CLIMATE CITY CONTRACT

Introduction Left Bank Climate Neutral 2030

Antwerpen voor Klimaat

CONTENTS

EXECUTIVE SUMMARY

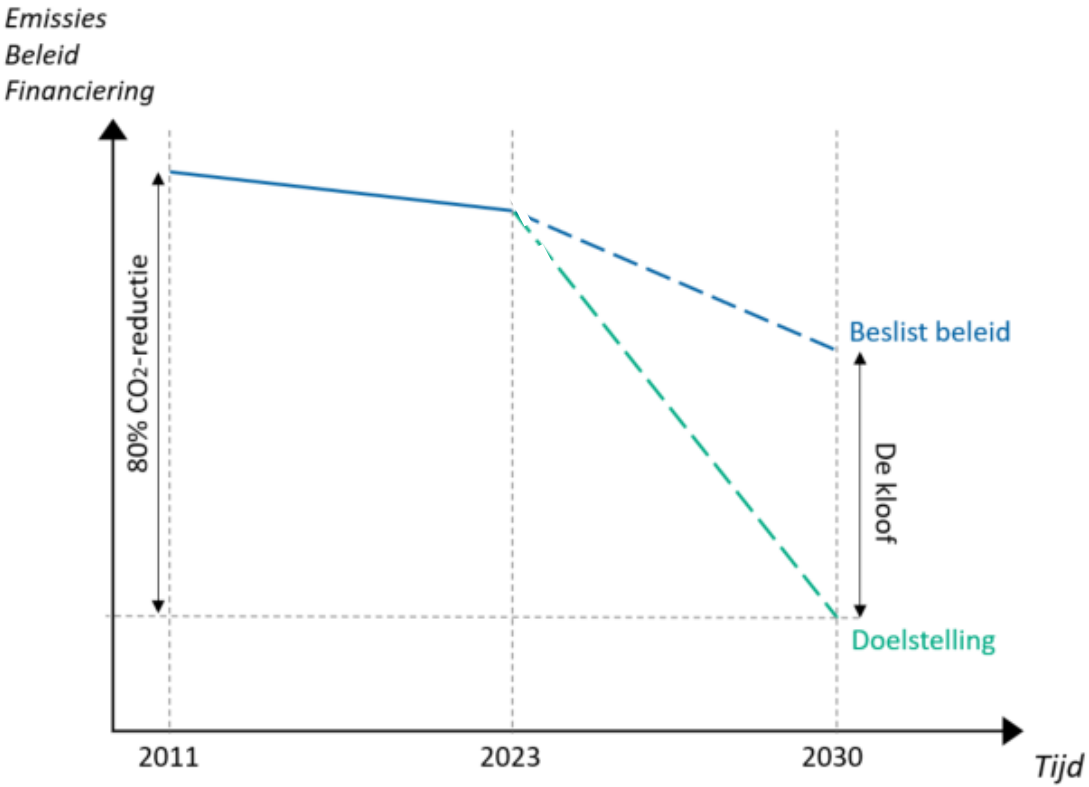
Objective

With the EU Mission for 100 Climate Neutral and Smart Cities by 2030, the European Union is looking for leading cities in the fight against climate change. Given that 70% of CO^2 emissions originate from cities, the local policy level is especially relevant in light of the climate mitigation goals in the Green Deal. For the 100 European cities, 12 cities from the associated countries were selected as pilot cities based on their ambitious and progressive climate policies to make this EU mission a success. The participating cities set the ambition of becoming climate neutral by 2030, putting them 20 years ahead of what the EU's legally-binding target is (2050). In this regard, the cities have the choice of either going for the full 100% reduction in greenhouse gases (zero emissions), or an 80% reduction, offsetting the remaining 20% of emissions. Both options fall under the definition of what the EU refers to as climate neutrality in the context of this mission.

The City of Antwerp is taking on this challenge at the Left Bank district, with the ambition of an 80% reduction in greenhouse gases by 2030. This is a pioneering project from various perspectives: the city wants to accelerate its climate policies from the Climate Plan 2030 at the Left Bank. The Left Bank will be used as a living lab to take a targeted approach towards climate neutrality from an ecosystem. As such, interim targets will be laid down to translate the substance of the Climate Plan 2030 into practice. The experience and expertise gained from this will be an accelerator for the rest of the City of Antwerp, and serve as inspiration for other cities in Flanders, Belgium and the rest of Europe.

Specifically, the target means aiming for an 80% reduction in CO_2 emissions by 2030. As a baseline for the 80% reduction, an emissions inventory was drawn up for the Left Bank district, but with reference year 2019. In other words, the horizon is being brought forward from 2050 to 2030 with the result that, despite the various commitments the city has already made, the pace of the transition will have to accelerate quite significantly. The chart below illustrates the concept of 'the gap'. The city is already pursuing an ambitious climate policy that puts us in line with the proposed reduction leading up to 2030 and 2050. Within the Climate Plan 2030[1], various commitments have been made toward 2030, but this is not yet in line with the ambition for the Left Bank. We refer to the difference between the pursued policy and the 80% reduction ambition as 'the gap', i.e. the additional challenge in emissions reductions that requires additional policy interventions and funding solutions. This document gives an idea of the gap and outlines the specific measures the city will work on in the coming years to bridge this gap.

[1] https://www.antwerpenmorgen.be/nl/projecten/klimaatplan-2030/media


Emissies
Beleid
Financiering
80% CO2-reductie
Beslist beleid
De kloof
Doelstelling
2011
2023
2030
Tijd

The Left Bank in a nutshell

The Left Bank was selected as it falls within the district-oriented approach enshrined in the city's governance agreement. The Left Bank is interesting on account of its specific demography and building typology, which is also typical of the rest of Antwerp. A highly mixed population with both elderly and young families, and a residential development with 83% multifamily housing, offer both challenges and opportunities in light of the energy transition. A district-focused approach on the Left Bank is drawn from horizontal and vertical streets. The City Climate Contract includes both adaptation and mitigation initiatives, with an emphasis on innovative actions that accelerate the reduction of CO_2 emissions.

Figure: City of Antwerp and the Left Bank district

As a pilot district with +/- 17,000 residents, the Left Bank offers a realistic and workable scale to accelerate the city's climate policy. The district consists of various housing typologies and has a very high proportion of vulnerable households. For example, 48.5% of children are born in disadvantaged families, and 44% of the housing units are occupied by social tenants. This makes the Left Bank the ideal location to work towards a socially just climate transition. Indeed, the abundance of multifamily

housing, vulnerable target groups and landlords is highly characteristic of the city of Antwerp, and by extension other major European cities.

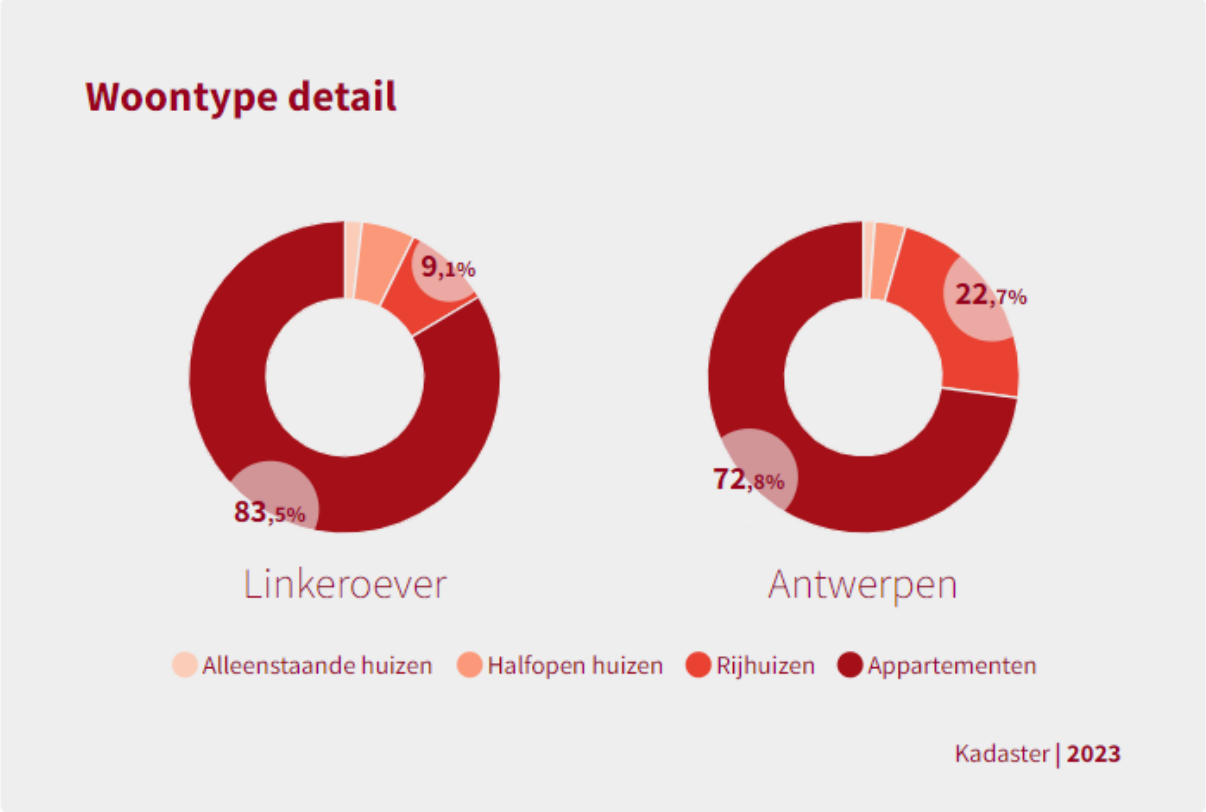


Figure: breakdown of the occupied housing stock by housing type for the Left Bank district and the city of Antwerp

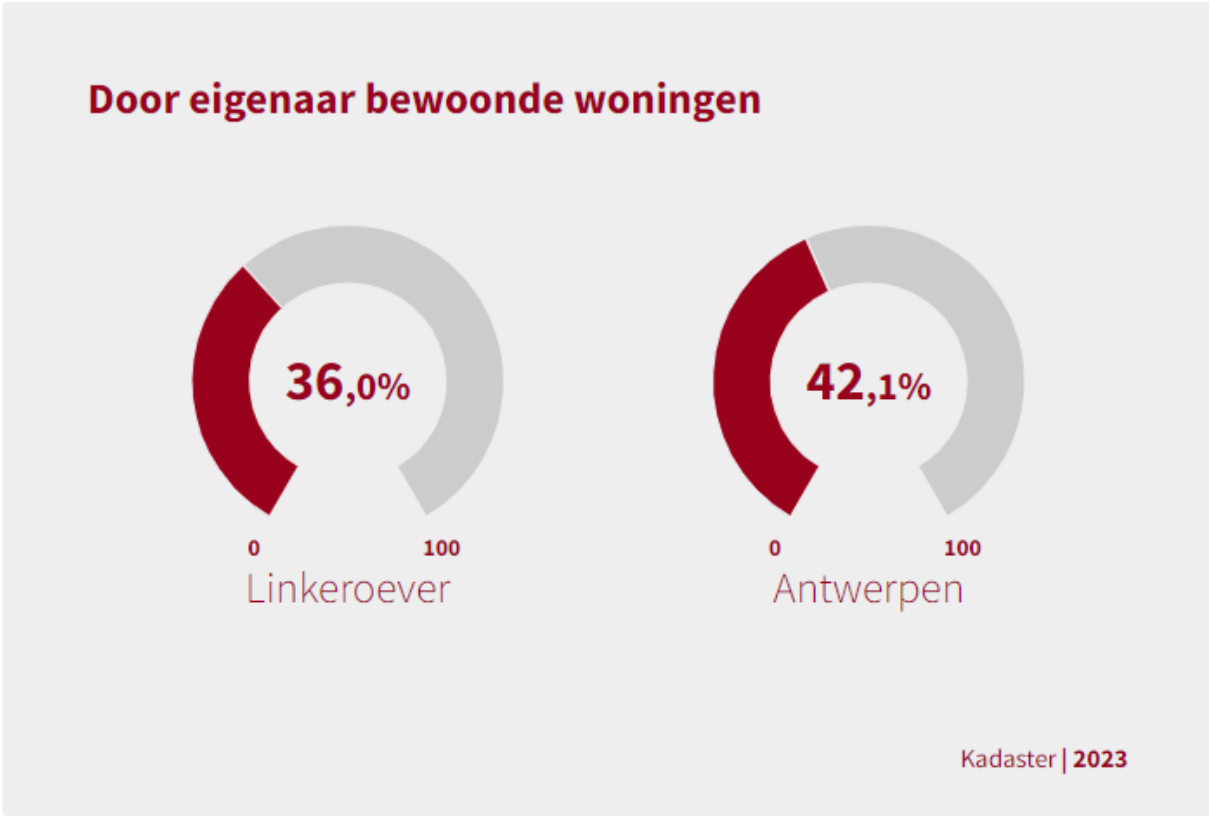


Figure: Share of owner-occupied houses for the Left Bank district and the city of Antwerp

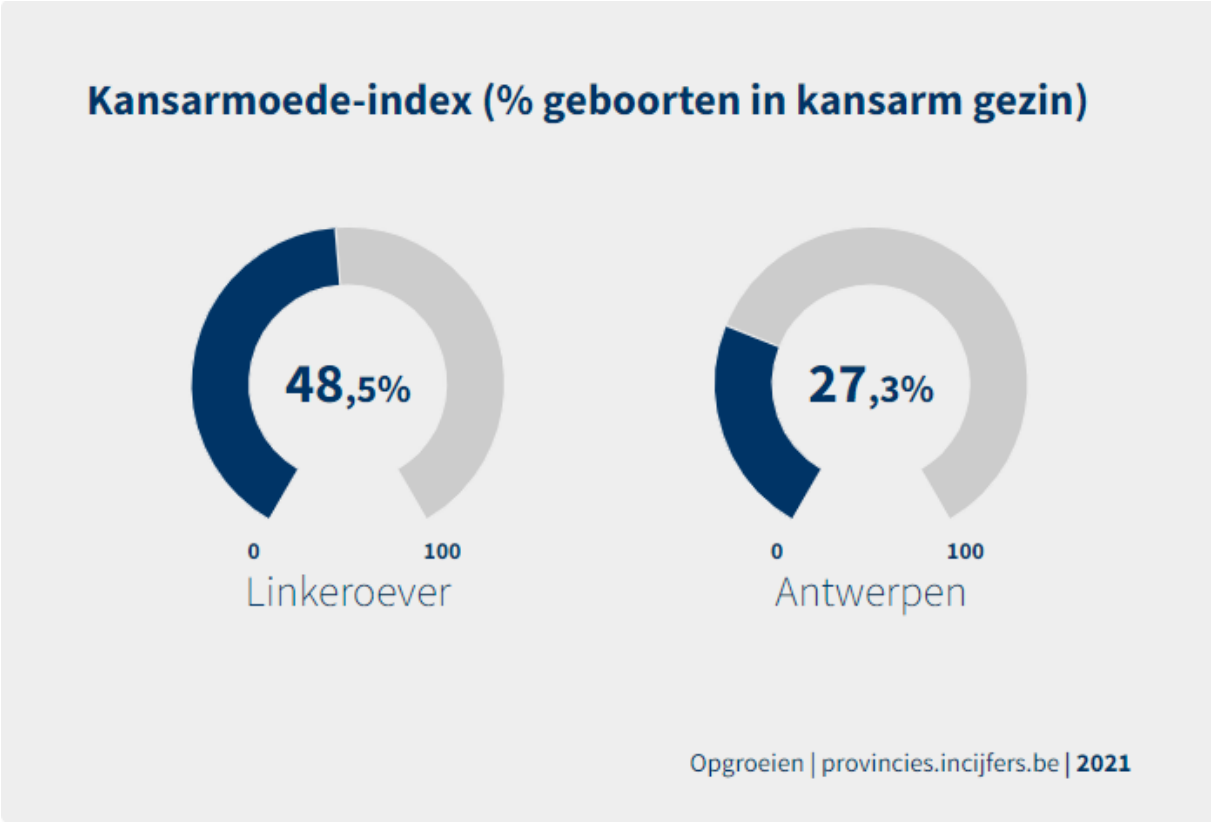


Figure: Share of owner-occupied houses for the Left Bank district and the city of Antwerp

Besides an interesting composition as regards demographics and building typology, this district is also interesting because it already has a number of projects in the pipeline and the city has an extensive service offering there in connection with the climate transition. For example, the Left Bank district is 1 of the 9 pilot districts for the rollout of the city's residual heat grid by 2030, the city is already assisting various co-owners in making their multifamily homes more sustainable, and a number of important (re)construction developments are in the pipeline, including the Europark, the Katwilgweg business parks and the former Combori site.

The action plan reprised the emissions inventory of the Left Bank district. The inventory shows that buildings and mobility are the largest emitters, accounting for 71 and 21% of emissions, respectively. These two sectors are therefore crucial to the objectives the city of Antwerp has set itself to further reduce emissions.

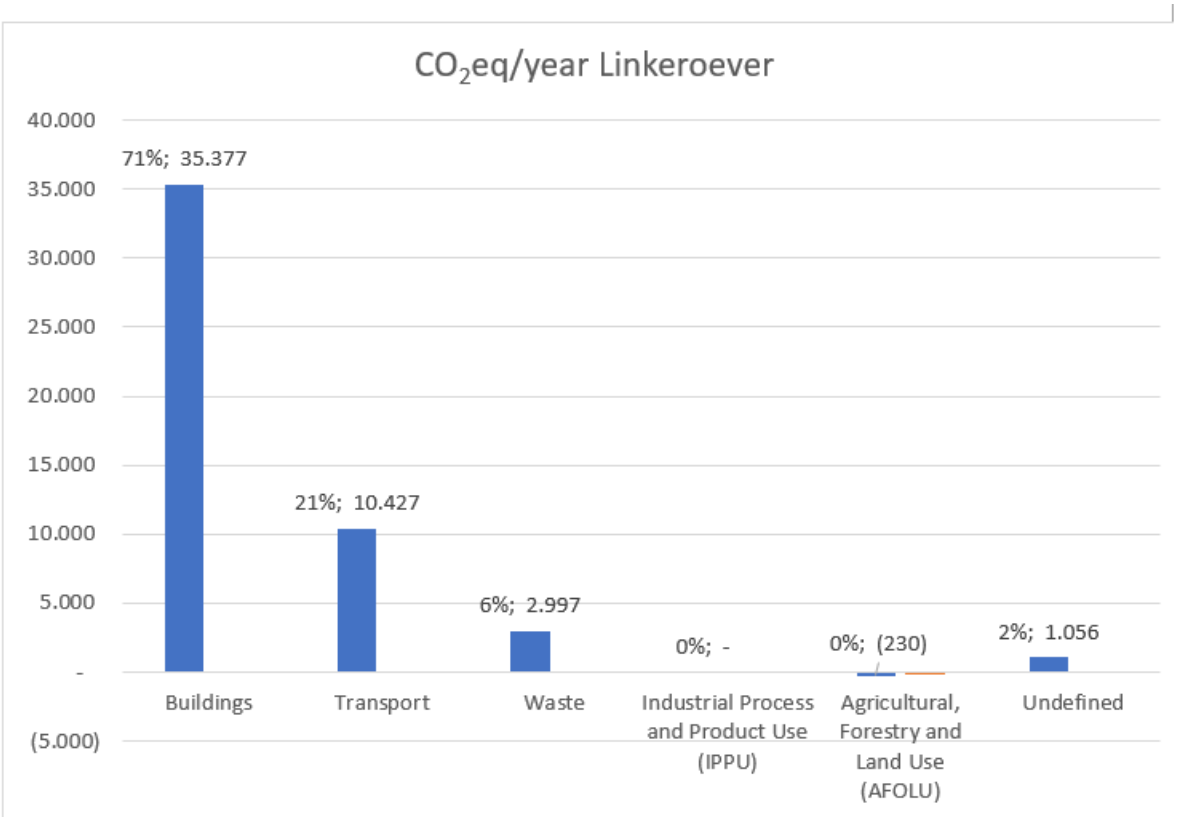


Figure: Emissions inventory Left Bank 2019

The Action Plan as a package of measures for closing the gap

The action plan sets out the actions needed to close the gap toward climate neutrality by 2030. It also explains the principles for establishing citywide, transformative climate action. In other words, the action plan combines two approaches:

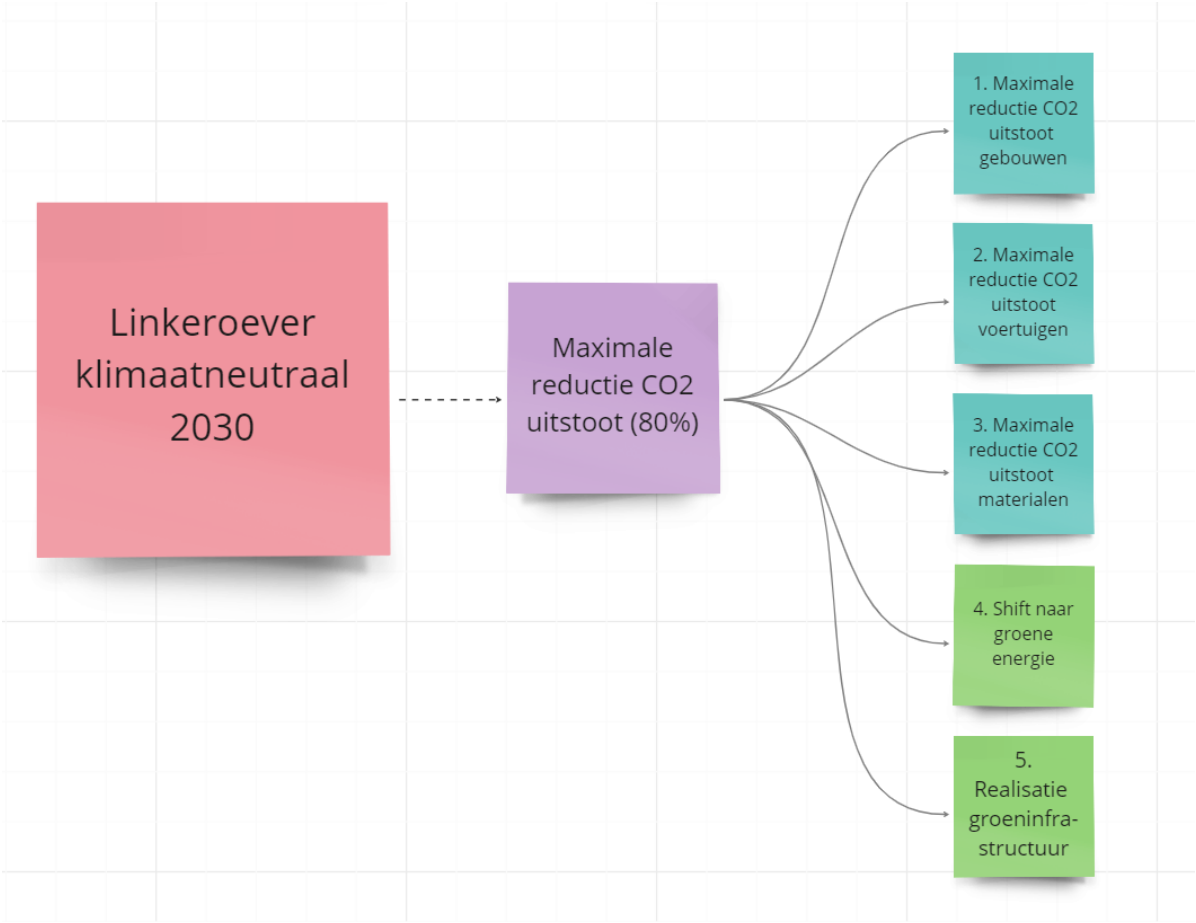
1) Measurable, reportable and verifiable (MRV) climate action planning based on a baseline inventory of greenhouse gas emissions, clear projects and action descriptions for the action area (portfolios) and insights into investment and capital needs as a preparatory step to draw up investment plans.

2) A strategic approach to the climate transition. Based on a theory of change, the plan identifies how social innovation and innovation in policy are used to support citywide and inclusive transformations.

The drafting of the action plan for climate neutrality on the Left Bank starts from a co-creation process: mobilising key stakeholders, engaging citizens and aligning the actions for systemic change and rapid decarbonisation.

The **Action Plan** builds on the City of Antwerp's existing action plans and processes. It focuses on identifying and closing the gap between the existing situation and the climate neutrality goal of the Cities Mission 2030. **Module A** of the Action Plan presents a comprehensive analysis of this existing

situation. The existing policy framework shows what actions from the action portfolio to build upon and identifies a number of barriers/opportunities to climate neutrality perceived at the local level. The emissions of the Left Bank district are also highlighted. In **Module B**, cross-cutting *impact pathways* are defined from the gap analysis (based on a participatory process) to bridge the gap and achieve climate neutrality. The relevant *interventions* are then identified. This sets out the structure for the actions from the action portfolio based on 5 action areas: three emissions reduction targets (emissions from buildings, vehicles and materials) and two offsetting targets (a shift to green energy and realising new green infrastructure). Finally, the actions from the action portfolio to implement the city climate contract are elaborated. **Module C** presents administrative policies that can strengthen/foster the implementation of the mission.



The interventions are put into practice in the portfolio via the breakthrough projects and strategic actions:

- We define a breakthrough project as a project that is committed to breaking through 1 or more barriers in 1 pilot case. These are innovative projects that ensure an acceleration in the climate transition for the city as a whole (and beyond) (e.g., fossil-free energy hubs) or large infrastructure projects that lead to an exponential acceleration on one or more impact pathways (e.g., fossil-free energy hubs).
- A strategic action is an action that will be implemented in the coming years, which will be essential in achieving climate neutrality. On the one hand, this involves scaling up and accelerating existing climate actions or launching new actions that are intended to meet a current or future need (e.g. connection policy heat grid).

The Investment Plan: funding clarified

The action plan outlines the actions we are taking to make the Left Bank climate-neutral. The investment plan explains the costs involved, and sets out how we can bridge this funding gap. A number of investments will be made by the City of Antwerp, but most funding will come from other parties, including social housing company Woonhaven, system operator Fluvius or private homeowners.

The plan has three components.

The starting point is an analysis of the current climate budget. Since the existing policy covers the city as a whole, the complete multi-year budget 2023-2028 will be taken into account. According to this plan, around 4% of all spending currently goes to climate. Mobility accounts for 45% of this amount, followed by the built environment with 27%. The total overview is shown below.

	2023	2024	2025	2026	2027	2028	Grand Total	%
MOB	**49.425.009**	**56.020.023**	**41.247.023**	**29.352.124**	**34.575.435**	**14.394.664**	**225.014.279**	**45,36%**
Exploitatie	3.716.153	4.210.571	3.908.521	4.382.174	3.573.449	3.595.506	23.386.373	
Investering	45.708.856	51.809.452	37.338.502	24.969.950	31.001.987	10.799.159	201.627.906	
BE&ES	**20.282.629**	**28.290.582**	**24.876.305**	**21.079.878**	**20.157.311**	**20.466.901**	**135.153.606**	**27,25%**
Exploitatie	17.729.401	20.311.752	19.557.917	19.854.878	20.157.311	20.466.901	118.078.160	
Investering	2.553.228	7.978.830	5.318.388	1.225.000			17.075.446	
NBS	**10.303.380**	**16.132.984**	**11.589.160**	**11.849.214**	**13.943.777**	**13.986.136**	**77.804.651**	**15,68%**
Exploitatie	3.776.009	3.860.353	4.709.380	4.709.380	4.709.380	4.709.380	26.473.884	
Investering	6.527.371	12.272.631	6.879.780	7.139.834	9.234.396	9.276.756	51.330.767	
GOV	**5.184.667**	**5.490.609**	**5.625.396**	**5.775.905**	**5.920.637**	**6.089.110**	**34.086.324**	**6,87%**
Exploitatie	5.184.667	5.490.609	5.625.396	5.775.905	5.920.637	6.089.110	34.086.324	
CIRC	**6.509.445**	**5.401.173**	**4.359.798**	**2.574.245**	**2.574.245**	**2.574.245**	**23.993.151**	**4,84%**
Exploitatie	2.070.309	2.568.712	2.574.245	2.574.245	2.574.245	2.574.245	14.936.000	
Investering	4.439.137	2.832.461	1.785.554	0			9.057.151	
Grand Total	**91.705.130**	**111.335.372**	**87.697.683**	**70.631.365**	**77.171.405**	**57.511.056**	**496.052.011**	**100%**
Stadsbudget	2.360.975.372	2.521.678.525	2.435.579.621	2.381.149.169	2.403.497.122	2.451.395.147	14.554.274.956	
% van budget	**3,88%**	**4,42%**	**3,60%**	**2,97%**	**3,21%**	**2,35%**	**3,41%**	

The second component addresses the investments required by all parties involved. A total of €1.33 billion is needed until 2030. 66% of this is public funds, 34% comes from the private sector. Part of this amount is already available, but €732 million (55%) still needs to be found. Most of this is in the (accelerated) renovation of housing. The plan subsequently explores different funding avenues, and gets close to the figure of €732 million. On the one hand, these are pre-funding mechanisms that create repayment capacity for more vulnerable owners. On the other hand, they are ways to reduce the actual financial burden through targeted government intervention.
Two innovations - appointing a financial project leader and setting up a Climate Bank - should ensure that the new funding channels are actually in place and that individual projects are directed to the most suitable of these channels.

A mission for the city together with its partners

A challenge on this scale cannot be taken on by a city alone. As such, the City of Antwerp brought together a strong field of key stakeholders who want to get behind the action portfolio.

For the drafting and implementation of the action portfolio, a thorough co-creative process was opted for, with stakeholders involved in the preparation, the steering committee, the coordination consultations and in the implementation of the actions from the action plan. There was also extensive outreach to new partners, with the aim of encouraging innovative projects to engage civil society and businesses in the process. Intensive collaboration with residents to turn action plans into implementation is also a crucial component of the implementation process. This is with an additional focus on vulnerable target groups, to ensure that the process is inclusive.

- ***Co-creative process with existing stakeholders:*** *co-creation of a portfolio of actions with stakeholders from the various emission domains, levers and internal city services, to ensure broad support for the action and investment plan*
- ***Outreach to new partners****: in parallel with the participatory approach, there is also a call to action to identify, stimulate and support concrete projects and experiments on the Left Bank. This is through a thematic call of the Climate Fund (see below). The actions resulting from this call can be incorporated into the action and investment plan.*
- ***Intensive cooperation with residents:*** *to implement a range of actions to achieve climate neutrality, cooperation with citizens is central. The city and district of Antwerp (to which the Left Bank belongs) can draw on on expertise gained from the Burgerbegroting (Citizen budget), Stadslab 2050, Over de Ring, garden streets, etc.) in this regard. Where relevant, the question of what supporting actions are needed to ensure inclusive implementation is raised in each case, taking into account the target group of residents.*

Throughout the Mission 2030, the city of Antwerp will draw on its existing assets and tool to enhance its participatory model:

- Broad expertise in co-creative processes
- Governance structure for the implementation of the 'Antwerp for Climate' Climate Plan 2030
- Climate Fund City of Antwerp
- Steering committee, transition team and coordination consultation Left Bank Climate Neutral
- Innovation space Climate & Environment
- Burgerbegroting
- Outreach to residents

Process: how did this city climate contract come about?

The following overview shows the process through which the Action and Investment Plan came about, given that the process encompasses both plans

Drafting of the City Climate Contract

To create the action portfolio, it was opted for a combination of a strong co-creative process reinforced with a highly specific call to action:

- Co-creation of a portfolio of actions with stakeholders from the various emission domains, levers and internal city services, to ensure broad support for the action and investment plan
- In parallel with the participatory approach, we already organised a first call to action in 2023 to identify and support concrete projects and experiments on the Left Bank. This was through a thematic call of the Climate Fund of the City of Antwerp. The actions resulting from this call were directly incorporated into the Action and Investment Plan.

Step 1: Building a strong mandate: January > April 2023

1.1 Stakeholder discussions

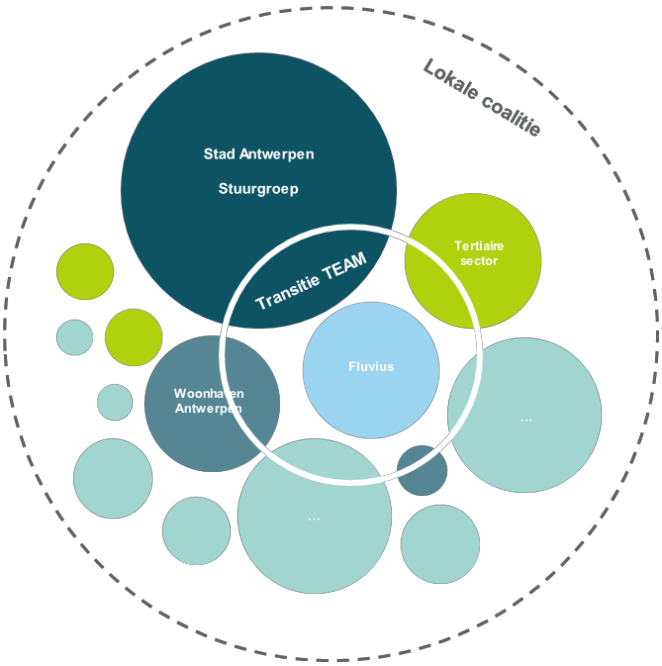
To ensure cooperation and commitment in the co-creation of an action and investment plan, around **30 stakeholder discussions** were organised with the city's services, supra-local authorities, stakeholders from the different emission domains (households, transport, tertiary sector, construction/development, etc.) and experts representing the different levers within this project (finance, policy, innovation, participation, etc.).

1.2 Composition of the Steering Committee City of Antwerp

The citywide **Steering Committee Left Bank 2030** was set up. The committee has representation from the relevant city services and political cabinets. The plan of approach and project structure were initially presented to this steering committee, so that there was a strong mandate within the City of Antwerp's own organisation. Going forward, this internal steering committee will ensure that the action and investment plan is anchored within the city's objectives at the right moments, so that collaboration is ensured both on the ground and behind the scenes of the mission.

1.3 Composition of the Transition Team

The development of a Left Bank 2030 *transition team* with representatives from within and beyond the city's organisation, with representation from all major emission domains. This team will meet at various key moments in the **Coordination Consultation Left Bank 2030.** Members of the transition team (or coordination consultation) will take on the role of identifying the actions in the action and investment plan, and be responsible for implementing them.



Milestones

- ***Milestone 1: Approval of plan of approach and project structure by the internal steering committee > April 2023***
- ***Milestone 2: Anchoring of the mandate at first coordination consultation Left Bank 2030 > May 2023***

Step 2: Getting insight into the system - January > June 2023

In parallel with creating a strong mandate, a baseline of the current state of climate and climate policy was drawn up and thresholds to achieve climate neutrality by 2030 were identified.

2.1 Analysis of the current situation

- Analysis of existing emissions inventory + analysis of consumption data
- Mapping the existing policy and strategy (Antwerp Climate Plan, supra-local policies, etc.)

- Analysis of existing funding streams of the current climate actions (city, Flemish, European)

2.2 Identify links and relationships + Define climate neutrality thresholds

- Stakeholder mapping: based on the interviews in Step 1 and the analysis of the current situation, a stakeholder mapping was carried out. These include both the stakeholders responsible for the major emission domains and different stakeholders per lever. A number of stakeholders were anchored in the project structure (transition team) and a number were responsible for drafting the action plan or served as sounding boards.
- System mapping: the main systems and existing resources (manpower, funding, etc.) that have an impact on achieving climate neutrality were mapped out. This analysis was intended to highlight mutual links and key patterns and dynamics, in order to identify systemic changes that can accelerate the climate transition by 2030. Based on the analysis of the current situation and the system and stakeholder mapping, the main thresholds for achieving climate neutrality were defined. The system mapping and definition of the key thresholds were done based on several thematic workshops in which the stakeholders involved reflected on the three areas that the city defined as the biggest challenges based on emissions figures (energy consumption of buildings; renewable energy generation; transport and mobility).

Step 3: Drafting of the action plan and investment plan: June > December 2023

In this phase, a portfolio of actions was drawn up in the various emission domains. Linked to these actions, an investment plan was drawn up that identified the necessary resources to implement the actions.

3.1 Drafting of possible scenarios and impact pathways toward a climate-neutral 2030

The scenarios were formulated based on the defined levers, and are located in all emission domains identified by the city as priorities. A financial component is also always linked to these scenarios (according to the investment plan) in which the capital required for each scenario is explored, and what the financing options and financing models are. These scenarios were drafted in co-creation with stakeholders from the different emission domains and levers.

3.2 Drafting a portfolio of actions and investment plan

A number of actions were chosen from the different scenarios in consultation with the Coordination Consultation Left Bank 2030. These were selected for (financial) feasibility and impact. All actions were written out in action sheets. An investment plan was drawn up based on the portfolio of action sheets. For each action, these describe how much funding, and what type, will be applied and from where it will come. In addition, the investment plan includes a financial-economic strategy to finance the actions in the action plan by 2030. This includes the mobilisation of public and private capital, as well as the need for European subsidies, innovative funding mechanisms, etc.

3.3 Listing of interventions in governance

Based on the action and investment plan, the possible measures were listed that target systemic barriers and opportunities for improving policies and governance models at the local and supra-local levels.

3.4 Listing of socioeconomic interventions

The socioeconomic and innovative measures necessary to implement and finance the action plan were also listed.

Milestones:

- ***Milestone 3: Draft portfolio action and investment plan at second Coordination Consultation > October 2023***

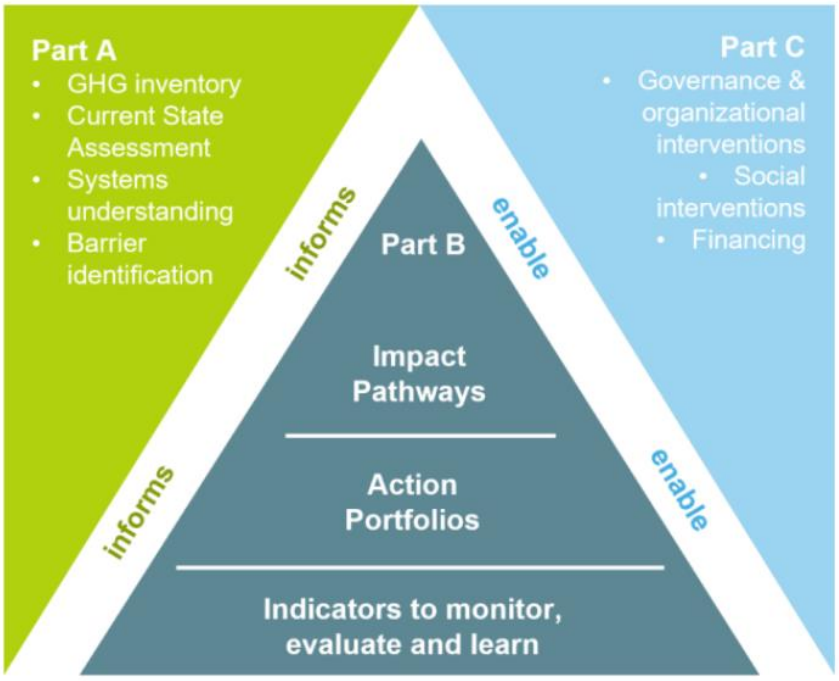


Figure 2: Schematic overview of contents and relationship of the different Parts in the Action

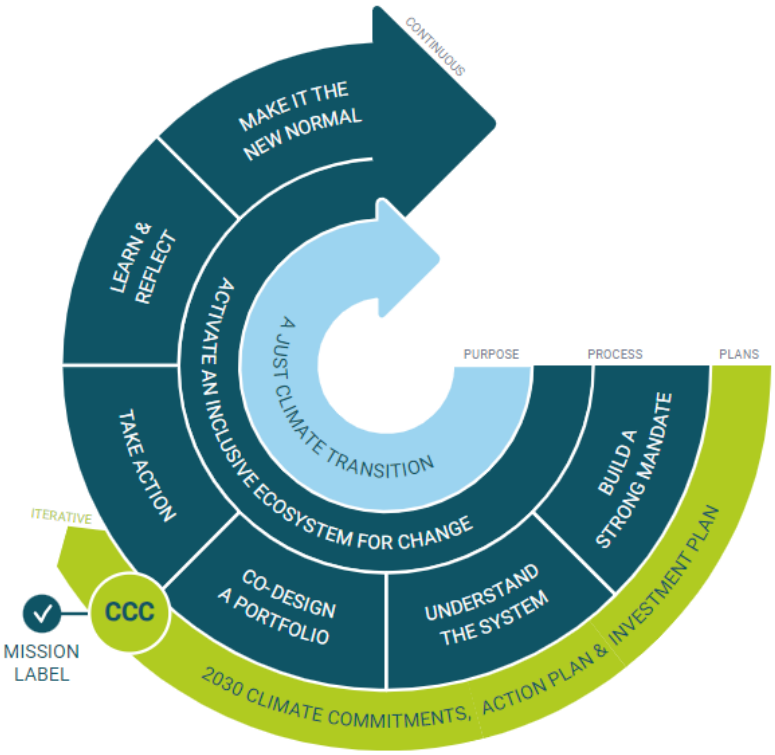
Follow up on implementation of the city climate contract

The project follow-up of the Mission will be included within the established governance structure, including:

- *Core Team Mission Left Bank 2030*
- *Transition Team Left Bank 2030*
- *Internal steering committee with political and administrative representation from the city administration*
- *External actors representing the major emission domains:*
  - *Woonhaven Antwerpen (Social Housing Company)*
  - *Together Climate Active (Climate Network and Matchmaking Platform)*
  - *Confederation of Real Estate Professions*
  - *Organisation for Sustainable Energy (ODE): Dirk Van Evercooren*
  - *Flux50: Frederik Loeckx*
  - *Fluvius: Jef Huyck*

- *Mobility and Transport City of Antwerp: Michiel Penne/Marijke De Roeck*
- *Flemish Energy and Climate Agency (VEKA): Margot Van Cauter*
- *NetZeroCities: Bob D'Haeselaer*

The following is a list of the actions of the transition team in the implementation of the action portfolio



Sharing of the portfolio

From spring 2024, the creation and content of the climate contract will be intensively shared with various stakeholders, citizens and cities in order to:

Inspire: the city of Antwerp is taking on the role of pilot city to inspire other Flemish cities and municipalities to accelerate and deepen their climate actions. This is done through initiatives such as the '100 neighbourhoods platform', the Climate Network of the Association of Flemish Cities and Municipalities

Activate: by intensively focusing on sharing our Mission, challenges and levers, we can ensure the activation of new stakeholders and new project ideas, so that the current action portfolio is continuously enhanced. We do this by being present at the forums where important stakeholders come together (through umbrella organisations such as AGORIA, EMBUILD, VITO,... and also by the umbrella organizations present to deploy the transition team for this purpose (ODE Flanders,CIB, Flux50). The addition to the action portfolio will always be underpinned by the system and leverage analysis from which the action portfolio has emerged. The focus will be on additional actions that focus on barriers that are not yet sufficiently addressed in the current action portfolio or that emerge from the implementation of the interventions that have already been included.

Participation: by creating momentum with this portfolio, we want to enter into participation with stakeholders involved at different levels, in order to achieve a constant feedback flow to enrich our portfolio and increase its capacity.

Implementation

Lokale overheden, nutsbedrijven, grote bedrijfsorganisaties, KMO's, huishoudens, bewoners en gemeenschapsgroepen spelen allemaal een essentiële rol in de uitvoering van dit actieportfolio. Het mogelijk maken van sterke verbindingen en een gedeeld begrip van prioriteiten tussen belanghebbenden maakt het actieportfolio levensvatbaar. De mate van betrokkenheid en inzet voor de portfolio van acties zal afhangen van het mandaat en de capaciteit van elke actor. Daarom is het voor een rechtvaardige overgang cruciaal om de uitvoering te verankeren in inclusie, intersectionaliteit en sociale rechtvaardigheid. Het transitieteam coördineert deze implementatie tussen verschillende organisaties en groepen en creëert zo mogelijkheden voor meer synergie en gezamenlijke voordelen in de stad.

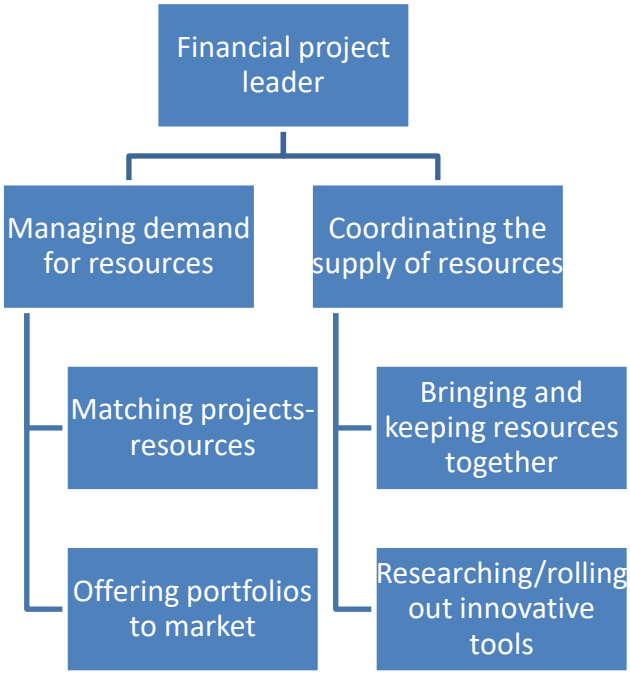
Operational planning:

- Coordinating the Left Bank Climate Neutral project, in the context of Antwerp's participation in the EU Mission for 100 climate-neutral and smart cities by 2030.
- Coordinate with the various internal and external consultative bodies of the Antwerp climate management (mitigation chamber, steering committee, climate council) which priorities, projects and trajectories contribute to the road to climate neutrality on the Left Bank by 2030 and report on progress within these bodies.
- Maintaining an overview of relevant current projects, looking for new opportunities and ensuring transparent and clear coordination between the city departments and political cabinets involved.
- Reporting to Transition Team

Financial planning

The management of the financial architecture is not an ad hoc affair but requires close follow-up.

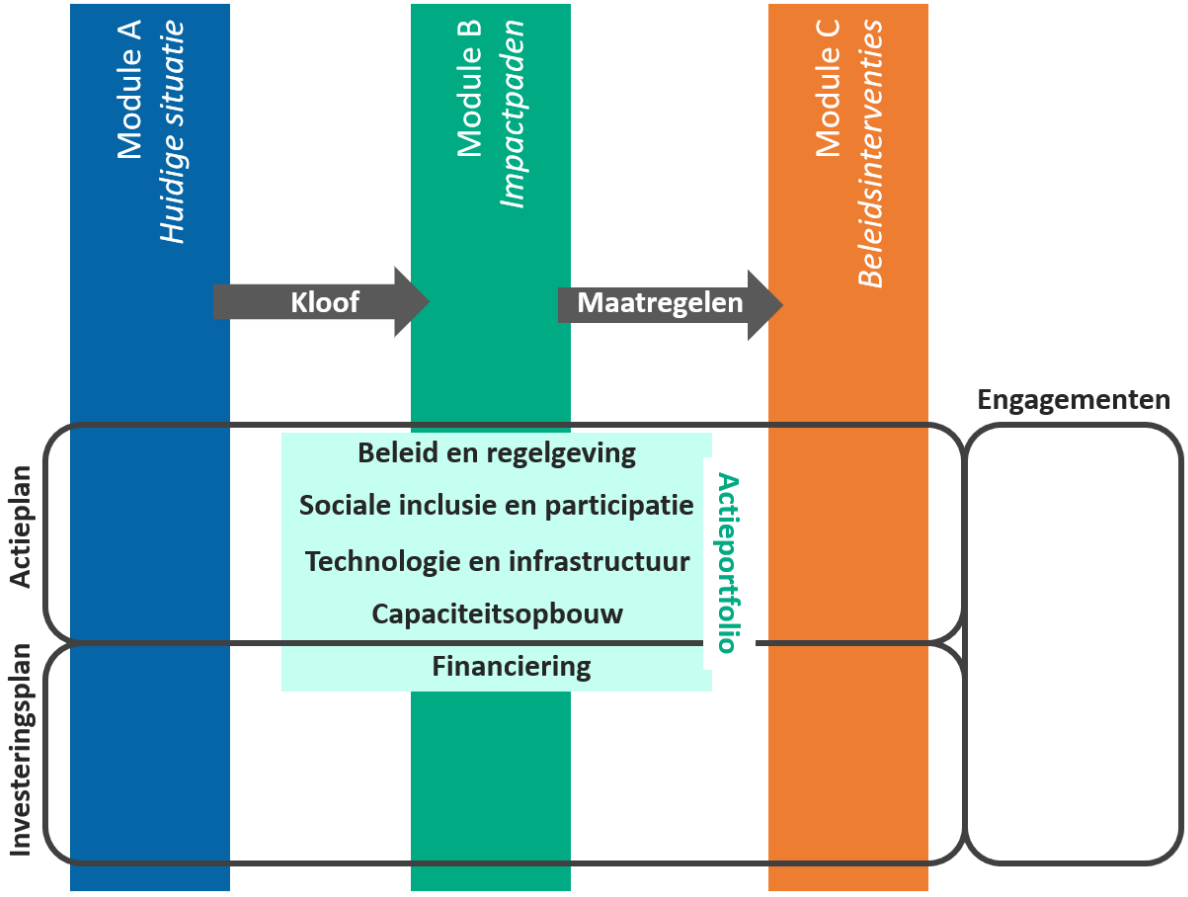
The following tasks are part of the financial planning:



Opvolging en herziening

The Left Bank Climate City Contract is not a final document. Rather, it represents the starting point of the action portfolio. New stakeholders will be brought on board throughout the process (until 2030), some actions will expire, new actions will be developed. Every two years, an update of the document is submitted to the College of Mayor and Aldermen of the City of Antwerp.

Structure of the Left Bank Climate Contract 2030 and reading guide



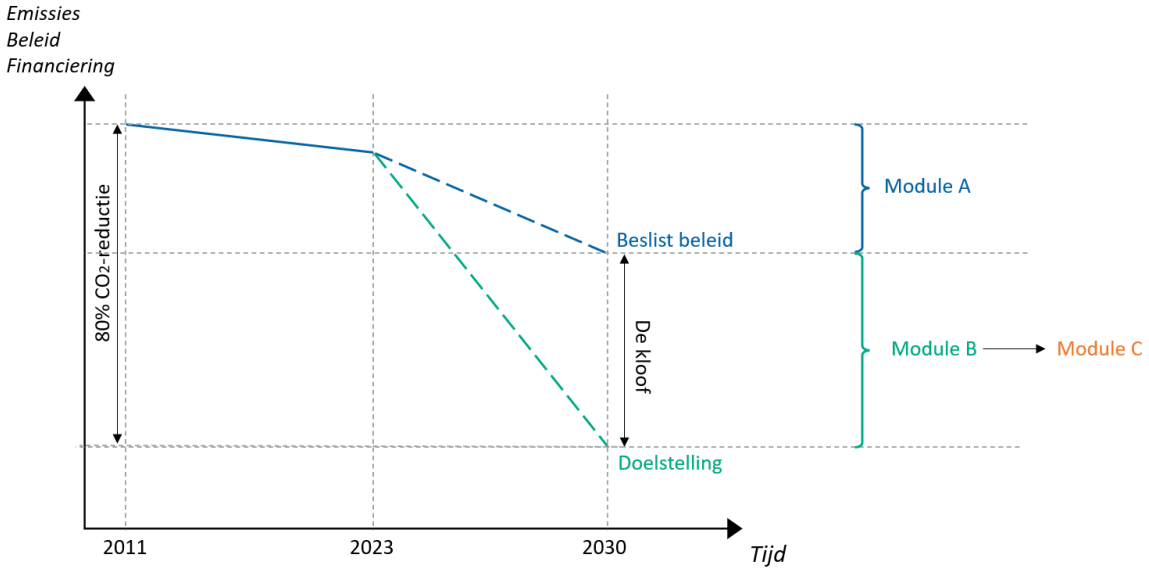
Above, you could get to know the most important aspects of this urban Climate Contract Left Bank 2030. To get to the bottom of the urban Climate Contract, you can delve into three documents:

- The **action plan** collects all the actions in the action portfolio and describes how they have been achieved.
- The **investment plan** is a further deepening of everything that falls under leverage.
- The **commitments** from the various stakeholders with regard to this urban Climate Contract are collected in the last section.

The action and investment plans are structured according to the same structure with a distinction between three modules:

- Module A describes the current situation in terms of emissions, policy, financing and barriers.
- By comparing the current situation with the objective, we obtain a certain gap. How to bridge the gap is part of module B, the central part of both plans.
- The additional measures, together with a plan to monitor them, form the basis for module C. This module provides a glimpse into the practical roll-out in terms of policy interventions, risks and the broader stakeholder network.

The distinction between the three modules is also shown in the graph below, which this document also introduced.



Climate City Contract:

Action plan Left Bank Climate Neutral 2030

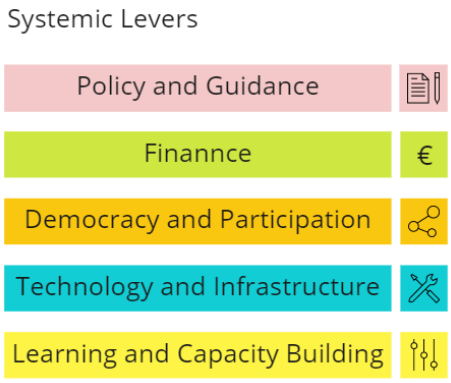
Inhoud

Introduction

The city of Antwerp was selected by the EU on the basis of progressive policy with actions from the city-wide climate plan (cfr A-2.1) that will be accelerated and piloted on the Left Bank in the light of the EU mission. These are measures in the following six areas that were proposed by the European Commission:

- Building energy consumption
- Renewable energy production
- Transport and mobility
- Waste treatment and circular economy
- Green measures and nature-based solutions

The Action Plan should allow Mission cities to structure the scope of the mission and operationalize their ambitions. For Antwerp, the Action Plan will describe the path to climate neutrality by 2030 for the Left Bank district. To this end, it defines a citywide portfolio of transformative actions needed to bridge current gaps in policy, regulation, project planning, financing, finance, social and behavioral aspects, and implementation. The portfolio of actions are cross-sectoral and designed to radically reduce greenhouse gas emissions using multiple "levers for change."



The present action plan is both a process and a document. As a process, it envisions new ways of working with local, regional and national stakeholders to achieve climate neutrality by 2030. As presented in the introduction, the process began in the fall of 2022 with the creation of an ambition and plan of action, the shaping of local partnerships and building support among residents and other stakeholders, and the launch of the first major projects. As a document, the action plan provides a state of the art of partnerships that are in operation and actions that have taken shape. The present action plan aims to reflect both the system analysis made and a portfolio of actions that, through their mutual synergy, will contribute to climate neutrality in the project area.

The action plan includes:

- Module A: Current State of Climate Action.
    - This module provides the existing local/supralocal policy framework within which the Left Bank Mission, Action Plan and Investment Plan were shaped (Module A-1)
    - Describes the systems analysis (both process and conclusions) of existing policies (Module A-2) and gap analysis (Module A-3). In particular: where are the barriers and opportunities to achieve climate neutrality in Left Bank.
- Module B: based on the above system analysis and from the 'theory of change', impact paths were formulated (Module B-1). Next, interventions are named. This sets out the structure for the actions from the action portfolio using 5 action areas: emissions from buildings, vehicles and materials, shift to green energy and new green infrastructure) (Module B-2). The description of all breakthrough and strategic actions from the action portfolio can be found in Module B-3.
- Module C: the strategies and actions needed to close the gap towards climate neutrality by 2030

The action plan combines two approaches:

1) Measurable, reportable and verifiable (MRV) climate action planning based on a baseline inventory of greenhouse gas emissions, clear projects and action descriptions for the action area (portfolios) and insights into investment and capital needs as a preparatory step to draw up investment plans.

2) Strategic approach based on a comprehensive 'theory of change' to harness social innovation and innovation in governance as enabling factors for successful, citywide and inclusive climate neutrality transformations.

THE CHOICE FOR AN AREA BASED APPROACH

In addressing this challenge, the City of Antwerp resolutely opts for an area-based approach. By working at the scale of 1 district, and concentrating breakthrough projects and actions here, we can really carry out our actions up to the level of implementation. Both the analysis phase (emissions, demographics, typology of the district) and the action portfolio contain a level of detail that goes far beyond a generic citywide approach that risks getting stuck at a theoretical level. This means a concrete path to climate neutrality at the local level applicable for each inhabitant, each dwelling,... .

The choice of the Left Bank district stems from a combination of opportunities and challenges that come together in this district.

As a pilot district with +/- 17,000 inhabitants, Left Bank offers a realistic and workable scale to accelerate the city's climate policy. The district consists of diverse housing typologies and has a very high proportion of vulnerable households. For example, on a 48.5% birth to a disadvantaged family and 44% of housing units are occupied by social tenants. This makes Left Bank a suitable location to work on a socially just climate transition. Moreover, the large presence of multi-family housing, vulnerable target groups and landlords is very characteristic for the city of Antwerp, and by extension for other European central cities.

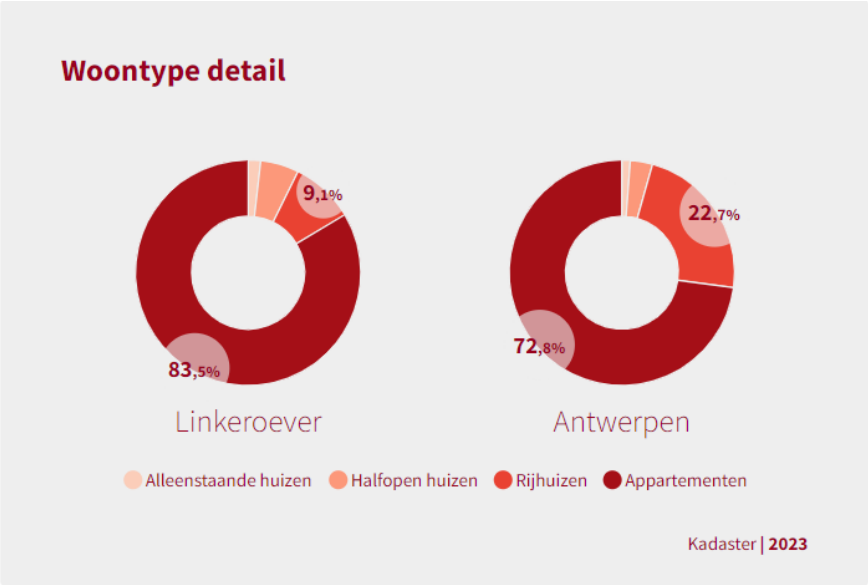


Figure: breakdown of the occupied patrimony by housing type for the Left Bank district and the city of Antwerp

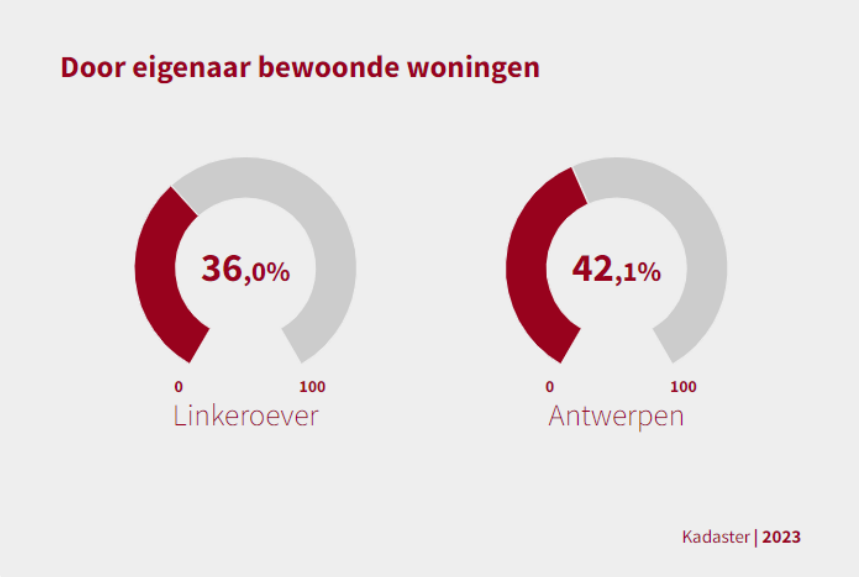


Figure: Share of owner-occupied dwellings for the Left Bank district and the city of Antwerp

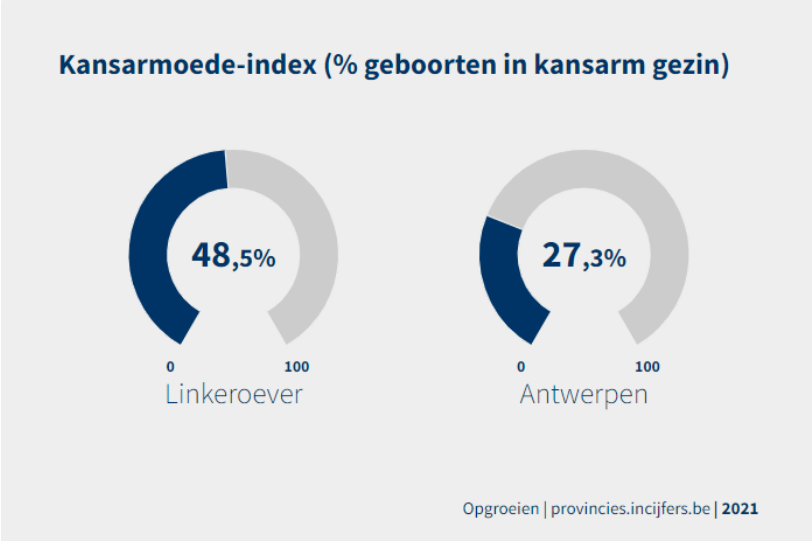
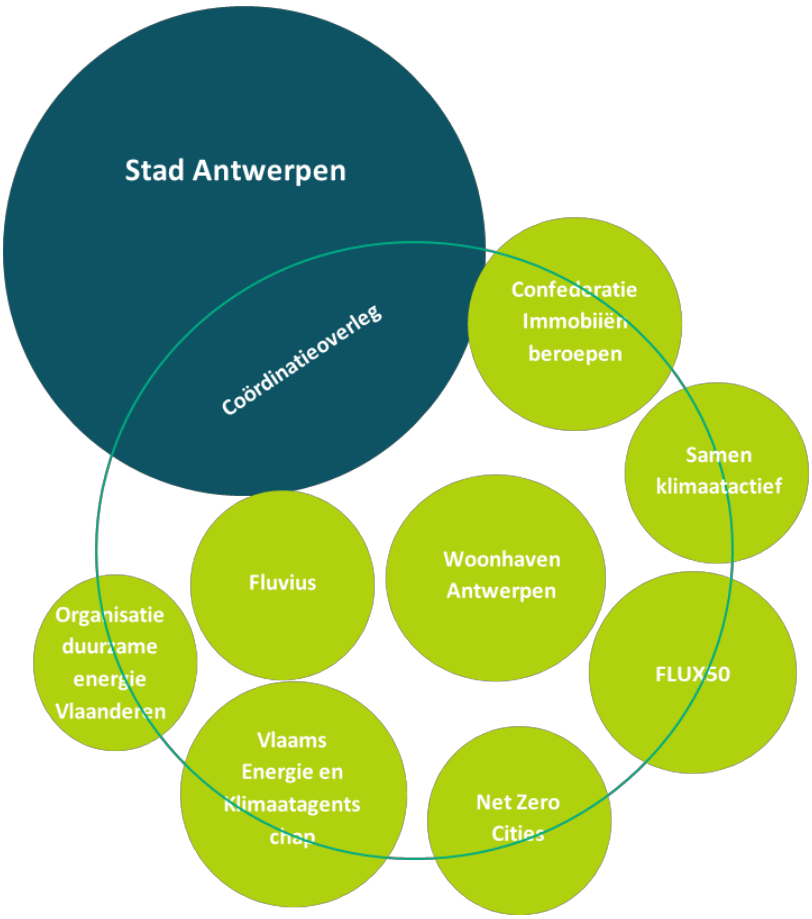


Figure: Percentage of births to disadvantaged families for the Left Bank district and the city of Antwerp

In addition to an interesting demographic and building type composition, this district is also interesting because a number of projects are already in the starting blocks and the city has extensive services there around climate transition. For example, the Left Bank district is 1 of the 9 pilot districts for the rollout of the city's residual heat network by 2030, the city is already assisting many co-owners in making their multi-family dwellings more sustainable, and a number of important (re)construction developments are planned, including the Europark, Katwilgweg business park and the former Combori site.

A CO-CREATIVE ACTION PORTFOLIO

The action portfolio before us today is the result of a co-creative process. The first step taken was the creation of a Coördination Team. The Coördination Team consist of political and administrative representation from the city of Antwerp and representation from the most important emission areas



(see also Module C-1 organizational interventions). The Coordination Team shapes the action portfolio and investment plan, guide decisions and priorities, and monitor progress and impact.

Part A: Current state of Climate Action

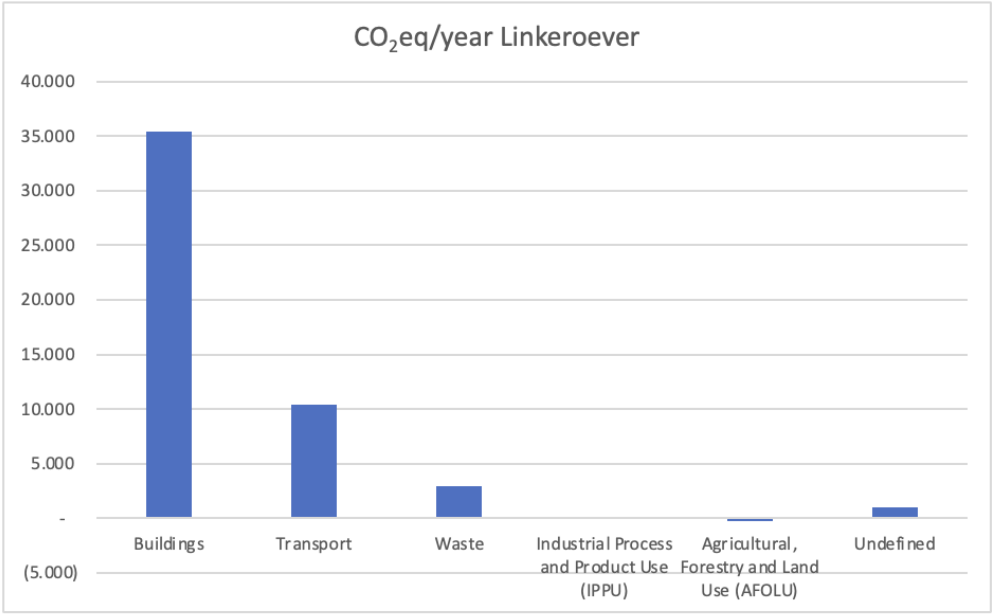
Module A represents the starting point of our challenge toward climate neutrality. Both in terms of emissions at the Left Bank district level and in terms of existing local and supra-local policies. From this starting point, a gap analysis was made, highlighting the challenge toward 2030. Both in terms of policy and CO2 emissions.

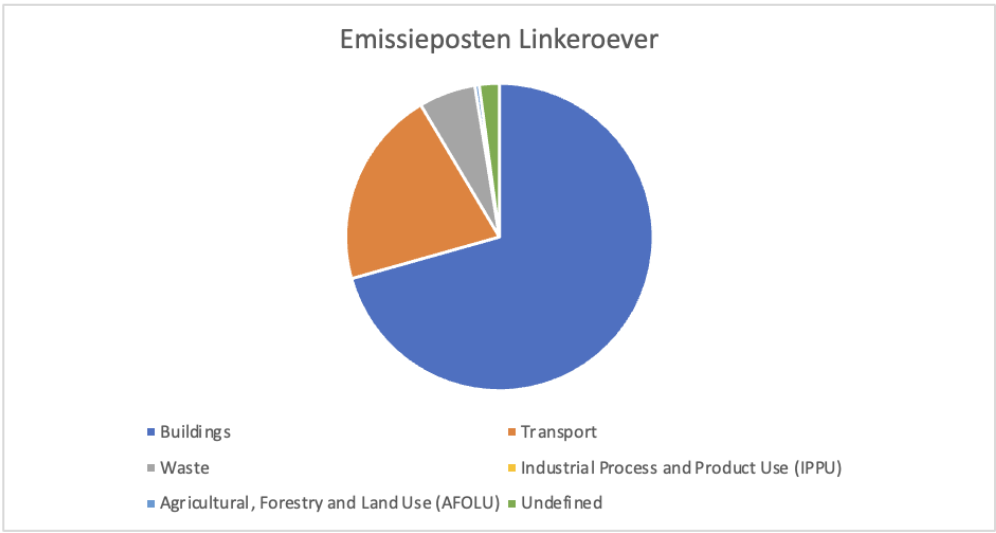
Module A-1 Emission Inventory Left Bank

Overview of greenhouse gas emissions

Table A-1.5 gives an overview of the greenhouse gas emissions of the Left Bank district, broken down according to the emission domains identified by Net Zero Cities:

A-1.5: Graphics and charts		
Unit	Ton CO2 equivalent/year	Share
Buildings	35.377	71%
Transport	10.427	21%
Waste	2.997	6%
Industrial Process and Product Use (IPPU)	-	0%
Agricultural, Forestry and Land Use (AFOLU)	(230)	0%
Undefined	1.056	2%
TOTAL:	**49.627**	





Buildings - 72%

The sector that immediately stands out is Buildings.

This group includes the energy consumption of all buildings on the Left Bank. Both residential and non-residential. Households account for 75% of natural gas consumption on the Left Bank. The remaining 25% is almost entirely attributable to the tertiary sector. As regards electricity consumption, the ratio is more 50/50 between households and tertiary sector.

Transport - 21%

The transport sector comes in second if we rank the sectors by share of emissions. These emissions are generated entirely by road traffic. Within this sector, light vehicles represent 81% of emissions and heavy vehicles 19%.

Waste - 6%

The third sector in the share of greenhouse gas emissions is the waste sector. Only residual waste is included as a source of greenhouse gas due to the fact it is incinerated. The other waste streams are assumed to be recycled.

We can distinguish between three sources of residual waste here:

- Collective collection through sorting streets with households as origin
- Collective collection through sorting streets from companies without employees
- Individual collection of residual waste by companies with at least 1 employee

Other (less than 1%)

The remaining sectors are only marginal compared to the three main sectors discussed above.

- IPPU: no information on industrial process emissions on Left Bank
- AFOLU: carbon storage by biomass on Left Bank.
- Unknown: a residual group of energy consumers that could not be assigned to any of the sectors.

Areas of focus

Based on the order of magnitude of emissions, we can identify the main emission items that need to be addressed. In order of decreasing importance, these are:

- Natural gas consumption by households: 23 kTon CO2e
- Road traffic light vehicles: 8 kTon CO2e
- Natural gas consumption tertiary sector: 8 kTon CO2e
- Electricity consumption by households: 2 kTon CO2e
- Residual household waste: 2 kTon CO2eFinal energy consumption by scope and sector (Module A-1.1)

Table A-1.1 shows the final energy consumption in the Left Bank territory. This consumption is subsequently used to calculate energy-related emissions.

A-1.1: Final energy use by source sectors				
Base year	2019			
Unit	MWh/year			
	Scope 1	**Scope 2**	**Scope 3**	**Total**
Buildings				
Electricity		42.013		**42.013**
Heat/cold	2.158			**2.158**
Natural gas	126.209			**126.209**
Liquified gas	1.291			**1.291**
Heating oil	18.478			**18.478**
Biomass	6.355			**6.355**
Solar thermal energy				**-**
Geothermal energy				**-**
Transport				
Electricity	-	119	-	**119**
Natural gas	192	-	-	**192**
Liquified gas	74	-	-	**74**
Diesel	29.332	-	-	**29.332**
Gasoline	10.155	-	-	**10.155**
Biofuel	2.404	-	-	**2.404**
Industrial Process and Product Use (IPPU)				
Electricity				**-**
Heat/cold				**-**
Natural gas				**-**
Liquified gas				**-**
Heating oil				**-**
Biomass				**-**
Agricultural, Forestry and Land Use (AFOLU)				
Electricity				**-**
Natural gas				**-**
Liquified gas				**-**
Heating oil				**-**
Coal				**-**
Unidentified				
Electricity		1.152		**1.152**
Natural gas	4.666			**4.666**
			Totaal:	**244.597**

Activity & greenhouse gas emissions by sector

Table A-1.3 only refers to activities that generate emissions that are unrelated to energy consumption. These are emission sources of CO_2, CH_4 and NO_2 that do not result from a combustion of fuels or purchase of energy.

A-1.3: Activity by source sectors			
Base year 2019 Unity: Tons CO_2-eq/year			
	Scope 1	Scope 2	Scope 3
Buildings	**31.234**	**4.142**	
Households	23.331	2.099	
Tertiairy sector (excl. Education)	6.515	1.692	
Educational buildings	977	39	
Industrial buildings	411	312	
Transport	**10.416**	**12**	
Light vehicles numbered roads	4.993	7	
Heavy vehicles numbered roads	1.466		
Light vehicles non-numbered roads	3.488	4	
Heavy vehicles non-numbered roads	468		
Waste			**2.997**
Collective waste sorting lanes - households			1.897
Collective waste sorting lanes - companies			121
Individual waste disposal service			979
Industrial Process and Product Use (IPPU)			
Energy			
Non-energy			
Agricultural, Forestry and Land Use (AFOLU)			
Biomass storage			**-230**
Undefined	**943**	**114**	

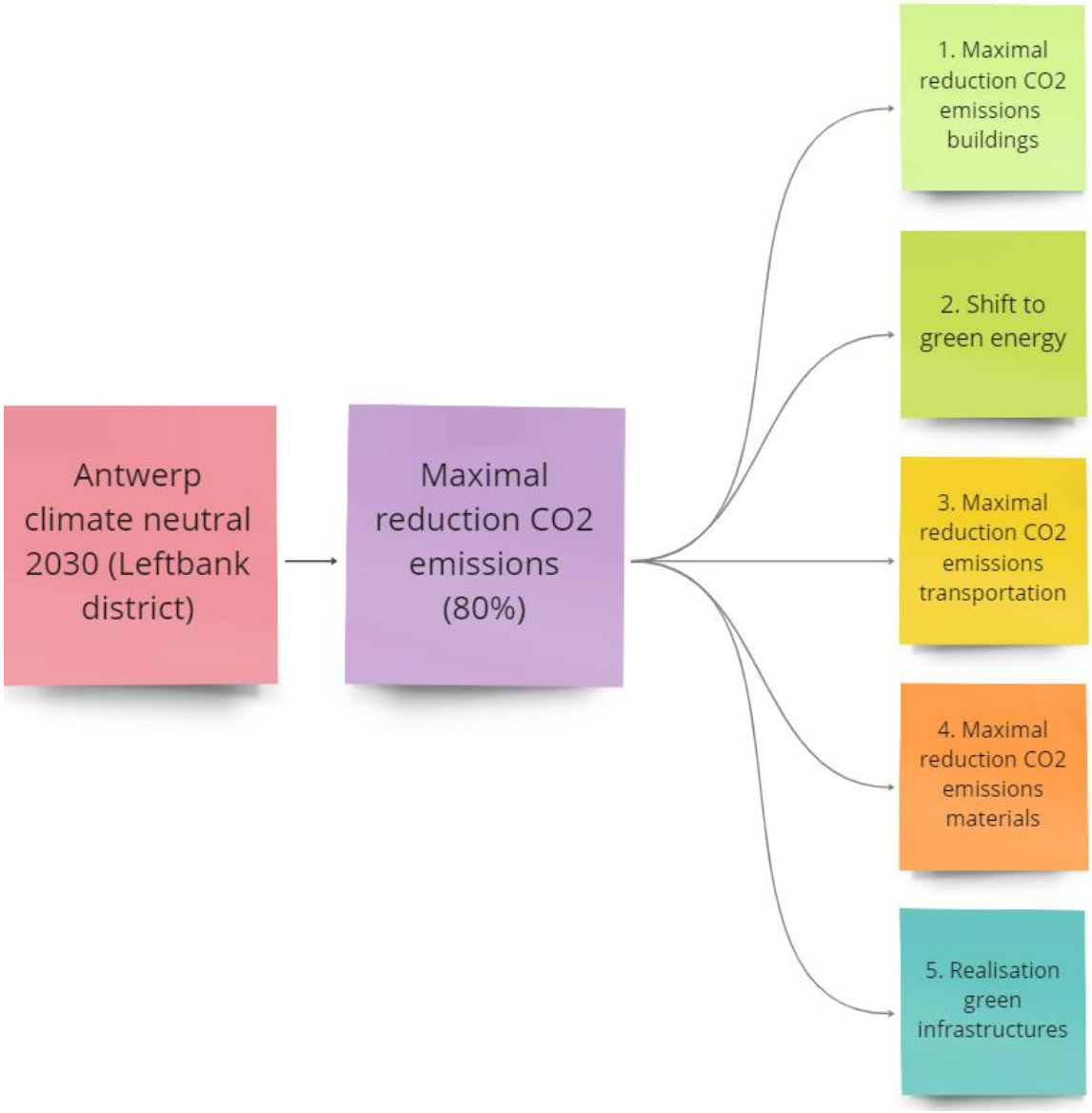
A-1.4: GHG emissions by source sectors				
Base year				
Unit	Ton CO_2 equivalent/year			
	Scope 1	Scope 2	Scope 3	**Total**
Buildings	31.234	4.142	0	**35.377**
energy	*31.234*	*4.142*	*0*	***35.377***
non-energy				
Transport	10.416	12		**10.427**
Waste			2.997	**2.997**
Industrial Process and Product Use (IPPU)	0	0	0	**0**
energy	*0*	*0*	*0*	***0***
non-energy			*0*	
Agricultural, Forestry and Land Use (AFOLU)	0	0	-230	**-230**
energy				
non-energy			*-230*	***-230***
Undefined	943	114		**1.056**
Total	**42.592**	**4.268**	**2.767**	**49.627**

Annex A-1.6 Nota_Emissie-inventaris_LO

Analysis emissions-inventory Left Bank

The emissions inventory paints a picture of the main emission items that need to be worked on. Natural gas consumption in households is a priority, followed by natural gas consumption in the tertiary sector and road traffic (light vehicles). The breakdown by sector also shows the weight of CO2 emissions in buildings. From this finding, an initial prioritization was made. Five areas of action

are defined:



The focus of this first phase of the mission to climate neutrality will thus be on the reduction of CO2 emissions from buildings and the shift to renewable energy. Of course, without losing sight of the other relevant themes and their interconnectedness.

Module A-2 Analysis of current climate policy and strategy

A-2.1: Description of relevant policy, projects and regulations.

The adaptation and mitigation policy in the city of Antwerp has taken shape within a European, national and regional regulatory framework. The structure of the regulatory framework will be shown below, with a focus on the city policy framework for the city of Antwerp.

This context frames and anchors the ambitions from the Left Bank Mission. The area of focus of competences in the area of mitigation and adaptation within the federal structure of Belgium at the regional level. For the implementation of European and Flemish regulations, local governments are essential.

A-2.1: Relevant policy, strategies and regulations.		
Name	**Description**	**Relevance**
EU		
Belgium (federal government)		
Belgian climate strategy 2050 (2020) National energy and climate plan	Implementation of Art 15 Regulation (EU) 2018/1999: each Member State must submit a long-term strategy by 1 January 2020, every 10 years, with a 30-year perspective Sets out the commitments made by the Belgian federal state and clarifies how these are distributed among the three federated states (Flanders, Wallonia, Brussels Capital Region).	This national strategy is made up of the regional climate strategies. The climate plan at the federal level guides the actions at the underlying levels.
Flanders (regional government)		
Flemish Climate strategy 2050	Long-term climate vision of the Flemish government, where the goal is to reduce greenhouse gas emissions from the non-ETS sectors by 85% by 2050, with the ambition of moving toward full climate neutrality. For residential buildings, this amounts to 75% by 2050; for non-residential buildings, the goal is carbon neutrality by 2050.	This strategy sets out the outlines leading up to 2050 for the various sectors. Within the CCC, the approach is emission domains that overlap to some extent with the sectors. The formulated building blocks can therefore provide guidance for the Left Bank in achieving the 2030 objective, although the speed of the transition on the Left Bank will have to be faster than the Flemish level and the building blocks still have to be converted into concrete actions. In this way, Left Bank will also be more likely to be a pilot that can serve as an example for the city of Antwerp as a whole, or other (Flemish) cities and municipalities.

Flemish Energy and Climate Plan 2021-2030	A vision of the Flemish government that includes the policies and measures taken and planned within the Flemish competences and the objectives and targets put forward by Flanders. Flanders is committed to the following objectives: (1) Reduction of greenhouse gases in the ESA sectors (40% reduction by 2030 compared to 2005), (2) LULUCF sector, (3) Energy savings and (4) renewable energy. The Flemish Energy and Climate Plan is divided into eight parts: 1. Introduction, policy framework and process 2. Decarbonisation: greenhouse gas emissions and removals 3. Decarbonisation: renewable energy 4. Energy efficiency 5. Energy security and internal energy market 6. Energy poverty 7. Research, innovation and competitiveness 8. Impact analysis and finance	The policy at the Flemish level has an impact on the actions at the city level. The Flemish government has various levers at its disposal that can accelerate the pace of the transition and support and enable cities to achieve net-zero. For example, the regulations at the Flemish level relating to the climate objectives will evolve over time, which can have a major impact on emissions at the level of a city or municipality. Examples here include the EPC label requirement that will become stricter over time. These regulations focus on the 2050 objectives, which means that not all regulations will find their way into Flemish policy in time to meet the goals on the Left Bank. As such, regarding the gap between the Flemish and local objectives, the City of Antwerp will have to build its own set of tools.
Flemish Long-term renovation strategy for buildings 2050	The Flemish long-term renovation strategy for buildings represents a further elaboration of the Flemish Climate Strategy 2050. The VLTRS states that in order to achieve the ambitious goals set out in the Climate Strategy, existing residential buildings must achieve a similar level of energy performance as new-build homes with building permits in 2015 by 2050 at the latest. This long-term goal means that the average EPC coefficient must be reduced by 75% by 2050. On the energy label EPC scales that are used (A to F), this corresponds to label A (EPC energy score <100). We need to renovate an average of 3% of existing homes to A label on an annual basis. The strategy places a strong	The VLTRS is largely applicable to Left Bank given that a significant percentage of emissions come from buildings. In the first instance, this strategy will reduce energy use, which inherently also entails a reduction but, in addition, encourages the use of renewable energy sources for the remaining energy demand. Again, the horizon will be different at the Flemish level than at the Left Bank level. This strategy is a good guideline for reductions in the Energy Systems and Built Environment emission domains, but EPC labels are not the whole picture either. An A label does not necessarily result in full

	emphasis on comprehensive renovations at key moments such as the purchase of a home, inheritance, change of tenant, etc. But even beyond these key moments, raising the rate of renovation will remain essential.	decarbonisation, and sometimes full decarbonisation can be achieved with a B label. The total picture on the Left Bank will therefore always have to be looked at.
Renovatiepact	Action plan (consistent with the VLTRS) to increase the rate of renovation, in order to achieve the renovation rate. The 'Renovatiepact' (Renovation pact) is a dynamic partner organisation in which resources, information, activities and competencies are shared for realising the common objective.	Left Bank can benefit from the Renovatiepact to achieve its objective, but conversely, the acceleration on Left Bank and the accompanying approach will also result in added value for the rest of Antwerp and Flanders by extension.
Local Energy and Climate Pact	Through this plan, the Flemish government, together with the Flemish cities and municipalities, has committed to make the climate transition a reality. 293 of the Flemish local governments have made a commitment through the Local Energy and Climate Pact 1.0 (LEKP 1.0(PDF file opens in new window)) to raise their climate ambitions. They are focusing on 4 areas: greening, energy, mobility and rainwater. Specific objectives are attached to these 4 areas. In response to the energy crisis, municipalities can also sign up to the LEKP 2.1.(PDF file opens in new window) This is an extension of the commitments on top of the LEKP 2.0 with a social component. This pact helps local governments address energy poverty and share energy costs.	Signing up to the Local Energy and Climate Pact should motivate cities and municipalities to commit to accelerated collective renovation. For the implementation of measures, cities and municipalities that signed up can apply for a grant. This LEKP should give cities additional motivation to help achieve the objectives of the Flemish Energy and Climate Plan. The City of Antwerp signed up to both LEKP 1.0 and 2.0 and is therefore also eligible for this support.
Flemish Mobility Vision 2040	A vision for mobility in Flanders where the aim will be to guarantee maximum connectivity and accessibility in 2050 in a sustainable and safe way and tailored to all people and companies. To achieve this, 4 perspectives were put forward, one of which was to ensure that there are no more transport emissions by 2050 and that material footprint for mobility will be reduced by 60% by 2050.	Mobility is an important issue in City of Antwerp. A Flemish mobility vision can therefore support the introduction of certain measures. Moving faster than the Flemish level is also the intention.

Flemish climate adaptation plan	A plan by Flanders (Department of the Environment) to prepare Flanders for the effects of climate change in both the short term (2030) and long term (2050).	With the Flemish Climate Adaptation Plan, Flanders has also made an explicit focus on climate resilience and climate security, by limiting its impact on the climate as much as possible and mitigating the consequences of climate change. In addition to mitigation, Left Bank will also focus on adaptation.
Solar Plan 2025	A plan in which the Government of Flanders aims to increase the installed capacity of solar energy to 8.9 GW. Contains normative, financial and accompanying measures to promote the growth of PV (solar panels) in Flanders.	The Solar Plan 2025 is part of the Flemish Energy and Climate Plan 2021-2030. The objective is to have a total installed capacity of 6.7 GW of PV installations in Flanders by 2030. By the end of October 2020, the total installed capacity was around 3.6 GW. The results on the solar map of Flanders show that the current installed capacity in the city of Antwerp is 125 MW, but the potential capacity is 2.290 GW. Following the Solar Plan 2025 would therefore not be an optimal use of the potential. However, the use of rooftops for solar panels on the Left Bank is currently minimal. There are therefore big gains to be made here. The Solar Plan can definitely play a supporting role in this regard, and the timing also fits with the ambitions on the Left Bank.
Wind Plan 2025	A plan in which the Government of Flanders aims to increase the installed capacity of onshore wind energy to 2,642 GW by 2030.	The Wind Plan 2025 is part of the Flemish Energy and Climate Plan 2021-2030. The objective is to increase the installed capacity for wind in Flanders to 2.5 GW by 2030. By the end of 2019, the total installed capacity was 1.3 GW. To avoid over-subsidising, the Government of Flanders introduced a maximum generation volume and lowered the limit between the smallest and largest representative project category wind from 3 MW to

		2.5 MW. For Left Bank, there is rather low potential for a large ground-based wind turbine. Nevertheless, smaller turbines on rooftops can be experimented with, although these are unlikely to fall below the lower limit of 2.5MW.
Heat Plan 2025	This plan implements the objectives for green heat and residual heat included in the Coalition Agreement 2019-2024, the policy note on Energy 2019-2014 and the Flemish Energy and Climate Plan 2021-2030 (VEKP) and, with 26 measures taken in the Vision paper on Additional Climate Measures, also switches up a gear to make the transition to sustainable heating and the greening of energy carriers. If residual heat and green heat are deployed, it is ensured that this is as efficiently as possible by effectively insulating and taking energy-efficient measures in production processes. As part of this heat plan, the EU's Fit for 55 package will also be analysed.	Collective heat is an important topic in this plan. Research is being conducted on how to create additional incentives for building heat grids. The City of Antwerp is one of the leaders in the area of collective heat and has a favourable context in terms of residual heat. In this way, it will also be possible for Left Bank to shift gears more quickly and not have to wait until the Heat Plan is fully in place.
Flemish Flexibility Plan 2025	Plan to increase the flexibility of the electricity grid to continue meeting the growing electricity demand.	Further growth of renewable energy sources, such as solar and wind power and electrification of heat and transport are important measures that are necessary to achieve further reduction of CO2 emissions and become less energy dependent. To meet the growth of renewable energy sources and further electrification will require more investment in the electricity grid, on the one hand, and will also require more flexibility. This flexibility can be used

		to match electricity supply and demand more effectively and avoid congestion on the electricity grid. In addition, flexibility can also help reduce system costs and therefore keep energy bills affordable for households and competitive for businesses. To achieve the desired speed on the Left Bank, focusing on flexibility will make it possible to eliminate the potential bottleneck in terms of infrastructure and grid reinforcement.
Regional rainwater regulation 2023	Imposes measures on every building contractor to avoid immediate rainwater runoff with the basic principle of using as much rainwater as possible. The following more stringent rules have been introduced: (1) the minimum volumes of rainwater cisterns are increased; (2) a rainwater cistern must be installed when rebuilding or expanding existing buildings; (3) the collected rainwater must be used to the maximum extent for applications where potable water is not necessary, including toilet flushing, cistern water, washing machines and outdoor use; (4) the buffer volume and infiltration area of the mandatory infiltration facility is increased; (5) the buffer volume for large paved areas is increased, when no infiltration facility can be installed due to technical reasons; (5) the possibility of taking on obligations related to rainwater collectively is introduced.	This regulation focuses primarily on climate adaptation and has a less direct impact on emissions. Nevertheless, it is relevant within this mission because various works will be organised both at the building level and in the public domain. These works are important key moments for enhancing climate resilience on the Left Bank as well.
Design guide for social housing	This design guide contains the structural engineering and conceptual guidelines to be used for all social housing, in other words both new construction and renovation projects. The VMSW (the current 'Wonen in Vlaanderen') tests the preliminary design or - if there is no preliminary	40% of the building stock on the Left Bank is owned by the social housing company Woonhaven. Their activities and finance are controlled to a large extent from the Flemish level, and more specifically Wonen in Vlaanderen. Certain measures within this

	design - execution file of a project against these structural engineering and conceptual guidelines. A favourable recommendation from the VMSW is required to receive subsidised finance. This design guide also imposes energy performance-related requirements.	policy may prevent an important partner such as Woonhaven from aligning their ambitions with those of the Climate City Contract. …
Space Flanders policy plan	In total, the people of Flanders occupy 32.6% of the space (2013 figures). Currently, 6 hectares of space is taken up per day. With no change in policy, land take will continue to increase to undesirable levels. At the same time, many underutilised or obsolete portions of our land use currently offer opportunities for additional housing units, workplaces or facilities. The Flanders Space policy plan proposes measures so that by 2040 there will be no additional land take. It also proposes measures such as climate-robust open spaces and the most efficient building network. (strategic objectives: (1) reduce additional land take; (2) better connection of the urban-economic space and energy networks; (3) live and work near current and future collective transport nodes and facilities; (4) robust open space; (5) create a network of green-blue arteries	The average living area on Left Bank is already relatively low currently. Nevertheless, future innovations will also require space both on private and public land, on the other hand, there will also be actions that will actually free up space. Within the Left Bank mission, it is therefore important to maintain this balance.
Vision 2050 - A long-term strategy for Flanders	The long-term vision is based in part on existing international and Flemish long-term visions and foresight studies. A focus on the transition approach was also retained, but we are ensuring that there is a real link to sustainable development and that the key objectives of a transition perspective were respected. On the other hand, we have respected the unique features and speed of each individual transition process.	Various transition paths run in parallel. The climate transition on the Left Bank will therefore also have to take into account other themes: - Knowledge development as a driving force - Smart use of materials - A low-carbon society - A robust water system - A sustainable food chain - A rapid and safe mobility system - Living in an attractive environment - Accessible and high-quality care - An agile government

Roadmap 2030	With the regional mobility plan 'Routeplan 2030', the Flemish government intends to realise an accessible and livable region with a systematically higher use of sustainable means of mobility by 2030. The goal is to ensure that 50% of travel is by sustainable mobility modes by 2030, the so-called 50/50 ambition or modal split. In this context, residents will have the opportunity to use alternative modes of transport over the next 10 years. The 2030 Roadmap opts for a 'mobility system focused on combi-mobility' as a driver for the transition: multimodal travel approaches where people making a journey combine different modes of transport and switch between them, in order to reach a destination as quickly and sustainably as possible.	The Route Plan 2030 falls within the decision of the Government of Flanders' decision to form 15 transport regions to implement mobility policy at the regional level, including the transport region of Antwerp. These transport regions must then implement policy at the regional level. The measures taken will also ultimately ensure that mobility will be made electric and more sustainable, with the goal of reducing total NOx and CO2 emissions. Again, this plan contains effective guidelines, although it will be important to turn these into concrete actions on the Left Bank by 2030.
Flemish Air Policy Plan	The Government of Flanders has set out a number of strategic objectives in this air policy plan: - In the short term (as soon as possible): European air quality standards and/or target values are achieved throughout Flanders. - In the medium term (2030): we are aiming to halve the health impact from air pollution compared to 2005 and reduce the area of ecosystems where the capacity for eutrophication or acidification is exceeded by one-third compared to 2005. Flanders is also aiming to halve, by 2030, the number of people living in an area where the annual average NO2 concentration exceeds the World Health Organization (WHO) advisory value in every municipality compared to 2016. As long as the WHO has not specified a new advisory value for long-term exposure to NO2, we are taking 20 µg/m³ as the target figure - In the long term (2050): throughout Flanders, the WHO	As air quality improves, emissions also decrease. This policy plan therefore also has a direct impact on emissions and is therefore relevant to this mission. Annex 2 of the document lists the measures taken by the local governments of Agglomeration of Antwerp. A detailed description can be found above under local policy.

	advisory values and the critical loads for eutrophication and acidification will be respected.	
City of Antwerp		
Climate plan 2030 'Antwerp for Climate'	The Climate Plan 2030 is a specific plan to reduce CO2 emissions within the territory of the city. In the first instance, the city will achieve this, in collaboration with all stakeholders, by reducing energy consumption for living, working and traffic, and making these more sustainable. A pleasant and healthy living environment, affordable and reliable energy supply, strengthening of the economic fabric with the creation of sustainable jobs, are some of the other avenues. 'Antwerp for Climate' bundles all measures and projects, and calculates them into potential climate gains.	With its Climate Plan 2030, Antwerp plans to reduce its emissions by 50-55% by 2030 compared to 2005. This is up to 15% more than the levels put forward by the EU. Antwerp is therefore the first city in Flanders to mirror the European Green Deal.
Strategic Spatial Plan Antwerp	The Antwerp Strategic Spatial Plan is an overarching vision for the city as a whole, that provides guidance on the spatial challenges facing the city. The city aims to be the most livable city in Flanders, striving for a high quality of life for its residents and visitors. That means a pleasant city to live, work and stay in. The spatial plan defines three layers which, from a spatial perspective, determine the quality of life in the city: a vibrant residential city, resilient landscape and smart network city. The spatial plan focuses on 7 subareas, each with its own identity. The Left Bank district is one of these 7 subareas. The ambition is to	With the Antwerp Strategic Spatial Plan, Flanders has also made an explicit focus on climate resilience and climate security, by limiting its impact on the climate as much as possible and mitigating the consequences of climate change. In this regard, Left Bank will receive additional focus as a climate-neutral district by 2030.

	deliver the final plan by early 2024, with a time horizon up to 2040.	
Strategic Energy Vision Antwerp (SEViA).	The Strategic Energy Vision Antwerp (SEViA) is a collaboration between the City of Antwerp and Fluvius, the system operator for electricity and natural gas in all Flemish municipalities. It is a spatial analysis that provides a framework for the energy policy of the city of Antwerp by 2050, thereby creating the outlines for a sustainable heat policy in the city. The technical and economic feasibility was examined for various energy concepts (heat grids, 100% electric and renewable gas) as alternatives to fossil fuels. A dynamic heat zoning map - which can be adapted in line with new insights - indicates which fossil-free heating is most beneficial in specific zones of the city.	Through SEViA's analysis and the accompanying heat zoning map, it has become clear that heat grids in many areas of the city offer a huge opportunity to make heat more sustainable. Through these insights, the Plan of Approach for Heat Grids was drawn up, which defines 9 pilot zones to start with the rollout of the heat grid. These are zones with many high-rise buildings, social housing and/or city-owned buildings. A large part of Left Bank is one of these pilot zones.
Antwerp Green Plan	To connect its green spaces and strengthen them both qualitatively and quantitatively, the city has developed a Green Plan. The green policy is tested against this policy document. The Green Plan divides the city into 14 green landscapes, one of which is Left Bank sand plain. Each of the landscapes has its own typical characteristics and strengths. There are also concrete guidelines for each landscape, adapted to the specific needs of the area.	If all the guidelines and actions in the Green Plan are realised, the entire green surface area of the city will grow by 3%, or 187 hectares, compared to 2017. Fully 6% or 358 hectares of green space will receive additional legal protection as a green area, and a further 15% or 819 hectares will become more qualitative thanks to new design or better management. The aim is to create a network of large-scale areas of greenery that liven up the city and give all residents access to pleasant green landscapes. As such, the city aims to create a sustainable living environment for people, plants and animals now and in the future.
Antwerp Water Plan	To protect us from heavy rainstorms and longer periods of drought, the city of Antwerp drafted a Water Plan. An international team of designers and hydraulic engineers made a comprehensive analysis of water over the centuries in Antwerp, and have proposed a framework and solutions to cope with both too much and too little water.	Left Bank offers various opportunities to follow the rainwater cascade, and to create new and widened watercourses and turn areas into wetlands. For example, there is a relatively large area of unpaved public space. The many large roof areas in the district

	Water is systematically given a place when large areas or squares are rebuilt. In addition, the water plan also offers concrete tools and short-term solutions to collect or immediately reuse water in all areas, as locally as possible. The City of Antwerp coordinates the Water Plan, in cooperation with the utilities water-link and Aquafin.	can be made water retardant and/or green, ane used for rainwater recovery.
Food Strategy (2022)	The Antwerp Food Strategy sets out a cross-cutting food policy and strategic framework to address the various links in the food system more sustainably. This policy starts from three basic principles (future-oriented, inclusive and avoiding food waste), four values (innovative, inclusive, circular and culinary) and seven impact makers (including the protein transition in the city's operations, local and future-oriented agriculture and space in the city for food production). With this strategy, the city has a framework for setting priorities and goals in its own approach to food.	
Sustainable Urban Logistics Plan (SULP).	The Sustainable Urban Logistics Plan (SULP) is currently being drafted. The objective of the SULP is for Antwerp to improve the city in terms of livability, without losing sight of the economic reality.	
Flemish Air Policy Plan 2030, Annex 2: description of measures taken by local governments in the air quality zone BEF02A 'Agglomeration of Antwerp'	This plan contains city-based measures to address air pollution in Antwerp. In particular, the goal is to reduce NO2 concentrations and thus reduce the impact of air pollution on our health and environment. The plan was drawn up pursuant to the European Air Quality Directive (2008/50/EC). An update is planned for 2025.	Relevance to Left Bank: - Energy renovation of buildings - Construction/Development: avoiding emissions from future building heating, in particular to protect sensitive functions (residential, schools, nurseries, care institutions). - Tackling emissions in the construction phase: focusing on low-emission and zero-emission machinery, logistics vehicles and power generators, envisaging power points on the public domain Emission-free energy systems (e.g. heat grid): - Mobility and transport: low-emission zone within

		which Left Bank is situated, modal shift to zero-emission/low-emission modes of transport - - - Make the city's own fleet more sustainable for mobility and provide electric logistics - Waste disposal and circular economy: - Low-emission logistics (hydrogen-powered waste trucks) - Green infrastructure and nature-based solutions: -vegetation as a buffer between source of pollution and receiver. Emission-free/low emission machinery for greenery management

Local climate and energy policy of the city of Antwerp

The actions in the Action Plan for the Left Bank are anchored in an existing, ambitious citywide urban policy. The plans below, which include the city's ambitions for climate, spatial planning, energy, adaptation and mobility, frame the urban policy in a Flemish and European perspective. The direct relevance to the Left Bank Mission is also brought into sharp focus. With the Left Bank Mission 2030, the city - from each of these plans - is innovatively accelerating urban development with the necessary partners on board, to take concrete steps towards climate neutrality.

Climate plan 2030 'Antwerp for Climate'

The Climate Plan 2030 implements the European and Flemish legislative framework. The plan is also part of the local government agreement 2019-2024 "The Big Link", in which a clear commitment was made. The Antwerp city administration approved the Climate Plan 2030 on 1 December 2020. The plan includes the necessary intermediate steps, actions that the city intends to achieve by 2030, in order to meet the goals by 2050.

In the Climate Plan 2030, the city made the decision to **reduce carbon emissions by 50%-55%, compared to 2005**. With this ambitious plan, Antwerp followed up on the **European Green Deal.** In addition to the substantive plans, the city set up a governance structure to work with all residents, entrepreneurs, organisations and businesses to implement the Climate Plan.

The city drew up a concrete set of measures to reduce CO_2 emissions (mitigation) and address climate change impacts such as drought, heat and flooding (adaptation), through a smart approach. The Climate Plan 2030 focuses on collective, systemic and infrastructure-related measures that reach more and larger groups. The climate plan integrates other policies such as Antwerp's water plan and green plan, and emphasizes further rollout and scale-up, for example, to build heat grids or push forward the wave of building renovation.

To roll out the Climate Plan 2030, a governance model was set up with internal and external stakeholders. An independent Climate Director maintains oversight, ensures progress and advises the college. The Climate Council consists of 17 external stakeholders. Members come from local organisations, knowledge institutions, companies and strategic partners of the city, and act in a personal capacity. Under the direction of the Climate Director, the Climate Council advises the college and contributes input and support from various sectors. The Climate Chambers housed within the city are made up of city departments and subsidiary organisations. They are tasked with strategically monitoring the implementation of the Climate Plan 2030, monitoring progress, setting up projects, actions and experiments, and identifying bottlenecks and proposals that need to be put on the policy agenda.

Relevance to the mission: the present Antwerp Climate City Contract argues for accelerated implementation of the Climate Plan 2030 on the Left Bank of the city. The city believes in the Left Bank as a pilot area to accelerate innovation and implementation of actions, to develop and test new tools, with the goal of further scaling them up to the rest of the city. In addition, the governance structure for the implementation of the Left Bank Mission largely builds on the governance model of the Climate Plan 2030.

Strategic Spatial Plan Antwerp (SRA)

The Climate Policy of Antwerp for Left Bank fall within a strategic spatial policy at the Flemish and local levels. In 2018, the Government of Flanders approved the strategic vision of the Flanders Spatial Policy Plan, which envisages an ambitious change pathway to use the existing space more efficiently and reduce pressure on the open space. Having more focus on climate, spatial efficiency and multimodal connections are the main strands at the Flemish level. The cities and municipalities also play an important role in this change pathway. As such, local governments are also starting to draft a municipal spatial policy plan. In 2018, the city drafted an Inspiration paper "Giving space to the city of tomorrow". The inspiration paper contains the spearheads for an overall spatial future vision for Antwerp with a time horizon leading up to 2050, and was produced on the basis of various studies and more than 15 city debates. More than 700 people were involved in drafting the paper.

The Strategic Spatial Plan Antwerp focuses on 3 themes: a vibrant residential city, a resilient landscape, and a smart network city.

- Vibrant residential city: quality, diverse and affordable housing, with energy efficient housing being one of the guiding principles.
- Resilient landscape: making the city resilient to climate change. Heat stress, flooding and biodiversity are fully highlighted in the SRA.
- Smart network city: sustainable transport, space for entrepreneurship and space for energy and circularity.

The Antwerp municipal council approved the draft SRA 'Giving space to the city of tomorrow' on 25 September 2023. Final approval is planned for spring 2024.

Relevance for the mission: With the Antwerp Strategic Spatial Plan, Flanders has made an explicit focus on climate resilience and climate security, by limiting its impact on the climate as much as possible and mitigating the consequences of climate change. The ambitions for Left Bank as one of the 7 subareas where climate ambitions will be scaled up by 2030 were specifically included in the Spatial Structure Plan. The spatial translation of a climate-neutral city district is described in detail in the SRA and is therefore firmly embedded (across legislatures) in the city's policy.

Figure: climate neutral city district - Antwerp Strategic Space Plan

Strategic Energy Vision Antwerp (SEViA).

The city of Antwerp developed a strategic energy vision (SEViA) in cooperation with Fluvius - the system operator for electricity and natural gas in all Flemish municipalities. It is a spatial analysis that provides a framework for the energy policy of the city of Antwerp by 2050, thereby creating the outlines for a sustainable heat policy in the city. The technical and economic feasibility was examined for various energy concepts (heat grids, 100% electric and renewable gas) as alternatives to fossil fuels. A dynamic heat zoning map - which can be adapted in line with new insights - indicates which fossil-free heating is most beneficial in specific zones of the city.

Relevance for the mission: Through SEViA's analysis and the accompanying heat zoning map, it has become clear that heat grids in many areas of the city offer a huge opportunity to make heat more sustainable. Through these insights, the Plan of Approach for Heat Grids was drawn up, which defines 9 pilot zones to start with the rollout of the heat grid. These are zones with many high-rise buildings, social housing and/or city-owned buildings. A large part of Left Bank is one of these pilot zones. Due to the large number of apartment buildings and social housing, located next to an

industrial area with residual heat, Left Bank is the perfect place to implement the rollout.

The specific elaboration toward 2030 is detailed in the "Roadmap 2030: Antwerp citywide heat grid." Where SEViA was an analysis of the off-take area, the Roadmap 2030 addresses the whole chain of the heat grid: the renewable residual heat sources, the heat grid itself and the buildings that can connect. Left Bank is one of the areas that will largely connect to the heat grid by 2030, supporting large apartment buildings toward climate neutrality.

The Left Bank heat grid will be rolled out over the period 2027-2030 with industrial residual heat from Melselepolder, port area on the Left Bank of the Scheldt. With the scale of this project and the linking of multiple sources on one network, Antwerp is playing a pioneering role within Flanders. The city's ambition is to connect 200,000 households or 50% of buildings to the heat grid by 2050. This is an enormous challenge that requires close collaboration with Fluvius. The acceleration on the Left Bank is designed to learn from the barriers and opportunities associated with effectively connecting residential and non-residential buildings.

Antwerp Green Plan

Brief description: To connect its green spaces and strengthen them both qualitatively and quantitatively, the city has developed a Green Plan. The green policy is tested against this policy document. The overarching Green Plan for the city as a whole outlines the desired green structure and general principles that can be applied citywide. The Green Plan divides the city into 14 green landscapes, one of which is Left Bank sand plain. Each of the landscapes has its own typical characteristics and strengths. There are also concrete guidelines for each landscape, adapted to the specific needs of the area.

Relevance for the missie: if all the guidelines and actions in the Green Plan are realised, the entire green surface area of the city will grow by 3%, or 187 hectares, compared to 2017. Fully 6% or 358 hectares of green space will receive additional legal protection as a green area, and a further 15% or 819 hectares will become more qualitative thanks to new design or better management. The aim is to create a network of large-scale areas of greenery that liven up the city and give all residents access to pleasant green landscapes. As such, the city aims to create a sustainable living environment for people, plants and animals now and in the future. Specifically for Left Bank: Before the launch of the Green Plan, several redevelopment projects in the Sand plain had already been decided on. The Charles De Costerlaan will be downgraded and given a green layout (6.8 hectares). The Sint-Annabos is largely left separate from the Oosterweel project. Applying suitable management, the diversity and visual quality can be further enhanced. A redevelopment of the Middenvijver residential expansion area as open space was also recently approved. This will generate 33.1 hectares of green space. Once all projects planned in the landscape are realised, the green area of the Left Bank sand plain will have grown by 13 hectares, or 4.2%. In addition, 125 hectares of the existing area, or 40% of the landscape will have taken on a more qualitative character.

Antwerp Water plan

Brief description: To protect us from heavy rainstorms and longer periods of drought, the city of Antwerp drafted a Water Plan. Other ways to collect water runoff, or significantly delay it, need to be explored. The city commissioned a water plan so that water can once again have a place in the city and to increase water awareness in Antwerp. The aim is not just to prevent floods. Water also makes the city more attractive, pleasant and cooler in the summer. An international team of designers and hydraulic engineers made a comprehensive analysis of water over the centuries in Antwerp, and have proposed a framework and solutions to cope with both too much and too little water. Water is systematically given a place when large areas or squares are rebuilt. In addition, the water plan also offers concrete tools and short-term solutions to collect or immediately reuse water in all areas, as locally as possible. The City of Antwerp coordinates the Water Plan, in cooperation with the utilities water-link and Aquafin.

Relevance to the mission: As part of the green-blue structure stream valleys and watercourses and thanks to the sandy soil that offers good infiltration, Left Bank offers various opportunities to follow the rainwater cascade, as well as to create new and widened watercourses and turn areas into wetlands. The different urban typologies on the Left Bank also provide opportunities for smart water management. For example, there is a relatively large amount of unpaved public space - relatively wide streets, lots of private greenery and among the many tall buildings - to slow down and infiltrate rainwater and transport excess water towards stream systems. In the more functional and industrial parts of the district, paved street profiles and unused spaces need to be depaved and greened as much as possible to benefit rainwater transport. The many large roof areas in the district can be made water retardant and/or green, ane used for rainwater recovery.

Sustainable Urban Logistics Plan (SULP).

Brief description: The Sustainable Urban Logistics Plan (SULP) is currently being drafted. In 2022, the framework was approved within which an urban logistics policy plan could be drawn up, with guiding principles including Traffic Safety, Connecting, Avoiding, Shifting and Cleaning Up. The first phase included an analysis of current urban logistics in Antwerp. Based on this analysis, challenges could be identified for the different area typologies within the city. Stakeholders were consulted in the spring of 2023, including internally within the city: their input will be taken into account along with the challenges to create informed ambitions and packages of measures. In this way, the SULP will ensure that livability is improved in Antwerp, without losing sight of the economic reality.

Relevance for the mission*:* Antwerp is participating city in a study by the Flemish Department of Mobility and Public Works (MOW) on emission-free urban logistics. This study is complementary to the SULP, so emission-free logistics is not explicitly addressed in the SULP. The study by the MOW also includes possible pilot projects, in which case Left Bank could be looked at to roll out a pilot. This study contributes to the ambition of the SULP to keep Antwerp livable and amenable.

A-2.2: Analysis of existing policy, strategy and regulations

Introduction

The city council approved participation in the EU Mission with strengthened ambitions for the Left Bank based on the idea that accelerating innovation, a district-oriented approach, and concrete work toward intermediate goals is necessary to achieve the larger goal (all of the city climate neutral by 2050). The challenges are immense, but with a focused focus, accelerated innovation, and a district-oriented approach, the city, in partnership with stakeholders, aims to advance Left Bank as a pioneer within the city and thus accelerate scaling up to the rest of the city. Where the above analysis outlined the Flemish and urban policy framework, A-2.2 examines in more detail the (regulatory) barriers at the Flemish level experienced from the urban level. Cooperation between local and supra-local authorities will be necessary to eliminate them and improve the effectiveness of actions.

Given the first analysis of the emissions inventory and the importance of reducing CO2 emissions in buildings, we are currently zooming in on barriers in the area of energy renovation and energy. In a later phase (update of the urban climate contract), thresholds in other policy areas will also be identified (spatial planning, mobility, adaptation, etc.).

Analysis of the barriers in existing policy & regulation in the area of energy transition

To reduce CO_2 emissions by 80% by 2030, the city of Antwerp is fully focused on energy-related renovations, renewable energy generation and green heat. The regulatory framework needs to be adapted to integrate new energy systems. Below is an outline of an analysis of the current barriers to the energy transition, which are hindering the energy transition at the local level.

Renovation

The Flemish energy and climate policy has undergone major reform in recent years. Above all on the ground of energy-related renovation policy, the Flemish government has taken various **initiatives in recent years that increasingly respond to the needs on the ground**. With the 'Mijn Verbouwlening' (My Rebuilding Loan), an essential and up until now lacking financing tool was introduced to the market. The loan is aimed (under specific conditions) at owner-occupiers in the lowest and middle income categories, private landlords and co-owners' associations.

In summary, the 'Mijn Verbouwpremie' (My Rebuilding grant) means that a differentiated grant policy can be pursued, with attention to vulnerable target groups. However, in view of the end of the legislature in 2024, these instruments currently only run until 2026, making projects with a long lead time that are started now uncertain as regards this finance option.

The Government of Flanders took the initiative to set up 'Energiehuizen' (Energy Houses) in Flemish cities and municipalities (or collaborations between municipalities). The structural anchoring of the Energy Houses as a local arm for coordinating and supporting citizens in energy-related renovations is a useful tool for local governments. The interaction between the Energy Houses and the Flemish government, which makes it possible to identify specific barriers and needs on the ground and thus act quickly, is an important step in the right direction.

However, insufficiently adapted regulations and the grant policy for co-owners' associations and landlords remain a major barrier for the city of Antwerp, as well as the search for financing mechanisms for the target group that has no repayment capacity.In developing new Flemish

instruments, the focus is often on single-family homes, but the specifics of co-ownership, the typology of the apartment building and the issue of split incentives are not adequately taken into account. There is a need for instruments tailored to these target groups (label at building level, grant policy at building level, raising awareness of co-ownership, additional support for landlords). In addition, we also note lack of flexibility and the financial realities that often necessitate incremental renovation to label A. On the ground, we also notice a discrepancy between the estimated cost of a renovations (and related ceiling amounts in grant systems) on which the grant policy is based, and the actual cost of a renovation. This means that in practice, the subsidised part is much lower than the theoretically determined percentages.

Flanders' ambition to **better integrate work on the ground related to housing and energy policy** is also a positive development. We see better anchoring of energy and climate policy in spatial planning instruments and the permit policy.

Affordability and pre-financing of energy-related renovations, limited capacity within the Energy Houses and in the building sector appear to be the main barriers to raising the renovation rate to the level needed to reach the Flemish renovation objectives (95,000 comprehensive energy-related renovations per year), but the Flemish government did take substantial steps in the right direction in recent years in terms of content. With growing capacity, the scope of action can also be broadened, which is necessary to go further than providing information. In order to remove the bottleneck for raising the renovation rate at the Energy Houses (based on their role of taking away the burden), the option of further automating the allocation of grants and loans, thereby removing the administrative burden from both the applicant and the Energy House, needs to be looked at.

The Government of Flanders promulgated a renovation obligation. Since 1 January 2023, residential buildings (single-family homes and apartments) have been subject to a renovation obligation. All homes purchased from 2023 on with an E or F label are required to be renovated to a D label or better within 5 years of purchase. This renovation obligation is positive, but on the other hand it is also a missed opportunity by setting the bar at the D label. The number of key moments between now and 2030/2050 is limited, so a B or A label would have been more interesting. The launch of an EPC label at building level for apartment buildings is essential so that a roadmap with the necessary obligations can be rolled out here as well. The EPC label in its current form has a number of shortcomings. For example, there still appear to be problems with the reliability of the EPC certificate and the tool ignores the realisation of climate-neutral renovation.
In addition, there is still room for improvement in the approach to landlords who do not work through social or conventional rentals. For them too, it should be possible to impose minimum EPC requirements towards rentability.

To achieve the necessary acceleration in the renovation rate and the transition to fossil-free energy systems, collective (neighborhood) renovation is often referred to. This measure can be effective but only if the necessary underlying systems are developed to support these projects. The experience of the city of Antwerp in the collective renovation of apartment buildings clearly revealed that the current financial, regulatory, organizational and technological systems are not designed for a collective approach. The translation from collective renovation of apartment buildings to the successful collective renovation of (private) family homes will therefore not only be a matter of creating a renovation offer tailored to a neighborhood, but at the same time will require the development of new financial, regulatory and technological tools.

Electricity from renewable energy

When it comes to increasing the share of renewable energy in electricity generation, local governments are often overlooked While efforts have been made to increase the generation of renewable electricity, this did not lead to an acceleration in the expansion of generation capacity. The policy for solar photovoltaics (PV) in recent years has been more likely to lead to **investment uncertainty and large fluctuations within the sector, for various reasons.** Since the energy crisis in 2022, PV became attractive again for businesses and families.

To better balance supply and demand, we need to to think beyond plot boundaries. Sharing across two addresses is a good first step in this regard, but needs to be expanded for further optimisation. Energy sharing within an apartment building, with another property owned, or between multiple access points of an organisation (e.g., a local government) was already possible in 2022. You could also already sell energy to third parties such as a neighbor or family member.

Since 2023, it has also been possible to create an energy community, within which various energy services can take place such as energy generation, sharing, storage, flexibility, etc. While energy communities can be a means for achieving more renewable energy potential, local flexibility among citizens and businesses, and social inclusion in the energy transition, setting them up, and energy sharing as an activity, still involves various structural obstacles. These are mainly due to a too rapid and complex introduction from European regulations, regardless of existing legislation and initiatives, which means that the processes and framework conditions at various bodies are not yet in place. Building a business case is a major challenge for the time being, because setting it up involves high costs and workload and few benefits, including administration, additional rates from energy suppliers, grid costs (including for parts that are not used), workload and complexity to set up a new entity. Moreover, there is still major risk and uncertainty (rates) and trust between the various partners is required. In other words, it is a good first step, but further optimisation and clarification are still necessary. The support of Flanders through so-called Assistance Hubs or Assistance Teams, which will make the necessary knowledge available to local governments, citizens, PCSW, SMEs, schools, associations, etc. and guide them, will hopefully already make a contribution in this regard.

As for wind energy, Flanders again achieved its own target in 2022, but much of the generation potential remains unexplored for the time being. A catch-up is called for in both solar and wind.

Green heat

Relative to its importance in the energy transition, **heat policy does not receive the attention it deserves**. However, in households, heat represents up to 75% of energy use and 85% of people in Flanders still heat their homes with fossil fuels. To heat the building stock with green energy, encouraging the use of **heat pumps** is important, but there the focus should not be only on individual heat pumps. In many cases, **collective heating systems** are more cost-efficient (both in terms of investment cost and operating cost) and the socially preferable solution to a feasible and affordable energy transition. Especially within major cities, heat demand density represents an opportunity, as does energy exchange between buildings with different functions. Moreover, there is a risk that the large-scale rollout of individual heat pumps in these areas, especially if uncontrolled or haphazard, could lead to noise pollution, pollution of the streetscape, worsening of the heat island effect (from air conditioning systems) and undue pressure on the electricity system. Collective systems can also

reduce the need for capacity on the low-voltage grid. This change requires expert and substantiated guidance. These are aspects that are common ground in guiding the professional field, even at the level of the International Energy Agency.

The Flemish government is expressly looking to local governments to take on the role of **energy director**. Given the specific knowledge on the ground and the fact that local governments are closest to citizens, this seems like a positive development. But local governments currently lack the necessary tools to take on this role of director. The existing grant framework for the rollout of green heat is not adequate for the rollout of large-scale heat programmes. The budgets are too small and the procedure too ad hoc. The rollout of large infrastructure in the form of transmission grids cannot be absorbed in the current financing framework, but is necessary for the rollout of a citywide heat infrastructure. Nor do local governments have the **legal levers** that may be needed to effectively implement heat policy plans or overcome the current barriers.

Towards integrated energy systems

The energy transition not only demands an increase in the generation capacity of green electricity and heat. Sustainably devising the necessary energy services requires **complex and integrated energy systems** to be built step by step, and we do not fully know what the finality of this is today. Optimising the interaction between supply, conversion, distribution, storage and demand across multiple energy vectors, for the purpose of minimising CO_2 and local pollutant emissions, is a vast challenge that still requires research and development. The **current regulatory framework is too restrictive** to develop and test these integrated systems. Given the diversity of local heat challenges, it seems that an overly strict framework would likely never work for all cities and municipalities. Finally, all existing instruments within the energy policy also need to be tested against this challenge. It must be possiblme to use the current framework for energy renovations, of which the EPC is an important part, flexibly in the context of collective heat projects. In order to connect a home to a heat grid, for example, achieving an EPC A label is not always required. In some cases, a combination of specific insulation interventions and modifications to the heat delivery system will be sufficient to heat the home 100% green via a heat grid. This approach could provide a solution for monumental buildings. Individual financial incentives (such as the EPC Label Grant) should be adaptable accordingly. It is also crucial that efficient residual heat can be valorised as renewable energy, so a connection for a home can be a significant plus point.

A-2 .2: Conclusions		
Levers	**Energy-related renovation**	**Renewable energy**
Policy and regulations	• Insufficiently adapted regulations (and grant policy) for co-owners' associations (apartment buildings) • Increase renovation obligation of D label (see infrastructure)	• Make regulatory framework for PV more attractive to increase generation capacity • Further develop the regulatory framework for energy communities and energy sharing to

	• EPC label requirement for all landlords	make the business case (cost/benefit) more interesting. • Provide necessary legal levers for implementation of local heat policy plans • Address the barriers in regulatory framework to achieve integrated energy systems • Better align energy-related renovation policy (e.g. EPC label policy) with renewable energy policy
finance	• Extend and expand 'Mijn verbouwlening' for target groups with no repayment capacity • Adapted financing mechanisms for co-ownership • Adapted financing mechanisms for split incentive • Grant percentages and ceilings: take into account the total renovation cost (in light of livability) which is usually associated with energy-related renovations. • Taking into account capacity for pre-finance	• Grant framework for collective heat is not aligned with major infrastructure works (e.g., construction of heat grids). Too much fragmentation, too small budgets, too short timing.
Infrastructure	• Take into account the actual costs of energy-related renovations • Renovation obligation (since 2023) within 5	• Continue to catch up with generation capacity of wind • Focus on collective renewable heat (heat

	years of purchase: examine whether D Label is highest achievable + intermediate steps to 2050 possible? • For apartment buildings: building-level label	grids, collective heat pumps).
Capacity	• Explore where automation of permits is possible (e.g. according to capacity of Energy Houses) • Focus on the capacity of the building sector	• Strengthen capacity of local energy directors
Participation	• Focus awareness-raising actions and deployment of resources not only on single-family homes but also to co-owners (apartment buildings)	

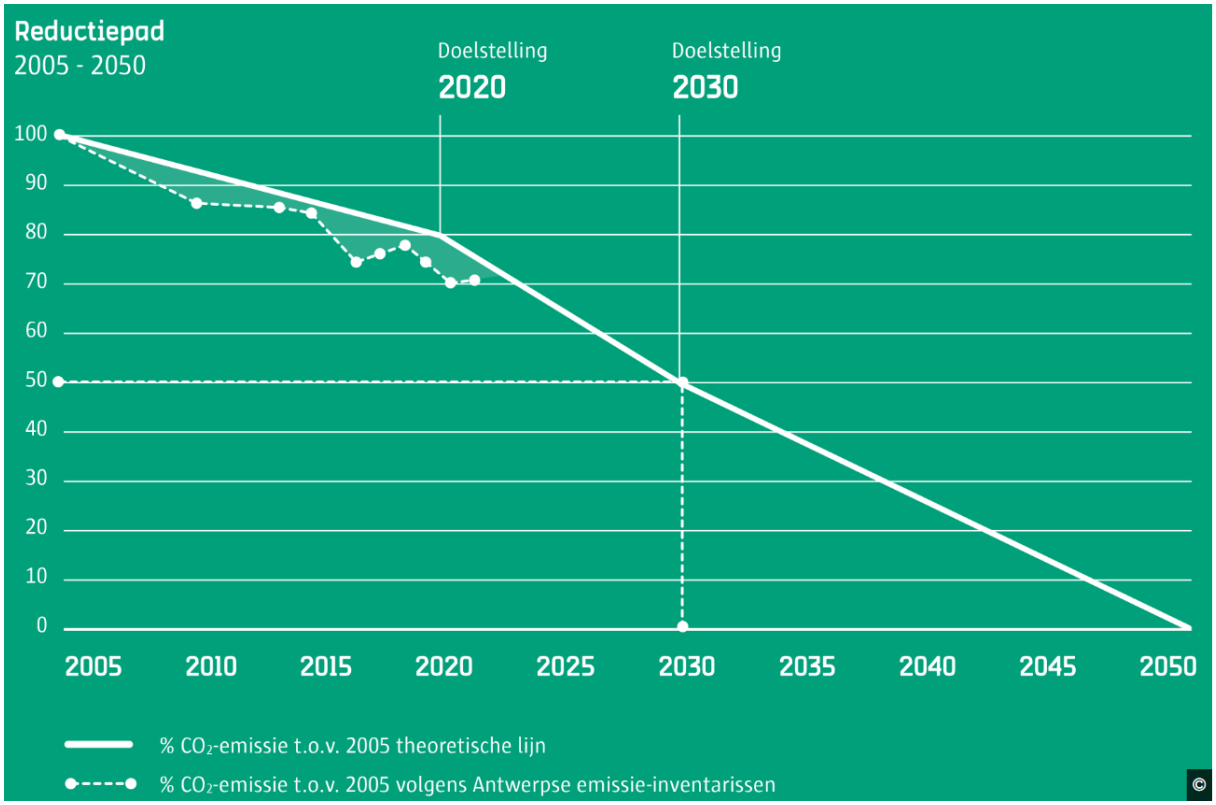
A-2.3: Gap analysis

With its "Antwerp for climate" climate plan, Antwerp aims to be a climate neutral and climate resilient city by 2050.

The climate plan states that in the shorter term, by 2030, we already want to reduce CO2 emissions by 50-55% in urban areas. This reduction has also been set for the Left Bank district, following the implementation of the Antwerp climate plan.

The current Antwerp Climate Plan was approved in December 2020 and covers the period 2021 - 2030. As far as climate adaptation is concerned, many projects have already been implemented to arm the city against the consequences of climate change, such as the decision (and implementation of already 1 route) to invest in a circular water network to combat the consequences of increasing drought and water scarcity in the inner city. Where further work is needed is to concretize the adaptation goals from the climate plan by naming clear target values. For climate mitigation, the city has an annual emissions inventory drawn up on the evolution of CO2-e emissions on its territory. Because of the availability of crucial data, this inventory is always published with a two-year delay. Currently Antwerp is still on schedule to meet its 2030 target (-50% reduction compared to 2005), but a calculation commissioned by the climate director of the city of Antwerp has shown that additional measures are needed to actually meet this target in 2030. Updating the current action sheets in the climate plan and drawing up additional measures/action sheets are therefore points for

attention for the next administration.



Compared to 2005, we observe a 29.1% decrease in emissions in 2021. The strong decrease can be explained by lower fossil fuel consumption, lower electricity consumption across all sectors, a decrease in the emission factor for electricity and the increase in local renewable electricity production from wind and solar power.

Table A-2.3 shows the emissions gap between the targets as formulated in the climate plan for the city of Antwerp, and the climate neutrality target in 2030, as formulated in the Left Bank Mission 2030.

The baseline emissions reflect the results of the emissions inventory for the Left Bank district reference year 2019) by emission domain and are the starting point of the gap analysis

- The residual emissions/offsetting represent the emissions that may need to be offset after implementation of the action portfolio (see also B-2.2: Summary strategy for residual emissions)
- The reduction target represents the difference between baseline emissions and residual emission

A-2.3: Emissions gap										
	Baseline emissions		**Residual emissions / offestting**		**Reduction target**		**Reduction emissions existing policies**		**Emissions Gap**	
	absolute waarden	percentage	absolute waarden	percentage	absolute waarden	percentage	absolute waarden	percentage	absolute waarden	percentage
Gebouwen	35.376,64	71%	7.075,33	20%	28.301,31	80%	14.150,65	50%	14.150,65	50%
Transport	10.427,30	21%	2.085,46	20%	8.341,84	80%	4.170,92	50%	4.170,92	50%
Afval	2.996,90	6%	599,38	20%	2.397,52	80%	1.198,76	50%	1.198,76	50%
Ongedefinieerd	1.056,12	2%	211,22	20%	844,90	80%	422,45	50%	422,45	50%

Module A-3 Systemic barriers and opportunities for climate neutrality by 2030

Introduction

Where the regulatory framework analysis (Module A-2) highlighted barriers in the supra-local legal framework, this module focuses on an analysis of systemic barriers, challenges and opportunities for the city toward climate neutrality. Based on the stakeholder discussions and system mapping workshops, the barriers and opportunities for the Left Bank were listed.

Module A-3 describes who the city collaborated with (A-3.1), the methodology used (systems mapping, A-3.2), what the focus will be (barriers and opportunities, A-3.3) and the approach the city and its partners will take (methods in tools, A-3.4).

A-3.1: Stakeholder mapping

A key aspect of Antwerp's approach to the Left Bank Climate Neutral mission is the ambition to achieve far-reaching collaboration. Based on an intensive partnership, barriers will be addressed and opportunities capitalised on. Based on the discussions and the analysis of the current situation, a stakeholder mapping was carried out. These are both the stakeholders responsible for the major emission domains and different stakeholders per lever. A number of stakeholders were incorporated into the project structure (coordination consultation), others are specifically deployed in the implementation of the action plan.

From late 2022 to the spring of 2023, around 30 stakeholders were asked about their vision for the mission, their possible roles and potential opportunities and barriers. These exploratory discussions with mainly external and some internal stakeholders provided highly valuable information that significantly contributed to and inspired the process of defining barriers and opportunities and subsequent impact pathways. Annex A-3.1 includes the overview of stakeholders in the preparation phase of the Left Bank Mission.

In line with the priorities of the mission, a **diverse group of stakeholders** was involved in the discussions. Depending on their expertise or work domain, and taking into account their own goals and capacities, **all stakeholders spoken to expressed their willingness to contribute to the realisation of the Left Bank mission** and to reflect and engage in further discussions on the subject.

The following are the **main take-aways** from these discussions:

- Plan actions and measures in a well-informed and timely manner, and also coordinate them with all involved parties in the broad sense. To avoid unpleasant surprises, but also to possibly combine and reinforce the actions and measures.
- Connected to this: also communicate actions and measures in a timely and suitable manner to the target group(s).
- Continue to push for changes in supra-local legislation where necessary and support where desired. Continue to scrutinise local regulations and support and make adjustments as needed.
- Keep in mind that it is not always straightforward or feasible to go beyond implemented standards/policy.
- Share experiences as much as possible so that other stakeholders can benefit.

- As a city, take advantage of the chosen contours of the project area to one district for experimentation, and emphasise the added value of this to stakeholders as well.
- As a city, also envisage in-house financial resources to implement the actions.
- Ensure that the energy and climate transition involves everyone, including the most vulnerable, and that everyone has a voice in it.

In addition to the stakeholders already involved in drafting the action plan, (types of) actors relevant in light of the implementation of the mission were also identified. Throughout the implementation phase, the ambition was also to establish an intensive partnership and attract new stakeholders on board throughout the operation of the mission, towards climate neutrality on Left Bank 2030.

Stakeholdermapping Mission Climate Neutral Left Bank 2030 :

Stakeholder category	Description	Impact	Influence	Strategy	Importance of the mission for stakeholder	Desired contribution	Actions to avoid	Strategy to engage stakeholder	Desired community building and/or communication products
Supralocal governments	European, federal, Flemish and provincial	High	High	Consultation	- Realise supra-local ambitions - Support local governments from supra-local role - Remove barriers in terms of regulatory framework	- Actively contribute to (an acceleration of the) mission by e.g. (steering) the adaptation of supra-local legislation or release of budgets - (Stimulate) knowledge exchange	- Indifference with regard to "local mission" - Political deadlock, meaning that the desired supra-local actions cannot be taken	Regular political and official meetings to identify bottlenecks and get them adjusted	- Representation in the coordination consultation (see NetZeroCities and VEKA) - multilevel governance - use existing consultation bodies at the official level - EU mission to address bottlenecks in cooperation with other major cities (including non-mission cities). - Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
City of Antwerp et al. local governments	City departments, subsidiaries, district and other local governments: AG Vespa, AG Stedelijk Onderwijs, AG Zorgbedrijf, etc.	High	High	Involve	- Co-execute decided policy - Include agreed role in mission - Possibility to test out actions for citywide rollout	Smooth and active cooperation to include (also in the context of decided policy) at least agreed role in mission	Insufficient cooperation to carry out agreed role due to not being (or feeling) sufficiently involved in the mission	- Stakeholder discussions to prepare mission - Regular alignment on relevant actions of the mission - emphasise the importance of their role in the Left Bank mission	- Representation in coordination consultation (see cabinets, company directors; K&L directorate and mission core team) - Regular coordination on relevant actions of the mission

									- Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Woonhaven Antwerp	Social housing company	High	High	Involve	- (Accelerated) realisation of the city's own stated ambitions in terms of energy-related renovation of the housing stock on the Left Bank - Take care of and involve social tenants in the mission	In accordance with the importance of the mission for stakeholder itself (see column opposite)	Insufficient cooperation to carry out agreed role due to not being (feeling) sufficiently committed to mission - Shift the focus on the energy-related renovation of the housing stock to another region	- Stakeholder discussions to prepare mission (already done) - Regular alignment on relevant actions of the mission	- Representation in coordination consultation - Regular coordination on relevant actions of the mission - Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Infrastructure, transport and utilities	Aquafin, Electrabel, Fluvius, De Lijn, NMBS, etc.	High	High	Involve	- Realise (and accelerating) the city's own ambitions for sustainable transformation on the Left Bank - Possibility to test out actions before citywide/national rollout	Actively contribute to realise (various) actions set up within the framework of the mission	Insufficient cooperation to carry out agreed role due to not being (or feeling) sufficiently involved in the mission	- Stakeholder discussions to prepare the mission - Regular alignment on relevant actions of the mission - Political consultation when needed or desired	- Representation in coordination consultation (Fluvius) - Regular coordination on relevant actions of the mission - Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Residents	- Regarding housing: both	High	Low	Support	- Make (accelerated)	- driving force to (accelerate) the	- Not involved or aware of	- Through interest groups, resident	- Future representation in coordination

	tenants and (co-)owners - Regarding status/income: all residents, with special attention to vulnerable target groups				energy-related renovation of rental or own home feasible - Be aware of what is happening in own district in the context of the mission	energy-related renovation of homes - Where applicable, develop actions (with city support) to lower the barriers. - Raise awareness of energy consumption (in addition to renovation)	the mission - burden of energy-related renovation too high - reluctant to implement the actions from the climate plans	and leisure associations - Social housing residents: via Woonhaven	consultations (through civil society)? - Organise activities (or connect to existing activities) to inform, encourage (generate enthusiasm/nudging) and support residents - Website/newsletter
Various companies on Left Bank	Retail and hospitality, limited number of businesses on Katwilgweg, medical practices, etc.	High	Low	Support	- Make (accelerated) energy-related renovation of rental or own premises feasible - Be aware of what is happening in own district in the context of the mission	- invest to (accelerate) energy-related renovations of buildings - Where applicable, develop actions (with city support) in (broad) framework to stimulate sustainability of own business activities. - Raising awareness of energy consumption	- Not involved or aware of the mission - burden of energy-related renovation too high - reluctant to implement the actions from the climate plans	- Organise relevant activities (info, questionnaire, etc.) with/by interest groups, sector federations, etc.	- Organise activities (or connect to existing activities) to inform and support businesses - Selectively invite to launch event Mission Left Bank Feb 2024 - Website/newsletter

Companies with offering in the context of Mission Left Bank	Innovative companies and start-ups: construction, technology, mobility, etc.	Low	High	Convince and Collaborate	- Focus on and/or test elaborated products or services with link to sustainability (with or without city support) - Possibility to pioneer and bring in more (future-oriented) business - Contribute to urban and broader sustainability ambitions	Actively contribute to realise (various) actions set up within the framework of the mission	Not involved or interested in or unaware of mission = missed (action) opportunities Economic feasibility of innovative projects is too low Regulatory framework is not supportive enough	- Launch project calls through in-house communication channels (K&L, B&I) - Launch project calls through interest groups, sector federations, etc. - consultation sessions with higher authorities to remove barriers.	- Representation in coordination consultation (Samen Klimaatactief, Flux50, ODE) - Consultation sessions with higher authorities to remove barriers - Organise activities (or connect to existing activities) to generate enthusiasm among and support companies - Selectively invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Project developers	In particular, Ghelamco (Katwilgweg business park) and Vooruitzicht NV (Regatta residential area and FAB181).	Low	High	Convince	- Be able to participate on a large scale in city-related (and broader) sustainability ambitions = also good for image - Take advantage of opportunities regarding e.g. energy systems (renewable energy)	Actively contribute to realise (various) actions set up within the framework of the mission	Insufficient cooperation to perform agreed role due to not being (feeling) sufficiently committed to the mission	- Stakeholder discussions to prepare mission (already done) - Regular alignment on relevant actions of the mission	- Organise activities (or connect to existing activities) to generate enthusiasm among and support project developers - Selectively invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Real estate sector: development	- Brokers - Building trustees	Low	High	Convince	- Gain additional opportunities from the mission to	In accordance with the importance of	Insufficient cooperation to carry out	- Stakeholder discussions to prepare mission	- Representation in coordination consultation (CIB)

and management	- Real estate federations				encourage co-owners to carry out energy-related renovation of homes homes based on their own role	the mission for stakeholder itself (see column opposite)	agreed role due to not being (or feeling) sufficiently involved in the mission	- Regular alignment on relevant actions of the mission	- Organise activities (or connect to existing activities) to generate enthusiasm among and support the real estate sector - Selectively invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Financial institutions	- Commercial banks - Lenders	Low	High	Convince	- Focus on and/or test elaborated products or services with link to sustainability (with or without city support) - Possibility to pioneer and bring in more (future-oriented) business - Contribute to urban and broader sustainability ambitions	Set up new finance models to enable / accelerate certain actions in the mission	Insufficient cooperation to carry out agreed role due to not being (or feeling) sufficiently involved in the mission	- Stakeholder discussions to prepare the mission (largely completed) - Regular alignment on relevant actions of the mission	- Organise activities (or connect to existing activities) to generate enthusiasm among and support the financial sector - Selectively invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Associations and organisations of all kinds (civil society) on Left Bank	Namely, interest groups, leisure and residents' associations	High	High	Involve	- Work towardsa on better district and city-related (and broader) sustainability ambitions based on the city's operations - Be informed and inform members	- Be part of the story to (accelerate) the energy-related renovation of homes - Where applicable, develop actions in-house (with	- Not involved in or unaware of the mission - (Organised or otherwise) refusal to contribute to the mission	- Organise relevant activities (info, questionnaire, etc.) with/by interest groups, sector federations, etc.	- Future representation in coordination consultations (on behalf of residents)? - Organise activities (or connect to existing activities) to inform, survey and generate enthusiasm among civil society

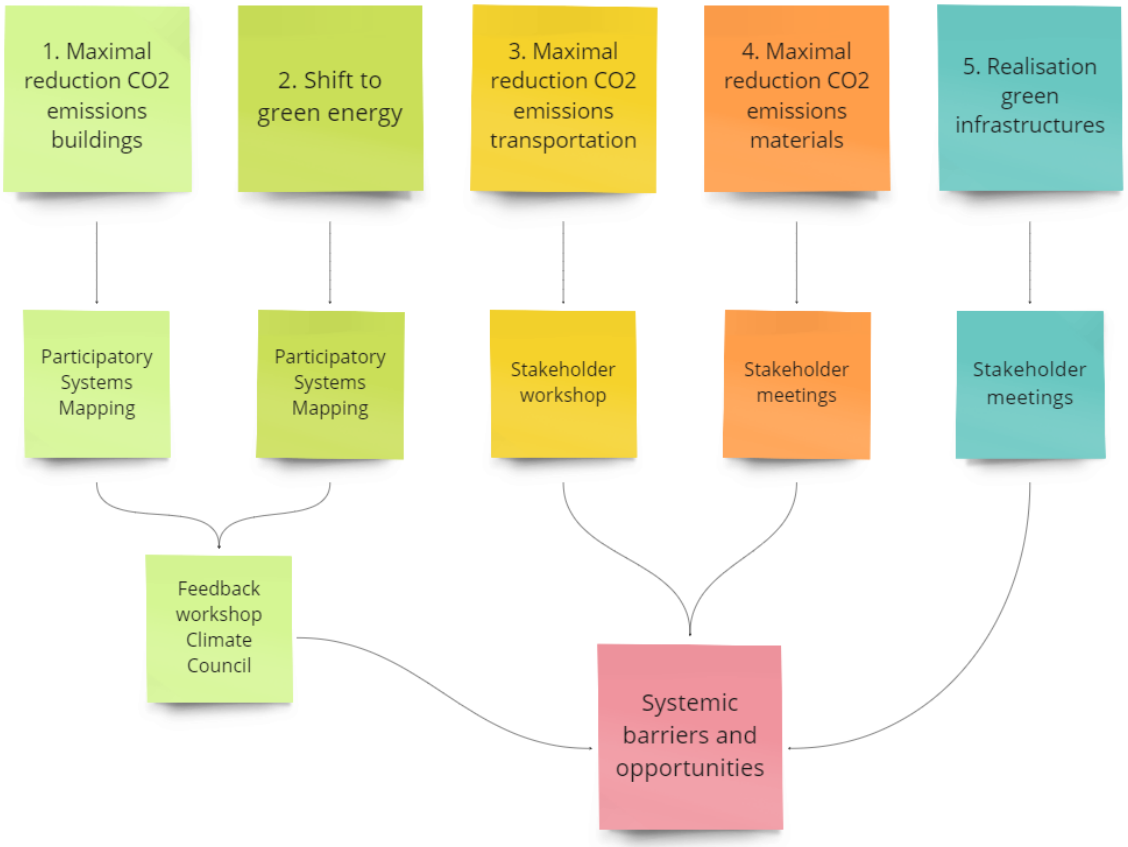
					about what is happening in the city's districts in the context of the mission	city support) in the (broad) context of the mission: every little bit that saves energy helps - Inform members about what is happening in their own districts in the context of the mission and encourage them to take action			- Selectively Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Associations and organisations of all kinds (civil society) with an offering in the context of the mission	In particular the social dimension of the mission (participation, vulnerable target groups, etc.)	Low	High	Convince	- Focus on and/or test elaborated products or services with link to sustainability (with or without city support) - Possibility to pioneer and bring in more (future-oriented) business - Contribute to urban and broader sustainability ambitions	Actively contribute to realise (various) actions set up within the framework of the mission	Not involved or interested in or unaware of the mission = missed (action) opportunities	- Launch project calls through in-house communication channels (K&L, B&I) - Launch project calls through interest groups, sector federations, etc.	- Organise activities (or connect to existing activities) to generate enthusiasm among and support civil society - Selectively invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Knowledge Institutions	University of Antwerp, VITO and other research	Low	High	Convince	- Focus on and/or test elaborated products or services with link	Actively contribute to realise (various) actions set up	Not involved or interested in or unaware of the mission	- Draft assignments - Launch project calls through in-	- Organise activities (or connect to existing activities) to generate enthusiasm among and

	institutions and knowledge centres (in the broad sense)				to sustainability (with or without city support) - Possibility to pioneer and bring in more (future-oriented) business - Contribute to urban and broader sustainability ambitions - jointly focus on grant project calls relating to climate transition	within the framework of the mission	= missed (action) opportunities	house communication channels (K&L, B&I) - Launch project calls through interest groups, sector federations, etc. - Ask to share knowledge and expertise	support knowledge institutions - sign declaration of commitment - Selectively Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter
Other stakeholders	Surrounding municipalities, other mission cities, international associations and organisations, etc.	Low	Low	Inform	Be aware of and/or learn from successful (or unsuccessful) actions in the Mission Left Bank	Knowledge exchange to adjust or accelerate the mission	For surrounding municipalities : dissatisfaction with / protest against action(s) from the mission	- Ask to share knowledge and expertise	- Incorporate consultation sessions - Selectively Invite to launch event Mission Left Bank Feb 2024 - Website/newsletter

A-3.2: System mapping

Introduction

The systems analysis was built step by step. It started from the five thematic action areas defined earlier. Workshops and stakeholder meetings revealed the main barriers and opportunities:



Participatory Systems Mapping (Buildings and Renewable energy)

The focus of this first phase of the mission to climate neutrality is the reduction of CO2 emissions from buildings and the shift to renewable energy. A system mapping workshop was prepared for the first two areas of action. This exercise aimed to uncover interconnections and key patterns and dynamics to enable systemic change and accelerate transitions by 2030.

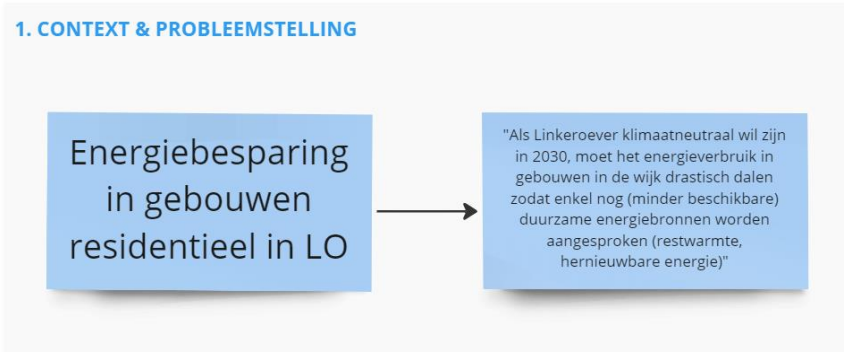
Two co-creative thematic workshops (approach using System Mapping Academy's Systems Mapping toolkit) were set up with the following builup:

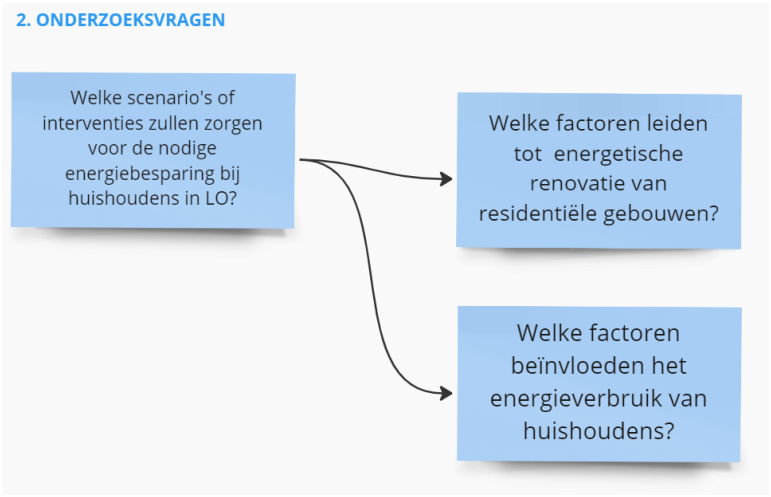
1. Introduction to system mapping
   Participants were introduced to systems-based approaches such as systems mapping and drawing up 'causal loops'.
2. Framing the system
   Every session starts from a problem definition. Research questions are put forward and the scope of the exercise is worked out.
3. Determining the variables
   The possible variables that have an impact on the problem definition are listed

4. Mapping the variables and interrelationships
   The interrelationships between the variables are visually mapped
5. Identifying levers for change
   Based on this analysis, levers for change are identified and developed

System mapping 1: Residential buildings

An initial workshop explored the factors that influence energy savings in residential buildings.





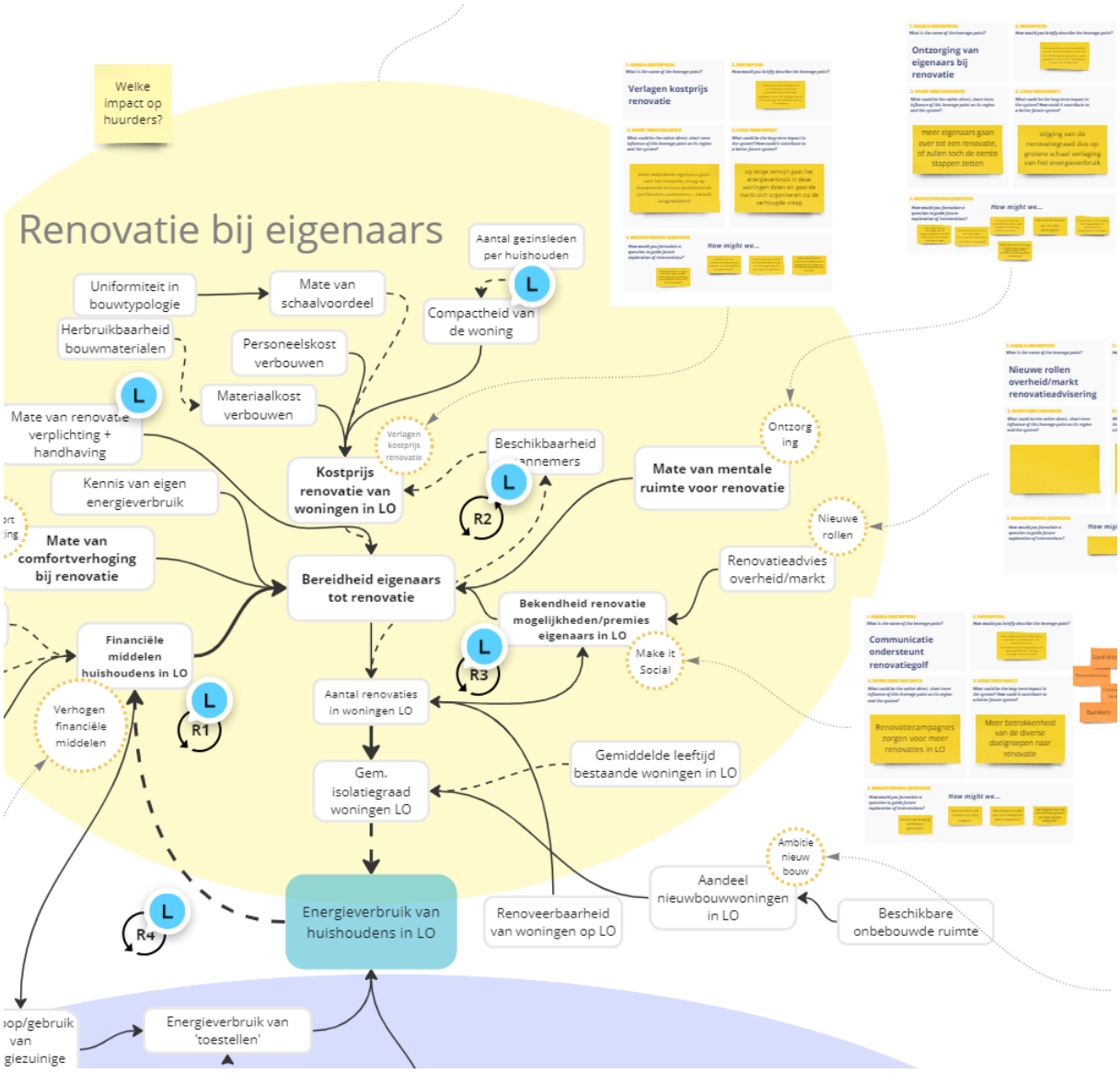


Figure: Detail of system mapping Energy consumption buildings

System mapping 2: Fossilfree enegy consumtion

A second workshop explores the broad energy system and the factors affecting the transition to renewable energy.

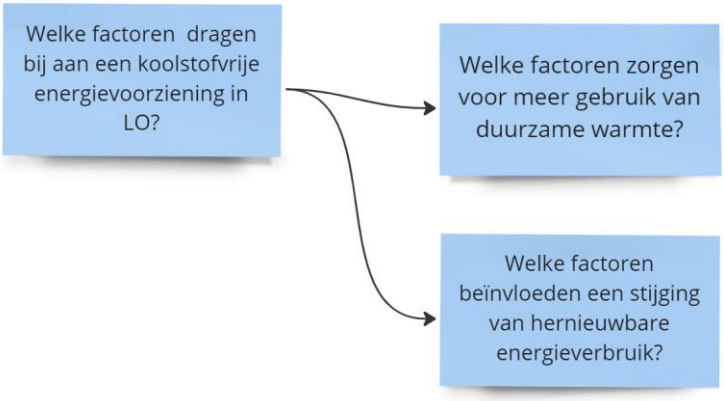
1. CONTEXT & PROBLEEMSTELLING

Een koolstofvrije energievoorziening in LO

→

"Als Linkeroever klimaatneutraal wil zijn in 2030 zal de wijk niet alleen minder energie moeten verbruiken, maar ook voorzien worden van (lokale) duurzame energie en warmte."

2. ONDERZOEKSVRAGEN



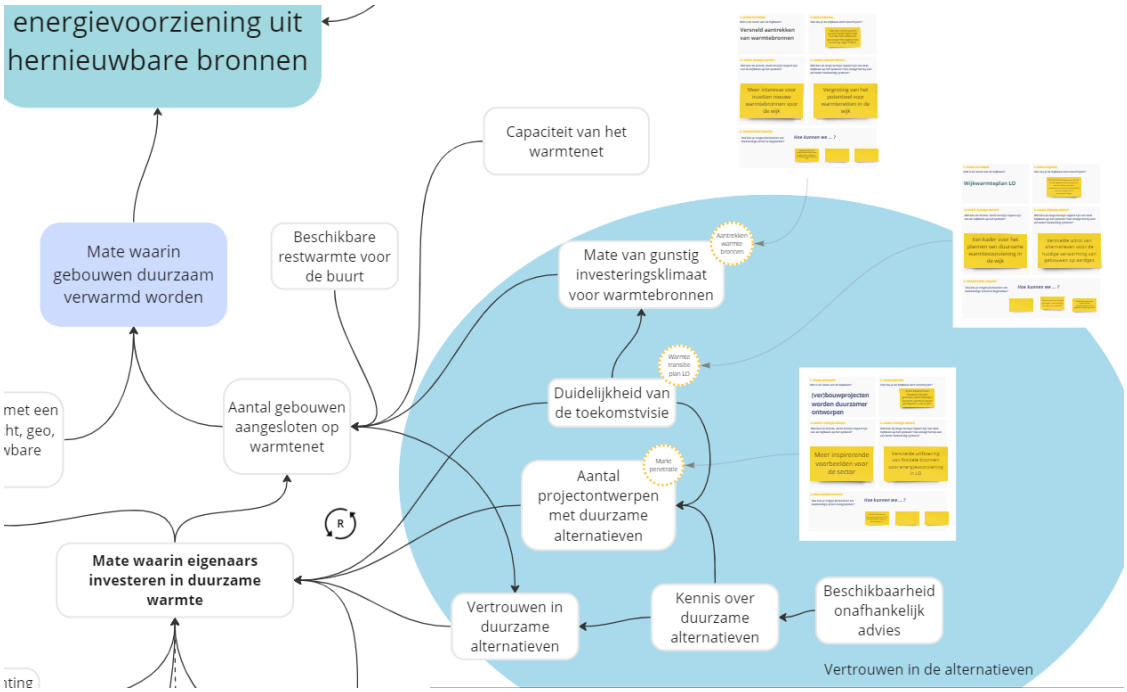


Figure 1: Workshop with members of the Antwerp Climate Council

The results of the workshops are system maps and sheets that name systemic levers for change and give rise to translation into actions. The results were presented and discussed with the members of the Climate Council of the City of Antwerp. Together with the many stakeholder discussions, this gathered valuable feedback for further shaping the mission. The sheets of the levers and system maps are attached as an annex

Figure: Example of sheet in system mapping

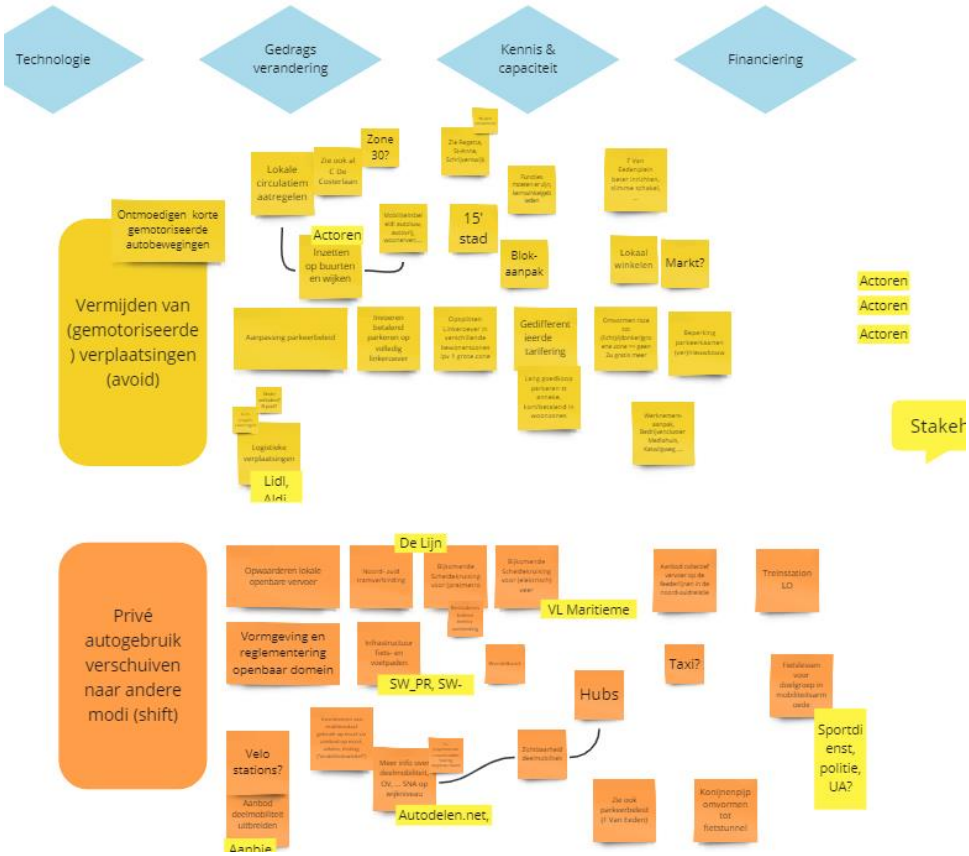
Workshop transport and mobility

For the system analysis around the themes of mobility and transportation, the starting point was the city's existing mobility vision. This is defined from 4 principles:

1. Avoiding motorized travel (avoid)
2. Shift private car use to other modes (shift)
3. Accelerated green shift (improve)
4. From private to shared use (liquid)

An internal workshop was organized within the city with relevant employees of the city of Antwerp. In addition, discussions were held with relevant external partners such as project developer

Vooruitzicht, public transport company De Lijn, ...



Method of stakeholder workshop Mobility and transportation

Stakeholdermeetings materials and green infrastructure

To gain insight into the opportunities and barriers around the themes of circularity (materials, waste) and green infrastructure, stakeholder meetings were set up with city staff and external parties. The Urban Management department was involved in waste collection and the Spatial Planning department in current and planned spatial developments (RUP Sint-Anneke plage, Europark, etc.).

From these discussions, actions and links were detected to complement and strengthen the action portfolio.

A-3.3: Description of the systemic barriers and opportunities for climate neutrality 2030

The stakeholder interviews and system mapping (A-3.1, A-3.2) prompted the formulation of a number of key systemic opportunities and barriers:

Reduction of emissions from buildings		
Barrier (B)/ Opportunity (O)/ Both (A)		**Description**
Similar typologies that are representative for the city of Antwerp	O	83% of the district consists of collective housing, so addressing renovation collectively offers a lot of potential for accelerating/scaling up the renovation rate
Large maintenance backlog for apartment buildings	B	Co-owned apartment buildings, which in the Left Bank district were mostly constructed in the 1960s and 1970s, often have a

		high maintenance backlog due to their complex structure (legal, socio-demographic and financial).
Significant amount of collective boilers	O	the significant amount of collective boilers in multifamily housing (in co-ownership and with the social housing company) improve the business case of a future heat grid and the realisation of (temporary) heat grids
Addressing unitary districts	B	Parts of the Left Bank district with the same typology of houses (unitary districts) allow for a more efficient collective approach to renovation
Limited rollout of digital meters	B	Limited rollout of digital meters These give both the owner and grid operator a better overview of the energy consumption depending on the switch to non-fossil energy.
Opportunity to combine heat grid infrastructure projects	O	Various infrastructure projects (mobility works, project developments) are planned in the Left Bank in the coming years. These may offer an opportunity for the accelerated construction of a heat grid in the district
Opportunity to combine heat grid with the spatial development of the district	O	The typology of the district, with an over-dimensioning of the public domain, is advantageous for the construction of a heat grid and heat islands
Higher heat demand density	O	The heat demand density in Left Bank is relatively high. This makes efficient solutions possible in terms of the rollout of the heat grid
No definitive planning for the construction of the heat grid	B	There is no definitive planning yet for the rollout of a heat grid in Left Bank. For part of the housing stock to be renovated in the district, the investment decision for connection therefore comes too late and there is a possible risk of lock-ins according to climate neutrality
Modifications of the electricity grid	B	The electricity grid on the Left Bank is not yet ready for the energy transition and electrification envisioned by 2030
Legislation facade PV	B	Due to the large proportion of apartment buildings in the district, generating solar energy through the facades (rather than on the roof) may be an excellent opportunity. However, there are still insufficient regulations in this area to achieve concrete realisations
Area-based work	O	The district is well-defined and smaller than the city area as a whole, making it easier to test new ways of thinking and doing things. The area-based approach can therefore be an opportunity.
40% social housing	A	Just one partner, Woonhaven, owns 40% of the housing stock in the district. It is therefore obviously an essential partner, but there is also a lot of dependence on this partner.
Knowledge about renovation support	B	Owners are not fully aware of the possibilities for renovation and support/grants.
Market offering for finance collective renovation	B	The offering in the market for finance products for collective renovation is limited.
High cost of renovations of social housing	B	Woonhaven has insufficient repayment capacity (via rental income) for the intended ambitions in terms of renovating the housing stock

High cost of renovating housing	B	Owners have insufficient financial resources to implement the necessary renovation goals. The current financial solutions are not currently sufficient to implement the desired acceleration
Investment gap heat grid	B	At the supra-local policy level, no investments are envisaged for the rollout of the proposed heat grid in the Left Bank. There is currently a shortfall of around 30% in the finance for construction (via grid operator Fluvius).
Moving house from social housing	B	The renovation of Woonhaven's housing stock follows the pace of social tenants moving house. To meet the targets by 2030, solutions will have to be found, at the same time respecting the residents involved
Coalition building for collective renovation	B	The city is currently the main driver of the renovation objectives. The current model of master plan renovation coaching by the city does not have the capacity to meet the goals by 2030. This is where coalition building is needed to achieve scale-up.
Role of the building trustee	B	The building trustee plays a key role in the renovation of apartment buildings. But they do not always sufficiently fulfil this role. This presents a barrier to scaling up/acceleration.
Supralocal support tools are not tailored to target group	B	Supra-local support tools for renovation often do not take the specifics of co-ownership, the typology of the apartment building and the issues of split incentive sufficiently into account.
No strict obligations for comprehensive renovation	B	There are no strict obligations for owners (renovation obligation D label) for comprehensive renovation
Regulatory framework not adapted to climate transition	B	The intended transition to climate neutrality has a spatial impact (facade insulation, noise, etc.) on the neighborhood. The regulatory framework has often not yet adequately provided for this
Pilot zone heating	O	The Left Bank was chosen as a pilotzone for the outroll of the city heating grid.
Insufficient inclusion in planning instruments	B	Climate-positivity isn’t supported by existing spatial planning instruments
Prices of gas versus electricity		Currently, the price of electricity remains relatively more expensive than gas. This constitutes a brake on the energy transition
Regulatory framework for energy sharing	B	The regulatory framework makes energy sharing within apartment buildings difficult to apply. This is a barrier on the acceleration of renewable energy generation in the district
Limited capacity of the building sector	B	There is limited capacity in the building sector (construction companies, engineering firms, architects, etc.). This may be a barrier to achieving the renovation goals
Older population	A	On average, the residents in the Linkoever are older than in the rest of the city. This could mean more changes in ownership in the coming years. Depending on how the renovation challenge is addressed, this can represent both an opportunity and a barrier

Difficulty introducing innovative products and services to co-owners' associations	B	The complex structure of a co-owners' association (VME) means that even a pilot project involves convincing a majority of owners to adopt an innovative approach.
Split incentive of landlords	B	Landlords who make energy investments in rental properties do not themselves derive any added value from the decrease in energy costs, as they benefit the tenant.

Reduction of emissions materials		
Barrier (B)/ Opportunity (O)/ Both (A)		**Description**
Sorting streets	O	Left Bank is the only district in the city where waste collection with sorting streets is still part of the policy. This presents an opportunity for improving selective waste collection and efficient mobility with waste collection trucks.
Pilots for reusing building materials	O	The district offers space for pilot projects for reusing building materials.
Circular pilot projects	O	The city has experience in developing ambitious district-oriented pilot projects with partners in the circular economy (Circulair Zuid, De Kringwinkel)

Reduction of vehicle emissions		
Barrier (B)/ Opportunity (O)/ Both (A)		**Description**
Space for cars	O	The historical layout of the public domain is geared toward vehicle traffic, and therefore in spatial terms does not provide an additional incentive for achieving the desired modal shift
Space for public transport	O	On account of its spatial layout with wider streets, the district lends itself more easily (compared to the city centre) to more effective access via public transport
Open space for logistical bundling	O	The typology of the district offers opportunities for bundling, and therefore reducing, logistical movements. There is space for goods storage, transshipment, etc.

Shift to renewable energy		
Barrier (B)/ Opportunity (O)/ Both (A)		**Description**
Legislation facade PV	B	Due to the large proportion of apartment buildings in the district, generating solar energy through the facades (rather than on the roof) may be an excellent opportunity. However, there are still insufficient regulations in this area to achieve concrete realisations
Insufficient embedding of climate positivity in planning tools	B	Climate positivity is not supported by sustainable planning tools (Spatial implementation plans, etc.).
Regulatory framework for energy sharing	B	The regulatory framework makes energy sharing within apartment buildings difficult to apply. This is a barrier on the acceleration of renewable energy generation in the district

Compensation green infrastructure		
Barrier (B)/ Opportunity (O)/ Both (A)		**Description**
City development and green	O	Large-scale spatial projects are already underway in the district (Scheldeboorden, etc.) that focus on greening and improving the district's climate resilience. This represents an opportunity to bolster this dynamic with new projects
Underutilised green spaces	O	The Left Bank still features a lot of underutilised green space (lawns, central verges, etc.). This provides opportunities for realising even more climate-robust green and blue networks.

Transition related		
Barrier (B)/ Opportunity (O)/ Both (A)		**Description**
Area-based work	O	The district is well-defined and smaller than the city area as a whole, making it easier to test new ways of thinking and doing things. The area-based approach can therefore be an opportunity.
Diverse district	A	The Left Bank is a diverse district in terms of the composition of its residents (as is the city itself). From new construction projects to social housing, young and old, cultural diversity, ... This requires a focus and effort to work out a participatory approach tailored to the various target groups. Moreover, it also offers an opportunity to subsequently scale up an approach that works well
Area-based work	B	The city's organisation does not currently work with an area- or district-based approach for projects of such complexity. This offers opportunities for subsequent scale-up of a successful approach, but also presents a barrier as new ways of governance need to be devised.
Internal collaboration	B	This mission requires close cooperation between departments within the city organisation. The current silo effect is a barrier to achieving a collaborative model that works well.

A more comprehensive table can be found in annex 3.2 A where barriers are linked to systemic levers and areas for action.

Interventions: Clustering of barriers and opportunities

To arrive at a portfolio of impactful actions from the barriers and opportunities, a more concrete level appeared necessary as an intermediate step. Each action area was therefore concretized into result-oriented interventions. The naming of the interventions was based on the accumulated knowledge from the entire analysis phase. The characteristics of the district, policy analysis, knowledge from the system maps and stakeholder interviews were taken into account. Explanations of the interventions are provided in the action portfolio (in the document under B-2), where the actions per intervention are listed. At the conclusion of the analysis phase, key barriers and opportunities were clustered around the interventions.

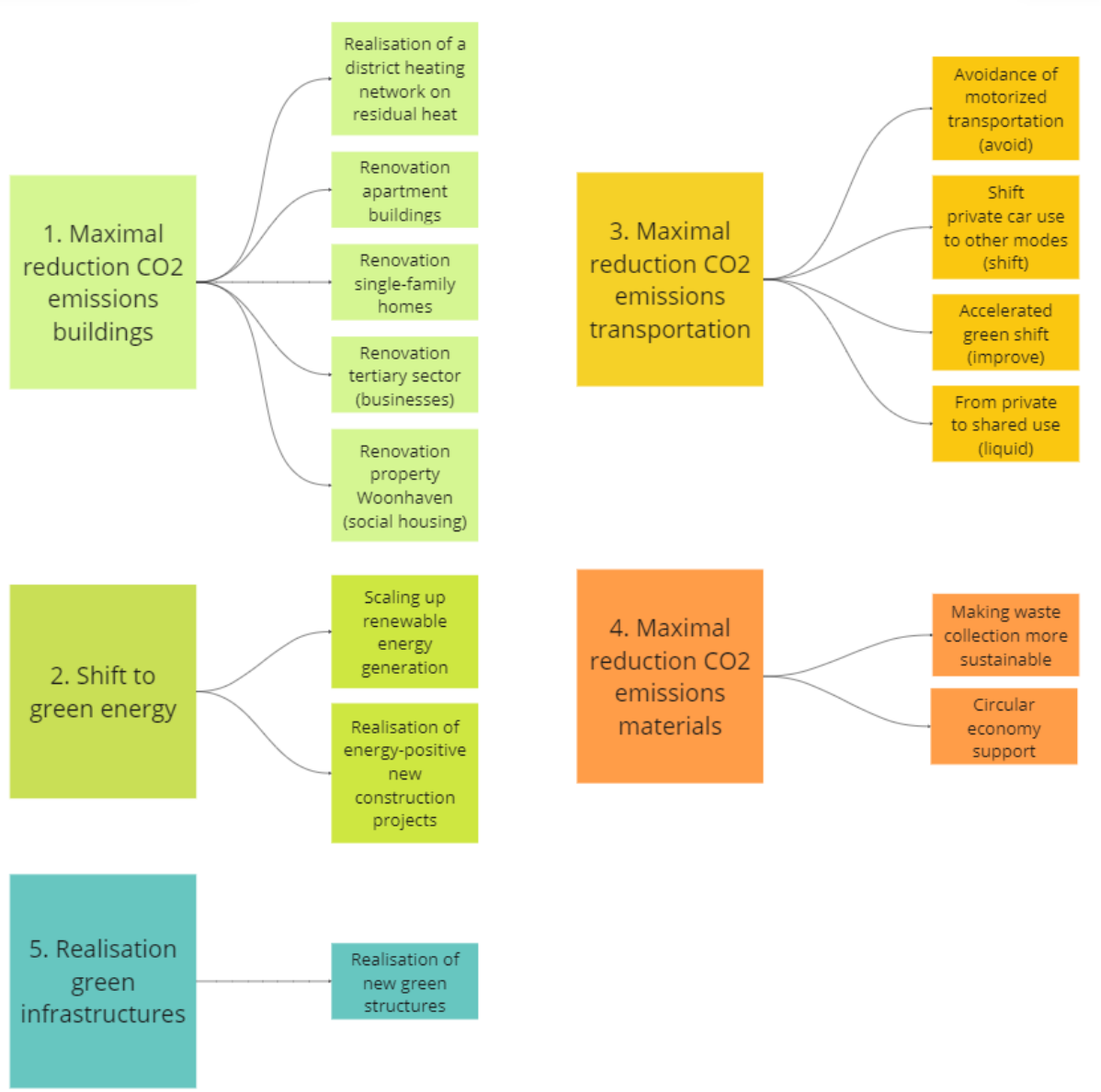
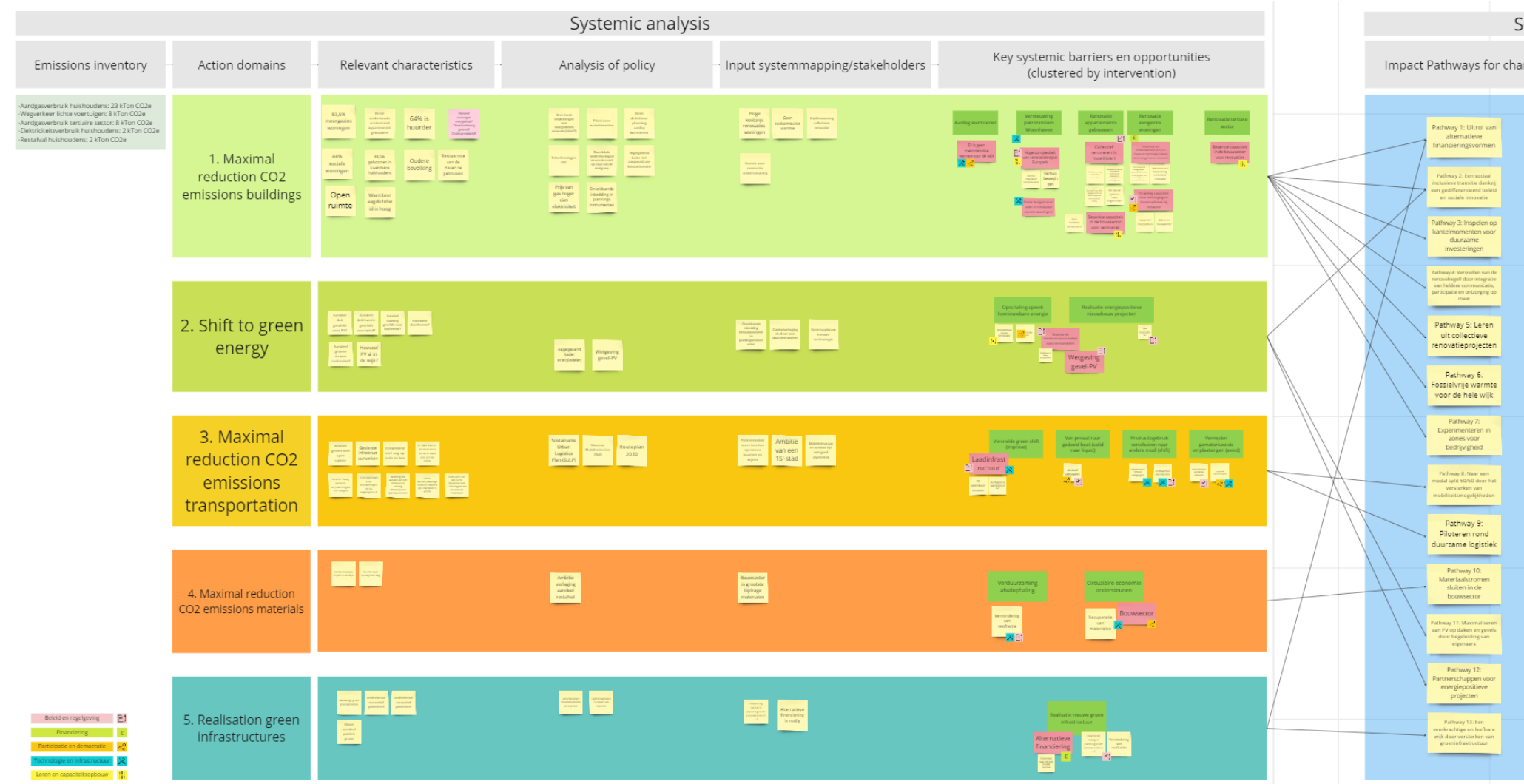


Figure: Interventions by domain of action.

Overview of analysis phase

As a summary, the process of the analysis phase is diagrammed below. The diagram is also provided as an annex 3.3.


Systemic analysis
Emissions inventory
Action domains
Relevant characteristics
Analysis of policy
Input systemmapping/stakeholders
Key systemic barriers en opportunities (clustered by intervention)
Impact Pathways for cha
-Aardgasverbruik huishoudens: 23 kTon CO2e
-Wegverkeer lichte voertuigen: 8 kTon CO2e
-Aardgasverbruik tertiaire sector: 8 kTon CO2e
-Elektriciteitsverbruik huishouders: 2 kTon CO2e
-Restafval huishoudens: 2 kTon CO2e
1. Maximal reduction CO2 emissions buildings
2. Shift to green energy
3. Maximal reduction CO2 emissions transportation
4. Maximal reduction CO2 emissions materials
5. Realisation green infrastructures
Beleid en regelgeving
Financiering
Participatie en democratie
Technologie en infrastructuur
Leren en capaciteitsopbouw
Pathway 1: Uitrol van alternatieve financieringsvormen
Pathway 2: Een sociaal inclusieve transitie dankzij een gedifferentieerd beleid en sociale innovatie
Pathway 3: Inspelen op kantelmomenten voor duurzame investeringen
Pathway 4: Versnellen van de renovatiegolf door integratie van heldere communicatie, participatie en ontzorging op maat
Pathway 5: Leren uit collectieve renovatieprojecten
Pathway 6: Fossielvrije warmte voor de hele wijk
Pathway 7: Experimenteren in zones voor bedrijvigheid
Pathway 8: Naar een modal split 50/50 door het versterken van mobiliteitsmogelijkheden
Pathway 9: Piloteren rond duurzame logistiek
Pathway 10: Materiaalstromen sluiten in de bouwsector
Pathway 11: Maximaliseren van PV op daken en gevels door begeleiding van eigenaars
Pathway 12: Partnerschappen voor energiepositieve projecten
Pathway 13: Een veerkrachtige en leefbare wijk door versterken van groeninfrastructuur

A-3.4: Description of the participatory model for the Left Bank Mission climate neutral 2030

The city of Antwerp drew up a plan of approach to achieve the City Climate Contract. The entire process is described in the summary document (introduction). The concrete steps in the process, milestones and deliverables were defined. For the drafting and implementation of the action portfolio, a comprehensive co-creative process was opted for, with stakeholders involved in the preparation, the steering committee, the coordination consultations and in the implementation of the actions from the action plan. There was also extensive outreach to new partners, with the aim of encouraging innovative projects to engage civil society and businesses in the process. Intensive collaboration with residents to turn action plans into implementation is also a crucial component of the implementation process. This is with a focus on vulnerable target groups, to ensure that the process is inclusive.

- ***Co-creative process with existing stakeholders:*** *co-creation of a portfolio of actions with stakeholders from the various emission domains, levers and internal city services, to ensure broad support for the action and investment plan*
- ***Outreach to new partners****: in parallel with the participatory approach, there is also a call to action to identify, stimulate and support concrete projects and experiments on the Left Bank. This is through a thematic call of the Climate Fund (see below). The actions resulting from this call can be incorporated into the action and investment plan.*
- ***Intensive cooperation with residents:*** *to implement a range of actions to achieve climate neutrality, cooperation with citizens is crucial. The city and district of Antwerp (to which the Left Bank belongs) can draw on on expertise gained from the Burgerbegroting (Citizen budget), Stadslab 2050, Over de Ring, garden streets, etc.) in this regard. Where relevant, the question of what supporting actions are needed to ensure inclusive implementation is raised in each case, taking into account the target group of residents.*

<u>Participatory model and tools</u>

1. Expertise in co-creative processes

The city of Antwerp has a long tradition of co-creation and co-creative processes. Governance processes from the Climate Plan, Stadslab 2050, the Big Link/Over de Ring projects and others proved useful for breakthroughs in complex processes in which, in each case, the intense collaboration with citizens and external stakeholders was essential.

An important aspect in this regard is that ownership of the co-creative process is embedded in the city's operations. Within the Climate and Environment business unit of the city of Antwerp, the participatory model has been taken on board by the Governance and Innovation team. A community manager has been appointed within this team to steer the participatory process for the preparation and implementation of the Left Bank Mission. In addition to the project leader supervising the complete design and implementation of the Left Bank Mission, a heat director will also be appointed (more info in B.2 of the action plan) for the concrete implementation of heat plans in collaboration with residents. This function will also

involve intensive collaboration with relevant stakeholders and residents. From the operations of the Ecohuis, there is already intensive guidance for residents and vulnerable target groups on the Left Bank, to make energy-related renovations possible. In anticipation of the investment plan (see below), there are still opportunities to deepen financial guidance for the implementation of the mission.

2. *Governance structure*

The city's Climate Plan was drawn up including a multi-level governance structure. The steering of projects and setting of strategy takes place in the Climate Chambers, while different pathways are elaborated via so-called climate tables. In addition, an external team works under a Climate Director (or independent curator) on engaging the community around the climate plan, and a Climate Council is convened to provide advice on specific topics.

Furthermore, there are various policy instruments used by the city on a daily basis in its (horizontal) policy and which the implementation of the City Climate Action Plan builds on.

3. Climate Fund of the City of Antwerp

The Climate Fund is an instrument managed by the city's Climate and Environment department to break down existing barriers and/or stimulate innovation from third parties. The city spends €200,000 to €250,000 annually on calls under the Climate Fund. Each of these calls have a specific thematic focus. The fund aims to encourage innovative projects from businesses, civil society and/or citizens that can find answers to the city's policy objectives, break through bottlenecks and make progress. Through thematic (open) calls, actors have the opportunity to apply for support (financial, often also in terms of advice and/or communication) from the city.

The Climate Fund is a public-private finance model through which the city seeks to foster (additional) private investment. In addition, the Climate Fund is an instrument to establish cooperation with relevant - often new - stakeholders in an innovative policy area. Each selected project will receive customised guidance from the city.

In light of Left Bank Climate Neutral, the city multiplied the budget for calls under the Climate Fund, specifically targeting innovative actions under the City Climate Contract. For example, the call in 2023 focused on the energy consumption of buildings, the generation of renewable energy and the construction of new project developments on the Left Bank.

4. Steering committee, transition team and coordination consultation of Left Bank Climate Neutral

The process for drafting the Left Bank City Climate Contract was described earlier in the overarching summary. Based on stakeholder discussions, an **internal city steering committee** was set up with official experts from different policy areas (mobility, climate and environment, public space, city management and others). This is needed to create a strong mandate and ownership from which to build strong support and partnership at the official and political levels. In addition, a **Left Bank 2030 transition team** was set up, with representatives from within and beyond the city's organisation, and representation from all major emission domains. This transition team will meet at several key moments in the **Left Bank 2030 Coordination Consultation.** This team approves the actions from the action portfolio and investment plan. In this way, we create support from within the sector, city services and political buy-in across party lines.

5. Innovation space Climate & Environment

Since 2012, the city of Antwerp has had its own Innovation Space Climate & Environment. Using the methodology of a living lab, experiments are designed around the future of a sustainable city. Government, businesses, residents and organisations work together on various themes and turn their ideas into concrete actions and projects. To help achieve the ambitious goals of the 2030 Climate Plan, the city can count on the experience accumulated through innovation projects that addressed complex climate challenges in the city. Experimentation and innovation are the key terms in this pathway.

In an innovation pathway, involved city services together with external stakeholders map out a specific issue and the overall system through workshops, interviews, etc. Together, they explore obstacles and opportunities and a process architecture is drawn up to arrive at ideas and concepts. Experiments or pilot projects result from this which examine which solutions work and which do not. The completed pathways provide insights and learning lessons that can serve as a basis for addressing new projects or provide a foundation for policy.

It goes without saying that the approach of the Innovation Space Climate & Environment will also be applied within the framework of the mission. The challenge of making the Left Bank district climate-neutral by 2030 will be the focus of innovation work in the coming years.

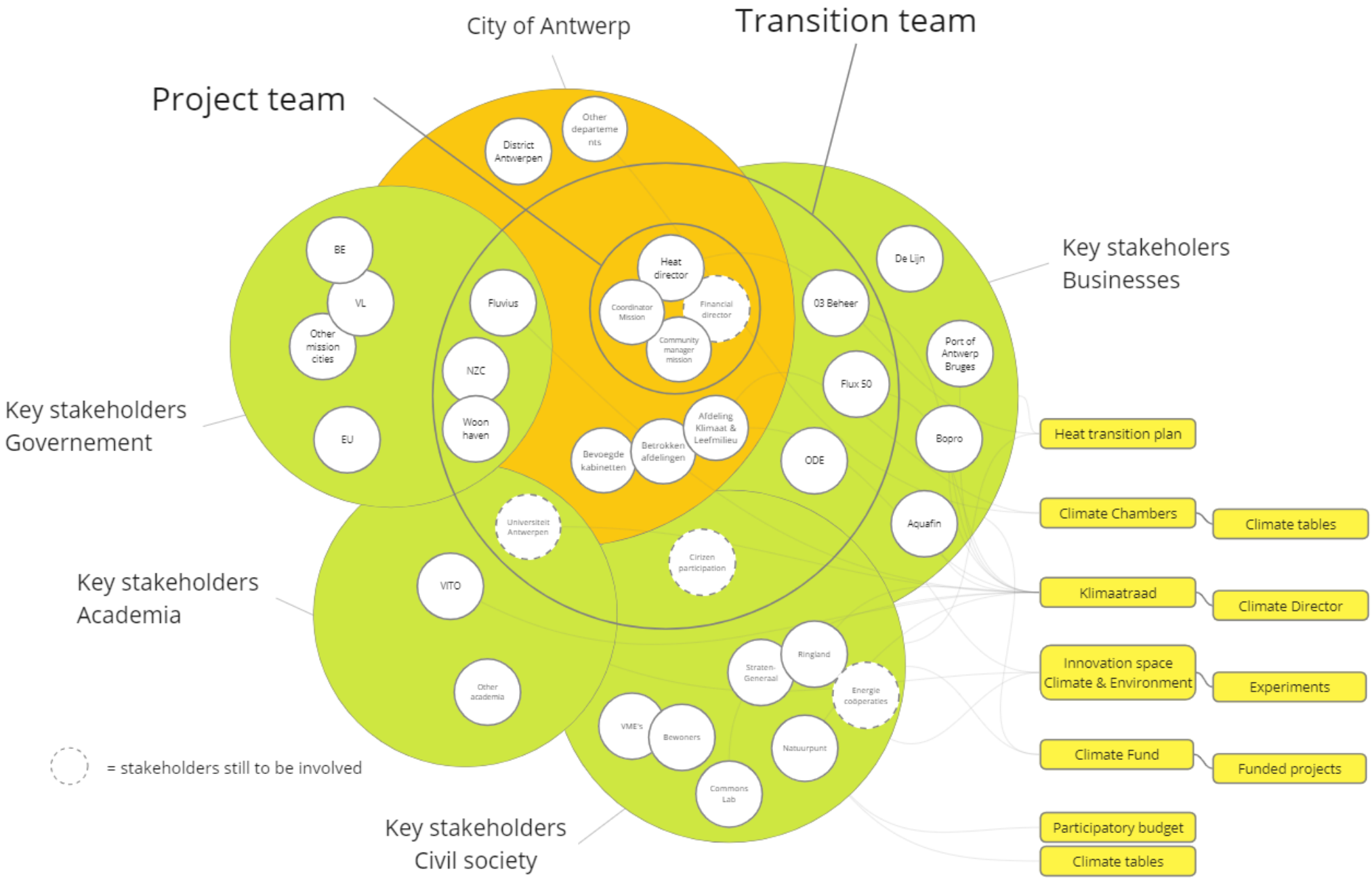
6. Outreach to residents

The implementation of the Left Bank Climate Contract will focus intensively on resident ownership. Citizens are the crucial link for the implementation of the actions from the action plan (e.g. connection to the heat grid, energy-related renovation of the residential sector, the switch to sustainable mobility, etc.). To get residents enthusiastic about the transition, it is important to generate support for the process. It is necessary to recruit Left Bank residents as local ambassadors, to tap into networks from within the district, and to develop a certain pride and ownership of Left Bank as a pilot area for climate transition. Citizen science projects, a festival on the energy transition, the idea of 'city makers', nudging tools (e.g. scoreboards for the reduction of CO^2) are ideas circulating to generate enthusiasm about the process. There needs to be a focus on vulnerable target groups for whom the transition will clearly not

be straightforward. Seniors, large families, single-parent families, economically vulnerable families, disabled people, people with a mental vulnerability, etc. The climate transition must not lead to social exclusion. The following actions are envisioned:

- Roundtable discussions will focus on engaging stakeholder groups grouped together by similar contexts, challenges and needs.
    - Apartment buildings and co-owners' associations: the large apartment buildings in the Left Bank district are uniform buildings where both owners and tenants live. Owners and landlords form associations that manage the collective parts of the building. The managers of the cooperatives govern the decision-making process of these associations, but lack the knowledge and capacity to structurally integrate renovation decisions into their services.
- Social housing residents: Woonhaven will ultimately renovate its entire building stock in the Left Bank district and needs the buy-in of its residents during the many house-movings and renovation steps. A dedicated community manager will encourage experimentation and participation within this community.
- Homeowners: Single-family homes at the Left Bank are often uniform houses on two floors with flat roofs. There is potential for an accelerated unified district approach to renovation, challenges and solutions. These homes have significant potential for renewable energy generation, energy sharing and electrification of heating and mobility infrastructure. In the long run, this will raise the renovation rate, foster experimentation and increase renewable energy generation. Climate tables can focus on buy-in from this group of stakeholders for accelerated uniform district approaches to renovation, energy transition and electrification of mobility infrastructure, challenges and solutions. Climate tables can focus on buy-in from this group of stakeholders for accelerated unified neighborhood approaches to renovation, energy transition and electrification of mobility infrastructure, challenges and solutions.

We summarize the model of cooperation schematically below. The diagram is also provided as an annex.


City of Antwerp
Transition team
Project team
Other departements
District Antwerpen
Heat director
Coordinator Mission
Financial director
Community manager mission
Key stakeholers Businesses
De Lijn
03 Beheer
Port of Antwerp Bruges
Flux 50
Bopro
ODE
Aquafin
Key stakeholders Governement
BE
VL
Other mission cities
EU
Fluvius
NZC
Woon haven
Bevoegde kabinetten
Betrokken afdelingen
Afdeling Klimaat & Leefmilieu
Heat transition plan
Climate Chambers
Climate tables
Klimaatraad
Climate Director
Innovation space Climate & Environment
Experiments
Climate Fund
Funded projects
Participatory budget
Climate tables
Key stakeholders Academia
Universiteit Antwerpen
VITO
Other academia
Cirizen participation
Key stakeholders Civil society
Straten-Generaal
Ringland
Energie coöperaties
VME's
Bewoners
Natuurpunt
Commons Lab
= stakeholders still to be involved

Part B - impact pathways toward climate neutrality in 2030

Part B contains the core of the action plan. Shaped by local governments, local actors and external stakeholders, consisting of the most essential elements: scenarios, strategic objectives, the impact, portfolio of actions and indicators for monitoring, evaluation and learning.

Module B-1 Scenarios for climate neutrality and impact pathways

Module B-1 describes the key strategic insights to achieve climate neutrality for the Left Bank district, and by extension the city.

Defining these essential impact paths gives the mission an initial compass. It also allows us to anticipate the further enrichment of our action portfolio in the coming years and work to further scale up where necessary.

B-1.1: Overview of impact pathways

As indicated in Module A, the analysis phase concluded with a clustering of barriers and opportunities around the results-oriented interventions of this mission. The next step in building a portfolio of actions was taken by formulating impact paths. From the definition of the interventions, the impact paths articulate the steps this mission will take to achieve the desired change. Impact paths often run transversally throughout the mission and overlap action areas and interventions. They form the foundation of the action portfolio now and in future iterations.

The "theory of change" (TOC) was formatted from the interventions. This exercise led to the definition of the main impact paths. This provides a good picture of the expected change through the actions of the city and stakeholders involved to achieve its strategic goals and thus achieve climate neutrality by 2030. It thus provides handles for monitoring the mission and adjusting the strategy based on new insights.

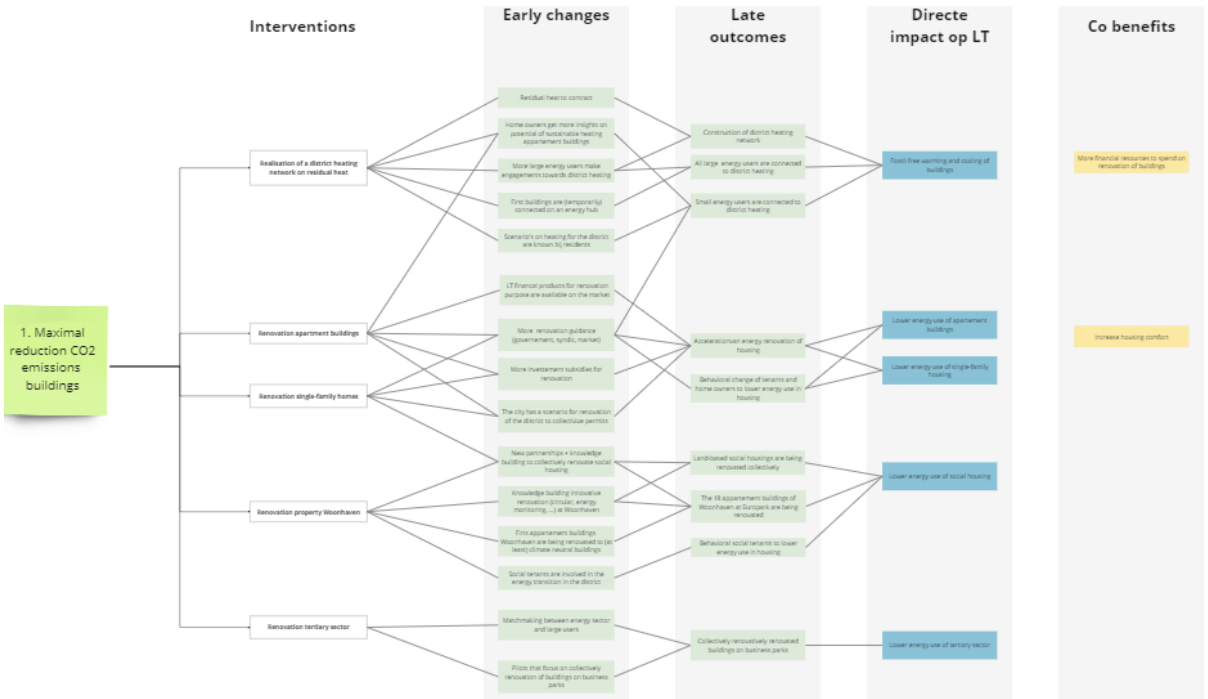


Image: Part of the theory of change (TOC)

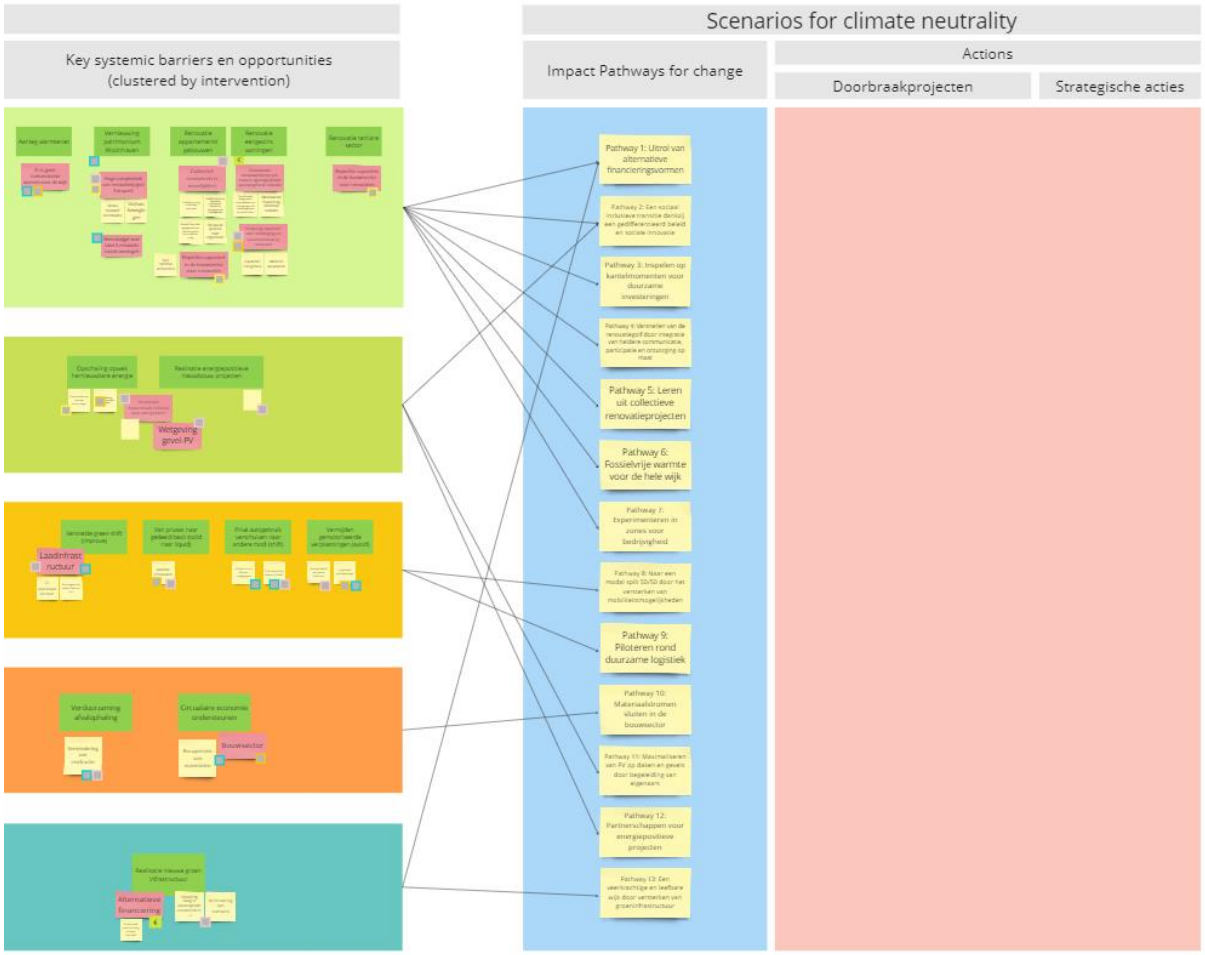


Figure: Overlapping impact pathways

The theory of change (TOC) is provided in an annex B1.1 .

B-1.2: Description of impact pathways

In the following table we present de most important impact pathways, classified bij action domain.

Impact pathways	Reduction emissions buildings	Reduction emissions vehicles	Reduction emissions materials	Renewable energy	Green infrastrucuture
Pathway 1: Rolling out alternative forms of financing	x	x	x	x	x
Pathway 2: A socially inclusive transition thanks to differentiated policies and social innovation	x	x	x	x	x
Pathway 3: Responding to tipping points for sustainable investments	x	x	x	x	x
Pathway 4: Accelerate the renovation wave by integrating clear communication, participation and customized de-risking	x				
Pathway 5: Learning from collective renovation projects	x				
Pathway 6: Fossil-free heat for the entire district	x				
Pathway 7: Experimenting on business sites	x	x		x	x
Pathway 8: Toward a modal split 50/50 by strengthening mobility options		x			
Pathway 9: Piloting in sustainable logistics		x		x	
Pathway 10: Closing material flows in the construction sector		x	x		
Pathway 11: Maximize PV on roofs and facades through guidance from owners				x	
Pathway 12: Partnerships for energy-positive projects				x	
Pathway 13: A resilient and livable district through strengthening green infrastructure					x

0. Transversal

Pathway 1: Rolling out alternative forms of financing

The mission is strongly committed to exploring and testing alternative financing techniques.

It is clear that financing the renovation of residential buildings is a major barrier to the transition to climate neutrality. Thus, the possibility of a new cooperative financial model will be explored, a

rolling fund tailored to the co-owners' association in which a (more wealthy) majority of owners remain committed to energy renovations. Building-related long-term financing from the market for the co-owners' association is also being explored, as well as business models such as "Heating as a service.

New mobility solutions, such as sustainable mobility services, automated/connected mobility, also rely on innovative forms of financing for scaling up as part of the mission.

Investments in green and blue infrastructure are also proving cost-effective in achieving various societal goals (livability, heat, climate resilience) but public budgets are often insufficient in the face of the challenges. Together with the University of Antwerp, among others, the city is investigating whether revenue models are possible that can activate private investments.

Pathway 2: A socially inclusive transition thanks to differentiated policies and social innovation

The city houses a large group of vulnerable households in the private and social housing market. In the city of Antwerp, 27.3% are born into a disadvantaged family. For the Left Bank district, the figure is 48%. Insufficient access to affordable, reliable and clean energy, mobility poverty and the principle of a just transition to a greener society are of great importance for Antwerp's social policy. This social transition is thus put on edge within the Antwerp mission.

Limited access to essential services such as water, electricity or gas reveals and exacerbates severe poverty. The Antwerp city government is committed to addressing energy poverty in a holistic way. The City of Antwerp's Energy House has long had a strong counseling and guidance program for disadvantaged groups. The scope of the energy scans, the basic service for social target groups, has been broadened and expanded in recent years so that as many target groups as possible can be guided to and benefit from the free energy advice, the installation of energy-saving products, the energy renovation advice and the energy renovation guidance provided by the Energy House. Therefore, the city's ambition is to make the heat transition plan for the Left Bank district an inclusive instrument.

A differentiated approach will translate into the portfolio of actions that focus on guidance and sensitization and the introduction of support mechanisms so that the climate transition becomes feasible for everyone. In addition, throughout the portfolio the reflex will be made of inclusiveness and applicability for vulnerable target groups.

In addition, social innovation (the development and implementation of new products, services and models to meet social needs and the creation of new social relationships or partnerships) will play an important role in making an inclusive transition a reality. We are exploring the possibilities of enhanced collaboration with Woonhaven and social networking organizations such as Beweging.net. Innovative solutions to the problem of split incentives for owners and tenants are also being actively sought. Other forms of financing such as the Flemish Emergency Purchase Fund for specific target groups will be actively used, and where possible evaluated and improved.

Pathway 3: Responding to tipping points for sustainable investments

An acceleration of the renovation wave can be caused by removing barriers tied to a particular timing or schedule. Or by just capitalizing on opportunities in timing. This mission emphasizes capitalizing on tipping points.

For example, energy hubs form a buffer between a necessary renovation of a boiler room and a potential connection to a future heat network. An additional advantage is the saving of investment costs that can be invested in, for example, making the building envelope more sustainable. Buildings are thus made future-proof more quickly and the housing costs of vulnerable families are reduced.

Turning moments can also be reinforced by low-threshold actions, such as the review and optimization of combustion installations that demonstrate that a building can already be heated at reduced temperature and owners are encouraged and included in the further switch to a heat pump or connection to the urban heat network.

Accelerating the mobility transition will look at tipping points that can be seized, such as buying a new car or moving house. We also see potential by linking the making of renovation plans (individuals, businesses, government) and reuse of building materials.

1. Maximum reduction in building emissions

Pathway 4: Accelerate the renovation wave by integrating clear communication, participation and customized de-risking

A clear and supported future scenario for all parties involved is the basis for ambitious action. The required renovation wave can be accelerated by a focus on tailored communication and participation of the various target groups. This is coupled with unburdening where necessary.

The City of Antwerp's Energy House is housed in the EcoHouse. The EcoHouse Antwerp is the demonstration and advice center for sustainable living and living in Antwerp. It also houses the central Housing Office and a customer office of Fluvius. All services for energy, living and energetic renovation are thus bundled in one place. Among other things, the EnergieHuis and Woonkantoor offer advice on lowering energy bills, financing energy renovation and the use of grants and loans. The Ecohouse strengthens the Flemish policy on energy renovation and sets up communication actions on BENOveren (Nearly Energy Neutral Renovation) and sustainable living and renovation in the city. In its advice, the Ecohouse integrates the needs and opportunities for investments in the insulation of the building envelope, the generation and application of sustainable energy, the connection to future heat networks, and the possibilities of individual sustainable heating systems such as heat pumps. In this way, the EcoHouse secures the output of the strategic energy vision for heat supply (SEViA) in the daily advisory operation. In addition to advice, the EcoHuis offers residents who wish to renovate thorough to E-60 or E-30 a guidance process.

A social heat transition plan is being drawn up. This builds on the renovation objectives of the city of Antwerp and the Strategic Energy Vision in which the Left Bank district was designated as a pilot zone for the rollout of a residual heat network by 2030. Within this heat transition plan, a future heat scenario and renovation scenario are worked out for the specific building typologies present in the district. Within the heat transition plan, a roadmap will be developed in which the necessary steps for renovation are indicated coupled with a timeline towards 2030. It is important here not only to make a technical analysis of the necessary investments, but also to draw up a participatory plan of what needs to happen within now and 5, 10 or 15 years. Understanding the path to 2030 and available support measures creates clarity about the activities required for building owners and tenants. Standard procedures and products can provide more insight and certainty for both demand (owners) and supply (suppliers and installers) and can reduce dependence on (external) study firms.

A Sustainable Heat Coordinator will be deployed in the Left Bank district who will be responsible for the implementation of the heat transition plan. Together with colleagues at the Antwerp Energy House, a mix of instruments such as advice, budget-neutral energy loans, renovation guidance for vulnerable target groups will be applied to achieve maximum implementation of a fossil-free Left Bank.

Pathway 5: Learning from collective renovation projects

Renovation on a collective scale is an important key to the success of this mission.

Collective (social) housing and unitary neighborhoods dominate Left Bank. The Antwerp social housing company Woonhaven houses 44% of Left Bank's inhabitants. Family housing in the Left Bank district is mainly concentrated in a number of unit neighborhoods. A bel-etage district, a garden district ... These unitary districts offer an opportunity to start thinking about collective renovation projects, linked to an energy supply at district level.

In the Left Bank district, 8 out of 10 residents live in a co-owned apartment building. The complex organizational structure of co-ownership and the large maintenance backlog that characterizes this building typology calls for a tailored approach to this target group. The city has been pioneering tailored guidance for this target group for several years. The city supports co-owners and syndicates in drawing up sustainable long-term plans that focus both on achieving the climate objective and on housing quality and deploys a team of renovation coaches to guide co-owners organizationally and financially.

District renovations, from ground-level social housing to apartment buildings in Europark, will be strengthened, refined and then scaled up. This can be done by drawing lessons from the first pilot projects. Opportunities lie in the use of new technology and innovative building techniques such as off-site construction, ... but also innovative procurement policies and innovative partnerships (e.g. with the construction industry, financial sector, etc.). The focus is, in a first phase, on learning from district renovations of social housing and private apartment buildings in the district

Pathway 6: Fossil-free heat for the entire district

The Left Bank district was designated by the city as 1 of 9 pilot zones for the priority rollout of a heat grid. Left Bank has many high-rise buildings and sufficient space in the public domain, which makes for a promising environment for a heat network. For several years, the city has focused on the collective renovation of private apartment buildings and social housing in Europark. This is considered an important lever to realize the rollout of the heat grid. The nearby Melselepolder industrial area has sufficient supply of industrial sustainable residual heat to meet the district's heat demand. Discussions are in progress with the relevant industry to contract and disconnect residual heat for the heat network.

The heat transition plan goes one step further and determines for each building typology in the district what the future heat scenario (heat grid connection or all electric) will be, and the associated renovation scenario. Financial incentives such as the rebate of the real estate tax of the city of Antwerp when switching to a fossil-free scenario offer an additional incentive for this.

Pathway 7: Experimenting on business sites

The tertiary sector itself represents a limited share of CO2 emissions in the Left Bank district. However, in the district there are 2 zones for activity where driven partners come together and experimentation becomes possible. For example, the renovated Katwilgweg site will be transformed into an energy-positive district and the Combori halls will become an innovation hub for new mobility concepts. In addition, efforts will be made to raise the awareness of stakeholders in the entire tertiary sector.

2. Maximum reduction of CO2 emissions in vehicles

Pathway 8: Towards a 50/50 modal split by strengthening mobility opportunities

An ambitious mobility policy not only results in a liveable and attractive city, it also has an impact on the reduction of CO2. We are striving for a 50/50 modal split for passenger traffic. This means that by 2030, at least 50% of all journeys in the Antwerp transport region, expressed in passenger kilometres, will be made by bicycle, train, tram, bus, on foot, taxi, water bus, sharing systems, and a maximum of 50% by car. The Antwerp Transport Region is larger than the city of Antwerp. The region has a total of 32 municipalities with a total population of more than 1 million.

The city offers a wide range of mobility options. At the same time, we are also tackling the infrastructure, so that it becomes pleasant and safer to cycle and easier to switch to sharing systems and public transport. We are committed to a combination of car traffic, public transport, safe cycling networks and also transport by water. In this way, together we will achieve this objective from the 'Toekomstverbond': a modal split of 50/50.

Pathway 9: Piloting sustainable logistics

The city's Sustainable Urban Logistics Plan (SULP), which is being drawn up, focuses, among other things, on avoiding, shifting and cleaning up logistics in the city. This combination of measures will also be researched and applied in the Left Bank district. In the first instance, the development of parcel lockers, clustered pick-up points or transshipment hubs and water-related logistics is being considered.

3. Maximum reduction of CO2 emissions from materials

Pathway 10: Closing Material Flows in the Construction Industry

A good urban climate policy looks beyond energy consumption on its own territory. Our carbon footprint depends not only on the size and nature of the energy we use and generate in the city, but also on the extraction of raw materials through production, transport and consumption of products and the processing of waste that arises from this. Construction is responsible for a significant part of CO2 emissions and the use of raw materials. That is why extra focus is being placed on pilot projects on circular construction, innovative materials and the reuse of building materials. Experiments range from locally grown hemp insulation, a circular hardware store for the district or an assessment framework for the choice between renovation and new construction.

4. Shift to renewable energy

Pathway 11: Maximizing PV on roofs and facades through guidance from owners

Solar energy offers great opportunities to evolve towards a CO2-neutral energy system in the long term. Electricity is a feasible and proven technology to capture and use that infinite amount of energy. Storage and transport is a necessary link between collection and use, given the irregular and

unpredictable availability. This is not yet obvious. Electrification will therefore go hand in hand with other technological developments such as energy storage, demand response and smart charging.

The city is focusing on tools to map the solar potential of buildings. They show which buildings have a high solar potential and suitable roof construction and where investments achieve the most return at the lowest cost and the highest possible return. This gives owners of free roof surfaces insight into the technical and economic potential of their roof. In addition, the city offers advice through a 'solar broker' to activate owners of large roofs to install solar panels or storage systems.

Pathway 12: Partnershipsfor Energy Positive Projects

The share of locally generated renewable energy in the district can increase if cooperation on energy projects arises and the production exceeds self-consumption.

Energy cooperatives and energy communities are drivers for scaling up renewable energy. Flanders is working on appropriate regulations that will enable renewable energy communities and forms of energy sharing. On the basis of this, energy cooperatives and renewable energy communities can be stimulated. Citizens and businesses are informed about the opportunities offered by this form of shared energy management. In addition, the city is working on a concession policy for cooperative investments or renewable energy communities on the urban patrimony.

Project developers are ready to take the step from energy-neutral to energy-positive for upcoming new construction projects and pilot projects will better map out the conditions (urban, energetic, social, financial, etc.).

5. Realisation of green infrastructure

Pathway 13: A resilient and liveable neighbourhood by strengthening green infrastructure

The large-scale landscape of the Scheldt and the sand plains of the Left Bank form a robust and ecologically valuable landscape framework. The characteristic landscape is extended along the infrastructure landscape and the open spaces in the built-up fabric. This contributes to a strong landscape cohesion, improved green permeability in the district and high-quality public spaces. This will create a new park structure that enhances the landscape diversity of the Left Bank. Throughout Europark, the focus is on a new, continuous connecting figure of soft connections and the reconnection of the missing link in the boulevard structure and bicycle network. By extension, green crossings both north-south and east-west will connect the various residential areas with the surrounding landscape and recreational area.

Module B-2 Climate Neutral 2030 Action Portfolio

Module B-2 contains the project description of each planned intervention and how these will be translated into actions that come together in a structure that systematically achieves climate neutrality by 2030. In addition, a brief description is given of how residual emissions are dealt with.

B-2.1: Description of Action Portfolios

The action portfolio of this mission will be structured according to the areas of action already formulated.

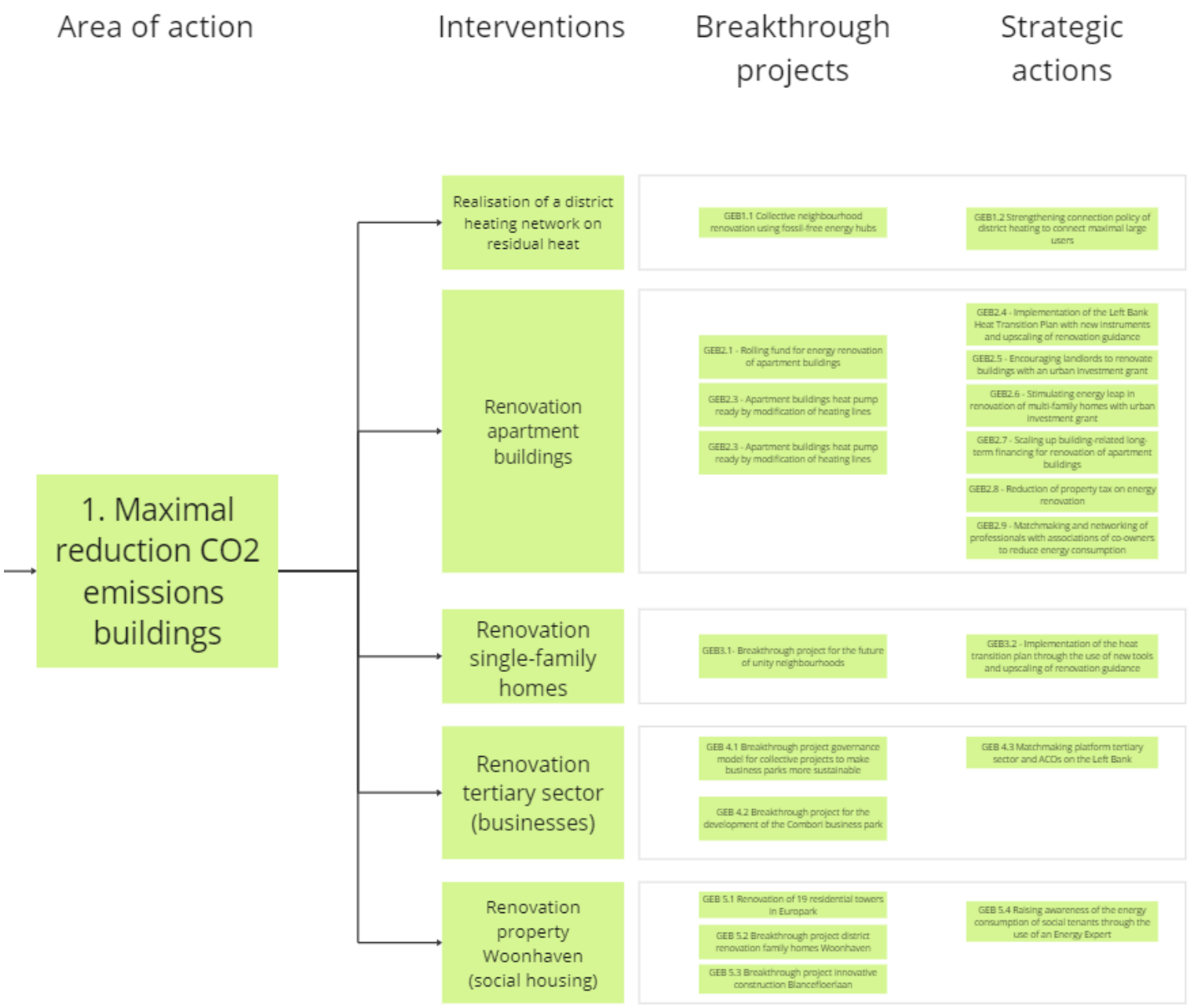
Within this structure, **interventions were defined** that aim to concretize how, across all areas of action, to achieve climate neutrality by 2030. Each intervention describes the effective way to achieve climate neutrality for the Left Bank district and by extension the city. In other words, the sum of all interventions must lead to climate neutrality in which at least 80% CO2 reduction is achieved.

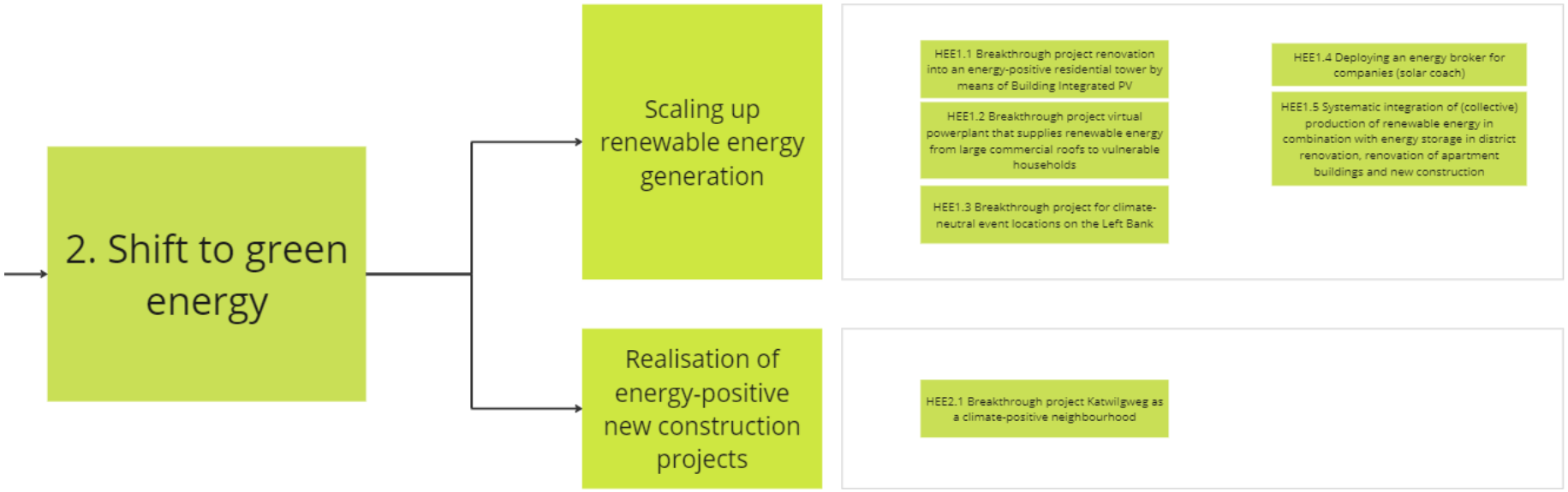
The actions and projects included in the interventions are necessary to remove the barriers on this path and accelerate them where necessary. The interventions are put into practice through breakthrough projects and strategic actions in the portfolio:

- We define a **breakthrough project** as a project that focuses on breaking through 1 or more barriers in 1 pilot case that accelerates the climate transition for the entire city (and beyond) or as a large infrastructure project that brings about an exponential acceleration on one or more interventions.
- A **strategic action** is an action that will be implemented in the coming years and will be essential to achieve climate neutrality. On the one hand, this involves scaling up and accelerating existing climate actions or introducing new actions that focus on meeting a current or future need.

The strength of the area-specific approach chosen by the City of Antwerp is reflected in the realisation of the breakthrough projects in a concentrated 'living lab'. This gives us the opportunity to simultaneously address a number of barriers/levers at the same time, in order to achieve a breakthrough for the entire city. The strategic actions will mainly be rolled out city-wide.

Both breakthrough projects and strategic actions were linked to the (main) leverage they were linked with through the theory of change (TOC). By doing so, we link the content of the action portfolio to the challenges defined in module A-3.2. The action portfolio that is before us today should be a good starting point, with the greatest efforts going towards breaking down the biggest barriers in the most important emission doma ins.


Area of action
Interventions
Breakthrough projects
Strategic actions
1. Maximal reduction CO2 emissions buildings
Realisation of a district heating network on residual heat
GEB1.1 Collective neighbourhood renovation using fossil-free energy hubs
GEB1.2 Strengthening connection policy of district heating to connect maximal large users
Renovation apartment buildings
GEB2.1 - Rolling fund for energy renovation of apartment buildings
GEB2.3 - Apartment buildings heat pump ready by modification of heating lines
GEB2.3 - Apartment buildings heat pump ready by modification of heating lines
GEB2.4 - Implementation of the Left Bank Heat Transition Plan with new instruments and upscaling of renovation guidance
GEB2.5 - Encouraging landlords to renovate buildings with an urban investment grant
GEB2.6 - Stimulating energy leap in renovation of multi-family homes with urban investment grant
GEB2.7 - Scaling up building-related long-term financing for renovation of apartment buildings
GEB2.8 - Reduction of property tax on energy renovation
GEB2.9 - Matchmaking and networking of professionals with associations of co-owners to reduce energy consumption
Renovation single-family homes
GEB3.1 - Breakthrough project for the future of unity neighbourhoods
GEB3.2 - Implementation of the heat transition plan through the use of new tools and upscaling of renovation guidance
Renovation tertiary sector (businesses)
GEB 4.1 Breakthrough project governance model for collective projects to make business parks more sustainable
GEB 4.2 Breakthrough project for the development of the Comboni business park
GEB 4.3 Matchmaking platform tertiary sector and ACOs on the Left Bank
Renovation property Woonhaven (social housing)
GEB 5.1 Renovation of 19 residential towers in Europark
GEB 5.2 Breakthrough project district renovation family homes Woonhaven
GEB 5.3 Breakthrough project innovative construction Blancefloerlaan
GEB 5.4 Raising awareness of the energy consumption of social tenants through the use of an Energy Expert


2. Shift to green energy
Scaling up renewable energy generation
HEE1.1 Breakthrough project renovation into an energy-positive residential tower by means of Building Integrated PV
HEE1.2 Breakthrough project virtual powerplant that supplies renewable energy from large commercial roofs to vulnerable households
HEE1.3 Breakthrough project for climate-neutral event locations on the Left Bank
HEE1.4 Deploying an energy broker for companies (solar coach)
HEE1.5 Systematic integration of (collective) production of renewable energy in combination with energy storage in district renovation, renovation of apartment buildings and new construction
Realisation of energy-positive new construction projects
HEE2.1 Breakthrough project Katwilgweg as a climate-positive neighbourhood


3. Maximal reduction CO2 emissions transportation
Avoidance of motorized transportation (avoid)
MOB1.1 Breakthrough project intricate network of off-street parcel lockers and pick-up points
MOB1.2 Breakthrough project for last-mile transhipment hub to be delivered
MOB1.3 Breakthrough project for water-bound (construction) logistics transport
MOB1.4 Expansion of 'smart mobility links'
MOB1.5 Innovative employee/commuter approach through accessibility managers
MOB1.6 Strengthening the walking and cycling network on the Left Bank (Scheldt Borders Master Plan)
Shift private car use to other modes (shift)
MOB2.1Additional electric ferry at the current Scheldt crossing between the Left and Right banks will be put into operation
MOB2.2 Building a connection between the Left and Right banks for cyclists and pedestrians
MOB2.3 Realisation of Antwerp-West train station
MOB2.4 Introduction of minimum modal split of 60/40 to be adhered to for all major events
MOB2.5 Organising cycling lessons for a target group with limited access to mobility (part of the 'Mobility Shop' project)
Accelerated green shift (improve)
MOB3.1 Stricter steps in the Low Emission Zone according to the implementing decree
MOB3.2 Accelerated transition to fossil-free public transport on the Left Bank from 2027
MOB3.3 Developing the loading infrastructure of the Left Bank according to the principles of the city
MOB3.4 Accelerating the transition to fossil-free commercial vehicles
From private to shared use (liquid)
MOB4.1 Car-sharing awareness campaign
MOB4.2 Embedding the presence of the offer and the visibility of shared mobility
MOB4.3 Expanding the Velo bike sharing network


4. Maximal reduction CO2 emissions materials
Making waste collection more sustainable
Circular economy support
MAT1.1 Pop-up container parks in the Linkeroever district
MAT1.2 Smart sorting lanes in the Linkeroever district
MAT2.1 Breakthrough project CO2 neutral and CO2-reducing materials (Regatta and Combori)
MAT2.2 Breakthrough project circular building materials (Regatta)
MAT2.3 Development of an assessment framework for the choice between renovation and new construction in the redevelopment of residential blocks


5. Realisation green infrastructures
Realisation of new green structures
GRN1.1 Realisation of new landscape park Europark
GRN1.2 Realisation of a new landscape park on the banks of the Scheldt
GRN1.3 Realisation Ringpark West

Maximum CO2 reduction in buildings – GEB

Realisation of a heat network on residual heat

Description

The city of Antwerp has the ambitious goal of developing a citywide heat grid to connect half the city by 2050. The commitments originate from the heat zoning map and the Plan of Approach for heat grids and are further described in the Roadmap 2030: citywide heat grid Antwerp. Fluvius is an important partner in this initiative and its main task is to roll out and manage the heat grid. In the first instance, they are playing a supplier role. The city has taken the role of director and guides the various projects from an overarching vision. It also acts as a moderator between Fluvius and external parties.

The Left Bank district was designated as 1 of 9 pilot zones for the priority rollout of a heat grid. Given the housing typology (many high-rise apartment buildings and social housing) and the nearby industrial area Melselepolder with sustainable residual heat, this district is very promising for the rollout of a heat grid.

Before Fluvius can make an investment decision and give an official green light for construction of the grid, all the pieces of the puzzle must be in place. There needs to be the contract with the residual heat source, but there also needs to be a guarantee on the off-take side. These still need to be connected by a pipeline network, and this needs to fit into broader planning of the public domain (e.g., on the Left Bank, the Oosterweel connection is critical for the timing here). In some pilot zones, including Left Bank, the discussions are not far enough advanced for Fluvius to make a formal investment decision. We may lose important opportunities in these areas. Certain buildings need a heating solution now or relatively soon and cannot wait for the grid to be rolled out. The city's role is in making it possible for these buildings to switch boilers to a renewable alternative, and yet not mortgaging the later connection to a heat grid and its rollout. Investments for district solutions cannot be pinned on individual customers. From an owner's perspective, it makes sense to look only at the property and not at the ideal solution for the district itself. As a city, we want to provide support here, and make the necessary investments, in order to ensure the preferred scenario is rolled out. This scenario will ultimately allow more citizens to enjoy sustainable and affordable heat than if each building provides its own individual solution.

Impact CO2

GHG emissions (tonnes CO2/Year):	Not applicable
Energy avoided/replaced (MWh):	10.268
GHG reduction volume of gas (MWh) :	50.705
GHG reduction volume CO2 (tonnes CO2/year):	9.647

Financial[1]

Investment challenge:	€28,060,064.81
Cost per unit of CO2 (euro/ton of CO2)	€58.18

Actions:

GEB1.1	GEB1.1 - Collective neighbourhood renovation using fossil-free energy hubs Collective neighbourhood renovation using fossil-free energy hubs	City of Antwerp	Breakthrough project	Technology & Infrastructure
GEB1.2	GEB1.2 -	City of Antwerp	Strategic action	Guidance and regulations

[1] Investment challenge based on the investment cost for the construction of the heat network excluding individual connections to individual buildings, cost/CO2 unit based on theoretical life of the heat network = 50 years

GEB1.1 - Collective neighbourhood renovation using fossil-free energy hubs

Definition

With this project, the city wants to focus on collective neighborhood renovation with the help of fossil-free energy hubs. These energy hubs can accelerate the transition of clusters of apartment buildings away from gas or fuel oil. The investment (in the renovation of one's own boiler room, in anticipation of the heat network in 2030) saved by the association of co-owners or the social housing company can be invested in making the building envelope more sustainable , which reduces the energy demand and thus the housing costs of these often vulnerable target groups. At the same time, the buildings remain connected to the heat network and do not compromise the business case.

With the roll-out of this project, we are focusing on new challenges that cities face in terms of climate, and the broad socio-ecological transition that goes with it. Making fossil fuels and thus achieving our climate goals go hand in hand with the need for affordable housing in a metropolitan context. Making the heat demand of collective housing forms more sustainable fits in well with the study *Energy Landscapes* commissioned by the Team Vlaams Bouwmeester, Ruimte Vlaanderen, VITO, VLM and VEKA. It points out that "collective interventions entail economies of scale that make investments in renewable energy infrastructure, distribution systems and buffering much more feasible and that [...] Achieving energy gains also yields gains for more collective living, for safeguarding open space structures, for the realisation of a functional mix, for the proximity of living and working environments."

Throughout the project, the focus will be on citizen participation and an active search will be made for linking opportunities around depaving and greening.

As part of this urban renewal project, the city applied for finance for the realisation of the temporary energy hub from the Flemish Government's Urban Renewal Fund. This energy hub will accelerate the transition of 2 residential towers (+- 300 families) off gas. The energy hub will be conceived as a movable infrastructure so that it can also serve other buildings in coordination with the phased connection to the heat network, so that they in turn can make the necessary investments in their outer envelope while waiting for a connection to the heat network.

The temporary energy hub facilitates private and public investments in the collective renovation (building envelope) of the residential blocks concerned. It also allows the building to be connected to the heat network afterwards, guaranteeing the business case for investments in the heat network and the sustainable heat transition in the long term.

Impact

- **Systemic lever**
  - Technology & Infrastructure
- **Indirect impact (co-benefits)**
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[2]

[2] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

    - Opportunity to link heat network spatial planning of district
    - Opportunity to connect heat network infrastructure projects
    - High heat demand density
    - Large presence of collective boiler rooms
    - No final planning for the construction of the heat network
    - Heat network investment gap

Expected result

- **Short-term (1-4 years):** Sustainable investment decisions of co-owners and Social Housing Company Woonhaven
- **Long-term (5 to 10 years):** successful roll-out of the heat network on residual heat in the Left Bank district

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Britt Verhesen
- **Implementation period of the project:** 4 years
- **Target group:** co-owners, housing company and social tenants
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
    - Residential port of Antwerp
    - Fluvius
    - Co-owners and property managers

Costs/Benefit

- **CAPEX (projectkost):** € 3.412.400
- **OPEX:**/

GEB1.2 - Strengthen heat grid connection policy by maximising connection of large consumers

Definition

The City of Antwerp is investigating how we can connect a maximum number of customers to the heat network and what conditions can be imposed in the event of renovation of large projects. The Roadmap 2030 assumes a connection rate of 85% for large consumers (>500 MWh on an annual basis). It is important that we, as a city, fully support this objective and ensure that these buildings are definitely connected to the heat network. It is also these large consumers who can complete the business case and facilitate a roll-out to be able to connect other smaller buildings as well.

The heat transition plan is already a tool to convince the owners of these large buildings involved to join. With a clear plan for heating and renovation, we want to lay down a clear vision from the city that creates trust among citizens. We are also looking at whether we can link targeted (geographically defined) regulations to preferred solutions with regard to heat, in order to nudge the large consumers or even oblige them to connect to the heat network. It is also up to Fluvius to make a good proposal and emphasise the advantages of a heat network, so that owners are already convinced to join.

Impact

- **Systemic lever**
  - Guidance and regulations
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens

- **Structural barrier(s) or lever/levers**[3]
  - Opportunity to link heat network spatial planning district
  - Opportunity to connect heat network to large infrastructure projects
  - High heat demand density
  - Large presence of collective boiler rooms
  - No definitive planning for the construction of the heat network
  - Heat network investment gap

Expected result

- **Short-term (1-4 years):** Sustainable investment decisions of co-owners and Social Housing Company Woonhaven
- **Long-term (5 to 10 years):** successful roll-out of the heat network on residual heat in the Left Bank district

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Vincent Van Ryssegem
- **Implementation period of the project:** 7 years
- **Target group:** building owners with high energy consumption

[3] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
    - Social Housing company ‘Woonhaven’
    - Tertiary sector
    - Fluvius
    - Co-owners and property managers

Costs/Benefit

- **CAPEX:** /
- **OPEX:** cost of project leader part of regular operation

Renovation of multi-family dwellings

Description

In the Left Bank district, 8 out of 10 residents live in a co-owned apartment building. The complex organizational structure of a co-ownership and the large maintenance backlog that characterizes this building typology requires an approach tailored to this target group. For a number of years, the city has been pioneering tailor-made guidance for this target group. The city supports co-owners and property managers in drawing up sustainable multi-year plans that focus on achieving the climate objective as well as on housing quality, and deploys a team of renovation coaches to guide co-owners organizationally and financially. The Flemish government adopted this approach in 2023. In addition to the development of the necessary financing instruments for making these buildings more sustainable, efforts will also be made to scale up renovation coaching and the development of new tools as part of the heat transition plan.

Impact CO2

GHG emissions (tonnes CO2/Year):	11.201
Energy avoided/replaced (MWh):	18.857
GHG reduction volume of gas (MWh) :	19.076
GHG reduction volume CO2 (tonnes CO2/year):	4.986

Financial[4]

Investment challenge:	€ 203,680,624
Cost per unit of CO2	€1,021.33

Actions

Fout! Verwijzingsbron niet gevonden.	Façade insight	Breakthrough project	Finance
Fout! Verwijzingsbron niet gevonden.	NON. Energy	Breakthrough project	Finance
Fout! Verwijzingsbron niet gevonden.	Pixii	Breakthrough project	Guidance and regulations

[4] Investment challenge based on the investment cost for the renovation of all private multi-family dwellings including own investment in fossil-free heat system (all electric or connection to heat network), cost/CO2 unit based on theoretical lifespan of the building after renovation = 40 years

GEB2.4 - Implementation of the Left Bank Heat Transition Plan with new instruments and upscaling of renovation guidance Definition	City of Antwerp	Strategic action	Guidance and regulations
Fout! Verwijzingsbron niet gevonden.	City of Antwerp	Strategic action	Finance
Fout! Verwijzingsbron niet gevonden.	City of Antwerp	Strategic action	Finance
Fout! Verwijzingsbron niet gevonden.	KBC	Strategic action	Finance

GEB2.8 - Reduction of property tax on energy renovation ## Definition Anyone in the city of Antwerp who heats their home or building fossil-free with a heat pump or a connection to the heat network can count on an exemption from the municipal surcharges on the property tax for six years. With this measure, the city wants to: • compensate for the (temporary) additional cost of heating with heat pumps (in anticipation of an "energy tax shift" that should allow heat pumps to run more cheaply than natural gas boilers); • give building owners who connect an existing building to a heat network the opportunity to recover their connection costs through tax relief;	City of Antwerp	Strategic action	Finance
GEB2.9 - Matchmaking and networking of professionals with associations of co-owners to reduce energy consumption ## Definition	Climate Active Together	Strategic action	Capacity building

GEB2.1 - Rolling fund for energy renovation of apartment buildings

Definition

With the support of financial and legal experts, engineering firm Gevelinzicht will investigate a new cooperative financial model for the financing of the energetic renovation of a multi-family building in co-ownership. It is a rolling fund tailored to the association of co-owners in which a majority of the owners will commit themselves to energy renovations through an alternative approach to financing. It is being examined whether existing models from other contexts (such as housing cooperatives, leasing) can be applied in the association of co-owners.

This project was selected through the call of the Climate Fund of the city of Antwerp 'Left Bank climate neutral'. The purpose of this call was to support projects in terms of content and finances that contribute to the ambition to make the Left Bank district climate neutral by 2030.

Impact

- **Systemic lever**
    - Finance
- **Indirect impact (co-benefits**)
    - Safe and affordable energy for all
    - Improving the health and well-being of citizens
    - Empowering communities and citizens
    - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[5]
    - Difficult introduction of innovative products and services to associations of co-owners
    - Role of the property manager
    - Similar typologies that are representative of the city of Antwerp

Expected result

- **Short-term (1-4 years):** Sustainable investment decisions of co-owners in pilot case
- **Long-term (5 to 10 years):** Scaling up rolling fund and market inclusion.

Implementation

- **Responsible organisation/entity:** Gevelinzicht ingenieursbureau
- **Contact:** Joni Staljanssens
- **Implementation period of the project:** 2 years
- **Target group:** co-owners and syndic
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
    - Co-owners and property managers

Costs/Benefit

- **CAPEX (projectkost):** € 30.000

[5] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB2.2 - Heating-as-a-service for small/medium-sized apartment buildings

Definition

NON.ENERGY is an innovative start-up that wants to offer heat pumps on a rental basis and as a total package, including warranty, service and monitoring. By unburdening customers financially and technically, the company wants to offer a solution to heat buildings fossil-free faster. NON.ENERGY will set up a platform for local installers who use sustainable techniques and also train them to install heat pumps. In addition, the company wants to further investigate the feasibility of the project through 5 pilot projects in small to medium-sized multi-family homes.

This project was selected through the call of the Climate Fund of the city of Antwerp 'Left Bank climate neutral'. The purpose of this call was to support projects in terms of content and finances that contribute to the ambition to make the Left Bank district climate neutral by 2030.

Impact

- **Systemic lever**:
    - Finance
- **Indirect impact (co-benefits**):
    - Safe and affordable energy for all
    - Improving the health and well-being of citizens
    - Empowering communities and citizens
    - Limiting energy dependency

- **Structural barrier(s) or lever/levers**6
    - Similar typologies that are representative of the city of Antwerp
    - Large maintenance backlog of apartment buildings
    - Adjustments to the electricity grid
    - Difficult introduction of innovative products and services to associations of co-owners
    - Role of the property manager

Expected result

- **Short-term (1-4 years):** Sustainable investment decisions of co-owners in 5 pilot cases
- **Long-term (5 to 10 years):** Scaling up the financing model

Implementation

- **Responsible organisation/entity:** NON. Energy
- **Contact:** Roel Van Eeckhout
- **Implementation period of the project:** 2 years
- **Target group:** co-owners and property managers
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
    - Co-owners and property managers

[6] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

Costs/Benefit

- **CAPEX (projectkost):** € 89.150,00

GEB2.3 - Apartment buildings heat pump ready by modification of heating lines

Definition

Pixii is a scientific institution and member organization that wants to convince associations of co-owners in the Left Bank district to analyze and optimize their current heating facilities by adapting the current heating line. In this way, a substantiated incentive is given to the association of co-owners to demonstrate that the building can already be heated at a reduced temperature. The co-owners within this project are also encouraged and included in the further switch to a heat pump or connection to the urban heat network in combination with making the building more sustainable and insulating.

This project was selected through the call of the Climate Fund of the city of Antwerp 'Left Bank climate neutral'. The purpose of this call was to support projects in terms of content and finances that contribute to the ambition to make the Left Bank district climate neutral by 2030.

Impact

- **Systemic lever**:
  - Guidance and regulations
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[7]
  - Difficult introduction of innovative products and services to associations of co-owners
  - Role of the property manager
  - Similar typologies that are representative of the city of Antwerp

Expected result

- **Short-term (1-4 years):** associations of co-owners will start optimising their heating lines and benefit from a decreasing housing cost
- **Long-term (5 to 10 years):** With the reserves that have been built up in the short term, investments are made on the multi-family homes to make them fossil-free

Implementation

- **Responsible organisation/entity:** PIXII (Passive House Platform vzw)
- **Contact:** Els Vanden Berghe
- **Implementation period of the project:** 2 years
- **Target group:** co-owners and syndic
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
  - Co-owners and property managers

[7] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

Costs/Benefit

- **CAPEX (projectkost):** 51.635 euro
- **OPEX:** /

GEB2.4 - Implementation of the Left Bank Heat Transition Plan with new instruments and upscaling of renovation guidance

Definition

The city drew up a **Heat Transition Plan** for the Left Bank district in which a future heat scenario and renovation scenario was developed for each typology of building (e.g. terraced house, detached apartment building,...). Based on this knowledge, the **Sustainable Heat Coordinator** will develop new tools and guidance, or scale up the current instruments in order to achieve maximum implementation of the plan.

Impact

- **Systemic lever**:
  - Guidance & Regulations
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
- **Structural barrier(s) or lever/levers**[8]
  - Similar typologies that are representative of the city of Antwerp
  - Large maintenance backlog of apartment buildings
  - Large presence of collective boiler rooms
  - Adjustments to the electricity grid

Expected result

- **Short-term (1-4 years):** a clear strategy to wean the entire district off fossil fuels
- **Long-term (5 to 10 years):** a detailed set of services and instruments that ensure the implementation of the heat transition plan

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact Person:** Nine Van Steenbergen
- **Implementation period of the project:** 7 years
- **Target audience:**
  - Co-owners and property managers
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
  - Citizens
  - Property owners
  - Fluvius
  - ...

Costs/Benefit

- **CAPEX (project cost):** to be determined at the time of elaboration
- **OPEX:** to be determined at elaboration

[8] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB2.5 - Encouraging landlords to renovate buildings with an urban investment grant

Definition

The City of Antwerp wants to deploy an additional grant to convince landlords to renovate their rental properties in an energy-efficient way while improving the quality of housing and guaranteeing affordability for tenants. Renovating rental properties contributes to the climate goals. Within the Flemish My Renovation Grant, landlords automatically belong to the highest income category and therefore the lowest grant. With its additional grant, the city ensures that landlords can count on the same support as the middle income category for works that improve the roof, exterior walls, floor and windows and doors energetically. The grant can be combined with the Flemish My Renovation Loan and/or the My Renovation Grant.

Impact

- **Systemic lever**:
  - Finance
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[9]
  - Split Incentive

Expected result

- **Short-term (1-4 years):** More sustainable investment decisions by landlords
- **Long-term (5 to 10 years):** Better quality of living and lower energy bills for tenants

Implementation

- **Responsible organisation/entity:** Energiehuis Antwerpen
- **Contact:** Jan Meuleman
- **Implementation time of the project:**
- **Target group:** Landlords
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:**
  - Citizens
  - Construction Companies
  - ...
-

Costs/Benefit

- **CAPEX (projectkost):** /
- **OPEX:** 1.200,000 euros

[9] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB2.6 - Stimulating energy leap in multi-family renovation with urban investment grant

Definition

The city wants to assist associations of co-owners of apartment buildings with their thorough energy renovations and develop an offer tailored to this target group.

The city's grant offers an additional incentive to renovate an apartment building to label A (less than 100 kWh/(m²year) or label B (between 200 and 100 kWh/(m²year).

Buildings in which the ACO succeeds in going fossil-free on top of this energy leap receive a bonus on top of the basic financial support.

Depending on the label obtained, this grant repays up to 20% of the investments made. The grant can be combined with the Flemish 'My Renovation Loan' and/or the 'My Renovation Grant'.

Impact

- **Systemic lever**:
  - Finance
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[10]
  - Difficult introduction of innovative products and services to associations of co-owners
  - Role of the property manager
  - Similar typologies that are representative of the city of Antwerp

Expected result

- **Short-term (1-4 years):** More sustainable investment decisions in co-owners' associations
- **Long-term (5 to 10 years):** Energy-efficient building stock with low housing costs and high quality of living coupled with maximum reduction in CO2 emissions

Implementation

- **Responsible organisation/entity:** Energiehuis Antwerpen
- **Contact:** Jan Meuleman
- **Implementation period of the project:** 5 years
- **Target group:** associations of co-owners
- **Scale of the action: City of** Antwerp

Costs/Benefit

- **CAPEX (projectkost):** /
- **OPEX:** 4,190,496 euros

[10] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB2.7 - Scaling up building-related long-term financing for renovation of apartment buildings

Definition

As part of the City of Antwerp's 'master plan approach' for multi-family housing, KBC Bank and Insurance has launched building-related long-term financing for associations of co-owners. By communicating this product in a targeted manner to ACOs, property managers, architects and construction companies on the Left Bank, we ensure that the threshold for radical energy renovation of apartment buildings is lowered.

Impact

- **Systemic lever**:
  - Finance
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[11]
  - Difficult introduction of innovative products and services to associations of co-owners
  - Role of the property manager
  - Similar typologies that are representative of the city of Antwerp

Expected result

- **Short term (1-4 years):** More sustainable investment decisions in co-owners' associations
- **Long-term (5 to 10 years):** Energy-efficient building stock with low housing costs and high quality of living coupled with maximum reduction in CO2 emissions

Implementation

- **Responsible organisation/entity:** KBC Banking and Insurance
- **Contact:** Melissa Neefs
- **Implementation time of the project:** Continuous
- **Target audience:** associations of co-owners
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
  - Citizens
  - Construction Companies
  - ...

Costs/Benefit

- **CAPEX (projectkost):** to be determined

[11] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB2.8 - Reduction of property tax on energy renovation

Definition

Anyone in the city of Antwerp who heats their home or building fossil-free with a heat pump or a connection to the heat network can count on an exemption from the municipal surcharges on the property tax for six years.

With this measure, the city wants to:

- compensate for the (temporary) additional cost of heating with heat pumps (in anticipation of an "energy tax shift" that should allow heat pumps to run more cheaply than natural gas boilers);
- give building owners who connect an existing building to a heat network the opportunity to recover their connection costs through tax relief;
- also encourage landlords to switch to heat pumps (3 out of 5 households in Antwerp rent) and in apartment buildings in the associations of co-owners (ACO) find the necessary majorities more quickly for in-depth renovation with fossil-free heating.

Impact

- **Systemic lever**:
  - Finance
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
- **Structural barrier(s) or lever/levers**[12]
  - Difficult introduction of innovative products and services to associations of co-owners
  - Role of the property manager
  - Similar typologies that are representative of the city of Antwerp

Expected result

- **Short-term (1-4 years):** More sustainable investment decisions in co-owners' associations
- **Long-term (5 to 10 years):** Energy-efficient building stock with low housing costs and high quality of living coupled with maximum reduction in CO2 emissions

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Veva Roesems
- **Implementation time of the project:** Continuous
- **Target audience:** associations of co-owners

[12] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
    - Citizens
    - Construction Companies
    - ...

Costs/Benefit

- **CAPEX (projectkost):** To be determined

GEB2.9 - Matchmaking and networking of professionals with associations of co-owners to reduce energy consumption

Definition

Samen Klimaatactief (SKA) will actively focus on bringing together a wide range of parties in the Left Bank district: on the one hand, the ACOs of large apartment buildings in the Left Bank district, on the other hand, various parties with a useful range of products or services for these target groups that can contribute to achieving the climate objectives of Antwerp-Left Bank by 2030.

Impact

- **Systemic lever**:
  - Learning and capacity building
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

Expected result

- **Short-term (1-4 years):** More sustainable investment decisions in co-owners' associations
- **Long-term (5 to 10 years):** Energy-efficient building stock with low housing costs and high quality of living coupled with maximum reduction in CO2 emissions

Implementation

- **Responsible organisation/entity:** Samen Klimaatactief
- **Contact:** Jan Jaeken
- **Implementation period of the project:** 2 years
- **Target audience:**
  - Co-owners and property managers
  - Do
- **Scale of action:** Left Bank district
- **Stakeholders involved:**
  - Companies
  - Associations of co-owners

Costs/Benefit

- **CAPEX (projectkost):** 78.200 euro

Renovation of single family homes

Description

The family homes in the Left Bank district are mainly concentrated in a number of unity neighbourhoods. A bel-etage district, a garden city neighbourhood,... These unity neighbourhoods offer an opportunity to start thinking about collective renovation projects, linked to an energy supply at district level.

Impact CO2

GHG emissions (tonnes CO2/Year):	6.453
Energy avoided/replaced (MWh):	5.187
GHG reduction volume of gas (MWh) :	10.884
GHG reduction volume CO2 (tonnes CO2/year):	2.537

Financial[13]

Investment challenge:	€ 92,844,800
Cost per unit of CO2	€780.37

Actions

Fout! Verwijzingsbron niet gevonden.	City of Antwerp	Breakthrough project	Capacity building
Fout! Verwijzingsbron niet gevonden.	City of Antwerp	Strategic action	Guidance and regulations

[13] Investment challenge based on the investment cost for the renovation of all private family homes including own investment in fossil-free heating system (all electric), cost/CO2 unit based on theoretical lifespan of the building after renovation = 40 years

GEB3.1- Spatial-energetic future vision of unity neighbourhoods

Definition

The city is investigating whether a spatial-energetic future vision can be drawn up for a unitary district on the Left Bank (e.g. bel-etage district). The city's advice (spatially and energetically) can then be tailored to this future vision of the future.
We are also working on an assessment framework, a supported urban vision applicable to permit applications for exterior façade insulation. In it, 3 aspects are weighed against each other: the occupation of the public domain, the energetic performance of the façade insulation, and the image quality and façade finish of the existing and/or new façade. The assessment framework could be applied in the Left Bank in the test phase.
After evaluation, this methodology can then be extended to all neighbourhoods and buildings in the city at a later stage.

Impact

- **Systemic lever**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[14]

Expected result

- **Short term (1-4 years):** a spatial-energetic future vision for a unitary neighborhood
- **Long-term (5 to 10 years):** tailored spatial-energetic advise

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Luk Lafosse
- **Implementation period of the project:** to be determined
- **Target group:** residents of the Left Bank district
- **Scale of action:** Left Bank district
- **Stakeholders involved:** Residents, urban services (space, climate and environment,...)

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:** to be determined

[14] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB3.2 - Implementation of heat transition plan through the use of new tools and scaling up renovation guidance

Definition

The city drew up a **heat transition plan** for the Left Bank district, in which a future heat scenario and renovation scenario was developed for each typology of building (e.g. ground-floor house, detached apartment building,...). Based on this knowledge, the **Sustainable Heat Coordinator** will develop new tools and guidance, or scale up the current instruments in order to achieve maximum implementation of the plan.

Impact

- **Systemic lever**:
  - Guidance & Regulations
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[15]
  - Approach to unitary neighbourhoods: Parts of the Left Bank district with the same typology of houses (unit neighbourhoods) enable a more efficient collective approach to renovation
  - Adjustments to the electricity grid: The electricity grid in the Left Bank is not yet ready for the intended energy transition and electrification by 2030

Expected result

- **Short-term (1-4 years):** a clear strategy to wean the entire district off fossil fuels
- **Long-term (5 to 10 years):** a detailed set of services and instruments that ensure the implementation of the heat transition plan

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact Person:** Nine Van Steenbergen
- **Implementation period of the project:** 7 years
- **Target audience:**
  - Individual homeowners
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**
  - Citizens

Costs/Benefit

- **CAPEX (project cost):** to be determined at the time of elaboration
- **OPEX:**

[15] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

Renovation of the tertiary sector

Description

The tertiary sector represents a limited share of CO2 emissions in the Left Bank district, but nevertheless offers opportunities for experimentation. For example, the 2 existing zones for business activity will be transformed into an energy-positive district (HEE2.1 action) and an innovation hub for new mobility concepts (GEB4.2 action). The action portfolio will also focus on raising awareness among the tertiary sector.

Impact CO2

GHG emissions (tonnes CO2/Year):	7.339
Energy avoided/replaced (MWh):	17.061
GHG reduction volume of gas (MWh) :	25.329
GHG reduction volume CO2 (tonnes CO2/year):	5.461

Financial[16]

Investment challenge:	€159,126,412
Cost per unit of CO2	€728.52

Actions

GEB 4.1 Breakthrough project governance model for collective projects to make business parks more sustainable	KBC Banking and Insurance	Breakthrough project	Funding
GEB 4.2 Breakthrough project for the development of the Combori business park	Outlook and PMV	Breakthrough project	Technology & Infrastructure
GEB 4.3 Matchmaking platform tertiary sector and ACOs on the Left Bank	Climate Active Together	Strategic action	Capacity building

[16] Investment challenge based on the investment cost for the renovation of all tertiary buildings including own investment in fossil-free heat system (all electric), cost/CO2 unit based on theoretical lifespan of the building after renovation = 40 years

GEB4.1 - From business park to creative hotspot to live and work

Definition

Collective projects to make business parks more sustainable have more impact than individual projects per company. However, even when companies are willing to work together, they often lack the right tools and governance models to take collective action. By developing a governance model in which they approach their project in a structured way and organize themselves, we ensure a valid party that will be able to more easily conclude contracts with third parties such as contractors, financial institutions and governments. The aim is to increase the willingness for collective action by facilitating it through a governance model and possibly a step-by-step plan that can be used.

Impact

- **Systemic lever**:
  - Finance
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Limiting energy dependency
  - Reduce conflicts over limited resources (land, water, resources,...)

Expected result

- **Short term (1-4 years):** More joint investments in making business parks more sustainable
- **Long-term (5 to 10 years):** climate-neutral business parks

Implementation

- **Responsible organisation/entity:** KBC Banking and Insurance
- **Contact:** Maartje Neels
- **Implementation time of the project:**
- **Target group:** Companies on business parks
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):** to be determined
- **OPEX:** to be determined

GEB4.2 - Breakthrough project development business park Combori

Definition

The aim is to redevelop the site with the imposing hall into a creative hotspot with housing and space for innovative companies in urban logistics and mobitech. The site has a surface area of more than 36,000 m² and is located next to the Regatta urban expansion project, the new large-scale residential area on the Galgenweel on the Left Bank, also an initiative of Voorzicht. The Spatial Implementation Plan (RUP) 'FAB181' was approved by the Antwerp City Council five years ago and allows for the redevelopment of the site into an urban working and living location. The site is dominated by an imposing brick hall of more than 27,000 m² which was founded in 1962 by Polydoor Mintiens as "COMptoir de BOulots et RIvets.

Impact

- **Systemic lever**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

Expected result

- **Short term (1-4 years):** More joint investments in making business parks more sustainable
- **Long-term (5 to 10 years):** climate-neutral business parks

Implementation

- **Responsible organisation/entity:** Vooruitzicht and PMV
- **Contact:** Natalie Nieuwinckel
- **Implementation time of the project:** 2023-2028
- **Target audience:** current and new citizens of the Left Bank
- **Scale of the action:** Left Bank district
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):** to be detemined
- **OPEX: /**

GEB4.3 - Matchmaking platform tertiary sector for the Left Bank district

Definition

Samen Klimaatactief (SKA) will actively focus on bringing together a wide range of parties in the Left Bank district: on the one hand, the actors of the tertiary sector and the SMEs in the Left Bank district, on the other hand, various parties with a useful range of products or services for these target groups that can contribute to achieving the climate objectives of Antwerp-Left Bank by 2030.

Impact

- **Systemic lever**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

Expected result

- **Short-term (1-4 years):** New contacts are established between the tertiary sector and SMEs in the district
- **Long-term (5 to 10 years):** More sustainable investments in the tertiary sector

Implementation

- **Responsible organisation/entity:** Samen Klimaatactief
- **Contact:** Jan Jaeken
- **Implementation period of the project:** 2 years
- **Target audience:**
  - Co-owners and property managers
  - Do
- **Scale of action:** Left Bank district
- **Stakeholders involved:**
  - Citizens
  - Do

Costs/Benefit

- **CAPEX (projectkost):** 78.200 euro
- **OPEX:**

Renewal of the Woonhaven patrimony

Description

The Antwerp Social Housing Agency is home to 44% of the inhabitants of the Left Bank. The majority of these social tenants live in Europark. This modernist residential area is characterized by its 19 high-rise blocks with social housing. In addition, Woonhaven's patrimony is spread across the district in a number of apartment buildings and unit districts.

Impact CO2

GHG emissions (tonnes CO2/Year):	7.854
Energy avoided/replaced (MWh):	13.562
GHG reduction volume of gas (MWh) :	11.433
GHG reduction volume CO2 (tonnes CO2/year):	2.974

Financial[17]

Investment challenge:	€ 572,152,000
Cost per unit of CO2	€4,808.99

Actions

GEB 5.1 Renovation of 19 residential towers in Europark	Woonhaven	Breakthrough project	Technology & Infrastructure
GEB 5.2 Breakthrough project district renovation family homes Woonhaven	Woonhaven	Breakthrough project	Capacity building
GEB 5.3 Breakthrough project innovative construction Blancefloerlaan	Woonhaven	Breakthrough project	Capacity building
GEB 5.4 Raising awareness of the energy consumption of social tenants through the use of an Energy Expert	Woonhaven	Supporting action	Learning and capacity building

[17] Investment challenge based on the investment cost for the **renovation** of the entire residential patrimony woonhaven (19 residential towers Europark, family homes and multi-family homes) including own investment in fossil-free heat system (all-electric or connection to the heat network), cost/CO2 unit based on theoretical lifespan of the building after renovation = 40 years

GEB5.1 - Climate-neutral renovation of residential towers in the Europark social housing estate

Definition

Europark's 19 residential towers will be renovated or converted into (at least) climate-neutral buildings. By focusing on innovative construction (new green/blue structures, sustainable mobility, circular construction, new planned concepts, innovative construction methods and innovative energy concepts), we increase the level of ambition and, where possible, accelerate the renovation process.

Impact

- **Systemic lever**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[18]
  - Similar typologies that are representative of the city of Antwerp
  - High heat demand density
  - No final planning for the construction of the heat network
  - 40% social housing
  - Relocations of social housing

Expected result

- **Short-term (1-4 years):** Renewal building stock Woonhaven
- **Long-term (5 to 10 years):** Energy-efficient building stock with low housing costs and high quality of living coupled with maximum reduction in CO2 emissions

Implementation

- **Responsible organisation/entity:** Woonhaven Antwerpen
- **Contactpersoon:** Jan Wouters
- **Implementation time of the project:** 2020-2039
- **Target audience:** Tenants Woonhaven Antwerpen
- **Scale of action:** Left Bank

Costs/Benefit

- **CAPEX (projectkost):** 537.400.000 euro
- **OPEX:**

[18] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB5.2 - Sustainable neighbourhood renovation of family homes in Woonhaven Antwerp

Definition

In a district with ground-level social housing, a concrete renovation offer will be developed to make these inhabited homes energy-neutral in an accelerated way.
To this end, Woonhaven will start a project with an innovative approach in which it will be investigated how the entire outer shell of inhabited single-family homes can be renewed in an accelerated way with the integration of sustainable techniques (PV installation, heat pumps, etc.). When implementing a renovation at district level or of a collective residential building, (collective) production of renewable energy in combination with energy storage is integrated from the start of the project (see action HEE 1.5).

In addition to a new technical renovation concept, it will also be investigated how new funding (e.g. from Europe) for district renovation can be attracted and how a successful participatory process can be completed with the residents. The neighbourhood in which this project is being rolled out contains a combination of social housing and owner-occupied housing. This combination offers the possibility to extrapolate new models that are being developed for social housing to owner-occupied housing. The purpose of the application to this ownership structure is to be able to scale up the new renovation offer to other districts in the Left Bank and the city of Antwerp.

A project manager will draw up a Design & Build specification in order to look for a consortium (design team, engineer, energy expert, contractor, etc.) to work in collaboration with the project to work with the project in collaboration with the project of the project in collaboration with the project of the project in collaboration with the project of the project in collaboration with the project of the project and the project will be drawn up by the project in collaboration with the project in the field of design. Woonhaven to set up this project. This will be done in several phases: analysis phase, drawing up specifications/project definition, appointment consortium, research, design, etc.

Impact

- **Systemic lever**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[19]
  - Similar typologies that are representative of the city of Antwerp
  - Presence of unitary districts
  - 40% social housing
  - Relocations of social housing
  - High cost of renovations of social housing

[19] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

Expected result

- **Short term (1-4 years):** A participatory collective design process is started for the district in which a technical, financial and participatory process is developed
- **Long-term (5 to 10 years):** Realisation of neighbourhood renovation with associated CO2 savings and upscaling to other residential areas

Implementation

- **Responsible organisation/entity:** Woonhaven Antwerpen
- **Contactpersoon:** Jan Wouters
- **Implementation time of the project:**
    - Research phase: 2024-2025
    - Implementation phase: 2025-2030
- **Target group:** social tenants and owners of private family homes
- **Scale of action:** 1 residential area in the Left Bank district
- **Stakeholders involved:** Woonhaven Antwerpen, design agencies, energy expert (see action GEB5.4),...

Costs/Benefit

- **CAPEX (project cost):** times to be determined during the research phase
- **OPEX:**
    - Research phase: 250,000 euros spread over 2024 and 2025

GEB5.3 - Innovative (re)construction with a circular touch on Blancefloerlaan

Definition

With the support of funds from the 'Open Call for Innovative Projects' of the Flanders Housing Agency, Woonhaven Antwerpen is realising an innovative renovation (new) construction project of 115 residential units on the Blancefloerlaan, focusing on circular use of materials (including the recovery of materials within its own patrimony & bio-based materials façade/roof structure), energy monitoring (building management system) and collective climate-robust gardens.

Impact

- **Systemic lever**: Technology and infrastructure
- **Indirect impact (co-benefits**)
    - Safe and affordable energy for all
    - Improving the health and well-being of citizens
    - Empowering communities and citizens
    - Limiting energy dependency
    - Reduce conflicts over limited resources (land, water, resources,...)

- **Structural barrier(s) or lever/levers**[20]
    - Similar typologies that are representative of the city of Antwerp
    - Presence of unitary districts
    - 40% social housing

Expected result

- **Short term (1-4 years):** renewal of the Woonhaven patrimony
- **Long-term (5 to 10 years):** Reduction of CO2 patrimony Woonhaven

Implementation

- **Responsible Organization/Entity:** Woonhaven Antwerpen
- **Contactpersoon:** Jan Wouters
- **Project implementation deadline:** 2024-2026
- **Target group:** social tenants
- **Scale of the action:** Left Bank district
- **Stakeholders involved:** Woonhaven Antwerpen

Costs/Benefit

- **CAPEX (projectkost):** 30.000.000 euro
- **OPEX:** to be determined

[20] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

GEB5.4 - Raising awareness among social tenants about energy consumption through the use of an energy advisor

Definition

The Social Housing Company Woonhaven Antwerpen is starting a participation project in the Left Bank district to actively involve its social tenants in the energy transition.

Woonhaven will recruit an internal energy advisor to actively inform and guide social tenants in reducing their energy and water consumption and in using the available techniques correctly.

- The internal energy advisor will set up an operation to provide collective and/or individual advice on:
  - Tenants in older homes (apartment or family home): heat and ventilate correctly to create a healthy and comfortable indoor atmosphere and prevent condensation and mold formation
  - tenants in new climate-neutral housing units with new (and therefore more complex) techniques such as balanced ventilation, low-temperature (floor) heating, etc.
  - Reducing energy and water consumption by advising on daily life (showering instead of bath,...) and focusing on lighting and (energy-efficient) household appliances. By announcing usage data in buildings (average, low, high) in an anonymised manner, tenants can gain a better understanding.
  - Choice of cheapest (green) electricity supplier
  - ...
- The internal energy advisor will train interested residents to become energy ambassadors, i.e. volunteers who can carry out the above-mentioned assignment to the neighbours in the neighbourhood/building
- Woonhaven will set up an information campaign to inform tenants at regular intervals about the various aspects involved, such as correct ventilation, heating, sustainable water use,... , both general and adapted to their home (existing or new apartment, single-family house, etc.) This can be done through the various media that Woonhaven uses to reach its tenants: residents' meetings, specific residents' letters, magazine Wonen en Weten, website, various social media, YouTube videos, etc.
- By means of follow-up of the results by means of, among other things, monitoring consumption data, parameters such as humidity, temperature and CO2 in the indoor air and feedback from users and, if necessary, adjusting operation. This data can also be used to calculate the results of this project based on the overall CO2 reduction and the overall financial savings for the tenants.
- From this project, strengthen existing collaborations, such as the energy scanning project by the Energy House of the City of Antwerp

Impact

- **Systemic lever**:
  - Guidance and regulations
- **Indirect impact (co-benefits)**
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens

    - Empowering communities and citizens
    - Limiting energy dependency

- **Structural barrier(s) or lever/levers**[21]
    - 40% social housing

Expected result

- **Short-term (1-4 years):** raising awareness of the energy behaviour of social tenants
- **Long-term (5 to 10 years):** CO2 reduction by reducing energy consumption

Implementation

- **Responsible organisation/entity:** Woonhaven Antwerpen
- **Contactpersoon:** Jan Wouters
- **Project implementation deadline:** 2024-2026
- **Target group:** social tenants
- **Scale of the action:** Left Bank district
- **Stakeholders involved:** Woonhaven Antwerpen

Costs/Benefit

- **CAPEX (projectkost): /**
- **OPEX:** 250,000 euros

[21] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

Maximum CO2 reduction in vehicles

An ambitious mobility policy not only results in a liveable and attractive city, it also has an impact on the reduction of CO2. We aim for a 50/50 modal split for passenger traffic. This means that by 2030, at least 50% of all journeys in the Antwerp transport region, expressed in passenger kilometres, will be made by bicycle, train, tram, bus, on foot, taxi, water bus, sharing systems, and a maximum of 50% by car. We offer a wide range of mobility options. At the same time, we are also tackling the infrastructure, so that it becomes pleasant and safer to cycle and easier to switch to sharing systems and public transport. The city is committed to a combination of car traffic, public transport, safe cycling networks and also transport by water. It will become increasingly attractive for visitors to park in a Park & Ride on the outskirts of the city and to enter the city by public transport, taxi or a sharing system. In this way, together we will achieve this objective from the Alliance for the Future: a modal split of 50/50.

The Left Bank was developed in the decades after 1945, when the car and the bus were seen as the mobility solutions of the future. It was not until the 1980s that a tram connection to the city centre was established, and it took until the 2000s before the start of a safe cycling network was given. Since 2017, the Left Bank has been part of the Low Emission Zone and in recent years, paid parking zones have also been introduced in this district. Since 2022, there has been a spacious Park & Ride for 1,500 cars on the edge of the Left Bank, so that visitors and commuters no longer have to park in the district itself.

The Left Bank is home to many newcomers from outside the EU. Some of these new residents cannot cycle and are completely dependent on public transport.

Together, the 8,784 households on the Left Bank own 5,432 cars. This means that for 61.84% of households, the car is often the first option to get around. The share of the car in the commuting journeys of residents on the Left Bank is 43.9%, the share of sustainable modes is 56.1%. With these modal split figures, the Left Bank belongs to the tail group of Antwerp districts in terms of sustainable mobility. However, the share of the car in leisure-related travel shows a different picture: with 30.5% car use, the residents of the Left Bank are just in the top 5 of sustainable leisure movers.

Avoidance of motorized transportation (avoid)

Description

Not moving or avoiding travel with an internal combustion engine is a first intervention in the field of mobility. This path can be walked for both passenger and freight transport.

In the case of passenger transport, there are a number of trips to avoid, especially in the commuting relationship, if the employer is willing to commit to working from home and to a digital working environment. Trips can also be avoided in the home-shop relationship if there is a smart focus on e-commerce and pick-up points within walking or cycling distance.

Furthermore, the kilometres travelled by car can also be limited if the traveller can park and switch to public transport or to a sustainable shared vehicle. The same principle applies to freight transport, where consolidation and transhipment points can also reduce the number of kilometres travelled by internal combustion engines.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	8.065
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	2.124

Financial

Investment challenge:	-
Cost per unit of CO2	-

Actions

MOB1.1	**Breakthrough project intricate network of off-street parcel lockers and pick-up points**	City of Antwerp	Breakthrough project	Technology & Infrastructure
MOB1.2	**Breakthrough project for last-mile transhipment hub to be delivered**	City of Antwerp	Breakthrough project	Technology & Infrastructure
MOB1.3	**Breakthrough project for water-bound (construction) logistics transport**	City of Antwerp	Breakthrough project	Capacity building
MOB1.4	Expansion of 'smart mobility links'	City of Antwerp	Strategic action	Technology & Infrastructure

MOB1.5	Innovative employee/commuter approach through accessibility managers	City of Antwerp	Strategic action	Learning and capacity building
MOB1.6	Strengthening the walking and cycling network on the Left Bank (Scheldt Borders Master Plan)	City of Antwerp	Strategic action	Technology & Infrastructure

MOB1.1 - Intricate network of off-street parcel lockers and pick-up points

Definition

This breakthrough project focuses on reducing the impact of logistics traffic as a result of B2C home deliveries. E-commerce and the related home deliveries have become commonplace; The number of e-commerce purchases is still on the rise and so is the number of home deliveries. A relatively common problem with these home deliveries is that the recipient is not at home at the time of delivery and therefore cannot receive the package. This is a so-called 'failed delivery': the logistics service provider is unable to deliver the package and takes it back. Depending on which logistics service provider makes the delivery, the package will be dropped off at a nearby pick-up point or a second home delivery attempt will be made at a later time. In the first case, the recipient has no influence on the choice of pick-up point. In the second case, again, there is no guarantee that the delivery will be successful.

This is an inefficient way of working that results in a lot of vehicle kilometres that could have been avoided. These vehicle kilometres in turn contribute to emissions, noise pollution, traffic safety, and traffic nuisance in the area. Avoiding these vehicle kilometres ensures that the associated nuisance is also avoided.

The roll-out of an intricate network of off-street parcel lockers and pick-up points offers the residents of Left Bank an alternative to home delivery. The persuasiveness of the system will be highly dependent on the degree of intricacy. If the pick-up points are located within very limited walking distance, the threshold for consumers to use them will be low. Such a system also has advantages for the logistics service provider, because packages can be delivered in a more bundled way and do not have to be stopped at every door. This mainly means time savings and additional operational efficiency due to the lack of failed deliveries. This system is advantageous for the city because of the elimination of vehicle kilometres and the associated emissions, noise nuisance, traffic nuisance and lack of safety.

In order to increase user-friendliness for users, and to avoid a proliferation of systems on or next to the public domain, it is important that these are so-called 'neutral' or 'open' lockers, in which any logistics service provider can carry out deliveries.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
  - Reduce conflicts over limited resources (land, water, resources,...)
- **Structural barrier(s) or lever/levers**[22]
- If the pick-up points are too far away, there is a risk that the recipient will drive the car to the pick-up point.

[22] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

Expected result

- **Short term (1-4 years):** Exploratory talks, needs analysis, roll-out and start-up of the network.
- **Long-term (5 to 10 years):** Parcel lockers / pick-up points are well established in the Left Bank. The number of home deliveries has fallen significantly.

Implementation

- **Responsible organisation/entity:** City of Antwerp – Mobility
- **Contact:** Tim Vervoort
- **Implementation period of the project:** 2.5 years
- **Target group:** All residents of the Left Bank who have parcels delivered to their homes.
- **Scale of the action:** Left Bank as a pilot and, if deemed favourable, also scale-up in other parts of the city
- **Stakeholders involved:** City departments, logistics service providers, merchants and residents of the Left Bank.

Costs/Benefit

- **CAPEX (project cost):** to be determined at the start of the project
- **OPEX:** to be determined at the start of the project

MOB1.2 - Transhipment hub to supply traders and entrepreneurs more efficiently

Definition

By focusing on a central transhipment hub for the Left Bank, various logistical movements can be avoided. In today's logistics landscape, the supplier often drives to the destination, regardless of the load factor of the truck or van. For example, it happens that vehicles only drive into the residential fabric of the Left Bank for one or two deliveries. This leads to a very fragmented way of delivery, with each supplier only driving to the destination for a limited number of stops. As with project MOB1.1, this system can also avoid unnecessary vehicle kilometres and the associated adverse effects.

By diverting deliveries to the hub instead of the destination, the above fragmentation is avoided. The hub should preferably be located as close as possible to the higher road network. Bundled last-mile deliveries can then be carried out from the hub: real milk rounds, in which all destinations of the various suppliers are served by a single vehicle via an efficient route. If necessary, return flows can also be included. This means optimising the kilometres driven on the Left Bank and thus also avoiding unnecessary emissions, noise pollution, and so on. The optimal deployment also increases the economic feasibility of using an electric vehicle for these last-mile deliveries. Depending on the volumes and type of goods, last-mile deliveries can also be made with light electric vehicles (LEVs) or cargo bikes.

A number of things are crucial for the proper functioning of a hub. For example, it is important that the various suppliers who 'leave' their goods at the hub have sufficient confidence in the party that takes care of the last mile. In addition, a hub can only be profitable if sufficient volume is handled. In this respect, a feasibility analysis will be required before starting the project in order to investigate the potential of the hub and the logistics sectors within which the hub can best start. To increase the volume supplied through the hub, the city can have all deliveries for its city locations on the Left Bank delivered via the hub. In this way, the city can support the hub without too much interference. The intention is that this hub will be fully organised by the market, with support from the city if necessary, for example in the search for a suitable location.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  The hub can also have a positive impact on the social economy by linking certain forms of employment to it
- **Structural barrier(s) or lever/levers**
  An important barrier will be the volume of goods processed, and the willingness to cooperate between the various actors. An important lever is the potential cost savings for the actors.

Expected result

- **Short term (1-4 years):** Exploratory analysis and conversations, matchmaking, drawing up a business plan and start-up hub.
- **Long-term (5 to 10 years):** The hub is profitable and a fixed value within the Left Bank

Implementation

- **Responsible organisation/entity:** City of Antwerp - Mobility
- **Contact:** Tim Vervoort
- **Implementation period of the project:** 4 years
- **Target group:** Logistics service providers and businesses on the Left Bank
- **Scale of action:** Left bank, if necessary also surrounding districts
- **Stakeholders involved:** Traders, logistics service providers, city locations on the Left Bank

Costs/Benefit

- **CAPEX (project cost):** Depends on set-up and location.
- **OPEX:** Depends on set-up and location.

MOB1.3 - Water-bound (construction) logistics transport to and from the Left Bank

Definition

Logistics transport by road has an impact on various areas. In addition to the impact, MOB1.1 and MOB1.2 also illustrate some of the inefficiencies. In various cities in Flanders and beyond, deliveries by water are regularly considered in order to limit the adverse impact of road transport. Applications in the construction sector are often looked at because of the large volumes of large goods that have to be transported to one and the same location. For example, multiple journeys by road can be replaced by one transport by water. Moreover, because of the shorter distance, it is easier to carry out the last mile with an electric vehicle.

The Left Bank also has potential exchange locations with the water: there are several jetties and a marina. In the first place, this breakthrough project will investigate the possibilities and potential of the Left Bank to allow certain transport flows to take place via water. In the second instance, a pilot project can be developed.

If appropriate, this project can be linked to breakthrough project MOB1.2 around the transhipment hub (provided that this hub is planned on the waterfront). In this breakthrough project, the focus should not only be on relocations within the construction sector, but also on other flows of goods should be included in the study.

Impact

- **Systemic lever**: shifting from transport by road to bundled transport by water.
- **Structural barrier(s) or lever/levers**[23]
  A major expected barrier is the potential for waterborne transport. This is determined, among other things, by the willingness of the stakeholders to make the switch. In addition to the volume transported, finding a suitable mooring and transhipment location will also be a challenge. It must be possible not only physically but also legally to deliver goods to one of the exchange points. A lever for the stakeholders is the fact that the congestion-prone region can be avoided by road via transport by water. The last mile only takes place within the Left Bank itself and therefore outside the most congestion-prone area.

Expected result

- **Short term (1-4 years):** Study work, analysis of potential, bringing stakeholders together, first pilot
- **Long-term (5 to 10 years):** Achieve profitability and acquire additional volume

Implementation

- **Responsible organisation/entity:** City of Antwerp - Mobility
- **Contact:** Tim Vervoort
- **Implementation period of the project:** 4 years
- **Target group:** Logistics service providers, construction sector
- **Scale of action:** Left Bank

[23] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

- **Stakeholders involved:** Construction sector, logistics service providers, jetty and marina managers, city services, etc.

Costs/Benefit

- **CAPEX (project cost):** Not yet in the picture
- **OPEX:** Not yet in the picture

MOB1.4 - Developing 'smart mobility links' that encourage the smart combination of means of transport

Definition

The city wants to encourage residents and visitors to use the most appropriate (combination of) means of transport for each trip, in order to limit the sometimes unnecessary use of cars where possible. By expanding existing or new mobility hubs and upgrading them into fully-fledged 'Smart Links' that are recognisable, readable, accessible and comfortable, the various means of transport connect seamlessly. In this way, the multimodal transition is both facilitated and stimulated.

By concentrating the various mobility services and additional facilities at these strategic locations and connecting them in a pleasant way, both switching and 'boarding' in this mobility system are stimulated. Signposting within one node to the various mobility services improves readability, and also draws users' and passers-by's attention to the varied range of services available.

On the Left Bank, Smart Links will be created/optimised at Frederik Van Eedenplein, Halewijn, (Sint-Anneke) Plage and P+R Left Bank.

Impact

- **Systemic lever**: A more attractive transfer encourages multimodal travel and the use of sustainable means of transport. In this way, this project contributes to less CO2 emissions, less air and noise pollution, less paved space, more social contact and a fitter population. The exact impact is very difficult to quantify, as the development of these smart links is only part of a larger story, and the impact is therefore highly dependent on multiple, related actions.

Expected result

- **Short term (1-4 years):** completion of 4 Smart Links on the Left Bank
- **Long-term (5 to 10 years):** A sustainable, lasting impact on mobility, with multiple positive effects in terms of health and climate (see above).

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Tom Vinck, Mattias Van den Bergh
- **Implementation period of the project:** 3 years
- **Target group:** residents and visitors of the Left Bank (everyone who moves around), P+R users
- **Scale of the action:** Left Bank district, P+R users
- **Stakeholders involved:**
    - Flemish region (subsidies)
    - Transport region
    - De Lijn
    - Shared mobility operators
    - Mobility and Parking Antwerp

Costs/Benefit

- **CAPEX (project cost):** 2.2 million for 4 locations together
- **OPEX:** not yet in the picture

MOB1.5 - Engaging employers through accessibility managers to make commuting more sustainable

Definition

The city is committed to making the commuting of medium-sized and large companies on its territory more sustainable by means of a team of accessibility managers. They provide cooperation agreements with these companies and, based on this, focus on a mobility scan of the employees, sustainable accessibility advice, a trial offer of sustainable mobility solutions, a learning network on HR and mobility, and various impact measurements.

Impact

- **Systemic hefboom**:
  - Learning and capacity building
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
  - Reduce conflicts over limited resources (land, water, resources,...)

Expected result

- **Short-term (1-4 years):** avoidance of motorized travel
- **Long-term (5 to 10 years):** avoidance of motorized travel

Implementation

- **Responsible Organization/Entity:**
- **Contact:**
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

MOB1.6-Strengthening the walking and cycling network on the Left Bank (master plan Scheldt borders)

Definition

To prevent possible future flooding, De Vlaamse Waterweg is also raising the dikes in Antwerp. The City of Antwerp is taking advantage of this intervention to construct a new, 6-kilometre-long green promenade along the Scheldt in the Left Bank. Road infrastructure will be rationalised, freeing up more space for a varied landscape, an accessible bank and a lively park.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
  - Reduce conflicts over limited resources (land, water, resources,...)

Expected result

- **Short term (1-4 years):**
- **Long-term (5 to 10 years):**

Implementation

- **Responsible Organization/Entity:**
- **Contact:**
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

Shift private car use to other modes (shift)

Description of intervention

Where journeys are unavoidable, the second intervention consists of a shift from 'carbon fuelled' transport to cycling or collective transport. Left Bank is one of the two districts with the highest number of De Lijn subscribers: 4 tram lines connect the entire district with the city centre, bus 36 connects all districts of this district with each other and 10 other bus lines provide a good connection to the western neighbouring municipalities.

In addition, it will be important to replace car journeys crossing the Scheldt with a ferry crossing or with a local train connection at the Kennedy Tunnel.

Finally, together with the Flemish government, the city also wants to continue to strengthen the bicycle network with the construction of the bicycle bridge in the south near the Kennedy tunnel and a bicycle tunnel in the north parallel to the new Scheldt tunnel of the Oosterweel connection. To further promote bicycle use, the city also wants to focus on cycling lessons for newcomers from countries with a limited cycling culture. According to the 2022 mobility survey, 85.8% of households on the Left Bank had at least one bicycle; This puts this district around the urban average of 84.5%.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	8.065
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	2.124

Financial

Investment challenge:	-
Cost per unit of CO2	-

Actions

Additional electric ferry at the current Scheldt crossing between the Left and Right banks will be put into operation	Flemish government | Dept. MOW | Department AMDK, De Vlaamse Waterweg NV	Breakthrough project	Technology & Infrastructure

Building a connection between the Left and Right banks for cyclists and pedestrians	The Vlaamse Waterweg and the city of Antwerp	Breakthrough project	Technology & Infrastructure
Realisation of Antwerp-West train station	City of Antwerp	Breakthrough project	Technology & Infrastructure
Introduction of minimum modal split of 60/40 to be adhered to for all major events	City of Antwerp	Supporting action	Policies & Regulations
Organising cycling lessons for a target group with limited access to mobility (part of the 'Mobility Shop' project)	City of Antwerp	Supporting action	Learning and capacity building

MOB2.1 - Deploying an additional electric ferry between the banks of the Scheldt

Definition

The Scheldt forms an important natural barrier for sustainable travel. However, passenger transport by water is a fully-fledged alternative to other means of transport. During the works on the Pedestrian Tunnel in 2023, an additional electric ferry was put into use. This ferry quickly proved to be very popular and made a strong contribution to the modal shift. However, after the completion of the works on the tunnel under the Scheldt, the ferry was stopped. The return of this electric ferry provides an additional sustainable connection between the two banks. Opting for a fossil-free means of transport also contributes to a cleaner and high-quality environment.

Impact

- **Systemic lever**: increase the intensity of the spring, gives an increase in pedestrians/cyclists crossing the Scheldt in this way
- **Indirect impact (co-benefits**) cleaner environment

- **Structural barrier(s) or lever/levers**[24]
- Scheldt capacity limit

Expected result

- **Short-term (1-4 years):** doubling intensity
- **Long-term (5 to 10 years):** further investigate whether additional connections are possible

Implementation

- **Responsible organisation/entity: (Flemish) Agency** for Maritime and Coastal Services
- **Contact:** Tim Vervoort
- **Implementation period of the project:** 1 year
- **Target group:** employees/visitors city
- **Scale of the action:** territory of Antwerp
- **Stakeholders involved:** mow Vlaanderen

Costs/Benefit

- **CAPEX (projectkost):** Ntb
- **OPEX:** tbc

[24] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

MOB2.2 - Building a connection between the Left and Right banks for pedestrians and cyclists

Definition

With The Great Connection, we are not only completing the Ring Road for cars, but also for cyclists. In the North, a comfortable bicycle tunnel will be built together with the Oosterweel tunnel. In the south, there will be a bicycle and pedestrian bridge over the Scheldt, near the Kennedy Tunnel.

This project should make an important contribution to the ambition to achieve a modal shift in which only 50% of journeys are made by car. For active road users who have to cross the Scheldt, a high-performance system of Scheldt crossings is necessary.

A new bicycle and pedestrian bridge adds to this system an essential fast and smooth connection in the south of the city. It also provides a connection between the Ring Parks and the many cycling and walking paths around, to and from the city. In the coming years, the current Ring Cycle Path will change from just a cycle path to a new green space for all types of cyclists and park visitors. Together with the future Scheldt bridge in the south and the Scheldt tunnel for cyclists in the north, this will create a high-performance network for a large number of cyclists. A real bicycle ring around the city where you can do 'a tour of Antwerp' by bike for the first time.

Impact

- **Systemic lever**: A high-performance system of Scheldt crossings for active road users stimulates multimodal travel and the use of bicycles. A network calculation based on travel time predicts a 74% increase in bicycle traffic crossing the Scheldt when the network with the Scheldt bridge is realized. The bridge itself will then facilitate about 50% of this traffic. In this way, this project contributes to less CO2 emissions, less air and noise pollution, less paved space, more social contact and a fitter population.
- **Indirect impact (co-benefits**): Within the project, the quays at the height of the Scheldt bridge will be designed as a climate-robust public space through, among other things, greening, depaving and the realization of cooling areas.

Expected result

- **Short term (1-4 years):** Appoint consortium for the design, construction and maintenance of the project
- **Long-term (5 to 10 years):** Commissioning of the bicycle and pedestrian bridge

Implementation

- **Responsible organisation/entity:** De Vlaamse Waterweg and the city of Antwerp - Mobility
- **Contactpersoon:** Philip Mallants
- **Implementation period of the project:** 6 years
- **Target group:** Cyclists
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:** Maritime Coastal Service, Agency for Roads and Traffic, citizens' movements, civil society, etc.

Costs/Benefit

- **CAPEX (project cost):** 254 million Euro (target budget 2022)
- **OPEX:** 1.8 – 5.6 million Euros (2022 est.)

MOB2.3 - Realisation of Antwerp-West train station

Definition

The train is a good alternative to the Antwerp Ring Road and the planned bicycle and pedestrian bridge. The connections in the stations Antwerp-South and Antwerp-Berchem and the very limited travel time by train to these stations ensure that a train station on the Left Bank has the potential to grow into an important hub for this city district. The city is urging SNCB to open Antwerp-West station as an essential part of the development of a coherent suburban network. The Antwerp-Ghent railway line is peripheral to the inhabited parts of the Left Bank: a decent and fast accessibility of the station must therefore be investigated. In this respect, fossil-free buses (see below) can also make a contribution. In this way, an additional Scheldt crossing can be realized at the local level.

Impact

- **Systemic lever**: the train is a good alternative to cars and bicycles and can take a large percentage for itself with a train station for residents/visitors at a shorter distance.
- **Indirect impact (co-benefits**): the area around the station can be set up as a green environment

- **Structural barrier(s) or lever/levers**[25]
- This area is currently not accessible and is isolated by the main road network. This will require additional efforts for pedestrians and bicycle connections.

Expected result

- **Short term (1-4 years):** feasibility study for design/construction/maintenance
- **Long-term (5 to 10 years):** inauguration of the train station

Implementation

- **Responsible organisation/entity: City of Antwerp**
- **Contact:** Tim Vervoort
- **Implementation time of the project: ?**
- **Target group:** train passengers
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:** NMBX/MOW/AWV/ ...

Costs/Benefit

- **CAPEX (project cost): to be determined**
- **OPEX: TBD**

[25] See also Module A-3 Systemic Barriers and Opportunities for Climate Neutrality

MOB2.4 - Implementation of minimum modal split of 60/40 for all major events

Definition

Events make the city vibrant and make people want to be in the city. Events also caused many people to move in and out of the city, often at the same time. After an event, they also want to leave for a short period of time.

The city of Antwerp wants to encourage visitors to make these journeys in the most appropriate way without overwhelming the area around the event and causing too much negative effects of too much search and congestion traffic.

The city of Antwerp wants to encourage and oblige organisers to take sufficient measures so that events are easily accessible and the journey to them is pleasant. After all, a pleasant journey is already part of the total experience of the event. An event that is easily accessible can also attract more visitors.

It is very important that less traffic increases road safety. Accessibility issues will deter visitors from attending an event both on the road and around the event. This is not only negative for the organisation, but also for the image of the city as a pleasant environment.

Impact

- **Systemic leverage**: Large, impactful organizations (in the public domain) must visit AGEV (advisory group on events safety). Here they are obliged to explain their measures. The city tries to make agreements with organizers at indoor locations (e.g. Sportpaleis, RAFC, Beerschot, Expo, ..)
- **Indirect impact (co-benefits**): learned behaviour at events is extended to regular travel (e.g. the commute) and vice versa.
- **Structural barrier(s) or levers:** mobility is not the core business of event organisers. As a result, there is often insufficient knowledge or attention for the consequences of visitor movements on the environment further away from the event site.

Expected result

- **Short term (1-4 years):** /
- **Long-term (5 to 10 years):** A sustainable, lasting impact on mobility, with multiple positive effects in terms of health, road safety and climate (see above).

Implementation

- **Responsible organisation/entity:** City of Antwerp event cell, mobility service
- **Contact: Karin Dries**
- **Project execution time:** continuous
- **Target audience:?**
- **Scale of action: ?**
- **Stakeholders involved:** Organisers, transport providers (SNCB, De Lijn, sharing providers, etc.),

MOB2.5 - Organising cycling lessons for target group with limited access to mobility (part of the 'Mobility Shop' project)

Definition

The cycling school of Sporting A offers cycling lessons for adults who want to learn how to ride a bike or feel safer on the bike. In addition, social organisations can request a tailor-made offer.

Impact

- **Systemic lever**: increasing opportunities on the labour market and participation in social activities because of additional travel possibilities by bicycle.
- **Indirect impact (co-benefits**): increased social participation, modal shift (often from walking/public transport to cycling)
- **Structural barrier(s) or levers/levers:** sufficient capacity, offer of lessons, reaching the target group, bicycle ownership/use after the lessons. Often, having a (decent) bicycle remains a barrier to keeping new cyclists from disadvantaged groups cycling. Shared bicycles and bicycle maintenance are often too expensive for this target group. Extensive cooperation with social enterprises is therefore desirable in order to be able to offer affordable bicycles.

Expected result

- **Short-term (1-4 years):** more adults in the neighbourhood learn to ride a bike and feel safe on the bike
- **Long-term (5 to 10 years):** shift to private car use to cycling

Implementation

- **Responsible organisation/entity:** Antwerp cycling school.
- **Contact:** Annemie Martens
- **Implementation time of the project:**
- **Target group:** people who cannot cycle (often disadvantaged groups)
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:** residents of the Left Bank district, city of Antwerp

Costs/Benefit

- **CAPEX (projectkost): /**
- **OPEX:**

Accelerated green shift (improve)

Description of intervention

Where car, collective transport or freight transport is unavoidable, it is important to focus on the transition to sustainable energy sources. Levers here are the regulations regarding the further tightening of the low-emission zones in Flanders and the mandatory electrification of company cars in Belgium. Both regulations together put a lot of pressure on private car users to opt for electric cars. That is why a network of charging stations is also being set up on the Left Bank and the installation of charging stations on private property is strongly encouraged. Today, there are 30 public charging stations in the district and another 30 in the P+R Left Bank.

As far as collective transport is concerned, the city is urging Flanders to deploy the electric ferry between Sint-Anna and Steenplein and the further electrification of the other ferries. In addition, De Lijn must also replace its diesel buses with electric buses by 2027.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	7.250
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	1.931

Financial

Investment challenge:	€ 134.847.950,00
Cost per unit of CO2	US€3,404.62

Actions

Stricter steps in the Low Emission Zone according to the implementing decree	AG MPA, Flemish Government	Breakthrough project	Policies & Regulations
Accelerated transition to fossil-free public transport on the Left Bank from 2027	De Lijn	Breakthrough project	Policies & Regulations
Developing the loading infrastructure of the Left Bank according to the principles of the	City of Antwerp, Fluvius	Supporting action	Technology & Infrastructure

city (including charging on private property, semi-public charging, etc.)			
Accelerating the transition to fossil-free commercial vehicles	Employers of residents of Left Bank	Supporting action	Policies & Regulations

MOB3.1 - Stricter steps for the Low Emission Zone according to the implementing decree

Definition

The Left Bank is part of the Low Emission Zone. In 2026, 2028 and 2031, the regulations provide for a step-by-step tightening of the access criteria, in order to keep older, more polluting vehicles out. From 2026, only diesel vehicles with an emission standard Euro 6 will be allowed, from 2028 this will become Euro 6d. From 2031, diesel vehicles will only be allowed with a temporary permit for a fee. For petrol vehicles, the standards will be tightened in 2026, 2028 and 2031 to Euro 3, Euro 4 and Euro 6 respectively. This will encourage an accelerated change of cars moving in the Left Bank district.

Impact

- **Systemic Leverage**: Policy and Regulation
- **Indirect impact (co-benefits**)
    - Safe and affordable energy for all
    - Improving the health and well-being of citizens
    - Limiting energy dependency

Expected result

- **Short-term (1-4 years):** reduction of CO2 reduction in vehicles
- **Long-term (5 to 10 years):** reduction of CO2 reduction in vehicles

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Tim Vervoort
- **Implementation period of the project:** 6 years
- **Target group:** travellers
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:** De Lijn/subcontractors and Flanders

Costs/Benefit

- **CAPEX (projectkost): /**
- **OPEX: /**

MOB3.2 - Accelerated transition to fossil-free public transport on the Left Bank from 2027

Definition

Emission-free public transport is essential to reduce CO2 emissions. Because the Left Bank is part of the low-emission zone, all regular public transport organised by the Flemish transport company De Lijn will be fossil-free by 2027. With the arrival of the Oosterweel works and the associated new green structure, this can also be done more quickly on the Left Bank. Due to the increased comfort (elimination of disturbing noise and vibrations, etc.) and the modern appearance, fossil-free buses will further increase the attractiveness of public transport on the Left Bank. This will create a high-quality underlying network in addition to the tram axis, which also takes into account the challenges in terms of climate and air quality. In this way, the alternative to car travel is also further strengthened.

Impact

- **Systemic lever**: the use of clean rolling stock in regular public transport is positive for the environment/quality
- **Indirect impact (co-benefits**): attracting more passengers through the use of cleaner transport
- **Structural barrier(s) or levers/levers:** this depends entirely on the purchase of rolling stock from De Lijn**/** budget Flemish government. The buses here are mainly De Lijn (East Flanders)

Expected result

- **Short-term (1-4 years):** 25% of scheduled vehicles
- **Long-term (5 to 10 years):** 80% of scheduled vehicles to 100%

Implementation

- **Responsible organisation/entity:** De Lijn
- **Contact:** Tim vervoort
- **Implementation period of the project:** 4 years
- **Target group:** travellers
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:** De Lijn/subcontractors and Flanders

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:** to be determined

MOB3.3 - Developing charging infrastructure on the Left Bank according to the principles of the city (including charging on site, semi-public charging, etc.)

The city is working hard to roll out a network of publicly accessible electric charging infrastructure to facilitate the transition from fossil to electric cars as much as possible and thus reduce the ecological impact of the fleet.

Residents and employees of the city can request the installation of a public charging station in their neighbourhood according to the principle of the Ladder of Charging. Laden's Ladder, in turn, is a translation of the POET principle; "Parking on site". If you have a car, you must first store and charge it on your own property. If you do not have the option of parking your car privately, you can go to the existing publicly accessible charging stations at department stores, public car parks or the many petrol stations and charging stations where charging facilities are offered.

Only those who do not have a publicly accessible charging station in the area, and do not have charging facilities on their own property, can request the installation of a public charging station in the area. However, this installation will be done according to the principle "Pole follows car". After all, we don't want to turn every parking space in the city into a charging station. After all, it is not possible and may not park at a charging station for longer than the necessary charging session. The roll-out of an urban network of public charging infrastructure is subsidiary to the private charging facilities and only serves as a collection network in the absence of charging facilities on private land and at petrol stations provided for this purpose.

For this roll-out, the city is calling on a concessionaire. The concessionaire is responsible for the processing of the requests, the installation and the maintenance of the installed charging installations.

Impact

- **Systemic lever**: Alleviating the charging needs of EV drivers
- **Indirect impact (co-benefits**)
- **Structural barrier(s) or levers:** Limited space on public property and respect of the parking balance

Expected result

- **Short term (1-4 years):** Creation of a fully-fledged reception network with at least 1 publicly accessible charging station (2 charging points) within 250 meters at each location in the city.
- **Long-term (5 to 10 years):** Further operation of the public charging network

Implementation

- **Responsible organisation/entity:** AG Mobility & Parking Antwerp
- **Contact:** Lukas Dedecker
- **Implementation period of the project:** to be determined
- **Target group:** Every (potential) e-driver
- **Scale of action:** Entire territory of the Left Bank
- **Stakeholders involved:** Private concessionaire appointed by MPA for installation and operation of the charging infrastructure, Fluvius, AWV

Costs/Benefit

- **CAPEX (projectkost): /**
- **OPEX: /**

MOB3.4 - Accelerating the transition to fossil-free commercial vehicles

Definition

With new rules for the tax deductibility of company cars and the CO2 contribution for company cars, the federal government is encouraging the transition to fossil-free cars. By 2030, almost all company cars on the Left Bank should be fossil-free.

Impact

- **Systemic hefboom**:
  - Policies & Regulations
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens

Expected result

- **Short term (1-4 years):** to be determined
- **Long term (5 to 10 years):** to be determined

Implementation

- **Responsible organisation/entity:** Employers of residents of Left Bank
- **Contact:** Marijke De Roeck
- **Project implementation deadline:** 2023-2031
- **Target group:** residents of the Left Bank district
- **Scale of the action:** Left Bank district
- **Stakeholders involved:** residents and employers of the Left Bank district

Costs/Benefit

- **CAPEX (projectkost): /**
- **OPEX: /**

From private to shared use (liquid)

Description

The two previous interventions – modal and green shift – can be accelerated if a fourth intervention is also used: that of shared mobility. Users of shared mobility and especially shared cars are more often also users of public transport or bicycles. Shared cars are used when it is really necessary and not as a daily habit. Depending on the source, one shared car replaces 5 to 7 private cars. Moreover, a shared car is much more cost-efficient for an end user, which means that the use of an electric shared car is also within reach for many more people.

In addition, Left Bank already has 16 stations for shared bicycles. The city is planning a further expansion here, so that a shared bicycle becomes a logical option in all districts of the Left Bank. There is also a range of electric shared bicycles and cargo bikes that help support the modal shift. To ensure that the residents of the Left Bank make more use of this, efforts are being made to find and provide information.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	4.591
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	1.348

Financial

Investment challenge:	-
Cost per unit of CO2	-

Actions

MOB4.1 – Car-sharing awareness campaign	Stad Antwerpen	Strategic action	Capacity Building
MOB4.2 - Embedding the presence of the offer and the visibility of shared mobility on the Left Bank	Stad Antwerpen	Strategic action	Technology and Infrastructure

MOB4.3 - Expanding the Velo bike sharing network	Stad Antwerpen	Strategic action	Technology and Infrastructure

MOB4.1 – Car-sharing awareness campaign

Definition

As part of its residents' approach, Smart ways to Antwerp focuses on awareness campaigns about car-sharing and the many benefits that go with it. Together with the car-sharing providers, a trial offer for residents is being worked out and, if necessary, provided with incentives.

Impact

- **Systemic hefboom**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

Expected result

- **Short term (1-4 years):**
- **Long-term (5 to 10 years):**

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Marijke De Roeck
- **Project Execution Period:** Ongoing
- **Target group: residents of** the Left Bank
- **Scale of the action:** Left Bank district
- **Stakeholders involved:** car-sharing providers, the city of Antwerp, residents of the Left Bank

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:** to be determined

MOB4.2 - Embedding the presence of the offer and the visibility of shared mobility on the Left Bank

Definition

Left Bank currently has 12 hubs for Donkey Republic's electric shared bikes. These are almost all virtual hubs that are only visible in the app and therefore have no indication (marking or signage) on the public domain. By providing real drop zones with markings and information boards, visibility and recognizability are increased. Because of the morphology of the Left Bank district, the bicycles here very often fall over due to the wind, which is why drop zones are best equipped with bicycle racks.

There are currently no physical drop zones on the Left Bank for shared scooters. The shared scooters are only used to a limited extent. The location where most trips with shared scooters are started is at the entrance to the pedestrian tunnel.

There are 4 drop zones for shared cargo bikes. Currently, there is only one provider of shared cargo bikes operational in Antwerp. Based on usage, there is currently no need to provide more drop zones.

To make shared mobility more visible and reliable, drop zones are set up at strategic locations and preferably bundled with other facilities (Velo stations, car-sharing places, public transport stops, etc.). The following locations are proposed as shared mobility hubs:

- P&R Left Bank
- Frederik Van Eedenplein
- Veer Sint-Anneke
- Intersection Halewijnlaan – Blancefloerlaan

10 drop zones with bicycle racks will be rolled out for the electric shared bicycles and 10 drop zones for the shared scooters.

In the context of the transition plan of the car-sharing places in Antwerp, the possibility of an additional car-sharing hub on the Left Bank can also be examined. The second phase of the transition plan will start soon, with the aim of expanding smart car-sharing spaces, especially beyond the Singel. A major aspect of this plan is to gradually transform the current exclusive Cambio places into (more) smart car-sharing places.

In the parking lot of the Van Eedenplein, an important mobility hub on the Left Bank, there are currently two reserved Cambio spaces. It is also desirable to create additional spaces and provide charging infrastructure, in order to provide the possibility for a hub of at least two electric car-sharing spaces. Furthermore, the Cambio brackets and signs must also be removed and then an info staple of 'smart car-sharing places' must be placed there.

Impact

- **Systemic Leverage**: N/A
- **Indirect impact (co-benefits**): nvt
- **Structural barrier(s) or lever/levers:** N/A

Expected result

- **Short-term (1-4 years):** Implementation of drop zones, implementation of smart car-sharing places
- **Long term (5 to 10 years):** N/A

Implementation

- **Responsible Organization/Entity:** SW MOB
- **Contact:** Jelle De Keyser and Flor Speleman
- **Project implementation deadline:** 2024-2025
- **Target group:** Residents and visitors (employees, commuters, recreationists, etc.) Left Bank
- **Scale of action:** Left Bank district
- **Stakeholders involved:** Donkey Republic and scooter sharing providers (drop zones), car-sharing providers (car-sharing hub)

Costs/Benefit

- **CAPEX (projectkost):** €27.377,5 excl.btw, kost autodeelhub
- **OPEX:** NVT

MOB4.3 - Expanding the Velo bike sharing network

Definition

Expanding the Velo bike sharing network in the Left Bank with 4 stations for a better connection between the P&R, the Veer and the city centre. For the connection to the P&R, 3 stations will be provided so that there is sufficient coverage and connection with the current network. For the connection with the Veer, the provision of 1 station in that context is sufficient.

Impact

- **Systemic hefboom**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

Expected result

- **Short-term (1-4 years):** more shared use
- **Long-term (5 to 10 years):** more shared use

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contactpersoon:** Michael Bastiaens
- **Project implementation deadline:** from 2024 onwards
- **Target group:** Residents and visitors to the Left Bank
- **Scale of action:** Left Bank district
- **Stakeholders involved:** Residents and visitors of the Left Bank district

Costs/Benefit

- **CAPEX (project cost):** €166,260.40 one-time investment cost
- **OPEX:** €58,106.60 /year

Maximum reduction of CO2 emissions from materials

A good urban climate policy looks beyond energy consumption on its own territory. Our carbon footprint depends not only on the size and nature of energy we use and generate in the city, but also on the extraction, production, transport and consumption of products and the food we consume and the processing of waste that arises from this.

Making waste collection more sustainable

Description

The city of Antwerp wants to lower the thresholds for separate waste collection for residents even further. Perfectly recyclable fractions that are not collected at home often disappear into the residual fraction. In order to further reduce its residual waste figure, the city of Antwerp has made a strong effort in recent years to further lower the threshold for recycling. Due to its scale and building typology, the Left Bank district offers opportunities to make waste collection more sustainable.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	-
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	582,48

Financial

Investment challenge:	-
Cost per unit of CO2	-

Actions

Pop-up container parks in the Left Bank district	City of Antwerp	Supporting action	Capacity building
Smart sorting lanes in the Left Bank district	City of Antwerp	Supporting action	Technology & Infrastructure

MAT1.1 - Pop-up container parks in the Left Bank district

Definition

The City of Antwerp wants to lower the thresholds for separate waste disposal for residents even further. Not everyone gets to the recycling centre easily, e.g. because they don't have a car, have difficulty walking, or are not familiar with how the recycling centre works. There is an increased risk that perfectly recyclable fractions that are not collected at home disappear into the residual fraction. In order to further reduce its residual waste figure, the city of Antwerp has made a strong effort to further lower the threshold for recycling. The pop-up recycling parks were expanded to 26 per year. A complete recycling park will be set up nearby.

Impact

- **Systemic hefboom**:
    - Capacity building
- **Indirect impact (co-benefits**)
    - Improving the health and well-being of citizens
    - Empowering communities and citizens

Expected result

- **Short-term (1-4 years):** making waste collection more sustainable
- **Long-term (5 to 10 years):** making waste collection more sustainable

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contactpersoon:** Frédéric Cuypers
- **Project Execution Period:** Ongoing
- **Target group:** residents of the neighbourhood
- **Scale of the action:** Left Bank district
- **Stakeholders involved: /**

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:** to be determined

MAT1.2 - Smart sorting streets in the Left Bank district

Definition

The entire Left Bank district will be equipped with smart sorting streets. The sorting streets are actively committed to reducing the proportion of residual waste by making the recyclable fractions cheaper. Because each fraction can be deposited at any time, these systems are ideal for apartment dwellers who do not have the space to sort all fractions in their home. Because the sorting lines are only emptied when they are full, unnecessary movements of garbage trucks are avoided. Thanks to the smart measurement, waste collection can also be planned more efficiently.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** making waste collection more sustainable
- **Long-term (5 to 10 years):** making waste collection more sustainable

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contactpersoon:** Frédéric Cuypers
- **Project Execution Period:** Ongoing
- **Target group:** residents of the neighbourhood
- **Scale of the action:** Left Bank district
- **Stakeholders involved: /**

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:** to be determined

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

Circular economy support

Description

The city wants to support projects that focus on circularity. Existing materials and products are shared, rented, reused, repaired, refurbished and recycled for as long as possible to create added value. In this way, the life cycle of products is extended. In addition, CO2 can be actively saved by using innovative building materials and processes.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	-
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	-

Financial

Investment challenge:	-
Cost per unit of CO2	-

Actions

Breakthrough project CO2 neutral and CO2-reducing materials (Regatta and Combori)	Prospect	Breakthrough project	Technology & Infrastructure
Breakthrough project circular building materials (Regatta)	Prospect	Breakthrough project	Technology & Infrastructure
Development of an assessment framework for the choice between renovation and new construction in the redevelopment of residential blocks	City of Antwerp	Supporting action	Policies & Regulations

MAT2.1 - Breakthrough project CO2 neutral and CO2 reducing materials (Regatta and Combori)

Definition

Project developer Vooruitzicht is investigating the application of biobased and CO2 neutral or reduced materials within the Regatta and Combori projects: from brick alternatives to biological insulation materials.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Reduce conflicts over limited resources (land, water, resources,...)
- **Structural barrier(s) or lever/levers**

Expected result

- **Short term (1-4 years):**
- **Long-term (5 to 10 years):**

Implementation

- **Responsible Organization/Entity:** Outlook
- **Contact:**
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

MAT2.2 - Development of an assessment framework for the choice between renovation and new construction in the redevelopment of residential blocks

Definition

Development of an assessment framework for the renovation of residential blocks to create clarity and clarity for tenants and owners. The value and quality of the built-up patrimony must be given great weight in this. The average buildings in streets and neighbourhoods must also be preserved as much as possible (insofar as they have a minimum architectural quality and are practically usable). The ecological trade-off between renovation or demolition, including all aspects of circular use, energy or nitrogen problems, must be mapped out.

Impact

- **Systemic hefboom**:
  - Policies & Regulations
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
  - Reduce conflicts over limited resources (land, water, resources,...)
- **Structural barrier(s) or lever/levers**

Expected result

- **Short term (1-4 years):**
- **Long-term (5 to 10 years):**

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:**
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

Shift to green energy

Scaling up renewable energy generation

Description of intervention

Solar and wind energy offer the city of Antwerp great opportunities to evolve towards a sustainable and CO2-neutral energy system in the long term. Electricity is a feasible and proven technology to capture and use that infinite amount of energy. Storage and transport are a necessary link between collection and use, given the irregular and unpredictable availability of wind and solar. This is not yet obvious. Electrification will therefore have to go hand in hand with other technological developments, such as energy storage (in batteries, heat, hydrogen and synthetic fuels), demand response and smart charging.

Flanders is working on regulations that enable renewable energy communities and forms of energy sharing. On this basis, we will promote ***energy cooperatives and renewable energy communities*** and inform citizens and businesses about the opportunities of this form of shared energy management. In addition, we are working on a concession policy for cooperative investments or renewable energy communities on the urban patrimony.

The city is committed to drawing up solar zoning plans. These plans show which buildings have a high solar potential and suitable roof construction and where investments achieve the most return at the lowest cost and the highest possible yield. This gives owners of large, free roof areas insight into the technical and economic potential of their roof. The city wants to work with partners to see how we can activate them to install solar panels or storage systems.

It is assumed that 25% of the total additional PV potential on the Left Bank will be realised by 2030, accounting for approximately 5.7 MWp extra in 2030. This is about twice as much as the additional capital estimated to be realised in a "business as usual" growth. The increase corresponds to an annual additional production of approximately 4,595 MWh/y.

As far as green electricity contracts are concerned, the share will be increased from 43% of total electricity consumption to 70%, which, in combination with the absolute increase in electricity consumption, will lead to approximately 23.7 GWh/y of *additional* green electricity contracts in 2030 compared to the reference situation. The CO2 impact of this measure is approximately 5 times greater than the impact of the PV. Nevertheless, both are of course necessary to achieve the intended reduction.

Impact CO2

GHG amic (from Co2/Jar):	-
Energy avoided/replaced (MWh):	To be supplemented
GHG reduction volume of gas (MWh) :	-
GHG reduction volume CO2 (tonnes CO2/year):	4.823

Financial

Investment challenge:	€22,976,625.00

Cost per unit of CO2	US€190.57

Actions

Breakthrough project renovation into an energy-positive residential tower by means of Building Integrated PV	Façade insight	Breakthrough project	Capacity building
Breakthrough project virtual powerplant that supplies renewable energy from large commercial roofs to vulnerable households	Lammp	Breakthrough project	Capacity building
Breakthrough project for climate-neutral event locations on the Left Bank	City of Antwerp	Breakthrough project	Technology & Infrastructure
Deploying an energy broker for companies (solar coach)	City of Antwerp	Supporting action	Policies & Regulations
Systematic integration of (collective) production of renewable energy in combination with energy storage in district renovation, renovation of apartment buildings and new construction	City of Antwerp	Supporting action	Policies & Regulations

HEE1.1 - How to make residential tower energy positive with solar panels on the façade

Definition

The engineering firm Gevelinzicht wants to realize the energetic façade renovation of a residential tower on the Left Bank in collaboration with the association of co-owners (VME). Together with manufacturers, Gevelinzicht investigates how solar panels in the façade ('building-integrated PV') can create added value for high-rise buildings.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency

Expected result

- **Short-term (1-4 years):** scaling up renewable energy generation
- **Long-term (5 to 10 years):** scaling up renewable energy generation

Implementation

- **Responsible organisation/entity:** Gevelinzicht architecten en ingenieurs
- **Contact:** Joni Staljanssens
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

HEE1.2 - Supplying renewable energy for company rooftops to social tenants

Definition

With the 'EnergieLink' project, the property management company LAMMP wants to promote the installation of solar panels among the service sector and industry on the Left Bank and use the proceeds in an innovative way. The energy generated initially goes to the companies themselves; The energy surpluses are distributed to social housing through 'power purchasing agreements'. For example, companies receive better compensation for their energy surpluses, while tenants of social housing enjoy energy at a lower price. In this way, LAMMP aims to make the service sector and industry more sustainable, while at the same time tackling energy poverty.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** scaling up renewable energy generation
- **Long-term (5 to 10 years):** scaling up renewable energy generation

Implementation

- **Responsible Organization/Entity:** LAMMP
- **Contactpersoon:** Melina Gorrebeeck
- **Project implementation deadline:** 2023-2025
- **Target group:** Companies and residents of the Left Bank district
- **Scale of action:** Left Bank district

Costs/Benefit

- **CAPEX (projectkost):** € 188.400,00
- **OPEX:**

HEE1.3 - Developing climate-neutral event venues on the Left Bank

Definition

The city of Antwerp wants to develop several climate-neutral event locations in the Left Bank district. The city wants to do this by supporting event organizers in switching to the use of 100% electrical energy (possibly) linked to the production of renewable energy. The city itself is also making the necessary efforts to facilitate this transition. One of the locations is the Middenvijver, where new electricity cabins will be installed for this purpose.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** scaling up renewable energy generation
- **Long-term (5 to 10 years):** scaling up renewable energy generation

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:** Nathalie Beloso
- **Implementation period of the project:** from 2024 onwards
- **Target group:** Organisers of events in the Left Bank district
- **Scale of action:** Left Bank district

Costs/Benefit

- **CAPEX (projectkost):** 400.000 euro
- **OPEX:** to be determined

HEE1.4 - 'Solar broker' offers owners advice and help to install solar panels on large roofs

Definition

A 'solar broker' appointed by the city offers advice and assistance with the realisation of PV on company roofs. The solar broker proactively visits business parks and other entrepreneurs with large roofs in Antwerp. The solar broker can also be included in the existing package of coaching programs that the city offers to entrepreneurs, so that they can also sign up themselves if they are interested.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Empowering communities and citizens
  - Limiting energy dependency
  - Reduce conflicts over limited resources (land, water, resources,...)
- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** scaling up renewable energy generation
- **Long-term (5 to 10 years):** scaling up renewable energy generation

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact person:** to be determined
- **Implementation period of the project:** to be determined
- **Target group:** companies on the Left Bank
- **Scale of the action: City of** Antwerp
- **Stakeholders involved:** companies on the Left Bank

Costs/Benefit

- **CAPEX (project cost):** to be determined

HEE1.5 - Combining (collective) production of renewable energy with energy storage in renovation and new construction

Definition

When implementing a renovation at district level or a collective residential building, (collective) production of renewable energy in combination with energy storage is integrated from the start of the project. Energy storage is crucial in absorbing peak loads on the grid, for example through the use of electric cars. The greening of the heat demand of buildings will also require an adjustment of the spatial layout of a district. In large new projects, it should become a reflex to apply the possibility of BEO (borehole energy storage) under the plot for sustainable seasonal energy storage.

Impact

- **Systemic hefboom**:
    - Technology & Infrastructure
- **Indirect impact (co-benefits**)
    - Safe and affordable energy for all
    - Improving the health and well-being of citizens
    - Empowering communities and citizens
    - Limiting energy dependency

- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** scaling up renewable energy generation
- **Long-term (5 to 10 years):** scaling up renewable energy generation

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact:**
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):**
- **OPEX:**

Realisation of energy-positive new construction projects

Impact CO2

- GHG emissions:
- Removed/ substituted energy, volume of fuel/ energy carrier, energy equiv:
- Amount of renewable energy generated: not applicable
- GHG gas volume reduction:
- GHG reduction volume CO2:

Financial

- Investment challenge: €92,844,800.00
- Cost per unit of CO2:

Breakthrough project Katwilgweg as a climate-positive neighbourhood	Ghelamco	Breakthrough project	Technology and Infrastructure

HEE2.1 - Developing the Katwilgweg business park as a climate-positive district

Definition

Nova-West is the first future-proof Flemish area development: climate-positive, nature-inclusive and with a strong work-life balance. The Nova-West area development endorses the climate ambitions of the City of Antwerp and even wants to go one step further: a climate-positive development for a new district. This will make Antwerp-West a lever for the climate transition of the Left Bank and Antwerp.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Safe and affordable energy for all
  - Improving the health and well-being of citizens
  - Empowering communities and citizens
  - Limiting energy dependency
  -
- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** scaling up renewable energy generation
- **Long-term (5 to 10 years):** scaling up renewable energy generation

Implementation

- **Responsible organisation/entity:** Ghelamco
- **Contact:**
- **Implementation time of the project:**
- **Target audience:**
- **Scale of action:**
- **Stakeholders involved:**

Costs/Benefit

- **CAPEX (projectkost):** to be determined

Realisation of new green structures

The Left Bank is the lung of the city due to the large green areas. To strengthen this role, efforts are being made to connect the various valuable, but fragile ecological structures. This requires leaving room for natural processes through the careful integration of (new) infrastructures, buildings and large-scale functions that respond to the underused recreational potential.

The large-scale landscape of the Scheldt and the Sandy Plain of the Left Bank form a robust and ecologically valuable landscape framework. The characteristic landscape is extended along the infrastructure landscape and the open spaces in the built-up fabric. This contributes to a strong landscape cohesion, improved green fordability in the district and high-quality public spaces. This will create a new park structure that enhances the landscape diversity of the Left Bank. Throughout Europark, efforts are being made to create a new, continuous connecting figure of soft connections and the elimination of the missing link in the boulevard structure and bicycle network. By extension, green crossings both north-south and east-west will connect the various residential areas with the surrounding landscape and recreational area.

Realisation of new landscape park Europark	City of Antwerp	Breakthrough project	Technology & Infrastructure
Realisation of a new landscape park on the banks of the Scheldt	City of Antwerp	Breakthrough project	Technology & Infrastructure
Realisation Ringpark West	City of Antwerp	Breakthrough project	Technology & Infrastructure

GRN1.1 - Realisation of a new landscape park for the Europark social housing estate

Definition

The Europark master plan and associated landscape design focuses on strengthening three major systems: water, forest and open plain. These three parameters are not only used as ecological building blocks, but also as recreational building blocks of the park. The realisation of the new landscape park will strengthen the climate resilience of the Left Bank district.

Impact

- **Systemic hefboom**:
  - Technology & Infrastructure
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Empowering communities and citizens

- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** new green structures
- **Long-term (5 to 10 years):** new green structures

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact Person:** Pia Looz
- **Implementation time of the project:**
- **Target group:** residents and visitors to the Left Bank
- **Scale of the action:** Left Bank district

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:**

GRN1.2 - Realisation of a new landscape park on and along the banks of the Scheldt

Definition

To protect the city from possible flooding, the dikes will be raised. This is done by De Vlaamse Waterweg nv and is part of the so-called Sigma Plan. The Sigma Plan determines the height of the dike and divides the area into an outer dike and inner dike landscape. Today, the landscape inside the dikes is characterised by large open grassy areas with tall trees. Existing trees will be preserved as much as possible. By reprofiling the area, we can enrich the diversity of the landscape and strengthen the blue-green network. Outside the, the valuable mudflats and salt marshes landscape will be preserved as much as possible and expanded where possible.

Impact

- **Systemic hefboom**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Empowering communities and citizens

- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** new green structures
- **Long-term (5 to 10 years):** new green structures

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact Person:** Pia Looz
- **Implementation time of the project:**
- **Target group:** residents and visitors to the Left Bank
- **Scale of the action:** Left Bank district

Costs/Benefit

- **CAPEX (project cost):** to be determined

~~OPEX:~~GRN1.3 - Realisation Ringpark West

Definition

To protect the city from possible flooding, the dikes will be raised. This is done by De Vlaamse Waterweg nv and is part of the so-called Sigma Plan. The Sigma Plan determines the height of the dike and divides the area into an outer dike and inner dike landscape. Today, the landscape inside the dikes is characterised by large open grassy areas with tall trees. Existing trees will be preserved as much as possible. By reprofiling the area, we can enrich the diversity of the landscape and strengthen the blue-green network. Outside the, the valuable mudflats and salt marshes landscape will be preserved as much as possible and expanded where possible.

Impact

- **Systemic hefboom**:
  - Capacity building
- **Indirect impact (co-benefits**)
  - Improving the health and well-being of citizens
  - Empowering communities and citizens

- **Structural barrier(s) or lever/levers**

Expected result

- **Short-term (1-4 years):** new green structures
- **Long-term (5 to 10 years):** new green structures

Implementation

- **Responsible organisation/entity:** City of Antwerp
- **Contact Person:** Pia Looz
- **Implementation time of the project:**
- **Target group:** residents and visitors to the Left Bank
- **Scale of the action:** Left Bank district

Costs/Benefit

- **CAPEX (project cost):** to be determined
- **OPEX:**

B-2.2: Concise Strategy for Residual Emissions

The strategy for eliminating residual emissions focuses on 2 pillars. On the one hand, we are investigating whether we can run Linkerover on green electricity as much as possible through a Public Purchasing Agreement, and on the other hand, CO2 is compensated outside the project area by means of the Carbon Capture and Storage Programme of the Port of Antwerp Bruges.

Public Purchasing Agreement with producer of wind and solar energy for the residents of the Left Bank district

The current action plan assumes an increase of 43% of green electricity compared to the total electricity consumption to 70%, which, in combination with the absolute increase in electricity consumption, will lead to approximately 23.7 GWh/y of *additional* green electricity contracts in 2030 compared to the baseline. The CO2 impact of this measure is approximately 5 times greater than the impact of scaling up the generation of renewable energy. It is therefore worthwhile to investigate whether the use of a Public Purchasing Agreement for the entire district with a producer of wind and solar energy can make the district run entirely on green electricity.

Carbon Capture & Storage programma Port of Antwerp Bruges: Antwerp@C

Antwerp is home to the **largest integrated energy and chemical cluster** in Europe. This makes it the ideal location to create new cross-company collaborations and to reduce CO_2.

It starts with the capture and local transport of CO_2. This requires pipelines, as well as a common installation for the liquefaction of CO_2, units for interim storage, etc. Because Belgium does not have the suitable subsoil to store CO_2 underground, **international cooperation is** necessary. On the one hand, to transport CO_2 across borders and, on the other hand, to store it permanently in, among other things, empty gas fields under the sea.

Antwerp@C foresees **two avenues** for cross-border CO_2 transport infrastructure. In a first phase, the CO_2 will be shipped in liquid form to depleted gas fields in the North Sea area. In addition, Antwerp@C is exploring the possibility of transporting CO_2 to the Netherlands via a pipeline in a second phase.

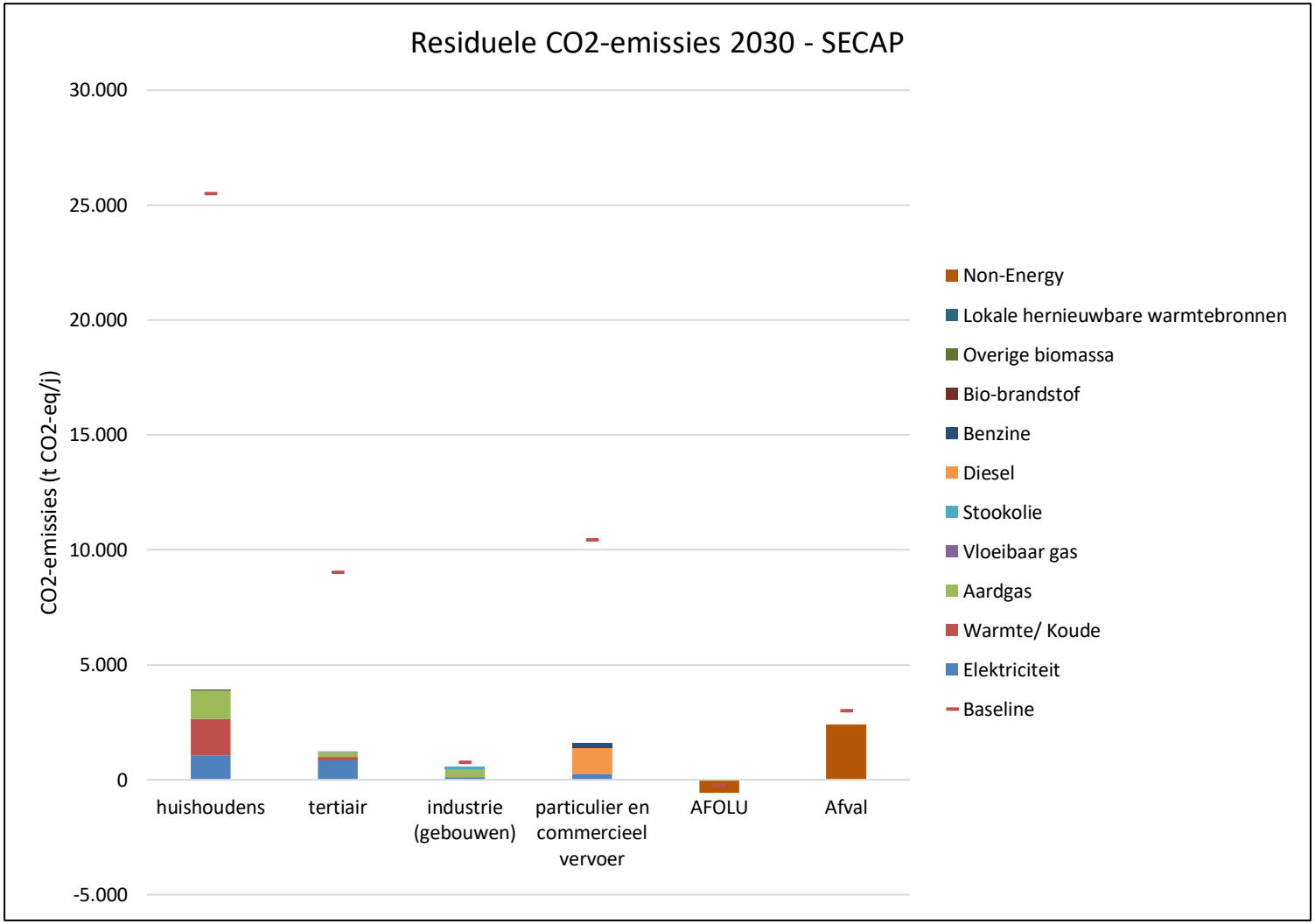
Module B-3 Monitoring, Evaluation and Learning Indicators

Module B-3 contains a selection of indicators from the indicator sets developed by NZC. The following should be provided: a summary table showing the selected indicators by result and impact, including targets and evaluation points (B-3.1); and a metadata table for each selected indicator, as specified in the extended indicator sets (B-3.2).

B-3.1: Overview of indicators

Results/impact	Action/ project	Indicator No. (uniquely identified)	Indicator name	Definition	Target values		
					2025	2027	2030
Reduction of CO2 emissions in buildings	BORN	t CO2 equivalent/j	**GHG emissions from stationary energy**	Greenhouse gas emissions (mainly CO2 emissions) from the operation of buildings.	32.846,89	20.044,96	7.243,03
Overarching	GEB, PAIN, MAT	t CO2 equivalent/j	**GHH emissions from grid-supplied energy**	Greenhouse gas emissions that occur as a result of the use of grid-supplied electricity, heat, steam, and/or cooling within city limits.	4.083,72	3.166,36	2.248,99
Reduction of CO2 emissions from vehicles	MOB	t CO2 equivalent	**GHG emissions from transport**	Greenhouse gas emissions from the use of vehicles.	10.427,36	6.011,33	1.595,30
Reduction of CO2 emissions from materials	MAT	t CO2 equivalent	**GHG emissions from waste**	Greenhouse gas emissions from waste disposal, waste incineration and landfills.	2.997,00	2.705,76	2.414,52
Shift to renewable energy	HEE	% in kWh	**Local renewable energy production**	Percentage increase in the share of local renewable energy thanks to the project.	10%	25%	45%
Realisation of green infrastructure	GRN	hectares / 100,000	**Green Space**	Green area (hectares) per 100,000 inhabitants	310,20	341,22	372,24
Overarching		t CO2 equivalent	**GHG emissions from IPPU**	Greenhouse gas emissions from industrial processes and product use within the city limits.	no figures available for the district Left Bank		
Realisation of green infrastructure	GRN	t CO2 equivalent	**GHG emissions from AFOLU**	The IPCC guidelines divide AFOLU emission activities into three categories: Livestock, Land, Aggregate Sources, and Non-Onshore CO2 Emission Sources.	-	-171,79	-343,59

Overarching		%	**Residual emissions**	The difference between the city's GHG emissions inventory and the 2030 climate neutrality target. The Mission recommends as a guideline to aim for a level of 'residual emissions' within city limits by 2030 that does not exceed 20% of the baseline GHG inventory, with the possibility that the remainder can be accounted for using carbon sinks or credits.	40%	30%	20%


Residuele CO2-emissies 2030 - SECAP
30.000
25.000
20.000
15.000
10.000
5.000
0
-5.000
CO2-emissies (t CO2-eq/j)
huishoudens
tertiair
industrie (gebouwen)
particulier en commercieel vervoer
AFOLU
Afval
Non-Energy
Lokale hernieuwbare warmtebronnen
Overige biomassa
Bio-brandstof
Benzine
Diesel
Stookolie
Vloeibaar gas
Aardgas
Warmte/ Koude
Elektriciteit
Baseline

B-3.2: Indicator metadata

B-3.2: Indicator Metadata	
Indicator name	**GHG emissions from stationary energy**
Indicator Unit	t CO2 equivalent/j
Definition	Greenhouse gas emissions (mainly CO2 emissions) from the operation of buildings.
Calculation	Calculation based on energy consumption and source of the buildings in the Left Bank district
Context indicator	
Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Buildings
Does the indicator measure indirect effects (i.e. co-benefits)?	Yes
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	Yes
If so, for which interventions is this relevant?	Interventions: - Construction of heat network - Renovation of family homes - Renovation of multi-family dwellings - Renovation of the tertiary sector - Renewal of the Woonhaven patrimony
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	
Expected data Source	Network administrator Fluvius
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

Indicator Name	**GHH emissions from grid-supplied energy**
Indicator Unit	t CO2 equivalent/j
Definition	Greenhouse gas emissions that occur as a result of the use of grid-supplied electricity, heat, steam, and/or cooling within city limits.
Calculation	Calculation based on the number of green energy contracts in the district
Context Indicator	

Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Buildings, Mobility & Transport, Energy Systems
Does the indicator measure indirect effects (i.e. co-benefits)?	Yes
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	Yes
If so, for which interventions is this relevant?	Interventions: - Construction of heat network - Renovation of family homes - Renovation of multi-family dwellings - Renovation of the tertiary sector - Renewal of the Woonhaven patrimony - Accelerated green shift vehicles
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	
Expected data Source	Network administrator Fluvius
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

Indicator Name	**GHG emissions from transport**
Indicator Unit	t CO2 equivalent/j
Definition	Greenhouse gas emissions that occur as a result of the use of grid-supplied electricity, heat, steam, and/or cooling within city limits.
Calculation	Calculation based on the number of green energy contracts in the district
Context Indicator	
Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Mobility and Transport
Does the indicator measure indirect effects (i.e. co-benefits)?	No
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	Yes
If so, for which interventions is this relevant?	Interventions: - Avoidance - Shift private car use to other modes (shift)

	- Versnelde green shift (improve) - From private to shared ownership (solid to liquid)
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	
Expected data Source	vehicle kilometres as reported in VITO's Antwerp Emission Inventory – 2019
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

Indicator Name	**Local renewable energy production**
Indicator Unit	%
Definition	Percentage increase in the share of local renewable energy thanks to the project.
Calculation	
Context Indicator	
Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Shift to renewable energy
Does the indicator measure indirect effects (i.e. co-benefits)?	No
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	And
If so, for which interventions is this relevant?	Interventions: - Scaling up renewable energy generation - Realisation of energy-positive new construction projects
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	
Expected data Source	
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-
Indicator name	**GHG emissions from waste**
Indicator Unit	t CO2 equivalent/j

Definition	Greenhouse gas emissions from waste disposal, waste incineration and landfills.
Calculation	Calculation based on the number of tonnages collected in the district supplemented by the residual waste tonnage per company in accordance with the Flemish average.
Context Indicator	
Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Waste and circular economy
Does the indicator measure indirect effects (i.e. co-benefits)?	No
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	Yes
If so, for which interventions is this relevant?	Interventions: - Making waste collection more sustainable
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	- Collected tonnages sorting lanes Left Bank - Average tonnages of industrial waste in Flanders
Expected data Source	- City of Anwterpen - Flemish Government
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

Indicator name	**Green space**
Indicator Unit	hectares / 100,000
Definition	Green area (hectares) per 100,000 inhabitants
Calculation	Calculation based on surface area of green space and water per inhabitant of the Left Bank district
Context Indicator	
Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Green infrastructure
Does the indicator measure indirect effects (i.e. co-benefits)?	No
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	Yes
If so, for which interventions is this relevant?	Interventions:

	- Realisation of new green infrastructure
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	Area of green spaces and water per capita
Expected data Source	- City of Antwerp
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

Indicator name	**GHG emissions from AFOLU**
Indicator Unit	t CO2 equivalent
Definition	The IPCC guidelines divide AFOLU emission activities into three categories: Livestock, Land, Aggregate Sources, and Non-Onshore CO2 Emission Sources.
Calculation	Calculation based on the maps from the Geoloket Vlaanderen
Context Indicator	
Does the indicator measure direct effects (i.e. reduction of greenhouse gas emissions?)	Yes
If so, which emission domains will be affected?	Green infrastructure
Does the indicator measure indirect effects (i.e. co-benefits)?	No
If so, what co-benefit does it measure?	
Can the indicator be used to monitor the interventions?	Yes
If so, for which interventions is this relevant?	Interventions: - Realisation of new green infrastructure
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Required data	Map layers Geo Loket Vlaanderen: • Low soil storage • Low storage in biomass
Expected data Source	- City of Antwerp
Expected availability	Ok
Suggested collection interval	2 years
Credentials	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

B-3.3 Learning and Reflection

As with many of the partners involved, the city of Antwerp has a lot of experience in implementing a learning process for complex, multi-level projects. The mission can build on this expertise. For example, a portfolio-based approach has already been developed within the city's Climate & Environment department. This iterative process flow is strongly focused on the collective generation of new insights and the capture of lessons learned at various levels (organizational, substantive, strategic) and the embedding of knowledge.

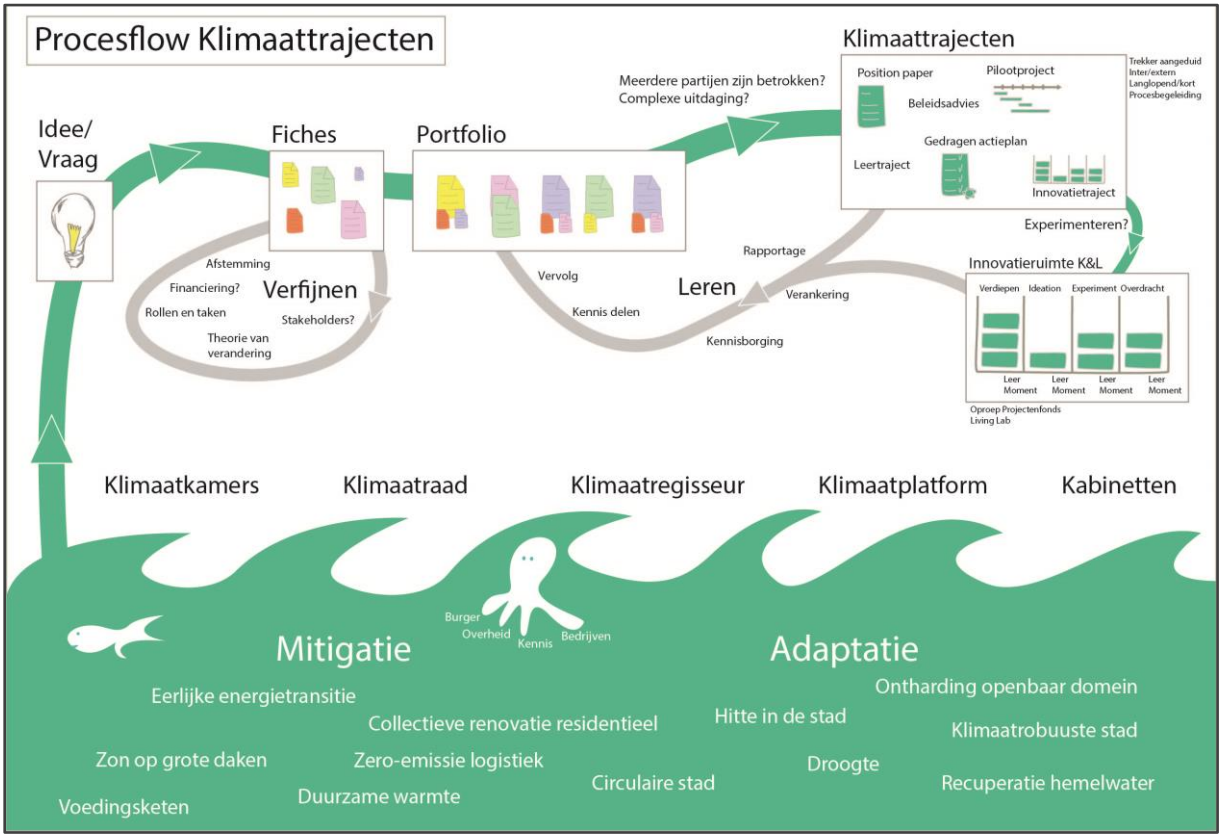


Figure: Portfolio operation - Iterative process flow complex trajectories (Department of Climate & Environment)

Where there is a need for experimentation, with multiple stakeholders and in practice, the methodology of the living lab on sustainability of the city (Innovation Space Climate & Environment) can be used. This living lab was developed within the city in 2013 and has since been building a methodology focused on collaborative learning and knowledge building.

In addition to setting up the 'challenge-driven' innovation trajectories, which address specific challenges, the entire mission will also be conceived as a living lab in itself. The area-specific approach (Left Bank district), the multi-stakeholder perspective and joint learning will be important starting points.

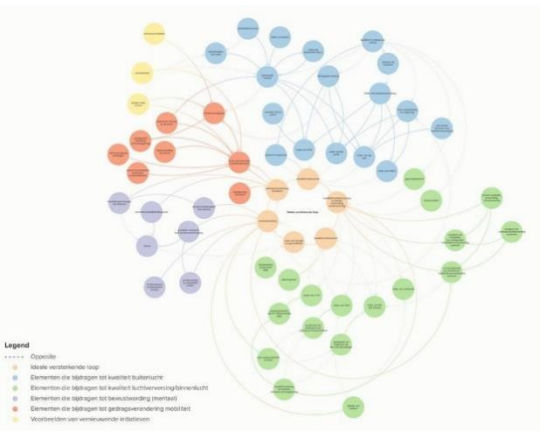


Image: Methodology Innovation Space Climate & Environment © Frederik Beyens© Frederik Beyens

The participatory model will be used to install a process of collaborative learning around the mission. For example, the broad network, consisting of parties from the so-called quadruple helix, will be involved for the dissemination of lessons, the coordination consultation to ensure strategic learning and embedding insights and adjusting strategy and action portfolio where necessary.

A learning trajectory will also be provided at the level of the actions themselves. Among other things, to always anchor the actions in a broader perspective of the mission and its strategic objectives.

Part C – Enabling climate neutrality by 2030

Part C "Enabling Climate Neutrality by 2030" aims to outline all enabling interventions, i.e. related to organisational setting or governance, or related to social innovations – designed to support and enable the climate action portfolios described in module B-2, as well as aimed at achieving co-benefits set out in the impact pathway (module B-1).

Module C-1 contains an overview of the interventions that are necessary with regard to organizational setting and governance from the city of Antwerp, and an overview of the adjustments that are necessary to supra-local policy in order to make the Mission successful.

Module C2 contains an overview of social interventions necessary for the success of the Mission and a description of their impact.

Module C3 provides an overview of the necessary supra-local policy interventions

Module C4 provides an overview of the required financial interventions from the investment plan.

Module C-1 Organizational Interventions and Governance

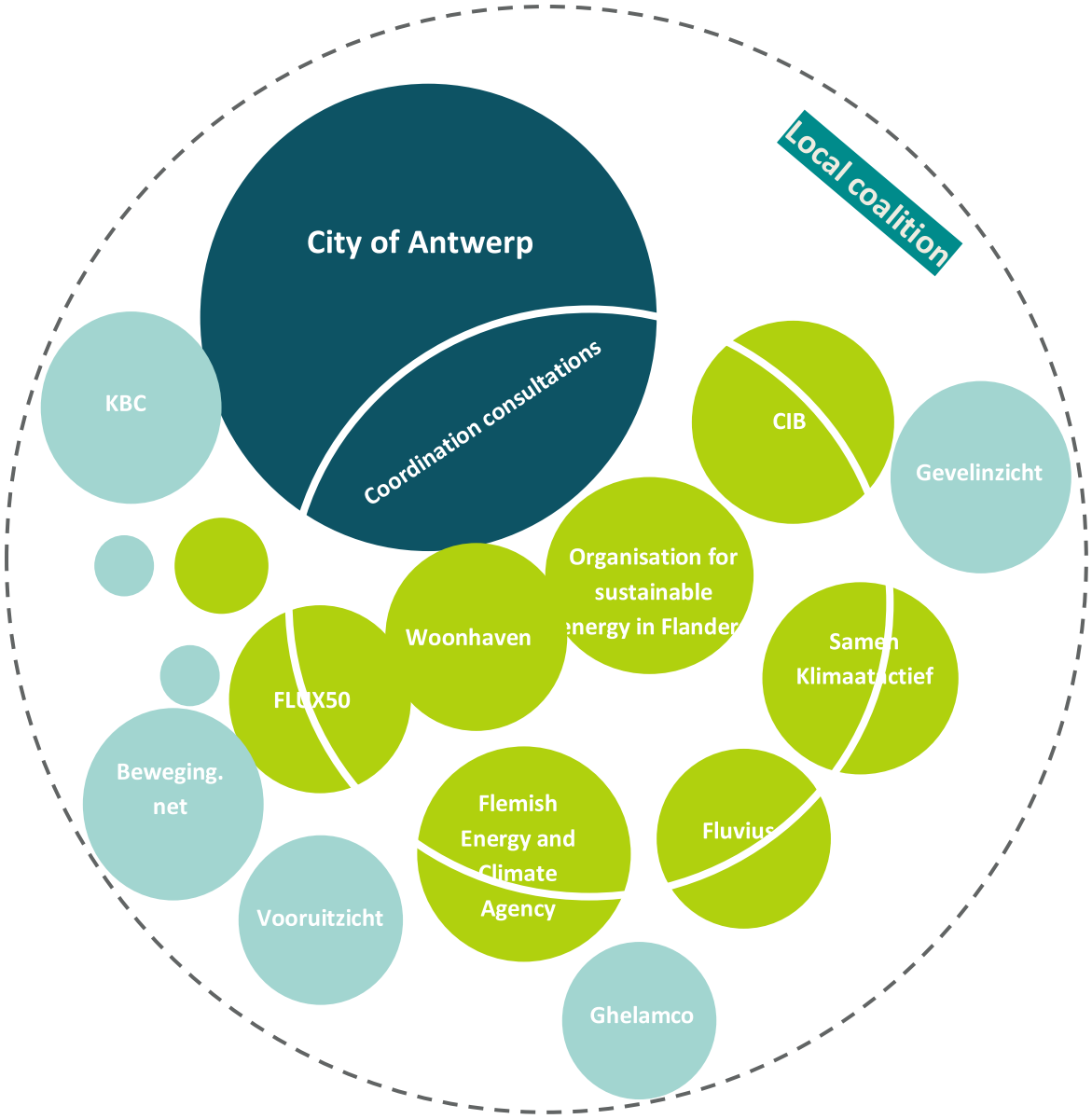
The City of Antwerp has a strong governance structure for the implementation of its climate plan. The experience and networks she has built up will also be used to make the Left Bank Mission climate-neutral by 2030 possible.

The city's Climate Plan was drawn up, including a *governance* structure at various levels. The management of projects and the determination of strategy takes place in the Climate Chambers, the elaboration of trajectories via so-called climate tables. In addition, an external team from a Climate Director (or intendant) works to involve the community around the climate plan and a Climate Council is convened to provide advice on specific themes.

In addition, there are many policy instruments that the city uses on a daily basis in its (horizontal) policy and on which the implementation of the Urban Climate Action Plan builds.

The follow-up of the implementation of the urban Climate Contract Left Bank 2030 requires a project structure tailored to the Mission, embedded in the organisation of the city of Antwerp and continuing the co-creative approach for which the basis was laid when the Climate Contract was drawn up.

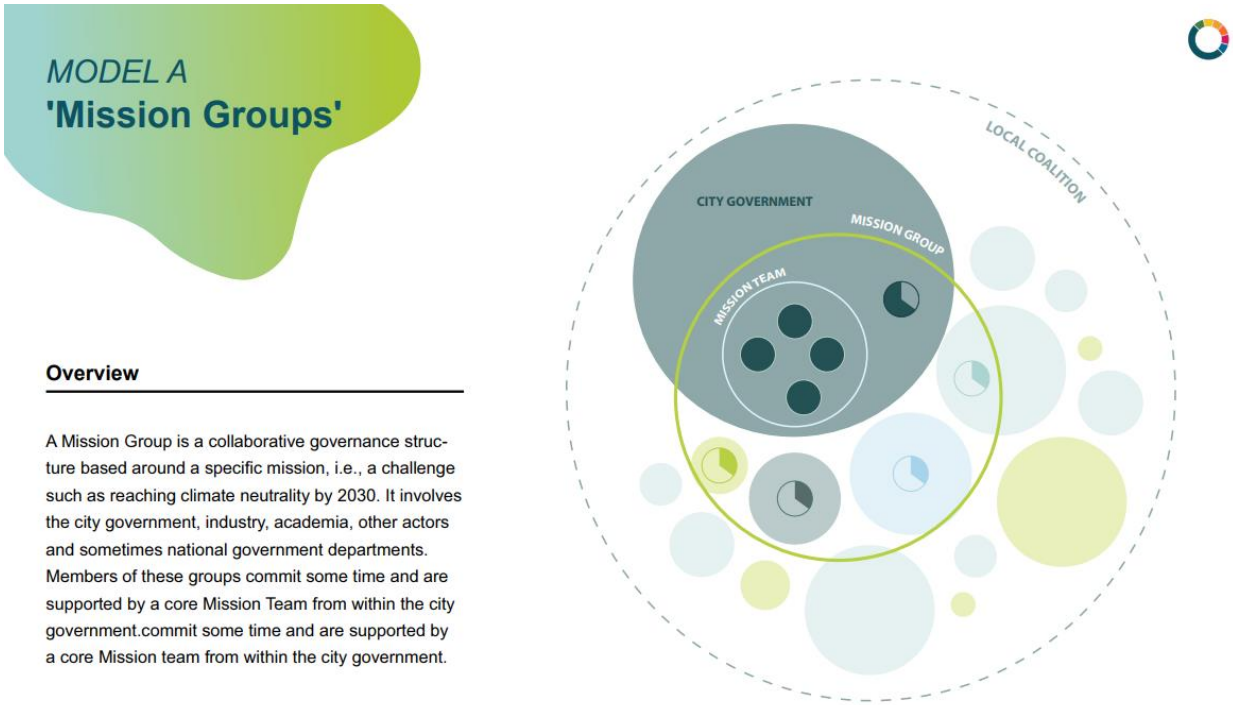
The following project structure has been developed for further follow-up:



- The city's internal **Steering Committee Left Bank 2030** was established and consists of representatives of the relevant municipal services and political cabinets. The action plan and the project structure were initially presented to this steering committee in order to obtain a strong mandate within the City of Antwerp's own organisation. In the further process, this internal steering committee will ensure that the action and investment plan responds to the urban objectives at the right moments, so that cooperation is achieved both on the ground and behind the scenes of the mission.
- The internal steering committee also approved the establishment of **the coordination consultation** for the Left Bank 2030 mission, with representation from all major emission domains. This team will meet at a number of key moments and will take responsibility for defining the actions in the Action and Investment Plan.
- Composition of the Coördination Team:
  - **Internal steering committee:** KB, KE, KF, KH, KS, KW, SW, SD, SB, OS, district of Antwerp and project team Left Bank 2030
  - External actors representing the major emission domains:

- Woonhaven Antwerpen (Social Housing Company)
- Together Climate Active (Climate Network and Matchmaking Platform)
- Confederation of Real Estate Professions
- Organisation for Sustainable Energy (ODE): Dirk Van Evercooren
- Flux50: Frederik Loeckx
- Fluvius: Jef Huyck
- Mobility and Transport City of Antwerp: Michiel Penne/Marijke De Roeck
- Flemish Energy and Climate Agency (VEKA): Margot Van Cauter
- Netjarosities: Bob D'Hazel's

Transition Team Left Bank 2030 (= internal steering group of the city of Antwerp and external members of the Coördination Team)



● **Build a shared vision**

The Transition Team creates the space for new opportunities, validating high ambitions, identifying potential risks and understanding the relationship between the actors involved. It does this by facilitating participatory future thinking and imagining in order to shift or broaden what is seen as possible in the ecosystem. Such a narrative is crucial to agree on a vision and a commonality language that creates a shared direction between local actors. The Team is working to translate this shared vision into a public narrative for action, increasing its tangibility as it evolves over time.

● **Cultivating and nurturing collaboration**

The Transition Team works to build and maintain trust, strengthen the relationships between actors in the ecosystem. It manages and manages the space in which actors and stakeholders are located, communicate, and collaborate in a way that aims to foster a culture of shared, distributed leadership across the ecosystem. It facilitates the proximity of people, especially those whose experience, imagination, and understanding of problems differ from those who are most involved in decision-making. This proximity ensures that the transition is meaningful collaboration resulting in the input and buy-in needed for positive and sustainable impact

C.1.1: Organisational interventions and governance		
Intervention	**Definition**	**Responsible Entity**
Establishment of coordination consultations	See above	City of Antwerp
Embedding Mission in the city's climate change	See above	City of Antwerp
Establishment of a core team	The core team is initially responsible for the relationships with NetZeroCities, the preparation of the Climate City contract, the elaboration of the action plan and investment plan and the building of a successful local and supra-local stakeholder operation. For the preparation of the action plan and investment plan, external process support is also called upon through the framework agreement process guidance of the Department of Urban Development/Climate and Environment.	City of Antwerp
Setting up sounding board groups	These different parts of the project structure take into account and seek to connect with the ongoing urban development projects on the Left Bank and their project structures (such as the Europark steering group and the Scheldt Borders steering group). This project structure will be further refined in the course of the process and supplemented where necessary (e.g. in function of active participation of the resident and/or business community, of sub-projects, etc.).	City of Antwerp

Module C-2 Social Interventions

Below is a short list of the necessary interventions, which has been elaborated in the impact pathways (module B1)

C.2.1: Social interventions		
Intervention	**Definition**	**Responsible Entity**
Development of (new) support mechanisms for vulnerable target groups	Focus on guidance and awareness-raising and the introduction of support mechanisms so that the climate transition becomes feasible for everyone	City of Antwerp together with its social partners (Woonhaven Antwerpen, beweging.net)
Stimulating social innovation through the use of the Urban Climate Fund and innovation space	The Climate Fund is a public-private finance model through which the city seeks to foster (additional) private investment. In addition, the Climate Fund is an instrument to establish cooperation with relevant - often new - stakeholders in aninnovative policy area. Each selected project will receive customised guidance from the city. Within the Mission project the instrument of the Climate Fund will give extra attention to the selection of social innovation projects	City of Antwerp together with its social partners (Woonhaven Antwerpen, beweging.net)
Drawing up the Left Bank Fossil Free Neighbourhood Implementation Plan	As part of the Heat Transition plan for the Left Bank a target-group strategy will be developed providing tools and guidance made to measure the needs of vulnerable groups.	City of Antwerp together with its social partners (Woonhaven Antwerpen, beweging.net)

Module C-3 Policy Interventions

To enable climate neutrality by 2030, interventions at a supra-local level are also necessary. The following is an overview of the necessary policy interventions at the supra-local level

Scope	Theme	Definition	Level of government
Climate policy - general	Local Energy and Climate Pact	By strengthening each other, municipalities and Flanders can achieve a lot. The LEKP is potentially a good instrument for this purpose, but it can be improved.1) LEKP should take more account of the specificities of a large city when building sites. A city should be able to carry out a materiality analysis and determine priority sites and actions based on this. At present, a local government has to monitor all construction sites, while this is not possible for a large city. 2) The LEKP may result in local climate plans (SECAP) being better aligned with the Flemish Energy and Climate Plan. In this way, the LEKP can connect the local and supra-local climate plans. Local and supra-local are then better attuned to each other. 3) Local authorities cannot achieve the objectives for their own patrimony without financial support. This can be linked to the obligation of a strategic real estate policy. This is now optional in the LEKP. 4) Long-term certainty is needed for local authorities (e.g. 1 long-term pact instead of successive partial pacts, guarantee that LEKP funds remain at least at the same level). 5) Bottlenecks identified by local authorities must actually be dealt with. 6) Scope 3 can be included as an overarching principle, e.g. having regard to the Flemish efforts with regard to food strategy, recent EU policy, etc.	Flanders

Climate policy - general	Energy taxes and levies	Flemish and federal levies on electricity and gas must be adjusted. Taxes on fossil fuel gas are lower than on electricity. This needs to be reversed. It must also be possible to provide sufficient reliable, sustainable and affordable alternatives so that Matthew effects are avoided and the climate transition is inclusive. Heat pumps, for example, are severely disadvantaged. Furthermore, the fossil federal subsidy of 13 billion euros may be phased out annually.	Flanders / Federal
Climate policy - general	Monitoring and data access to climate policy	Demand for improved monitoring of climate policy and energy transition. A series of crucial indicators, such as the renovation rate of buildings, the number of vehicle kilometres cannot be entered. Also data on heating systems in buildings, fossil-free heating systems, the use of electricity for heat and charging electric cars... Missing. Local authorities, energy houses and property managers should have access to the EPC database for the buildings on their territory or under their management.	Flanders
Climate and heat policy	Call Green Heat / Energy Decree	The existing subsidy framework for the roll-out of green heat is not sufficient for the roll-out of large-scale heat programmes. The budgets are too small and the procedure too ad hoc. The roll-out of district-wide heat infrastructure requires an adapted, and more extensive, framework.	Flanders
Climate and heat policy	Phasing out natural gas	Depreciation of natural gas networks is currently still 50 years. Large parts of the natural gas network will have to be depreciated at an accelerated rate in the light of climate neutrality in 2050. It is best to adjust the depreciation now so that it can be borne by as many affiliates as possible. If that has to happen in, say, 2045, those burdens may fall on the weakest shoulders. Develop a Social Climate Plan in order to be able to claim the resources of the European Social Climate Fund.	Flanders / Federal

Climate and heat policy	Noise heat pumps	A sharp increase in noise nuisance complaints is expected during the roll-out of heat pumps. This can lead to resistance to heat pumps in densely populated areas. There is no regulation for most residential heat pumps in Vlarem. To prevent each municipality from drawing up its own regulations, it is better to develop a Flemish uniform regulation for all heat pumps (and not just those with an electrical capacity larger than 5 kW).	Flanders
Climate - energy renovation	Operation of Energy Houses	The Energy Houses play an important role where citizens can go with questions and solutions regarding the energy transition and renovation assignment. This could be further developed so that all citizens can benefit from it.	Flanders
Climate - energy renovation	Financing energy renovation	The current financial instruments are insufficient to finance the major renovation and energy transition. There is a need for a large climate fund or transition fund (as in the Netherlands, for example) in which governments and private players and the EIB participate. Various forms of loans, pre-financing, on-bill-repayment, on-tax-repayment must be offerable. People with little or no access to the capital market should be included. Landlord-tenant situation needs to be resolved. "Warm rent" could be added as a solution.	Flanders / Federal
Climate - energy renovation	Amendment of the Co-ownership Act	The energy renovation of apartment buildings is hampered by cumbersome decision-making procedures for ACOs. Concrete proposals are 1) the reintroduction of more flexible written decision-making (in addition to the annual mandatory general meeting) for interim decision-making, 2) the application of a normal majority instead of two-thirds for (energy) renovation works and 3) the publication of a list of legally required works that can be voted on by a simple majority.	Federal

Climate - energy renovation	Renovation by landlords	Housing units on the private rental market are lagging behind in energy renovation. Landlords should be given extra incentives to renovate. The reintroduction of the ban on indexation of rents for the most energy-guzzling homes (homes without EPC or with energy labels F, E and D) can help with this. This can be aligned with the energy labels in the stricter path of the renovation obligation when selling. It is also useful to impose an EPC obligation for all rented residential units, regardless of transfer or rental (as is also provided for non-residential buildings).	Flanders
Climate - energy renovation	Energy label multi-family homes	An EPC label at building level for apartment buildings (instead of EPC common parts) is necessary. This gives associations of co-owners a better picture of the totality of their building and the necessary (energy) renovation works. As a result, they can then jointly decide on the necessary investments.	Flanders
Climate - energy renovation	Licences	Permits are a major barrier to the necessary acceleration of renovation. Exemption from the permit requirement for insulating on the outside of existing side walls, rear facades and roofs, by adding this to Article 2.1 of the Exemption Decree, which determines for which activities a reconstruction permit for urban development activities is not required. By exempting these works from the permit requirement, this accelerates the renovation by (1) removing barriers for citizens, (2) simplifying renovation supervision and (3) reducing the administrative burden of the municipal Permits Department.	Flanders

Renewable energy	Cost-reflective fees use grid	At present, no distinction is made between distribution network tariffs and charges according to proximity. Especially in apartment buildings, this discourages the exchange of locally generated energy. There is a need for cost-reflective levies and distribution costs when using the electricity grid. These should only be charged as soon as the generated energy leaves the building, and not charged between the different meters within the same building. A fair differentiation in the distribution network tariffs and levies will stimulate the local generation and exchange of energy. In this way, consumers will also be stimulated to participate in flexibility as much as possible.	Flanders
Renewable energy	Energy sharing (within an energy community)	Through energy sharing within an energy community, a greater potential of local renewable energy, flexibility and social inclusion in the energy transition can be achieved. However, due to the rapid and complex introduction of European legislation, separate from existing legislation and initiatives, its operationalisation is still accompanied by various structural obstacles. There is currently still a lot of uncertainty regarding the costs associated with energy sharing, which makes it a major challenge to build a business case. There is a need for a stable regulatory framework with clear roles and responsibilities for all market participants. Each within their own competences, these parties must have sufficient degrees of freedom in the concrete implementation of these roles and responsibilities, provided that they result in simple and transparent processes and efficient data exchanges between market parties. It is therefore necessary to ensure that additional fees are transparent and cost-reflective.	Flanders

Climate adaptation - green	Exemption from environmental permit when felling trees in residential areas	Flemish regulations regarding felling policy ensure that we, as a city, cannot take sufficiently strict action on the felling of high-quality private trees, resulting in a loss of climate benefits from trees. It is difficult for the city to make a trend break possible in the additional paving and 'deforestation' in the city. This felling policy is also at odds with the demand via LEKP to increase the tree area, and with the optimisation of the urban planning regulations as a climate tool. https://www.natuurenbos.be/vrijstellingen-stedenbouwkundige-vergunningsplicht-kappen-bomen-buiten-bos https://www.vrp.be/post/de-bouwcode-als-klimaattool	Flanders
Climate adaptation - water	Groundwater regulations VLAREM	This groundwater regulation also determines the conditions for both temporary and permanent drainage. Although these changes are based on Lansink's ladder (first limit, then return, then reuse and only then discharge), it appears from the draft texts that in the case of contaminated groundwater (which is almost always the case in the city of Antwerp), deviations for return and reuse are less well worked out than those for discharge.	Flanders
Climate adaptation - water	Infiltration Bonus	The drinking water bill currently consists of 3 parts: the purchase of drinking water, the municipal sanitation contribution (for the disposal of waste and rainwater) and the supra-municipal sanitation contribution (for the purification of waste water and part of the rainwater). The three parts are calculated on the basis of drinking water consumption, where the sanitation contribution is not fully linked to drinking water consumption. For example, the drainage of rainwater is more likely to be determined by the size of the connected pavement. An incentive should be provided via the water bill to drain little rainwater into the sewer system.	Flanders

Climate adaptation - water	Subsidies Blue Deal	Reusing circular water requires major investments. With the low price of drinking water and because the full risk of water shortages is not taken into account, the costs associated with circular water are often in the same order of magnitude as those of using drinking water. Financial support is needed to further support the development of circular water.	Flanders
Air quality	Domestic wood heating	A further reduction in emissions and concentrations of particulate matter (PM) and soot (BC) is necessary. According to the annual air quality report in the Antwerp conurbation, wood combustion is largely responsible for the concentrations of particulate matter and soot. The Green Deal for Domestic Wood Heating includes actions regarding the phasing out of fireplaces and the most polluting stoves, mandatory inspection and inspection of decentralized wood burning appliances and a Flemish urban planning regulation regarding exhausts of wood burning appliances. These actions have yet to be implemented in concrete terms.	Flanders

Module C-4 Financing of the Action Portfolio

Within the action plan, the link has already been made to financing for climate neutrality in several places. The financing issue is therefore explored in more detail in the investment plan. This plan follows the logic of the construction of the action portfolio, i.e. interventions with strategic actions and breakthrough projects underneath. In the investment plan, we consider the cost of the interventions to be the theoretical cost of climate neutrality.

However, we know from practice that simply having these financial resources available is insufficient to achieve the climate goal. There is an additional need for investments in the systemic levers to get the interventions (behaviourally) activated. The levers are used through the roll-out of concrete breakthrough projects and the provision of strategic actions. The support of the interventions comes at a cost. The total cost of all these levels leads to the practical cost of achieving climate neutrality. The cost of all interventions, strategic actions and breakthrough projects can be found in the action sheets in Chapter B-2 and a tabular overview is given in the investment plan. as well as a tabular overview in the Investment Plan.

The explanation of these costs is followed in the investment plan by a gap analysis and how the financial gap can be bridged.

Outlook and next steps

This section should draw the necessary conclusions on the above Action Plan and highlight the next steps and plans for the further refinement of the Action Plan as part of the Climate City Contract.

From a climate-neutral district to a climate-neutral city

The strength of the area-specific approach chosen by the City of Antwerp is reflected in the realisation of the breakthrough projects in a concentrated 'living lab'. This gives us the opportunity to simultaneously address a number of barriers/levers at the same time, in order to achieve a breakthrough for the entire city. This does not lead to a linear upscaling to the other districts, but to an exponential upscaling. Moreover, through a strong combination of actors who include actions in the action portfolio and who are represented in the transition team, we achieve a rapid implementation of this upscaling in the daily operation of the city (services and instruments), the inclusion of breakthroughs in supra-local policy and the integration of innovative (construction) techniques,... This upscaling will not start from 2030

The strategic actions that are currently included will be rolled out city-wide, and the results of this will therefore directly contribute to the CO2 reduction throughout the city's territory.

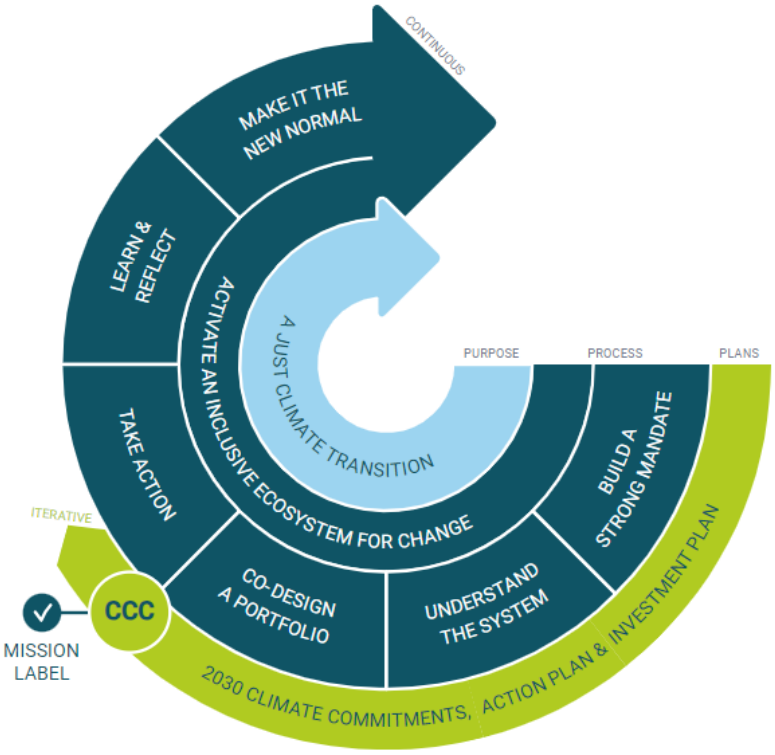
Project follow-up

The project follow-up of the Mission will be included within the established governance structure, including:

The transition team consists of:

- Core Team Mission Left Bank 2030
- Coördination Team Left Bank 2030
    - Internal steering committee with political and administrative representation from the city administration
- External actors representing the major emission domains:
    - Woonhaven Antwerpen (Social Housing Company)
    - Together Climate Active (Climate Network and Matchmaking Platform)
    - Confederation of Real Estate Professions
    - Organisation for Sustainable Energy (ODE): Dirk Van Evercooren
    - Flux50: Frederik Loeckx
    - Fluvius: Jef Huyck
    - Mobility and Transport City of Antwerp: Michiel Penne/Marijke De Roeck
    - Flemish Energy and Climate Agency (VEKA): Margot Van Cauter
    - Netjarosities: Bob D'Hazel's

The following is a list of the actions of the transition team in the implementation of the action portfolio



Parts of the portfolio

From spring 2024, the creation and content of the climate contract will be intensively shared with various stakeholders, citizens and cities in order to:

Inspire: the city of Antwerp is taking on the role of pilot city to inspire other Flemish cities and municipalities to accelerate and deepen their climate actions. This is done through initiatives such as the '100 neighbourhoods platform[26]', the Climate Network of the Association of Flemish Cities and Municipalities

Activate: by intensively focusing on sharing our Mission, challenges and levers, we can ensure the activation of new stakeholders and new project ideas, so that the current action portfolio is continuously enhanced. We do this by being present at the forums where important stakeholders come together (through umbrella organisations such as AGORIA, EMBUILD, VITO,... and also by the umbrella organizations present to deploy the transition team for this (ODE Flanders, CIB, Flux50). The addition to the action portfolio will always be underpinned by the system and leverage analysis from which the action portfolio has emerged. The focus will be on additional actions that focus on barriers that are not yet sufficiently addressed in the current action portfolio or that emerge from the implementation of the interventions that have already been included.

[26] https://www.vlaanderen.be/lokaal-bestuur/beleid-in-ontwikkeling-2019-2024/relanceprojecten/lokaal-energie-en-klimaatpact/100-wijken-platform

Participation: by creating momentum with this portfolio, we want to enter into participation with stakeholders involved at different levels, in order to achieve a constant feedback flow to enrich our portfolio and increase its capacity.

Implementation

Local authorities, utilities, large business organisations, SMEs, households, residents and community groups all play an essential role in the implementation of this portfolio of action. Enabling strong connections and a shared understanding of priorities between stakeholders makes the action portfolio viable. The level of involvement and commitment to the portfolio of actions will depend on the mandate and capacity of each actor. Therefore, for a just transition, it is crucial to anchor implementation in inclusion, intersectionality and social justice. The transition team coordinates this implementation between different organizations and groups, creating opportunities for more synergy and joint benefits in the city.

Operational Planning:

- Coordinating the Left Bank Climate Neutral project, in the context of Antwerp's participation in the EU Mission for 100 climate-neutral and smart cities by 2030.
- Coordinate with the various internal and external consultative bodies of the Antwerp climate management (mitigation chamber, steering committee, climate council) which priorities, projects and trajectories contribute to the road to climate neutrality on the Left Bank by 2030 and report on progress within these bodies.
- Maintaining an overview of relevant current projects, looking for new opportunities and ensuring transparent and clear coordination between the city departments and political cabinets involved.
- Reporting to coordination consultation Left Bank climate neutral 2030

Financial planning

The management of the financial architecture is not an ad hoc affair but requires close follow-up.

The following tasks are part of the financial planning:

Follow-up and review

The Left Bank Urban Climate Contract is not a final document. Rather, it represents the starting point of the action portfolio. New stakeholders will be brought on board throughout the process (until 2030), some actions will expire, new actions will be developed. Every two years, an update of the document is submitted to the College of Mayor and Aldermen of the City of Antwerp.

Attachments

- Annex A-1.6 Emission-inventory_LeftBank
- Annex A-3.1 Overview stakeholders_voorbereidingsfase.docx
- Annex A-3.2 Fiches_Hefbomen.pdf
- Annex A-3.3 Proces_Systemic_analysis
- Annex A-3.4 Systeemmap_Energieverbruik_gebouwen.pdf
- Annex A-3.5 Systeemmap_Koolstofvrije_energievoorziening.pdf
- Annex A-3.6 Overzicht_systeemanalyse.jpg
- Annex A-3.7 Participatiemodel.jpg
- Annex B-1.1 Theorie_van_verandering.jpg

CLIMATE CITY CONTRACT:

Commitments

Antwerpen voor Klimaat

Content

Antwerpen voor Klimaat

1. INTRODUCTION

In December 2020, the Antwerp City Council approved the Climate Plan 2030. This climate plan embodies the comprehensive and leading climate policy of the City of Antwerp. It establishes a framework and actions for urban policies in the field of climate mitigation and adaptation. The overarching ambition of all actions is to reduce greenhouse gas emissions in the city by 50% to 55% by 2030 compared to the base year 2005. In the plan, the city bundles actions and ambitions in the field of energy-efficient living, energy savings in services and industry, renewable energy production, a sustainable heat transition and sustainable mobility. The plan also pays extensive attention to tackling flooding, a sustainable water policy, cooling and green-blue measures in the private and public domain.

The city has applied for the EU-2030 Mission because it believes in the philosophy of a paradigm shift, where breakthrough projects accelerate the climate transition. Innovation in various sectors is driven by governments, in this case local governments. Participation in this mission is intended as a catalyst for the City of Antwerp to accelerate actions of the 2030 Climate Plan and to scale up climate ambitions. Interim objectives help to achieve long-term ambitions.

With its candidacy, the city has purposefully focused on a climate-neutral ambition for 2030 for the city's left bank ('Left Bank'). The area has several assets that make an ambition for climate neutrality, provided European support, realistic. A high potential for collective renovation of apartments, replacement of fossil fuels, renewable energy production, energy communities and the construction of the heat network are concrete pathways on which acceleration is realistic on the Left Bank. In the field of mobility and spatial planning, important projects are in the pipeline in the light of The Big Link (‘De Grote Verbinding’). Examples of this are the sustainability of traffic in the city, including smart connections and the expansion of cycling and charging infrastructure. The initiatives on the Left Bank are sufficiently advanced, ambitious and challenging. The technical and financial support, cooperation with the private sector, other governments and organisations, can help to accelerate the implementation of existing policy objectives. By encouraging innovation, carrying out pilot actions and accelerating the implementation period of its climate policy, Antwerp wants to realise its ambitions and put the Left Bank forward as a *best practice* for the rest of the city.

The City has a leading *governance model* for the Climate Plan 2030 in which collaboration with stakeholders within the quadruple helix is central. The City of Antwerp also approved an Urban Climate Contract for the implementation of Climate Neutrality on the Left Bank by 2030. With this declaration of commitment, the City of Antwerp wishes to formalise its partnership with its stakeholders and consolidate its commitment to accelerating the implementation of its climate policy in light of the EU's mission Climate-Neutral and Smart Cities. Some stakeholders are already closely involved in the co-creative process that has shaped the Antwerp Urban Climate Contract and are taking commitments to specific actions from the Action Plan. Other stakeholders will be crucial in the further development and successful implementation of the ambitions of the urban Climate Contract and express their support for Antwerp's ambitions on the Left Bank. Support for the plan will be continuously welcomed and requested in the coming years, as the Climate Contract is intended to be a living document through the years (until 2030) and is an iterative collaborative process in the pursuit of climate neutrality.

1. GOAL: CLIMATE NEUTRALITY ON THE LEFT BANK BY 2030

The area was deliberately limited to the Linkeroever district (9.96 km²), where various policy actions and emission reduction roadmaps are in place to realistically achieve the ambition of climate neutrality by 2030. The port of Antwerp, which occupies 72 km² of the city's administrative boundaries, is also not part of the project area. This port is managed separately and is home to the largest petrochemical cluster in Europe, crucial for the regional economy.

The Linkeroever district is characterized by an open landscape and a modernist residential structure with high-rise buildings. The Europark area consists of 19 high-rise apartment blocks with social housing, surrounded by apartment buildings in co-ownership and a number of unit districts (e.g. bel-etage houses, garden cities,...). The city will significantly accelerate the district's transition to climate neutrality in terms of emissions, while improving the connecting green structures and strengthening ecological functions.

The ambition to achieve climate neutrality for this district goes hand in hand with increasing resilience to the adverse effects of climate change. Due to its openness and proximity to the Scheldt, the Left Bank has a unique cooling capacity and is resistant to flooding and drought. The protection of the city of Antwerp against an intensification of future environmental risks will be strengthened by ambitious adaptation measures on the Left Bank. A new strategic Antwerp Space Plan will support the ambitions in the field of climate neutrality. This ambition requires a significant effort in terms of spatial planning and strengthening the functions of the landscape and is supported by complementary actions in different sectors. Transforming the Left Bank into the greenest district in the city requires a comprehensive vision that structurally connects the left and right banks of the Scheldt. To achieve this goal, the bank of the Scheldt will be raised to provide protection against flooding and will accommodate a high-quality park landscape with ecological and recreational functions for the citizens of the Left Bank and Antwerp Intra-Muros.

New infrastructure for sustainable mobility will be integrated. The involvement of citizens in the mission will be of great importance. Their involvement is the cornerstone for the climate-neutral and resilient transformation of the area. The city already has a thorough advisory policy in the field of energy renovation and will significantly strengthen its operational capacities in the coming years. The pursuit of climate neutrality goes hand in hand with an effort to increase social cohesion and quality of life at district level. In the Europark Master Plan, the new landscape design forms a connection between the green and blue spaces of the district, while the building volume and residential and functional densification increase in function of the housing shortage and mobility. Achieving climate neutrality on the Left Bank by 2030 will require a strong political commitment and additional resources at various levels. However, it is a realistic goal that can equitably transform the district into a leading district in terms of climate neutrality with due attention to the large presence of vulnerable target groups.

2. PRIORITIES AND STRATEGIC INTERVENTIONS

The 2030 climate neutrality target for the Left Bank sets out four key ambitions:

1. A thorough energy renovation of the building stock, fully exploiting the district's renewable energy potential and involving citizens in the clean energy transition. This includes all public and private buildings in the district, reaching both homeowners and tenants.

2. A complete roll-out of the urban heat network on the Left Bank, fed by residual heat from nearby port activities, to which the majority of the homes will be connected. The remaining homes will switch to an *all-electric* scenario, reinforcing the business case for a wide rollout of photovoltaic systems. Temporary energy hubs will act as a solution where necessary to realistically implement the switch from fossil to fossil-free heating and decouple from the timetable for the roll-out of the urban heat network. The energy hubs will continue to be useful as functional backups when the heat network is operational.

3. Reducing the dependency on fossil fuels in terms of mobility, by investing in bicycle and electric charging infrastructure, smart mobility, multimodal hubs and improving the proximity and accessibility of the district by connecting living and working areas and offering a mix of functions. The Scheldt bridge in the south, in combination with the bicycle connection via the new Scheldt tunnel for Oosterweel in the north, forms the final piece of the entire bicycle network on both banks of the Scheldt. Antwerp will then have a 360° bicycle ring.

4. Through the creation of new park structures in the district where recreation goes hand in hand with more biodiversity, efforts are being made to adapt and ecology. In the new parks (Scheldeboorden, Ringpark West and landscape park Europark) maximum efforts are being made to store water and create cooling spots.

3. GUIDING PRINCIPLES IN THE PROCESS

The city of Antwerp sees the implementation of the climate targets as a process that is constantly evolving. Although the name suggests otherwise, the 'Urban Climate Contract Antwerp' is not a contract in which commitments are laid down. It is an ambition document in which concrete actions are worked on to achieve these ambitions through collaboration with stakeholders. The actions in the Action Plan are constantly evolving. New actions will be set up, other stakeholders will be brought on board throughout the process. The document will be updated and evaluated every two years. In the implementation of the ambition 'Left Bank Climate Neutral by 2030', the city is striving for a process in which the following principles are guidelined:

1. Co-creative: process in which we work in partnership, from openness and transparency towards close cooperation with stakeholders. Stakeholders will be involved from the *quadruple* helix, as well as from different levels of government.

2. Inclusive: the city of Antwerp pursues a fair and inclusive climate policy that takes into account the social capacity of citizens. Attention will be paid to vulnerable target groups and the prevention of

energy poverty in order to prevent these target groups from being hit hardest in the climate transition.

3. Innovative: stimulating innovation is central to this process. The central objective is to use expertise and creativity to make use of technological developments, social and financial solutions to achieve breakthroughs in the field of regulation, policy and financing of the climate transition. The Left Bank is being put forward as a pilot area to stimulate innovation, to test solutions with the possibility of scaling up to the rest of the city.

4. Citizen involvement: in order to achieve climate neutrality, numerous actions are needed from the residents of the Left Bank. Citizen involvement will be needed to overcome resistance, create support and, where necessary, enable action at the level of families. The policy will focus strongly on individual guidance of households in the climate transition, as well as on guidance on associations of co-owners and syndics. The needs and requirements of citizens as stakeholders will be taken into account.

5. Feasibility: the choice for the Left Bank was deliberately based on the idea that an area-specific acceleration of innovation within a pilot area offers a realistic and workable scale. Beyond ideals, implementability, financing capacity and affordability (challenge) are taken into account for the implementation of the objectives.

6. Quality of life: finally, analogous to the principles of the administrative agreement, the city strives for a connecting process that focuses on quality of life and is driven by a local, neighborhood-oriented process in which innovative solutions that are scalable to the rest of the city are worked on based on local needs.

4. SIGNATURE

Organisations (according to your own signature formula):

Date Organisation name Signature

_____

Function

_____

Address

_____

Naam
Stad Antwerpen
Fluvius
Samen Klimaatactief
Woonhaven Antwerpen
Confederatie van Immobiliënberoepen Vlaanderen (CIB)
Flux 50
NetZeroCities
ODE Vlaanderen
Vlaams Energie- en Klimaatagentschap (VEKA)
Agentschap Maritieme Dienstverlening en Kust / Vloot
De Lijn
De Vlaamse Waterweg
Gevelinzicht
Ghelamco
KBC Bank en Verzekering
LAMPP
NON.ENERGY
Pixii/Passiefhuis-Platform
Vooruitzicht
Beweging.net
Maatschappij Linkerscheldeoever
Port of Antwerp Bruges
Universiteit Antwerpen
VITO
…