NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

## Climate City Contract

# 2030 Climate Neutrality Investment Plan

## 2030 Climate Neutrality Investment Plan

## of the city of Sofia

**V2.1**



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# Glossary of Terms

| Acronym | Description |
|---|---|
| AP | Action Plan |
| IP | Investment Plan |
| KPI | Key Performance Indicator |
| MEL | Monitoring Evaluation & Learning |
| MRV | Monitoring Reporting Verification |
| WP | Work Package |

# 1 Part A – Current State of Climate Investment

Part A "Current State of Climate Investment" is the **structural element** of the climate neutrality investment plan, putting the basis for the development of the plan through a detailed-oriented evaluation and assessment of the city's existing financial policies and funding/financing activities.

## 1.1 Module IP-A1: Existing Climate Action Funding and Financing

**A-1.1: Textual element**

The municipalities' budgets in Bulgaria consist of two main sources of incomes – (1) municipality own incomes (*more information is given in Module IP-A2*) and (2) transfers from national budgets for delegated activities. The budgets of municipality owned-companies and projects implemented with attracted funding are not part of the municipality's budget. In order to evaluate and assess the Municipality of Sofia approach for financing climate activities we constantly present information for different funding streams.

**1. Municipality budget**

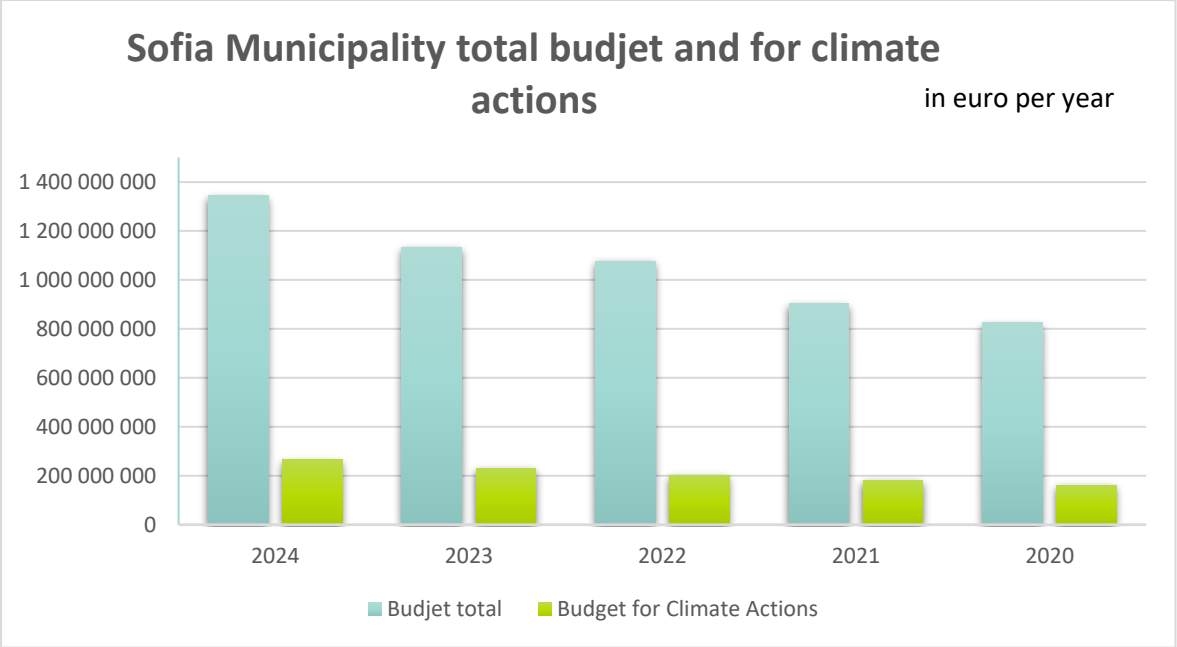
The aggregated information bellow demonstrates **the municipality ongoing commitments to climate related activities.** For the last five years the per cent allocated for climate activities is the same – 20%. However, the absolute value of the budget increase rapidly – from 824 mln. euro in 2020 to 1,346 mln. euro in 2024. This is 39% increase for five years.

Due to the fact that the funding for climate activities is constant the increase in municipality absolute budget value leads to expansion with 100 mln euro more for this year to 264 345 554 euro. The budget for 2024 is the highest allocation for climate related activities in the history of Sofia Municipality. The only activity that is delegated from the national government to the municipality is related to climate mitigation and adaptation.

The constant raise of budget for climate activities, illustrated bellow, shows **the strong desire of the municipality of Sofia to work towards achieving a sustainable and climate neutral community in benefit for everyone**.

**Table 1: Historical Municipal Budget and Budget for Climate Actions**

| Budget Data | 2024 | 2023 | 2022 | 2021 | 2020 |
|---|---|---|---|---|---|
| Municipal Budget (€) | 1 345 546 830 | 1 132 952 745 | 1 077 005 124 | 903 248 225 | 824 157 202 |
| Municipal Budget for Climate Actions (€) | 264 345 554 | 230 363 250 | 201 932 289 | 180 723 272 | 162 081 941 |
| % of Municipal Budget for Climate Actions & Projects (%) | 20% | 19% | 20% | 20% | 20% |




## 2. Municipality owned companies

Sofia Municipality owns three transport related companies that operate the public transport in the city. These companies are:

- *Metropoliten* serves the metro system in Sofia;
- *Sofia Electrical Transport* operates tram and trolley transport in Sofia and
- *Sofia Auto Transport* operates busses in Sofia.

Each year the municipalities requires from each company to deliver a specific transport service. The total kilometers sets by the city for the period 2020-2023 is in the range between 57,273 thousands km/year and 59,240 thousands km/year. The deviation is around 2 thousands km/year but the companies' budgets increase with more than 100 mln euro from 2020 to 2023. This is a result of the unstable international situation after the COVID-19 pandemic and the war in Ukraine, that had an impact on the price of an energy products and logistics chains.

**The development of public transport in terms** of infrastructure, expansion of routes and delivery of comfortable vehicles **is important policy of Sofia municipality that contribute to climate neutrality** of the city community by 2030.

**Table 1.1: Historical Municipality-owned companies' budget**

| Budget Data | 2023 | 2022 | 2021 | 2020 |
|---|---|---|---|---|
| Municipality-owned companies Budget (€) | 232 617 354 | 191 706 334 | 161 706 795 | 130 163 153 |

## 3. Climate related projects

**Sofia Municipality is very active and successful in attracting funding for its investment priorities, including climate actions**. Forty four per cent of total of 93 projects, which implementation starts from 2020, are related with climate neutrality. For the period of 5 years the total budget that Sofia municipality attracted is approximately 795 million euro, which is comparable to the municipality budget for the same period – 775 million euro (see Table 1). From the table below it is clear that the levels of attracted by the Municipality funding very much depends on the financing

schemes life-cycle. Therefore, it could be assumed that as the programming cycle progresses, the levels of attracted funding will increase, reaching their zenith in 2026.

**Table 2: Finance Sources by Field of Actions, for Years 2020 to 2023**

| Fields of Action | Sector Subsection | Budget Allocation for Climate Projects € | | | |
|---|---|---|---|---|---|
| | | 2023-2024 | 2022 | 2020-2021 | Total |
| Transportation | Soft measures and SUMP | 5 516 061,21 | | 2 018 559,38 | 7 534 620,60 |
| | Public transport (Metro, busses, trams etc.) | 447 712 233,17 | 111 188 301,64 | 134 244 898,07 | 693 145 432,89 |
| Built Environment | Construction of public building | 82 743 856,57 | | 4 428 530,60 | 87 172 387,17 |
| Energy Systems | Solar Thermal / Solar PV | | 393 082,22 | | 393 082,22 |
| | Soft measures | | | 219 655,08 | 219 655,08 |
| Green Infrastructure and Nature Based Solutions | Parks, Community Gardens, Protected Areas, Forestry | 206 500,05 | 25 564,59 | 5 543 828,45 | 5 775 893,10 |
| Waste and Circular Economy | Waste management | | | 399 408,95 | 399 408,95 |
| **Total in €** | | ***536 178 651,01*** | ***111 606 948,46*** | ***146 854 880,54*** | ***794 640 480,00*** |

**Conclusion**: Data on past and current funding of climate change related activities **demonstrate the municipality's consistent efforts to achieving a better life for people**. Own budget and attracted funds invested are with the same magnitude approximately 780 mln euro for period of 5 years. The own budget investments are within 20% of the total municipality budget, while the attracted funds fluctuated depending of the life-cycle of financing mechanism.

## 1.2 Module IP-A2: Strategic Funding and Financing Evaluation

**A-2.1: Textual element**

The main sources of financing in the Sofia Municipality are own revenues, transfers from the national budget, as well as attracted financing from various sources. **The potential for future sources is mainly in the direction of attracting additional financing.**

The analysis of the type of expenses per funds sources shows that the Municipality uses the attracted funds for capital-intensive investments, while the own funds are concentrated in the maintenance of the already created assets.

As can be seen from table 2a, **one third of the funds that the municipality spends by fields of action are aimed at the reconstruction and maintenance of the road network**, but not the construction of new ones; the resources raised are used to purchase public transport vehicles.

**Table 2a: Finance Sources by Field of Actions, for Years 2020 to 2024 municipality budget**

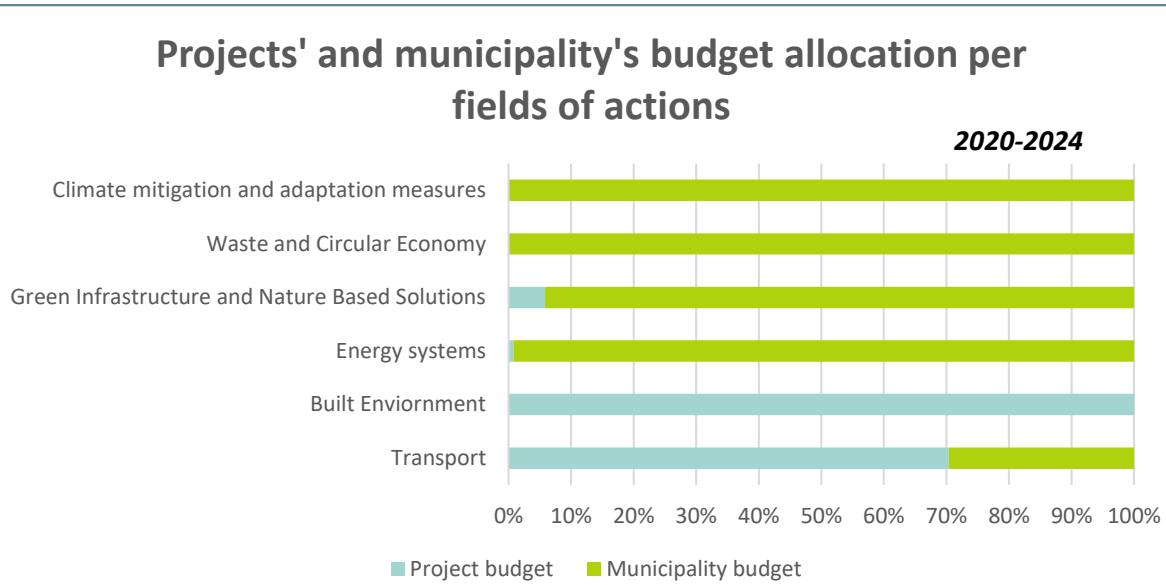
| Fields of Action | Sector Subsection | Per cent of budget allocation |
|---|---|---|
| | | % |
| Transportation | *Streets construction and maintenance* | *33,13%* |
| Built Environment | | *0,00%* |
| Energy Systems | *Street lights* | *6,87%* |
| Green Infrastructure and Nature Based Solutions | *Maintenance of parks, community garden* | *8,25%* |
| Waste and Circular Economy | *Waste collection and management* | *45,95%* |
| Climate mitigation and adaptation measures | | *5,79%* |
| **Total** | | ***100,00%*** |

Expenditures for the "Green infrastructure" and "Waste" fields of action are 54% of all the municipality's expenditures for climate activities. **The Sofia municipality does not invest its own funds for the construction of new public buildings**, but seeks attracted financing.

**Table 2b: Finance Sources by Field of Actions, for Years 2020 to 2024 externally funded projects**

| Fields of Action | Sector Subsection | Per cent of total |
|---|---|---|
| | | % |
| Transportation | *Soft measures and SUMP* | *0,95%* |
| | *Public transport (Metro, busses, trams etc.)* | *87,23%* |
| Built Environment | *Construction of public building* | *10,97%* |
| Energy Systems | *Solar Thermal / Solar PV* | *0,05%* |
| | *Soft measures* | *0,03%* |
| Green Infrastructure and Nature Based Solutions | *Parks, Community Gardens, Protected Areas, Forestry* | *0,73%* |
| Waste and Circular Economy | *Waste management* | *0,05%* |
| **Total** | | ***100,00%*** |

In general, **costs in modernization of energy systems and energy efficiency are limited**. A total of approximately 8% is invested by both funding sources.

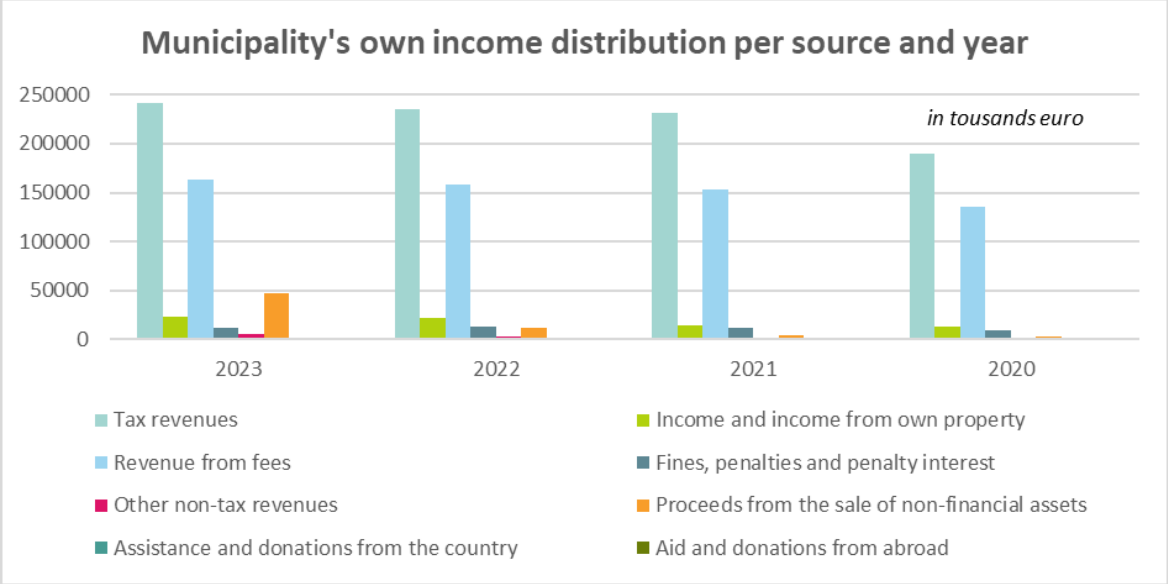



The municipality's own revenues are distributed in the following categories:

1) Tax revenues
2) Income and income from own property
3) Revenue from fees
4) Fines, penalties and penalty interest
5) Other non-tax revenues
6) Proceeds from the sale of non-financial assets
7) Assistance and donations from the country
8) Aid and donations from abroad

**Approximately 40% of the own funds are earmarked for the implementation of the municipality's annual capital program**. It does not include capital expenditures in municipality owned companies.

As can be seen from the figure below, the **income of the Municipality has been stable** and has a smooth growth over the last 4 years. The relatively more rapid gap between 2020 and 2021 is a result of the economic slowdown during Covid-19 pandemic.




The summarized information below shows, the **main source of own revenue are taxes - on average 53% and from fees - 36%**. Tax revenues are mainly formed by tax on movable and immovable property of citizens and businesses, and fees - by household and business waste fee and fee for use of municipal property.

**Table 3: List of Income Sources for the City**

| Income Category | Average income for the period 2020-2023 | % of city budget |
|---|---|---|
| ***Own income*** | **426 766 892,96 €** | |
| 1. Tax revenues | 224 214 918,35 € | 52,54% |
| 2. Income and income from own property | 18 440 031,73 € | 4,32% |
| 3. Revenue from fees | 15 245 224,88 € | 35,72% |
| 4. Fines, penalties and penalty interest | 11 824 591,61 € | 2,77% |
| 5. Other non-tax revenues | 2 135 541,43 € | 0,50% |
| 6. Proceeds from the sale of non-financial assets | 16 562 788,18 € | 3,88% |
| 7. Assistance and donations from the country | 1 045 350,06 € | 0,24% |
| 8. Aid and donations from abroad | 91 422,82 € | 0,02% |
| ***Transfers from national budget for delegated activities*** | **500 804 756,04 €** | |

**Sofia Municipality attracts external financing mainly from the European Structural and Investment Funds - 73% of all attracted funds for climate activities**. The programs that finance projects related to climate neutrality are the "Environment", "Regional Development" and "Transport". The municipality own contribution is on average 62%, due to the fact that part of the projects are revenue generating ones.

**The Recovery and Resilience Plan**, through which the municipality finances reconstruction and increasing the energy efficiency of public buildings and, in particular, educational infrastructure, ranks second in terms of the share of funding attracted.

**National investment programs and other EU sources** are approximately 5% of all attracted funds.

**Table 4: List of Capital Sources for the City 2020-2024**

| Type | Size Range | Level | Description |
|---|---|---|---|
| National investment programmes | 35 148 642,00 € | Public | 31% grant; 69% own contribution |
| European Structural and Investment Funds | 629 291 941,00 € | Public | 32% grant; 62% own contribution |
| Recovery and Resilience Plan | 193 712 503,30 € | Public | 73% grant; 27% own contribution |
| Other EU financing mechanisms | 9 034 303,30 € | Public | 71% grant; 29% own contribution |
| **Total in €** | **867 187 389,60 €** | | |

## 1.3 Module IP-A3: Barriers to Climate Investment

**Table 5: Barriers to Climate Investment**

| **A-3.1: Textual element** | | | |
|---|---|---|---|
| **Financial Barriers to achieving Climate Neutrality** | **Typology of Barrier** | **Description** | **Sector and stakeholders involved** |
| Coordination between public and private sector policies design and implementation | Strategical/Financial | Low level of coordination and coherence between the actions of municipal/national authorities and businesses in Sofia. As a result, reduced opportunities to attract financing, difficulties in assessing the impact of climate-related activities | Public authorities, private sector |
| Productive stakeholder engagement actions | Strategical | Absence of systematic identification, analysis, and implementation of actions designed to influence stakeholders. | Public authorities, different stakeholders |
| Competition between municipality policies | Financial | Although climate change policies are of the highest priority, there is often strong competition | City Council, Municipality administration |

| | | | |
|---|---|---|---|
| | | between different policies for financial support at City Council level | |
| Lack of incentives for residential building retrofit | Financial | Residential building retrofit is capital intensive. Without proper incentives citizens do not participate in financial schemes. | National public and local authorities, other funding entities |
| Data collection, storage, processing and sharing | Administrative | Procedures for data collection, storage, processing and sharing between stakeholders needs to be improved | Public authorities, stakeholders |
| Experience in fund raising | Administrative/Capacity | The lack of a personal specialist in attracting funds leads to missing out on attractive opportunities | Municipality administration |
| Projects pipe-line ready to be implemented | Administrative/Capacity | The lack of ready-to-implement projects leads to reduced investment opportunities | Municipality administration |
| Experience in the field of Green Public Procurement | Administrative/Capacity | It has not yet been adopted into the Municipality's procedures | Municipality administration |

# 2 Part B – Investment Pathways towards Climate Neutrality by 2030

## 2.1 Module IP-B1: Cost Scenarios for Climate Neutrality

| **B-1.1: Textual element** |
|---|
| Sofia has actively engaged in costing activities as part of its strategy to achieve carbon neutrality by 2030. These activities have been carried out collaboratively, involving internal municipal departments and external partners, such as finance consultants and energy experts. The cost assessment has covered all climate actions identified in the Action Plan, with a particular focus on capital expenditures (CapEx) and operational expenditures (OpEx) to ensure rigorous budget planning.<br>As part of the development of its Sustainable Energy and Climate Action Plan (SECAP) 2021-2030, Sofia has already undertaken costing exercises for the key actions. These cost assessments have allowed the city to prioritize initiatives based on their financial viability and their potential impact on reducing greenhouse gas emissions. This approach has helped Sofia structure a realistic investment plan that is tailored to the specific financial needs of each project. |

To gather the necessary data for these cost assessments, Sofia has relied on various optimal sources, including municipal databases for information on current energy consumption and existing infrastructure, as well as national and European statistical offices for macroeconomic data and financial indicators. Sector reports, case studies, and consultations with specialized experts have also been valuable sources, providing precise and up-to-date information on costs and technological trends. Additionally, data from ongoing pilot projects have provided useful benchmarks for estimating the costs of similar initiatives.

**Sofia has identified several high-priority and capital-intensive actions in its 2030 Climate Neutrality Action Plan. These include:**

- **Public transport modernization**: This project involves the replacement of old depreciated and polluting vehicles with new and comfortable ones, which will attract more and more passengers and help protect the environment. It is planned to focus on trams, articulated trolleybuses and ensure an optimal energy mix between electricity, diesel and CNG. This project will contribute to the overall goal 80% of all trips to be made by sustainable forms of transport by 2035
- **Energy-efficient retrofitting of public buildings**: The retrofitting of existing public buildings to meet higher energy efficiency standards is a priority. This includes insulation, window replacement, and the installation of efficient heating and cooling systems. The costs are substantial, given the scale of the public buildings involved and the need for high-quality materials and technologies.
- **Development of safe, convenient and well connected network of cycling lanes**: Sofia plans to expand the cycling infrastructure within its territory. Cycling can contribute to less congestion, cleaner air, an attractive and vibrant urban environment and, last but not least, a healthier lifestyle. Currently Sofia has approximately 350 km cycling lane network. However, the bicycle network in the city territory is not well connected and there are very few bicycle routes that are really convenient, safe, comfortable and attractive for cyclists. Within this activity, (1) a bicycle infrastructure standard will be created, (2) new bicycle routes and infrastructure will be built, and (3) information and education campaigns will be organized.
- **Development of green urban infrastructure**: This involves the creation and maintenance of extensive green spaces, such as new parks, urban forests, and green roofs. These projects require substantial capital for land acquisition, landscaping, and ongoing maintenance, but offer long-term environmental and social benefits.

Considering the analysis of municipal budget and financial sources, the average annual budget of the city of Sofia amounts to ca 160 M EUR where only 20% are allocated for climate-related actions. Attracted external funds are coming from European funding programs or loans from different financial institutions like the EIB and EBRD.

Additionally, the analysis of municipal financial resources and budget available for climate related actions shows that the funds are insufficient even for the implementation of existing strategies that results in delays in their implementation. Therefore, in order to be able to finance and implement all actions necessary to achieve the targeted of 81% reduction of the GHG emissions, it is needed to guarantee additional external funding sources.

The cost scenarios analyzed by Sofia Municipality are **the BAU scenario "Without CCC"** that is in fact described in above paragraph, where funds are insufficient and the target is unlikely to be achieved up to 2030; and **the "CCC" scenario** providing the opportunity to get access to broader range of financial sources that will guarantee the successful implementation of the synergic portfolios of actions and respectively to the achievement of the target planned.

Anticipated costs in the "Without CCC" scenario comprise all the investment costs for the actions planned within the existing documents amounting to over **544 500 289 EUR.**

Anticipated costs for both existing strategies as of today up to 2030, including the complementary actions addressing the emissions gap for Sofia Municipality have been assessed based on the economic model for Sofia.

### Table 6: Sectorial Costing

| Fields of Action | Action/ Indicator | Implementation Costs/CAPEX (MEUR 2020-2030) | OPEX (MEUR 2020-2040) | Direct impacts KtonCO2e Reduction | Cost Effectiveness (EUR/tCO2e) | Indirect impacts - benefits (MEUR 2020-2040) |
|---|---|---|---|---|---|---|
| Transport | *Reduced motorized passenger transportation need* | *€ -* | *€ 1 620* | *118* | *€ -* | *€ 321* |
| | *Shift to public & non-motorized transport* | *€ (50)* | *€ 250* | *46* | *€ 1,08* | *€ 195* |
| | *Increased car pooling* | *€ -* | *€ 368* | *27* | *€ -* | *€ 98* |
| | *Electrification of cars + motorcycles* | *€ (8)* | *€ 10* | *4* | *€ 2,01* | *€ 2* |
| | *Electrification of buses* | *€ (30)* | *€ 63* | *29* | *€ 1,05* | *€ 28* |
| Buildings & Heating | *Building renovations (envelope)* | *€ (226)* | *€ 41* | *15* | *€ 14,78* | *€ 4* |
| | *New energy-efficient buildings* | *€ (340)* | *€ 81* | *28* | *€ 12,34* | *€ 9* |
| | *Efficient lighting & appliances* | *€ (329)* | *€ 208* | *123* | *€ 2,67* | *€ 3* |
| | *Decarbonizing heating generation* | *€ (1 070)* | *€ 480* | *683* | *€ 1,57* | *€ 66* |
| Electricity | *Decarbonizing electricity generation* | *€ (614)* | *€ 6 216* | *1996* | *€ 0,31* | *€ -* |
| Waste | *Increased waste recycling* | *€ 0* | *€ 2* | *8* | *€ (0,01)* | *€ 0* |
| ***TOTAL*** | | ***€ (2 714)*** | ***€ 9 752*** | | ***€ 0,85*** | ***€ 845*** |

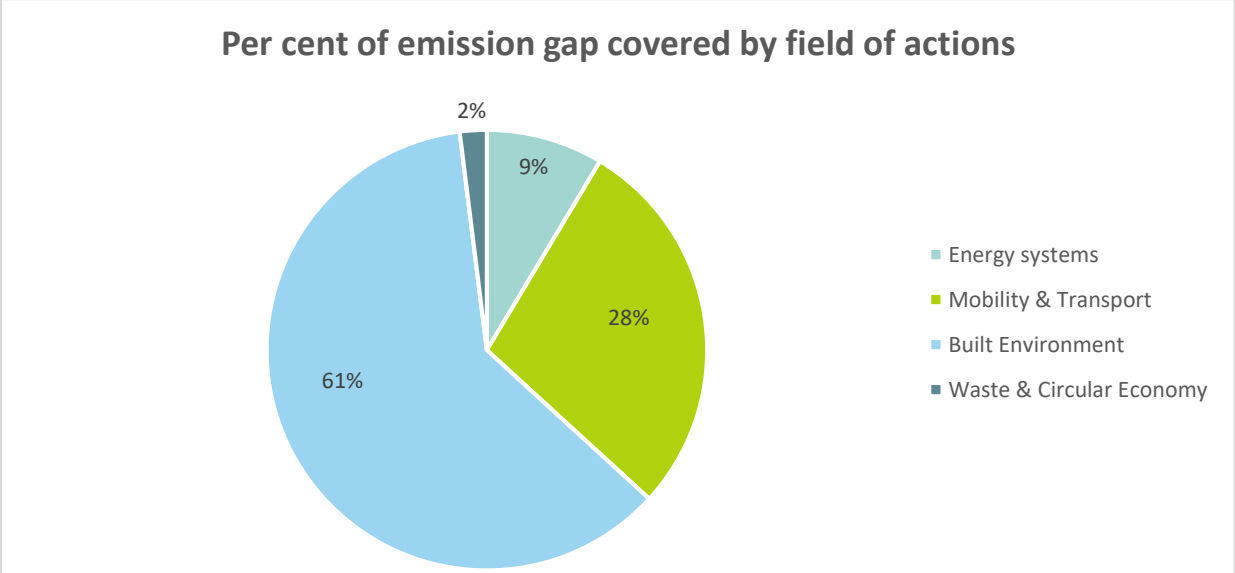
## Table 7: Capital Intensive Projects

| Fields of Action | Action / Indicator | | | | |
|---|---|---|---|---|---|
| Energy systems | The total of 14 actions are envisaged under the field of Energy systems. The actions will be implemented by Sofia Municipality, Sof Connect Management and Sofiyska voda | **Capex (€m)** | **Opex (€m)** | **Cost Effectiveness (EUR/tCO2e)** | **Investment (Split by Stakeholders)** |
| | | 45 500 | tbc | 329 EUR/tCO2e | To be further specified |
| | | **Projects Description:** Stakeholders' actions are targeting the energy needs and are designed to decrease energy use. For example, establishment and management of Low Emission Zone – household heating, implementation of small hydropower plants at water supply network, installation of a new charging infrastructure for recharging electric vehicles using recovered electrical energy etc. | | | |
| | | **Capex (€m)** | **Opex (€m)** | **Cost Effectiveness (EUR/tCO2e)** | **Investment (Split by Stakeholders)** |
| Mobility & Transport | The total of 5 actions are envisaged under the field of Mobility &Transport. The actions will be implemented by Sofia Municipality, and Sof Connect Management | 592 800,00 | tbc | 1320 EUR/tCO2e | To be further specified |
| | | **Projects Description:** Stakeholders' actions are focused on modernization of their vehicle fleet. Sofia municipality plans to renewal of public transport fleet, to promote cycling and introduce low emission zone. | | | |
| | | **Capex (€m)** | **Opex (€m)** | **Cost Effectiveness (EUR/tCO2e)** | **Investment (Split by Stakeholders)** |
| Built Environment | The total of 8 actions are envisaged under the field of Built Environment. The actions will be implemented by Bulgarian Green Building Council, Sofia Municipality, Sof Connect Management. Bulgarian Construction Chamber and Clean tech Bulgaria. | 173 000 000 | tbc | 177EUR/tCO2e | To be further specified |
| | | **Projects Description:** Together with actions under Mobility & Transport field these actions are most capital intensive and with the highest result of saved greenhouse emissions. The actions are focused on decreeing the energy needs of buildings and processes. | | | |
| | | **Capex (€m)** | **Opex (€m)** | **Cost Effectiveness (EUR/tCO2e)** | **Investment (Split by Stakeholders)** |
| Waste & Circular economy | The total of 3 actions are envisaged under the field of Waste & Circular economy. The actions will be implemented by Sofia Municipality | 5 000 000 | tbc | 159EUR/tCO2e | To be further specified |
| | | **Projects Description:** The aim of actions is to reduce the quantity of waste that is treated in the Waste Treatment Plant and to increase the recycled waste fraction and gas production. | | | |

The table below presents in summarized manner the contribution of envisaged actions by field of action to cover the emission gap. The gap is calculated as 40% of total emissions or 1 619 526.96 tCO2e. As it could be seen from the data below, still 6% of the emission gap is not covered. However, some of the envisaged actions that could have significant effect on the emission level in Sofia are subject of further data collection and estimation. These actions are (1) the introduction of both Low Emission Zones - for transport and for household heat, and (2) the digitalization of construction sector.

| Field of actions | Emissions tCO2e |
|---|---|
| Energy systems | 136 895,00 |
| Mobility & Transport | 449 214,00 |
| Built Environment | 975 070,00 |
| Waste & Circular Economy | 31 463,00 |
| **TOTAL** | **1 592 642,00** |

The figure below demonstrates Sofia's municipality plans to target the biggest emissions contributors, namely buildings and transport.




## 2.2 Module IP-B2: Capital Planning for Climate Neutrality

| Textual element |
|---|
| Sofia has secured several existing financial resources to support its climate action projects. These resources include:<br>• **Municipal funding**: A significant portion of Sofia's budget is allocated to energy efficiency, renewable energy projects, and other climate actions. This includes funds for public building renovations, sustainable urban mobility projects, and green infrastructure development.<br>• **External funding**: Sofia has leveraged European funding sources, particularly through the EU's Recovery and Resilience Facility and Structural Funds, which play a crucial role in financing large-scale projects like the metro system expansion and renewable energy installations.<br>• **Budget available for climate investment and financial status**<br>The budget allocated for climate-related investments is substantial. For example, the budget distribution detailed in the SECAP indicates that Sofia is committed to dedicating significant financial resources to its |

sustainability goals, with a focus on energy efficiency and renewable energy. The city's financial strategy ensures that there is a balanced approach, aiming for budget efficiency while avoiding deficits.

- **Optimizing the use of public funding and private investment**

To optimize the use of both public funding and private investment, Sofia plans to continue leveraging its strong track record with EU funds, while also attracting private sector investments through public-private partnerships (PPPs). These partnerships are crucial for large-scale projects that require substantial capita.

Sofia is also exploring innovative financing mechanisms like green bonds, which could provide additional funding streams dedicated specifically to environmental projects. By combining these approaches, Sofia aims to ensure that all identified costs related to achieving climate neutrality by 2030 are adequately covered.

- **Experience with private sector involvement**

Sofia has experience working with the private sector, particularly through its involvement in the Green Cities Action Plan with the European Bank for Reconstruction and Development (EBRD). This collaboration has helped Sofia build a pipeline of projects that include private sector participation, especially in areas such as urban transport and energy efficiency.

**Table 8: Capital Planning by Stakeholder**

| Field of Action | Action / Indicator | Citizens (€) | Private Sector (€) | Municipality (€) | Transport Operators (€) | Utility Providers (€) | Total (€) |
|---|---|---|---|---|---|---|---|
| Transport | *Reduced motorized passenger transportation need* | *€ -* | *€ -* | *€ -* | *€ -* | *€ -* | *€ -* |
| | *Shift to public & non-motorized transport* | *€ (10)* | *€ -* | *€ (4)* | *€ (48)* | *€ -* | *€ (61)* |
| | *Increased car pooling* | *€ -* | *€ -* | *€ -* | *€ -* | *€ -* | *€ -* |
| | *Electrification of cars + motorcycles* | *€ (6)* | *€ (3)* | *€ (0)* | *€ -* | *€ -* | *€ (9)* |
| | *Electrification of buses* | *€ -* | *€ -* | *€ -* | *€ (37)* | *€ -* | *€ (37)* |
| | *Optimized logistics* | *€ -* | *€ -* | *€ -* | *€ -* | *€ -* | *€ -* |
| | *Electrification of trucks* | *€ -* | *€ (12)* | *€ (2)* | *€ (49)* | *€ -* | *€ (63)* |
| Buildings & Heating | *Building renovations (envelope)* | *€ (186)* | *€ (66)* | *€ (13)* | *€ -* | *€ -* | *€ (265)* |
| | *New energy-efficient buildings* | *€ (122)* | *€ (243)* | *€ (41)* | *€ -* | *€ -* | *€ (405)* |
| | *Efficient lighting & appliances* | *€ (276)* | *€ (98)* | *€ (20)* | *€ -* | *€ -* | *€ (394)* |

| Field of Action | Action / Indicator | Citizens (€) | Private Sector (€) | Municipality (€) | Transport Operators (€) | Utility Providers (€) | Total (€) |
|---|---|---|---|---|---|---|---|
| | *Decarbonizing heating generation* | *€ 172* | *€ 62* | *€ (290)* | *€ -* | *€ (1 209)* | *€ (1 264)* |
| Electricity | *Decarbonizing electricity generation* | *€ (89)* | *€ (32)* | *€ (6)* | *€ -* | *€ (619)* | *€ (745)* |
| Waste | *Increased waste recycling* | *€ -* | *€ -* | *€ 0* | *€ -* | *€ -* | *€ 0* |
| **TOTAL** | | **€ (515)** | **€ (392)** | **€ (375)** | **€ (134)** | **€ (1 827)** | **€ (3 243)** |
| *% of Total* | | *16%* | *12%* | *12%* | *4%* | *56%* | *100%* |
| | | | | | | | |
| *Euros Per Capita (2030 population)* | | € (375) | € (285) | € (273) | € (97) | € (1 329) | € (2 359) |

**Table 9: Capital Planning**

| Field of Action | Action / Indicator | Cost to Municipality | Cost to Other | % of Costs Covered |
|---|---|---|---|---|
| **Transport** | *Reduced motorized passenger transportation need* | € - | € - | |
| | *Shift to public & non-motorized transport* | € (4) | € (58) | |
| | *Increased car pooling* | € - | € - | |
| | *Electrification of cars + motorcycles* | € (0) | € (9) | |
| | *Electrification of buses* | € - | € (37) | |
| | *Optimized logistics* | € - | € - | |
| | *Electrification of trucks* | € (2) | € (61) | |
| **Buildings & Heating** | *Building renovations (envelope)* | € (13) | € (252) | |
| | *New energy-efficient buildings* | € (41) | € (365) | |
| | *Efficient lighting & appliances* | € (20) | € (374) | |
| | *Decarbonizing heating generation* | € (290) | € (975) | |
| **Electricity** | *Decarbonizing electricity generation* | € (6) | € (739) | |
| **Waste** | *Increased waste recycling* | € 0 | € - | |
| ***TOTAL*** | | **€ (375)** | **€ (2 868)** | |

## 2.3 Module IP-B3: Economic and Financial Indicators for Monitoring, Evaluation and Learning

| B-3.1: Textual element |
| --- |
| **Monitoring system for green investments**<br>Sofia has developed a comprehensive monitoring system to evaluate the impact of its green investments. This system is specifically designed to track the implementation and effectiveness of energy efficiency measures, renewable energy projects, and other sustainability initiatives. The monitoring framework includes regular data collection on energy consumption, GHG emissions, and the performance of implemented projects. This allows the municipality to assess the return on investment and ensure that projects are contributing effectively to the city's climate goals.<br><br>**System for estimating emission reductions and co-benefits**<br>Sofia employs recognized methodologies to estimate the reduction of greenhouse gas emissions and assess the co-benefits of its climate actions. The SECAP outlines detailed procedures for calculating GHG emissions reductions, which are based on the baseline inventory of emissions. This inventory is updated regularly to reflect the impact of new measures and projects. The system also considers co-benefits such as improved air quality, energy savings, and enhanced public health, which are integral to evaluating the overall success of the climate action plan.<br>**Monitoring and evaluation system for capital investment planning**<br>Sofia has implemented a robust monitoring and evaluation (M&E) system that tracks the progress of its capital investment plans. This system includes process mapping to identify any deviations from the planned investments and timelines. The M&E framework is designed to ensure that financial resources are being used efficiently and that the city remains on track to meet its climate neutrality targets by 2030. Regular evaluations are conducted to adjust plans as necessary, ensuring that investments are aligned with the city's strategic goals.<br><br>**Key indicators aligned with the action plan**<br>The indicators most aligned with Sofia's Climate Action Plan include energy consumption metrics, GHG emission levels, and the share of renewable energy in the city's energy mix. These indicators are central to tracking progress towards the city's 2030 goals and are measured through the monitoring systems established by the municipality. Data on these indicators are collected continuously and analysed to provide insights into the effectiveness of implemented measures. However, more efforts are needed to standardize the calculation methodology across different sectors and administrative units within Sofia municipality. The employee needs capacity building and further training how to collect, store and analyse the data.<br><br>**Availability of required data**<br>The data required for the calculation of these indicators are largely available within Sofia's existing infrastructure. The municipality has access to comprehensive energy and emissions data, which are critical for accurate monitoring and evaluation. However, for certain projects, particularly those involving new technologies or private sector collaboration, additional data collection may be necessary. In such cases, Sofia is prepared to engage with external stakeholders to ensure all relevant data are captured. |

**Table 10: Economic Indicators by Sector**

| Fields of Action | Indicator | Indicator Unit | Indicator Baseline* | Indicator Target 2030* |
|---|---|---|---|---|
| Transportation | *Reduced motorized passenger transportation need* | *% reduction by 2030*<br>*% reduction in car passenger kilometers by 2030*<br>*average passengers per car* | | 35% |
| | *Reduced passenger kilometers by car through shift to public & non-motorized transportation* | | | 30% |
| | *Car pooling* | | 1,2 | 1,5 |
| | *Electrification of cars + motorcycles by 2050* | *% of fleet electrified* | 0% | 30% |
| | *Electrification of buses* | *% of fleet meets the highest eco standards* | 10% | 90% |
| | *Optimization of trucking logistics - light duty trucks (< 3.5 t)* | *average utilization of maximum load weight for light duty trucks (< 3.5t)* | 23% | 35% |
| | *Optimization of trucking logistics - heavy duty trucks (> 3.5 t)* | *average utilization of maximum load weight for heavy duty trucks (< 3.5t)* | 45% | 50% |
| | *Electrification of light duty trucks <3.5t by 2050* | *% of fleet electrified* | 0% | 40% |
| | *Electrification of heavy duty trucks <3.5t by 2050* | *% of fleet electrified* | 0% | 30% |
| | | | | |
| Built Environment | *Building renovation (envelope)* | *% annual renovation rate* | 0,8% | 0,8% |
| | *New buildings built to top performing standard* | *% of buildings built to the top standard* | 0% | 20% |

| Fields of Action | Indicator | Indicator Unit | Indicator Baseline* | Indicator Target 2030* |
|---|---|---|---|---|
| | *Efficient lighting and appliances* | *% annual renovation rate* | 0,8% | 0,8% |
| | *Heating technologies* | *share of heating as district heating* | 46% | 58% |
| | *Decarbonizing district heating* | *share of district heating produced using fossil fuels* | 100% | 60% |
| | *Decarbonizing district heating* | *share of district heating produced using electric heat pumps* | 0% | 35% |
| | *Decarbonizing district heating* | *share of district heating produced using bio fuels* | 0% | 5% |
| | *Heating technologies* | *share of heating as local heating* | 54% | 42% |
| | *Decarbonizing local heating* | *share of local heating produced using fossil fuels* | 24% | 20% |
| | *Decarbonizing local heating* | *share of local heating produced using electric heat pumps* | 76% | 70% |
| | *Decarbonizing local heating* | *share of local heating produced using bio fuels* | 0% | 10% |
| | | | | |
| **Energy Systems** | *Renewable / fossil fuel electricity production* | *share of electricity produced using fossil fuels* | 52% | 35% |
| | | | | |
| **Waste and Circular Economy** | *Paper recycling* | *% recycling rate* | 97% | 99% |
| | *Metal recycling* | *% recycling rate* | 87% | 90% |
| | *Plastic recycling* | *% recycling rate* | 76% | 80% |
| | *Glass recycling* | *% recycling rate* | 76% | 90% |
| | *Organic recycling* | *% recycling rate* | 100% | 100% |
| | | | | |

**Table 11: Financial Indicators by Sector (Economic Model)**

| Field of Action | Indicator | NPV Investment Expense - CAPEX (MEUR 2020-2030) | NPV Operational Savings - OPEX (MEUR 2020-2040) | NPV Co-benefits (MEUR 2020-2040) | NPV Return on Investment (ROI) (MEUR 2020-2040) | % Return on Investment (ROI) | Year 2030 kton CO2e Reduction | NPV MEUR Investment Expense / Year 2030 kton CO2e Reduction |
|---|---|---|---|---|---|---|---|---|
| **Transport** | *Reduced motorized passenger transportation need* | € - | € 1 620 | € 321 | € 1 941 | 0% | 118 | € - |
| | *Shift to public & non-motorized transport* | € (50) | € 250 | € 195 | € 395 | 787% | 46 | € 1,08 |
| | *Increased car pooling* | € - | € 368 | € 98 | € 466 | 0% | 27 | € - |
| | *Electrification of cars + motorcycles* | € (8) | € 10 | € 2 | € 4 | 50% | 4 | € 2,01 |
| | *Electrification of buses* | € (30) | € 63 | € 28 | € 61 | 203% | 29 | € 1,05 |
| | *Optimized logistics* | € - | € 404 | € 117 | € 521 | 0% | 99 | € - |
| | *Electrification of trucks* | € (48) | € 10 | € 3 | € (35) | -73% | 5 | € 9,98 |
| **Built environment** | *Building renovations (envelope)* | € (226) | € 41 | € 4 | € (181) | -80% | 15 | € 14,78 |
| | *New energy-efficient buildings* | € (340) | € 81 | € 9 | € (250) | -74% | 28 | € 12,34 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Efficient lighting & appliances* | € (329) | € 208 | € 3 | € (118) | -36% | 123 | € 2,67 |
| | *Decarbonizing heating generation* | € (1 070) | € 480 | € 66 | € (525) | -49% | 683 | € 1,57 |
| **Electricity** | *Decarbonizing electricity generation* | € (614) | € 6 216 | € - | € 5 603 | 913% | 1996 | € 0,31 |
| **Waste** | *Increased waste recycling* | € 0 | € 2 | € 0 | € 3 | -2737% | 8 | € (0,01) |
| **TOTAL** | | **€ (2 714)** | **€ 9 752** | **€ 845** | **€ 7 883** | **290%** | **3180** | **€ 0,85** |

**Table 11-1: Financial Indicators by Sector**

| Fields of Action | Indicator | Indicator Unit |
|---|---|---|
| Transportation | ***Reduction in GHG emissions due to transport improvements***<br>• ***Description****: This indicator measures the annual reduction in greenhouse gas emissions (in tons of CO2 equivalent) resulting from improvements to the transportation network, such as busses meets the highest eco standards or the expansion of the metro.*<br>• ***Utility****: It quantifies the positive environmental impact of transportation projects on the city's emission reduction targets.* | ***(tCO2e) per year*** |
| | | |
| Built Environment | • ***Reduction in GHG emissions due to improvements in the Built Environment***<br>• ***Description****: This indicator measures the annual reduction in greenhouse gas emissions (in tons of CO2 equivalent) resulting from improvements in the built environment, such as energy efficiency upgrades in public buildings, retrofitting insulation, and the installation of renewable energy systems like solar panels.*<br>• ***Utility****: It quantifies the positive environmental impact of projects focused on the built environment, contributing to the city's overall emission reduction targets.* | ***(tCO2e) per year*** |
| | | |
| Energy Systems | • ***Reduction in GHG emissions (tCO2e) per year due to improvements in Energy Systems***<br>• ***Description****: This indicator measures the annual reduction in greenhouse gas emissions (in tons of CO2 equivalent) resulting from improvements in energy systems, such as the increased use of renewable energy sources (solar, wind, etc.), the modernization of energy infrastructure, and the integration of smart grids.*<br>• ***Utility****: It quantifies the positive environmental impact of energy system enhancements, supporting the city's goals of reducing carbon emissions and transitioning to sustainable energy sources.* | ***(tCO2e) per year*** |
| | | |
| Green Infrastructure and Nature Based Solutions | • ***Reduction in GHG emissions (tCO2e) per year due to Green Infrastructure and Nature-Based Solutions***<br>• ***Description****: This indicator measures the annual reduction in greenhouse gas emissions (in tons of CO2 equivalent) resulting from the implementation of green infrastructure and nature-based solutions, such as urban reforestation, green roofs, the creation of parks, and the restoration of wetlands.*<br>• ***Utility****: It quantifies the environmental benefits of enhancing green spaces and implementing nature-* | ***(tCO2e) per year*** |

| | | |
|---|---|---|
| | *based solutions, contributing to the city's overall emission reduction goals while also improving urban resilience and biodiversity.* | |
| | | |
| Waste and Circular Economy | • ***Reduction in GHG emissions (tCO2e) per year due to Waste and Circular Economy initiatives***<br>• ***Description**: This indicator measures the annual reduction in greenhouse gas emissions (in tons of CO2 equivalent) resulting from waste management improvements and the implementation of circular economy practices, such as increased recycling rates, waste-to-energy processes, composting, and the reduction of landfill use.*<br>• ***Utility**: It quantifies the positive environmental impact of waste reduction and resource efficiency strategies, helping the city achieve its emission reduction targets and promoting sustainable waste management practices.* | ***(tCO2e) per year*** |
| | | |

# 3 Part C – Enabling Financial Conditions for Climate Neutrality by 2030

## 3.1 Module IP-C1: Climate Policies for Capital Formation and Deployment

**C-1.1: Textual element**

1. Optimization of capital allocation for achieving carbon neutrality

In the framework of the 2030 carbon neutrality goal, the city of Sofia recognizes the crucial importance of optimizing capital allocation between public and private sources. This optimization is essential to finance the actions identified in the Action Plan to achieve climate neutrality.

2. Current policy formulation process

Sofia has a well-defined process for policy formulation that supports financing and investment in innovative areas and climate actions. The key elements of this process include:

- Governance structure:

Sofia has established a governance structure that includes various specialized teams to oversee the development and implementation of climate policies. This includes teams dedicated to the action portfolio, investment plan, commitments, and communication.

- Use of own revenues and external funding:

The municipality of Sofia finances its climate actions primarily through two sources: its own revenues and external funding, including European Structural and Investment Funds. The budget for climate actions represents an average of 20% of the municipality's total budget, with a notable increase in recent years, reaching €264 million in 2024.

- Innovative financing approaches:

Sofia has also explored innovative approaches to finance its climate actions, such as increased use of European funds and planning for the issuance of green municipal bonds. These approaches are essential to bridging the funding gaps needed to achieve climate goals.

- Monitoring and evaluation:

A monitoring and evaluation mechanism is in place to measure the impact of green investments. This mechanism allows for tracking project progress and adjusting policies based on the results obtained.

3. Integration of the transition team in financial policy formulation

To prevent the transition team from operating in isolation, Sofia has implemented a collaborative process where this team plays a central role in the formulation of financial policies related to climate actions:

- Active participation in budgetary decisions:

The transition team actively participates in budget discussions and the development of financial policies, ensuring that climate priorities are considered in resource allocation.

- Continuous consultation:

There is an ongoing consultation process between the transition team and the municipality's financial departments to ensure coherence between carbon neutrality objectives and financial decisions.

Monitoring and Adjustment of Policies: Sofia has established a financial policy monitoring system that allows for the adjustment of resource allocation based on evolving needs and new information.

- Impact of national and European policies

National and European policies play a key role in providing a framework and additional resources to support Sofia's climate actions. For example, European Union funds, such as the Recovery and Resilience Facility, are used to finance energy efficiency projects for public buildings and other green infrastructure, complementing local resources.

By optimizing capital allocation and actively integrating the transition team in financial policy formulation, Sofia is positioning itself to achieve its ambitious carbon neutrality goals by 2030. This approach ensures an effective mobilization of resources and coordination among various stakeholders for a successful ecological transition.

### Table 12: List of Climate Policies to Enable Capital Deployment

| Climate Policy | Policy Status (Enacted, In Process, Development, etc.) | Description of the policy (sector, targeted audience, etc.) | Intended Outcome for Capital Formation |
|---|---|---|---|
| Energy efficiency and renewable energy programs | In process | This policy focuses on increasing energy efficiency in public buildings, such as schools, hospitals, and municipal offices, while also promoting the adoption of renewable energy sources like solar and geothermal energy across the city. The program targets public sector institutions for the retrofitting of buildings and encourages private sector and residential property owners to invest in renewable energy installations through incentives and subsidies. | |
| Green urban infrastructure development | Enacted | The policy involves the creation and enhancement of green spaces within Sofia, including parks, community gardens, and urban forests. It aims to increase the city's resilience to climate change while improving air quality and providing recreational areas for residents. The policy targets municipal authorities responsible for urban planning, urban developers involved in constructing new green spaces, and local communities who will benefit from and participate in the maintenance of these green areas. | |
| Sustainable urban mobility | Enacted | This policy aims to reduce greenhouse gas emissions from the transportation sector by investing in sustainable urban mobility solutions. It includes expanding the metro system, electrifying the public bus fleet, and developing infrastructure for cycling and walking. The policy is designed to | |

| | | | |
|---|---|---|---|
| | | target urban commuters and public transportation users by providing them with cleaner, more efficient transport options, while city planners are engaged in the development and implementation of these transportation improvements. | |
| Circular economy and waste management initiatives | Enacted | The focus of this policy is on promoting circular economy practices by enhancing recycling programs, reducing overall waste generation, and encouraging the reuse of materials. It targets municipal waste management authorities to improve collection and processing systems, businesses to adopt sustainable practices, and the general public to participate in waste reduction and recycling efforts. | |
| Climate adaptation and resilience building | | This policy involves developing and implementing strategies to make Sofia more resilient to the impacts of climate change. It focuses on strengthening infrastructure, reducing disaster risks, and increasing public awareness about climate adaptation. The policy targets municipal authorities in charge of infrastructure planning and disaster management, infrastructure developers who will execute the projects, and local communities who need to be informed and involved in resilience-building efforts. | |

## 3.2 Module IP-C2: Identification and Mitigation of Risks

**C-2.1: Textual element**

1. Risk management in the implementation of the investment plan

The city of Sofia recognizes that the implementation of the Investment Plan to achieve carbon neutrality by 2030 involves significant risks that could impact the city's ambitions. To proactively manage these risks, Sofia has integrated risk analysis into its investment decision-making process and established a risk management framework to ensure the resilience of climate projects.

2. Risk analysis in the decision-making process

Risk analysis is a central element of Sofia's investment decision-making process. At each stage of planning and project approval, potential risks are identified and assessed. This analysis takes into account financial risks, such as cost overruns, as well as technical and environmental risks that could jeopardize the success of climate projects.

3. Regular identification and measurement of risks

The city of Sofia has implemented a systematic process to identify and measure risks associated with financing actions. This process includes:

- Preliminary assessments: Before launching any project, a comprehensive risk assessment is conducted to identify potential areas of vulnerability.
- Continuous monitoring: Once projects are underway, regular monitoring is performed to measure the evolution of risks and adjust strategies accordingly.
- Modeling tools: Sofia uses modeling tools and simulations to anticipate the potential impacts of identified risks, allowing for better-prepared responses.

4. Risk mitigation and quantification methods

Sofia's understanding of risk mitigation and quantification methods is advanced and relies on several key principles:

- Dependence on public-private partnerships: The reliance on public-private partnerships to finance carbon neutrality projects carries a risk if private partners encounter financial difficulties or fail to meet their commitments. Sofia implements robust contractual mechanisms to minimize this risk.
- Risk of technological obsolescence: Projects involving investments in new green technologies may be exposed to the risk of rapid obsolescence. Sofia ensures that technological upgrade clauses are included in contracts and stays informed of technological developments to prevent investments from becoming quickly outdated.
- Risk of failing to meet environmental performance standards: If carbon neutrality projects fail to meet required environmental performance standards, this could result in financial penalties or loss of funding. Sofia implements rigorous monitoring systems to ensure project compliance with established standards.
- Cost overruns in energy renovation projects: Energy renovation projects, essential for carbon neutrality, risk exceeding allocated budgets. Sofia anticipates this risk by incorporating financial contingencies into budgets and closely monitoring cost developments.
- Variability of European subsidies: A significant portion of Sofia's project funding comes from European subsidies. Any reduction or unforeseen change in these subsidies could jeopardize projects. To mitigate this risk, Sofia diversifies its funding sources and negotiates firm commitments with funders.

5. Risk management framework and review process

Sofia's risk management framework has been designed to be both adaptable and proactive. This framework includes:

- Monitoring mechanisms: Oversight committees are responsible for the continuous assessment of risks throughout the lifecycle of projects.
- Periodic reviews: The risk management framework is regularly reviewed, at least once a year, to incorporate new data and adjust strategies based on lessons learned from previous projects.

- Rapid response process: In the event of a risk occurrence, a rapid response process is triggered to minimize negative impacts on ongoing projects.

By integrating rigorous risk analysis into its investment process and implementing appropriate mitigation strategies, Sofia ensures that potential obstacles to achieving its climate goals can be effectively managed. This risk management framework guarantees that the city remains on track to achieve carbon neutrality by 2030, while also adapting to unforeseen challenges.

**Table 13: Climate Investment Plan Risk Framework**

| Fields of Action | Sectoral Project | Risks Identified | Description of Risk | Risk Priority | Mitigation of Risk |
|---|---|---|---|---|---|
| Transportation | Expansion of electric vehicle (EV) charging Infrastructure | Delays in infrastructure deployment | The project might face delays due to regulatory hurdles, supply chain disruptions, or technical challenges in installing EV charging stations across the city. | High | Streamline permitting processes, establish partnerships with reliable suppliers, and create contingency plans for supply chain issues. |
| | Public transport modernisation | High upfront costs | The initial investment required for purchasing electric buses and upgrading the fleet might exceed budget estimates, potentially leading to financial strain. | Medium | Secure diverse funding sources, including public-private partnerships and European subsidies, and incorporate financial contingencies in the budget. |
| Built Environment | Energy-efficient building retrofitting | Cost overruns | Retrofitting older buildings for energy efficiency could result in unforeseen costs due to structural issues or the need for specialized materials. | High | Conduct thorough pre-assessments of buildings, include financial buffers in the project budget, and negotiate fixed-price contracts with contractors. |
| | Green roofs and walls installation | Technological obsolescence | Advances in green infrastructure technology could render early installations obsolete, requiring additional | Medium | Include upgrade clauses in contracts and stay updated on technological trends to ensure installations |

| | | | | | |
|---|---|---|---|---|---|
| | | | investment to maintain efficiency. | | are future-proof. |
| Energy Generation | | | | | |
| Green infrastructure and Nature Based Solutions | Urban tree planting program | Tree survival rates | Newly planted trees may not survive due to poor soil conditions, lack of water, or other environmental factors, reducing the overall effectiveness of the program. | Medium | Implement a robust maintenance program, including regular watering, soil improvement, and monitoring to ensure tree health. |
| Waste and Circular Economy | Expansion of recycling programs | Low participation rates | Residents and businesses may not participate fully in the expanded recycling programs, leading to lower-than-expected waste diversion rates. | Medium | Implement strong incentives for participation, provide clear education on recycling practices, and introduce penalties for non-compliance. |
| City Wide Risks (Cross Cutting) | Comprehensive climate adaptation plan | Inadequate funding | The comprehensive nature of the climate adaptation plan may require more funding than initially allocated, potentially limiting its effectiveness. | High | Diversify funding sources, including seeking international grants and private investments, and prioritize projects within the plan based on risk and impact. |

## 3.3 Module IP-C3: Capacity Building and Stakeholder Engagement for Capital and Investment Planning

**Model IP-C3**

The internal capacity of the Transition Team is lacking a financial analyst to prepare a robust CBA of actions based on the BAU scenario and the scenario with the CCC. So, for the next iteration the municipality is planning to involve an expert in this field. The municipality employee needs capacity building and training for methodologically correct procedures for data collection, storage and processing.

As far as the implementation of the plan is concerned, the team is well-resourced and able to implement the plan depending on the availability and access to sufficient funds. Of course, the municipality will not be able to implement the plan alone so an engagement strategy for the stakeholders to participate with their own resources, both human and financial, has been considered and will be developed.

Additionally, contacts will be made with financing institutions for supporting the financing and development of Sofia's Climate Action Plan.

**C-3.1: Textual element**

**Assessment and development of internal capacity for the transition to carbon neutrality**

The city of Sofia recognizes the critical importance of developing and assessing the internal capacity needed to support the transition to carbon neutrality by 2030. This includes a thorough evaluation of the capabilities of the transition team and a stakeholder mapping to effectively engage relevant financial and non-financial actors.

**Resources and skills of the transition team**

*Current resources and available skills*

Sofia's transition team is well-structured and has a solid foundation of expertise in climate project management, green finance, and environmental engineering. However, some gaps have been identified:

- Specific knowledge of financial instruments: While the team has a good understanding of financial principles, there is a lack of in-depth expertise on specific financial instruments, such as green bonds, complex public-private partnerships, and innovative financing models.
- Human resources: The transition team is well-equipped in terms of personnel for strategic planning and coordination, but would benefit from adding specialists in sustainable finance and financial risk analysis.
- Technical and data processing capabilities: Mastery of financial modeling tools and investment tracking could be improved to optimize the efficiency of investments in climate projects.

*Plans to address the gaps*

Sofia plans to overcome these gaps by:

- Training and capacity building: implementing a continuous training program for the transition team in collaboration with experts in climate finance and risk management.
- Targeted recruitment: hiring specialists in green finance and investment tracking technologies to strengthen the team's technical skills.
- Partnerships with external experts: collaborating with academic institutions, sustainable finance consulting firms, and international organizations to bring in additional expertise and share best practices.

**Identification of relevant stakeholders for developing the investment plan**

*Mapping financial stakeholders*

Sofia has identified several key stakeholders who can contribute to the financing and development of the Investment Plan for carbon neutrality:

- Banks: These institutions play a central role in financing public projects and can offer favorable loan conditions for green projects.
- Private sector companies: Companies, particularly those in the energy, transportation, and real estate sectors, must invest in decarbonizing their assets. They represent strategic partners for co-financing transition projects.
- Private capital providers: Investment funds specializing in sustainable projects and venture capital funds can provide crucial funding for innovative and high-risk projects.

**Stakeholder engagement strategy**

Sofia has developed a clear engagement strategy for the identified stakeholders:

- Workshops and seminars: Organizing collaborative workshops with banks, private companies, and investors to identify co-financing opportunities and discuss risk-sharing mechanisms.
- Partnership agreements: Developing Memorandums of Understanding (MoUs) with key stakeholders to formalize financial commitments and establish long-term collaborations.
- Incentives for non-financial actors: Implementing incentive schemes such as grants for residential energy retrofitting or tax reductions for companies that adopt sustainable practices.

By carefully assessing internal capacity and mapping relevant stakeholders, Sofia ensures it is well-positioned to develop and implement a robust Investment Plan to achieve carbon neutrality by 2030. A clear engagement strategy and plans to address identified gaps will ensure that the city can effectively mobilize the necessary resources to succeed in this transition.

**Table 14: Stakeholder Engagement Mapping**

| Stakeholders involved | Required Investment (€) | Network | Influence | Interest | Level and Type of Engagement |
|---|---|---|---|---|---|
| **Municipality of Sofia** | Not specified | Municipality, waste management companies, public transport services | High - Responsible for planning and regulation of sustainable infrastructures | High - Ensuring sustainable public services and reducing carbon emissions | Coordination, planning, implementation of emission reduction projects, collaboration with local businesses for green technologies |
| **Ministry of Environment and Water, Ministry of Energy, etc.** | Not specified | Bulgarian government, national agencies | High - Establishes legislative frameworks and policies for climate actions | High - National coordination of climate actions and compliance with EU directives | Provision of funding, coordination of local climate actions with national policies |
| **European Investment Bank (EIB)** | Not specified | European financial institutions, climate funds | High - Key financer of major infrastructure and climate projects | High - Funding green growth initiatives and sustainable urban development | Provides loans and grants for projects like green infrastructure, public transport modernization, and energy efficiency renovations |

| Stakeholders involved | Required Investment (€) | Network | Influence | Interest | Level and Type of Engagement |
|---|---|---|---|---|---|
| **Horizon Europe** | Not specified (project dependent) | European Union research and innovation program | High - Supports innovation and development in sustainability and climate resilience | High - Advancing technological and innovative solutions to climate challenges | Funds research and development projects, pilot programs, and climate resilience studies; partners with academic and private sector stakeholders |
| **Private Investors (e.g., Venture Capital, Green Funds)** | Not specified | Financial institutions, venture capitalists, green investment funds | High - Provides capital for innovative climate solutions and green technology startups | High - Return on investment and growth in green tech and sustainable energy sectors | Invests in startups and innovative projects related to clean energy, sustainable transport, and green construction, often with co-financing agreements with the municipality or other stakeholders |
| **Citizens and NGOs** | Not specified | Community groups, environmental organizations | High - Political support and community engagement | High - Participation and community awareness on climate issues | Active participation through citizen initiatives, awareness workshops, public consultation forums; supports projects on urban greening and renewable energy advocacy |
| **Private Sector - Construction (e.g., Construction Chamber)** | Not specified | Bulgarian Construction Chamber, construction materials companies | High - Involved in digitalization and innovation in the construction sector | High - Improving energy efficiency and sustainable development in the sector | Partnerships for energy renovation projects, use of sustainable materials, engagement in green construction projects; collaborates on energy-efficient building upgrades under municipal contracts |

| Stakeholders involved | Required Investment (€) | Network | Influence | Interest | Level and Type of Engagement |
|---|---|---|---|---|---|
| **Private Sector - ICT** | Not specified | ICT companies | Medium to High - Provides technological solutions for sustainability projects | High - Technological innovation and support for sustainability initiatives | Provision of technological solutions, support for digitalization of municipal management processes, collaboration with the municipality for smart city solutions like GIS systems |
| **Private Sector - Energy Management (e.g., Cleantech Bulgaria, Baumit Bulgaria)** | Varies (€3-8 million for specific projects) | Green infrastructure and energy management companies | Medium to High - Promotes green infrastructure and energy solutions | High - Development of green infrastructures and improvement of energy efficiency | Participation in green infrastructure projects, provision of solutions for resource management, collaboration on circular economy initiatives like waste-to-energy projects |
| **Private Sector - Transport (e.g., Public transport and ecological solutions companies)** | Varies (€5-15 million for fleet upgrades) | Public transport and ecological logistics companies | Medium to High - Development of sustainable transport solutions | High - Reduction of carbon emissions and improvement of public transport | Investment in green transport technologies (trams, electric buses), collaboration with the municipality for sustainable mobility solutions, particularly under the Green City Action Plan |
| **Academic and Research Institutions (e.g., University of Sofia, Bulgarian Academy of Sciences)** | Not specified | University of Sofia, Bulgarian Academy of Sciences, technological research centers | High - Provides necessary scientific knowledge and technological innovations | High - Addressing climate challenges and training the next generation of climate leaders | Research and development, collaboration on technological and educational projects, training workshops on energy efficiency and sustainable resource management; often funded by Horizon Europe or other EU programs |

**Table 15: Stakeholder Activity Cost**

| Stakeholders involved | Activity | Cost to Municipality (€) |
|---|---|---|
| **Municipality of Sofia** | Implementation of measures under the fields of Mobility & Transport, Build Environment, Energy Systems and Waste & Circular Economy | Combination of own budget, private investments and attracted funds |
| **Private Sector - Energy Management** | Participation in green infrastructure projects, providing solutions for resource management, collaborating on circular economy initiatives such as waste-to-energy projects. | Public and private co-financing; specific amount varies by project |
| **Private Sector - Construction** | Energy renovation of buildings and development of green constructions using sustainable and energy-efficient materials. | Public and private investments; specific amount varies |
| **Private Sector - Transport** | Investment in green transport technologies (trams, electric buses), fleet modernization, and improvement of sustainable mobility infrastructure. | Public and private investments; specific amount varies |
| **European Investment Bank (EIB)** | Loans and grants for projects such as green infrastructure, public transport modernization, and energy renovations. | External funds provided as loans and grants |
| **Horizon Europe** | Funding for research and development projects, pilot programs, and climate resilience studies in partnership with academic and private actors. | Grant funds; no direct cost to the municipality |
| **Academic and Research Institutions** | Research and development, collaboration on technological and educational projects, training workshops on energy efficiency and sustainable resource management. | Funded by Horizon Europe and other EU programs; no direct cost to the municipality |