Climate City Contract

2030 Climate Neutrality Action Plan

2030 Climate Neutrality Action Plan of Bordeaux Metropole

BORDEAUX MÉTROPOLE

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Table of Contents

Summary

Textual element

Bordeaux Métropole is taking the opportunity of the Climate City Contract initiative to challenge its greenhouse gas reduction scenarios using the various tools proposed by Mission ‘100 Villes’. Our aim is to learn as much as possible from experience, our current policies and actions. The action plan component of the CCC will therefore be based on a selection of actions from our Metropolitan Climate Plan, adopted in September 2022 in accordance with French law, but integrated to the “Climate city contract” with raised ambitions.

The iterative work of the "Climate city contract" will enable us to seek to accelerate as far as possible the actions already launched or planned by Bordeaux Métropole, and also to imagine with local stakeholders other levers for decarbonization. In fact, the drafting of this first version of our Climate city contract is an opportunity to identify the regulatory and political obstacles and the investments needed to successfully implement our policy in favor of the climate and decarbonization of our territory.

Bordeaux Métropole took the opportunity offered by Mission 100 Villes to challenge the estimated reduction in greenhouse gases (scope 1 and 2) in its current policy, by seeking to remove the obstacles and barriers identified in collaboration with local stakeholders. Thanks to this collective effort involving all levels of governance, Bordeaux Métropole aims to accelerate decarbonization as much as possible and hopes to achieve climate neutrality by 2030.

This document follows on from the commitment plan. It reports on the GHG Emissions Inventory (2019) in GPC (scope 1,2,3), but only scope 1 and 2 count towards the trajectory towards climate neutrality. This document shows the GHG emissions gaps between the current plans and strategies, as well as the systemic obstacles, opportunities and levers for moving towards climate neutrality towards 2030. The impact pathways are presented, along with a portfolio of actions and monitoring indicators. Finally, the governance and cross-cutting methods used with the various stakeholders in the region are also explained.

List of figures

The list of figures **identifies the titles and locations** (page numbers) of **all visual elements:** figures, drawings, photos, maps, etc. used in the CCC Action Plan.

List of tables

The list of tables **identifies the titles and locations** (page numbers) of **all tables** used in the CCC Action Plan.

Abbreviations and acronyms

The list of abbreviations and acronyms **identifies the abbreviations** (a shortened form of a word used in place of the full word) **and acronyms** (a word formed from the first letters of each of the words in a phrase of name) used in the CCC Action Plan.

Abbreviations and acronyms	Definition
ADEME	Agence de la transition écologique : French Agency for Ecological Transition
AFOLU	Agriculture, Forestry and Other Land Use (AFOLU)
ALEC	Agence locale de l'énergie et du climat : local agency for energy and climate
EPCI	Etablissement public de coopération intercommunal : public establishments for intercommunal cooperation
ETS	Emissions Trading System
FNV	France nation verte : France green nation

IPPU	Industrial Processes and Product Use (IPPU)
LTECV	Loi de transition énergétique pour la croissance verte : the energy transition law for green growth
PCAET	Plan climat-air-énergie territorial : Territorial climate, air and energy plan
PLU	Plan local d'urbanisme : Local urbanism plan
PNACC	Plan national d'adaptation au changement climatique : national climate change adaptation plan
PPE	Programmation pluriannuelle de l'énergie (PPE) : Multi-year energy plan (PPE)
RER	Réseau express régional : express regional network
REVE	Réseau vélo express : express cycle network
SCOT	Schéma de cohérence territorial : territorial coherence scheme
SNBC	Stratégie nationale bas carbone : national low-carbon strategy
SPASER	Schéma de promotion des achats publics socialement et économiquement responsables : Scheme to promote socially and economically responsible public procurement
SRAA	Stratégie de résilience agricole et alimentaire : Agricultural and food resilience strategy : Agricultural and food resilience strategy :
SRADDET	Schéma régional d'aménagement, de développement durable et d'égalité des territoires : regional scheme for planning and sustainable development of territories
TETE	Territoire engagé pour la transition écologique : territory committed to ecological transition
ZIBAC	Zone industrielle bas-carbone : low-carbon industrial zone
ZIRI	Zone d'Intégration des réseaux intelligents : smart grid Integration zone

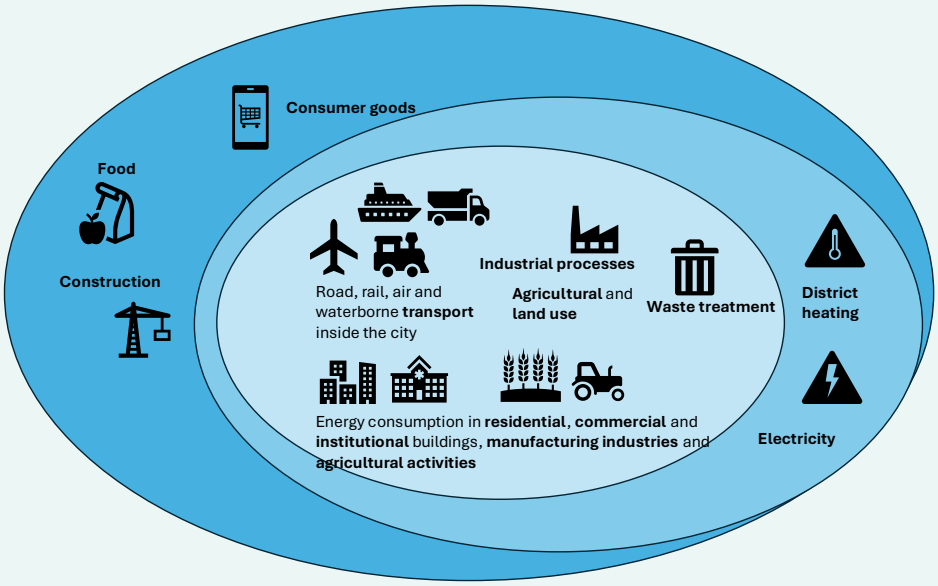
1 Part A – Current State of Climate Action

1.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

Table I-1.1: Climate Neutrality Target by 2030			
Sectors	**Scope 1**	**Scope 2**	**Scope 3**
Stationary energy	Included	Included	Optional information
	Emissions from stationary combustion in boilers, turbines, engines and similar installations in residential, commercial and institutional buildings, manufacturing industries and agricultural activities. Fugitives missions from natural gas grid	Emissions associated with electricity and generation processes and district heating whose consumption takes place in Bordeaux Métropole	indirect emissions associated to energy consumption including grid losses
Transport	Included	Included	Optional information
	Emissions related to combustion in the different modes of road, rail, air and waterborne transport	Emissions associated with electricity and generation processes whose consumption takes place in Bordeaux Métropole	Emissions related to transport of the inhabitants to their final destination, the visitors and transport of goods imported/exported from Bordeaux Métropole
Waste/waste water	Included		Included
	Treatment of waste and wastewater including solid waste disposal, biological treatment (composting and methanization) and incineration		Treatment of waste outside Bordeaux Métropole borders
IPPU	Included	Not applicable	Optional information
	Direct emissions from industrial processes and product use (air conditioning and cold production in buildings)		
AFOLU	Included	Not applicable	Optional information
	Direct emissions from land and livestock, including sink		
Other			Emissions from Construction materials, food and consumer goods imported by Bordeaux Metropole
Carbon sink	Carbon sequestration form forest and bocage hedges Carbone emissions from land use		Carbon sequestration from imported wood products
Geographical boundary	**Same as city administrative boundary**	**Smaller than city administrative boundary**	**Larger than city administrative boundary**

(Tick correct option)	X		
Specify excluded/additional areas			

Figure 1- map of GHG emisions flows



Scope 1 et **scope 2:** calculated and monitored in the CCC

Scope 3: calculated but not monitored. This scope is not part of the climate neutrality target

Figure 2: Map of Bordeaux Métropole's territory

GhG Emissions Baseline inventory

It should be noted that the carbon assessment standard required by Climate City Contract, namely the GHG protocol (or Greenhouse Gas Protocol), differs somewhat from the method and breakdown used in the 'Bilan des émissions de gaz à effet de serre du territoire métropolitain'. Work has been carried out to bring the two into line. In addition, no exclusions have been made in the scope of the greenhouse gas inventory for the reference year (2019). The European Emissions Trading System (ETS) has been included in the scope of the GHG inventory. Given that our territory is taking ambitious action to support economic and industrial players in decarbonizing their activities, we felt that it made sense to keep the GHG emissions generated by these players within scope of the GHG inventory.

It is important to stress out that this strategy towards 2030 climate neutrality has been established building up as much as possible on the preexisting PCAET strategy features, to facilitate its understanding and appropriation by Bordeaux Métropole stakeholders. Including the ETS and choosing 2019 as the reference year is consistent with this strategy.

In addition, all the greenhouse gases included in the infokit are used in the calculations, which are as follows:
- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous Oxide (N_2O)
- F-gases (hydrofluorocarbons and perfluorocarbons)
- Sulphur hexafluoride (SF_6) and
- Nitrogen trifluoride (NF_3).

The local energy agency of Gironde carries out an annual assessment of GHG emissions on scopes 1 and 2 of Bordeaux Métropole. The data is entered on the MyCovenant platform. In addition, the Métropole regularly carries out a complete territorial GHG emissions report, integrating scope 3. However, the treatment of associated items (food, purchasing and construction) is based on average values and ratios. Uncertainty is currently very high, which makes it difficult to implement and quantify actions. Initially, the community wishes to refine its collection and processing method for these items before including it in the scope of its CCC. The latest available inventory relates to data for the year 2021. However, the CCC is based on a reference year of 2019 to be consistent with the metropolitan current Climate action Plan.

For the CCC, the operational objectives set as part of the Climate Plan were taken up and translated into the impact pathways. Indeed, the inventory of emissions produced by the ALEC (Agence Locale de l'Energie et du Climat) is sufficiently precise and disaggregated to highlight the most impactful sectors and sub-sectors, on which priority action must be taken. For example, less in-depth work has been carried out in the agricultural and waste treatment sectors because these are areas with little impact compared to transport or energy consumption in buildings.

The potentiality of developing carbon sink inside Bordeaux Métropole were estimated for its current Climate action plan. It includes forestry and agriculture, land use, wooden product consumption and urban trees. This calculation shows that only a small part of the emissions can be compensated by local actions.

A-1.1: Final energy use by source sectors			
Base year	2019		
Unit	GWh		
	Scope 1	Scope 2	Scope 3
Buildings	**5 998 GWh**	**5 037 GWh**	
Coal	230 GWh		
fuel oil	370 GWh		
LPG	14 GWh		
Gas	4 447 GWh		
Electricity		4 714 GWh	
Wood	495 GWh		
District heating		288 GWh	
Steam		36 GWh	
Other renewable energy	442 GWh		
Transport	**5 433 GWh**	**461 GWh**	
Fuel	5 300 GWh		
Gas	134 GWh		
Electricity		69 GWh	
Biofuel		391 GWh	
Waste	**0 GWh**	**0 GWh**	
Industrial Process and Product Use (IPPU)	**0 GWh**	**0 GWh**	
Agricultural, Forestry and Land Use (AFOLU)	**0 GWh**	**0 GWh**	

Figure 3 - Energy consumption by source sectors

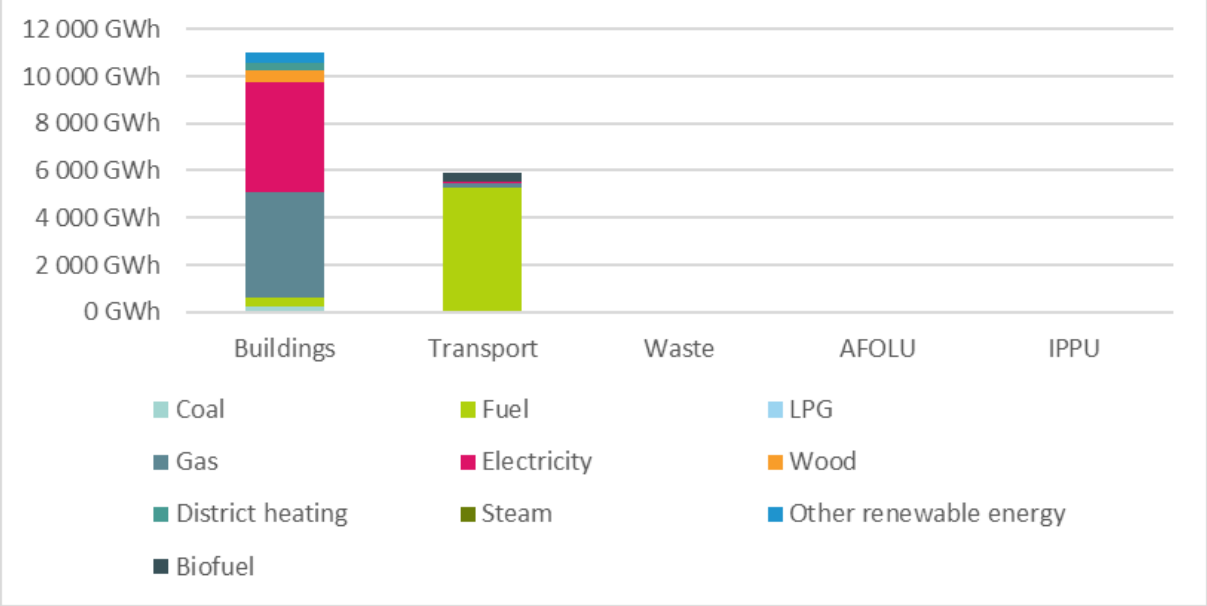


Figure 4 - Energy consumption by source sectors

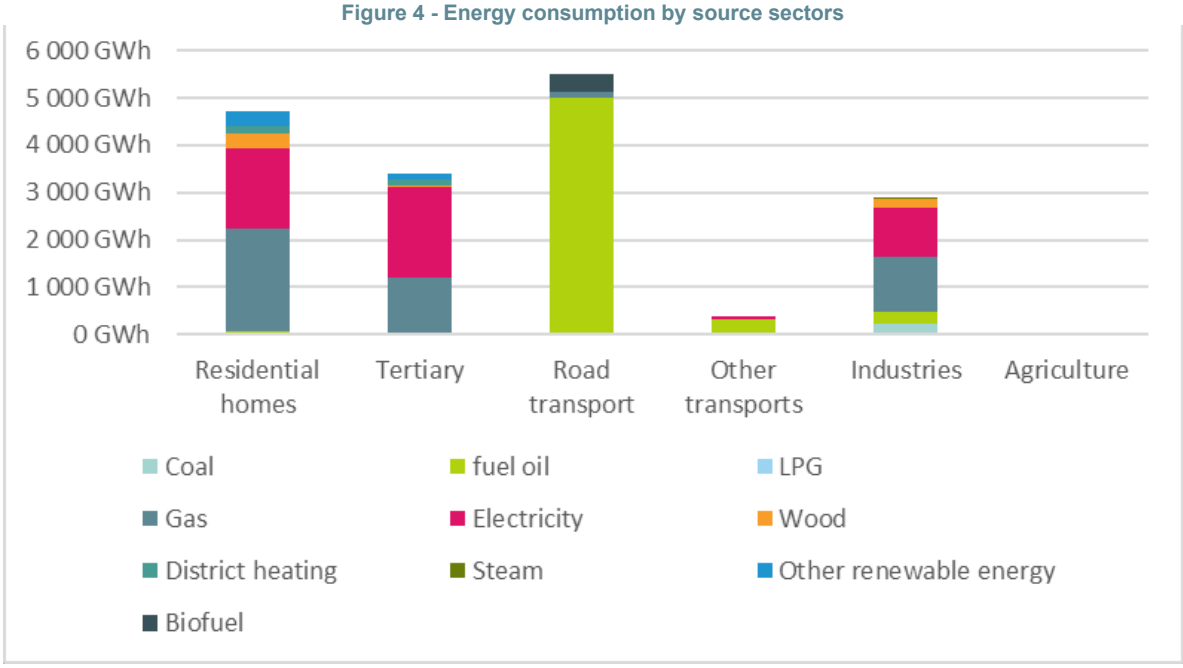
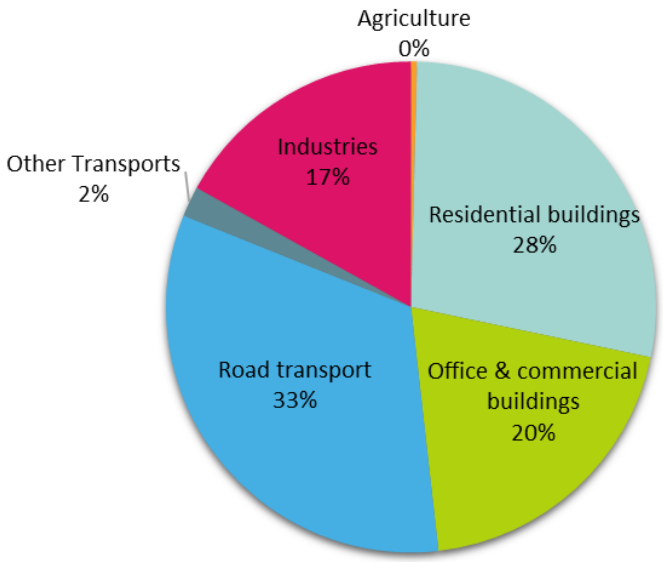


Figure 5 - Share of Energy consumption by source sectors (%)



Buildings are the main consumers of energy (65%). Residential buildings first, then office and commercial buildings and finally industries. Gas and electricity are the two energies most consumed by buildings. Then, we find the transport sector (35% of energy consumed). This sector consumes almost exclusively petroleum products for road transport.

A-1.2: Emission factors applied						
(Please specify for primary energy type and GHG emission factor according to methodology used).						
For calculation in t or MWh of primary energy						
(Please indicate method used, e.g., GPC, IPCC, CRF, national etc.)						
Primary energy/ energy source	Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	F-gases (hydrofluorocarbons and perfluorocarbons)	Sulphur hexafluoride (SF_6)	Nitrogen trifluoride (NF_3)
Electricity	0,04	-	-	-	-	-
District heating	0,10	-	-	-	-	-
Gas	0,18	0,01	0,00	-	-	-
LPG	0,23	0,01	0,00	-	-	-
Fuel oil	0,27	0,00	0,00	-	-	-
Diesel	0,25	0,00	0,00	-	-	-
Gasoline	0,25	0,00	0,00	-	-	-

Coal	0,34	0,02	0,00	-	-	-
Biofuel	-	-	-	-	-	-
Wood	-	0,02	-	-	-	-

A-1.3: GHG emissions by source sectors					
Base year					
Unit		ktCO2e			
		Scope 1	Scope 2	Scope 3	Total
Buildings		1 044 ktCO2e	229 ktCO2e	251 ktCO2e	**1 525 ktCO2e**
Transport		1 375 ktCO2e	3 ktCO2e	1 304 ktCO2e	**2 681 ktCO2e**
Waste		71 ktCO2e	0 ktCO2e	125 ktCO2e	**196 ktCO2e**
Industrial Process and Product Use (IPPU)		356 ktCO2e	0 ktCO2e	0 ktCO2e	**356 ktCO2e**
Agricultural, Forestry and Land Use (AFOLU)	Sources (positive emissions)	6 ktCO2e	0 ktCO2e	0 ktCO2e	**6 ktCO2e**
	Sinks (negative emissions)	-37 ktCO2e			
Other scope 3		0 ktCO2e	0 ktCO2e	3 514 ktCO2e	**3 514 ktCO2e**
Total		**2 852 ktCO2e**	**232 ktCO2e**	**5 195 ktCO2e**	**8 279 ktCO2e**

A-1.3: GHG emissions by source sectors					
Base year					
Unit		ktCO2e			
		Scope 1	Scope 2	Scope 3	Total
Buildings		1 044 ktCO2e	229 ktCO2e	251 ktCO2e	**1 525 ktCO2e**
Transport		1 375 ktCO2e	3 ktCO2e	1 304 ktCO2e	**2 681 ktCO2e**
Waste		71 ktCO2e	0 ktCO2e	125 ktCO2e	**196 ktCO2e**
Industrial Process and Product Use (IPPU)		356 ktCO2e	0 ktCO2e	0 ktCO2e	**356 ktCO2e**
Agricultural, Forestry and Land Use (AFOLU)	Sources (positive emissions)	6 ktCO2e	0 ktCO2e	0 ktCO2e	**6 ktCO2e**
	Sinks (negative emissions)	-37 ktCO2e			
Other scope 3		0 ktCO2e	0 ktCO2e	3 514 ktCO2e	**3 514 ktCO2e**
Total		**2 852 ktCO2e**	**232 ktCO2e**	**5 195 ktCO2e**	**8 279 ktCO2e**

A-1.3a: GHG Emissions by Source Sector - Baseline Year					
Base Year	2019				
Unit	t CO_2 equivalent/year				
	Scope 1	**Scope 2**	**Scope 3**	**Total**	**% of Total**
Transport	1187122			1187122	39%
Buildings & Heating	1268441			1268441	41%
Electricity		101179		101179	3%
Waste*			97700	97700	3%
Other (incl. IPPU & AFOLU)	423559			423559	14%
Total	2879121	101179	97700	3078000	100%

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

A-1.4: Activity by source sectors.			
Base year: 2019			
	Scope 1	Scope 2	Scope 3
Sector: Buildings	**1 044 ktCO2e**	**229 ktCO2e**	**251 ktCO2e**
Residential buildings	422 ktCO2e	89 ktCO2e	101 ktCO2e
Commercial and institutional buildings and facilities	224 ktCO2e	93 ktCO2e	73 ktCO2e
Manufacturing industries and construction	364 ktCO2e	47 ktCO2e	77 ktCO2e
Agriculture, forestry, and fishing activities	3 ktCO2e	0 ktCO2e	1 ktCO2e
Fugitive emissions from oil and natural gas systems	31 ktCO2e	0 ktCO2e	0 ktCO2e
Sector: Transport	**1 375 ktCO2e**	**3 ktCO2e**	**1 279 ktCO2e**
On-road	1 292 ktCO2e	0 ktCO2e	302 ktCO2e
Railways	1 ktCO2e	3 ktCO2e	9 ktCO2e
Waterborne navigation	27 ktCO2e		108 ktCO2e
Aviation	54 ktCO2e		861 ktCO2e
Sector: Waste	**71 ktCO2e**	**0 ktCO2e**	125 ktCO2e
Sector: Industrial Process and Product Use (IPPU)	**356 ktCO2e**	**0 ktCO2e**	**0 ktCO2e**
Industrial processes	233 ktCO2e	0 ktCO2e	0 ktCO2e
Product use	123 ktCO2e	0 ktCO2e	0 ktCO2e
Sector: Agricultural, Forestry and Land Use (AFOLU)	**-31 ktCO2e**	**0 ktCO2e**	**0 ktCO2e**
Emissions	6 ktCO2e	0 ktCO2e	0 ktCO2e
Sink - Land Use	15 ktCO2e		
Sink - Forestry and agriculture	-32 ktCO2e		
Sink - Wood Products	-19 ktCO2e		
Sector: Other scope 3	**0 ktCO2e**	**0 ktCO2e**	**3 514 ktCO2e**
Construction Materials			515 ktCO2e

Food			1 789 ktCO2e
Consumer goods			1 210 ktCO2e

Figure 6 - GHG emissions by source sectors

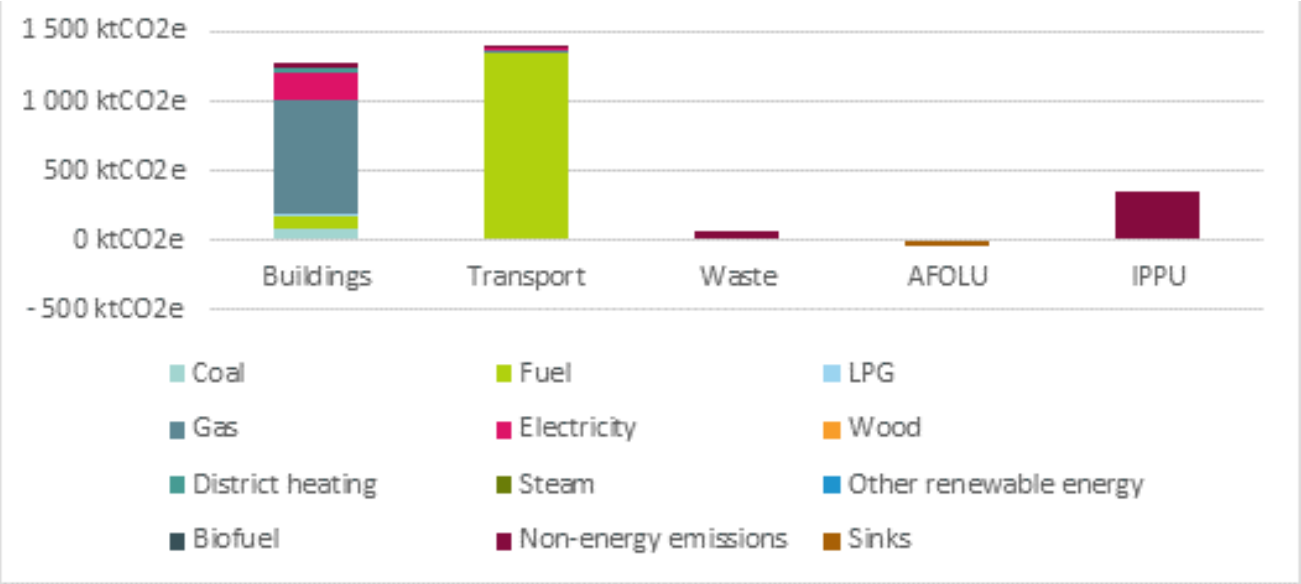


Figure 7 - GHG emissions by source sub-sector

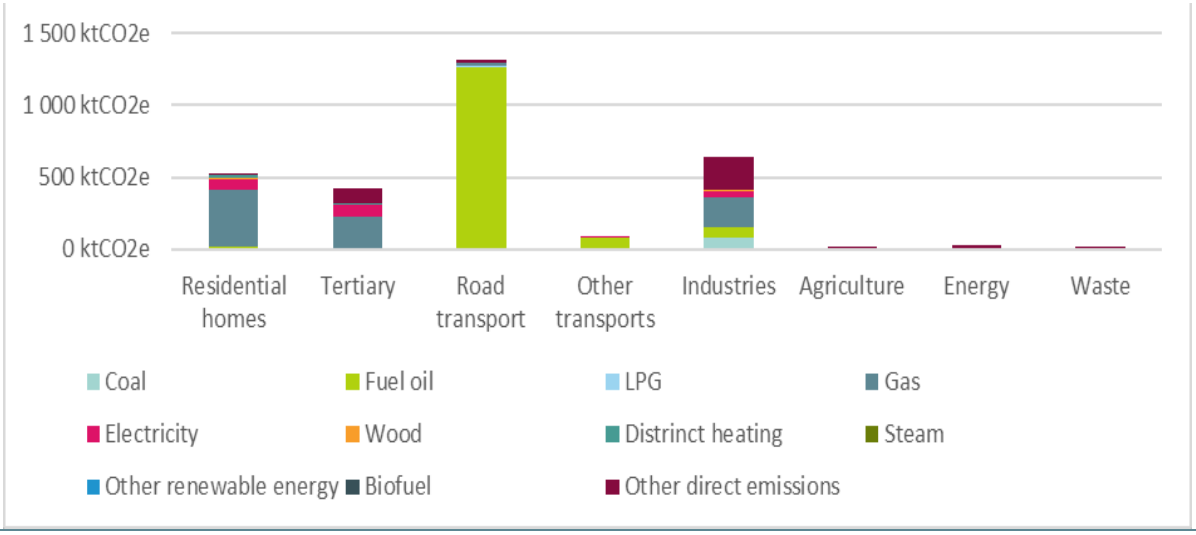
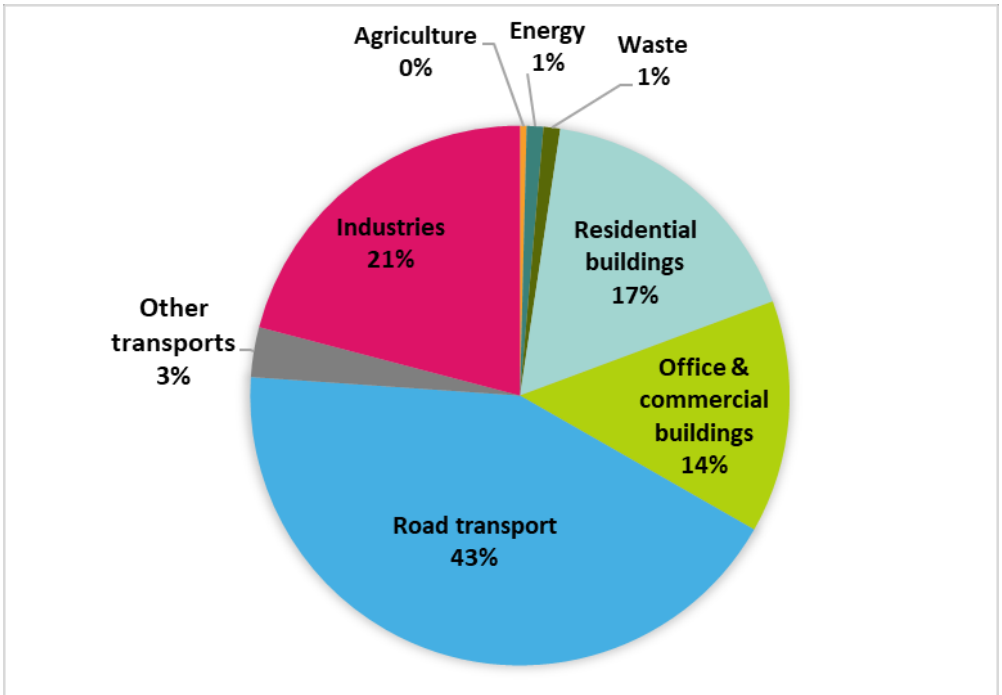


Figure 8 - Share of GHG emissions by sector (%)



Road transport is the main producer of greenhouse gases (43%). It is directly linked to the energy consumed: diesel and gasoline, whose emission factor is very high. The buildings sector comes next: industries first (21% of Bordeaux Métropole emissions), then residential buildings (17%) and 14% for tertiary buildings (office and commercial buildings). The emission of industrial sector increases because of direct emissions caused by the processes, in pink. Those emissions are difficult to reduce because that implies a deeper update of productions systems. The annual carbon sinks cover only 1,2% of the emissions.

Module A-2 Current Policies and Strategies Assessment

A-2.1: Description & assessment of policies

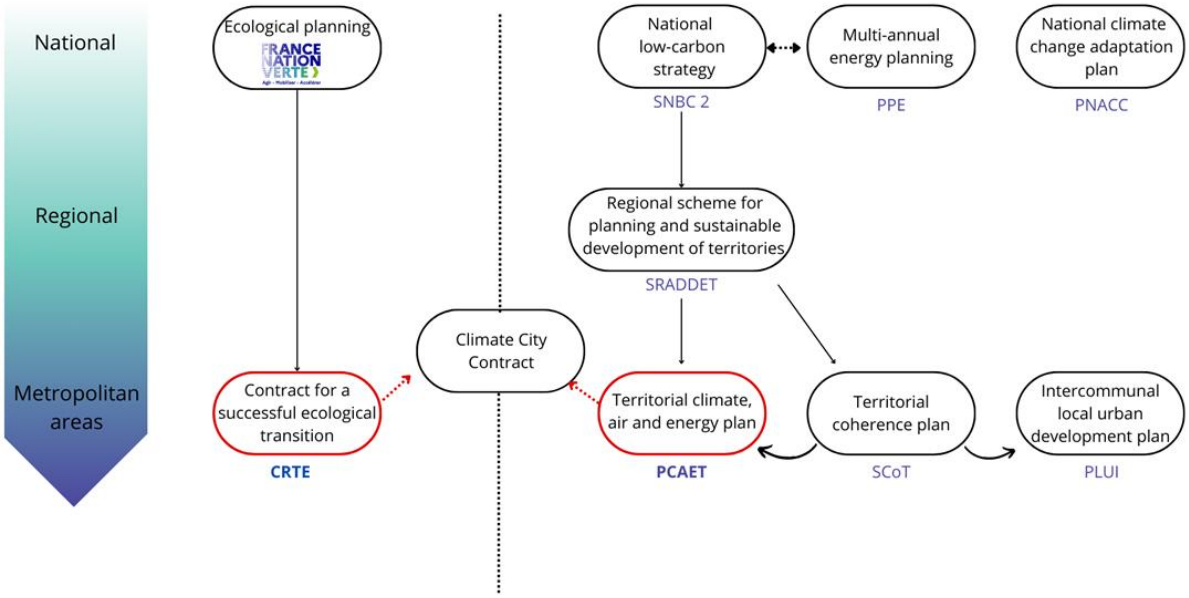
National low-carbon strategies and laws

The energy transition law for green growth (LTECV, 2015) requires France to draw up a roadmap to fight global warming. The French climate plan (2017) strengthened targets of the energy transition law for green growth, to be compatible with the Paris agreement (carbon neutrality in 2050).
The national low-carbon strategy (SNBC, 2015 - SNBC 2, 2020) is the French roadmap for achieving carbon neutrality by 2050 and reducing the carbon footprint of French consumption. It sets out guidelines for implementing the transition to a low-carbon, circular and sustainable economy. The SNBC defines a trajectory in all sectors of activity for reducing greenhouse gas emissions until 2050 and sets short- and medium-term targets (carbon budgets). It has two ambitions: to achieve carbon neutrality by 2050 and to reduce the carbon footprint of French people. The national low-carbon strategy must be taken into account by local decision-makers at every scale, particularly when drawing up local climate plans because it is a legal obligation for local authorities. This national strategy also is the reference base to build the multi-annual energy plan (PPE, 2016 - PPE 2, 2020).

In addition to the low-carbon strategy, a national climate change adaptation plan (PNACC) defines concrete actions to adapt French territories to climate change.

Regional low carbon strategies

The regional scheme for planning and sustainable development of territories (SRADDET) is the main document for French regions concerning ecological transition. The SRADDET is elaborated and voted by the regional council but the regional prefect (representative of the State in each region) must approve the document. It defines mid-term and long-term targets in many areas, including air quality, the fight against climate change, energy management and recovery, the development of renewable and recovered energy sources, and the protection and restoration of biodiversity. The SRADDET must follow the national low-carbon strategy.



Local existing plans and policies

In September 2022, Bordeaux Métropole adopted a new Territorial Climate Air and Energy Plan (PCAET), it aims at achieving carbon neutrality by 2050. This planning document is in line with French regulatory expectations under the National Low Carbon Strategy (SNBC) and the Regional Plan for Development, Sustainability and Territorial Equality (SRADDET).

The PCAET contains detailed energy planning measures. It also connects with most other metropolitan plans and strategies, which contribute to achieving its climate neutrality targets:

- Urban master plan
- Transportation master plan, as well as dedicated plans for urban logistics roadmap, cycling, and walking Plan
- Biodiver'City Plan
- Housing energy retrofit Roadmap
- Economic development plan
- Sustainable tourism roadmap
- Strategic waste plan

- Social and solidarity economy roadmap
- Master plan for metropolitan rivers and infrastructure
- Aquatic environment management and flood prevention strategy
- Territorial Food Project
- Responsible digital strategy
- SPAZER

The portfolio of actions in section B-2 includes several actions from the PCAET and other strategies listed above. However, the work of the Impact Pathways has enabled other levers of change to be considered in relation to existing actions or those already planned before the CCC.

Climate targets and emissions gaps

Bordeaux Métropole's current climate-action plan (PCAET 2023) aims to reduce Bordeaux Métropole's carbon footprint (scope 1, 2 and 3 emissions) by 79% between 2019 and 2050. Its target scenario also halves total energy consumption and doubles the production of renewable and recovered energy by 2050. These targets were produced using detailed cross-sector modelling.

This PCAET scenario provides the basis for the **"business as planned" (BAP) scenario for the CCC**. Using unchanged hypotheses, results were modelled in terms of direct territorial emissions (scopes 1 and 2). This BAP scenario puts Bordeaux Métropole on a trajectory to **reduce its territorial GHG emissions by 45% by 2030**—already an ambitious target in the city's context of economic and demographic growth. This new modeling exercise produced detailed emissions gaps by sector and key actions, summarized above.

New pathways targeting climate neutrality by 2030 were modelled and debated with city officials, informing the **climate neutrality scenario and pathways** presented below (B-1).

Scenario modelling revealed several key conclusions that informed pathway design:

- Most of the local actions required to achieve net zero by 2030 already appear in the current climate-action plan. The key challenge will be scaling them up rapidly enough to hit targets initially planned for the 2035-2050 horizon within the next decade.
- A similar acceleration of national action is indispensable to achieve climate neutrality locally. All credible pathways to net zero in Bordeaux include decarbonizing the national electricity and gas networks at a rhythm that brings 2040 targets closer to 2030. National policy and markets must also quickly provide the conditions for accelerating electric vehicle adoption for transportation uses that cannot be covered by transit and active modes. The upcoming revision of France's national low-carbon strategy (SNBC) and related legislation will provide a key opportunity to push this ambitious agenda.
- The shortened timeline for full decarbonization highlights certain tensions between reducing Bordeaux Métropole's territorial emissions (scopes 1 and 2) and reducing its overall carbon and material footprint (imported emissions). The PCAET scenario places a particular emphasis on energy and material efficiency measures that, over time, can reduce the volumes of new vehicles, building retrofits and other equipment required to reduce local emissions. While energy and material efficiency remain at the forefront of our CCC pathways, the accelerated timeframe does substantially increase the role of technological interventions in achieving climate targets.
- Such an unprecedented acceleration of climate action raises questions not only about the technical feasibility, but also the equity and acceptability of several key policy measures.

The deployment of a low-emissions driving zone, of building-retrofit targets that go beyond already ambitious national norms, and of large-scale biomethane facilities are all examples of actions whose calendars must be accelerated without sacrificing the time inherently necessary for consensus-building and adapting results to local conditions.

In sum, while Bordeaux Métropole has already initiated most actions required to decarbonize, closing the emissions gap will require at once an unprecedented scaling up of local measures and changes, a similarly ambitious national acceleration, and continuous monitoring and dialogue to ensure that deep decarbonization policies also provide for an environmentally responsible and socially just transition.

A-2.1: Emissions Gap (kt CO2e)

	Baseline Emissions (BAU 2030)	Emissions Reduction Resulting from CNAP		Remaining Emissions		Residual Emissions Offsetting[1]		Emissions Gap (amount necessary to achieve net-zero)	
	(Absolute value)	(Absolute value)	(% of BAU 2030)	(Absolute value)	(% of BAU 2030)	(Absolute value)	(% of BAU 2030)	(Absolute value)	(% of BAU 2030)
Transport	1155	738	64%	417	36%	231	20%	186	16%
Buildings & Heating	1265	934	74%	331	26%	253	20%	78	6%
Electricity	128	96	75%	32	25%	26	20%	6	5%
Waste	48	6	12%	42	88%	10	20%	32	68%
Other (incl. IPPU & AFOLU)[2]	424	169	40%	254	60%	85	20%	169	40%
Total	3019	1943	**64%**	1 076	36%	604	20%	473	16%

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

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

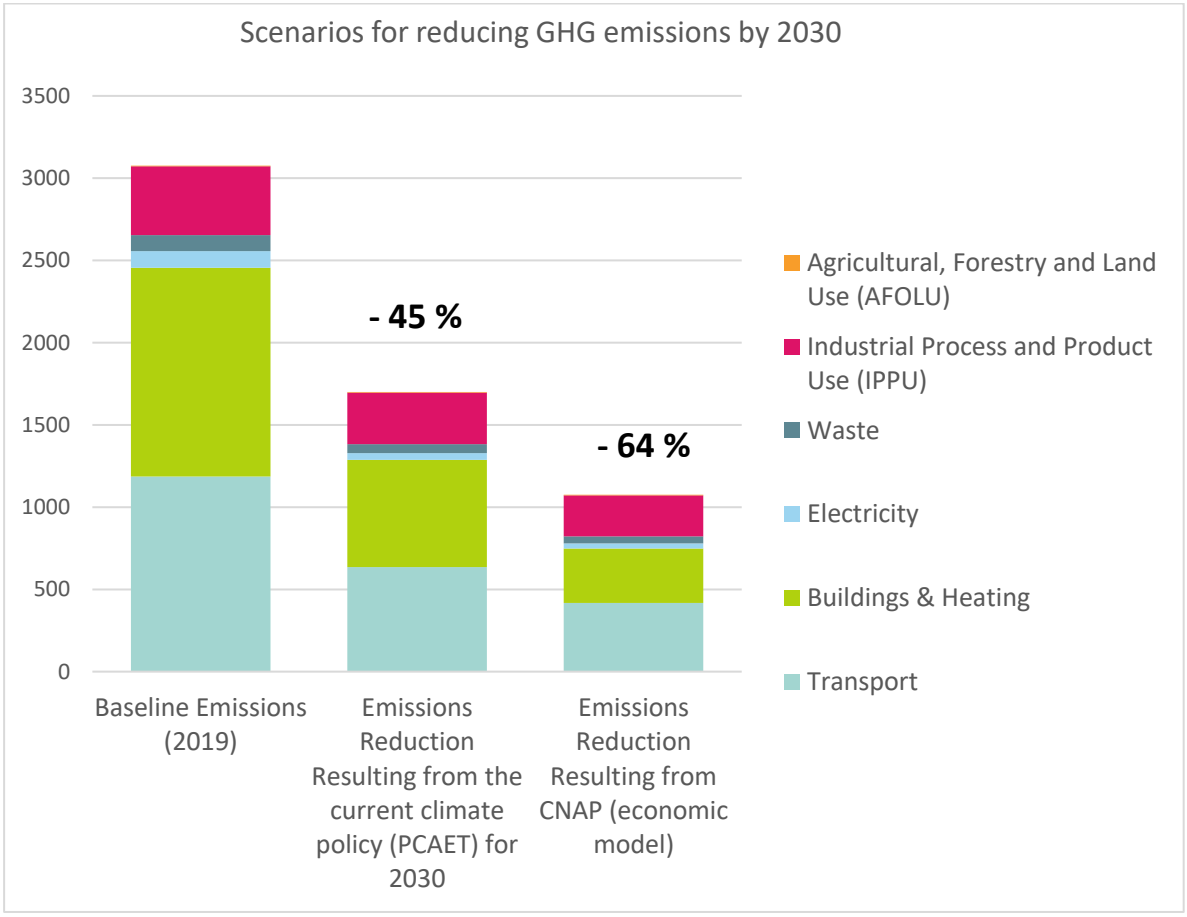
https://netzerocities.app/group-capabilitybuildingprogrammebuildingastrongeconomiccase

The Climate action plan of Bordeaux Métropole should allow to reduce by 45% the greenhouse gas emissions, which is already ambitious.

We have used the economic model proposed by NetZero city to determine the greenhouse gas reduction potential by 2030. This enabled us to model a -64% reduction in emissions between the BAU (Business as usual) scenario and 2030. If we exclude the other sector (including IPPU and AFOLU) (see table above) we arrive at a reduction of -68% by 2030. As mentioned above, the CCC action plan does not allow to reach the -80% objective. The reminding gap is due to the carbon intensity of French electricity and gas which should decrease faster than the objectives of the current national strategy (SNBC – National low carbon strategy). It is important to stress out that this strategy towards 2030 climate neutrality has been established building up as much as possible on the preexisting PCAET strategy features, to facilitate its understanding and appropriation by Bordeaux Métropole stakeholders. As a result, Bordeaux Métropole chose 2019 as a baseline and included the heavier industry and the ETS in the strategy. These choices can be regarded as a testimony of Bordeaux Métropole's level of ambition towards neutrality.

Regarding baseline, Bordeaux Métropole considers that choosing 2019 is quite ambitious, as it is the last available greenhouse gas inventory that was not affected by the drop-in activity due to the 2020-2021 pandemic. As mentioned in the Commitment Plan, Bordeaux Métropole's territorial emissions had already fallen by 11% between 2010 and 2019. Choosing an earlier baseline would have gotten us much closer to the 80% emission reduction target.

Figure 9 - Target value and emissions gap by sectors



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

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

The Bordeaux metropolitan area is a dynamic, growing agglomeration, with a dense transit-oriented center. Bordeaux Métropole has recently developed a full range of pro-climate strategies, programs, partnerships, and outreach initiatives for businesses and residents, outlined in its recently revised climate-action plan (PCAET, 2023).

As such, Bordeaux faces similar challenges as many other large, environmentally progressive European cities:

- Reconciling demographic growth and decarbonization.
- Operating an unprecedented acceleration of public and private initiatives across all emissions domains to hit targets initially planned for 2040-2050 by 2030.
- Effectively reducing emissions in domains that have traditionally been hard to reach by city policy—such as medium-distance car traffic that operates beyond public transit networks, or private freight and industrial processes.
- Coordinating policy across multiple administrative scales.
- Initiating rapid changes to the built environment, lifestyles and business models without provoking counterproductive resistance or placing an unfair burden on poorer households and businesses.

Bordeaux Métropole's relatively comprehensive set of pro-climate policies provide much of the local toolbox for the acceleration needed to achieve climate neutrality in the next decade. Recent European and national policies, responding to the European "Fit for 55" climate targets, have created new regulatory, financial, and operational tools in several key sectors. In the past few years, businesses and residents have demonstrated their ability to rapidly shift away from long held-practices towards new ones—as in the case of reduced building energy consumption and widescale adoption of telework and teleservices.

	Systemic barriers	**Opportunities**
Global	- **Strong demographic and economic growth.** Bordeaux is an attractive metropolitan area, with population growth estimated at 1.34%/year through 2030. In addition to having to decarbonize the existing urban system, Bordeaux will also have to respond to additional needs in terms of housing, mobility, services, etc.	- Growth and denser land use also provide opportunities for key climate-friendly policies, such as mixed-use and transit-oriented development (TOD), the rehabilitation of vacant housing and offices, market trends favoring collective housing and smaller average dwelling units, and the redevelopment of brownfield sites.

	- **Limited land availability**. Largely developed, Bordeaux has few remaining land opportunities and has to drastically reduce new land consumption by 2030, in line with recent national policy (zéro artificialisation nette). climate-friendly infrastructures, industries and services are in land-use competition with other urban priorities (housing, natural spaces, etc.). - **The multiplicity of ecological transition plans and resulting silos** between plans and services (mobility, housing, energy, etc.). - **Key national and European policies must be accelerated,** compared to current government targets, especially in the realms of national energy grids, building energy regulations and support for retrofits, heavy industry, and long-range transportation (see below). **- Uneven stakeholder engagement.** Bordeaux Métropole only controls a minority of the levers necessary for local decarbonization. The Bordeaux PCAET contains numerous key measures whose implementation depends on businesses and other scales of public administrations (municipalities, Department, Region), in cooperation with civil organizations and citizens. **- Renewed questions about the social acceptability and equity of a rapid transition to a low-carbon urban model.** Key measures will involve fundamental shifts in current	- The new metro climate-action plan (PCAET) has helped consolidate a cross-sector approach to environmental transition, both in terms of planning and administration. The CCC will build on this framework to consolidate a systemic approach to urban transitions. - Recent European and national initiatives have provided strengthened climate commitments and support for local action. France's new environmental planning package, "France Nation Verte," is built around clear 2030 carbon targets. This trend will continue, with the upcoming revision of the national low-carbon strategy (SNBC) and related legislation to meet "Fit by 55" targets. As a vanguard of French climate action, Bordeaux will continue to push for climate-friendly legislation and seize on new opportunities afforded by national and European programs. - The new metro climate-action plan (PCAET) has clarified different stakeholders' responsibility for implementing planned measures. Citizen engagement has also been strengthened, with the creation of a "citizen climate council" and crowdfunding schemes that allow citizens to contribute to the implementation of climate positive projects (e.g. photovoltaic production unit, urban farms, etc.). **-** Local policy also responds to real demand for urgent climate action and a greener urban model. Decarbonization will provide tangible co-benefits for many sectors of society: reduction of air pollution, energy poverty, and of dependence on fossil fuels, as well as more active lifestyles and lower energy bills.

	lifestyles and business models, with a risk of local reluctance and even opposition.	Maximizing and promoting these co-benefits will make it easier to engage stakeholders and citizens.
	- The financial cost of rapidly scaling up climate action. Very significant public and private investments need to be front-loaded to accelerate key policies, such as the massification of building retrofitting, the decarbonization of industrial processes, the deployment of new transit infrastructure and services, etc. Climate investments will generate financial savings and other cobenefits for administrations, businesses, and households—in the end generating net savings for Bordeaux—albeit probably over a longer timeframe.	- European, national and regional programs all provide public financial support that can be mobilized for locally beneficial programs—such as aid for housing retrofitting, low-emissions vehicles, public transit and district heating. - Strong job creation and investments are among the key tangible benefits of accelerated climate action for Bordeaux area residents and businesses. The 2020s will be a key decade for demonstrating that a low-carbon transition can be a net contributor to city prosperity and well-being.
	- **A rapid evolution of jobs, skills and training needs**. Scaling up climate policy will create unprecedented demand for qualified personnel in key sectors, some of which are already confronted with a penury of skilled workforce. This is particularly true for the buildings sector and for workers specialized in carbon-free industrial processes.	- Recent crises—especially Covid-19 and energy cost inflation—have demonstrated the capacity of local stakeholders to quickly adopt new practices and sustain them over time (for instance, the widespread adoption of teleworking, energy sufficiency in building heating practices, etc.).
	- Inertia in key technological and urban systems. Certain technologies, such as decarbonized industrial processes, are either not yet mature or have incompressible roll-out timeframes incompatible with a 2030 net zero target. Many planned changes to land use and the built environment are also medium-term levers, whose impact may be observed after 2030.	- Bordeaux Métropole has invested heavily in research and innovation partnerships. As part of the POPSU transitions program, several research projects have started. Among these, work on developing more reliable methods for calculating local GHG inventories will begin in collaboration with Bordeaux Sciences Economiques (BSE) and A-Urba. Bordeaux Métropole has established a partnership with the Transitions Institute of the University of Bordeaux, with the goal of disseminating knowledge on

		ecological transition, with a particular emphasis on behavioral sciences. - Internationally, Bordeaux Métropole plans to strengthen its support for the development of solidarity and decentralized cooperation projects, especially with local areas vulnerable to climate change.
Energy System	- **It will be difficult to cover all the metropolitan area's energy needs with locally produced renewable energies**. The deployment of solar rooftop and building heat pumps face difficulties in terms of local heritage-site protections in central Bordeaux. Larger PV installations have run into a lack of available land. And despite technically favorable conditions, wind units have encountered strong local resistance. Even with the most ambitious energy savings and renewables programs, Bordeaux will need to import some renewables from regional sources. - Bordeaux's district heat network—which has traditionally been a key public lever for injecting renewables into the local energy mix—has an already ambitious development program, which cannot be amplified or accelerated on a 2030 timeframe.	- Bordeaux Métropole benefits from good sunshine conditions conducive to the development of solar-based energy production. - Local household demand for PV installations is increasing sharply. - Discussions are accelerating for the deployment of large-scale PV on parking lots and commercial roofs. - Bordeaux Métropole is studying the feasibility of even more ambitious PV projects such as the deployment of solar panels on key road transport routes (metropolitan ring road, national highways). - Bordeaux Métropole is launching the "Bordeaux Solar City" Project, which aims to forge new partnerships with energy companies and investors to support renewables development on city property and partner sites. - France's new national program of "renewable energy acceleration zones," created in 2023, will help streamline renewable energy (RE) projects. The program will identify areas that municipalities deem preferential for new RE installations—signaling local support for these installations. - Bordeaux Métropole is increasingly supporting the development of renewable energies in the areas surrounding the metropole, through direct-purchasing mechanisms by energy consumers and the recently created metropolitan carbon

		cooperative. These initiatives foster a new form of cooperation between Bordeaux and its hinterland, while providing metropolitan businesses and residents concrete opportunities to support climate action.
Mobility and transport	**Passenger traffic:** - Medium-range commuting, which straddle the metro area's administrative boundaries, count for a major portion of car-related GHG emissions. Bordeaux Métropole only has part of the levers in hand for addressing this traffic, for which traditional transit solutions only solve partially the issue. - **Bordeaux Métropole already has a well-developed transit system, with nearly 80 km of tramway lines** complemented by numerous bus routes. Planned tram extensions and new service offers will add capacity over the next decade, but then might reach full capacity—even a tipping point where new lines could prove counterproductive—without achieving the modal share targeted in the climate-action plan. Any new extensions would take up to a decade to come to fruition. - **Walking and biking are widely practiced, but promoting further active mobility remains an uphill battle**. Current walking rates are already high. The metro area's current and planned bike network includes 1,000 km of bike-friendly roads. Yet not all residents take advantage of the new bike infrastructures for short-range commuting or short trips. Further development of walking and biking is limited by distance and influenced by a variety of	- More restrictive land use (*zéro artificialisation nette)* will encourage transit-oriented development and shorter commuting. - As part of its 2020-2030 mobility plan, the metro transit network will be further enhanced by regular inter-urban links comprising express buses and regional express trains (*RER métropolitain*). These extensions will provide a new impetus to ridership and help structure an intermodal transportation offer for medium-range travel. - Active modes are an increasingly attractive alternative to car use for many residents and even businesses. The future bike network (*ReVE*) will provide complete, high-capacity coverage for the metro area. New urban design and road retrofits are making urban space more amenable to active modes, even outside the metropolitan center. - More and more private individuals and businesses are adopting electric vehicles. There has been a sharp increase in demand for the installation of recharging points in the region, and nationwide support for leasing electric vehicles has met with considerable success.

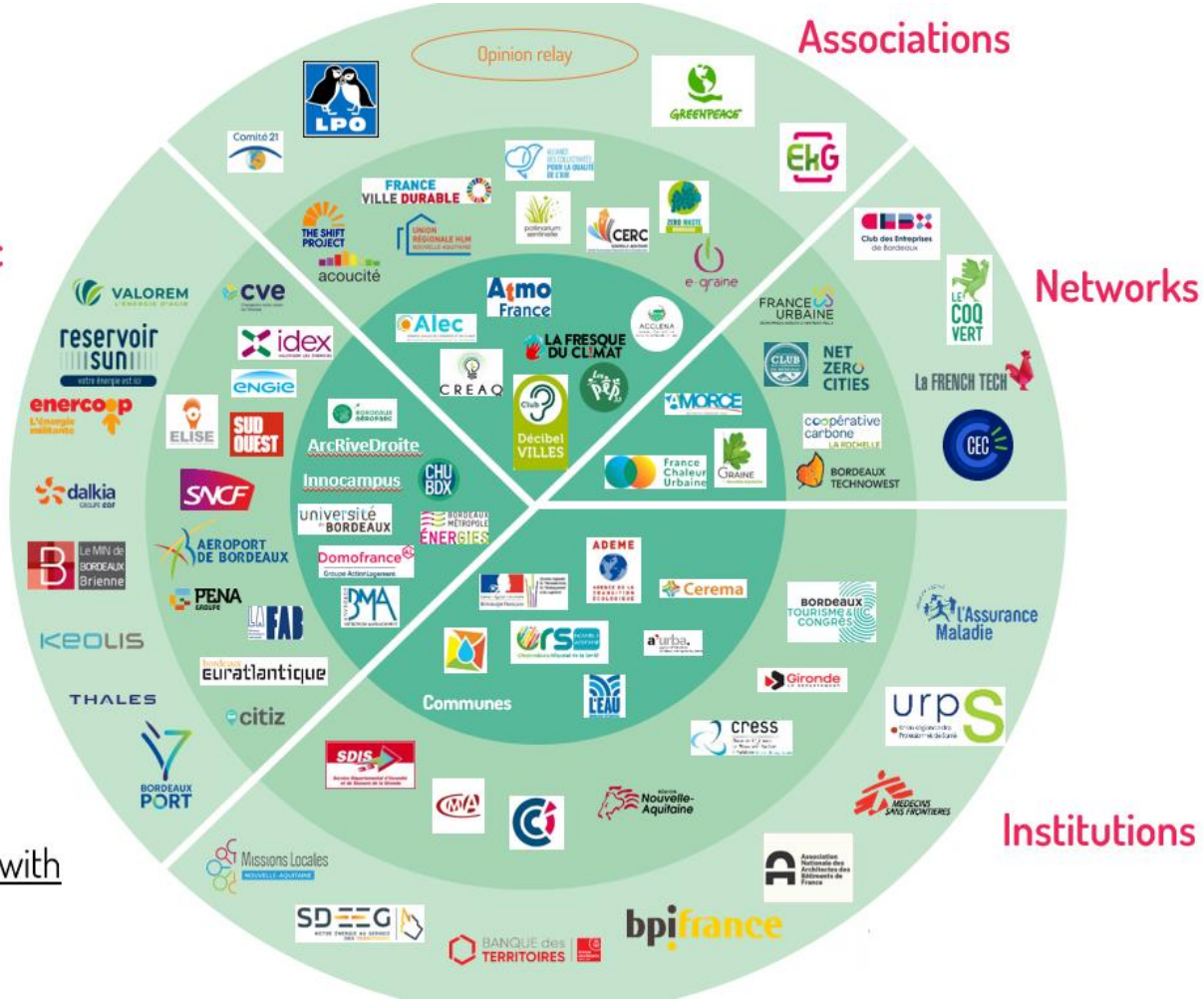
	factors (quality of urban space, vehicle speeds, etc.). And the ageing of the metro population could make the adoption of active modes even more complex. - There is strong attachment to individual car ownership, some local resistance to actions limiting car use and insufficient adoption of low-emissions vehicles. Adoption of electric vehicles is closely linked to household purchasing power. The models offered by manufacturers tend to be top-of-the-range, and it is difficult for low-income households to afford electric vehicles. Freight and urban logistics: - City authorities' role in decarbonizing urban logistics is particularly complex, as the sector is mainly in the hands of private operators over which the territory has little control. The rapid development of e-commerce has added to the urgency of finding new solutions for "last mile" urban deliveries.	- Recent initiatives seeking to limit the place of car traffic (parking and speed limitations, etc.) have demonstrated tangible cobenefits in terms of more attractive public space. - National mandate for the implementation of low-emissions driving zones in most French agglomerations has created a common framework, mandate to act and tools for accompanying new measures limiting the most polluting car traffic. - Bordeaux Métropole recently launched a new sustainable logistics roadmap, associating key stakeholders from different freight sectors. This initiative will provide the much-needed governance and policy framework for provoking positive movement on the subject. - The low-emissions driving zone will provide an impetus for adoption of decarbonized vehicles, especially for urban deliveries.
Waste and circular economy	-Circular Economy issues are complex and involve a multitude of stakeholders. They require knowledge of the data and the use of a common methodology by all actors. -Circular economy sectors still rely heavily on public investment. - There are cultural obstacles to changing the practices of certain economic and industrial players. The French government relies on many EPR (Extended Producer	-The circular economy is an environmental, social and economic challenge. It is an opportunity for regional development. For the vast majority of companies, it is also a competitive advantage. -Developments in the AGEC Law of February 10, 2020 on the fight against waste and the circular economy.

	Responsibility) chains. On a national level, the EPR sector for building and public works products is lagging behind, even though its waste volumes are more substantial. -Lack of sites and land available for all circular economy projects, and in particular the reuse of building materials, recycling centers and bio-waste.	- A decree implementing this AGEC law sets targets for reuse rates in public procurement contracts. - Existence of numerous economic sectors in the metropolitan territory (a conducive territorial scale). This scale is relevant to the deployment of circular economy systems. - Existence of a large ecosystem of projects and players in the metropolitan area (notably the Region, ADEME, civil organizations and the Social and Solidarity Economy entities). -The forthcoming completion of an "urban metabolism" study will enable us to characterize and quantify the flows of raw materials and energy resulting from industrial and socio-economic activities.
Green infrastructure and nature-based solutions	During heatwaves, 42% of the population of Bordeaux population is considered highly vulnerable. Several experiments have been launched to create shaded areas in the city, change roof coverings and remove waterproofing from soils. For some of them, there are obstacles: infrastructure, unsuitable materials, financial cost or the replicability of some installations in other areas of the territory.	-Extend the attractiveness of existing urban parks -Updating the vulnerability diagnosis of the territory -Participation in the European Commission's Climate Mission for which the metropole has signed the charter
Built environment	- As in much of France, building retrofits are on the rise, but there are multiple hurdles to achieving the scale and energy performances needed for full decarbonization by 2030. - Many local households and businesses are reluctant to renovate their buildings. The main reasons for this are the cost of	- The recent increase in national support for home renovation will make it easier to carry out large-scale renovations across the country. - National regulations for the energy performances of commercial buildings and rental housing are a

	renovation, the inconvenience caused by the work, and a lack of confidence in the benefits of renovation. As far as housing is concerned, the high property turnover rates (a house is owned for just 6 years on average) does not encourage people to invest in renovation. - **The public resources currently available to help households and businesses** renovate their buildings are insufficient to cope with a sharp increase in demand for renovation. - **The lack of a skilled building working force** is particularly crucial. The number of craftsmen in the region is not sufficient to meet renovation needs, and the creation of a suitable sector is realistic in the long term. - **Major parts of the metro area are covered by a heritage protection plan (PSMV),** where heritage protection rules often limit retrofitting and heat pumps. **- Bordeaux will grapple with increasingly frequent and intense heatwaves.** Widespread adoption of individual air conditioning is a significant risk for hitting 2030 energy-reduction targets.	powerful incentive for owners to renovate their properties. Bordeaux's new climate-action plan aims to hit mandated targets sooner than national deadlines. - The energy-saving efforts made by households and businesses during the energy crisis have demonstrated their ability to rapidly reduce its energy consumption. - Bordeaux Metropole is increasingly adopting a global approach to building issues, favoring quality renovation over new construction, while integrating the issues of adapting to climate change (summer and winter comfort) and combating fuel poverty.
Green industry	- **Until now, the metro area has lacked a comprehensive, shared roadmap for industrial decarbonization.** **- Necessary industrial transformations will provoke shifts in employment.** The increase in green jobs and the	- A national drive to reindustrialize green jobs has resulted in new government programs to support firm- and district-scale industrial decarbonization projects. - In 2023, two major initiatives launched in the Bordeaux metro area: "Territory of Industry" (2023-

	reduction of employment in heavily carbonized sectors or processes both need to be anticipated to avoid future resistance or market difficulties. - **The cost of decarbonizing** processes carries the risk of reduced industrial competitiveness - **Many technical solutions** for decarbonizing industrial processes have low TRLs (Technology Readiness Levels), which are incompatible with rapid decarbonization of the sector. - Industry is particularly affected by the shortage of available land in the Bordeaux metro area.	2027) and the "Bordeaux énergies Eau Environnement et Synergies en Zones Industrielles et Portuaires" project (launched in 2023). Both will provide key support to industry in decarbonizing processes and reducing the use of natural resources. - The Bordeaux Port Authority (Grand Port Maritime de Bordeaux), home to some 8,100 shipping and industry jobs, also has its own “industrial and territorial ecology” strategy, which favors circular-economy dynamics and aims to reduce the port’s carbon footprint.

Figure 10- Systems and stakeholders mapping


Associations
Networks
Institutions
Private and public compagnies
Opinion relay
Communes
LPO
GREENPEACE
Comité 21
FRANCE VILLE DURABLE
THE SHIFT PROJECT
acoucité
CERC
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Atmo France
Alec
LA FRESQUE DU CLIMAT
CREAQ
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BORDEAUX TECHNOWEST
France Chaleur Urbaine
LE COQ VERT
La FRENCH TECH
CEC
Club des Entreprises de Bordeaux
ADEME
Cerema
BORDEAUX TOURISME & CONGRÈS
L'Assurance Maladie
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Gironde
SDIS
Nouvelle-Aquitaine
MÉDECINS SANS FRONTIÈRES
Missions Locales
SDEEG
BANQUE des TERRITOIRES
bpifrance
Existing partnerships
Sustainability strategy
Existing collaborations
Strategy for further development and formalization
Identified actors to meet with
Launch strategy

2 Part B – Pathways towards Climate Neutrality by 2030

Module B-1 Climate Neutrality Scenarios and Impact Pathways

B-1.1: Impact Pathways					
Fields of action	Systemic levers	Early changes (1-2 years)	Late outcomes (3-4 years)	Direct impacts (Emission reductions	Indirect impacts (co-benefits)
Sector: Energy system *Subsectors*:* Decarbonizing heating generation	Technology and infrastructure Governance and policy	District heating: feasibility studies for remaining opportunities for network extension and densification (districts with sufficient thermal density). Target: 16 feasibility studies, around ten new network projects or extensions to existing networks Adopt a dedicated strategy and action plan for cooling networks adapted to the different types of districts and buildings.	900 GWh in 2030 delivered via heating networks, 80% of which will be renewable and recovered energy. The resources consumed by the district heating networks will come from the local area and neighboring areas (particularly biomass).	-679 ktCO2eq	Air quality Employment Property Value Equality
	Finance and funding Governance and policy	Encourage industries that release large quantities of exploitable heat[1] to locate relevant	Development of the heating networks at industrial sites identified as relevant		

[1] I.e. furnaces, boilers, incinerators, turbines, etc. Particularly as part of a global partnership with the area's biggest energy consumers (the "top ten") located mainly along the Garonne (Ambès, Bègles, Bassens): aeronautics, space and defence industries, pharmaceutical industry, agri-food industry, etc.
* : sub-sectors from economic model. We have reorganized the architecture of the impact pathways but we have kept the figures for the economic model.

	Learning and capabilities	processes near the district heating network. Undertake feasibility studies specific to each industrial site, in line with the district-heat network development plan and depending on the industrial needs of the recovery site's neighbors.			
	Technology and infrastructure Learning and capabilities	Develop the first large-scale methanization projects in Bordeaux Métropole. Targets: wastewater treatment plants, biowaste recovery, first industrial methanization plant.	Develop a 30 GWh industrial biowaste methanizer already planned in the Bordeaux Port complex Plan the development of 2 other projects of a similar size in cooperation with neighboring metropolitan areas to come online in 2032 and 2038 respectively Identify sites for then 2 other projects, as well as methanizer projects in wastewater treatment plants (WWTPs) in order to inject at least 50 GWh of biogas into the network.		
	Governance and policy	Working group with neighboring	Implementation of identified		

	Learning and capabilities	areas to study and initiate the development of methanization projects located outside Bordeaux Métropole	methanization projects and development of new projects with nearby territories		
Sector: Energy system *Subsectors* :* Decarbonizing electricity generation and consumption	Technology and infrastructure Finance and funding	Develop the first large-scale photovoltaic installation projects, both on shaded areas and on private and public roofs, by providing dedicated engineering and appropriate funding.	The majority of car parks and roofs are equipped with photovoltaic panels, with priority given to the largest exposed areas.	-96 ktCO2eq	Air quality Employment Property Value Equality
	Governance and policy Finance and funding Social innovation	Support the development of regional renewable energy projects through the dedicated agency, Bordeaux Métropole Energies, and a new carbon cooperative. Structure a monitoring system for the purchase of renewable energy in partnership with existing observatories (ALEC, AREC, etc.), to collect and process data on the supply of green gas and electricity to public bodies, businesses and households, with a view to developing direct	Increased proportion of renewable energy in energy purchases by the Bordeaux Métropole and local energy consumers (businesses, administrations and households)			

		purchasing mechanisms.			
Sector : Mobility & transport Subsector*: *Shift to public & non-motorized transport* and Reduced motorized passenger transportation need	Technology and infrastructure	Public transit: improve and develop the existing network: extension of tramway line A, improvement and development of the express bus network	Development underway on new infrastructures, especially the metropolitan rapid transit system (“RER métropolitain”) Km of bus lanes doubled	-341 ktCO2eq	Air quality Equality Employment Noise reduction Road safety Physical health
	Technology and infrastructure	Develop a massified cycling network “ReVE” (Réseau vélo express) network Maintain and develop cycling facilities and services, update the cycling facilities guide, improve signposting, etc.	ReVe express network fully developed A full range of cycling information, facilities, and services accompany the massive adoption of cycling as a mode of daily mobility		
	Finance & funding	Support municipal authorities in their efforts to develop cycling: loan of electrically-assisted bicycles Promotion of local grants, introduction of a fleet of electrically-assisted bicycles for staff, etc.	Successful results scaled up to other areas of the territory		
	Technology and infrastructure	Design public spaces that are more walkable, deploy “walkable areas”	Full coverage of “walkable areas” Walking is an attractive alternative to cars across the		

			metropolitan area		
	Learning and capabilities	Encourage independent pedestrian travel to and from school by experimenting with closing off school streets and encouraging ecomobility in schools (pedibus, vélobus).	Successful results scaled up across the metropolitan area		
	Social innovation	Support the development of teleworking and teleservices, as an alternative to polluting transportation	Regular teleworking for eligible employees is generalized, anticipating national “France Verte 2030” targets		
Sector: Mobility & transport Subsector : Increased car pooling	Governance & policy	Develop carpooling for medium- and long-distance journeys through a coordinated multi-partner carpooling plan to develop dedicated carpooling lanes and carpooling areas.	Widespread use of daily carpooling for journeys that cannot be made using active modes/public transport	-53 ktCO2eq	
	Social innovation Learning and capabilities	Develop car pooling by encouraging local authorities to dedicate roads, by proposing that managers of open car parks create reserved spaces, by trialing a car-sharing service in mixed-use developments and by raising awareness of car-sharing among	Car-sharing is an attractive alternative to individual car ownership. It is a permanent feature of mobility practices, both for everyday transport and for long-distance journeys.		

		company employees. Integrating carpooling and carsharing services into digital tools (Mobility as a service)			
Sector : Mobility and transport Subsector : Decarbonising motorized vehicles *(electrification of cars + motorcycles, buses)*	Technology and infrastructure	Accelerate the transition of the public transit (TBM) bus fleet to replace diesel and hybrid buses with electric and bioNGV buses	No more metro transit buses powered by petroleum products	-89 ktCO2eq	
	Governance & policy Technology and infrastructure	Draw up a master plan for electric vehicle recharging facilities (SDIRVE) Plan in particular the provision to the public of a large number of recharging points for electric vehicles by reintroducing the 170 points of the former Bluecub service Encourage the roll-out of private offers.	Cover the territory with a network of recharging points		
	Governance & policy Technology and infrastructure	Implement a low-emissions zone (LEZ), with a gradual reinforcement of criteria for exclusion of high-pollution vehicles	LEZ has reached maximum criteria, creating a substantial incentive for the adoption of low-emissions vehicles, public transit and active modes		

Sector : Mobility and transport Subsector : Reduced motorized passenger transportation need					
Sector : Mobility and transport Subsector : Decarbonizing freight (Optimized logistics + decarbonized trucks)	Governance and policy	Draw up an urban logistics plan for the metropolitan area and neighboring areas to organize last-mile deliveries, organize HGV traffic and regulate access times.	Evaluation of the logistics plan and generalization of the most positive results, incorporating feedback from other French and European cities	-256 ktCO2e	
	Technology and infrastructure Governance and policy	Encourage logistics operators to adopt lower-emissions modes vehicles (cyclologistics, electrification of trucks, etc.)	No more internal-combustion light commercial vehicles Substantial efficiency improvements for heavy commercial vehicles		
Sector : Waste & circular economy	Governance and policy Social innovation	In connection with the Local Programme for the Prevention of Household and Similar Waste (PLPDMA): develop awareness-raising, promotional and support initiatives aimed at individuals, businesses and local authorities on all zero-waste issues	-15% reduction in household and similar waste per capita by 2030 by reducing consumption and improving recycling facilities	- 6 ktCO2e	Employment Air quality Eco-system health Water Quality

	Governance and policy	Encourage construction and public works companies to recycle their materials and promote the circular economy and the reuse of materials. To facilitate the storage and recycling of materials, define a land strategy and make a strong commitment to regulatory changes to facilitate recycling and reuse through the circular economy strategy to be adopted in 2023.	Construction and public works companies no longer face major hurdles to the circular-economy approaches	Unquantified	
	Governance and policy Finance and funding Learning and capabilities	Encouraging the circular economy: Adoption of a circular economy roadmap by 2026 In public procurement (development of a comprehensive catalogue of purchasing strategies adapted to the different procurement needs ”SPASER”) Among residents, by supporting retailers' civil organizations to	Circular economy principles are widely respected in public procurement and have gained a substantial hold on consumer behavior By 2030, 30% of supplies purchased by local authorities will be reused or recycled. By 2028, six ephemeral “reuse areas,” temporarily	Unquantified	

		promote responsible consumption and through communication campaigns targeting the sectors that emit the most GHG. Supporting the City of Bordeaux's experiment for reducing commercial advertisements in residential areas ("Oui pub" campaign)	installed at regular intervals in different Bordeaux Métropole neighborhoods and towns, provide a cluster for this new economic model.		
Green infrastructure & nature-based solutions	Governance and policy	Launch of the "Territorial Food Project" to coordinate the Metropole's actions on the territorial food system, from production to consumption.	A large number of farmers are setting up organic farming projects and short local circuits in the region, based on the existing agricultural fabric. Agricultural practices that sequester carbon and are resilient to drought (agroforestry, agroecology, permaculture) are developing strongly.	unquantified	Eco-system health Physical health Water quality Community assets Air quality Property value Employment
	Social innovation Democracy /participation	Develop the network of shared gardens in the metropolitan area, with the support of partner organizations responsible for helping to create	Increasing the number of shared gardens throughout the region		

		new gardens and running existing ones.			
	Governance and policy	Implementation of the "Metropolitan Forest Strategy" and the "1 million trees" project to preserve existing forests and develop and diversify the canopy.	The involvement of civil society and companies has made it possible to meet the objectives and improve the quality of life by combating urban heat islands.		
	Governance and policy	Drawing up an ambitious strategy to combat the artificialization of land and urban sprawl, based on urban planning tools	Drastic reduction in the artificialization of land and renaturation of certain urban areas		
Sector : Built environment Subsector : Massive Building renovations (envelope)	Finance and funding	Dramatically accelerate housing retrofitting rates. Prioritize support for households experiencing energy poverty in the high-performance renovation of their homes. Renovate 50% of housing and social housing = 50 000 houses	Retrofits have hit peak deployment rates. Renovate 100% of housing and social housing = 100 000 houses	-204 ktCO2e	Employment Property value Air quality Equality
	Finance and funding Technology and infrastructure	Massively deploy low-carbon heat sources: heat pumps and district heating, etc.	0 fuel-oil heaters in buildings in 2030		
	Governance and policy	Dramatically accelerate commercial retrofit rates and	The most energy-intensive spaces are renovated with a		

		energy-performance targets. Accelerate the deadlines of national regulation ("décret tertiaire" = regulation concerning tertiary sector)	high level of energy performance, exceeding national regulations.		
	Learning and capabilities	Skills training and best-practice networking among all building-industry stakeholders	Building industries have sufficient manpower and skills sets for peak roll-out of retrofits and appliance turnover create a link between these structures and project leaders		
Sector: Built environment Subsector: New energy-efficient buildings	Governance and policy	Impose the use of biosourced, local-sourced without energy intensive process of transformation, and reused materials in urban planning documents (PLU, PLH, SCOT) to limit the systematic use of carbon-based materials.	Widespread use of low-carbon construction methods in all new buildings	-31 ktCO2e	
	Governance and policy Social innovation	Promoting sustainable, health-friendly urban planning	A large proportion of vacant and under-occupied spaces are being put to good use, drastically reducing the	unquantified	

			need for new construction. Households and businesses are adopting new ways of living and working by sharing space.		
Sector: Built environment Subsector: Efficient lighting & appliances	Social innovation Learning and capabilities	Carry out an awareness-raising and support campaign on the principles of resource efficiency and cost saving (control of heating and air conditioning, management of lighting and household appliances, etc.).	Local households and businesses are limiting their energy consumption by adopting long-term eco-actions	-20 ktCO2e	
Sector : Green industry	Technology and infrastructure Governance and policy	Promote less carbon-intensive processes among the territory's industrial actors	The industries with the highest emissions in the region have replaced fuel oil and coal with low-carbon energy sources. All industries have improved their processes to save energy.	NC Quantifications exists but is not integrated	Reducing air pollution Reducing the energy costs of the territory's economic players
	Gouvernance and policy	Strengthening partnerships with industry as part of the " Territory of Industry" label (2023 - 2027) and the "Bordeaux énergies Eau Environnement et Synergies en Zones Industrielles et Portuaires" project (launched	Implementation of the first large-scale program to decarbonise industrial processes resulting from these collaborative frameworks		

		in 2023) to support industry in decarbonising and reducing the use of natural resources.			
	Finance and funding	Support companies using materials with low environmental impacts Leverage Bordeaux Métropole's public procurement to favor locally sourced bio-materials (environmental clauses in metropolitan purchasing and tenders) Encourage municipal authorities to do the same	Pioneering companies and public procurement have helped generalize the use of low-impact and bio-sourced materials.		
	Learning and capabilities	Design large-scale experiments and industrial R&D on "functional economy" and "collaborative economy" models for green industry	Successfully tested "functional economy" models are available for roll-out, offering a viable pathway for industrial-scale pooling of resources		

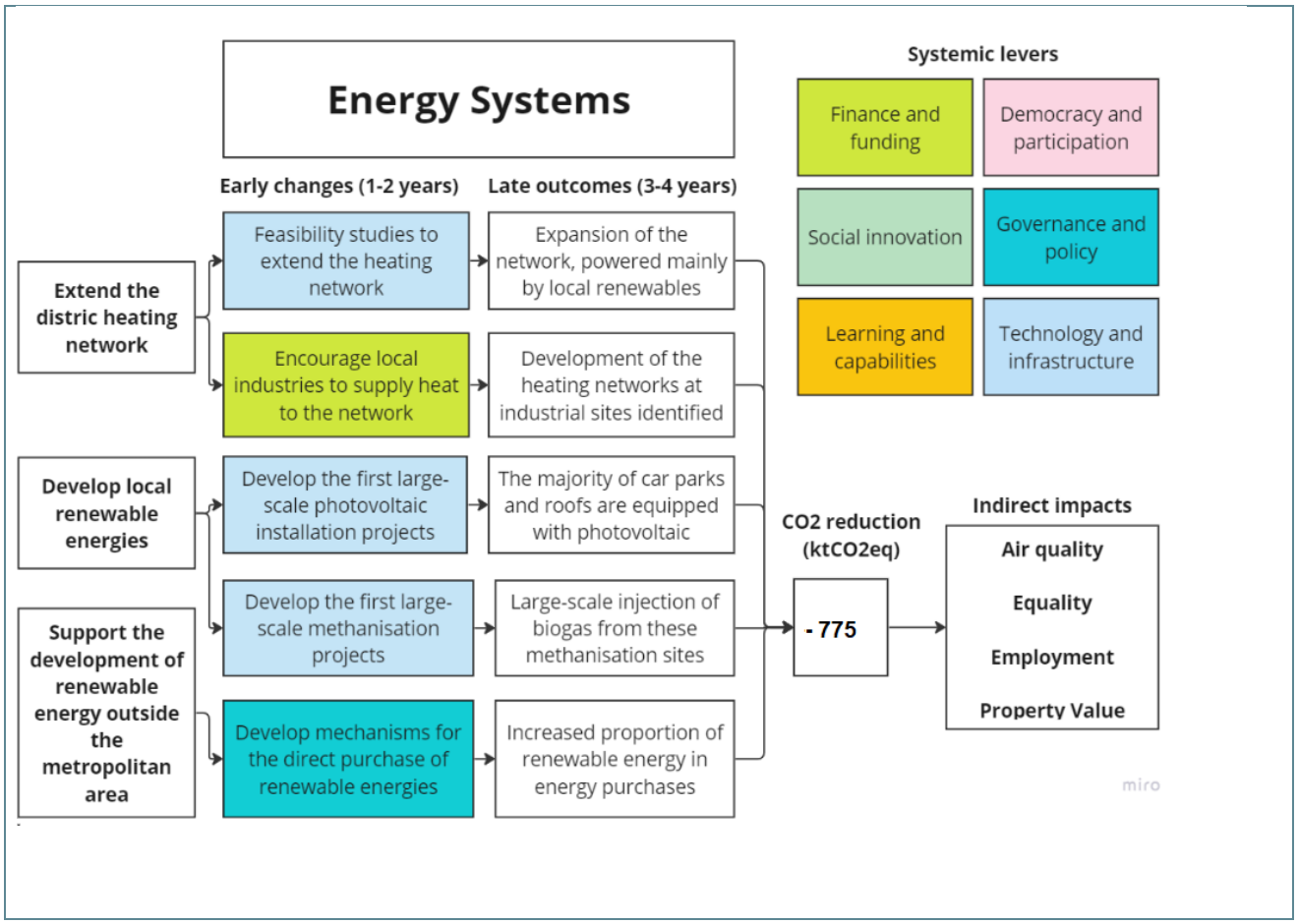
B-1.2: Description of impact pathways
Several key principles guided pathway design :

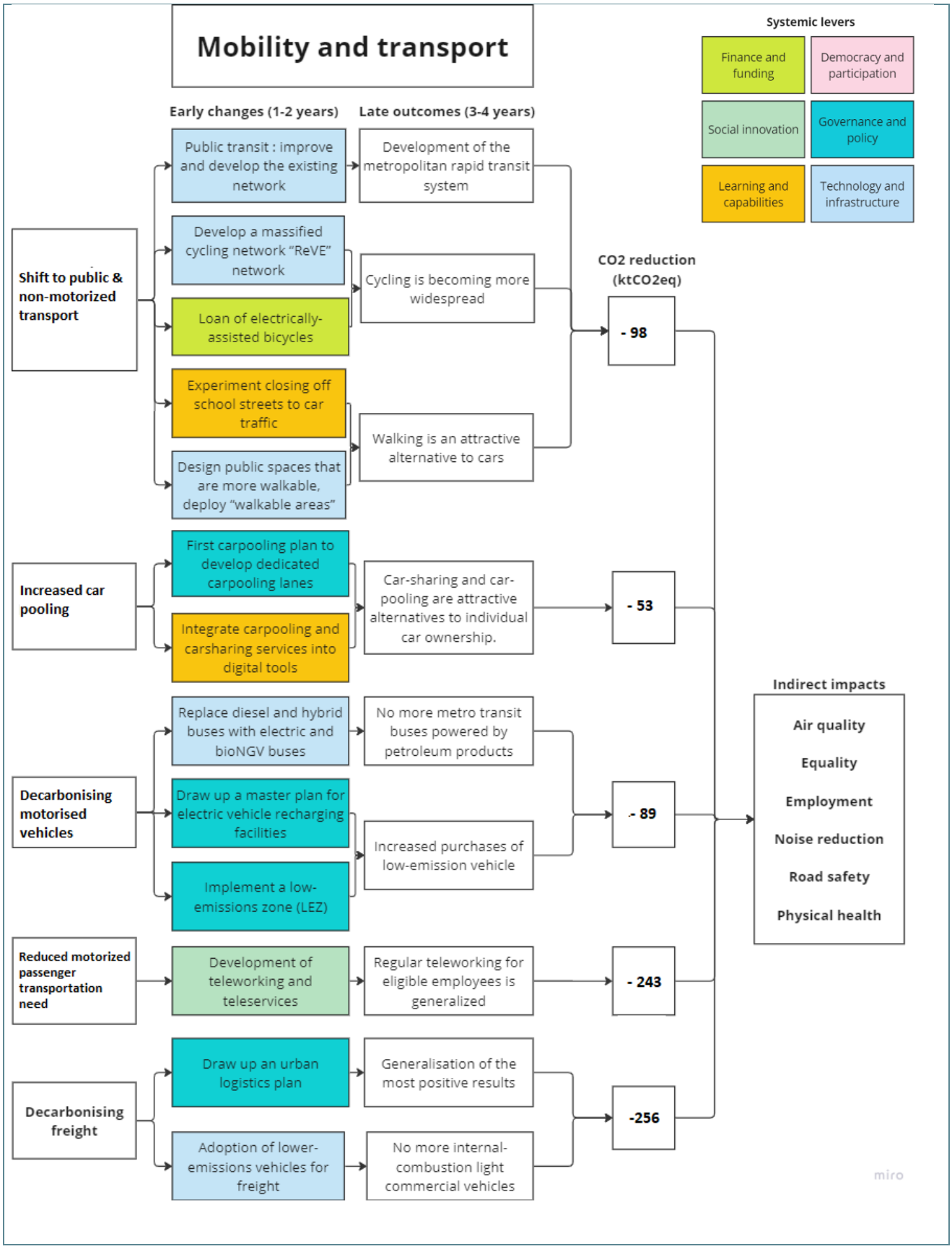
Build on existing climate strategies and action plans, focus on closing the 2030 emissions gap, anticipate longer term targets. Bordeaux Métropole's 2023 climate-action plan contains a pathway for achieving climate neutrality by 2050. Our CCC pathway builds on this existing scenario, but with much earlier dates for achieving targets (exploratory scenario). New pathway design focused on actions needed to achieve an unprecedented effort on a much shorter timeframe, whether in terms of scaling up technical interventions such as retrofitting building; accompanying major shifts in residents' and businesses' behavior and choices; or engaging partners and consolidating effective governance and partnerships. While focusing on 2030 targets and available technologies, our CCC pathways address synergies with measures aimed at achieving Bordeaux Métropole's longer-term outcomes—especially in terms of land-use levers and fostering future technological innovations.

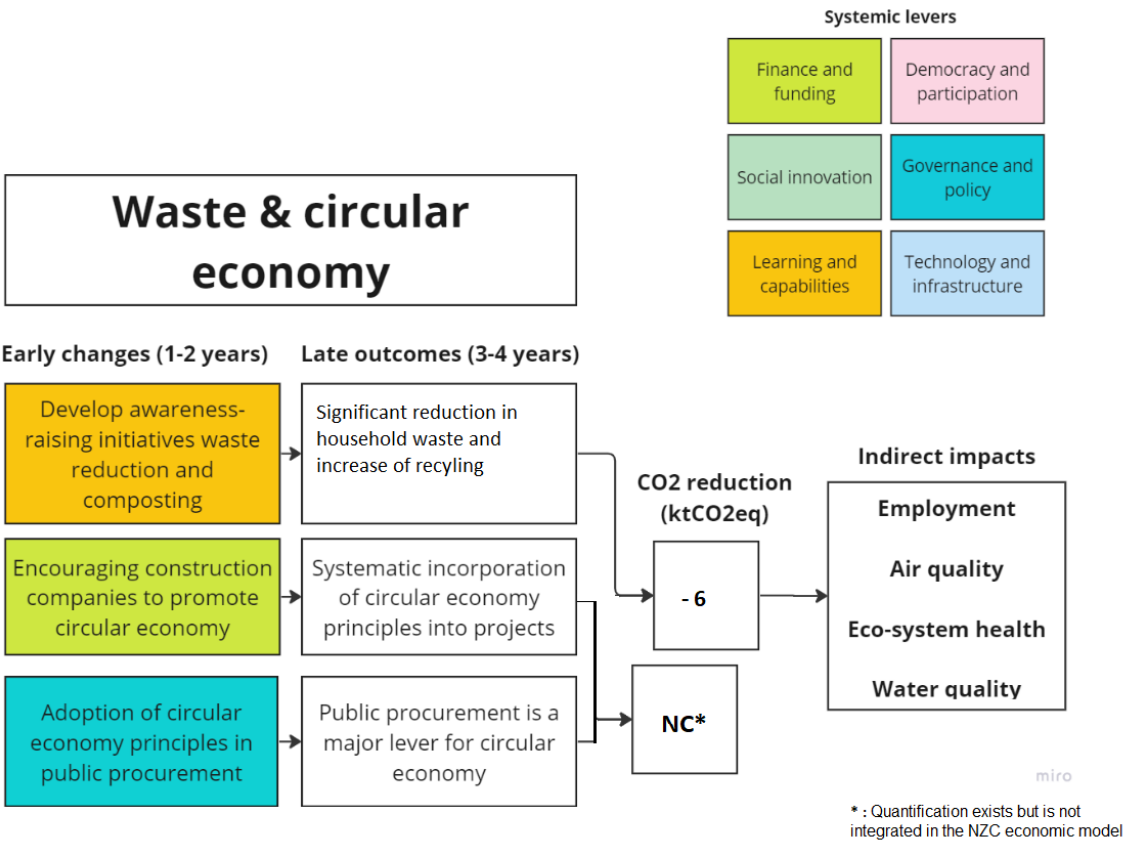
Adopt a systems approach, activating a maximum number of available levers. Bordeaux Métropole has adopted ambitious climate targets and action plans for most emissions domains. Pathway design thus put particular emphasis on connecting the dots to achieve systemic change. For each emissions domain, our pathways activate multiple systemic levers identified in the NZC Theory of Change. They also adopt a "reduce-improve-switch-generate" approach to energy systems and emissions reductions, aligned with Bordeaux Métropole's choice to prioritize the reduction of energy and material needs as the guiding principle for local climate action. Since the Bordeaux urban system expands well beyond metropolitan administrative boundaries, pathways include levers requiring cooperation with neighboring cities and regional authorities—particularly for generating renewable energy and addressing medium-distance car traffic. Among the individual projects presented in module B.2, some projects are tagged as "priority projects". It does not mean that these projects are more important than others in terms of 2030 outcomes, but only that they require more massive or urgent investment or action from Bordeaux Métropole's team to make sure to achieve our ambitious carbon reduction targets.

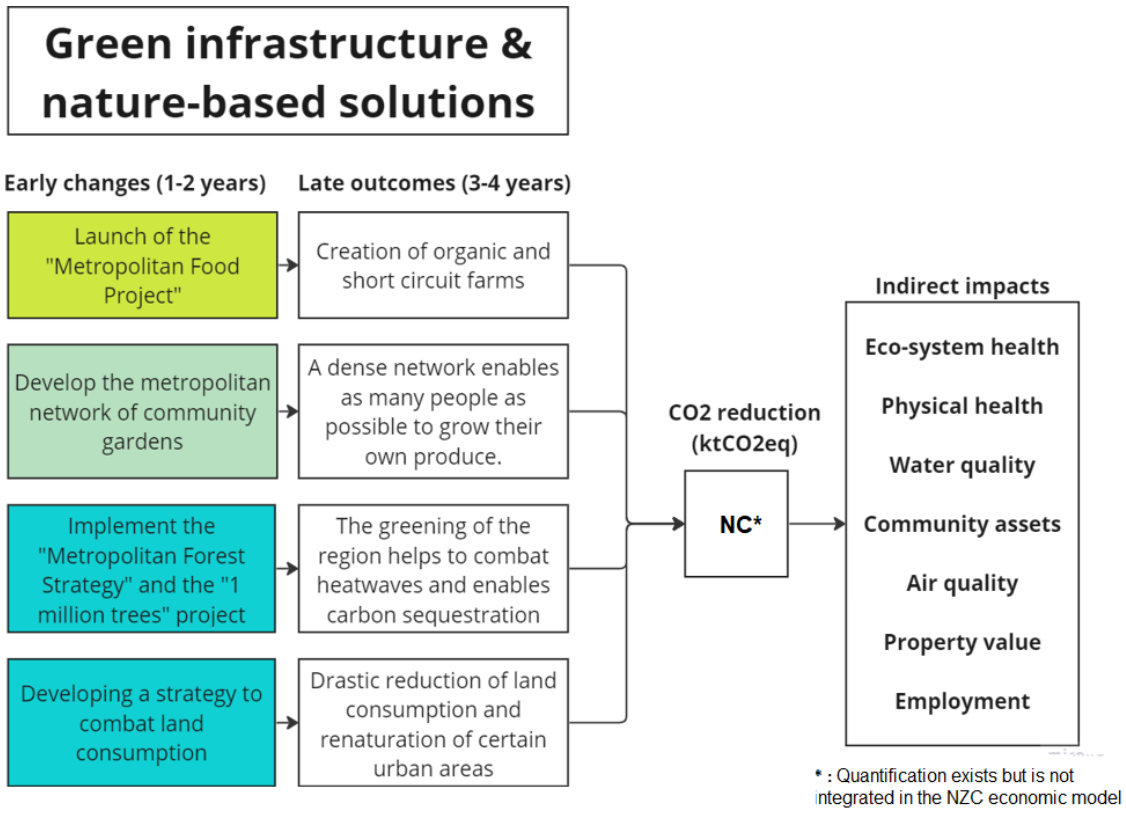
Capitalize on new climate opportunities. Work on the current state of action (part A above) underscored just how quickly the context for French climate action is evolving, creating exciting new opportunities for accelerating local decarbonization. Recently announced demonstrator projects for industrial decarbonization and metropolitan-scale rapid transit ("RER métropolitain"), new national initiatives on building retrofits and low-emissions driving zones, and widespread adoption of teleworking are among the levers whose potential for meaningful emissions cuts by 2030 has grown dramatically in just a few years. Our pathways emphasize the importance of capitalizing on these new opportunities to ensure they translate into rapid and durable climate-friendly trends.

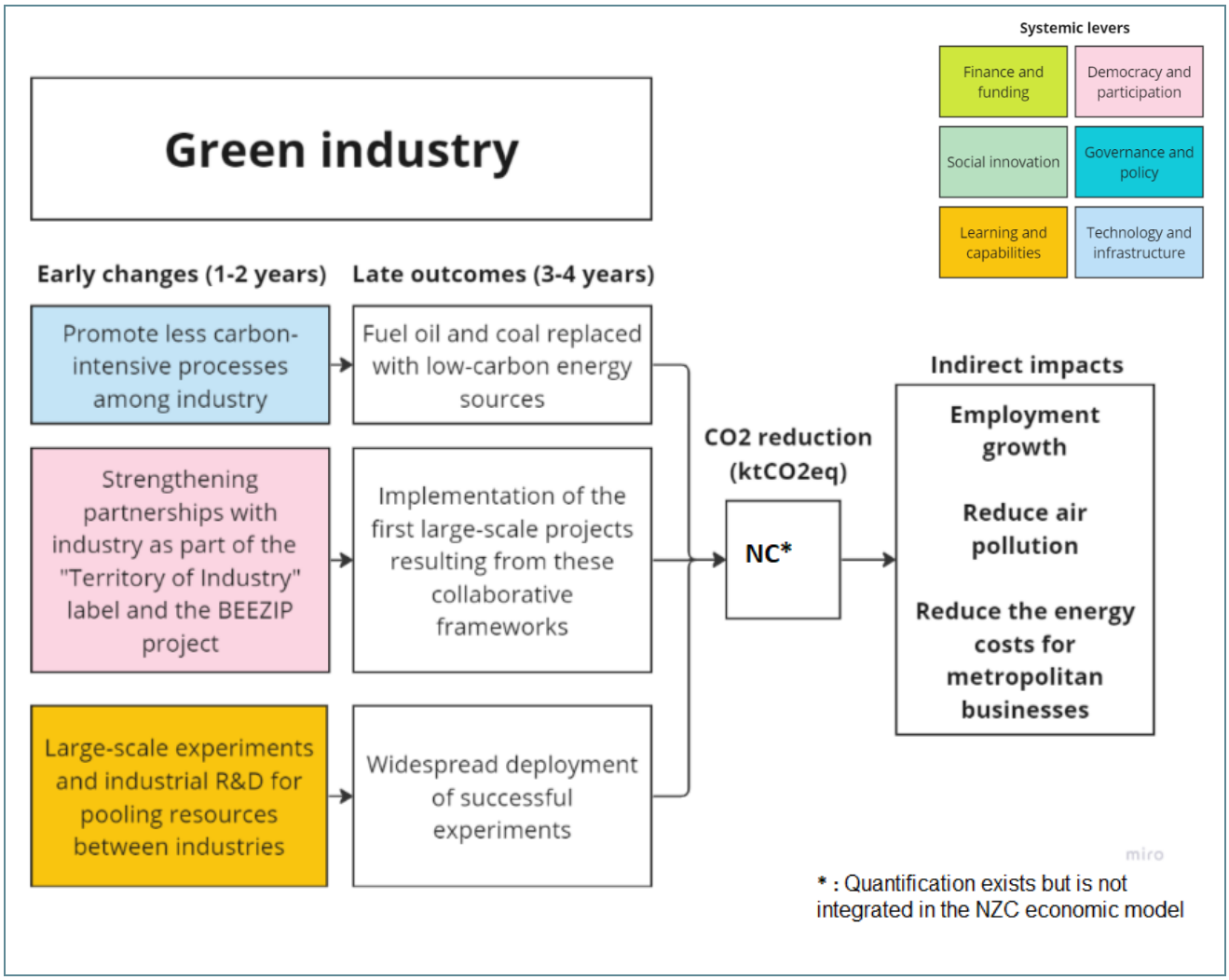
Aim for meaningful, observables outcomes. Emphasis has been placed on identifying intermediary outcomes that will provide Bordeaux Métropole with regular feedback on action implementation, direct results, and systemic impacts for each emissions domain. This mix of quantitative and qualitative targets will help Bordeaux navigate the "messy middle" of an accelerated transition to climate neutrality, while also communicating with stakeholders and citizens about the tangible changes they should see resulting from collective climate action.


Energy Systems
Systemic levers
Finance and funding
Democracy and participation
Social innovation
Governance and policy
Learning and capabilities
Technology and infrastructure
Early changes (1-2 years)
Late outcomes (3-4 years)
Extend the distric heating network
Feasibility studies to extend the heating network
Expansion of the network, powered mainly by local renewables
Encourage local industries to supply heat to the network
Development of the heating networks at industrial sites identified
Develop local renewable energies
Develop the first large-scale photovoltaic installation projects
The majority of car parks and roofs are equipped with photovoltaic
Support the development of renewable energy outside the metropolitan area
Develop the first large-scale methanisation projects
Large-scale injection of biogas from these methanisation sites
Develop mechanisms for the direct purchase of renewable energies
Increased proportion of renewable energy in energy purchases
CO2 reduction (ktCO2eq)
- 775
Indirect impacts
Air quality
Equality
Employment
Property Value
miro


Mobility and transport
Systemic levers
Finance and funding
Democracy and participation
Social innovation
Governance and policy
Learning and capabilities
Technology and infrastructure
Early changes (1-2 years)
Late outcomes (3-4 years)
CO2 reduction (ktCO2eq)
Shift to public & non-motorized transport
Public transit : improve and develop the existing network
Development of the metropolitan rapid transit system
Develop a massified cycling network "ReVE" network
Loan of electrically-assisted bicycles
Cycling is becoming more widespread
Experiment closing off school streets to car traffic
Design public spaces that are more walkable, deploy "walkable areas"
Walking is an attractive alternative to cars
- 98
Increased car pooling
First carpooling plan to develop dedicated carpooling lanes
Integrate carpooling and carsharing services into digital tools
Car-sharing and car-pooling are attractive alternatives to individual car ownership.
- 53
Decarbonising motorised vehicles
Replace diesel and hybrid buses with electric and bioNGV buses
Draw up a master plan for electric vehicle recharging facilities
Implement a low-emissions zone (LEZ)
No more metro transit buses powered by petroleum products
Increased purchases of low-emission vehicle
- 89
Reduced motorized passenger transportation need
Development of teleworking and teleservices
Regular teleworking for eligible employees is generalized
- 243
Decarbonising freight
Draw up an urban logistics plan
Adoption of lower-emissions vehicles for freight
Generalisation of the most positive results
No more internal-combustion light commercial vehicles
-256
Indirect impacts
Air quality
Equality
Employment
Noise reduction
Road safety
Physical health
miro


Systemic levers
Finance and funding
Democracy and participation
Social innovation
Governance and policy
Learning and capabilities
Technology and infrastructure
Waste & circular economy
Early changes (1-2 years)
Late outcomes (3-4 years)
Develop awareness-raising initiatives waste reduction and composting
Significant reduction in household waste and increase of recyling
Encouraging construction companies to promote circular economy
Systematic incorporation of circular economy principles into projects
Adoption of circular economy principles in public procurement
Public procurement is a major lever for circular economy
CO2 reduction (ktCO2eq)
- 6
NC*
Indirect impacts
Employment
Air quality
Eco-system health
Water quality
miro
* : Quantification exists but is not integrated in the NZC economic model


Green infrastructure & nature-based solutions
Early changes (1-2 years)
Late outcomes (3-4 years)
Launch of the "Metropolitan Food Project"
Creation of organic and short circuit farms
Develop the metropolitan network of community gardens
A dense network enables as many people as possible to grow their own produce.
Implement the "Metropolitan Forest Strategy" and the "1 million trees" project
The greening of the region helps to combat heatwaves and enables carbon sequestration
Developing a strategy to combat land consumption
Drastic reduction of land consumption and renaturation of certain urban areas
CO2 reduction (ktCO2eq)
NC*
Indirect impacts
Eco-system health
Physical health
Water quality
Community assets
Air quality
Property value
Employment
* : Quantification exists but is not integrated in the NZC economic model


Green industry
Systemic levers
Finance and funding
Democracy and participation
Social innovation
Governance and policy
Learning and capabilities
Technology and infrastructure
Early changes (1-2 years)
Late outcomes (3-4 years)
Promote less carbon-intensive processes among industry
Fuel oil and coal replaced with low-carbon energy sources
Strengthening partnerships with industry as part of the "Territory of Industry" label and the BEEZIP project
Implementation of the first large-scale projects resulting from these collaborative frameworks
Large-scale experiments and industrial R&D for pooling resources between industries
Widespread deployment of successful experiments
CO2 reduction (ktCO2eq)
NC*
Indirect impacts
Employment growth
Reduce air pollution
Reduce the energy costs for metropolitan businesses
miro
* : Quantification exists but is not integrated in the NZC economic model

2.1 Module B-2 Climate Neutrality Portfolio Design

Sector	Subsector (from the NZC Economic model)	List of actions	Description	GHG emissions reductions estimated
Mobility and Transport	Reduced motorized passenger transportation need Shift to public and non motorized transport	*Improve the existing public transit network, develop express bus lines and the new metropolitan rapid transit (RER) network*	Bordeaux Métropole's 2020-2030 mobility plan + Developing the metropolitan RER	*202*
		Increase cycling and walking	Double the number of km of bus lanes.	*59*
		Support teleworking and teleservices	Cycling plan and walking plan	*79*
	Increased car pooling	*Encourage car-pooling and car-sharing*	Extending the cycle express network	*53*
	Electrification of cars + motorcycles Electrification of buses	*Decarbonize personal vehicle and transit fleets*	Extending and strengthening walkable areas	*89*
	Optimized logistics + Electrification of trucks	*Decarbonize freight*	Develop car-sharing by encouraging local authorities to dedicate roads, by trialling a car-sharing service in mixed-use developments and by raising awareness of car-sharing among company employees. Integrating carpooling and carsharing services into digital tools (Mobility as a service)	*256*
Building environment	Building renovations (envelope)	*Accelerate the retrofit of public and private commercial buildings*	Bordeaux Métropole supports project owners in implementing the tertiary sector Decree and, more broadly, in all their renovation projects (diagnosis, financial package, monitoring, etc.).	*63*
		Accelerate the retrofit of residential housing (collective and individual housing)	By relying on existing schemes, in particular the MaRénov' platform, and complementing the financial measures the Metropole will strengthen the support of condominiums renovate their collective dwellings.	*141*
	New energy-efficient buildings	*Improve the energy performance of new buildings*	Identify available space in the area: vacant offices, second homes, underutilized premises. Systematically question the act of building by imposing this principle, derived from the Bordeaux “frugal building label”. Set an example in the optimization and sharing of space	*31*

			in development projects and public buildings. Promoting sustainable, health-friendly urban planning.	
	Efficient lighting & appliances	*Promote energy and resource efficiency in buildings* and help household in energy poverty	To gain a better understanding of businesses and households practices by studying actual energy consumption and communicate on best practices. Support households in fuel poverty (nearly 36,000 households), by distributing small eco-friendly equipment and helping them to identify and implement solutions with the best economic impact on their budget.	*20*
Energy systems	**Decarbonizing heating generation**	*Develop the production of renewable, locally sourced heating and cooling, including heat recovery from industries*	To triple the production of renewable heat by its heating networks, based on recovered energy, geothermal energy and biomass.	*679*
	Decarbonizing electricity generation	*Develop the production of local renewable electricity*	To develop nearly 16 new networks that will deliver a total of nearly 720 GWh of renewable heat.	*1*
		Import renewable energies, especially from neighboring areas	Develop photovoltaic energy is the main resource for the production of renewable electricity (with an overall production target of almost 265 GWh by 2028).	*95*
Waste and circular economy	**Reduced waste and increased waste recycling**	*Reduce waste production*	Bordeaux Metropole will implement a low-carbon urban logistics plan for the whole city and its neighbouring areas, incorporating in particular the role of river freight in the city center and supporting rail freight in order to limit the use of road transport, particularly heavy goods vehicles.	*4*
		Develop and promote circular economy with stakeholders	The Metropole intends to pursue the actions it has been taking for several years and to structure the network of players in the area to aim for a reduction in all flows from all sources	*2*
IPPU and AFOLU	**Green infrastructure and nature based solution**	*Support an economically viable, socially and environmentally responsible agricultural sector*	The agricultural and food resilience strategy (SRAA), meets the challenges of the climate ambitions in several ways: maintaining agricultural land, developing organic farming and agroforestry, developing and relocating sectors, particularly fruit and vegetables, pulses, bio-based materials and biomass,	-

			diversifying production and other measures to adapt to climate change.	
		Sanctuarise carbon sinks and biodiversity hotspots by reinforcing the role of nature and applying the "zero artificial development" principle	the Metropolis will aim : to preserve the heritage of trees through the sequestration potential they represent ; to develop and diversify of the canopy (metropolitan project "a million trees") and to improve management to benefit all its functions (supporting biodiversity, regulating the urban climate, carbon sequestration).	-
		Create cool areas in the metropolitan territory by depaving, and greening the city	The aim is to create a veritable metropolis-wide network of cooling spaces and paths: oases (neighborhood scale), parks and gardens (municipal scale), long cooling paths (inter-municipal scale) and major cooling destinations (metropolitan scale).	-
	Green industry	*Develop a shared comprehensive industrial decarbonation strategy through the "Industry Territory" initiative*	To reinforce the support and development of low-carbon industrial projects of Bordeaux Métropole, the Greater seaport of Bordeaux and COBAN (North Arcachon basin agglomeration community).	*27*
		Develop partnerships with local industries and port authorities to promote synergies and decarbonization projects	project called BEES ZIP (Bordeaux energy water environment and synergies in industrial and port areas).	*142*
		TOTAL		**1943**

B-2.2: Individual action outlines		
Action outline	Action name	**Develop the production of renewable, locally sourced heating and cooling, including heat recovery from industries**
	Action type	Physical/spatial interventions Technical interventions
	Action description	In addition to the 15 existing district, to develop nearly 16 new networks that will deliver a total of nearly 720 GWh of renewable heat. These projects can require high levels of investment, often by concessionaires and more rarely by Bordeaux Metropole, which are always balanced. In addition, the need for a cooling solution for buildings will become increasingly important. Individual or collective renewable solutions will be sought to limit fossil fuel consumption (tempered loops, geothermal energy, Canadian wells, solar air conditioning, heat pumps, etc.).
Reference to impact pathway	Field of action	Sector: Energy Systems Subsector: Developing local renewable energy production and consumption
	Systemic lever	Technology and infrastructure Governance and policy
	Outcome (according to module B-1.1)	Aiming for 900 GWh in 2030 delivered via heating networks, 80% of which will be renewable and recovered energy. The resources consumed by the district heating networks will come from the local area and neighboring areas (particularly biomass).
Implementation	Responsible bodies/person for implementation	Municipality, Metropolis, Public, Network concessionaire
	Action scale & addressed entities	Districts, buildings
	Involved stakeholders	Local authorities Companies Bordeaux Métropole energy ALEC
	Comments on implementation	Priority investment/action for the next years
Impact & cost	Generated renewable energy (if applicable)	NC
	Removed/substituted energy, volume, or fuel type	NC
	GHG emissions reduction estimate (total) per emission source sector	-679 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Develop the production of local renewable electricity**
	Action type	Physical/spatial interventions Technical interventions
	Description	The full production costs of the various renewable energy sources are already competitive with those of historical sources, and they are profitable both when fed into the grid and when distributed and self-consumed in tertiary or residential buildings. The development assumptions only consider projects that are economically balanced. Given the urban context of the Metropolis, and in particular the large areas of car parks and, above all, roofs that have been artificialized, photovoltaic energy is the main resource to produce renewable electricity (with an overall production target of almost 265 GWh by 2028). In the longer term, the diversification of renewable sources will have to be considered (biomass cogeneration, hydroelectricity, wind turbines) to have a complementary, secure and continuous production over time. Bordeaux Métropole wants to promote photovoltaic solarisation with stakeholders of the territory and has launched a new project “Bordeaux Solar City Project” (60,000 m² by 2026).
Reference to impact pathway	Field of action	Sector: Energy System Subsector: Developing local renewable energy production and consumption
	Systemic lever	Physical/spatial interventions Technical interventions
	Outcome (according to module B-1.1)	Develop the first large-scale photovoltaic installation projects, both on shaded areas and on private and public roofs, by providing dedicated engineering and appropriate funding. Develop the first methanization projects: wastewater treatment plants, biowaste recovery, first industrial methanization plant, etc.
Implementation	Responsible bodies/person for implementation	Municipality, Public
	Action scale & addressed entities	Metropolis wide
	Involved stakeholders	Local authorities Companies Bordeaux Métropole énergie ALEC Residents
	Comments on implementation	Priority investment/action for the next years
Impact & cost	Generated renewable energy (if applicable)	227 GWh
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-1 KtCO2e
	GHG emissions compensated (natural	/

	or technological sinks)	
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Import renewable energies, especially from neighboring areas**
	Action type	Other interventions
	Action description	There is no definition of renewable energy imports from a physical point of view. A "legal and financial" approach to defining the territorial import of renewable energies is proposed, considering the ownership of production units, the legal and financial mechanisms for their construction, and the purchasing circuits for their production. In France, 27% and 0.5% of the national electricity and gas mix are of renewable origin, and are therefore imported by the metropolitan territory, independently of any voluntary local action. In addition, 11% and 1.4% of residential electricity and gas consumers respectively have already subscribed to a "100% green" offer (CRE, 2020, France-wide data), and are thus voluntarily importing energy. The goal is for all consumers in the metropolitan area (residents, businesses, etc.) subscribe to energy supply offers from the most local renewable sources possible (metropolis, department, region).
Reference to impact pathway	Field of action	Sector: Energy System Subsector: Developing local renewable energy production and consumption
	Systemic lever	Governance and policy Finance and funding Social innovation
	Outcome (according to module B-1.1)	Support the development of regional renewable energy projects through Bordeaux Métropole Energies and Structuring and setting up a monitoring system for the purchase of renewable energy
Implementation	Responsible bodies/person for implementation	Local authorities
	Action scale & addressed entities	Metropolitan wide and neighbouring areas
	Involved stakeholders	Companies Bordeaux Métropole énergie ALEC Residents
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate	-95 ktCO2e

	(total) per emission source sector	
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Improve the existing public transit network, develop express bus lines and the new metropolitan rapid transit (RER) network**
	Action type	Technical interventions Physical / spatial interventions
	Action description	Bordeaux Métropole's 2020-2030 mobility plan sets out a series of actions aimed at developing this type of public transport (to gain 5 points in modal share by 2030). An analysis of the travel situation reveals that 22% of road journeys come from outside the city and account for 58% of the kilometres travelled: these journeys are therefore a particular focus of the plan's actions. A network of express bus lines is under study. The first Bordeaux-Créon line, due to open in 2019, is already exceeding forecasts for the number of passengers per day. Other lines have been studied in 2022: Bordeaux / Blaye, Bordeaux / Médoc and the south-western belt of the Metropole, then in 2023: Bordeaux Bassin Nord and Bordeaux / Belin Beliet.Bordeaux Métropole also wants to consolidate its rail services by developing the metropolitan RER.
Reference to impact pathway	Field of action	Sector: Mobility and transport Subsector: Shift to public and nonmotorized transport
	Systemic lever	'Technology and infrastructure
	Outcome (according to module B-1.1)	Developing the metropolitan RER Double the number of km of bus lanes
Implementation	Responsible bodies/person for implementation	Mobility Division of Bordeaux Metropole
	Action scale & addressed entities	Metropolis wide
	Involved stakeholders	Syndicat Mixte Nouvelle Aquitaine Mobilités SNCF Transport delegate Gironde Department, Nouvelle Aquitaine Region, State
	Comments on implementation	Mobility action plan 2020-3030 timeline Priority investment/action for the next years
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	To be calculated
	GHG emissions reduction estimate	-202 KtCO2e

	(total) per emission source sector	
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Increase cycling and walking**
	Action type	Technical interventions Physical / spatial interventions
	Action description	Two initial Bordeaux-wide cycle plans have doubled the length of the cycle network from 750 km to 1,500 km between 2010 and 2021. **A third cycling plan was therefore adopted on 10 November 2021**. Its aim is to increase the modal share of cycling to 18% by 2030, compared with 8% in 2017. This new cycling plan aims to improve the quality of cycling facilities to make them safer, and also to improve their continuity and signposting in order to further develop active modes of transport. It comprises 16 actions organised into 4 areas. The modal share of walking currently represents 29% of journeys made in the metropolis, and offers significant potential for development over short distances, as 30% of journeys made by car are still less than 2 km away. On 10 November 2021, **the Bordeaux Metropolitan Council adopted its first metropolitan walking plan.** The aim of the plan is to provide a calmer living environment while helping to reduce greenhouse gas emissions and pollutants linked to road transport. Drawn up in consultation, the plan proposes 19 actions grouped into 5 areas.
Reference to impact pathway	Field of action	Sector : Mobility and transport Subsector : (Shift to public and nonmotorized transport)
	Systemic lever	Technology and infrastructure Finance & funding Technology and infrastructure Learning and capabilities
	Outcome (according to module B-1.1)	Extending the cycle express network Extending and strengthening walkable areas Priority investment/action for the next years
Implementation	Responsible bodies/person for implementation	Mobility Division of Bordeaux Metropole
	Action scale & addressed entities	Metropolis wide
	Involved stakeholders	Cycling civil organisations Schools Local authorities
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	/

	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-59 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Encourage car-pooling**
	Action type	Physical/spatial interventions Technical interventions Other interventions
	Action description	The road network in the conurbation remains particularly congested at peak times, and the pollutant emissions generated by this road traffic remain too high. On the ring road, the occupancy rate is only 1.2 people per vehicle, and for the conurbation as a whole, it is 1.34 people per vehicle. Car-sharing, such as car-pooling, is an important way of relieving congestion on the roads. To mobilize and encourage this practice, a coordinated multi-partner carpooling plan will be drawn up by 2022. In addition, given that metropolitan vehicles are on the road less than 5% of the time, car-sharing services will also be developed to free up public space for little-used vehicles and reduce the GHG emissions of road transport. A car-sharing vehicle could replace up to 7 vehicles, which would reduce the need to build vehicles and the associated emissions, and would make it possible to limit the automatic use of cars.
Reference to impact pathway	Field of action	Sector: Mobility and transport Subsector: (Increase shared transport and car pooling)
	Systemic lever	Governance & policy Social innovation Learning and capabilities
	Outcome (according to module B-1.1)	Develop car-sharing by encouraging local authorities to dedicate roads, by proposing that managers of open car parks create reserved spaces, by trialing a car-sharing service in mixed-use developments and by raising awareness of car-sharing among company employees. Integrating carpooling and carsharing services into digital tools (Mobility as a service)
Implementation	Responsible bodies/person for implementation	Metropolis, Public, Companies
	Action scale & addressed entities	Metropolitan wide
	Involved stakeholders	Syndicat Mixte Nouvelle Aquitaine Mobilités Chamber of Commerce and Industry Chamber of Trade Gironde Department, Nouvelle Aquitaine Region, State

	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-53 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Support teleworking and teleservices**
	Action type	Other interventions
	Action description	Remote working is a decision taken by the employee and employer, who formalize its implementation through a collective agreement or a charter drawn up by the employer, the local authority can play an important role in organizing teleworking. The local authority can play an important role in organizing telecommuting and leading specific actions to develop the reception of teleworkers in local workplaces workplaces, in order to create a balanced dynamic across the region.
Reference to impact pathway	Field of action	Sector: Mobility and transport Subsector: Reducing demand for mobility
	Systemic lever	Governance and policy
	Outcome (according to module B-1.1)	Generalise remote work regular for eligible employees
Implementation	Responsible bodies/person for implementation	Bordeaux Metropole
	Action scale & addressed entities	Metropolis wide and neighbouring areas
	Involved stakeholders	Compagnies Employees Public authorities
	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	/

	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-79 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Decarbonize personal vehicle and transit fleets**
	Action type	Technical interventions Physical / spatial interventions
	Action description	There is currently very little diversity in road transport motorisation, with petroleum products accounting for the vast majority. As a result, they are responsible for a third of the region's greenhouse gas emissions and a third of its energy consumption. In order to meet climate and air quality objectives, a diversification of motorisation methods is essential, at a time when carbon-free thermal and electric solutions are being developed. Each of these solutions has its own range of relevance and corresponds to different uses; decarbonised mobility therefore requires the consideration of a multitude of options adapted to each context. Through its 2020-2030 Mobility Plan, Bordeaux Métropole aims to support the deployment of low-carbon vehicles and thus to support the electrification targets set for the vehicle fleet at national level. Bordeaux Métropole manages a network of 253 recharging points for electric vehicles, with 91 stations on the city's roads. These charging stations are accessible to all users. From 2024 onwards, the Metropole will therefore undertake a plan to renew its equipment at all stations, in order to replace the most dilapidated charging points. At the end of 2022, Bordeaux Métropole voted in favor of its Electric Vehicle Charging Infrastructure Master Plan (SDIRVE), a plan for the deployment of on-street charging facilities, in addition to the other charging facilities available to the public (notably parking lots and private facilities).This gradual increase is expected to reach 20 to 25 stations/year, with a target of 70 stations by the end of 2025. Some twenty sites have already been validated and are scheduled for 2024.
Reference to impact pathway	Field of action	Sector: Mobility and transport Subsector: (Decarbonising motorised vehicles)

	Systemic lever	Governance & policy
	Outcome (according to module B-1.1)	No more buses powered by fossil fuel. Cover the territory with a network of recharging points.
Implementation	Responsible bodies/person for implementation	Metropolis, Metropole Public
	Action scale & addressed entities	Metropolis wide streets and districts (both commercial and residential ones)
	Involved stakeholders	Syndicat Mixte Nouvelle Aquitaine Mobilités Chamber of Commerce and Industry Chamber of Trade Gironde Department, Nouvelle Aquitaine Region, State
	Comments on implementation –	2020-2030 Mobility Plan Electric Vehicle Charging Infrastructure Master Plan (SDIRVE),
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	
	GHG emissions reduction estimate (total) per emission source sector	-89 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Decarbonize freight**
	Action type	Physical/spatial interventions Technical interventions Other interventions
	Action description	Freight transport (excluding air transport) accounts for around 14% of energy consumption in 2019, and could increase by 10% by 2030 in a business-as-usual scenario (source: SDE).The objective set out in the current climate strategy (PCAET) is to reverse the upward trend in energy consumption in the freight transport sector, excluding air transport, and the associated greenhouse gas emissions, and to reduce them by 24% and 96%. Bordeaux Metropole will therefore be implementing a low-carbon urban logistics plan for the whole city and its neighboring areas, incorporating in particular the role of river freight in the city center and supporting rail freight in order to limit the use of road transport, particularly heavy goods vehicles.
Reference to impact pathway	Field of action	Sector: Mobility and transport Subsector: Decarbonising freight

	Systemic lever	Governance and policy, Technology and infrastructure
	Outcome (according to module B-1.1)	Evaluation of the logistics plan and generalisation of the most positive results, incorporating feedback from other French and European cities. No more trucks or internal combustion light commercial vehicles.
Implementation	Responsible bodies/person for implementation	Municipality, public, companies
	Action scale & addressed entities	
	Involved stakeholders	
	Comments on implementation	Low-carbon urban logistics plan
Impact & cost	Generated renewable energy (if applicable)	NA
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	*-256 ktCO2e*
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
(Fill out one sheet per intervention/project)		
Action outline	Action name	**Reduce waste production and develop recycling**
	Action type	Other interventions Physical/spatial interventions
	Action description	In addition to the greenhouse gases emitted, the decomposition or treatment of waste pollutes the terrestrial, aquatic and aerial environments. The issues of reducing waste at source, collection and treatment raised in the latest Local Program for the Prevention of Household and Similar Waste (PLPDMA) intersect with those of the Climate Plan. The Metropole intends to pursue the actions it has been taking for several years and to structure the network of players in the area to aim for a reduction in all flows from all sources
Reference to impact pathway	Field of action	Sector: Waste and circular economy
	Systemic lever	Governance and policy Social innovation Democracy/participation
	Outcome (according to module B-1.1)	-15% reduction in household and similar waste per capita by 2030 by reducing consumption and improving recycling facilities

Implementation	Responsible bodies/person for implementation	Bordeaux Metropole Residents
	Action scale & addressed entities	Metropolitan wide
	Involved stakeholders	Residents civil organizations
	Comments on implementation	Priority investment/action for the next years
Impact & cost	Generated renewable energy (if applicable)	
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-4 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Develop and promote circular economy in all sectors**
	Action type	Other interventions Physical/spatial interventions
	Action description	Give priority to developing 4 local industries: ▪ reuse of building materials, eco-construction ▪ bio-waste and organic matter, ▪ deposits and food containers, ▪ digital and waste electrical and electronic equipment (WEEE). The ZIRI ("Zone for the Integration of Intelligent Networks") aims to facilitate and support synergies between companies. The ZIRI network currently has 90 members in Blanquefort, Mérignac, Le Haillan, Artigues-Près-Bordeaux and Bassens. The ZIRIs network provides two levers for action: - Pooling synergies: energy purchases and waste collection are pooled, as are services (fire safety, cleaning of premises, regulatory controls, mobility passes, health insurance, etc.), - Substitution synergies are identified and supported during synergy search workshops. But the ZIRI network is also about facilitating and bringing together member companies through monthly meetings, workshops and working groups.
Reference to impact pathway	Field of action	Sector: Waste and circular economy
	Systemic lever	Governance and policy, Finance and funding, Learning and capabilities
	Outcome (according to module B-1.1)	Ramp-up of the circular economy strategy (Road map)

		Set up six ephemeral reuse areas temporarily installed at regular intervals in the heart of neighbourhoods and towns.
Implementation	Responsible bodies/person for implementation	Bordeaux Metropole Compagnies Networks Circular economic chains
	Action scale & addressed entities	Metropolitan wide
	Involved stakeholders	Heads of civil organisations networks Heads of GMS networks Environmental education civil organisations Landlords Local authorities
	Comments on implementation –	To be define in the Circular economy roadmap
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-2 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Support an economically viable, socially and environmentally responsible agricultural sector**
	Action type	Physical/spatial interventions Technical interventions Other interventions
	Action description	In 2021, Bordeaux Métropole launched its agricultural and food resilience strategy (SRAA), the action plan for which is currently being drawn up. Based on the work of the Advisory Council on Sustainable Food Governance (CCGAD) and following on from the Metropolitan Food and Sustainable Agricultural Policy adopted in November 2018, this programme aims to coordinate the Metropole's actions on the territorial food system, from production to consumption. The agricultural section of the SRAA meets the challenges of the climate ambitions in several ways: maintaining agricultural land, developing organic farming and agroforestry, developing and relocating sectors, particularly fruit and vegetables, pulses, bio-based materials and biomass, diversifying production and other measures to adapt to climate change.
Reference to impact pathway	Field of action	Sector: Green infrastructure and nature-based solutions Subsector: Developing agro-ecological production, forests and green spaces

	Systemic lever	Governance and policy Social innovation Democracy/participation Governance and policy
	Outcome (according to module B-1.1)	A large number of farmers are setting up organic farming projects and short local circuits in the region, based on the existing agricultural fabric. Agricultural practices that sequester carbon and are resilient to drought (agroforestry, agroecology, permaculture) are developing strongly.
Implementation	Responsible bodies/person for implementation	- Town Planning Department - Nature Department - Mission 1M d'arbres - ADG climate action and energy transition - ADG plant heritage and biodiversity - Territorial clusters
	Action scale & addressed entities	Metropolitan area and
	Involved stakeholders	Neighboring towns and territories Regional and departmental institutions - Gironde Chamber of Agriculture - Agri-Sud-Ouest Innovation - Market gardening companies and local producers - Agricultural civil organisations - ATMO Nouvelle Aquitaine - Educational establishments
	Comments on implementation	Agricultural and food resilience strategy (SRAA)
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	/
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Sanctuarise carbon sinks and biodiversity hotspots by reinforcing the role of nature and applying the "zero artificial development" principle**
	Action type	Physical/spatial interventions Technical interventions
	Action description	By implementing a metropolitan forest strategy, the Metropolis will aim to: - First and foremost, to preserve this heritage of trees through the sequestration potential they represent, which will take several decades to replenish in the case of new plantations, - to develop and diversify the canopy (metropolitan project "a million trees")

		- And improve management to benefit all its functions (supporting biodiversity, regulating the urban climate, carbon sequestration).
Reference to impact pathway	Field of action	Sector: Green infrastructure and nature-based solutions Subsector: forests and green spaces
	Systemic lever	Finance and funding Governance and policy Learning and capabilities
	Outcome (according to module B-1.1)	Agricultural and Forestry practices that sequester carbon and are resilient to drought (agroforestry, agroecology, permaculture) are developing strongly.
Implementation	Responsible bodies/person for implementation	Metropolis
	Action scale & addressed entities	Metropolis wide
	Involved stakeholders	- Municipalities - Sysdau - Region - Farmers - County - Chamber of agriculture - A'Urba - ARS - Developers, promoters, landlords, architects,
	Comments on implementation	Priority investment/action for the next years
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	/
	GHG emissions compensated (natural or technological sinks)	-46 ktCO2e
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Create cool areas in the metropolitan territory by depaving, and greening the city**
	Action type	Physical/spatial interventions Technical interventions
	Action description	During heatwaves, 42% of the metropolitan population is considered to be highly vulnerable. The refreshing metropolis program was launched in response to the crucial challenge of adapting the metropolis and its territories to heat. Four key issues (proximity to cool spaces, water and shade; living soil; canopy; thermal comfort in public buildings and housing) are set out in a territorial cooling strategy that takes into account social and territorial vulnerabilities.

		In terms of public spaces, the aim is to create a veritable metropolis-wide network of cooling spaces and paths: oases (neighborhood scale), second skin parks and gardens (municipal scale), long cooling paths (inter-municipal scale) and major cooling destinations (metropolitan scale).To ensure that every inhabitant is within a 5-minute walk of a cool space (climate plan ambition), Bordeaux Métropole intends to create, strengthen or reveal 100 islands of urban freshness by 2026.
Reference to impact pathway	Field of action	Sector: Green infrastructure and nature-based solutions Subsector: Developing agro-ecological production, forests and green spaces
	Systemic lever	Technology and infrastructure Governance and policy Social innovation Democracy/participation
	Outcome (according to module B-1.1)	To develop the network of shared gardens in the metropolitan area, with the support of partner organizations responsible for helping to create new gardens and running existing ones. Implementation of the "Metropolitan Forest Strategy" and the "1 million trees" project to preserve existing forests and develop and diversify the canopy. The involvement of civil society and companies has made it possible to meet the objectives and improve the quality of life by combating urban heat islands.
Implementation	Responsible bodies/person for implementation	- ADG Climate action and energy transition - Innovation and digital development - Territorial clusters - Territorial support - Mission 1M of trees - ADG Plant Heritage and Biodiversity - Water - Prevention - Communication - Administrative life and quality of life at work
	Action scale & addressed entities	Metropolitan wide
	Involved stakeholders	Bordeaux Metropole - A'Urba - ALEC - School of architecture and landscape - Developers - Roads and urban planning department - BRGM / SABOM - Local authorities - Individuals in their gardens
	Comments on implementation	The refreshing metropolis program 1 million trees Program Priority investment/action for the next years
Impact & cost	Generated renewable energy (if applicable)	NA
	Removed/substituted energy, volume, or fuel type	NA

	GHG emissions reduction estimate (total) per emission source sector	NA
	GHG emissions compensated (natural or technological sinks)	-19 ktCO2e
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Accelerate the retrofit of public and private office and commercial buildings**
	Action type	Physical/spatial interventions Technical interventions
	Action description	In 2019, the commercial and office building sector will account for 20% of the region's energy consumption. In order to reduce the sector's consumption, the Tertiary decree makes it compulsory to carry out actions to reduce final energy consumption in tertiary buildings energy consumption in commercial and office building of more than 1000m². More over, Bordeaux Métropole is directly concerned by this decree for its own buildings. On the other hand, Bordeaux Métropole will support companies in carrying out this work. Bordeaux Métropole support project owners in implementing the tertiary sector Decree and, more broadly, in all their renovation projects (diagnosis, financial package, monitoring, etc.)
Reference to impact pathway	Field of action	Sector: Built environment Subsector: (Building energy efficiency renovations)
	Systemic lever	fiscal/financial Technology/infrastructure "Technology/infrastructure fiscal/financial" policy/ regulatory learning and capabilities Governance and policy
	Outcome (according to module B-1.1)	Accelerate the dead lines of the "decret tertiaire"
Implementation	Responsible bodies/person for implementation	- ADG Climate Action and Energy Transition - Buildings Department - Economic development department - Contractualization Mission - Territorial clusters
	Action scale & addressed entities	Metropolitan wide Priority investment/action for the next years
	Involved stakeholders	- Nouvelle-Aquitaine region - Municipalities - Companies - CCI & Chamber of Trades and Crafts of Gironde - Partner professional organizations - ADEME - ALEC
	Comments on implementation	Intervention regulations

Impact & cost	Generated renewable energy	/
	Removed/substituted energy, volume, or fuel type	-780 GWh
	GHG emissions reduction estimate (total) per emission source sector	-63 ktCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Accelerate the retrofit of residential housing (collective and individual housing)**
	Action type	Physical/spatial interventions Technical interventions
	Action description	The Metropolis wants to accelerate the renovation of the housing stock. By relying on existing schemes, in particular the MaRénov' platform, and complementing the financial measures the Metropole has raised its ambitions in terms of renovation in its programme 2022- 2026 energy renovation programme. The action consist in strengthen the support of condominiums renovate their collective dwellings.
Reference to impact pathway	Field of action	Sector: Built environment Subsector: (Building energy efficiency renovations)
	Systemic lever	fiscal/financial Technology/infrastructure "Technology/infrastructure fiscal/financial" policy/ regulatory learning and capabilities
	Outcome (according to module B-1.1)	Improve the rehabilitation program to support households in the high-performance renovation of their homes. Renovate between 50% and 75% of housing and social housing.
Implementation	Responsible bodies/person for implementation	- ADG climate action and energy transition - Housing department - Economic development department - Communication department
	Action scale & addressed entities	Metropolitan wide Priority investment/action for the next years
	Involved stakeholders	-Conseil Régional Nouvelle Aquitaine -Chambre des Métiers et de l'Artisanat de la -- Gironde -Organisations professionnelles partenaires -Civil organisations Espaces France Rénov' -ALEC -ATMO Nouvelle Aquitaine -Bordeaux Métropole Énergie
	Comments on implementation	MaRénov platform
Impact & cost	Generated renewable energy (if applicable)	/

	Removed/substituted energy, volume, or fuel type	-1 485 GWh
	GHG emissions reduction estimate (total) per emission source sector	-141 ktCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Improv the energy and environmental performance of new buildings**
	Action type	Sector : Built environment
	Action description	Identify available space in the area: vacant offices, second homes, underutilized premises. Systematically question the act of building by imposing this principle, derived from the Bordeaux “frugal building label”. Set an example in the optimization and sharing of space in development projects and public buildings. Promoting sustainable, health-friendly urban planning. The objective defined as part of the Climate Plan strategy is to reduce new construction by 40%, i.e. from 900,000 m² of new buildings in 2019 to 540,000 m². This would contribute to to an 81% reduction in the building sector's carbon footprint (GHG emissions over the entire life cycle of buildings) in the city by this date.
Reference to impact pathway	Field of action	Sector: Built environment
	Systemic lever	Governance and policy
	Outcome (according to module B-1.1)	Widespread use of low-carbon construction methods in all new buildings A large proportion of vacant and under-occupied spaces are being put to good use, drastically reducing the need for new construction. Households and businesses are adopting new ways of living and working by sharing space.
Implementation	Responsible bodies/person for implementation	General urban Planning Department Housing Department Adg Action climatique et transition énergétique
	Action scale & addressed entities	Metropolitan wide
	Involved stakeholders	Municipalities Civil organisations Residents Companies
	Comments on implementation	New housing built respecting the RE 2020 standards (environmental regulations for new buildings replacing RT 2012) Impose the use of biosourced, geosourced and reused materials in urban planning documents (PLU, PLH, SCOT) to limit the systematic use of carbon-based materials.

Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-31 ktCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline		**Promote energy and resources efficiency in buildings and support households in fuel poverty**
	Action type	Research, support and awareness-raising
	Action description	To gain a better understanding of these practices, Bordeaux Métropole will be studying actual consumption by businesses and households. The first step will be to identify actual practices related to energy consumption and GHG emissions. Support households in fuel poverty (nearly 36,000 households), by distributing small eco-friendly equipment and helping them to identify and implement solutions with the best economic impact on their budget. Carry out an awareness-raising and support campaign on the principles of economical use (control of heating and air conditioning, management of lighting and household appliances, etc.).
Reference to impact pathway	Field of action	Sector: Built environment Subsector: (Building energy efficiency renovations)
	Systemic lever	learning and capabilities Social innovation financial
	Outcome (according to module B-1.1)	Carry out an awareness-raising and support campaign on the principles of economical use (control of heating and air conditioning, management of lighting and household appliances, etc.).
Implementation	Responsible bodies/person for implementation	ADG Climate action and energy transition Housing Department Communication Department
	Action scale & addressed entities	Metropolitan wide
	Involved stakeholders	Civil organisations Municipalities ADEME Residents Compagnies
	Comments on implementation	PCAET
Impact & cost	Generated renewable energy (if applicable)	/

	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-20 ktCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Develop a shared comprehensive industrial decarbonation strategy through the "Industry Territory" initiative**
	Action type	Support Fiscal/Financial
	Action description	The aim of the " Industry Territory " initiative is to give priority support to projects geared towards the ecological transition: a national confirmation of the ambitious low-carbon industrial policy pursued in the region. To reinforce the support and development of low-carbon industrial projects, Bordeaux Métropole, the Grand Port Maritime de Bordeaux and COBAN are making a collective commitment to 6 major axes :(1) (Zero Net Artificialization (ZAN), (2) R&D projects with research and companies, actions to decarbonize industrial activities, (3) job recruitment for the ecological transition,(4) territorial marketing, (5) development of an industrial recycling and recovery sector, etc.).
Reference to impact pathway	Field of action	Sector: Green industry Subsector: Sober and sustainable industrial production
	Systemic lever	Gouvernance and policy
	Outcome (according to module B-1.1)	Implementation of the first large-scale projects to decarbonise industrial processes resulting from these collaborative frameworks
Implementation	Responsible bodies/person for implementation	Bordeaux Metropole, the Greater seaport of Bordeaux and the Local administration of Noth Bassin d'Arcachon Nord
	Action scale & addressed entities	Metropolitan and all area around the Garonne river
	Involved stakeholders	Bordeaux Metropole, the Greater seaport of Bordeaux and the Local administration of North Bassin d'Arcachon Nord
	Comments on implementation –	
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	-27 ktCO2e

	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

B-2.2: Individual action outlines		
Action outline	Action name	**Develop partnerships with local industries and port authorities to promote synergies and decarbonization projects**
	Action type	Financial studies Physical/spatial interventions Technical interventions
	Action description	Bordeaux Métropole is the laureate of the national call for projects ZIBAC supports industrial territories in their ecological and energy transformation. Around 30 private, public and voluntary organizations are taking part in and/or supporting this project called BEES ZIP (Bordeaux energy water environment and synergies in industrial and port areas). This scheme provides funding for around twenty studies over a 24-month period. The vision is characterized by : - an approach developed jointly with all local players - a strong determination to reduce GHG emissions: optimizing processes, increasing carbon sequestration capacity, continuing to develop a very low-carbon energy mix and efficiency, using alternative fuels, etc. - Decarbonization scenarios whose effects are cumulative and non-exclusive, which at a minimum would make it possible to reduce the ZIP's emissions by 34% in 2030 and 93%. - The gradual decarbonization of its industrial processes, thanks in particular to renewable, low-carbon electricity and its ability to produce and import green hydrogen to produce "defossilized" fuels and molecules.
Reference to impact pathway	Field of action	Sector: Green industry Subsector: Sober and sustainable industrial production
	Systemic lever	Governance and policy Finance and funding Learning and capabilities
	Outcome (according to module B-1.1)	Large-scale roll-out of experiments conducted with local industry to encourage the mutualization of resources
Implementation	Responsible bodies/person for implementation	Economic Development division BEES ZIP organization
	Action scale & addressed entities	Metropolitan area – more particularly The Industrial port zone
	Involved stakeholders	Around twenty local industrial companies
	Comments on implementation	BEE ZIP- ZIBAC own implementation
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume, or fuel type	/

	GHG emissions reduction estimate (total) per emission source sector	-142 KtCO2e
	GHG emissions compensated (natural or technological sinks)	/
	Total costs and costs by CO2e unit	Please look at the Investment plan for more information

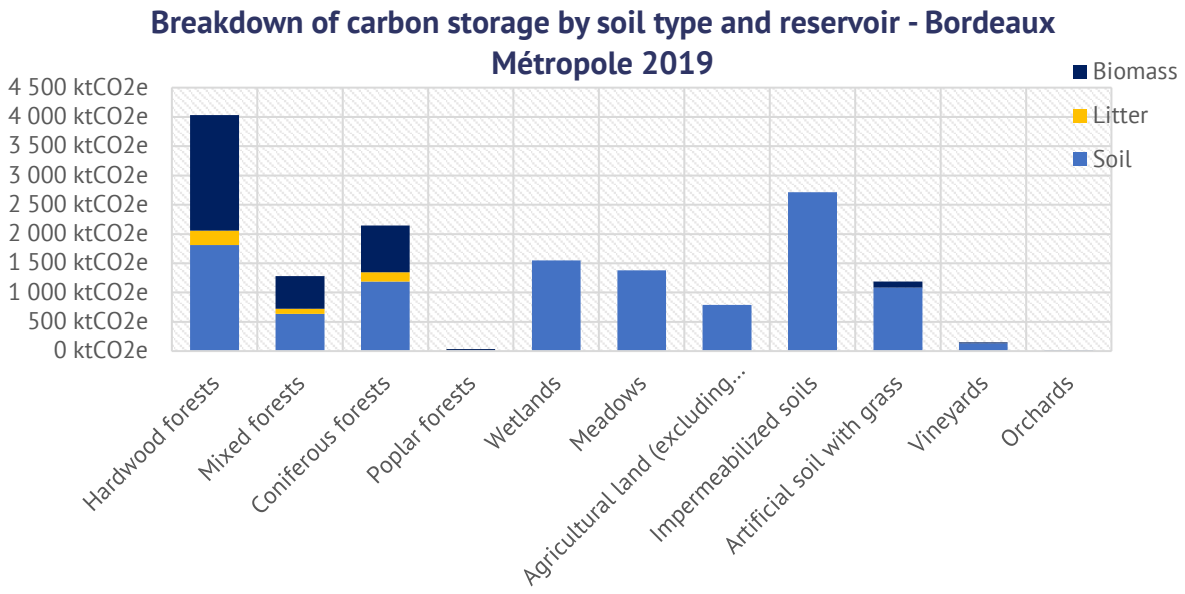
B-2.3: Summary strategy for residual emissions

Despite very ambitious hypothesis for reducing carbon emissions on its territory, Bordeaux Métropole will most likely still have an emission gap in 2030. According to the strategy presented above, the gap is estimated to 473,000 tCO_2 of which 75% can be explained by heavy industry and transports.

Bordeaux Métropole's strategy presented above pushed ambitions as far as possible for these categories of emissions but does not control all levers regarding these sectors' decarbonation. Due to the presence of an highway on the territory, and heavy industries from big national or international companies, the stakeholders responsible for these residual emissions will be very difficult to reach at the local level. Going further will imply to also raise ambitions for heavy industries and long-distance road transport at the national level.

However, Bordeaux Métropole clearly stated its commitment towards climate neutrality in its 2022 action plan and is maintaining this ambition with the CCC. To that extent, Bordeaux Métropole is both counting on its carbon sinks and on carbon compensation outside the territory.

Figure 11- Target value – breakdown of carbon storage by soil type and reservoir



The potential for developing carbon sinks within the territory is very low, as shown in the graph above (76 ktCO2e by 2030). Thus, Bordeaux Métropole will have to go through compensation for its remaining emissions.

Bordeaux Métropole has been working on its strategy for compensating remaining emissions since 2022. Even though this strategy is not finalized yet, it can be expected to be voted in the next few years. At the moment, the most likely outcome will be to integrate the already existing Carbon cooperative of La Rochelle, an other communality of Nouvelle-Aquitaine. This Carbon cooperative finances carbon compensation projects in Nouvelle-Aquitaine, all being certified by a Label bas carbon controlled by the French ministry of ecological transition. , it is estimated that the participation of Bordeaux Métropole to the Carbon cooperative could finance the compensation of up to 80,000 $ktCO_2$ outside its territory, preferably in Gironde or within neighboring departments with projects mostly centered on reforestation.

Teams from Bordeaux Metropole keeps working on the characterization of this compensation strategy and will integrate it in following versions of the CCC.

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

We are working closely with Bordeaux Métropole's administrative departments to analyze and improve the reliability of our indicators. In this first version of the CCC, we are integrating only the mandatory indicators (GHG emissions indicators) provided by NetZero city. Nevertheless, here is the list of indicators below, which will enable us to monitor and steer the implementation of the action plan. We will identify target values for 2027 and 2030 in the very near future to be able to integrate these indicators to future iterations of the CCC.

- Modal share of public transportation
- Modal share of bikes
- car occupancy rate
- electrification of the private vehicle pool
- Number of charge points (IRVE)
- Tertiary private buildings benefiting from public support for retrofitting
- Tertiary public buildings in a process of retrofit
- Installed PV power
- Share of agricultural surfaces labelled organic or in process of labelling
- Number of new planted tree
- percentage of tree canopy within the city
- number of cooling islands
- Weight of non-recycled household waste
- Grid supply heat

On a more middle term perspective, Bordeaux Métropole is working on establishing and generalizing a more comprehensive approach of climate and environmental policies evaluation and monitoring. At the moment, the priority is strengthening the financial and economic aspects of this monitoring. However, on a longer term, estimating and measuring other co-benefits than the air quality will become part of this strategy and will be integrated to future iterations of the CCC.

Outcomes/ impacts addressed	Action/ project	**Indicator No.** (unique identified)	Indicator name	Target values			
(List early changes/ late outcomes and impacts to be	(List action/ pilot project if applicable)	(Indicate unique identifier)	(Insert indicator name)	2025	2027	2030	Unit

evaluated by indicator)							
	Improve the existing public transit network, develop express bus lines and the new metropolitan rapid transit (RER) network Increase cycling and walking Encourage car-pooling and car-sharing Decarbonize personal vehicle and transit fleet Deploy electric-vehicle charging points Support teleworking and teleservices Decarbonize freight		**GHG emission from transport**	x	x	x	KtCO2e
			GHG emissions from IPPU	x	x	x	KtCO2e
			GHG emission from stationary energy	x	x	x	KtCO2e
			GHG emissions from grid supply energies	x	x	x	KtCO2e
			GHG emission from AFOLU	x	x	x	KtCO2e
			GHG emissio	x	x	x	KtCO2e

			n from waste				

B-3.2: Indicator Metadata	
Indicator Name	**GHG emission from transport**
Indicator Unit	KtCO2e
Definition	
Calculation	
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Transport
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	NA
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Improve the existing public transit network, develop express bus lines and the new metropolitan rapid transit (RER) network Increase cycling and walking Encourage car-pooling and car-sharing Decarbonize personal vehicle and transit fleet Deploy electric-vehicle charging points Support teleworking and teleservices Decarbonize freight
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	GHG emissions Inventory / ALEC
Is the data source local or regional/national?	Local source
Expected availability	Each 2 years
Suggested collection interval	Each 2 years
References	
Deliverables describing the indicator	
Other indicator systems using this indicator	

B-3.2: Indicator Metadata	
Indicator Name	**GHG emission from IPPU**
Indicator Unit	KtCO2e
Definition	/
Calculation	GHG protocol
Indicator Context	

Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Industry
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	NA
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Green Industry
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	Encourage car-pooling and car-sharing
Expected data source	ALEC
Is the data source local or regional/national?	Metropolitan
Expected availability	Each 2 years
Suggested collection interval	Each 2 years
References	
Deliverables describing the indicator	/
Other indicator systems using this indicator	/

B-3.2: Indicator Metadata	
Indicator Name	**GHG emissions from grid supply energies**
Indicator Unit	KtCO2e
Definition	GHG protocol
Calculation	GHG protocol
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	no
If yes, which co-benefit does it measure?	/
Is the indicator useful for monitoring the output/impact of action(s)?	yes
If yes, which action and impact pathway is it relevant for?	Energy system
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	-
Data requirements	
Expected data source	ALEC

Is the data source local or regional/national?	metropolitan
Expected availability	Each 2 years
Suggested collection interval	Each 2 years
References	
Deliverables describing the indicator	/
Other indicator systems using this indicator	/

B-3.2: Indicator Metadata	
Indicator Name	**GHG emission from AFOLU**
Indicator Unit	KtCO2e
Definition	GHG protocol
Calculation	GHG protocol
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	AFOLU
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	NA
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Green infrastructure and nature-based solutions
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	YES
Data requirements	
Expected data source	ALEC
Is the data source local or regional/national?	Metropolitan
Expected availability	Each 2 years
Suggested collection interval	Each 2 years
References	
Deliverables describing the indicator	/
Other indicator systems using this indicator	/

B-3.2: Indicator Metadata	
Indicator Name	**GHG emission from waste**
Indicator Unit	KtCO2e
Definition	GHG Protocol
Calculation	GHG Protocol
Indicator Context	

Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Waste
Does the indicator measure indirect impacts (i.e., co- benefits)?	no
If yes, which co-benefit does it measure?	NA
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Waste and circular economy
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	Rapport Nepsen
Is the data source local or regional/national?	metropolitan
Expected availability	Each 2 years
Suggested collection interval	Each 2 years
References	
Deliverables describing the indicator	/
Other indicator systems using this indicator	/

3 Part C – Enabling Climate Neutrality by 2030

3.1 Module C-1 Governance Innovation Interventions

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

Bordeaux Métropole takes a global, collaborative approach to achieving its climate objectives, both internally and in collaboration with local stakeholders. The metropole integrates climate considerations into all its policies, ensuring a holistic and inclusive approach to ecological transition and climate resilience.
To build a solid contract and achieve its ambitions, Bordeaux Métropole has drawn on the recommendations of Net Zero City's "Transition Map and experience". Bordeaux Métropole intends to involve both the economic sector (public and private) and civil society organizations and citizens in the transition to climate neutrality for the territory.

Monitoring within the administration

The transition team is coordinated internally by the ACTE Division (Climate Action and Energy Transition) within the DGTERE (Department of Ecological Transition and Environmental Resources), with support from the DRI (Direction des Relations Internationales) and the TATC Department (Future of Territories, Territories in Cooperation). The Finance and Procurement

Department and the Economic Development Department have joined the transition team to contribute their respective expertise to the CCC. The transition team comprises around ten in-house staff.
Within the ACTE department, two divisions are working on the implementation of the region's energy transition, the renovation of residential and office and commercial buildings, as well as on GHG assessment, and the monitoring and coordination of partnerships with local actors on low-carbon ecological transition issues.

The current Climate Plan includes a technical committee made up of all those involved in implementing metropolitan actions, as well as a monitoring committee made up of all elected representatives. Monitoring and evaluation of the CCC will be organized in the same way, within the framework of existing committees. In fact, the types of action and the contacts involved coincide. Each year, the Transition team will identify the progress of planned actions using a grid of indicators. A collaborative effort to improve the reliability of indicators has been initiated with teams from the various departments. For overall CCC monitoring, the transition team will meet on a monthly basis.

As regards monitoring the actions of partners and stakeholders, the department will also keep track of the progress made by CCC signatories. An annual event will be organized to bring together all signatories. A quarterly follow-up will enable more individualized monitoring with each partner.

The necessity to involve all territorial stakeholders

As an administration, Bordeaux Métropole only accounts for 6% of the territorial GHG emissions. It means that most of GHG emission reduction by 2030 will involve other stakeholders.

The main actions to be implemented by these stakeholders can imply heavy investments, behavioral changes, or competency building:

- Citizens are mostly expected to adopt behavioral changes with limited investments, specifically for their transport habits or waste production. However, some heavier investments are also expected from them, in housing retrofit, or electric vehicles for example.
- For tertiary companies (including the public tertiary sector) the main expectation is investing in building retrofit, energy and mobility decarbonation, and renewables production. They will also need to adopt less intensive changes, such as energy sobriety. As employers, they also have a responsibility in fostering and facilitating changes for citizens, through teleworking and teleservices for example.
- Major industries will mainly need to invest in decarbonizing their process.
- Some economic actors are also strategic for building and publics works included in the action plan, for example in building retrofit, transport infrastructure building, or renewables installation. It is important to make sure they all have the skills to do these works in the most efficient and decarbonize way, including new low carbon and reused material.
- Other economic actors, such as banks and insurance companies will also be involved to enable the investments necessary to the action plan. The main challenge regarding these stakeholders will be connecting them with other stakeholders in need of financing or insuring.

Bordeaux Métropole’s strategy to involve all these stakeholders in the action plan will be different for citizens and for other economic players. In both cases, Bordeaux Metropole’s strategy is focused

on animation (consultation, organizing events and workshops) but with the clear objective of fostering behavior changes and investments necessary to the action plan.

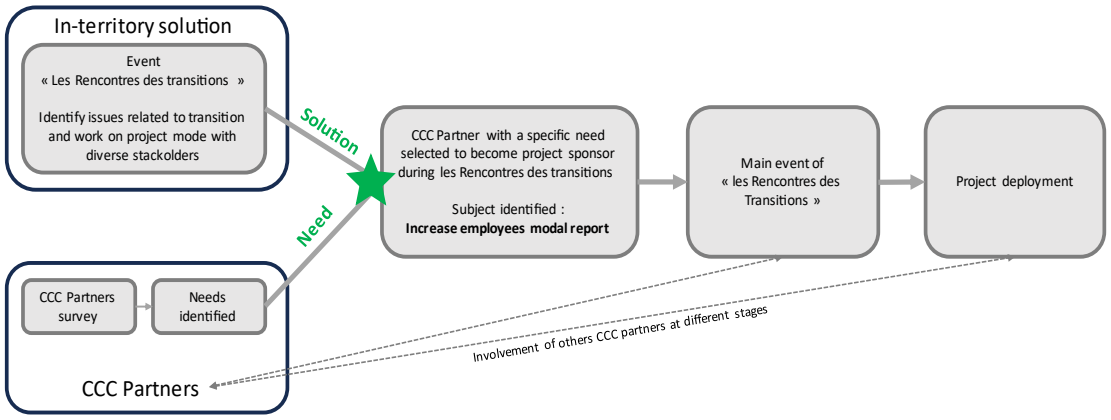
Multi-level governance citizens, non-governmental and academic organizations

Citizen participation is an integral part of the territory's operations. To this end, various entities have been set up to encourage citizen participation and inclusion in the life and policies of their region. **The Sustainable Development Council (C2D)** is a group of volunteer citizens committed to Bordeaux Metropole. It is a citizens' consultation organization that enables all those who wish to do so to participate in the development of metropolitan projects. The C2D is made up of a Council and a Forum. In 2025, a working group dedicated to climate contributing policies will be created within the C2D, in order to facilitate citizen consultation on Bordeaux Métropole's global climate strategy and feedback on more specific policies. This climate policies dedicated working group, that will be called the « Comité citoyen Climat » (Climate Citizen's Comitee), will meet twice a year.

In 2023, the City of Bordeaux launched its first **Great Citizen Dialogue: a participative and collaborative process** which, every two years, explores an important issue for the city's future, and considers solutions, ideas, directions and strategies. In 2023, the topic was "The City of Bordeaux and the climate emergency". Organized in three stages, this tool for citizen participation enabled the group of participants to formulate an opinion and recommendations on the issue of climate emergency in Bordeaux. The metropolis is currently working closely with these two entities to improve the structuring of governance (participation in decision-making on climate policies) over the coming months. The idea is not to remain with simple consultation, but to really involve citizens and associations in decision-making and monitoring the implementation of specific subjects.

The Metropole will coordinate its climate action plan with the various citizen participation mechanisms mentioned above. The aim is to fully integrate citizens into the decision-making and monitoring process for climate policy. We are working closely with these entities to improve the structure of governance and the participation of citizens and associations over the coming months. These two systems will help to involve citizens and build a common understanding and support for the climate agenda and its co-benefits.

Moreover, strengthening the links between Bordeaux Métropole, the academic world and citizens is a major lever to be activated to accelerate the deployment of change management solutions. **The University of Bordeaux has an important role to play in governance,** in terms of both research and training. The ABCD project, proposed as a submission to the "pilot cities" call for projects, will help strengthen the links between metropolitan services, citizens and the academic world in the definition and implementation of innovative measures to accelerate the transition. The outcome of this collaboration will be concrete results:



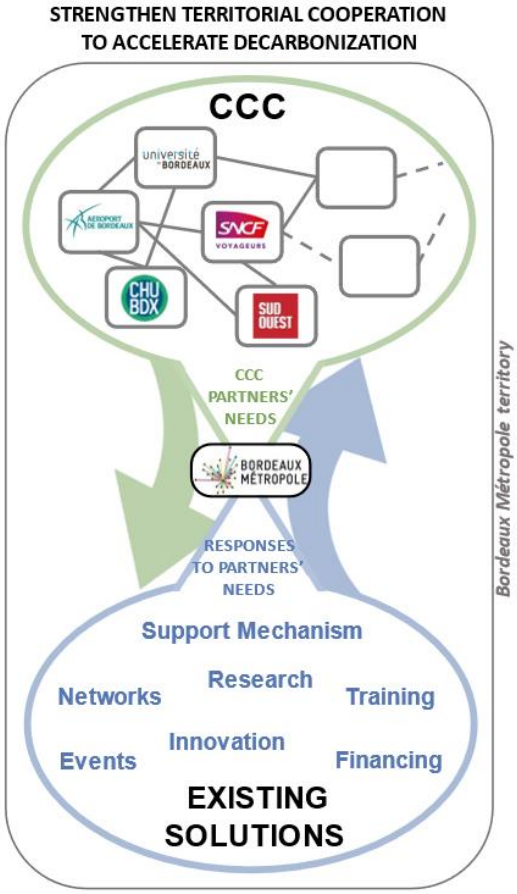
Partnerships to strengthen private-sector action

Private and public stakeholders have an important role to play in reaching climate neutrality. Our strategy is to engage key economic actors through the Climate City Contract of Bordeaux Métropole, leveraging their flagship status to accelerate towards climate neutrality. We aim to gather partners' needs related to ecological transition and connect them with existing solutions within the territory.

Bordeaux Métropole acts as a catalyst, ensuring that the solutions provided address partners' needs and benefit to others facing similar challenges. This approach also helps identify unmet needs, such as significant financing need for building renovations and tools to measure impact of projected and implemented actions. Additionally, it connects actors who typically do not interact, despite having common interests.

Many partners have expressed the need for opportunities to meet and exchange ideas. Therefore, we will organize gatherings to share best practices, inspire each other, and foster connections that could lead to collaborative projects.

Figure 12 - Strengthen territorial cooperation to accelerate decarbonization



Several initiatives to support economic players exist in the region. Some examples below.

- **ZIBAC Network**
  For example, as part of the national call for projects (low-carbon industrial zone), of which the Metropole is the winner, some thirty private, public and associative structures are participating in the project to decarbonize industry. The decarbonization of industries in a 900-hectare zone primarily dedicated to petrochemicals, but not only, poses major challenges, particularly in terms of in terms of GHG emissions (2.6 million tons of CO2 emitted, including manufacturers from outside Metropolitan France, who are partners in the project). It is also crucial to strengthen the circular economy and industrial ecology to optimize the region's resources (water, electricity, etc.).

  The consortium will set up the “Bees ZIP” association (Bordeaux energy Water Environment and Synergies in Industrial and Port Zones), which will carry out these studies, and will also act as a catalyst to animate, federate and structure local players in the region wishing to embark on an ambitious and sustainable environmental transition.

Bees ZIP comprises 21 actions to be carried out over 2 years, with a budget of 3.1 million of euros. In particular, they aim to :

- Develop the energy mix and promote synergies between players
- Preserve water and pool resources
- Capture, store and reuse CO2 emissions

- Develop employment and training
- Preserve biodiversity
- Working with and for citizens
- Welcoming new virtuous industries by optimizing industrial real estate
- Developing infrastructures and logistics
- This ambitious project aims to meet the climate challenge by decarbonizing the region's industries
- accelerating the ecological transition of the metropolitan industrial basin, and anticipating
- and anticipating future employment and training needs.

➢ **Transition support kit for businesses**

Bordeaux Métropole offers all entrepreneurs a transition support kit to help them become responsible players in the territory. This kit provides expert, free, independent support make business activities part of a low-energy approach and ecological transition; structure and develop your CSR policy; promote ethical environmental values ; and offer employees optimized travel and working conditions; and anticipate future regulatory obligations. Link

➢ **Ecological charter for the « Opération d'Intérêt Métropolitain » (OIM) Bordeaux Aéroparc**

Created in 2015, the Opération d'Intérêt Métropolitain (OIM) Bordeaux Aéroparc is a land development operation located in the three communes of Mérignac, Le Haillan and Saint-Médard-en-Jalles. Within this area, three ecological and energy transition charters are being implemented. The aim of each is to support the various stages in the life of a project, in order to manage a real estate or development project in a more ecological and responsible way. three charters have been defined:

- A charter for a virtuous project at the design stage ;
- A charter for a virtuous construction site during project creation ;
- A charter for virtuous practices throughout the company's activity.

ZIRI website link

➢ **The ZIRI ("Zone for the Integration of Intelligent Networks")**

This network aims to facilitate and support synergies between companies based on the principle of industrial ecology: "one company's waste becomes another company's raw material". The ZIRI network currently has 90 members in Blanquefort, Mérignac, Le Haillan, Artigues-Près-Bordeaux and Bassens. The ZIRIs network provides two levers for action:

- Pooling synergies: energy purchases and waste collection are pooled, as are services (fire safety, cleaning of premises, regulatory controls, mobility passes, health insurance, etc.), and substitution synergies are identified and supported during synergy search workshops.
- But the ZIRI network is also about facilitating and bringing together member companies through monthly meetings, workshops and working groups.

Ziri website

C.1.2: Sample Table: Relations between governance innovations, systems, and impact pathways

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
Cross-cutting synergies within the administration	Create a global vision of all the plans and schemes impacting the implementation of action towards climate neutrality.	The multiplicity of ecological transition plans and resulting silos between plans and services (mobility, housing, energy, etc.).	the ACTE Division (Climate Action and Energy Transition)	Provide more operational departments with an overall vision of the local authority's actions. This approach will enable us to overcome the obstacles of working in silos.	transversality efficiency synergies between projects
Network for stakeholders signatories (private, non-governmental organisations)	Propose a network for exchange and sharing with local stakeholders who have signed the CCC	Uneven private stakeholders engagement. Bordeaux Métropole only controls a minority of the levers necessary for local decarbonization.	Bordeaux Métropole University of Bordeaux		Collective skills training operational project accelerate the low-carbon transition
Transversality with other public institutions	Create more transversality with other public institutions in particular with the Sustainable Development Club for municipalities and also with the work of the TATC department, which works on cooperation with neighboring territories	The Bordeaux Metropole's policies contains numerous key measures whose other scales of public administrations (municipalities, County, Region), in cooperation with civil organisations and citizens.	Bordeaux Métropole TATC Sustainable Club for municipalities department Region County		Coordinating policy across multiple administrative scales.

3.2 Module C-2 Social Innovation Interventions

This module lists the actions taken by the city to support and foster social innovation initiatives or non-technological innovation more broadly (e.g., in entrepreneurship, social economy, social awareness &

mobilization, social cohesion and solidarity, etc) aimed to address the systemic barriers and leverage the opportunities identified in Module A-3[2]. It also includes:

C-2.2: Description of social innovation interventions

Bordeaux Métropole is stamped with a culture of collaborative partnership with the actors in its territory. Collaboration with the various stakeholder communities is based on participation, social inclusion and innovation. Local stakeholders are consulted (through surveys, consultations or participatory budgets such as the "1Millions of Trees" project), but also supported by various mechanisms (such as employment center or the renovation of commercial buildings). The idea is for the Bordeaux metropolitan authority to act as a catalyst for change towards an ecological transition that benefits everyone. The long-term viability of most initiatives is crucial to ensuring that they are effective and achieve their objectives.

Revitalization of economically disadvantaged neighborhoods (Quartier prioritaire)

Bordeaux Métropole is leading and coordinating the urban renewal of 11 neighborhoods in 8 communes. Urban renewal aims to improve housing, promote social diversity, open up neighborhoods and stimulate economic development. It involves rehabilitation operations, sometimes destruction-reconstruction, and the rehousing of residents.
Bordeaux Métropole's ambition is to take comprehensive action to improve the quality of life of residents, strengthen social ties, enhance the assets of neighborhoods and better integrate them into the urban area. Urban renewal has an ecological dimension, as it involves rebuilding the city on itself and reusing its built and land resources.

Webpage link

Ecological transition dimension of Bordeaux's neighborhood centers (Maison de quartier)

There are 8 « maisons de quartiers » in Bordeaux. Each is run by a different association. The associations reach a variety of audiences. The association is committed to reinforcing its action toward ecological transition. The association develop ecological awareness among the public by various actions. For example, to develop biodiversity by participating in greening the city, promoting eco-friendly mobility, sustainable food, and setting an example in terms of waste reduction, reuse and recycling.

Super Challenges to raise awareness and change practices

Bordeaux Métropole organizes Super Challenges every year on different themes. In 2023, 44 households participated in the Super Water-Energy Challenge, 120 households in the Super Waste Challenge, and 121 households in the Super Food Challenge. These challenges aim to raise awareness and support metropolitan households towards consciousness and changes in practices: significant reduction in energy and water consumption, waste production; and the adoption of healthy, local, and seasonal food.

Document link

Raising awareness of the ecological transition among secondary school students

[2] For more guidance on social innovation, please refer to the NetZeroCities Quick Read on Social Innovation,to the NetZeroCities Report on indicators & assessment methods for social innovation action plans and the Social Innovation Toolkit. Social innovation case studies are also available on the NetZeroCities website.

For the 2021-2022 school year, 4313 students in the metropolitan area benefited from educational interventions by local associations around the challenges of ecological and social transition. In partnership with GRAINE Nouvelle Aquitaine, the “Juniors du Développement Durable” scheme offered four training courses for professionals to develop participants' knowledge and skills on the following themes: reducing waste and plastic in leisure centers, including biodiversity in educational projects, preserving water resources, and improving children's well-being and health in their structure.

House of employment and companies (Maison de l’emploi et de l’entreprise)

Bordeaux's “house of employment and enterprises” offers a center dedicated to small businesses. In 2021, a support unit on ecological transition for small businesses was opened. This system has made it easier for 350 small businesses in Bordeaux to obtain assistance and link up with their operators. Through an approach that goes straight to the professionals, a face-to-face interview and a free diagnosis are carried out, in order to assess individual issues and needs covering high-value levers in the current economic, regulatory and environmental contexts, namely: energy, mobility, digital sobriety, raw materials supply, CSR, waste management.

Webpage link

Support for energy-efficient retrofits of commercial and offices buildings

Bordeaux Métropole has set up a program to support the energy-efficiency renovation of tertiary buildings, by carrying out energy studies and providing project management assistance. This support is not limited to companies subject to the “Décret tertiaire”, but applies to all companies wishing to implement energy efficiency measures in their buildings. The scheme may concern owner-occupiers, owner-landlords or tenants. Bordeaux Métropole can finance certain studies (diagnostics or energy audits) as well as support for renovation work (advice, project management assistance). Bordeaux Métropole does not finance any of the work: the company bears the entire cost of the project. Membership of the charter enables companies to join a network of players mobilized around energy efficiency issues, to exchange best practices and thus benefit from appropriate support tools. Today, the charter has 22 signatories. This support enables beneficiaries to make the trade-offs necessary to optimize their energy expenditure and reduce the environmental footprint of their real estate assets.

Webpage link

A citizens' experiment to reduce advertising prints

« OuiPub » is an experiment run by 14 municipalities in France, including Bordeaux. This innovative approach involves prohibiting the distribution of ads in house mailboxes unless there is consent from the owner, represented by a « OuiPub » sticker. It is a major step forward for citizens, allowing them to choose whether they still wish to receive ads, instead of being exposed to them without agreeing. After 2 years of experimentation, less than 1% of mailboxes are covered with a « OuiPub » sticker, resulting in a reduction of ads delivery and therefore a reduction of paper waste to be collected.

As part of the study, a survey shows that 96% of citizens are no longer willing to receive ads, with 75% citing ecological reasons. This indicates that citizens are ready for major changes towards more sustainability.

Webpage link

Project Pilot ABCD

A collaboration between Bordeaux Métropole and the University of Bordeaux (The Institute of transitions). This project named ABCD (Acting By Collaborating Differently) aims at strengthen collaboration between metropolitan services, citizens, economic players and academia in defining and implementing innovative schemes to accelerate the ecological transition.

The expected results are structuring and leading stakeholder networks of urban and ecological transition. A major annual event will be organized to promote co-construction and the sharing of bast practices. These meetings will lead to new collaborative projects co-lead by the networks. A major event is scheduled for October 2024.

4 Outlook and next steps

This section should draw any necessary conclusions on the CCC Action Plan above and highlight next steps and plans for refining the CCC Action Plan as part of the Climate City Contract in future iterations.

Plans for next CCC and CCC Action Plan iteration

The development of the Climate Contract has raised important methodological questions in the elaboration of sectoral greenhouse gas reduction trajectories. **The ambitious assumptions for achieving climate neutrality by 2030 are a way of highlighting the colossal efforts required to accelerate current policies.**

As previously mentioned, Bordeaux Métropole has voted ambitious GHG emissions reduction targets for its PCAET. Thanks to the CCC's iterative exercise, Bordeaux Métropole is committed to accelerating as much as possible, with the help of the territory's stakeholders, towards achieving climate neutrality. The CCC action plan is largely based on the policy of the PCAET voted in 2022. **The next steps in monitoring and updating the CCC will therefore follow that of the PCAET.**

Final approval of the PCAET is expected by the end of 2024. Indeed, following the project's approval in September 2022, the associated public entities (State, Environmental Authority, etc.) and the general public (via Bordeaux Métropole's participation platform) were called upon to issue opinions during 2023. These comments will be taken into account in the final version, which will be put to the vote of the Metropolitan Council in 2024. The final version will also be used to consolidate the indicators. **The mid-term review is scheduled for 2025, and the revision of the PCAET is planned for 2028.**

Progress on the action plans will be monitored annually via the indicators and operational feedback from Bordeaux Métropole's departments.

5 Annexes

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

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

Climate Neutrality Commitments of
Bordeaux Métropole

BORDEAUX MÉTROPOLE

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Table of contents

1 Introduction

Introduction

With the “Fit for 55” program, the EU has committed itself to reducing its emissions by at least 55% by 2030 compared to 1990, and to achieving climate neutrality by mid-century. In this context, cities and Metropolises have a key role to play in making a substantial contribution to the implementation of the European Green Deal. They have the opportunity to accelerate the decarbonization of territories and ensure a fair and equitable transition.

Bordeaux Métropole includes 28 municipalities over an area of 578.3 km², with a population of 814,049 (INSEE, 2019). The administration is involved in a wide range of areas, including mobility, economic development, metropolitan spatial planning, environmental policies. Committed to the ecological and energy transition since 2009 with its first Climate action plan, Bordeaux Métropole has made climate emergency one of its top priorities.

Between 2010 and 2019, local greenhouse gas emissions (scope 1 and 2) fell by 11% (source: ALEC). The current metropolitan team wishes to reinforce and accelerate the low-carbon transition and resilience in the face of climate change. In September 2022, Bordeaux Métropole adopted a new Territorial Climate Air Energy Plan (Plan climat air energie territorial PCAET), aimed at achieving carbon neutrality by 2050. This ambitious planning document is in line with the French regulatory expectations of the National Low Carbon Strategy (Stratégie nationale bas-carbone - SNBC) and the regional plan for regional planning, sustainable development (Schéma régional d'aménagement, de développement durable et d'égalité des territoires - SRADDET). The PCAET aims to achieve carbon neutrality by offsetting 100% of its residual emissions (scope 1 and 2). The Metropolis also aims to reduce the territory's carbon footprint (scope 1, 2 ,3) by 79% between 2019 and 2050, cut by 2 energy consumption and almost double the production of renewable and recovered energy. The PCAET also plans a 100% compensation of residual emissions (scope 1,2).

It turns out that only 6% of the territory's carbon footprint is emitted by Bordeaux Métropole as a local authority. Reaching the goal of carbon neutrality is therefore absolutely dependent on the involvement of all local players (businesses, institutions, civil society, citizens, etc.). That's why the strategy of the PCAET is based on a founding principle: to promote ownership of the challenges of ecological transition by local stakeholders. The goal is to encourage local players to act in their own fields (energy, production, consumption, mobility, infrastructure, etc.), to bring about significant, systemic changes across the metropolitan area. Climate neutrality can only be achieved through cross-sectoral, multi-level collaboration.

Bordeaux Métropole is involved in various European Commission programs and missions, notably the “Adaptation to Climate Change” mission. It is also a signatory to the Covenant of Mayors and the Green City Accord. Aware of the urgent need to accelerate the implementation of high-impact actions to reduce GHG emissions, Bordeaux Métropole is delighted to have been selected as one of the EU's “100 Intelligent and Climate Neutral Cities” consequently to applying in January 2022. Participation in

the network of the mission cities enables the Metropolis to take part in exchange networks with other European local authorities on common issues (methodology, reporting and monitoring tools, partnerships, climate democracy, etc.) and to spread best practices that can be replicated. Finally, this is a real opportunity to better identify the systemic obstacles to achieve its climate ambitions the sooner possible.

The objective for the Metropolis, beyond meetingits regulatory targets is to go further an accelerate the energy and ecological transition, by identifying the levers required to reach climate neutrality by 2030. Drawing up the Climate City Contract is therefore an opportunity to raise the region's ambitions for 2030 and provide an answer to these various challenges.

2 Articulation between PCAET and CCC

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Link with the Climate Air Energy Territorial Plan (PCAET)

The challenge will be to coordinate the pre-existing regulatory Climate Plan in France with the new European Climate City Contract initiative. Bordeaux Métropole is taking the opportunity to challenge its greenhouse gas reduction scenarios using the various tools provided by the “100 cities” Mission. Our aim is to learn as much as possible from experience, our current policies, and actions. The action plan component of the CCC will therefore be based on a selection of actions from our Metropolitan Climate Plan, adopted in September 2022 in accordance with French law.

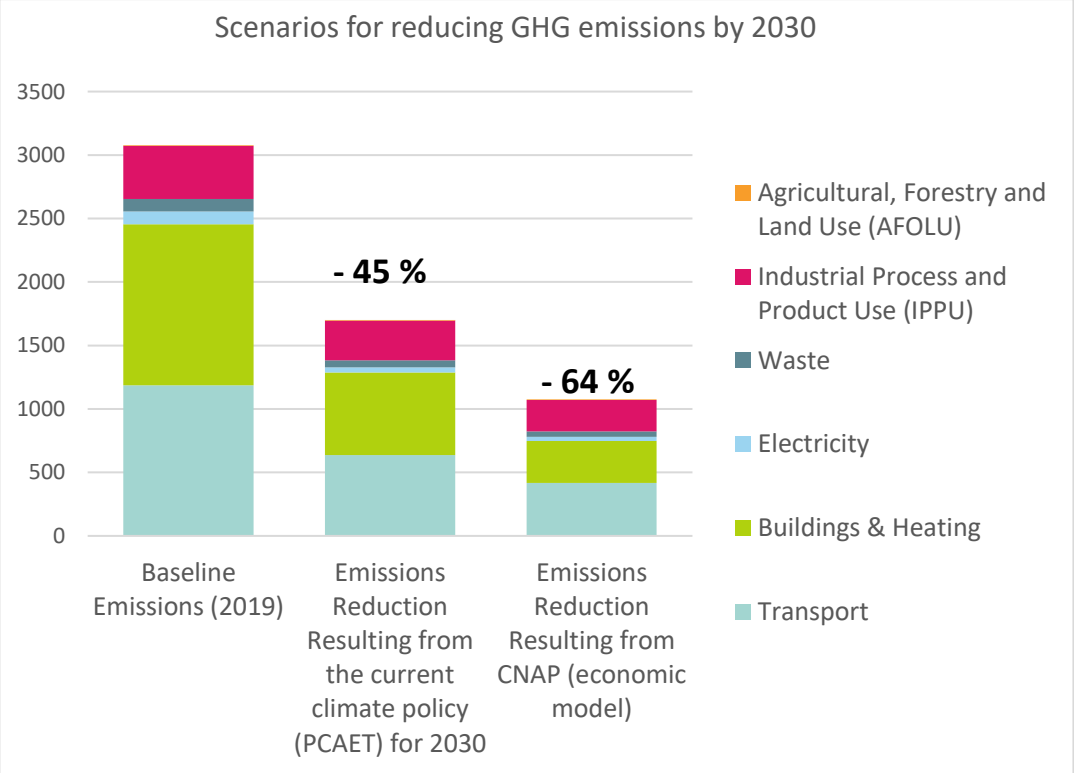
Firstly, the iterative work of the "Climate city contract" enables us to seek to accelerate as far as possible the actions already launched or planned by Bordeaux Métropole. One of the advantages of building the CCC Action plan on our pre-existing strategy is to easily identify the changes and raised ambitions working with currently implemented actions that are already understandable for our stakeholders but imagining going further, as the work on the CCC is an opportunity to imagine other levers for decarbonization with local stakeholders. As a matter of fact, the drafting of this first version of our Climate city contract has been an opportunity to identify the regulatory and political obstacles to lift and the priority investments to successfully implement our policy in favor of the climate and decarbonization of our territory and to accelerate these policies towards a 2030 climate neutrality.

Secondly, the CCC meets our need to quantify more precisely the financing required to reach metropolitan climate path. Bordeaux Métropole is already working on different national and international investments programs. The iterative work around the CCC and more particularly the investment plan will allow us to strengthen our first estimate of the costs corresponding to the scenarios of greenhouse gas reduction towards carbon neutrality. The Metropolis will be able to better pilot and adjust its investment plan.

3 Towards a resilient, carbon neutral, 100% renewable energy territory

2050 target and 2030 target

Bordeaux Métropole Climate Air Energy Territorial Plan regulatory objective is already to become carbon neutral. To do so, the target is to reduce the carbon footprint by 79% (scope 1,2,3) between 2019 and 2050, divide by two the electrical consumption while an expected population increase of 25%. According to this plan, the aim is to reduce by 45% territorial emissions (scope 1, 2) by 2030.
Bordeaux Métropole is taking the opportunity of the "100 climate-neutral and smart cities by 2030" mission to challenge his estimated reduction of greenhouse gas emission (scope 1, 2) by identifying more ambitious levers, and new ways of collaborating in its territory.
Within the framework of the NetZeroCities economic modeling, and according to the most ambitious hypothesis, pursuing and accelerating our politics would allow 64% reduction of greenhouse gas between 2019 and 2030.



Thanks to this collective work involving all organization levels, Bordeaux Métropole aims to accelerate as much as possible decarbonization and get as close as possible to neutrality by 2030.

It is important to stress out that this strategy towards 2030 climate neutrality has been established building up as much as possible on the preexisting PCAET strategy features, to facilitate its understanding and appropriation by Bordeaux Métropole stakeholders. As a result, Bordeaux Métropole chose 2019 as a baseline and included the heavier industry and the ETS in the strategy.

This perimeter can be regarded as a testimony of Bordeaux Métropole's level of ambition towards neutrality.

Regarding baseline, Bordeaux Métropole considers that choosing 2019 is quite ambitious, as it is the last available greenhouse gas inventory that was not affected by the drop in activity due to the 2020-2021 pandemic. As already mentioned in the introduction, Bordeaux Métropole's territorial emissions had already fallen by 11% between 2010 and 2019. Choosing an earlier baseline would have gotten us much closer to the 80% emission reduction target.

Regarding perimeter, only scope 1 and 2 are taken into account in the CCC greenhouse gas inventory. It should be noted that the carbon accounting standard required by the Climate City Contract, namely the GHG Protocol (Greenhouse Gas Protocol), differs from the breakdown we use in french GHG inventory, Bilan carbone® method. Work has been carried out to adapt to the GPC Protocol. Furthermore, no exclusions have been made in the scope of the GHG inventory for the base year (2019). The European Emissions Trading System (ETS) has been included in the scope of the GHG inventory. Given that our territory is taking ambitious action to support economic and industrial players in decarbonizing their activities, we decided to continue considering the GHG emissions generated by these industrial actors on a local scale. Excluding the whole industrial sector, the reduction in GHG emissions would be as high as 68% in 2030 compared with 2019.

Finally, decarbonization will bring concrete benefits to many sectors of society such as:

- Reduced air pollution, fuel poverty and noise through decarbonation of heating and mobility;
- Increased property value and employment due to retrofit work;
- Increased health and safety due to the reduction of motorized transportation need;
- Increased water quality, eco-system health and community asset through circular economy, nature based solution and waste reduction;
- Increased collaboration between stakeholders to generate new synergies and added value for the territory.

By encouraging and valuing these co-benefits, it will be easier to involve stakeholders and citizens in the decarbonization process.

4 Strategic priorities

Strategic priorities

The pre-existing PCAET (2022-2028) is based on the triptych "Think differently, do differently, live differently" and promotes a balanced approach between projects falling within the direct remit of the Metropolis and territorial animation actions. The first axis, "Penser autrement" ("Think differently"), includes actions designed to encourage training and awareness-raising, develop cooperative practices, steer and make visible the territorial trajectory, and accompany all publics through the process of change. The second area, "Doing things differently", includes actions aimed at developing low-carbon economic sectors and activities or those with sequestration potential, as well as supporting the transition of businesses towards a lower environmental impact. The third theme, "Living differently", covers actions aimed at transforming the behavior of all those involved, in the areas of everyday life - travel, housing or business premises, consumption (of food and other

products). It also addresses the structuring issue of spatial planning, as a factor in balanced resource management and health promotion. These three themes are broken down into objectives.

To bring our actions into line with the Climate Contract reference framework, five strategic priorities have been identified between now and 2030 to accelerate progress towards climate neutrality:

1) Generalize low-carbon mobility across the region

The Metropolis already has a substantial public transport network. However, it will seek to improve it and further develop TRAM lines (B to Gradignan and D to Saint Médard). The Metropolis will gradually replace the TBM (local public transport operator) fleet of internal combustion and hybrid buses with electric and bioGNV buses.

Bordeaux Métropole will continue to implement its third Bicycle Plan, notably with the development of the REVE network (Express Bike network). This will extend over 275km and includes 14 routes serving the territory's main centers of activity and employment, a cycling network that will be connected to other major transport networks. The Metropolis municipalities will be supported in their efforts to further develop cycling and walking among residents, in collaboration with local associations. In terms of medium and long-distance car-sharing, a coordinated, multi-partner car-sharing plan will be developed, along with various incentive measures.

2) Decarbonize and massively renovate the region's building

Bordeaux Métropole wants to accelerate the current residential renovation program as much as possible, by working alongside government schemes to support households in the high-performance renovation of their homes. Particular attention needs to be paid to the most vulnerable households, especially those in fuel poverty. According to the latest roadmap, Bordeaux Métropole is aiming to achieve annual energy savings of 60 GWh by 2026, resulting from the energy-efficient renovation of 11,500 homes per year across the territory, and ultimately to reach 100% of renovated homes. At the same time, the aim is to reduce fossil fuel consumption in buildings by developing heat pumps, district heating and so on. It would be desirable to achieve zero oil-heated housing by 2030. It is an extremely ambitious goal, but one that seems unavoidable in the context of an accelerated scenario of climate neutrality by 2030.

The Metropolis will also do its utmost to accelerate the implementation of the “Decret tertiaire” (Tertiary decree) in the region. In France, the Tertiary decree applies to owners and tenants of establishments housing commercial or office activities (public or private buildings with a surface area over 1,000 m² are subject to it). The Tertiary decree requires those subjects to the law to reduce their final energy consumption by 40% by 2030, compared with a reference year that cannot be earlier than 2010. We'll be helping to build a network of players in the construction industry, to increase skills and employment in the field of energy-efficient building renovation. Finally, we will actively work to reduce the environmental impact of construction, by promoting reuse and recyclability in the building and public works sector, and by developing a sustainable construction approach with industry players.

3) Develop local production and consumption of renewable energies

Over the next three years, we will be studying heating networks in all neighborhoods with sufficient thermal density and defining a strategy and specific action plan for cooling networks, adapted to the different types of neighborhoods and buildings. The plan is to locate industrial sites whose processes release large quantities of heat (furnaces, boilers, incinerators, turbines, etc.), in particular as part of a global partnership with the area's biggest energy consumers (the “top 10”) located mainly along the Garonne river (Ambès, Bègles, Bassens): aeronautics, space and defense industries, pharmaceutical industry, food industry, etc. We will then carry out specific feasibility studies for each industrial site, in line with the heating network development plan and the industrial needs of the site's neighbors.

The Metropolis wishes to promote photovoltaic solarization of the territory. In April 2024, the Bordeaux Solar City Project was launched. The aim of this project is to publicize the projects currently underway on its own property (60,000 m² by 2026), as well as those of its partners in order to create a

momentum for photovoltaic development. By 2030, Bordeaux Métropole aims to have developed around 150 MWc of photovoltaic installations on shaded areas and on the roofs of public and private buildings throughout the territory, with a view to achieving an installed capacity of 300 MWc.

In terms of energy recovery, the Metropolis will be developing the first methanization projects: wastewater treatment plants, biowaste recovery, the first industrial methanization plant, etc. Through our semi-public company “Bordeaux Métropole Énergies”, we will support regional renewable energy projects. We will study and initiate the development of two methanization projects with neighbouring territories.

Finally, we will begin structuring and setting up a monitoring system to purchase renewable energies in partnership with existing observatories (ALEC, AREC, etc.), to collect and process data on the supply of green gas and electricity to local authorities, businesses and households, with a view to developing direct purchasing mechanisms.

4) Developing a low-carbon, circular economy for all the economic and industrial sectors

Bordeaux Métropole wishes to promote less carbon-intensive processes among the region's industrial players. This will involve strengthening partnerships with industries through a variety of mechanisms (notably the ZIBAC project described in the “Procedures and implementation” section). It will be possible to use Bordeaux Métropole's public procurement contracts to encourage the use of locally sourced bio-based materials (environmental clauses in metropolitan purchases and calls for tender).

The Metropolis will make its connections, networks, assets and land available to work towards the rapid and sustainable development of the region's ecological transition sectors and support the emergence of new players.

In terms of waste, with the local program for the prevention of household and similar waste, the Metropolis is aiming for a 15% reduction in per capita household and similar waste by 2030, thanks to reduced consumption and improved recycling facilities.

By 2028, the Metropolis plans to set up six ephemeral reuse areas installed at regular intervals in the heart of neighborhoods and towns. By 2026, Bordeaux Métropole will also have a fully-fledged circular economy plan for its territory.

5) Protecting residents and building resilience to the effects of climate change

The new “cooling Metropolis” program is a territorial strategy to meet the crucial challenge of adapting the metropolitan area to heat waves. The program has several focuses:

- Proximity to cool spaces, water and shade ;
- The redevelopment of living soil ;
- Greening the canopy ;
- Thermal comfort in public buildings and housing.

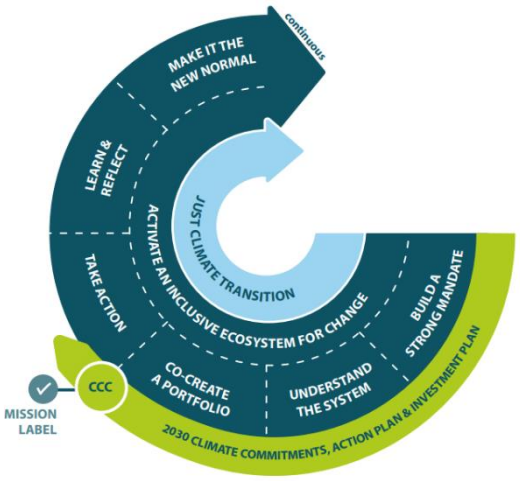
By 2026, Bordeaux Métropole will reinforce or reveal 100 urban “cool islands” reachable by walking distance. Other actions linked to climatic hazards (flooding, landslides, fire) are subjects of specific action programs, but are not detailed in the Climate Contract.

Bordeaux Métropole has also adopted its Agricultural and Food Resilience Strategy (Stratégie de Résilience Agricole et Alimentaire - SRAA), certified as a Territorial Food Project (Projet Alimentaire Territorial - PAT) by the French Ministry of Agriculture and Food Sovereignty. The main aims of the agricultural component are to encourage the adaptation of farming practices to climate change by promoting the development of environmentally-friendly urban and peri-urban agriculture, based on the sustainability of farms and the quality of production.

5 Process and principles

Process and principles

Bordeaux Métropole takes a global, collaborative approach to achieving its climate objectives, both internally and in collaboration with local stakeholders. The Metropolis integrates climate considerations into all its policies, ensuring a holistic and inclusive approach to ecological transition and climate resilience.
To build a solid contract and achieve its ambitions, Bordeaux Métropole has used the recommendations of Net Zero City's "Transition Map and experience". Bordeaux Métropole intends to involve both the economic sector (public and private) and civil society organizations and citizens in the transition to climate neutrality.



Setting up a "transition team"

The transition team is coordinated internally by the Climate Action and Energy Transition Department (ACTE), with support from the International Relations Department (DRI) and the Territories of Tomorrow, Territories in Cooperation Department (DTATC). The Finance and Purchasing Department and the Economic Development Department (DDE) have also joined the transition team to contribute their respective expertise to the CCC. The transition team comprises around ten in-house staff.

Within the ACTE division, two departments – "Animation of transitions" and "Energy strategy and action" - are working on the implementation of the territory's climate and energy transition, the renovation of residential and tertiary buildings, as well as on carbon accounting and the monitoring and management of partnerships with local players on low-carbon ecological transition issues.

DTATC is developing partnerships with neighboring regions. Each territory has its own specificities, but also interdependencies. The Metropolis embodies the political will to work towards reducing territorial fractures. Inter-territorial cooperation is a strong lever for territorial rebalancing and solidarity. We work together on a wide range of issues, including mobility, urban logistics, agriculture and food, economic development and more. The energy and ecological transition is also a major challenge for these territories.

The DRI enables the Metropolis to cooperate on a European and international scale, to keep abreast of existing best practices and to promote metropolitan know-how. It ensures Bordeaux Métropole's coherent presence in the various networks dealing with climate change issues, in addition to the European Commission's "cities" and "climate" missions (Eurocities, Energy cities, etc.).

The necessity to involve all territorial stakeholders

As an administration, Bordeaux Métropole only accounts for 6% of the territorial GHG emissions. It means that most of GHG emission reduction by 2030 will involve other stakeholders.

The main actions to be implemented by these stakeholders can imply heavy investments, behavioral changes, or competency building:

- Citizens are mostly expected to adopt behavioral changes with limited investments, specifically for their transport habits or waste production. However, some heavier investments are also expected from them, in housing retrofit, or electric vehicles for example.

- For tertiary companies (including the public tertiary sector) the main expectation is investing in building retrofit, energy and mobility decarbonation, and renewables production. They will also need to adopt less capital-intensive changes, such as energy sobriety. As employers, they also have a responsibility in fostering and facilitating changes for citizens, through teleworking and teleservices for example.
- Most of the major industries have already started to invest in their decarbonization process (scope 1,2) but will have to even further accelerate (scope 3).
- Some economic actors are also strategic for building and providing the public works included in the action plan, for example in building retrofit, transport infrastructure building, or renewables installation. It is important to make sure they all have the skills to do these works in the most efficient and decarbonize way, including innovative low carbon and reused material.
- Other economic actors, such as banks and insurance companies will also be involved to enable the investments necessary to the action plan. The main challenge regarding these stakeholders will be connecting them with other stakeholders in need of financing or insuring.

Bordeaux Métropole's strategy to involve all these stakeholders in the action plan will be different for citizens and for other economic players. In both cases, Bordeaux Metropole's strategy is focused on animation (consultation, organizing events and workshops) but with the clear objective of fostering behavior changes and investments necessary to the action plan.

Strong citizen involvement

Citizen participation is an important part of the region's operations. Various committees have been set up to encourage citizen participation and inclusion in local life and policies. The Sustainable Development Council (C2D) is a group of volunteer citizens committed to Bordeaux Métropole. It is a citizens' consultation body that enables all those who wish to do so to participate in the development of metropolitan projects. The C2D is made up of a Council and a Forum. The Council comprises as many "permanent" members as there are elected representatives (104), who serve for three years. C2D members work in small groups on specific topics (housing, transport, waste, the environment, regional planning, etc.). Topics are proposed by the Metropolis or chosen by the C2D itself, as appropriate. In 2025, a working group dedicated to climate contributing policies will be created within the C2D, in order to facilitate citizen consultation on Bordeaux Métropole's global climate strategy and feedback on more specific policies. This climate policies dedicated working group, that will be called the « Comité citoyen Climat » (Climate Citizen's Comitee), will meet twice a year.

At a communal level, the City of Bordeaux launched its first Great Citizen Dialogue in 2023: a participative and collaborative process which proposes to explore every two years an important issue for the city's future, and to consider solutions, ideas, directions and strategies. In 2023, the topic was "The City of Bordeaux and the climate emergency". Organized in three stages, this tool for citizen participation led to the creation of a Citizens' Convention made up of 100 randomly selected citizens representative of the Bordeaux population, who met several times over several months to formulate an opinion and recommendations on the issue of the climate emergency at Bordeaux level.
The Metropolis intends to build up on this preexisting communal experimentation and coordinate its climate action plan with the various citizen participation entities mentioned above.

Moreover, strengthening the links between Bordeaux Métropole, the academic community and citizens is a major lever to be activated to accelerate the deployment of solutions to accompany change. The University of Bordeaux has an important role to play in the transition team, in terms of both research and training. Our ABCD project, submitted as a candidate for the "pilot cities" call for projects, will help strengthen the links between metropolitan services, citizens and academia in the definition and implementation of innovative measures to accelerate the transition. The outcome of this collaboration will be concrete results:

- The structuring and animation of networks of players and the acceleration of meetings to create the conditions for sharing and co-constructing solutions for the territory's transition. A major annual event will be organized to promote the co-construction and shared deployment of solutions.
- These meetings will lead to projects co-sponsored and co-lead by the networks, making them gas pedals project.

Strengthening the involvement of public and private players

Private and public stakeholders have an important role to play in achieving climate neutrality in our territory. Most major players have already adopted a strategy to reduce their carbon footprint. We are working to network them so that they can share best practices, capitalize on successful experiences, foster cooperative practices and engage their ecosystems to accelerate the transition. These key players will be able to create a ripple effect across the region. The CCC partnership scheme is an excellent way of formalizing and highlighting their commitments, in order to give impetus to a wider dynamic in favor of climate neutrality.

Several business support schemes are active in the region. For example, as part of the national call for projects (low-carbon industrial zone - Zone industrielle bas carbone (ZIBAC)), of which the Metropolis is winner, some thirty private, public and associative structures are taking part in the BEES-ZIP project ("Bordeaux energies water environment and synergies in industrial and port zones"). The strength of this project lies in the fact that it brings together so many players from all walks of life. This combination has made it possible to build a global project that approaches decarbonization from different angles, whether socio-economic or technological, depending on the case. This approach has been co-constructed with all local players (industrialists, local authorities, clusters, residents' associations, consular authorities, etc.) to ensure a 360° approach to decarbonization, with spin-offs in terms of employment, reindustrialization, economic development, land optimization, adaptation to climate change and biodiversity preservation.

Setting up a shared assessment and monitoring system

The pre-existing Climate Plan provides for a technical committee bringing together all those involved in implementing metropolitan actions, as well as a steering committee comprising all the relevant elected representatives. Monitoring and evaluation of the CCC will be organized in the same way, within the framework of existing bodies. In fact, the types of action and the contacts coincide. Each year, the Transitions Management team will identify the progress of planned actions using a grid of indicators. A collaborative effort to improve the reliability of indicators has been initiated with teams from the various departments.

Monitoring of the CCC investment plan will also be carried out within the framework of existing bodies. Indeed, Bordeaux Métropole has a steering committee for green budgeting and green finance, which brings together all the relevant elected representatives who are also involved in monitoring the CCC action plan. For overall monitoring of the CCC, the transition team will meet on a monthly basis.

As regards monitoring the actions of partners and stakeholders, the management team will also keep track of the progress made by CCC signatories. An annual event will be organized to bring together all signatories. A quarterly follow-up will enable more individualized monitoring with each partner.

The already planned annual monitoring exercises of the CCC will also be an occasion to assess the other changes to be implemented (e.g.: regarding co-benefits estimation, financial monitoring and the carbon compensation strategy).

6 Signatories

Process and principles

The list of signatories below is not complete. Other signatory partners are expected to join the process by the time the Climate Contract is submitted in September 2024. After submission of the Climate Contract, the approach may be joined by other committed players wishing to contribute to the region's decarbonization ambitions.

- ALEC33
- BORDEAUX AIRPORT
- ENEDIS
- KEOLIS

- BORDEAUX METROPOLE ENERGIE
- BORDEAUX TOURISM OFFICE
- BORDEAUX UNIVERSITY
- BORDEAUX CHU
- DOMOFRANCE
- ORANGE
- SNCF
- SUDOUEST
- VEOLIA
- YARA

BORDEAUX MÉTROPOLE	EXTRAIT DU REGISTRE DES DELIBERATIONS DU CONSEIL DE BORDEAUX METROPOLE	*Délibération*
	Séance publique du 26 septembre 2024	***N° 2024-460***

Convocation du 19 septembre 2024
Aujourd'hui jeudi 26 septembre 2024 à 14h30 le Conseil de Bordeaux Métropole s'est réuni, dans la Salle du Conseil sous la présidence de Madame Christine BOST, Présidente de Bordeaux Métropole.

ETAIENT PRESENTS :

M. Dominique ALCALA, Mme Géraldine AMOUROUX, Mme Stephanie ANFRAY, M. Christian BAGATE, Mme Amandine BETES, Mme Claudine BICHET, M. Patrick BOBET, Mme Simone BONORON, Mme Christine BOST, Mme Pascale BOUSQUET-PITT, Mme Fatiha BOZDAG, Mme Myriam BRET, Mme Pascale BRU, M. Eric CABRILLAT, Mme Sylvie CASSOU-SCHOTTE, M. Olivier CAZAUX, M. Thomas CAZENAVE, M. Gérard CHAUSSET, Mme Camille CHOPLIN, M. Max COLES, Mme Typhaine CORNACCHIARI, M. Didier CUGY, Mme Laure CURVALE, Mme Béatrice DE FRANÇOIS, M. Stéphane DELPEYRAT-VINCENT, Mme Eve DEMANGE, M. Gilbert DODOGARAY, M. Christophe DUPRAT, M. Jean-François EGRON, Mme Anne FAHMY, M. Bruno FARENIAUX, Mme Véronique FERREIRA, M. Jean-Claude FEUGAS, M. Nicolas FLORIAN, Mme Françoise FREMY, M. Alain GARNIER, M. Guillaume GARRIGUES, Mme Anne-Eugénie GASPAR, Mme Daphné GAUSSENS, M. Nordine GUENDEZ, M. Maxime GHESQUIERE, M. Frédéric GIRO, M. Laurent GUILLEMIN, Mme Fabienne HELBIG, M. Pierre HURMIC, M. Radouane-Cyrille JABER, Mme Delphine JAMET, Mme Sylvie JUQUIN, Mme Sylvie JUSTOME, Mme Andréa KISS, M. Michel LABARDIN, M. Patrick LABESSE, M. Gwénaël LAMARQUE, Mme Fannie LE BOULANGER, Mme Harmonie LECERF MEUNIER, Mme Anne LEPINE, Mme Zeineb LOUNICI, M. Jacques MANGON, M. Guillaume MARI, M. Stéphane MARI, M. Baptiste MAURIN, Mme Claude MELLIER, M. Thierry MILLET, M. Fabrice MORETTI, M. Marc MORISSET, M. Pierre De Gaétan N'JIKAM MOULIOM, Mme Marie-Claude NOEL, M. Patrick PAPADATO, Mme Céline PAPIN, Mme Pascale PAVONE, M. Jérôme PESCINA, M. Stéphane PFEIFFER, M. Michel POIGNONEC, M. Philippe POUTOU, M. Patrick PUJOL, M. Jean-Jacques PUYOBRAU, Mme Isabelle RAMI, M. Benoît RAUTUREAU, M. Franck RAYNAL, M. Michael RISTIC, M. Bastien RIVIERES, M. Clément ROSSIGNOL-PUECH, Mme Karine ROUX-LABAT, M. Alexandre RUBIO, Mme Nadia SAADI, Mme Béatrice SABOURET, M. Emmanuel SALLABERRY, Mme Brigitte TERRAZA, M. Jean-Baptiste THONY, M. Serge TOURNERIE, M. Jean TOUZEAU, M. Thierry TRIJOULET, M. Jean-Marie TROUCHE, Mme Josiane ZAMBON.

EXCUSE(S) AYANT DONNE PROCURATION :

M. Alain ANZIANI à Mme Véronique FERREIRA

Mme Brigitte BLOCH à M. Didier CUGY

Mme Christine BONNEFOY à Mme Daphné GAUSSENS

M. Alain CAZABONNE à M. Emmanuel SALLABERRY

Mme Nathalie DELATTRE à M. Patrick BOBET

M. Olivier ESCOTS à M. Jean-Claude FEUGAS

M. Stéphane GOMOT à M. Maxime GHESQUIERE

Mme Nathalie LACUEY à M. Jean-Jacques PUYOBRAU

Mme Marie RECALDE à M. Gérard CHAUSSET

M. Fabien ROBERT à M. Nicolas FLORIAN

EXCUSE(S) EN COURS DE SEANCE :

PROCURATION(S) EN COURS DE SEANCE :

Mme Amandine BETES à Mme Typhaine CORNACCHIARI le 26 septembre
Mme Claudine BICHET à M. Alain GARNIER le 26 septembre
Mme Brigitte BLOCH à Mme Sylvie CASSOU-SCHOTTE le 27 septembre
Mme Christine BONNEFOY à Mme Karine ROUX-LABAT le 27 septembre
M. Olivier CAZAUX à M. Patrick PAPADATO le 26 septembre
Mme Camille CHOPLIN à M. Laurent GUILLEMIN le 26 septembre
Mme Béatrice DE FRANCOIS à Mme Andréa KISS le 27 septembre
Mme Anne-Eugénie GASPAR à Mme Andréa KISS le 26 septembre
M. Laurent GUILLEMIN à Mme Anne LEPINE le 27 septembre
Mme Fabienne HELBIG à M. Stéphane MARI le 26 septembre
M. Pierre HURMIC à M. Clément ROSSIGNOL-PUECH le 26 septembre
Mme Harmonie LECERF-MEUNIER à Mme Anne LEPINE le 26 septembre
M. Guillaume MARI à M. Bastien RIVIERES le 27 septembre
Mme Céline PAPIN à Mme Marie-Claude NOEL le 26 septembre
M. Jérôme PESCINA à M. Eric CABRILLAT le 27 septembre
M. Franck RAYNAL à M. Michel LABARDIN le 27 septembre
Mme Marie RECALDE à Mme Anne-Eugénie GASPAR le 27 septembre
Mme Nadia SAADI à M. Guillaume MARI le 26 septembre
M. Serge TOURNERIE à M. Bruno FARENIAUX le 26 septembre

LA SEANCE EST OUVERTE

BORDEAUX MÉTROPOLE	**Conseil du 26 septembre 2024**	***Délibération***
	ADG Action Climatique et Transition Energétique	***N° 2024-460***

Mission UE 100 villes climatiquement neutres en carbone et intelligentes d'ici 2030 - Contrat climatique (Climate city contract) - Décision - Adoption

Madame Claudine BICHET présente le rapport suivant,

Mesdames, Messieurs,

En 2021, avec le programme "Fit for 55", l'UE s'est engagée à réduire ses émissions d'au moins 55 % d'ici à 2030 par rapport à 1990 et à atteindre la neutralité climatique d'ici au milieu du siècle. Dans ce contexte, les villes et Métropoles ont un rôle majeur à jouer, pour contribuer de manière substantielle à la mise en œuvre du Green Deal européen.

Bordeaux Métropole a été sélectionnée dès 2022 par la Commission européenne dans le cadre de la Mission "100 Villes climatiquement neutres en carbone et intelligentes d'ici 2030". 112 villes et métropoles européennes en ont été lauréates dont neuf en France (Paris, Angers Loire Métropole, Dijon Métropole, Dunkerque, Grenoble-Alpes Métropole, Lyon, Marseille, Nantes Métropole et Bordeaux Métropole).

Grâce à cette Mission 100 Villes, Bordeaux Métropole est au cœur d'un réseau de collectivités européennes pionnières qui serviront d'exemples pour accélérer la transition écologique et énergétique et tenter d'accélérer vers la neutralité climatique à l'échelle de ces territoires.

Dans ce cadre, les villes lauréates doivent rédiger un Contrat Climatique, ou Climate City Contract (CCC) qu'elles doivent soumettre en septembre 2024 à la Commission européenne. Le contrat climatique est une démarche itérative qui comprend un plan engagement, un plan d'action et un plan d'investissement associés. L'engagement autour du Contrat climatique est l'objet de la présente délibération.

La Commission européenne attribuera ainsi un label aux collectivités lauréates ayant soumis un contrat climatique qui, au-delà de la visibilité ainsi donnée au territoire à l'échelle européenne, donne accès à des accompagnements techniques pour mener sa politique climatique et pourrait aussi faciliter l'accès à des investissements privés.

Le contrat climatique constitue également une opportunité d'identifier et faire remonter les freins opérationnels et financiers des villes et métropoles, dans la mise en œuvre des politiques actuelles en faveur du climat, pour inciter la Commission européenne à aider davantage les collectivités et adapter leur dispositif.

1. Engagements de Bordeaux Métropole dans le cadre de son Contrat climatique

Bordeaux Métropole a adopté en septembre 2022 un Plan Climat Air Energie Territorial (PCAET), qui vise la neutralité carbone d'ici 2050. Ce document de planification, déjà ambitieux, s'inscrit dans le cadre des attentes réglementaires françaises de l'actuelle Stratégie Nationale Bas Carbone (SNBC).

Bordeaux Métropole a alors saisi l'opportunité de la Mission 100 Villes et du Contrat climatique pour modéliser une accélération de sa trajectoire de réduction des gaz à effet de

serre de son territoire en cherchant à identifier les potentiels leviers d'accélération de la décarbonation. Contrairement au PCAET qui ne dispose pas d'un volet de financement, l'exercice itératif du Contrat climatique permettra dans les mois et années à venir de travailler sur un chiffrage plus précis des coûts d'investissement publics et privés nécessaires à la décarbonation des secteurs les plus émissifs (bâtiments résidentiels et tertiaire, transport routier, industrie, etc.).

L'objectif de Bordeaux Métropole est de tenir ses objectifs réglementaires conformément à son PCAET, et grâce à la Mission européenne des 100 villes, et à l'action conjointe des acteurs économiques (privé, public) et de la société civile, la Métropole espère accélérer d'ici 2030 vers la neutralité climatique du territoire.

Le plan d'engagement est décliné en un plan d'actions, lequel s'adosse aux actions du PCAET. Ce plan d'action est complété par un plan d'investissement. Les services métropolitains ont été accompagnés par NetZéroCities pour l'utilisation d'un modèle économique permettant d'estimer les investissements nécessaires à la mise en œuvre des politiques et actions permettant l'accélération de la décarbonation du territoire. Ce premier travail exploratoire sera complété de façon itérative dans les mois et années à venir. Il sera également nourri par d'autres travaux menés en parallèle sur cette thématique d'investissement climatique.

Le document annexé à cette délibération sera soumis à la Commission européenne en septembre prochain, il reprend ces objectifs et décline les intentions de Bordeaux Métropole pour y parvenir.

2. Démarche partenariale avec les acteurs du territoire

Le Contrat climatique est pensé comme un instrument d'innovation en matière de gouvernance pluri-acteurs. Or, la volonté d'engager le plus concrètement possible les acteurs du territoire (entreprises, acteurs parapublics, communes, associations, citoyens) par différentes instances d'échange et de co-construction, est déjà une volonté du Plan Climat actuel (2023-2028) et du projet de mandature.

Une dizaine d'acteurs (privés, parapublics et publics comme le CHU, Enedis, le Groupe Sud-Ouest, l'Université de Bordeaux, etc) ont d'ores et déjà manifesté leur concours au CCC et à l'objectif commun d'une décarbonation du territoire à un horizon aussi proche que possible. Ces derniers ont transmis des courriers de soutien qui seront annexés au plan d'engagement soumis à la commission européennes. Les services métropolitains préciseront d'ici fin 2024 les modalités de collaboration.

Ainsi, le Contrat climatique permet aux acteurs du territoire d'être co-signataires du plan d'engagement et de manifester leur volonté d'agir pour contribuer à l'atteinte des ambitions climatiques du territoire. Le CCC constitue donc une opportunité complémentaire pour formaliser l'engagement de ces acteurs dans la transition écologique bas carbone au regard de cette Mission européenne. Enfin, elle permettra indirectement de valoriser l'ensemble des dispositifs métropolitains partenariaux déjà existants, sur les questions liées à la transition écologique.

Ceci étant exposé, il vous est demandé, Mesdames et Messieurs, si tel est votre avis, de bien vouloir adopter les termes de la délibération suivante :

Le Conseil de Bordeaux Métropole,

VU le Code général des collectivités territoriales et notamment son article-L. 5217-2

VU la loi n°2010/788 du 12 juillet 2010 portant engagement national pour l'environnement

VU la délibération métropolitaine n°2022-539 du Conseil de Bordeaux Métropole du 30 septembre 2022 approuvant le Plan climat air énergie territorial,

ENTENDU le rapport de présentation,

CONSIDERANT QUE Bordeaux Métropole souhaite accélérer tant que possible l'atténuation des gaz à effet de serre de son territoire en collaboration étroite avec les acteurs de son territoire,

DECIDE

Article 1 : En cohérence avec le PCAET métropolitain, d'approuver les engagements et les priorités d'actions figurant dans le contrat climatique (document ci-joint).

Article 2 : d'autoriser Madame la Présidente à approuver la soumission du Climate City Contract (Contrat climatique) auprès de la Commission européenne.

Article 3 : d'autoriser Madame la Présidente à accomplir toutes les formalités nécessaires à l'exécution de la présente délibération, dont la signature du contrat joint.

Les conclusions, mises aux voix, sont adoptées à la majorité.
Abstention : Monsieur POUTOU;
Contre : Monsieur MORISSET
Ne prend pas part au vote : Monsieur GOMOT, Monsieur MANGON

Fait et délibéré au siège de Bordeaux Métropole le 26 septembre 2024

REÇU EN PRÉFECTURE LE : **4 OCTOBRE 2024** **DATE DE MISE EN LIGNE :** **4 OCTOBRE 2024**	Pour expédition conforme, par délégation, la Vice-présidente, Madame Claudine BICHET