Part B: technical description

CLIMABOROUGH

BUILDING GREEN AND CLIMATE NEUTRAL CITY-HUBS

No.	*Participant Organisation Name*	*Role in the project*	*Short*	*Country*
1	**ANCI TOSCANA**	*Coordinator*	ANCI	Italy
2	**HELMHOLTZ ZENTRUM HEREON**	*Lead of climate evaluation*	HEREON	Germany
3	**MAJOR CITIES OF EUROPE**	*Lead of Dissemination*	MCE	Germany
4	**INSTITUT MINES-TELECOM**	*Lead of Digital Twins*	IMT	France
5	**NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY**	*NEB & Dissemination*	NTNU	Norway
6	**UNIVERSITY OF AALBORG**	*Lead of Citizens' engagement*	AAU	Denmark
7	**POLITECNICO DI MILANO**	*Lead of Urban planning*	POLIMI	Italy
8	**SYNDICAT INTERCOMMUNAL DE GESTION INFORMATIQUE**	*Lead of platform management*	SIGI	Luxembourg
9	**DATEN-KOMPETENZZENTRUM STÄDTE UND REGIONEN**	*Lead of Data*	DKSR	Germany
10	**LINKS FOUNDATION**	*Lead of exploitation*	LINKS	Italy
11	**URBANDNA**	*Lead of Hubs and co-creation*	UDNA	UK
12	**URBAN LAB**	*City Angel*	ULAB	Italy
13	**ENERGY CITIES**	*City Angel*	ENEC	France
14	**EZAVOD**	*Lead of lending/fundraising*	EZAVOD	Slovenia
15	**CITY of SOFIA**	*City leader*	SOFIA	Bulgaria
16	**CITY of TURIN**	*City leader*	TORO	Italy
17	**CITY of IOANNINA**	*City leader*	IOA	Greece
18	**CITY of MARIBOR**	*City leader*	MARI	Slovenia
19	**ZUM d.o.o. urbanizem, planiranje, projektiranje**	*Affiliated to City of Maribor*	ZUM	Slovenia
20	**CITY of ATHENS (DAEM)**	*City leader*	ATH	Greece
21	**CITY of CASCAIS**	*City leader*	CAS	Portugal
22	**CITY of DIFFERDANGE**	*City leader*	DIFF	Luxembourg
23	**GRENOBLE ALPES-METROPOLE**	*City leader*	GAM	France
24	**CITY of KRK**	*City Follower*	KRK	Croatia
25	**CITY of KATOWICE**	*City Follower*	KATO	Poland
26	**CITY of PILSEN (SITMP)**	*City Follower*	PILS	Czech Rep.
27	**CITY of PRIJEDOR**	*City Follower*	PRI	BiH
28	**Development Agency „PREDA“ Prijedor**	*Affiliated to City of Prijedor*	PREDA	BiH

No.	Status	Organisation Name	Short name	Country
29	Associated	**CITY of PODGORICA**	PODGO	Montenegro
30	Associated	**ISSY MEDIA (City of Issy-les-Moulineaux)**	ISSY	France

1. Excellence

1.1 Objectives and ambition

1.1.1 Background

CLIMABOROUGH is a direct descendant of Designscapes (http://designscapes.eu), a project funded by the H2020 programme (2017-2021), which was built on an original concept proven to be extremely successful in its deployment. The focus of Designscapes was on **applying design tools and methods to innovation processes in, by and for cities,** the latter seen as fertile environments – including a wide set of challenges and a wealth of opportunities – to conceive, promote, and achieve **user-driven innovation** in "niches", as per the definition used in the transition management literature. In so doing, Designscapes formed an outstanding **EU wide community** of 99+ public and private "design enabled" innovators in urban environments, supported by a cascade funding mechanism that was implemented in 3 consecutive rounds of an EU wide call. The call eventually funded 48 feasibility studies, 41 prototypes and 10 scalability proofs from EU MS and AS – quite heterogeneous in terms of underlying innovation type (product, service, process, etc.), identity of proposers, and urban challenges the new ideas or projects were set up to tackle. One thing was common though: namely that all proposals were making intense use of (co)design methods and tools within the contexts of the Cities hosting their pilot activities. The call was managed by ANCI Toscana, the association of Tuscan municipalities, lead partner of Designscapes and now CLIMABOROUGH. In spite of its high degree of novelty (also on a procedural side), the call successfully passed the audit of the European Court of Auditors, without a single budget item being rejected. Moreover, funded initiatives displayed a clear potential and capability of **surviving in the respective markets** while at the same time **tackling successfully the so-called "wicked problems"** of modern times, such as demographic decline, foreign immigration, global warming, or people's disengagement from political and civic activities. Finally, direct **financial support to those initiatives** was complemented by a **huge capacity building effort** in design enabled innovation management, targeting the proposers first, as well as multiple stakeholder groups (citizens, researchers, practitioners, innovators and policy makers). In this way, Designscapes has fostered the linkages between research, policy and practice and paved the way to a considerable number of successful innovations, including from the public sector, which are now finding their own ways to scale and grow up. In CLIMABOROUGH, we have added further substance, also through new partners, to the Designscapes user base, assets and approach.

1.1.2 Ambition

CLIMABOROUGH has the ambition to **bridge the gap between design and implementation of urban innovations, particularly in the face of climatic change and its consequential needs for adaptation and mitigation**. The European Commission stressed this important point in its first official document of the 100 Climate Neutral and Smart Cities Mission (henceforth: the Mission): "*The main obstacle to climate transition is not a lack of climate-friendly and smart technologies, but the capacity to implement them*." This perfectly fits with the statement by Sir David Attenborough at the opening of the Glasgow COP26 Climate Summit, that in order to reduce global warming in the shortest possible time, "*we must recapture billions of tons of carbon from the air. We must fix our sights on keeping one and a half degrees within reach.* ***A new industrial revolution, powered by millions of sustainable innovations, is essential, and is indeed already beginning***".

There are many bottlenecks in the transition from prototyping to testing of innovation and from successful testing to market deployment. Some of them are summarised by the expression "**Valley of Death**" - or the anecdotal evidence that less than 20% of R&D results actually become products and services that people are ready to buy. In the specific domain of climate adaptation and mitigation, a particularly puzzling evidence (which may be peculiar to Europe, given the national barriers still impeding the formation of a truly Single Market) is that very few results from Smart City and so-called Lighthouse projects become actually widespread, gaining the critical mass required to transform solution providers from promising start-ups to pan-European "unicorns". Quite the opposite, the wheel tends to be reinvented locally every time and the administrative borders of the Cities participating in pilot actions tend to become insurmountable walls and barriers to replication - particularly from country to country.

In CLIMABOROUGH, we call such impasse "**siloed urban innovation**" and ask ourselves whether and to which extent **urban planning can and should be transformed in its current approach to spatial design and spreading of human activities, in order to break the silos that impede or slow down the transition** of European Cities towards a new ecological and digital order. In particular, we define and promise to test three innovative concepts:

1) The "**Climate Sandbox**", facilitating under a legal and/or administrative point of view, the diffusion of technologically and socially innovative solutions, whenever they can document a strong capacity of carbon

dioxide recapturing or climate change adaptation, much in the same way as in the past, urban transformation initiatives were facilitated by the regulator, whenever they promised to bring high socio-economic benefits;

2) The "**ClimHub**", which is more than a Lighthouse pilot, in the sense that it promotes and actively works for a faster and more widespread diffusion of sustainable innovations against the climatic threats, leveraging on the evidence-based learning generated by co-creation dynamics seeing startup companies and solution providers involved on a peer basis with local public sector authorities in innovative replication methods;
3) The "**Climate Service**", consisting in the transformation of climate-related data - together with other relevant information - into customised products such as projections, forecasts, information, trends, economic analyses, assessments,counselling on best practices, development and evaluation of solutions and any other service in relation to climate that may be of use for the society at large[1].

These three concepts will be tested within a significant number of European cities, characterised by a wide variety in size, interests and geographical location as described in the 5 steps of section 1.2, namely 8 leaders (all enrolled in the Mission) and 4 follower cities (+ 2 associates acting as observers).

CLIMABOROUGH is an **Innovation project designed to field test the ClimHub, Climate Sandbox and Climate Service concepts within 12 European Cities engaged (+2 observers) in their ecological and digital transition**. The project aims to enhance traditional urban and spatial planning approaches through **data and knowledge based decision making** (including a possible new role for GIS - Geographic Information Systems)**, including climate services co-production for transitions, cross-city and cross-country pilot co-creation** as well as the tactical use of **public procurement of innovative solutions**. The goal is not just to enhance an open set of tools leveraging climate transition in cities, but also to boost the exchange of experimental good practices, experiences and lessons learnt in this field, to help cities meet climate neutrality by 2050. This will be achieved by the following expected results: (A) **building *ClimHubs of Cities* and solution providers to work on experimentations in real conditions**, (B) **harnessing the collective intelligence of local stakeholders for collaborative solution development,** (C) **defining *Climate Services* as a model strategy to use data and visualisation tools for climate transition**, (D) **field testing the *Climate Sandbox* concept as a way to prioritise and facilitate transformation of successfully deployed prototypes into established solutions for climate adaptation and mitigation in cities**, and (E) **monitoring and assessing the progress in achieving those goals and in implementing a climate neutrality planning scheme**.

A key point for the project is that it is as important to adopt "**circular technology principles**" - thus reuse and combine existing solution prototypes for climate neutrality in Cities - as to innovate urban and strategic planning practices as a framework in which actions and initiatives for achieving that goal should converge. This means going beyond real life experimentation (expected result A above) and collective strategic learning (expected result B) to achieve "***a systemic transformation (…), supported by customised climate services, accompanied by a more strategic, holistic and long-term climate investment approach, together with a new city governance for climate action.***[2]".

This is why, in our opinion, a siloed urban innovation approach and a non-synergistic structure of operations cannot be climate effective and this must be reflected also in the practice of spatial planning and management, which all too often seems to follow its rituals rather than making own views and provisions more open (and flexibly so) to fighting the challenges of climate adaptation and mitigation. We see today an increasing number of start-ups and established companies proposing climate neutral products and services in cities, but struggling to find spaces and favourable legal and administrative environments for their **innovations to be experimented, implemented, and ultimately scaled above the pilot dimension**. Moreover, what is often lacking is a shared perception of the consequences for climate of alternative options for spatial planning that rarely go beyond generic recommendations without efficacy. This is probably also due to the difficulty of data gathering, measuring and visualisation of the implications of certain, apparently innocent, decisions. An example can be that of an IT Director considering not being involved in a Nature Based Solutions (NBS) impact assessment project, based on the implementation of a local data platform, thinking that it is not interesting or central for the digital transformation plans of the City. He/she will therefore not support the project, with negative consequences on the effectiveness of an action - the implementation of NBS - that may be extremely helpful for the urban environment but also depends on acceptance of all stakeholders, and especially the decision makers. Data underpins everything in a city, so any solution that has not built that into its thinking will be deficient (expected result C).

Once firmly established, evidence-based (via data) policies need new spaces for implementation. All too often, the existing legal and administrative conditions hamper or slow down the **needed transformation processes, which due to lack of evidence, are perceived as subjectively useful, instead of responding to a common interest**. Here is

[1] EU Roadmap for Climate Services. Street, R. et al (2015).

[2] Proposed Mission: 100 Climate-neutral Cities by 2030 – by and for the Citizens, Hanna Gronkiewicz-Waltz (chair), Allan Larsson (vice-chair), Anna Lisa Boni (rapporteur), Katrine Krogh Andersen, Paulo Ferrao, Emmanuel Forest, Romana Jordan, Barbara Lenz, Julio Lumbreras, Chrysostomos Nicolaides, Joakim Reiter, Martin Russ, Anne Sulling, Daniël Termont, Maria Vassilakou. (2020)

where our concept of Climate Sandbox becomes operational (expected result D). The term Sandbox has become popular in recent years, to define special platforms where regulators allow technology solutions to be tested without having to fit into an existing regulatory framework. Our definition of Sandbox moves one step ahead, from the prototyping or testing to the implementation phase. **We launch it as a challenge for urban planners and city decision makers, to define special pathways for climate related innovations to "fast track" the market**.

Urban planning and regulations influence the organisation of spaces, people and economies in and out of cities by promoting strategies, actions and policies that can also include and prioritise reaching climate neutrality. Their concrete adoption first implies coordination among different sectors (e.g. transport, energy, public services, but also lifestyles and behaviours, environment and ecosystems) and then integration among different types of intervention (policies, regulations, monitoring,...) that are related to planning in general and to long lasting transformation in particular, in a unique overall strategy setting common goals and targets. The strong fragmentation of policies has indeed limited the adoption of measures for climate adaptation and mitigation, and for carbon emission reduction. Furthermore, it contributed to the production of an uncertain framework in which collaboration between public institutions and private actors has become difficult to pursue. The spatial domain of urban planning has proved to span from local interventions in small neighbourhoods, to the entire urban landscape[3] but **comprehensive planning for climate has yet to prove its potentials and show its effectiveness** at different spatial scales for various aims, although theorised several decades ago[4]. The purpose of CLIMABOROUGH is to operationalize a comprehensive planning approach by proposing a unique, climate-sensitive urban planning framework able to synthesise and systematise the complex and often confusing sets of contributions established by sector-specific plans. The proposed planning framework is supported by two pillars: (1) a better utilisation of spatialized data, able to produce meaningful maps displaying territorial challenges and opportunities and providing the analytical infrastructure for experiment-driven policy making[5] and for gaining feedback from experiments; and (2) the direct involvement of citizens and stakeholders in the co-creation of shared visions of problems and solutions. The comprehensiveness of this climate-sensitive planning framework will be related to the **4 key sectors considered in CLIMABOROUGH, i.e.: (i) stationary energy, (ii) transports, (iii) waste, (iv) circular economy**, with particular attention on how accessible and participated experiments contributing to urban planning could foster more sustainable and healthier lifestyles and behaviours. Enabled by best available science-based climate information, the CLIMABOROUGH urban planning framework will work as an infrastructure tool to align initiatives, decisions and behaviours towards a climate neutrality mission[6]. Its alignment role will be reinforced by the development of an **Urban Planning Handbook** (milestone #10) composed of two documents, a technical one for policy makers, planners, public employees; another, "translated" in non-technical language, accessible, readable and usable by non-expert people, also to guide citizens in their actions to contribute practically to the transition to a net-zero emission economy across all sectors.

The efficacy of the planning policies and strategies adopted for climate neutrality transition will be measured and assessed through the **CLIMABOROUGH Monitoring tool** (milestone #1) based on performance indicators that can estimate the correct achievement of the carbon emission reduction objectives. The Monitoring tool can be used and applied for diverse planning purposes (among the many, regulating and assessing different scenarios of urban transformation). The methodology of the Monitoring tool will be set up with the Cities involved in order to test the replicability and the efficacy of the instrument in diverse contexts and with different socio-economic and environmental conditions. This will establish a continuous, unfiltered monitoring and evaluation system in the project (expected result E) as the basis for an efficient urban climate governance improvement, including all cities' internal processes and their consequences on external service providers.

In so doing, CLIMABOROUGH has the ambition to close the gaps between cities and **services**, between cities and **start-ups**, between cities and the **investment community**, and between cities and **their stakeholders**. "**MORE OF THE SAME IS NOT ENOUGH**". This is the principle CLIMABOROUGH adopts as a basis to make evident that the Climate Neutrality Mission implementation will be less effective unless synergized and integrated with other actions to produce a sounder impact on urban climate.

1.1.3 Specific objectives

Objective	Description	KPI

[3] Sandström I.G., Angelstam P., Khakee A. (2006) Urban comprehensive planning – identifying barriers for the maintenance of functional habitat networks, Landscape and Urban Planning, 75(1-2), 43-57.

[4] Wiens J. (1989) The Ecology of Bird Communities, Cambridge University Press, Cambridge. - Peterson D.L., Parker V.T. (Eds.) (1998) Ecological Scale. Theory and Applications, Columbia University Press, New York.

[5] Concilio G., Pucci P. (2021), The data shake: an opportunity for experiment-driven policy making. In Concilio G., Pucci P., Lieven R., Mareels G. (Eds) The Data Shake: Opportunities and Obstacles for Urban Policy Making, Springer International Publishing

[6] Kattel R., Mazzucato M. (2018) Mission-oriented innovation policy and dynamic capabilities in the public sector. Industrial and Corporate Change, 27(5), 787–801.

Key objective 1. Build, launch and manage a mission-oriented and hub-based programme to support a diverse range of urban areas across Europe in co-creating innovation to reduce emissions. **Connected to EXPECTED RESULTS: A, B, C**		
Specific objective 1.1 *Involvement of Cities* (Demand-driven approach)	A key point to fight climate change is to break silos not just internally in cities, but also between cities. The first objective will be to build on top of the 14 involved cities in the project to apply a demand-driven approach. And also to exploit the extensive relationships we hold with the 18 smart city 'Lighthouse programmes (124 cities); EU Smart City Marketplace initiatives (e.g. notably the 'Small Giants' community its mobility transition focus) and Living-in.eu (Currently counts more than 100 cities committed to the "European way" of digitalisation; Relation can be established via the various partners involved).	• 2 ClimHubs • 8 leader cities • 4 follower cities involved • 2 observer cities (associate) • 300 cities contacted • 10 new[7] cities recruited • Joint activities with EU SCM and Lighthouse communities • Support to Mission CSA
Specific objective 1.2 *Range of urban areas* (Heterogeneity of cities, matching EU's heterogeneity)	The cities involved in the consortium have a high degree of diversity according to many parameters (among which: degree of urbanisation, population, climate conditions, GDP). This heterogeneity will be further developed with the newly recruited cities.	• 20 countries • Small to metropolitan areas included
Specific objective 1.3 *Replication and mentoring* (Effective scale up)	The leader cities will support follower cities as mentors. Every topic will have a "City Angel" (from non-City partners) to help the mentors to support the follower cities to replicate the projects. The DG Research Innovation award winning 'packaging' approach provides an underpinning method in support.	• 8 mentors • 8 replications • 2 City Angels • 5 million funds • 4 packaged solution portfolios
Contribution to the work programme - *Contribution to the implementation of the Climate-Neutral and Smart Cities Mission and the various programs reported in the call for proposals.* - *Support a diverse range of urban areas across Europe.* - *Pilot demonstrations in at least 4 cities and, at least 4 follower cities* - *Support to leader cities to mentor followers.* - *Definition of a replication roadmap, re-usable in future demonstrations;* - *Increase the capacity building among European cities, to reduce the gap between cities to reach climate neutrality by 2030;* - *Define a community of cities collaborating on climate neutrality innovation via Living in EU, Smart City Marketplace initiative, Energy Cities, Major Cities of Europe, SIGI and DKSR communities.*		
Key objective 2. Establish and develop a scheme to support cities to define a business model with startups and established companies to improve the scalability of climate friendly solutions. **Connection to EXPECTED RESULTS: A, B, D**		
Specific objective 2.1 *Thematic plans* (connecting cities via topic)	To facilitate and ease the construction of a collaborative ecosystem and the matchmaking between public, industry partners, and investors, the project builds 2 hubs with associated executive plans.	• 2 ClimHubs • 2 topics (4 mission fields) • 1 executive plan per topic
Specific objective 2.2 *New Business Models* (connecting cities and startups)	The biggest issue for climate transition in cities, and more generally in the public sector, is the lack of a business model. The project aims at involving more public bodies (mainly local governments) and SMEs to find a common ground of work.	• 50+ local public bodies • 100+ SMEs • 4 packaged solution themes with bankable business models
Specific objective 2.3 *Innovative Procurement*	The project will further develop the successful scheme of Designscapes to provide cities with an innovative procurement mechanism useful to replicate successful	• 12 procurement calls in 2 rounds • No. of awarded services: 24

[7] Not included in the current consortium but in the mission entitled "100 Climate Neutral and Smart Cities by 2030".

(improve local solutions)	solutions to address climate change.	

Relation with the Work Programme and mission

- *Reduce the gap between cities and startups to create synergies to work on climate innovation to meet the targets set by the mission and the related programmes, also to create a new business model in the domain;*
- *Improve the scalability of existing solutions to increase the usefulness of unexploited services and products necessary to meet mission objectives in cities;*
- *Improve bankability of pilot demonstrations in cities, via the definition of business models*

Key objective 3. Support the ongoing formation of a community of cities and related stakeholders (citizens, companies, SMEs, associations…) to define a participatory model and ensure uptake endures and expands **Connection to EXPECTED RESULTS: B, C, D**		
Specific objective 3.1 *Co-creation*	Innovation proposed in each pilot will be the result of a participatory model, that will define long term outcomes and short and medium term action	• 24 products/services[8] • 800 stakeholders involved • 5000 citizens involved[9] • 1 standardised participatory modelling approach tested and validated for replicability • > 80% of satisfaction (cities)
Specific objective 3.2 *Living Labs*	Living Labs will represent a crucial infrastructure of support for participatory processes, and will be the repository of knowledge and the hub for capabilities that will underpin co-creation and support replications. Living labs will also be the space of interaction between stakeholders with different competences and skills, from public servants, to technical experts, from policy makers to designers and citizens	• 2 actions • 16 pilots • 8 services/products replicated

Relation with the Work Programme

- *Definition of co-creation mechanism, between cities and with stakeholders to improve participation of stakeholders in climate transition and urban planning;*
- *Support the participation of citizens to policy making in climate transition;*
- *Reduce the gap between city administrations and stakeholders in policy making.*

Key objective 4. Define and build a climate neutrality monitoring tool on the integration existing solutions **Connection to EXPECTED RESULTS: All**		
Specific objective 4.1 *Platform* (Open Urban Data and common Open Platform)	The project will propose a completely open source platform, as a knowledge centre, built on two successful and complementary ones, making it possible to provide a common digital space to CLIMAHUBS and tools for cities in their climate and digital transition.	• 40 datasets[10] • 16 services included • 100 stakeholders[11] involved • Full open source compliance
Specific objective 4.2 *Climate Neutrality monitoring tool* (Model on impact assessment)	Based on the data collected by the platform (SO4.1), the project intends to find a monitoring tool to define impact assessment in cities and to measure the healthiness of the progress towards climate neutrality and reduction in carbon emission, taking into consideration the governance and capacity development needs The question to answer is: how much does a demonstrator support climate neutrality?	• 1 monitoring tool • 14 Cities involved • 4 successful demonstrators • -55% emissions • Adaptation efforts defined and included in the cities development plans
Specific objective 4.3 *Improvement of existing solutions*	The definition of a platform and monitoring tool requests to inspect the opportunity to further exploit existing technologies not yet fully used, such as AI and Digital Twins. The project will define desktop research and it will	• AI / Advanced Analytics analyses • 1 Digital Twins PoC

[8] 16 products/services deployed and 8 replicated successfully.

[9] Full list available in section 2 ("Target groups").

[10] Those will be created by startups and proposed by cities (when existing).

[11] City servants of cities and users of the services. It will be a sample of the stakeholders involved and described in "Target groups".

	develop a proof of concept of a Digital Twin with the data collected.	

Relation with the Work Programme

- *Support the NetZeroCities project with a platform and various tools compliant with its plans and strategies;*
- *Integrate two existing solutions fully successful to propose an easy-to-use dashboard to cities;*
- *Identification of a re-usable monitoring tool to improve the assessment of demonstrations from a climate neutrality point of view;*

1.2 Methodology

CLIMABOROUGH is founded on a **staged methodology with 5 complementary and interdependent steps** addressing: (i) Co-creation of solutions in cities towards climate neutrality with stakeholders, (ii) Connection between startups/SMEs and cities for climate friendly services via public procurement, (iii) Deployment of climate services with living lab techniques, (iv) Definition of a Climate Neutrality monitoring tool (including monitoring climate transition of cities integrated in urban planning) and its evaluation framework, (v) Mentoring services to improve replication between cities. The processes within, and the outputs of, each stage will be governed by a panel of local government policy makers and experts in the field of smart city and climate change. These experts not only provide knowledge and know-how to the project, they also act as a communication channel bringing extensive networks, also in the domain of cities - a key point to drive the project to success. This naturally leads the project to be consistent with the pillars of the Mission, namely: 1) Climate City Contracts, as the project supports the cities to co-create needs and solutions with other cities and with the support of experts; 2) Mission Platform: building an open source platform fully compliant with NetZeroCities; 3) Tailor-made support with funding and financing: solutions that clearly contribute to societal equity and democracy, proposing and testing more distributive economic models, sensitive to gender equality, guaranteeing fair distribution of spaces and resources; 4) A Mission label to unlock synergies with other programmes, with a huge networking program driven by associations of cities; 5) Innovative city governance models and citizen engagement, via a model of co-creation including stakeholders in the definition of solutions; 6) Common frameworks for monitoring, reporting and verification, via the building of climate services and an ad hoc evaluation approach tailored on cities.

Key for CLIMABOROUGH is the HUBS approach that will support participating cities to define and deploy climate oriented, pathbreaking innovations – both on the technological and service side (i.e. content) and on the legal, administrative and spatial planning side (i.e. enabling conditions) – as defined by their Mission plans.

We have two thematic hubs, called **CLIMHUBS**. One focused on the transition "**from waste to circularity**", the second addressing the shift "**from isolated energy and mobility systems to integrated services**". They will address 4 of the 6 proposed fields[12] of the Mission. These themes offer engagement on more conventional infrastructure and service contents, where the innovation is perhaps on enabling conditions (e.g. like incentivising behaviour and lifestyle changes for specific vulnerable groups) through to areas of more progressive technical innovation. Each of the 2 hubs will include 4 of the 8 leader cities and the remaining ones as followers. The former demonstrate; the latter co-design, provide constructive challenge, and are ready for replication.

This approach will deliver: (a) effective knowledge exchange between cities, (b) more effective and collaborative replication amongst and from demonstrating leader cities and (c) codification of solutions for broader scaling in the market (exploiting the DG Research and Innovation award winning 'packaging approach' demonstrated within the Smart Cities 'Lighthouse' programmes).

The first action of the project will be to establish and consolidate the Cities in these Hubs. The whole structure will be supervised by a partner, UDNA, managing the related WP2, with the support of two "**City Angel**" partners (**Energy Cities & Urban Lab**) taking the operational responsibility for each theme together with their related cities. Additionally, climate proofing will be implemented by **HEREON** as a garant that all future activities will comply with the Paris Agreement. These chosen partners, ULAB, ENEC and HEREON, are well-recognised experts in mentoring cities in the field of the hubs related to them and in climate-related research.

[12] In its info kit, the mission indicates as key fields: (i) stationary energy, (ii) transport, (iii) waste, (iv) circular economy, (v) agriculture, forestry and other land use and (vi) industrial processes and product use. CLIMABOROUGH adopted the first 4.

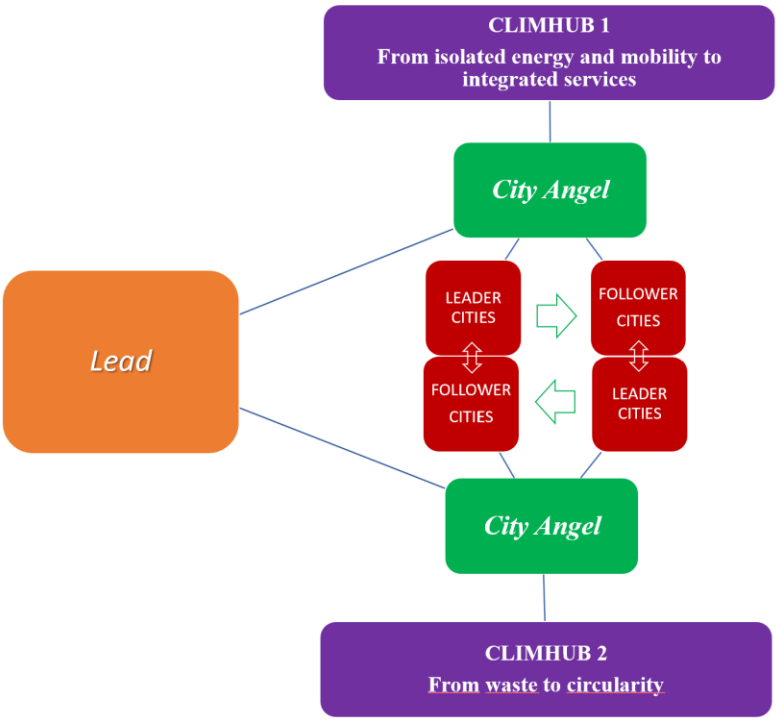


Figure 1: The CLIMABOROUGH Hubs

The **CLIMHUBS will work from end to end of the project life-cycle**, with a goal to reduce and make more fluid the currently lengthy life-cycles (consistent with the need for the market to speed up the adoption of solutions that secure our 2030 and 2050 goals):

- **Co-create**: leader cities will define, via the participatory mechanisms defined below, the strategic direction of their demonstrator together with a follower city selecting an objective on their topic. Design will consider what social needs are being met and outcomes desired; what technical options can service these; and what business models and financing schemes best serve successful implementation - in relation to the context of each city.
- **Business Models and Procurement**: each theme will consider the relative merits of different business models for the contexts of their cities; and where appropriate ensure that innovative procurement approaches are designed and tested that provide market opportunities for innovative small businesses.
- **Deployment**: each leader city will deploy the service/product, with contributions from follower cities.
- **Evaluation**: all cities will evaluate the various demonstrations within their hubs, supported by POLIMI (urban planning) and HEREON (climate transition) for defining monitoring tools.
- **Mentoring**: leader cities will mentor, also with the support of CITY ANGELS, the follower cities to drive and support them to replication - addressing enabling conditions (planning, societal engagement etc) and investment needs.

The 2 hubs will be linked in two ways. Firstly, with leader and follower cities being active across both areas in different roles. And secondly, by common, cross-cutting needs - like digitalisation, community engagement, planning, regulation etc. This will also favour innovative start-ups, as the successful innovations will be proposed for the attention of impact investors and venture capitalists for financial support to their further scaling and business growth.

1.2.1 STEP 1: Co-creating solutions between cities towards climate neutrality with stakeholders

The co-creation process of CLIMABOROUGH is based on three sub-steps: (a) **Building Systemic Innovation Capacity**, (b) **Codification and Packaging of Solutions**, and (c) **Data co-creation between cities**. The CLIMABOROUGH's ambition is to showcase to city managers, decision makers and other stakeholders across Europe the benefits and impacts (economic, environmental and social) of adopting the solutions co-developed with innovative SMEs and startups, and user communities, then demonstrated in several urban locations. This will strengthen their confidence and drive mitigation and adaptation, building their capacity to collectively contribute to climate neutrality.

This process will demonstrate, as requested and proposed by the New European Bauhaus (NEB), **the vital role that art and culture play**, as value-generating agents as well as engagement drivers, **throughout the co-design process**, acting both at levels of solution definition/development and attractiveness/marketing/adoption. This cross-disciplinary perspective will require considerable engagement and mentoring of 'conventional' technicians involved in infrastructure and service design activities. The City Angels will play important roles to ensure the Mission pillars remain in balance with other aspects of development.

STEP 1a. Building Systemic Innovation Capacity

The understanding and practices of innovation vary enormously across European cities. Our observation is that they are highly fragmented. What cities do to enable innovators and what innovation labs and hubs act on are often disconnected. Yet, we face future challenges that require extensive innovation. As such, from the outset, we will seek to connect and build capacity in all leader cities on 'systemic innovation'. This will follow a researched and tested (in India as part of the 100 Smart Cities Programme, and in EU cities, e.g. Brno) 4-pillar model for urban innovation (see Figure), which brings together the enabling actions of MS/city, with the (quadruple helix) communities that must innovate, the (virtual/physical) place and processes that make it happen, and the means by which that is made successful (investment, governance, measurement).

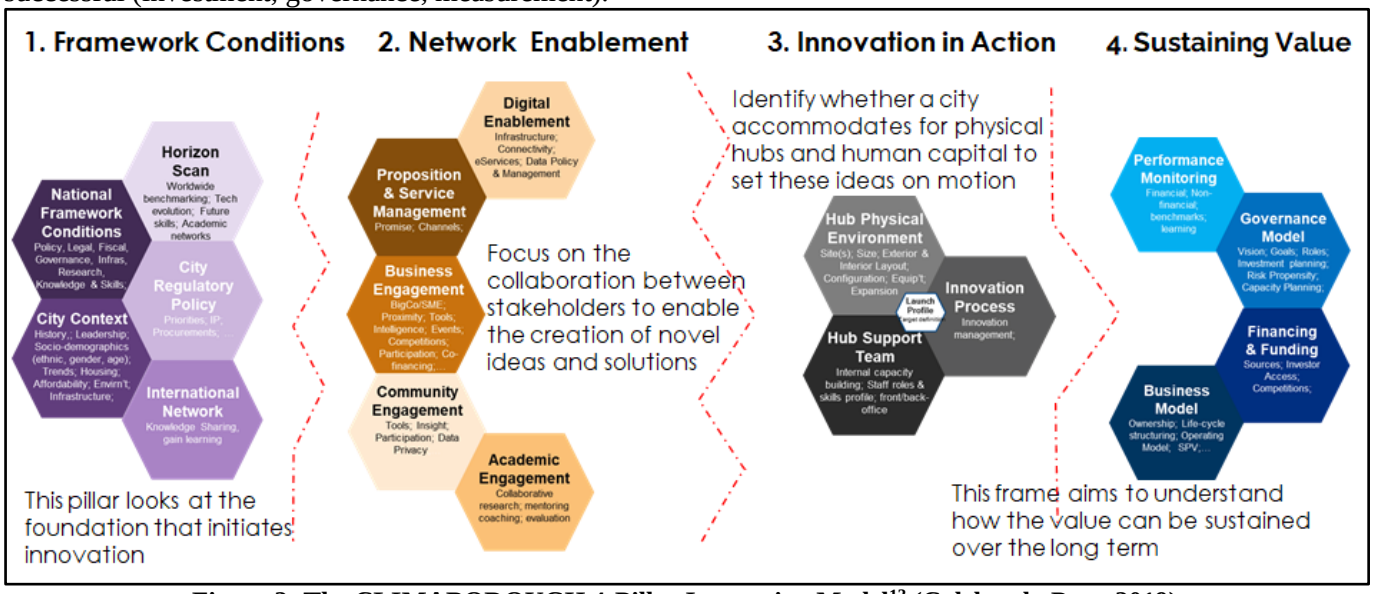


Figure 2: The CLIMABOROUGH 4-Pillar Innovation Model[13] (Colclough, Papa 2019)

This framework was co-developed through in-field application; augmented through collaborative multi-University research; tested and proven; published; and includes implementation tools; indicators, and case learning. The project will actively and collaboratively further develop this knowledge, and share and improve it with the wider pan-EU innovation community.

STEP 1b. Codification and Packaging of Solutions

The Sharing Cities EU-funded smart cities 'Lighthouse' programme (involving London, Lisbon, Milan, Warsaw, Burgos and Bordeaux) sought to scale-up smart city solutions. It set a bold goal to trigger €500m investment, leveraging the €25m EU-funds. To date the programme has identified a funnel in excess of €1 billion, and captured €270m. This bigger programme goal resulted in the cities collaborating far more effectively, and collectively delivering a variety of 'packaged' smart city solutions.

The best metaphor for the packaging concept is '**Lego™**' - familiar, trusted, affordable, standard and interoperable. Yet *enabling* innovation, and not built around 'one-size-fits-all' solutions. This increased the confidence of cities, industry and investors. It provides a structured backbone for scale market adoption. It affords better, cheaper, and faster solutions - which is of particular importance for smaller cities (which is where the majority of the EU population lives). **The philosophy, process and learning from that project is entirely applicable to the context of this proposal, and will be adopted by CLIMABOROUGH**.

Figure 3 summarises the packaging approach, highlighting (1) **the 'Lego™' metaphor**; (2) **the robust underpinning framework that notably brings social needs, technical designs, and business models and financing together** - often domains that remain in silos to the detriment of city outcomes; (3) **the cross-Lighthouse programme collaboration and beyond** (e.g. with the Smart Cities Marketplace); (4) through l**ife-cycle support delivering materials for the right people** at the right time (5) the **strength of a principle-led approach** (6) **delivery of practical guidance, tools, templates for a variety of city solutions** - also very relevant to this call, and (7) **benefits that the approach offers to city hall, industry investor and society**.

[13] Innovation in Cities: A prosperous route to a new mode of urban living, 2019, Colclough, Papa: https://issuu.com/francescopapa1/docs/innovation_dsui_white_paper_u-dna_v3.11_jul19

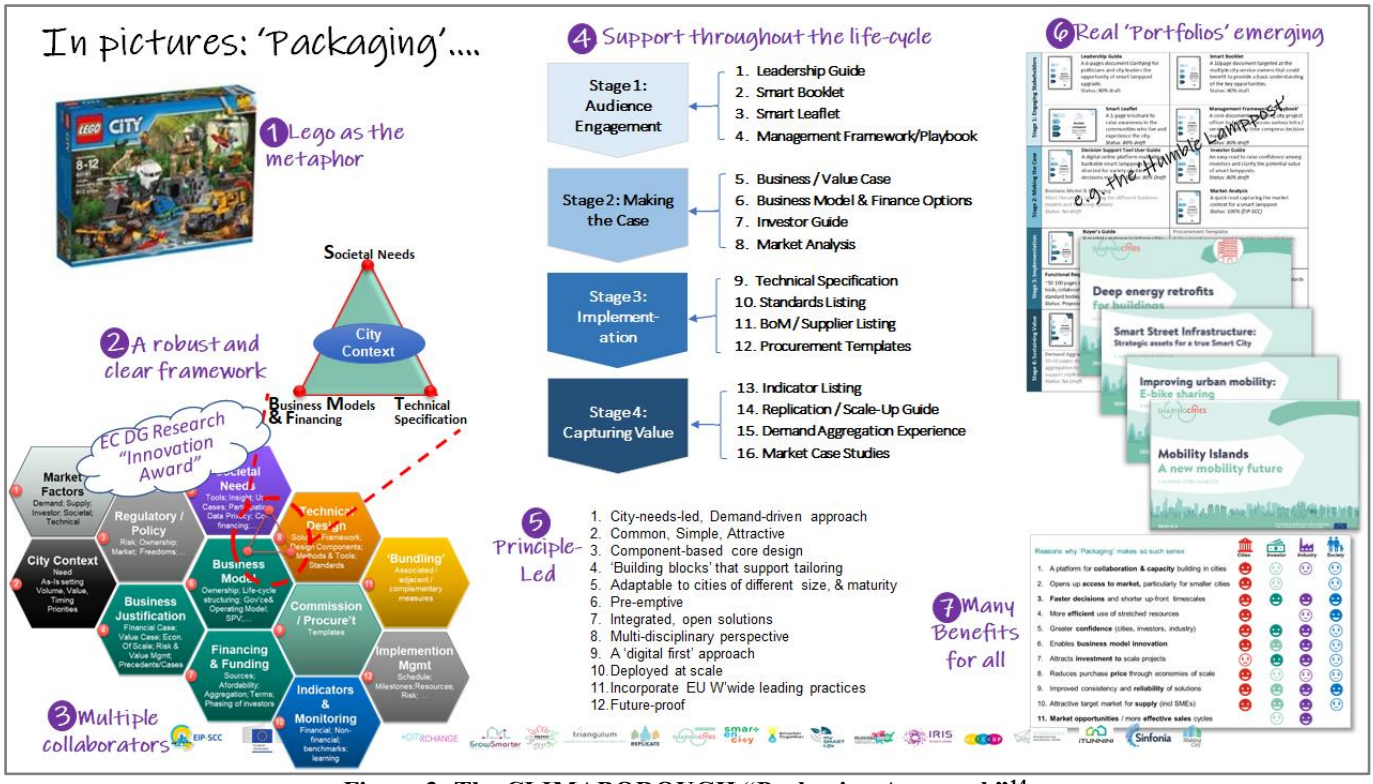


Figure 3: The CLIMABOROUGH "Packaging Approach"[14]

STEP 1c. Data co-creation between cities

We explained in Step 1a. how the vision of CLIMABOROUGH is to develop LEGO bricks to co-create services and products with cities. This has an impact on data as to create and implement these solutions, so it is also necessary to consider it. This includes many different sides of the same story: harmonisation, standardisation, data harvest and compliance, different sources of data. It is important to make cities network to get closer and closer on this subject. **CLIMABOROUGH will also include co-creation from a technical side, supporting municipal actors to interact with each other. This activity will, once again, start from the existing Morgenstadt Urban Data Community (UDC)**[15]. Organised by DKSR, the Urban Data Community offers municipalities, municipal subsidiaries, and regional organisations an exchange platform for jointly advancing digital urban development. The UDC will serve as a blueprint for city exchange within CLIMABOROUGH. Regular meetings and various event formats within the community will ensure short distance to efficiently develop solution approaches in close collaboration, make them scalable, and ensure rapid implementation in the individual member cities. In addition to the necessary development time, collaboration can save costs – for example, when joint procurement is worthwhile, or an application developed by municipality A is adopted by municipalities B, C and D.

We link the community with our diverse partners from the smart city sector in **innovation partnerships**. This enables access to diverse data sources and ensures the quality of the solutions in the long term. All cities come together to co-develop solutions. In the framework of the project it will also serve to refine the challenges for the open call for innovative procurement (see next step), to build up knowledge, simply a space for all city partners to come together regularly). Procured solutions will be listed on the online platform DKSR.square[16], which is a dedicated web portal for the UDC community with the aim of enabling rapid scaling and replication of existing open source as well as conventional solutions. All open source solutions are linked to a **GitHub repository**, from where Open Code can be adapted. DKSR.square can also serve as a web portal for all CLIMABOROUGH cities to exchange with their peers in private forums. A dedicated knowledge section and glossary provides information about the most important urban data topics. That makes it a sustainable tool that helps to scale solutions and grow cooperation beyond the project. The UDC distinguishes itself from other initiatives as the focus is on the joint development and ease of replication of digital solutions.

1.2.2 STEP 2: Connecting startups and cities for climate friendly services via public procurement

The goal of public procurement of innovation (structured in two consecutive rounds during the project's lifetime) is to **provide to all leader cities and, later, follower cities the services and products corresponding to their needs**. To this end, each of the 8 leading European cities identified above will be supported by a **federated public**

[14] The DG Research award winning "Smart City Packaging Approach" has been captured as short papers, presentations, and demonstration solution portfolios (e.g. urban data platform, mobility island, smart lamppost)

[15] https://www.dksr.city/en/acting-together/

[16] http://square.dksr.city/de

procurement of innovation call, managed by ANCI and potentially benefiting the remaining 7. Same will happen for the follower cities to fulfil the replication and scalability goal of the project.

Why this approach? It is fundamental to **align the leader cities** (and later the followers) as a single call procedure in every city would represent a bottleneck hardly solvable, but this is just one part of our story. Public procurement is an excellent tool, particularly if used in federating various cities and communities, to give visibility to it and to **attract an important number of startups and SMEs with stand alone solutions with a high potential, but not yet valorized**. This innovative tool, adopted by the Designscapes project, will represent an excellent value **to drive cities out of their *usual chains and bottlenecks* and to launch a very innovative process**.

The specific procurement instrument selected for this exercise is the innovation partnership, see art. 31 of the Directive 2014/24/EU. ANCI will launch and manage the tenders on behalf of the cities, identified as explained above. In preparation for the calls, **ANCI**, supported by all members of the consortium, **will organise 12 (online) Open Market Consultations, starting from the publication of the 12 challenge documents, which will be the basis for the discussions to be held during those events**.

This will happen in 2 different and very distinct phases:

- In the first half of the project [M07-M18]: **8 calls for innovation partnerships will be launched for the leader cities (4 per hub and 1 per city) with a global budget of 2.5 million Euros.**
- In the second half of the project [M31-M42]: **4 calls for innovation partnerships will be launched for the replication of services (1 per follower city without a limitation per hub) with a global budget of 700,000 Euros.**

During the consultations, the partners and cities will gain better insights on the state-of-the-art of technologies and on-going service developments, while potential bidders will become more familiar with the operational contests where innovations should be introduced. Thanks to the established dialogue between these two parties, potential implementation risks will be identified, and the sustainability chances of envisaged solutions will be enriched with concrete stakeholders' feedback. Finally, the calls for innovation partnerships will be published on TED (Tenders Electronic Daily), the online version of the 'Supplement to the Official Journal' of the EU dedicated to European public procurement, and also widely announced, including on Cordis as well as on the official website and videoconferencing systems. They will also be advertised on various social media platforms such as Twitter, Facebook and LinkedIn.

Each of the calls will foresee **6 evaluation criteria**:

- *Alignment:* Applications must be fully aligned with their targeted challenge.
- *Excellence:* Proposals must include a clear set of objectives and excellence/quality of the solution.
- *Design commitment:* Proposals must demonstrate the rationale and motivation of using which tools and methods for co-design and co-creation during the pilot implementation
- *Value for money:* Applicants must: (i) describe the solution specification and deployment steps that they aim to implement and consequently its value/benefit for the challenge; (ii) detail the overall project cost, the amount of funding requested and how it will be spent.
- *Capacity:* Applicants must provide credible evidence that the project delivery team has the necessary skills, infrastructure and management experience to be able to deliver the project in the timescales and budget specified.
- *Citizens' involvement*: the possibility that the solutions be used, tested and possibly assessed by citizens, thus demonstrating their utility for the community or for the city.

In the second phase, it will all work according to the same process, but the tender scheme will be obviously "replicating" the one of the first phase.

The role of City Angels will also be key as they will play a crucial role in **supporting** the cities in (i) the inclusion of citizens in the strategic urban planning process and in the city policy-making and decision making process, (ii) bringing local actors, resources and knowledge together into a permanent ecosystem, (iii) investigating novel and more diversified sources of financing, avoiding dependency on a single source of funding or models of ownerships where one stakeholder holds overarching decisional power (Topi, Lucchini 2019[17]). As described in par. 1.2.1, local partners, coordinated by the two City Angels, will provide **group capacitation and individual support** to the city representatives so they can update the initial content into a form that uses terms and language that innovation suppliers can easily assimilate. Special attention will be paid to finding a common denominator among different cities and countries, as well as enriching the challenge documents with information on privacy, security, ethics and interoperability requirements. After this improvement, the challenge documents will be ready to be shared with the participants in the Open Market consultations.

In support of the selection, the Consortium will hire a pool of legal and IPR experts after the closure of the Calls, paying attention to their potential conflicts of interest. The list of experts will be kept secret to all except in case of

[17] Topi C., Lucchini C., "Why City Agencies are key to the EU urban Agenda. A policy brief", Urban Lab, Torino, 2019. ISBN 9788861730076 https://eucanet.files.wordpress.com/2019/04/policy-brief_final-2.pdf

Name	Country	Expertise
Bardek Lisac Musec Skoko	Croatia	Public procurement
Bird & Bird	Europe	Procurement challenges/processes
Corvers	Benelux	Public (innovation) procurement
Equator Advocaten - Avocats	Belgium	Public procurement
Havel, Holásek & Partners s.r.o	Czech Republic	Procurement
LAW LAB	Cyprus & Greece	Procurement and Administrative
PwC Legal Eesti	Estonia and Baltic	Public procurement
Schramm Öhler Rechtsanwälte	Austria	Public procurement, competition law

an audit. Here are some EU firms who could be involved in the selection task.

An **External Advisory Board** to the project will be established in support of the process, involving 5 key profiles:

Name Surname	Short bio
Stefania Crotta (Italy)	*Stefania is director of **Energy, Environment and Territory** at the Regional government of Piedmont and technical coordinator of the Commission of Regional Councillors in the context of consultations on draft legislative decrees and ministerial measures on energy related matters.*
Lisa Lang (Belgium)	*Lisa is director of Policy & EU Affairs Orchestrator at EIT Climate KIC. She has been acknowledged by Forbes as one of the Top 50 Women in Tech. She defines herself as an **Innovation & Skills Expert, CCI & NEB Advocate**, connecting the dots.*
Mor Harir (Israel)	*Mor is the Director of Innovation and Sustainability at Ramat Gan Municipality. Mor is an expert of **climate change**, with an important focus on **cities**. She gained her experience in Innovation management as a consultant and a researcher at the Israel Smart Cities Institute (ISCI). Later, as the CEO of a Start-Up in the Smart Mobility field - JusDrive.*
Snezana Scepanovic (Montenegro)	*Snezana is manager for International cooperation and Financing at the Innovation Fund of Montenegro; and full Professor at Faculty for Information technologies, University "Mediterranean", Montenegro. She is also an expert in **evaluation of projects and monitoring and implementation of grants**.*
Joanna Syrda (Poland)	*Joanna is an assistant professor at University of Bath (UK), part of the management board of ASM ASM Research Solutions Strategy (Poland) and of the Steering Committee of ECTP . Her research agenda focuses on (a) **differentiated goods markets, market structure & outcomes, and resulting policy implication**, (b) search, social learning, herd behaviour and reputation concerns, and (c) **gender equality**. Her research has been featured in media outlets across the globe.*

1.2.3 STEP 3: Deploying climate products and services with living lab techniques

Once the public procurement will have made it possible to define climate products and services useful for cities, it will be necessary to deploy them and to test them in real conditions to evaluate the results.

CLIMABOROUGH has defined its **demonstration stages in three cycles** concentrated on testing the functioning, accuracy and effectiveness of technical and non-technical outputs with the various stakeholders involved in the definition of the services and any others involved. At the end of every cycle, the demonstrators, linked to datasets (see step 4c), will be evaluated to define: (i) the usefulness of the solution, (ii) the impact on urban planning efficiency and (iii) the impact on climate neutrality.

Leader cities will then have a first prototyping cycle of 5 months, consisting of the deployment and the collection of data useful for the evaluation, later followed by small cycle of evaluation (1 month), useful to deploy the service again with eventual improvements, before a **final evaluation**, necessary to benchmark the service for mentoring and replication.

The conclusions will be drawn after those cycles as to define (1) which are the main determinants of the acceptance and use of the solution(s), (2) its impact on climate neutrality, (3) eventual needs of improvements, and (4) what are the best conditions for future deployments.

The third cycle will be done by replication, allowing follower cities to deploy services deployed in leader cities and the project tools (platform and the climate neutrality monitoring tool).

The EAB panel composed of acknowledged experts in policy making, cities, climate change and gender equality will support with their feedback on the assessment and validation of the demonstrators.

1.2.4 STEP 4: Defining a Climate Neutrality monitoring tool and its evaluation framework

CLIMABOROUGH will define a Monitoring tool, based on a set of Performance indicators (KPIs) to measure the change in crucial sectors for reaching climate neutrality and quantify the project impacts. The indicators will track progress towards the net zero emissions and help define the most appropriate planning strategies to ensure the achievement of key and specific objectives.

This effort will request to have a platform and data to analyse, then this step will be done on a 3 sub-steps approach: (a) building the project Data Platform, (b) collect from startup services and cities the data and (c) define the evaluation with KPIs and the related target values. This is described in the next paragraphs more in detail.

STEP 4a. Urban Planning and Climate neutrality evaluation

CLIMABOROUGH will define a **Monitoring tool by identifying a set of Performance indicators (KPIs)** useful to identify the impact of solutions and project impacts in terms of climate neutrality. Those indicators will track progress towards the net zero emissions and help define the most appropriate planning strategies to ensure the achievement of specific objectives.

The tool will be defined considering the different territorial specificities of the CLIMABOROUGH Cities to guarantee the replicability of the tool itself and the adoption in many other contexts. The Monitoring tool will be validated in 4 cities (the other 4 will be validated in a more "traditional way", also to compare the results) selected according to the different characteristics explained in paragraph 1.2.2. The KPIs will be developed taking into account the indicator sets already existing at national and EU level for the evaluation of CC resilience. The tool will also take into account the experiences made in other Adaptation Mission projects and especially try to harmonise European wide approaches currently undertaken regarding measuring climate adaptation at the local level. To this purpose there will be a series of virtual workshops.

This tool will be then used and exploited by the **Climate services** proposed by the project. What are climate services? They cover the transformation of climate-related data — together with other relevant information — into customised products such as projections, forecasts, information, trends, economic analysis, assessments (including technology assessment), counselling on best practices, development and evaluation of solutions and any other service in relation to climate that may be of use for the society at large. As such, these services include data, information and knowledge that support adaptation, mitigation and risk management[18].

To make the monitoring tool and climate services compliant and useful, CLIMABOROUGH will propose a data platform, as described below.

STEP 4b. CLIMABOROUGH Data Platform

The hubs will be virtual and they will be represented by a platform that will also make available to cities tools to manage and follow the KPIs associated with every pilot. The platform will be mostly based on two existing complementary solutions, provided on a fully open source model. One is provided by SIGI (SIGINOVA) and one by DKSR (Open Urban Data Platform), those will be supported by IMT with their knowledge and know-how about Digital Twins, making sure to support testing the adaptation of this technology to the platform.

The **choice of** these **two platforms** has been made due to their **particular nature**, particularly **SIGINOVA** which is an open framework to deliver digital urban solutions created by SIGI, an association of 101 cities in Luxembourg with a specialisation in IT, and now deployed in all municipalities in Luxembourg. Its framework is in the process of being published as an **open-source** project so that cities in other countries can also use it and contribute to its further evolution (pilot project ongoing in Belgium). The plan is to **support the scale up of this solution**, **also due to the integration with the DKSR Open Urban Platform (OUP)**. The DKSR OUP is an open source platform following the DIN SPEC 91357 for open urban platforms as recommended by the Smart Cities Marketplace, living-in.eu, and others for harmonising, anonymising and making sense of real-time urban data to address challenges and monitor the impact in various areas of urban design. The platform will be linked to the Copernicus Climate Change (https://climate.copernicus.eu) and EURO-CORDEX (https://www.euro-cordex.net) platforms to provide the best climate science related information available.

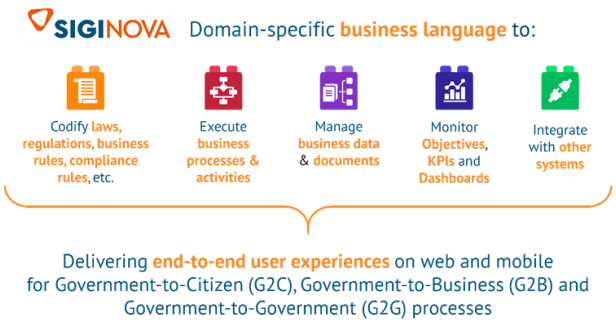
Existing solutions

SIGINOVA is based on a low-code, domain specific scripting language specialised to create government-to-citizens (G2C), government-to-business (G2B) and government-to-government (G2G) user experiences orchestrating different building blocks, namely:

- Business logic from national laws, city regulations, business rules, compliance rules, etc.;
- Business processes and activities;
- Business data and documents;
- KPIs and political/operational objectives published in dashboards;
- APIs to exchange data, documents and business activities/processes with others.

Siginova is based on a 100% open-source technology stack: Kubernetes, Docker, Rancher, MongoDB, PostgresSQL, Redis, Elasticsearch, RabbitMQ, MPS, Jasper, Apexcharts, Swagger, etc. It includes security and GDPR privacy by

[18] EU Roadmap for Climate Services. Street, R. et al (2015).



design. It is vendor-agnostic and supports scalable cloud deployment respecting data sovereignty and vendor neutrality requirements. Business analysts can use the low-code language to create applications for municipalities much faster than with traditional development tools. Applications are published via an app store on a portal embedding social media features such as news channels, notifications, chat, etc. accessible from desktop as well as mobile devices (responsive web interface).

The **DKSR Open Urban Platform (OUP)** is an open-source urban data platform based on the Smart City Marketplace (formerly EIP-SCC) reference architecture and on specifications according to DIN SPEC 91357 for open urban data platforms. Overall the DKSR OUP follows the specifications set out by the MIMsPlus document by living-in.eu.[19] The core technology is based on the field-tested UrbanPulse Platform, developed by the urban software institute, which has already been successfully implemented, tested, and is continuously enhanced in over 40 municipalities. The platform has its particular strengths operating IoT-based applications with real-time functionalities (such as, for example, environmentally sensitive traffic control). Such applications account for a large part of the Smart City solutions that can benefit from an OUP (see Figure 4).

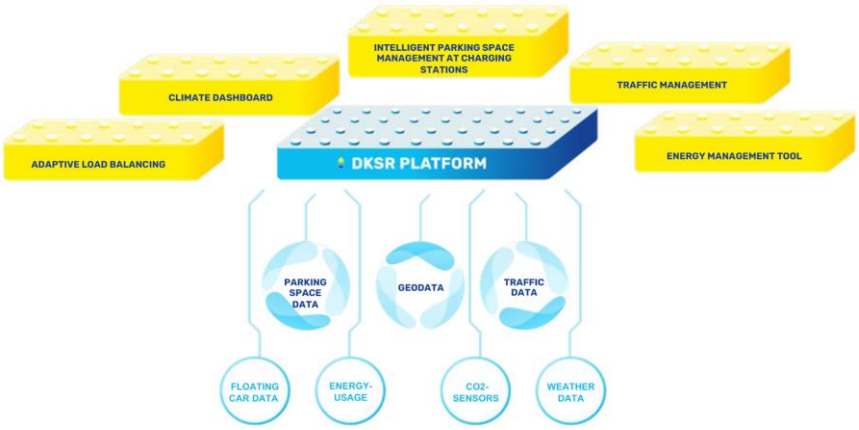


Figure 4: The CLIMABOROUGH OUP as objective data aggregation and harmonisation layer

The OUP Platform focuses on minimal latency, meaning that the time between data acquisition and data provided is kept as low as possible, within a milliseconds range. In this way, sensor data can be processed, analysed, and distributed in near real-time, and used to immediately respond to what is happening in the city, municipality, or region.

Integration of solutions, data and further developments planned

[19] https://living-in.eu/groups/commitments/technical

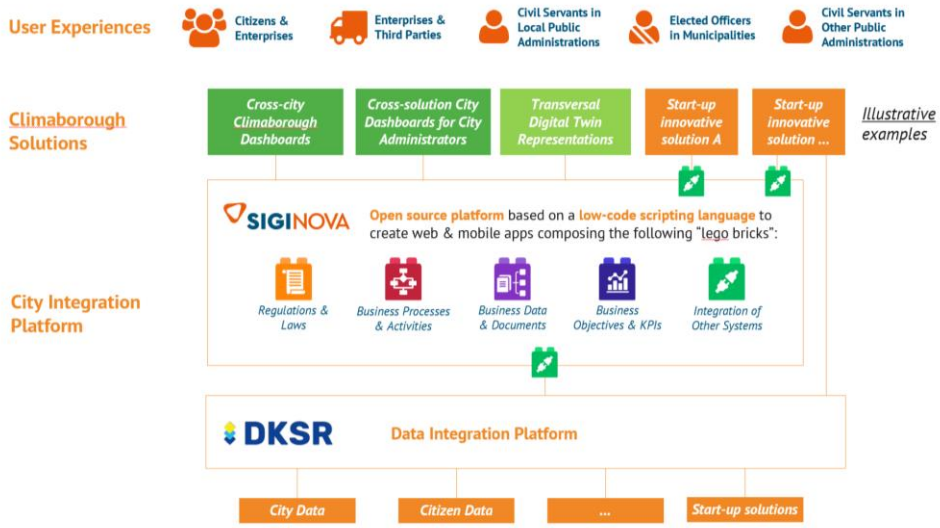


Figure 5: The CLIMABOROUGH platform architecture

SIGINOVA and OUP are two perfectly compliant solutions, which will be integrated as shown in figure 7. The various climate services proposed by the startups will be linked to the platform (based on SIGINOVA), making it possible to use OUP potential which will be fully connected to the platform. This will be **open source**, therefore compliant to any other platform, **including for reporting purposes with NetZeroCities**. The particular advantage is that SIGINOVA will provide the framework to give to cities a tool providing (i) Faster development and reuse of digital solutions across different cities, (ii) co-design with business stakeholders to create end-to-end G2C, G2B and G2G user experiences and (iii) digital sovereignty: data + software + cloud sovereignty. Moreover, it will allow all users with custom profiles a dedicated interface (a civil servant and a citizen will have a different interface). OUP will be connected to SIGINOVA, being the two solutions fully compliant, with the duty to collect and harmonise the data to make it useful for cities and the evaluation (see STEP 4c).

STEP 4c. Connecting data to the solution

The procurement process will drive to **select various climate related services/products** (16 expected[20]), provided by **startups**, useful for deployment in cities. Those **services will create and provide data that will be collected by the platform** and they will be made available for the construction and the deployment of the Climate Neutrality monitoring tool as described in STEP 4a above.

The collection of data will be a key element of the project as it will allow to connect the demonstrators, as a whole and individually, to the climate impact of the service, allowing a view and an evaluation per pilot, per city, per hub and per project.

1.2.6 STEP 5: Mentoring between cities to improve replication of services

CLIMABOROUGH will work on one hand to produce a **replication plan** at the level of the municipality/city involved in the project consisting of identification of project results' potential and possible pathways of using them in the future and on the other hand to work on experience exchange and knowledge transfer between pilot projects. The latter will aim to make a **comparative study of the implemented experiments**, from all relevant points of view. It will be done to increase replicability and facilitate dissemination. Two **joint meetings** will be organised by ENEC, with the support of ULAB, with Partner cities to inform them about the elaboration of the replication plan and exchange knowledge transfer between pilot projects and several bilateral meetings to concentrate on each city replication plan. The followers that will be interested in replicating a service/product will be then supported by City Angels to **fully replicate the cycle of the leader cities**. This activity, related to WP5 and broken in 2 tasks, will work 4 sub-steps as reported below that will feed the **replication roadmap** of the project.

STEP 5a. Definition of replication strategies

Each follower City will elaborate an integrated replication strategy based on the feedbacks received throughout the project activities, this will be done thanks to (i) a peer to peer review with leader cities;, mentoring on their products/services, and (ii) an intensive lab session per each follower city, including related stakeholders.

STEP 5b. Setting up a replication framework

This task will focus on the analysis of the different activities demonstrated in the leader cities and the evaluation of their respective replicability potential, involving replication of solutions within and between the lighthouse cities. This will include various activities, namely (i) **evaluate the local conditions in cities**, (ii) deliver a individual roadmaps including the objectives and areas targeted and different stakeholders, and (iv) exchange with the other

[20] 8 more are expected from followers after the leader cities deployment.

leader cities on their respective replication process through organising decision-maker workshops/city residents.

STEP 5c. Increase the number of cities

CLIMABOROUGH will work to involve new cities and to increase the base of cities that may replicate services, making possible also to improve the scalability of startups solutions. This process will be based on a number of actions, such as (i) establishment of group of cities (up to 10) willing to replicate the solutions, (ii) organisation of "replication" workshops/webinars during existing events (Energy Cities and Major Cities conferences, other events of partners), (iii) Organisation of one study visit in each of the leader city, (iv) organisation of a dedicated task force to share experience and advice cities willing to replicate Smart solutions: participation in EU initiatives promoting knowledge-sharing among smart cities (e.g. Scalable Cities' City Coordinators Group, Joint SCC events; Covenant of Mayors' activities).

STEP 5d. Dedicated public procurement

The replication will take benefit of a dedicated public procurement round, to allow 4 services/products to be taken up in follower cities as explained in STEP 2. Follower cities will then restart the process from STEP 2.

STEP 5e. Connecting startups to investors to fund more services

This step draws on the findings of exploitation in order to elaborate a well-thought-out and coherent go-to-market plan meant to drive the exploitation efforts once the grant period is over. It will focus on the analysis of the competitive positioning and the competitive benchmark against the yardstick of best-in-class rival offerings. A parallel thread will have to do with testing market hypotheses related to problem-solution fit and product-market fit: prospective users will be engaged in the experimental playgrounds set in WP5 and WP1. Results obtained will allow refining the multi-sided business model with the goal of elaborating scale-up strategies (e.g., growth hacking) as well as monetisation logics meant to attract premium clients for startups. This process will support replication, creating a matchmaking process with impact investors and venture capitalists through the so-called "information memoranda" for possible financial support to their further scalability and growth. We think of solutions having an initial TRL of 5-7 and being brought to a higher level thanks to the CLIMABOROUGH demonstrations. Should the outcomes of this process be encouraging, the consortium will reinforce existing collaborations with EU business angels, venture capitalists and impact investors to create a waterfall financial instrument located in Luxembourg, aiming to give continuity to the interplay between public and private resources.

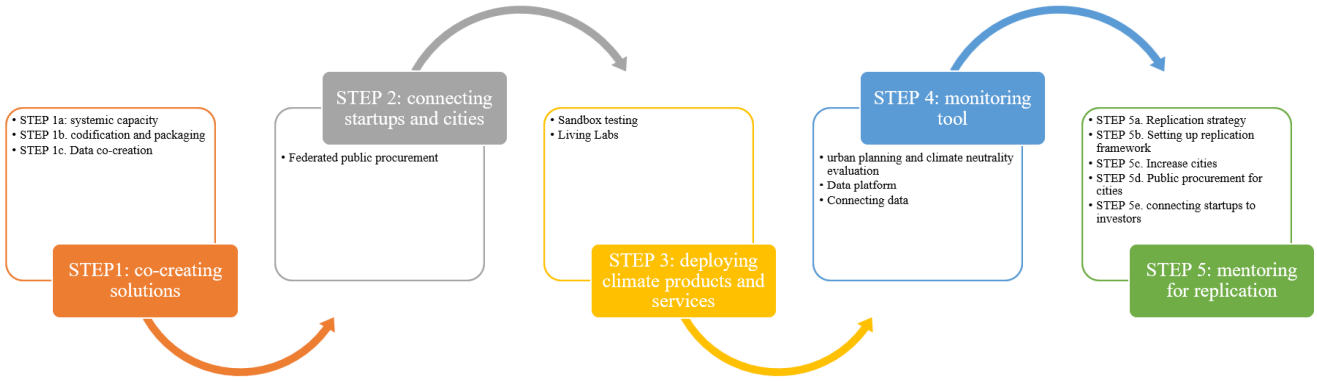


Figure 6: The CLIMABOROUGH STAGED methodology

1.2.7 Cities of the CLIMHUBS: leaders and followers

CLIMABOROUGH has involved directly, as requested by the call, cities in two roles: leader and follower.

Action/HUB	Description	City ANGEL	City LEADER	City FOLLOWER
From isolated	The need to rethink the way we live and we move in our everyday life comes from the evidence of the last years	Urban Lab	Differdange Grenoble	Torino Maribor

energy and mobility to integrated services	crises, that qualify the energy crisis in relation to: a) the need to differentiate and distribute the sources (and the geopolitical dependence they may create), b) the need to make clear and urgent choices towards less polluting sources for sustainable mobility and changes in mobility habits and housing. and c) the need to rethink the demand, that implies a radical rethinking of our socio-technical systems.		Athens Sofia	Cascais Ioannina Katowice Prijedor Krk Pilsen
From waste to circularity	Waste is a key in climate neutrality strategy. The shift from waste to 'resource recovery' requires both mindset and technological change. Cities offer a logical convening force for circulatity. Ideas, collaboration, value cases, and capacity building are vital aspects to address those.	Energy Cities	Torino Maribor Cascais Ioannina	Differdange Grenoble Athens Sofia Katowice Prijedor Krk Pilsen

Leader cities

The leader cities submitted an Expression of Interest to the "*100 Climate Neutral and Smart Cities by 2030*" mission. This role requires an involvement in the definition of the pilots, support to the coordination for the public procurement, the deployment of the solutions, the dissemination / communication and to give full access to useful information (including on the field visits) to the project partners. This includes mentorship to the follower cities for replication of the services. Every city will lead a pilot under one topic, where the city is obliged to ensure sufficient commitment; and it becomes a follower on another topic, in which the city needs to learn from more advanced ones. The Cities were selected from a "*diverse range of urban areas across Europe*" as requested by the call. All these cities are related to a thematic hub and a challenge in which they will lead an experimentation pilot, as reported below. As explained in the previous paragraphs, the choice of cities has been driven by different characteristics, with a particular interest in defining variety from various points of view, more precisely:

City	Country	Country Size	Country GDP	Capital	Size	Position	Landscape	Air quality
Athens	Greece	MID-SIZED	LOW	NATIONAL	over 500.000	Mediterranean	Sea	Moderate
Cascais	Portugal	MID-SIZED	MEDIUM	REGIONAL	Below 500.000	Atlantic	Sea	Good
Differdange	Luxembourg	SMALL	HIGH	REGIONAL	Below 500.000	Central Europe	River	No data
Grenoble	France	BIG	IIIGH	REGIONAL	Below 500.000	Alps	River/mountain	Moderate
Ioannina	Greece	MID-SIZED	LOW	REGIONAL	Below 500.000	Mediterranean	Lake	No data
Maribor	Slovenia	SMALL	MEDIUM	REGIONAL	Below 500.000	Balkans	River/mountain	Moderate
Sofia	Bulgaria	MID-SIZED	LOW	NATIONAL	over 500.000	Balkans	Mountain	Poor or very poor
Torino	Italy	BIG	MEDIUM	REGIONAL	over 500.000	Alps	River/mountain	Poor or very poor

Table 1. Distribution of cities in CLIMABOROUGH[21]

CLIMABOROUGH's vision is related to the "Small Giants" concept, defined in the framework of the Smart City Marketplace of the European Commission, but considering that our project also needs to include cities that may not have been considered part of that initiative because of their size. Many other features, related to the city or the country, have to be taken into consideration to have a real success of the mission. The "European champions" are for sure very important, but it is a key element to include and to work with "smaller" or less advanced cities, often

[21] We consider:
- big countries the top 5 in the EU per population, mid-sized between 6 and 15 and small after 16.
- high GDP to be part of the top 5 in the EU per population, medium between 6 and 15 and low after 16.
- Air quality is define on EEA data: https://www.eea.europa.eu/themes/air/urban-air-quality/european-city-air-quality-viewer

underestimated, while they show a particular resilience and ability to innovate with lower resources and a clear desire to collaborate with other cities and with local stakeholders.

The variety of leader cities is a key of the project and they have been selected to be as different as possible on an 8 points categorization. **This variety is an important strength to test and to stress the various tools defined, built and deployed by the project**; this being a fundamental principle to build a strong and transparent monitoring system. It is not surprising to have, in some categories, **cities with some similar characteristics, enalbling us to test the results by category**. An example is Athens and Ioannina, two cities of the same country, but with a huge difference from any other point of view (size, landscape, data). Their participation will allow **CLIMABOROUGH to test the usefulness of the tools and methodologies, including the need to test co-creation and replication methods also internally in a country**. This is **valid also for any other category**. Another example are Torino and Grenoble, very different cities with a geographical and landscape affinity. Then, we can conclude that **CLIMABOROUGH's vision is to use the variety of its cities to drive this heterogeneity on demonstrators to evaluate the initiatives on climate strategies and to define the impact of on the field experimentations on climate neutrality**.

Every City works on a particular challenge and will follow the ones of another topic, enabling more advanced cities to support less advanced cities on that topic, and vice versa. The leaders will also mentor, supported by the City Angels, the follower cities to improve the chances of replication processes. This will strengthen collaboration.

Challenges of LEADERS of the "From isolated energy and mobility to integrated services" CLIMHUB

ATHENS (Greece)
Population: 664.000 Inhabitants (3.828.434 in agglomeration)
Air Quality: Moderate
Landscape: Mediterranean/Sea/Mountain

Challenge: The City of Athens has identified the environmental challenges and focuses the recent years in the creation of a greener city enhancing the indicator of quality of life as a crucial urban target. Since Athens is a city that suffers from heat waves, floods and poor air quality, the need of a cultural change to understand, support, and promote its green environment is primordial. To this end, Athens launched its Resilience Strategy in 2014 that mapped the city's needs and suggested a set of practical actions for implementation towards an open, proactive and green city. Athens aims at **reducing the level of stationary energy consumption** targeting sources such as buildings' interventions (near zero energy buildings, smart grids) starting from institutional sites and facilities (municipal) and with the vision to expand to others as well. Generally the city is on its pathway towards digitalization of its services and management of urban assets, introducing smart city solutions in its operation.
Actions foreseen include **infrastructure improvements** e.g. building renovations, cool pavements, green roofs, street smart lightning etc. Other measures include a research on the increase of green spaces and percentage of shadowing with tree and vegetative cover e.g. pocket parks in order to tackle the urban heat island effect. Finally the above are directly correlated with the vision of citizens' and visitors' raising awareness and behavioural change.

DIFFERDANGE (Luxembourg)
Population: 26.000 Inhabitants
Air Quality: No Data
Landscape: River/Central Europe

Challenge: Differdange is the third biggest town in Luxembourg located in the south of the country in the border triangle with Belgium and France. Since the 19th century, Differdange has shown its strength with the start of industrialization with local mining operations and one of Luxembourg's biggest blast furnaces. With its economic development, Differdange offered to be a new home for people from all around the world with 118 nationalities making up more than 50 percent of the population. Diversity comes with socioeconomic challenges, which Differdange had to manage in its past and which are a factor in reaching climate neutrality goals. This is why the environmental policies of the city concentrate a lot on growing support in the population, while not forgetting the city's ties to the local industrial sector. The city of Differdange committed to climate transition since 2013 signing the Pacte Climat mission (local and national initiative in the framework of the European Energy Award) and joining the Klima-Bündnis Lëtzebuerg (national office of the European Climate Alliance). Differdange is also active on circular economy with initiatives to support the development of a healthy, organic, short-circuited food system to increase local production in fruits and vegetables, also leveraging cross-border cooperation (cfr. Territoire Naturel Transfrontalier). With the Climaborough project, Differdange will address two main climate action challenges: i) adopting innovative ideas, processes and tools to **stimulate climate-responsible behaviours** taking into account the opportunities and challenges of the multinational/multicultural population in Differdange; and ii) **involving the private sector in the climate actions,** in particular the large industrial partners active on the territory of Differdange in economic sectors such as steel, plastic fabrication, food processing, etc.

GRENOBLE (France)
Population: 450.000 Inhabitants
Air Quality: Moderate
Landscape: Mountain/River/Alps

Challenge: Grenoble-Alpes Métropole is composed of 49 municipalities and 450.000 inhabitants. The Metropole is carrying out an ambitious development project called GRANDALPE[22] with the City of Grenoble, Echirolles and Eybens. This project concerns an area with 30.000 inhabitants and 40.000 jobs and aims to make this district an active living space, an innovative economic hub, and a leader in new mobility. The GRANDALPE project is also intended to be a demonstrator of the ecological transition and will **mobilise all the assets to build a city without fossil fuels**. Within this meta-project, the Metropole is developing a new way of doing the "Fabrique de la ville" with 3 main areas of work: (a) **promoting the voice of citizens** in its development, (b) mixing **culture and art** in the project, (c) developing **tactical urbanism**. The objective is to develop temporary activities / projects with all the resources and stakeholders (companies, SSE actors, artists, and citizens) to prefigure the transformation of the territory. Grenoble-Alpes Métropole will propose to work on the elaboration of innovative processes of consultation and participation to accompany the implementation of GRANDALPE's actions according to the 3 work axes presented above: voice of citizens, culture and art, tactical urbanism.

SOFIA (Bulgaria)
Population: 1.500.000 Inhabitants
Air Quality: poor
Landscape: Mountain/Balkans

Challenge: Sofia is the capital of Bulgaria and the 14th largest city in Europe with almost 1,5 million inhabitants . Some of the main problems facing Sofia are the **high levels of harmful emissions and the high levels of noise pollution** in the city. One of the reasons for this is **car traffic**, the large number of **old cars**, including a large number of **diesel cars**. At the same time, global greenhouse gas emissions are constantly rising and are the main cause of climate change. Continuous exposure to high concentrations of harmful emissions has a negative impact on human health in high-traffic areas. **The car's impact on the environment has been proven to be negative**. It is one of the main air pollutants in cities. The large number of cars leads to traffic problems, congestion and reduced quality of the urban environment. The centre of Sofia is an area full of diverse activities, which naturally attracts a large amount of car traffic. At the same time, getting around and parking in the central part of the city is very difficult. Unlike most Western European large cities, where the street network is built as a structure and dimensions almost 100% adapted to cars, in Sofia this is not the case. The existing primary street network as a structure is incomplete. That is why our main goal is to **reduce the use of personal cars**, which will have a positive impact on air quality and climate change. By solving **key parking problems and offer more cleaner, shared light mobility options,** Sofia will largely achieve control of unwanted car traffic and congestion. The effect we are looking for in improving parking conditions, by tightening controls and introducing greater restrictions, is to speed up the transition and get as close as possible to climate neutrality. Sofia's ambition is to put an end to the aimless wandering of cars in the central parts of the city in search of parking places. Providing citizens with an intelligent technological solution that will reduce harmful emissions and climate neutrality will not remain a mirage.

LEADERS of CLIMHUB "From waste to circularity"

CASCAIS (Portugal)
Population: 216.000 Inhabitants
Air Quality: Good
Landscape: Sea/Atlantic

Challenge: Cascais is in the outskirts of the Lisbon Metropolitan Region, it also has a striving tourist industry which leads to the valorisation of the unique landscape and cultural heritage. EMAC – Cascais Ambiente is the municipal company responsible for environmental management on behalf of the Municipality of Cascais. Its mission is to contribute to the sustainable development of the Cascais municipality and improve the quality of life of its residents and visitors, assuming itself as a reference in the community. Cascais has officially approved its **Carbon Neutrality Roadmap 2050**, following Portugal's signature of the Paris Agreement and its national roadmap presented in 2019. To promote our carbon neutrality goals and to reach European recycling goals, Cascais must improve the recycling rate of households by promoting sustainable consumption to favour a circular economy as well as the reduction of waste in landfill. We aim to increase **waste streams for recycling purposes** including biowaste, textile and others with recycling potential. This is particularly useful in door-to-door collection services or waste tracking to ensure the collected waste is properly channelled to build new products. This is also complementary to the support we can give services (such as restaurants or the tourism sector) to transform their management procedures **to reduce waste production and to engage their clients in the process**.

IOANNINA (Greece)
Population: 112.000 Inhabitants
Air Quality: no data
Features: lake/Mediterranean

[22] https://www.grenoblealpesmetropole.fr/754-grand-alpe.htm

Challenge: Ioannina is the capital and the largest city of Epirus, a north-western region of Greece. Its modest population and its character as a university city with strong environmental elements and rich historical heritage offer potential for a high quality of life. The City's Municipality, cooperating with the citizens and local stakeholders, aspires that Ioannina will pioneer in the process of neutralizing GHG emissions and climate mitigation, and in the radical transformation of mentality as well, to preserve the right of future generations of Ioannina to enjoy a sustainable city. Ioannina is a lake city with a small, **inhabited island** in it, so there is regular transportation within the island and the city, with an important presence of tourists also for short periods. IOA aims to make this lake as green as possible, in collaboration with the island local community, **improving the tourists' behaviours**. IOA also wants to complement this with **smart green benches and info kiosks** by the lake and near the boats' boarding place. Municipality also works on the operation of a waterfront for a seaplane transportation of the city with the Ioanian islands, so there are thoughts of a **green smart boarding station** in this area of the lake too.

MARIBOR (Slovenia)
Population: 105.000 Inhabitants
Air Quality: Moderate
Features: Mountain/River/Balkans

Challenge: The City of Maribor is the 2nd largest city in Slovenia, with the 2nd largest University. To better address environmental issues, Maribor has set up **a joint municipal administration together with neighbouring municipalities** (functional urban areas) namely, Joint Environmental Protection Service (SSVO). In 2018 a new Automated Sorting Plant for municipal solid waste built by a waste utility company owned by the city, opened. This plant has the capacity of sorting 52,000 tonnes of waste per year. In the first year the plant sorted around 26,000 tonnes of MSW in testing mode and in 2021 it is fully operational with full capacities. With the reduction in the amount of landfill, MOM significantly contributed to a decrease in GHG emissions. MOM plans to upgrade the plant capacity. For this, technologically advanced waste management based on the use of information and communication technology, electronic collection, monitoring of quantities using sensors and data processing needs to be upgraded. Processing and analysis serve to monitor mass flows and optimise transport logistics.

TORINO (Italy)
Population: 860.000 Inhabitants
Air Quality: poor
Landscape: Mountain/River/Alps

Challenge: Torino is one of the major cities in Italy, well known for its innovation soul, well represented today by the Torino City Lab (www.torinocitylab.com/en), born to allow testing and scaling of innovative urban solutions of public interest in any domain of the Smart city, with a strong focus on social and environmental sustainability, including food and nature based solutions. One of its districts, Barriera di Milano is one of the most ancient and it is located about 1.5 km from the city centre. Historically it arose as a working-class district, also with a particularly high rate of immigrants within its inhabitants. The City of Torino is working on an NBS project in this district, both vertical and horizontal. In this context, the City intends to build in the district some recycling areas. However, the biggest concern relates to people's reactions that might see such a solution as a "luxury" given that residents face much more concrete and pressing daily emergencies (work, food, poverty, criminality). A transversal reading of these emergencies, in any case, must go hand in hand with the creation of the shared language. An accompaniment of citizens to get closer to the potential inherent in a "greener" relationship with the urban habitat can also serve as a glue between communities and segments of the population that are very distant from each other. To this end, Torino intends **to encourage individuals to adopt a more responsible behaviour** and to deploy ad hoc sensor systems, on a broader scale, replacing the current door-to-door waste collection.

Follower cities

The Follower cities are not in the Mission and is a city with a particular need to follow others in climate neutrality policies for various reasons, such as smaller dimensions, social or societal needs, or a political vision still to be defined. These cities have been selected mostly in Eastern Europe and with characteristics that may make the mentoring of leader cities and experts particularly important and useful. The most important target is to increase the number of cities in the mission and to cover countries not represented in the leading cities. The choice of followers

has been done to complete leader ones, mostly with cities of Eastern Europe in countries not yet part of the previous group.
Follower cities will have no obligations in replication, but they will support leaders to co-create their solutions and they will be mentored by those to increase the chances to replicate. The goal of CLIMABOROUGH is to lead cities to work together and to improve the exchange of good practices between them, increasing the opportunities of replication.

KRK (Croatia)
Population: 6.200 Inhabitants
Air Quality: No data
Landscape: Sea/Island/Mediterranean

Description: The City of Krk, with its 6.200 inhabitants, in its self-governing scope performs tasks of local importance that directly meet the needs of citizens, and which are not assigned by the Constitution or law to state bodies, and tasks that are complementary to project activities are: settlement and housing, space and urbanism, utilities, protection and improvement natural environment and other activities in accordance with special laws.
Islands are on the verge of major changes - the future European Green Plan and the Mediterranean Strategy for Sustainable Development 2015-2022 strive to achieve the goal of a climate-neutral Europe through strengthening the economy with green technology, creating a sustainable economy and reducing pollution.
The Green economy is the future of Croatia, which is of great importance for our islands, because sustainable development means economic and social growth in line with the ecosystems in which it operates, and as such is sustainable in the long run. The future of our islands is based on development strategies for the use of renewable energy sources, while at the same time reducing the harmful effects of global climate change.

KATOWICE (Poland)
Population: 290.000 Inhabitants
Air Quality: Poor
Landscape: River/Central Europe

Description: Katowice is the main city of the Upper Silesian metropolitan area and the 11th-most populous city in Poland, while its urban area is the most populous in the country and one of the most populous in the EU. Katowice City as a Local Public Authority provides services in different areas (e.g. education, culture, health care, building and maintaining roads) for citizens which are based on national and local regulations. Katowice City has great experience with international projects which are organised within various subject matters. Moreover, since 1st of January 2013 an Energy Management Department exists in Katowice City Hall's organisational structure, which is responsible for i.e. initiating and participating in preparations for programs, pertaining to energy efficiency improvement including utilisation of renewable energy sources, monitoring of effects obtained as a result of its realisation, and educational and informative activities for local residents. Katowice runs a series of actions relating to realisation of projects, investment and educational tasks in terms of energy efficiency improvement and environmental protection. Except for the above mentioned international projects, the city realises a series of programs and strategies of the local and provincial level, including: 1. Air Protection Program for Silesian voivodeship, 2. City Development Strategy, 3. Environmental Protection Program for Katowice for 2014-2017, 4. Assumptions to plan the supply of heat, electricity and fuel gas for the city of Katowice, 5. Low-carbon economy plan for the city of Katowice".

PILSEN (Czech Republic)
Population: 172.000 Inhabitants
Air Quality: Moderate
Landscape: River/Central Europe

Description: Pilsen is the fourth largest city in the Czech Republic. It is located in western Bohemia. It is an important industrial, commercial, cultural, and administrative centre. Industrialisation took off in the 19th century. At that time, such industrial giants as the engineering complex Skoda and the Pilsen Brewery were established. Nowadays, the modern industrial zone in Borska Fields represents an extraordinary project in the Czech industrial sphere. Given the numerous woods and rivers that surround Pilsen, recreational possibilities for the citizens and visitors are numerous. Next to being home to the traditionally very advanced engineering, machinery and electrotechnics industry, the city has recently positioned itself as an innovation hub, attracting

multiple companies providing solutions in the fields of software development, sustainable mobility, artificial intelligence, UAVs, digital twins, autonomous driving etc.
Pilsen is a city right on the forefront of the fight against climate change, and was recently one of the locations in which round table discussions over the adaptation of climate change took place (the others being Prague and Brno).
Led by the Czech Environmental Partnership Foundation, the discussions were open to research institutions, think tanks, NGOs, non-profits, city representatives and other professionals and addressed the current issues these cities faced in the face of climate change.

PRIJEDOR (Bosnia)
Population: 98.000 Inhabitants
Air Quality: no data
Landscape: River/Balkans

Description: the City of Prijedor is located in the northwestern part of Bosnia and Herzegovina, the entity of the Republic of Srpska, on the banks of the river Sana and Gomjenica, and on Kozara mountain slopes. Prijedor became an important commercial and trade centre thanks to Roman roads and navigation of the Sana river, as well as the first railway built-in 1873. Historical buildings and infrastructure from the Ottoman and Austrian-Hungarian periods are a feature of the urban landscape.
Today, Prijedor is a large urban, trade and industrial centre and hosts some of the famous international companies and companies from Bosnia Herzegovina. According to the latest census conducted in 2013, in the area of Prijedor municipality were registered 97.588 inhabitants situated in 71 settlements (organised in 49 local communities), of which about half makes rural population, making it the seventh-largest city in Bosnia and Herzegovina. The vision of Prijedor is comprehensive and determines the city and its inhabitants to move forward in new challenges, building the future of a new, advanced and modern European city. The rich heritage in every sense lays a good foundation for a new concept and commitment to make the city a city of youth, a city of perspective, modern and the highest quality possible solutions for the benefit of all citizens.

1.2.6 Gender mainstreaming

Talking about favourable urban conditions, we include the gender dimension (in WP7) taking into account aspects of access, mobility, safety, well being, climate resilience and democratic participation. Cities are often designed, planned and built according to traditional gender roles. This reflects in inaccessibility, urban insecurity, increased violence and health problems and creates disproportionate burdens for women, girls and sexual and gender minorities of all ages and abilities, reinforcing existing inequalities. Against this background, CLIMABOROUGH promotes gender equality by incorporating this dimension in all aspects of the project: 1) Gender equality is promoted as a transversal theme; the consortium is composed of men and women representing diversity of gender and ethnicity, race, class etc., selected to maintain excellence in project activities. In particular, the leader city teams already have in most cases a ratio of, at least, 50% of women involved (TORO, IOA, DAEM, GAM, DIFF, SOFIA, MARI). 2) Gender will be integrated by enacting inclusive and participatory practices in the pilots (WP3 and WP5), through equity in task distribution and co-creation of knowledge. 3) A well-balanced gender representation will be ensured during project implementation (50% female ratio). 4) Gender-aware analyses, gender-inclusive tools and recommendations to address knowledge gaps will be provided. 5) Finally, gender specific guidelines will be issued for the preparation of the WP4 calls for tender. This task will be run with the support of the EAB, led by Dr. Joanna Syrda, a globally recognized expert on gender equality issues[23].

1.2.7 Implementation of Open Science Practises

The consortium members are committed to Open Science as a complementary vision to design, art and culture enabled innovation making citizens and other key stakeholders aware of and engaged in crucial (action) research and innovation activities. The project methodology will help tackle a number of complex challenges in participant cities by tearing down the barriers between researchers, industry, government and civil society (the Quadruple Helix) and conferring a prominent role to citizens and generically end users. With Topic 5 harnessing open science and inclusive action research at the service of urban climate neutrality, the project aims to close the gaps that have impeded the identification of reliable, pan-European technology solutions in this domain.
Our overall aim is to make the CLIMABOROUGH a dynamic part of the open science community, promoting the adoption and support of FAIR principles in the fields of procurement of innovation, which will lead to a higher degree of reusability and sustainability of data and digital artefacts in the domain. This goal will be supported by several activities, including (a) the facilitation and aggregation of access to information on the "FAIRification" of digital innovation and public procurement-related data, (b) the adaptation of a FAIR metric concept relevant to the topics of the pilots, and (c) the use of the project community for FAIR data-sharing in the project's platform, which will be maintained and operated with the broadest possible consensus among companies and all process stakeholders. This is proven by the inclusion of platform and tools perfectly open source and compatible with other platforms, including NetZeroCities.

[23] https://researchportal.bath.ac.uk/en/persons/joanna-syrda

1.2.8 Research Data Management and Management of other Research Outputs

CLIMABOROUGH will collect information from various sources via different means related to several processes (e.g. statistical sources, information campaigns, selection and award of call participants, city demonstrators) and stakeholders (SMEs, city representatives etc.) that are involved in the project. Generated data from the development of such activities will be archived for self-sustainability purposes, in order to allow the consortium to utilise it at a later stage or to provide this information freely to anyone who would continue working on the project datasets after its end. Following the guidelines for **Open Access** to the scientific knowledge produced within the EU funded projects, the CLIMABOROUGH consortium is committed to implementing measures that allow sharing of all outputs wherever commercial and industrial exploitation allows doing so. Public project deliverables will be uploaded to the project website to become open and freely accessible. We will make full use of Open Research Europe to increase the visibility of results and to enhance in-project and post-project awareness. The Open paradigm used for publishing project results is reflected in the Data Management Plan, part of T7.2 "Risk, data and innovation management". The initial version of the DMP will be released by M06 and evolve during the lifetime of the project (with updated versions at M24 and M48) in order to present the status of the project's reflections on data management.

2. Impact

2.1 Project's pathways towards impact

In Europe, cities occupy a small slice of land, just 4% of the EU area, although they host about 75% of its population (2020). This share was about 58% in 1960, meaning that urban population increased by 126 million in less than 60 years. The pressure on pollution and climate change of this concentration is not surprising: "*(...) cities account for more than 65% of energy consumption and for more than 70% of CO2 emissions*". This pressure is not equal in every country, in Belgium 98% of its inhabitants live in urban areas, but it is increasing everywhere as it is expected to rise to 85% by 2050. This situation makes it necessary to find innovative solutions to reduce the impact of this rising population, with a global positive effect on climate change. Such innovative solutions cannot be limited to the built spaces people occupy or the tools they use for everyday living (including to work and move); they rather need to consider how these spaces are organised and managed on EU territories and what spatial planning can do to transform them into resources for climate resilience. Data shows that many factors have an impact, as the urban concentration is not just related to the overall share of the population in those areas.

Cities offer a logical 'unit of change' - because they can interact with their local population. However smaller cities - where the majority of the EU population actually lives - struggle to engage the market, access financing, and build capacity for change. **This risks a two-speed Europe, where the larger cities advance and open a gap to those smaller under-capacity ones**. **Our focus is to ensure that does not happen**.

To cite just another paradox of the European scenario of innovation, while large cities – according to Jane Jacobs[24] view, which is widely shared also in modern times – have the best chances of driving the transformation trends, **it is at the level of small and medium sized towns and cities[25] that such transformation must plant its roots and become pervasive to produce its effects**. We read as an agreement to this statement the fact that quite a low threshold in terms of population (50.000 inhabitants, becoming 10.000 in the smallest EU countries) has been set by the creators of the mission entitled "100 Climate-neutral and Smart Cities by 2030". Quoting from that mission statement, it is "*important to be inclusive, ensuring that cities in all Member States can participate, and needs to be truly diverse in encouraging expressions of interest from cities of different sizes and levels of preparedness, and from all corners of Europe*".

CLIMABOROUGH proposes 5 impact pathways, resulting from the 5 steps defined in Section 1, and related to the 5 expected outcomes of the call, as described below.

EXPECTED OUTCOME #1. "*Effective management of trade-offs and ownership of transformative changes through the engagement and empowerment of stakeholders, citizens and inhabitants, paying special attention to vulnerable and at-risk for precarity social groups and communities, including people with disabilities, older people and youth***"**

IMPACT PATHWAY #1. CLIMABOROUGH approach is to co-creating common solutions that fit the needs of **large and small cities**, capturing and curating these solutions for rapid scale adoption and local tailoring, mentoring (particularly smaller) cities, and seeking funds to support implementation will all help ensure cities of all type and size are supported as they transition to climate neutrality; and the project delivers a strong pathway to impact, due to its contribution to the mission. The local investments must clearly be **demand-driven**, in the twin sense of

[24] Jacobs, J., The Economy of Cities. Vintage, New York, 1969.

[25] Wagner, M., Growe, A., "Research on Small and Medium-Sized Towns: Framing a New Field of Inquiry", World 2021, 2, 105–126. https://doi.org/10.3390/world 2010008

reflecting local, and possibly quite common across countries and cities, needs and requirements in terms of solutions for climate change mitigation and adaptation (from which the experimental recourse to innovative public procurement calls, based on the aggregation of public demand) and **exploiting the added value of participatory co-design and co-creation to improve their scalability prospects (STEP 1)**.

EXPECTED OUTCOME #2. "*Solutions that ensure a more equitable, just, synergetic and optimal use of urban spaces integrating well-balanced built/green/blue/accessible infrastructures and biodiversity-friendly nature-based solutions for attractive, circular, healthy, resilient, secure and liveable cities with thriving citizens, communities, ecosystems and biodiversity and reduced urban environmental footprint."*
IMPACT PATHWAY #2. It is exactly within that range of cities that the aforementioned lack of policy experience and capacities becomes even more compelling, making it difficult to match territorial challenges with innovative solutions. **CLIMABOROUGH involves 14 cities from 12 countries with a big variety of characteristics**, making huge the potential impact of the project from this point of view. This variety, coupled with the mechanisms related to **public procurement (STEP 2)**, to connect startups and cities for climate friendly services is expected to have a huge impact to create an osmotic structure between cities to improve their solutions, with a tremendous impact on emissions and climate change. Indeed, we are aware that the budget of €3.2M this project will allocate to the tenders is huge. However, we tried to distribute the €2.5M budget assigned to the 8 leader cities and make room to replication, but a calculation done "on the back of an envelope" led to very small amounts left for this specific purpose. Therefore, in order to ensure true scalability prospects to the "best performers", it was essential to increase the budget of another €0.7M and fully dedicate it to the follower cities.

EXPECTED OUTCOME #3. *"Transparent and efficient decision-making processes for people-centric urban planning and design for climate neutral cities achieved through innovative collaborative methods such as co-creation, living labs, crowdsourcing, crowdfunding, collective intelligence and collaborative economy in combination with technological innovations, data-driven approaches and enhanced cross-sectoral integration"*.
IMPACT PATHWAY #3. The project has an ambitious approach to co-creation and deployment of climate neutral products and services with living lab techniques **(STEP 3)**, following the previous two pathways/steps. This is strictly related to all the other 4 steps and works on 3 cycles as necessary to follow the acceptance of the tools/solutions and to improve their effectiveness. It is a key aspect of the project's impact generation, as it is an action that is strictly related to replication (see WP5 and par. 1.2.5), as it will allow also to define funding opportunities **(STEP 5)** for startups and SMEs because CLIMABOROUGH will work to **involve more cities** and to **involve the investment community**.

EXPECTED OUTCOME #4. "*Innovative urban planning and design practices, harnessing, compiling and mainstreaming local knowledge, creativity, ingenuity and design quality, triggering behavioural and lifestyles changes and fostering co-created approaches, holistic responses to interlinked challenges within a city, and effective use of digital tools, such as Digital Twins, for solutions drawing on cross-domain data e.g. through data shared via data space for smart communities and sectoral data spaces*. **IMPACT PATHWAY #4**. **CLIMABOROUGH aims at changing the mindset around and in Cities**. Urban planning is one the fields that could more effectively benefit from data/knowledge as per the climate and environmental impact and translate such benefit into a strategy, action or measures contributing to climate resilience. Urban planning with regulatory frameworks can increase the use of low carbon initiatives and alternatives, and incentivize the change of behaviour and lifestyle towards climate neutrality. Moreover, **Urban planners have always been those with the greatest potential to anticipate the SMART transformation of cities**, promot
ing an adequate transport infrastructure. For a long time, data, digital cartography, simulation and analysis models have been offered to support decisions and policies for the governance of urban transformations involving citizens in a transparent participation process. The involvement of people in a planning process is essential for setting needs and aspirations, and acquiring local knowledge useful for defining planning strategies and priorities. Despite the role of planning in contrasting climate change effects, **the quality of cities often does not seem to benefit from these opportunities**, when no crisis spares cities: environmental, climatic, social, economic crises. To move state of the art on, CLIMABOURGH will propose **(STEP 4)** an **open source platform** built on two existing solutions, connected to a **Climate neutrality monitoring tool** setting KPIs to create an evaluation model on the impact on climate of the deployed services. This will allow us to use the **climate and urban planning data** of cities' demonstrations and to monitor their impact, as it will be coupled with a Climate neutrality monitoring tool and climate services, to make it possible to propose a model to cities for evaluating their impacts, more particularly, the impact of their services/products.

EXPECTED OUTCOME #5. Contribution to the implementation of the Climate-Neutral and Smart Cities Mission,

the Zero Pollution Action Plan, the Biodiversity Strategy, Fit for 55 Strategy, Circular Economy Action Plan, the Urban Agenda for the EU, the New Leipzig Charter, the European partnership on Driving Urban Transitions for a sustainable future (DUT) and the New European Bauhaus Initiative, in line with the European Green Deal ambition and objectives

IMPACT PATHWAY #5. CLIMABOROUGH works on a scheme based on support to **peer to peer learning between cities**, via the support of various high-level partners, with heterogeneous specialisations, and particularly four of them, managing the hubs or working as city angels. **The role of lead cities as leaders and followers will increase the exchange of good practices and lessons learnt with an increasing effect in their growth**. **The inclusion of purely follower cities, not yet engaged in the mission, is another key element to give a concrete impact to the various objectives of the mission itself** and the various policies mentioned by the call for proposals. As explained in the KPIs and the previous paragraphs and sections, it is fundamental to engage cities more and more to engage them in a **shared and participatory process, based on replication and mentoring between leaders and followers (STEP 5)**. This outcome, as the related step, is strictly related to the previous ones, feeding it. It should be noted that all 8 leader cities applied for the Mission and 6 partners (Pilsen, Grenoble, Issy, Athens, Cascais and DKSR) have signed in or supported living.in-eu.

2.1.1 Target Groups

The table below captures the target groups and their behaviours relevant to achieving and diffusing the project vision and ambition. Understanding these profiles is essential for the definition of the desired impact pathways. CLIMABOROUGH **can rely on the community of DESIGNSCAPES** (https://designscapes.eu), formerly led by ANCI, spanning across almost all EU Member and Associated States, its wide community of R&D and innovation performers, as well as the cities already being part of the consortium (12 from 11 countries plus 2 associated ones). Moreover, it can count on two major EU-wide communities of Cities, being MCE (50 city members and a network of about 100) and ENEC both members of the consortium (+100 members and a network of thousands of cities in Europe). Plus the EU Smart Cities Marketplace 'Small Giants' initiative with its ~50 city members.

Community name	Relevance	KPIs
Cities	○ *Leaders + Followers (already in the project consortium)* ○ *Additional ones (attracted/mobilised during the project's timeline)* ○ *City networks (in the project consortium)* ○ *City networks (attracted/mobilised during the project's timeline)*	○ *14* ○ *30* ○ *02* ○ *05*
SMEs - including startups	○ *Participating in the Open Market consultations* ○ *Participating (awarded or not) in the Innovative Procurement calls* ○ *Additional ones (attracted/mobilised during the project's timeline)*	○ *50* ○ *30* ○ *40*
Private investors	○ *Already involved in the preparation of the proposal* ○ *Additional ones (attracted/mobilised during the project's timeline)*	○ *01* ○ *10*
Academia and research institutes	○ *Already involved in the preparation of the proposal* ○ *Additional ones (attracted/mobilised during the project's timeline)*	○ *08* ○ *40*
Other stakeholders to be involved during the project's lifetime	○ *Civil society organisations (e.g. environmental activists)* ○ *Regional / national policy makers* ○ *Media, press (local and international)* ○ *Sister or related EU funded projects* ○ *European Commission DGs/JRC and other international organisations* ○ *Citizens*	○ *100* ○ *40* ○ *24* ○ *10* ○ *05* ○ *5 000*

2.1.2 Project`s Unique Contributions to Outcomes and Wider Impacts

To summarise the previous discussion, we highlight the following points:

- Tactical use of public demand to mobilise cross-city, cross-country innovations tackling global warming
- Engagement of a significant number of cities in the pilots
- Create an open community of cities based on communicating thematic hubs
- Adoption of innovative a co-creation methodology and tools to stimulate cities' climate neutrality solutions
- Improved skills and capacities of policy makers in the governance of innovation
- Reuse of the Designscapes methodology to define public procurement urban innovation

- Exemplary and replicable implementation of innovative public procurement at EU level
- Monitoring tool with performance indicators for assessing the climate neutrality progress of cities

2.1.3 Other Specific Impacts

Environmental impacts

- Improve the number of climate neutral services in the cities of the consortium
- Possible influence on other EU and associate countries cities' resilience to climate neutrality

Economic impacts

- Increased opportunities for start-up/SMEs creation, growth and jobs
- Possible multiplier effects from cross-country operations
- Define a business model to support public-private partnerships at city level on climate innovations

Societal impacts

- Strengthening of social fabric in the participant cities
- Reusable methods and tools for grassroots innovation
- Increased inclusive citizen engagement and demonstrable impacts of communitarian approaches to innovation

Institutional impacts

- Establishment of new partnerships and cooperation models between public and private stakeholders
- Build a community of cities and related stakeholders at EU level on climate neutrality issues
- Monitoring tool for defining planning strategies oriented to climate neutrality

Policy impacts

- Improve mechanisms and tools to policy making on climate neutrality
- Confirmation of transformative potential of public procurement of innovation
- Possible reduction of the diversification of local innovation-prone strategies.

2.1.4 Requirements and Potential Barriers to Impact Achievement

The risk analysis carried out in Section 3 makes a list of the potential impediments to project implementation and achievement of goals. These include, among others:

- Lack of interest of follower cities
- Poor reaction/participation from innovative SMEs to the public procurement initiative
- Limited collaborations between cities in sharing experiences and practices
- Low acceptance of tools from cities and stakeholders
- Low participation of non-partner cities

Our main arguments to counteract the above considerations are that:

- Involved leader cities have adhered to the "100 Climate neutral and Smart Cities" challenge and signed a letter of commitment (attached to this proposal)
- City Angels and leader cities will support follower cities
- The budget set aside for public procurement is quite significant (3,2 million Euros) and we expect at least 2 winners per call with distinct proposals, distributing the risk of failure across more examples
- We have involved 2 european (ENEC, MCE) and 2 local (SIGI, ANCI) associations of cities
- We defined a very ambitious dissemination strategy as reported in the paragraph below

2.2 Measures to maximise impact - Dissemination, exploitation and communication

A project of the size and scope of CLIMABOROUGH must have a particular ambition in dissemination and communication. Quoting the HE call, "*To facilitate replication, upscaling and up-taking of the generated outcomes and to foster capacity building/upskilling of public authorities, local actors and communities, actions should engage in ambitious outreach, communication, dissemination and training activities in coordination and complementarity with the Mission Platform.*" Being engaged with cities, local authorities and stakeholders it is necessary to work on a double plan, considering a communication plan adapted to guide and shape our "city" communication activities and public profile, in order to create a "brand" image of the project enhancing its further continuity.

2.2.1 Dissemination and Communication

2.2.1.1 Communication

The communication strategy focuses on 2 levels, called "**Branding of the project**" (project as a whole) and "**Raising Cities awareness**" (Cities level).

"**Branding of the project**", considering the Cities as a single entity including not just administration, but also its entire ecosystem, will boost communication at city level, as the particular structure of CLIMABOROUGH project highly focuses on Cities. The communication will be also related to the **NEB community**, key to engage stakeholders and, particularly, citizens. This will also aim to involve, in the best possible way, all types of stakeholders to increase the projects' visibility at City level and to make more efficient public procurement and Living Lab Activities.

Communicating about the City's reference zone, their activities and milestones is considered as essential as communicating about the project in itself. This strategy will play a great role in the creation of local communities of interest in each Pilot. As a leader of WP6, MCE will take the lead of the organisation and set-up of communication activities at project level, with the involvement of every partner (event participation, regular updates on activities, calls…). This phase will define and deploy various activities: (i) Design and creation of the **project Logo and Motto** (multi-lingual in order to maximise its impact); (ii) Design and creation of the **project website** which is at the cornerstone of the communication and dissemination plan, (iii) creation of **marketing collaterals** in English, (iv) creation of a **multilingual document** as a visual basis for marketing collaterals to be developed for distribution at events where Project Partners are participating. These materials will be created in order to meet the needs of the different stakeholders, (v) animation of stakeholders' communities via digital **newsletters, Social Networks** (LinkedIn, Facebook, Twitter, Instagram, Youtube channel) with the regular publication of updates on the References zones (social account and digital communication tool from Cities will be used in order to take the best advantage from the existing community) and **podcasts** to present best practices developed by the cities, (vi) organisation of a **yearly Conference** on Climate neutrality (hosted by a different City of the consortium every year) to foster communication about the project. These events will collaborate with MCE and ENEC (or other City conferences already existing) but will also be included in the annual Cities agendas, (vii) organisation of "replication" **workshops/webinars** preferably during already existing events (Energy Cities annual conference, Sustainable Energy Week, Open Days, Major Cities of Europe conference)..

Regarding "**Raising Cities awareness**", considering Cities as a single entity including not just administration, but also its entire ecosystem, will boost communication at city level to engage the local community. Each city will appoint a communication officer who is in charge of communicating and raising awareness on its own City (ex. Cities calls, local events participation) but also of regularly reporting to the WP6 leader its activities. Cities will be in charge of finding, supported by the WP and project coordination, the best channels to reach the most stakeholders in the most efficient way. The aim of these activities will be to give visibility to the project brand at local level (mainly through local language), to foster prominence of procurements and to identify the best local (intended as local, regional and national) events to be exploited to reach a good number of stakeholders. This will be fundamental to have successful Public procurement calls and Living Labs activities. Cities will be supported by City Angels. The activities will be done in collaboration with cities, some examples are:

(i) 2 **press releases** and 2 **press conferences** per city to launch the first procurement process and to present the final results, (ii) creation of a local **business community** involving business especially Small and Medium Companies and institutional entities, and create interest in the activities conducted in every city reference zone, (iii) spreading the word and **increasing the awareness** of each City Reference zone and its activities, (iv) **innovation workshops** with cities and local businesses, (v) creation **specific digital flyers** for each audience type, (vi) creation and animation of a **blog** for every city and (vii) participation and organisation of **local events** related to the activities conducted in every city.

2.2.1.2 Dissemination

The aforementioned Plan will be coupled by more "conventional" measures and channels – included in the KPIs of the table below – that are accessory rather than key to the aim of outreach, as it is the case of the participation in conferences and workshops done in presence.

The objective in this case will be to increase the visibility of the project and its achievements to the scientific and research communities, mostly via the publication of papers, participation in conferences (online and in presence).

2.2.1.3 Dissemination and Communication KPIs

Conventional measures/channels	KPIs[26]	Innovative measures/channels	KPIs
○ *Monthly visitors to the website*	○ *1 000*	○ *People exposed to social media groups*	○ *100 000*
○ *Visitors to the partner sites*	○ *50 000*	○ *Downloads from online public repository*	○ *50 000*
○ *Readership of press launches etc.*	○ *100 000*	○ *Readers of the FAQ page*	○ *20 000*
○ *Conference*	○ *20*	○ *Webinars and e-workshops organised*	○ *100*
○ *Publication of journal articles*	○ *10*	○ *Documents online public repository*	○ *500*
○ *Audiences of events in person*	○ *10 000*	○ *Audiences of online events*	○ *10 000*

[26] KPIs are for the whole duration of the project.

○ *Newsletter issues/recipients*	○ *300*	○ *European MS/AS/IPA countries involved*	○ *35*
○ *Press releases*	○ *100*	○ *Podcasts of video recorded live speeches*	○ *200*
○ *Promotional videos*	○ *50*	○ *Overall blog posts*	○ *2 500*

2.2.2 Exploitation Targets and Challenges

Similar considerations are also applicable to the Exploitation function of the project. This term takes on a quite unusual meaning because of the not for profit and community building oriented nature of the aforementioned project dissemination activities. Indeed, towards the end of the 4-year work plan, CLIMABOROUGH partners guided by LINKS as innovation manager of the consortium will engage themselves in defining the business case(s) and roadmap(s) for the long-term valorisation of delivered assets. However, and with the important exception of the "success stories" resulting from the innovative procurement calls, which our consortium will not claim any royalty on but undoubtedly constitute an important source of revenues for the engaged SMEs according to our project vision, all other aspects related to exploitation will be handled according to a logic that prioritises the permanent establishment of a EU-wide community of experts and practitioners, centred on the idea of synergizing private and public funds for innovation, also thanks to the training and capacity building initiative that UDNA and AAU, supported by ULAB and ENEC, are going to coordinate. A live community of peers, which we will try hard to integrate within the mission platform and stakeholder groups already existing at the EU level. All these and other aspects will be crystallised into a post-grant roadmap, which will be developed and executed at consortium and individual partner levels.

2.2.3 Strategy for the Management of Intellectual Property

The nature of this action is not a traditional research project where results are due to exhaustive IPR issues which usually need deep analyses to be tackled successfully. Nevertheless, we will sign a Consortium Agreement (CA) based on the standard DESCA model and describe all partners' project-related background information and IPR they make available to the action. The CA will be signed by all participants before the project starts. The basic principle is that any foreground knowledge resulting from the project belongs to the partner who generated it. If any knowledge is generated jointly and its separate parts cannot be easily distinguished, it will be jointly owned, unless the partners concerned agree on a different solution. The granting of Access Rights to a jointly owned foreground will be royalty-free and the granting of Access Rights to its own foreground will either be on royalty-free or (less likely) based on fair and reasonable conditions. Finally, the suppliers will not be requested to grant access to their IPs nor any sort of royalty for the support received in the pilots. This will be reflected in the contract with ANCI following the award of the tenders. However, full access to data will be requested from the winners of the public procurement processes.

2.3 Summary

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
Extreme fragmentation of EU national markets, a known obstacle to widespread innovation. **Untapped potential of co-design and co-creation** to facilitate cross-city innovations. **Ongoing pathway of European cities to climate neutrality**. **Untapped potential of public procurement of innovation**, coupled with design in cities. Private funds looking for social investment opportunities.	**12 open market consultations**. **12 public procurement** of innovation calls. **24 awarded proposals** of urban service innovation. **1 dedicated private investment fund** with 20 applications. **1 fully open source working platform**. 1 Climate neutrality monitoring tool 1 **community with 300 cities**.	**Exploitation:** if successful the project mechanism to synergise public and private funding can become a permanent service. **Dissemination:** an ambitious scheme to engage cities' ecosystems and to define a precise branding of the project. **Communication measures:** an ambitious structure to reach cities and their stakeholders via an own website, city blogs and partner web pages, social networks and a network of cities able to reach all mission countries .
TARGET GROUPS	**OUTCOMES**	**IMPACTS**
SMEs. Start up enterprises. University spin-offs.	**14 European cities** are involved in the piloting phase, fastening the pace to climate neutrality until 2030.	**Scientific:** Better insights in the mechanism of cross-country and cross-city scalability of innovation.

Policy makers. Civil servants. Academics. Civil society. Business angels. Impact investors. Private funds Cities of the mission Cities outside the mission NEB Community	**5000 citizens** involved. **300 cities** involved. **24 SMEs and startups** being facilitated in their pathway to scalability. **10 Impact investors and business angels** improving their access to and understanding of the potential of innovations.	**Technological:** Advances in R&D and innovation at the service of climate neutrality. **Financial:** Convergence of public and private resources towards the most credible and reliable solutions. **Economic:** Higher number of pan-European "champions" reaching sustainable growth. **Societal:** Fastening the process of urban climate neutrality in the EU.

3. Quality and efficiency of the implementation

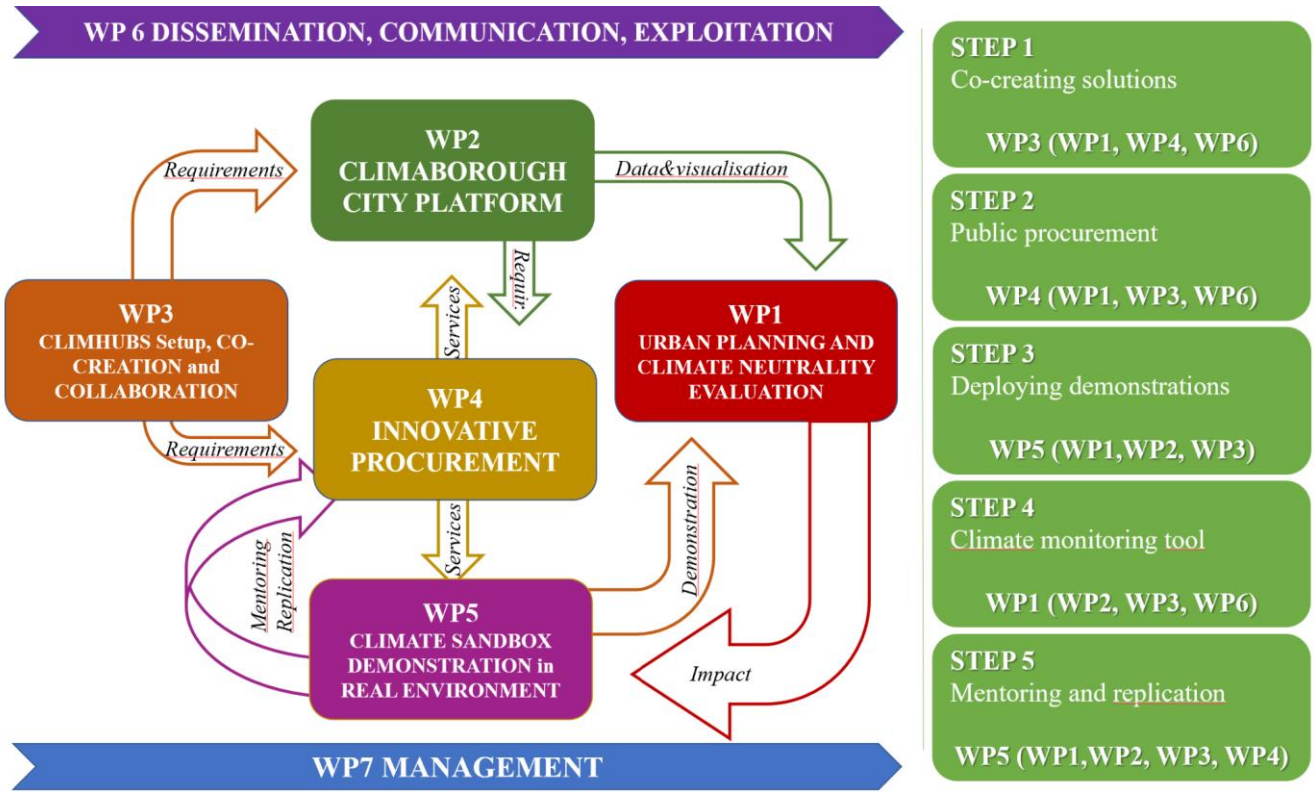
3.1 Work plan and resources

The work plan for CLIMABORROUGH is broken down into logical tranches using the Work Breakdown Structure (WBS) approach. The diagrams below (PERT and GANTT) highlight how the interconnected and dependent work packages & Tasks inter-relate and map over time.

Table 3.1a: List of work packages

WP	WP Title	Lead No	Lead Short Name	PMs	Start	End
WP1	Urban Planning and Climate Neutrality Evaluation	7	POLIMI	145,5	*1*	*48*
WP2	CLIMABOROUGH City Platform	9	DKSR	179	*1*	*48*
WP3	CLIMHUBS Setup, Co-Creation and Collaboration	11	UDNA	191	*1*	*48*
WP4	Innovative Procurement	1	ANCI	125	*7*	*42*
WP5	Climate Sandbox Demonstration in Real Environments	9	AAU	217,5	*12*	*44*
WP6	Dissemination, Communication and exploitation	10	LINKS	242	*1*	*48*
WP7	Management	1	ANCI	104	*1*	*48*
				1204		

3.1.1 PERT Chart



In the structure of CLIMABOROUGH, the role of WP1 and WP3 is central as they drive and/or influence all STEPS (see methodology) of the projects as defined below. In the PERT, the boxes on the right define the role of WPs in each of them, being the leader out of brackets and the functional ones not leading into brackets.

3.1.2 GANTT Chart

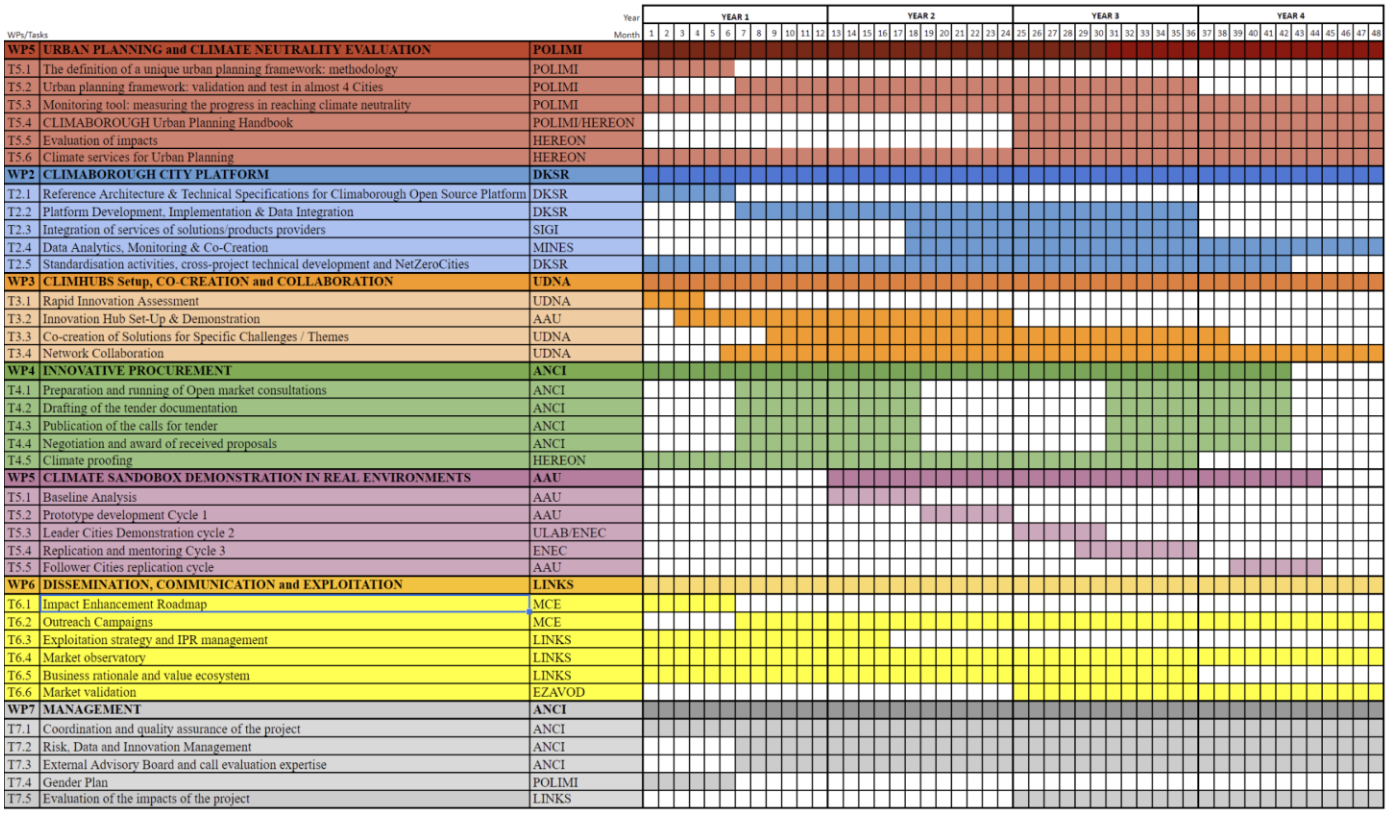


Table 3.1b: Work package descriptions

WP No.	WP1			*Start / End*	M01 – M48		*Lead*	*POLIMI*		*Total PM*	*145,5*			
WP Title	**Urban Planning and Climate Neutrality Evaluation**													
Short name	ANCI	HEREON	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAV
PM/partner	6	23	0	0	2	0	32	0	0	8	2	5	3	0
Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PREDA
PM/partner	6	6	6	3	3	6	6	6	6	4,5	4,5	4,5	1	3

Objectives

This WP is devoted to the development and testing of an urban planning framework to reduce the uncertainty of policy measures for climate adaptation and mitigation. Operational objectives are:

(i) development and validation of an urban planning framework able to synthesise and systematise the complex and often confusing set of contributions established by different plans related to different sectors and enabling collaborative work on problems identification and solution design;

(ii) Creating a KPIs based tool to monitor/measure the project impacts and the progress towards Climate Neutrality;

(iii) Developing CLIMABOROUGH Urban Planning Handbooks targeting both expert and technical subjects (professionals, policy makers, urban managers) as well as lay people (citizens, civic organisations, …);

(iv) Collecting data and monitoring projects achievements and impacts to guide fine tuning and adjustments of the projects activities and collecting evidence of the project results;

(v) Designing climate services to support climate transition.

Description of work

T1.1 Urban planning framework: development [M01-M06]; Leader: POLIMI | Participants: All.

Under the guidance of POLIMI, this task will provide a methodological approach for combining the multiple instruments (strategies, policies, action plans, white books, ..) that address issues related to planning and that could have a role in the transition to climate neutrality. The goal of net zero emission requires integrated approaches across traditional sectors, and the creation of a systemic planning framework acting as an enabler and not a barrier to innovation. Furthermore, this planning framework will take into consideration (1) how to integrate the wide set of knowledge available, and (2) foster co-definition of problems and co-creation of solutions. About the integration of spatialized data, a mapping methodology will be provided to guide informed design solutions, specifically regarding the implementation of a resilient city to contemporary challenges. About co-planning processes some modalities will be suggested to integrate citizens into design processes.

T1.2 Urban planning framework: validation and testing [M07-M36]; Leader: POLIMI | Participants: All.

The result from T1.1 will be validated by applying it in 4 cities (2 leaders from each hub) to identify the weaknesses and critical aspects of the approach and, if necessary, to modify its structure. The validation will be carried out in relation to the key sectors of CLIMABOROUGH and will focus on (1) the effective utilisation of spatialized data in the production of meaningful maps; and (2) its usability by citizens and stakeholders for the definition of a shared vision on problems and solutions. This task will work in collaboration with WP5.

T1.3 Monitoring tool: measuring progress in climate neutrality [M01-M48] ; Leader: POLIMI with the support of HEREON| Participants: LINKS, ANCI, CITIES.

This task will set-up the CLIMABOROUGH Monitoring tool by identifying a set of Performance indicators (KPIs) to measure the change in crucial sectors for reaching climate neutrality and quantify the project impacts.

The indicators will track progress towards the net zero emissions and help define the most appropriate planning strategies to ensure the achievement of specific objectives. The tool will be defined considering the different territorial specificities of the CLIMABOROUGH Cities to guarantee the replicability of the tool itself and the adoption in many other contexts. The Monitoring tool will be validated in 4 cities (the remaining 4 complementary to those selected in task 1.2) selected according to the different characteristics explained in paragraph 1.2.2. The KPIs will be developed taking into account the indicator sets already existing at national and EU level for the evaluation of CC resilience. The tool will also take into account the experiences made in other Adaptation Mission projects and especially try to harmonise European wide approaches currently undertaken regarding measuring climate adaptation at the local level. To this purpose there will be a series of virtual workshops. In the end, the tool will be used to measure and disseminate the project's results within scientific and policy makers' communities.

T1.4 CLIMABOROUGH Urban Planning Handbooks [M25-M48] ; Leader: POLIMI with the support of HEREON | Participants: ANCI, CITIES.

The methodology used for defining the common urban planning framework and the monitoring tool will be described step-by-step in a handbook (digital format) to enable other cities interested in the CLIMABOROUGH approach to replicate it by following the instructions explained in the Manual and adapt it considering their urban planning instruments. The handbook aims to share knowledge, experiences and competences between cities and will have two distinguished versions: one devoted to experts, professionals, policy makers and will be devoted to guide Cities through the application of the CLIMABOROUGH approach (i.e., unique urban planning framework and monitoring tool); the other, supplied in a non-technical language will be readable and usable by any interested citizen or any non expert subject whose actions/behaviours, decisions and life-style are considered keys for the transition to a net-zero emission economy across all sectors.

Task 1.5 CLIMAHUBS Impacts Assessment [M25-M48] Leader: HEREON| Participants: All.

For each expected impact the set of Key Performance Indicators (KPIs from T1.3) will be quantified, which will facilitate the effective monitoring and quantification of the CLIMABOROUGH impacts. The impact analysis will show whether the approach and the overall implementation have been useful. A series of broad stakeholder consultations for all test cases will also look into long term impacts which cannot be gauged through the KPIs. Based thereon, conclusions can be drawn for both the up-scaling of procedures developed within the project in the pilot cities and for the design of future project evaluations in a climate-resilience (and city-specific) context.

Task 1.6 Climate services for Urban Planning (M01-M48) Leader: HEREON Participants: All

The availability and sharing of best available climate knowledge and information is a key prerequisite for successful transition planning in cities. Best available climate knowledge customised to serve as climate services for urban planning is decisive when it comes to effective transition processes. In this task, we will co-produce together with relevant stakeholders in the CLIMAHUBS the necessary climate services that will support the CLIMHUBS in their transition processes. We will make use of the business models for climate services developed in WP4 and produce customised prototypes of climate services and will test them for replicability and scalability.

Deliverables

D1.1 Monitoring tool of CLIMABOROUGH project (Leader: POLIMI; R, PU, M06) *The Monitoring Tool has the scope to define a common framework of KPIs to measure the project impacts and to guide urban planning strategies towards Climate Neutrality*.

D1.2 CLIMABOROUGH Urban Planning Handbook (Leader: POLIMI; R, PU, M48) *The handbook has the scope to guide readers to the adoption of the CLIMABOROUGH approach and has a twofold target: experts, professionals, policy makers and citizens, non expert subjects. The deliverable will be released in a digital format and will have two distinguished documents clearly differentiating the two targets.*

D1.3 Monitoring reports: *summary of the progress and advancements of CLIMABOROUGH identified impacts, classified on five specific sustainability pillars: Environment, Economy, Society, Institution, Policies*. **(Leader: HEREON; R, PU, M14, M38)**

D1.4 Customised climate services for the CLIMAHUBS: *description of the co-produced necessary climate services that will support the HUBS in their transition processes***. (Leader: HEREON; R, PU, M46)**

WP No.	**WP2**		***Start / End***	**M01 – M48**		***Lead***	***DKSR***		***Total PM***		***179***			
WP Title	**CLIMABOROUGH City Platform**													
Short name	ANCI	HEREON	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAV
PM/partner	3	2	0	28	0	0	0	30	44	2	0	5	5	2
Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PREDA
PM/partner	5	5	5	5	5	5	3	3	3	3	3	3	0	3

Objectives

The overarching objective of this WP is to ensure a successful deployment of the project platform and enable the replication of procured data-driven solutions. Specific objectives are the following:

(i) Establish technical requirements for tendering data-driven solutions during public procurement;

(ii) Develop and implement the CLIMABOROUGH open source platform for data integration, service integration and monitoring based on the complementing SIGINOVA & DKSR open source platforms)

(iii) Integration and harmonisation of CLIMABOROUGH (real-time) city data as basis for data visualisation and public procurement of new solutions as part of WP4;

(iv) Develop relations with other relevant platforms through APIs / connectors where necessary and possible (e.g. NetZeroCities Platform, existing city data / IoT platforms);

(v) Integration of different innovative solutions into a digital twin concept to support decision-making;

(vi) Ensure technical relations and standardisation activities are coordinated with other relevant projects and initiatives.;

Description of work

T2.1 Reference Architecture & Technical Specifications for CLIMABOROUGH Open Source Platform [M1 - 6] Task Lead: DKSR | Participants: SIGI, IMT, All

In this task, the overall architecture and relation between the different components will be described. In particular, it will define, based on project and city requirements, (i) a reference architecture for the CLIMABOROUGH Open Source Platform and (ii) technical requirements for new services selected via the public procurement to connect data and services to the CLIMABOROUGH platform based on existing de facto data interoperability standards and European building blocks.

T2.2 Platform Development, Implementation & Data Integration [M6 - 48] Task Lead: DKSR | Participants: SIGI, IMT, All

This task will involve the preparation of the platform integration plan using input from WP2 about the requirements, in detail it will define (i) the technical development of the open source platform, (ii) the implementation of the open source platform on the cloud, (iii) the development of API interfaces (connectors) for (real-time) data integration from partner cities and other data sources (e.g. Copernicus, Weather Data, Data from EU Open Data Portal etc.) (iv) the general guidelines on format and data exchange among partners, investigation and improvement on data exchange to foster inter-cities collaboration, and (v) the continuous development, maintenance and operation of CLIMABOROUGH Platform.

T2.3 Integration of data and services from solution providers [M18 - 36] Task Lead: SIGI | Participants: All

This task will deploy the integration of services and more particularly (i) the integration of new data sources from procured solutions (inbound; e.g. sensor data; DKSR) and (ii) the creation of dashboards for the Project and for each City visualising relevant KPIs (identified in WP2) representing the impact of the different start-up innovations tested

in the living labs.

T2.4 Data Analytics & Digital Twin: Further Development of CLIMABOROUGH Platform [M18 - 48] Task Lead: IMT | Participants: All

This task aims at proposing improvements and recommendations on the developed platform, based on WP3 requirements with a particular focus on: (i) Innovative ideas about using AI / Advanced Analytics (e.g. Urban Transfer Learning, NLP analysis) based on provided IoT and social media data to predict and discover related trends (e.g. climate transition) and further analysis as data enrichment.(ii) Digital Twin PoC: development of a prototype of Digital Twin based on an existing platform. This framework will allow the creation of Digital Twins from non-smart physical objects and related services.

T2.5 Standardisation and cross-project cooperation [M1 - 42] Task Lead: DKSR | Participants: All

This task will assure compliance of the platform with the various EU communities and projects, with a particular focus on the outcomes of the NetZeroCities project. In particular it will work on (i) the contribution of CLIMABOROUGH to ongoing national and international standardisation activities (e.g. DIN working group on digital twins, IEEE working group on smart cities, etc.) and initiatives (e.g.living-in.eu / MIMsPlus; FIWARE Smart Data Models, etc.), (ii) establishing relations with other EU projects such as NetZeroCities and Scalable Cities / Smart Cities Marketplace with regards to technical aspects and (iii) the publication of open source results on Github, where possible.

Deliverables

D2.1 Reference Architecture for CLIMABOROUGH Platform*: define architecture, building blocks and standards, as well as requirements, blockers, plans, critical gaps etc.* **(Leader: DKSR; R, PU, M06)**

D2.2 Technical Report on Platform Development and Deployment: *it will report the preparation of the platform integration plan using input from WP2 about the requirements* **(Leader: DKSR; R, PU, M18)**

D2.3 Technical Report on integration of services: *Specification of the API interface to be used by start-up solutions to update relevant KPIs to be visualised in Project and City Dashboards* **(Leader: SIGI; R, PU, M36)**

D2.4 Report on AI & Digital Twinning*: report on AI&DT potential* **(Leader: IMT; R, PU, M36)**

D2.5 Report on standardisation: *it reports the compliance of the platform with the various EU communities and projects, with a particular focus on the outcomes of the NetZeroCities project* **(Leader: DKSR; R, PU, M48)**

WP No.	**WP3**		***Start / End***	**M01 – M48**		***Lead***	***UDNA***		***Total PM***	***191***			
WP Title	**CLIMHUBS Setup, Co-Creation and Collaboration**												
Short name	ANCI	HEREON	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAV
PM/partner	7	0	2	0	10	14	0	0	0	0	26	6	6	0
Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PRED
PM/partner	11	11	11	5,5	5,5	11	11	11	11	8	8	8	4	4

Objectives

The core objective of the WP is to accelerate proven innovative solutions to market adoption. More specifically, to:
(i) strengthen the systemic innovation capabilities within each city;
(ii) build and demonstrate a bottom-up capacity to innovate to address the specific challenges faced by participating cities;
(iii) support and codify co-creation best practices in each of the thematic hubs;
(iv) collaborate proactively to help cities in and beyond CLIMABOROUGH to focus on their commonalities to help network and learn from codified approaches and solutions.

Description of work

T3.1 - Rapid Innovation Assessment [M1 - 4] Task Lead: UDNA | Participants: All

This will involve the application of a proven 4-pillar urban innovation diagnostic. This is a flexible instrument that enables a city to swiftly assess its current state-of-play, applying methods from individual on-line completions through city hall assessment, to a wider ecosystem workshop assessment. This will clarify what urban innovation means, where each city should focus, what is required to deliver a more systemic approach to innovation. It spans (i) framework conditions (ii) network enablement (iii) innovation in action and (iv) sustaining value. This will engage and mobilise the various constituents to provide a common language and foundation for city-specific action and project action.

T3.2 CLIMHUBS Set-Up [M3 - M24] Task Lead: AAU | Participants: ULAB, ENEC, All

Based on the context of each city, challenges faced, and intentions for each theme, we will build on existing projects and tailor a method suitable for the project and each city. This will then be applied to establish an appropriate platform (including where appropriate physical facility or facilities in a city) to support innovation.

T3.3 Co-creation of Solutions for Specific Challenges [M9 - M38] Task Lead: AAU | Participants: All
Each city, challenge, and user community will then be analysed to develop a co-creation process with appropriate stakeholder participation to ensure successful delivery. As such, each theme will deliver valuable local output and collectively deliver insights at a project level. This work will involve actions that address all 4 pillars of the urban innovation framework; and as such will address the necessary process to bring new solutions from lead to follower cities (in their specific context), and how best to bring new innovations to market adoption - the latter of which must address the key aspect of societal participation and mindset/behaviour change. The framework, and thus the task, addresses what is required to ensure appropriate business models and financing are put in place to provide air for new innovations to thrive; and delivers confidence to investors to get involved.
T3.4 Network Collaboration [M6 - M48] Task Lead: UDNA | Participants: MCE, ENEC, NTNU, Cities, All
This task seeks to ensure effective collaboration between lead and follower cities. And, based on our agreed systemic approach, to coherently share practices with and learn from other EU-supported initiatives. For the former, we will establish close links and active involvement of fellow cities in lead city practices, as a critical friend; with lead cities providing mentoring as fellow cities establish their local capabilities. This process will draw out city context insights (e.g. innovation in large or smaller cities). We will also make comparisons and draw insights at a thematic level (this will link to and align with the packaging approach that will be applied to codify solutions for scale market adoption). For the latter, we will capture, codify and share our experience at an innovation working session together with other like-minded EU projects and networks (e.g. ENOLL) to seek to develop a better understanding of how systemic innovation can be improved across EU cities and its business ecosystem.

Deliverables
D3.1 Innovation Assessment Report*: identifying current state, challenges, priorities, blockers, emerging plans, critical gaps etc.* **(Leader: UDNA; R, PU, M04)**
D3.2 Challenge Solutions*: more specific detail on the practical solutions that have been co-created; transferred from leader to follower; and successfully (or not) moved to the market* **(Leader: AAU; R, PU, M12, M24)**
D3.3 Systemic Urban Innovation & Co-Creation Insights*: an easy to read paper capturing the key insights from both the internal CLIMABOROUGH project activities, and our interaction with the wider ecosystem; including policy recommendations relevant at city, national and EU levels* **(Leader: UDNA; R, PU, M48)**

WP No.	**WP4**		***Start / End***	**M01 – M48**		***Lead***	***ANCI***	***Total PM***	***125***				
WP Title	**Innovative Procurement**												
Short name	ANCI	HEREON	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAVOD
PM/partner	26	6	0	0	0	0	3	1	1	2	0	0	0	10
Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PREDA
PM/partner	7	7	7	3,5	3,5	7	7	7	7	5	5	5	2,5	2,5

Objectives
The specific objectives of this WP are associated with the rules and procedures of innovative public procurement in general (and Innovation Partnerships specifically) according to the EU 2014 directives and their national implementations (in Italy, Legislative Decree 50 of 2016 named “Code of Public Contracts”). More in detail they are:
(i) To pave the ground for the calls for tender through Open market consultations.
(ii) To draft, revise and publish the documentation related to both market consultations and procurement calls on TED – the EU online service (Tenders Electronic Daily) as well as on Cordis and the partner websites.
(iii) To liaise with WP6 team members for the dissemination of these initiatives on the online communication infrastructure and the partner and stakeholder ecosystem residing on it.
(iv) To appoint expert evaluators (the contracts of which are managed in T4.3) for the evaluation and support in negotiation of received proposals.
(v) To award the Innovation Partnership contracts to the MEAT (Most Economically Advantageous Tenders)

Description of work
T4.1 – Preparation and running of Open market consultations [M07-M09 and M31-M33] Leader: ANCI | Participants: All.
The purpose of this task is to set up the framework and plan the activities associated with the launch of the open market consultations. Such an instrument, foreseen by the 2014 EU directives, aims at actively approaching the market to find out about the technological state of the art, as well as about future developments associated with the procurer challenges, while scouting and recruiting innovative SMEs that have the skills and expertise to provide solutions. For this purpose we will work on: (i) publishing the executive plans delivered in WP3 on the official project website to identify the profile of desired innovators for each topic and challenge; (ii) drafting the rules for organising the

consultation, including for participant registration, personal data protection and business confidentiality preservation in case anything is shared during the live broadcasting of sessions – most likely to occur on the official online communication infrastructure of CLIMABOROUGH; (iii) publishing the invitations on TED and widely advertising the consultation on the various channels activated and managed by the WP6 team; (iv) recording the sessions and uploading them to the website; (v) make a closed door evaluation of the outputs and outcomes of the sessions in order to shape the contents of the next Task.

T4.2 – Drafting of the tender documentation [M07-M09 and M31-M33] Leader: ANCI | Participants: All.

The objective of the Task is to prepare the legal documentation required for the five innovative procurement calls. Partners will co-create the Terms of Reference, the application form, the list of eligibility and selection criteria, the Innovation Partnership contract template and any other needed content to launch the calls. While ANCI will launch the calls, which will therefore rest under the Italian procurement law (Legislative Decree No. 50/2016) the different cities participating in the project as Leaders or followers will be expressly integrated in the call provisions as prospective pilot sites. The aim of the "participant package" will be to clarify unequivocally what is asked of innovation suppliers (particularly SMEs) to secure their admission to the negotiation phase.

T4.3 – Publication of the calls for tender [M10-M15 and M34-M39] Leader: ANCI | Participants: All.

The call documentation will be published on TED, Cordis and the CLIMABOROUGH website and the whole process will be managed electronically. In parallel, the WP7 and WP6 teams will jointly plan and execute the related dissemination campaign. This will consider i) several waves of dissemination to inform, attract and motivate SMEs; ii) social media posts to increase outreach; iii) information spread to associations of European cities (such as TBD) and business associations to spread the news among as many stakeholders as possible. A Frequently Asked Questions facility will be set up and managed during the entire duration of the call publication period. At the end of this task, it is expected that potential bidders will gain a deep understanding of the challenges at stake, the type of technologies searched for, and end up presenting a candidature to the call.

T4.4 – Negotiation and award of received proposals [M16-M18 and M40-M42] Leader: ANCI | Participants: none.

Being the process multi-staged, after the successful check of eligibility conditions, participants will be invited to face to face (remote) sessions of negotiation with representatives of ANCI to identify those aspects of their proposals needing additional technical improvement or refinement. At the end of these meetings the terms will be opened to present the final offers, thus including prices, which will no longer be negotiated but only ranked according to MEAT[27] principles. In this phase of evaluation and possibly also in the previous phase of negotiation, ANCI will be supported by a team of external experts forming the real evaluation committee together with some individual partner representatives. The evaluation rules will be communicated in advance within the tender documentation. Every proposal will be evaluated by at least three experts. The final results will be published on TED.

T4.5 - Climate proofing (M01-M36). Leader: HEREON. Participants: all CLIMAHUBS

With the CLIMABOROUGH climate proofing instrument, we support the mainstreaming of climate information into mitigation and/or adaptation strategies and programmes, analysing every new procurement and management proposals through a climate change lens. The instrument will take as its basis the best climate science available and will help produce customised climate services for urban procurement processes. This instrument will also help analyse possible climate stress situations in the future.

Deliverables

D4.1 Open Market Consultation Documentation: *output of T4.1 with the contents described therein.* **(Leader: ANCI; R, PU, M07, M31)**

D4.2 Innovative Procurement Tender Documentation: *output of T4.2 with the contents described therein.* **(Leader: ANCI; R, PU, M09, M33)**

D4.3 List of Awarded Proposals: *output of T4.4 with the contents described therein.* **(Leader: ANCI; R, PU, M18, M40)**

D4.4 Climate proofing instrument: *this document will describe the instrument built in T4.5* **(Leader: HEREON; R, PU, M36)**

WP No.	**WP5**			***Start / End***	**M12 – M44**		***Lead***	**AAU**		***Total PM***	**217,5**		
WP Title	**Climate Sandbox Demonstration in Real Environments**												
Short name	ANCI	HEREON	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAVOD
PM/partner	5	0	2	0	1	30	3	0	2	0	5	12	13	0

[27] MEAT stands for *Most Economically Advantageous Tender*

Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PREDA
PM/partner	13	13	13	6,5	6,5	13	13	13	13	10,5	10,5	9,5	6	4

Objectives

This work package will deploy solutions and test-run the tools developed within CLIMABOROUGH in, at least, the leader cities. This test-run entails the actual development, implementation and monitoring of local policies in 3 cycles, feeding the results back into the overall project's solutions. WP5 ensures the applicability of these tools and methodologies in a real-world setting and is functional to prove the validity of the Climate Sensitive Urban Planning Framework (WP1, Task1.1 and Task 1.2). In fact, the pilot cities which will be part of this test run have been chosen such that they each face challenges (related to CLIMHUBS). This way, the solutions developed by the project can be replicated all over Europe. The objectives of this work package are:

(i) to define concrete scenarios for the implementation of new solutions in each of the cities, which are in line with the local government's strategy and the mission;

(ii) Iteratively evaluate the impact of those on climate neutrality and their usefulness by making use of the project tools and methodologies, while continuously feeding back the local results to the project; thus, improving the applicability of the project's solutions.

(iii) Implement and define mentoring and replication processes to support the leader cities to mentor the followers and to help these ones to replicate the project solutions, reducing the gap between them.

Description of work

T5.1 Baseline Analysis [M12 - M18] Task Lead: AAU | Participants UDNA, ENEC, ULAB, MCE, HEREON

The cities will analyse the current situation based on the locally available data at the start of the project. This task entails the collection of data from local data sources; including non-official sources or data held by third parties, in collaboration with WP2 and WP3. Based on this data the cities will make a baseline analysis of the potential scenarios, feeding the 1st cycle of urban planning actions in WP1, while WP2 will use this pointer to incorporate the local data into the decision support tools. A baseline analysis is paramount to eventually determine the impact of the new policy on a local scale and also functional to the creation of the Monitoring tool as per the data available and that eventually still necessary for the completion of the KPIs. Here is where the concept of Sandbox will be for the first time adopted and tested.

T5.2 Prototype development Cycle 1 [M18 - M24]. Task Lead: AAU | Participants UDNA, ENEC, ULAB, MCE, HEREON

This task starts immediately after the awards of the call (Task 4.4) and consists in the design of a low-fidelity prototype of each proposal, that allows for a first evaluation of the innovation process. In particular the prototypes will help define a) the way selected proposals can address the local needs, b) the technical and organisational context in which the proposal will be implemented, including the infrastructure that will support the prototype or that will be needed to support it and c) the stakeholders the prototype will engage, taking into account the previous stakeholders mapping in the co-creation phase (Task 3.3) and possible integrations to such mapping. The evaluation of prototypes will contribute to the deployment of city demonstrators, while at the same time defining the needed adjustments in the legal and administrative environments to facilitate their take up and scalability. This phase will approximately last 6 months and will include both the low-fidelity prototype development and its evaluation.

T5.3 Leader Cities Demonstration cycle 2 [M24 - M30] Task Lead: ULAB/ENEC | Participants AAU, UDNA, ENEC, ULAB, MCE, HEREON

This task will start from the evaluation of the prototypes in task 5.2 and further develop them into fully functioning innovations, that include business-related aspects and considerations about the broad socio-technical and legal and administrative change brought about by the winning proposals. The evaluation of this phase will concern the mechanisms of change activated by the proposal, its systemic effects in the urban ecosystem, including the definition of the users engaged in the change, the way the proposal addresses their needs or their routines, the positive and negative reactions of the ecosystem to the proposal, and the business as well as regulatory processes the proposal is activating.

T5.4 Replication and mentoring Cycle 3 [M28 - M36] Task Lead: ENEC | Participants AAU, DKSR, ULAB, MCE, HEREON

This task will prepare the ground for replication of the procured solutions. ENEC will coordinate, with ULAB, the leading cities to mentor the follower cities to increase the chances to replicate the procured services. The replicability strategies elaborated in This task will define criteria for the replication, including the definition of the legal and administrative environments, systemic characteristics, technical infrastructures, social and cultural competences needed to support the replication. Leveraging existing communities (ENEC, MCE, Morgenstadt Urban Data Community) and being closely aligned with and complementing the activities of WP3 and WP5, this Task also aims at growing the knowledge of participating cities on all things data and enabling them to replicate and make use of data-driven services on the basis of the open CLIMABOROUGH platform, by organising regular review meetings and

linking CLIMABOROUGH cities to ongoing activities of members of the existing DKSR Square platform, which offers an open as well as private space for city actors to exchange with each other, learn and replicate existing, open source solutions.

T5.5 Follower Cities replication cycle [M38 - M44] Task Lead: AAU| Participants DKSR, ENEC, ULAB, MCE, HEREON

This Task will implement the proposal in the follower cities, taking into account the necessary adaptations of the innovations to the new contexts. This phase will consider the criteria defined in Task 5.4, identify the community leaders that can support the replication and define the ecosystem elements (including the legal and administrative requirements) that will support the replication or that will possibly hinder it (and in the latter case define mitigation strategies for reducing their influence). The methodology is described in par 1.2.5.

D5.1 Baseline analyses: *1 baseline analysis for each of the pilot cities developing the Climate Sandbox concept* **(Leader: AAU; R, PU, M18)**

D5.2 Deployment report: *demonstrators at a thematic and city level, with case studies and key learnings documented for sharing purposes* **(Leader: AAU; R, PU, M31, M37, M45)**

D5.3 Replication and Mentoring plan: *plan reporting the mentoring methodology for lead cities to support replication* **(Leader: ENEC; R, PU, M30)**

D5.4 Replication roadmap: *based on D5.3, it reports the replication roadmap based on the Climate Sandbox concept* **(Leader: ENEC; R, PU, M48)**

WP No.	**WP6**		***Start / End***	**M01 – M48**		***Lead***	***LINKS***		***Total PM***		***242***		
WP Title	**Dissemination, Communication and exploitation**												
Short name	ANCI	HEREO	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAVOD
PM/partner	10	5	26	3	6	5	**9**	6	**6**	34	3	12	9	13
Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PREDA
PM/partner	15	8	8	5	4	8	11	5	8	7	5	4	3,5	3,5

Objectives

The main goal of this WP is to position CLIMABOROUGH as a benchmark city innovation programme, ensuring the highest impact through the following action pillars:

(i) Attracting and engaging project stakeholders (city managers, entrepreneurs, academics, civil society members, climate activists, etc.) on the project's online communication infrastructure, populating it with frequent public events and periodic newsletters.

(ii) Following up on the Designscapes 1 activities for the management of project website and social media, specialising them to the new purposes of the project, particularly the information related to the Open market consultations and Calls for innovative public procurement described in WP4 as well as the project pilots described in WP2.

(iii) Complementing the joint dissemination activities (mostly run online) with individual partner contributions, mostly cities, but also the organisation of local events (possibly in the native languages of participant countries) to build long-lasting collaborations and communities.

(iv) Creating and seizing synergies with the NEB community and other EU networks, initiatives and projects to maximise the outreach capacity, with special emphasis on the sister projects funded by the same Call.

Description of work

T6.1 Impact Enhancement Roadmap [M01-M06] Leader: LINKS with MCE | Participants: All.

This crucial first task involves the setup and maintenance of an impact enhancement roadmap. The easy to follow document will bridge the separate communication, dissemination and exploitation activities covered in this WP with an overarching strategy to form a holistic approach to all levels of promotion, helping partners understand what type of engagement is needed, why, where, when and how. A draft roadmap reflecting the overall strategy of all promotional tools and activities has already been outlined (see Section 2.2). The roadmap itself consists of a target audience and interests matrix along with a set of strategies with detailed activity tables per project phase. The Roadmap will not only guarantee communication and dissemination happens at the right times for the right purposes but will ensure all planned activities are monitored to assess performance so future tactics can be updated and refined based on feedback.

T6.2 Outreach Campaigns [M01-M48] Leader: MCE with the support of NTNU | Participants: All

This task covers both general awareness raising and information sharing (Dissemination) and more detailed result/impact generation tailored to specific audiences (Communication). It will cover the (i) Dissemination Campaign, key actions include: CLIMABOROUGH identity and branding, website and online presence, dissemination activities. (see section 2.2.1) and (ii) Communication campaign: targeted events, cross-project activities, networking on regional and EU institutional level, final dissemination event.

T6.3 Exploitation strategy and IPR management [M01-M16] Leader: LINKS | Participants: All
Acknowledging the paramount importance of results valorisation, the task is aimed at crafting the overarching exploitation vision for the CLIMABOROUGH project. To ensure an EU-wide impact through the long-term sustainability of project outcomes, the task will work – since the advent of the project – on the identification of exploitable results and on the definition of a common strategic roadmap for materialising their potential. This activity stream will be supported by practices and measures – made available by LINKS analysts – apropos of knowledge and IPR management. Themes covered will be management of results (e.g., result ownership, access rights to background and foreground, transfer of results), protection of results (where the potential economic benefits clearly outweigh the financial cost of seeking such a protection), valorisation of results, (i.e., maximisation of project impacts and of returns yielded to partners) and governance model (e.g., responsibilities, roles, and tools chosen with the intent of ensuring a structured yet flexible management).

T6.4 Market observatory [M01-M48] Leader: LINKS | Participants: All
With the purpose of providing the Consortium with continuous strategic guidance capable of steering the platform roadmap, CLIMABOROUGH intends to establish a permanent market observatory. The present task will implement such an observatory and will investigate the new breed of business models ushered-in for the co-production, sharing and valorization of public sector information and services. Such an exploratory activity is accomplished through the formulation of a comprehensive framework that systematises business models situated at the interplay of exponential technologies and public sector innovation, implemented either by startups or large established enterprises in collaboration with public agencies. The Task will take advantage of secondary research grounded on grey literature (e.g., white papers, industry reports) while the Consortium considers, to the extent possible, the chance of engaging sectoral informants for interviews and focus groups.

T6.5 Business rationale and value ecosystem [M01-M36] Leader: LINKS | Participants: All
With the aim of providing solid foundations for the valorisation of project results in the European Smart City landscape, the task focuses on key strategic aspects of market exploration. Themes dealt with are (but not limited to): stakeholder analysis, target segment identification, empirical assessment and prioritisation of current users' pains and gains, design of a compelling value proposition addressing problems and opportunities identified, conceptualisation and formalisation of a sound business model.
In view of the multi-sided nature of CLIMABOROUGH's market, emphasis will be laid on the characterisation of the value network: actors belonging to the value ecosystem will be analysed, interfaces among these actors as well as respective value exchanges will be defined, appropriate marketing mix will be investigated to stimulate user on-boarding. A spiral of steps that is peculiar to an iterative and agile (a.k.a. 'lean') approach will put CLIMABOROUGH business partners in the position of dynamically testing important market hypotheses: to this end, the Consortium will adopt Lean Startup and Customer Development approaches, supported by facilitation tools such as Test Cards, Learning Cards, and Progress Board.

T6.6 Market validation [M24-M48] Leader: EZAVOD and LINKS | Participants: DKSR, SIGI and All
The present task draws on the findings of T6.3 and T6.5 in order to elaborate a well-thought-out and coherent go-to-market plan meant to drive the exploitation efforts once the grant period is over. To this end, the project business idea stemming from T6.5 will be validated from the competitive standpoint: building on T6.3 findings, the task will focus on the analysis of the competitive positioning and the competitive benchmark against the yardstick of best-in-class rival offerings. A parallel thread will have to do with testing market hypotheses related to problem-solution fit and product-market fit: prospective users will be engaged in the experimental playgrounds set in WP5 and WP1. Results obtained will allow refining the multi-sided business model with the goal of allowing business partners to reach economic sustainability through the CLIMABOROUGH platform while delivering social and environmental value. Furthermore, looking at the project follow-up, market sensing findings will be painstakingly examined to elaborate scale-up strategies (e.g. growth hacking) as well as monetisation logics meant to attract premium clients.

Deliverables

D6.1 Dissemination and communication plan: *released at early project stage including the definition of the online communication infrastructure of T6.1.* **(Leader: MCE; R, PU, M06)**

D6.2 Dissemination and communication update: *based on the results of DEC activities, having D6.1 contents as baseline. Timing is carefully chosen to draw lessons that can be taken up in the following edition of the strategy.* **(Leader: MCE; R, PU, M15, M30)**

D6.3 Exploitation and IPR plan and strategy: *The will contain CLIMABOROUGH's exploitation vision, a set of possible strategic options, a framework for mapping the project's foreground as well as an initial assessment of the market opportunity in terms of scope, trends, dynamics. It will also include a plan of action for the first half of the project's lifetime***. (Leader: LINKS; R, RE, M16)**

D6.4 Sustainability Plan: *This will include the final exploitation strategy for the post-grant phase clearly outlining*

the foreground produced and how the consortium will set up to maximise its impact and to guarantee the long term financial sustainability of the related activities. **(Leader: EZAVOD and LINKS ; R, RE, M48)**

WP No.	**WP7**	***Start / End***	**M01 – M48**	***Lead***	***ANCI***	***Total PM***	***104***

WP Title **Management**

Short name	ANCI	HEREO	MCE	IMT	NTNU	AAU	POLIMI	SIGI	DKSR	LINKS	UDNA	ULAB	ENEC	EZAVOD
PM/partner	33	3	2	2	2	2	3	2	3	7	3	3	3	2
Short name	SOFIA	TORO	IOA	MARI	ZUM	ATH	CASCA	DIFF	GAM	KRK	KATO	PILS	PRI	PREDA
PM/partner	3,5	3,5	3,5	3,5	0	3,5	3,5	3,5	3,5	1,5	1,5	1,5	1,5	0

Objectives

The overarching objective of this WP is to ensure a successful execution of the project. Specific objectives are the following:
(i) To comply with the legal, contractual, financial, and reporting requirements of Horizon Europe and EC.
(ii) To coordinate and manage the consortium towards efficient and effective project implementation.
(iii) To carry out the reporting of the expenses held within the calls for innovative procurement.
(iv) To define the contractual relationship with the External Advisory Board and the experts evaluators..
(v) To manage and periodically update the risk logs of the project.
(vi) To elaborate and update a data management plan containing (Open Access, project data FAIRification and GDPR compliance).
(vii) To manage and to define gender plan

Description of work

T7.1 – Coordination and quality assurance of the project [M01-M48] Task Leader: ANCI | Participants: All.
This Task will put in place all the procedures needed for a correct execution of the planned tasks in the Work Plan. To this end, the project coordinator, ANCI, will elaborate a project management handbook during the first month of the timeline for project management and quality assurance. This will include guidelines for financial reporting to the EC, templates for the deliverables and presentations, measures to ensure internal review and timely preparation of deliverables, as well as internal communication rules and procedures. This Task also involves coordinating and managing administrative matters and giving administrative support to all partners, preparing periodic reports to the EC, ensuring sound financial management (cost monitoring, accounting, cost statement preparation, distribution of funds), timely compilation of deliverables, periodic reporting and continuous communication with the EC services and project advisor(s). The official Progress Report and Final Report will be generated and submitted at the deadlines stated in the grant agreement.
T7.2 – Risk, Data and Innovation Management [M01-M48] Task Leader: ANCI| Participants: All.
This Task has three main goals and action lines:
1) will develop and update the risk registry, including the identification of critical implementation risks and the definition of related mitigation processes and contingency plans. The risk registry will cover technical, innovation, project management, and exploitation risks, employing ISO 31000 risk management procedures and practices.
2) will prepare and periodically update the project's Data Management Plan. Particularly, it will ensure that all the (non-confidential or privacy protected) dataset collected in CLIMABOROUGH adhere to the FAIR principles (Findable, Accessible, Interoperable, Reusable) and describe the life cycle for the data to be collected, processed, generated, and archived in full compliance with GDPR and open access requirements.
3) will be responsible for continuous monitoring and management of the innovation generated during the project, including Intellectual Property Rights (IPR) in accordance with the provisions of the Consortium Agreement covering both background and foreground knowledge developed during the project.
T7.3 – External Advisory Board and call evaluation expertise [M01-M48] Task Leader: ANCI | Participants: none.
This Task deals with the administrative and financial management of the relationships between CLIMABOROUGH and the appointed members of the two groups of domain experts supporting the project - the External Advisory Board and the team of evaluators for the five procurement calls. It also deals with the coordination of the specific work to be performed by the respective group members. This explains why task responsibility is conferred to the Lead Partner.
T7.4 – Gender plan [M01-M06] Task Leader: ANCI with the support of experts | Participants: All.

This task will define the guidelines to integrate gender dimension into "Topic-oriented strategic plans". This process will make women's concerns and experiences an integral dimension of the design, implementation, monitoring, and evaluation of systemic territorial transformations of the 8 leader Cities in all political, economic, and societal spheres with the goal of achieving gender equality and to consider gender inclusion in an intersectional way. The guidelines will include recommendation for the following topics: access, mobility, safety and freedom from violence, health and hygiene, climate resilience, cultural integration, aware and bottom-up participation and security of tenure — has profound economic and social consequences for women, girls, sex and gender minorities of all ages and abilities. To elaborate the recommendations we envisage 4 main steps: 1-Creating a baseline foundation by establishing gender principles. 2- Establishing a process framework that embraces monitoring, evaluation, accountability and learning. 3- Designing a participatory framework that creates buy-in, gathers data, and engages beneficiaries in design. 4- Creating an application framework for Implementation. These recommendations will be adopted in the tenders' drafting, publication, process and in the phase of selection of received bids (WP4), mentoring (T5.5) and dissemination (WP6).
Task 7.5 Evaluation of the impacts of the project [M24-M48] Leader: LINKS | Participants: WP leaders.
The document will present an analysis of the CLIMABOROUGH impacts and make recommendations for improvements of specific elements of the approach and methods of the implementation procedures for future exploitation.

Deliverables

D7.1 CLIMABOROUGH Project Manual*: containing detailed information on management practices: procedures for reporting, drafting/reviewing deliverables, quality and risk management, etc.* **(Leader: ANCI; R, CO, M1)**
D7.2 Data Management Plan*: issued in three versions during the project's lifetime, complying with both Open Access and GDPR provisions.* **(Leader: ANCI; R, PU, M06, M24, M48)**
D7.3 Gender requirements for public procurement, evaluation and urban executive plans*: this document will report the gender requirements for the public procurement activities, evaluation and for the elaboration of the Urban executive plans.* **(Leader: ANCI with the support of experts; R, PU, M6).**
D7.4 Project outreach report: *the document will present an analysis of CLIMABOROUGH impacts and make recommendations for improvements of specific elements of the approach and methods of the implementation procedures for future exploitation.* **(Leader: LINKS with the support of experts; R, PU, M46).**
Horizon Europe formats will be adopted for the risk management, mid-term and final reports.

Table 3.1c: List of Deliverables

No.	Deliverable name	WP	LEAD	Type	Level	Date
D7.1	CLIMABOROUGH Project Manual	WP7	ANCI	R	CO	M01
D3.1	Innovation Assessment Report	WP3	UDNA	R	PU	M04
D7.2.1	Data Management Plan 1	WP7	ANCI	R	PU	M06
D2.1	Reference Architecture for CLIMABOROUGH Platform	WP2	DKSR	R	PU	M06
D6.1	Dissemination and communication plan	WP6	MCE	R	PU	M06
D1.1	Monitoring tool of CLIMABOROUGH project	WP1	POLIMI	R	PU	M06
D4.1.1	Open Market Consultation Documentation 1	WP4	ANCI	R	PU	M07
D4.2.1	Innovative Procurement Tender Documentation 1	WP4	ANCI	R	PU	M09
D7.3	Gender requirements for public procurement, evaluation and urban executive plans	WP7	ANCI	R	PU	M12
D3.2.1	Challenge Solutions 1	WP3	AAU	R	PU	M12
D1.3.1	Monitoring report 1	WP1	HEREON	R	PU	M14
D6.2.1	Dissemination and communication update	WP6	MCE	R	PU	M15
D6.3	Exploitation and IPR Plan and Strategy	WP6	LINKS	R	CO	M16
D2.2	Technical Report on Platform Development and Deployment	WP2	DKSR	R	PU	M18
D4.3.1	List of Awarded Proposals 1	WP4	ANCI	R	PU	M18
D5.1	Baseline analyses	WP5	AAU	R	PU	M18
D7.2.2	Data Management Plan 2	WP7	ANCI	R	PU	M24
D3.2.2	Challenge Solutions 2	WP3	AAU	R	PU	M24
D5.3	Replication and Mentoring plan	WP5	ENEC	R	PU	M30

No.	Deliverable name	WP	LEAD	Type	Level	Date
D6.2.2	Dissemination and communication update	WP6	MCE	R	PU	M30
D4.1.2	Open Market Consultation Documentation 2	WP4	ANCI	R	PU	M31
D5.2.1	Deployment report 1	WP5	AAU	R	CO	M31
D4.2.2	Innovative Procurement Tender Documentation 2	WP4	ANCI	R	PU	M33
D2.3	Technical Report on integration of services	WP2	SIGI	R	PU	M36
D2.4	Report on AI & Digital Twinning	WP2	IMT	R	PU	M36
D4.4	Climate proofing instrument	WP4	HEREON	R	PU	M36
D5.2.2	Deployment report 2	WP5	AAU	R	CO	M37
D1.3.2	Monitoring report 2	WP1	HEREON	R	PU	M38
D4.3.2	List of Awarded Proposals 2	WP4	ANCI	R	PU	M40
D5.2.3	Deployment report 3	WP5	AAU	R	CO	M44
D2.4	Systemic Urban Innovation & Co-Creation Insights	WP2	UDNA	R	PU	M44
D1.4	Customised climate services for the CLIMHUBS	WP1	HEREON	R	PU	M46
D2.2	Innovation Demonstrators	WP2	AAU	DEM	PU	M46
D7.4	Project Outreach Report	WP7	LINKS	R	PU	M46
D1.2	CLIMABOROUGH Urban Planning Handbook	WP1	POLIMI	R	PU	M48
D2.5	Report on Standardisation	WP2	DKSR	R	PU	M48
D3.3	Systemic Urban Innovation and Co-creation Insights	WP3	UDNA	R	PU	M48
D5.4	Replication roadmap	WP5	ENEC	R	PU	M48
D6.4	Sustainability Plan	WP6	EZAVOD	R	CO	M48
D7.2.3	Data Management Plan 3	WP7	ANCI	R	PU	M48

Table 3.1d: List of milestones

N.	Milestone name	WP (s)	Due date	Verification
1	Monitoring Tool of CLIMABOROUGH project	WP1	M06	Deliverable 1.1
2	Gender Equality Plan	WP7	M12	Deliverable 7.3
3	CLIMABOROUGH Platform is deployed with first datasets	WP2	M18	Deliverable 2.2
4	Award of Innovative Procurement Call 1	WP4	M18	Deliverable 4.3.1
5	Leader cities' products/services deployed	WP3/5	M30	Deliverable 5.2
6	Advanced analytics and dashboard. Digital Twins	WP2	M36	Deliverables 2.3/2.4
7	Validation of the CLIMABOROUGH Urban planning framework	WP1	M36	Deliverable 1.2
8	Climate proofing instrument	WP4	M36	Deliverable D4.4
9	Award of Innovative Procurement Call 2	WP4	M40	Deliverable 4.3.2
10	CLIMABOROUGH Urban planning Handbook	WP1	M48	Deliverable 1.2
11	Replication roadmap	WP5	M48	Deliverable 5.4

Table 3.1e: Critical risks for implementation

Description of Risk	Odds	Severity	WP	Proposed risk mitigation measures
R1. The Monitoring tool acceptance by cities is low	Medium	High	WP1	The use of climate services and data reduces this risk, however the role of WP5 and the evaluation of services and tools will make sure that the project can react in time to this risk.
R2. Solutions of the startups are not compliant with platform	Medium	High	WP2	The experience to work with cities of SIGI (101 cities adopted SIGINOVA) and DKSR will support. Moreover, the public procurements will be defined in accordance with WP2 to make binding the compliance.

Description of Risk	Odds	Severity	WP	Proposed risk mitigation measures
R3. Political priorities of leader cities suddenly change because of political change, requiring us to intervene in challenges and scenarios.	Medium	Medium	WP3/5	8 Leader cities have been preselected to act as funded members of the consortium. Those are part of the Mission and the political and top management has already been involved with a letter of commitment. The presence of City Angels mitigates these risks.
R4. Selected needs and/or requirements are not appealing enough to SMEs.	Low	Medium	WP3	The Open Market consultations will serve to advertise the calls and clarify the needs and requirements in full. We will prioritise those (sub)topics that hold interesting business opportunities and fit to the conditions and limits of co-creation in terms of budget, scope, duration and effort.
R5. The opportunities for private funding are not sufficiently grounded on demonstration evidence.	Low	Medium	WP4	All winners of the innovative procurement calls are mandated to follow the guidelines included in their awarded offers and comply with the KPIs associated with them. The number of followers is very high and will reduce any risks.
R6. Follower cities drop out during the piloting phase.	Medium	High	WP5	The partners have set up a close relationship with those cities, in many cases pre-existing to the project. Therefore, City Angels will have the role to reduce the risk of such situations, via mentoring and daily follow-up.
R7. The deployment of services/products suffers of delays	High	Medium	WP5	CLIMABOROUGH will use Designscapes techniques. This project worked on 99 funded initiatives. A stepwise approach is foreseen, however, which may lend itself to adjustments during the execution of the process.
R8. Difficulties in expanding the project community and their engagement	Medium	Low	WP6	The presence of various associations of cities and partners well known at European level makes this risk very low and it allows the consortium to have a set of tools to react to any issues.
R9. A partner withdraws from the project.	Low	Medium	WP7	Most of the partners are linked and often by relations going beyond this project. The level of expertise and experience is so high that the remaining ones would quite easily take up the tasks left out by the withdrawing partner.
R10. Unforeseen changes in key personnel and resources during the project.	Medium	Medium	WP7	All partner organisations have more than one person in charge of the work and being aware of the project related activities. In case of complete change, the Project Manager would ensure support to the substitutes and help them familiarise with the project's activities and progress.

Table 3.1f: Summary of staff effort

N.	Partner	WP1	WP2	WP3	WP4	WP5	WP6	WP7	TOT	% on total
1	ANCI	6	3	7	26	5	10	33	90	7%
2	HEREON	23	2	0	6	0	5	3	39	3%
3	MCE	0	0	2	0	2	26	2	32	3%
4	IMT	0	28	0	0	0	3	2	33	3%
5	NTNU	2	0	10	0	1	6	2	21	2%
6	AAU	0	0	14	0	30	5	2	51	4%
7	POLIMI	32	0	0	3	3	9	3	50	4%
8	SIGI	0	30	0	1	0	6	2	39	3%
9	DKSR	0	44	0	1	2	6	3	56	5%
10	LINKS	8	2	0	2	0	34	7	53	4%

N.	Partner	WP1	WP2	WP3	WP4	WP5	WP6	WP7	TOT	% on total
11	UDNA	2	0	26	0	5	3	3	39	3%
12	ULAB	5	5	6	0	12	12	3	43	4%
13	ENEC	3	5	6	0	13	9	3	39	3%
14	EZAVOD	0	2	0	10	0	13	2	27	2%
15	SOFIA	6	5	11	7	13	15	3.5	60.5	5%
16	TORO	6	5	11	7	13	8	3.5	53.5	4%
17	IOA	6	5	11	7	13	8	3.5	53.5	4%
18	MARI	3	5	5.5	3.5	6.5	5	3.5	32	3%
19	ATH	6	5	11	7	13	8	3.5	53.5	4%
20	CASCA	6	5	11	7	13	11	3.5	56.5	5%
21	DIFF	6	5	11	7	13	5	3.5	50.5	4%
22	GAM	6	5	11	7	13	8	3.5	53.5	4%
23	KRK	4.5	5	8	5	10.5	7	1.5	41.5	3%
24	KATO	4.5	5	8	5	10.5	5	1.5	39.5	3%
25	PILS	3.5	5	8	5	9.5	4	1.5	36.5	3%
26	PRI	1	0	4	2.5	4	3.5	1.5	16.5	1%
27	ZUM	3	0	5.5	3.5	6.5	4	0	22.5	2%
28	PREDA	3	3	4	2.5	6	3.5	0	22	2%
Total PMs		**145.5**	**179**	**191**	**125**	**217.5**	**242**	**104**	**1204**	**100%**
% on total		**12%**	**15%**	**16%**	**10%**	**18%**	**20%**	**9%**	**100%**	

Table 3.1g: 'Subcontracting costs' items

ANCI	Cost (€)	Description of tasks and justification
Subcontracting	3.200.000	Public procurement calls (12 of them)

Table 3.1h: 'Purchase costs' items

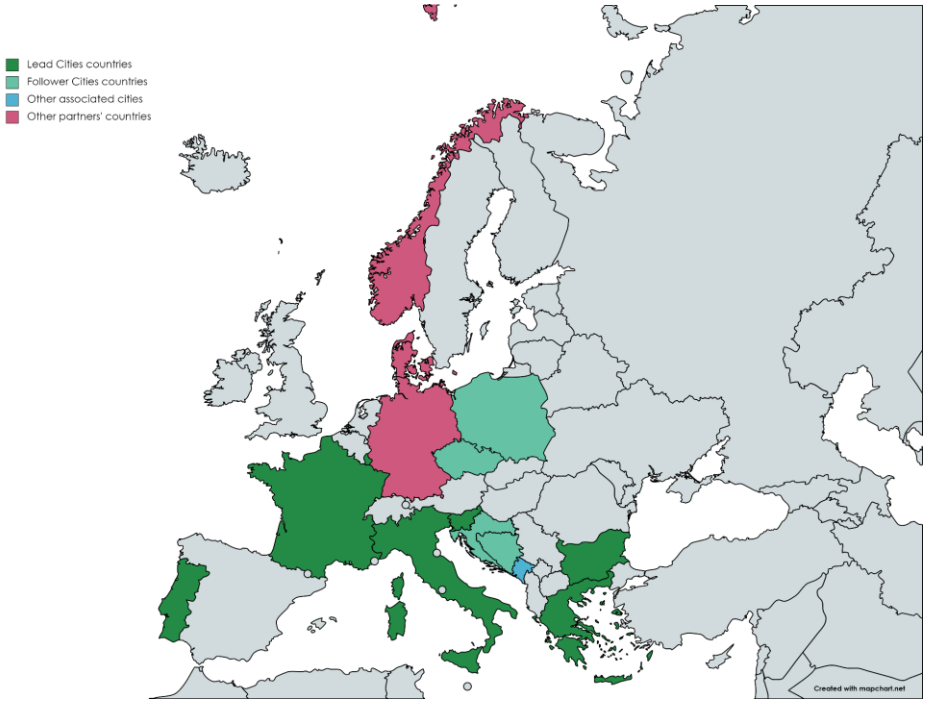
MCE	Cost (€)	Justification
Travel and subsistence	50.000	20K for MCE use (consortium meetings and dissemination activities) and 30K for EAB experts (1 travel/y)
Other goods, works and services	10.000	Dissemination costs (printing and marketing collaterals)
Total	60.000	

SIGI	Cost (€)	Justification
Travel and subsistence	10.000	Travels for consortium meetings and related travels
Equipmens	180.000	Server hosting costs for platform
Other goods, works and services	10.000	Financial Audit costs
Total	200.000	

ULAB	Cost (€)	Justification
Travel and subsistence	20.000	Consortium meetings and visiting cities
Other goods, works and services	15.000	Dissemination costs (marketing collaterals and video)
Total	35.000	

IOA/KRK/KATO/PR	Cost (€)	Justification
Travel and subsistence	20.000	Consortium meetings and visiting cities
Total	20.000	

3.2 Capacity of participants and consortium as a whole



CLIMABOROUGH will be led by *ANCI, the Association of Tuscan Municipalities*. ANCI has an extensive track record as a pioneer in the mobilisation of **design enabled innovation** processes in cities through coordinating the flagship H2020 Designscapes project. ANCI will drive the overall project effort and ensure rigorous standards of quality are enforced throughout.
Politecnico di Milano with its Department of Architecture and Urban Studies holds a worldwide renowned expertise in **urban planning** and has been working on climate friendly policy design and evaluation since the 2000s. They share a long standing R&D cooperation with *Helmholtz Center Hereon*, very experienced in research activities on "Earth and Environment", "Information" and "Matter", leading various projects to support cities with **climate services** and coordinating EURO-CORDEX (https://www.euro-cordex.net/).
On the **IT side**, the consortium can rely on three core partners, *SIGI*, *DKSR* and *Institut Mines-Telecom*, proposing tools (see section 1.2, STEP 4) and bringing an extensive experience in working with cities on data and platform development. SIGI and DKSR will also bring their own networks of cities for dissemination. On **co-creation, living labs, mentoring and replication**, the consortium can rely on outstanding experts, next to the already mentioned ANCI, Politecnico di Milano and Hereon Institute, such as *University of Aalborg*, *Urban DNA*, *Energy Cities*, *Urban Lab*.
Cities were described in section 1, but we recall here the presence of 14 of them acting as leaders (*Athens, Cascais, Differdange, Grenoble, Ioannina, Maribor, Sofia, Torino*), followers (*Katowice, Krk, Pilsen, Prijedor*) and associates/observers (Issy-les-Moulineaux and Podgorica). **Fundraising** and **business development** will be led by two top notch experts such as *E-zavod* and the *LINKS Foundation*. **Dissemination and Communication** will be ensured by all partners, but driven by the experienced association *Major Cities of Europe* with the support of City Angels (*Urban Lab* & *Energy Cities*), *NTNU* and the partner cities. Finally, the project will be well connected to **communities/associations of cities** (*Energy Cities, Major Cities of Europe, SIGI, ANCI*), and EC initiatives about cities (*Smart City Marketplace, Living in EU*) including the Mission on Climate Neutral and Smart Cities by 2030.
Other useful skills of consortium members are:

- Direct connection with the New European Bauhaus initiative (AAU, NTNU, POLIMI).
- Direct connection to NetZeroCities project (POLIMI, ENEC)
- Direct experience in providing digital solutions to cities (IMT, DKSR, SIGI)
- Distinctive expertise in the management of exploitation and IPR plans (LINKS, EZAVOD, UDNA, HEREON).
- Successful track record of training and capacity building events in local public administration/cities (AAU, ANCI, UDNA, ENEC, ULAB, HEREON).
- Successful track record of co-creation and co-design events in urban Living Labs (POLIMI, AAU, UDNA, ENEC, ULAB).
- Practical knowledge of the issues of local public administration (ANCI, MCE, ENEC, ULAB, UDNA, HEREON).
- Signatory or supporter of Living.in-EU (PILS, GAM, ISSY, ATH, CASCA, DKSR)
- HEREON coordinates EURO-CORDEX and the Climate Services Partnership (https://climate-services.org).