the template provided below.

- Make sure to also include, within this section, the actions pertaining to Organisational and Governance Innovation, as well as the actions related to Social and Other Innovation fields.

INDIVIDUAL ACTIONS

ACTION TITLE	CONSOLIDATION OF AN ENERGY-EFFICIENT DISTRICT HEATING SYSTEM
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: local residents
FIELD OF ACTION	ENERGY SYSTEMS
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	BUILDINGS, IPPU
COVERED INTERVENTIONS	→ Rehabilitation of the primary thermal networks for the transport of thermal energy in the Municipality of Constanța - Stage I → Rehabilitation of the primary thermal networks for the transport of thermal energy in the Municipality of Constanța - Stage II → Rehabilitation of heating networks in Constanța Municipality - Stage III → Rehabilitation of secondary thermal networks and metering at block level for the municipality of Constanța - Stage IV → Rehabilitation of energy heating networks - Stage V → Rehabilitation of energy heating networks in the municipality of Constanța → Source of thermal and electrical energy production through high efficiency cogeneration (C.E.T) → Upgrading the chemical section of C.E.T. Palas to meet current capacity demands → Improving energy efficiency at thermal points by installing photovoltaic panels to power their technological needs → Building a 20MW solar power plant with storage systems to produce green hydrogen through electrolysis → Building facilities for green hydrogen production in electrolysis plants and storage systems for use in cogeneration units → Implementing a comprehensive software suite to optimize district heating processes → Renovating / building block and district power plants in areas not connected to SACET → Installing CO2 capture and use capacity from flue gases during electricity and heat generation at C.E.T. Palas
BRIEF DESCRIPTION	REHABILITATION OF THERMAL NETWORKS AND ENERGY HEATING NETWORKS



ACTION TITLE

CONSOLIDATION OF AN ENERGY-EFFICIENT DISTRICT HEATING SYSTEM

The interventions aim to modernize and enhance the efficiency of the district heating system in Constanța Municipality through a comprehensive, multi-stage approach. The action begins with the rehabilitation of the primary heating networks for the transport of thermal energy in Stages I and II, focusing on the modernization of the main pipelines to reduce energy losses, improve reliability, and ensure sustainable operation. Stage III involves the further modernization of the heating networks within the municipality, in order to enhance energy conservation and operational stability. In Stage IV, the secondary heating networks are upgraded and advanced metering systems are implemented at the block level, enabling precise tracking of energy consumption, promoting efficient use and ensuring equitable billing. Stage V completes the network upgrades, delivering system-wide optimization and compliance with modern energy standards. As the intervention includes the completion of the primary heating network rehabilitation, the continuation of the secondary network and heating point upgrades, together with the works foreseen for Stage V, we will reach the final optimization of the primary heating network, ensuring full system modernization and compliance with the contemporary energy standards.

SOURCE OF THERMAL AND ELECTRICAL ENERGY PRODUCTION THROUGH HIGH EFFICIENCY COGENERATION (C.E.T)

The intervention involves building a high-efficiency, gas-fired cogeneration unit for thermal energy production in Constanța, meeting the latest energy efficiency, environmental, and climate change standards. It will provide a flexible, high-efficiency source of electric and thermal energy, primarily through high-efficiency cogeneration with a gas turbine and recuperator boiler, using natural gas with the option to mix in green hydrogen.⁶

UPGRADING THE CHEMICAL SECTION OF C.E.T. PALAS TO MEET CURRENT CAPACITY DEMANDS

This intervention will solve the challenges represented by the oversized section with outdated, inefficient equipment lacking automation and chemical parameter monitoring. The modernization works will reduce the water and reagent consumption in the treatment process, lower the quantity and improve the quality of water discharged into the sewage system, decrease the maintenance costs for the water treatment facility, and lower the electricity consumption in the chemical section. All of these improvements will lead to lower treated water prices, reduced energy production and thermal energy transport costs, together with a decrease in polluting emissions.

IMPROVING ENERGY EFFICIENCY AT THERMAL POINTS BY INSTALLING PHOTOVOLTAIC PANELS TO POWER THEIR TECHNOLOGICAL NEEDS

The intervention aims to power the technological needs of the targeted facilities with renewable energy, in order to reduce their reliance on fossil fuels. By integrating solar power into the energy supply of the thermal points, the intervention will not only cut the generated GHG emissions, but also enhance the sustainability of Constanța's heating infrastructure.

BUILDING A 20MW SOLAR POWER PLANT WITH STORAGE SYSTEMS TO PRODUCE GREEN HYDROGEN THROUGH ELECTROLYSIS

This intervention involves constructing a 20MW solar power plant equipped with storage systems to produce green hydrogen through electrolysis. Green hydrogen is a clean energy carrier which can be used across various sectors, leading, in time, to a lower dependence on fossil fuels. Through the integration of large-scale renewable energy production with advanced storage solutions, this intervention will lead to reduced CO₂

⁶ More technical details about this intervention are provided in Annex 6.



ACTION TITLE	CONSOLIDATION OF AN ENERGY-EFFICIENT DISTRICT HEATING SYSTEM
	emissions, while enhancing the energy independence and resilience at the local level, by fostering innovation through the adoption of sustainable energy technologies. BUILDING FACILITIES FOR GREEN HYDROGEN PRODUCTION IN ELECTROLYSIS PLANTS AND STORAGE SYSTEMS FOR USE IN COGENERATION UNITS This intervention entails building facilities for green hydrogen production through electrolysis plants powered by renewable energy, along with storage systems to supply hydrogen for cogeneration units. By generating green hydrogen (a zero-emission fuel) and using it in cogeneration units for simultaneous heat and power production, the investments will enhance energy efficiency and reduce the GHG emissions. As such, its implementation will lead to the diversification of the local clean energy portfolio, decreasing the dependence on fossil fuels based on sustainable energy solutions. IMPLEMENTING A COMPREHENSIVE SOFTWARE SUITE TO OPTIMIZE DISTRICT HEATING PROCESSES The systems within the district heating system which are targeted by the intervention include production (C.E.T. power and thermal plants), transmission (primary networks), distribution (secondary networks, thermal points, and modules), and supply (heat agent billing and customer portfolio management). The aim of this intervention is to integrate all the operational applications into an advanced software platform, covering SCADA for production and distribution, billing, weather forecasts, energy trading, market integration, and customer management. This process will provide detailed visualization for operators, authorities, and related entities.⁷ RENOVATING / BUILDING BLOCK AND DISTRICT POWER PLANTS IN AREAS NOT CONNECTED TO SACET This intervention involves renovating the existing block and district power plants, as well as constructing new ones in the areas not connected to the centralized district heating system. By equipping the targeted power plants with modern, energy-efficient technologies, the intervention will improve the energy supply reliability and reduce the carbon emissions in the foreseen areas. INSTALLING CO₂ CAPTURE AND USE CAPACITY FROM FLUE GASES DURING ELECTRICITY AND HEAT GENERATION AT C.E.T. PALAS This intervention focuses on developing a capacity to capture and use carbon dioxide from the flue gases produced during electricity and heat generation in high-efficiency cogeneration at C.E.T. Palas. The captured CO₂ can be used in the food industry, for CO₂ fertilization in greenhouses to enhance crop yields, and also in various other industrial processes. These interventions will be prioritized for implementation by 2030, given their strategic importance at the local level. As such, dedicated efforts will focus on mobilizing the resources needed to ensure their execution, with any remaining interventions to be carried forward for completion by 2035.
OUTCOME	Modern and energy efficient heating production, transport and distribution system
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Energy Manager → Public Heating Service Operator

⁷ More technical details about this intervention are provided in Annex 6.



ACTION TITLE	CONSOLIDATION OF AN ENERGY-EFFICIENT DISTRICT HEATING SYSTEM
INVOLVED STAKEHOLDERS	→ Providers of the required works and equipment → Homeowners Associations → Citizens living in multi-apartment residential buildings → South-East Regional Development Agency → Ministry of Energy → Energy Regulatory Authority
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 100,767.28 tons CO₂/year per action as follows: → 54,701.93 tons CO₂/year from Buildings → 46,065.34 tons CO₂/year from IPPU 2035: 124,349.72 tons CO₂/year per action as follows: → 73,406.87 tons CO₂/year from Buildings → 50,942.85 tons CO₂/year from IPPU
% OF TOTAL CO₂ REDUCTION	2030: 12.32% 2035: 13.45%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	13,250 MWh hydrogen from solar energy
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 52,508.76 MWh electrical energy from Scope 2 → 151,245.80 MWh natural gas from Scope 2 IPPU → 210,799.05 MWh thermal energy from Scope 3 2035: Buildings → 73,512.27 MWh electrical energy from Scope 2 → 211,744.12 MWh natural gas from Scope 2 IPPU → 237,628.02 MWh thermal energy from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	ENHANCING THE LOCAL SUPPLY OF RENEWABLE ENERGY
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: local residents
FIELD OF ACTION	ENERGY SYSTEMS



ACTION TITLE	ENHANCING THE LOCAL SUPPLY OF RENEWABLE ENERGY
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	BUILDINGS, TRANSPORT
COVERED INTERVENTIONS	→ CT - Green energy → Network of charging stations for EVs
BRIEF DESCRIPTION	CT - GREEN ENERGY The initial intervention within this action aims to advance the Municipality's transition to sustainable energy solutions, through the development and operationalization of photovoltaic parks, which will use solar power for the production of electricity from renewable sources. These facilities will specifically address the energy consumption needs of the Municipality, thereby decreasing the reliance on polluting sources. The intervention covers the procurement, installation and commissioning of the requisite installations and equipment, ensuring their optimal operation and integration into the Municipality's energy systems. NETWORK OF CHARGING STATIONS FOR EVs The action also comprises the development of an extensive network of charging stations for electric vehicles (EVs). The charging stations will be strategically distributed across the municipality, in order to ensure a more accessible and convenient charging for the EV users. By ensuring adequate coverage throughout the Municipality, this intervention aims to comprehensively address the growing demand for EV charging infrastructure. Furthermore, it is envisioned that this intervention will indirectly encourage a greater shift among the citizens and the businesses toward the adoption of EVs, thus reducing the dependency on cars powered by polluting fossil fuels and implicitly fostering a cleaner mobility alternative. In addition to the above, at the metropolitan level, dedicated efforts will also focus on expanding the green energy generation capacities, as the metropolitan area provides both the necessary space and favourable natural conditions for such installations. In this context, special attention will be given to mobilizing private capital (including through public-private partnerships) to support these strategic investments in clean energy generation. The public administrations of the metropolitan area, together with Constanța MA IDA will thus prioritize stimulating the private sector investments in these capacities by 2030, with the goal of further increasing the green energy capacities by 2035.
OUTCOME	High share of renewables in the total electricity consumption
RESPONSIBLE ENTITY / BODY / PERSON	City Hall
INVOLVED STAKEHOLDERS	→ Providers of the required works and equipment → Energy operators → South-East Regional Development Agency → Environmental Fund Agency → Ministry of Environment → Ministry of Energy → Ministry of Transport → Citizens → Businesses



ACTION TITLE	ENHANCING THE LOCAL SUPPLY OF RENEWABLE ENERGY
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 8,877.07 tons CO₂/year per action as follows: → 6,898.93 tons CO₂/year from Buildings → 1,978.14 tons CO₂/year from Transport 2035: 9,522.31 tons CO₂/year per action as follows: → 7,084.36 tons CO₂/year from Buildings → 2,437.95 tons CO₂/year from Transport
% OF TOTAL CO₂ REDUCTION	2030: 1.08% 2035: 1.03%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	2035: 22,500 MWh/year
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 15,000.00 MWh/year electrical energy (substituted with renewable energy) Transport → 2,130.00 MWh/year diesel from Scope 1 → 2,110.50 MWh/year gasoline from Scope 1 → 4,800.00 MWh/year electrical energy substituted with renewable energy from Scope 2 (estimated based on the possible number of EV charging station according to the allocated budgets, and the yearly electricity demands for EVs that will replace fossil fuel cars by 2030) 2035: Buildings → 17,000.00 MWh/year electrical energy (substituted with solar electrical energy) Transport → 2,762.00 MWh/year diesel from Scope 1 → 2,737.00 MWh/year gasoline from Scope 1 → 5,500.00 MWh/year electrical energy substituted with renewable energy from Scope 2 (estimated based on the possible number of EV charging station according to the allocated budgets, and the yearly electricity demands for EVs that will replace fossil fuel cars by 2035)
TIMELINE (START AND END)	2026-2035

ACTION TITLE	MODERNIZATION OF PUBLIC LIGHTING TO REDUCE ENERGY CONSUMPTION
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: local residents
FIELD OF ACTION	ENERGY SYSTEMS



ACTION TITLE	MODERNIZATION OF PUBLIC LIGHTING TO REDUCE ENERGY CONSUMPTION
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	BUILDINGS, TRANSPORT
COVERED INTERVENTIONS	→ Expansion of the energy-efficient public lighting system → Rehabilitation and energy proofing of existing public lighting systems
BRIEF DESCRIPTION	EXPANSION OF THE ENERGY-EFFICIENT PUBLIC LIGHTING SYSTEM This intervention aims to expand the coverage of the public lighting infrastructure across the entire Municipality, addressing the needs of the underserved areas while also extending the network to the newly developed urban areas. As such, the intervention will ensure the population's access to properly illuminated streets and public areas. The investment's scope includes the installation of energy-efficient LED streetlights alongside other installations and technologies, designed to provide smart and sustainable public lighting solutions. REHABILITATION AND ENERGY PROOFING OF EXISTING PUBLIC LIGHTING SYSTEMS This intervention, focused on the rehabilitation and energy-proofing of the existing public lighting systems, foresees the comprehensive modernization of the public lighting network across the municipality: replacing the outdated, high-energy consumption fixtures with advanced, energy-efficient LED alternatives, plus installing a dimming and remote management system, which will allow for dynamic adjustments tailored to the existing needs (e.g., varying illumination levels based on the time of day or prevailing ambient conditions). As such, the intervention will reduce the electricity consumption and operational costs, while improving the quality and reliability of the public lighting infrastructure. It will also ensure better control over the system, advancing the Municipality's objectives of establishing a climate-neutral and smart public lighting network.
OUTCOME	Reduced energy consumption for public lighting
RESPONSIBLE ENTITY / BODY / PERSON	City Hall
INVOLVED STAKEHOLDERS	→ Providers of the required works and equipment → Energy operators → South-East Regional Development Agency → Environmental Fund Agency → Ministry of Environment → Ministry of Energy → Citizens
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 5,685.18 tons CO₂ per year as follows: → 4,791.26 tons CO₂/year from Buildings (public lighting) → 1,430.28 tons CO₂/year from Transport 2035: 6,391.66 tons CO₂ per year as follows: → 4,961.39 tons CO₂/year from Buildings (public lighting) → 893.92 tons CO₂/year from Transport
% OF TOTAL CO₂	2030: 0.69%



ACTION TITLE	MODERNIZATION OF PUBLIC LIGHTING TO REDUCE ENERGY CONSUMPTION
REDUCTION	2035: 0.69%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings (public lighting) → 10,417.40 MWh electrical energy from Scope 2 Transport → 2,007.19 MWh diesel from Scope 1 → 1,283.17 MWh gasoline from Scope 1 → 6.93 MWh diesel from Scope 3 2035: Buildings (public lighting) → 11,905.60 MWh electrical energy from Scope 2 Transport → 3,211.50 MWh diesel from Scope 1 → 2,053.07 MWh gasoline from Scope 1 → 11.09 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	ENCOURAGING PUBLIC TRANSPORT
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: metropolitan → TARGET GROUP: metropolitan residents
FIELD OF ACTION	MOBILITY AND TRANSPORT
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	TRANSPORT
COVERED INTERVENTIONS	→ Purchase of electric / zero emissions buses → Modernization of public transport stations → nZEB Depot for zero emissions buses → Metropolitan public transport → Metropolitan train
BRIEF DESCRIPTION	PURCHASE OF ELECTRIC / ZERO EMISSIONS BUSES This intervention involves the acquisition of modern, environmentally sustainable vehicles, aimed at replacing and expanding the current fleet of public transportation buses. The new buses will be powered by clean energy sources, ensuring zero GHG



ACTION TITLE

ENCOURAGING PUBLIC TRANSPORT

emissions during their operation. In addition to being environmentally friendly, the buses will incorporate advanced technologies, making them not only less polluting but also smart, safer and more comfortable, also offering accessibility features for individuals with disabilities.

MODERNIZATION OF PUBLIC TRANSPORT STATIONS

This intervention involves the comprehensive upgrade of the existing public transport station facilities, aimed at improving their functionality, accessibility and overall user experience. The stations will become more attractive (e.g., through contemporary designs, smart technologies, seating optimized for passenger comfort) and safe (e.g., weather-resistant structures, improved accessibility features to accommodate individuals with disabilities), aiming to increase the attractiveness of the public transport system and encourage the residents to use it more frequently for their daily travel needs.

NZEB DEPOT FOR ZERO EMISSIONS BUSES

This intervention involves the creation of a public transportation facility designed to accommodate, support and maintain the fleet of zero-emission buses. The NZEB Depot will be developed to minimize both the GHG emissions and the operating costs, through energy efficiency solutions (focused on reducing the energy consumption), green energy supply, the use of sustainable materials and installations and a structure resilient to the climate changes. Its design will also ensure the depot's adaptability to any potential changes (e.g., fluctuations in the energy demand, changes in the usage patterns).

METROPOLITAN PUBLIC TRANSPORT

This intervention is looking at the operationalization of the Metropolitan Public Transport Intercommunity Development Association and of the public service contract, according to the EU Regulation no. 1370/2007 regarding the railway and road transport for passengers' public service, for the first ring of Constanța Municipality (Cumpăna and Valu lui Traian communes, Năvodari and Ovidiu cities).

METROPOLITAN TRAIN

The metropolitan train for Constanța Metropolitan Area and County represents a key investment in sustainable and climate-resilient urban mobility. This intervention is designed to provide a reliable, fast and environmentally friendly transport alternative, contributing to the region's shift toward low-carbon travel. By enhancing the connectivity between Constanța and surrounding localities, the metropolitan train will reduce road congestion, promote the use of public transportation, and decrease reliance on private vehicles. As part of the CNAP, the intervention will support the local and national goals in mitigating the climate changes, by reducing the GHG emissions and energy consumption in the transport sector. Moreover, the intervention will contribute to improving the quality of life for the residents, by offering a modern, comfortable and accessible travel option. Through this intervention, Constanța County Council aims to develop metropolitan railway public transport infrastructure which will improve the citizens' mobility in a sustainable manner. Its implementation will also ensure a proper accessibility both for the daily commute of the metropolitan area's residents and for large-scale tourism during the summer season. Consequently, it will provide connections between Constanța Municipality, the urban localities in Constanța County, Mihail Kogălniceanu Airport, the tourist resorts along the Romanian coast, as well as key urban development zones and marginalized communities.

These interventions will also receive dedicated attention by 2030, given their significant potential to reduce the GHG emissions not only locally but across the metropolitan area, as they are expected to help alleviate the transport pressures caused by the commuting



ACTION TITLE	ENCOURAGING PUBLIC TRANSPORT
	and freight movements between the city and its metropolitan area. Moreover, these interventions are designed in an integrated manner from two perspectives: first, by advancing both the road and rail public transport systems; and second, by implementing them not only within the city limits, but across all the jurisdictions of Constanța's metropolitan area. In these efforts, the support of Constanța MA IDA will be essential in mobilizing and aligning all the LAUs within the metropolitan area, as well as engaging all the relevant third parties toward the shared objective of increasing the public transport use through strategic, well-coordinated, and efficient investments.
OUTCOME	High modal split of carbon neutral public transport
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța MA IDA → County Council
INVOLVED STAKEHOLDERS	→ The other LAUs in Constanța 's Metropolitan Area and Constanța County → Local and metropolitan public transport operators → National public and private railway transport operators → Romanian Railway Authority → Romanian Railway Reform Authority → South-East Regional Development Agency → Ministry of Transport → Ministry of Public Works → Citizens
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 11,937.92 tons CO₂ per year from Transport 2035: 15,256.13 tons CO₂ per year from Transport
% OF TOTAL CO₂ REDUCTION	2030: 1.46% 2035: 1.65%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Transport → 38,331.43 MWh diesel from Scope 1 → 12,823.75 MWh gasoline from Scope 1 → -11,700.00 MWh electrical energy from Scope 2 (increase in electrical energy demand for public transport) → 106.14 MWh diesel from Scope 3 2035: Transport → 45,417.16 MWh diesel from Scope 1 → 17,953.25 MWh gasoline from Scope 1



ACTION TITLE	ENCOURAGING PUBLIC TRANSPORT
	→ -11,700.00 MWh electrical energy from Scope 2 (increase in electrical energy demand for public transport same public transport but more people using it) → 131.96 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	PROMOTING NON-MOTORIZED MOBILITY
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: metropolitan → TARGET GROUP: metropolitan residents
FIELD OF ACTION	MOBILITY AND TRANSPORT
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	TRANSPORT
COVERED INTERVENTIONS	→ "Riviera Tomis" - Sustainable Urban Mobility Corridor → "Integrated accessibility of the ""Oil Terminal"" area, including new connecting roads and street grid within the area, cycle tracks and pedestrian walkways, a new modern regional station, modernized and restructured railway infrastructure" → Tomis Boulevard - Intermodal Urban Mobility Corridor → Constanța Velo City → Pedestrian access and mobility in the central area → Pedestrian bridge over the railways between 4-5 km and Faleză Sud neighborhoods → Pedestrian promenade and bicycle path - the section between Lebedei Street and the base of the slope corresponding to the intersection of Pușkin Street and Mihai Eminescu Street → Sustainable urban mobility interventions in various neighborhoods → Peninsula – Low emission zone
BRIEF DESCRIPTION	RIVIERA TOMIS PROJECT This intervention seeks to establish a sustainable urban mobility corridor within the municipality of Constanța, enhancing access between the Tomis Port and the Mamaia resort. The primary objective of this initiative is to improve the connectivity and accessibility of the coastal area while fostering sustainable transport solutions. The intervention encompasses the reconfiguration of Tomis Boulevard, specifically on the section between Ion Rațiu Street/Poporului Street and the administrative boundary with the Ovidiu Territorial Administrative Unit (ATU). The planned works aim to modernize infrastructure, optimize traffic flow, reduce CO₂ emissions and enhance connectivity within the TEN-T network. Key interventions include urban regeneration, the development of dedicated lanes for public transport and bicycles, the refurbishment of sidewalks and roadways, the installation of public lighting, the creation of green spaces and irrigation systems and the provision of bus stops and electric vehicle charging stations. Furthermore, the construction of an overpass at the intersection of Tomis



ACTION TITLE

PROMOTING NON-MOTORIZED MOBILITY

Boulevard and Aurel Vlaicu Boulevard is envisioned.

By implementing the "Riviera Tomis" project, the municipality aspires to deliver a modern and accessible coastal route that promotes the adoption of environmentally friendly modes of transport, contributing to the sustainable development of Constanța.

INTEGRATED ACCESSIBILITY OF THE "OIL TERMINAL" AREA

The urban reconversion intervention for the "Oil Terminal" area in Constanța is a significant initiative aimed at transforming 38 hectares of inactive industrial land into a modern and accessible urban space for the community. This ambitious project is the result of a partnership between the state-owned company Oil Terminal and the private sector.

The development plan envisions creating a "city within a city," incorporating the following key elements:

- New road network - establishing connecting roads and streets within the area to enhance accessibility and mobility
- Bike paths and sidewalks- developing infrastructure to support pedestrian and cycling travel, promoting environmentally friendly transportation
- Modern regional station - constructing a new station to meet the transport needs of the region and facilitate both local and regional connections.
- Modernized and restructured railway infrastructure - rehabilitating and reorganizing the existing railway network to ensure the efficient transport of goods and passengers.

Furthermore, the initiative will feature a botanical garden and a park equipped with facilities for relaxation, sports and entertainment. Additional developments will include office spaces, commercial and leisure areas, markets showcasing local producers, themed restaurants, bistros, cafés and cultural and educational facilities.

TOMIS BOULEVARD - INTERMODAL URBAN MOBILITY CORRIDOR

The intervention encompasses the rehabilitation and expansion of Tomis Boulevard, with the modernization of the roadway to enhance traffic flow and reduce travel times. The initiative includes the development of a contemporary road network designed to support both public and private transportation. For public transport, the project will introduce dedicated bus lanes and modern stations equipped with digital facilities to provide real-time passenger information. In terms of non-motorized mobility, bicycle lanes will be constructed along the entire length of the boulevard, while sidewalks will be rehabilitated and widened to encourage pedestrian use.

The project embraces the concept of intermodality, integrating public transport with facilities for cyclists and pedestrians to facilitate seamless transitions between different modes of transport. Dedicated intersection points will be developed to connect motorized and non-motorized transport systems, including links with regional transport networks.

The anticipated outcomes include a reduction in CO₂ emissions through the promotion of sustainable alternatives to car travel, enhanced road safety through the modernization of pedestrian crossings and the installation of smart lighting, improved connectivity between central and peripheral areas of the city and the creation of a more welcoming and attractive urban environment for both residents and visitors.

CONSTANȚA VELO CITY

The intervention is an initiative by Constanța City Hall aimed at promoting sustainable mobility through the expansion and modernization of the city's cycling infrastructure. The primary objective is to encourage the use of bicycles as an environmentally friendly and efficient mode of transport, contributing to a reduction in CO₂ emissions and alleviating urban traffic congestion.



ACTION TITLE

PROMOTING NON-MOTORIZED MOBILITY

The key components of the project include the creation and expansion of dedicated bicycle lanes to connect the city's central and peripheral areas, the implementation of the "Black Sea Bike" bike-sharing system offering two hours of free use and the development of secure bicycle parking stations at key points to improve accessibility and safety for users.

Through the implementation of these measures, the "Constanța Velo City" project aims to transform Constanța into a cyclist-friendly city, promoting an active and healthy lifestyle while fostering the development of a more sustainable community.

PEDESTRIAN ACCESS AND MOBILITY IN THE CENTRAL AREA OF CONSTANȚA MUNICIPALITY

The intervention is designed to promote sustainable urban mobility through the regeneration of the central area. The primary objective is to create a high-quality, pleasant and accessible urban environment by implementing a range of measures, including:

- Rehabilitation and expansion of the sidewalk network - existing sidewalks will be modernized and new ones constructed, ensuring safe connections between the central and peripheral areas of the city
- Creation of pedestrian zones - areas dedicated exclusively to pedestrians will be developed, helping to reduce road traffic and create a more pedestrian-friendly urban space.
- Implementation of an ecological public transport system -an eco-friendly public transport system will be introduced, aimed at reducing CO₂ emissions and improving accessibility within the central area.
- Bicycle parking - secure bicycle parking stations will be installed near major points of interest, facilitating easier and safer access for cyclists.

PEDESTRIAN BRIDGE OVER THE RAILWAY LINES BETWEEN 4-5 KM AND FALEZA SUD NEIGHBORHOOD

The intervention aims to enhance pedestrian connectivity between the 4-5 km area and the Faleza Sud neighborhood by constructing a dedicated pedestrian bridge over the railway tracks. This initiative seeks to improve accessibility, safety and mobility for both residents and visitors, facilitating seamless movement between these key urban areas.

By implementing this pedestrian bridge, the project is expected to reduce travel times, alleviate congestion at existing crossings and promote sustainable transport options. Additionally, it will contribute to the revitalization of the Faleza Sud area, potentially stimulating economic development and improving the overall quality of life for the community.

PEDESTRIAN PROMENADE AND BICYCLE PATH BETWEEN LEBEDEI STREET AND THE BASE OF THE SLOPE CORRESPONDING TO THE INTERSECTION OF PUȘKIN STREET AND MIHAI EMINESCU STREET

The intervention aims to develop a modern and accessible public space intended for both pedestrians and cyclists. This intervention is part of a broader urban revitalization plan focused on improving mobility and creating a pleasant environment for the community.

The key components of the project include:

- Development of a pedestrian promenade - a dedicated promenade for pedestrians will be constructed, facilitating safe and convenient movement between the two specified areas.
- Construction of a bicycle path - a specialized bicycle path will be integrated into the promenade, encouraging the use of bicycles as an environmentally friendly mode of transport.
- Creation of relaxation areas and green spaces -areas for rest and recreation,



ACTION TITLE	PROMOTING NON-MOTORIZED MOBILITY
	along with green spaces, will be developed to enhance the area's appeal and comfort. The implementation of this project will help reduce road traffic, promote sustainable transport alternatives and enhance the overall quality of life for residents and visitors. SUSTAINABLE URBAN MOBILITY INTERVENTIONS IN VARIOUS NEIGHBORHOODS The intervention forms part of the city's broader strategy to enhance urban mobility through the implementation of the Sustainable Urban Mobility Plan (SUMP). This plan focuses on creating an efficient, integrated, sustainable and safe transport system that fosters development and guarantees a high quality of life. The key components of the project include the improvement and modernization of public transport, the development of infrastructure for pedestrians and cyclists, the promotion of intermodality, enhancement of urban road safety, optimization of urban road transport, improvement of urban logistics, management of mobility demand and the integration of intelligent transport systems to establish an efficient and sustainable transport network. PENINSULA – LOW EMISSION ZONE This intervention aims to establish the Peninsula Area as a low-emission zone by introducing new regulations to reduce overall traffic and enhancing infrastructure to encourage clean transport modes such as walking and cycling. These measures are designed to improve air quality and promote public health. This action comprises an integrated package of multiple, diverse, large-scale interventions, as it is considered essential (similar to the public transport measures) for achieving climate neutrality by 2030 and further reducing the CO₂ emissions by 2035, given the significant pollution caused by transport in Constanța and its metropolitan area. As observed above, it envisions a mix of active mobility solutions (cycling and walking) to be implemented not only within the city but also across the LAUs throughout the metropolitan area. Several projects included in this action's intervention list hold high strategic importance due to their potential to reduce the CO₂ emissions, while simultaneously enhancing Constanța's attractiveness through green, smart, innovation-oriented solutions, namely: Tomis Riviera, Tomis Boulevard, Oil Terminal, as well as the Constanța Velo City and Peninsula Low Emission Zone programmes.
OUTCOME	High modal split of walking and cycling
RESPONSIBLE ENTITY / BODY / PERSON	→ Constanța City Hall
INVOLVED STAKEHOLDERS	→ Oil Terminal Company → Railway Infrastructure Administration → Ministry of Transport → South-East Regional Development Agency → Public Transport Operators → National Environmental Agency → Local NGOs that are active in the field of citizens engagement, active citizenship, community initiatives
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL)	2030: 17,878.46 tons CO₂ per year from Transport 2035: 19,666.31 tons CO₂ per year from Transport



ACTION TITLE	PROMOTING NON-MOTORIZED MOBILITY
PER EMISSION SOURCE SECTOR	
% OF TOTAL CO₂ REDUCTION	2030: 2.19% 2035: 2.13%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Transport → 40,143.81 MWh diesel from Scope 1 → 25,663.39 MWh gasoline from Scope 1 → 138.61 MWh diesel from Scope 3 2035: Transport → 44,158.19 MWh diesel from Scope 1 → 28,229.72 MWh gasoline from Scope 1 → 152.47 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	USING TRAFFIC MANAGEMENT AND THE PARKING POLICY AS A TOOL TO REDUCE TRAFFIC JAMS
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: metropolitan → TARGET GROUP: metropolitan residents, urban transport sector
FIELD OF ACTION	MOBILITY AND TRANSPORT
SYSTEMIC LEVER	Technology/Infrastructure
EMISSION DOMAIN(S)	TRANSPORT
COVERED INTERVENTIONS	→ Modernization of traffic lights system → Adaptive traffic management system → Sustainable Mobility Center
BRIEF DESCRIPTION	TRAFFIC LIGHT SYSTEM MODERNIZATION This intervention involves upgrading the existing traffic light infrastructure to enhance traffic flow and safety. As part of this initiative, in October 2024, the traffic lights at the intersection of Tomis Boulevard and Soveja Street were fully shut down for modernization, which included the installation of additional traffic light poles, LED-



ACTION TITLE	USING TRAFFIC MANAGEMENT AND THE PARKING POLICY AS A TOOL TO REDUCE TRAFFIC JAMS
	equipped traffic light bodies and the replacement of electrical installations. ADAPTIVE TRAFFIC MANAGEMENT SYSTEM This intervention aims to optimize traffic flow by adjusting traffic signals in real-time based on current traffic conditions. This system is designed to improve the efficiency of public transport, enhancing frequency and reducing travel times. An additional key focus is improving travel safety, particularly for pedestrians and cyclists. SUSTAINABLE MOBILITY CENTER Between 2016 – 2020 in the Municipality of Constanta it has been piloted the implementation of the SUMP and the required infrastructure for updating, continuous monitoring, analysis and optimization and participatory decision with the involved stakeholders. This intervention is aiming the operationalization of the system by updating the components of infrastructure and selection and training of the required human resources. It begins with the establishment of a mobility data collection and processing unit to gather essential transportation insights. A detailed transport model of the municipality and metropolitan area will also be developed, to support efficient planning and optimization. To address environmental concerns, an air quality monitoring network and mobile lab will be deployed, complemented by an advanced air quality modelling platform. Additionally, a noise level monitoring network and mobile lab will provide real-time data to assess and mitigate urban noise pollution. Building on these foundations, sustainable transport analysis and optimization tools will be implemented to improve mobility efficiency. A decision support system will facilitate data-driven planning, while a sustainable mobility forum will engage stakeholders in participatory decision-making, ensuring inclusive and community-driven solutions.
OUTCOME	Operational SUMP Abatement of motorized flows from dense urban areas and prioritization of public transport
RESPONSIBLE ENTITY / BODY / PERSON	→ Constanța City Hall → Constanța County Council → Constanța Metropolitan Area Development Agency → Innovation Cluster MEDGreen
INVOLVED STAKEHOLDERS	→ The other LAUs in Constanța Metropolitan Area and Constanța County → Local and metropolitan public transport operators → National public and private railway transport operators → South-East Regional Development Agency → Ministry of Transport → Ministry of Public Works → Residents → Technology Providers → Traffic Management Experts → Environmental and Safety Experts → Technology and Traffic System Providers
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION	2030: 6,890.61 tons CO₂ per year from Transport 2035: 9,187.48 tons CO₂ per year from Transport



ACTION TITLE	USING TRAFFIC MANAGEMENT AND THE PARKING POLICY AS A TOOL TO REDUCE TRAFFIC JAMS
SOURCE SECTOR	
% OF TOTAL CO₂ REDUCTION	2030: 0.84% 2035: 0.99%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Transport → 13,881.17 MWh diesel from Scope 1 → 11,541.38 MWh gasoline from Scope 1 → 53.91 MWh diesel from Scope 3 2035: Transport → 18,508.23 MWh diesel from Scope 1 → 15,388.50 MWh gasoline from Scope 1 → 71.88 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	INCREASING THE ENERGY PERFORMANCE OF PUBLIC BUILDINGS
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local (building level) → TARGET GROUP: public institutions and entities
FIELD OF ACTION	BUILT ENVIRONMENT
SYSTEMIC LEVER	Technology/Infrastructure
EMISSION DOMAIN(S)	BUILDINGS
COVERED INTERVENTIONS	→ Energy renovation of different administrative, social, educational, cultural and military public buildings
BRIEF DESCRIPTION	The energy renovation of multiple administrative, social, educational, cultural, and military public buildings in Constanța aims to improve their energy efficiency and reduce their energy consumption, while also shifting their energy use toward green sources, in line with the planned local and metropolitan green energy generation interventions. Accordingly, the interventions will include the thermal rehabilitation of the buildings, the modernization of the heating and electrical systems, and the implementation of environmentally friendly, energy-efficient solutions. The measures will also involve



ACTION TITLE	INCREASING THE ENERGY PERFORMANCE OF PUBLIC BUILDINGS
	connecting the buildings to the green energy system or, where appropriate, installing on-site clean energy solutions, such as solar panels, on the renovated buildings.
OUTCOME	Enhanced energy performance of public buildings
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Public Entities headquartered in targeted public buildings → Associations of house owners and citizens in targeted private buildings → Energy Manager
INVOLVED STAKEHOLDERS	→ Constanța City Hall → Constanța 's Public → Heating Company → Associations of home owners Constanța → South-East Regional Development Agency → Romanian Green Building Council → Energy Cluster
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 5,034.42 tons CO₂ per year from Buildings 2035: 6,355.35 tons CO₂ per year from Buildings
% OF TOTAL CO₂ REDUCTION	2030: 0.62% 2035: 0.69%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	10,000 MWh/year
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 4,570.00 MWh electrical energy from Scope 2 → 10,429.80 MWh natural gas from Scope 2 → 3,744.23 MWh thermal energy from Scope 2 2035: Buildings → 7,050.00 MWh electrical energy from Scope 2 → 12,205.09 MWh natural gas from Scope 2 → 4,381.55 MWh thermal energy from Scope 2
TIMELINE (START AND END)	2026-2035

ACTION TITLE	INCREASING THE ENERGY PERFORMANCE OF RESIDENTIAL BUILDINGS
TYPE OF ACTION	Technical intervention



SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local (housing blocks) → TARGET GROUP: citizens, Homeowners Associations
FIELD OF ACTION	BUILT ENVIRONMENT
SYSTEMIC LEVER	Technology/Infrastructure
EMISSION DOMAIN(S)	BUILDINGS
COVERED INTERVENTIONS	→ Energy renovation of private multi-apartment residential buildings
BRIEF DESCRIPTION	The energy renovation interventions for the multi-apartment residential buildings will target several residential areas in Constanța, including Badea Cârțan, Soveja, and other neighborhoods with older apartment blocks. These interventions will focus on thermal rehabilitation, modernization of heating and electrical systems, and the integration of energy-efficient and environmentally friendly solutions. As part of the projects to be implemented, the energy consumption needs will also be considered, by (re)connecting the buildings to the district heating system for apartment-level consumption, alongside installing green energy solutions for common area consumption. The Homeowners Associations will play a key role in this action through their representation and mediation functions, engaging with the residents to mobilize their support for these interventions and encouraging them to partially, or where feasible, fully finance the works needed, from their own resources.
OUTCOME	Enhanced energy performance of residential buildings
RESPONSIBLE ENTITY / BODY / PERSON	→ Constanța City Hall → The Order of Romanian Architects, Constanța Branch (and their national/international partners) → Associations of home owners and citizens in the targeted private multi-apartment buildings → Local energy agencies and sustainability institutions
INVOLVED STAKEHOLDERS	→ Constanța City Hall → Local Public Heating Company → Associations of Homeowners, such as the Federation of Homeowners' Associations in Constanța → South-East Regional Development Agency → Romanian Green Building Council (RoGBC) → Local energy and environmental agencies → Sustainability organizations and clusters from Constanța → Partner construction companies and engineers specializing in energy renovation
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 84,074.94 tons CO₂ per year from Buildings 2035: 87,793.62 tons CO₂ per year from Buildings
% OF TOTAL CO₂ REDUCTION	2030: 10.28% 2035: 9.50%



GENERATED RENEWABLE ENERGY (IF APPLICABLE)	20,000 MWh
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 47,863.30 MWh electrical energy from Scope 2 → 233,001.90 MWh natural gas from Scope 2 → 67,994.10 MWh thermal energy from Scope 2 2035: Buildings → 52,387.52 MWh electrical energy from Scope 2 → 248,535.36 MWh natural gas from Scope 2 → 72,527.04 MWh thermal energy from Scope 2
TIMELINE (START AND END)	2026-2035

ACTION TITLE	MITIGATION OF URBAN HEAT ISLANDS THROUGH URBAN RENEWAL
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: citizens, tourists
FIELD OF ACTION	BUILT ENVIRONMENT
SYSTEMIC LEVER	Technology/Infrastructure
EMISSION DOMAIN(S)	BUILDINGS
COVERED INTERVENTIONS	→ Integrated rehabilitation of public areas in the central area and neighborhoods (green areas, alleys and sidewalks, urban furniture etc.) → Urban Renewal of public areas around the Central Railway Station → Integrated urban regeneration of the Oil Terminal area, including new parks, green spaces, public spaces, public utility buildings (e.g. Constanța City Hall and Constanța County Council headquarters, schools, kindergartens and nurseries, a new hospital, open-air theatre, performance hall, new religious buildings) and leisure facilities (botanical garden, aqua park, cultural park).
BRIEF DESCRIPTION	INTEGRATED REHABILITATION OF PUBLIC AREAS IN THE CENTRAL AREA AND NEIGHBORHOODS This intervention focuses on revitalizing the green spaces, alleys, sidewalks, and urban furniture within the central area of Constanța and its surrounding residential neighborhoods in an integrated manner, being closely aligned with other CNAP interventions, such as the energy-efficient building renovations, the public transport and green mobility improvements, and the expansion of the green areas. The overarching goal is to enhance the aesthetic appeal, functionality, and accessibility of these areas and neighborhoods, while simultaneously reducing their carbon footprint and vulnerability to the adverse impacts of climate change. Strategically, the public administration plans to



ACTION TITLE	MITIGATION OF URBAN HEAT ISLANDS THROUGH URBAN RENEWAL
	implement four major urban regeneration projects that will comprehensively address the thermal rehabilitation of multi-apartment residential buildings, expand and improve their adjacent green spaces to mitigate the urban heat island effects, introduce green and active mobility solutions by integrating the public transport with cycling and pedestrian infrastructure, and establish community centres focused on social innovation. URBAN RENEWAL OF PUBLIC AREAS AROUND THE CENTRAL RAILWAY STATION This intervention aims to transform the area surrounding Constanța's Central Train Station into a modern, accessible, and vibrant urban space, while also reducing its carbon footprint and increasing its resilience to climate change. The local plans foresee the development of new parks, green areas, and public facilities, alongside enhancements to the transport infrastructure, in order to facilitate better connectivity and encourage green mobility. The intervention will create a welcoming environment for travellers and residents alike, while supporting the economic, social, and environmental vitality of the city. INTEGRATED URBAN REGENERATION OF THE OIL TERMINAL AREA, INCLUDING NEW PARKS, GREEN SPACES, PUBLIC SPACES, PUBLIC UTILITY BUILDINGS This intervention is a comprehensive regeneration project targeting the Oil Terminal area, with the goal of transforming it from contaminated industrial land into a dynamic, green, and innovative mixed-use district. Through comprehensive remediation, the project will pave the way for developing Romania's largest net-zero neighborhood. The project envisions the creation of new parks, green spaces, and public areas, along with the construction of key public facilities, including the Constanța City Hall, Constanța County Council headquarters, schools, kindergartens, a new hospital, an open-air center, a theatre, a performance hall, and new religious buildings. It will also include leisure amenities such as a botanical garden, a water park, and a cultural park. This project represents the most extensive and ambitious urban regeneration initiative in Romania since 1989, positioning the Municipality of Constanța as a model of best practice not only at the regional and national levels but also across Europe, with the potential to serve as a global benchmark for climate-neutral and smart urban transformation.
OUTCOME	Reduced UHIs in densely populated urban areas
RESPONSIBLE ENTITY / BODY / PERSON	→ Constanța City Hall → Ministry of Transport → National Railway Company (NRA)
INVOLVED STAKEHOLDERS	→ Constanța City Hall → Constanța County Council → South-East Regional Development Agency → Residents of Constanța (including homeowner associations) → Public Transport Operators → Private Sector (Investors and Construction and Engineering Companies) → Public Utility Providers (electricity, water, gas, waste management) → Educational Institutions (such as local universities for research and innovation) → Cultural Institutions (e.g., theatres, museums, community centres) → Civic and Community Groups → NGOs involved in urban development and sustainability
GHG EMISSIONS REDUCTION	2030: 114,023.07 tons CO₂ per year through reduction and abatement as follows: → 13,538.91 tons CO₂ reduction from Buildings



ACTION TITLE	MITIGATION OF URBAN HEAT ISLANDS THROUGH URBAN RENEWAL
ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	→ 100,484.16 tons CO₂ abatement as follows: ◆ Buildings: 58,260.51 tons CO₂/year ◆ Transport: 9,708.66 tons CO₂/year ◆ IPPU: 31,531.48 tons CO₂/year ◆ Waste: 952.27 tons CO₂/year ◆ AFOLU: 31.24 tons CO₂/year 2035: 119,766.93 tons CO₂ per year through reduction and abatement as follows: → 14,283.31 tons CO₂ reduction from Buildings → 105,483.62 tons CO₂ abatement as follows: ◆ Buildings: 61,159.18 tons CO₂/year ◆ Transport: 10,191.70 tons CO₂/year ◆ IPPU: 33,100.29 tons CO₂/year ◆ Waste: 999.64 tons CO₂/year ◆ AFOLU: 32.80 tons CO₂/year
% OF TOTAL CO ₂ REDUCTION	2030: 13.94% 2035: 12.96%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 12,649.73 MWh electrical energy from Scope 2 → 35,679.70 MWh natural gas from Scope 2 → 2,329.08 MWh thermal energy from Scope 2 2035: Buildings → 13,914.71 MWh electrical energy from Scope 2 → 39,247.67 MWh natural gas from Scope 2 → 2,561.99 MWh thermal energy from Scope 2
TIMELINE (START AND END)	2026-2035

ACTION TITLE	CONSOLIDATING THE INTEGRATED WASTE MANAGEMENT FOR A CIRCULAR ECONOMY
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: citizens, tourists, waste operators
FIELD OF ACTION	WASTE AND CIRCULAR ECONOMY
SYSTEMIC LEVER	Technology/Infrastructure



ACTION TITLE	CONSOLIDATING THE INTEGRATED WASTE MANAGEMENT FOR A CIRCULAR ECONOMY
EMISSION DOMAIN(S)	WASTE, TRANSPORT
COVERED INTERVENTIONS	→ Digital eco islands for separate waste collection → Separate waste collection center through voluntary contribution → Neutralization of MSW by pyrolysis for hydrogen production and use in a hydrogen fueled bus line
BRIEF DESCRIPTION	DIGITALIZED ECOLOGICAL ISLANDS FOR SEPARATE WASTE COLLECTION As part of a project funded by the National Recovery and Resilience Plan (NRRP), the Romanian Ministry of Environment has begun the installation of digitalized ecological islands for separate waste collection across various localities, including Constanța . These islands are equipped with digital components, such as hardware systems and software platforms, enabling access control, user activity monitoring, and reporting to authorities. The primary objective is to optimize waste management and encourage recycling. SEPARATE WASTE COLLECTION CENTRES THROUGH VOLUNTARY CONTRIBUTIONS This intervention seeks to establish dedicated centres for the separate collection of recyclable waste and bio-waste, which cannot be collected through individual systems. These centres will also serve as collection points for bulky waste, used electrical and electronic equipment, used batteries, hazardous waste and construction and demolition waste. The project encourages voluntary contributions from residents, ensuring the proper disposal and recycling of various waste types, thereby promoting environmental sustainability. NEUTRALIZATION OF MSW BY PYROLYSIS FOR HYDROGEN PRODUCTION AND USE IN A HYDROGEN FUELED BUS LINE In 2017, Constanța Municipality became the first Romanian region that was included in the European map of regions committed to promote hydrogen energy applications. Innovation Cluster MEDGreen implemented several projects aiming to support the development of startups for production of hydrogen energy solutions, products and services. Constanța Port Administration has been involved in the project PIONEERS, aiming to evaluate the possibility to locate a hydrogen terminal in the Port of Constanța, as a source of hydrogen based on manufacturing value chains from the MENA Region. "Ovidius" University of Constanta developed the core competence center for production and use of hydrogen from renewable energy sources – HyRES. Building on accumulated experience, this intervention will establish a pilot facility to process selected municipal solid waste (MSW) through pyrolysis, enabling hydrogen production, conditioning, storage, and distribution via dedicated refuelling stations. A hydrogen-fueled bus line, featuring four buses, will be introduced to demonstrate the feasibility of hydrogen-powered public transport for both citizens and tourists. By operating the hydrogen production facilities and bus line, valuable data will be collected to support decision-making on expanding hydrogen use in the region. Additionally, awareness-building initiatives will engage stakeholders and the public, highlighting hydrogen's role in sustainable mobility and the energy transition.
OUTCOME	Demonstration of the possibilities of developing synergies between neutralization of MSW and clean transport based on hydrogen Functional circular economy system at local and metropolitan level
RESPONSIBLE ENTITY / BODY / PERSON	→ Constanța City Hall → Constanța Waste Management Operator



ACTION TITLE	CONSOLIDATING THE INTEGRATED WASTE MANAGEMENT FOR A CIRCULAR ECONOMY
INVOLVED STAKEHOLDERS	→ Constanța City Hall → Polaris M Holding → CT Bus → Innovation Cluster MEDGreen → Ministry of Environment → Local NGOs focused on environmental protection → Local NGOs focused on citizen engagement and community initiatives → Private Sector Partners (technology providers, waste management companies) → Local Innovation Ecosystem → Constanța residents and community members
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 660.08 tons CO₂ per year from Waste 2035: 1,204.54 tons CO₂ per year from Waste
% OF TOTAL CO ₂ REDUCTION	2030: 0.08% 2035: 0.13%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	5000 MWh/year
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Waste → 1.32 MWh GPL from Scope 1 → 1,436.10 MWh diesel from Scope 1 → 141.91 MWh electrical energy from Scope 2 → 4.20 MWh electrical energy from Scope 3 → 588.60 MWh diesel from Scope 3 2035: Waste → 2.49 MWh GPL from Scope 1 → 2,703.24 MWh diesel from Scope 1 → 267.13 MWh electrical energy from Scope 2 → 7.91 MWh electrical energy from Scope 3 → 1,107.96 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	DEVELOPING AN EXTENDED NETWORK OF GREEN AREAS FOR CARBON CAPTURE
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED)	→ SCALE: local → TARGET GROUP: citizens



ACTION TITLE	DEVELOPING AN EXTENDED NETWORK OF GREEN AREAS FOR CARBON CAPTURE
ENTITIES)	
FIELD OF ACTION	GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	AFOLU
COVERED INTERVENTIONS	→ Pocket parks and community green areas in all major neighborhoods → Urban forests → Redesign and rehabilitation of existing parks
BRIEF DESCRIPTION	POCKET PARKS AND COMMUNITY GREEN AREAS IN ALL MAJOR NEIGHBORHOODS This intervention involves the creation of small, accessible and sustainable green spaces within each major neighborhood, ensuring that every community has nearby areas to enjoy nature for recreation, relaxation and social interaction, while complementing the city's existing parks. Through this intervention, the underused / vacant plots will be transformed into natural spaces which enhance the local biodiversity, by incorporating greenery and creating environmentally sustainable environments. The spaces will feature urban vegetation (trees and plants), permeable pavements, natural walking paths and other elements (relaxation areas, play spaces and facilities for accessibility) designed to support carbon sequestration, reduce the UHIs, absorb rainwater and improve the air quality. Additionally, the use of energy-efficient lighting and eco-friendly urban furniture (e.g., for seating), will help minimize the environmental impact of these urban spaces. URBAN FORESTS This intervention envisions the establishment of urban forests (areas populated with trees, shrubs and other vegetation within the urban landscape), with the goal of expanding the green spaces in the Municipality, as the planting of trees and vegetation will contribute to the development of an interconnected urban network of local green corridors. REDESIGN AND REHABILITATION OF EXISTING PARKS This intervention includes the development and revitalization of the existing green spaces, together with a range of urban enhancements (infrastructure improvements, landscaping, installation of urban furniture - seating, lighting, other elements designed to foster public engagement and social interaction). The newly rehabilitated parks and the installed urban furniture will be designed to be visually appealing, functional, comfortable and inclusive (accessible for the people with disabilities), promoting intergenerational activities and encouraging a wide range of outdoor experiences. The objective is to transform the existing parks into natural havens which encourage the citizens to spend more time outdoors, whether for physical activity, relaxation or social interaction. All of the above interventions aim to enhance the CO₂ capture, mitigate the UHIs and boost the resilience to the climate changes (e.g., by reducing the heat and providing shade during summer, facilitating rainwater absorption etc.). Additionally, they will improve air quality, offering significant benefits for the citizens' health (both physical and mental), safety and overall well-being (i.e., through the creation of recreational spaces). Collectively, these interventions will support the transition towards climate neutrality, facilitate the adaptation to the climate changes through ecosystem services and enhance the local quality of life, while increasing the city's attractiveness to tourists.



ACTION TITLE	DEVELOPING AN EXTENDED NETWORK OF GREEN AREAS FOR CARBON CAPTURE
OUTCOME	Consolidation of an integrated network of green-blue areas acting as carbon sinks
RESPONSIBLE ENTITY / BODY / PERSON	City Hall
INVOLVED STAKEHOLDERS	→ Local NGOs specialized in environmental issues and community development → Architects and other experts specialized in urban development / planning and environmental sciences → Private contractors specializing in the works required for the interventions → Homeowners Associations → Residents
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: Abatement of 104,748.70 tons CO₂ per year as follows: → Buildings: 60,733.08 tons CO₂/year → Transport: 10,120.70 tons CO₂/year → IPPU: 32,869.67 tons CO₂/year → Waste: 992.68 tons CO₂/year → AFOLU: 32.57 tons CO₂/year 2035: Abatement of 105,748.59 tons CO₂ per year as follows: → Buildings: 61,312.81 tons CO₂/year → Transport: 10,217.31 tons CO₂/year → IPPU: 33,183.43 tons CO₂/year → Waste: 1,002.16 tons CO₂/year → AFOLU: 32.88 tons CO₂/year
% OF TOTAL CO₂ REDUCTION	2030: 12.80% 2035: 11.44%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	-
TIMELINE (START AND END)	2026-2035

ACTION TITLE	RENATURATION OF THE SEA COAST
TYPE OF ACTION	Technical intervention
SCALE AND TARGET GROUP (ADDRESSED)	→ SCALE: metropolitan



ACTION TITLE	RENATURATION OF THE SEA COAST
ENTITIES)	→ TARGET GROUP: citizens, tourists
FIELD OF ACTION	GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS
SYSTEMIC LEVER	Technology / infrastructure
EMISSION DOMAIN(S)	AFOLU
COVERED INTERVENTIONS	→ Consolidation and rehabilitation of sea slopes
BRIEF DESCRIPTION	CONSOLIDATION AND REHABILITATION OF SEA SLOPES This intervention aims to stabilize the eroding sea slopes, fortify the shoreline against the impacts of tides, storms and other meteorological manifestations and rehabilitate the associated degraded natural habitats. As such, it will not only ensure a better public safety, but also preserve the aesthetic and ecological integrity of the local coastline. Furthermore, the intervention will also provide enhanced recreational spaces in nature for the residents and for the tourists. Overall, this intervention serves as a proactive measure of advancing environmental sustainability (by protecting and enhancing the maritime environment and its biodiversity) and addressing the climate changes through both mitigation (by contributing to the CO₂ emission capture) and adaptation (by using the ecosystem services to build resilience).
OUTCOME	Consolidation of an integrated network of green-blue areas acting as carbon sinks
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța County
INVOLVED STAKEHOLDERS	→ Ovidius University (Faculty of Natural and Agricultural Sciences) → Constanța Maritime University → Navigable Canals Administration → Environmental Protection Agency → Local NGOs specialized in environmental issues → Other experts specialized in environmental and marine sciences → Private contractors specializing in the works required for this intervention → Residents → Tourists
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 29,514.00 tons CO₂ per year from reduction and abatement as follows: → Reduction of 772.10 tons CO₂ per year from Buildings → Abatement of 28,741.90 tons CO₂ per year as follows: ◆ Buildings: 16,664.49 tons CO₂/year ◆ Transport: 2,777.01 tons CO₂/year ◆ IPPU: 9,019.08 tons CO₂/year ◆ Waste: 272.38 tons CO₂/year ◆ AFOLU: 8.94 tons CO₂/year 2035: 32,548.44 tons CO₂ per year from reduction and abatement as follows: → Reduction of 806.87 tons CO₂ per year from Buildings → Abatement of 31,741.58 tons CO₂ per year as follows: ◆ Buildings: 18,403.70 tons CO₂/year



ACTION TITLE	RENATURATION OF THE SEA COAST
	◆ Transport: 3,066.83 tons CO₂/year ◆ IPPU: 9,960.36 tons CO₂/year ◆ Waste: 300.81 tons CO₂/year ◆ AFOLU: 9.87 tons CO₂/year
% OF TOTAL CO₂ REDUCTION	2030: 3.61% 2035: 3.52%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 871.65 MWh electrical energy from Scope 2 → 1,527.58 MWh natural gas from Scope 2 → 284.01 MWh thermal energy from Scope 2 2035: Buildings → 958.81 MWh electrical energy from Scope 2 → 1,680.34 MWh natural gas from Scope 2 → 312.41 MWh thermal energy from Scope 2
TIMELINE (START AND END)	2026-2035

ACTION TITLE	DIGITALIZATION OF PUBLIC SERVICES FOR CLIMATE NEUTRALITY
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: City Hall internal staff, local ecosystem (public institutions and organizations, universities and RDI organizations, private companies, NGOs), citizens
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
SYSTEMIC LEVER	→ Technology & Infrastructure → Governance & Policy & Regulations → Learning & Capabilities
EMISSION DOMAIN(S)	TRANSPORT
COVERED INTERVENTIONS	→ Constanța Smart City → Digital City Hall → Re-valuing urban quality & climate neutrality in European waterfront cities (acronym REVALUE) → Software platform for integrated mobility management



ACTION TITLE	DIGITALIZATION OF PUBLIC SERVICES FOR CLIMATE NEUTRALITY
BRIEF DESCRIPTION	CONSTANTA SMART CITY This intervention included a comprehensive set of initiatives and investments aimed at advancing the digitalization of the urban management processes and public services within the municipality. It involves implementing and integrating advanced software solutions and IT systems, alongside developing the required infrastructure (hardware, networks and other connectivity solutions), in order to ensure that the digital tools can be effectively deployed and maintained across various sectors of municipal governance and public service delivery. This smart city intervention aims to improve the efficiency, transparency and accessibility of the local public services, by modernizing and optimizing the internal and external processes through digitalization and the adoption of other technology-driven solutions. DIGITAL CITY HALL This digital transformation intervention involves the deployment of various measures focused on digitizing the operational activities across the structures and departments of the local public administration. The measures include the installation of advanced software and IT systems, alongside the necessary hardware infrastructure, with the goal of optimizing the internal performance, for greater efficiency and effectiveness. As a result, the intervention will enhance the digital maturity of the internal staff and drive the overall advancement of digitalization within the City Hall. RE-VALUING URBAN QUALITY & CLIMATE NEUTRALITY IN EUROPEAN WATERFRONT CITIES (ACRONYM REVALUE) This intervention is part of an international project funded by Horizon Europe, running until early 2027, in which Constanța City Hall and Constanța MA IDA collaborate with 8 other waterfront cities across Europe: Alesund (Norway), Bruges (Belgium), Burgas (Bulgaria), Rimini (Italy), Cascais (Portugal), Izmir (Turkey), Pisek (Czech Republic) and Rijeka (Croatia). The intervention's main goal is to reassess the urban quality of the coastal cities, in light of the new European objectives for climate neutrality. As part of the intervention, the cities' long-term territorial development plans will be updated, in order to better align with the challenges posed by the climate changes and to meet the EU's climate neutrality targets. Various methodologies and tools focused on achieving these climate goals will be developed, tested and shared in a holistic and participatory manner. The intervention will address the following key areas: urban space quality, energy and mobility, circular economy, data- and digital information-based solutions, nature-based solutions for environmental protection. SOFTWARE PLATFORM FOR INTEGRATED MOBILITY MANAGEMENT This intervention focuses on the development of a comprehensive, integrated mobility management software platform, aimed at optimizing and improving the coordination of the local transportation systems. The platform will feature a range of functionalities designed to enhance the traffic flows' efficiency, alleviate the congestion and promote sustainable mobility solutions. It will function as a central digital hub, providing data insights into the local transportation patterns and other mobility-related data. As such, the platform will assist the local authorities in making well-informed decisions and in optimizing the transportation infrastructure and flow management, to better serve the local needs.
	OUTCOME
	Consolidation of a smart city ecosystem for climate neutrality → City Hall → Constanța MA IDA
RESPONSIBLE ENTITY / BODY / PERSON	



ACTION TITLE	DIGITALIZATION OF PUBLIC SERVICES FOR CLIMATE NEUTRALITY
INVOLVED STAKEHOLDERS	→ Public (internal) departments and entities responsible for transportation and mobility → Private providers of digital and technical solutions → Private providers of training services for digital skills → International partners involved in the Re-valuing Urban Quality & Climate Neutrality in European Waterfront Cities project → Other experts specializing in the digitalization of public administrations and urban mobility (including the SUMP consultants) → Local universities and RDI organizations → Local private companies → Local NGOs → Residents
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 765.62 tons CO₂ per year from Transport 2035: 1,684.37 tons CO₂ per year from Transport
% OF TOTAL CO ₂ REDUCTION	2030: 0.09% 2035: 0.18%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Transport → 1,542.35 MWh diesel from Scope 1 → 1,282.38 MWh gasoline from Scope 1 → 5.99 MWh diesel from Scope 3 2035: Transport → 3,393.17 MWh diesel from Scope 1 → 2,821.23 MWh gasoline from Scope 1 → 13.18 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	CLIMATE NEUTRALITY OFFICE DEVELOPMENT AND OPERATIONALIZATION
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: City Hall personnel



ACTION TITLE	CLIMATE NEUTRALITY OFFICE DEVELOPMENT AND OPERATIONALIZATION
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
SYSTEMIC LEVER	→ Governance & Policy & Regulations → Learning & Capabilities
EMISSION DOMAIN(S)	BUILDINGS
COVERED INTERVENTIONS	→ Capacity building for climate governance → Energy manager → PPP Specialist
BRIEF DESCRIPTION	CAPACITY BUILDING FOR CLIMATE GOVERNANCE This intervention seeks to establish a Climate Neutrality Office within the City Hall, to oversee the implementation and monitoring of the CCC, plus capacity building for the team assigned to this Office. The allocated funds include: staff costs, outsourcing expertise in areas where internal capabilities are insufficient, measures to strengthen the know-how on climate neutrality (training activities such as workshops and structured training programs, study visits, knowledge and experience exchanges, participation in thematic events etc. ENERGY MANAGER This intervention involves the appointment of an Energy Manager within the City Hall; the allocated funds cover their salary to oversee and manage the energy-related tasks and initiatives (projects, programs, strategies, policies, energy audits etc. PPP SPECIALIST This intervention involves the appointment of an Energy Manager within the City Hall; the allocated funds cover their salary to oversee and manage the energy-related tasks and initiatives (projects, programs, strategies, policies, energy audits etc.
OUTCOME	Efficient organisational framework for the implementation of climate neutral policies
RESPONSIBLE ENTITY / BODY / PERSON	City Hall
INVOLVED STAKEHOLDERS	→ City Hall staff → M100 National Hub → External training providers (specialized in fields related to climate neutrality and energy management) → Outsourced experts (consultancy and technical assistance providers)
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 23,752.24 tons CO₂ per year from Buildings 2035: 28,686.11 tons CO₂ per year from Buildings
% OF TOTAL CO₂ REDUCTION	2030: 2.90% 2035: 3.10%



ACTION TITLE	CLIMATE NEUTRALITY OFFICE DEVELOPMENT AND OPERATIONALIZATION
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 20,478.42 MWh electrical energy from Scope 2 → 58,985.86 MWh natural gas from Scope 2 → 10,966.61 MWh thermal energy from Scope 2 2035: Buildings → 25,729.29 MWh electrical energy from Scope 2 → 74,110.44 MWh natural gas from Scope 2 → 13,778.56 MWh thermal energy from Scope 2
TIMELINE (START AND END)	2026-2035

ACTION TITLE	LOCAL NETZERO COALITION ESTABLISHMENT, MAINTENANCE AND GROWTH
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: metropolitan → TARGET GROUP: metropolitan ecosystem (public institutions and organizations, universities and RDI organizations, private companies, NGOs), citizens, any other interested stakeholder
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
SYSTEMIC LEVER	→ Governance & Policy & Regulations → Learning & Capabilities → Democracy & Participation → Social Innovation → Finance & Funding
EMISSION DOMAIN(S)	Buildings, Transport
COVERED INTERVENTIONS	→ Formalization and activation of the local netzero coalition → Climate neutrality metropolitan caravan → Workshops focused on fostering a metropolitan approach to climate neutrality → Climate neutrality neighborhood advisory councils
BRIEF DESCRIPTION	FORMALIZATION AND ACTIVATION OF THE LOCAL NETZERO COALITION This intervention envisions the creation, maintenance, and expansion of a NetZero Coalition to engage a wide range of stakeholders (from public sector entities, to citizen organizations, NGOs, private companies, real estate developers, universities, and RDI organizations, as well as various national and international experts). Other entities targeted for membership in the Coalition include Chambers of Commerce, associative



ACTION TITLE

LOCAL NETZERO COALITION ESTABLISHMENT, MAINTENANCE AND GROWTH

structures (e.g., clusters, hotel associations, Homeowners Associations), as well as key organizations like Constanța Port Authority, alongside the individual citizens. The aim is to mobilize resources, including financial support, and to pool expertise across key sectors, fostering broad participation to effectively advance the net-zero agenda. The formalization component includes the work done to promote the Coalition and attract members from the local ecosystem. The activation component includes capacity-building initiatives for the Coalition members, along with a range of activities (e.g., meetings, working sessions, workshops) and events (e.g., public debates and consultations, conferences, thematic hackathons and ideathons). Among its initiatives, the Coalition would promote the adoption of green energy solutions and energy efficiency measures in private buildings, including residential homes and apartments, service-sector facilities, and industrial sites. It would also advance circular economy initiatives, such as expanding the municipal composting programs, incentivizing the recycling of construction and demolition waste, and partnering with the local businesses to reduce single-use packaging. By leveraging the expertise and networks of its members, the Coalition could also facilitate the development of pilot projects (e.g., waste-to-energy facilities, energy communities, and any other potential social and technological innovations emerging from the local universities and businesses), while advocating for regulatory changes (e.g., those supporting green mobility, traffic reduction, zero-waste policies across the metropolitan area etc.).

CLIMATE NEUTRALITY METROPOLITAN CARAVAN

This intervention involves organizing a Climate Neutrality Caravan across the LAUs of the metropolitan area, coordinated by Constanța Metropolitan Area IDA, to scale the impact of the CCC to the metropolitan level. The initiative will engage the local public administration staff, the stakeholders from the local ecosystems, and the citizens to build awareness and foster active participation in climate action, supporting the achievement of climate neutrality by 2030 and expanding these efforts further by 2035.

WORKSHOPS FOCUSED ON FOSTERING A METROPOLITAN APPROACH TO CLIMATE NEUTRALITY

This intervention includes capacity-building and preparatory activities to strengthen the interjurisdictional cooperation within Constanța's metropolitan area, which will be very important for achieving climate neutrality by 2030 and scaling the decarbonization efforts by 2035. The workshops will focus on bridging the transition gaps between the LAUs and fostering collaborative approaches and solutions to reduce the GHG emissions across the metropolitan area. They will also support the local administrations in aligning their plans and actions, ensuring consistent and coordinated implementation of climate change mitigation measures.

CLIMATE NEUTRALITY NEIGHBORHOOD ADVISORY COUNCILS

This intervention involves establishing and operationalizing Climate Neutrality Neighborhood Advisory Councils to strengthen community engagement in climate action. These Councils will encourage the residents to actively participate in various climate change mitigation initiatives led by the public administration and its related institutions, and also the ones implemented by the local NGOs, while also mobilizing the citizens to adopt measures to reduce their own CO₂ footprints within their households and neighborhoods. Moreover, by fostering collaboration among the residents, the Councils will also help form neighborhood-scale clusters dedicated to climate neutrality initiatives. Beyond mobilizing and connecting the residents, the Councils will also gather proposals from their communities for submission to the Local Council, activate the public spaces to encourage climate-friendly behaviors, organize community debates (including in



ACTION TITLE	LOCAL NETZERO COALITION ESTABLISHMENT, MAINTENANCE AND GROWTH
	schools), and host events that support the implementation of the interventions outlined in the Climate Neutrality Action Plan. The activities of these Councils will be coordinated by the Homeowners Associations, to ensure effective community representation and sustained action.
OUTCOME	Local and metropolitan ecosystem of relevant actors for climate policies
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța MA IDA
INVOLVED STAKEHOLDERS	→ Local public institutions and organizations → Local universities and RDI organizations → Local private companies → Local NGOs → Other local associative structures → Homeowners Associations → Residents → Private providers (including NGOs) which offer services for event organization, specialized training and for other activities related to the 4 interventions → Organizations (e.g., various funding entities, private companies) which can provide funding for the activities associated with the 4 interventions → M100 National Hub → Romanian Order of Architects → World Bank
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 44,973.77 tons CO₂ per year as follows: → Buildings: 24,361.27 tons CO₂/year → Transport: 612.50 tons CO₂/year → Waste: 20,000.00 tons CO₂/year abated from Scope 3 2035: 49,603.57 tons CO₂ per year as follows: → Buildings: 26,929.82 tons CO₂/year → Transport: 673.75 tons CO₂/year → Waste: 22,000.00 tons CO₂/year abated from Scope 3
% OF TOTAL CO₂ REDUCTION	2030: 5.50% 2035: 5.37%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 21,003.51 MWh electrical energy from Scope 2 → 60,498.32 MWh natural gas from Scope 2 → 11,247.80 MWh thermal energy from Scope 2 Transport



ACTION TITLE	LOCAL NETZERO COALITION ESTABLISHMENT, MAINTENANCE AND GROWTH
	→ 1,233.88 MWh diesel from Scope 1 → 1,025.90 MWh gasoline from Scope 1 → 4.79 MWh diesel from Scope 3 2035: Buildings → 24,154.03 MWh electrical energy from Scope 2 → 69,573.07 MWh natural gas from Scope 2 → 12,934.97 MWh thermal energy from Scope 2 Transport → 1,357.27 MWh diesel from Scope 1 → 1,128.49 MWh gasoline from Scope 1 → 5.27 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	JOINT CLIMATE MITIGATION - ADAPTATION APPROACHES
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local, metropolitan, regional (South-East Development Region) → TARGET GROUP: City Hall, Constanța MA IDA, the other LAUs within Constanța's metropolitan area, citizens
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
SYSTEMIC LEVER	→ Governance & Policy & Regulations → Learning & Capabilities
EMISSION DOMAIN(S)	Buildings, Transport, IPPU
COVERED INTERVENTIONS	→ Applying urban planning principles which promote integrated climate mitigation and adaptation approaches → Operationalization of the Constanța branch of the National Competence Center on Adaptation to Climate Change
BRIEF DESCRIPTION	APPLYING URBAN PLANNING PRINCIPLES WHICH PROMOTE INTEGRATED CLIMATE MITIGATION AND ADAPTATION APPROACHES This intervention involves incorporating the existing guidelines (e.g., those for green spaces in residential areas and urban regeneration) into the territorial planning documents, including by annexing them to the urban planning certificates. By embedding these guidelines into the planning processes, the intervention will play a critical role in advancing climate neutrality, while simultaneously enhancing climate change adaptation and resilience at both the local and metropolitan levels, ensuring that the future developments actively contribute to reducing the CO2 emissions and mitigating climate risks. OPERATIONALIZATION OF THE CONSTANTA BRANCH OF NATIONAL COMPETENCE



ACTION TITLE	JOINT CLIMATE MITIGATION - ADAPTATION APPROACHES
	CENTER ON ADAPTATION TO CLIMATE CHANGE – DTE CLIMATE Between 2023 and 2025, the DTE Climate project—Competence Center for Climate Change Digital Twin for Earth Forecasts and Societal Redressment—is being implemented. This project aims to establish a National Competence Center for Climate Change Adaptation. As part of this effort, the Ovidius University of Constanța has founded the Constanța Branch of the National Center and a website is developed (https://dteclimate.insae.ro). The project is in the implementation process and shall be finalized on December 31st 2025. This intervention aims to support the operationalization of the Constanța branch of the Center, by developing the procedures for integrating the local decision organizations and stakeholders. Additionally, it seeks to secure the required approvals for incorporating DTE Climate into the decision-making processes for climate change adaptation at both the city and county levels. As such, the intervention includes monitoring related ecosystems to assess environmental changes and conducting in-depth modelling and analyses to better understand climate dynamics. Risk analyses will be carried out to identify vulnerabilities and enhance governance frameworks for climate change adaptation. Another key aspect of the intervention is the co-creation and co-design of resilience-building and adaptation measures, together with the relevant stakeholders. Feasibility studies will support informed decision-making, while capacity-building initiatives will equip local organizations and stakeholders with the necessary knowledge and skills to implement effective adaptation measures.
OUTCOME	Measures for adaptation to climate change in Constanța Municipality and Constanța County Efficient organisational framework for the implementation of climate neutral policies
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța MA IDA → Constanța County Council → Ovidius University
INVOLVED STAKEHOLDERS	→ City Hall Staff → M100 National Hub → Outsourced experts (consultancy and technical assistance providers) → Other LAUs within Constanta's metropolitan area → Developers of the relevant existing guidelines → Consultants responsible for the territorial planning documents → Romanian Order of Architects → Other external experts specialized in urban development and climate changes → Real estate developers → Developers of the works/investments/projects referenced in the relevant guidelines
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 10,888.06 tons CO₂ per year as follows: → Buildings: 10,428.69 tons CO₂/year → Transport: 459.37 tons CO₂/year 2035: 12,052.77 tons CO₂ per year as follows: → Buildings: 11,516.83 tons CO₂/year → Transport: 535.94 tons CO₂/year



ACTION TITLE	JOINT CLIMATE MITIGATION - ADAPTATION APPROACHES
% OF TOTAL CO₂ REDUCTION	2030: 1.33% 2035: 1.30%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 9,584.11 MWh electrical energy from Scope 2 → 29,805.34 MWh natural gas from Scope 2 Transport → 925.41 MWh diesel from Scope 1 → 769.43 MWh gasoline from Scope 1 → 3.59 MWh diesel from Scope 3 2035: Buildings → 11,021.73 MWh electrical energy from Scope 2 → 34,276.14 MWh natural gas from Scope 2 Transport → 1,079.65 MWh diesel from Scope 1 → 897.66 MWh gasoline from Scope 1 → 4.19 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	CLIMATE NEUTRALITY BRANDING
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local → TARGET GROUP: local ecosystem (public institutions and organizations, universities and RDI organizations, private companies, NGOs), citizens
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
SYSTEMIC LEVER	Governance & Policy & Regulations
EMISSION DOMAIN(S)	BUILDINGS, IPPU
COVERED INTERVENTIONS	→ Branding the city as a model of sustainability, highlighting the successful partnership between the public and private sectors
BRIEF DESCRIPTION	BRANDING THE CITY AS A MODEL OF SUSTAINABILITY, HIGHLIGHTING THE SUCCESSFUL PARTNERSHIP BETWEEN THE PUBLIC AND PRIVATE SECTORS



	This intervention focuses on developing a brand that integrates the local identity with Constanța's strategic commitment to sustainability and climate neutrality, serving as a catalyst to mobilize both the community and organizational stakeholders to actively contribute to achieving the local climate goals. It aims to foster cooperation with the private sector, while also encouraging community involvement in climate action. The intervention also foresees communicating, promoting, and applying the brand through participation in and organization of relevant events, creating a shared platform that inspires collective action towards climate neutrality at the local level.
OUTCOME	Enhanced reputation and attractiveness, climate leadership, stronger public-private collaboration, stronger public engagement and support
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Branding experts
INVOLVED STAKEHOLDERS	→ Local private companies → Local NGOs → Local associative structures (including civic groups) → Residents
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 24,102.25 tons CO₂ per year as follows: → Buildings: 5,415.56 tons CO₂/year → IPPU: 18,686.69 tons CO₂/year 2035: 26,993.48 tons CO₂ per year as follows: → Buildings: 9,349.08 tons CO₂/year → IPPU: 17,644.40 tons CO₂/year
% OF TOTAL CO₂ REDUCTION	2030: 2.95% 2035: 2.92%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 5,059.89 MWh electrical energy from Scope 2 → 14,271.88 MWh natural gas from Scope 2 → 931.63 MWh thermal energy from Scope 2 IPPU → 12,638.17 MWh electrical energy from Scope 2 → 25,760.80 MWh natural gas from Scope 2 2035: Buildings → 9,107.81 MWh electrical energy from Scope 2 → 25,689.38 MWh natural gas from Scope 2 → 1,676.94 MWh thermal energy from Scope 2



TIMELINE (START AND END)	IPPU → 17,693.44 MWh electrical energy from Scope 2 → 36,065.12 MWh natural gas from Scope 2
	2026-2035

ACTION TITLE	CLIMATE NEUTRALITY REGULATIONS
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: metropolitan → TARGET GROUP: local ecosystem (public institutions and organizations, universities and RDI organizations, private companies, NGOs), citizens, any other interested stakeholder
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
SYSTEMIC LEVER	→ Governance & Policy & Regulations → Learning & Capabilities
EMISSION DOMAIN(S)	BUILDINGS, TRANSPORT
COVERED INTERVENTIONS	→ Low emission zones → NZEB TOR for building renovation → Revision of local urban planning regulations to support the transition towards climate neutrality → Condominium governance innovations
BRIEF DESCRIPTION	LOW EMISSION ZONES This intervention will establish and operationalize low emission zones through effective regulations, demarcation, promotion, and the development of monitoring applications, reducing the transport-related emissions as a critical step towards climate neutrality by 2030, with further expansion and optimization planned by 2035. NZEB TOR FOR BUILDING RENOVATION The nZEB terms of reference for building renovation will be developed and implemented to embed the nearly Zero-Energy Building principles into the renovation of both the private and public buildings, aligning the building sector with the climate neutrality objectives by 2030, while scaling up these standards by 2035 to deepen the emission reductions in the built environment. REVISION OF LOCAL URBAN PLANNING REGULATIONS TO SUPPORT THE TRANSITION TOWARDS CLIMATE NEUTRALITY The revision of the local urban planning regulations will be carried out to align the territorial development with the official climate neutrality commitments, ensuring that both the new and the ongoing urban developments actively contribute to the emission reduction targets by 2030, with continuous updates and expansions by 2035 to integrate the evolving best practices and capture additional emission



ACTION TITLE	CLIMATE NEUTRALITY REGULATIONS
	reduction opportunities.
	CONDOMINIUM GOVERNANCE INNOVATIONS This intervention will create new governance models for the residential condominiums, enabling their integration into the local climate neutrality framework and the Local NetZero Coalition. By 2030, these models will empower the residents to participate actively in the emission reduction efforts, with further scaling and replication across the metropolitan area by 2035 to broaden the collective climate impact. These interventions will be prioritized for implementation by 2030 to achieve climate neutrality in Constanța, forming a cornerstone of the city's emission reduction approach. By 2035, they will be further expanded to broaden the scope of the emission reduction and capture, ensuring sustained progress towards deeper decarbonization and also increased climate resilience.
	Innovative regulatory framework for climate neutrality
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța MA IDA
INVOLVED STAKEHOLDERS	→ Real estate developers → Homeowners Associations → Residents → Romanian Order of Architects → Romanian Green Buildings Council → Other external experts specialized in territorial planning, urban development and climate changes → Ministry of Public Works
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 25,809.10 tons CO₂ per year as follows: → Buildings: 24,430.97 tons CO₂/year → Transport: 1,378.12 tons CO₂/year 2035: 26,252.08 tons CO₂ per year as follows: → Buildings: 24,644.27 tons CO₂/year → Transport: 1,607.81 tons CO₂/year
% OF TOTAL CO₂ REDUCTION	2030: 3.15% 2035: 2.84%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 20,126.64 MWh electrical energy from Scope 2 → 62,591.21 MWh natural gas from Scope 2



ACTION TITLE	CLIMATE NEUTRALITY REGULATIONS
	→ 11,475.60 MWh thermal energy from Scope 2 Transport → 2,776.23 MWh diesel from Scope 1 → 2,308.28 MWh gasoline from Scope 1 → 10.78 MWh diesel from Scope 3 2035: Buildings → 21,085.05 MWh electrical energy from Scope 2 → 65,571.75 MWh natural gas from Scope 2 → 12,022.06 MWh thermal energy from Scope 2 Transport → 3,238.94 MWh diesel from Scope 1 → 2,692.99 MWh gasoline from Scope 1 → 12.58 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	RAISING AWARENESS AND ENGAGING LOCAL ECOSYSTEMS TO ACHIEVE CLIMATE NEUTRALITY
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: local, metropolitan → TARGET GROUP: residents, utility providers, energy suppliers, related service providers, metropolitan ecosystem (public institutions and organizations, universities and RDI organizations, private companies, NGOs, educational institutions), citizens
FIELD OF ACTION	SOCIAL AND OTHER INNOVATION
SYSTEMIC LEVER	→ Finance & Funding → Learning & Capabilities → Democracy & Participation → Social Innovation
EMISSION DOMAIN(S)	ALL
COVERED INTERVENTIONS	→ Transform Waste: Zero Waste Project for a Sustainable Future → Collaboration with architects and urban planners to promote the adoption of climate neutrality-focused approaches → Climate neutrality engagement initiatives for pupils and students → Metropolitan communication on climate neutrality → Including climate measures in the participatory budgeting → Civic imagination & innovation for climate neutrality → Establishment and operationalization of the Faleză Nord Energy Community



ACTION TITLE	RAISING AWARENESS AND ENGAGING LOCAL ECOSYSTEMS TO ACHIEVE CLIMATE NEUTRALITY
BRIEF DESCRIPTION	TRANSFORM WASTE: ZERO WASTE PROJECT FOR A SUSTAINABLE FUTURE This intervention is part of an international project in which Constanța participates as a partner. It focuses on soft measures aimed at primary school students, with the goal of raising awareness among the children and the young people about biodiversity, environmental protection and the prevention, reduction, reuse and recycling of plastic waste. The key activities within this intervention include mobilization (free distribution of containers for collecting plastic bottles), education and engagement (through videos, printed materials, events and competitions).
	COLLABORATION WITH ARCHITECTS AND URBAN PLANNERS TO PROMOTE THE ADOPTION OF CLIMATE NEUTRALITY-FOCUSED APPROACHES This intervention aims to advance climate neutrality by strengthening collaboration with experts from the Romanian Order of Architects and the Romanian Register of Urban Planners to facilitate targeted discussions on urbanism and architecture topics critical for emission reduction and also climate resilience. Through thematic meetings, public debates, and workshops on subjects such as nZEB standards, energy efficiency, urban regeneration, and green space development, the intervention will build professional capacity and align the local practices with the assumed climate neutrality goals. The allocated funds will cover the trainer, speaker, and moderator costs, along with event organization expenses, ensuring effective knowledge transfer and stakeholder alignment to support Constanța's climate neutrality targets.
	CLIMATE NEUTRALITY ENGAGEMENT INITIATIVES FOR PUPILS AND STUDENTS This intervention combines measures designed to engage the children and young people (alongside their families, teachers, mentors, and peers) in activities that directly support the transition to climate neutrality. By organizing educational and awareness campaigns, thematic sustainability and climate mitigation workshops in schools, and training Youth Ambassadors to promote climate neutrality among their peers, the intervention aims to instil climate-conscious mindsets and behaviors from an earlier age. In doing so, it will help shape a generation committed to sustainable practices, ensuring long-term positive changes that will reinforce and expand the city's efforts towards achieving and maintaining climate neutrality for years to come.
	METROPOLITAN COMMUNICATION ON CLIMATE NEUTRALITY This intervention involves developing and distributing publication materials (e.g., brochures, leaflets, newsletters) across the metropolitan area and to the broader public, to educate and empower the residents to adopt climate change mitigation behaviors and habits. By providing clear, accessible information on various climate-neutral actions (e.g., installing household solar panels, practicing selective waste recycling, choosing bicycles or public transport over private cars), the intervention will actively support the community's participation in the metropolitan climate neutrality efforts. Through informed choices and correct daily actions, the residents will contribute directly to reducing the emissions and advancing the area's transition towards climate neutrality. INCLUDING CLIMATE MEASURES IN THE PARTICIPATORY BUDGETING This intervention involves integrating climate neutrality elements and related financing into the existing participatory budgeting processes at the local level. By doing so, it will empower the residents to propose and support projects that offer concrete solutions for climate change mitigation (both in terms of carbon reduction, and carbon storage) within their communities. This approach will enable the citizens to actively contribute to the city's climate neutrality goals.



ACTION TITLE	RAISING AWARENESS AND ENGAGING LOCAL ECOSYSTEMS TO ACHIEVE CLIMATE NEUTRALITY
	CIVIC IMAGINATION & INNOVATION FOR CLIMATE NEUTRALITY This intervention organizes sessions on civic imagination and innovation, including at the neighborhood level, to foster social innovation that can accelerate climate change mitigation actions. By actively engaging the citizens, these sessions will spark fresh ideas and empower the local community to co-create innovative solutions, driving collective ownership and generating new tangible pathways for the local transition towards climate neutrality. ESTABLISHMENT AND OPERATIONALIZATION OF THE FALEZĂ NORD ENERGY COMMUNITY The EU Directive on energy efficiency no. 1791/2023 is putting the energy efficiency principle as the fundamental principle of energy policy within the EU member states. The provisions of the Directive have been implemented in the national legislation and the adjustment of strategies and policies are on the way. A central role in implementing the new vision on energy efficiency can be played by renewable energy communities and citizen energy communities that are generically called energy communities. The intervention is aiming to pilot the establishment of such a community in a very special district of the municipality – Faleză Nord. The position of the district is unique because it is located near the seashore that gives the opportunity for testing the use of heat pumps connected to the sea water and is located at a very high distance from the future powerplant that makes the transportation of thermal energy very expensive. This intervention encompasses a comprehensive set of activities aimed at establishing and operationalizing an Energy Community in the Faleză Nord district. It begins with the identification of core members of the energy community, including residents, utility providers, energy suppliers, service providers, and other key stakeholders. A detailed energy audit at the district level follows, alongside an evaluation of air quality and an assessment of the renewable energy potential, secondary energy resources, and existing energy supply facilities. Building on these insights, a targeted energy efficiency improvement strategy will be developed for the district. A specialized tool for modelling and simulating energy efficiency measures will also be created to support decision-making. Additionally, the intervention will explore the feasibility of developing heating and cooling solutions that use seawater as a thermal energy source and heat sink. Another key aspect of this intervention is the co-creation and co-design of measures to enhance energy efficiency while integrating renewable and secondary energy resources. To ensure long-term impact, continuous monitoring and evaluation of air quality and the habitat within the district will be conducted. Furthermore, an awareness-building and participatory decision-making platform will be established to engage the community effectively. Finally, dissemination and communication efforts will ensure that findings and best practices are widely shared.
OUTCOME	Full operational energy district that shall serve as an example of best practice of energy community that shall be replicated in the other districts of the city Enhanced civic engagement and increased stakeholder participation in achieving the climate neutrality goals
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța MA IDA → Energy Manager → Innovation Cluster MEDGreen → Constanța County School Inspectorate



ACTION TITLE	RAISING AWARENESS AND ENGAGING LOCAL ECOSYSTEMS TO ACHIEVE CLIMATE NEUTRALITY
INVOLVED STAKEHOLDERS	→ Local NGOs
	→ Local kindergartens, schools, high schools and universities → Residents → Homeowners Associations → Utility providers → Energy suppliers → Related service providers → South-East Regional Development Agency → Ministry of Energy → Energy Regulatory Authority → Private companies → Romanian Order of Architects → Romanian Register of Urban Planners → Other architects, urban planners, urban development experts and climate specialists → Private providers (including NGOs) which offer services for event organization and other services related to the 5 interventions → M100 National Hub
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 102,856.96 tons CO₂ per year as follows: → Buildings: 39,744.35 tons CO₂/year → Transport: 802.68 tons CO₂/year → IPPU: 26,161.37 tons CO₂/year → Waste: 36,134.140 tons CO₂/year (including 35,000 tons CO₂/year abated from Scope 3) → AFOLU: 14.42 tons CO₂/year 2035: 130,560.68 tons CO₂ per year as follows: → Buildings: 39,387.58 tons CO₂/year → Transport: 1,159.43 tons CO₂/year → IPPU: 50,412.58 tons CO₂/year → Waste: 39,580.93 tons CO₂/year (including 38,500 tons CO₂/year abated from Scope 3) → AFOLU: 20.16 tons CO₂/year
% OF TOTAL CO ₂ REDUCTION	2030: 12.57% 2035: 14.13%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 33,673.57 MWh electrical energy from Scope 2 → 99,822.23 MWh natural gas from Scope 2 → 18,558.87 MWh thermal energy from Scope 2



ACTION TITLE	RAISING AWARENESS AND ENGAGING LOCAL ECOSYSTEMS TO ACHIEVE CLIMATE NEUTRALITY
	Transport → 1,800.46 MWh diesel from Scope 1 → 1,154.14 MWh gasoline from Scope 1 → 6.22 MWh diesel from Scope 3 IPPU → 17,693.44 MWh electrical energy from Scope 2 → 36,065.12 MWh natural gas from Scope 2 Waste → 1,635.95 MWh electrical energy from Scope 2 AFOLU → 52.13 MWh diesel from Scope 1 → 0.04 MWh electrical energy from Scope 2 → 0.15 MWh diesel from Scope 3 2035: Buildings → 34,693.98 MWh electrical energy from Scope 2 → 102,847.14 MWh natural gas from Scope 2 → 19,121.26 MWh thermal energy from Scope 2 Transport → 2,600.66 MWh diesel from Scope 1 → 1,667.09 MWh gasoline from Scope 1 → 8.99 MWh diesel from Scope 3 IPPU → 50,552.67 MWh electrical energy from Scope 2 → 103,043.20 MWh natural gas from Scope 2 Waste → 1,916.87 MWh electrical energy from Scope 2 AFOLU → 72.98 MWh diesel from Scope 1 → 0.05 MWh electrical energy from Scope 2 → 0.21 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	ART PROMOTING CLIMATE NEUTRALITY
TYPE OF ACTION	Soft intervention
SCALE AND TARGET	→ SCALE: metropolitan



ACTION TITLE	ART PROMOTING CLIMATE NEUTRALITY
GROUP (ADDRESSED ENTITIES)	→ TARGET GROUP: creative industries stakeholders, citizens
FIELD OF ACTION	SOCIAL AND OTHER INNOVATION
SYSTEMIC LEVER	→ Democracy & Participation → Social Innovation → Finance & Funding
EMISSION DOMAIN(S)	BUILDINGS, TRANSPORT, IPPU, WASTE, AFOLU
COVERED INTERVENTIONS	→ Contemporary art for climate neutrality (including artworks themselves, artists, exhibitions in museums)
BRIEF DESCRIPTION	CONTEMPORARY ART FOR CLIMATE NEUTRALITY (INCLUDING ARTWORKS THEMSELVES, ARTISTS, EXHIBITIONS IN MUSEUMS) This intervention includes supporting, promoting and showcasing various forms of art, artistic expressions and artists within the city, focusing on themes related to climate neutrality (supporting artists, producing climate-themed artworks, organizing exhibitions and events to raise awareness and inspire action towards climate mitigation practices and behaviors and also to foster cultural dialogues on climate change issues). The allocated funds will be used for the artists' remuneration, producing the artworks, organizing exhibitions and related activities.
OUTCOME	Increased visibility of climate neutrality in the physical environment through street art
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Cultural institutions (at local, metropolitan, county, regional levels) → Artists
INVOLVED STAKEHOLDERS	→ NGOs (especially the ones active in the cultural sector) → Additional stakeholders in the cultural and artistic sectors / creative industries → Residents → Private companies → National Cultural Fund Administration → Ministry of Culture
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	2030: 21,374.83 tons CO₂ per year as follows: → Buildings: 9,634.99 tons CO₂/year → Transport: 535.12 tons CO₂/year → IPPU: 10,090.81 tons CO₂/year → Waste: 1,099.78 tons CO₂/year → AFOLU: 14.12 tons CO₂/year 2035: 25,968.78 tons CO₂ per year as follows: → Buildings: 11,584.58 tons CO₂/year → Transport: 891.87 tons CO₂/year → IPPU: 12,351.08 tons CO₂/year → Waste: 1,118.20 tons CO₂/year → AFOLU: 23.04 tons CO₂/year



ACTION TITLE	ART PROMOTING CLIMATE NEUTRALITY
% OF TOTAL CO ₂ REDUCTION	2030: 2.61% 2035: 2.81%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 8,163.29 MWh electrical energy from Scope 2 → 24,199.33 MWh natural gas from Scope 2 → 4,499.12 MWh thermal energy from Scope 2 Transport → 1,200.31 MWh diesel from Scope 1 → 769.43 MWh gasoline from Scope 1 → 4.15 MWh diesel from Scope 3 IPPU → 6,824.61 MWh electrical energy from Scope 2 → 13,910.83 MWh natural gas from Scope 2 Waste → 1,586.38 MWh electrical energy from Scope 2 AFOLU → 51.09 MWh diesel from Scope 1 → 0.04 MWh electrical energy from Scope 2 → 0.15 MWh diesel from Scope 3
	2035: Buildings → 10,204.11 MWh electrical energy from Scope 2 → 30,249.16 MWh natural gas from Scope 2 → 5,623.90 MWh thermal energy from Scope 2 Transport → 2,000.51 MWh diesel from Scope 1 → 1,282.38 MWh gasoline from Scope 1 → 6.92 MWh diesel from Scope 3 IPPU → 12,385.40 MWh electrical energy from Scope 2 → 25,245.58 MWh natural gas from Scope 2 Waste → 1,982.97 MWh electrical energy from Scope 2 AFOLU



ACTION TITLE	ART PROMOTING CLIMATE NEUTRALITY
	→ 83.40 MWh diesel from Scope 1 → 0.06 MWh electrical energy from Scope 2 → 0.24 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035

ACTION TITLE	ENCOURAGING BEHAVIORAL CHANGES TOWARDS CLIMATE CHANGE MITIGATION
TYPE OF ACTION	Soft intervention
SCALE AND TARGET GROUP (ADDRESSED ENTITIES)	→ SCALE: metropolitan → TARGET GROUP: metropolitan ecosystem (public institutions and organizations, universities and RDI organizations, private companies, NGOs, educational institutions), citizens
FIELD OF ACTION	SOCIAL AND OTHER INNOVATION
SYSTEMIC LEVER	→ Finance & Funding → Learning & Capabilities → Democracy & Participation → Social Innovation
EMISSION DOMAIN(S)	BUILDINGS, TRANSPORT, IPPU, WASTE, AFOLU
COVERED INTERVENTIONS	→ Promoting behavioral changes to adopt sustainable energy solutions (e.g., reducing energy consumption, transitioning to green energy alternatives) → Promoting behavioral changes to adopt sustainable waste management and circular economy practices (e.g., selective waste sorting, composting biodegradable waste, minimizing waste generation - including reducing food waste and the disposal of clothing) → Promoting behavioral changes to adopt active and low-emission mobility options (e.g., walking, cycling, adopting eco-friendly micro mobility solutions, using public transport, car-sharing) → Promoting behavioral changes to adopt joint climate change mitigation and adaptation practices → New educational products for climate neutrality
BRIEF DESCRIPTION	PROMOTING BEHAVIORAL CHANGES TO ADOPT SUSTAINABLE ENERGY SOLUTIONS (E.G., REDUCING ENERGY CONSUMPTION, TRANSITIONING TO GREEN ENERGY ALTERNATIVES) This intervention combines awareness-raising, informational and educational activities with activation measures (e.g., incentives and other forms of support), to engage the population and promote the adoption of sustainable energy solutions within the citizens' households. PROMOTING BEHAVIORAL CHANGES TO ADOPT SUSTAINABLE WASTE MANAGEMENT AND CIRCULAR ECONOMY PRACTICES (E.G., SELECTIVE WASTE SORTING, COMPOSTING BIODEGRADABLE WASTE, MINIMIZING WASTE GENERATION - INCLUDING REDUCING FOOD WASTE AND THE DISPOSAL OF CLOTHING)



ACTION TITLE	ENCOURAGING BEHAVIORAL CHANGES TOWARDS CLIMATE CHANGE MITIGATION
	This intervention combines awareness-raising, informational and educational activities with activation measures (e.g., incentives and other forms of support), to engage the population and promote the adoption of sustainable waste management behaviors. PROMOTING BEHAVIORAL CHANGES TO ADOPT ACTIVE AND LOW-EMISSION MOBILITY OPTIONS (E.G., WALKING, CYCLING, ADOPTING ECO-FRIENDLY MICRO MOBILITY SOLUTIONS, USING PUBLIC TRANSPORT, CAR-SHARING) This intervention combines awareness-raising, informational and educational activities with activation measures (e.g., incentives and other forms of support), to engage the population and promote the adoption of cleaner and healthier mobility solutions for their travel needs. PROMOTING BEHAVIORAL CHANGES TO ADOPT JOINT CLIMATE CHANGE MITIGATION AND ADAPTATION PRACTICES This intervention includes a combination of awareness-raising, informational and educational activities, alongside various activation measures (e.g., incentives and other forms of support) to engage the public and promote solutions which simultaneously reduce the households' carbon footprints and enhance their resilience to the climate changes, thereby also reducing the individuals' daily vulnerability to the adverse meteorological manifestations. Simultaneously, all of the above-mentioned interventions will also seek to educate and mobilize the local and metropolitan organizations (institutions, companies, other entities), with the same objectives: raising awareness, fostering motivation and promoting (pro)active participation across the 4 key focus areas targeted by these interventions. NEW EDUCATIONAL PRODUCTS FOR CLIMATE NEUTRALITY This intervention focuses on developing and delivering a variety of curricular and extracurricular educational initiatives across all the educational levels — from the primary and secondary schools (e.g., Green Week in schools) to high schools, universities, and postgraduate programs (e.g., specialized study programs). All of these will equip the learners with both theoretical knowledge and practical solutions for climate change mitigation through carbon emission reduction and capture, tailored to each education level, from foundational concepts to advanced approaches. The content will cover all the fields of action and all the categories of systemic levers, carefully adapted to the learners' age and area of specialization.
OUTCOME	Higher adoption of individual behaviors and organizational practices which reduce the carbon footprint of individuals and organizations, enhanced ability to adapt to the climate changes
RESPONSIBLE ENTITY / BODY / PERSON	→ City Hall → Constanța MA IDA → Constanța County School Directorate → Local universities → Local NGOs
INVOLVED STAKEHOLDERS	→ Residents → Local kindergartens, schools, high schools and universities → Private companies → Local public institutions



ACTION TITLE	ENCOURAGING BEHAVIORAL CHANGES TOWARDS CLIMATE CHANGE MITIGATION
GHG EMISSIONS REDUCTION ESTIMATE (TOTAL) PER EMISSION SOURCE SECTOR	→ Other local organizations → M100 National Hub → Any other organization which can support (for instance, through funding) and assist in implementing (for instance, by providing the necessary expertise) the activities included in the interventions
	2030: 73,591.01 tons CO₂ per year as follows: → Buildings: 31,313.73 tons CO₂/year → Transport: 802.68 tons CO₂/year → IPPU: 15,323.09 tons CO₂/year → Waste: 26,122.69 tons CO₂/year (including 25,000 tons CO₂/year abated from Scope 3) → AFOLU: 28.75 tons CO₂/year 2035: 84,697.37 tons CO₂ per year as follows: → Buildings: 31,278.38 tons CO₂/year → Transport: 1,783.74 tons CO₂/year → IPPU: 22,685.66 tons CO₂/year → Waste: 28,897.75 tons CO₂/year (including 27,500 tons CO₂/year abated from Scope 3) → AFOLU: 51.84 tons CO₂/year
% OF TOTAL CO ₂ REDUCTION	2030: 8.99% 2035: 9.16%
GENERATED RENEWABLE ENERGY (IF APPLICABLE)	-
REMOVED / SUBSTITUTED ENERGY, VOLUME OR FUEL TYPE	2030: Buildings → 26,530.69 MWh electrical energy from Scope 2 → 78,647.82 MWh natural gas from Scope 2 → 14,622.14 MWh thermal energy from Scope 2 Transport → 1,800.46 MWh diesel from Scope 1 → 1,154.14 MWh gasoline from Scope 1 → 6.22 MWh diesel from Scope 3 IPPU → 10,363.30 MWh electrical energy from Scope 2 → 21,123.86 MWh natural gas from Scope 2 Waste → 1,619.43 MWh electrical energy from Scope 2 AFOLU → 104.26 MWh diesel from Scope 1



ACTION TITLE	ENCOURAGING BEHAVIORAL CHANGES TOWARDS CLIMATE CHANGE MITIGATION
	→ 0.08 MWh electrical energy from Scope 2 → 0.30 MWh diesel from Scope 3 2035: Buildings → 27,551.10 MWh electrical energy from Scope 2 → 81,672.73 MWh natural gas from Scope 2 → 15,184.53 MWh thermal energy from Scope 2 Transport → 4,001.02 MWh diesel from Scope 1 → 2,564.75 MWh gasoline from Scope 1 → 13.83 MWh diesel from Scope 3 IPPU → 22,748.70 MWh electrical energy from Scope 2 → 46,369.44 MWh natural gas from Scope 2 Waste → 2,478.72 MWh electrical energy from Scope 2 AFOLU → 187.66 MWh diesel from Scope 1 → 0.14 MWh electrical energy from Scope 2 → 0.54 MWh diesel from Scope 3
TIMELINE (START AND END)	2026-2035



Present the targeted actions grouped together according to each field of action. Use one sheet for each distinct field of action, following the template provided below.

- Make sure to also include within this section the actions pertaining to Organisational and Governance Innovation, as well as the actions related to Social and Other Innovation fields.

PORTOFOLIO OF ACTIONS

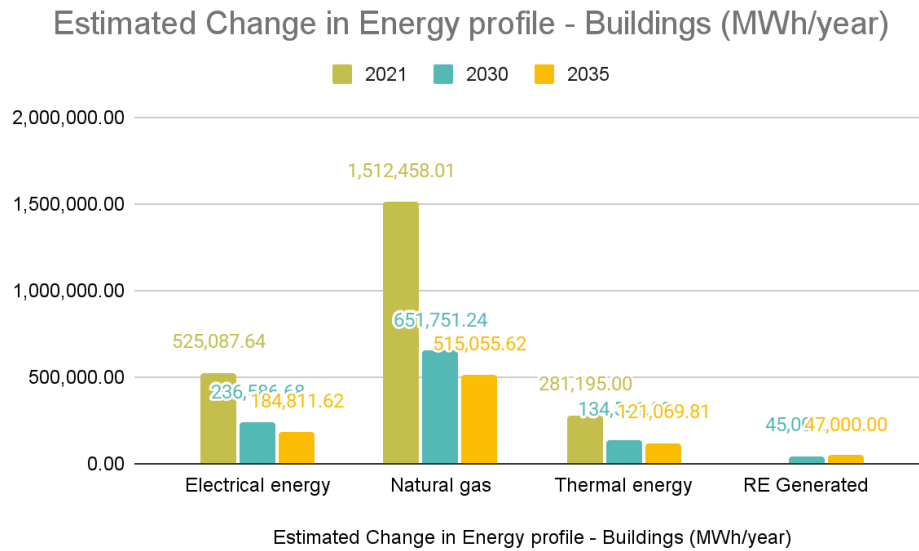
FIELD OF ACTION	ENERGY SYSTEMS
LIST OF COVERED ACTIONS	→ Consolidation of an energy-efficient district heating system → Enhancing the local supply of renewable energy → Modernization of public lighting to reduce energy consumption
FIELD OF ACTION	MOBILITY AND TRANSPORT
LIST OF COVERED ACTIONS	→ Encouraging public transport → Promoting non-motorized mobility → Using traffic management and the parking policy as a tool to reduce traffic jams
FIELD OF ACTION	BUILT ENVIRONMENT
LIST OF COVERED ACTIONS	→ Increasing the energy performance of public buildings → Increasing the energy performance of residential buildings → Mitigation of urban heat islands through urban renewal
FIELD OF ACTION	WASTE AND CIRCULAR ECONOMY
LIST OF COVERED ACTIONS	→ Consolidating the integrated waste management for a circular economy
FIELD OF ACTION	GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS
LIST OF COVERED ACTIONS	→ Developing an extended network of green areas for carbon capture → Renaturation of the sea coast
FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION
LIST OF COVERED ACTIONS	→ Digitalization of public services for climate neutrality → Climate neutrality office development and operationalization → Local NetZero coalition establishment, maintenance and growth



FIELD OF ACTION	ORGANISATIONAL AND GOVERNANCE INNOVATION → Joint climate mitigation - adaptation approaches → Climate neutrality branding → Climate neutrality regulations
FIELD OF ACTION LIST OF COVERED ACTIONS	SOCIAL AND OTHER INNOVATION → Raising awareness and engaging local ecosystems to achieve climate neutrality → Art promoting climate neutrality → Encouraging behavioral changes towards climate change mitigation

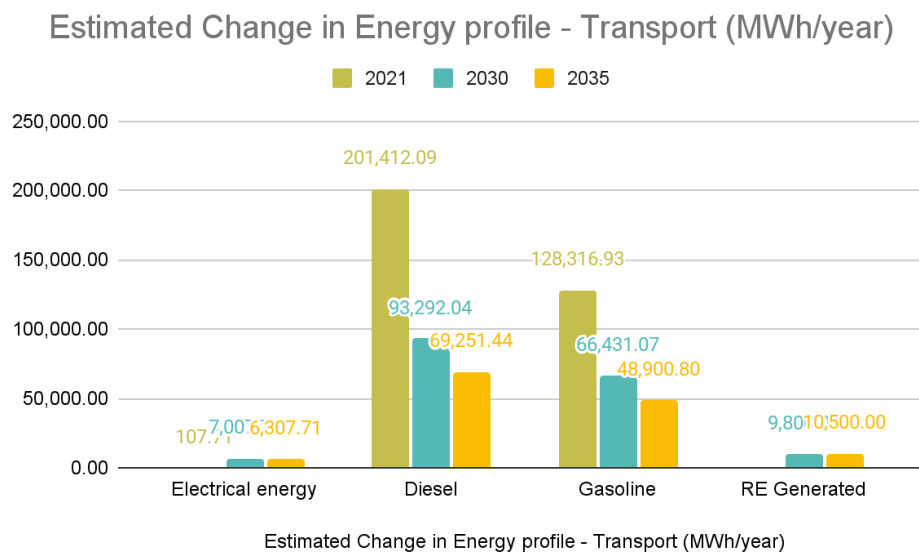


FIGURE 24 ESTIMATED CHANGE IN ENERGY PROFILE - BUILDINGS (MWH/YEAR)



Source: authors' calculations

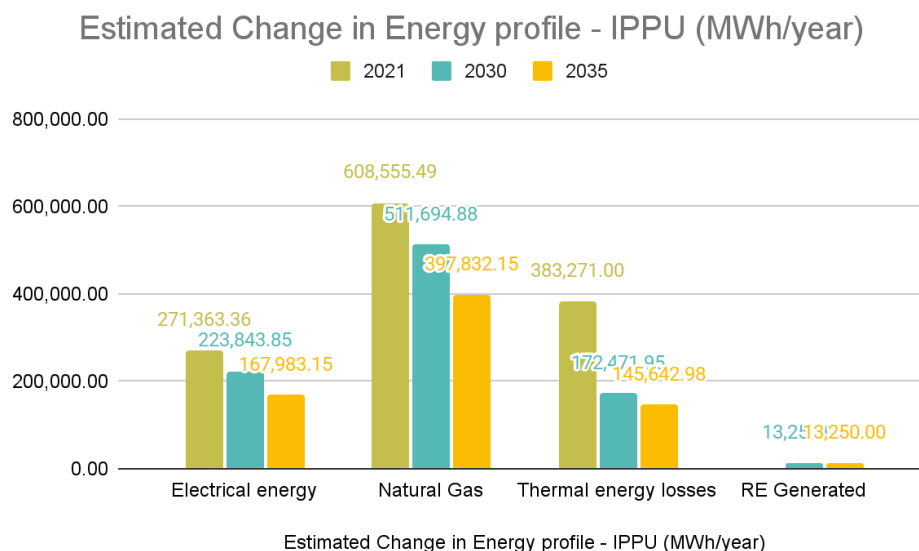
FIGURE 25 ESTIMATED CHANGE IN ENERGY PROFILE - TRANSPORT (MWH/YEAR)



Source: authors' calculations

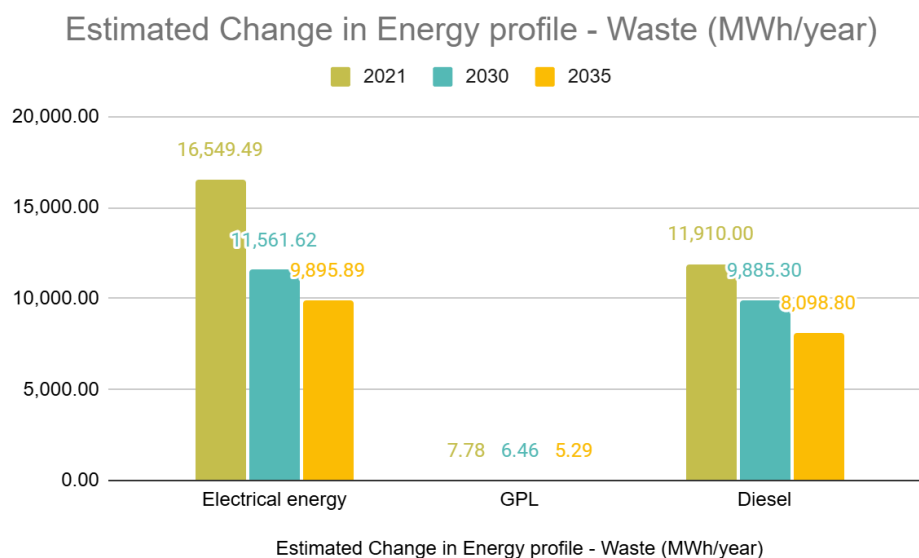


FIGURE 26 ESTIMATED CHANGE IN ENERGY PROFILE - IPPU (MWH/YEAR)



Source: authors' calculations

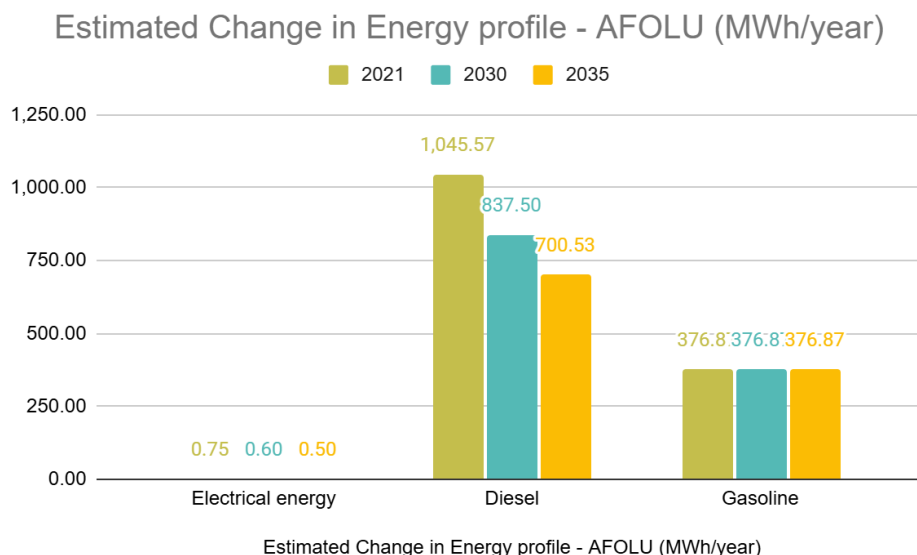
FIGURE 27 ESTIMATED CHANGE IN ENERGY PROFILE - WASTE (MWH/YEAR)



Source: authors' calculations



FIGURE 28 ESTIMATED CHANGE IN ENERGY PROFILE - AFOLU (MWH/YEAR)



Source: authors' calculations

In addition to the actions outlined above, which, as detailed in the descriptions of their individual sheets, have a primarily local focus (though some extend their impact to the metropolitan area, thereby engaging stakeholders at this broader level), a series of 11 complementary actions, amounting to approximately 770.85 eur million, are included. These actions have a metropolitan scope, specifically targeting the LAUs within the metropolitan area of Constanța . A detailed list of these actions, categorized by their fields of action, is presented in Annex 1 of the Climate Neutrality Action Plan. The Annex also contains all the programs, projects and measures linked to each action, along with the respective budgets allocated to each action.



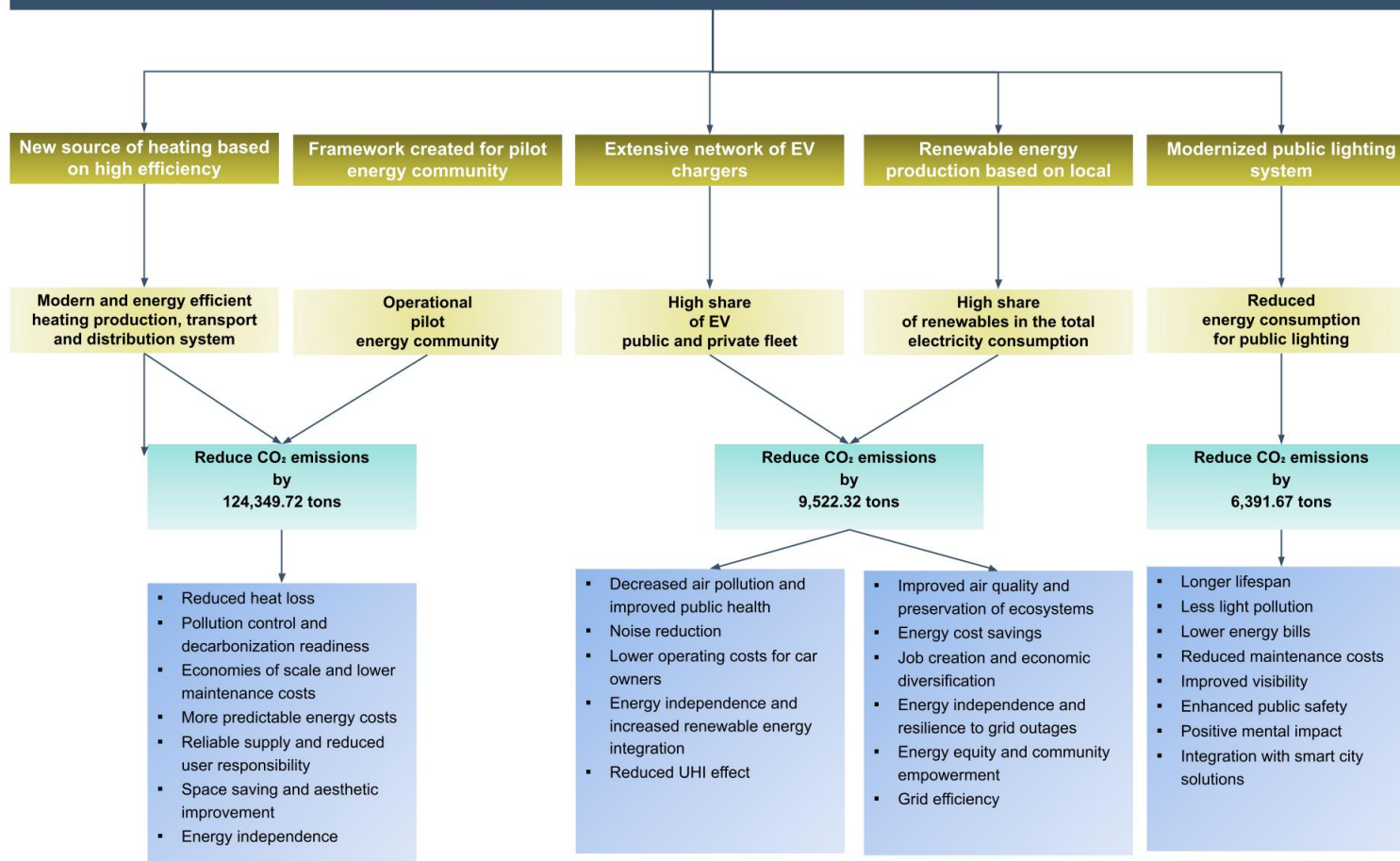
IMPACT PATHWAYS

Provide a brief description of the theory of change you will use to achieve climate neutrality.

- **Use both textual and visual elements, as appropriate, to illustrate the impact pathways, which will be furtherly presented in the subsequent table.**
- **Make sure to also include within this section the actions pertaining to Organisational and Governance Innovation, as well as the actions related to Social and Other Innovation fields.**

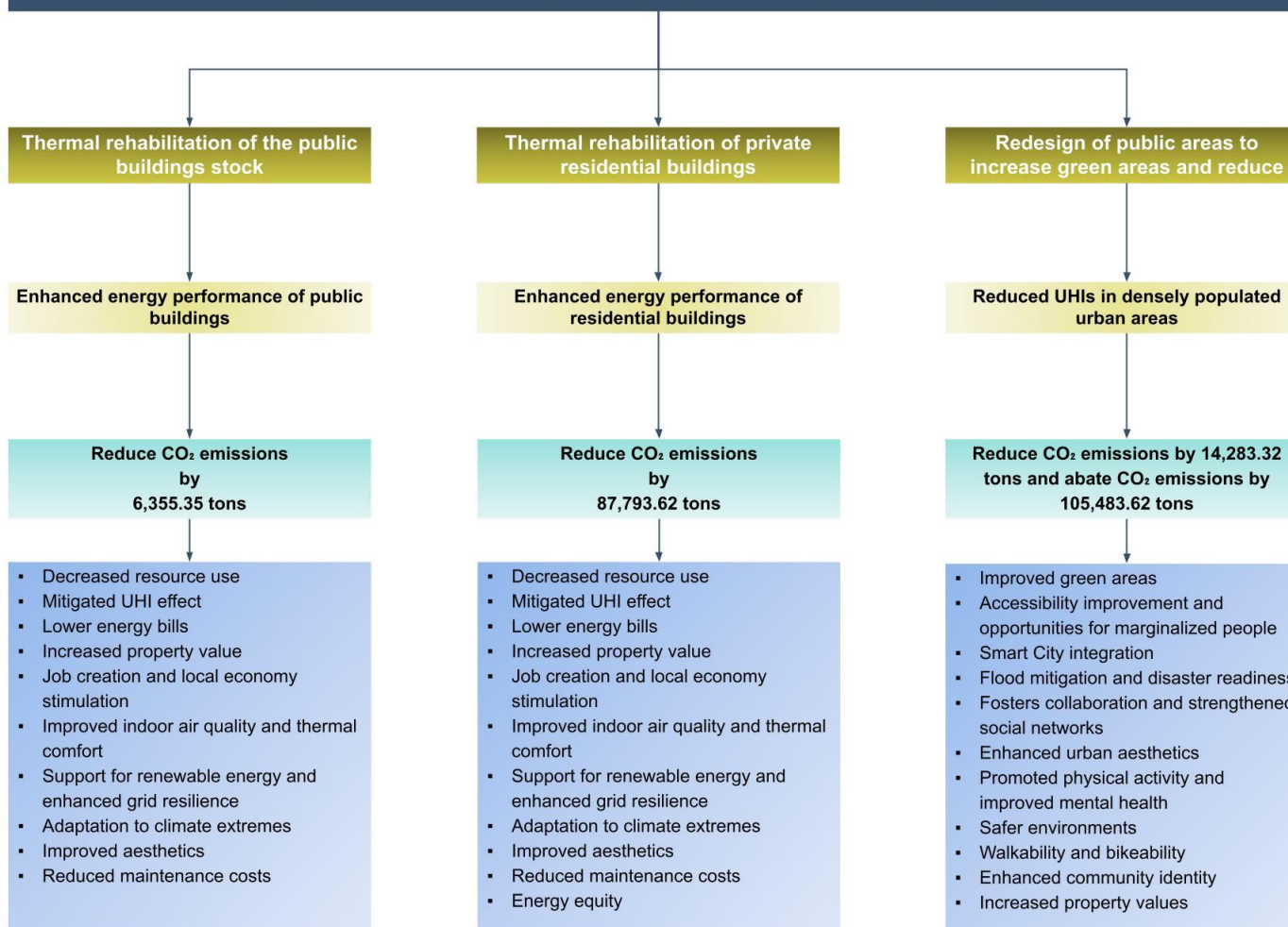


ENERGY SYSTEMS 2035



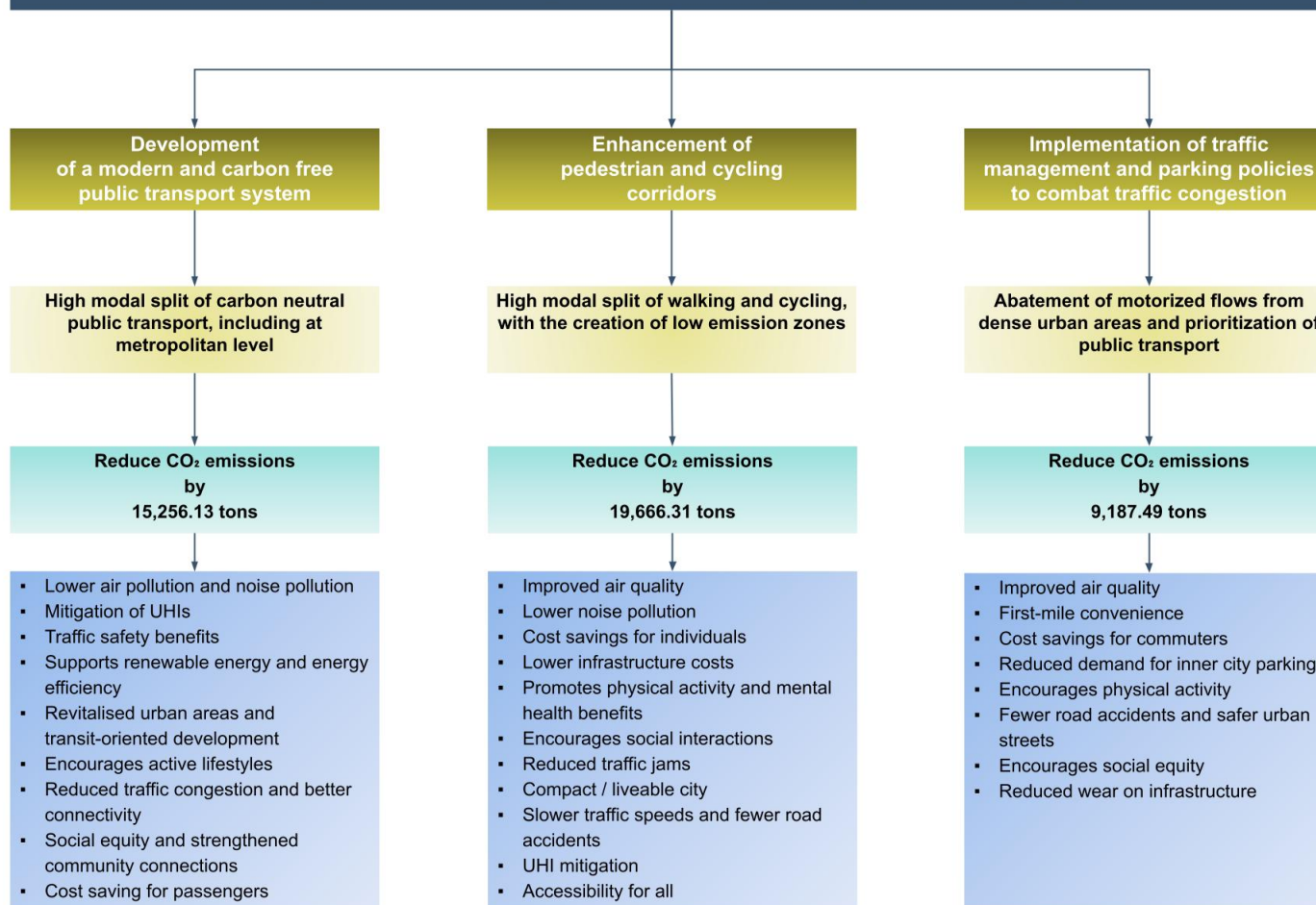


BUILT ENVIRONMENT 2035





MOBILITY & TRANSPORT 2035





WASTE & CIRCULAR ECONOMY 2035

Completion of the
Integrated
waste management system

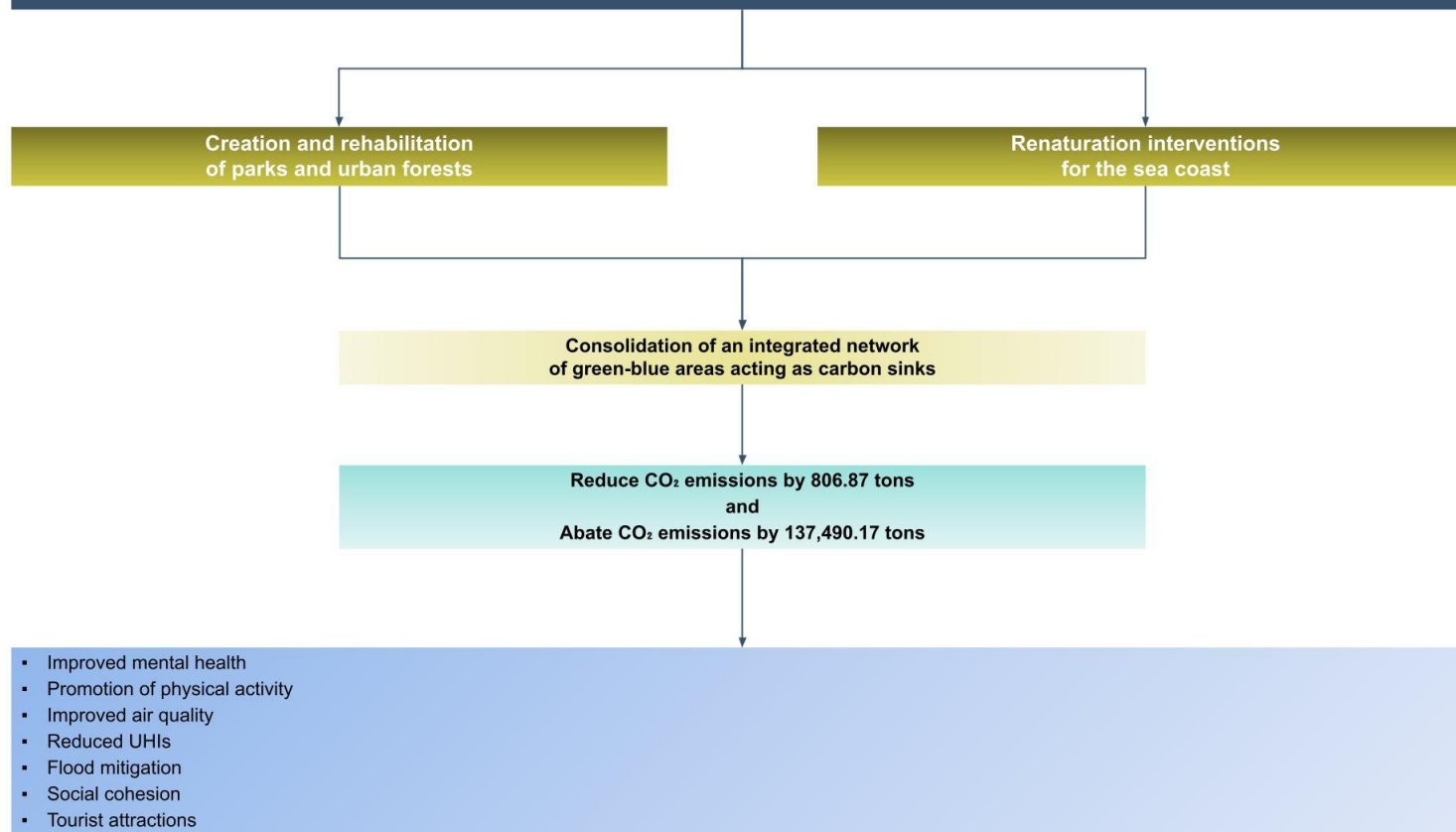
Functional circular economy system at local and metropolitan level,
including neutralisation of municipal solid waste
for green energy production

Reduce CO₂ emissions
by
1,204.54 tons

- Operational and disposal cost savings
- Improved air and water quality
- Job creation and increased local tax revenues
- Community engagement
- Improved quality of life

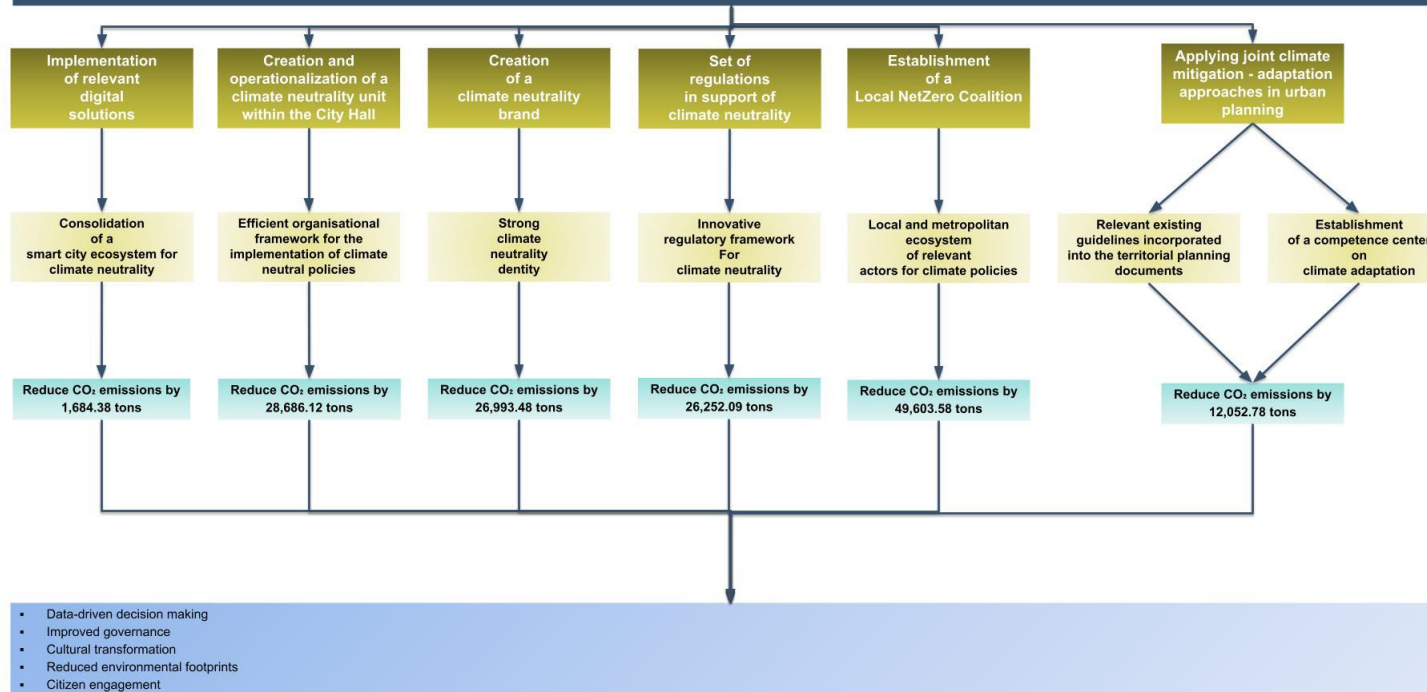


GREEN INFRASTRUCTURE & NATURE BASED SOLUTIONS 2035





ORGANISATIONAL & GOVERNANCE INNOVATION 2035





SOCIAL & OTHER INNOVATION 2035

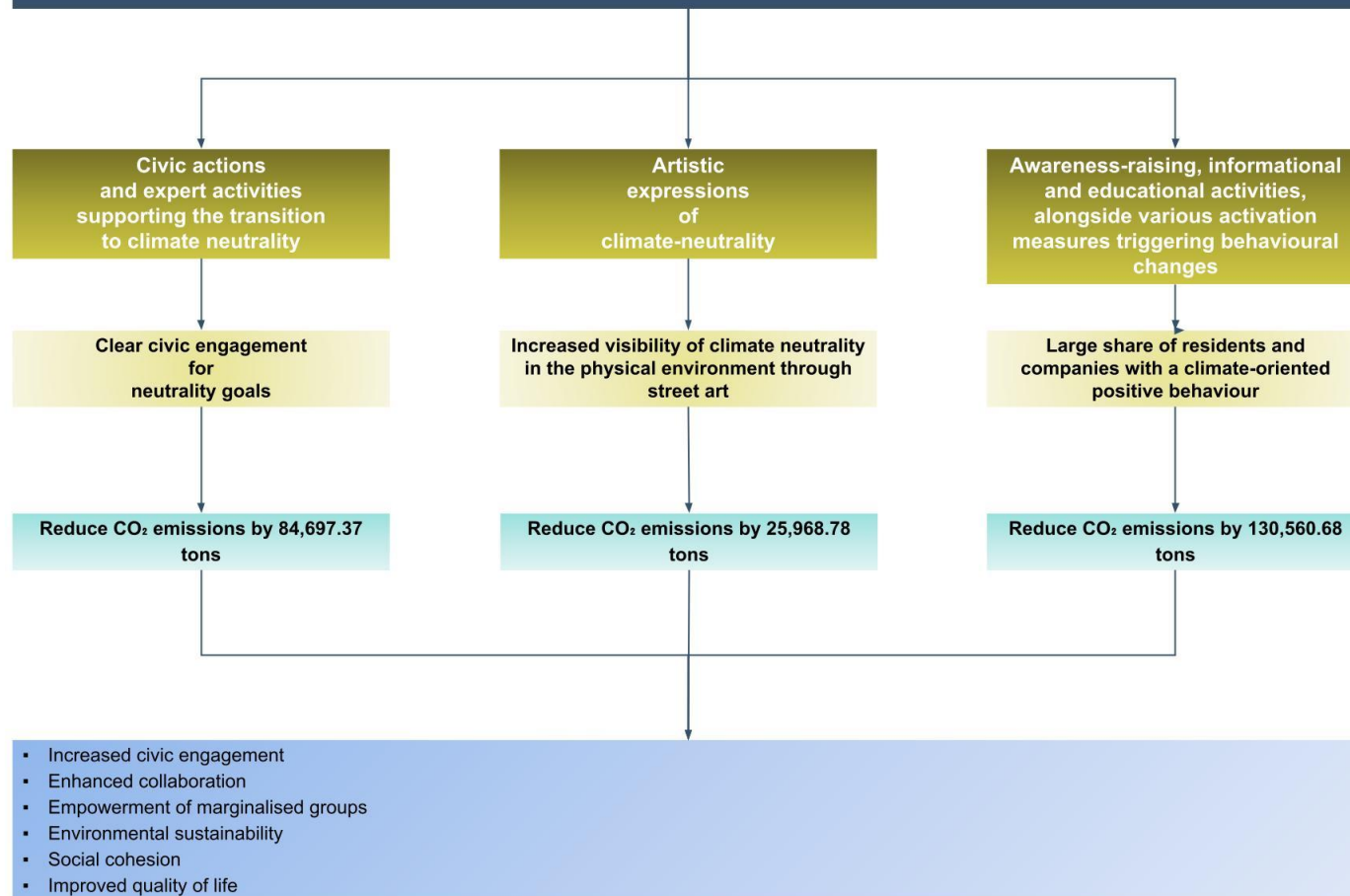




TABLE 13 IMPACT PATHWAYS

FIELDS OF ACTION	SYSTEMIC LEVERS	EARLY CHANGES (1-2 YEARS)	LATE OUTCOMES (3-4 YEARS)	2030 DIRECT IMPACTS (EMISSION REDUCTIONS)	2035 DIRECT IMPACTS (EMISSION REDUCTIONS)	INDIRECT IMPACTS (CO-BENEFITS)
ENERGY SYSTEMS	Technology / infrastructure	New source of heating based on high efficiency cogeneration	Modern and energy efficient heating production, transport and distribution system	Reduce CO ₂ emissions by 100,767.28 tons	Reduce CO ₂ emissions by 124,349.72 tons	- Reduced heat loss - Pollution control and decarbonization readiness - Economies of scale and lower maintenance costs - More predictable energy costs - Reliable supply and reduced user responsibility - Space saving and aesthetic improvement - Energy independence
	Social Innovation	Framework created for pilot energy community	Operational pilot energy community			- Decreased air pollution and improved public health - Noise reduction - Lower operating costs for car owners - Energy independence and increased renewable energy integration - Reduced UHI effect
	Technology / infrastructure	Extensive network of EV chargers	High share of EV public and private fleet	Reduce CO ₂ emissions by 8,877.08 tons	Reduce CO ₂ emissions by 9,522.32 tons	- Improved air quality and preservation of ecosystems - Energy cost savings - Job creation and economic diversification - Energy independence and resilience to grid outages - Energy equity and community empowerment - Grid efficiency
	Technology / infrastructure	Renewable energy production based on local resources	High share of renewables in the total electricity consumption			- Longer lifespan - Less light pollution - Lower energy bills - Reduced maintenance costs - Improved visibility - Enhanced public safety - Positive mental impact - Integration with smart city solutions
	Technology / infrastructure	Modernized public lighting system	Reduced energy consumption for public lighting	Reduce CO ₂ emissions by 5,685.19 tons	Reduce CO ₂ emissions by 6,391.67 tons	
BUILT ENVIRONMENT	Technology / infrastructure	Thermal rehabilitation of the public buildings stock	Enhanced energy performance of public buildings	Reduce CO ₂ emissions by 5,034.42 tons	Reduce CO ₂ emissions by 6,355.35 tons	- Decreased resource use - Mitigated UHI effect - Lower energy bills - Increased property value - Job creation and local economy stimulation - Improved indoor air quality and thermal comfort - Support for renewable energy and enhanced grid resilience - Adaptation to climate extremes - Improved aesthetics - Reduced maintenance costs



FIELDS OF ACTION	SYSTEMIC LEVERS	EARLY CHANGES (1-2 YEARS)	LATE OUTCOMES (3-4 YEARS)	2030 DIRECT IMPACTS (EMISSION REDUCTIONS)	2035 DIRECT IMPACTS (EMISSION REDUCTIONS)	INDIRECT IMPACTS (CO-BENEFITS)
	Technology / infrastructure	Thermal rehabilitation of private residential buildings	Enhanced energy performance of residential buildings	Reduce CO ₂ emissions by 84,074.95 tons	Reduce CO ₂ emissions by 87,793.62 tons	- Decreased resource use - Mitigated UHI effect - Lower energy bills - Increased property value - Job creation and local economy stimulation - Improved indoor air quality and thermal comfort - Support for renewable energy and enhanced grid resilience - Adaptation to climate extremes - Improved aesthetics - Reduced maintenance costs - Energy equity
	Technology / infrastructure	Redesign of public areas to increase green areas and reduce traffic jams	Reduced UHIs in densely populated urban areas	Reduce CO ₂ emissions by 13,538.91 tons and abate CO ₂ emissions by 100,484.16 tons	Reduce CO ₂ emissions by 14,283.32 tons and abate CO ₂ emissions by 105,483.62 tons	- Improved green areas - Accessibility improvement and opportunities for marginalized people - Smart City integration - Flood mitigation and disaster readiness - Fosters collaboration and strengthened social networks - Enhanced urban aesthetics - Promoted physical activity and improved mental health - Safer environments - Walkability and bikeability - Enhanced community identity - Increased property values
MOBILITY AND TRANSPORT	Technology / infrastructure	Development of a modern and carbon free public transport system	High modal split of carbon neutral public transport, including at metropolitan level	Reduce CO ₂ emissions by 11,937.92 tons	Reduce CO ₂ emissions by 15,256.13 tons	- Lower air pollution and noise pollution - Mitigation of UHIs - Traffic safety benefits - Supports renewable energy and energy efficiency - Revitalized urban areas and transit-oriented development - Encourages active lifestyles - Reduced traffic congestion and better connectivity - Social equity and strengthened community connections - Cost saving for passengers
	Technology / infrastructure	Enhancement of pedestrian and cycling corridors	High modal split of walking and cycling, with the creation of low emission zones	Reduce CO ₂ emissions by 17,878.47 tons	Reduce CO ₂ emissions by 19,666.31 tons	- Improved air quality - Lower noise pollution - Cost savings for individuals - Lower infrastructure costs



FIELDS OF ACTION	SYSTEMIC LEVERS	EARLY CHANGES (1-2 YEARS)	LATE OUTCOMES (3-4 YEARS)	2030 DIRECT IMPACTS (EMISSION REDUCTIONS)	2035 DIRECT IMPACTS (EMISSION REDUCTIONS)	INDIRECT IMPACTS (CO-BENEFITS)
						- Promotes physical activity and mental health benefits - Encourages social interactions - Reduced traffic jams - Compact / liveable city - Slower traffic speeds and fewer road accidents - UHI mitigation - Accessibility for all
	Technology / infrastructure	Implementation of traffic management and parking policies to combat traffic congestion	Abatement of motorized flows from dense urban areas and prioritization of public transport	Reduce CO ₂ emissions by 6,890.62 tons	Reduce CO ₂ emissions by 9,187.49 tons	- Improved air quality - First-mile convenience - Cost savings for commuters - Reduced demand for inner city parking - Encourages physical activity - Fewer road accidents and safer urban streets - Encourages social equity - Reduced wear on infrastructure
WASTE AND CIRCULAR ECONOMY	Technology / infrastructure	Completion of the integrated waste management system	Functional circular economy system at local and metropolitan level, including neutralisation of municipal solid waste for green energy production	Reduce CO ₂ emissions by 660.08 tons	Reduce CO ₂ emissions by 1,204.54 tons	- Operational and disposal cost savings - Improved air and water quality - Job creation and increased local tax revenues - Community engagement - Improved quality of life
GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS	Technology / infrastructure	Creation and rehabilitation of parks and urban forests	Consolidation of an integrated network of green-blue areas acting as carbon sinks	Reduce CO ₂ emissions by 772.10 tons and abate CO ₂ emissions by 133,490.60 tons	Reduce CO ₂ emissions by 806.87 tons and abate CO ₂ emissions by 137,490.17 tons	- Improved mental health - Promotion of physical activity - Improved air quality - Reduced UHIs - Flood mitigation - Social cohesion - Tourist attractions
	Technology / infrastructure	Renaturation interventions for the sea coast				
ORGANISATIONAL AND GOVERNANCE INNOVATION	Technology / infrastructure	Implementation of relevant digital solutions	Consolidation of a smart city ecosystem for climate neutrality	Reduce CO ₂ emissions by 765.63 tons	Reduce CO ₂ emissions by 1,684.38 tons	- Data-driven decision making - Improved governance - Cultural transformation - Reduced environmental footprints - Citizen engagement
	Governance and policy	Creation and operationalization of a climate neutrality unit within the City Hall	Efficient organisational framework for the implementation of climate neutral policies	Reduce CO ₂ emissions by 23,752.24 tons	Reduce CO ₂ emissions by 28,686.12 tons	
	Governance and policy	Creation of a climate neutrality brand	Strong climate neutrality identity	Reduce CO ₂ emissions by 24,102.26 tons	Reduce CO ₂ emissions by 26,993.48 tons	
	Governance and policy	Set of regulation in support of climate neutrality	Innovative regulatory framework for climate neutrality	Reduce CO ₂ emissions by 25,809.10 tons	Reduce CO ₂ emissions by 26,252.09 tons	



FIELDS OF ACTION	SYSTEMIC LEVERS	EARLY CHANGES (1-2 YEARS)	LATE OUTCOMES (3-4 YEARS)	2030 DIRECT IMPACTS (EMISSION REDUCTIONS)	2035 DIRECT IMPACTS (EMISSION REDUCTIONS)	INDIRECT IMPACTS (CO-BENEFITS)
	Democracy and participation	Establishment of a Local NetZero Coalition	Local and metropolitan ecosystem of relevant actors for climate policies	Reduce CO ₂ emissions by 44,973.77 tons	Reduce CO ₂ emissions by 49,603.58 tons	
	Governance and policy	Applying joint climate mitigation - adaptation approaches in urban planning	Relevant existing guidelines incorporated into the territorial planning documents	Reduce CO ₂ emissions by 10,888.07 tons	Reduce CO ₂ emissions by 12,052.78 tons	
			Establishment of a competence center on climate adaptation			
SOCIAL AND OTHER INNOVATION	Social innovation	Civic actions and expert activities supporting the transition to climate neutrality	Clear civic engagement for neutrality goals	Reduce CO ₂ emissions by 73,591.02 tons	Reduce CO ₂ emissions by 84,697.37 tons	• Increased civic engagement • Enhanced collaboration • Empowerment of marginalized groups • Environmental sustainability • Social cohesion • Improved quality of life
	Social innovation	Artistic expressions of climate-neutrality	Increased visibility of climate neutrality in the physical environment through street art	Reduce CO ₂ emissions by 21,374.84 tons	Reduce CO ₂ emissions by 25,968.78 tons	
	Learning and capabilities	Awareness-raising, informational and educational activities, alongside various activation measures triggering behavioral changes	Large share of residents and companies with a climate-oriented positive behaviour	Reduce CO ₂ emissions by 102,856.96 tons	Reduce CO ₂ emissions by 130,560.68 tons	



STRATEGY FOR RESIDUAL EMISSIONS

Describe your approach to managing residual emissions.

BUILDINGS

To eliminate residual emissions from buildings, a holistic approach could be adopted, focused on energy efficiency and sustainable construction. Neighborhood-level awareness campaigns might educate citizens about the benefits of building orientation, efficient ventilation systems, and the use of eco-friendly construction materials, emphasizing energy efficiency and thermal comfort. Fiscal incentives, such as tax breaks or subsidies for individuals who invest in passive energy systems, including solar panels and heat pumps, could encourage the widespread adoption of these technologies. A "Green Buildings Loan Program" offering zero-interest loans for apartment associations to insulate buildings could substantially reduce energy consumption. These initiatives could be further strengthened through public-private partnerships promoting green certifications to motivate developers and property owners to adopt sustainable practices.

The unique coastal environment provides opportunities to integrate marine-inspired solutions into urban development. Harnessing coastal winds and humidity for passive cooling, using architectural designs like wind towers or evaporative cooling systems, might significantly lower summer energy demands. The implementation of saltwater heat pumps could leverage the proximity of the Black Sea to provide a renewable energy source for heating and cooling large residential and commercial complexes. Additionally, green roofs and living façades might offer insulation, absorb CO₂, and mitigate urban heat islands while using desalinated seawater for irrigation. Establishing neighborhood-level microgrids powered by solar energy and paired with community storage batteries could ensure energy self-sufficiency and reduce reliance on fossil fuels. Pilot projects incorporating offshore wind and tidal energy into the city's energy mix might also play a critical role in supplementing building energy needs.

TRANSPORT

In transportation, the focus would center on electrification, improvements in public transit, and fostering sustainable behavioural changes. Programs such as trading PET bottles for bus or tram tickets may embed sustainable practices into daily habits, while also addressing waste management. Expanding the "Rabla" program to include subsidies for bicycles and electric vehicles could encourage residents to transition to cleaner transportation alternatives. Collaborations with supermarkets might result in campaigns that incentivize eco-friendly transportation methods, such as electric buses or shared bicycles, through discounts or reward programs for participating customers.

The city's coastal geography offers a natural framework to enhance cycling infrastructure along the shoreline, complete with e-bike rental stations and secure storage facilities to promote zero-emission commuting. Developing integrated multi-modal transport hubs that seamlessly connect bus, tram, cycling, and walking pathways with seaside activities may encourage transitions to sustainable travel options while supporting the city's role as a key maritime hub.

WASTE



Constanța's waste management strategies could be strengthened through stricter recycling regulations and community-based initiatives. Competitions among apartment associations for green space care might simultaneously encourage waste reduction and address urban heat islands. Advanced waste-to-energy plants may convert non-recyclable waste into renewable energy, reducing emissions and providing an alternative energy source. Educational campaigns in schools and workplaces could instill long-term waste separation habits, supporting broader sustainability goals.

Collaborating with fishing communities to recover sea plastic and recycle it into usable products, such as construction materials or textiles, might not only reduce waste but also create local employment opportunities. Blue carbon projects, such as seaweed farming and coastal wetland restoration, may enhance carbon sequestration while producing valuable byproducts for biofuels and biodegradable packaging. Implementing IoT-enabled smart waste systems, with bins that notify collection services when full and sort waste in real-time, could optimize recycling processes and reduce unnecessary transport emissions.

INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU)

To address industrial emissions, Constanța will prioritize collaboration with businesses, encouraging them to adopt emission reduction targets as part of their corporate social responsibility strategies. Subsidies for industries adopting green technologies like carbon capture and storage (CCS) or renewable energy sources could accelerate the shift toward sustainability. Enforcing strict emissions caps and promoting local production could further minimize industrial and transportation-related emissions.

The city's proximity to the Black Sea enables innovative solutions like carbon capture from seawater, a process that extracts CO₂ from the atmosphere and offsets emissions from industrial processes. Encouraging circular practices in maritime industries, such as refurbishing old vessels and reusing materials, might significantly reduce emissions while bolstering the local economy.

AGRICULTURE, FORESTRY, AND LAND USE (AFOLU)

Although emissions from agriculture and land use are relatively low, Constanța will take proactive measures to ensure this sector contributes to broader sustainability efforts. Urban agriculture initiatives, including rooftop gardens and community plots, might absorb CO₂ while improving food security and community resilience. Expanding tree planting programs and preserving green spaces within urban planning may capture carbon and mitigate the effects of climate change. Additionally, promoting sustainable farming practices in peri-urban areas through educational programs and grants could further reduce emissions.

The Black Sea's ecosystem offers a valuable opportunity to expand seaweed farming, which may sequester significant amounts of CO₂ while supplying sustainable raw materials for food, biofuels, and cosmetics. Protecting and restoring marine ecosystems, such as seagrass meadows and coastal wetlands, could enhance biodiversity, improve water quality, and provide a natural and effective carbon sink.



INDICATORS FOR MONITORING, EVALUATION AND LEARNING

TABLE 14 PORTOFOLIO OF INDICATORS

ACTION	OUTCOME / IMPACT ADDRESSED	INDICATOR TITLE	INDICATOR CODE	TARGET VALUES		
				2027	2030	2035
ALL	CO ₂ emissions reduction	Change of the greenhouse gas emissions during the lifetime of the Climate Neutrality Action Plan	CT-NZC-I1	50%	80%	90%
ALL	CO ₂ emissions reduction	Total greenhouse gas emissions per year	CT-NZC-I2	511,032.90	204,413.16	102,206.58
ALL	CO ₂ emissions reduction	Residual emissions	CT-NZC-I3	511,032.90	204,413.16	102,206.58
ALL	CO ₂ emissions reduction	GHG emission from grid supplied electrical energy per year	CT-NZC-I4	134,976.09 t CO ₂ e	36,063.33 t CO ₂ e	7,314.86 t CO ₂ e
Encouraging public transport Promoting non-motorized mobility Using traffic management and the parking policy as a tool to reduce traffic jams	High modal split of carbon neutral public transport High modal split of walking and cycling Abatement of motorized flows from dense urban areas and prioritization of public transport	GHG emission from Transport per year	CT-NZC-I5	44,714.04 t CO ₂ e	21,886.53 t CO ₂ e	9,637.17 t CO ₂ e
Consolidating the integrated waste management for a circular economy	Functional circular economy system at local and metropolitan level	GHG emission from Waste per year	CT-NZC-I6	52,580.74 t CO ₂ e	18,927.47 t CO ₂ e	10,057.46 t CO ₂ e
Increasing the energy performance of public buildings Increasing the energy performance of residential buildings	High energy efficiency of public and residential buildings	GHG emission from Buildings per year	CT-NZC-I7	268,323.50 t CO ₂ e	62,094.63 t CO ₂ e	17,702.88 t CO ₂ e
Local Net Zero coalition	CO ₂ emissions reduction	GHG emission from IPPU per year	CT-NZC-I8	145,220.79 t CO ₂ e	100,694.05 t CO ₂ e	60,160.93 t CO ₂ e



ACTION	OUTCOME / IMPACT ADDRESSED	INDICATOR TITLE	INDICATOR CODE	TARGET VALUES		
				2027	2030	2035
establishment, maintenance and growth						
Local Net Zero coalition establishment, maintenance and growth	Local and metropolitan ecosystem of relevant actors for climate policies	Climate-Neutral City Companies	CT-NZC-I9	40	100	120
Consolidation of an energy-efficient district heating system	Modern and energy efficient heating production, transport and distribution system	District heating system losses (%)	CT-NZC-I10	40%	15%	7%
Developing an extended network of green areas for carbon capture	Consolidation of an integrated network of green-blue areas acting as carbon sinks	Negative emissions through natural sinks	CT-NZC-I11	66,745.30 t CO ₂ e	133,490.60 t CO ₂ e	137,490.16 t CO ₂ e
Modernization of public lighting to reduce energy consumption	Reduced energy consumption for public lighting	Share of energy efficient bulbs for public lighting (%)	CT-NZC-I12	50%	80%	100%
Encouraging public transport	High modal split of carbon neutral public transport	Modal split of public transport	CT-NZC-I13	37%	48%	55%
Promoting non-motorized mobility	High modal split of walking	Modal split of walking	CT-NZC-I14	28%	40%	45%
Consolidating the integrated waste management for a circular economy	Functional circular economy system at local and metropolitan level	Recycling rate of municipal waste (%)	CT-NZC-I15	5%	30%	50%
Raising awareness and engaging local ecosystems to achieve climate neutrality Encouraging behavioral changes towards climate change mitigation	Civic engagement for climate neutrality goals	Improved citizen participation	CT-NZC-I16	2730	4,550	9,100
ALL	Mobilization of funding for climate neutrality	Public and External Capital Invested in Climate Action Projects	CT-NZC-I17	30%	50%	100%



For every proposed indicator, fill out one Metadata Indicator sheet, by using the template provided below.

INDICATOR METADATA

INDICATOR NAME	CHANGE OF THE GREENHOUSE GAS EMISSIONS DURING THE LIFETIME OF THE CLIMATE NEUTRALITY ACTION PLAN
INDICATOR UNIT	%
DEFINITION	The change in GHG emissions from the start to the completion of the Climate Neutrality Action Plan (CNAP) implementation - the point in time when all the actions under the Climate Neutrality Action Plan have been carried out and the CNAP is fully realized.
CALCULATION	GHG emissions at the end of the Climate Neutrality Action - GHG emissions at the start of the Climate Neutrality Action) / GHG emissions at the start of the Climate Neutrality Action * 100
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	ALL
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	NO
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	-
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	Yes
EXPECTED DATA SOURCE	GHG emission inventory (compiled by the technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP) Industry Associations (with support from industry clusters and the Chamber of Commerce and Industry)
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report



INDICATOR NAME	CHANGE OF THE GREENHOUSE GAS EMISSIONS DURING THE LIFETIME OF THE CLIMATE NEUTRALITY ACTION PLAN
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	TOTAL GREENHOUSE GAS EMISSIONS PER YEAR
INDICATOR UNIT	%
DEFINITION	The total cumulative CO ₂ emissions produced by all targeted sectors in a given year.
CALCULATION	The sum of the CO ₂ emissions produced by each targeted sector in a given year.
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	ALL
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	NO
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	-
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System



INDICATOR METADATA

INDICATOR NAME	GHG EMISSION FROM GRID SUPPLIED ELECTRICAL ENERGY PER YEAR
INDICATOR UNIT	t CO ₂ equivalent
DEFINITION	GHG emissions occurring as a consequence of the use of grid-supplied electrical energy within the city boundary
CALCULATION	Specific calculation for the electrical energy use within each Sector (See <i>GHG Baseline Inventory</i>)
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	ALL
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS?)	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Energy independence and resilience to grid outages Energy cost savings
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years

INDICATOR METADATA

INDICATOR NAME	GHG EMISSION FROM TRANSPORT PER YEAR
INDICATOR UNIT	t CO ₂ equivalent
DEFINITION	Greenhouse gas emissions from the operations of vehicles.
CALCULATION	Specific calculation for the electricity uses within the Transport Sector (See <i>GHG Baseline Inventory</i>)
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE	YES



INDICATOR NAME	GHG EMISSION FROM TRANSPORT PER YEAR
GAS EMISSIONS?)	
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	TRANSPORT
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Lower air pollution and noise pollution Mitigation of UHIs Traffic safety benefits Supports renewable energy and energy efficiency Revitalized urban areas and transit-oriented development Encourages active lifestyles Reduced traffic congestion and better connectivity Social equity and strengthened community connections Cost saving for passengers Improved air quality Lower noise pollution Cost savings for individuals Lower infrastructure costs Promotes physical activity and mental health benefits Encourages social interactions Reduced traffic jams Compact / livable city Slower traffic speeds and fewer road accidents UHI mitigation Accessibility for all
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System



INDICATOR METADATA

INDICATOR NAME	GHG EMISSION FROM WASTE PER YEAR
INDICATOR UNIT	t CO ₂ equivalent
DEFINITION	Greenhouse gas emissions from waste collection, treatment, waste incineration and landfills.
CALCULATION	Specific calculations within the Transport Sector (See GHG Baseline Inventory)
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	WASTE
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Operational and disposal cost savings Improved air and water quality Job creation and increased local tax revenues Community engagement Improved quality of life
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	GHG EMISSION FROM BUILDINGS PER YEAR
INDICATOR UNIT	t CO ₂ equivalent



INDICATOR NAME	GHG EMISSION FROM BUILDINGS PER YEAR
DEFINITION	Greenhouse gas emissions (mainly CO ₂ emissions) from the operations of buildings.
CALCULATION	Specific calculations within the Buildings Sector (See GHG Baseline Inventory)
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	BUILDINGS
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Decreased resource use Mitigated UHI effect Lower energy bills Increased property value Job creation and local economy stimulation Improved indoor air quality and thermal comfort Support for renewable energy and enhanced grid resilience Adaptation to climate extremes Improved aesthetics Reduced maintenance costs Energy equity
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	GHG EMISSION FROM IPPU PER YEAR
INDICATOR UNIT	t CO ₂ equivalent



INDICATOR NAME	GHG EMISSION FROM IPPU PER YEAR
DEFINITION	Greenhouse gas emissions from industrial processes and product use within the city boundary.
CALCULATION	Specific calculations within the IPPU Sector (See GHG Baseline Inventory)
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	IPPU
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Improved governance Enhanced collaboration Environmental sustainability
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	NO
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP, with assistance from the teams which developed the SECAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	CLIMATE-NEUTRAL CITY COMPANIES
INDICATOR UNIT	Number
DEFINITION	Number of local companies developing solutions related to climate neutrality.
CALCULATION	The number of companies that have joined or are part of a Local Coalition dedicated to Climate Neutrality OR the number of companies collaborating in various ways (e.g., as solution providers, partners in RDI projects, local



INDICATOR NAME	CLIMATE-NEUTRAL CITY COMPANIES
	investors, or other roles) with the CCC stakeholders (e.g., Public Administration, universities, NGOs, institutions, etc.) in the field of climate neutrality.
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	IPPU
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Improved governance Enhanced collaboration Environmental sustainability
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	NO
EXPECTED DATA SOURCE	NetZero Local Coalition website / reports
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Yearly
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Adaptation based on Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	RESIDUAL EMISSIONS
INDICATOR UNIT	t CO ₂ equivalent
DEFINITION	The difference between the city's GHG emissions inventory and the climate neutrality target.
CALCULATION	Emissions baseline minus the emission reductions.
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE	NO



INDICATOR NAME	RESIDUAL EMISSIONS
GAS EMISSIONS?)	
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	-
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	NO
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	-
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Technical experts responsible for developing the CNAP
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	NEGATIVE EMISSIONS THROUGH NATURAL SINKS
INDICATOR UNIT	t CO ₂ equivalent
DEFINITION	“Natural sinks” refer to the planting of trees or other conversion of land use. Carbon sinks should be accounted for as part of the ‘AFOLU’ sector of the GHG inventory and can be independently monitored as a progress indicator to show negative emissions.
CALCULATION	Negative Emissions (namely the amount of negative emissions achieved through natural sinks in the city) = Carbon stock post-implementation (namely the total carbon stock measured after the natural sinks have been established) – Carbon stock baseline (namely the total carbon stock measured before the implementation of natural sinks).
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES



INDICATOR NAME	NEGATIVE EMISSIONS THROUGH NATURAL SINKS
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	AFOLU
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Improved mental health Promotion of physical activity Improved air quality Reduced UHIs Flood mitigation Social cohesion Tourist attractions
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Public administration – Urban Planning, Territorial Planning, and Cadastre personnel & Public Domain and Real Estate personnel & Environmental personnel
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	SHARE OF ENERGY EFFICIENT BULBS FOR PUBLIC LIGHTING (%)
INDICATOR UNIT	%
DEFINITION	Share o
CALCULATION	Share of energy efficient bulbs (%) = (Energy efficient bulbs / Total bulbs) x 100
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT	BUILDINGS



INDICATOR NAME	SHARE OF ENERGY EFFICIENT BULBS FOR PUBLIC LIGHTING (%)
IMPACT?	
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Longer lifespan Less light pollution Lower energy bills Reduced maintenance costs Improved visibility Enhanced public safety Positive mental impact Integration with smart city solutions
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Public lighting operator
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	MODAL SPLIT OF PUBLIC TRANSPORT (%)
INDICATOR UNIT	%
DEFINITION	The percentage share of total trips within a given area made using public transportation (buses) compared to other modes of transport such as private vehicles, walking, or cycling.
CALCULATION	Public transport trips / Total trips
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	TRANSPORT



INDICATOR NAME	MODAL SPLIT OF PUBLIC TRANSPORT (%)
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Lower air pollution and noise pollution Mitigation of UHIs Traffic safety benefits Supports renewable energy and energy efficiency Revitalized urban areas and transit-oriented development Encourages active lifestyles Reduced traffic congestion and better connectivity Social equity and strengthened community connections Cost saving for passengers
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Data compiled by the technical experts responsible for developing the SUMP Local transport operators Survey conducted at local level (questions about how the citizens travel)
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2-3 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Adaptation based on Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	MODAL SPLIT OF WALKING (%)
INDICATOR UNIT	%
DEFINITION	The percentage share of total walking trips compared to other modes of transport such as private vehicles, public transport, or cycling.
CALCULATION	Walking trips / Total trips
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES



INDICATOR NAME	MODAL SPLIT OF WALKING (%)
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	TRANSPORT
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Improved air quality Lower noise pollution Cost savings for individuals Lower infrastructure costs Promotes physical activity and mental health benefits Encourages social interactions Reduced traffic jams Compact / liveable city Slower traffic speeds and fewer road accidents UHI mitigation Accessibility for all
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Data compiled by the technical experts responsible for developing the SUMP Local transport operators Survey conducted at local level (questions about how the citizens travel)
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Every 2-3 years
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Adaptation based on Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	RECYCLING RATE OF MUNICIPAL WASTE (%)
INDICATOR UNIT	%
DEFINITION	The share of recycled municipal waste of the total municipal waste generation.



INDICATOR NAME	RECYCLING RATE OF MUNICIPAL WASTE (%)
CALCULATION	Share of Recycled Waste (%) = (Recycled Municipal Waste / Total Municipal Waste Generation) × 100
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	WASTE
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Operational and disposal cost savings Improved air and water quality Job creation and increased local tax revenues Community engagement Improved quality of life
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	YES
EXPECTED DATA SOURCE	Local public administration database (covering waste generation, collection, and recycling at the local level) Local waste management operators National Environmental Agency
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Yearly
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	IMPROVED CITIZEN PARTICIPATION
INDICATOR UNIT	number
DEFINITION	The number of citizens participating in awareness campaigns regarding sustainability and the environment



INDICATOR NAME	IMPROVED CITIZEN PARTICIPATION
CALCULATION	Social media reach metrics for online campaigns and participation reports for in-person events
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	YES
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	ALL SECTORS
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	YES
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	Increased civic engagement Enhanced collaboration Empowerment of marginalized groups Environmental sustainability Social cohesion Improved quality of life
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	NO
EXPECTED DATA SOURCE	Internal reports
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Yearly
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Comprehensive MEL Indicator System

INDICATOR METADATA

INDICATOR NAME	PUBLIC AND EXTERNAL CAPITAL INVESTED IN CLIMATE ACTION PROJECTS
INDICATOR UNIT	%
DEFINITION	The percentage of capital invested for the implementation of the CNAP. The indicator covers both its own sources and the funds received from the State budget, European fund, as well as external financing organizations (e.g., commercial banks, EBRD).
CALCULATION	Amount of capital invested / Total CNAP budget



INDICATOR NAME	PUBLIC AND EXTERNAL CAPITAL INVESTED IN CLIMATE ACTION PROJECTS
DOES THE INDICATOR MEASURE DIRECT IMPACTS (I.E. REDUCTION IN GREENHOUSE GAS EMISSIONS?)	NO
IF YES, WHICH EMISSION SOURCE SECTORS DOES IT IMPACT?	-
DOES THE INDICATOR MEASURE INDIRECT IMPACTS (I.E. CO-BENEFITS)?	NO
IF YES, WHICH CO-BENEFIT DOES IT MEASURE?	-
IS THE INDICATOR CAPTURED BY THE EXISTING CDP/ SCIS/ COVENANT OF MAYORS PLATFORMS?	NO
EXPECTED DATA SOURCE	Local budget - investments program
EXPECTED AVAILABILITY (1-5)	5
SUGGESTED COLLECTION INTERVAL	Yearly
DELIVERABLES DESCRIBING THE INDICATOR	Baseline Inventory and Monitoring Report
OTHER INDICATOR SYSTEMS USING THIS INDICATOR	Adapted based on the Comprehensive MEL Indicator System



STAKEHOLDERS

Provide a concise overview of the key stakeholders who hold significant influence or impact on the local transition to climate neutrality.

- **Make sure to also address the internal and external stakeholders that are relevant to the climate neutrality transition in terms of the necessary financing. For these stakeholders, address the funding issues both in the influence and interest columns, where applicable.**

The local public administration, alongside Constanța Metropolitan Area Intercommunity Development Association, has firmly integrated sustainability into the city's urban development strategies. This commitment is reflected in key strategic documents, including the 2023–2030 Integrated Urban Development Strategy (IUDS). The 2023–2030 Integrated Urban Development Strategy (IUDS) adopted a participatory approach, involving stakeholders through research, surveys, consultations, and an online platform. It aimed to reflect the needs of citizens and target groups. Additionally, it supported participation by accelerating the digitization of public institutions and listed priority projects for easy monitoring. **The city's approach prioritizes inclusivity and collaboration, engaging a wide range of stakeholders at local and metropolitan level, including public and private sectors, NGOs, citizens, research institutions, and funding bodies.**

In developing the Climate Neutrality Action Plan, the city followed the collaborative methodology outlined by the M100 National Hub and the European Commission's NetZeroCities initiative for EU Climate-Neutral and Smart Cities. This process began with forming a dedicated internal team within the City Hall, bringing together experts from various departments to integrate their expertise into the plan's development. Additionally, Constanța MA IDA contributed by providing critical data to address the metropolitan aspect of the plan. The collaborative spirit continued throughout the preparation of the CNAP, with a wide array of departments within the City Hall. The external collaboration was further reinforced by the partnership between Constanța City Hall and Constanța MA IDA, which designated coordinators and experts from both organizations to co-design the CNAP, ensuring comprehensive input and shared ownership of the process. Several key local stakeholders, including the public district heating and transport companies, Ovidius University, and the Medgreen Innovation Cluster, actively participated in preparing the CNAP. Climate City Contract (CCC) signatories and other relevant stakeholders were also consulted to reinforce the co-creation approach.

- **PUBLIC & INTERJURISDICTIONAL ASSOCIATIONS:** Building on a foundation of metropolitan-level collaboration, CNAP is further promoting integrated actions and fostering cooperation among Constanța City Hall departments and interjurisdictional associations to strengthen both local and metropolitan governance.
- **PRIVATE SECTOR:** To boost the local ecosystem's involvement in reaching climate neutrality, the NetZero Coalition will collaborate with local private sector stakeholders to align their efforts with the city's CO₂ emission reduction goals.
- **LOCAL NGOS:** Local NGOs, citizens, and associations play a vital role in the success of the Action Plan. The collaborative process for the 2023–2030 Integrated Urban Development Strategy (IUDS) established the basis to map local stakeholders and cultivate mutual commitments for the successful implementation of the CNAP's ambitious endeavour.



- **FUNDING ENTITIES:** This category includes both the entities managing non-reimbursable funds from public sources (e.g., the Managing Authorities and the Intermediate Bodies for European and national government funds, along with the European Commission and its subordinate bodies overseeing directly the EU funding programs) and the private funders (e.g., commercial banks and other private investors), together with other international funding organizations (e.g., EBRD, EIB, WB). All of these play a critical role in strategically directing the financial resources and prioritizing the climate-neutral investments to guide Constanța and its metropolitan area toward a climate-neutral future. However, the most significant stakeholders are the ones managing non-reimbursable funding sources, particularly as Constanța's investment projects and the associated capital heavily depend on this type of project financing. This reliance has substantially influenced the local priorities in the last almost 20 years and will continue to do so, especially as these funds increasingly support sustainable, low-carbon investments.
- **ACADEMIA AND RDI:** Local universities and RDI organizations are key players in addressing climate challenges. By collaborating with academic institutions and research centres, the city ensures that innovative research drives initiatives in energy efficiency, sustainable mobility, urban renewal, and green infrastructure, all aimed at achieving climate neutrality.

STAKEHOLDERS GROUPS

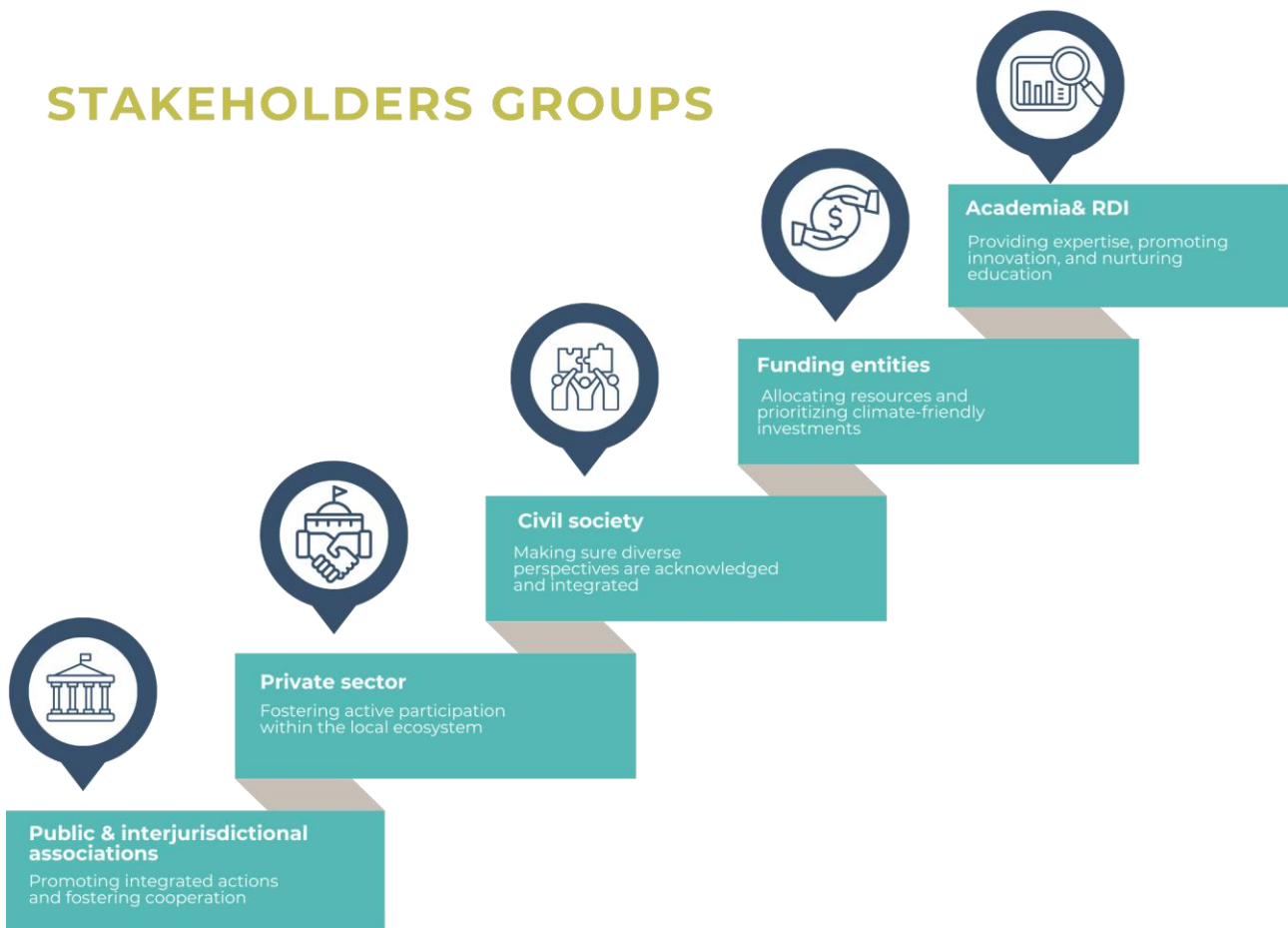




TABLE 15 STAKEHOLDERS ANALYSIS

STAKEHOLDER	SYSTEM	NETWORK	INFLUENCE	INTEREST	ENGAGEMENT
<u>CONSTANȚA CITY HALL</u>	PROCESS	PUBLIC ADMINISTRATION	Constanța City Hall, in collaboration with citizens, the local community, and external partners, will develop, implement, evaluate, and monitor actions outlined in the city's Climate Neutrality Action Plan.	Involving all stakeholders to achieve the Climate Neutrality Action Plan's goals and targets.	HIGH
<u>CONSTANȚA LOCAL COUNCIL</u>	PROCESSES	PUBLIC ADMINISTRATION	Constanța Local Council supports the Climate City Contract by providing resources, enacting policies, encouraging community involvement, and overseeing initiatives for municipal climate neutrality and sustainability.	Advancing climate initiatives aligned with local community needs.	HIGH
<u>CONSTANȚA METROPOLITAN AREA'S INTERCOMMUNITY DEVELOPMENT ASSOCIATION</u>	ALLIANCES	INTERJURISDICTIONAL ASSOCIATION	The metropolitan governing body works to extend the climate neutrality vision, measures, and collaboration across the entire Constanța metropolitan area.	Fostering collaboration and knowledge-sharing to drive climate neutrality projects from the local to the metropolitan level.	HIGH
<u>CONSTANȚA COUNTY COUNCIL</u>	ALLIANCES	PUBLIC ADMINISTRATION	Constanța County Council implements measures to achieve climate neutrality goals and promotes environmental awareness in rural communities.	Expanding Constanta's climate neutrality transition model to the country level.	HIGH
<u>CT BUS S.A.</u>	INFRASTRUCTURES	PUBLIC SECTOR	CT BUS S.A is developing and providing efficient, low emission, high-quality public transportation services that serve the needs of all citizens.	Modernizing the fleet and expanding the green public transportation network.	HIGH
<u>ENEL DISTRIBUȚIE DOBROGEA S.A. CONSTANȚA</u>	INFRASTRUCTURES	PUBLIC SECTOR	Designing and implementing measures to reduce the environmental impact of the energy system.	Enhancing internal processes, boosting infrastructure efficiency, and improving financial sustainability.	HIGH
<u>REȚELE ELECTRICE ROMÂNIA S.A.</u>	INFRASTRUCTURES	PUBLIC SECTOR			
<u>TERMOCENTRALE CONSTANȚA S.R.L.</u>	INFRASTRUCTURES	PUBLIC SECTOR			
<u>TERMOFICARE CONSTANȚA S.R.L.</u>	INFRASTRUCTURES	PUBLIC SECTOR			
<u>RAJA S.A.</u>	INFRASTRUCTURES	PUBLIC SECTOR	Overseeing water and wastewater services to safeguard freshwater ecosystems, eliminate pollution, and promote carbon-neutral, circular water usage.	Improving water resource protection and boosting wastewater reclamation rates.	HIGH
<u>DOBROGEA INTERCOMMUNITY DEVELOPMENT ASSOCIATION</u>	INFRASTRUCTURES	PUBLIC SECTOR	Ensuring efficient waste management, promoting recycling, reducing landfill usage, and ultimately contributing to climate neutrality and sustainability at the local level.	Through collaboration and resource-sharing, the association aims to enhance environmental protection and support the transition to a circular economy.	HIGH
<u>NATIONAL COMPANY FOR MARITIME PORTS ADMINISTRATION SA CONSTANTA</u>	INFRASTRUCTURES	PUBLIC SECTOR	As the Port's administrator, it oversees planning and investment decisions for the projects impacting the Port.	Reducing the CO ₂ emissions and decreasing the investment and operating costs at the Port level, including through partnerships with the local and county public administrations, the private operators within the Port and innovative projects.	HIGH



STAKEHOLDER	SYSTEM	NETWORK	INFLUENCE	INTEREST	ENGAGEMENT
<u>THE ORDER OF ROMANIAN ARCHITECTS - DOBROGEA BRANCH</u>	CAPACITIES	NGO	Advocating for sustainable architecture by incorporating energy efficiency, renewable materials, and nature-based solutions to lower carbon emissions and enhance environmental resilience.	Supporting climate-conscious building design and construction.	MODERATE
<u>NON-GOVERNMENTAL ECOLOGICAL ORGANIZATION "MARE NOSTRUM"</u>	CAPACITIES	NGO	Shaping policies, promote sustainability, and drive innovation in renewable energy, urban planning, and social justice to accelerate the city's climate neutrality efforts.	Driving lasting change by collaborating with communities, advocating for inclusive policies, and partnering with governments, ensuring a resilient and equitable future for the city.	LOW
<u>CONSTANȚA RESTART</u>	CAPACITIES	NGO			LOW
<u>"ÎMPREUNĂ PENTRU VIITOR CONSTANȚA" ASSOCIATION</u>	CAPACITIES	NGO			LOW
<u>THE ROMANIAN PROFESSIONAL ASSOCIATION OF URBAN PLANNERS - CONSTANȚA BRANCH</u>	CAPACITIES	NGO			LOW
<u>CONSTANȚA COMPANIES ASSOCIATION</u>	CAPACITIES	NGO			LOW
<u>MENTOR ALLIANCE ASSOCIATION</u>	CAPACITIES	NGO			LOW
<u>BIO DANUBIUS CLUSTER</u>	CAPACITIES	NGO			LOW
<u>INOMAR CLUSTER</u>	CAPACITIES	NGO			LOW
<u>ACT FOR TOMORROW</u>	CAPACITIES	NGO			LOW
<u>MEDGREEN CLUSTER</u>	CAPACITIES	NGO			LOW
<u>"OVIDIUS" UNIVERSITY</u>	CAPACITIES	RDI			HIGH
<u>CONSTANȚA MARITIME UNIVERSITY</u>	CAPACITIES	RDI	Promoting local climate neutrality by integrating RDI involvement and customized curriculum development.	Fostering innovation and offering academic programs centred on climate neutrality.	HIGH
<u>"MIRCEA CEL BATRAN" NAVAL ACADEMY</u>	CAPACITIES	RDI			HIGH
<u>"ANDREI ȘAGUNA" UNIVERSITY</u>	CAPACITIES	RDI			HIGH
<u>"SPIRU HARET" UNIVERSITY</u>	CAPACITIES	RDI			HIGH
<u>GAUDEAMUS FOUNDATION - "TOMIS" UNIVERSITY</u>	CAPACITIES	RDI			HIGH
<u>CONSTANȚA PREFECTURE</u>	ALLIANCES	PUBLIC ADMINISTRATION	Coordinating and supporting the implementation of climate policies in line with national objectives.	Ensuring string governance and alignment with broader climate goals at the local level.	MODERATE
<u>CONSTANȚA CHAMBER OF COMMERCE, INDUSTRY, NAVIGATION AND AGRICULTURE</u>	ALLIANCES	PUBLIC SECTOR	Advocating for climate neutrality principles within the local business community.	Creating customized climate neutrality initiatives for local businesses.	LOW
<u>CONSTANȚA ENVIRONMENTAL PROTECTION AGENCY</u>	ALLIANCES	NGO		Promoting a carbon-neutral and resilient community through educational campaigns that emphasize climate neutrality and sustainable development.	HIGH



STAKEHOLDER	SYSTEM	NETWORK	INFLUENCE	INTEREST	ENGAGEMENT
			Implementing projects aimed at enhancing the resilience of natural systems to climate change.		
<u>ASSOCIATION FOR SUSTAINABLE DEVELOPMENT OF CONSTANȚA COUNTY</u>	ALLIANCES	NGO	Facilitating climate-related initiatives, promoting collaboration among stakeholders, and supporting sustainable practices to achieve long-term climate neutrality goals.	Ensuring that actions and policies align with the broader public good.	HIGH
<u>“DOBROGEA” EMERGENCY SITUATIONS INSPECTORATE OF CONSTANTA COUNTY</u>	CAPACITIES	PUBLIC SECTOR	Minimizing emergency impacts and boosting climate resilience through risk assessment, preparedness, and public education.	Prioritizing public safety, coordinating emergency efforts, and delivering support during climate-related emergencies.	MODERATE
<u>CONSTANȚA DIRECTORATE FOR PUBLIC HEALTH</u>	CAPACITIES	PUBLIC SECTOR	Offering climate-health expertise supporting health policies encouraging active transportation, and preparing for heat waves.	Tackling the health effects of climate change and promoting strategies for mitigation.	MODERATE
<u>„SFÂNTUL APOSTOL ANDREI” EMERGENCY CLINICAL COUNTY HOSPITAL</u>	CAPACITIES	PUBLIC SECTOR			MODERATE
<u>CONSTANȚA COUNTY EMPLOYMENT AGENCY</u>	CAPACITIES	PUBLIC SECTOR	Linking workforce development with climate initiatives by providing training for green jobs and promoting employment in sustainable industries.	Building a skilled workforce for green job opportunities to drive economic growth and strengthen climate resilience in the region.	MODERATE
<u>General Directorate of Social Assistance of Constanța Municipality</u>	CAPACITIES	PUBLIC SECTOR	Combining social welfare and climate resilience efforts to ensure vulnerable populations have access to resources and support, while promoting community resilience and sustainable livelihoods for disadvantaged groups.	Promoting social equity and resilience in the community amidst climate challenges.	MODERATE
<u>CONSTANȚA GENERAL DIRECTORATE FOR SOCIAL ASSISTANCE AND CHILD PROTECTION</u>	CAPACITIES	PUBLIC SECTOR			MODERATE
<u>CONSTANȚA COUNTY AGENCY FOR PAYMENTS AND SOCIAL INSPECTION</u>	CAPACITIES	PUBLIC SECTOR			MODERATE
<u>CONSTANȚA AGRICULTURE DIRECTORATE</u>	INFRASTRUCTURES, CAPACITIES, FUNDS	PUBLIC SECTOR	Encouraging sustainable farming practices and improving agricultural resilience to climate change.	Promoting climate-smart framing, resource conservation, biodiversity, preservation, and support for extreme weather mitigation.	MODERATE
<u>CONSTANȚA COUNTY COUNCIL OF STUDENTS</u>	CAPACITIES, ALLIANCES	REPRESENTATIVE ASSOCIATION	Encouraging and empowering students to tackle environmental and social challenges, including those related to climate change.	Promoting a culture of environmental responsibility and civic participation.	MODERATE
<u>CONSTANȚA COUNTY SCHOOL INSPECTORATE</u>	CAPACITIES	PUBLIC SECTOR	Encouraging schools to actively participate in local climate neutrality efforts.	Promoting a climate neutrality mindset among students and educators.	HIGH
<u>CONSTANȚA COUNTY DIRECTORATE FOR STATISTICS</u>	CAPACITIES	PUBLIC SECTOR	Gathering and sharing environmental and climate data along with relevant indicators.	Facilitating the development of evidence-based policies, resource allocation, and monitoring of climate-related initiatives.	LOW
<u>ROMANIAN GREEN BUILDING COUNCIL</u>	ALLIANCES	NGO (CERTIFICATION BODY)	Encouraging best practices, technologies, and certifications to achieve climate neutrality in buildings.	Transforming the build environment into a climate-neutral sector.	MODERATE



STAKEHOLDER	SYSTEM	NETWORK	INFLUENCE	INTEREST	ENGAGEMENT
<u>SOUTH-EAST REGIONAL DEVELOPMENT AGENCY</u>	FUNDS	REGIONAL DEVELOPMENT AGENCY	Allocating funds for climate neutrality projects across various ministries supporting the public administration's efforts to make Constanța city and its metropolitan area carbon-neutral, and promoting it as a model for others to follow.	Enhancing and supporting Romania's efforts to meet climate neutrality goals.	MODERATE
<u>INVESTMENTS AND EUROPEAN PROJECTS MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
<u>FINANCE MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
<u>DEVELOPMENT, PUBLIC WORKS, AND ADMINISTRATION MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
<u>TRANSPORT AND INFRASTRUCTURE MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
<u>ENERGY MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
<u>ENVIRONMENT MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
<u>RESEARCH, INNOVATION AND DIGITALIZATION MINISTRY</u>	FUNDS	PUBLIC SECTOR			MODERATE
COMMERCIAL BANKS	FUNDS	BANKING INSTITUTIONS	Securing funding for public investments in climate neutrality beyond local budgets and supporting private projects to reduce local greenhouse gas emissions.	Aligning with European principles and goals for climate neutrality by developing a variety of friendly banking services.	MODERATE
OTHER PRIVATE COMPANIES	FUNDS	PRIVATE SECTOR	Launching climate neutrality projects to cut emissions and supporting public and community-driven efforts, including through CSR initiatives.	Strengthening brand identity by promoting climate neutrality and resilience through increased awareness and active engagement in addressing climate change.	MODERATE
<u>IULIUS COMPANY</u>	ALLIANCES	COMPANY			MODERATE
HOMEOWNERS ASSOCIATIONS	CAPACITIES, PROCESSES, ALLIANCES, FUNDS	CIVIL SOCIETY	Engaging in dialogues with the apartment building residents, to encourage and motivate them to collaborate on improving the energy efficiency of the residential buildings, reducing the energy consumption within their households and adopting other solutions which could help lower and capture the CO ₂ emissions at both the household and building levels.	Providing improved living conditions and lower building maintenance costs for the residents of the apartment buildings under their management.	HIGH
CITIZENS	CAPACITIES, PROCESSES, ALLIANCES, FUNDS	CIVIL SOCIETY	Participating in and launching initiatives to improve daily life, reduce carbon footprints, and protect natural ecosystems.	Boosting well-being, climate resilience, and satisfaction through active participation.	HIGH



Shortly describe the participatory model for achieving climate neutrality, highlighting the collaboration with the local community (citizens), local stakeholders (e.g., private companies, NGOs, research organizations) and external partners (e.g., other public administrations, regional development agencies, national ministries, other organizations).

- Relevant aspects may include the local context, the prior experience in community and stakeholder collaboration (e.g., jointly developed and implemented projects, strategic partnerships) and the engagement with various external partners.
- Present the participatory measures used in developing this Action Plan (if applicable) and the participatory method (approaches, processes, mechanisms, instruments, structures, capacity building) to be employed in order to ensure both the implementation and monitoring of the current Climate Neutrality Action Plan.
- Make sure to also describe the actions pertaining to Organisational and Governance Innovation, as well as the actions related to Social and Other Innovation fields.
- Do not forget to make reference to upholding the principles of climate justice, particularly for the marginalized communities.

PREEXISTING BASIS FOR PARTICIPATORY AND COLLABORATIVE ACTIONS

The local governance framework in Constanța embraces a participatory approach, both as a legal mandate and a practical tool for decision-making. The following selected examples highlight the city's dedication to participatory governance, ensuring that citizens actively shape their community's future and enabling the exchange of knowledge, resources, and best practices with other European cities to address local urban challenges with integrated, sustainable solutions.

- **PARTICIPATORY BUDGETING:** A key mechanism for public involvement is Participatory Budgeting, facilitated through the platform "Tu decizi pentru Constanța." This platform allows residents, workers, and students to propose and vote on projects that allocate a portion of the local budget. Projects with the highest votes across ten categories are selected annually, ensuring continuous citizen engagement.
- **COLLABORATIVE INITIATIVES WITH NGOS:** Initiatives like the "Natură Urbană - Oxigen pentru Constanța" project aim to enhance urban regeneration and green spaces. This project, involving Constanța City Hall, Constanța School Inspectorate and Act for Tomorrow Association, focuses on creating urban forests, increasing green areas, and promoting environmental education, waste recycling, and volunteerism. A notable example is the community urban forest planting project in Marvimex, Inel 2, in April 2023.
- **COLLABORATION WITH OTHER EUROPEAN CITIES:** The Portis – Port Cities: Innovation for Sustainability project, funded by HORIZON 2020 and implemented by the Intercommunity Development Association "Constanța Metropolitan Area," aimed to address mobility issues in European port cities. It was carried out in Aberdeen, Antwerp, Constanța, Klaipeda, and Trieste, with Ningbo (China) as a major international follower. The project highlighted cooperation between these European cities to enhance city-port integration, promote economic growth, and improve residents' quality of life.
- **COLLABORATIVE INITIATIVES WITH THE PRIVATE SECTOR:** Oil Terminal and Iulius signed a partnership for an urban regeneration project in Constanța, aligning with the city's development goals. This investment will transform a 38-hectare inactive land plot into a



mixed-use development with urban gardens, offices, shopping, entertainment areas, educational and cultural facilities, and integrated infrastructure.

→ **STRATEGIC COLLABORATIONS:** Constanța Municipality aligns its interventions with the New European Bauhaus, the New Leipzig Charter, and Romania's Urban Policy. The Action Plan integrates local and regional strategies like SECAP, IUDS, and SUMP, focusing on energy efficiency, renewable energy, public transport modernization, and green infrastructure. Nationally, it aligns with Romania's Long-Term Strategy for Greenhouse Gas Emission Reduction and the National Plan for Energy and Climate. At the European level, it supports the European Green Deal, the Paris Climate Agreement, and the Covenant of Mayors framework, ensuring consistency with global climate goals and sustainable development principles.

DRAFTING PROCESS

The drafting of the CNAP followed a collaborative, multi-level approach, involving a diverse range of internal and external stakeholders, including key City Hall departments, local entities, and expert organizations, ensuring a co-designed, inclusive process that fostered shared responsibility and commitment for the successful implementation of climate neutrality goals.

→ INTERNAL GOVERNANCE:

- ◆ Experts from key City Hall departments (Strategies and European Funds, Urban Planning and Heritage, Public Services, Logistics etc.) involved in drafting the CNAP.
- ◆ Departments reported to the Mayor and contributed according to their areas of expertise.

→ EXTERNAL GOVERNANCE:

- ◆ Strengthened interjurisdictional cooperation through a partnership between Constanța City Hall and Constanța MA IDA.
- ◆ Several coordinators and experts from both organizations assisted in the preparation, ensuring a co-design approach.

→ STAKEHOLDER PARTICIPATION:

- ◆ Active involvement of local stakeholders, including the public district heating company, public transport company, Ovidius University, and Medgreen Innovation Cluster.
- ◆ Consultation with Climate City Contract (CCC) signatories for ongoing feedback and reinforcement of the co-creation process.

→ COLLABORATION OBJECTIVE:

- ◆ Cultivating mutual commitments for the successful implementation of the CNAP.

IMPLEMENTING, MONITORING, AND UPDATING PROCESS

CNAP includes actions in both organisational and governance innovation, as well as social and other innovation. These actions involve the digitalization of public services for climate neutrality, establishing and operationalizing a climate neutrality office, and forming a Local NetZero coalition. Additionally, CNAP focuses on joint climate mitigation-adaptation approaches, climate neutrality branding, and implementing supportive regulations. On the social front, efforts include raising awareness and engaging local ecosystems, using art to promote climate neutrality, encouraging behavioral changes towards climate change mitigation, and empowering marginalized groups. These initiatives collectively aim to foster a sustainable and climate-resilient future through innovative governance and social engagement.



The implementation phase will focus on establishing the necessary structures to ensure efficient and quality execution of the CNAP.

- Establish a Climate Neutrality Office within the City Hall to oversee CNAP implementation.
- Appoint an Energy Manager and PPP Specialist to handle energy initiatives and public-private partnerships.
- Develop and maintain a NetZero Coalition to consolidate expertise and resources.
- Formalize Climate Neutrality Neighborhood Advisory Councils to foster local collaboration on climate initiatives.

The monitoring process will be essential for understanding the effectiveness of the actions outlined in the CNAP.

- Monitor CNAP actions using MEL indicators, assessing their impact and costs.
- Prepare bi-annual GHG emissions inventory and semi-annual monitoring reports for other actions.
- Communicate progress and challenges transparently to engage the community.

The CNAP will be updated at least every two years in alignment with the GHG emissions inventory updates, ensuring that the plan evolves based on the latest data and insights.

- Update the CNAP every two years, or more frequently if needed, incorporating stakeholder input.
- Ensure updates reflect new actions, completed initiatives, and ongoing stakeholder participation.

The CNAP adopts an approach rooted in climate justice to protect marginalized communities by prioritizing social inclusion principles. It focuses on addressing the needs of disadvantaged groups, such as children, the elderly, single-parent families, individuals with health conditions, low-income populations, and marginalized communities. When internal expertise is insufficient, external specialists, including local NGOs, sociologists, and anthropologists, are engaged. Through its measures, the CNAP aims to directly reduce the vulnerability of these groups to climate change impacts while providing co-benefits for the broader local population.



BARRIERS

Provide a summary of the main local barriers impeding the city's transition towards climate neutrality.

- For each barrier, briefly outline its impact on hindering the climate neutrality achievement and describe the approach / intervention / solution for overcoming it through the implementation of the current Climate Neutrality Action Plan.
- Make sure to also incorporate barriers related to climate investment: structural, policy, economic and financial obstacles which could hinder the deployment of capital to support climate action.

Given the complexity of the transition to climate neutrality, a series of barriers inevitably arise, which could hinder this process, as outlined in the table below. However, the mapping of these barriers was not limited to their identification; it also aimed at finding solutions to address them. Therefore, for each identified barrier, a specific solution has been proposed to mitigate its impact, as detailed below.



TABLE 16 KEY BARRIERS

EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
TRANSVERSAL BARRIERS	Dual challenge of urban sprawl and hollowing out of urban core	This process barrier is the result of insufficiently regulated market driven development and the lack of a cohesive vision for the medium and long-term development of the city in relation to the metropolitan area. The phenomenon manifests itself in the form of development concentrated on the outskirts of the city and outside the administrative boundaries, typically on the edge of peri-urban settlements and a rather slow regeneration process of the urban core. In the last decades, urban development in Constanța took place without an up-to-date spatial plan able to guide urban regeneration and growth while reinforcing sustainable practices. The General Urban Plan (GUP) in force has been elaborated in 1997 and successively extended since, therefore it no longer reflects the current state of urban realm and can no longer fulfil its role to guide development according to a coherent vision. It is currently under revision, yet the process has been rather slow and difficult. Moreover, the metropolitan area also lacks a coherent vision for development in the absence of a metropolitan level spatial plan and with Constanța County Territorial Development Plan still under elaboration. This results in a dual challenge. On the one hand sprawl and fragmented development leads to inefficient land-use patterns – monofunctional development, inadequate access to basic and social infrastructure within walking distance, and disconnect between spatial and transport development, locking people into car dependency and unsustainable living patterns, generating traffic inefficiencies, and driving up the demands and cost related to the provision of basic infrastructure. On the other hand, the limited and uncoordinated regeneration projects within the urban core, leads to missed opportunities to foster sustainable development and climate neutrality, by enhancing walkability, access to green spaces and public infrastructure, while promoting compact, mixed-use, transit-oriented development over sprawl.	This barrier is a general challenge in urban planning and development, not being solely tied to the climate neutrality dimension, so its resolution extends beyond the CNAP. However, the local and metropolitan teams implementing the CNAP will tackle it comprehensively and within their scope, through the actions proposed for urban renewal, energy systems, mobility, waste management and green infrastructure. Nonetheless, the main measures addressing this barrier are the soft interventions, with the most significant being: the workshops focused on fostering a metropolitan approach to climate neutrality, applying urban planning principles which promote integrated climate mitigation and adaptation approaches, the revision of local urban planning regulations to support the transition towards climate neutrality, the collaboration with architects and urban planners to promote the adoption of climate neutrality-focused approaches.
ENERGY SYSTEMS	Inefficient district heating system	The existence of a central heating system in Constanța opens up significant opportunities to accelerate the transition to climate neutrality, yet several factors limit the city's capacity to capitalize on this prospect. At the moment, the central heating system is based entirely on the burning of natural gas, generating substantial CO₂ emissions, requiring significant investments to transition to renewable energy sources. Nevertheless, the economic feasibility of such investments is uncertain. On the one hand, Constanța's centralized heating system has a more limited coverage compared to other major cities, due to the large share of single-family home neighborhoods. In this context, the proliferation of individual heating systems at the expense of centralized heating systems poses a direct threat to maintaining the critical number of users required to maintain the system's economic feasibility, operational efficiency and environmental sustainability. On the other hand, in the last decade, a large number of users opted out of the system.	To mitigate this barrier and its adverse climate and economic impacts, the CNAP foresees an action aimed at consolidating an energy-efficient district heating system, by rehabilitating the primary thermal networks and energy heating networks, alongside integrating the high-efficiency cogeneration (C.E.T) for thermal and electrical energy production. Alongside these infrastructure investments, the CNAP also proposes a soft intervention to encourage behavioral changes related to the energy sector, with one key goal being to connect the citizens to the local district heating system as part of adopting sustainable energy solutions.



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
		In 2021, Constanța registered the second fastest rate of disconnection in Romania, with nearly one fourth of all users (10,732 out of 46,031) opting out in 2021 alone. This phenomenon stems from the increasing cost of thermal energy caused by the elimination of the public subsidy in 2011 and the growing inefficiencies of the system, the lower costs associated with individual gas heating systems and the permissive regulations regarding illegal disconnections and new constructions. The declining number of users, particularly given the local configuration of the central heating system and the aging infrastructure, have resulted in severe inefficiencies. For example, in 2022, SACET Constanța estimated the loss of thermal energy at nearly 60% of the quantity produced for delivery. Overall, the system oversizing compared to the current number of users and leads excessing energy consumption and low cost-effectiveness, reducing the system's reliability, and limiting revenue streams and investment capacity.	
BUILT ENVIRONMENT	Low energy efficiency in multi-family and public buildings and slow regeneration process	The low energy efficiency of the building stock presents a significant challenge for advancing climate neutrality. On the one hand, the housing stock, predominantly built between 1960 – 1990 is aging and no longer compliant with modern energy efficiency standards, calling for urgent regeneration to be able to remain safe and comfortable for their residents, competitive on the housing market and to support the transition to climate neutrality. On the other hand, public buildings consume a large amount of energy to ensure comfort and continuous operations, due to inefficient heating and cooling systems, outdated equipment and inadequate thermal insulation. Despite the availability of EU and national funding for thermal rehabilitation, progress has been rather slow. Moreover, comprehensive renovation projects that provide substantial energy performance improvements, while also addressing structural, functional and architectural regeneration remain rare. It is particularly difficult to implement such projects in multi-family buildings due to the limited capacity of homeowners' associations to initiate and coordinate complex renovation projects, navigate complex bureaucracy, reach consensus among all residents and secure the necessary co-funding. This increases the burden put on the local administration, which lacks adequate capacity to keep up with the growing demands to prepare funding applications and manage such a vast portfolio of deep regeneration projects. Without strong incentives for private developers to go beyond the minimum energy efficiency requirements, integrate renewable energy systems or, when possible, connect to the central heating system, new constructions continue to have energy inefficiencies.	Recognizing the critical importance of this barrier, the CNAP outlines sound measures to tackle it. For the built environment, dedicated actions target increasing the energy performance of both the public buildings (e.g., administrative, social, educational, cultural, military facilities) and private multi-apartment residential buildings. The key soft interventions include promoting behavioral changes to adopt sustainable energy solutions, developing a NZEB TOR for building renovation and implementing innovations in condominium governance. The awareness and education interventions will also play a significant role, particularly through the establishment of the Climate Neutrality Neighborhood Advisory Councils, coordinated primarily by Homeowners Associations (who will be assigned specific responsibilities on this topic). The interventions aimed at mobilizing the private sector through enhanced planning and regulations will further help address this barrier. The implementation of the Energy Community pilot proposed in the CNAP will also help address this barrier, by introducing an innovative action model. The operationalization of the Climate Neutrality Office, the launch of the NetZero Coalition and especially the Energy Manager's activities will significantly increase the capacity to support all of these efforts.
BUILT ENVIRONMENT	Large energy demands and limited optimization opportunities in single-family neighborhoods	In Constanța, a large share of housing stock is made out of single-family homes located in high-density neighborhoods. These are typically, characterized by larger energy demands compared to multi-family buildings, since each home relies on its own heating, cooling and electrical system. In addition, the majority of homes are quite old,	In order to encourage the homeowners to adopt behaviors aimed at reducing the CO₂ emissions caused by their energy consumption patterns, the CNAP includes multiple awareness-raising and education interventions. These interventions will promote the adoption of green energy solutions and encourage improvements in



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
		having been built without energy efficiency in mind – they are not optimized for energy conservation and use wood or natural gas for heating and hot water production, being a significant source of CO₂ emissions and pollutants. The high density and lack of green areas in such neighborhoods exacerbated the urban heat island effect, leading to higher energy consumption in the summer, when A/C systems are used. The fragmented infrastructure limits the opportunities to implement large-scale renewable energy systems or energy-saving technologies and to achieve economies of scale in energy distribution. Moreover, the adoption of individual renewables has been rather slow, due to limited financial incentives and lack of support and guidance for homeowners to implement energy efficiency upgrades suitable for their particular situation. Compared to multi-family buildings, the thermal and energy optimization of single-family homes require extensive individual retrofitting to achieve similar results, which can be cost-prohibitive for homeowners, thus additional support is required.	home energy efficiency (not only in terms of investments in renovations and technologies, but also through behavioral changes). Furthermore, it is expected that the public administration's efforts to reduce the citywide CO₂ emissions will serve as a positive model, inspiring the citizens to actively participate in this pursuit. The implementation of the Energy Community pilot proposed in the CNAP will also help address this barrier, by introducing an innovative action model. Moreover, in order to mitigate the UHI effect in these neighborhoods and capture some of the resulting CO₂, the CNAP plans substantial investments in expanding the green area network, e.g., creating new pocket parks and community green spaces in all of the major neighborhoods, redesigning and rehabilitating the existing parks, planting urban forests.
BUILT ENVIRONMENT	Limited deployment of renewable energy solutions in residential buildings	This barrier is driven by a combination of capacity and behavioral challenges, rooted in technical, financial, and regulatory obstacles, as well as a lack of awareness among citizens regarding the benefits of renewable energy solutions and limited capacity for local administration to mobilize resources. Many homeowners, private developers, and homeowners' associations remain indifferent to the green energy transition, hindering collective efforts toward sustainability. A significant issue lies in the physical limitations of residential buildings, particularly older ones constructed during the communist era. These structures often lack the infrastructure or space needed to install renewable energy technologies like solar panels or heat pumps. In addition, the high initial costs of adopting such technologies create a barrier for both current homeowners and developers, who may be reluctant to invest without clear, immediate returns. The regulatory environment further exacerbates these issues, with cumbersome approval processes that further slowdown the shift to sustainable energy sources. As a result, the full potential for achieving climate neutrality in these communities is not being realized, as both structural and systemic challenges continue to impede progress.	The CNAP not only includes a specific action to enhance the local supply of renewable energy, but also features a range of interventions to support the transition to such energy sources. These include planning and regulatory measures, awareness-raising and education (including promotion and information) activities to encourage behavioral changes and active engagement of citizens and private sector actors. Together, these interventions aim to help the citizens and the local organizations to better understand the benefits they can gain from investing in renewable energy solutions and provide them with guidance on how to do so more easily. The implementation of the Energy Community pilot proposed in the CNAP will also help address this barrier, by introducing an innovative action model. Additionally, over time, dedicated efforts will be focused (under the governance structures outlined in the CNAP) on finding solutions to address the infrastructural challenges related to this barrier.
BUILT ENVIRONMENT	High density single-family neighborhoods exposed to higher climate hazard risks	A large share of Constanța's urban fabric is made out of high-density single-family neighborhoods, which have very limited access to greenery and extensive impervious surfaces. These conditions exacerbate climate-related risks, such as urban-heat island effect, flooding and increased runoff. The combined effects of these conditions create significant barriers to the transition towards climate neutrality. They lead to increased energy consumption and emissions in the summer, while limiting the possibility to implement solutions aimed at carbon sequestration, air quality improvements, or at reducing ambient temperatures and energy demands.	While this barrier cannot be fully addressed through the CNAP alone, the actions related to green infrastructure and nature-based solutions will contribute to its reduction. Additionally, the CNAP includes actions which integrate both the climate mitigation and climate adaptation approaches, particularly through the soft interventions which promote daily behavioral changes, not just dedicated investments. This holistic approach aims to reduce the exposure of the population and local organizations to the negative effects of climate changes. Once the branch of the National Competence Center on climate change adaptation is established, it will also help address this barrier through the measures it will develop. It is also important to mention that the SECAP is specifically designed to address



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
			climate change adaptation, in addition to climate neutrality. Together with the IUDS, the SECAP will complement the CNAP, enhancing the climate resilience at both the local and metropolitan levels, while also supporting the transition to climate neutrality.
BUILT ENVIRONMENT	Environmental and economic challenges associated with the presence of industrial platforms and brownfield in the city center	The extensive brownfield site of the former Oil Terminal and the industrial platforms within the port of Constanța, located in the center of the urban fabric, poses significant challenges to the accessibility and quality of life within the city, thus hindering efforts to encourage sustainable behaviors, and contributes to environmental degradation, hindering efforts to reduce emissions and pollution. The neglected brownfield in particular is a missed opportunity for compact, transit-oriented development, economic growth, carbon sequestration and enhanced access to green spaces, and for the large-scale demonstration of green solutions within the city. Prior to redevelopment, complex environmental challenges need to be overcome and an extensive remediation process is required for site decontamination, calling for coordinated public-private efforts.	Both the Oil Terminal and the Port exceed the administrative capacity allocated solely for the CNAP's implementation. However, in terms of urban renewal, the CNAP foresees integrated urban regeneration interventions for the Oil Terminal area and urban renewal projects for the public spaces in the central area, neighborhoods and around the Central Railway Station. Additionally, the IUDS includes a dedicated set of urban regeneration projects. Moreover, both the City Hall and the MA IDA collaborate closely with the local partners (e.g., real estate developers and private industrial operators) to establish PPPs focused on urban regeneration. The planning efforts are conducted in collaboration with specialized experts (e.g., urban planners, architects), leveraging the partnerships with organizations such as the Romanian Order of Architects, the World Bank and various companies and organizations specialized in the field; through these collaborations, integrated urban regeneration concepts are developed and implemented for the most challenging areas. The activities carried out by the local branch of the National Competence Center on Climate Change Adaptation will also play a key role in addressing this barrier, once it operates systematically. The Port area is designated as an emissions zone which will not be addressed through the CNAP, as it currently exceeds the capacity of the public administration. However, the City Hall is committed to addressing this issue by 2050 through dedicated actions, by closely working with the Port Authority and the private operators in the field.
MOBILITY & TRANSPORT	Car dependency in peri-urban areas leading to transport inefficiencies	This structural barrier stems from the extensive development of the peri-urban area, characterized by inefficient land-use patterns (i.e., monofunctional, leapfrog development), low-densities, and lack of neighborhood amenities, resulting in extended travel distances and the need to commute for daily activities (i.e., work, school, shopping). Metropolitan public transport routes are limited and undersized relative to the demand, resulting in car dependency and the need for individuals to make multiple daily car trips to meet their basic needs. In addition, the absence of infrastructure for cycling or walking further entrenches reliance on cars. As a result, peri-urban dwellers are locked into unsustainable travel patterns, which further exacerbate traffic congestion in and around Constanța, driving up emissions and costs associated with sustainable mobility solutions.	The complexity and long-standing nature of this barrier, which stems from various factors centred around the urban planning system, far exceed the scope of the CNAP. As such, it is primarily addressed through the SUMP and more broadly through the IUDS. However, the CNAP also includes several actions aimed at partially solving this issue: nearly 1 EUR billion of the climate neutrality investments are allocated to actions which will improve the mobility flows by enhancing the sustainability and intermodality of the transport system, both locally and metropolitan-wide. These actions focus on promoting public transport, encouraging non-motorized mobility (cycling and walking) and using traffic management and parking policies to reduce the congestion. Additional funds are dedicated to digitalization and smart city solutions, including a software platform for integrated mobility management and other digital tools for efficient, green mobility.



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
			Furthermore, the CNAP includes soft interventions such as planning and regulation (including low-emission zones), promoting behavioral changes to adopt active and low-emission mobility options, and fostering civic innovation in the key emission sectors (which include the mobility and transport). The activities of the Sustainable Mobility Center will also play a key role in addressing this barrier once it becomes fully operational. Likewise, the intervention aimed at operationalizing the Metropolitan Public Transport IDA and the public service contract will make a significant contribution to overcoming the presented challenges.
MOBILITY & TRANSPORT	Public transport inefficiencies	The level of public transport usage in the urban and metropolitan area and the environmental sustainability of the system are limited by several inefficiencies. First of all, various infrastructure barriers limit the attractivity and efficiency of the transit system. The age and dependency on diesel fuel of public transport fleets result in high CO₂ emissions and air and noise pollution. Moreover, the lack of priority bus lanes results in frequent delays and limited reliability. There is a limited integration of rail, bus and taxi services, particularly in the main train station area, as well as limited opportunities to transition from car to public transit when entering the city. Secondly, the lack of integration of different transit services limits the system's reliability and people's interest in using bus services on a daily basis. In Constanța urban and metropolitan bus routes are services by both public and private operators, leading to a lower degree of integration with respect to transfer points, scheduling, ticketing and quality of service. In addition, since all metropolitan connections are provided by private operators, frequencies and routes are often determined based on profitability rather than accessibility criteria, particularly since one particularity of the licensing system limit the flexibility of adjusting vehicles to demand – i.e., at the moment of applying for a license, individual buses are assigned to a specific route.	As previously mentioned, the CNAP includes several interventions aimed at developing the public transport system at local and metropolitan level, primarily through the purchase of electric/zero-emission buses (including the pilot foreseen for the hydrogen-fueled buses), the modernization of public transport stations, the establishment of an nZEB depot for zero-emission buses and the development of the metropolitan train system. Additionally, the CNAP proposes the development of sustainable and intermodal urban mobility corridors to enhance integrated accessibility to key local areas and park-and-ride facilities. These measures, combined with dedicated spatial planning and regulatory actions (including local public policies), will support the sustainable development of the public transport system and reduce its carbon footprint, increasing its regular use by both citizens and tourists. The activities carried out by the Sustainable Mobility Center will also play a key role in addressing this barrier, once it operates systematically. At the metropolitan level, the intervention focused on operationalizing the Metropolitan Public Transport IDA and the public service contract will have the most significant positive impact in addressing this barrier.
MOBILITY & TRANSPORT	Seasonal transport inefficiencies	Traffic congestion in and around the city is exacerbated during the summer, with a direct impact on emissions and quality of life within Constanța. This barrier stems, on the one hand, from the lack of a direct link between the major roads connecting the other regions of Romania and respectively the resorts located on the south of the coast with the popular Mamaia – Năvodari resort area. On the other hand, tourists are highly dependent on cars, either personal or on the ride-sharing system, to navigate between the various attraction points along the coast (e.g., nightclubs in Mamaia -Năvodari attracts tourists from southern resorts like Costinești or Eforie). In addition, residential parking within the inner city becomes even more scarce during the summer, particularly in the neighborhoods located along the beach and the touristic harbour of Tomis (i.e., <i>Faleză Nord, Universitate, Centru</i>). This is due to limited availability of parking infrastructure dedicated to tourists and the lack of convenient	This barrier is particularly significant due to the tourist profile of Constanța and its metropolitan area. However, all the actions proposed by the CNAP regarding the sustainable mobility and non-polluting transport directly contribute to addressing it, as they target both the residents and the tourists. The activities carried out by the Sustainable Mobility Center will also play a key role in addressing this barrier, once it operates systematically. Moreover, as previously mentioned, the CNAP is not the only strategic document addressing this emission sector, as mobility is the key focus of the SUMP, which includes complementary investments, programs and policies aimed at addressing the deficiencies of the local and metropolitan transport network. At the same time, the IUDS also plays an integral role in tackling this barrier, through its portfolio of projects.



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
		options to reach the beach by public transit.	
MOBILITY & TRANSPORT	Limited deployment and uptake of green mobility solutions among population	The city and its metropolitan area have yet to unlock the potential of green mobility solutions to drive the transition to climate neutrality. At the moment, the deployment and uptake of green mobility solutions among individuals, both tourists and residents, is constrained by both structural and behavioral barriers. On the one hand, the limited deployment of green transport infrastructure and scarce interventions in support of active mobility discourage the adoption of carbon-neutral mobility alternatives at both the urban and metropolitan scale. Insufficient park-and-ride facilities to connect peri-urban residents to major public transport routes, dedicated bus lanes to enhance the efficiency and reliability of public transit, and safe walking and cycling infrastructure further perpetuates car dependency. On the other hand, the limited adoption of existing green mobility solutions is also influenced by entrenched behavioral patterns. High rates of car ownership, a tendency to rely on cars even for short trips, and lenient residential parking policies make personal vehicles the preferred mode of transport, outweighing investments in public transport, walking, or cycling infrastructure. In addition, insufficient EV charging infrastructure and the high costs associated with electric vehicles sustain the reliance on fossil fuel-powered cars, further delaying the transition to climate-friendly mobility practices.	The effective mitigation of this barrier will ultimately stem from the strategic combination of both the hard and the soft actions outlined in the CNAP for mobility and transport. The hard actions (namely the substantial investments in infrastructure and advanced technologies) will lay the necessary foundation for the foreseen changes, while the soft actions (including targeted planning interventions and comprehensive behavioral change campaigns) will complement these efforts by fostering a cultural shift towards sustainability. The CNAP also foresees the establishment of a low-emission zone in the Peninsula Area, where new regulations will be implemented to reduce overall traffic, alongside infrastructure improvements to promote clean transport modes such as walking and cycling. The activities carried out by the Sustainable Mobility Center will also play a key role in addressing this barrier, once it operates systematically.
GREEN INFRASTRUCTURE	Deficiencies related to the green-blue infrastructure	Constanța's green and blue infrastructure is currently underutilized and faces significant challenges due to haphazard development that encroaches on existing green areas and biodiversity, limiting the potential for future expansion. The city lacks a cohesive strategy for connecting green and blue spaces into a functional network, preventing it from fully leveraging these areas to support climate mitigation and adaptation efforts. Constanța has a low proportion of green spaces relative to its population, which are unevenly distributed. Access to greenery is particularly limited in high-density neighborhoods and in new residential development zones. In addition, the quality of green spaces in Constanța is suboptimal, with many parks and natural areas being poorly maintained, fragmented, or inaccessible to residents. Tree coverage is also insufficient, with improper cutting and inadequate maintenance of street greenery exacerbating the urban heat island effect and increasing energy consumption during the summer, particularly in single-family home neighborhoods. The coastal lakes – Siutghiol, Tăbăcăriei, in spite of being located near tourist and high-density areas, are insufficiently integrated into human activities due to conservation and protection policies, missing out on significant opportunities to improve access to nature, and recreational space. Similarly, protected natural areas are poorly managed, with restrictions on access and limitations on activities, further excluding these spaces from local community life and preventing their full potential from being realized.	To effectively address this barrier, a total of nearly 106 EUR million has been allocated through the CNAP, which is distributed across several actions aimed at developing an extensive network of green areas for carbon capture and the renaturation of the coastline. The interventions to be carried out in this regard as part of the CNAP include the creation of pocket parks and community green spaces in all the major neighborhoods, the development of urban forests and the redesign and rehabilitation of the existing parks. Additionally, the consolidation and rehabilitation of the sea slopes will also be undertaken. Moreover, the green spaces are inherently incorporated into all the urban renewal projects outlined in the CNAP, as part of the local efforts to reduce the UHI effect. The proposed urban planning interventions will further support these objectives by focusing on integrated mitigation and adaptation approaches, which will naturally incorporate and address components related to the green and blue infrastructure. All of these interventions will not only contribute to the capture of the CO₂ emissions, but also to increasing the resilience to the negative impacts of the climate changes, by integrating nature-based solutions. Additionally, the other complementary projects outlined in the IUDS will furtherly support the protection and expansion of the local biodiversity.



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
		The city's coastal areas, which have significant potential for year-round recreational activities, are often underutilized during the off-peak months. Limited infrastructure, such as proper amenities, facilities, and activities tailored to colder seasons, prevents residents and visitors from fully enjoying these natural assets throughout the year. The focus on tourism during the summer months has led to a lack of development for alternative uses of the coastline, resulting in missed opportunities for promoting sustainable, year-round leisure, and sports activities.	
GREEN INFRASTRUCTURE	Limited deployment of nature-based solution	This barrier related to capacity and resource flow arises from multiple challenges, including a general lack of awareness about the advantages of nature-based solutions and insufficient financial and policy backing. Nature-based approaches, such as green roofs, urban forests, and restored wetlands, offer significant benefits in mitigating climate change by reducing the urban heat island effect, boosting biodiversity, and enhancing stormwater management. However, in Constanța, the adoption of these solutions is often overlooked in favour of more traditional infrastructure. This is due in part to competing land-use demands, higher initial costs, and the belief that such solutions are not essential. Additionally, bureaucratic hurdles and the absence of a clear, unified strategy to incorporate nature-based solutions into urban development further hinder their implementation. As a result, Constanța misses out on critical opportunities to sequester carbon, adapt to climate extremes, and promote a more sustainable urban environment.	
WASTE & CIRCULAR ECONOMY	Inefficient waste management and limited deployment of circular economy initiatives	In spite of important investments in waste management infrastructure – i.e., sorting and treatment plants, compliant waste landfills and the closure of noncompliant landfills, Constanța still faces a low level of selective waste collection. This barrier stems, on the one hand, from insufficient local infrastructure for separate collection and composting, and on the other hand from the slow implementation of recycling and waste prevention programmes. In addition, the deployment of circular economy initiatives from the private sector is limited due to a lack of incentives and awareness, combined with the high costs associated with transitioning to circular practices. A behavioral barrier further exacerbates inefficiencies in waste management, specifically the limited awareness among individuals about the consequences of irresponsible waste disposal, the importance of waste prevention, and opportunities for recycling and reuse.	In order to enhance the selective waste collection and recycling at the local level, the CNAP has planned a dedicated action to consolidate the integrated waste management for a circular economy. This action will involve the installation of digital eco-islands for separate waste collection and the establishment of a separate waste collection center through voluntary contributions. The innovative intervention involving the neutralization of MSW through pyrolysis for hydrogen production and its use in a hydrogen-fueled bus line will also help address this barrier, by positively impacting the reuse of municipal solid waste - transforming it into a sustainable fuelling solution for buses. Additionally, the CNAP proposes the implementation of an intervention aimed at fostering behavioral changes to encourage sustainable waste management and circular economy practices. The campaigns which will be pursued under this action will promote activities such as selective waste sorting, composting biodegradable waste, and minimizing waste generation, including reducing food waste and the disposal of clothing. Furthermore, the Transform Waste: Zero Waste Project for a Sustainable Future is already under implementation at the local level.
TRANSVERSAL BARRIERS	Port operations reliant on	Port operations at major hubs like the Port of Constanța are heavily reliant on	As previously mentioned, the Port was excluded as an emissions area in the current



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
	conventional energy sources	conventional energy sources, primarily fossil fuels such as diesel and heavy fuel oil. This dependency poses a significant barrier to climate neutrality due to the carbon-intensive nature of these fuels. Port machinery, including cranes, forklifts, and trucks, as well as the ships docked at the port, generate substantial greenhouse gas emissions and contribute to air pollution. The widespread use of fossil fuels not only increases the port's carbon footprint but also exacerbates local air quality issues, impacting nearby communities. Moreover, the infrastructure supporting port operations often lacks integration with renewable energy systems. For example, the absence of shore-to-ship power facilities forces docked ships to keep their engines running to meet energy needs, further compounding emissions. Transitioning to electrified equipment and renewable energy sources is hindered by the high upfront costs, logistical challenges, and a lack of clear policies or incentives.	CNAP through a collective agreement between Constanța City Hall and Constanta MA IDA, which are responsible for its implementation. This decision was established during the preparation of the Expression of Interest for the M100 Selection Call. The exclusion is based on several factors: → The implementation timeline of the CNAP is insufficient for the complexity of the actions required at the Port level (investments, processes, human and financial resources needed) to reduce the CO₂ emissions. → The Port does not fall under the jurisdiction of the local public administration. It is a public-private maritime facility owned by the Romanian state, encompassing Constanța area, Midia area and Mangalia area, along with Tomis tourist port. Its regulation and operation are, as such, overseen by the National Company Administrația Porturilor Maritime S.A. Constanța, which operates under the Ministry of Transport and Infrastructure. → The traffic coordination, including the scheduling and transit of vessels and berth allocation, is managed by the Commission for the Coordination of the Movement of Maritime and River Vessels in the Port of Constanta. → Many private operators conduct activities within the port, alongside the private companies offering goods and ship-related services. Given these circumstances, it has been determined at the local level that the CO₂ emissions from the Port will be addressed by 2050. The current CNAP implementation period will serve as a preparatory phase, laying the groundwork for the future actions, as achieving climate neutrality at the Port by 2050 requires incremental progress to be pursued through the collaborative efforts of all the stakeholders, under Constanța City Hall's leadership. However, the CNAP interventions dedicated to operationalizing the Sustainable Mobility Center and establishing a local branch of the National Competence Center on Climate Change Adaptation will partially help address this barrier during the CNAP's implementation timeframe.
TRANSVERSAL BARRIERS	Congestion, land-use conflicts and environmental impacts associated with port activities	The Port of Constanța's operations contribute to significant congestion, land-use conflicts, and environmental impacts, creating barriers to climate neutrality. Heavy truck and rail traffic stemming from freight movement to and from the port often leads to severe congestion in surrounding urban areas. This increases air pollution, greenhouse gas emissions, and noise pollution, while also degrading the quality of life for local communities. The high volume of vehicles and limited infrastructure for green logistics further exacerbate these issues, hindering the city's transition to more sustainable mobility and urban planning solutions. Additionally, the port's expansion and associated land-use demands frequently conflict with urban green spaces, residential development, and biodiversity conservation. As the port grows, it encroaches on potential areas for green infrastructure or community amenities, limiting opportunities to enhance urban resilience to climate change. The environmental impacts of port activities, including habitat destruction, marine pollution, and reduced water quality, further strain ecosystems.	
TRANSVERSAL BARRIERS	Limited integration of strategic plans and lack of coordinated action at municipal and metropolitan level	This process barrier is rooted in the insufficient coordination and alignment between the different decision factors acting within the municipality and metropolitan area of Constanța. On the one hand, better alignment is required between the Municipality of Constanța and the local administrative units included in the Metropolitan Area of Constanța and in the city's functional urban area, since these are the areas where a significant part of development takes place and where daily commuters come from. On the other hand, given its strategic location and resources – i.e., the Black Sea and beach resorts, Port of Constanta, Canalul Dunărea-Marea, coordination is also required between local and central level authorities, to ensure proper alignment of the local development vision with national strategic plans for critical transport infrastructure and tourism. The implementation of a cohesive strategy, particularly when it comes to spatial and	This barrier is not unique to the CNAP, due to its broad scope and the complexity of the factors contributing to it, which require multifaceted solutions. However, regarding the climate neutrality component, a stronger interjurisdictional cooperation at the metropolitan level will be ensured through the solid partnership between Constanța City Hall and Constanța MA IDA: while the CNAP's focus is primarily on the urban core of Constanta, its impact is metropolitan in scale, due to the specific actions designed to achieve such a reach. As such, Constanța MA IDA will take the key role of bridging the gap between Constanta's public administration and the LAUs of its metropolitan area, acting as a facilitator. The CNAP includes several interventions designed to address this barrier: some of them (i.e., those related to Smart City and Digital City Hall) will have an indirect positive impact, while others (i.e., capacity building for climate governance,



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
		economic development and transport planning, is hampered by the lack of consultations and exchange, particularly in the context of the key coordinating document (Constanța County Spatial Development Plan) still under development. This disjointed planning framework prevents the implementation of an integrated vision for the metropolitan area's growth, leading to urban sprawl, inefficient land use, and infrastructure mismatches. Without a clear and integrated strategy, efforts to transition to climate neutrality are fragmented, inefficient, and less impactful.	Climate Neutrality Metropolitan Caravan) will have a more direct effect. It also envisions various forms of collaboration with spatial planning and urban development experts (including architects, urban planners, climate specialists) for some of the proposed interventions, namely: the workshops promoting a metropolitan approach to climate neutrality, the application of integrated climate mitigation and adaptation principles, the revision of urban planning regulations and the collaboration with architects and urban planners to promote the adoption of climate neutrality. Furthermore, Constanța City Hall has recently signed a technical assistance agreement with the World Bank, through which it will receive specialized support in fostering interjurisdictional cooperation and advancing the transition to climate neutrality and climate change adaptation in the coming years. Nonetheless, recognizing that all of these initiatives alone are still insufficient, Constanța City Hall will also strengthen its presence within the Romanian Association of Municipalities, while Constanța MA IDA will aim to furtherly consolidate its role in the Romanian Federation of Metropolitan Areas and Urban Agglomerations. Both of them will also actively participate in the dialogues within the M100 National Hub and the Ministry of Development, Public Works and Administration, aiming to push the discussions on urban development and climate neutrality and to work, together with their national peers, to identify collective solutions to these strategic challenges, which are common across the country.
TRANSVERSAL BARRIERS	Limited capacity within public administration with respect to climate neutrality priorities	This challenge arises from the insufficient emphasis on climate neutrality as a core aspect of urban development and the inadequate prioritization of integrated interventions to achieve it. Current urban planning documents and local policies in Constanța fall short of serving as effective tools for promoting climate-neutrality. The absence of updated territorial planning documents further complicates the coordination of impactful climate actions. However, the ongoing revisions of Constanța's General Urban Plan and Constanța's County Spatial Development Plan present opportunities to address these gaps and incorporate climate-neutrality into the planning frameworks. Additional regulatory obstacles, such as cumbersome bureaucracy tied to expropriation processes for public infrastructure, lack of clear regulations at the national level (e.g., ambiguous micro-mobility policies), and inefficient public procurement legislation, further delay the implementation of climate-neutral measures. These systemic issues need resolution to enable the accelerated adoption of policies and practices that align with climate goals.	The practical implementation of the CNAP will, in itself, serve as a valuable means of strengthening the internal administrative capacity to support the transition to climate neutrality. Additionally, the CNAP includes actions specifically designed to reduce this barrier, for instance: → The digitalization of the public services for climate neutrality, which foresees smart city projects, including digitizing the internal processes and developing collaboration tools for engaging the citizens and the stakeholders. → The Climate Neutrality Office development and operationalization, which includes capacity-building interventions, for improving climate governance. → The NetZero Coalition establishment, maintenance and growth, which also foresees workshops to promote the metropolitan approach to climate neutrality. → The joint climate mitigation-adaptation approaches, through which urban planning principles will be developed and implemented to promote integrated mitigation and adaptation strategies. → The climate neutrality regulations, through which the local urban planning regulations will be revised to support the transition to climate neutrality. Furthermore, the CNAP proposes interventions to compensate for the internal capacity deficits by leveraging the local expertise, through collaborations with the



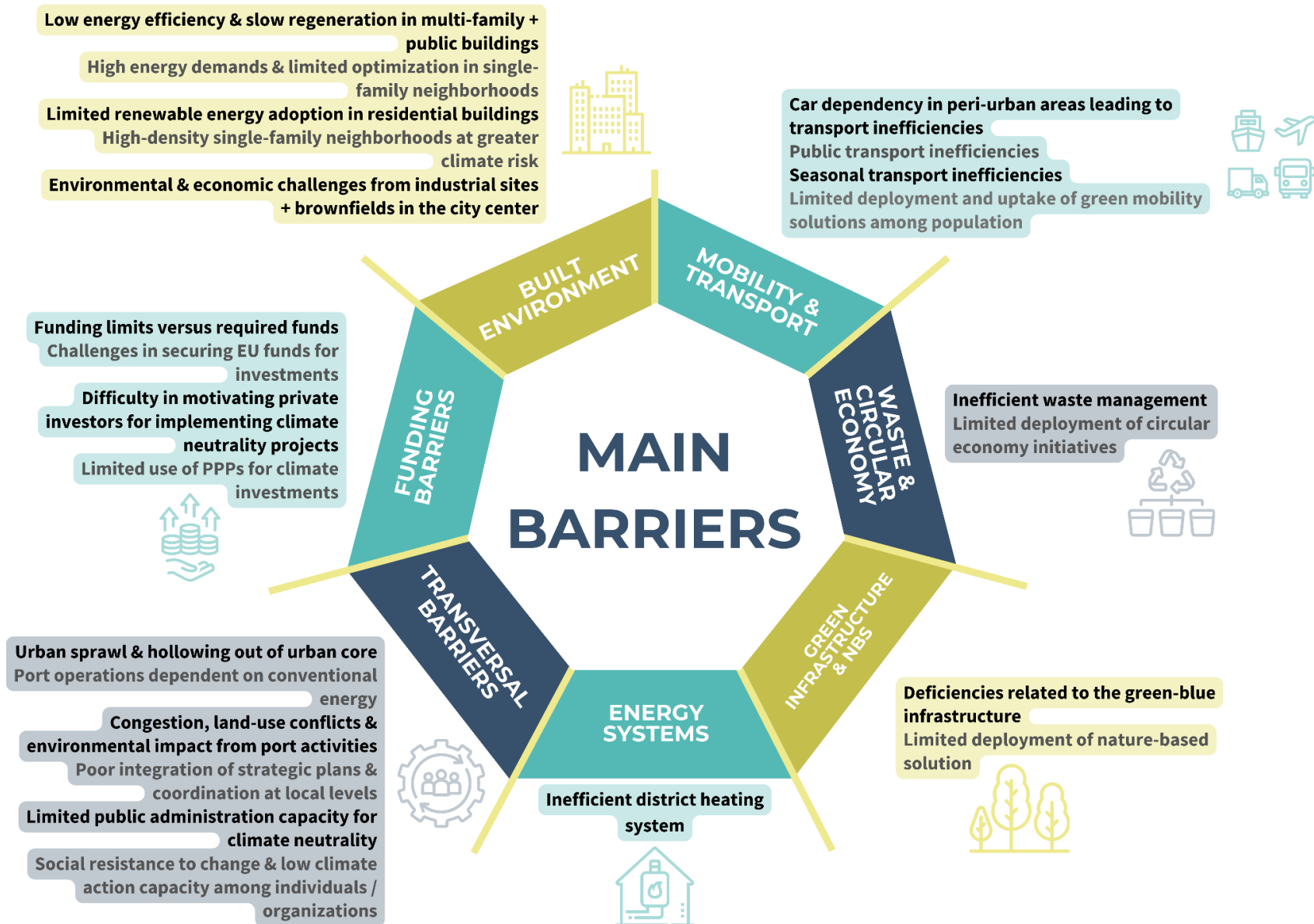
EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
			universities, NGOs, companies, citizens and independent experts. To supplement these actions, Constanța City Hall and Constanța MA IDA will also seek external resources for consolidating their administrative capacity, drawing from both the national sources (mainly through the M100 National Hub) and the international opportunities (as outlined in the Opportunities and Assistance Needs sections). Regarding the national dimension, the issues contributing to this barrier will be actively lobbied with the relevant central authorities by participating in national-level thematic events (e.g., conferences, debates, consultations), while leveraging existing national platforms to advocate for solutions to these shared challenges.
TRANSVERSAL BARRIERS	Social resistance to change and limited capacity for climate action among individuals and organizations	This challenge arises from a combination of behavioral, economic, and institutional factors. In Constanța, many individuals and businesses remain unaware of the pressing need for climate action or the advantages of adopting sustainable practices. This is partly due to limited educational campaigns and inadequate public outreach on environmental matters. Financial constraints also contribute, as green technologies—such as energy-efficient renovations or renewable energy systems—are often perceived as costly or inaccessible for households and smaller enterprises. Unsustainable habits, including a heavy reliance on private cars and a preference for single-use products, further complicate efforts to shift behaviors toward more sustainable alternatives. At the institutional level, a lack of capacity and expertise to implement and support climate initiatives undermines efforts to foster public trust in collaborative solutions. Compounding this issue is the absence of robust local and regional data on the environmental awareness and competencies of residents and stakeholders. This gap makes it challenging to develop targeted strategies that effectively promote climate-neutral practices across the community.	Given the magnitude of this barrier, the CNAP outlines 3 key actions, worth 11.4 EUR million, which focus on Social and Other Innovation: raising awareness and engaging the local ecosystems to achieve climate neutrality, supporting artists whose works are related to climate neutrality and encouraging behavioral changes towards climate change mitigation. These actions aim to foster the changes needed within the local community and ecosystem, by generating awareness through communication and promotional interventions, education and training activities, participation, engagement and innovation events, as well as through urban art. Their goal is to motivate the individuals and the local organizations to actively engage in the transition to climate neutrality. Additionally, part of the Governance Innovation actions also focuses on participation, with interventions aimed at co-designing, co-implementing and co-monitoring processes, e.g., the NetZero Coalition, the Climate Neutrality Metropolitan Caravan, the Climate Neutrality Neighborhood Advisory Councils, the Condominium Governance Innovations. Moreover, all of the actions taken by the local public administration to achieve a carbon neutral city will serve as a model of leadership and inspiration for the citizens and the local organizations, as they are expected to encourage them to contribute to the transition through their own mitigation efforts and less-polluting behaviors.
FUNDING BARRIERS	The existing funding limits in relation to the required funds	The public administration faces significant financial and administrative challenges in advancing climate neutrality investments. The complex needs of the city and those of its metropolitan area result in competing priorities, making it difficult to allocate resources for long-term sustainability projects, which often require substantial upfront funding and coordination. To the municipality's limited budget is added the overall financial uncertainty. Additionally, the fragmented governance structure and the division of budgets between Constanța Municipality and the surrounding units lead to disjointed efforts and delays. The city's capacity to secure EU funding and manage large-scale initiatives further	The solution to overcoming this barrier lies in the Investment Plan associated with the CNAP, which strategically identifies and connects all the funding sources needed to meet the financial requirements of the actions proposed for achieving climate neutrality. The funding sources outlined in the Investment Plan encompass both public funds (including non-reimbursable funding from the SE Regional Program, Operational Programs, governmental grants, European Commission-managed programs and funds from Norwegian and Swiss sources) and private capital, as the CNAP aims to mobilize private capital from various sources (e.g., local companies, banking



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
		slows its transition to climate-neutral urban development.	institutions, the community) to bridge the current funding gaps. Moreover, the actions proposed in the CNAP will drive changes in local investment programs and policies, contributing both to cost savings (primarily through the optimization of resources from modernizing the key infrastructure) and to generating additional revenues which will support the local budget, helping to fund part of the investments needed for implementing the CNAP.
FUNDING BARRIERS	Difficulties in securing EU funds for public and private investments	This challenge arises, in part, from inefficiencies in the management of EU funds at the national level. Accessing these funds is hindered by delays in launching funding calls and an overall lack of stability and predictability in timelines, which disrupts the ability of stakeholders in Constanța to plan and implement projects efficiently. The application process is often overly complex, with rigorous compliance requirements and bureaucratic hurdles making it not only time-intensive but also financially draining—especially for smaller organizations with constrained resources. Both actors from public institutions and the private sector frequently struggle to navigate these administrative obstacles, leading to delays in much-needed investments aimed at advancing climate neutrality goals. For private companies, the situation is further complicated by restricted access to funding, uncertainties in planning, and occasional delays in payments or reimbursements. These financial risks discourage private sector involvement, stalling progress on critical initiatives that could support a more sustainable future for Constanța.	This barrier is systemic and challenging to overcome, as it exists at the national level and is entirely independent of the responsibilities and capacity of the funding beneficiaries –local public administrations, NGOs, private companies. Nevertheless, Constanța City Hall and Constanța MA IDA will persist in advocating with the funding entities (both the managing authorities and the intermediary bodies) responsible for the Romanian non-reimbursable funding programs, seeking greater clarity and efficiency in the management of the funding calls. This effort will be done primarily through platforms such as the M100 National Hub, and other important associative structures which have a strong national presence. In parallel, the capacity of public administration to absorb and manage non-reimbursable funds will continue to be enhanced through training for the internal staff and, if needed, external expertise. Furthermore, Constanța City Hall will explore partnership mechanisms to better equip the private beneficiaries in accessing and managing such funds.
FUNDING BARRIERS	Difficulty to motivate private investors to implement climate neutrality projects	Encouraging private investors to engage in climate neutrality projects and pursue innovative entrepreneurial opportunities in Constanța faces several challenges that create reluctance among investors to commit to initiatives with the potential to significantly impact climate neutrality. One of the primary barriers is the perceived lack of profitability tied to these projects. Many climate neutrality efforts, especially within local industries, come with high upfront costs and extended payback periods, making them less appealing to investors seeking quick or substantial returns. This caution is further amplified by economic uncertainty, which heightens risk-aversion among private sector players. Additionally, the uncertainty surrounding new and emerging technologies used in climate neutrality projects adds another layer of hesitancy for investors. Regulatory challenges also contribute to the issue, as inconsistent or unclear national regulations fail to create a supportive environment for private sector engagement and research and innovation activities. Furthermore, many investors lack awareness of the potential opportunities these projects present, including long-term value creation and the role their involvement could play in advancing Constanța's climate neutrality objectives. This combination of economic, regulatory, and informational barriers deters private sector investment in initiatives that could drive significant environmental and economic benefits.	The CNAP was designed to encourage the private sector's financial involvement, through the proposed interventions, as outlined in the actions' individual sheets. As the document is grounded in the principle of co-implementation, the private sector is anticipated to contribute an estimated 500 million euros in capital from private sources towards the transition to climate neutrality, as outlined in the Investment Plan. In addition to the defined co-participation actions, the public administration will dedicate ongoing efforts throughout the implementation period to further engage the private sector in these investments. This is especially important as, by 2035, significantly larger private investments may be necessary due to factors which are difficult to fully anticipate at this stage, such as inflation, new emerging actions, or challenges with public funding. Nevertheless, there is a continuing need for the local public administration to strengthen its capacity to better access private capital to support all of the climate change mitigation investments.



EMISSION DOMAIN	IDENTIFIED BARRIER	DESCRIPTION	PROPOSED SOLUTION
FUNDING BARRIERS	Limited use of PPPs for climate neutrality investments	The limited adoption of Public-Private Partnerships for climate neutrality investments in Constanța is driven by a range of structural and procedural challenges. The process for establishing PPPs is often lengthy and complicated, coupled with an unclear legal framework at the national level, which discourages both public and private sector participation. Local authorities frequently lack the necessary expertise and experience to manage these processes effectively, leading to difficulties in overseeing and controlling projects. Furthermore, PPPs typically require transferring significant control to private partners, raising concerns about ensuring that projects align with the public's climate neutrality objectives. Financial risks also present a significant barrier to implementing PPPs, as public entities may be required to provide substantial initial funding or assume liability for cost overruns, which is particularly challenging for administrations with limited resources. Additionally, public opposition to private involvement in the management of public infrastructure further complicates the situation. National regulatory obstacles also cause delays and uncertainty, making it hard for stakeholders to commit to projects. These factors limit the PPP use, despite their potential to provide much-needed resources and expertise for Constanța's climate neutrality goals.	In order to address this barrier, the CNAP proposes an action under the Organizational and Governance Innovation field, focused on the development and operationalization of a Climate Neutrality Office. This action includes an intervention for creating a dedicated Public-Private Partnership (PPP) Specialist position within the City Hall; it involves appointing a specialist responsible to oversee the initiation, coordination and management of PPPs related to climate neutrality. The allocated funds cover their salary (a dedicated fraction of their work schedule which will be allocated exclusively to tasks related to climate-neutrality PPPs), plus the training needed to support the effective execution of tasks related to these PPPs.





RISKS

Provide a short summary of the main risks which may affect the achievement of the city's climate-neutrality goals.

- For each risk, briefly outline its impact on hindering the climate neutrality achievement and describe the approach / intervention / solution for overcoming it through the implementation of the current Climate Neutrality Action Plan.
- Make sure to also incorporate the risks related to the financing of the climate investments.

The transition to climate neutrality faces not only barriers which could impede its progress, but also various risks which may arise throughout the process. These risks, along with the key solutions proposed to mitigate them, are outlined in the table below.



TABLE 17 MAIN RISKS

FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
ENERGY SYSTEMS	Energy price volatility	The fluctuation of the energy prices, particularly in light of the recent and current geopolitical developments, adversely affects the costs associated with this utility for the citizens, the local organizations and the public administration (especially if considering the subsidies). This dynamic also undermines the attractiveness of the central heating system and exacerbates the vulnerability of the disadvantaged groups to the energy poverty risk.	This risk will primarily be mitigated through the optimization of energy consumption, enabled by the modernization works to be done under the CNAP actions for the consolidation of an energy-efficient district heating system, the modernization of public lighting and the improvements to the energy performance of public and residential buildings. It will be further mitigated by the interventions proposed for increasing the local supply of renewable energy. Furthermore, the pilot activation of the Faleză Nord Energy Community will serve as a best practice model for enhancing energy independence among the population and reducing the local vulnerability to such price-related risks. The Energy Manager will play a coordinating role in overseeing these actions, as well as other initiatives implemented locally for increasing the sustainability of the energy production, distribution and consumption systems, which will implicitly contribute to reducing the vulnerability to the energy price volatility.
ENERGY SYSTEMS	Inefficiencies of the central heating system	The inefficiencies of the central heating system, driven by the outdated infrastructure and the significant energy losses, have increased household disconnections over time. They also negatively affect the energy efficiency within the local households, raise the costs for supplying heating and burdens the local budget through both the lost revenues and the high modernization expenses needed to regain the users.	This risk is addressed through a dedicated action under the CNAP, which comprises interventions amounting to €344.6 million aimed at modernizing the district heating system and enhancing its energy efficiency. Additionally, efforts will be made for encouraging the residents to (re)connect to the central heating system, primarily through the campaigns to be conducted as part of the soft intervention aimed at fostering behavioral changes towards the adoption of sustainable energy solutions. These efforts will also be supported by the activities of the Climate Neutrality Neighborhood Advisory Councils, as well as the other interventions proposed in terms of communication and engagement.
BUILT ENVIRONMENT	Fluctuating costs of construction materials and services	In recent years, the construction sector has experienced significant price volatility in both materials and labour. This makes it challenging to accurately estimate the costs of the interventions for the built environment, complicating the calculation and allocation of the needed funding and creating the risk that the public administration may need to identify solutions to address the potential price fluctuations over time.	The ability to fully mitigate this risk is limited; however, within the capacity of the local public administration, the internal staff responsible for preparing the funding applications for the projects aimed at enhancing the energy performance of buildings and urban renewal will consider the potential price increases during the budgeting process. The experts contracted to prepare the technical and economic studies, which will serve as the foundation for the works, will also be required to account for these potential fluctuations. Any residual price differences are expected to be covered by the local budget, unless a more effective mechanism to address these gaps is identified in the meantime.
BUILT ENVIRONMENT	Ageing of the housing stock	The widespread presence of very old and structurally vulnerable housing stock locally poses multiple risks, in terms of: safety (jeopardizing the residents' well-being), costs (imposing more complex and expensive rehabilitation works, both financially and in	Indeed, this risk presents an additional burden on the energy efficiency and urban renewal interventions proposed for the local buildings, but it cannot be avoided.



FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
		terms of time) and resilience (increased susceptibility to the severe weather events caused by the climate changes).	Therefore, the works to be undertaken will take these challenges into account, aiming to mitigate their impact. The related projects will be appropriately budgeted, to ensure that sufficient non-reimbursable funds are requested for their implementation.
BUILT ENVIRONMENT	Complexity of deep building renovation projects	The local buildings (both the residential and the public structures) require not only basic thermal rehabilitations but rather comprehensive deep renovation projects. These are highly complex, demanding advanced technical expertise, skilled labour, specialized materials, cutting-edge technologies and substantial resources, (extended timelines and higher costs). Consequently, there is a significant risk of failing to capitalize on the opportunities to implement such deep renovation works for the local buildings.	This risk will be mitigated through at least 3 approaches: first, by strengthening the skills of the internal staff, such as to better manage the complexity of these projects; second, through the collaboration with field experts (e.g., architects, urban development specialists) to identify the optimal intervention solutions (as proposed through the soft interventions included in the CNAP); and third, by contracting external expertise when the internal capabilities are insufficient to address these challenges.
MOBILITY & TRANSPORT	Imbalance between local mobility challenges and the pace of solution implementation	The transport sector is marked by significant deficiencies, including the rising motorization index driven by urban development and the planning issues, as well as the seasonal pressures from tourism, all of them contributing to congestion and pollution. These challenges are escalating more rapidly than the implementation of solutions (strategic planning, investments in infrastructure and technologies) aimed at streamlining and greening the mobility sector. This disparity creates a complex and imbalanced dynamic, intensifying the demands on the public administration in terms of both human and financial resources.	Both of these risks share a common mitigation approach, which is not based on a single solution but rather a combination of measures aimed at addressing them: → Implementing the interventions proposed in the CNAP (for developing the public transport infrastructure and fleet, promoting the adoption of non-motorized mobility solutions, adopting traffic management systems and parking policies to alleviate congestion, piloting low emission zones etc.), while closely aligning these actions with the other major investments and projects planned at the local and metropolitan levels: the ones outlined in the SUMP to enhance the sustainability of the transport sector and those proposed in the IUDS to improve the mobility flows.
MOBILITY & TRANSPORT	Imbalance between the infrastructure development needs and actions	This risk is complex, as the urban development (particularly the new real estate) and the urban sprawl in the metropolitan area are outpacing the public administrations' capacity to plan the transport sector effectively. The lack of integrated, strategic green mobility projects, the underdeveloped infrastructure (especially in the peri-urban areas) and the fragmented investments at the metropolitan level (which also insufficiently account for intermodal transport), all compounded by the limited human and financial resources (especially within the MA's LAUs), exacerbate the situation. As a result, the citizens face increased congestion, higher travel costs, lost time and pollution, while the public administrations struggle with misaligned efforts, lack of coordination and inefficient use of public funds.	→ Continuing the efforts to strengthen the capacity for urban development planning, with a particular emphasis on enhancing the interjurisdictional cooperation at the metropolitan, county and regional levels for integrated project development (the most relevant in this regard will be the activity of the Metropolitan Public Transport IDA). In this context, support will be sought from local catalysts and facilitators (e.g., Constanța MA IDA, South-East RDA), as well as external specialists (notably through the technical assistance agreement with the World Bank, but also through potential future collaborations with other national and international partners). The impact of these risks will also be partially mitigated once the Sustainable Mobility Center implements its foreseen package of measures, which will contribute to enhancing the transport flows and accelerate the adoption of innovative mobility optimization solutions.
MOBILITY & TRANSPORT	Challenges arising from the actions of the central authorities in the transport sector	The central authorities, particularly the Ministries responsible for transportation and public works, exhibit a slow pace in implementing major transport infrastructure projects. This is further compounded by the inefficient management of EU funds allocated for such works, along with various legislative inefficiencies, including the lack of adequate attention given to metropolitan areas at the national level (especially concerning the metropolitan transport).	The only action which the local public administration can take to mitigate the scale of this risk is to continue, in collaboration with its Romanian counterparts, to lobby the relevant central authorities (those managing the transport sector and large infrastructure projects, as well as those responsible for the management of the EU funds).



FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
			Constanța is already proactive in this regard and will continue to advocate for these issues at the central level, including through the national cooperation platforms for cities and metropolitan areas.
WASTE & CIRCULAR ECONOMY	Unsustainable behaviors and practices in waste management	Constanța (and virtually the entire Romania) lacks a well-established culture of sustainable waste management, such as waste sorting, recycling and composting, reusing through repair or reducing food and textile waste. This deficiency exists both at the individual and organizational levels, stemming from various socio-cultural patterns within Romanian society. As a result, it poses a high risk to the effectiveness of the measures that the public administration seeks to implement in order to establish a sustainable and circular waste management system at the local level.	To mitigate this risk, the CNAP outlines an intervention focused on promoting behavioral changes to encourage the adoption of sustainable waste management and circular economy practices. Another key aspect of reducing this risk will be the public administration's efforts to serve as a model for citizens and organizations in sustainable waste management, to provide the necessary infrastructure and to activate various mechanisms of citizen cooperation and civic engagement, in order to motivate the residents to adopt fewer polluting behaviors related to waste. Additionally, other local and county-level actors, such as the waste operators, the "Dobrogea" Intercommunity Development Association and various local NGOs, are already involved in mitigating this risk. At the national level, there is increasing support for reducing the waste generation and promoting recycling, with the national RetuRO SGR system serving as a main example of such initiatives.
WASTE & CIRCULAR ECONOMY	Systemic deficiencies which undermine the capacity for sustainable waste management	The deficiencies threatening the capacity to implement circular and green waste management processes at the local and metropolitan levels extend beyond the behavioral component (i.e., awareness, education, motivation, responsibility). They have deeper roots, which are entrenched in multiple areas, from processes (namely the challenges related to planning the waste management systems, from the developing major investments and implementing strategic projects, to coordinating the responsibilities across multiple stakeholders) to infrastructure (issues related to the waste collection solutions, the sorting and recycling systems, the facilities for storing the waste and processing it for revalorization, the lack of facilities for managing hazardous and non-recyclable waste). All of these shortcomings risk making the transition to a circular waste management system more difficult.	Mitigating this risk extends beyond the implementation of the CNAP interventions aimed at strengthening the integrated waste management for a circular economy. It also encompasses several other dimensions, including: → Cohesively implementing the projects outlined in the local strategic documents (e.g., IUDS) and county-level strategic plans (e.g., 2020-2025 County Waste Management Plan), with a particular focus on securing the non-reimbursable funds available for infrastructure investments in the waste sector → Continuing and, more importantly, consolidating the collaborations with the relevant stakeholders at local, metropolitan and county levels, particularly through the "Dobrogea" Intercommunity Development Association, to improve the planning and execution of joint projects → Accessing European opportunities to strengthen the administrative capacity on circular economy topics and to pilot innovative projects in the field
GREEN INFRASTRUCTURE & NATURE-BASED SOLUTIONS	Adverse effects of urban development on the natural environment	Certain deficiencies in urban development (i.e., the chaotic densification and other unsustainable patterns) have a negative impact on the natural environment, particularly the green and blue spaces. All of these result in the risk of accelerated shrinkage of their areas, which in turn affects the ecosystem services (reducing the local resilience to the climate changes) and harms the urban biodiversity (by disrupting the local species). These negative effects risk to persist and intensify over time, requiring substantial resources for their mitigation.	The CNAP proactively addresses this risk by allocating nearly €106 million for the expansion of green areas within Constanța, through various interventions. This allocation comes in addition to the funds designated for the urban renewal projects aimed at reducing the UHIs, part of which also focus on greening the public areas undergoing urban renewal. Alongside these interventions, the public administration will strengthen the dialogue with the real estate developers, to ensure a more balanced integration of the built and natural areas (at the local level, there is already a successful model of such collaboration, namely the partnership with Iulius Company). The interventions to be undertaken in terms of urban planning for accelerating the climate neutrality transition



FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
			and the policy measures aimed at promoting joint climate mitigation and adaptation strategies will also contribute to mitigating this risk. Furthermore, through the soft interventions, the public administration will engage with the residents and other private stakeholders to encourage them to take individual actions to develop green spaces (e.g., the courtyards and the areas in front of apartment buildings, the surroundings of business premises). In mitigating this risk, Constanța Municipality will also rely on the support to be received from the local branch of the National Competence Center on climate change adaptation and its experts, once the branch's activities are fully operational.
GREEN INFRASTRUCTURE & NATURE-BASED SOLUTIONS	Environmental vulnerabilities resulting from infrastructure projects and other human interventions	Any human intervention must be carried out with caution, in order to prevent irreversible damage to local biodiversity. The greatest risk in this regard lies in the impact of the infrastructure works on the natural environment, especially due to the scale of such projects. This highlights the need for careful planning, which prioritizes the protection and conservation of the local biodiversity and, where possible, ensures the expansion of the green-blue areas, to support the flourishing of the local species (trees, plants, small animals, insects etc.).	As already mentioned in the description of this risk, its mitigation requires careful planning that prioritizes the protection and conservation of the local biodiversity and, where feasible, facilitates the expansion of the green-blue areas, to support the flourishing of the local species. This will be one of the priorities for the local public administration in preparing the infrastructure investment projects, ensuring that the supporting documentation reflects this priority and directs the works to align with these objectives. In mitigating this risk, Constanța Municipality will also rely on the support to be received from the local branch of the National Competence Center on climate change adaptation and its experts, once the branch's activities are fully operational.
GOVERNANCE	Imbalance between the scale and complexity of the CNAP's investments and the capacity for managing them	The limited administrative capacity (already constrained by the operational limitations affecting all the local public administrations in Romania and expected to be further strained with the implementation of the CNAP), alongside the scale and cost considerations, plus the complexity of the investments tied to the CNAP (which require a large workforce, specialized technical expertise and financial knowledge), pose a significant governance risk. This risk is compounded by the potential, yet unpredictable challenges (e.g., technical issues, delays in documentation and works, financial difficulties, political instability, poor regulations and lack of standardization at central level, legislative changes, increasing complexity of legal procedures, other unforeseen circumstances), underscoring the need for comprehensive contingency planning.	This risk will remain present throughout the CNAP implementation period; however, several measures will be taken to counter it, including: → Activating the Climate Neutrality Office, which, in collaboration with the Energy Manager and the PPP Specialist, will direct all of their resources exclusively towards climate neutrality projects → Training the internal staff to strengthen the administrative capacity, through various forms of learning (e.g., training sessions, experience exchanges, study visits), by accessing the learning resources and opportunities available at the European level → Optimizing the internal operating processes across all the departments, with a focus on enhancing the digital maturity of the City Hall → Delegating part of the responsibilities to the local ecosystem of partners, by sharing the CNAP tasks according to the expertise of each stakeholder → Requesting external support from specialists, particularly through the M100 National Hub, as well as other relevant partners → Co-opting external experts by outsourcing them and accessing the European opportunities (e.g., resources offered by the EIT-KICs, technical assistance from Interreg and Urbact experts, international innovation projects) available for collaborations with such specialists



FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
GOVERNANCE	Capacity disparities among the LAUs within the metropolitan area	There is a clear disparity in administrative capacity between Constanța and the smaller LAUs within its metropolitan area, affecting both the planning and the implementation (including financing and monitoring) processes. These capacity challenges at the metropolitan LAUs' level stem, in part, from the fact that, in comparison to the major urban centres, they struggle to be as competitive in attracting skilled individuals to key positions. Overall, these differences could influence the scale of the CNAP's impact at the metropolitan level and delay the anticipated progress, particularly if the cooperation with other LAUs is obstructed by administrative challenges, conflicting interests, difficulties in aligning priorities and other challenges which may arise, some of which are unforeseeable at the moment.	Mitigating this risk will revolve around strengthening the interjurisdictional cooperation at the metropolitan area level through the following actions: → Consolidating the role of Constanța MA IDA as a catalyst for integrated development and a partnership facilitator at the metropolitan level → Collaborating with the World Bank team on interjurisdictional cooperation topics, based on the technical assistance agreement concluded at the end of year 2024, which specifically outlines various support activities in this area → Accessing the European resources available on these topics, such as the materials provided by the European Urban Initiative or the Functional Urban Areas in the EU project → Continuing the proactive participation in the Romanian Federation of Metropolitan Areas and Urban Agglomerations, where Constanța MA IDA's Coordinator currently serves as the Executive Director
FINANCING	Low deployment of private capital	The recent years have been marked by various financing challenges, including the fluctuating inflation and interest rates, as well as the difficulties in accessing credit lines; these trends are expected to persist at least in the medium term. In this challenging financial context, along with the uncertainties and the implicit reluctance they generate, the high costs associated with supporting CO₂ emissions reduction at both the individual (household) and organizational (company) levels may reduce the interest of both the citizens and the private sector in making investments (regardless of size) in climate change mitigation. This is especially true when considering the competing needs of both individuals and companies, who also have to allocate funds to other priorities. Additionally, there is the already limited capacity to invest, particularly in climate neutrality solutions; this is especially evident for the individuals with low incomes and the SMEs, for whom such investments would cause financial burdens (on top of the already existing ones). The interest in such investments is even lower for those who do not immediately and clearly understand their returns and additional benefits.	This risk is challenging to address, due to the multitude of factors which influence the investment decisions of economic operators and the spending choices of citizens. However, insofar as it is within the capacity of the local public administration, it will ensure that, through the soft interventions proposed through the CNAP, the economic operators and the citizens are educated on the benefits of such measures, enabling them to fully understand both the direct impacts and the associated co-benefits. The administration will also work to strengthen the dialogue with these stakeholders, in order to foster a partnership framework for action and encourage their active participation. For this reason, the CNAP includes a comprehensive portfolio of interventions aimed at citizens and local stakeholders, specifically designed to motivate their involvement in the transition to climate neutrality. Being focused on raising awareness, education, and engagement, the proposed interventions aim to mitigate, to the extent that it lies within the public administration's authority, any reluctance to invest personal funds towards climate change mitigation measures.
FINANCING	Challenges in accessing the non-reimbursable funds	In addition to the risk that the public administration may be unable to support the scale of the CNAP's investments from its own funds, and the further risk of not securing enough private capital to cover the financing gaps, there are also significant risks related to the non-reimbursable funds required for implementing the climate neutrality projects (and without which the CO₂ reduction and capture targets cannot be achieved). These risks stem from various deficiencies, which, if not addressed promptly and effectively by the managing authorities and intermediate bodies, could persist in the following years. These risks include the complex and sometimes overly burdensome requirements for accessing the available funds, the delays in the launch calendars for the funding calls (which often do not provide enough time for submitting applications) and the risk of not meeting the deadlines of the current programming	To mitigate this risk as much as possible, the internal staff of the City Hall will continue to prepare the projects (concepts, technical and economic documentation) for the investments included in the CNAP in a timely and thorough manner. This will ensure that, when the funding calls are launched, these projects can be promptly transformed into applications ready for submission. However, achieving this will require the further enhancement of the internal team responsible for the projects' preparation and, if needed, the recruitment of external experts. Nonetheless, on a positive note, the City Hall already has a solid foundation in this regard, owing to the experience gained from the previous projects financed through non-reimbursable funds. Moreover, the issues contributing to this risk will continue to be reported to the managing authorities and intermediate bodies, including through the associative



FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
		period (especially as the evaluation and contracting phases can sometimes be excessively time-consuming).	structures that Constanța City Hall and Constanța MA IDA are part of, with the hope that they will be addressed swiftly and appropriately.
PARTICIPATION	Low civic and organizational participation	Despite the numerous interventions for civic engagement and stakeholder participation outlined in the social innovation and multi-level cooperation actions proposed through the CNAP, there remains a significant risk that the individuals and the local organizations will either fail to engage in this collective effort or contribute at levels far below what is needed or expected; this may occur for various reasons, such as the lack of education, the disinterest or the prioritization of other needs. Additionally, there could be opposition, particularly due to the lack of understanding regarding the co-benefits which would result from the successful implementation of the CNAP actions. This risk will be further amplified if the communication measures pursued by the public administration to promote the transition towards a carbon-neutral and smart city will not be executed effectively, potentially failing to adequately reach and engage the general public.	Mitigating this risk revolves around collaborating with those local stakeholders which have the capacity to mobilize and support the citizens' involvement in the CO ₂ emissions reduction efforts, namely the educational institutions, local NGOs, civic groups and Homeowners Associations. To facilitate the effective cooperation with these key local actors, the CNAP includes interventions such as the creation of the NetZero Coalition and other coordination mechanisms, including the Climate Neutrality Neighborhood Advisory Councils and the new governance models for condominiums. Furthermore, it foresees engagement initiatives tailored to pupils and students, all of these interventions aiming to foster the civic mobilization needed to support the transition efforts. Additionally, significant attention will be directed towards the communication component, supported by dedicated resources allocated to a variety of interventions, e.g.: developing and promoting a city brand that integrates the local identity with the city's strategic commitment to sustainability and climate neutrality, supporting and showcasing art and local artists centred on climate neutrality themes, launching metropolitan communication campaigns focused on climate neutrality.
PARTICIPATION	Limited social innovation	The current demographic challenges, such as the migration of young talents to other urban centres within the country (e.g., Bucharest) and abroad, along with the decline in student populations due to broader demographic issues, may weaken the local community's ability to support the social innovation and civic engagement initiatives needed for accelerating the transition to climate neutrality.	This risk is not related solely to the CNAP, as the demographic challenges represent a broad and complex issue that extends beyond its scope. Nevertheless, within its framework, the document outlines interventions targeted at fostering social innovation (e.g., integrating climate change mitigation measures into participatory budgeting and organizing civic imagination and innovation activities). Additionally, it includes a dedicated set of interventions designed specifically for pupils and students: → Initiatives to engage the children, youth and their peers in the climate neutrality efforts (e.g., awareness campaigns, sustainability workshops, Youth Ambassador training). → (Extra)curricular educational resources across all levels, from primary schools (e.g., Green Week) to university and postgraduate programs (e.g., specialized study courses).
OTHER	Incapacity of the education system to support the transition to climate neutrality	Both the school and university education systems require improvements to their educational offerings and the modernization of the teaching processes, in order to foster responsible behaviors, critical decision-making and innovation-oriented thinking. These qualities are much needed for mobilizing the children and the young people to advocate for urgent global issues, such as climate change mitigation and adaptation, digitalization and innovation, or social inclusion. Without greater alignment between the educational systems and the current national and European priorities, the students will lack the education, training and guidance needed to adopt such values and behaviors.	To address this risk, the CNAP includes interventions targeting the education sector, namely the development of new educational materials and activities for pupils and students, centred around the concept of reducing the climate footprint and its related topics. The implementation of these interventions will be supported by directly inviting the local schools and universities to participate in the NetZero Coalition. In the initial phase, this will enable them to understand the overall approach and its positive implications for their primary beneficiaries (the children and the youngsters). In the



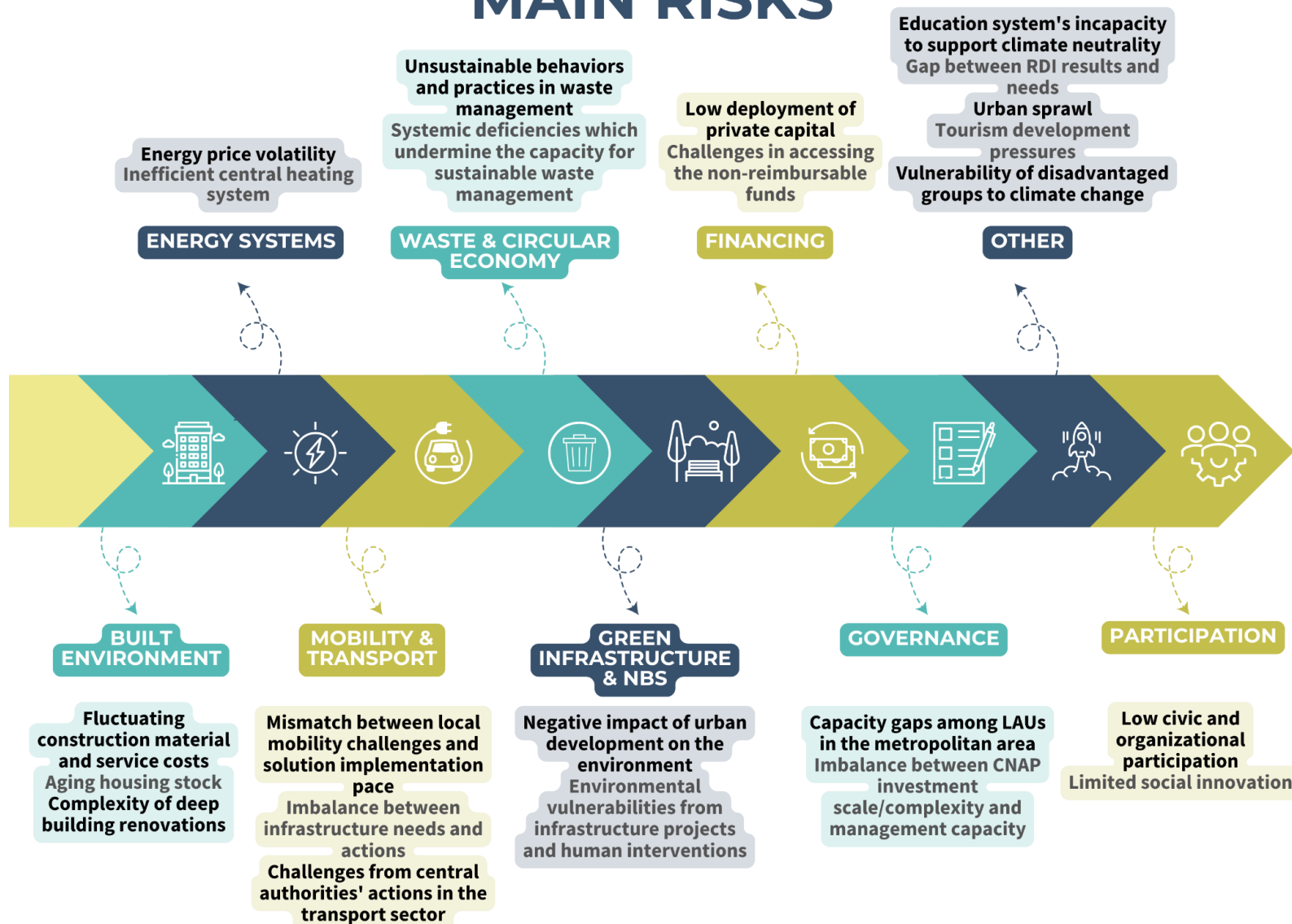
FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
			subsequent phase, it will encourage their active support for the proposed interventions.
OTHER	Gap between RDI results and actual needs	It is widely acknowledged that the results of the RDI activities are not always tailored to address real market and societal needs. This also applies to the innovations required to support the transition to climate neutrality through new solutions (e.g., processes, technologies). If this gap is not bridged, the capacity to adopt innovation as a catalyst for climate change mitigation will remain inadequate in the medium and long term.	This risk is also part of a much broader challenge; however, with regard to its specific impact on the CNAP and the associated RDI niches, it will be mitigated by the partnership model proposed within the NetZero Coalition. As this model will also facilitate matchmaking among the local stakeholders, it can even be used to align the RDI results from the local universities and RDI organizations with the needs of the public and private sectors, in order to provide solutions to support the transition to a carbon-free and smart city.
OTHER	Urban sprawl	The manifestation of urban sprawl and its associated phenomena, such as the overburdening of urban and peri-urban networks and systems (which are increasingly unable to cope with the heightening pressures and meet the needs of both the public and private sectors), can significantly hinder the local and metropolitan efforts to achieve climate neutrality. This risk manifests in multiple forms, including the inefficient land use, the negative impact on the biodiversity and the reduced capacity of the ecosystem services to mitigate the climate changes (e.g., reducing the UHIs, absorbing the rainwater). Additionally, the urban sprawl strains the mobility systems and utility infrastructure, increases the CO ₂ emissions (while complicating the efforts to reduce and capture them) and drives higher resource demand, due to the outward expansion of the urban areas. This dispersed nature of development presents major challenges for integrated and cohesive climate neutrality planning and leads to very high (and even unsustainable) investment costs.	The solution to this risk has been outlined on numerous occasions in relation to the risks described above: it lies, on the one hand, in strengthening the interjurisdictional cooperation at the metropolitan level to enhance the strategic planning for urban development, ensuring it is as integrated as possible, and on the other hand, in fostering a stronger collaboration with the private sector, particularly with the real estate developers, to ensure their investments prioritize the quality and sustainability of the urban environment. The NetZero Coalition can serve as an effective coordination mechanism for these partnerships, and the planning and regulatory efforts proposed in the CNAP will be supported, as previously mentioned, through assistance from field experts (architects, urban planners, other urban development specialists). Nonetheless, it is important to recognize that the CNAP is not the primary vehicle for addressing this risk, as it is part of a broader challenge with far-reaching implications. The solutions belong to a larger system, with IUDS serving as the main guiding instrument.
OTHER	Pressures associated with tourism development	The fact that Constanța and its metropolitan area are popular tourist destinations due to their access to the Black Sea and their proximity to the Danube Delta poses the risk of overcrowding during the peak tourist seasons. The influx of visitors puts a significant pressure on the local systems and infrastructure, particularly during the summer months, resulting in increased traffic, higher waste generation (including food waste), strains on the local biodiversity and greater consumption of energy, water, gas and other resources in the accommodation units, restaurants, cafes etc. These impacts, which may even lead to irreversible damage, are likely to persist and potentially worsen in the following years, if cooperative efforts are not made among the local tourism and HORECA stakeholders, in order to shift towards environmentally responsible practices, especially focusing on reducing the carbon footprint of the tourism-related activities.	The NetZero Coalition will be the cooperation mechanism for engaging with the actors in the tourism sector (from individual entities, such as accommodation and catering units or tour operators, to associative structures in HORECA and the broader tourism industry). These stakeholders will be invited to join the Coalition and assist in identifying and implementing solutions that can reduce the negative impact of the local and metropolitan tourism on the natural ecosystems, while minimizing its carbon footprint across the entire value chain (from the service providers to the final consumers, namely the tourists).
OTHER	Vulnerability of the disadvantaged groups to the climate changes	Up to now and moving forward (as the transition to climate neutrality progresses), the disadvantaged groups (e.g., children, the elderly, single-parent families, individuals with various health conditions, low-income individuals, those from marginalized	Climate justice is a fundamental principle of the CNAP, which is why the needs of the disadvantaged groups will be considered in all of the undertaken actions. In the cases where the internal staff is unable to address the social inclusion dimension, external



FIELD OF ACTION	IDENTIFIED RISK	RISK DESCRIPTION	MITIGATION SOLUTION
		communities) remain more vulnerable to the adverse effects of the climate changes, due to their inherent vulnerabilities. Without the fast and effective implementation of social inclusion principles and, more specifically, an approach aligned with the values of climate justice, these groups risk enduring further hardship.	specialists will be engaged - particularly from the local NGOs, but also external experts (e.g., sociologists and anthropologists), if needed. In mitigating this risk, Constanța Municipality will also rely on the support to be received from the local branch of the National Competence Center on climate change adaptation and its experts, once the branch's activities are fully operational. Nonetheless, all the measures included in the CNAP will directly contribute to reducing the vulnerability of the disadvantaged groups to the climate changes, both through their direct impacts and through the co-benefits that will be experienced by the entire local population.



MAIN RISKS





OPPORTUNITIES

Outline the main opportunities you aim to leverage in order to accelerate the local transition towards climate neutrality.

The transition of Constanța and its metropolitan area towards climate neutrality is undoubtedly complex; however, the opportunities to accelerate this process are equally diverse. In the context of developing the Climate Neutrality Action Plan, the main opportunities which Constanța City Hall and Constanța MA IDA aim to better understand and leverage during its implementation phase have been identified, in line with those already highlighted in the IUDS and the SECAP.

Naturally, by 2035, additional opportunities will emerge, which are not currently identified in this section; during the updates to the Climate Neutrality Action Plan, these new opportunities will be incorporated into this section and pursued as feasible, taking into account both their accessibility and the most urgent local and metropolitan needs.

OPPORTUNITIES FOR CAPACITY BUILDING

→ **ADDRESSING THE INTERNAL KNOWLEDGE GAPS BY LEVERAGING EXTERNAL CAPACITY-BUILDING RESOURCES.** Although Constanța City Hall and Constanța MA IDA face certain internal challenges regarding the human resources (i.e., the insufficient number of personnel to manage the climate neutrality transition) and their expertise (i.e., the lack of specialized knowledge to support this transition effectively and efficiently), these gaps can be addressed by leveraging the numerous capacity-building resources which are available at the moment (and which will undoubtedly increase in the future):

- ◆ The resources (e.g., studies, analyses, methodologies, tools, best practice examples, peer learning opportunities) provided by the M100 National Hub, as well as those developed by the EU Mission for Climate-Neutral and Smart Cities, particularly through the NetZeroCities platform.
- ◆ The resources available through other networks managed by the European Commission (e.g., European Urban Initiative, Urbact, Interreg, Driving Urban Transitions), as well as from other networks operating at the European level (e.g., CapaCities, Viable Cities) and even at the global level (e.g., ICLEI - Local Governments for Sustainability).
- ◆ The capacity-building opportunities provided through the technical assistance collaborations offered by various European organizations (e.g., European Bank for Reconstruction and Development, European Investment Bank) and global organizations (e.g., World Bank).
- ◆ Collaboration opportunities (whether through partnerships or subcontracting) with various third parties (e.g., companies, independent experts), who can provide the technical expertise required to address the existing gaps.

→ **ENHANCING THE AWARENESS, UNDERSTANDING AND ACTIVE ENGAGEMENT OF THE LOCAL ECOSYSTEM AND COMMUNITY.** In addition to the need to strengthen the internal



capacity in order to support the transition to climate neutrality, there is also the need to enhance the capacity of the local ecosystem stakeholders and citizens, in line with the same logic and objectives. The CNAP foresees multiple actions to address this need, as the motivation, ideas and support which can be provided by the private sector (companies, NGOs) and the community are valuable opportunities to expand the capacity needed to pursue the pathways towards a climate-neutral and smart city. As such, the collaboration between the public administration and the local stakeholders is regarded as a key asset, especially since these local actors can, in turn, support other various relevant initiatives. In this regard, the main options of interest are the funding calls available for education (e.g., those provided through national programs such as the 2021–2027 Operational Program for Education and Employment, which can be used for citizen training, or the 2021–2027 Operational Program for Smart Growth, Digitalization and Financial Instruments, which supports employee training in local companies) and civic participation (e.g., funding from various private donors to support the local NGOs in community development, environmental protection, social inclusion and other projects). Additionally, the European programs which provide funds for climate change mitigation projects are equally important, as they consistently emphasize civic engagement and stakeholder participation.

OPPORTUNITIES FOR INFRASTRUCTURE DEVELOPMENT

- **ANCHORING THE CNAP IN THE PROJECTS ALREADY IMPLEMENTED AT THE LOCAL AND METROPOLITAN LEVELS.** To date, both Constanța City Hall and Constanța MA IDA, along with the Local Administrative Units within the metropolitan area, have undertaken numerous projects focused on sustainable development and modernization. These projects have been developed across all the major infrastructure fields related to the key emission sectors (e.g., green mobility, clean energy, energy efficiency in buildings and lighting, sustainable waste management). In addition to these, various green projects have been initiated by private partners, such as Iulius Company, which has actively participated in local urban regeneration initiatives. Collectively, these projects represent the foundation on which the CNAP has been developed and will underpin the implementation of the hard actions planned for completion by 2035.
- **CAPITALIZING ON THE LOCAL AND METROPOLITAN RESOURCES.** This opportunity entails, on one hand, leveraging the natural resources inherent to the local and metropolitan territory, in order to advance the implementation of the CNAP (e.g., using the existing solar, wind and water potential to generate green energy). On the other hand, it involves using the existing assets, such as the land which will be used for expanding the green spaces, the existing railways which will be used for developing the metropolitan train line and the spaces and buildings (e.g., the disused industrial sites) which will be used for urban regeneration projects.
- **ACCELERATED TECHNOLOGICAL ADVANCEMENTS.** The development of new technological solutions which can support the green processes and accelerate the transition to climate neutrality is advancing at an unprecedented pace, being visible across all the key emission sectors (both solutions for public investments, such as large-scale infrastructure, utilities and digitalization and innovations for the private sector, which can support circular and low-CO₂ production and service systems). Furthermore, these innovative tools and technologies



receive strong support at both national and European levels, through significant funding opportunities, both as non-reimbursable public funds and private financing, in line with the EU's dual transition towards a green and digital economy. The adoption of such technologies to support the actions outlined in the CNAP is a high priority for Constanta, given its commitment to strategically driving urban development processes focused on innovation.

OPPORTUNITIES FOR PROCESS OPTIMIZATION

→ **GROWING INTEREST IN INNOVATION.** Constanta's transition towards becoming a city which is not only climate-neutral but also smart will also benefit from the growing European and national focus and implicit support for innovative programs and projects that leverage:

- ◆ Digital solutions, which can optimize and improve the performance of various internal operational processes and external governance activities, while also enabling the modernization and more efficient functioning of the infrastructure investments.
- ◆ Technological solutions, particularly in the context of the increasing focus on projects which test / use various RDI results in real-world applications (e.g., the research activities aimed at achieving a low-carbon economy).
- ◆ Social innovation solutions, which can emerge from the local community through grass-roots initiatives.

In this regard, we mention the opportunities provided by various national (e.g., the 2021–2027 Operational Program for Smart Growth, Digitalization and Financial Instruments, the National Recovery and Resilience Plan, the funding calls managed by the Executive Unit for Financing the Higher Education, Research, Development and Innovation) and European (particularly Horizon Europe, the Interregional Innovation Investments (I3) Instrument and the Innovation Fund) funding programs.

→ **LEGAL FRAMEWORKS SUPPORTING THE REDUCTION AND CAPTURE OF CO₂ EMISSIONS.**

Especially at the European level, and more recently at the national level, the legislation is increasingly focused on directly supporting the pollution reduction and the transition to sustainable, resilient development models (particularly from the climate perspective). The opportunities stemming from this shift are twofold:

- ◆ On one hand, the local public administrations will progressively find it easier to navigate this transition, benefiting from a clearer legal framework, which will enable better strategic planning and more effective implementation of investments.
- ◆ On the other hand, the increasingly advanced legal provisions also directly impact the private actors (particularly the economic operators) and the citizens, guiding their processes and behaviors towards practices which are less harmful to the environment and the climate.

→ **EUROPEAN AND NATIONAL METHODOLOGIES CLEARLY DEFINING THE PATH FOR REDUCING AND CAPTURING CO₂ EMISSIONS.**

With the launch of the EU Mission for Climate-Neutral and Smart Cities and the work done by the NetZeroCities and various other European partners to support this Mission, the framework for pursuing the urban transition to climate neutrality has become significantly clearer and more accessible for the local public administrations within the EU, as they now have access to various methodologies, models, mechanisms and tools to support these efforts. At the national level, this opportunity has been



mirrored by the launch of the M100 platform, which adopted the European resources and further developed its own guidelines and solutions tailored to the Romanian cities, based on their specific needs. This provides an excellent opportunity for Constanța and its metropolitan area to establish a more clearly defined pathway for planning, implementing and monitoring its climate neutrality transition.

- **CAPITALIZING ON CLIMATE CHANGES AS INNOVATION DRIVERS.** Although the impact of the climate changes is predominantly negative, Constanța has chosen to capitalize on the positive aspects emerging from these changes over time. For instance, the rise in the average winter (and autumn) temperatures will, in the medium term, contribute positively in several ways:
- ◆ Lower energy consumption for heating, reducing the energy required.
 - ◆ Increased share of renewable resources in final energy consumption, flattening the peak demands.
 - ◆ Accelerated and widespread adoption of heat pump technologies (air-to-water systems), which is both accessible and efficient for the temperatures recorded and projected in Constanța .
 - ◆ Accommodation and enhanced survival chances for Mediterranean vegetation, extending the foliage periods throughout the year.
 - ◆ Potential for attracting more tourists outside the summer season, positively impacting the local economy.

Thus, Constanța will ensure that it leverages these effects not only to enhance its climate resilience, but also to directly support the climate change mitigation actions outlined in the CNAP.

OPPORTUNITIES RELATED TO THE RESOURCE FLOWS' CAPITALIZATION AND INTERCONNECTION

- **GROWING CONSUMER DEMAND FOR SUSTAINABLE, CLIMATE-FRIENDLY PRODUCTS AND SERVICES.** In the recent years, there has been a noticeable shift in the consumers' behavior, with higher attention being paid to the products and services which are sustainable and produced through environmentally and climate-friendly processes. As such, when making their purchasing decisions, the consumers are increasingly choosing the companies which prioritize the environmental and climate concerns. This shift, combined with the progressively stricter EU requirements imposed on companies regarding their daily operations, development plans and market offerings, is driving the economic operators (both the manufacturers and the service providers) to reduce their environmental and climate footprint, to engage in CSR and ESG activities for protecting and preserving the natural environment and to create greener products/services. Given that Constanta's transition to climate neutrality cannot rest solely in the hands of the local public administration, this trend presents an excellent opportunity to involve the local private sector in the climate change mitigation actions.
- **RESOURCE FLOWS AVAILABLE IN THE TERRITORY TO ACCELERATE THE ACHIEVEMENT OF CLIMATE NEUTRALITY.** The resources which are available to Constanța and its metropolitan area to facilitate and accelerate the transition to climate neutrality also include the flows resulting from the collaborations established with and within various associative structures



(e.g., inter-community development associations, networks of economic stakeholders), representing a significant opportunity to achieve the pursued goals. However, external support is needed at the local level, to help Constanța City Hall and Constanța MA IDA identify the most effective mechanisms and channels for directing these resources in a unified approach, with the specific aim of reducing and capturing the CO₂ emissions.

→ **JOINT CLIMATE MITIGATION AND ADAPTATION APPROACHES.** As highlighted in the part dedicated to the Process Opportunities, the joint climate mitigation and adaptation approaches are perceived as a major opportunity, given their mutual benefits. For instance, expanding the green areas and reducing the land sealing can enhance the rainwater absorption, while the increased rainfall can be captured to alleviate the pressure on the water supply and irrigation systems for the city's green areas. The adoption of nature-based solutions can also help manage the water flows, slow the runoff and store the water for reuse and also for the creation of wetlands. Planting trees not only contributes to capturing the CO₂ and reducing the urban heat island effects, but also provides additional health and well-being benefits for the population. To maximize these benefits, Constanța will also focus on leveraging the resources provided through the EU Mission on Adaptation to Climate Change and accessing the support offered by the Pathways2Resilience platform.

OPPORTUNITIES RELATED TO CREATING AND STRENGTHENING ALLIANCES

→ **INCREASING GENERAL COMMITMENT TO MINIMIZING POLLUTION IN ORDER TO AVOID THE NEGATIVE EFFECTS OF THE CLIMATE CHANGES.** An increasing number of individuals and entities, (companies, NGOs, institutions, other organizations) are devoting greater attention not only to environmental protection and biodiversity conservation, but also to effectively reducing the pollution, in order to mitigate the adverse impacts of the climate changes, as the negative effects are becoming increasingly tangible, influencing their lives and operations. This growing awareness presents a favourable context for planning the launch and development of the NetZero Coalition in Constanta, which aims to attract the interest, resources and efforts of various local and metropolitan stakeholders. This context is particularly advantageous as:

- ◆ There is a growing array of opportunities (e.g., innovative ideas and concepts, practical guidelines and tools, funding mechanisms) for establishing public-private partnerships, fostering other types of collaborations with the private sector (e.g., leveraging private solutions to address public challenges) and even enabling / supporting private-private development partnerships, through which various concepts and efforts aimed at accelerating the progress towards climate neutrality can be jointly advanced and refined.
- ◆ At both national and European levels, there are multiple public and private initiatives which support (e.g., through project funding, collaboration guides, participatory working tools, cooperation platforms) multi-stakeholder collaborations within participatory frameworks.

→ **BROAD SPECTRUM OF INTERNATIONAL PARTNERS AVAILABLE FOR DEVELOPING COLLABORATIONS ON SHARED CLIMATE CHANGE MITIGATION OBJECTIVES.** Given that reaching climate neutrality is a shared objective at the European level, with cities being a top



priority due to their significant impact and resources, numerous cities across the EU and other European countries are taking proactive measures to achieve this goal. This shared ambition has fostered a strong interest for collaborations among peers from different countries, in order to advance these efforts collectively, both through mutual learning (e.g., exchanges of experiences and best practices, study visits, peer reviews, consultations, dialogues) and through the development of joint projects (implemented through transnational partnerships). Naturally, Constanța's main interest lies in engaging in such collaborations with:

- ◆ Cities labelled by the EU Mission for Climate Neutral and Smart Cities, by leveraging various European programs (e.g., Life, Horizon Europe, DUT, Urbact, Interreg) and opportunities (e.g., the ones launched through Urban Agenda for the EU, European Urban Initiative, New European Bauhaus, NetZeroCities).
- ◆ Cities in Norway, Iceland and Liechtenstein, by accessing the funding calls launched under the EEA Grants and the Norwegian Mechanism.
- ◆ Cities in Switzerland, by accessing the funding calls launched under the Swiss-Romanian Cooperation Program.

→ **COLLABORATIONS WHICH CAN BE ESTABLISHED WITH NATIONAL PEERS, IN ORDER TO COLLECTIVELY WORK TOWARDS THE SHARED OBJECTIVE OF CLIMATE NEUTRALITY.**

The launch of the M100 National Hub has formally established the goal of transitioning the Romanian cities towards climate-neutral and smart urban environments, making it a shared priority among all the urban authorities in the country. This National Platform offers a high potential for collaboration, in order to collectively advance Romania's climate neutrality agenda. In this context, Constanța aims to establish various partnerships with its Romanian counterparts, namely:

- ◆ The other 9 cities selected to be part of the M100 Cohort (Alba Iulia, Bistrița, Brașov, Bucharest, Buzău, Iași, Oradea, Reșița, Timișoara), along with the 3 Romanian cities (Bucharest - District 2, Cluj-Napoca, Suceava) labelled by the EU Mission for Climate-Neutral and Smart Cities, with support from the M100 National Hub.
- ◆ The metropolitan area's LAUs, with support from Constanța MA IDA.
- ◆ The other cities in Constanța County, with support from Constanța County Council.
- ◆ The other cities in the South-East Region, with support from the South-East Regional Development Agency.
- ◆ Other cities nationwide, with support from the Romanian Association of Municipalities, as well as other metropolitan areas and urban functional areas, with support from the Romanian Federation of Metropolitan Areas and Urban Agglomerations.

OPPORTUNITIES FOR DEPLOYING PUBLIC AND PRIVATE CAPITAL

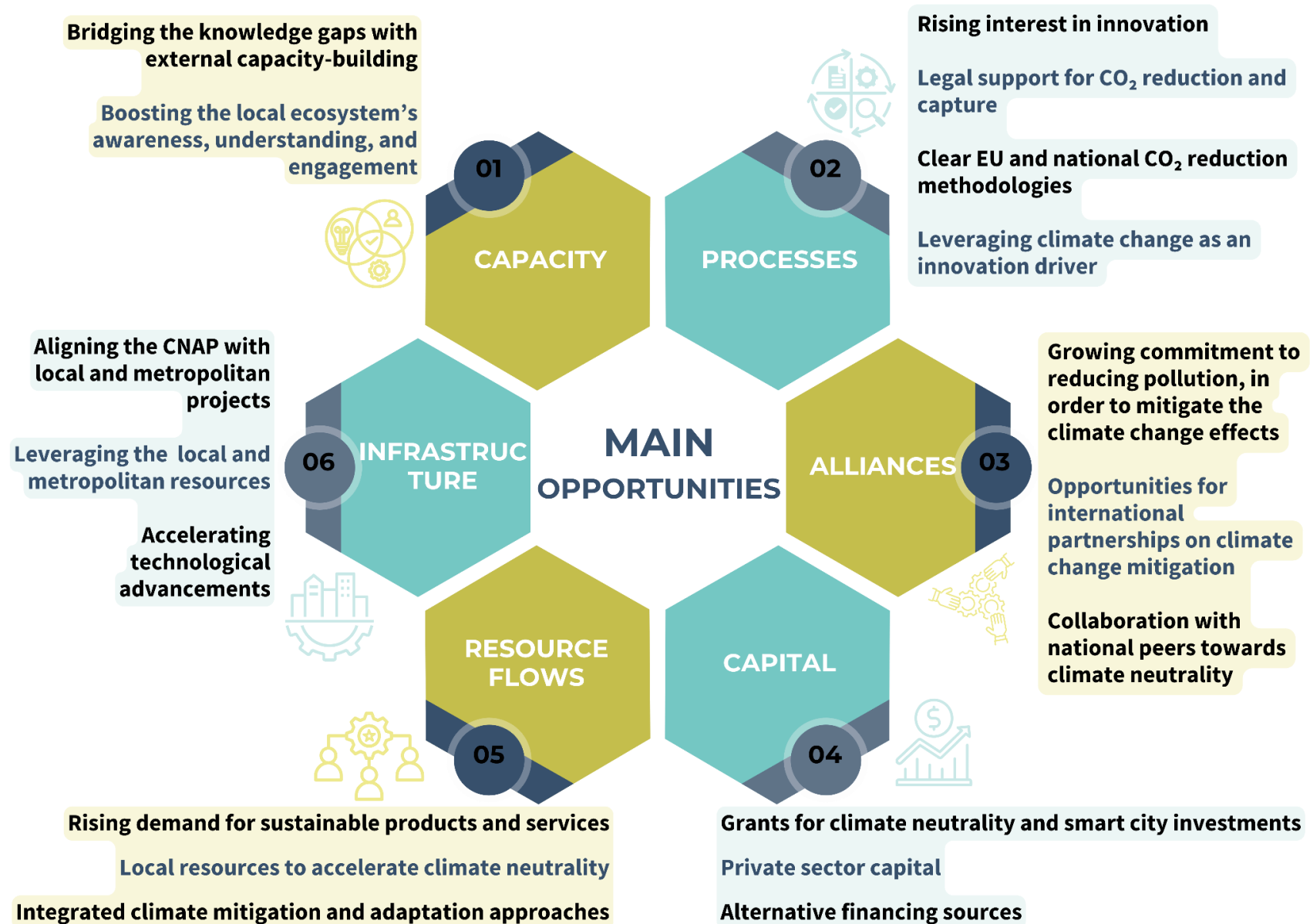
→ **ACCESS TO GRANTS FOR CLIMATE NEUTRALITY AND SMART CITY INVESTMENTS.**

Considering the constraints of the local budget, particularly in relation to the substantial investments required for the implementation of the Climate Neutrality Action Plan, the grants available at both the national and European levels for CO₂ reduction projects across the key emission sectors, as well as those targeting digitalization and other smart city technological solutions, are of significant interest. The highest priority is given to the funds allocated through the M100 National Hub, as this financing will be specifically designated for the cities selected to be part of its Cohort.



- **CAPITAL WHICH CAN BE SECURED FROM PRIVATE COMPANIES.** Equally important is the capital which the companies operating locally (both Romanian and foreign firms) can allocate for their own investments aimed at reducing and / or capturing the CO₂ emissions, as well as for public-private partnerships and various CSR and ESG initiatives undertaken by these companies.

- **OTHER FINANCING SOURCES.** If the funds required for some of the actions outlined in the CNAP cannot be accessed, alternative sources of financing will be explored and used, depending on their suitability. These may include loans from commercial banks or institutions such as the EBRD, the EIB and World Bank, as well as support from individuals, for example, through the issuance of green bonds.





ASSISTANCE NEEDS

Provide a brief overview of the key areas or aspects where external support would be required, in order to overcome the local barriers, mitigate the external risks and capitalize on the available opportunities, such as to achieve climate neutrality.

- Take into account the gaps that need to be fulfilled (e.g., financing, data collection, monitoring and assessment, knowledge deficiencies, governance, citizen engagement, stakeholder collaboration, innovative approaches etc.).

The implementation of the Climate City Contract presents a significant challenge due to its complexity and ambitious goal, compounded by the numerous obstacles and risks which may emerge during the transition towards climate neutrality. At the same time, it also offers a wide range of opportunities which can be leveraged from various sources, requiring the strategic allocation of resources to effectively capitalize on them.

In this context, Constanța City Hall and Constanța Metropolitan Area Intercommunity Development Association have identified some key areas where external support, particularly from the M100 Consortium, would be beneficial, in order not only to facilitate the reduction and capture of the CO₂ emissions, but especially to ensure that the climate mitigation planning has both a high impact and long-term sustainability.

THE NEED TO ENSURE THE SUBSTANTIAL INVESTMENT COSTS REQUIRED TO ACHIEVE CLIMATE NEUTRALITY

Financing the transition to climate neutrality, especially within the context of an ambitious Investment Plan which projects significant costs for the actions proposed to reduce and capture the CO₂ emissions, poses considerable challenges. The required investments are exceptionally high, both in terms of initial costs and operationalization. This is particularly challenging given the limited local budgets, a significant portion of which is already allocated to other expenses (not exclusively climate neutrality projects). Furthermore, the available non-reimbursable funds are insufficient and difficult to access, with complex application processes, especially considering the limited number of internal staff handling these tasks. Additionally, while private funds have been previously attracted at the local level, this process is still in its early stages, leaving considerable room for further improvements and expansion.

- Thus, the primary need which emerges revolves around dedicated financing to support Constanța (and the other Romanian cities) in their transition to climate neutrality. Specifically, there is a need for targeted funds to be allocated through the M100 National Hub, in order to facilitate the implementation of the climate change mitigation projects, programs and policies.
- Another critical need is the support in accessing and mobilizing private capital from a diverse range of sources (e.g., local businesses, citizens, commercial banks, institutions such as the EBRD) and through various mechanisms (e.g., public-private partnerships, loans, green bonds, crowdfunding, other private financial services). Additionally, there is a need for assistance in better managing the process of blending the existing financial resources in order to address the funding gaps, through collaboration with various stakeholders in the field.



- Also, within this scope of assistance, there is a need for support in using innovative financing instruments, which extend beyond the traditional models of securing and managing the necessary funds.

THE NEED TO HAVE PROPER OPERATIONAL AND ADMINISTRATIVE CAPACITY

The successful implementation of all the actions proposed for the transition to climate neutrality, which need to be done swiftly, efficiently and sustainably, demands a broad range of diverse skills and a sufficiently large team of dedicated and specialized experts. Achieving such an ambitious operational goal is challenging, particularly in light of the current limitations within the local public administration and the metropolitan area's Intercommunity Development Association. These challenges include the insufficient staffing, especially when it comes to dedicating resources exclusively to climate neutrality tasks, the lack of specialized skills in this complex field, the difficulties in prioritizing the actions and the absence of proper monitoring, assessment and risk management tools. Moreover, the frequent legislative changes at the central level have a disruptive impact at the local level and the bureaucratic procedures related to the investments and the financing (including the inefficient legislation) add further complexity. The low level of interoperability between various institutions also adds to these challenges.

- The main support needed to address all of the aforementioned challenges is the assistance in the internal operationalization of the Climate Neutrality Office, Energy Manager position and PPP Specialist position, as the proper implementation of these roles would help clarify and alleviate many of the difficulties outlined earlier.
- Equally important is the support in accessing a wide range of capacity-building opportunities to be used internally, by leveraging know-how from more channels.
- Assistance would also be valuable in accessing external expertise from various sources to complement the internal staff shortage, enabling a more effective management of the diverse actions included in the CNAP and their associated processes (ranging from design and implementation to monitoring and evaluation, as well as the transversal integration of communication measures, stakeholder and citizen participation, climate justice, joint climate mitigation and adaptation efforts etc.)

THE NEED TO REDUCE THE EXISTING DISPARITIES BETWEEN CONSTANȚA MUNICIPALITY AND THE LOCAL ADMINISTRATIVE UNITS (LAUS) IN ITS METROPOLITAN AREA

The metropolitan area of Constanța is marked by significant disparities between Constanța Municipality and the LAUs within its boundaries. These disparities extend beyond territorial differences in socio-economic development, infrastructure, public services, connectivity and accessibility, by also including variations in the capacities of the local public administrations. These capacity differences refer to the employed workforce, the level of available expertise, the financial resources from the local budgets and the ability to secure external funding, the technological tools used, the organizational and operational processes in place, as well as the scope and efficiency of planning and implementing investments. All of these disparities could influence the pace and extent of scaling up the positive impact of the Climate City Contract from Constanța to its wider metropolitan area. Furthermore, the collaboration between the local public administrations on joint projects, programs and policies remains an area with significant potential for improvement. In this context, there is the risk that replicating the climate neutrality actions in the LAUs within the metropolitan area, as well as jointly developing integrated climate change mitigation initiatives, may progress more slowly or yield less impact than anticipated.



- All of the above underscore the critical need for assistance in enhancing the administrative capacity of the metropolitan LAUs to plan, implement and sustain both individual and collaborative projects aimed at reducing and capturing the CO₂ emissions.
- Equally important is the need for support in strengthening the interjurisdictional cooperation to foster a more integrated, cohesive and unified approach towards achieving climate neutrality.

THE NEED TO OPERATIONALIZE AND GROW A GOVERNANCE STRUCTURE THAT IS BOTH MULTI-LEVEL AND MULTI-STAKEHOLDER

Given the complexity of the Climate City Contract and the diverse range of stakeholders which need to be involved (public institutions, businesses, universities and RDI organizations, NGOs, associations, independent experts, and, of course, citizens), it is essential to establish and strengthen a multi-level, multi-layer governance structure at both the local and metropolitan levels. This governance system must be founded on partnerships which prioritize open dialogue, transparent collaboration and inclusive involvement, ensuring an effective support for the transition to climate neutrality.

- The fundamental need in this regard is the support for the formalization and activation of the NetZero Coalition proposed through the Climate Neutrality Action Plan. This includes identifying and attracting members (entailing also promotion measures), as well as strengthening its capacity through the establishment of a clear framework for cooperation, communication and operation, the development of the needed competencies and the creation of intervention packages and activities to be implemented.
- Additionally, assistance is required for the activities themselves, such as consultations and debates, co-design and co-delivery processes for climate neutrality actions, as well as co-monitoring and co-assessment of the Climate City Contract.

THE NEED TO FOSTER STRONGER CITIZEN ACCEPTANCE AND PARTICIPATION

Although various initiatives have already been and continue to be implemented at the local level to encourage the civic participation in the city's development, they still remain insufficient. As a result, the level of citizen engagement and proactiveness is inadequate, also impacting the local capacity for social innovation. All of these present major challenges in the context of the transition to climate neutrality, as the Climate City Contract requires a deeper understanding of the process and of its impacts by the citizens. A clearer understanding of the benefits associated with transitioning to a carbon-neutral and smart city would likely foster a greater acceptance and encourage a shift in behaviors towards more environmentally conscious actions, as well as the generation and harnessing of more ideas from the community. This is particularly important given that many citizens do not fully comprehend these transition efforts, which are not always popular among them, and may be resistant for various reasons, leading to a lack of openness toward active participation.

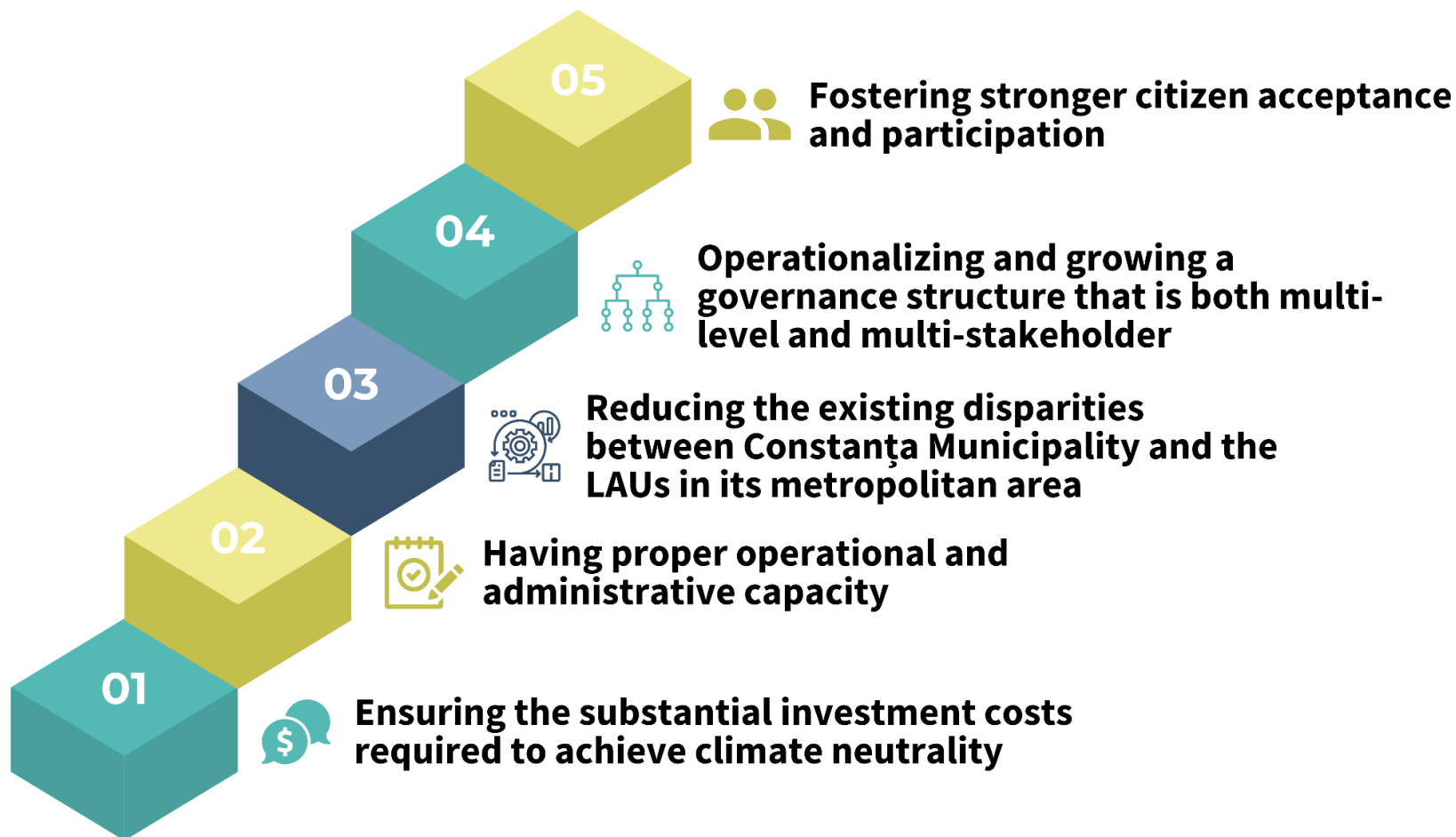
- The main assistance need in this regard is to enhance the capacity (know-how) of Constanța City Hall, Constanța Metropolitan Area Intercommunity Development Association (MA IDA) and the relevant stakeholders (e.g., community NGOs, Homeowners Associations) to carry out the actions proposed by the Climate Neutrality Action Plan in terms of Social and Other Innovation (actions which range from information dissemination, community outreach, thematic education and awareness-raising to participatory processes for co-design, co-implementation and co-monitoring, plus social innovation initiatives).



- Support is also needed to effectively manage such a diverse range of measures required to foster a stronger and more consistent citizen participation and implicitly to accelerate the desired behavioral changes.
- Last but not least, assistance is needed to ensure a more inclusive and equitable involvement at all levels, regardless of age (e.g., children, youth, adults, elderly) or social background (e.g., participation of vulnerable groups, such as individuals from marginalized communities).



MAIN ASSISTANCE NEEDS





IV. OUTLOOK AND NEXT STEPS

Provide a short overview of the future steps for the Action Plan, including the methods, tools, frequency, and milestones for implementation, monitoring, updating and improvement.

- Mention the main implementation thresholds and areas requiring future improvement of documentation, including the envisioned approach for addressing them.
- Make note of periodic iteration and review sessions.

IMPLEMENTATION

The key implementation milestones of the Climate Neutrality Action Plan are contingent upon the schedules of the funding calls launched through the main funding programs which will be accessed to secure the financial resources needed for implementing the proposed actions, as detailed below:

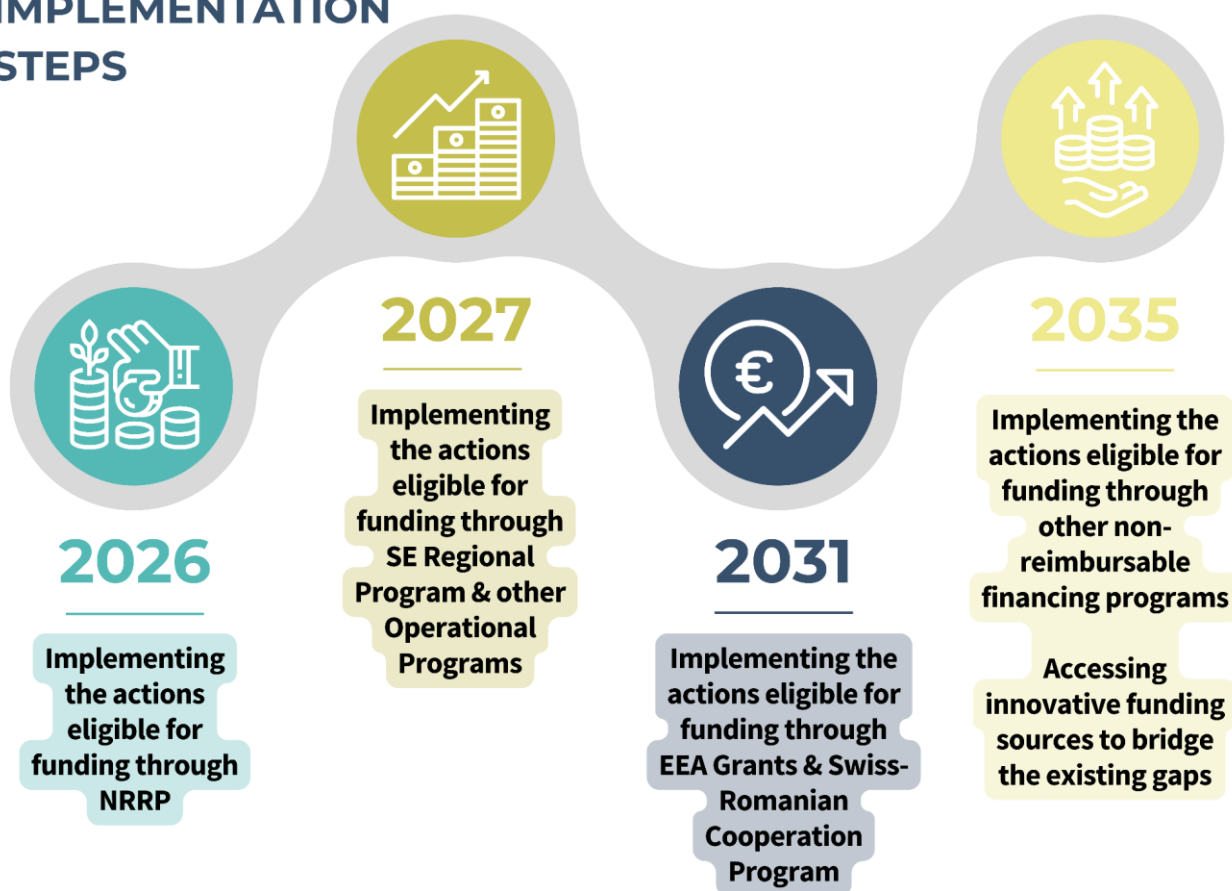
- **BY 2026:** implementing the actions eligible for funding through the National Recovery and Resilience.
- **BY 2027 / 2029:** implementing the actions eligible for funding through the South-East Regional Program and the other Operational Programs.
- **BY 2031:** implementing the actions eligible for funding through the EEA Grants, the Norwegian Mechanism and the Swiss-Romanian Cooperation Program.
- **BY 2035:** implementing the actions eligible for funding through other non-reimbursable financing programs, both at the national level (e.g., various governmental funding programs) and the European level (e.g., programs managed by the European Commission). Furthermore, innovative funding sources, particularly from private entities and previously untapped, will be accessed, in order to bridge the existing funding gaps.

Moreover, throughout the entire implementation period of the Climate Neutrality Action Plan, various investments, programs and policies focused on climate change adaptation will also be carried out in a complementary fashion, at both local and metropolitan levels. These efforts will focus on fostering an integrated mitigation-adaptation approach, in order to furtherly reduce the vulnerability of the individuals and organizations within the territory of Constanța and its metropolitan area to the adverse effects of climate change.

Simultaneously, applications will be developed for participating in various national and European competitions (e.g., awards, titles, other thematic contests) centred on themes related to climate neutrality, innovation and smart city initiatives.



IMPLEMENTATION STEPS



MONITORING, EVALUATION AND LEARNING

The monitoring and evaluation process will be conducted in accordance with the schedule proposed for each MEL indicator:

- **MEL INDICATORS ASSOCIATED WITH THE GHG EMISSION INVENTORY:** monitored and evaluated biennially.
- **OTHER MEL INDICATORS:** assessed at intervals of 6 months to a maximum of 1 year.

The learning process will be continuous, representing, in fact, a natural progression of knowledge accumulation derived from the experiences gained during the implementation of the Climate Neutrality Action Plan. As an estimated timeline, the objectives of the learning process are aligned with the following key milestones:

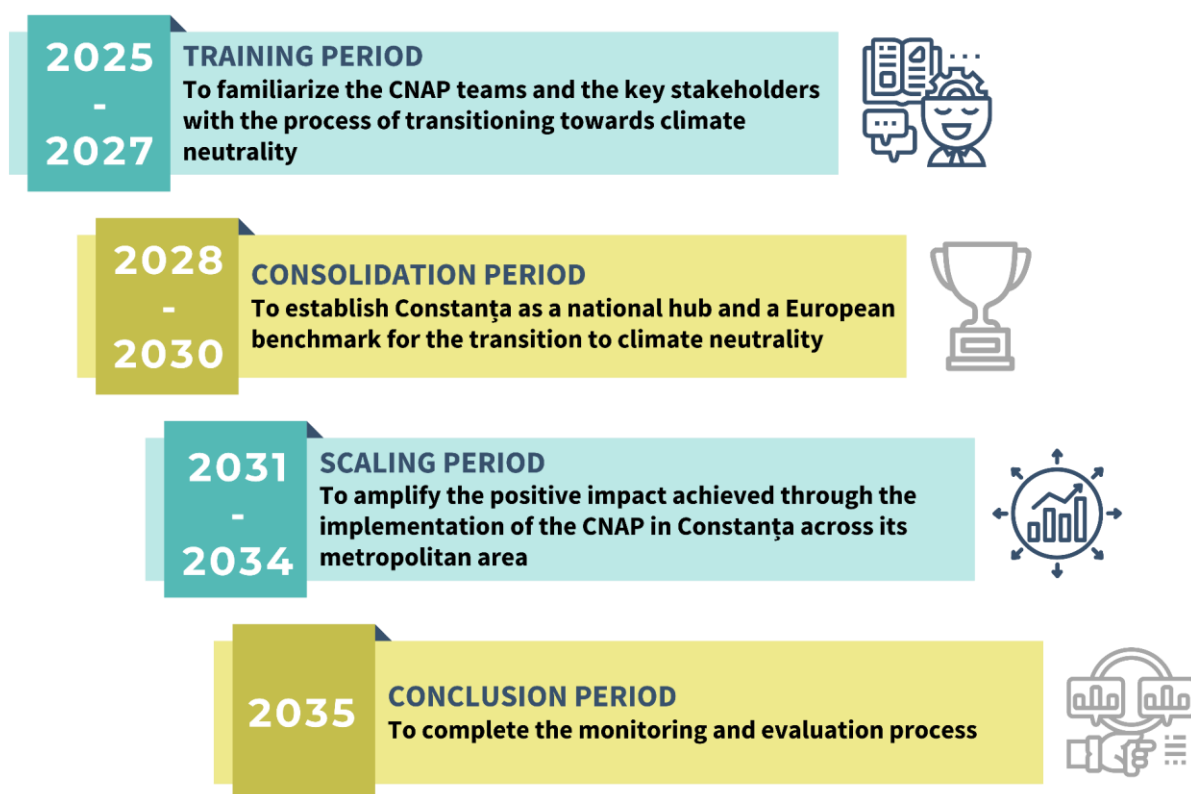
- **TRAINING PERIOD (2025–2027):** The main objective of this phase will be to familiarize the CNAP teams and the key stakeholders with the process of transitioning towards climate neutrality. During this period, the key areas requiring improvement will also be more clearly identified.
- **CONSOLIDATION PERIOD (2028–2030):** This phase will focus on establishing Constanța as a national hub and a European benchmark for the transition to climate neutrality. The areas previously identified as needing improvement will be effectively addressed and enhanced during this time horizon.
- **SCALING PERIOD (2031–2034):** The main objective during this phase will be to amplify the positive impact achieved through the implementation of the CNAP in Constanța across its metropolitan area. The actions successfully implemented as part of the Climate Neutrality



Action Plan in Constanța will be replicated across the LAUs within its metropolitan boundaries.

- **CONCLUSION PERIOD (2035):** In this final phase, the main objective will be to complete the monitoring and evaluation process. The focus will be on deriving key conclusions, including the insights gained from the monitoring of MEL indicators and the key learnings accumulated throughout the implementation. These findings will guide the future actions (namely, from 2035 onward).

LEARNING STEPS



REITERATIONS AND UPDATES

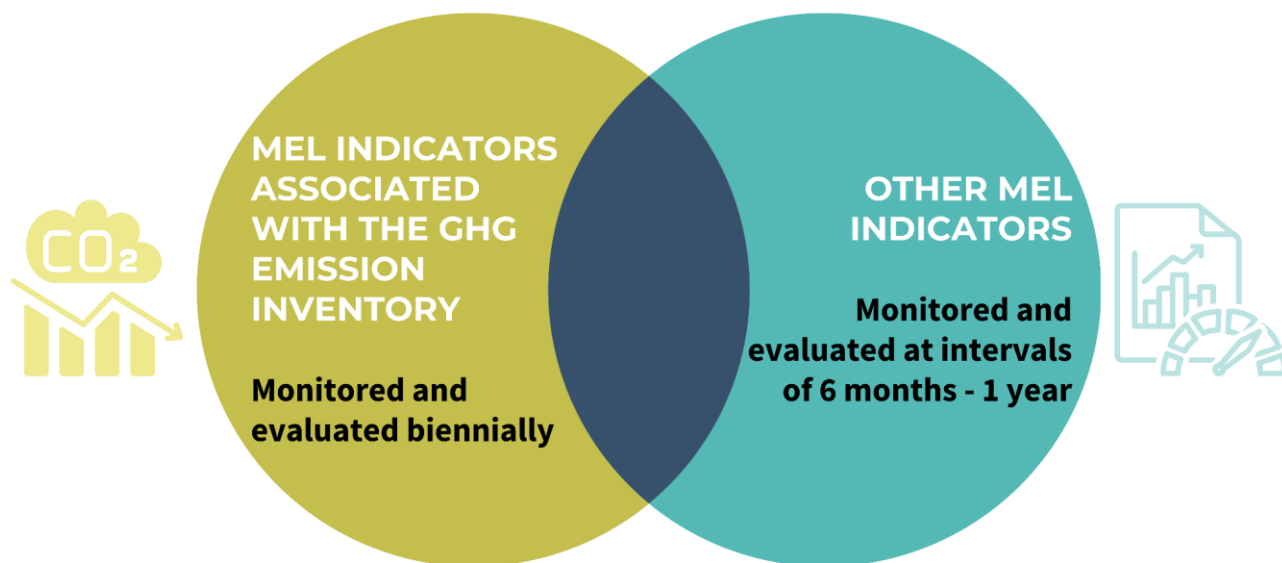
The Climate Neutrality Action Plan update process will take place at least once every 2 years, specifically coinciding with the update of the GHG emissions inventories and the related MEL indicators. Accordingly, the CNAP updates are tentatively scheduled for the following years: 2027, 2029, 2031 and 2033. However, if circumstances arise which warrant more frequent updates (e.g., the completion of a significant number of actions, the introduction of new actions, or the need to improve the documentation based on the results of the other MEL indicators), the CNAP will be updated more frequently, as needed.

The key mechanisms to be activated for the aforementioned processes are the Climate Neutrality Office (in conjunction with the Energy Manager and the PPP Specialist) and the NetZero Coalition, along with the Climate Neutrality Neighborhood Advisory Councils, which have been thoroughly detailed in the preceding sections. Additionally, tailored tools will be developed to support these processes, for instance: working procedures for the Climate Neutrality Office, clear responsibility matrices for the Energy Manager and the PPP Specialist, a governance framework and activity program for the NetZero Coalition, key action points for the



Climate Neutrality Neighborhood Advisory Councils, methodologies and digital tools for participatory monitoring and evaluation (such as citizen-facing interfaces and applications).

MONITORING AND UPDATING



CNAP UPDATE PROCESS

at least once every 2 years (coinciding with the update of the GHG emissions inventories & related MEL indicators)

CNAP UPDATE CALENDAR

2027 - 2029 - 2031 - 2033

CHALLENGES AND AREAS FOR IMPROVEMENT

The challenges and areas for improvement align with those identified in the Assistance Needs section, being closely connected to the barriers and risks highlighted in their dedicated sections, all of which require focused attention. As such, the main key points are the ones outlined below. The approach to addressing these issues is also outlined in the sections referenced earlier, with the addition of leveraging the opportunities detailed in their dedicated section.

- **CAPACITY BUILDING:** The need to strengthen the internal capacity for implementing, monitoring and evaluating the CNAP, particularly within Constanța City Hall and Constanța MA IDA.
- **EXTERNAL GOVERNANCE:** The need to consolidate the external governance structure of the CNAP, by actively and effectively involving the key local stakeholders - public institutions and companies, universities and RDI organizations, NGOs and other associative structures, businesses and independent experts.
- **CIVIC ENGAGEMENT:** The need to enhance the citizens' participation in a more inclusive and transparent manner, fostering their active involvement in the implementation and monitoring of the CNAP.
- **FINANCING:** The need to identify and secure all the funding needed to support the expenses outlined in the Investment Plan, with the most challenging aspect being the mobilization of the private capital.



CHALLENGES AND AREAS FOR IMPROVEMENT



CAPACITY BUILDING

To strengthen the internal capacity -> implementing, monitoring and evaluating the CNAP



EXTERNAL GOVERNANCE

To consolidate the external governance structure of the CNAP -> actively and effectively involving the key local stakeholders



CIVIC ENGAGEMENT

To enhance the citizens' participation -> more inclusive and transparent manner



FINANCING

To identify and secure all the funding -> to support the expenses outlined in the Investment Plan



ANNEXES

ANNEX 1. METROPOLITAN ACTIONS

FIELDS OF ACTION	ACTION	PROJECT / PROGRAM / MEASURE	BUDGET (EURO)
ENERGY SYSTEMS	Enhancing the local supply of renewable energy	Photovoltaic parks (Eforie, Tuzla, 23 August, Agigea, Corbu, Costinești, Cumpăna, Murfatlar, Năvodari, Ovidiu, Poarta Albă, Techirghiol, Valu lui Traian, Lumina, Mihail Kogălniceanu)	7,400,000
	Modernization of public lighting to reduce energy consumption	Expansion and modernization of public lighting (Eforie, Ovidiu, Lumina, Mihail Kogălniceanu, Murfatlar, Năvodari, Poarta Albă, Valu lui Traian, Techirghiol, Agigea, 23 August, Corbu, Costinești, Cumpăna)	5,965,048
BUILT ENVIRONMENT	Increasing the energy performance of public buildings	Energy renovation of public buildings (Agigea, Poarta Albă, Eforie, Mihail Kogălniceanu, Murfatlar, Techirghiol, Tuzla, 23 August, Corbu, Costinești, Cumpăna, Lumina, Năvodari, Ovidiu, Valu lui Traian)	109,346,470
	Increasing the energy performance of residential buildings	Energy renovation of residential buildings (Murfatlar, 23 August, Agigea, Corbu, Costinești, Cumpăna, Eforie, Lumina, Mihail Kogălniceanu, Năvodari, Ovidiu, Poarta Albă, Techirghiol, Tuzla, Valu lui Traian)	177,695,839
	Mitigation of urban heat islands through urban renewal	Rehabilitation of public space (Năvodari, Ovidiu, Eforie, Lumina, Murfatlar, Poarta Albă, Costinești, Cumpăna, Techirghiol)	63,737,770
MOBILITY AND TRANSPORT	Encouraging public transport	Purchase of electric buses (Eforie, Techirghiol)	2,061,627
		Modernization of railway stations (Eforie, Costinești)	10,000,000
	Promoting non-motorized mobility	Cycling infrastructure (23 August, Agigea, Corbu, Costinești, Cumpăna, Eforie, Lumina, Mihail Kogălniceanu, Murfatlar, Năvodari, Ovidiu, Poarta Albă, Techirghiol, Tuzla, Valu lui Traian)	48,607,985
		Sustainable urban mobility corridors (23 August, Agigea, Corbu, Costinești, Cumpăna, Eforie, Lumina, Mihail Kogălniceanu, Murfatlar, Năvodari, Ovidiu, Poarta Albă, Techirghiol, Tuzla, Valu lui Traian)	240,200,000
	Using traffic management and the parking policy as a tool to reduce traffic jams	Park & ride facilities (Eforie)	3,500,000
WASTE AND CIRCULAR ECONOMY	Consolidating the integrated waste management for a circular economy	Separate waste collection centres (Eforie, Murfatlar)	5,371,558



FIELDS OF ACTION	ACTION	PROJECT / PROGRAM / MEASURE	BUDGET (EURO)
GREEN INFRASTRUCTURE AND NATURE BASED SOLUTIONS	Developing an extended network of green areas for carbon capture	Expansion and modernization of parks and green areas (Eforie, Tuzla, 23 August, Agigea, Corbu, Costinești, Cumpăna, Lumina, Mihail Kogălniceanu, Murfatlar, Năvodari, Ovidiu, Poarta Albă, Techirghiol, Valul lui Traian)	54,700,000
		Green curtains along main roads (Eforie)	600,000
		Urban forests	160,000
ORGANISATIONAL AND GOVERNANCE INNOVATION	Digitalization of public services for climate neutrality	Smart city / village solutions & digital services	41,400,623
SOCIAL AND OTHER INNOVATION	Raising awareness and engaging local ecosystems to achieve climate neutrality	Metropolitan awareness campaigns	100,000
TOTAL			770,846,920



ANNEX 2. PUBLIC BUILDINGS

The analysis included buildings of local interest, according to the list extracted from various public information on the Municipality of Constanța . Some of the buildings were resold or were the subject of a transfer of ownership or administration, to supra-municipal bodies or to natural or legal persons. In this case, the new headquarters of the respective institutions were identified according to publicly available data (contact details of the official website, in particular, or entries from the headers of official documents), for which the surface area calculation was performed. In the case of mixed-function buildings, which are distributed between several public administration entities, the distributed calculation of the surfaces was ensured according to the estimated surface area allocated to each service, in part, without the constructed area calculated per building exceeding the actual constructed area, on the land. In the case of functions that were not identified on another site, the surface was applied to the building located at the address, even if it currently houses another function, has been retroceded in the meantime or is the subject of a transfer of ownership. The total measured surface is 158,719.50 sqm built-up area and 334,007.75 sqm gross floor area, distributed as presented in the following table.

	Medium built-up area (sqm)	Total built-up area (sqm)	Medium gross floor area (sqm)	Total gross floor area (sqm)		Electrical energy (MWh/sqm)	Natural gas (MWh/sqm)	District heating (MWh/sqm)	Electrical energy (MWh/year)	Natural gas (MWh/year)
Small medical units	627.87	38,300.31	809.78	49,396.83		0.13	0.14	0.09	6,322.79	7,113.14
Large medical units	1,377.13	63,348.14	2,639.02	121,394.83	8.48%	0.14	0.14	0.09	17,480.86	17,480.86
Nurseries	777.26	31,090.58	954.94	38,197.61	2.67%	0.14	0.13	0.07	5,347.67	4,812.90
Kindergartens	843.90	167,935.30	1,436.28	285,818.77	19.97%	0.14	0.13	0.07	40,014.63	36,013.17
Pre-university education	1,801.45	336,870.98	3,441.64	643,586.51	44.96%	0.14	0.13	0.07	90,102.11	81,091.90
Compulsory social assistance	1,754.24	21,050.86	3,351.27	40,215.28		0.08	0.09	0.06	3,217.22	3,619.38
Local public administration	1,145.47	69,873.95	1,938.57	118,252.51		0.08	0.09	0.06	9,460.20	10,642.73
Public markets and commercial centers	4,182.69	108,749.92	5,182.00	134,732.06		0.10	0.11	0.07	12,934.28	14,551.06
Total	12,510.01	837,220.04	19,753.50	1,431,594.40		0.95	0.95	0.55	184,879.76	175,325.13
Share of energy			Source: EUROPE'S				67.59%			



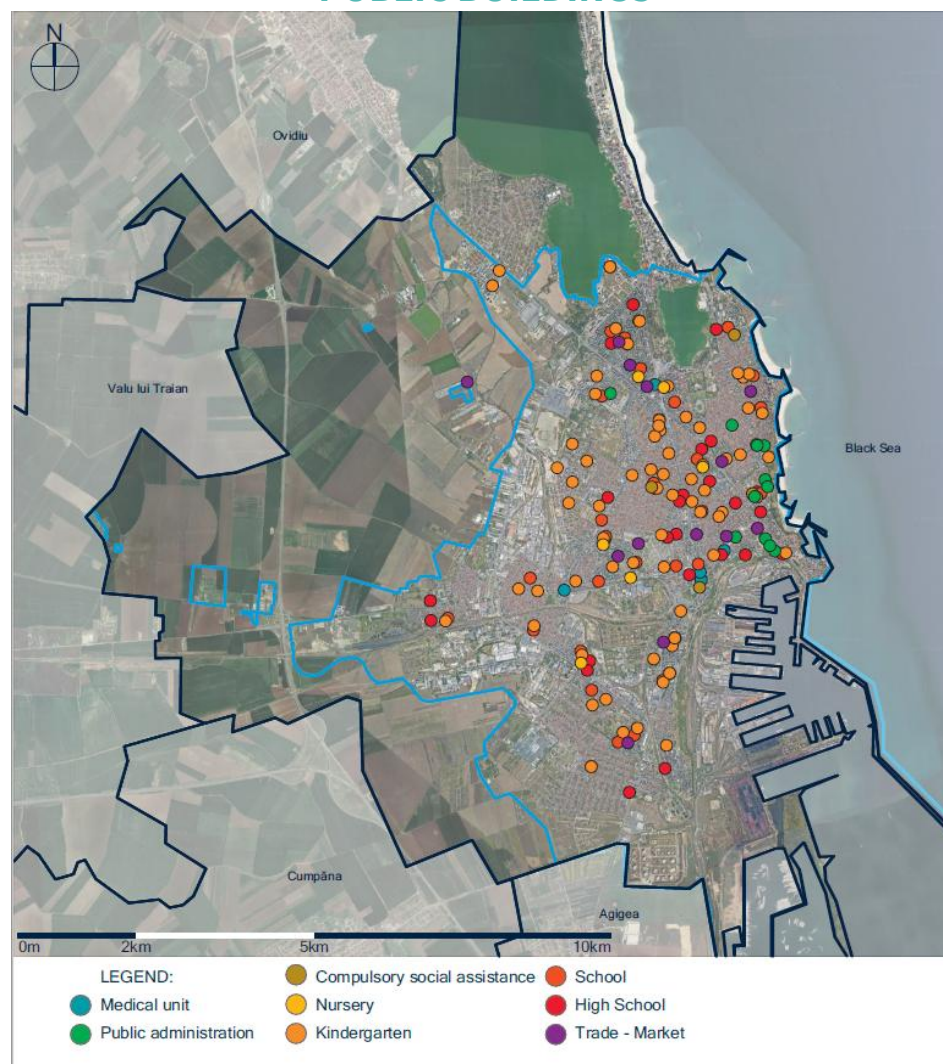
	Medium built-up area (sqm)	Total built-up area (sqm)	Medium gross floor area (sqm)	Total gross floor area (sqm)		Electrical energy (MWh/sqm)	Natural gas (MWh/sqm)	District heating (MWh/sqm)	Electrical energy (MWh/year)	Natural gas (MWh/year)
			BUILDINGS UNDER THE MICROSCOPE							
Electricity	32%									
Natural gas	36%									
District heating	22%									
Renewable	10%									
Building type	Energy (MWh/sqm/year)		Source: INCD URBAN INCERC							
Office	0.25									
Education, culture	0.35									
Health	0.4									
Tourism	0.3									
Trade	0.3									

Source: the authors, various sources

This annex contains, below, the list of public buildings in local public ownership, taken into account in this analysis, structured by types of functions and reported to the Municipality of Constanța as a whole, but also reported to each sector in particular.



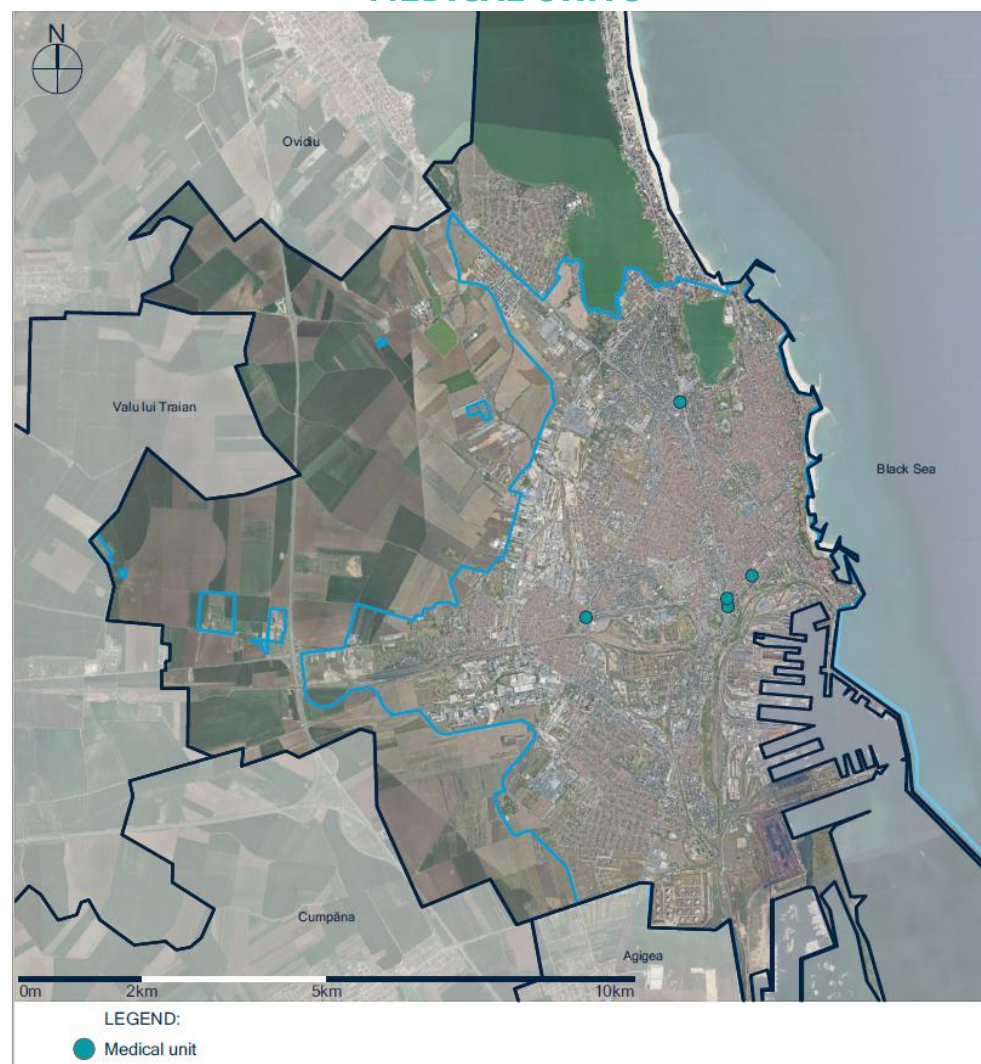
PUBLIC BUILDINGS



LOCAL PUBLIC BUILDINGS IN CONSTANȚA



MEDICAL UNITS



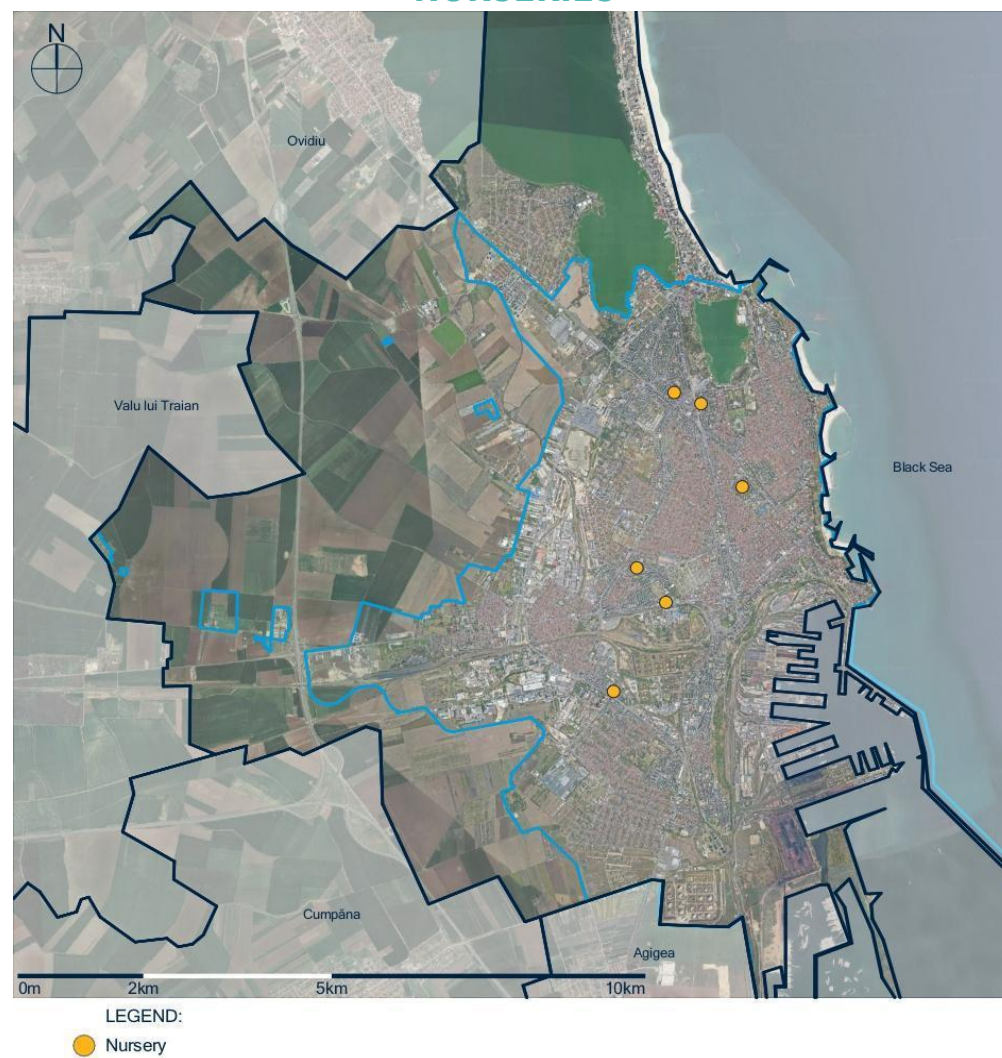
LOCAL SMALL MEDICAL UNITS IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Spitalul Clinic de Boli Infecțioase	1.505,00	4.515,00	Dispensar Medical Nr. 16	417,00	834,00
Policlinica cu Plată	591,00	9.030,00	Dispensarul TBC al Spitalului de Pneumoftiziologie	507,00	1.521,00
Policlinica Numărul 2	1.806,00	9.030,00			



NURSERIES



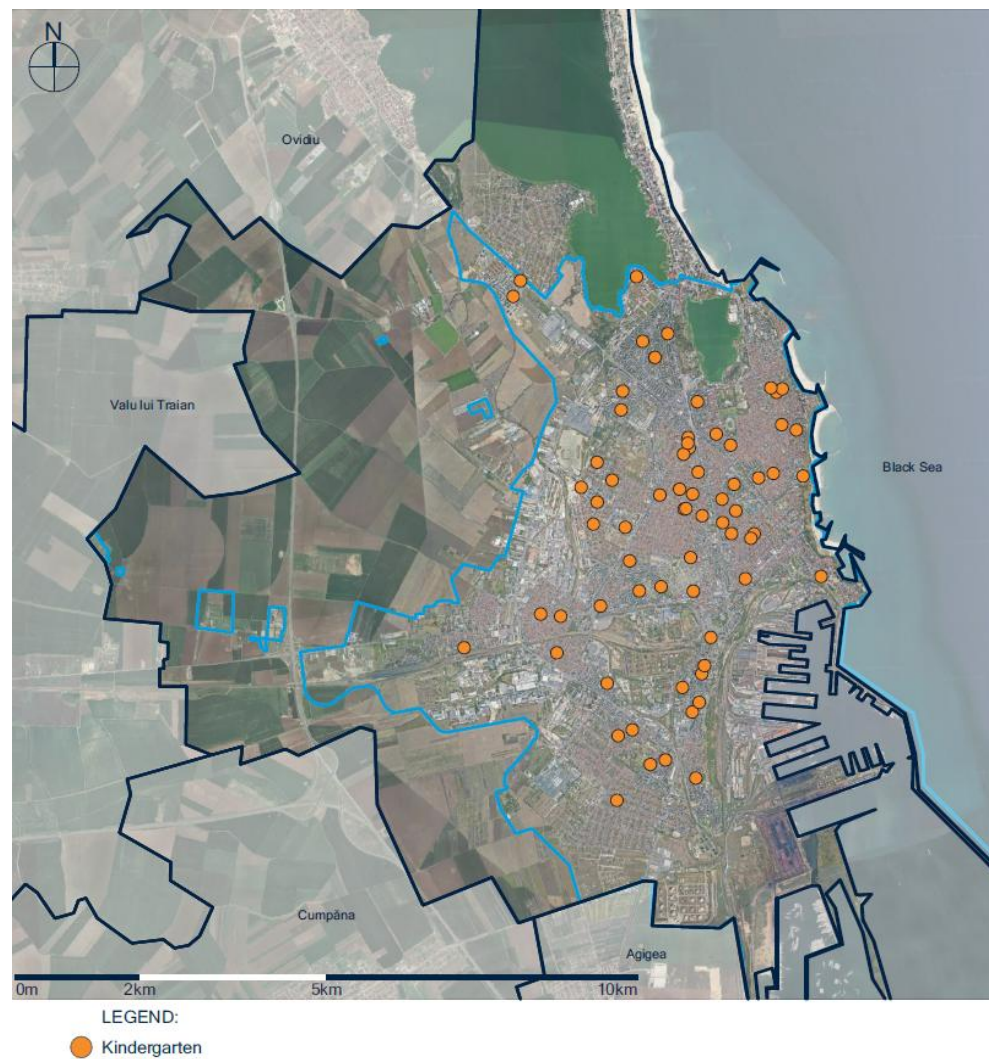
NURSERIES IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Cresa nr. 5 "Lumea Poveștilor"	382,00	1.146,00	Creșa nr. 1 "Delfinașul"	421,00	1.263,00
Creșa "Albă ca Zăpada"	920,00	920,00	Creșa nr. 2 "Căsuța Spiridușilor"	973,00	973,00
Creșa nr. 13 "Fluturașii"	895,00	895,00	Creșa "Licuricii"	184,00	920,00



KINDERGARTENS



KINDERGARTENS IN CONSTANȚA



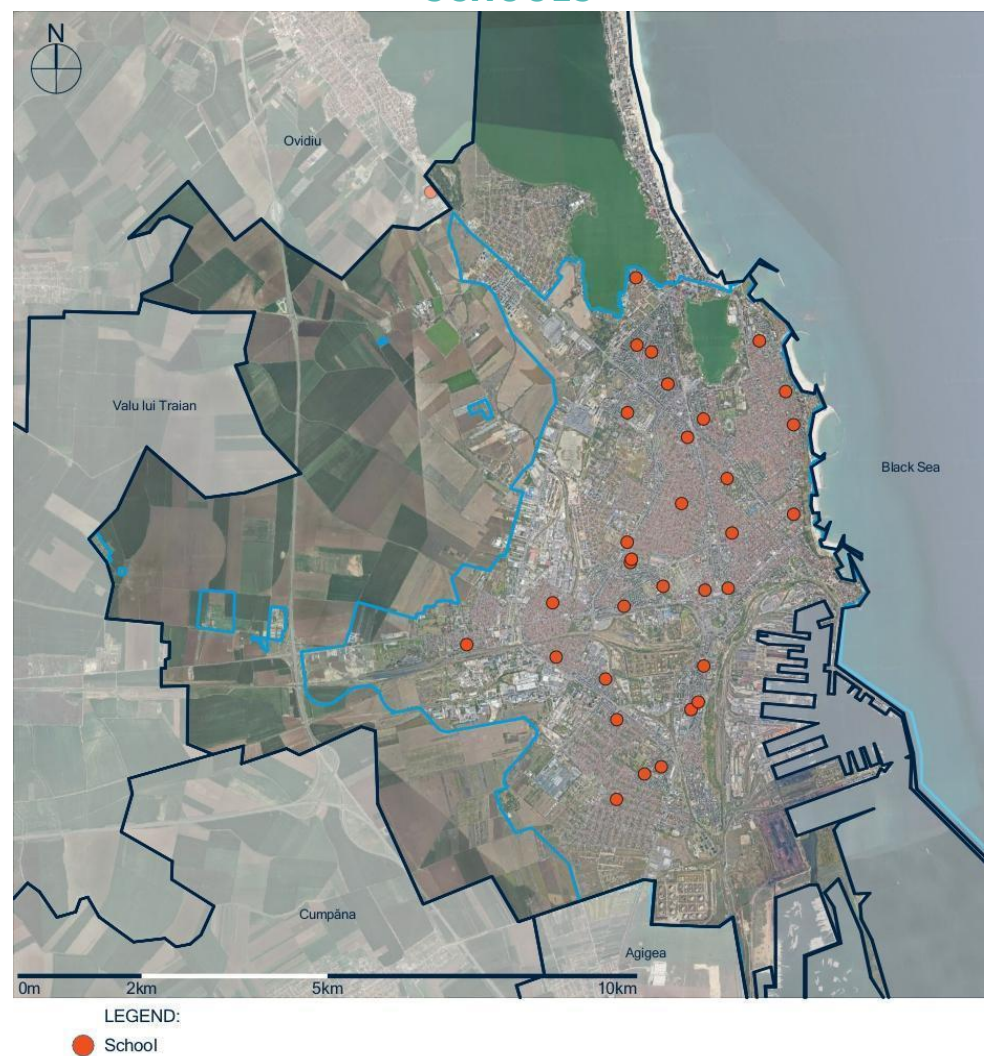
SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Grădinița "Little Kids"	186,00	465,00	Grădinița cu Program Prelungit nr. 19	482,00	964,00
Grădinița "Kity Bity"	200,00	600,00	Grădinița cu Program Normal nr. 51	737,00	1.842,50
Grădinița cu Program Prelungit "Guliver"	277,00	831,00	Grădinița cu Program Prelungit nr. 6	1.728,00	3.456,00
Grădinița "Colibri"	190,00	475,00	Grădinița cu Program Normal nr. 58 Bilingvă Rom-turcă	129,00	129,00
Grădinița "Bumblebees"	163,00	326,00	Grădinița cu Orar Prelungit nr. 57	595,00	1.190,00
Grădinița "Hello Teddy"	300,00	900,00	Centrul educațional "Colțișorul Copilăriei"	113,00	339,00
Grădinița "Mini London"	133,00	332,50	Grădinița cu Program Normal "Năsturel"	231,00	231,00
Grădinița "Căsuța din Pădure"	260,00	780,00	Grădinița cu Program Prelungit nr. 2	785,00	785,00
Grădinița Program Prelungit Mugurel	939,00	1.878,00	Grădinița cu Program Normal nr. 30	841,00	841,00
Grădinița Perluțele Mării	468,00	936,00	Grădinița cu Program Prelungit nr. 33	926,00	1.852,00
Grădinița nr. 12 "Amicii"	1.038,00	2.076,00	Grădinița cu Program Prelungit "Căsuța de turtă dulce"	488,00	976,00
Grădinița "Azur"	352,00	704,00	Grădinița "Victoria"	100,00	200,00
Grădinița cu Program Prelungit "Steluțele Mării"	1.141,00	3.423,00	Grădinița "Primăverii"	806,00	806,00
Grădinița cu Program Prelungit "Norocel"	442,00	884,00	Grădinița cu Program Prelungit "Roboțel"	838,00	838,00
Creșa-grădiniță "Universul Piticilor"	196,00	392,00	Grădinița cu Program Normal nr. 35	410,00	410,00
Grădinița cu Program Normal "Zubeyde Hanım"	113,00	226,00	Grădinița cu Program Normal nr. 22	692,00	692,00
Grădinița cu Program Prelungit Nr. 8	418,00	836,00	Grădinița "Victoria Tomis Plus"	584,00	584,00
Grădinița "Căluțul de Mare"	603,00	1.809,00	Grădinița "Start Kids"	203,00	609,00
Grădinița Comenius	224,00	896,00	Grădinița cu Program Normal nr. 24	154,00	308,00
Grădinița cu Program Prelungit nr. 45	404,00	808,00	Grădinița cu Program Normal nr. 34	546,00	546,00
Grădinița cu Program Prelungit nr. 47 "Lumea Poveștilor"	273,00	546,00	Grădinița "Tom Degețel"	1.027,00	1.027,00
Grădinița "IQ"	599,00	2.096,50	Grădinița "Aristocats"	210,00	210,00
Grădinița cu Program Prelungit nr. 53	686,00	1.372,00	Grădinița cu Program Prelungit	213,00	426,00



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
			"Baby Genius"		
Grădinița cu Program Prelungit nr. 14	566,00	1.132,00	Grădinița "Mica Sirenă"	234,00	468,00
Grădinița cu Program Prelungit nr. 35	302,00	302,00	Școala și Grădinița "Champions for Life"	142,00	284,00
Grădinița "Santa Maria del Mar"	156,00	312,00	Grădinița "Adia Afterschool"	193,00	386,00
Grădinița cu Program Prelungit nr. 42	410,00	820,00	Grădinița "Căsuța cu Povești - "Petre Ispirescu""	326,00	326,00
Grădinița cu Program Prelungit nr. 10	375,00	750,00	Grădinița cu Program Normal nr. 16	230,00	460,00
Grădinița cu Program Prelungit nr. 44	122,00	122,00	Grădinița "Adia"	262,00	655,00
Grădinița cu Program Normal nr. 37	277,00	277,00	Grădinița cu Program Normal nr. 38 "Abracadabra"	888,00	888,00
Grădinița cu Program Prelungit nr. 49 "Lumea copiilor"	355,00	1.065,00	Grădinița - Școala Anastasia	1.413,00	706,50
Grădinița cu Program Normal nr. 23	1.234,00	2.468,00	Grădinița - Școala Brancoveneasca	882,00	882,00
Grădinița "Zurli"	549,00	549,00			



SCHOOLS



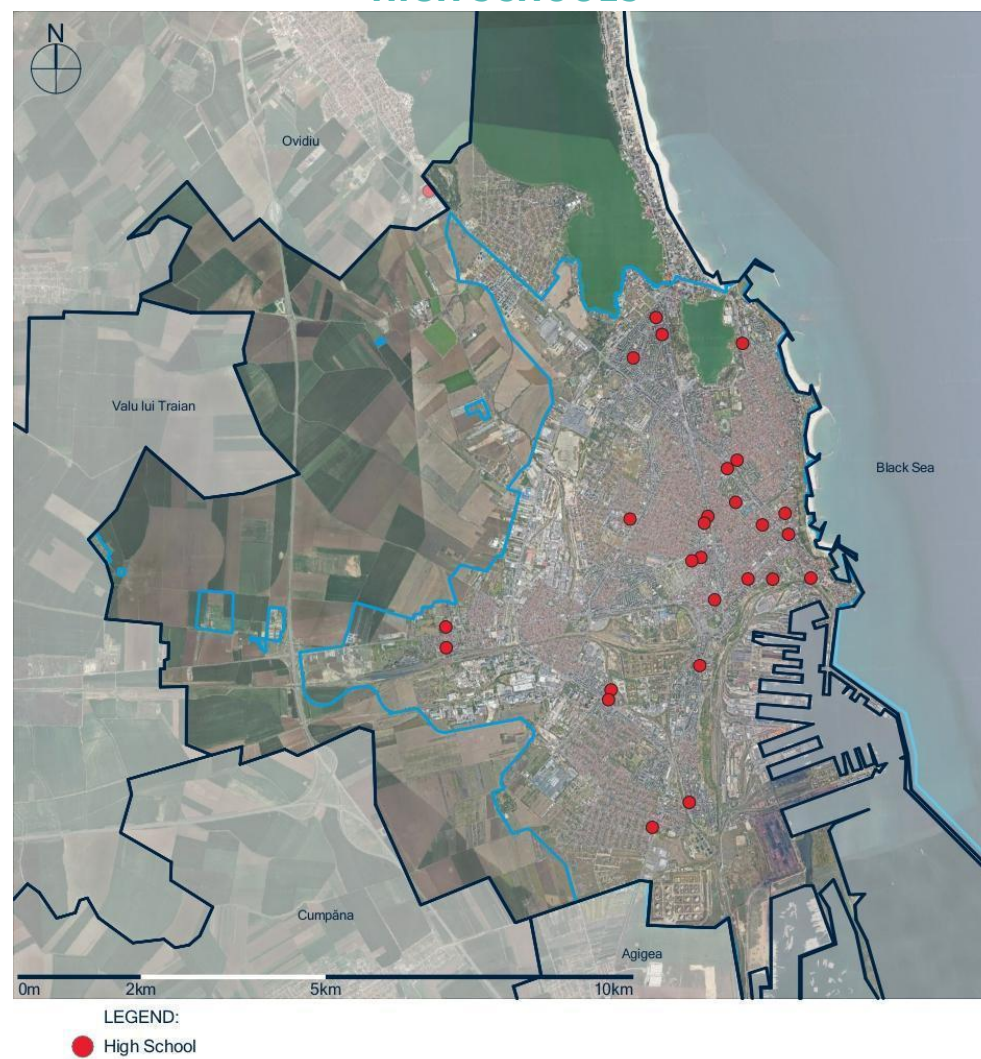
SCHOOLS IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Școala Gimnazială nr. 30 "Gheorghe Țițeica"	834,00	2.502,00	Școala Gimnazială "Petre Ispirescu"	326,00	978,00
Școala Gimnazială nr. 24 "Ion Jalea"	760,00	2.280,00	Școala Gimnazială "Ciprian Porumbescu"	1.269,00	2.538,00
Școala Gimnazială nr. 12 "Bogdan Petriceicu Hașdeu"	1.273,00	4.455,50	Școala Gimnazială "Ferdinand"	705,00	2.115,00
Școala Gimnazială nr. 28 "Dan Barbilian"	886,00	2.658,00	Școala Generală "Mihail Koiciu"	607,00	1.821,00
Școala Gimnazială nr. 7 "Remus Opreanu"	879,00	2.637,00	Școala Gimnazială "Dimitrie Cantemir"	1.045,00	3.135,00
Școala Gimnazială nr. 29 "Mihai Viteazul"	897,00	2.691,00	Școala Gimnazială nr.17 "Ion Minulescu"	742,00	2.226,00
Școala Gimnazială nr. 39 "Nicolae Tonitza"	965,00	3.860,00	Școala Gimnazială "Colibri"	585,00	1.755,00
Școala Gimnazială nr. 23 "Constantin Brâncoveanu"	859,00	2.577,00	Școala Generală "Marin Sorescu"	433,00	866,00
Școala Gimnazială nr. 8	1.601,00	3.202,00	Școala Generală Nr. 39	965,00	3.860,00
Școala Gimnazială Nr. 6 "Nicolae Titulescu"	1.206,00	3.618,00	Școala Generală "Ion Luca Caragiale"	1.141,00	2.282,00
Școala Generală Nr. 37	779,00	2.337,00	Școala cu Clasele I-VIII nr. 19	1.165,00	1.165,00
Școala Gimnazială "Dr. Constantin Angelescu"	1.234,00	2.468,00	Școala cu clasele I-VIII "Dimitrie Știrbei"	778,00	2.334,00
Școala Gimnazială nr. 40 "Aurel Vlaicu"	1.061,00	4.244,00	Școala "Wilhelm Moldovan"	838,00	3.352,00
Școala Generală nr. 16	1.644,00	4.110,00	Școala "Ion I. C. Brătianu"	1.683,00	3.366,00
Școala Gimnazială nr. 18 "Jean Bart"	1.267,00	2.534,00	Școala Anastasia	1.413,00	706,50
Școala Gimnazială nr. 33 "Anghel Saligny"	779,00	2.337,00	Scoala Brancoveneasca	2.288,00	4.576,00



HIGH SCHOOLS



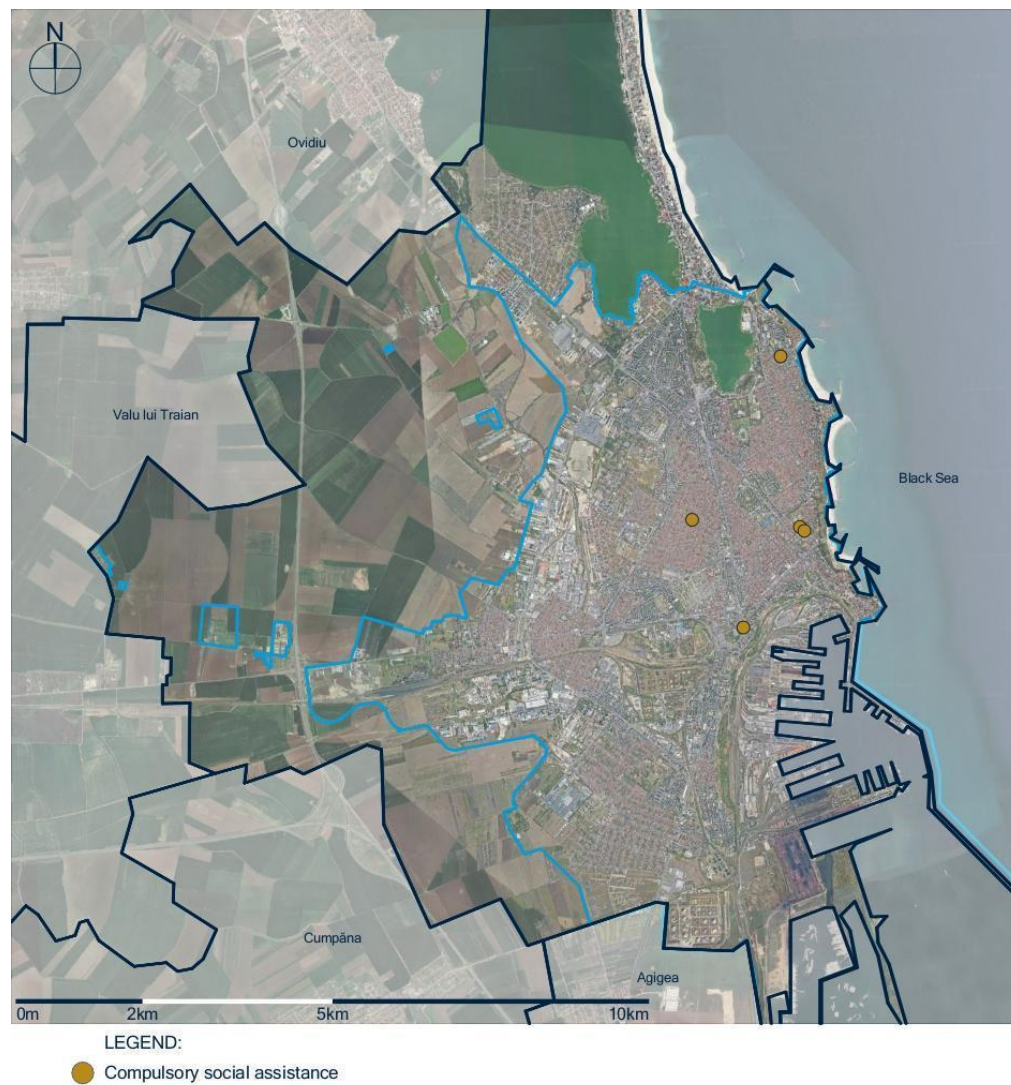
HIGH SCHOOLS IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Colegiul Național "Mircea cel Bătrân"	2.816,00	5.632,00	Liceul Tehnologic "Tomis"	3.834,00	7.668,00
Liceul Teoretic "Ovidius"	2.876,00	8.628,00	Liceul Tehnologic "Ca Rosetti"	882,00	1.764,00
Liceul Teoretic "Traian"	921,00	2.763,00	Liceul Tehnologic de Electrotehnică și Telecomunicații	858,00	2.574,00
Liceul Teoretic "George Călinescu"	943,00	2.829,00	Liceul "Ioan N. Roman"	885,00	2.655,00
Liceul Teoretic "Lucian Blaga"	2.801,00	8.403,00	Liceul Tehnologic "Gheorghe Miron Costin"	732,00	1.464,00
Liceul Teoretic "Decebal"	1.170,00	2.340,00	Colegiul Comercial "Carol I"	1.050,00	3.150,00
Liceul Teoretic "George Emil Palade"	1.133,00	3.399,00	Colegiul Național de Arte "Regina Maria"	2.106,00	7.371,00
Colegiul Național "Mihai Eminescu"	1.696,00	5.088,00	Colegiul Național Militar "Alexandru Ioan Cuza"	2.669,00	2.669,00
Liceul de Marină	648,00	1.944,00	Colegiul Național Pedagogic "Constantin Brătescu"	1.078,00	2.156,00
Liceul Economic "Virgil Mădgearu"	957,00	2.871,00	Liceul Economic "Gaudeamus"	956,00	1.912,00
Liceul de Program Sportiv	1.812,00	3.624,00	Liceul Teoretic "Pontica"	1.048,00	3.144,00
Liceul Teoretic "Dimitrie Leonida"	4.093,00	4.093,00	Liceul cu Program Sportiv "Nicolae Rotaru"	4.520,00	9.040,00
Liceul Energetic	855,00	2.565,00	Liceul CFR	2.492,00	2.492,00



COMPULSORY SOCIAL ASSISTANCE



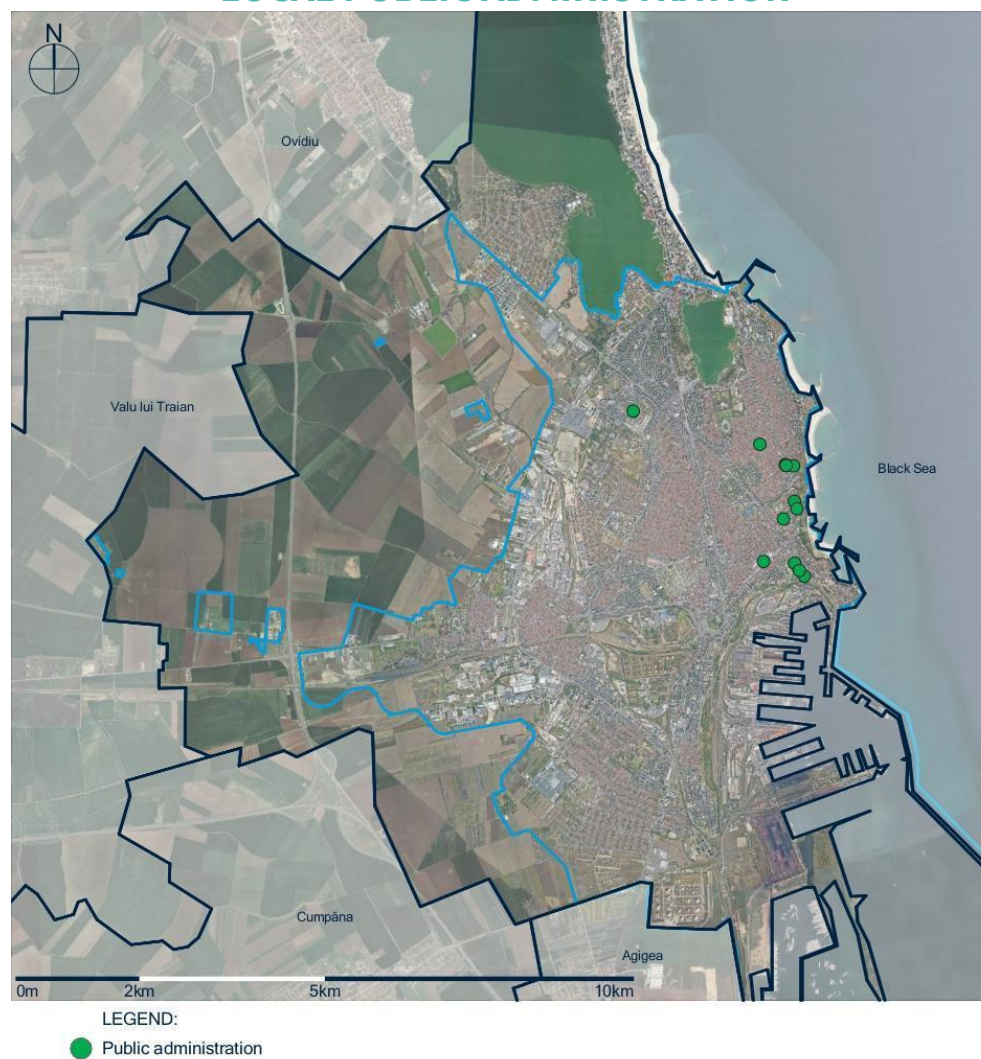
LOCAL COMPULSORY SOCIAL ASSISTANCE INFRASTRUCTURE IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Direcția Generală de Asistență Socială Constanța (DGAS Constanța)	2.347,00	4.694,00	Serviciul De Evidență și Plăți - DGASPC (Direcția generală de asistență socială și protecția copilului) Constanța	612,00	612,00
Agenția Județeană pentru Plăți și Inspecție Socială	944,00	2.832,00	Centrul de Primire a Copilului în Regim de Urgență	1.471,00	1.471,00
Direcția Generală de Asistență Socială și Protecția Copilului	223,00	669,00			



LOCAL PUBLIC ADMINISTRATION



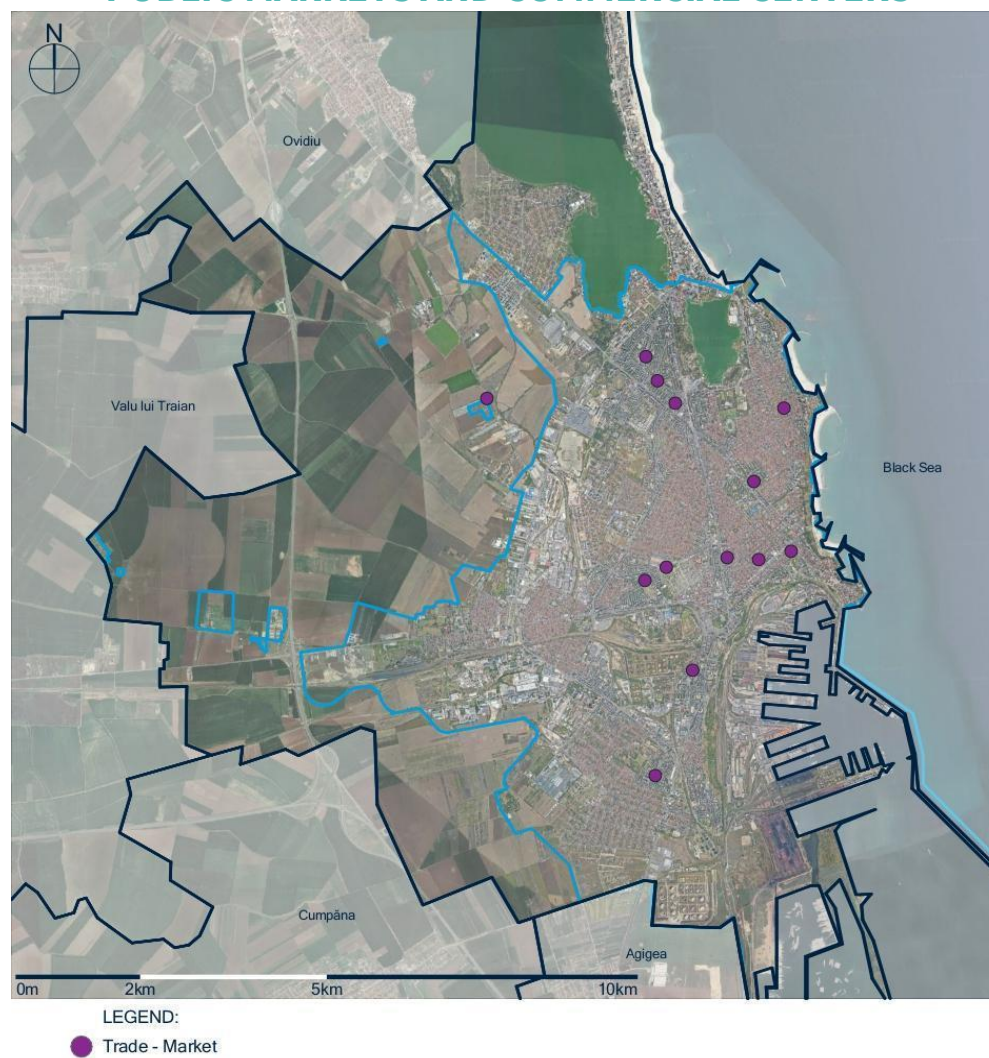
LOCAL PUBLIC ADMINISTRATION BUILDINGS IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Primăria Municipiului Constanța	3.788,00	11.364,00	Poliția Constanța - Secția 2	490,00	980,00
Inspectoratul de Poliție al Județului Constanța	1.712,00	5.136,00	Direcția Poliției Transporturi - Serviciul Județean Constanța	527,00	1.317,50
Poliția Constanța - Secția 3	505,00	505,00	Poliția Constanța - Secția 3	587,00	587,00
Poliția Constanța - Secția 1	554,00	1.108,00	Direcția Generală de Evidență a Persoanelor Constanța	1.653,00	413,25
Serviciul Cazier Judiciar Constanța	505,00	505,00	Casa Căsătoriilor	400,00	800,00



PUBLIC MARKETS AND COMMERCIAL CENTERS



LOCAL PUBLIC MARKETS AND COMMERCIAL CENTERS IN CONSTANȚA



SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)	SQUARE / ADDRESS / NAME / PLAN CODE / LEVEL	TOTAL BUILT-UP AREA (SQM)	TOTAL GROSS FLOOR AREA (SQM)
Piața Griviței	5.029,00	7.543,50	Piața Filipescu	438,00	657,00
Piața Tomis 3	1.814,00	1.814,00	Piața Gorbaciov	2.209,00	2.209,00
Piața Brotăței	1.650,00	1.650,00	Piața Tic Tac	365,00	365,00
Piața Unirii	1.123,00	1.123,00	Piața De Gross Constanța	2.408,00	2.408,00
Piața Km 4-5	2.082,50	2.082,50	Piața Tomis 2	2.122,00	2.122,00
Piața Balada	2.481,00	2.481,00	Piața Abator	688,00	688,00
Piața I.L.Caragiale	1.294,00	1.294,00			



ANNEX 3. TRANSPORT

For the Transport sector, estimations include the energy requirements for Private and commercial Transport, Public transport (buses), and Municipal Transport (fleet of the City Hall and subordinated institutions).

Primary sources of information:

- Data on vehicles in Constanța Municipality requested to DRPCIV for 2021 (private and commercial transport)
- Data reported by City Hall for 2021 (public transport and municipal transport)
- Sustainable Energy and Climate Action Plan of Constanța Municipality (2023)
- International studies

SUB-CATEGORY	TYPE	MWH / YEAR	TONS CO ₂ e / YEAR
PRIVATE AND COMMERCIAL TRANSPORT	CARS	267,251.19	72,230.16
PRIVATE AND COMMERCIAL TRANSPORT	MOPEDS, MOTORCYCLES	1,217.01	322.51
PRIVATE AND COMMERCIAL TRANSPORT	BUSES AND MICROBUSES	14,112.23	3,880.71
SUBTOTAL PRIVATE AND COMMERCIAL TRANSPORT		282,580.44	76,433.38
PUBLIC TRANSPORT	BUSES	45,815.82	12,599.35
MUNICIPAL TRANSPORT	PUBLIC FLEET OF CITY HALL	747.44	204.75
SCOPE 3	ALL	693.03	190.58
All	All	329,836.73	89,428.07



PRIVATE AND COMMERCIAL TRANSPORT

Private and commercial transport – cars

PRIVATE AND COMMERCIAL TRANSPORT - CARS	GASOLINE	DIESEL	ELECTRIC	HYBRID (DIESEL + ELECTRIC)	HYBRID (GASOLINE + ELECTRIC)	GASOLINE + CNG	GASOLINE + LPG	OTHER (GASOLINE + E85, GNC)	TOTAL
Total number of private and commercial and public automobiles (DRPCIV, 2021: autoturisme, automobile mixte)	74545	61928	264	234	1,962	20	602	12	139,567
% of total automobiles	53.41%	44.37%	0.19%	0.17%	1.41%	0.01%	0.43%	0.01%	100.00%
All types of autovehicles in Constanța (DRPCIV, 2021)	79,611	78,985	271	234	1962	23	607	13	169,614
% automobiles of all types of autovehicles	93.64%	78.40%	97.42%	100.00%	100.00%	86.96%	99.18%	92.31%	82.29%
Average number of kilometres / vehicle year (source: SECAP Constanța, page 77)	5,100	5,100	5,100	5,100	5,100	5,100	5,100	5,100	5,100
% of kilometres / vehicle / year within city boundary	40%	40%	40%	40%	40%	40%	40%	40%	40%
Average number of kilometres / vehicle / year within city boundary	2,040	2,040	2,040	2,040	2,040	2,040	2,040	2,040	2,040
Distance travelled (km / year) Note: To estimate average km within the city boundary, it was assumed that 40% of the average distance / vehicle / year is urban (2040 km / vehicle / year). For reference, an average distance of 1800 km was used for 2014 (SEAP Constanța).	152,071,800.00	126,333,120.00	538,560.00	477,360.00	4,002,480.00	40,800.00	1,228,080.00	24,480.00	284,716,680.00



PRIVATE AND COMMERCIAL TRANSPORT - CARS	GASOLINE	DIESEL	ELECTRIC	HYBRID (DIESEL + ELECTRIC)	HYBRID (GASOLINE + ELECTRIC)	GASOLINE + CNG	GASOLINE + LPG	OTHER (GASOLINE + E85, GNC)	TOTAL
Fuel consumption (litres / year), based on assumed fuel consumption of 9 litres per 100 km for gasoline, 11 litres per 100 km for diesel, and 5 liters per 100 km for hybrid vehicles (Source: SECAP Constanța) . From this amount the fuel consumption reported by the Constanta City Hall for its municipal fleet was subtracted.	13,677,737.33	13,830,599.80	0.00	23,868.00	200,124.00	2040	73684.8	-	27,808,053.93
Fuel consumption (tons / year)	10,121.53	11,756.01	0.00	20.29	148.09	1.51	54.53	-	22,101.95
Energy requirement (MWh / year)	124,494.77	139,896.52	107.71	241.42	1821.528648	18.56808	670.6790496	-	267,251.19
Tons CO ₂ e / year	32,991.11	38,471.54	35.76	66.39	482.7050917	4.9205412	177.7299481	-	72,230.16



Private and commercial transport - motorcycles and mopeds

PRIVATE AND COMMERCIAL TRANSPORT - MOTORCYCLES AND MOPEDS	GASOLINE	DIESEL	ELECTRIC	HYBRID (GASOLINE + ELECTRIC, DIESEL + ELECTRIC, GPL + ELECTRIC)	TOTAL
Mopeds (L1e, L2e)	47	0	0	0	47.00
Motorcycles(L3e, L4e, L5e, L6e, L7e)	2762	21	5	0	2,788.00
Total number of mopeds and motorcycles	2,809.00	21.00	5.00	0.00	2,835.00
Average number of kilometres / vehicle year (source: SECAP Constanța, page 77)	3,400	-	-	-	-
% of kilometres / vehicle year within city boundary	40.00%	-	-	-	-
Average number of kilometres / vehicle / year within city boundary	1,360.00	-	-	-	-
Distance travelled (km / year) Note: To estimate average km within the city boundary, it was assumed that 40% of the average distance / vehicle / year is urban (1,360 km / vehicle / year).	3,820,240.00	-	-	-	-
Fuel consumption (litres / year), based on assumed fuel consumption of 3.5 litres per 100 km (Source: SECAP Constanța)	133,708.40	-	-	-	-
Fuel consumption (tons / year) - based on density of gasoline	98.94	-	-	-	-
Energy requirement (MWh / year) - based on calorific value (12.3 for gasoline)	1,217.01	-	-	-	-
Tons CO ₂ e / year	322.51	-	-	-	-



PRIVATE AND COMMERCIAL TRANSPORT - MOTORCYCLES AND MOPEDS	GASOLINE	DIESEL	ELECTRIC	HYBRID (GASOLINE + ELECTRIC, DIESEL + ELECTRIC, GPL + ELECTRIC)	TOTAL
<i>Note: The energy requirement and emissions were calculated only for gasoline motorcycles and mopeds, as they account for 99.1% of the fleet.</i>					

Private and commercial transport - buses and minibuses

PRIVATE AND COMMERCIAL TRANSPORT - BUSES AND MINIBUSES	GASOLINE	DIESEL	TOTAL
Number of buses and minibuses (private and commercial) - after subtracting the number of public transport fleet buses	3	840	843
% of total private and commercial buses and minibuses	0.36%	99.64%	100.00%
Average number of kilometres / vehicle year (source: SECAP Constanța, page 77)	11,452.00	11,452.00	11,452.00
% of kilometres / vehicle year within city boundary	40%	40%	40%
Average number of kilometres / vehicle / year within city boundary (40% of 11,452 km)	4,580.80	4,580.80	4,580.80
Total distance travelled within city boundary (km)	13,742.40	3,847,872.00	3,861,614.40
Fuel consumption (litres / year), based on the following averages for gasoline: 11.96 l / 100 km, and diesel: 36.22 l / 100 km (source: SECAP Constanța)	1,643.59	1,393,699.24	1,395,342.83
Fuel consumption (tons / year)	1.22	1,184.64	1,185.86



PRIVATE AND COMMERCIAL TRANSPORT - BUSES AND MICROBUSES	GASOLINE	DIESEL	TOTAL
Energy requirement (MWh / year)	14.96	14,097.27	14,112.23
Tons CO ₂ e / year	3.96	3,876.75	3,880.71

PUBLIC TRANSPORT

NO. TOTAL AUTO	NO. TOTAL BUSES (ANNUAL)	TOTAL KM / TYPE	AVERAGE CONSUMPTION / 100 KM	FUEL TYPE
Ayats	10	96,610.00	45%	diesel
ISUZU	104	6,364,189.71	42%	
MAZ 103	79	831,877.00	39%	
MAZ 107		2,599,968.20		
MAZ 203		676,976.79		
MERCEDES	18	1,404,121.00	15%	
TOTAL	211	11,973,742.70	/	

Source: Constanța City Hall

PUBLIC TRANSPORT - BUSES	DIESEL - ISUZU CITIPOINT	DIESEL - MAZ	DIESEL - MERCEDES BENZ	DIESEL - AYATS	TOTAL
Number of buses	104.00	79.00	18.00	10.00	211
Km travelled / year	6,364,189.71	4,108,821.99	1,404,121.00	96,610.00	11,973,742.70
Diesel consumption (liters / year)	2,672,959.68	1,602,440.58	210,618.15	43,474.50	4,529,492.90
Diesel consumption (tons / year)	2,272.02	1,362.07	179.03	36.95	3,850.07
Energy requirement (MWh / year) - conversion of tons diesel to MWh	27,036.99	16,208.69	2,130.40	439.74	45,815.82
Tons CO ₂ e / year	7,435.17	4,457.39	585.86	120.93	12,599.35



MUNICIPAL TRANSPORT

MUNICIPAL TRANSPORT - PUBLIC FLEET	GASOLINE	DIESEL	TOTAL
Number of vehicles	17	44	61
Fuel consumption (litres / year)	8,724.67	66,043.40	74,768.07
Fuel consumption (tons / year)	6.46	56.14	62.59
Energy requirement (MWh / year)	79.41	668.03	747.44
Tons CO ₂ e / year	21.04	183.71	204.75

Source: Constanța City Hall

SCOPE 3 EMISSIONS - TRANSPORT

The calculation of Scope 3 emissions in the Transport sector was based on the following estimations:

- According to the fuelo.net database, there are 40 fuel stations in Constanța ⁸
- The average distance from refineries to Constanța: $(295 \text{ km} + 292 \text{ km} + 21.3 \text{ km}) / 3 \approx 202.77 \text{ km}$. This was calculated based on refineries in Romania fueling the stations of the oil and gas companies with highest market share (OMV Petrom - Brazii de Sus, Lukoil - Ploiești, Rompetrol - Năvodari).
- The average distance for tankers to cover fuel stations in Constanța was assumed to be 15 km
- The average fuel consumption of a tanker: Around 33 liters of diesel per 100 km (0.33 liters / km)
- Tanker average capacity: 35,000 liters
- Total consumption in liters (gasoline and diesel) in Constanța / year: 33,941,366.13 liters / year. To transport this quantity, 969.75 tankers of 35,000 liters would be needed.
- To calculate the consumption for one tanker, the average fuel consumption was multiplied by the distance travelled of 217,77 km (202.77 km + 15 km): $0.33 \text{ liters/km} * 217,77 \text{ km} = 71.86 \text{ liters of diesel}$
- Therefore, the total fuel consumption for all tankers to transport the total fuel to stations in Constanța was estimated as follows: $71.86 \text{ liters} * 969.75 = 69,690.45 \text{ liters of diesel / year}$.
- To estimate the energy content of diesel in megajoules (MJ), the average energy density of diesel was used, which is about 35.8 MJ per liter⁹

⁸ <https://ro.fuelo.net/gasstations?lang=ro>

⁹ MIT, Units & Conversions Fact Sheet (Derek Supple, MIT Energy Club), available at: <https://indico.ictp.it/event/8008/session/3/contribution/23/material/slides/2.pdf>



- Energy requirement (MJ): $35.8 \text{ MJ} * 59,272.63 \text{ liters} = 2,494,918.09 \text{ MJ / year}$
- **Energy requirement (MWh): $2,494,918.09 \text{ MJ / year} * 0.000277778 = 693.03 \text{ MWh / year}$ (1 MJ = 0.000277778 MWh)**
- **This is equivalent with 190.58 tons CO₂e (conversion factor for diesel, from MWh/year to tons of CO₂ is 0.275).**

Using this total, the share of energy requirement was estimated for Municipal transport, Public transport, and Private and commercial transport, based on their respective share from the total fuel consumption.

TRANSPORT - SCOPE 3 EMISSIONS	PRIVATE AND COMMERCIAL TRANSPORT - AUTOMOBILES	PRIVATE AND COMMERCIAL TRANSPORT - BUSES AND MICROBUSES	PRIVATE AND COMMERCIAL TRANSPORT - MOTORCYCLES AND MOPEDS	PUBLIC TRANSPORT - BUSES	MUNICIPAL TRANSPORT - PUBLIC FLEET	TOTAL
DIESEL (litres / year) - Scope 1	13,854,467.80	1,393,699.24	0	4,529,492.90	66,043.40	19,843,703.34
GASOLINE (litres / year) - Scope 1	13,953,586.13	1,643.59	133,708.40	0	8,724.67	14,097,662.79
Subtotal - Scope 1	27,808,053.93	1,395,342.83	133,708.4	4,529,492.90	74,768.07	33,941,366.13
% of total fuel consumption	81.93%	4.11%	0.39%	13.35%	0.22%	100.00%
Fuel consumption for tankers (Scope 3)	57,097.16	2,865.00	274.54	9,300.23	153.52	69,690.45
Energy requirement (MJ / year)	2,044,078.50	102,567.06	9,828.46	332,948.11	5,495.95	2,494,918.09
Energy requirement (MWh / year)	567.80	28.49	2.73	92.49	1.53	693.03
Tons CO ₂ e / year	156.15	7.83	0.75	25.43	0.42	190.58



ANNEX 4. WASTE

For the Waste sector, estimations include the energy requirements of waste collection, treatment, recycling, composting and landfilling processes, as well as landfill gas emissions (diffused methane).

Primary sources of information:

- Sustainable Energy and Climate Action Plan of Constanța Municipality (2023)
- County Waste Management Plan (2020-2025)¹⁰
- County Waste Management Plan (2020-2025), Annexes¹¹:
- Environmental Report for the County Waste Management Plan (2020)¹²
- International studies

SECTOR	PROCESS	ENERGY REQUIREMENT (MWh / YEAR)	TONS CO ₂ e / YEAR
WASTE	Collection	8,447.63	2,323.10
WASTE	Sorting	665.71	221.02
WASTE	Recycling	169.06	56.13
WASTE	Landfilling	3,494.86	962.15
WASTE	Non-recovered methane (from landfilling)	n/a	96,390.00
WASTE	Waste Management (collection, sorting, recycling, landfilling)	12,777.27	99,952.40
WASTE	Wastewater treatment	15,690.00	5,209.08
TOTAL	All	28,467.27	105,161.48

¹⁰ https://www.cjc.ro/dyn_doc/anunturi/PJGD/8.1-2021-PJGD_2020-2025_Constanta.pdf

¹¹ <https://www.cjc.ro/sectiune.php?s=171>

¹² https://www.cjc.ro/dyn_doc/anunturi/PJGD/6.2_Raport%20de%20Mediu.pdf



WASTE COLLECTION (DIESEL)

ENERGY CONSUMPTION AND EMISSIONS FROM WASTE COLLECTION

- Quantity of waste collected (2021): 154,524.31 tons
- Total distance travelled for collection (2021): 1,527,839 km
- Average fuel consumption (2021): 0.55 liters / km
- Total fuel consumption (2021): 825,448 liters (709.89 tons)
- **Energy requirement for collection (MWh / year): $709.89 \text{ tons} \times 11.9 = 8,447.63 \text{ MWh / year}$**
- **This is equivalent with 2,323.10 tons of CO₂ / year (conversion factor for diesel, from MWh/year to tons of CO₂ is 0.275).**

WASTE COLLECTION (2021)	DIESEL	SOURCE
Quantity of waste collected (tons)	154,524.31	Constanța City Hall
Average truck capacity (tons)	7.50	Constanța City Hall
Average fuel consumption (litres / km)	0.55	Constanța City Hall
Distance travelled	1,527,839.00	Constanța City Hall
Fuel consumption (litres / year)	825,448.00	Constanța City Hall
Fuel consumption (tons / year)	709.89	Density of 0.86 kg / liter
Energy requirement for collection (MWh/year) - Scope 1	8,447.63	Net calorific value of diesel of 11.9 MWh / ton
Tons CO ₂ e / year	2,323.10	Conversion factor for diesel, from MWh/year to tons of CO₂ is 0.275



WASTE SORTING (ELECTRICITY)

ENERGY CONSUMPTION AND EMISSIONS FROM WASTE SORTING

- Quantity of sorted waste (2021): 1,764.52 tons
 - P.E.T. (code 15.01.02) = 338.13 tons;
 - L.D.P.E. foil (code 15.01.02) = 139.57 tons;
 - P.P.-H.D.P.E. plastic (code 15.01.02) = 139.85 tons;
 - other plastics (code 15.01.02) = 49.76 tons;
 - paper (code 20.01.01) = 248.71 tons;
 - P.A.P. cardboard (code 15.01.01) = 501.15 tons;
 - tetra pack (code 15.01.05) = 9.98 tons;
 - non-ferrous waste (code 15.01.04) = 14.8 tons.
- **Energy requirement for sorting per ton of waste: 665.71 MWh / year (electricity) - reported by the Constanța City Hall.**
- **This is equivalent with 221 t CO₂e (conversion factor for electrical energy, from MWh to tons CO₂ is 0.332).**



WASTE RECYCLING (ELECTRICITY)

The sorting station owned by MM Recycling also owns a PET recycling facility. The electricity requirement of mechanical and physical recycling technologies is estimated between 300 and 700 KWh/ton¹³. An average of 500 KWh/ton was used to estimate the electricity consumption associated with recycling processes (0.5 MWh/ton). Based on the quantity of PET sorted of 338.13 tons reported by Constanța City Hall, the energy requirement associated with waste recycling (mechanical and physical technologies) was estimated using an average of 0.5 MWh/ton. This corresponds to 169.06 MWh (56.13 t CO₂e, Scope 2).

ENERGY CONSUMPTION AND EMISSIONS FROM RECYCLING

- Energy requirement for recycling (MWh/ton of waste): 500 MWh / t (electricity)
- Estimated quantity of recycled plastic waste: 338.13 t
- **Energy requirement: 338.13 t * 0.5 MWh / t = 169.06 MWh**
- **This is equivalent with 56.13 t CO₂e (conversion factor for electrical energy, from MWh to tons CO₂ is 0.332).**

Note: Increasing recycling and composting rates is critical to reduce emissions associated with landfilling. Avoided emissions result from diverting waste from landfills through recycling and composting, reducing the need for new raw materials and preventing the release of greenhouse gases typically associated with landfilling.

¹³ Garcia-Gutierrez, P., Amadei, A.M., Klenert, D., Nessi, S., Tonini, D., Tosches, D., Ardente, F. and Saveyn, H., Environmental and economic assessment of plastic waste recycling, EUR 31423 EN, Publications Office of the European Union, Luxembourg, 2023, page 49, available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC132067>



WASTE LANDFILLING (DIESEL, ELECTRICITY, GPL) AND ESTIMATED DIFFUSED METHANE EMISSIONS

a) OPERATIONS AT LANDFILLS

According to data reported by the operator of the landfill, the following energy resources were required in 2021 for the total quantity of waste:

- Electricity: 41,543 KWh / year (41.543 MWh / year)
- Diesel fuel: 489 t / year
- GPL (for the thermal plant in the administrative building): 1,100 liters / year¹⁴

ENERGY CONSUMPTION AND EMISSIONS FROM OPERATIONS AT LANDFILLING

- Quantity of landfilled municipal waste originating from Constanța Municipality (based on data reported by Constanța City Hall): 153,373.42 tons.
- The landfilled waste generated in Constanța Municipality (153,373.42 tons) represents **59.5% of the total quantity of waste** that entered the landfilling facility in 2021 (257,586.64 tons). Based on this data, the energy required for the waste generated in Constanța Municipality in 2021 was estimated.

Electricity

- **Estimated energy requirement: $59.5\% \times 41.543 = 24.72$ MWh / year**
- **This is equivalent with 8.21 t CO₂e (conversion factor for electrical energy, from MWh to tons CO₂/year is 0.332).**

Diesel fuel

- Estimated fuel consumption: $59.5\% \times 489 = 290.96$ t / year
- **Estimated energy requirement: $290.96 \text{ t / year} \times 11.9 = 3,462.36$ MWh / year**
- **This is equivalent with 952.15 t CO₂e (conversion factor for diesel, from MWh to tons CO₂ is 0.275).**

LPG (Liquefied Petroleum Gas) for the heating system

- GPL (for the thermal plant in the administrative building - not impacted by the quantity of waste): 1,100 liters / year
- Assuming a density of 0.54 kg/liter, the consumption is 0,594 t / year
- Assuming a net calorific value of GPL of 13.1 MWh / t
- **Estimated energy requirement: $13.1 \text{ MWh / t} \times 0,594 \text{ t / year} = 7.78$ MWh / year**
- **This is equivalent with 1,79 CO₂e (conversion factor for GPL, from MWh to tons CO₂ is 0.231).**

¹⁴ Environmental Impact Report in order to obtain the environmental approval for the project: Extension of ecological landfill for household and industrial waste in Ovidiu, Constanța County - Cell VIII, 2022, page 49, available at: <https://apmct.anpm.ro/documents/840114/69092388/RIM++TRACON+SRL+celula+VIII+C-ta.pdf/8e4e991e-49a5-4a39-9a73-410ee41f708a>



b) ADDITIONAL EMISSIONS FROM LANDFILL GAS

In landfills, waste degrades and gas - mainly carbon dioxide (CO₂) and methane (CH₄) - is released slowly over time. The primary concern in landfill emissions is methane. According to the IPCC's methodology for waste sector emissions¹⁵, CO₂ emissions from the degradation of organic waste are excluded from national GHG inventories because they are considered biogenic and not a net addition to atmospheric carbon.

EMISSIONS FROM LANDFILLING (NON-RECOVERED METHANE)

The quantity of methane released from landfilled waste was estimated based on an available estimations for 2022:

- **Estimation of total diffused (non-recovered) methane emissions of the Ovidiu landfill for 2022: 6029,3 t CH₄**¹⁶
- In 2021, waste was landfilled exclusively in Cell 7 of the Ovidiu facility, as landfilling was ceased for all other cells. Considering that from the total 7 cells in the landfill, cells 1-6 had a low rate of biogas emissions (7% for cells 1 and 2, and 20% for cells 3, 4, 5, 6) in 2022, and specific information for each cell was not available, **it was assumed that about 6000 t CH₄ were diffused from Cell 7.**
- Landfilled waste from Constanța Municipality represents 59.5% of the total quantity of waste that entered the landfilling facility in 2021 from Constanța Municipality and other smaller municipalities (See previous section)
- **Based on this, it was assumed that 59.5% of the methane emissions are associated with the landfilling of waste from Constanța Municipality: 59.5% * 6,000 t CH₄ = 3,570 t CH₄.**
- The Global Warming Potential (GWP) for non-fossil methane is 27 (over 100 years)¹⁷. This means that 1 ton of methane has the same warming effect as 27 tons of carbon dioxide (CO₂) over 100 years.
- **In tons CO₂e, the estimated methane released through landfilling generated by Constanța Municipality in 2021 corresponds to 3,570 t CH₄ * 27 = 96,390 t CO₂e.**

Note: This amount is based on estimated diffused methane of the Ovidiu landfill in 2022¹⁸. To refine this estimation, the total quantity of diffused (non-recovered) methane emissions of the landfill for Cell 7 in 2021 (or estimated CO₂e) is required.

¹⁵ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 3. Solid Waste Disposal, available at: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf, page 6

¹⁶ Environmental Impact Report in order to obtain the environmental approval for the project: Extension of ecological landfill for household and industrial waste in Ovidiu, Constanța County - Cell VIII, 2022, page 127, available at: <https://apmct.anpm.ro/documents/840114/69092388/RIM++TRACON+SRL+celula+VIII+C-ta.pdf/8e4e991e-49a5-4a39-9a73-410ee41f708a>

¹⁷ Greenhouse Gas Protocol (August 2024), page 2, available at: <https://ghgprotocol.org/sites/default/files/2024-08/Global-Warming-Potential-Values%20%28August%202024%29.pdf>

¹⁸ Environmental Impact Report in order to obtain the environmental approval for the project: Extension of ecological landfill for household and industrial waste in Ovidiu, Constanța County - Cell VIII, 2022, page 127, available at: <https://apmct.anpm.ro/documents/840114/69092388/RIM++TRACON+SRL+celula+VIII+C-ta.pdf/8e4e991e-49a5-4a39-9a73-410ee41f708a>



PROCESS	FACILITY	TYPE OF WASTE	LOCATION	QUANTITY OF WASTE (T/YEAR)	SCOPE	ELECTRIC L ENERGY (MWH/YEAR)	SCOPE	LPG (T/YEAR)	LPG (MWH / YEAR)	SCOPE	DIESEL (T/YEAR)	DIESEL (MWH/YEAR)	TOTAL
Sorting	S.C. MM RECYCLING S.R.L. Constanța	Recyclable waste collected separately	Constanța	1,764.52	Scope 2	665.71	Scope 2	0.00	0.00	Scope 1	0.00	0.00	665.71
Recycling	S.C. MM RECYCLING S.R.L. Constanța.	P.E.T.	Constanța	338.13	Scope 2	169.06	Scope 2	0.00	0.00	Scope 1	0.00	0.00	169.06
Landfill	Landfill Ovidiu	Mixed waste from population and economic agents, Street waste, Recyclable waste collected separately, Recyclable waste collected together	Ovidiu	153,373.42	Scope 3	24.72	Scope 3	0.59	7.78	Scope 3	290.96	3,462.36	3,494.86



WASTEWATER

To estimate the CO₂ emissions associated with wastewater treatment, a request for information was submitted to RAJA S.A. by Constanța City Hall. The reported information on the total volume of billed wastewater for Constanța Municipality and the energy consumption are presented below.

ENERGY CONSUMPTION AND EMISSIONS - WASTEWATER

- The volume of wastewater billed in the Municipality of Constanța in 2021 was 22,164,193 cubic meters¹⁹
- The electricity consumption related to the wastewater treatment process billed to the Municipality of Constanța in 2021 was 15,690 MWh.
- **This is equivalent to 5.209,08 t CO₂e** (conversion factor for electrical energy, from MWh to tons CO₂/year of 0.332).

¹⁹ Data provided directly by RAJA S.A.



ANNEX 5. AFOLU

Table 24 ENERGY REQUIREMENTS FOR GREEN SPACES 2022

	SURFACE OF GREEN SPACES (HECTARES)	DIESEL (LITERS)	GASOLINE (LITERS)	DIESEL (MWH)	GASOLINE (MWH)	ELECTRICAL ENERGY (MWH)
	COMPANY 1					
January 2022	579.23	1,868.87	414.60	18.90	3.77	
February 2022	579.23	2,395.09	348.14	24.23	3.17	
March 2022	579.23	2,443.37	358.16	24.71	3.26	
April 2022	579.23	2,826.62	1,417.24	28.59	12.90	
May 2022	579.23	4,129.59	2,713.63	41.77	24.70	
June 2022	579.23	2,882.23	2,304.43	29.15	20.97	0.10
July 2022	579.23	3,815.70	1,882.21	38.60	17.13	0.13
August 2022	579.23	4,117.53	1,505.59	41.65	13.70	0.13
September 2022	579.23	3,070.24	1,203.53	31.06	10.95	0.09
October 2022	579.23	2,254.30	1,103.80	22.80	10.05	0.04
November 2022	579.23	2,429.24	619.60	24.57	5.64	0.11
December 2022	579.23	2,971.11	306.38	30.05	2.79	0.13
TOTAL COMPANY 1		35,203.89	14,177.31	356.09	129.04	0.72
	COMPANY 2					
TOTAL COMPANY 2		61,595.00	27,228.00	623.03	247.83	
TOTAL GREEN SPACES		96,798.89	41,405.31	979.12	376.87	0.72



Source: Energy estimates received from Municipality

Table 25 ENERGY REQUIREMENTS FOR ARABLE LAND LOCATED WITHIN THE MUNICIPALITY

CHAPTER IV: A) ARABLE LAND LOCATED WITHIN THE LOCALITY – FIELD CROPS

2021 -HECTARE-								
CROP	ROW CODE	TOTAL LOCALITY	HOUSEHOLDS WITHOUT LEGAL PERSONALITY, DOMICILED IN THE LOCALITY	PERSONS DOMICILED IN OTHER LOCALITIES	ENTITIES WITH LEGAL PERSONALITY OPERATING WITHIN THE LOCALITY	LITERS DIESEL / HECTARE / YEAR	MWH DIESEL	MWH ELECTRICAL ENERGY
A	B	5	6	7	8			
Total cereals for grains (excluding seeds) code (02+...+19)	1	1,746.97	27.01		1,719.96	60.00	17.67	not applicable
Winter common wheat	2	708.26	9.70		698.56			
Spring common wheat	3	105.00			105.00			
Barley	8	432.26	17.31		414.95			
Autumn barley	9	83.58			83.58			
Spring barley	10	31.50			31.50			
Oats	11	16.10			16.10			
Corn for grains	12	370.28			370.28			
Total grain legumes (excluding seeds) code (21+...+26)	20	93.72			93.72	40.00	0.95	not applicable
Peas for grains	21	93.72			93.72			
Total oil plants (excluding seeds) code (39+...+47)	38	475.50	18.30		457.20	40.00	4.81	not applicable
Sunflower	39	417.30	8.30		409.00			



CHAPTER IV: A) ARABLE LAND LOCATED WITHIN THE LOCALITY – FIELD CROPS

2021	-HECTARE-							
Rapeseed for oil	40	58.20	10.00		48.20			
Total field vegetables (excluding seeds) code (63+...+73+75+...+92)	62	219.62	1.62		218.00	40.00	2.22	not applicable
Other vegetables cultivated for fruit	79	218.94	0.94		218.00			
Total fodder plants (excluding seeds) code (94+...+98+174)	93	232.18	7.98		224.19	40.00	2.35	not applicable
Other annual plants for hay and green mass	95	112.47			112.47			
Alfalfa	97	119.71	7.98		111.73			
Plants for seed production and seed crops, seed lots for sale - total code (106+123+127+131+132+135+142+145+150+165)	105	38.62			38.62	40.00	0.39	not applicable
Other fodder root crops for seeds	130	38.62			38.62			
TOTAL		5,612.53	109.14		5,503.39	260.00	28.39	NOT APPLICABLE

Source: Information received from municipality | Diesel energy estimates received via phone interview with Ministry of Agriculture representative



Table 26 ENERGY REQUIREMENTS FOR LIVESTOCK WITHIN THE MUNICIPALITY

CHAPTER VII: DOMESTIC ANIMALS AND/OR WILD ANIMALS RAISED IN CAPTIVITY UNDER LEGAL CONDITIONS

2021 -UNITS-													
SPECIES/CATEGORY OF ANIMALS	ROW CODE	TOTAL LOCALITY		HOUSEHOLDS WITHOUT LEGAL PERSONALITY, DOMICILED IN THE LOCALITY		PERSONS DOMICILED IN OTHER LOCALITIES		LEGAL ENTITIES CONDUCTING ACTIVITIES WITHIN THE LOCALITY		DIESEL LITERS/UNIT/ YEAR	MWH DIESEL	KWH ELECTRICAL ENERGY/UNIT /YEAR	MWH ELECTRICAL ENERGY
A	B	SEM.1	SEM.2	SEM.1	SEM.2	SEM.1	SEM.2	SEM.1	SEM.2				
		9	10	11	12	13	14	15	16				
Cattle under 1 year - total code (03+05)	2	11.00		11.00						50.00	0.11	50.00	0.55
Cattle aged 1-2 years - total code (09+12)	8	2.00	2.00	2.00	2.00					80.00	0.02	75.00	0.15
Female cattle aged 2 years and over - code (20+23)	19	61.00	95.00	61.00	75.00		20.00			150.00	0.96	150.00	14.25
Young sheep under 1 year	33	70.00	70.00	70.00	70.00					10.00	0.71	10.00	0.70
Sheep - other categories	34	160.00	316.00	160.00	316.00					20.00	3.20	20.00	6.32
Goats - total code (37+...+40)	36	221.00	221.00	221.00	221.00					10.00	2.24	15.00	3.32
Pigs - total code (42+43+45+49)	41	16.00	16.00	16.00	16.00					0.50	0.16	20.00	0.32



CHAPTER VII: DOMESTIC ANIMALS AND/OR WILD ANIMALS RAISED IN CAPTIVITY UNDER LEGAL CONDITIONS

2021	-UNITS-												
Poultry - total code (69+...+74)	68	2,300.00	2,300.00	2,300.00	2,300.00					0.20	23.26	1.00	2.30
Bee families	78	648.00	434.00	648.00	434.00					0.01	4.39	0.20	0.09
TOTAL		3,489.00	3,454.00	3,489.00	3,434.00	0.00	20.00	0.00	0.00	320.71	35.05	341.20	0.0279918

Source: Information received from municipality | Diesel energy estimates received via phone interview with Ministry of Agriculture representative | Electrical energy requirements estimated with Gemini Pro Advance Research and confirmed via phone interview with Ministry of Agriculture representative



ANNEX 6. ADDITIONAL TECHNICAL DETAILS ABOUT THE INTERVENTIONS INCLUDED IN THE CONSOLIDATION OF AN ENERGY-EFFICIENT DISTRICT HEATING SYSTEM ACTION

SOURCE OF THERMAL AND ELECTRICAL ENERGY PRODUCTION THROUGH HIGH EFFICIENCY COGENERATION (C.E.T)

The intervention aims to establish a high-efficiency cogeneration unit for thermal energy production in Constanța's central heating sector. This gas-fired unit will be designed with flexibility to integrate renewable gases and meet the latest standards, ensuring full compliance with energy efficiency, environmental, and climate change requirements.

The intervention involves the construction of a high-efficiency cogeneration unit for both electricity and thermal energy production in the central heating sector. The gas-fired unit is designed for flexibility and high efficiency, being primarily focused on cogeneration, by using a gas turbine and a recuperator boiler, along with all the necessary auxiliary equipment. The system will operate on natural gas, but is adaptable to incorporate a methane-hydrogen mixture, with flexibility in hydrogen usage throughout the investment's economic life, avoiding long-term dependency on a specific fuel mix. The intervention aligns with Investment Measure 5 of the Key Programme 5, which supports the modernization and construction of high-efficiency cogeneration plants and district heating networks, specifically within Investment Area 5.1, aimed at advancing high-efficiency cogeneration investments.

The investments involves the development of a high-efficiency cogeneration facility for both thermal and electrical energy production, along with all the necessary auxiliary equipment and installations. The intervention replaces the existing power plants and/or thermal power plants with significantly higher CO₂ emissions (such as coal, lignite, or oil) with a more efficient, low-emission system, leading to a substantial reduction in the greenhouse gas emissions. It also focuses on economic goals, including a significant reduction in fuel consumption, operating costs, and the cost of producing useful energy. Socially, we aim to improve the accessibility of SACET for the population and enhance their thermal comfort. Environmentally, we target a decrease in pollutant emissions, including CO₂ emissions per unit of useful energy, and a reduction in primary energy consumption per MWh of useful energy.

The proposed configuration is designed to meet the mandatory requirements for efficient district heating systems set forth in Directive 27/2012/EU (EED) on Energy Efficiency. It aims to ensure that 75% of thermal energy is delivered from a combination of high-efficiency cogeneration and renewable sources. For this investment project, the delivery of thermal energy to the SACET primary heating network will be facilitated through the use of cogeneration plants for the base load and hot water boilers for peak demand.



The proposed cogeneration solution also complies with all the requirements outlined in the Energy Efficiency Directive, ensuring high overall efficiency, primary energy savings, and a reduction in greenhouse gas and pollutant emissions. It also adheres to the stipulations of current financing programs, including meeting the specific emission limit of 250 g CO₂/kWh for useful energy produced, without relying on low CO₂-emission fuels like green hydrogen. All the equipment intended to operate on natural gas is capable of running with a hydrogen mixture of up to 20% volume. As hydrogen becomes more accessible in the future, the equipment can be adjusted or upgraded to increase hydrogen content. When green hydrogen is used, the share of thermal energy derived from renewable resources will increase, supporting future energy efficiency targets. This new energy source is designed for flexibility, allowing it to adapt to the EU programmatic changes aimed at transitioning to cleaner, more environmentally friendly energy, while also ensuring the achievement of energy efficiency goals.

IMPLEMENTING A COMPREHENSIVE SOFTWARE SUITE TO OPTIMIZE DISTRICT HEATING PROCESSES

The intervention targets multiple key components, namely production (Heat and Thermal Power Plants – C.E.T.), transport (primary networks), distribution (secondary networks, thermal points, and modules), and supply (heat agent billing and customer portfolio management). The goal of the intervention is to integrate all of the operational applications into a sophisticated software platform, including SCADA for production, SCADA for distribution, technical and financial billing software, weather forecasting applications, electricity and thermal energy trading platforms, energy market integration, existing databases, and customer portfolio management tools. Additionally, the system would provide a comprehensive view of the district heating infrastructure across various management levels, including operators, public service agencies, local authorities and related entities.

HEAT AND ELECTRICAL ENERGY PRODUCTION SYSTEM (C.E.T.)

- Automatically optimizing the production schedules to enhance planning and process evaluation.
- Forecasting thermal loads, a critical element for efficient production optimization and planning.
- Prioritizing the most cost-effective production units, using heat storage to alleviate peak demand and reduce overall production costs.
- Maximizing revenues by adjusting production during periods of favorable electricity prices.
- Using weather and load forecasts to accurately predict primary fuel consumption, enabling additional savings when purchasing fuel.

HEAT ENERGY DISTRIBUTION SYSTEM (NETWORK, POINTS, AND THERMAL MODULES)

- Optimizing supply temperature to cut distribution costs by balancing heat losses and pumping expenses.
- Optimizing network pressure to lower pumping costs.
- Implementing an intelligent design tool to streamline decision-making, reduce capital investments (CAPEX), and optimize operational costs (OPEX) by saving time.



- Analyzing various scenarios to find the most efficient and cost-effective technical and economic solutions, maximizing savings in both investments and operations.

SUPPLY SYSTEM

- Integrating the technical billing system with production, distribution, and customer portfolio management systems to ensure smooth and accurate operations.



ROMANIA
CONSTANTA COUNTY
MUNICIPALITY OF CONSTANTA
No. 144925/01.07.2025



FOR:

European Commission

· Mission Unit for 100 Climate-Neutral and Smart Cities

LETTER OF INTEREST

To whom it may concern,

Through this letter, **the Municipality of Constanța**, represented by the undersigned, Mr. Vergil Chițac, Mayor, in collaboration with **Constanța Metropolitan Area Intercommunity Development Association** (comprising the Municipality of Constanța, five cities, and ten communes within its metropolitan area, and Constanța County Council), represented by the undersigned, Mr. Adrian Crăciun, Coordinator of the Development Strategies and Programs Department, hereby **respectfully submit for your consideration the candidacy of the Municipality of Constanța** to become a member city within the cohort of the EU Mission for Climate-Neutral and Smart Cities.

In this regard, we formally express our commitment to achieving climate neutrality by the year 2030, adhering rigorously to the framework established by the EU Mission, both as regards the strategic methodology and the operational processes and solutions outlined therein.

In 2024, the Municipality of Constanța was selected, following a competitive selection process, as one of the ten Romanian cities to receive support from the **M100 Mirror Mission Cities Hub Romania**, with the objective of attaining climate neutrality by 2035, in line with the model and principles of the EU Mission for Climate-Neutral and Smart Cities, as the M100 National Hub mirrors the European framework.

Subsequently, in accordance with the logic and methodology of the M100 National Hub, the Municipality of Constanța, in partnership with Constanța Metropolitan Area Intercommunity Development Association, prepared in 2025 a **Climate City Contract** with a time horizon extending to the year 2035, through which we formally committed to achieving climate

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neutrality by that date, in strict adherence to the strategic and operational framework established at the European level in this regard.

Nonetheless, in the hope that you will accept the Municipality of Constanța as a member city within the cohort of the EU Mission for Climate-Neutral and Smart Cities, we hereby undertake to urgently accelerate this transition, committing to achieve climate neutrality by the year 2030, supported by the considerations detailed below.

Our main focus with respect to the reduction of the CO₂ emissions generated locally at the moment is directed towards the **infrastructure investments**, as these represent the most significant current need within the Municipality of Constanța and its metropolitan area. For this very reason, we are intensively engaged in **advancing the greening of the public systems and facilities**. The most critical systems, given their substantial potential for CO₂ emission reductions and their considerable investment volume, are as follows:

- The **district heating system**, for which we have developed a comprehensive, integrated portfolio of interventions aimed not only at the rehabilitation of the primary and secondary distribution networks, but also at the enhancement of the energy production sources and their associated facilities, including the district thermal points and heating plants. Furthermore, this portfolio includes the adoption of additional green energy solutions, CO₂ capture and storage technologies, and the integration of digital technologies to optimize the system's performance.
- The **energy production systems**, for which, due to favourable geographical conditions, the Municipality of Constanța and the surrounding metropolitan area benefit from significant natural solar and wind potential, as well as from green energy potential derived from marine sources. Due to these, we, together with other partners within the metropolitan area, are actively investing in and supporting projects aimed at the construction and integration of renewable energy production facilities.
- The **public transport system**, for which we are implementing actions to facilitate shared mobility both by road and by rail. In terms of **road transport**, we are undertaking integrated interventions to green the bus fleet through the procurement of electric buses, while simultaneously developing the supporting infrastructure needed for their efficient operation: expansion of dedicated bus lanes, construction of garages (including nZEB depots) and related facilities, installation of charging stations, implementation of smart passenger waiting stations, adoption of real-time passenger information systems, and digital route planning applications. All these efforts extend beyond the local scale, as we have been consistently undertaking actions to expand the public transportation services across the entire metropolitan area. In terms of **rail transport**, we are in the process of introducing a dedicated metropolitan train route serving the entire metropolitan area of Constanța, in collaboration with the Ministry of Transport and other central public institutions with competencies in the field.

One of the strategic ambitions that will enable the Municipality of Constanța to accelerate the transition towards climate neutrality, with the objective of achieving a reduction of at least 80% in the greenhouse gas emissions by the year 2030, is the adoption of an **integrated approach**

to **local transformation through urban regeneration**. The main levers supporting the transition to climate neutrality under this pillar are as follows:

- The implementation of **four urban regeneration projects targeting the residential neighborhoods** within the Municipality of Constanța, addressing in an integrated manner the comprehensive thermal rehabilitation of the collective residential buildings, the expansion and enhancement of their adjacent green spaces to mitigate the effects of the urban heat islands, the implementation of green and active mobility solutions (integrating the public transport options with the cycling and pedestrian infrastructure), and the establishment of community centers dedicated to social innovation.
- The advancement of a project aimed at the **green and innovative transformation of the contaminated lands within the Oil Terminal area**, through their comprehensive remediation, with the purpose of developing the largest net-zero neighborhood in Romania. This project constitutes the most extensive and ambitious urban regeneration initiative undertaken in Romania since 1989, positioning the Municipality of Constanța as a model of best practice not only at the regional and national levels, but also at the European level, and potentially at a global scale.

We would also like to highlight that we have succeeded in developing **solid partnerships with the central government institutions** on various topics related to environmental sustainability and climate action. Some illustrative examples in this regard include the collaboration with the Ministry of Transport for the introduction of the metropolitan train, with the Ministry of Energy for the development of renewable energy infrastructure within the metropolitan area, and with the Ministry of Development, Public Works and Administration for the implementation of innovative urban regeneration initiatives.

Furthermore, we maintain **active collaborations with our counterparts at the national level**, including with other municipalities through the National Association of Romanian Municipalities, and with other interjurisdictional cooperation structures through the National Federation of Romanian Metropolitan and Urban Agglomerations.

At the **European level**, we have engaged in similar collaborations, having participated as a beneficiary in the Functional Urban Areas in the EU project (implemented by the World Bank with funding from the European Commission) and being an active member of the METREX Network for European Metropolitan Regions and Areas, with which we closely cooperate on various collaborative initiatives, including those pertaining to environmental sustainability and climate action topics.

Additionally, we have established **strategic partnerships with major international organisations**, such as the European Bank for Reconstruction and Development (which collaborates with the regional operator RAJA S.A. Constanța on water and wastewater infrastructure projects) and the World Bank (which works with both the Municipality and the Intercommunity Development Association on topics related to integrated and sustainable urban development).

In light of the above, we respectfully request that you consider accepting the Municipality of Constanța as a member of the EU Mission for Climate-Neutral and Smart Cities. Based on the aforementioned efforts and commitments, we are prepared to accelerate our local and metropolitan actions to achieve climate neutrality by the year 2030 and, subsequently, to increase our CO₂ emission reduction targets by the year 2035.

In this regard, by July 15, 2025, we will submit to you our updated Climate City Contract, establishing a time horizon of 2030 for the achievement of climate neutrality and 2035 for the enhancement of our emission reduction targets.

We look forward to your favourable response and thank you for your attention and consideration.

Yours faithfully,

Vergil Chițac

Mayor

Municipality of Constanța



Adrian Crăciun

Coordinator of the Development Strategies and
Programs Department

Constanța Metropolitan Area Intercommunity
Development Association

