

UP2030

Urban Planning and design ready for 2030



D6.9 — Exploitation & Sustainability Planning & Activities Report 2



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About UP2030:

UP2030 is dedicated to aiding cities in achieving climate neutrality through enhanced urban planning and design. The project introduces the innovative 5UP approach to support city stakeholders and local authorities in integrating climate-neutral strategies into their everyday actions and long-term planning. Focused on promoting spatial justice and inclusive participation, UP2030 empowers communities and local governments to become agents of change, driving socio-technical transitions that enhance urban liveability and sustainability. The project's strategy aims to produce actionable insights and scalable solutions for urban environments, prioritizing resilience, equity, and sustainable urban development.

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Abstract	This deliverable presents an updated and final overview of the exploitation and sustainability activities carried out during the second phase of UP2030. Building on D6.8, it provides a market and SWOT analysis of the project’s key sectors and outlines exploitation plans for the 15 Key Exploitable Results (KERs) selected from the 44 identified Exploitable Results. The document outlines strategies, actions, responsibilities, and financial considerations to ensure the continued use and impact of these results beyond the project. In parallel, it details the sustainability plans for the 11 pilot cities, describing how their prototypes and the UP2030 tools tested within them will be maintained, integrated, and scaled after project completion. Developed under Work Package 6, the deliverable serves both as a practical toolbox for partners and as a repository documenting the long-term pathways of UP2030 solutions. It concludes with key insights on general post-project uptake and impact.			

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Executive summary

This deliverable provides a comprehensive overview of the project's exploitation and sustainability efforts during the second part of the project. After outlining the market overview and analysis of UP2030 key sectors, the deliverable provides updated exploitation plans for the Key Exploitable Results (KERs). The plans provide a structured approach for developing comprehensive post-project exploitation plans for the KERs, describing the strategies, planned activities, responsibilities, and financial considerations to support their continued use and impact after UP2030. In parallel, the document outlines the sustainability plans of the pilot cities' prototypes. On the one hand, it describes how each prototype will be maintained, further used, or expanded to generate long-term impact in the cities beyond the lifetime of the project. On the other hand, it details how the UP2030 tools applied in the prototypes will continue to be used, embedded and sustained within the pilots after the end of the project.

This work has been conducted as part of Work Package 6 (WP6) UP-Taking: Dissemination, Exploitation, Communication and Sustainability of UP2030, and of Task 6.3 (T6.3) Exploitation, Standardization and Market Readiness. It follows the first report on "Exploitation & Sustainability Planning & Activities" (Deliverable 6.8 (D6.8)), which was submitted at M18, and is a direct continuation of that deliverable, serving as an updated and final version. As a sensitive document, the deliverable targets UP2030 partners, specifically solutions providers and owners of other Exploitable Results (ERs), as well as the pilot cities. The deliverable acts both as a toolbox, outlining exploitation and sustainability routes and strategies, as well as a repository for documenting the pathways of the UP2030 results and prototypes during and after the project.

At M18 of the project, D6.8 identified 44 exploitable results, which include the tools provided by the project partners, as well as the scientific and academic knowledge results generated by the consortium during the project. From these 44 results, 15 results were selected based on different criteria as the KERs of the project and became the main focus of T6.3 and exploitation efforts and plans. These KERs are divided into 4 main categories, adapted from the original Grant Agreement: 1. Digital Infrastructure tools for energy efficiency; 2. Data governance and digital spatial planning and design tools for climate resilience; 3. Participation and engagement tools; 4. Scientific knowledge & Academic knowledge.

Sustainability efforts, in parallel, concentrate on the project's 11 Pilot Cities and their prototype solutions, particularly during the upscaling and sustainability phases. These efforts define objectives and actions to ensure the project's impact continues beyond its formal duration and to evaluate how the solutions will sustain this impact, be integrated, and remain in use over time.

The deliverable is structured as follows: Section 1 introduces the deliverable; Section 2 presents the methodology; Section 3 provides insights from market and Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis; Section 4 details the exploitation plans for the 15 KERs; Section 5 outlines the sustainability plans of the pilot prototypes; and Section 6 concludes with key findings and recommendations.

Content alignment with other UP2030 deliverables

The UP2030 project fosters exchange and cooperation among partners and deliverables beyond the structure of the WPs. Therefore, the content of this document has been developed in alignment with University of Cambridge (UCAM), Centro de Investigación de Recursos y Consumos Energéticos (CIRCE), DRAXIS Environmental SA (DRAXIS), ICLEI European Secretariat (ICLEI) and WP3 and WP5. The following table lists the deliverables and milestones (Mil) that were input for this present document and the upcoming ones that could benefit from the content here presented.

Input from	Contributes to
D3.5 — Bundle of digital twin tools for net zero decision-making 2 D3.7 — Digital planning and design tools for climate neutral cities 2 D5.3 — UP2030 Service platform	D5.3 UP2030 Service platform D5.7 Online Learning Programme materials
Mil13 All cities have at least one successful prototype Mil14 Cities run fourth workshop on upscale Mil15 Training programme successful delivery completed	Mil14 Cities run fourth workshop on upscale Mil16 Service platform up operative

This deliverable is intended for KER and tool providers, pilot cities, and the wider UP2030 consortium, offering a final internal overview of how project results will continue beyond UP2030. As the project concludes, the content supports partners in finalizing post-project responsibilities and ensuring continuity of tools, prototypes, and exploitation pathways. Being a Sensitive document, dissemination will remain internal and limited to consortium channels, serving as a shared reference for coordinating follow-up actions and understanding the long-term impact and legacy of UP2030.

Acronyms

Acronym	Full name
AI	Artificial Intelligence
B2G	Business-to-Government
BH	Buro Happold
BIM	Building Information Modelling
BKK	Budapest Transport Centre
BMC	Business Model Canvas
CA	Consortium Agreement
CBA	Cost Benefit Analysis
CCC	Climate City Contract
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CEN/TC	CEN Technical Committee
CEN/TS	CEN Technical Specification
CERTH	Centre for Research & Technology, Hellas
CIRCE	Centro de Investigación de Recursos y Consumos Energéticos
CO ₂	Carbon Dioxide
COR	Centro de Operações Rio
CRF	City Resilience Framework
CYFUD	Child and Youth-Friendly Urban Design
D	Deliverable
DCAP	District Climate Action Plan
DRAXIS	DRAXIS Environmental SA
DSS	Decision Support System
DT	Digital Twin

ER	Exploitable Result
ESA	Ecosystem Services Assessment
ESS	Ecosystem Services
EU	European Union
LINKS	Fondazione LINKS
GA	Grant Agreement
GB	Great Britain
GEM	Green Economy Model
GGGI	Global Green Growth Institute
GHG	Greenhouse Gases
GIS	Geographic Information System
GÜNAM	Center for Solar Energy Research and Application
HS	Healthy Streets
HRB	Horizon Results Booster
IBB	Istanbul Metropolitan Municipality
ICLEI	ICLEI European Secretariat
IoT	Internet of Things
ISO	International Standards Organization
IP	Intellectual Property
IPP	Instituto Pereira Passos
IPR	Intellectual Property Rights
iUE	Institute for Urban Excellence
KC	Knowledge Center
KER	Key Exploitable Result
KPI	Key Performance Indicator
LAA	Learning and Action Alliance

LCA	Life Cycle Assessment
Mil	Milestone
ML	Machine Learning
MOOC	Massive Open Online Courses
M	Month
MfC	Mapping for Change
MoU	Memorandum of Understanding
NbS	Nature-based Solutions
NGO	Non-Governmental Organization
NSM	Neutrality Story Maps
NZC	NetZeroCities
NZNF	Net Zero Neighborhood Framework
ODTÜ-GÜNAM	Center for Solar Energy Research and Applications of Middle East Technical University
OUC	Consortium Urban Operation
PAC	Air and Climate Plan
PDS	Sustainable Development and Climate Action Plan of Rio de Janeiro
PEU	Urban Structuring Projects
POC	Proof of Concept
PUC-Rio	Pontifical Catholic University of Rio de Janeiro
PV	Photovoltaics
R&D	Research & Development
RCities	Resilient Cities Network
RoI	Republic of Ireland
SD	System Dynamics
SECAP	Sustainable Energy and Climate Action Plan
StepUP_LxALL	Application of the UP approach to Lisbon

SUMP	Sustainable Urban Mobility Plan
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TRL	Technology Readiness Level
TSPA	Thomas Stellmach Planning and Architecture
TUD	Technische Universiteit Delft
UCAM	University of Cambridge
UCCRN	Urban Climate Change Research Network
UDCW	Urban Design Climate Workshops
UGEM	Urban Green Economy Model
UIC	International University of Catalonia
v	Version
VPC	Value Proposition Canvas
VUB	Vrije Universiteit Brussel
WP	Work Package

1 Introduction

The Deliverable 6.9 (D6.9), *Exploitation & Sustainability Planning & Activities Report 2*, constitutes a key element within Task 6.3 (T6.3) of the UP2030 project, updating and expanding upon Report 1 (D6.8 — Exploitation & Sustainability Planning & Activities Report 1) submitted at M18. While the first report provided the foundation by identifying 44 Exploitable Results (ERs) and developing initial exploitation and sustainability pathways, this deliverable takes a more operational and impact-oriented perspective.

This document is divided into two parts. The first focuses on the 15 selected Key Exploitable Results (KERs), which represent the most relevant and impactful outcomes of UP2030. It explores their exploitation strategies in depth, focusing on practical applications, responsibilities, financial strategies, and pathways to ensure continued use after the project. These strategies have been defined in collaboration with the partners responsible for the individual KERs, through structured workshops and tailored exploitation methodologies and worksheets. The second part of the deliverable assesses the sustainability of the 11 Pilot Cities' prototypes, particularly by examining how the solutions tested in UP2030 have been embedded into their local storylines (vision, action, upscale, sustainability) and how they will continue to generate impact beyond the project's conclusion.

For the purposes and efforts of T6.3, exploitation refers to the use of project results for scientific, commercial, societal, or political benefit, transforming outcomes into innovations, market products, services, or policy recommendations that can be adopted and scaled to address pressing urban and environmental challenges (Tributsch, 2023; Dahan, 2021).

1.1 Purpose and scope

This deliverable functions as a toolbox and repository for documenting exploitation and sustainability pathways. It targets UP2030 partners, especially solution providers, ER owners, and pilot cities, offering them structured strategies and actionable plans to ensure continued relevance and impact of the results.

The specific objectives of this report are:

1. **To ensure sustainability:** outlining strategies, responsibilities, and resources to maintain the KERs and prototypes after the project ends.
2. **To ensure use:** specifying how results will be adopted by target users and embedded into real-world contexts.
3. **To ensure impact:** maximizing the societal, economic, and environmental benefits of UP2030 outcomes.
4. **To demonstrate feasibility:** providing concrete, realistic, and evidence-based plans for post-project exploitation and sustainability.

In addition, exploitation efforts have served to build capacity among project partners to manage their results effectively, understand market dynamics and stakeholder ecosystems, and secure the legacy of their work.

1.2 Document structure

The document is organized as follows:

- ❖ Section 1 – Introduction: description of the purpose and scope of the document and its structure.

- ❖ Section 2 – Methodology: outlines the methodology for the ERs, including the approach to identifying KERs, developing exploitation plans and running collaborative workshops, and the methodology for the prototypes, outlining the approach and strategy for sustainability plans.
- ❖ Section 3 – UP2030 Market analysis: reflects on the market and contextual analysis, with emphasis on Strengths, Weaknesses, Opportunities and Threats (SWOT) insights relevant to exploitation.
- ❖ Section 4 – KERs Exploitation presents the exploitation strategies for each of the 15 KERs, structured through summarizing tables that consolidate inputs, responsibilities, financial considerations, and expected impacts.
- ❖ Structure 5 – Prototypes Sustainability: details the sustainability plans for the 11 Pilot prototypes, highlighting their integration, upscaling, and long-term impact potential.
- ❖ Structure 6 – Conclusion: concludes with reflections on key findings and recommendations for ensuring the lasting value of UP2030 outcomes.

1.3 Definition of terminologies

This sub-chapter includes the definition of the terminologies used in this deliverable, and it aims to bring a common understanding of the different terms applied for the analysis of this report. The definitions are derived from texts on exploitation provided by the European Commission, or from various cited sources in the literature (European Commission, n.d.-a).

Table 1: Definition of key terminologies

Terminology	Definition
ERs	Any tangible or intangible output of the action, such as device, data, knowledge, and information whatever their form or nature, whether they can be protected. It is all the output generated by the project during its implementation, including all the tools and the knowledge.
KERs	'Identified main interesting results, which have been selected and prioritized due to their high potential to be 'exploited' – meaning to make use and derive benefits- downstream the value chain of a product, process or solution, or act as an important input to policy, further research, or education' (European Commission, n.d.-a).
Tools	The products, services, processes, etc. provided by the technical partners of the project.
Scientific knowledge	New research findings, insights, and data gained through the research process of the project. It can include new frameworks, methods, theories, or advancements developed in UP2030, contributing to the scientific community, and advancing the state of the art in various fields.
Academic knowledge	This is similar to the category above, but with a focus on contribution to the academic world.

Exploitation	Refers to the utilization of results in further research activities other than those covered by the action concerned, or in developing, creating, and marketing a product or process, or in creating and providing a service, or in standardization activities. Exploitation can be commercial, societal, political, or aimed at improving public knowledge and action.
Commercialization	Refers to the act of transforming products and services into commercially sustainable assets. In the context of intellectual property (IP), this term is more precisely described as the process of introducing IP to the market with the aim of generating future profits and fostering business expansion.
Value Proposition Canvas (VPC)	The VPC is an instrument that allows one to establish a logical starting point for building and testing a product or service. It is done to create products and services that meet the needs of people. To do that it is important to keep track of the target users' pains, gains, and to-do's – which are all opportunities for providing value to them. A value proposition can be made for any products, service or even project. More than just being a description of the project or service – it's the specific solution it provides and the promise of value the end-user can expect from it (Komatsu Cipriani, 2022).
Business Model Canvas (BMC)	A strategic management tool with nine building blocks that help visualize and design how a business creates, delivers, and captures value. This information will serve as a baseline from which, together with the tool providers, can be used to develop more detailed and practical commercialization plans
Intellectual Property Right (IPR)	IPR: the legal rights and protection given to intellectual assets: Background: what is needed to develop the results. IP that existed before the project started. For more information, check the Consortium Agreement (CA). Foreground: project results; any IP produced during the project.

2 Methodology

This chapter describes the methodology applied to plan for the exploitation and sustainability of UP2030 solutions, namely the structured process of identifying, analyzing, and guiding the future use of the project's solutions. The goal is to ensure that these solutions are effectively adopted and generate impact beyond the lifetime of the project, reaching stakeholders such as end-users, researchers, policymakers, businesses, and civil society actors (European Commission. (n.d.-a)).

For this deliverable, project's solutions are grouped into two complementary categories.

1. **ERs** - including innovations, technologies, methodologies, frameworks, and knowledge generated throughout the project with potential economic, scientific, social, and environmental impacts (European Commission, n.d.-a). For these ERs, an exploitation methodology has been developed, as introduced in Report 1 (D6.8) and further explained below (Section 2.1), which defines the process of ensuring continued use of the ERs from their identification and validation in the first half of the process (defined in Report 1), to their concrete exploitation plan definition (defined in this deliverable). The four ER categories presented here are based on the categories defined in the Grant Agreement (GA) (UP2030, 2022), with two adjustments: the data validation category has been excluded, as no UP2030 KERs fall under it, and the scientific and academic categories have been merged into a single group for the purpose of this deliverable. The resulting four categories are summarized in Table 1.

Table 1: Exploitable Results categories (UP2030, 2022).

(ER) Category	(ER) Category description
1. Digital infrastructure - energy efficiency	Digital tools and end-to-end solutions for digital governance, data collection for interventions and guide decision-making for energy efficiency and renewable integration (processing, analysis, and geospatial visualization).
2. Data governance and digital spatial planning and design - climate resilience	Digital solutions to support better decision-making in the design of climate adaptation and mitigation actions, designed to aid urban planners, local governments and stakeholders involved in making informed decisions regarding climate adaptation and mitigation actions.
3. Participation and engagement	Methods and tools on participation and community engagement, and multistakeholder partnerships to support better decision-making on spatial solutions and spatial justice.
4. Scientific & Academic knowledge	The scientific and academic knowledge results of the project consist of the research findings, knowledge, and innovation generated throughout the project; as well as knowledge linked to the academic and educational field. These results are disseminated through the UP2030 website and other dissemination channels, including

	publications, which play a key role in sharing information, contributing to the scientific community, and advancing the state of the art in various fields.
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2. **Pilot Cities' Prototypes** - representing the practical application of UP2030 solutions in real urban contexts. A dedicated sustainability methodology has been developed (Section 2.2), focusing on how prototypes will be maintained, scaled, and embedded into local governance and planning processes. The prototypes are summarized in Table 2.

Table 2: Pilot's Prototypes.

Pilot City	Prototype
1. Belfast	Net Zero Neighborhood Framework (NZNF)
2. Milan	1. Ecosystem Services Assessment (ESA) and Methodology 2. City Resilience Framework (CRF)
3. Budapest	Budapest Healthy Streets Knowledge Center (KC)
4. Muenster	Roadmap for climate-friendly neighborhood development in existing buildings
5. Rio de Janeiro	1. Urban Design Climate Workshop 2. Rapid and continuous flood risk assessment and adaptation planning for Rio de Janeiro
6. Zagreb	Modular Urban Farm: Green Techniques Curriculum Methodology
7. Lisbon	Application of the UP approach to Lisbon (StepUP_LxALL)
8. Rotterdam	Resilient District Toolkit
9. Thessaloniki	District Climate Action Plan (DCAP)
10. Granollers	Set of guidelines for a greener city with opportunities for everyone
11. Istanbul	1. Integrated Digital Twin Framework 2. Integrated Urban Furniture for public awareness and sustainable energy

The methodology is therefore structured into two interlinked but different components:

- **Exploitation methodology:** ensuring continued use of the ERs by defining exploitation strategies, use models, responsibilities, financial considerations and post-project roadmaps.

- **Sustainability methodology:** ensuring long-term impact of the pilot cities' prototypes by outlining objectives, actions, governance and financial mechanisms for continued use and integration beyond UP2030.

2.1 Exploitation methodology

According to the European Commission, exploitation refers to the effective use of project results, ensuring that developed tools, knowledge, and solutions are transformed into concrete applications that generate positive societal, environmental, scientific, or economic impact (European Commission, n.d.-a).

The UP2030 exploitation methodology follows a three-phase framework, ensuring a logical progression from identifying project results to preparing them for exploitation after the end of the project. This structured methodology enables partners to evaluate the value of their results, define relevant exploitation strategies, and build internal capacity for their future use.

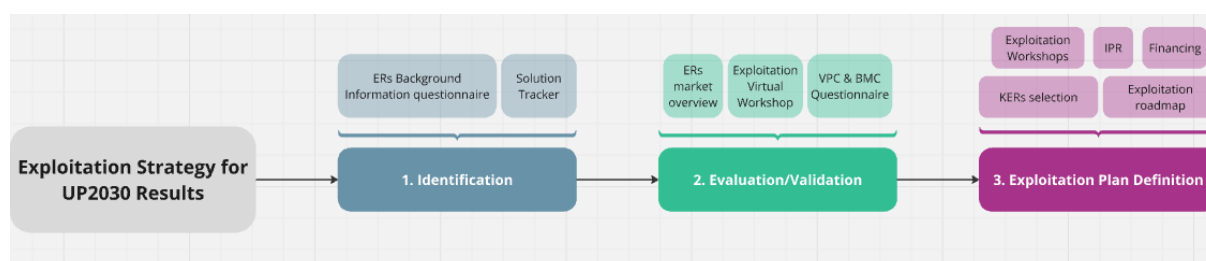


Figure 1: Overview of the exploitation methodology.

- **Phase 1 – Identification & Characterization of Exploitable Results (covered in D6.8):** Mapping of all ERs, categorization, and initial characterization of their potential. During this first phase, project partners defined and documented their expected Exploitable Results, setting the foundation for targeted future exploitation activities.
- **Phase 2 – Evaluation & Validation of the Exploitable Results (covered in D6.8):** identified ERs are assessed to determine their value proposition, market relevance, and adoption potential.
- **Phase 3 – Exploitation Plan Definition (focus of D6.9):** Development of tailored exploitation plans for each KER, in collaboration with result owners and providers, including concrete actions for post-project uptake.

This report therefore focuses on Phase 3, which builds on the foundation set in D6.8. The work has combined structured methodologies with collaborative activities to ensure feasibility and ownership of the exploitation plans. In addition, the work of Phase 3 was also kick-started and structured around the service provided by the **Horizon Results Booster (HRB)**. This external support provided guidance for shaping the development of the project's final exploitation activities. Particularly, it supported the selection of the KERs by providing clear criteria and a structured approach for prioritization, as well as the definition of the exploitation plan framework and roadmap, through key materials and workshops.

The main methods used in Phase 3 are summarized in Table 3.

Table 3: Phase 3 – Exploitation Plans Definition: Methods and Objectives.

Phase	Methods	Descriptions & objectives
Phase 3: Exploitation Plans Definition	KERs selection (section 2.1.1)	Selection of the 15 most impactful exploitable results (from the 44 identified in D6.8) based on defined criteria.
	Exploitation Plan Methodology (section 2.1.2)	Development and application of a structured exploitation framework across each of the KERs.
	Bilateral Meetings with KERs partners (section 2.1.3)	Tailored discussions with result owners to refine exploitation pathways, validate responsibilities, and ensure post-project commitment.
	Market Overview (section 2.1.4 & 3)	Updated UP2030 market overview – including the analysis of the main industries of the project.
	Workshops for post-project concrete actions (section 2.1.4)	Collective workshops to explore concrete actions for post-project bundling, use and impact.

Each of these methods is further outlined and described in the subsections below.

2.1.1 KERs selection

Within the broader set of ERs, some results demonstrate higher potential for impact or use. These are referred to as KERs. As defined in Horizon Europe guidance, KERs are the “main interesting results, selected and prioritized due to their high potential to be exploited”—whether that’s for commercial benefit, public value, or as a critical input for further research, innovation, or policymaking (European Commission, n.d.-a).

Following this definition, the UP2030 consortium applied the following selection criteria, building on HRB guidance:

1. Respond to specific needs of defined target users.
2. Solve and targets needs much better than "state of the art" - Has unique value proposition.
3. Have partners willing to invest time/money after project end to keep result alive.
4. Have sufficient Technology Readiness Level (TRL) for exploitation phase.
5. Reflect key narrative and objectives of the project (e.g., KER is implemented in the project pilots).

While all ERs are monitored, KERs require deeper evaluation and tailored exploitation plans, especially to ensure post-project sustainability and adoption. Based on the mentioned criteria, 15 KERs were identified at M20 of the project – outlined in Table 4 below, which includes KER partner and their category.

Table 4: UP2030 KERs.

*	KER name	Partner	Category
1	MIRA Digital Twins Platforms	Maggioli SpA	Energy Efficiency
2	Business Information modelling (BIM) module & building life cycle assessment (LCA) module	Centro de Investigación de Recursos y Consumos Energéticos (CIRCE)	
3	UBEM: AI-powered Decision-making Tool for Decarbonisation	Middle Est Technical University (METU), Centre for solar energy research and application (GÜNAM)	
4	Air quality monitoring and forecasting	Fondazione LINKS (LINKS)	Climate Resilience
5	City Scan	Thomas Stellmach Planning and Architecture (TSPA)	
6	Quick checks on climate impacts (climate proofing)	Buro Happold (BH)	
7	DRAXIS UP2030 Decision Support System (DSS)	DRAXIS Environmental SA (DRAXIS)	
8	ESA	LINKS	
9	UDCW (Urban Design Climate Workshops) Methodology	Urban Climate Change Research Network (UCCRN)	
10	HydroFlows	Deltares	
11	Urban Green Economy Model (UGEM)	Global Green Growth Institute Hungary (GGGI)/ Centre for Research & Technology, Hellas (CERTH)	Participation & Engagement
12	Neutrality Story Maps (NSM)	Vrije Universiteit Brussel (VUB)/CERTH	
13	UP2030 Service Platform	ICLEI European Secretariat (ICLEI)	
14	Massive Open Online Courses (MOOC)	International University of Catalonia (UIC)	Scientific & Academic knowledge

15	5UP Approach	Fraunhofer IAO	
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The selection of these 15 KERs was first validated with Fraunhofer IAO (UP2030 project coordination team) and subsequently reviewed with the responsible solution providers and the rest of the consortium during a dedicated Exploitation Session, ensuring collective agreement.

2.1.2 Exploitation Plan Methodology

The exploitation plan methodology provides a structured, replicable approach for developing comprehensive post-project exploitation strategies for each KER. It aims to:

- *Ensure use*: specify how each KER will be implemented, adopted, and used by its target users, highlighting its value proposition and competitive advantage.
- *Ensure sustainability*: define strategies, resources, and responsibilities to maintain the KER after project completion.

The methodology builds on the HRB framework and consists of three main components, corresponding to the templates developed and filled for each KER.

1. Characterization table

This section summarizes the main features of each KER, providing a concise yet comprehensive overview of its purpose, users, and added value. Particularly, it includes:

- *VPC*: outlines target users' pains, gains, and jobs-to-be-done to identify where and how the KER creates value (Komatsu Cipriani, 2022).
- *Use Model*: defines how the KER will be put into use (e.g. service provision, licensing, technology transfer, open-access tool, training).
- *Exploitation route*: linked to the "use model", specifies how the solution will be made available to target users (e.g. contract research, new research project, scientific dissemination through publication).
- *Timing and Impact*: Specifies when the KER will be ready for exploitation and estimates its expected impact over a 3-year horizon.
- *IPR Information*: summarizes background and foreground IP, ownership arrangements, and whether Memorandum of Understanding (MoU) or joint exploitation agreements are required when multiple partners are involved.
- *BMC*: For KERs with commercial potential, a BMC will complement the VPC. This tool helps partners outline how the solution creates, delivers, and captures value in the market. The BMC is optional and applied only to commercial KERs and serves as the basis for the financial section and Exploitation Roadmap.

2. KER exploitation Roadmap

This section supports partners in planning and implementing post-project actions to ensure sustained use and impact. One significant risk faced by a consortium is the inability to successfully exploit key results, advance the TRL, or bring the solution to market due to insufficient resources. The exploitation roadmap aims to mitigate this risk by initiating concrete and specific plans. It includes:

- *Exploitation Activities*: specific steps to be undertaken in the first six months post-project to secure adoption or further development.

- *Roles and Responsibilities*: clear allocation of roles among partners involved in exploitation activities.
- *Milestones and KPIs*: indicators and timeframes to monitor progress.
- *Financial & Sustainability Plan*: estimation of post-project costs, expected revenues and identification of funding sources (e.g. internal resources, new grants, public or private financing) to ensure continuity.
- *Funding mechanisms*: potential funding mechanisms available for the KER partner to further develop and/or implement activities to ensure the solution's continued use and adoption after the end of the project are also explored in this section.

3. Standardization Roadmap

Early in the project, T6.3 explored engagement with CEN Technical Committee (CEN/TC) 465 through ICLEI's membership, as this committee focuses on sustainable and smart cities and communities and was initially identified as a potential entry point for aligning relevant UP2030 results with ongoing standardization activities. However, the collaboration did not progress during the second half of the project, and no formal engagement pathway or follow-up activities were established.

Despite the absence of a formal link with CEN/TC 465, standardization considerations continued to be assessed at the level of individual KERs. This section assisted partners in identifying opportunities for standardization as a pathway to exploitation. It involves:

- Mapping existing or emerging standards applicable to the KER;
- Identifying relevant standardization bodies (e.g. European Committee for Electrotechnical Standardization (CEN), International Standards Organization (ISO), national entities);
- Planning engagement steps for standardization or certification processes.

Together, these three sections form the core framework of the UP2030 Exploitation Plans. A dedicated worksheet integrating all components was developed and shared with each responsible KER partner for completion and review, ensuring consistency, ownership, and alignment across all results.

2.1.3 Bilateral meetings with KERs providers

To ensure that each exploitation plan was fully developed, realistic, and aligned with both the project objectives and partner capacities, dedicated bilateral meetings were organized with the responsible partners for each KER. These meetings represented a key step in translating the exploitation methodology into actionable and partner-owned plans. Particularly, the meetings aimed to refine exploitation pathways, validate information and responsibilities, and secure partners' post-project commitment.

Prior to the meetings, each partner received a pre-filled exploitation plan (Section 2: KER Characterization) based on available project data, with comments and gaps highlighted for completion. Partners were asked to review and update their plans and begin drafting Section 3 (KER Exploitation Roadmap).

They served to:

- Clarify and validate the KER characterization and roadmap content;
- Address missing information or uncertainties;
- Agree on follow-up actions and next steps for finalizing the plans.

2.1.4 Market Overview

The market overview of the UP2030 key industries examines current trends, opportunities, barriers, and target users across the project's different Exploitable Results (ERs).

The scope of this analysis is broad, focusing on the four ERs main categories, analyzed through a SWOT framework.

These categories are closely aligned with the project's overarching objective of achieving climate neutrality and form the foundation of the UP2030 market exploration.

This overview builds upon the market analysis conducted at M6 for D6.8, offering an updated perspective focused primarily on the SWOT analysis of the project's result categories.

2.1.5 Workshops for post-project concrete actions

A series of three online workshops were organized in collaboration with University of Cambridge (UCAM) (T3.3), which worked closely with project solution providers and collected complementary data for their D3.7. The workshops, held mainly on Miro, aimed to identify and explore concrete post-project actions to ensure continued use, collaboration, and scaling of UP2030 tools and methodologies.

2.1.5.1 Workshop 1: Integration & bundling opportunities

Workshop 1 aimed to explore opportunities for post-project collaboration among different tools, investigating the potential for bundling tools into integrated solutions that address urban challenges holistically. Particularly, the workshop aimed to:

- Identify synergies across tools.
- Explore existing and potential collaboration & bundling opportunities across tools.
- Explore how collaborations (data exchange, technical integration, shared outputs) can add value and overcome individual limitations.
- Assess potential value for end-users and solution providers.
- Encourage further cooperation among solution providers beyond the project.

2.1.5.2 Workshop 2: Target User Engagement & Value

This session focused on engagement with target users outside the UP2030 consortium, particularly those identified in each tool's exploitation plan and related questionnaires. The goal was to assess the current level of interaction with potential adopters and understand how such engagement could be strengthened and expanded post-project. The goal was to:

- Check the status and nature of early engagement with users.
- Reasons why engagement might not yet have occurred and barriers faced (e.g. lack of resources, unclear communication channels, limited visibility).
- Identify what would enable or scale such engagement (e.g. co-creation events, demonstration activities, partnerships with local authorities or private actors).
- Understand the perceived value of each tool for different user groups, helping refine the Value Proposition in the exploitation plans.

2.1.5.3 Workshop 3: Tool's use in pilot prototype during & after UP2030

The third workshop examined how each tool contributes to the pilot prototypes during the project and how it could continue to generate value after project completion. The discussion focused on long-term availability, maintenance, and integration of tools within pilot cities workflows.

The goal was to explore:

- Implementation status of each tool within the pilot prototypes and expected completion timeline during the action phase.
- Positioning for long-term use, exploring whether tools will remain accessible, supported, and integrated beyond the project's lifetime - both within the pilot cities and potentially in other contexts.
- Contribution to sustainability and upscaling, identifying how tools could enable replication, inform broader policies, or be adopted by additional stakeholders.

To support this process, a dedicated worksheet was prepared for each tool provider. It was reviewed and initiated during the workshop, then finalized individually by partners. The worksheet focused on the tool's future use, integration, and impact in the pilots and its potential contribution to the prototypes' long-term sustainability and upscale. The worksheets were summarized in an excel table - prototypes tracker (see chapter 2.2.3) and are included as annex 2.

The information collected during this workshop feeds directly into both the KER Exploitation Plans and the Sustainability Plans of the pilot prototypes.

2.1.6 KER Exploitation Table

Findings and inputs from all three workshops, together with data gathered through the exploitation methodology and the 1:1 meetings with the KERs providers, are synthesized in Chapter 4, which includes a dedicated sub-section for each KER. Each sub-section follows a common structure, summarized in the table below.

Table 5: KER Exploitation Plan – Table Structure.

Section	Description of Input
Lead Partner	Name of the partner(s) responsible for the KER.
IPR Information	Overview of relevant IP considerations, ownership arrangements, and licensing conditions where applicable.
Description/Purpose	Small summary describing the KER, its core function, and its primary value or benefit.
Main Target Users	Definition of the main user groups and intended application contexts, based on the value proposition and market insights.
Implementation & Engagement Status	Status of the KER's current implementation and level of engagement with target users, informed by Workshop 2 and partner inputs.

Use Model	Explanation of how the KER will be accessed or delivered (e.g., service model, platform, open-access resource), including expected readiness or time to market.
Exploitation Route	Main pathway through which the KER will be exploited, such as commercialization, service provision, training, policy integration, or new research initiatives.
Actions, Responsibilities & Milestones After the Project	Key post-project exploitation actions, specifying responsibilities for tool development and deployment, and key milestones.
Bundling & Synergies	Existing or anticipated collaborations with other UP2030 tools, based on Workshop 1 discussions and identified complementarities.
Uptake & Replicability	Plans for scaling, replication, or uptake beyond UP2030, including interest from additional cities or external stakeholders (Workshop 2 & 3 data).
Financial/Sustainability Mechanism	Mechanisms that ensure continuity after project end, such as funding sources, revenue models, maintenance arrangements, or hosting agreements.
Expected Impact (3-Year)	Anticipated societal, environmental, scientific, or market impact expected within three years of project completion.
Barriers/Challenges	Key risks or obstacles that may influence exploitation, typically 1–2 main barriers identified through the methodology and workshops.

2.2 Prototypes Sustainability Methodology

The pilot cities' prototypes represent the practical implementation of UP2030 solutions within real urban contexts, in the project's pilot cities. A dedicated sustainability approach has been developed to assess how these prototypes will be maintained and embedded into local governance and urban planning processes after the end of the project.

2.2.1 Link with Upscaling Phase of UP2030

This approach is closely linked to the Upscaling Phase, led by ICLEI as part of WP5 efforts, which focus on equipping cities with the necessary tools and strategies to refine their governance and financial frameworks, ensuring that best practices are transferable and adaptable across different urban contexts. This analysis, developed through targeted workshops and continuous engagement with the pilot cities, places a clear focus on how the pilots will upscale and build upon the prototypes, adapting them to other regions, or sectors. Specifically, cities built on the financial and governance instruments provided by GGGI and Adelphi respectively, to come up with some concrete recommendations and guidelines to expand the impact of their prototypes.

As the upscaling phase also emphasizes post-project continuity, the sustainability approach is fully aligned with these efforts. It focuses on determining if and how the tools, methods, and ERs taking

part of the prototypes, will continue to be used by the cities after the project. This includes both their role in enabling upscaling and their broader integration within municipal systems and planning frameworks.

2.2.2 Sustainability Approach

This approach places a focus on the UP2030 solutions, exploring how they have been used, implemented and embedded into the pilots' throughout the project, and how they will continue to generate impact beyond the project's conclusion.

The key objectives of this phase are to:

- **Assess tools' contribution and post-project use:** explore how each UP2030 solution contributes to the pilot prototypes and evaluate whether these tools will remain available, supported, and operational after the project's end.
- **Examine integration and embedding:** analyze how tools and methods have been or can be integrated into local governance, planning, and decision-making frameworks to ensure long-term institutional uptake.
- **Evaluate operational sustainability:** identify local capacities, resources, and technical arrangements (hosting, maintenance, training) needed to sustain the tools' operation post-project.
- **Analyze long-term impact in the pilots:** understand how the continued use of tools and methods contributes to the prototypes' broader objectives - such as improving local climate neutrality strategies, citizen engagement, and data-driven urban planning.
- **Establish impact monitoring mechanisms:** define indicators and methods for tracking the prototypes' performance and ongoing contribution to urban sustainability goals beyond UP2030.
- **Identify risks and challenges for sustainability:** assess potential barriers, technical, financial, institutional, or governance-related, that may affect the continuity and scaling of the prototypes and propose mitigation measures.
- **Explore uptake and replicability beyond UP2030:** investigate opportunities for replicating successful approaches in other cities or regions, leveraging partnerships, funding mechanisms, and policy frameworks to enable transferability and broader impact.

2.2.3 Sustainability methods

Methods applied during this phase are summarized in Table 6 below.

Table 6: Prototypes sustainability phase and approach.

Methods	Description
1. Prototypes Tracker	An Excel-based tracking file summarizing each prototype's journey within the project, with a specific focus on the upscaling and sustainability phases. It outlines key aspects of tool-pilot collaboration. Included as Annex 2.
2. Workshop with tool providers	Workshop 3 (introduced in Section 2.1.5) explored how each tool contributed to the pilot prototypes during the project and how it could continue to generate value after project completion.

3. Worksheet	The worksheet (introduced in Section 2.1.5) focused on the tool's future use, integration, and impact in the pilots, as well as its contribution to the prototypes' long-term sustainability and upscaling. Insights from this activity inform both the KER Exploitation Plans and the Prototypes Sustainability Plans.
4. Sustainability methodology plan	A structured approach for synthesizing findings and outlining sustainability actions, including responsible actors, timelines, and potential funding or governance mechanisms for continued prototype use.

Findings and inputs from these methods are synthesized in Chapter 5, which includes a dedicated sub-section presenting the sustainability plans for each prototype. Each prototype section is structured around two complementary tables:

- **Prototype Sustainability Plan Table** (Table 7), summarizing the city's long-term upscaling and sustainability objectives, next steps, governance and financial mechanisms, and expected impacts.
- **Tool Integration & Sustainability Table** (Table 8), detailing how the UP2030 tools applied in the prototype will continue to be used, embedded, and sustained after the project.

Table 7: Prototype Sustainability Plan – Table Structure.

Section	Description of Input
Main Sustainability Objectives	Key elements the city aims to sustain post-UP2030 (e.g., climate-neutral district planning, participatory governance structures, cross-departmental processes).
Next Steps	Concrete actions planned to maintain, deepen, or upscale the prototype after the project.
Governance Mechanism	How the prototype will be embedded into municipal governance, policies, strategies, or procedural workflows.
Financial Mechanism	Funding sources, budget allocations, or partnerships that will support continuity.
Expected Long-Term Impact	Anticipated environmental, social, economic, or governance outcomes.
Risks & Barriers	Primary risks or constraints that may challenge long-term sustainability.

Table 8: Tool Continued use & Integration - Table structure

Aspect	Description of Input
Tool Function	Brief description of the tool's role in the prototypes
Post-Project Use & Integration	How the city intends to continue using the tool and how it will be embedded into municipal workflows, strategies, or procedures.

Operational Sustainability	Arrangements that ensure continued functionality (maintenance, updates, responsible units).
Financial Sustainability	Identified or expected funding sources enabling long-term operation.
Expected Long-Term Impact	Environmental, social, or governance benefits associated with continued use.
Replication/Uptake	Potential for applying the tool or prototype in additional districts or other cities.
Main Risks/Challenges	Key challenges that may affect sustained use, scaling, or operational continuity.

3 UP2030 Market Overview

This chapter provides an overview of the market context in which the UP2030 solutions operate. It outlines the main categories of ERs contributing to the overarching goal of planning for climate neutrality and supporting cities in their transition to net-zero, resilient, and inclusive urban systems:

- **Digital Infrastructure Tools for Energy Efficiency:** tools enabling simulation, optimization, and decision-support for energy systems and building decarbonization.
- **Spatial Planning and Design Tools for Climate Governance:** digital and methodological instruments supporting evidence-based planning, data integration, and governance for climate adaptation and mitigation.
- **Citizen Engagement Tools for Spatial Justice:** participatory platforms and engagement frameworks ensuring spatial justice, social inclusion and equity within climate-neutral transitions.

Each section includes a concise market description and a SWOT analysis outlining key strengths, weaknesses, opportunities, and threats that shape the exploitation potential of UP2030 outcomes. It ensures that the project's results are effectively aligned with their specific market and have a foundation for long-term impact.

3.1 Digital Infrastructure tools for energy efficiency

This category encompasses digital solutions designed to model, analyze, and optimize urban energy performance, supporting data-driven pathways to Net-Zero Energy Districts (European Commission, 2020). These tools enhance the integration of renewable energy, improve energy efficiency, and reduce greenhouse gas emissions through advanced simulation and LCA methods (IEA, 2017).

They are designed for simulating energy demand and assessing environmental impacts across different urban systems. By providing detailed insights into energy integration and greenhouse gases (GHG) emissions reduction, the tools enable cities to enhance energy efficiency, integrate renewable energy sources, and adopt sustainable building practices. Collectively, they support the transition of urban areas into resilient, sustainable, and net-zero or positive energy districts.

Within the framework of UP2030, four digital tools have been developed to contribute to the creation of programs and strategies for mitigating environmental impact in urban settings through the calculation of direct GHG emissions:

- BIM Module and LCA, developed by CIRCE.
- AI-powered toolset for the decarbonization of building & transport solutions, developed and co-created by METU and GUNAM.
- MIRA solution for Cities as Digital Twins solution, developed by MAGGIOLI.
- Circular Urban Planning tool proposed by ETH.

These solutions support cities in meeting obligations under national Energy and Climate Plans and in achieving local and regional targets, particularly in developing programs for energy efficiency, building renovation, and emissions reduction (European Commission, 2023).

3.1.1 SWOT Analysis

Strengths	Weaknesses
• Clear alignment with strong policy drivers (EU Green Deal, climate neutrality, regulation around building/energy performance) (European Commission, 2020). • High technological maturity in simulation, BIM and digital twin frameworks. • The ability to support multiple scenario types (retrofit, mobility, storage, renewables) increases market relevance.	• Up-front costs for data acquisition, sensors, hosting, modelling and integration can be significant for cities. • Many cities may lack the internal capabilities (data, IT staff, modelling capacity) to sustain complex digital infrastructure tools. • Interoperability, data standardization and governance remain weak across many local administrations. • Scarcity of data.
Opportunities	Threats
• Many cities have renovation and energy transition programs that require digital decision support, representing ready markets (European Commission, 2023). • Growing demand for positive energy districts, renewable-integration planning, mobility-system decarbonization. • Potential to scale tools from pilot cities to other cities or districts, or to replicate across geographies.	• Competitive market: many digital twin and modelling vendors and platforms, risk of commoditization. • If regulatory or procurement regimes change slowly, uptake may be delayed. • If the tools are not maintained/updated, they can become obsolete quickly in a fast-moving tech environment. • Budget pressures at municipal level may delay investment. • Socio-economic and policy challenges, such as local context, incentives, social factors, and regulatory frameworks, which can hinder the adoption of decarbonization strategies.

3.2 Data governance and digital planning tools for climate neutral cities

This category encompasses digital and analytical solutions that support informed decision-making for climate adaptation and mitigation in urban contexts. These tools empower urban planners, local governments, and stakeholders to manage, analyze, and visualize geospatial and environmental data effectively, enabling the design and implementation of strategies that strengthen cities' resilience and transition toward climate neutrality (European Commission, 2022).

The solutions leverage geospatial data, advanced analytics, and simulation techniques to support urban design, spatial planning, and governance processes (UP2030, 2022). They enable multi-scalar analysis, from buildings and neighborhoods to entire metropolitan regions – facilitating the integration of environmental, social, and economic dimensions into climate-neutral planning (JRC, 2020).

Within UP2030, this category includes ten tool providers that jointly represent a comprehensive ecosystem of digital and governance-oriented instruments:

- Aquatec resilience strategies database and tool, developed by Aquatec
- Quick checks on climate impacts (climate proofing), developed by BH
- HydroFlows, developed by Deltares
- ESA, developed by LINKS
- Equal Services & Facilities Assessment, developed by LINKS
- Resilience Assessment Framework, developed by Laboratorio Nacional De Engenharia Civil (LNEC)
- B-WaterSmart tools, developed by LNEC
- MIRA Digital Twins Platform, developed by Maggioli SpA
- Community Maps, developed by Mapping for Change (MfC)
- GeoKey, developed by MfC
- City Scan, developed by TSPA
- UDCW Simulation Toolkit, developed by UCCRN
- UDCW Methodology, developed by UCCRN
- UDCW / Facilitation Toolkit, developed by UCCRN
- Urban Carbon Emission Data Flow Mapping, developed by UIC
- UGEM, developed by GGGI

Each of these partners has developed resources in the domains of data governance, digital spatial planning, or design decision-support, helping cities operationalize their climate action plans and long-term urban visions.

3.2.1 [SWOT Analysis](#)

Strengths	Weaknesses
• Strong policy push in Europe for data-driven urban governance, smart cities and climate neutrality – creating demand for planning tools (European Commission, 2022). • Increasing availability of geospatial, Internet of things (IoT), and real-time data assets enabling richer analytics and decision-making.	• Many municipalities still have low digital maturity or lack internal capacity to adopt advanced tools (infrastructure, skills, data systems) (OECD, 2020). • Fragmentation in standards, data-sharing frameworks and interoperability across jurisdictions and platforms. • High cost of deployment and maintenance for full lifecycle of digital planning tools (hosting, updates, user training).

Opportunities	Threats
• Growing awareness among local governments of the need for integrated planning tools that combine climate mitigation/adaptation, spatial design, and governance. • Rising municipal interest in resilience dashboards and climate-risk assessment tools. • Synergies with open data initiatives and FAIR data principles enabling wider adoption. • Strong replication potential across European cities developing Climate City Contracts (CCC) and urban digital twins. • European funding programs (Digital Europe, Horizon, Smart Cities Marketplace) and climate-neutral city missions open up opportunities for uptake and scaling.	• Rapid technological change (AI, data platforms, digital twins) may render existing tools obsolete or require frequent upgrades, increasing risk for providers. • Regulatory or governance bottlenecks: data privacy, cross-municipal data sharing, procurement procedures may limit adoption (OECD, 2020). • Market competition from large generic platforms, preferred over specialist planning-tool providers. • Budget constraints and shifting political priorities in city administrations may delay investment in new tools.

3.3 Citizen engagement Tools for spatial justice

The citizen engagement sector entails methods and tools on community engagement and multistakeholder partnerships to support better decision-making on spatial solutions and for spatial justice (OECD, 2020). It refers to a set of (digital) solutions and platforms designed to initiate and support collaboration and communication between different stakeholders including governments, organizations, businesses, and citizens. These tools and software aim to empower citizens and raise more marginalized voices by involving them in decision-making processes and community development (UN-Habitat, 2022).

Within UP2030, the category includes the following tools:

- NSM, by VUB/CERTH
- Community Maps, by MfC
- Urban Design Manual for Child and Youth-Friendly Cities, by Design Clips (DC)
- Spatial Justice Package, by TUD
- Storytelling for Participatory Exchange, by Institute for Urban Excellence (iUE)
- UDCW Facilitation Toolkit, by UCCRN
- Livable Cities Index, by CETAQUA
- UGEM, by GGGI

These tools contribute to more inclusive planning practices by enhancing access to information, supporting co-creation processes, and enabling cities to embed equity and justice considerations into climate and spatial strategies (JRC, 2020).

3.3.1 SWOT Analysis

Strengths	Weaknesses
- Enhanced social impact and inclusivity: digital engagement platforms foster broader citizen participation and empower under-represented communities in urban decision-making (OECD, 2020). - Transparency and accountability: open-access data and participatory mapping increase government transparency and strengthen public trust. - Co-creation and collaboration: tools promote stakeholder dialogue and democratize planning through co-designed solutions. - Efficiency and cost reduction: digital participation reduces consultation costs and accelerates feedback loops for municipalities. - Link between climate and social justice: platforms make it possible to integrate equity, health, and accessibility concerns within climate-neutrality strategies.	- Variable data quality and reliability: crowd sourced information can be inconsistent or biased without robust validation mechanisms. - Unequal access and participation willingness: digital divides persist; marginalized groups remain under-represented despite online availability. - Resource limitations in municipalities: cities may lack staff or funding to maintain engagement platforms and analyze inputs - Complexity of tools: non-technical users can face barriers to effective participation. - Data-privacy and ethical concerns: collecting and managing citizen data introduces governance risks. - Difficulty in measuring impact: demonstrating tangible outcomes from participatory processes remains challenging, limiting perceived value.
Opportunities	Threats
- Rising demand for equitable and inclusive governance: national and EU policies increasingly require participatory components in urban and climate projects (The Insight Partners, 2021) - Advances in digital and AI-driven participation tools: natural-language processing, sentiment analysis, and automated moderation can improve engagement quality (McShane, & S. Legard, n.d)	- Market competition: numerous civic-tech platforms create saturation and require strong differentiation and user trust. - Limited economic incentives: tools with primarily social benefits struggle to attract long-term commercial investment. - Regulatory and policy barriers: urban-planning frameworks often lack formal mandates for inclusion or social-justice criteria.

- | | |
|---|--|
| <ul style="list-style-type: none">• Integration with environmental monitoring: crowdsourced data and participatory mapping can feed into sustainability dashboards and urban digital twins. | |
|---|--|

4 KERs Exploitation

This chapter presents the synthesis of the exploitation plans for the 15 KERs of UP2030. The plans are based on data and inputs collected throughout the project in close collaboration with the tools' providers and partners responsible for each KER. The chapter builds upon the foundations laid in the first version of this report (D6.8) and integrates additional material produced through the exploitation plan methodology, the dedicated workshops, and the individual 1:1 meetings held with KER owners – as presented in the Methodology (Chapter 2). Together, these processes have informed the exploitation pathways, responsibilities, financial considerations, and post-project actions consolidated for each KER.

Further details are provided in Annex **Error! Reference source not found.**, which includes the completed exploitation plan templates completed for all 15 KERs.

4.1 MIRA Digital Twins Platforms

Section	Input
Lead Partner	Maggioli
IPR Information	Maggioli is the owner of the MIRA platform, and of any additional components developed on top of MIRA.
Description/Purpose	MIRA is a configurable solution to model a city as a network of interconnected Digital Twins (DTs) and monitor/simulate performance based on data for each individual asset. It allows users to define DTs of two types (asset or network of assets), integrating information sources to monitor performance and add simulation or optimization services (e.g. building demand response, mobility simulation).
Target Users/Market Segment	Cities; industrial and commercial sectors; urban planners; policymakers and government bodies.
Engagement Status	- Tool implemented in Istanbul (UP2030 pilot). - Engagement with industrial users through informal discussions and Proof of Concepts (POCs).
Use Model	Provision of a commercial platform and associated services. Outputs include charts, and external simulation/optimization results (e.g. CO ₂ footprint of an area).
Exploitation route	Commercialization via Maggioli's extensive network (250+ companies). Demonstrations and information campaigns to be launched post-project.
Actions, Responsibilities & Monitoring after the project	- Conduct additional pilot studies (2 within 18 months). - Refine technical features and methodologies based on user feedback (within 9 months). - Develop additional functionalities (e.g. data visualization

	dashboards). - Secure additional research & development (R&D) funding (3 new projects' proposal within 18 months). - Organize training workshops and dissemination events (3 within 12 months) Responsible: Maggioli
Bundling & Synergies	During the project, and for Istanbul implementation, bundled with CIRCE's and METU/GÜNAM's tools, providing target users an all-in-one solution for real-time visualization, energy profiling, and AI-powered decision support. Continuation of bundling after the end of the project is under discussion, as well as other bundling opportunities with other urban monitoring tools.
Uptake & Replicability	-Several cities expressed interest in using the tool as part of a consortium seeking Horizon funding – currently applying to other Horizon funding. -The tool can incorporate several different types of data and thus can be adapted for use in areas as mobility, flooding, climate and more.
Financial/Sustainability Mechanism	-Costs: operational (maintenance and hosting), administrative (overheads for implementation), and dissemination. -Funding: own funds and other funded projects until sustainable revenue model is achieved. -Revenues from consulting fees, usage and licensing.
Expected Impact (3-Year)	Enables evidence-based decisions in urban planning, environmental management, and energy optimization; supports smart city and climate resilience agendas; contributes to improved quality of life and reduced resource use.
Risks/Challenges	Maturity of the tool.

4.2 BIM module & building LCA module

Section	Input
Lead Partner	CIRCE
IPR information	CIRCE will own the modules and exploit them through licenses or other commercial arrangements.
Description/Purpose	Online tool integrating BIM and LCA modules to assess environmental impacts across the building lifecycle, supporting energy-efficient renovation decisions.
Target Users/Market Segment	Municipalities, urban planners, architects, energy service companies; focus on medium-sized cities (e.g. Zaragoza).

Engagement Status	Piloted in Istanbul during the UP2030 project.
Use Model	Delivered as an online application integrating two core modules within a cloud-based platform accessible via internet (no local installation). Includes optional consultancy and training services for setup and adoption.
Exploitation route	Commercialization through paid access to the platform or consultancy service (licensing + training). Potential use in new research projects.
Actions, Responsibilities & monitoring after the project	-Conduct additional pilot studies (2 within 18 months). -Integrate both tools and refine technical features (within 9 months). -Develop user interface and dashboards (within 9 months). -Submission of funding proposal for R&D (3 within 12 months). -Develop marketing strategy and user guides. -Organize training workshops and dissemination events (3 within 12 months). Responsible: CIRCE.
Bundling & Synergies	Part of a bundle of energy-efficiency and digital infrastructure tools with Maggioli and METU/GÜNAM Tools, implemented in Istanbul (energy component only). No post-project bundling plans defined so far.
Uptake & Replicability	Intention to continue improving the tool beyond the current project, either through a new project or as part of internal development.
Financial/Sustainability Mechanism	-Costs: development and operational costs (maintenance, hosting, personnel, dissemination). -Revenues: tool usage fees and consultancy services. -Funding: own budget and public funding (e.g. national and EU calls) until revenue model stabilizes.
Expected Impact (3-Year)	Reduction in GHG emissions and energy prices; empowered citizens and decision-makers; optimized investment in renovation projects towards sustainable cities.
Risks/Challenges	-Data availability for construction materials (composition, origin, and manufacturing processes) is limited to the local level. -Tool treated as an optional add-on rather than a decisive element in urban decision-making.

4.3 UBE: AI-powered Decision-making Tool for Decarbonisation

Section	Input
Lead Partner	METU, GÜNAM
IPR information	IPR owned by development team (İ. Gürsel Dino, S. Kalkan, Ç. M. Akgül); code, datasets, and models protected; may include open-source or proprietary components.
Description/Purpose	AI-based urban energy and transport modelling tool supporting decarbonization of buildings and e-mobility. Includes UBE for retrofit scenario analysis (2025–2050) and Urban Building Transportation Energy Model (UBTEM) for optimal photovoltaics (PV)-based e-scooter charging locations.
Target Users/Market Segment	Cities, policymakers, urban planners, architects, researchers, utilities, and e-mobility companies.
Engagement Status	- Applied in Istanbul (Kadıköy district) through bundling with CIRCE and Maggioli. - Engagement with decision-makers and stakeholders outside UP2030 through workshops.
Use Model	Provided as a service combining user workshops, scenario calculation, and an interactive GIS-based interface for results and reports.
Exploitation route	Non-commercial route through dissemination, academic collaborations, and integration into research and policy; further R&D via new projects and institutional partnerships.
Actions, Responsibilities & Milestones after the project	METU and GÜNAM will be actively engaged with expanding the tool's capabilities and related technical developments. Istanbul Metropolitan Municipality (IBB) will be responsible for the dissemination of the results of the decarbonization scenarios and the benefits of these scenarios on the city-scale.
Bundling & Synergies	Integrated with CIRCE's LCA module and Maggioli's MIRA platform in Istanbul for combined assessment and visualization; no continued bundling foreseen after end of the project.
Uptake & Replicability	Implemented in Istanbul; adaptable to other cities - currently preparing an EU-funded project proposal in collaboration with IBB, which foresees the use and further development of the tool in another district.
Financial/Sustainability Mechanism	Costs: operational (hosting, maintenance, staff); covered through future funded projects and research grants (e.g. TUBITAK, EU).

Expected Impact (3-Year)	Advances urban decarbonization research, supports policy and planning, and enhances energy efficiency and comfort while reducing emissions.
Barriers/Challenges	Barriers relate to limited user awareness and communication on tool functionality; need for clear explanation of results and integration into relevant municipal workflows to maximize impact.

4.4 Air quality monitoring and forecasting

Section	Input
Lead Partner	LINKS
IPR information	LINKS holds IPR for proprietary components; ERMES released as open-source; Air Quality Service distributed via software license.
Description/Purpose	AI-based forecasting service providing daily, seasonal, and annual pollutant maps via the ERMES web app. Integrates satellite, weather, and topological data for high-resolution (≤ 500 m) air quality assessment.
Target Users/Market Segment	Local authorities, policymakers, environmental agencies, researchers, and citizens.
Engagement Status	Implemented in Lisbon and Zagreb pilots.
Use Model	ERMES open-source interface; Air Quality Service licensed software. Includes optional training and technical support.
Exploitation route	Direct exploitation through service licensing to municipalities, environmental agencies and smart cities operators; indirect use in R&D collaborations.
Actions, Responsibilities & Milestones after the project	- Refine machine learning (ML) models with new datasets; enhance forecast precision. - Optimize ERMES dashboard (≤ 6 months). - Conduct ≥ 2 new pilots & publish validation results (≤ 12 months). - Formalize ≥ 3 adoption agreements (≤ 24 months). Responsible: LINKS
Bundling & Synergies	-
Uptake & Replicability	Designed for deployment in additional EU cities; adaptable to different environmental and climatic contexts.
Financial/Sustainability Mechanism	-Costs: operational, personnel, technology transfer and dissemination. -Revenues from licensing and service contracts;

	-interim coverage from LINKS internal budget and EU/national R&D funding.
Expected Impact (3-Year)	Enables cost-effective, high-resolution air quality monitoring; supports policy compliance and citizen awareness, reducing emissions and exposure risks.

4.5 [City Scan](#)

Section	Input
Lead Partner	TSPA
IPR information	Built in Grasshopper (Rhino 3D) using open-source libraries; open-source access intended. Service offered for operation/customization.
Description/Purpose	Parametric workflow combining urban design, environmental analysis, and data-driven indicators (e.g. walkability, density, solar potential) to support climate-aligned planning and participatory co-design.
Target Users/Market Segment	Municipal and regional planning authorities, developers, non-governmental organizations (NGOs), and practitioners in Europe, Africa, and Asia.
Engagement Status	-Implemented in Granollers. -no engagement with main target users initiated yet.
Use Model	Open-source tool within Grasshopper; TSPA offers consulting, simulations, and tailored workflows.
Exploitation route	Direct use via contracts and consulting; further R&D and potential spin-off exploration.
Actions, Responsibilities & Milestones after the project	-Conduct ≥ 1 pilot (≤ 1 year). -Refine scripts and visualization; release v2.0 (≤ 1 year). -Submit ≥ 2 funding proposals (≤ 1 year). -Publish research papers, case studies, or guidelines to showcase benefits. -Launch outreach & case studies campaign (≤ 6 months). Responsible: TSPA team (2–3 experts).
Bundling & Synergies	None during UP2030; open to post-project collaborations with compatible digital or environmental tools.
Uptake & Replicability	Intend to further search for opportunities to apply, test and improve the tool with aiming to improve the planning processes for developing climate resilient and carbon neutral neighborhoods.

	Currently looking at the different funding opportunities with private or public sector.
Financial/Sustainability Mechanism	Costs: operational, personnel, dissemination. Funded via consulting contracts, research grants, and internal resources.
Expected Impact (3-Year)	Accelerates data-informed, low-carbon urban planning and participatory decision-making.
Barriers/Challenges	-Internal resources. -Clear frameworks to approach different target users. -Requires niche technical skills (Grasshopper).

4.6 Quick checks on climate impacts (climate proofing)

Section	Input
Lead Partner	BH
IPR information	Methodology owned by BH; open-source access planned. Quantitative applications may require software with existing IPRs (e.g. climate simulation, carbon accounting).
Description/Purpose	Analytical framework assessing climate impacts of urban projects, integrating mitigation and adaptation pathways in early planning to support climate-proof, resilient development.
Target Users/Market Segment	Municipal planning departments, architects, urban designers, climate units, and public authorities engaged in local decision-making.
Engagement Status	-Implemented in Münster and Rotterdam pilots; applied also in Neue Mitte Tempelhof (Berlin). -In touch with planning department of different municipalities regarding opportunities for implementation of the tool: an additional urban planning project in Berlin (Buch am Sandhaus). -Engaged with urban planners as part of urban competitions and master planning phases, integrating the methodology.
Use Model	Methodology provided through a downloadable handbook and guidelines; service offered for implementation and training.
Exploitation route	Direct use by municipalities and practitioners; indirect use via creation of standards or integration into new projects and educational programs.
Actions, Responsibilities & Milestones after the project	-Develop online version (v2.0 ≤12 months). -Conduct ≥3 dissemination events & publish papers (≤6 months). -Establish ≥3 collaboration agreements with cities/institutions

	(≤12 months). Responsible: BH & municipal partners.
Bundling & Synergies	-Exploring bundling opportunities with UCAM, combining adaptation and mitigation approaches; and with TSPA, to facilitate mapping and stakeholder engagement.
Uptake & Replicability	As part of further public tenders, BH actively working with cities and further municipalities (e.g. Berlin and Munich). Since the beginning of the project, the tool has been implemented in a project for delivering climate districts in Hessen and a district redevelopment in Berlin.
Financial/Sustainability Mechanism	Tool operates without cost; implementation covered by municipalities or stakeholders; future support via grants and local funding schemes.
Expected Impact (3-Year)	Enables climate-neutral, resilient planning by embedding adaptation and mitigation early in project design.
Barriers/Challenges	Sustained use requires active co-creation through workshops and public engagement, and wider dissemination of the new checklist to facilitate independent adoption by cities.

4.7 DRAXIS UP2030 DSS

Section	Input
Lead Partner	DRAXIS
IPR information	Copyright owned by DRAXIS. The DSS itself belongs to DRAXIS. Other tools that may interact with it remain under the ownership of their respective providers.
Description/Purpose	DRAXIS DSS is a geospatial intelligent platform offering a complete solution for the collection, processing, analysis, and visualization of data through geospatial intelligence and ML. It supports decision-makers and urban planners by providing insights that improve city management, urban planning, and resource efficiency, and help tackle air pollution, climate change, and mobility challenges.
Target Users/Market Segment	Municipal authorities, urban planners, sustainability officers, and local innovation hubs working on climate transition and environmental management.
Engagement Status	-The tool was implemented in Thessaloniki during UP2030. -Discussions have taken place with regional and municipal stakeholders outside the project, who have responded positively, recognizing the DSS as a valuable enabler of integrated urban planning and resilience assessment.

Use Model	Web-based platform. Consulting services are also provided to assist cities in effectively implementing the DSS.
Exploitation route	Direct use: commercialization; users pay a subscription or licensing fee to access the platform's tools. Indirect use: technology transfer through licensing. Complemented by consulting services to assist cities in adoption and integration.
Actions, Responsibilities & Milestones after the project	Development actions: develop additional functionalities (e.g. visualization dashboards); secure additional R&D funding. Adoption actions: develop user guide, marketing and sales strategy, customer support services, distribution partnerships, training workshops, dissemination activities. Responsible partner: DRAXIS. Milestones: pilot studies and version updates within 9–12 months post-project; submission of funding proposals for R&D within 12 months
Bundling & Synergies	DRAXIS intends to explore synergies with other UP2030 tool providers to offer integrated solutions, especially around data visualization, participatory planning, and climate-neutrality assessment frameworks
Uptake & Replicability	Discussions have taken place with regional and municipal stakeholders outside the project, who have responded positively, recognizing the DSS as a valuable enabler of integrated urban planning and resilience assessment.
Financial/Sustainability Mechanism	Costs: hosting and maintenance, updates, personnel, dissemination, and promotion. Revenue: contracts with government and municipal agencies, and the private sector. Funding sources: internal DRAXIS budget, national and European research funds.
Expected Impact (3-Year)	Scientific: contributes to advancements in data science and urban analytics. Economic: commercialization stimulates the urban tech market and creates new business opportunities.
Barriers/Challenges	Main barriers include limited funding availability, lack of technical capacity within local administrations

4.8 ESA

Section	Input
Lead Partner	LINKS
IPR information	Copyright owned by LINKS. Open-source tool with freely available modules and interoperability features.
Description/Purpose	The ESA tool is an open-source digital workbench containing more than thirty modules related to ecosystem services. It enables users to assess the supply and value of ecosystem services, including regulating, provisioning, life-support, and cultural services, within urban contexts. The tool integrates ecosystem service evaluation into decision-making for urban transformation projects
Target Users/Market Segment	Urban planners and designers; local and regional governments; environmental agencies; landscape architects; real estate developers; infrastructure and transport planners.
Engagement Status	-Implemented in Milan during UP2030. -Discussions ongoing with other researches from academia to explore potential collaboration and use of the tool with other cities outside the consortium.
Use Model	Open-source software available for any user interested in conducting ESAs. Implementation requires users with GIS expertise. Supported by a guidance document and example report for managing input data and interpreting results.
Exploitation route	Direct use: open-access dissemination (publication). Indirect use: training and technical support services; integration with GIS platforms (ArcGIS, QGIS) to expand reach among planners and agencies.
Actions, Responsibilities & Milestones after the project	Collaboration with target users, publication of research papers and case studies to validate and encourage adoption. Milestones: -Post-project technical roadmap finalization (Month 1–6). -Prototype optimization and beta testing (Month 6–12) with early adopters. Responsible partner: LINKS Foundation.
Uptake & Replicability	The city of Turin (outside UP2030) shown interest in adopting the tool.
Financial/Sustainability Mechanism	No costs expected. Currently exploring new funding opportunities (EU).
Expected Impact (3-Year)	Environmental: enhanced ecosystems management; supports decision-making to minimize environmental degradation and

	promote sustainability; identification of areas for conservation/restoration; supports climate action. Societal: improved decision-making, reduced barriers to expertise, increased awareness, and time/resource efficiency.
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4.9 UDCW (Urban Design Climate Workshops) Methodology & Tools

Section	Input
Lead Partner	UCCRN
IPR information	Copyrights: UCCRN. IPR generated during the project belongs to UCCRN. Discussions with partners are ongoing for potential tool coupling; in such case, a joint ownership agreement will be signed with relevant counterparts.
Description/Purpose	The UDCW Methodology supports local authorities and practitioners in measuring the effectiveness of planning and design solutions at quantitative (modelling of environmental indicators) and qualitative level (engagement, co-design, evaluation of co-benefits). It integrates and scales up climate change mitigation and adaptation in cities through knowledge sharing, collaboration, and action planning. It includes two toolkits: -UDCW Simulation Toolkit: GIS and 3D modelling tools for heat waves, floods, energy, and carbon analyses at multiple scales (city/district/neighborhood). -UDCW Facilitation Toolkit: participatory exercises (collaborative mapping, city visions, “a day in the life”, 3D neighborhood configurator) to enable co-design and participatory planning processes.
Target Users/Market Segment	Urban planners and designers (public and private sector); graduate students (MSc, PhD level) in multidisciplinary programs; Technical offices of Municipality interested in integration of some simulation functionalities (GIS).
Engagement Status	-Implemented in Thessaloniki and Rio de Janeiro under UP2030. -Continuous engagement with students: continuous loop of education-research. UCCRN trains on a regular basis Master students and PhD (in particular UCCRN_edu Master at University of Naples and fellow partners- UIC Barcelona, UDC Dublin, UGE Paris) using the UDCW Methodology as basis for learning modules. Two modules are dedicated to UDCW simulation and UDCW facilitation. -Urban planners and designers: UCCRN currently engaged in pilots, and through internships UCCRN is providing training on the use of the tools.
Use Model	Provision of a service: depending on the context, the methodology can be applied through different formats:

	-Knowledge Exchange (panel sessions, side events). -Capacity Building (with multidisciplinary experts and local authorities). -Design Studio (with students, practitioners, and local stakeholders). Supported by the UDCW Simulation and Facilitation Toolkits.
Exploitation route	-Application through contracts or participation in research projects with full support from UCCRN experts. -Capacity building and educational activities through UCCRN Hubs (European, Global, Regional).
Actions, Responsibilities & Monitoring after the project	- Actions for development: Conduct further pilot studies; refine simulation modules; increase reliability of methodology. - Actions for adoption: Publish technical documents and guidelines; systematize toolkit implementation; organize dissemination events; collaborate with target users. Responsible partner: UCCRN. Milestones: - Completion of additional pilot studies in at least two cities (Month 6 after the end of the project). - Release of updated version (v2.0) with refined features (Month 9 after the end of the project). - Submission of ≥ 3 funding proposals (Month 6 after the end of the project). - At least three dissemination events and collaboration agreements with ≥ 3 institutions (Month 6 after the end of the project).
Bundling & Synergies	Potential for tool bundling and joint exploitation with other UP2030 tools providers (Deltares, Buro Happold, TSPA) under discussion. Outcomes produced for the pilot of Thessaloniki are being integrated in the Decision Support Systems (DDS) tool, developed by DRAXIS.
Uptake & Replicability	-Beyond UP2030, tool testing has been developed in the last three years for educational and research scope in Naples, Cornella de Llobregat, Dublin, Mons, Rotterdam, Barcelona and Aalborg. -HORIZON Proposals have been submitted (Rio de Janeiro as pilot case and Thessaloniki Metropolitan Region as follower case). Moreover, seven project proposals (even not yet funded) include the test of the UDCW in more than 10 pilot cases in EU, Canada, Brazil and India. Submitted proposals include EU and extra EU funds. -Also, there are on-going requests to adapt and test the tool in different cities and regional contexts (in particular Latin America, South Europe and North Europe). -UCCRN has finalized two contracts for UDCW implementation:

	- UDCW for prototyping of a climate itinerary in the Municipality of Cornellà de Llobregat (Spain) for Climate KIC's project "Climate Itineraries". - UDCW for Provision of Services for Climate Modelling in Dún Laoghaire Rathdown County Council (Ireland).
Financial/Sustainability Mechanism	Estimated annual costs: Operational ≈10k€/y; Overheads ≈60k€/y; Dissemination ≈10k€/y. Cost coverage: Fully covered by contracts applying UDCW methodology (Capacity Building/Educational). Funding sources: EU and international project grants; national/regional tenders; private consultancy contracts.
Expected Impact (3-Year)	Scientific: fosters multidisciplinary research, generates new insights and best practices across architecture, planning, and climate sciences. Societal: accelerates climate-resilient urban development through incorporation of scientific knowledge in practitioners' daily work.
Barriers/Challenges	The tools require specific training by UCCRN experts, so a barrier could be the necessity to have a dedicated training. Thus the constraints are time and resources for both UCCRN experts and target users

4.10 HydroFlows

Section	Input
Lead Partner	Deltares
IPR information	Copyright on software, models, data packages, and guideline documents. The creator of the results becomes the owner – Deltares, protected by copyright.
Description/Purpose	HydroFlows is a library of modular workflows for conducting flood risk assessments in a standardised and reproducible manner. It includes automated setup of physics-based models, statistical analysis, and impact assessments. The tool supports cities in establishing rapid assessments of climate risks as a baseline for risk-informed and water-sensitive adaptation planning and design.
Target Users/Market Segment	City professionals (technical staff and policy makers); academic researchers and students; private consultants (engineering and design firms).
Engagement Status	Implemented in Rio de Janeiro under UP2030.

Use Model	Implemented as an automated workflow for rapid climate risk assessments, consisting of: 1) A library of building blocks for flood risk workflows. 2) A framework for generating workflows executable in different engines. Implementation involves customization for city-specific assessments, use of public datasets, and collaboration with partners for co-creation and access to risk assessment reports.
Exploitation route	Direct use: Contract research and consulting; participation in research and development projects; collaboration with cities for real-world applications. Indirect use: Knowledge sharing and dissemination through publications and conferences.
Actions, Responsibilities & Monitoring after the project	Actions for development: Conduct additional pilot studies; apply solution in consultancy and advisory projects; refine technical features and add functionalities; secure R&D funding. Actions for adoption: Expand online support materials; disseminate via networks and events; organize training workshops; collaborate with users for implementation; publish papers and case studies. Responsible partner: Deltares. Milestones: - Completion of pilot studies in new contexts (12 months). - Updated version (v2.0) released (9 months). - Submission of two R&D proposals (9 months). - Three dissemination events and one scientific publication (9 months).
Bundling & Synergies	- Integrated with FloodAdapt within UP2030 (Rio de Janeiro). Combination supports comprehensive flood risk management and climate resilience planning. - Potential for tool bundling and joint exploitation with other UP2030 tools providers (UCCRN, TSPA) under discussion.
Uptake & Replicability	Expected replication through application in additional cities and projects via consultancy and research collaborations.
Financial/Sustainability Mechanism	Costs: Maintenance of digital platforms, personnel costs for maintenance/support/development, dissemination activities. Revenue sources: Research funds (EU Horizon, national subsidies), assignments from governments, development banks, private sector (e.g. insurance).

	Funding sources: EU Horizon research projects; Dutch national subsidies; regional government assignments; private contracts (insurance, engineering firms).
Expected Impact (3-Year)	Socio-economic: Quantifies flood risks in economic terms (losses/benefits) and includes co-benefits such as equity and focus on vulnerable groups. Scientific: Contributes to technical and methodological advancement in flood risk assessment and adaptation planning.

4.11 UGEM

Section	Input
Lead Partner	GGGI & CERTH
IPR information	Background: GEM and the downscaled UGEM model have been developed using Vensim by Dr. Andrea M. Bassi at KnowlEdge Srl. The IP of the UGEM is held by Andrea and KnowlEdge Srl, with GGGI as co-owner under a collaboration agreement. The separately developed urban housing module for UGEM is owned by CERTH, with GGGI as co-owner. Foreground: UGEM developed under UP2030 through the downscaling of the original Green Economy Model (GEM), is owned by Dr. Andrea M. Bassi (<i>not partner to the UP2030 project</i>), and used GGGI and CERTH according to individual agreements between the parties. -UGEM may be licensed to / customized for third parties (municipalities) for independent use with optional training and support. -GEM and UGEM is partially open access. The model source code and documentation are available on an open-access basis (the model must be requested from Dr. Bassi, GGGI or CERTH), but operating and modifying the model requires the Vensim system-dynamics software, which is subject to its own licensing conditions: the free (PLE) version provides limited accessibility and functions, whereas the professional and commercial license allows for full model functionality and unrestricted variable use. -Vensim Pricing depends on the buyer. Different pricing for PLE, non-academic/academic and professionals. Ranging from \$478-\$1195 but the license is forever. User may pay an annual maintenance at around \$100. -MoU between CERTH, GGGI and Dr. Bassi is to be signed.
Description/Purpose	The UGEM is based on the original GEM system dynamics model designed for policy planning across economic sectors. It enables cities to simulate and evaluate low-carbon and green economy development scenarios. UGEM, built using the System Dynamics

	(SD), supports medium- to long-term cross-sectoral planning (e.g. for economic and social planning, as well as strategy development for energy, industry, waste, NbS, buildings, and more) to inform climate-neutral strategies and robust policy formulation.
Target Users/Market Segment	Cities pursuing climate neutrality and integrated climate strategies.
Implementation & Engagement Status	CERTH has developed a housing module as part of the downscaled GEM that is to be implemented in Thessaloniki under UP2030. No further engagement with target users has started yet. At the start of the project many UP2030 cities showed some initial interest, but had limited understanding what the tool could do - as a lesson learned Dr. Bassi, GGGI & CERTH must develop informative booklets and showcase the results of the tool from implementation in Thessaloniki (and other examples) to help shape expectations and understanding.
Use Model	-Open-source software base (Vensim) combined with proprietary model (GEM and UGEM). -Service provision by Dr. Bassi at Knowledge SLR, GGGI and CERTH to assist municipalities. -Product Customization for each city's data and needs. -Optional licensing to third parties with training and support. The license cost is a fixed, one-time fee with no expiration. Ongoing support and training could be provided by the developers based on city needs, either on-site or remotely (at a cost).
Exploitation route	-Contract research and further project applications; -Licensing to municipalities and third parties; It uses a commercial simulation software that requires a one-time paid license (approx. €400-1,000) -Dissemination: publication on the downscaled GEM (UGEM) and housing module, conferences and different online communication materials.
Actions, Responsibilities & Milestones after the project	-Conduct further pilot studies in additional municipalities. -Secure funding for additional testing and replication. -Disseminate results via conferences/webinars, Net Zero Cities & UP2030 platforms -Develop user guides and online materials, logo and information booklet -Publish Research paper to showcase benefits and encourage use -Develop and sign MoU between Dr. Bassi, GGGI & CERTH Responsibility: GGGI and CERTH.
Bundling & Synergies	Partners for bundling not identified yet. However, interest in bundling with any tool that develops data or support low-carbon pathway and scenario development could provide useful inputs. Moreover scenario development needs stakeholder engagement - GEM relies on official datasets, data quality is ensured through the involvement of experts, statistical data and stakeholder

	engagement (experts providing inputs, analyzing scenarios and outputs) - any tool that supports stakeholder engagement ensures enhanced results.
Uptake & Replicability	The GEM model has been applied internationally; UGEM's urban adaptation aims for future testing and replication in additional cities, building upon experience with Thessaloniki during the project.
Financial/Sustainability Mechanism	Personnel and communication costs are covered by developing partners. Revenues from licensing, training, and consultancy services. Further R&D funded through EU (Horizon Europe, LIFE) or municipal budget.
Expected Impact (3-Year)	Long-term use of the UGEM can stimulate local economic activity by promoting green construction and renovation, lower housing costs (in by applying the housing module), and reduce energy consumption and GHG emissions. This generates both environmental and socio-economic benefits.
Barriers/Challenges	As the tool is resource intensive (HR, technical capacities, software requirements) cities may not be comfortable / be able to implement the tool without the support from Dr. Bassi/ GGGI/ CERTH - for this cities need to obtain or set aside funds. Limited understanding at the outset what the tool could do, what purpose it serves. Its potential results and limitations.

4.12 Neutrality Story Maps

Section	Input
Lead Partner	VUB & CERTH
IPR information	-Copyrights owned by CERTH and the VUB. The IPR is governed by the Creative Commons Attribution–NonCommercial - ShareAlike 4.0 International (CC BY-NC-SA 4.0) license, allowing sharing and adaptation with attribution and non-commercial use. - CERTH and VUB jointly developed the tool. The roles, responsibilities, and commercial rights of both parties will be defined through a Memorandum of Understanding (MoU).
Description/Purpose	NSM is a mobile-friendly web platform for digital storytelling and citizen engagement on climate neutrality. It enables cities to communicate local climate challenges and initiatives while allowing citizens to share personal stories, hopes, and experiences about climate change through multimedia narratives (text, photo, audio, video). It supports co-creation, awareness, and participatory urban planning.

Target Users/Market Segment	Primary users: Cities, policymakers, and government bodies. Secondary users: Citizens and community groups.
Implementation & Engagement Status	-Implemented across all 10 UP2030 pilot cities, each with a dedicated and co-designed NSM city page to promote local ownership and tailored engagement. -Also engaged with city officials in other sister projects (Re-Value) to present the tool and gauge their interest. -Also workshopped tool with 100 students outside of the project to test and validate the tool.
Use Model	-Web-based, mobile-friendly platform (citizen-centric B2G model). Cities and citizens register, create stories, and view them on map or timeline. -Hosted by CERTH; free access for 5 years post-project. Afterward, continuation or upgrades available via service contracts with CERTH.
Exploitation route	-Research dissemination (VUB), publications, and case studies. -Commercial exploitation (CERTH) through service provision or spin-off; potential indirect commercialization beyond 5-year free period.
Actions, Responsibilities & Milestones after the project	-User training and support will be provided. -Post-project scaling and commercialization strategy will be developed to expand the reach of the solution to other cities outside of the UP2030 network. -Create white paper based on the offerings of the platform or on the outputs of the cases studies that will be implemented during the project as marketing and promotion material. -Paper on challenges to co-creating socio-technical solutions with multiple cities. -Actively disseminate solution through networks, webinars, conferences, etc. Responsibilities: will be defined through MoU.
Bundling & Synergies	- No current or planned bundling within other tools.
Uptake & Replicability	- So far, the cities expressed interest in using the platform for the 5 years they get it for free after the project ends but not beyond that. By showcasing the prototype of each pilot city that includes success stories, lessons learned, and future strategies, NSM helps with encouraging the uptake of successful strategies and approaches in other cities. -VUB and CERTH are in the process of drafting a joint ownership agreement in order to use the tool in other projects, cities and contexts.
Financial/Sustainability Mechanism	Operational and maintenance costs (hosting, personnel, outreach) covered initially by project and CERTH.

	Long-term sustainability through service contracts, consulting, and potential licensing or spin-off revenues.
Expected Impact (3-Year)	Social: Enhances citizen participation, inclusion of marginalized voices, and co-creation of climate solutions. Scientific: Provides new data and insights for research on socio-technical co-creation and participatory urban design
Barriers/Challenges	Time constraints, resources, and participation fatigue.

4.13 UP2030 Service Platform

Section	Input
Lead Partner	ICLEI Europe (platform host) with contributions from adelphi, GGGI, GreenAdapt, Fraunhofer, and R-Cities
IPR information	Each partner retains ownership of the tools and materials they contributed (Foreground IPR). ICLEI holds a non-exclusive right to host, present, maintain, and promote these works on the platform after UP2030. All involved parties have signed a MoU aligned with the GA and CA to clarify ownership and future exploitation roles.
Description/Purpose	The UP2030 Service Platform is the project's digital legacy hub, hosting practical tools, guidance, methodologies, and case studies that help cities design and implement climate-neutral, resilient, and just urban transformation pathways. It centralizes UP2030 outputs - including tools, guides, the 5UP workbook, and upscale methodology - into a single accessible platform supporting long-term use and replication.
Target Users/Market Segment	Urban planners and municipal officers; NGOs and community organizations; consultants and private-sector sustainability actors; financing institutions; neighborhood associations; and academics and students working on climate-neutral and just cities.
Implementation & Engagement Status	Platform development is ongoing and will be finalized by the end of the project (Dec 2025). Engagement has been continuous through workshops, partner consultations, and content collection with tool developers. Presentation and testing with UP2030 cities is planned for the project's final phase.
Use Model	Open-access online platform providing tools, guides, step-by-step instructions, and connections to the UP2030 MOOC. Includes navigation guidance, methodological explanations, and practical resources. The platform will be operational by end of UP2030.
Exploitation route	Continued enrichment through new research projects and collaboration opportunities.

	Promotion via NetZeroCities (NZC) Portal, Smart Cities Marketplace, and partner channels. Presentation at Smart City Expo World Congress. Long-term open-access legacy resource hosted and maintained by ICLEI.
Actions, Responsibilities & Milestones after the project	For tool further development: -Refine features and content based on user feedback and pilot learnings. -Integrate lessons from UP2030 transferability packages. -Seek Horizon Europe and other project opportunities to enhance platform content. ICLEI + content providers jointly responsible (per MoU). For tools' adoption: -Disseminate via Smart Cities Marketplace, NZC Portal, and partner channels. -Promote case studies and guidelines demonstrating value. -Integrate the platform into future projects and scientific communities. ICLEI leads outreach; tool providers support. Milestones: -Platform finalization before project end. -Platform integration into at least one marketplace (Smart City). -Inclusion in at least one funding proposal within 12 months post-project.
Bundling & Synergies	The platform hosts the following UP2030 tools: Urban Typologies, Transformative Governance Tool, Cost-Benefit Analysis Guide, Green Finance Guide, and 5UP Workbook. These bundled resources create an integrated service offer for cities. The bundle will be maintained after the project under the partners' MoU.
Uptake & Replicability	The platform will be promoted to all UP2030 cities and to external Mission Cities via NZC and Smart Cities Marketplace. It is designed for replication across European and global cities seeking climate-neutral, resilient, and just transformation pathways. Further uptake will be supported through joint dissemination and integration into future projects.
Financial/Sustainability Mechanism	Currently no guaranteed post-project budget. Sustainability relies on partners jointly seeking funding (Horizon calls, project integrations, collaboration opportunities) to maintain and expand the platform. Operational costs (hosting, updates, admin) will be covered through such funding arrangements.
Expected Impact (3-Year)	Scientific: advances knowledge on climate-neutral and just cities through open distribution of tools and methodologies.

	Societal: supports spatial justice, community empowerment, and inclusive planning practices. Economic: reduces planning costs by providing ready-to-use tools and best practices, improving efficiency in urban transitions.
Barriers/Challenges	Lack of secured funding for long-term maintenance. Dependence on partner capacity to continue content updates and dissemination.

4.14 MOOC

Section	Input
Lead Partner	UIC
IPR information	Background IPR: Course content contributions from UP2030 partners and tools providers. Foreground IPR: Joint copyright ownership of video and learning materials; UIC is the primary IPR holder as host of the MOOC platform and responsible for content dissemination and long-term accessibility. Free and open access to core content; optional paid certification feature under exploration.
Description/Purpose	The MOOC is a comprehensive, open-access training program aimed at empowering city practitioners with knowledge, skills, and tools for climate-neutral, resilient, and socially just urban planning. It includes five modules (Updating, Upskilling, Upgrading, Upscaling, Uptaking), combining theoretical, methodological, and applied content through video capsules, case studies, and quizzes.
Target Users/Market Segment	-Primary users: Urban planners, architects, consultants, city practitioners, policymakers, NGOs, and public officials. -Market segment: Professional education in sustainable and climate-neutral urban planning. Geographical focus: Primarily EU countries.
Implementation & Engagement Status	MOOC launched in November 2025 – and now ready to be used.
Use Model	Open-source MOOC hosted on UIC's internal platform. Includes video lectures, tutorials, quizzes, certification options, and discussion forums. Content available both as full curriculum and as stand-alone videos. Accessible, multilingual, and designed for practitioners' needs.
Exploitation route	-Dissemination through UP2030 platforms, URnet's learning platform, UIC academic channels, and partner networks.

	-Integration with future URnet/UIC training offers and research-based collaborations.
Actions, Responsibilities & Milestones after the project	-Enrich course with new tools and materials. -Update content based on user feedback -Develop guides and support materials. -Disseminate through events, networks, and social media. -Maintain and update MOOC via UIC. -Tool partners responsible for updating content on their respective tools.
Bundling & Synergies	- No direct bundling with UP2030 tools foreseen, though tools are featured within the MOOC (Module 2).
Uptake & Replicability	- Long-term availability on UIC and URnet platforms; integration with future courses ensures continuous access and visibility. Potential for replication in other academic and professional training contexts.
Financial/Sustainability Mechanism	Core access remains free. Sustainability supported through: -Optional certification fees. -Paid event participation (e.g., workshops, webinars). -Possible future grants or institutional funding. Operational and dissemination costs covered by UIC and partner budgets initially.
Expected Impact (3-Year)	-Scientific: Builds practitioner capacity, bridging academic and practical knowledge. -Environmental/Societal: Promotes climate-neutral and equitable urban transformation through improved professional competence -Educational: Strengthens continuous professional learning across EU cities.
Barriers/Challenges	-High volume of existing online courses (risk of user saturation). -Limited time for professional learners. -Resource needs for regular updates and translation.

4.15 5UP Approach

Section	Input
Lead Partner	Fraunhofer IAO; Resilient Cities Network (RCITIES)
IPR information	Foreground IPR: Shared IP (included in the 5UP booklet indicating each partner's authorship). Ownership distribution: -Fraunhofer & RCITIES: Methodology owners and content curators. -UIC: Conceptualization initiator. -University of Stuttgart IAT: Tool developer.

	-Other partners (e.g. MfC, TSPA, city partners): Input contributors and validation partners. -WeDigital: Design of PDF workbook. No further agreements foreseen.
Description/Purpose	The 5UP Approach is a framework to guide cities and practitioners in implementing socio-technical transitions toward climate neutrality, resilience, and spatial justice. It structures systemic change through five interlinked stages - Updating, Upskilling, Upgrading, Upscaling, and Uptaking. 5UP Workbook: A practical guide for planning meaningful and consistent climate action and implementation in cities.
Target Users/Market Segment	Primary users: municipal authorities (medium to large cities, particularly those part of the EU Mission for 100 Climate-Neutral Cities).
Engagement Status	Applied in all UP2030 pilot cities as a core guiding framework. Some cities (e.g. Milan) have begun adopting the approach for additional local initiatives.
Use Model	PDF workbook and extended Excel-based toolkit available for download. Optionally, technical support and consulting services (fee-based) provided for municipalities to ensure effective application.
Exploitation route	Municipal implementation via open-access workbook and toolkit; inclusion in educational content (e.g. MOOC); integration in new Horizon proposals; integration into the service platform. Dissemination via research publications, conferences, and policy briefs.
Actions, Responsibilities & Milestones after the project	-Refine workbook and update content based on lessons learned. -Create and maintain Excel-based tool. -Integrate 5UP into the NZC the UP2030 Service Platform. -Disseminate via seminars, conferences, and publications. Responsible: Fraunhofer and RCITIES (dissemination, integration); WeDigital (support).
Bundling & Synergies	Potential integration with the NZC and Smart City Marketplace platforms.
Uptake & Replicability	-Framework adopted across all UP2030 cities; designed for scalability to new municipalities and research projects through open-access materials and service-based support.
Financial/Sustainability Mechanism	-Non-commercial model with optional revenue through consulting services.

	Additional sustainability through partnerships with municipalities and future EU or national project funding (e.g. Horizon Europe, LIFE, national innovation funds).
Expected Impact (3-Year)	-Scientific: strengthens urban transformation frameworks via socio-technical integration. -Societal: supports equitable, resilient, and participatory city transitions. -Economic: improves investment efficiency and alignment of urban transformation efforts. -Environmental: enhances urban sustainability and adaptation capacity.
Barriers/Challenges	-Limited municipal resources and cross-departmental collaboration. -Need for continued engagement and technical support capacity.

5 Prototypes Sustainability

This chapter presents the sustainability plans for the UP2030 pilot prototypes, outlining how each city intends to maintain, embed, and further develop the outcomes generated through the project. The analysis focuses on two main components:

- how each prototype will be sustained beyond UP2030, including planned steps, governance, and financial arrangements; and
- How the UP2030 tools integrated into each prototype will continue to be used, supported, and maintained within local processes.

The content builds on the transferability packages developed by ICLEI as part of the WP5 upscaling efforts, as well as workshop 3 and worksheet inputs – as outlined in the Methodology (Chapter 2.2).

More detailed information is provided in Annex **Error! Reference source not found.**, which includes Excel-based tracking file summarizing each prototype’s journey within the project, with a specific focus on the upscaling and sustainability phases, and on tools’ integration and continued use.

5.1 Belfast - Net Zero Neighborhood Framework (NZNF)

Section	Input
Main sustainability objectives	The aim is that the NZNF can be scaled across the city and beyond, taking as a reference the lessons learned from the testing on the southern section of Belfast’s city center, which contains a mix of functions and land uses including residential, tourism, commercial, office, hospitality and transport.
Next steps & Responsibilities	The specific steps and objectives that need to be accomplished include: -Agreeing on the Council's approach for post-project dissemination and upscaling. -Further developing actor and stakeholder relationships. -Ensure alignment with city and regional strategies (such as the Belfast Agenda, Resilience Strategy, and Climate Ambitions). -Develop adaptable, flexible solutions suited to different urban contexts. -Explore the current finance and governance arrangements for each of the three sectors (residential, public buildings, and commercial) -Assess what changes or requirements would be necessary in terms of finance and governance to enable effective upscaling.
Governance mechanism	Embed governance and accountability by introducing clear targets, data collection, and top-down commitment across public and private sectors. Utilize public-body duty reporting as an incentive for immediate action. Ensure strategic oversight and coordination across departments and sectors through existing structures such as the Place Partnership and Our Planet network.
Financial mechanism	Establish sustainable funding models combining financial incentives and disincentives to mobilize sectors. Develop grant schemes and low-cost loans/revolving funds, following the ‘invest-to-save’ example (QUB revolving fund: £250 k → £10 m). Explore EBIS loan models, ECO funding, and targeted UK Government support.

Expected long-term impact	Establish a replicable net-zero neighborhood framework supporting emission reductions through retrofit, active travel and greening, while strengthening governance and data-driven decision-making across the city.
Risks & Barriers	-Residential: limited and unringfenced retrofit funding; lack of coherent approach from central government. -Public buildings: absence of targets and accountability; insufficient funding and data; slow scheme delivery. -Commercial: fragmented governance and restricted funding compared to GB/Rol; data gaps and viability issues for retrofit projects; falling demand for office space. Overall → need for clear policy direction, cross-sector coordination, and dedicated finance streams.

5.1.1 Tools continued use & integration

5.1.1.1 Design Clips – Safe Routes, Healthy Places Toolkit

Aspect	Key Information
Tool Function	Provides adaptable toolkits and campaign materials to promote active school travel, particularly the Walking Bus pilot. Co-developed with Belfast City Council to support awareness and engagement on low-carbon mobility. The materials were used to engage schools across the project area, while collecting feedback that will inform future implementation.
Post-project use & integration	Belfast City Council will continue using the toolkit during the next academic year to promote school travel initiatives. The materials are aligned with the Net Zero Neighborhood Framework and can be embedded in future school travel and mobility strategies.
Operational sustainability	Local stakeholders have been actively involved in the co-development of the toolkits, ensuring ownership and long-term usability. The toolkits include a variety of practical materials (such as project roadmaps, campaign templates, and participatory tools with detailed instructions) that build local capacity and enable independent application beyond the project. In addition, a matrix has been developed to help local enablers adapt the resources to different project scales, offering options for applying the toolkit according to available resources and objectives
Financial Sustainability	No dedicated funding required; the toolkit is designed for independent use and maintenance by schools and local stakeholders without additional financial resources.
Expected long-term impact	-The toolkit advances the pilot's long-term vision by integrating child- and youth-focused perspectives into active travel and urban design. It helps sustain and expand the Walking Bus and supports the city's Net Zero goals by encouraging healthy, low-carbon school travel. Over time, it builds social impact by boosting awareness of active travel and climate issues, empowering communities to advocate for safer, greener streets shaped by children's insights.

	-At the governance level, the toolkit equips municipalities with practical resources, such as roadmaps and engagement strategies, that streamline processes, reduce dependence on external experts, and guide effective community engagement. Ultimately, it strengthens both community participation and municipal capacity, enabling lasting environmental and social benefits
Replication & Uptake outside UP2030	Adaptable to different schools and contexts using the CYFUD (Child and Youth-Friendly Urban Design) framework. Already applied in other contexts (e.g., Climaborough Lot 3 – Pilsen).
Main Risks/challenges	Dependence on continued school engagement and resources; mitigated through flexible, low-cost implementation materials and stakeholder ownership.

5.1.1.2 Mapping for Change – Community Maps

Aspect	Key Information
Tool Function	Community Maps has been actively implemented as one of the engagement tools during the visioning phase within Belfast. It also forms one of the tools incorporated within the Safer Routes Healthy Places Belfast Toolkit, developed by DC, that supported the Walking Bus initiative.
Post-project use & integration	Community Maps will continue to be used for participatory planning and engagement, particularly in visualizing environmental and social data. The Safer Routes Healthy Places Belfast Toolkit is designed for self-implementation and may be adopted by schools through existing programs such as Eco-Schools and Belfast Healthy Cities who will be promoting the materials on their website. Community Maps outputs are being integrated into framework documents and policy recommendations. The Walking Bus is featured in project communications and highlighted as a case study in planning materials.
Operational sustainability	Training and capacity-building sessions were held with municipal staff to ensure they can maintain and update the platform. Ongoing technical support and updates are planned to ensure sustainability. Video tutorials have also been created to support the further dissemination of training materials. District-level training and capacity building will be provided once they are ready to initiate their engagement processes.
Financial sustainability	Community Maps requires hosting and occasional technical support. These costs could be sustained through integration into city programs or external funding. The Walking Bus toolkit does not require ongoing costs
Expected long-term impact	Community Maps supports co-design and adaptive planning aligned with Belfast's neutrality and sustainability goals. The Walking Bus promotes active travel and community cohesion, addressing transport and health equity. -Environmental: Supports greening and active travel, contributing to

	climate resilience. -Social: Enhances community engagement, equity, and awareness of local issues. -Economic: Informs cost-effective interventions and promotes healthier transport options
Replication/Uptake	Community Maps has been used in multiple cities and continues to attract interest for participatory planning. The Walking Bus concept is relevant to many urban contexts and has potential for replication.
Main Risks/challenges	-Limited school capacity and competing priorities. -Lack of dedicated staff for ongoing delivery. -Ensuring accessibility and avoiding participant fatigue. -Technical limitations and data completeness for mapping.

5.1.1.3 UCAM - Urban Regeneration Carbon Accounting & Management

Aspect	Key Information
Tool Function	Provides quantification tools for achieving net zero, including carbon and cost analysis.
Post-project use & integration	It has been designed to scale up and apply to other regeneration projects within the city – enabling Belfast City Council to conduct small scale carbon accounting. This is supported by the provision of a methodological guide. The tool is included within Belfast’s regeneration framework.
Operational sustainability	The tool is Excel based, and features named cells used within each calculation. These can be updated with new data/inputs which then change the outcomes produced by the tool. A methodological guide was provided to local stakeholders, designed to support users of the tool has been created and shared with the city.
Financial sustainability	Tool’s continued use does not entail any costs.
Expected long-term impact	It is designed to enable the city council to estimate the carbon emission impacts of urban regeneration, so there are environmental benefits. Supporting the development of carbon neutral neighbourhoods.
Replication/Uptake	There are currently no plans for replication at the moment.
Main Risks/challenges	Lack of updated data sets. Lack of time and capacity within the city council to find updated data.

5.2 Milan - Ecosystem Services Assessment (ESA) and Methodology

Section	Input
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Main sustainability objectives	The prototype, with its analysis of ESS but most importantly the methodology (InVEST), has been adapted to the municipal context, and now assimilated and replicated by municipal staff for urban and policy design. - For example, the assessment of the “Urban Cooling” Ecosystem Service is already contributing to the monitoring activities of the Municipality’s Air and Climate Plan. - The objective moving forward is to ensure that the methodologies developed (such as InVEST and the complementary ESS tools) are fully integrated into municipal workflows and continue to be used after the end of the project. The objective is to support internal decision-making and the design and assessment of urban transformation projects and plans, filling existing methodological and data gaps. The aim is to make these methods complementary with tools already in use, scientifically sound, and supported by trained municipal staff able to apply them independently.
Next steps	-Apply the InVEST methodology in support of the future Urban Green Plan, to guide decisions. -Integrate InVEST with other ecosystem service methods already in use within the Municipality to create a comprehensive framework for future planning and monitoring. -Conduct internal training sessions to review the InVEST handbook and ensure staff capacity (Urban Resilience Department & LINKS). -Expand use of the prototype to other Green Department units and explore alignment with other departments. -Disseminate knowledge and methods within the Municipality and at public events. -Hold meetings to explore complementarities between UP2030 methodologies and existing municipal tools (Urban Resilience Department & LINKS). -Explore synergies with LAA on the economic dimension of ecosystem services.
Governance mechanism	The integration of the methodologies is supported by a transversal working group within the Municipality (Urban Resilience and Green Departments) and external collaboration with LAA. Internal governance ensures that the methodologies are embedded in planning and decision-making processes and complement existing instruments.
Financial mechanism	The tools used (e.g., InVEST and CRF) are open-source and managed with municipal resources, requiring no external funding or licensing fees. The Municipality will finance upscaling and sustainability activities internally, relying on existing staff and departmental resources to maintain and apply future projects funded by the EU Commission may support further adaptation and application. The GGGI financial tool could be used to identify funding for implementation of NbS and other resilience measures.
Expected long-term impact	Improved evidence-based decision-making and integration of ESA into municipal planning. Strengthened institutional capacity and cross-departmental collaboration.

Risks & Barriers	Fragmentation of existing data and assessment methods across departments. -Lack of methods adapted to urban ecosystem services and local data availability. -Limited resources and staff capacity for continuous data management and methodological updates
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5.2.1 Tools continued use & integration

5.2.1.1 LINKS – InVEST

Aspect	Key Information
Tool Function	It provides a quantitative assessment, both biophysical and economic, of the ecosystem services provided in urban environments. InVEST was applied in the prototype to evaluate the ecosystem services provided by urban green areas (urban cooling effect and carbon storage and sequestration), and to measure the environmental and economic impacts of urban interventions at different scales (urban, neighborhood, public square). Within UP2030, it was used to analyze the Urban Cooling service, helping the Municipality of Milan quantify the amount of green surfaces required by 2030 to maintain local temperature increases within 2°C, in line with the Air and Climate Plan (PAC).
Post-project use & integration	The Municipality will continue collaborating with LINKS beyond UP2030. The tool will be used to support technical staff in the Air and Climate Plan, the forthcoming Urban Green Plan, and future EU-funded projects. It will be integrated into municipal planning workflows and combined with other existing methodologies.
Operational sustainability	InVEST is open-source and requires only basic GIS skills. It can be maintained and operated independently by municipal staff using internal resources. A dedicated handbook has been produced to guide users in applying and replicating the methodology with local data. Staff training and internal capacity building ensure its continued application.
Financial sustainability	Tool is open source. No dedicated funding required. The Municipality manages the tool with its own personnel resources. Future EU-funded projects may provide opportunities to further develop or adapt the methodology.
Expected long-term impact	The tool contributes to Milan's long-term vision by embedding ESA into planning and decision-making. By integrating ESAs into decision-making processes (e.g., the Air and Climate Plan, the future Urban Green Plan), it ensures that urban transformations maximize environmental, economic, and social benefits, while strengthening internal capacities and enabling future replication and upscaling beyond the project.

Replication/Uptake	The methodology is transferable to other urban contexts. The City of Turin has already expressed interest in adopting the tool. Future replication is expected through collaboration in upcoming EU projects.
Main Risks/challenges	The main barrier is the need for regular updating and processing of input data, which is essential to maintain the reliability and relevance of outputs.

5.3 Budapest – Healthy Streets Knowledge Center (KC)

Section	Input
Main sustainability objectives	The main objective of Budapest is to ensure the sustainability and operational continuity of the Healthy Streets Knowledge Centre (KC) beyond UP2030. The goal is to keep the platform relevant, active, and functional, supporting the adaptation and implementation of the Healthy Streets (HS) methodology. Key objectives include: -Scaling up communication and involvement of district municipalities, decision-makers, and planners. -Ensuring the KC's operational framework, financial sustainability, and capacity needs are defined and met. -Promoting long-term dissemination and application of HS methodology across Budapest and beyond.
Next steps	-Implement 12-month action plan outlining responsibilities and next steps for KC sustainability. -Define operational framework and indicators for KC performance monitoring, assigning clear roles and responsibilities. -Ensure collaboration between founding partners are ongoing and regular. -Maintain and update the KC platform, adding new resources and methodologies. -Develop training programs and capacity-building activities for municipal staff (long-term goal). -Analyze the possibility to integrate Healthy Streets and climate aspects into regulations by 2026 (if possible, implement). -Engage additional municipalities from August 2025 onwards. -Build and coordinate an expert network, including a yearly conference and partnerships with national and international actors. Ensure regular engagement and support to local districts and urban planners. -Provide continuous support and recommendations for urban planners and decision-makers on applying HS methodology. -Communicate and disseminate the KC and promote community participation. -Estimate financing and HR needs and fulfilled and identify solutions for long-term continuity.
Governance mechanism	The KC will be maintained through a structured operational and governance framework defining roles, responsibilities, and monitoring indicators. The Municipality will ensure active engagement with the KC's user base (target users are district municipalities in the city and urban planners and developers),

	ensure regular updates, and coordinate annual capacity-building and dissemination events. The KC will ensure urban planning methodologies proposed by the city and its key authorities are aligned and harmonized according to the HS methodology. Regulatory questions will be explored and clarified in terms of making Healthy Streets urban design methodology mandatory when designing and upgrading public spaces across the city.
Financial mechanism	-Estimated annual costs: ~1 FTE staff position to operate the KC and ~6,200 EUR for 2 annual events/conferences. -Short–medium term sources: municipal budget (staff and event costs), own budgets of participating members (Budapest Transport Center and the municipality’s Urban Planning Company), and inclusion of KC in future Horizon Europe calls and other funding opportunities. Obtaining private sponsors for events, relying on MoUs signed between private sector actors and the Municipality as part of the city’s City Climate Contract. -Long-term sources: user or membership fees (once benefits are measurable), conference fees, and potential support from European City Facility or philanthropic funds.
Expected long-term impact	The KC will serve as a permanent knowledge hub supporting evidence-based, healthy, and climate-neutral urban planning. It will strengthen collaboration across district municipalities, enhance professional capacity on sustainable urban design, and ensure the long-term application of the Healthy Streets methodology in policy and practice.
Risks & Barriers	-Challenges in ensuring continuous operation and funding of the KC – resource availability of members. -Lack of clear operational terms and indicators. -Limited access to professional knowledge and best practices on Healthy Streets. - Contradictory and conflicting urban planning methodologies and guides in the city issued by the city, its subsidiaries and other parties. -Weak collaboration between local governments. -Lack of supportive policy and regulatory mechanisms. -Uncertain financing beyond the project.

5.3.1 Tools continued use & integration

5.3.1.1 Design Clips – Child and Youth Friendly Urban Design

Aspect	Key Information
Tool Function	The tailored toolkit was co-developed with BKK, the Budapest Transport Centre. The toolkit has been introduced to support BKK’s School Street pilot within the broader context of Budapest Healthy Streets. It has been piloted in a workshop with a school preparing to test a School Street closure in autumn, and BKK plans to expand its use to more schools in the new academic year. The toolkit will also be uploaded to Budapest’s <i>Healthy</i>

	<i>Streets Knowledge Hub</i> to support future projects involving children and young people in urban design initiatives
Post-project use & integration	The toolkit will be applied in additional schools as part of the School Street pilot led by BKK. Beyond this, BKK may also integrate the materials into future initiatives. Furthermore, uploading the toolkit to the <i>Healthy Streets Knowledge Hub</i> will ensure that resources for involving children and young people in urban design remain accessible for future projects across different districts of the city.
Operational sustainability	Local stakeholders have been actively involved in the co-development of the toolkits, ensuring ownership and long-term usability. The toolkits include a variety of practical materials (such as project roadmaps, campaign templates, and participatory tools with detailed instructions) that build local capacity and enable independent application beyond the project. In Budapest, a dedicated training session was delivered to BKK staff to strengthen their skills and confidence in applying the methods in future projects.
Financial sustainability	No dedicated funding required; the toolkit is designed for independent use and maintenance by schools and local stakeholders without additional financial resources.
Expected long-term impact	The toolkit contributes to the pilot's long-term vision by embedding child- and youth-friendly perspectives into active travel and urban design initiatives. In Budapest, it strengthens the School Street approach by equipping BKK with practical tools and training to involve children and young people in the design of safer, more child-friendly streets.
Replication/Uptake	The toolkit is adaptable to different schools and projects and could be used by BKK, City of Budapest or other local enablers in future active school travel initiatives or urban design projects to engage children and youth. The CYFUD (Child and Youth-Friendly Urban Design) is an adaptable framework that has already been applied in other projects and contexts (e.g., the Commit 2 Green Horizon project, Thessaloniki pilot for co-designing natural schoolyards). Additionally, DC is participating as part of a wider consortium in the Climaborough public procurement for Lot 3 in Pilsen, to develop a solution for data-driven and community-led School Streets.
Main Risks/challenges	Continued use depends on initiating and coordinating projects that engage children/young people; varying interest/resources across schools (mitigated by the toolkit's guidance, templates, and adaptable scenarios).

5.3.1.2 *Mapping for Change – Community Maps*

Aspect	Key Information
Tool Function	The Community Maps platform has been fully implemented in Budapest. A localized Hungarian version was developed in collaboration with the municipality's Green Infrastructure Development Unit and the Department of Climate and Environment. The tool was deployed to collect citizen proposals and visualize existing green infrastructure plans. In addition, the tool is being used within Budapest's Healthy Streets Knowledge Centre to (i) map successful proposals for the implementation of Health Streets and (ii) support community engagement within the districts implementing Healthy Streets.
Post-project use & integration	The platform will continue to be used to support the Healthy Streets initiative and future participatory mapping projects. It will serve as a resource for district municipalities to engage residents in urban planning and green infrastructure development. There are also discussions on implementing the tool to support Budapest's participatory budgeting program. In addition, the tool has been embedded into Budapest's updated Green Infrastructure Strategy and is part of the Healthy Streets Knowledge Centre. It supports the city's "Concrete and Asphalt for Green Surfaces" program and the pilot sponge city initiative.
Operational sustainability	Ongoing technical support and updates are planned to ensure sustainability. Video tutorials have also been created to support the further dissemination of training materials. District-level training and capacity building will be provided once they are ready to initiate their engagement processes.
Financial sustainability	Hosting and technical support incur small annual costs (E.g. annual hosting and updates are currently £100 excl. VAT). These could be sustained through municipal budgets or external funding aligned with green infrastructure and citizen engagement initiatives.
Expected long-term impact	Environmental: Supports green infrastructure planning and climate resilience. Social: Enhances public participation and civic engagement and enables transparent communication between city stakeholders. Economic: Enables cost-effective planning by identifying high-impact, community-supported interventions.
Replication/Uptake	Several cities within and beyond UP2030 have expressed interest, particularly those focusing on participatory planning and green infrastructure. The platform is highly adaptable and has already been deployed in various contexts over the past 12 years. Plans are in place to promote its use in other cities through workshops and partnerships.
Main Risks/challenges	Securing long-term funding for hosting and support. Ensuring continued political and institutional commitment. Maintaining community engagement over time.

5.4 Münster – Roadmap for Climate-friendly Neighborhoods

Section	Input
Main sustainability objectives	The main objective defined by Münster for the upscaling phase is to foster the acceptance of this roadmap and integrate it into the existing planning procedures of the city. The guidelines aim to prepare the city against climate change impacts and enhance stakeholder participation. These are the specific objectives defined by Münster: -Creation of working structures for the ongoing updating of the guideline. -Integration of the guideline into the “Climate City Process”. -Utilization of synergies with the “Guideline for climate-friendly development of New Development Areas”. -Prospective expansion of the guideline so that it can also be used by planners, architects (and possibly the public).
Next steps	-Test the guidelines in additional neighborhoods and project areas, including existing urban districts. -Align the roadmap with the digital tool used for new area development to ensure a comprehensive approach to both existing and new neighborhoods. -Clarify ownership of the roadmap across municipal departments. -Develop a plan to formalize the guideline into a legally binding document to support implementation. -Define data requirements per department based on roadmap indicators. -Establish a regular coordination meeting (Jour Fixe) on climate-friendly neighborhoods. -Create institutional commitments for the guideline’s use across departments.
Governance mechanism	Governance has been the key priority aspect that needs to be improved to ensure a successful implementation of the upscaling actions in Münster. -Redefine the internal structures within the municipality, so that the guidelines have a real impact in the planning processes of the city. -Communication and information exchange with different municipal departments and decision makers need to be enhanced, making sure that all administrative departments that are connected to the climate-just transformation of urban districts are on the same page -The guidelines need to be aligned with the other existing instruments within the municipality, to ensure a successful integration of it into the Climate City Process. -Münster proposed the creation of a Task Force to work in an orderly manner, bringing together representatives from different departments and neighborhoods to discuss challenges, opportunities and next steps. The objective is to present a solid plan to politicians and decision-makers and gain their approval for the implementation of the guidelines
Financial mechanism	Funding has not been defined as a priority issue for the city at this time, as the success of the upscaling plan depends first and foremost on strengthening governance structures within the city. In addition, the city of Münster has already established a climate protection and adaptation control system, including a financial climate budget. This budget is used to monitor key measures for achieving the city's climate targets.

Expected long-term impact	The roadmap will embed climate-neutral and climate-adapted neighborhood planning into Münster's institutional framework, supporting informed, cross-sectoral decision-making
Risks & Barriers	-Lack of clarity of the responsibilities and technical methods for the ongoing updating of the guidelines. -Lack of an institutionalized exchange in the administration and uncertainty about the activities of other departments, as political parties are often not informed about administrative activities. -Contradictory and conflict-generating administrative structures. -Lack of formal decision-making authority of the Climate Protection Staff Unit.

5.4.1 Tools continued use & integration

5.4.1.1 Buro Happold – Climate Proofing Method

Aspect	Key Information
Tool Function	The Climate Proofing Method provides a structured guideline for climate-friendly neighborhood development, supporting municipal staff in achieving climate-neutral and climate-adapted urban areas. The tool offers step-by-step guidance through planning instruments, measures, databases, funding opportunities, and participation approaches essential for sustainable district planning
Post-project use & integration	The tool has been integrated into strategic guidelines for developing existing districts. It is intended for continued use beyond the project to guide planning and decision-making. The ownership of the guideline will be transferred to the city's Climate Unit, which will be responsible for maintaining and coordinating its use. Buro Happold will facilitate a final feedback session with the city to consolidate inputs and ensure smooth transition before the project ends.
Operational sustainability	The guideline is designed as a living document, to be regularly updated and refined by the city's Climate Unit. Municipal staff were trained during three collaborative workshops with Buro Happold, receiving the necessary materials to ensure independent use. Following project completion, Buro Happold's role will be limited to on-request support for technical or methodological question
Financial sustainability	The tool operates without cost; the only expenses relate to internal staff time or external consultants providing technical guidance when needed. No additional maintenance or license fees apply.
Expected long-term impact	By embedding climate strategies into neighborhood planning, the tool promotes resilient, low-carbon urban development and stronger interdepartmental collaboration. Key impacts include improved data-driven decision-making, consistent application of climate principles in planning, enhanced accountability, and the establishment of climate-friendly practices across municipal processes.

Replication/Uptake	As part of further public tenders, Buro Happold is actively working with cities and further municipalities (e.g. Berlin and Munich) in applying the climate proofing tool. Since the beginning of the project, the tool has been implemented in a project for delivering climate districts in Hessen and a district redevelopment in Berlin.
Main Risks/challenges	The main challenges are represented by a possible lack of coordination and communication between different stakeholders and their associated ambitions for a project and a possible lack of available project-specific data in early project phases that need to be overcome.

5.5 Rio de Janeiro

Rio de Janeiro did not take part of the Upscaling phase (WP5), led by ICLEI, so information regarding sustainability and upscaling of the prototype is missing. The following section focuses on sustainability and integration of the tools part of the prototype – UDCW, by UCCRN and HydroFlows by Deltares – within the pilot after the end of the project.

5.5.1 Tools continued use & integration

5.5.1.1 UCCRN – UDCW Methodology & Tools

Aspect	Key Information
Tool Function	The UDCW methodology is being partially implemented in Rio de Janeiro, with the full application of the UDCW simulation and the partial application of the UDCW facilitation. The UDCW is being applied to down scale the Sustainable Development and Climate Action Plan of Rio de Janeiro (PDS).
Post-project use & integration	The UDCW methodology, particularly the simulation toolkit can be integrated into the city's existing GIS workflows for planning and design. Collaboration between the UCCRN Latin America Hub, the European Hub, Instituto Pereira Passos (IPP), and Pontifical Catholic University of Rio de Janeiro (PUC-Rio) will support continued methodological adaptation and application in other Rio districts. The Resilience Center will benefit from the UDCW outputs as part of PDS implementation.
Operational sustainability	UCCRN will provide training, technical support, and capacity-building activities to strengthen municipal expertise in simulation and climate design. Long-term collaboration between UCCRN's hubs and the city is foreseen through ongoing educational and research partnerships. Rio will remain a case study for UDCW application and training activities conducted by University of Naples Federico II, New York Institute of Technology, and PUC-Rio.
Financial sustainability	Funding opportunities include: -Municipal or local authority budgets to contract UCCRN for service provision. -Project-based grants (transnational, national, regional, or private foundations).

	-Horizon Europe and international research projects (e.g., a Horizon proposal including Rio as pilot case and Thessaloniki as follower city).
Expected long-term impact	The UDCW supports the city's carbon neutrality, resilience, and equity objectives by embedding climate data into spatial planning. It enhances risk-informed design, links planning decisions to the City Masterplan (Plano Diretor) and its implementation tools - Consortium Urban Operation (OUC), Urban Structuring Projects (PEU), and Areas of Special Interest), and reinforces cultural heritage protection, mobility, and housing inclusion
Replication/Uptake	Beyond UP2030, testing have been developed in the last three years for educational and research scope in Naples, Cornella de Llobregat, Dublin, Charleroi, Rotterdam, Durban, Barcellona, Aalborg. The UDCW is being adapted and tested in multiple international contexts, with seven project proposals submitted covering over 10 pilot cases across Europe, Canada, Brazil, and India.
Main Risks/challenges	-High technical requirements for simulation and facilitation components, including 3D modelling, microclimate analysis, and indicator-based assessment. -Dependence on expert knowledge for continued application and updating. -Lack of binding mechanisms or funding for implementing design proposals developed through the tool. -Need for further architectural and executive project development to move from strategy to execution.

5.5.1.2 *Deltares – HydroFlows & FloodAdapt*

Aspect	Key Information
Tool Function	The HydroFlows and FloodAdapt tools support rapid and continuous flood risk assessment and adaptation planning. Applied in the Acari River Basin, one of Rio's most flood-prone areas, they enable automated flood risk modelling, evaluation of adaptation strategies, and improved urban drainage master planning. The tools provide a data-driven and adaptive framework for strengthening flood resilience, aligned with Rio's Plan for Sustainable Development and Climate Action (PDS Vision 2050).
Post-project use & integration	The tools were handed over to RioÁguas (municipal drainage authority) and COR (Centro de Operações Rio) following an 18-month collaboration. They are now being internalized and used to support policy decisions feeding into the Urban Drainage Masterplan. RioÁguas can apply them to other catchments across the city to guide resilience and adaptation planning.
Operational sustainability	A training workshop (April 2025) marked the completion of tool implementation and staff capacity building. RioÁguas received hands-on training in flood risk management and tool operation. Deltares remains

	available for technical support when needed but the tools can operate independently within the municipal workflow.
Financial sustainability	-
Expected long-term impact	Improved flood resilience and data-informed decision-making for urban drainage and adaptation planning. The tools support continuous monitoring of flood risk, integration of adaptation measures into policy, and reduced vulnerability in flood-prone areas.
Replication/Uptake	-
Main Risks/challenges	-

5.6 Zagreb

Upscaling phase was not formalized in Zagreb – so information regarding sustainability and upscale of the prototype, particularly in terms of next steps, governance, and financial mechanisms, is not currently available. The section focuses on the integration and sustainability mechanisms regarding the tool: Modular Agro-Tech Education Toolkit, by Vesela Motika.

Section	Input
Main sustainability objectives	To design a proposal for a universal generic curriculum that is not "site-specific" but is adapted for replication and application in all types of educational institutions that have an interest and the possibility of applying the "green curriculum"
Next steps	
Governance mechanism	Integration into policies, plans, or municipal workflows.
Financial mechanism	Budget lines, grants, partnerships ensuring continuity.
Expected long-term impact	Environmental, social, economic, governance.
Risks & Barriers	

5.6.1 Tools continued use & integration

5.6.1.1 Vesela Motika - Modular Agro-Tech Education Toolkit

Aspect	Key Information
Tool Function	Short description of how the tool contributed to the prototype
Post-project use & integration	How city will continue using the tool; how the tool is integrated into city workflow/policies
Operational sustainability	How the tool will continue functioning and being used – and who is responsible for it
Financial sustainability	Expected or identified sources
Expected long-term impact	
Replication/Uptake	Potential use in other districts or by other cities
Main Risks/challenges	

5.7 Lisbon - StepUP LxALL

Section	Input
Main sustainability objectives	Ensure the continuity, scaling, and replication of climate-neutral and resilience-oriented interventions under the StepUP_LxALL – Towards Climate Neutrality and Improving the Quality of Life in the Neighborhood initiative. The aim is to align all actions with the Lisbon CCC 2030, reinforcing coordinated interventions, responding to population needs, and strengthening accountability across municipal and parish levels.
Next steps	-Continue meetings with parish representatives and pilot teams. -Identify enabling services to facilitate implementation of priority solutions. -Redesign solutions to address identified local challenges. -Integrate intelligent decision support systems developed through the prototype. -Develop a catalogue/portfolio of solutions and products to support replication. -Monitor the benefits of green initiatives through dedicated KPIs. -Include the strategy as a priority action in the Municipal Plan 2026–2030. -Present and promote the Lisbon prototype at relevant national and international events.
Governance mechanism	Lisbon's efforts in terms of environmental sustainability, climate resilience and carbon neutrality require overcoming silos, bringing all the relevant actors to the same page and working as a team. To this aim, as mentioned before, protocols and agreements will be signed with actors that have already been involved and with others that will be involved in the future, using as a reference the guidelines set out in Lisbon's Climate City Contract. In addition, engagement activities with

	beneficiaries were planned since the beginning of the project, to communicate them the benefits of the interventions and foster their acceptance to the project.
Financial mechanism	Lisbon has identified the search of finance and procurement solutions as one of the main priorities for scaling up the activities and ensuring the continuity of the prototype. The current municipal budget needs to be strengthened following the principles of equity and sustainability and for this the Lisbon City Council will explore and promote synergies between different funding sources. Lisbon will also explore the possibility to use the finance tools developed by GGGI in the future, which was already useful for brainstorming on different actions that the city could conduct in the upcoming months.
Expected long-term impact	The approach promotes cross-sectoral collaboration, equitable distribution of benefits, and enhanced community participation in achieving CCC 2030 objectives.
Risks & Barriers	Lack of collaboration among key stakeholders. People are currently working in silos, and it is necessary to get the commitment of everyone, without exception. Lack of sustainable finance and procurement sources. The municipal budget needs to be strengthened by combining different sources of funding. Weak green infrastructure, vulnerable to storms such as “Martinho”, causing the fall of numerous trees in March 2025. Restrictions arose from either the limitations imposed by the municipality or the preferences of the site managers themselves, which shaped the feasibility of implementing certain actions.

5.7.1 Tools continued use & integration

5.7.1.1 LNEC – RAF resilience assessment framework

Aspect	Key Information
Tool Function	Provides a resilience assessment framework identifying strengths and weaknesses and supports the analysis of the effects of measures implemented in the pilot and the potential replication of results in other parishes or facilities. It offers relevant information on the effects of measures on climate resilience, using dedicated indicators.
Post-project use & integration	The tool is available to the city as one of the studies supporting decision-making processes. It has not yet been decided if additional actions will be pursued after the project.
Operational sustainability	The tool use is straightforward and costless. Local authorities can operate it independently if the required data is available. Local stakeholders have received sufficient training and materials to continue using it. Short courses can be organised on request to support continued use.

Financial sustainability	The RAF App requires no specific funding for operation, as it runs on existing municipal systems. Continued application can be supported through EU-funded projects or academic collaborations (e.g. participation in the UIC Master Course in Spain).
Expected long-term impact	Supports better decision-making by providing objective, data-driven insights on resilience. It assists in the assessment of opportunities to reinforce existing city systems, improves understanding of the effects of adaptation measures, strengthens communication between departments, and contributes to Lisbon's transition toward a climate-resilient and adaptive city.
Replication/Uptake	Another EU funded project and collaboration in a Master Course at UIC, Spain.
Main Risks/challenges	-Sustained use requires continued collaboration between city departments, parishes, and facility managers. -Need to establish reference values and ensure agreement on indicators for consistent resilience benchmarking. -Risk of reduced engagement without clear ownership or institutional commitment.

5.7.1.2 *ETH – Circularity Assessment Tool*

Aspect	Key Information
Tool Function	A QGIS-based plugin that enables the assessment of circularity in the built environment, supporting the reuse of materials and components in refurbishment and construction. The tool quantifies material flows and GHG emissions, helping policymakers and planners identify priority materials and strategies to develop an efficient circular economy
Post-project use & integration	ETH expects the tool to be used to inform future policies on circular construction and material reuse. Once more refined and locally contextualized data are available, it will provide precise, data-driven guidelines for circularity in urban planning and building design.
Operational sustainability	The tool functions independently as a QGIS plugin, requiring no licensing. It can be used by trained staff but some modifications for specific case studies may require coding or LCA expertise. ETH plans to offer technical support on request and maintain communication with users for feedback and updates.
Financial sustainability	Open-source and free to use. No dedicated funding mechanism is needed. Continued use depends on municipal access to data and internal staff capacity.
Expected long-term impact	The tool fosters circularity in the construction sector, reducing GHG emissions and resource consumption while creating economic opportunities in reuse markets. It provides insight into which materials

	and supply chains should be prioritised for sustainable growth and investment.
Replication/Uptake	No plans envisioned.
Main Risks/challenges	The tool relies on data from the cities which are not necessarily available The Life Cycle Assessment databases need to be contextual too meaning it necessitates experts to function.

5.8 Rotterdam – Resilient District Toolkit

Section	Input
Main sustainability objectives	Rotterdam aims to integrate the Resilient District Learning Toolkit into the city's policy structure, establishing it as the essential resource for implementing the neighborhood resilience approach. Having been developed in the context of the BoTu neighborhood, Rotterdam now wants to explore how the toolkit could be replicated in other districts and scaled up to city level. To this end, it is also essential to align the toolkit with the various planning processes and approaches of different municipal departments, integrating it into existing plans and programs. This will involve bringing together practitioners from various departments (mobility, biodiversity, climate adaptation, etc.) to explore how resilience can be incorporated into different policy domains.
Next steps	-Further develop the toolkit and organize workshops for using the toolkit and building capacity on accessing and using it. -Communicate the lessons learned to other groups. -Train the municipality workers to continue developing the toolkit. -Create a program of activities and events that could support the upscaling.
Governance mechanism	Lessons learned from the policy perspective to be transferred in other policy cycles and sectors
Financial mechanism	-
Expected long-term impact	The toolkit is not comparable to anything that the municipality already has. It can give an added value to the resources that are already existing.
Risks & Barriers	-Poor transition from the implementation phase to maintenance activities due to different departments' responsibilities in the municipality. -Lack of consensus found in the evaluation with the citizens, as there are concerns over the maintenance of the green spaces. -Improvable interaction between the project scale and the urban scale and the relevant departments. The existing processes within the municipality can be sometimes parallel, overlapping and conflicting with each other. -Loss of institutional memory, which has an impact on the continuation of the project. Related to this, there is also a loss of resources due to the end of the projects or change of personnel, since the municipality works mainly on a project-based approach, meaning that there is not usually a continuity after the project ends. This has an influence on the continuation and therefore, on the impact of the activities as well.

	-Lack of leadership on the project, as there were many cross-department discussions that slowed down the procedures and no specific department guiding the process. Too much joint ownership could create risks such as delays and stagnation.
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5.8.1 Tools continued use & integration

There is no direct matching with UP2030 tools for the prototype with the exception of the NSM by VUB. Since the toolkit largely relies on internal city processes & existing tools, the focus is mostly on ensuring that the existing diversity of resources is captured first.

5.9 Thessaloniki - District Climate Action Plan (DCAP)

Section	Input
Main sustainability objectives	-Explore how the DCAP can be embedded within the municipality's existing strategic planning frameworks. This includes embedding climate action into broader urban planning, strengthening cross-departmental coordination, and developing replicable tools and processes. -Extend the implementation of the prototype to additional districts and neighborhoods across the metropolitan area, with particular emphasis on areas that face higher environmental vulnerability, social inequality, and limited access to green infrastructure.
Next steps	-DCAP actions, related to urban planning and "physical" interventions. -Establishment of collaborations with different municipal departments and stakeholders. -Address the fragmentation of climate action by promoting integrated, cross-departmental coordination and ensuring institutional continuity beyond isolated pilot efforts. -Align climate actions with existing municipal strategies like SUMP and SECAP, reducing policy redundancy and increasing coherence. -Correct spatial inequalities in access to green infrastructure and resilience.
Governance mechanism	It is essential to identify and engage with municipal departments that are responsible for planning and implementation, breaking silos and fostering multi-level and multi-departmental collaboration. In addition, many projects require cooperation not only within municipal departments but also with external bodies, and therefore it is essential to establish adequate working procedures for successful implementation. While the Municipality adopts high-level strategies around mobility, urban greening or food management, sometimes there might be a gap between strategic goals and what is feasible under social constraints. For the specific upscaling actions that Thessaloniki is planning, community involvement and acceptance needs to be accomplished to continue with their development.
Financial mechanism	The Cost Benefit Analysis (CBA) Guide (developed by GGGI) can be embedded into the city's planning procedures to evaluate climate actions under the DCAP. By using the CBA methods recommended, Thessaloniki can:

	-Quantify the economic, environmental, and social benefits of interventions such as green roofs, energy retrofitting, or microclimate mitigation. -Compare investment scenarios across focus areas (e.g., Lachanagora, XII Apostoloi, Antigonidon Square) to prioritize actions with the greatest net benefit. -Present evidence-based justifications to municipal authorities and external investors for resource allocation.
Expected long-term impact	The upscaling and sustainability of the DCAP will provide an opportunity to embed climate actions into the city's strategic and operational planning frameworks (operational plan, SUMP, SECAP, etc.), ensuring continuity, institutional ownership and long-term impact. Stakeholders involved actively in the DCAP process can benefit from capacity building, knowledge exchange, and access to tools and data (e.g. vulnerability maps, spatial assessments) that can improve planning and decision-making in their own departments.
Risks & Barriers	-Capacity gap in producing or commissioning technical studies, especially under constrained municipal budgets. -Staff shortages, seasonal constraints, and lack of unified planning can undermine the timely and effective delivery of interventions. -Financial and political hesitations that often block systemic transformation. Community resistance and political reluctance to alter existing traffic or land use patterns can often stall or block proposed interventions. -Complex coordination between multiple municipal and external bodies, which can cause delays and confusion due to fragmented responsibilities and unclear procedures. -Multi-ownership of land and unclear legal status of spaces create obstacles to implementation.

5.9.1 Tools continued use & integration

5.9.1.1 DRAXIS - Decision Support System (DSS)

Aspect	Key Information
Tool Function	The DSS developed by DRAXIS enables sustainable urban planning, scenario evaluation, and decision-making. It provides an operational platform for monitoring urban indicators, assessing policy impacts, and facilitating participatory planning. The tool supports data-driven governance in Thessaloniki and complements the city's digital transformation and climate neutrality goals. All core functionalities have been implemented, and the final updates, including integration of environmental, climate, socio-economic, and urban planning strategies related datasets, have been completed. The tool is fully operational and accessible to pilot stakeholders through the digital environment.
Post-project use & integration	The Municipality of Thessaloniki will continue using the DSS to support the Climate Neutrality Action Plan and evidence-based decision-making.

	Although not yet formally embedded, it aligns with the city's Smart City strategy and can be integrated into internal planning workflows.
Operational sustainability	The DSS uses open-source technologies and allows straightforward integration of new data as municipal needs evolve. Training materials and video tutorials have been provided. Hosting and maintenance can be sustained through municipal IT infrastructure or, if needed, continued collaboration with DRAXIS under a light service agreement. DRAXIS will provide technical support and data update assistance upon request.
Financial sustainability	Hosting can be managed internally by the municipality or supported through service agreements with DRAXIS. The system's open-source foundation minimizes operational costs.
Expected long-term impact	Supports Thessaloniki's vision for climate neutrality and digital governance by improving data-based policy design, transparency, and public participation. The DSS contributes to reduced emissions, better resource management, and more efficient allocation of municipal resources.
Replication/Uptake	Regional and municipal stakeholders outside the project have shown interest in adopting the DSS for integrated urban planning and resilience assessment.
Main Risks/challenges	Long-term success depends on sustained technical capacity and institutional prioritization within the municipality. Continued engagement and alignment with Thessaloniki's digital strategy will be essential.

5.9.1.2 UCCRN -UDCW Methodology & Tools

Aspect	Key Information
Tool Function	The UDCW methodology is being fully implemented in Thessaloniki, with the application of UDCW facilitation and UDCW simulation to the Diotikirion district. The UDCW contributed to the Diotikirion Climate Action Plan.
Post-project use & integration	The UDCW Toolkit contributed to the DCAP and can be replicated in other neighbourhoods to develop district climate action plans. Thessaloniki and UCCRN are exploring further collaboration under new EU projects, potentially expanding the tool's application across additional city areas.
Operational sustainability	The toolkit cannot be operated independently; it requires technical expertise and training. The Simulation Toolkit is based on GIS freeware but requires paid licenses for 3D modelling tools, while the Facilitation Toolkit can be replicated with internal personnel trained in facilitation and graphic methods. UCCRN will provide support upon request and training to ensure correct use.

Financial sustainability	UCCRN's support can be continued through project-based collaborations or external funding (e.g., Horizon Europe). Future implementation may depend on securing funding for training and technical support.
Expected long-term impact	Strengthens Thessaloniki's climate-resilient and just transition vision by delivering risk-informed planning, scenario testing, and participatory design. It provides the scientific evidence base for integrating adaptation and mitigation strategies into city planning instruments (Operational Plan, SUMP, Green Infrastructure, SECAP).
Replication/Uptake	Beyond UP2030, testing have been developed in the last three years for educational and research scope in Naples, Cornellà de Llobregat, Dublin, Charleroi, Rotterdam, Durban, Barcellona, Aalborg. The UDCW is being adapted and tested in multiple international contexts, with seven project proposals submitted covering over 10 pilot cases across Europe, Canada, Brazil, and India.
Main Risks/challenges	Sustained impact depends on regular updates and continued data contributions from city departments. Limited technical or financial resources may hinder long-term maintenance.

5.9.1.3 GGGI – CERTH – Green Economy Model

Aspect	Key Information
Tool Function	The UGEM's housing module supports Thessaloniki's climate neutrality efforts by simulating economic, social, and environmental impacts of housing policies and green renovation programs. Finalizing the housing module; supply and demand sub-components have been completed. Currently calibrating the house pricing component before final integration to UGEM.
Post-project use & integration	The housing module will applied aligned with Thessaloniki's DCAP. The city plans to use the model to support a social housing program (across the city, not just in the pilot district), simulating construction timelines, required funding, and estimated housing prices and rents based on OECD and EU ratios. The model allows for dynamic scenario simulations in real time.
Operational sustainability	The tool is operational, but requires training or continued assistance from the developing partners for use by city staff. It uses a commercial simulation software that requires a one-time paid license (approx. €400-1000) with continuous technical support from the SW provider.
Financial sustainability	The license cost is a fixed, one-time fee with no expiration. Ongoing support and training could be provided by the developers based on city needs, either on-site or remotely (at a cost).
Expected long-term impact	Long-term use of the UGEM can stimulate local economic activity by promoting green construction and renovation, lower housing costs (in by applying the housing module), and reduce energy consumption and GHG

	emissions. This generates both environmental and socio-economic benefits.
Replication/Uptake	The model is established at city level, and data downscaling could support application at district level. Belfast and Istanbul previously expressed interest in adopting the model, but engagement depends on completing full model calibration.
Main Risks/challenges	-Changes in socio-economic conditions affecting housing markets. -Policy shifts that reallocate funding away from social housing. -Limited staff capacity or training for continued tool use post-project.

5.10 Granollers

Section	Input
Main sustainability objectives	The primary goal is to adapt the prototype to the specific context and needs of Granollers, ensuring its viability and usability as a "style guide" or "resource kit" for the Territory & Sustainability area team. This will serve as a practical reference throughout the various phases of new urban development plans, projects, and technical solutions. Additionally, there is the transferability of this "style guide" to other similar cities and institutions, to pave the way to climate neutrality, climate resilience and social justice in planning.
Next steps	-Present a technical communication on the Granollers' guidelines at CONAMA Local 2025 edition. That will be part of the official publication of the national congress. -Implement the transferability package to similar cities/institutions -Present the "Guidelines for a greener city" with opportunity for everyone to the steering committee of the city council, civil servants and external professionals
Governance mechanism	The main efforts on governance were centered on identifying barriers and opportunities for implementing the prototype, designing communication and transferability actions to enhance understanding, and engaging stakeholders to ensure effective adoption. These are the key actions that need to be taken to build a solid governance structure for the prototype: -Integrate the guide's recommendations into public tenders, ensuring that the established criteria are effectively applied. -Disseminate knowledge through participatory bodies and citizen governance spaces to enhance collective awareness and engagement. -Communicate the procedures and expected results in an inclusive way, endorsed by real-life applications of the guide's recommendations through practical examples
Financial mechanism	-Identify Institutional Funding programs that support urban regeneration and public space development. -Align municipal budget and fiscal strategies with local environmental and social priorities. -Promote collaborative and participatory funding, strengthening community

	participation in funding initiatives and prioritizing citizen-driven projects. -Explore European grants and programs focused on urban sustainability and innovation. -Drive investments and economic revitalization, supporting investment programs that create economic and social impact.
Expected long-term impact	Granollers aims for its prototype to have a lasting effect by adapting it to the specific context and needs of the city, so that it can be used in the future urban development plans, projects and technical solutions.
Risks & Barriers	Barriers that will be overcome are the following: -Facilitate the integration of applied research and innovative solutions within the local context to ensure both their relevance and practical effectiveness. -Enhance knowledge dissemination and foster greater acceptance among primary key target groups of the prototype - municipal technicians, urban planners, planners and decision policy-makers - who will engage with the prototype. -Emphasize the inclusion of financial considerations as a core recommendation in the style guide, enabling an initial appraisal of the feasibility and implementation potential of the proposed measures.

5.10.1 Tools continued use & integration

5.10.1.1 Aquatec – RESCCUE

Aspect	Key Information
Tool Function	Tool's application in the frame of the Granollers pilot (future neighborhood of La Bòbila). Results of this exercise have allowed to extract some guidelines and recommendations related to the promotion of nature-based solutions (sustainable urban drainage systems) as a cost-efficient measure to: manage stormwater in a decentralized way, increase pervious surfaces and green areas and improve urban resilience to flooding episodes
Post-project use & integration	While the tool itself is not directly reused, its results and methodologies are integrated into the city's planning framework through the Set of Guidelines for a Greener City with Opportunities for Everyone. These guidelines serve as an operational and regulatory reference for future urban developments, aligning with the city's resilience and adaptation strategies.
Operational sustainability	Municipal technicians involved in UP2030 are trained and familiar with the tool's functionalities. The city has access to tutorials developed within UP2030. The tool can be applied whenever the municipality needs to evaluate climate change adaptation measures and prioritize them using cost-benefit or multicriteria analysis.
Financial sustainability	The tool is available for free use by the city; no additional operational costs are required. Future application depends primarily on staff time and data availability.

Expected long-term impact	Its use contributes to the pilot's second key objective -climate resilience - while also generating social and economic co-benefits through greener, healthier, and more adaptive neighborhoods.
Replication/Uptake	The RESCCUE database and tool is being updated in the framework of HE ICARIA project (https://www.icariastrategies.eu/) coordinated by AQUATEC. ICARIA's pilots, replicators and other sites will use the tool during the process of building resilience for urban spaces and its critical assets.
Main Risks/challenges	Successful application depends on data availability and technical understanding of local climate conditions. A minimum dataset is required for the tool to perform prioritization analyses, including cost, effectiveness, and co-benefit indicators. Without this, the tool cannot be used effectively.

5.10.1.2 TSPA – City Scan

Aspect	Key Information
Tool Function	The City Scan Tool, developed by TSPA, was applied in the La Bòbila neighborhood to generate and analyze four urban design scenarios. These scenarios explored spatial, social, and environmental dimensions of urban development. The resulting analysis informed the Set of Guidelines for a Greener City with Opportunities for Everyone, Granollers' main prototype, consolidating lessons and recommendations for future planning.
Post-project use & integration	The outputs of the tool have been integrated into the city's planning process. The generated design scenarios and comparative insights support long-term planning and policy development. The guidelines informed by the tool are intended for formal adoption by the municipal council and will guide future urban sector planning across the city.
Operational sustainability	The tool is open source but requires specific technical expertise in scenario modelling and parameter configuration (Rhino 3D, Grasshopper). The municipality was not trained to operate the tool independently. Future use would require TSPA's technical support for updates or new applications, including potential training workshops or collaborative refinement sessions.
Financial sustainability	Continued or expanded use would require follow-up collaboration agreements with TSPA for technical support, scenario development, or integration of new indicators. Future applications depend on external funding, as the municipality currently lacks budget allocation for tool operation.
Expected long-term impact	Environmental benefits include reduced emissions and improved biodiversity; social benefits include greater accessibility and equity; economic benefits include more cost-effective and adaptive urban investments.

Replication/Uptake	TSPA is exploring new opportunities to apply or further develop the tool through EU Mission Cities funding, national and regional programs, and international donors (e.g. EIB, GIZ, C40).
Main Risks/challenges	Key risks include tool complexity, dependence on expert support, and budget constraints. The tool currently lacks a user-friendly interface and cannot be operated without external technical assistance or dedicated funding for further development.

5.11 Istanbul

Section	Input
Main sustainability objectives	Assess how the developed tools and practices could be adapted to different local contexts in Istanbul. Four specific areas were chosen as the focus areas (Beşiktaş, Ataşehir, Eyüpsultan, and the Princes' Islands (Adalar)), with the aim to integrate those technical solutions with local decision-making, financial sustainability, and socio-cultural dynamics. More specifically, goal is: -To expand the implementation of the UBEM tool and solar-powered urban furniture across various districts to support a city-wide transition to energy-efficient, low-carbon urban living. -Integrate digital twin technologies and renewable energy solutions into urban planning processes, increasing data standardization, and encouraging citizen engagement.
Next steps	-Develop district-specific local action plans. -Provide capacity-building training for municipalities and technical staff. -Expand financial incentives for rooftop systems and mobile solutions. -Integrate digital twin technology into decision making processes.
Governance mechanism	Need to work to overcome legislative and regulatory barriers that prevent these projects from being carried out. One possible way to do this is by trying to build bridges between local and national governments, so that local government gains more capacity to implement green and innovative technologies that directly benefit citizens.
Financial mechanism	Need to simplify current financial requirements. Which often goes hand-in-hand with regulation issues. Istanbul expressed the necessity of making incentives and funding mechanisms for PV integration available for citizens and organizations. Demonstrating that this type of solutions are feasible for daily use is the first step, but it will also be necessary for various stakeholders, such as financial institutions and central government, to offer integrated solutions to citizens and local authorities. In addition, exploring other funding opportunities will be necessary for Istanbul.
Expected long-term impact	-New Business Fields: PV companies, energy consultants -Aesthetics + Sustainability: Visibility through PV-integrated furniture -Participation: Digital twin interface allows non-technical users to engage

	-Education: Innovative awareness programs for youth -Tourism: Scalable models in areas like Adalar "
Risks & Barriers	-There are legal gaps and uncertainties for all districts in Istanbul. -Lack of supportive mechanisms at the local level. -In relation to infrastructure, there is a lack of infrastructure to support the implementation of the PV panels. -There is a lack of incentives and funding mechanisms for PV integration, which has a direct impact on the awareness level of both policy makers and citizens.

5.11.1 Tools continued use & integration

5.11.1.1 METU and ODTU-GUNAM – UBEM: AI-powered Decision-making Tool for Decarbonization

Aspect	Key Information
Tool Function	The UBEM/UBTEM tool is an AI-powered decision-support system for evaluating and comparing building renovation strategies from ecological, economic, and thermal comfort perspectives. It produces performance indicators that feed into CIRCE's LCA calculations and are integrated into MAGGIOLI's MIRA digital platform. This workflow enables a comprehensive digital twin approach to urban decarbonization.
Post-project use & integration	Istanbul plans to continue using the tool beyond UP2030. The city will employ it to inform district-level renovation planning, and the Istanbul Metropolitan Municipality (IBB) has committed to embedding the tool's methodology in developing local climate action plans. Training and briefings can be provided to extend tool use across departments.
Operational sustainability	The tool is web-based and can be accessed through an online interface by municipal users. It requires hosting and technical support, which will be provided by the university's infrastructure (METU/ODTU-GÜNAM). No paid licenses are required. The tool can be independently operated once access is granted, with follow-up support and training available upon request.
Financial sustainability	No additional license fees apply. Technical maintenance and hosting are sustained through the university's internal resources and research infrastructure. Future improvements may be financed through new EU-funded collaborations.
Expected long-term impact	The tool supports Istanbul's building stock decarbonization by identifying the most cost-effective renovation strategies, improving energy efficiency, reducing GHG emissions, and enhancing indoor comfort.
Replication/Uptake	The tool can be redeveloped for other districts or cities, as it is data-driven and adaptable. A new EU project proposal is being prepared with IBB to apply the tool in another district. Other municipalities have shown interest, particularly in its multi-criteria evaluation features.
Main Risks/challenges	The tool's continued use depends on data quality, accessibility, and calibration for each new district. Data dependency and technical skills are

	the main barriers to replication. Simplification for non-technical users is a recommended improvement.
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5.11.1.2 CIRCE – BIM/LCA

Aspect	Key Information
Tool Function	CIRCE's BIM and LCA modules provide analytical frameworks to evaluate the environmental, economic, and social impacts of building renovation interventions. The modules assess energy performance, emission reduction potential, and life-cycle efficiency, contributing essential inputs to Istanbul's renovation planning.
Post-project use & integration	The tool has not yet been embedded into Istanbul's plans or workflows. However, the data and results generated can be integrated into broader datasets used by city stakeholders for data-driven decision-making in future planning and policy processes.
Operational sustainability	Once integrated into the MIRA digital platform, stakeholders can access and operate the modules autonomously. Local hosting is possible on municipal servers. No direct post-project support is planned, though migration to city-managed infrastructure is feasible
Financial sustainability	No ongoing license costs. Post-project hosting and maintenance can be sustained using existing municipal IT infrastructure.
Expected long-term impact	The tool supports Net-Zero transition goals by improving building efficiency and reducing energy demand. Benefits include lower energy costs for households, reduced CO ₂ emissions, and improved indoor comfort, enhancing both environmental and social sustainability.
Replication/Uptake	CIRCE identified potential future collaboration through the Build4GreenIST Horizon Europe project, which aims to guide green building renovation in Istanbul's urban transformation program. Further replication outside the pilot has not yet been confirmed.
Main Risks/challenges	Key risks include data quality maintenance, availability of trained staff, and political commitment to adopt the tool in planning processes. Since use is not mandatory, it risks being treated as optional without clear policy integration.

5.11.1.3 Maggioli – MIRA

Aspect	Key Information
Tool Function	The MIRA Digital Twin Platform provides a modular, data-driven environment that integrates outputs from UBEM/UBTEM and LCA modules into a single interface. It supports energy and emissions monitoring, urban

	planning, and climate neutrality strategy implementation through visual dashboards and simulations.
Post-project use & integration	The city of Istanbul will retain access to the tool after the project. It can expand the pilot to a full-scale city application by providing additional datasets. Training and integration support are available upon request from Maggioli.
Operational sustainability	MIRA has a user-friendly, open architecture allowing local authorities to update data and run analyses independently. Hosting and updates are covered by Maggioli for one year after project completion. Afterward, maintenance and licensing costs will require a new agreement between Maggioli and the city.
Financial sustainability	The service is paid, with one year of support included post-project. Future operational costs depend on city-provider negotiations for hosting, maintenance, and updates.
Expected long-term impact	MIRA supports Istanbul's smart city and carbon neutrality goals by enabling continuous monitoring of energy use, emissions, and resource efficiency.
Replication/Uptake	Several cities have expressed interest in adopting MIRA as part of a consortium seeking Horizon funding. The platform's flexible architecture allows application to multiple urban domains such as energy, mobility, flooding, and climate adaptation.
Main Risks/challenges	The main risk is the lack of reliable citywide data required for expanding from the pilot to full-scale implementation. Sustained use depends on budget availability and technical collaboration with Maggioli.

5.12 All 11 UP2030 Pilots

In addition to the tools implemented in individual cities, several UP2030 tools were deployed across all 11 pilot cities, contributing to shared learning, cross-city alignment, and broader project impact. These tools support cities in areas such as communication, economic assessment, and governance, and remain accessible for continued use beyond the project.

5.12.1.1 VUB & CErTH – Neutrality Story Maps

Aspect	Key Information
Tool Function	NSM showcases the prototype of each pilot city, including success stories, lessons learned, and future strategies. It is used to encourage the uptake of successful strategies and approaches in other cities by presenting them in an accessible multimedia narrative format.
Post-project use & integration	Cities have expressed interest in using the platform for the five free years after the project ends, but not beyond that at this stage. It will be hosted by CErTH for the first 5 years. After that, cities would need to draft a bilateral contract with CErTH if they wish to continue using it, add features,

	or adapt it for other contexts. The tool has been embedded in the pilot cities' communication strategies, and pilots are already using it to communicate their UP2030 activities to the public.
Operational sustainability	Cities can independently add and edit content on the tool. For technical adjustments, adding new features, or fixing bugs, cities must contact CERTH.
Financial sustainability	Use is free for the first five years while hosted by CERTH. After this period, continued use or further development will depend on agreements with CERTH. VUB notes time and resources as a challenge.
Expected long-term impact	By showcasing pilots' work and prototypes in an accessible format, NSM enables other neighborhoods in the same city to learn from and adopt similar climate-neutrality strategies and approaches.
Replication/Uptake	NSM encourages uptake of strategies by presenting pilots' results in a structured and accessible way. VUB and CERTH are drafting a joint ownership agreement to use the tool in other projects, cities, and contexts.
Main Risks/challenges	Cities' limited time and resources for maintaining content.

5.12.1.2 GGGI – Cost-Benefit Assessment Guide (CBA Guide)

Aspect	Key Information
Tool Function	Helps cities evaluate the economic viability of climate projects by guiding them to the most suitable cost-benefit analysis (CBA) tool for their specific context. Through a short set of guiding questions, cities can identify the best-fit tool based on their technical capacity, data availability, and project type. It simplifies the selection and use of existing CBA tools, helping cities assess both monetary and non-monetary benefits (like health and environmental impacts), and build stronger, evidence-based investment cases. The Guide also provides recommendations for data sources and provide examples for tool use (case studies).
Post-project use & integration	Cities can access the tool via the Service Platform: https://urbanplanningfor2030.eu/tools
Operational sustainability	The tool is hosted on the UP2030 Service Platform, operated by ICLEI. Updating will only be possible if the team secure fundings.
Financial sustainability	Future Horizon Europe or other types of funding to review and update the tool.
Expected long-term impact	Cities use the CBA tools suitable to their needs and available resources thanks to improved access to existing tools to make informed decisions.

	Expected impact: Increase in number of green urban projects and policies and thanks to (i) more efficient allocated resources, and (ii) increased project attractiveness through the comprehensive assessment of their costs and benefits.
Replication/Uptake	Can be used by any cities (Europe and beyond)
Main Risks/challenges	• The CBA Guide simplifies cities' access to CBA support tools and, at the same time, creates awareness of the aspects that an urban planner needs to account for when doing CBA. This includes scenario building, the various types of benefits, and the meaning of discounting. While this is expected to remove a relevant barrier to using CBA, the Guide cannot rule out every challenge. • When an urban planner applies the Guide, the suggested tools are those that suit her needs best, but this does not rule out some specific needs remaining unmet.

5.12.1.3 GGGI – Green Finance Guide

Aspect	Key Information
Tool Function	Helps cities identifying and leveraging appropriate financial instruments and funding sources. It provides an overview of both conventional and innovative financing tools, guidance on how to combine them effectively (for relevant instruments), and examples of how they've been used in urban contexts (case studies). The guide also covers key stakeholders and maps international financial and technical assistance providers, to support cities in developing bankable, investor-ready projects.
Post-project use & integration	Cities can access the tool via the Service Platform: https://urbanplanningfor2030.eu/tools
Operational sustainability	The tool is hosted on the UP2030 Service Platform operated by ICLEI. Updating will only be possible if the team secure fundings.
Financial sustainability	Future Horizon Europe or other types of funding to review and update the tool.
Expected long-term impact	Cities can better navigate the financial landscape, overcome existing barriers to lack of funding, and make focused efforts to effectively mobilize resources and sources of green finance. Increase the utilization of innovative financial instruments and strategies for green projects from European cities. Case studies inform the development of a bankable and investor-ready pipeline of green projects. Cities have a better understanding of key stakeholders to engage with to raise finance, blending strategies and can identify relevant technical

	assistance and financing programs to develop and finance projects, including the mobilization of private finance.
Replication/Uptake	Can be used by any European cities or beyond (but the tools is mainly focused on Europe)
Main Risks/challenges	• Difficulty understanding the functioning of the tools. • With the filters given the Guide may not generate results (this is also flagged by the tool), which may lead to frustration, requiring the user to do reruns. • Cities need to take next steps alone, as it is only a guide. • The Guide does not consider the city's environmental regulations, including Institutional and legal frameworks, the City's financial health and sources of finance, expenditures, institutional and legal frameworks, Government structure, Decree, and the quality of interactions among government entities at different levels. • The actual availability of certain types of financing is influenced by broader market and economic conditions, trends, and local contexts.

5.12.1.4 *Adelphi – Transformative Governance*

Aspect	Key Information
Tool Function	The Governance Analysis Framework and the accompanying recommendations were developed as a generalized guide for cities to assess – in a structured way – their governance arrangements for an area or task they are currently working on. This helps understand the actors, intuitional and policy set-up in which the desired actions are taking place and identify strengths and weaknesses for a given transformative endeavor. Cities can use the framework to dive deeper into the governance needs for the prototype implementation as well as to understand the possibilities for a broader transformation it can trigger – e.g. in other places or for other actors.
Post-project use & integration	The tool is available as an online self-assessment questionnaire via the UP2030 Service Platform. City officials, urban planners, policymakers and multi-stakeholder teams can use it at any stage of urban planning or governance reform, and for any transformation topic (from specific initiatives to broader policy fields or daily departmental operations). Results (scores across the five dimensions) can be used to identify low-scoring areas, prioritize governance improvements, and develop governance action plans, while aligning findings with the 5UP framework to support long-term scalability and integration into wider urban strategies and policies.

Operational sustainability	Operationally, the tool functions as a structured self-assessment that can be run internally by city administrations or in workshops with relevant stakeholders. Its flexible design allows repeated use in different phases of urban planning and governance reform, including when expanding pilots to city-wide strategies or integrating climate action into broader strategies.
Financial sustainability	Future Horizon Europe or other types of funding to review and update the tool.
Expected long-term impact	By enabling cities to systematically assess and improve governance structures, align governance frameworks with climate neutrality goals, and strengthen integrative, inclusive, adaptive, pluralist, long-term and intensive governance practices, the tool supports progress towards climate neutrality, liveability and sustainable urban development. It is intended to enhance coordination across multiple governance levels and to provide actionable recommendations for improving governance arrangements that underpin the upscaling of transformative urban solutions.
Replication/Uptake	Tool can be used by city officials, urban planners, policymakers and multi-stakeholder teams, for any transformation topic and at different stages of urban planning and governance reform.
Main Risks/challenges	Expertise requirements: users need access to information on the policy context (existing policies, responsible institutions) and knowledge of relevant actors in the governance process.

6 Conclusions

The exploitation and sustainability work carried out in UP2030 demonstrates a clear pathway for the continued development, use, and integration of the project's KERs and pilot prototypes beyond the end of the project. The 15 KERs selected during the second reporting period have now reached defined exploitation strategies, use models, responsibilities, and, where relevant, financial and governance arrangements. This confirms that all KERs have identified concrete routes for post-project uptake; either through direct use by partners, integration into municipal workflows, service provision, open-access resources, or inclusion in future research and innovation activities. Synergies across KERs highlight the value of tool bundling and integrated use. This positions the KER portfolio as a coherent set of complementary solutions rather than isolated outputs.

Across the consortium, partners have expressed commitment to maintain, further develop, or commercialize their solutions. Several KERs are being embedded into organizational portfolios, municipal procedures, or upcoming European and national funding opportunities, strengthening their long-term sustainability.

The 5UP Approach, UP2030 Service Platform, and MOOC collectively form the project's core legacy package, ensuring that the methodologies, tools, and knowledge developed in UP2030 continue to support cities and practitioners beyond the project. Together, they provide a comprehensive pathway for long-term impact: the 5UP Approach offers a structured framework for systemic urban transformation, the Service Platform provides key resources to extend the impact of the work done during the project and address main challenges in governance and finance, and the MOOC builds the capacities needed for their practical application and replication across diverse urban contexts. These solutions are complemented by the UP2030 project website, where external users can access project's tools, prototypes, and other resources.

A majority of the tools deployed in the pilot cities will continue to be used after UP2030, either as operational tools within municipal departments, as living documents or guidelines, or through integration into city planning processes. In many cases, cities have already initiated internal arrangements for tool ownership, maintenance, or regular updates.

The prototypes developed in the 11 Pilot cities have further demonstrated strong potential for long-term integration. Cities have identified clear sustainability and upscale pathways, such as embedding solutions into regulatory frameworks, applying them in additional districts, adopting them into city-wide strategies, or including them in ongoing planning, mobility, climate neutrality, or resilience programs.

The integration of UP2030 tools into the Pilots has strengthened cross-departmental collaboration within municipalities, enhancing workflow continuity and reducing fragmentation. Several prototypes have already triggered broader organizational or policy changes, confirming their strategic relevance beyond the pilot areas.

Overall, the exploitation methodological approaches introduced during UP2030, including the sustainability methodology for prototypes, and the exploitation methodology refined through Horizon Results Booster support, have reinforced partners' capacity to plan, implement, and sustain systemic urban transformation processes. The work confirms that UP2030 results will continue to generate impact after project closure, supporting scientific advancement, municipal innovation, community engagement, and climate-neutral urban development. Many solutions have already identified replication potential in additional cities, both within and outside the consortium. In conclusion, D6.9 demonstrates that UP2030 leaves a mature and actionable legacy. The project outputs are positioned

not only for continued use but also for expansion, replication, and integration into future urban transformation efforts across Europe and beyond.

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8 Annex 1 – Full Exploitation Plans

8.1 MIRA Digital Twin Platform

8.1.1 KER Characterization

8.1.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	MIRA is a configurable solution to model a city as a network of interconnected Digital Twins (DTs) (neighbors, buildings, mobility systems, etc.) and monitor/simulate performance based on data for each individual asset (DT). The solution allows users to define their digital twins of 2 types: An individual asset (e.g. building, space, parking,...) or a network of assets (e.g. neighbourhood of different buildings, spaces, parking lots,...). In each DT we can integrate information sources to monitor performance and integrate simulation, optimization and other related services (e.g. building demand response, mobility simulation, ...) on top of each DT (either at asset or network level)
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most.	Cities, Industrial and commercial sectors, Urban planners, Policymakers and government bodies
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Decision-making challenges Collect, Combine and Visualize heterogeneous sources of information Analyze the above information and calculate KPIs
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	The following innovative aspects can be associated with MIRA and digital twin solutions in general: 1) Advanced Data Integration and Analytics 2) Real-time Predictive Capabilities 3) Cross-domain Applications: Digital twins can bridge the gap between traditionally isolated domains, such as manufacturing, supply chain, and maintenance, it would represent a significant innovation. This seamless integration would lead to a holistic view of operations and enable better decision-making across the organization. 4) Virtual Simulation and Scenario Planning 5) User-friendly Interface and Accessibility 6) Security and Privacy Measures
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	MIRA Platform Other outputs of MIRA can be KPIs, Charts of specific telemetries or their combination and function (e.g. CO2 footprint of a city or an area), outputs of external services (simulation, optimization, BIM, mobility, etc.).
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)?	The expected end of project TRL is TRL 7: system prototype demonstration in operational environment. The TTM will be post-UP2030.

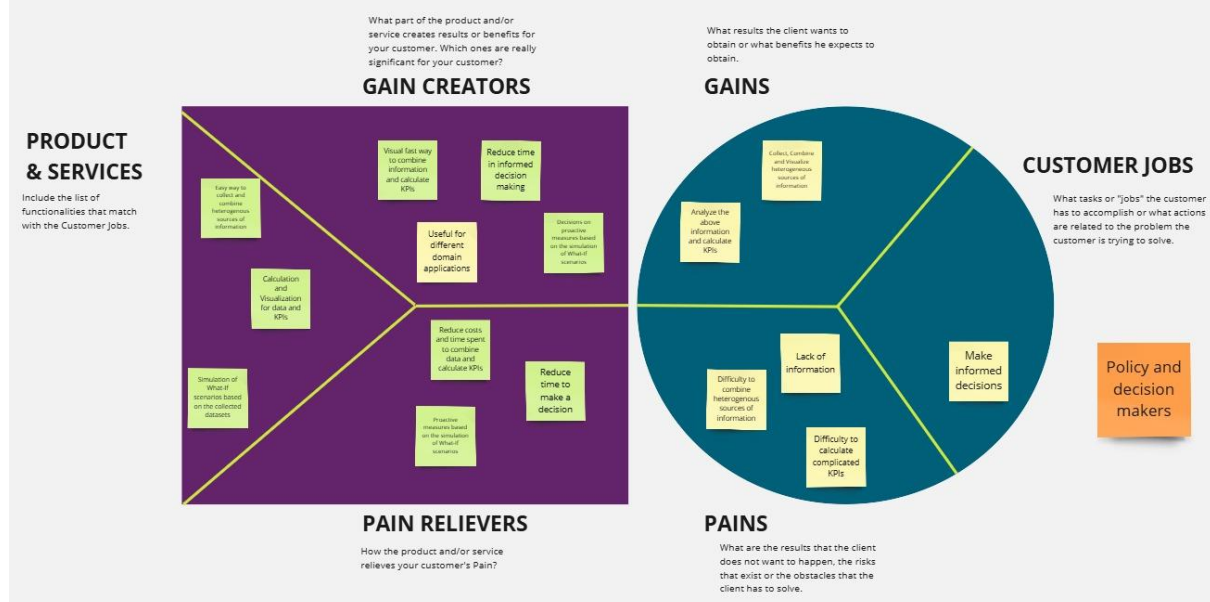
	**The TTM can include post-UP2030 plans	
Exploitation Route	Linked to the “use model”, specify here the key exploitation route(s) – how the solution will be made available to target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Commercialization; Contract research (with external target users); A new research project; Implementation in education programs; publications; etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Commercialization: Exploitation activities will leverage the significant commercial network of Maggioli Group (more than 250 companies) offering demonstrations and information campaigns on the basis of a plan that will be defined at the end of UP2030 project.
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Societal: The outputs of the tool can empower informed decision making in several sectors as urban planning, civil planning, environment and more. The resulting decisions/actions can result in an immediate improvement in the quality of life of citizens. Furthermore, economic and environmental positive impact can also be identified.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Istanbul
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	

8.1.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish? What problems are they trying to solve? - Collect, Combine and Visualize heterogeneous sources of information - Analyze the above information and calculate KPIs	What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems? - Easy way to collect and combine heterogeneous sources of information - Calculation and Visualization for data and KPIs - Simulation of What-If scenarios based on the collected datasets
Customer Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face? What annoys or frustrates them in their current situation? - Lack of information - Difficult to calculate complicated KPIs	How does your solution reduce or eliminate target users pains? How does it make their life easier? - Visual fast way to combine information and calculate KPIs - Reduce time in informed decision making

Difficulty to combine heterogeneous sources of information	- Useful for different domain applications - Decisions on proactive measures based on the simulation of What-If scenarios
Customer Gains	Gain Creators
<i>What outcomes or benefits do target users expect?</i>	<i>How does your solution provide these benefits?</i>
Make informed decisions	- Reduce costs and time spent to combine data and calculate KPIs - Proactive measures based on the simulation of What-If scenarios - Reduce time to make a decision

MIRA Digital Twins Platforms - Maggioli SpA



8.1.1.3 Market Analysis

	Description	Input
Market information	Provide information on market: Description; trends; size	The current market trends and emerging developments that might be shaping the digital twins industry include: 1) Integration with Artificial Intelligence (AI) and Machine Learning (ML) 2) IoT Sensor Proliferation 3) Edge Computing for Real-time Insights 4) Digital Twins for Smart Cities and Infrastructure: 5) Digital Twins in Healthcare 6) Cross-industry Applications 7) Virtual Reality (VR) and Augmented Reality (AR) Integration 8) Data Privacy and Security

Competitors	What are your “competitors” (the ones offering “alternative solutions”)?	MICROSOFT, ANSYS, IBM, ABB, Ditto Offering various solutions supporting DT modelling mainly at asset level
SWOT	Provide information on - Strengths (internal – innovations, unique value proposition of your solution) - Weaknesses (internal – barriers to entry and adoption) - Opportunities (external – market opportunities, growth potentials) - Threats (external – risks in market, including competitors, regulatory or policy changes, etc.)	Strengths: - Easy way to collect and combine heterogeneous sources of information; - Calculation and Visualization for data and KPIs -Simulation of What-If scenarios based on the collected datasets - Data driven decision making - Optimization of workflows, process and responses based on data and simulations Weaknesses: - User adoption - Data availability and quality Opportunities: - Climate resilience agenda - Energy efficiency agenda - Civil protection agencies can benefit of the simulation tool for disaster recovery Threats: - Complexity and Cost of Implementation - Data Interoperability and Standardization - Data Privacy and Security Concerns - Lack of Industry Standards and Best Practices - Legacy System Integration - Data Quality and Reliability - Skills and Expertise Gap

8.1.1.4 IPR Information

	Description	Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement	MIRA trademark; MAGGIOLI is the owner of the MIRA platform. Copyright
IPR Foreground	What is the IPR Foreground (Type/Partner)? - what IPR will be generated during the project? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in	MAGGIOLI will be the owner of the additional components developed by MAG on top of MIRA, during the project

	proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/multilateral Memorandum of Understanding agreements should be signed among relevant partners	
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8.1.2 KER Exploitation Roadmap

8.1.2.1 Exploitation Activities

	Description	Input
Actions for development	List and describe the specific actions you will take to finish developing your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	- Conduct other pilot studies - Refine technical features/methodologies based on user feedback - Develop additional functionalities (data visualization dashboards, etc.) - Secure additional funding for R&D
Actions for adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively - What steps will you take after the project ends to ensure the solution is adopted? - What additional developments or resources will be needed to guarantee that the solution is utilized effectively? - Will you need to secure a budget? - Will additional analysis of market drivers, target users, and business models be required to estimate costs?	- Develop comprehensive user guide and online support materials to facilitate adoption - Actively disseminate solution through networks, webinars, conferences etc. - Organize training workshops for target users to demonstrate use of the solution - Collaborate with target users to implement solution - Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. Who will be responsible for the exploitation and follow-up actions?	
Milestones	Describe potential KPIs and monitoring parameters within a specific timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies - Milestone: Completion of additional pilot studies in at least two different contexts or cities. - Timeline: Within 6 months post-project. Refinement of Technical Features - Milestone: Finalization of updated technical specifications and methodologies based on pilot feedback. - Timeline: Within 9 months post-project.

		- KPI: Release of version 2.0 of the solution or methodology. Funding for R&D - Milestone: Submission of at least three funding proposals for further research or development. - Timeline: Within 6 months post-project. For use: Dissemination Efforts - Milestone: Organize at least three dissemination events (webinars, conferences, or network presentations). - Timeline: Within 6 months post-project Collaboration with Target Users - Milestone: Establish formal collaboration agreements with at least three key users or institutions. Timeline: Within 6 months post-project
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8.1.2.2 Financial & Sustainability Plan

	Description	Input
Costs	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. Outline the necessary expenses and investments to ensure a smooth transition from the project's completion to the next phase. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	- Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies etc.) - Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. - Dissemination, promotion and outreach
Revenues	Identify the revenues expected from exploiting or ensuring the use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - How will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	- Other funded projects - Own funds
Other sources of coverage	Define how costs will be managed until a sustainable funding model is secured (i.e., before collecting the first revenue). **Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	- Other funded projects - Own funds

8.1.2.3 Standardization Roadmap

	Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify.	Relevant technical standards include ISO 23247 for digital twin frameworks, ISO/IEC 27001 for information security and ISO/IEC 30182 for smart city data models. Sector-specific standards such as OGC, 3D Tiles, and IFC support

	** Including technical (e.g., ISO, IEC) and sector-specific standards	integration with GIS and BIM tools. Additionally, FIWARE and ETSI ISG CIM (NGSI-LD) standards enable real-time data exchange and semantic interoperability across urban platforms.
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	MIRA is aligned with technical/interoperability standards, for the sectors/modules that development has been completed.
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	Relevant standardization bodies include ISO/TC 268 (sustainable cities), ISO/IEC JTC 1 (IT and digital twins), CEN/TC 465, and ETSI ISG CIM (context information management). OGC (CityGML), buildingSMART (IFC), and the FIWARE Foundation also contribute to interoperability, urban data modeling, and smart city integration standards.
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	No
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	No
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	No
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	Yes, aligning with existing standards significantly improves adoption, usability, and scalability of the MIRA platform. Standards ensure interoperability with other urban systems, streamline integration processes, and build trust among stakeholders. They also reduce vendor lock-in, support compliance with regulations, and facilitate wider replicability and scalability across cities and regions.
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	Several challenges can hinder pursuit of standardization. These include high costs related to certification and compliance, time-intensive processes to align with evolving standards, and a lack of specialized knowledge or resources. Additionally, fragmented or overlapping standards can create confusion, slowing down decision-making and integration efforts.

8.1.3 Tools integration – plans for possible joint exploitation

	Description	Input
Existing Bundle of tools during the project	Is your solution currently part of a bundle of tools within UP2030? If yes, also specify:	Yes.
	Which other solutions are part of the bundle?	CIRCE energy consumption profiling tool, METU/GÜNAM AI-powered decision-making tool

	Is your solution being implemented as part of the bundle in any UP2030 cities, or any other cities?	Yes (Istanbul)
	Is the bundle expected to be maintained after the project ends?	Yes
	How does the bundling of the solutions benefit you as a solution provider?	Bundling MIRA, CIRCE, and METU/GÜNAM tools enhances our value proposition by offering comprehensive, interoperable urban solutions. It boosts scalability, improves user experience, and strengthens partnerships through unified, data-driven services.
	How does the bundling of the solutions benefit your target users?	Bundling MIRA, CIRCE, and METU/GÜNAM provides target users—cities, planners, and policymakers—with a seamless, all-in-one solution for real-time visualization, energy profiling, and AI-powered decision support. This integration simplifies workflows, reduces costs, enhances data-driven planning, and accelerates sustainability goals through actionable insights, improved coordination, and more effective urban management strategies.
Potential bundling of tools post-project	Do you envision, or would you be interested in, bundling your solution with any other solution part of the project for collaboration after UP2030? If yes, also specify:	Yes. MIRA can easily be integrated with tools in the smart cities and IoT sectors.
	Which solutions would you like to collaborate with?	Those related to urban monitoring.
	Why would this collaboration be beneficial (e.g., synergies, shared user base, complementary functions)?	Collaboration between MIRA and urban monitoring tools enables real-time data integration, predictive modeling, and informed decision-making. This synergy supports efficient urban planning, resilience, and citizen engagement. Complementary functions and a shared user base create a unified system that enhances transparency, responsiveness, and long-term sustainability in city management.
	Are there specific urban challenges or end-user needs that you think could be better addressed through bundled solutions?	Bundled solutions can better address urban challenges like traffic congestion, pollution, energy inefficiency, and emergency response. By integrating systems, cities gain holistic insights, enabling faster, data-driven decisions. End-users—planners, policymakers, and citizens—benefit from streamlined tools that improve coordination, transparency, and service delivery across multiple domains.
	Are there barriers (e.g., technical, financial, or IP-related) preventing such collaborations from being pursued?	Barriers include data high integration costs and unclear intellectual property rights. Technical complexity and lack of common standards hinder seamless collaboration. Financial constraints and limited public sector capacity further delay adoption.

8.1.4 Business Model Canvas (BMC)

Business Model Canvas		
Key Partners	Key Activities	Value Proposition
IoT sensor manufacturers Software development companies (vertical solutions)	Preliminary sessions to establish objectives, KPIs and required datasets Integrate the data sources Calculate and visualize KPIs	See above sections

Customer relationships	Customer Segments
In-person Online	Cities Industrial and commercial sectors Urban planners VPC
Key Resources	Channels
Skills/expertise on data analysis and KPIs depending on the domain (environment, traffic, energy, etc) Access to sources and format of the datasets required Clear definition from the user side of the objectives (depending on the domain)	Social media Network existing platforms conferences leverage the significant network of Maggioli Group (more than 250 companies) offering demonstrations
Cost Structure	Revenue Streams
Consulting fees for analysis, data collection/integration and KPI calculation/visualization per specific use case/domain. Development of the core tool Development of specialized APIs	asset sale usage fee licensing

8.2 BIM Module & Building life cycle assessment (LCA) – CIRCE

8.2.1 KER Characterization

8.2.1.1 Overview

Description		Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The solution provides a comprehensive assessment of the environmental impact of districts throughout their lifecycle, covering production, construction, use, and end-of-life phases. By integrating estimated variables into a structured database, it significantly reduces modelling time and costs. This approach enables users to make informed decisions on renovation projects based on technical and economic data. Additionally, the solution includes an energy management tool that optimizes the use of energy in cities by overseeing buildings, infrastructure, mobility, and renewable energy sources to enhance efficiency. It will also incorporate City Information Modelling (CIM) data from demonstration sites, supported with GIS integration. All information will be presented in a user-friendly format, ensuring accessibility for users without a technical background.

Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Municipalities, Cities, Department of urban planning of city councils or municipalities. The intention is to go first with cities in Spain, like Zaragoza from which CIRCE has more knowledge, and then other cities with similar size. The intention is not to go to small cities as the impact won't be that large, considering that there will be less buildings. Energy service companies, companies offering energy management systems or services. Architects and Urban designers. Architectural firms or construction companies, in charge of the design of new buildings or renovation of existing buildings, which aim is the construction of buildings that generate low emissions and contribute to energy efficiency.
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Target users face a lack of sufficient information to make informed investment decisions, particularly regarding future emission reductions and energy efficiency improvements. They do not have a dedicated tool to support decision-making, explore multiple renovation scenarios, or compare different options effectively. This gap hinders strategic planning and limits the ability to optimize sustainability efforts.
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	These modules will include the assessment of production, construction, use and end-of-life of districts, in terms of environmental impacts, and can be combined with real-time variables, forming a structure database that reduces the modelling time and costs. This mechanism will help users to decide on whether to carry out renovation projects based on technical-economic data. The solution will be extended to integrate City Information Modelling (CIM) data from demo sites supported with GIS. All the information would be displayed in a user-friendly way so that it can be understood by people who do not have a technical background.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be delivered/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	This energy-efficiency solution is delivered as an online application with an intuitive user interface, integrating two core tools within a single cloud-based platform. Users can access the platform via the internet without the need to install any software locally. The first tool focuses on managing all energy-related components of the pilot area—including buildings, infrastructures, and renewable energy sources—with the aim of optimising energy consumption and promoting sustainable urban development. The second tool addresses the environmental impact of renovation actions planned within the city. It calculates the net change in emissions, estimating both the emissions avoided through sustainable interventions and those generated during the implementation process. To support the effective adoption of the solution, the platform is complemented by a consultancy service. This includes expert guidance during initial setup, as well as

		technical support and training sessions tailored to user needs. These services ensure that stakeholders can fully leverage the tools for planning, decision-making, and monitoring in energy transition and urban sustainability projects.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The solution is expected to be ready for implementation within one year . Currently, the integration of both tools is still in progress, requiring further development to ensure seamless functionality. Additionally, the user interface needs to be designed and implemented, as this aspect is being handled by a project partner. To ensure successful market entry, marketing actions will also be carried out to promote the solution and reach target users effectively.
Exploitation Route	Linked to the “use model”, specify here the key exploitation route(s) – how the solution will be made available to the target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Commercialization; Contract research (with external target users); A new research project; Implementation in education programs, publications etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Commercialization: Pay access to platform, or pay the whole consultancy service (that imply using the platform + training) New Research Project
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	• Obtain a reduction in GHG emissions and energy prices. • Optimize citizens investments in renovation projects to turn into sustainable cities. • Engagement of the citizens. • Autonomy of the users to make decisions, as they do not need to have high technical knowledge.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Istanbul
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	The energy part is being used as a basis for another project to increase the functionalities.

8.2.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
<i>What tasks are your target users trying to accomplish? What problems are they trying to solve?</i> - To reduce GHG emissions - To reduce energy bills. - To improve the mobility in the city. - To promote energy awareness.	<i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> An energy-efficiency tool made by two different tools. The first one is a tool that manages all the components of the pilot that use or generate energy (buildings, infrastructures, mobility, removable energy sources) to reach the best use of energy, looking forward to achieving energy efficiency and more sustainable cities. The environmental part, the second tool, is related to renovation actions that are planned to be done in

	cities, it helps to measure how much emissions will be saved with the changes and how much there will be created because of them. This is useful to understand if the investment in renovation and refurbishment makes sense in environmental terms. The two parts could be used separately or together.
Customer Pains	Pain Relievers
<i>What challenges, risks, or obstacles do your target users face?</i> Lack of data.	<i>How does your solution reduce or eliminate target users pains?</i> Provide the information that citizens need to be able to make decisions. This information would be displayed in a user-friendly way so that it can be understood by people who do not have a technical background.
Customer Gains	Gain Creators
<i>What outcomes or benefits do target users expect?</i> - Obtain a reduction in GHG emissions and energy prices. - Engagement of the citizens. - Optimize their investments in renovation projects to turn into sustainable cities.	<i>How does your solution provide these benefits?</i> It helps to manage energy assets and demand to optimise the use of energy sources. This allows to optimise the available energy and reduce the energy bill. The idea is to maximise self-consumption and manage loads, which would also help to reduce emissions. To provide a mechanism to help make a decision on whether to carry out renovation projects based on technical-economic data. The intention is to be able to assess whether or not the investment makes sense.

8.2.1.3 Market Analysis

Description		Input
Market information	Provide information on market: Description; trends; size	Main Trends: growing importance for BIM models and LCA as well as their request since they help to reduce the carbon prints in construction and industrial sectors. Market volume: 100-500 users Market value: 2,000€ - 4,000€
Competitors	What are your “competitors” (the ones offering “alternative solutions”)?	Energy assessment software for buildings and at city level.
SWOT	Provide information on • Strengths (internal – innovations, unique value proposition of your solution) • Weaknesses (internal – barriers to entry and adoption) • Opportunities (external – market opportunities, growth potentials potentials) • Threats (external – risks in market, including competitors, regulatory or policy changes, etc.)	Strengths: These modules will include the assessment of production, construction, use and end-of-life of districts, in terms of environmental impacts, and can be combined with real-time variables, forming a structure database that reduces the modelling time and costs. The solution will be extended to integrate City Information Modelling (CIM) data from demo sites supported with GIS. User autonomy. Weaknesses: difficult obtaining the information of materials, equipment, architecture of the buildings and cities

		Opportunities: Tool for helping users to obtain energy savings and thus economic savings. Trends of reducing GHG emissions, building sustainable buildings, being efficient in the use of energy. Threats: There is little technical information/knowledge on BIM files and on environmental evaluations such as LCAs; Lack of workforce with knowledge of the technical skills for BIM and LCAs.
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8.2.1.4 IPR Information

	Description	Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement	
IPR Foreground	What is the IPR Foreground (Type/Partner)? • what IPR will be generated during the project? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/multilateral Memorandum of Understanding agreements should be signed among relevant partners	CIRCE will own the modules and will exploit them through licenses or any other type of commercial tool. Moreover, CIRCE will exploit these modules in another research projects after UP2030 finishes.

8.2.2 KER Exploitation Roadmap

8.2.2.1 Exploitation Activities

	Description	Input
Actions for development	List and describe the specific actions you will take to finish developing your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	• Conduct other pilot studies. • Refine technical features/methodologies based on user feedback. • Integrate both tools. • Develop additional functionalities (data visualization dashboards, etc.). Develop user interface. • Look for new funding tools for R&D.
Actions for adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• Work on a complete price analysis to analyze the revenues and profit that will be obtained. Develop a complete Business Plan. • Develop comprehensive user guide and online support materials to facilitate adoption. • Develop a marketing strategy. • Actively disseminate the solution through networks, webinars, conferences etc.

	• Will you need to secure a budget? • Will additional analysis of market drivers, target users, and business models be required to estimate costs?	• Organize training workshops for target users to demonstrate use of the solution. • Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use. • Apply for new public calls or other funding instruments.
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	CIRCE will be responsible for actions for development and adoption mentioned before.
Milestones	Describe potential KPIs and monitoring parameters within a specific timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies • Milestone: Completion of additional pilot studies in at least two different contexts or cities. • Timeline: Within 18 months post-project. Refinement of Technical Features • Milestone: Finalization of updated technical specifications and methodologies based on pilot feedback. • Timeline: Within 9 months post-project. • KPI: Release of version 2.0 of the solution or methodology. Funding for R&D • Milestone: Submission of at least three funding proposals for further research or development. • Timeline: Within 12 months post-project. For use: Dissemination Efforts • Milestone: Organize or participate in at least three dissemination events (webinars, conferences, or network presentations). • Timeline: Within 12 months post-project Collaboration with Target Users • Milestone: Establish formal collaboration agreements with at least three key users or institutions. Timeline: Within 12 months post-project

8.2.2.2 Financial & Sustainability Plan

	Description	Input
Costs	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. Outline the necessary expenses and investments to ensure a smooth transition from the project's completion to the next phase. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends.	• Costs for development actions mentioned before. • Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies etc.) • Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. • Dissemination, promotion and outreach.

	**Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	
Revenues	Identify the revenues expected from exploiting or ensuring the use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - How will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	Revenues will come from fees of using the tool and consultancy services to help users use the tool and develop further activities derived from the use of the tool.
Other sources of coverage	Define how costs will be managed until a sustainable funding model is secured (i.e., before collecting the first revenue). **Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	We will look for new national and European incentives to cover costs until the funding model is efficient.

8.2.2.3 Funding Mechanisms

	Description	Comment
EU	Horizon Europe	Cluster 5 - Destination 4 (Efficient, sustainable and inclusive energy use) and MISSION- CITIES
National	PERTE	PERTEs are strategic public-private initiatives funded through Spain's Recovery, Transformation and Resilience Plan (funded by Next Generation EU). Each PERTE focuses on a key economic sector or transformation area considered critical for Spain's modernisation.
Regional	AECID innovación 2025	AECID (Agencia Española de Cooperación Internacional para el Desarrollo) launched Innovación 2025 as part of Spain's strategic framework for international development cooperation . This initiative promotes the co-creation and transfer of innovative solutions to partner countries, especially in Latin America, Africa, and the Mediterranean.
Private		

8.2.2.4 Standardization Roadmap

	Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	Building Information Modeling (BIM) Standards - ISO 19650 series – Organization and digitization of information about buildings and civil engineering works, including building information modeling (BIM) → This is the main global standard for BIM workflows, information management, and collaboration. - ISO 19650-1:2018 – Concepts and principles

		• ISO 19650-2:2018 – Delivery phase of assets • EN ISO 16739-1:2020 – Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries Life Cycle Assessment (LCA) and Environmental Performance Standards • ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework • ISO 14044:2006 – Environmental management – Life cycle assessment – Requirements and guidelines → These standards define how to perform a scientifically sound LCA. • EN 15978:2011 – Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method → Specific to construction sector — standardizes LCA for buildings (including production, construction, use, end-of-life).
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	• ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework • ISO 14044:2006 – Environmental management – Life cycle assessment – Requirements and guidelines → These standards define how to perform a scientifically sound LCA.
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	No, we haven't engaged with standardization bodies before, and we are not planning to do it during or after the project.
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	No
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	No
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	Yes, because using standards improves the possibility of scalability of the solution.
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	No

8.2.3 Tools integration – plans for possible joint exploitation

Description		Input
Existing Bundle of tools during the project	Is your solution currently part of a bundle of tools within UP2030? If yes, also specify:	Yes
	Which other solutions are part of the bundle?	Tools for energy efficiency - Digital infrastructure
	Is your solution being implemented as part of the bundle in any UP2030 cities, or any other cities?	Yes, in Istanbul we are implementing part of our tool, not the whole of it.
	Is the bundle expected to be maintained after the project ends?	There is no prevision yet.
	How does the bundling of the solutions benefit you as a solution provider?	There is no prevision yet.
	How does the bundling of the solutions benefit your target users?	The tool can be used by urban planners, designers, constructors, etc. to collect as much data as possible and to assess different end-of-life scenarios and circularity indicators at district level. The tool has replication potential; those buildings of similar characteristics located within the same district of pilots at district level can be quantified.
Potential bundling of tools post-project	Do you envision, or would you be interested in, bundling your solution with any other solution part of the project for collaboration after UP2030? If yes, also specify:	There is no interest in bundling with other solutions so far.
	Which solutions would you like to collaborate with?	
	Why would this collaboration be beneficial (e.g., synergies, shared user base, complementary functions)?	
	Are there specific urban challenges or end-user needs that you think could be better addressed through bundled solutions?	
	Are there barriers (e.g., technical, financial, or IP-related) preventing such collaborations from being pursued?	

8.2.4 Business Model Canvas (BMC)

Business Model Canvas	
Key Partners	Key Activities

Municipalities Tool developers	Testing the solution, exploitation activities, contact with potential customers, promotion actions, continue technology validation.
Customer relationships	Customer Segments
Online	Municipalities, Cities, Energy service companies, Urban planners, Architects and Urban designers
Key Resources	Channels
People who are experts in energy efficiency, LCA, mobility plans Data bases from pilots, energy data, and environmental data	Social media Networking Conferences
Cost Structure	Revenue Streams
Human resources IPR costs Simapro Licence Marketing and sales costs	Licensing

8.3 UBEM: AI-powered decision making tool for decarbonisation

8.3.1 KER Characterization

8.3.1.1 Overview

Description		Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The tool (UBTEM) includes two parts: a decision-support tool for buildings' decarbonization actions (UBEM) and another tool that supports the optimal placement of e-vehicle charging stations in cities. These solutions were developed for the long-term analysis (years 2025-2050) predict and analyze (i) energy demand in buildings, (ii) impact of various scenarios considering impact of climate change, (iii) PV-based electricity production, and (iv) optimization of charging locations for PV-powered e-mobility. While the tool's main objective is to support well-informed decision-making for the decarbonization of buildings and e-vehicles, the tool also based on a comprehensive dataset and digital models of buildings, their energy performances, and PV systems. As the objective of the tool is to support decision-making for carbon neutrality of cities, the tool addresses urban challenges, including high CO2 emissions due to buildings and traffic, aging building stock that has low energy and thermal performance, severe traffic congestion, high and energy costs, as well as some social challenges including energy poverty and indoor overheating related health

		risks. In this regard, the tool utilizes artificial intelligence and other machine learning approaches in the following modules: Buildings decarbonization: Module 1 supports the calculation of climate change impact on building energy use/thermal occupant comfort for all years between 2025 and 2050, and the exploration of different building energy retrofit options including rooftop PV panels. This module allows the development of different scenarios and the comparative analysis of: • Long-term energy use and production, CO2 emissions • Economic indicators such as return on investment, payback period, abatement costs The tool can be used as a stand-alone GIS-based application. Module 2 the design of real-time control of micro-e mobility (e-scooter), building energy use and PV electricity generation co-deployment. Transport decarbonization helps users determine the optimal locations of PV-integrated e-scooter charging stations using existing travel data and surplus rooftop PV electricity.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Cities, Policymakers and government bodies, Urban planners, Architects and Urban designers, Academia and Researchers, electricity distribution companies, e-mobility companies, building owners
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	The main problems are: The high energy use and high CO2 emissions of buildings; the aging building stock and poor thermal performance of buildings; low occupant comfort due to overheating, especially under global warming threats; fossil-fuel based building and transport systems Other problems include: The lack of data-driven decision-making tools to support scenario analysis; the ability for city-scale and integrated analyses for decarbonization actions
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	• The UBEM solution focuses of the city-scale assessment of different energy retrofit scenarios, considering improvements in building envelope systems, energy systems, and PV electricity generation potential. It is based on real data obtained from open-source data repositories and municipality records. The tool can make continuous long-term predictions (years 2025 to 2050) by considering all variables including future global warming scenarios, CO2 intensity of the electricity grid, the discount rate. • The UBTEM solution focuses on urban transport systems, particularly e-mobility. It involves the integration of data from transport companies on e-scooter usage and energy consumption. The solution helps find the optimal locations of charging stations using different algorithms by (i) maximizing the distance between charging stations, (ii) minimizing the difference between parking spots and

		charging points, and (iii) placing stations close to areas with high PV potential. UBEM and UBTEM leverage advanced data-driven techniques, such as AI and ML, to accurately predict performance indicators related to energy use and occupant thermal comfort. By utilizing building, context, and climate-related input features, these tools enable rapid estimation of different energy retrofit scenarios, allowing for informed decision-making and the assessment of their impact in various future years. UBEM and UBTEM offer the opportunity for participatory planning and engagement of stakeholders using AI-based decision tool.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	The tool will be implemented as a provision of a service. Specifically, the use of the tool will need two phases: 1. A workshop with the end users to develop a number of scenarios that they want to explore. Afterwards, the tool will calculate the energy, environmental and financial parameters 2. The results of these calculations will be presented to the users with an interactive, GIS-based tool, as well as a detailed report summarizing the key findings of the scenarios.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The implementation of the tool is ready. The TTM will be post-UP2030.
Exploitation Route	Linked to the "use model", specify here the key exploitation route(s) – how the solution will be made available to target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Commercialization; Contract research (with external target users); A new research project; Implementation in education programs; publications Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Dissemination: share our findings, methodologies, and best practices through academic publications, conferences, and workshops to ensure wide dissemination of knowledge. Collaborations with research institutions, universities, and urban planning agencies will foster knowledge exchange and further development of UBEM and UBTEM. Engaging with local authorities and policymakers, the tools owners will advocate for the integration of these tools in urban planning practices and influence policy decisions. Further development of the tool through new research projects is also one of the main exploitation routes. So far, we have been exploring state-of-the-art <u>Large Language Models</u> to improve user interaction.
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Scientific: these tools will advance knowledge and understanding in the field of urban energy systems, building performance, and sustainable urban planning. They will enable researchers to analyze and study complex energy interactions within neighborhoods and cities, leading to new insights and innovative solutions. Economic: UBEM and UBTEM will support cost-effective planning by providing valuable insights for urban planners and policymakers, helping them make informed decisions on energy efficiency measures, renewable energy integration, and optimal energy management strategies. Social: these tools will contribute to improved quality of life by promoting the development of connected, compact, and low-

		carbon neighborhoods, leading to enhanced livability, healthier indoor environments, and reduced energy poverty. Environmental: UBEM and UBTEM will play a crucial role in achieving energy efficiency and emissions reduction goals by reducing building energy, identifying energy-saving opportunities, and promoting renewable energy adoption, thereby mitigating the environmental impact of urban areas. Overall, the expected impact of UBEM and UBTEM encompasses scientific advancements, cost-effective planning, improved quality of life, and environmental sustainability.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Istanbul's decarbonization of buildings and e-scooters
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	Yes, the tool is being developed under different research grants by METU and GUNAM. These are scientific research grants funded by The Scientific and Technological Research Council of Türkiye (TUBITAK).

8.3.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs What tasks are your target users trying to accomplish? What problems are they trying to solve? - Decarbonization of buildings - Reducing energy demands of buildings, associated CO2 emissions implementing different retrofit strategies - Consider long-term variables (2025-2050) during decision-making, such as global warming effects on building thermal loads, grid carbon intensity, discount rates - Increased thermal comfort - Increased use of PV-generated electricity in buildings and e-vehicles for decarbonization of transportation	Products & Services What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems? Our UBEM/UBTEM tool provides data-driven solutions to support urban planners, municipalities, researchers, and private-sector stakeholders in decarbonizing building energy use and transportation in cities. The key products and services include: - Advanced Urban Building Energy Models (UBEM) for analyzing heating, cooling, and electricity demand in buildings: (i) Forecasts energy demand for 2025, and 2050, under climate change scenarios, (ii) Supports active/passive retrofit strategies to reduce energy consumption, (iii) helps create Positive Energy Districts (PEDs) by integrating renewables, (iv) Assesses Indoor Overheating Degree (IOD) for thermal comfort evaluation, and (v) AI-powered predictive models for building energy demand forecasting UBTEM model help find the optimal the placement of e-scooter charging stations With these integrated approaches, our tool supports cities in climate mitigation and adaptation planning for decarbonization .
Customer Pains What challenges, risks, or obstacles do your target users face? In real-world, it is not possible to evaluate the <u>city-scale</u> impact of different climate change adaptation and mitigation strategies on (i) building energy performance, (ii) associated co2 emissions, and (iii) thermal comfort. For	Pain Relievers How does your solution reduce or eliminate target users pains? - AI-powered UBEM/UBTEM decision-making tool can directly address these user pains by offering a precise calculations and scenario-based analysis - The tool digitally simulates various climate adaptation and mitigation strategies, enabling municipalities to assess:

decision-making and comprehensive analysis including not only environmental impacts but also financial feasibility, the use of digital tools that can be used for evaluation of different scenarios in a quick and robust way. - Typically, decisions do not incorporate long-term variables, i.e. the global warming effects on building energy use. This misinforms analyses for long-term decision making. - The lack of <u>interactive interfaces</u> that the users can use to explore and comparatively analyze their scenarios hampers decision-making To increase PV-integration, target users should optimize e-mobility infrastructure, considering PV potential. This optimization problem requires the digital models that consider multi-objective criteria to locate e-mobility charging stations. With this way, when the real-world application for PV-powered e-mobility is considered, this model can guide municipality.	- Building energy performance under different retrofit scenarios. - Associated CO₂ emissions reductions with energy efficiency measures and renewable energy integration. - Thermal comfort improvements in response to climate change. - Economic analyses to assess the financial consequences (return on investment, payback period, abatement costs) of retrofit measures. - The tool optimizes e-mobility infrastructure enabling municipalities to strategically apply e-mobility solutions while maximizing PV efficiency. Supporting decision-making, reducing trial-and-error costs, and optimizing PV-e-mobility infrastructure, the AI-powered UBEM/UBTEM tool transforms municipalities in sustainable urban energy planning.
Customer Gains	Gain Creators
What outcomes or benefits do target users expect? * Digital solutions (fast and robust) that can be used for decision-making processes for decarbonization of cities	How does your solution provide these benefits? Help decision-makers make well-informed decisions considering a variety of technical, environmental and economic factors. It helps users build different scenarios for (i) passive systems i.e. building envelope improvements, (ii) active energy systems i.e. heat pumps and (iii) renewable energy integration i.e. rooftop PVs. The tool allows users to filter buildings based on different considerations, i.e. its age or energy use. Following, the scenarios can be applied on these buildings. The tool is unique, as it considers long-term effects (2025-2050) and it can address city-scale analyses. The GIS-based interactive interface also allows users' active exploration of different scenarios and lets the compare the baseline condition and the scenarios.

8.3.1.3 IPR Information

Description	Input
IPR Background List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement	The approach to urban building energy modelling and machine learning based predictive models have been developed previously in a TUBITAK funded research project (Project no: 120M997) IPR protection measure: IPR owner: İpek Gürsel Dino, Sinan Kalkan, Çağla Meral Akgül
IPR Foreground What is the IPR Foreground (Type/Partner)? - what IPR will be generated during the project? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development.	The development team will hold the ownership and future intellectual property rights. The generated IPRs will be: Software Code & Models (potentially open-source or proprietary) Urban Energy & Mobility Datasets (depending on access rights and confidentiality) Publications & Technical Reports (conference papers, journal articles) Decision Support Tools (dashboard interfaces, GIS-based tools for planners)

**If relevant, bilateral/multilateral Memorandum of Understanding agreements should be signed among relevant partners

8.3.2 KER Exploitation Roadmap

8.3.2.1 Exploitation Activities

	Description	Input
Actions for development	List and describe the specific actions you will take to finish developing your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	• Conduct other pilot studies • Refine technical features/methodologies based on user feedback • Develop additional functionalities (data visualization dashboards, etc.) • Secure additional funding for R&D
Actions for adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively. • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively? • Will you need to secure a budget? • Will additional analysis of market drivers, target users, and business models be required to estimate costs?	• Continuous communication with the pilot owner (Istanbul Metropolitan Municipality) • Publish research papers to showcase benefits, validate solution and encourage use Short-term - the involvement of UP2030 cities provides a real-world testing ground: by implementing our solution in diverse urban contexts and demonstrating its positive outcomes in terms of energy efficiency, carbon reduction, and sustainable urban development, we can establish a strong track record and build credibility in the market - the collaboration with UP2030 cities enables us to gather valuable feedback and insights from local authorities, stakeholders, and residents. This will help refine and improve solution. - The visibility and exposure gained through the UP2030 project can open doors to new partnerships, funding opportunities, and market expansion. Long-term - It focuses on maximizing their impact and adoption within the academic and urban planning communities. We will actively share our findings, methodologies, and best practices through academic publications, conferences, and workshops to ensure wide dissemination of knowledge - Collaborations with research institutions, universities, and urban planning agencies will foster knowledge exchange and further development of UBEM and UBTEM. - Engaging with local authorities and policymakers, we will advocate for the integration of these tools in urban planning practices and influence policy decisions.

		- Objective is to ensure that UBEM and UBTEM are widely utilized and contribute to sustainable urban development and energy efficiency
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	METU and GUNAM act as tool-developers, and IMM acts as the pilot provider and tool user. METU and GUNAM will be actively engaged with expanding the tool's capabilities and the related technical developments. IMM will be responsible for the dissemination of the results of the decarbonization scenarios and the benefits of these scenarios on the city-scale.
Milestones	Describe potential KPIs and monitoring parameters within a specific timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies • Milestone: Completion of additional pilot studies in at least two different contexts or cities. • Timeline: Within 6 months post-project. Refinement of Technical Features • Milestone: Finalization of updated technical specifications and methodologies based on pilot feedback. • Timeline: Within 9 months post-project. • KPI: Release of version 2.0 of the solution or methodology. Funding for R&D • Milestone: Submission of at least three funding proposals for further research or development. • Timeline: Within 6 months post-project. For use: Dissemination Efforts • Milestone: Organize at least three dissemination events (webinars, conferences, or network presentations). • Timeline: Within 6 months post-project Collaboration with Target Users • Milestone: Establish formal collaboration agreements with at least three key users or institutions. Timeline: Within 6 months post-project

8.3.2.2 Financial & Sustainability Plan

Description		Input
Costs	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. Outline the necessary expenses and investments to ensure a smooth transition from the project's completion to the next phase. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	- Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies etc.) - Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. - Dissemination, promotion and outreach
Revenues	Identify the revenues expected from exploiting or ensuring the use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - How will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	The future funded projects can be the finance for the continued use and operation of the solution.
Other sources of coverage	Define how costs will be managed until a sustainable funding model is secured (i.e., before collecting the first revenue). **Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	Other project grants, national or regional incentives

8.3.2.3 Funding Mechanisms

Description		Comment
EU	Horizon Europe CETP DUT INTERREG Instrument for Pre-accession Assistance (IPA)	
National	The Scientific and Technological Research Council of Türkiye (TUBITAK)	
Regional		
Private		

8.3.2.4 Standardization Roadmap

Description		Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	ASHRAE standards (e.g., ASHRAE 90.1, ASHRAE 55) are used for building energy performance evaluation and thermal comfort criteria. U.S. Department of Energy (DOE) guidelines are followed for defining building operation schedules and internal loads.

		• European standards (e.g., EN 15251) are applied for the assessment of indoor overheating and thermal comfort, particularly in residential buildings. • TS 825 (Turkish Standard for Thermal Insulation Requirements for Buildings) is used to define minimum insulation levels and U-value thresholds specific to the national context. Building Energy Performance and Sustainability Standards • ISO 52000 series – standards define holistic approach to assess energy performance of buildings • ISO 50001:2018 – energy management systems, requirements with guidance for use • ISO 52016-1:2017 – calculation methods for energy needs for heating and cooling • EN 15603 – energy performance of buildings Renewable Energy Systems Standards • IEC 61853 series – Photovoltaic (PV) module performance testing and energy rating Sustainable and smart cities: • ISO 37120:2018 – sustainable cities and communities, indicators for city services and quality of life • ISO 37122:2019 – indicators for smart cities • CEN/TC 465 – Sustainable and Smart Cities and Communities; developing European-specific standards -> in relation to ISO 37120 and 37122, but adjusting them to EU legislation, including the European Green Deal, Digital Europe Programme, Climate Adaptation Mission, etc.
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	• TS 825 (Turkish Standard for Thermal Insulation Requirements for Buildings) is used to define minimum insulation levels and U-value thresholds specific to the national context.
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	Yes, several standardization bodies and committees are active in this domain. These include: • ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers), which develops widely used standards for energy performance, HVAC systems, and thermal comfort. • CEN (European Committee for Standardization), responsible for standards like EN 15251. • TSE (Turkish Standards Institution), the national body that publishes TS 825, regulating thermal insulation requirements in Türkiye.

		• U.S. Department of Energy (DOE), which offers operational guidelines and modeling protocols widely adopted in energy simulations.
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after the project?	We have not formally engaged with any standardization bodies thus far. However, we actively follow the standards published by ASHRAE, EN, and TSE in our methodology.
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	We are currently assessing the alignment of UBTEM functionalities with relevant standards, including TS 825, ASHRAE guidelines, and CEN regulations. We actively monitor developments from organizations such as ASHRAE, ISO, and TSE to ensure methodological compliance and to adopt future updates.
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	AI-driven digital tool that allows scenario analysis for different energy renovation actions, allowing a very fast and accurate calculation of energy savings, CO ₂ reductions, indoor overheating degree, initial costs of renovation, and long-term economic assessments. The tool has user-friendly interfaces that allow non-experts (e.g., municipal stakeholders) to explore retrofit options and climate adaptation strategies interactively, increasing accessibility and usability. The results obtained from our tool can inform standards considering long-term effects and multi-objective performance metrics.
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	Yes, aligning with existing standards significantly enhances the adoption, usability, and scalability of our solution. In our scenario-based assessments, national standards such as TS 825 are already integrated to evaluate the impact of thermal insulation improvements in accordance with regulatory requirements. This ensures that the proposed retrofit actions are realistic, compliant, and transferable within the local context.
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	Yes, there are several challenges that may limit the potential for formal standardization of our solution. Most notably, the high context dependency of the modeling framework poses a barrier. UBTEM relies on localized building typologies, climate conditions, urban morphology, and user behavior patterns, which vary significantly across regions and cities. As a result, developing a universally applicable standard without compromising the model's adaptability and precision may be difficult. Additionally, standardization processes often require considerable time, administrative coordination, and technical documentation, which can be resource-intensive.

8.3.3 Tools integration – plans for possible joint exploitation

	Description	Input
Existing Bundle of tools during the project	Is your solution currently part of a bundle of tools within UP2030? If yes, also specify:	Yes.

	Which other solutions are part of the bundle?	CIRCE— BIM Lifecycle Module and MAGGLIOLI-MIRA Digital Twin
	Is your solution being implemented as part of the bundle in any UP2030 cities, or any other cities?	Yes, our solution is currently being implemented within the scope of the UP2030 project in the selected pilot area of Istanbul (Kadıköy district).
	Is the bundle expected to be maintained after the project ends?	No, the current bundle is not expected to be maintained in its original form after the project ends. However, individual components of the solution, our tool (the UBEM/UBTEM model), will remain available for further development for new projects and adaptation of new technologies. Long-term maintenance would require dedicated institutional or municipal support beyond the project's duration.
	How does the bundling of the solutions benefit you as a solution provider?	Bundling our solution with complementary tools, such as CIRCE's emission and life cycle assessment (LCA) tool, offers added value. The integration allows users to simultaneously assess long-term emissions, building-level energy performance, and LCA results within a unified framework. Moreover, the integration of these outputs in the MIRA digital twin platform provides users with a comprehensive, streamlined, and visually accessible interface. This enhances the interpretability of complex multi-dimensional data, facilitates more informed decision-making, and increases the overall usability and impact of our tool as part of the UP2030 ecosystem. However, our tool can be used as a standalone with its own 3D GIS-based interface and allow scenario analysis.
	How does the bundling of the solutions benefit your target users?	For users, the bundling of our solution with complementary tools offers a significant advantage by providing integrated insights across multiple dimensions of sustainability. Instead of working with separate systems, users can simultaneously explore building-level energy performance, long-term emissions, and environmental impacts within a single unified environment. Through its integration into the MIRA digital twin platform, users benefit from a centralized and intuitive interface that simplifies the complexity of technical data. This not only supports better-informed and faster decision-making but also enhances usability and accessibility for both technical and non-technical stakeholders, such as municipalities, planners, and community actors. This bundling supports users to understand the interconnected impacts of their decisions, compare retrofit or decarbonization scenarios more effectively, and align their actions with long-term climate goals in a user-friendly manner.
Potential bundling of tools post-project	Do you envision, or would you be interested in, bundling your solution with any other solution part of the project for collaboration after UP2030? If yes, also specify:	No
	Which solutions would you like to collaborate with?	-

	Why would this collaboration be beneficial (e.g., synergies, shared user base, complementary functions)?	-
	Are there specific urban challenges or end-user needs that you think could be better addressed through bundled solutions?	Yes, bundled solutions are particularly well-suited to address complex and interrelated urban challenges. Integrated climate adaptation and mitigation planning: Cities increasingly need to assess building retrofits not only for energy savings but also for long-term emission reduction, thermal comfort, and life cycle impacts. Bundled solutions help users evaluate synergies across these domains within a unified framework. Lack of technical capacity among local stakeholders: Bundled platforms offer user-friendly, interoperable interfaces that lower the technical barrier and empower decision-making. Need for spatially explicit, scenario-based planning: When bundled into digital twins like MIRA, the integrated solutions can be used to visualize and compare the outcomes of various scenarios, supporting comprehensive analyses.
	Are there barriers (e.g., technical, financial, or IP-related) preventing such collaborations from being pursued?	Differences in data structures, model assumptions, and system architectures can make tool interoperability complex and time-consuming. Standardization of inputs and outputs across tools often requires additional development effort. Some tools are developed under proprietary licenses or institutional restrictions, which can limit the extent of integration or data sharing. Financial and human resources required for coordination, technical adaptation, and long-term maintenance of bundled solutions may exceed the capacity of individual partners, especially beyond the project lifecycle.

8.4 Air quality monitoring and forecasting

8.4.1 KER Characterization

8.4.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The service will be able to forecast the level of pollutants and therefore compute an air quality index given an area of interest within the supported geographical regions. The tool will process satellite, topological and weather data using ML algorithms to provide the forecast.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Early adopters: local authorities at city level. Other potential end-users can be: Policymakers and governmental bodies, Local communities and Citizens, Researchers from academia and research centers.

Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	- Monitoring air quality via in-situ stations is costly in terms of CAPEX and OPEX, especially in the case of wide urban areas and high installation density, which is required to achieve a high spatial resolution - Lack of highly resolved air quality monitoring and forecast data - Improving the urban setting may require long periods, while air quality forecasts are provided in the short term.
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	The most innovative aspect of our solution is the use of AI to combine data coming from different sources such as satellite, weather station and topology in order to obtain a final prediction.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	The software is composed by: 1) A web-based application named ERMES (Enhancing Resiliency to Manage Emergency situations) enabling the visualisation of: (i) daily maps of the major pollutant levels with an improved spatial resolution to prioritise areas at risk within a city better (ii) daily forecasts enabling short-term decisions such as local traffic policies; (iii) seasonal/annual maps to plan long term interventions aimed at reducing the average pollutant levels. 2) the Air Quality service forecast that delivers the data to the ERMES application The ERMES application will be released as open source software, while the service will be made available through an ad-hoc software license. The software will be provided with a user manual and the licence can include cost for training for the company that will operate the service and the application and the costs of additional modifications. Additional end-user training could be performed by the company that will operate the product according to specific agreement with their customers.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The solution will be ready and operational by the end of the project at TRL7.
Exploitation Route	Linked to the "use model", specify the key exploitation route(s) – how the solution will be made available to target users beyond the project. **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs.	The tool will be developed within the project and the implementation by the cities can provide a valuable performance assessment (beside the one that will be done during development). This situation can also represent an opportunity to gather additional data and further improve the tool. Plan is to promote its widespread use beyond the project.

	Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact/environmental etc.	Environmental: the constant monitor and forecasting of air pollutants level in certain area can represent a valuable source of information for citizens and can also provide support to decision makers in subjects such as traffic regulations or urban regeneration or emissions reduction, which will bring an important impact in terms of environment.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Lisbon, Zagreb
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	

8.4.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish? What problems are they trying to solve? - To monitor air quality, forecast upcoming air quality levels to decide short-term policies to keep pollutant levels below risk thresholds - study the air quality levels at seasonal/annual scale to decide long-term policies and consider this data for urban planning.	What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems? - A web-based interface enabling the visualisation of: (i) daily maps of the major pollutant levels with an improved spatial resolution to prioritise areas at risk within a city better - (ii) daily forecasts enabling short-term decisions such as local traffic policies; - (iii) seasonal/annual maps to plan long term interventions aimed at reducing the average pollutant levels.
Customer Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face? - Monitoring air quality via in-situ stations is costly in terms of CAPEX and OPEX, especially in the case of wide urban areas and high installation density, which is required to achieve a high spatial resolution - Lack of highly resolved air quality monitoring and forecast data - Improving the urban setting may require long periods, while air quality forecasts are provided in the short term.	How does your solution reduce or eliminate target users pains? The tool leverages heterogeneous data such as satellite networks (i.e., Sentinel-5P), topographic data (land cover, digital elevation models), and weather forecasts, as well as advanced AI models to provide high-resolution (up to 500m) air quality maps, limiting the installation of new air quality stations, thus providing better information while avoiding additional costs.
Customer Gains	Gain Creators
What outcomes or benefits do target users expect? Air pollution levels do not exceed the thresholds indicated by the policy in force (i.e., Ambient Air Quality Directives	How does your solution provide these benefits?

on October 26, 2022. This revision is geared towards aligning the EU's air quality standards more closely with the World Health Organization's recommendations.)

User friendly interface for spatiotemporal visualisation of pollutant levels and air quality maps, including historical observations as well as short term forecasts.

8.4.1.3 IPR Information

Description	Input
IPR Background List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	The ERMES platform, which will be released in open source.
IPR Foreground What is the IPR Foreground (Type/Partner)? - What IPR will be generated during the project, and which partner will be the owner? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	LINKS will fully hold the IPR on the proprietary components that have been developed within the projects. The ERMES application will be released as open source software, while the Air Quality service will be made available through an ad-hoc software license.

8.4.2 KER Exploitation Roadmap

8.4.2.1 Exploitation Activities

Description	Input (the text in red can be deleted, it's just an example!)
Actions for development List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	Following the completion of the project, the development of the Air Quality Service will focus on: - refining its machine learning models by integrating additional training datasets from real-world deployments - and expanding its forecasting capabilities to include more precise pollutant dispersion modeling. - The ERMES platform will undergo optimization for improved performance, scalability, and user experience. - Additional pilot studies will be conducted with municipal authorities and regional environmental agencies to assess model accuracy under different environmental and climatic conditions

Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	To facilitate widespread adoption: • targeted outreach will be conducted toward public administration technology service providers, urban environmental policy organizations, and smart city initiatives. • Demonstration sessions and webinars will be organized to familiarize potential adopters with the platform's functionalities. • Comprehensive user documentation and technical support materials will be developed, and dedicated training workshops will be provided to ensure proper tool usage. • Moreover, engagement with policy stakeholders will highlight the role of the service in supporting EU Air Quality Directive compliance.
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	LINKS Foundation will lead the technology transfer activities, including outreach, training, and pilot implementations, ensuring that the software is effectively adopted by commercial partners who will operate and maintain the service.
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	Advancement of the scientific methodology: Release of an updated version of the forecasting model (within 6 months post-project). Optimization of the ERMES web-based dashboard: Improved version with enhanced visualizations and user interaction (within 6 months post-project). Pilot validation: Completion of additional pilot studies in at least two European cities (within 6 months post-project). Scientific dissemination: Publication of a research paper showcasing the tool's capabilities and validation results (within 12 months post-project). Market adoption: Establishment of formal agreements with at least three potential adopters (within 24 months post-project).

8.4.2.2 Financial & Sustainability Plan

	Description	Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	To sustain and support the KER after the project, key cost elements will include: Operational costs: Maintenance and hosting of the ERMES platform, continuous model updates, and system monitoring. Personnel: Costs for staff involved in platform maintenance, training sessions, and customer support. Technology transfer and training: Resources allocated for licensing agreements, workshops, and tailored consulting services for public administrations. Dissemination and outreach: Marketing and awareness campaigns to drive adoption among municipalities and environmental agencies.

Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?	Software licensing fees: The Air Quality Service will be commercialized through an ad-hoc software license for municipalities, environmental agencies, and smart city operators. Public sector contracts: Direct agreements with city governments and regional authorities for customized deployment and support. Research collaborations: Participation in new research projects (Horizon Europe, national R&D initiatives) that fund further development and refinement of the system.
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. • Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	Self-financing: Initial funding from LINKS Foundation's internal budget to support post-project activities. EU and national research funding: Seeking grants from programs focused on environmental monitoring, digital transformation, and AI applications for sustainability. Strategic partnerships: Establishing collaborations with private technology providers that could integrate the Air Quality Service into broader urban monitoring solutions.

8.4.2.3 Funding Mechanisms

Scale	Funding mechanisms
EU	Horizon Europe calls on environmental AI applications, Copernicus user uptake programs, Digital Europe Program, LIFE program for environmental solutions
National	National innovation funds supporting smart cities and AI-based environmental monitoring (e.g., Italy's PNRR initiatives)
Regional	National innovation funds supporting smart cities and AI-based environmental monitoring (e.g., Italy's PNRR initiatives)
Private	Direct licensing agreements with companies providing smart city solutions, consulting firms specializing in environmental monitoring, and corporate partnerships with industries needing compliance solutions

8.5 City Scan

8.5.1 KER Characterization

8.5.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	City Scan is a workflow built around parametric and creative urban design explorations to simulate, assess and optimize urban design plans. It aims to bridge the gap between data-driven analysis and actionable urban planning and design outputs to support informed spatial planning and place-based, analytical, and rational decision making. City Scan tool employs a step-by-step approach to create and assess urban designs, focusing on indicators such as walkability, density, solar energy potential, and energy demand, carbon sequestration, among others. These indicators can be customized based on the requirements of each project.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to	Municipal authorities; particularly planning and development departments.

	address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	National, regional governments or governmental agencies (in Europe, North Africa and Western Asia, South-East Asia, Sub-Saharan Africa) Real-estate developers NGOs Planning Practitioners in Europe (medium to big size cities) North Africa and Western Asia, South-East Asia, Sub-Saharan Africa) Business owners in Europe
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	- Complex Climate Data Analysis and Action: In the context of climate adaptation and sustainability, users face the challenge of integrating and analyzing complex climate data. This includes quantifying climate risk, understanding climate impact, and developing decarbonization strategies. The complexity of this data can make it difficult for users to derive actionable insights and make informed decisions. - Complex Regulations and Policies: For urban planning and infrastructure development, users need to align spatial planning tools with other policy instruments and frameworks for climate action and building regulations. This involves continuous monitoring, feedback, communication, and knowledge exchange. Ensuring that spatial planning tools reflect and contribute to broader goals, such as reducing greenhouse gas emissions and enhancing resilience, can be a complex and resource-intensive process. - Work in silos: Urban practitioners and city administrators often face challenges in coordinating multiple factors in urban planning, such as land use, mobility infrastructure, green space allocation, energy consumption, and climate resilience. It can be difficult to visualize and analyze how these elements interrelate in the urban context, leading to inefficient or poorly optimized urban designs. - Lack of Integration and data informed decision between urban development and sustainability goals: the ongoing issues is the disconnect between urban development and sustainability goals that are backed-up by data and not only intuition. Urban practitioners and city administrations often struggle to integrate green infrastructure, energy efficiency, and carbon neutrality into new projects. There is also a challenge in ensuring that sustainability measures align with urban growth needs. - Lack of resources to evaluate and compare multiple design scenarios and assess trade-offs between them, such as economic growth, environmental impact, social inclusivity, and climate resilience. - Limited engagement of stakeholders: lack of engagement from all relevant stakeholders, including local communities, private developers, and city authorities. Many planning decisions are not transparent or made without sufficiently consulting key stakeholders and their needs.
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)?	• The workflow the tool enables is unique, being in the intersection between data science, tech companies and urban planners and designers.

	What are the benefits of your solution, and how do these benefits align with what your user wants?	- The tool aims to combine the expertise and knowledge in sustainable urban planning and design principles with data science and technology to provide accurate and data backed up, creative solutions that addresses holistic city visions that are aligned with climate goals and developed in participatory processes. - The tool provides real-time, data-driven simulations to evaluate the impact of different urban design scenarios - It allows to integrate green infrastructure, renewable energy, and climate resilience into urban design from the outset and with measured impacts. - Visualizes urban designs in a simple, accessible way to engage all stakeholders and address diverse needs, and present the trade-offs that can be presented in the meeting, allowing to find the most optimal solutions.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	- The tool is built in the Grasshopper environment, within Rhinoceros 3D. It uses a range of open-source libraries and plugins to enhance its functionality. Therefore, a Rhinos 3D license and knowledge to operate Grasshopper is needed at this point in time. - The tool we have developed is open source. - TSPA can offer service to customise the tool to specific contexts and their needs, run the simulations, and package the outputs.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The tool is currently ready to be used and can be applied to other contexts already known (as of 03.2025). However, TSPA intends to further develop and refine the tool outside UP2030. For example, build a more intuitive user interface, improve the flow of data (outputs) into data sheets, optimize dependencies between various analysis and urban form as well as integrate couple of new analysis parameters. However, these upgrades do not interfere with the application of the tool in the present.
Exploitation Route	Linked to the "use model", specify the key exploitation route(s) – how the solution will be made available to target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs; publications; etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Contract agreements with external users to customize and implement City Scan, as a part of research or as a part of direct urban planning or design projects. We are also open to searching for a new research project, or a funding program to refine the tool. Internally we are exploring the idea of the spin off as well.
Impact 3-year time	Describe the impact of the implementation/use of your solution.	Scientific: contribution to data-driven urban planning methodology and strengthening of interdisciplinary research on urban sustainability

	**This can be in terms of scientific impact/society impact/economic impact/environmental etc.	Societal impact: enhanced carbon neutrality-oriented decision-making for cities; more resilient and equitable planning and design process through leveraging of a climate-data informed co-design process.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Granollers
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	No.

8.5.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish? What problems are they trying to solve? - Make informed decisions regarding land use, zoning regulations, and infrastructure development. Anticipating future urban growth scenarios and understanding the potential impact of such scenarios. - Quantifying climate risk and impact, understanding climate risk, and developing decarbonization strategy. The users aim to integrate climate data and science-aligned analytics at various levels to help identify, measure, and understand potential climate risks and opportunities within portfolios and locations. The users seek insights into climate resilience through location-based risk analysis and visualizations. - Main tasks: develop and compare urban design scenarios, to choose the most optimal urban form. - Analyse the impact of urban designs and certain spatial configurations on the environment. - Improve participatory process, by having more transparent, engaged discussion for new developments in the city. - Accelerate the carbon neutral urban planning process, both in terms of gaining the skills and tools necessary, and the speed at which developments are implemented.	What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems? - Parametric design allows to simulate multiple urban designs quickly, many times faster than it usually takes, if following traditional urban design process. - Incorporating statistical and environmental analysis data into the process allows us to compare and assess different urban design scenarios, and evaluate their impact on environment, economy, and more. Thus, enables data informed decision-making process, that considers range of different factors, which usually are treated separately (for example: urban typologies relations to energy demand, or green infrastructure configuration with carbon neutrality goals.) - The tool provides relevant insights and information in the form of high-level visualizations, which may be in the form of maps, graphs or charts. which aims to boil down complex information into simple, accurate, and operable visualizations. - Thus, the tool offers a data-driven service that fosters net-zero urban planning, supporting the target user in achieving their goal of creating climate-resilient urban environments - Additionally, it helps to have more transparent participatory processes and improve communication between stakeholders. By visualizing the urban design live, i.e. during the participatory meetings, it is possible to simulate different design inputs, and incorporate feedback from stakeholders live, directly presenting the trade-offs, and findings alternative solutions)
Customer Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face? - When gathering spatial data and navigating data-scarce environments users often encounter challenges related to the availability and quality of data, especially in remote or underdeveloped areas.	How does your solution reduce or eliminate target users pains? - Integrates factors like green spaces, solar gain, urban density, and network accessibility into a single model, helping users assess trade-offs and make informed decisions. Facilitates communication and alignment across departments towards common goals.

- For urban development, users need to align policies, regulations and ongoing projects. This involves continuous monitoring, communication, and knowledge exchange among different departments. - Often urban designs are drawn and assessed based on intuition and are thematically isolated or lack data to inform decisions and develop integrated plans	- Displays interconnected data (e.g., building density, solar energy production, carbon sequestration) instantly, enabling users to evaluate the impact of urban planning decisions based on real-time data, not intuition. - Combines advanced analysis methods, such as overlay analysis, proximity analysis, and network analysis, into a user-friendly interface, reducing the need for specialized expertise. Users can request sophisticated spatial analyses without requiring deep technical knowledge or computational resources.
Customer Gains	Gain Creators
What outcomes or benefits do target users expect? - Expect faster and more informed decision-making when designing urban spaces. City Scan's ability to simulate multiple urban design scenarios quickly provides a more efficient approach than traditional methods, helping users make well-informed decisions on land use, zoning, and infrastructure development. - Offers real-time data integration, combining environmental, economic, and social data into one comprehensive model. Users can see real-time impacts of their design choices, helping them understand the long-term effects of different urban configurations on the environment (e.g., carbon sequestration, energy demand, solar gain). - Enables the creation of climate-resilient urban environments by integrating green infrastructure, solar energy, and climate risk data. Users can simulate different climate scenarios and evaluate decarbonization strategies, supporting efforts to achieve net-zero carbon goals. - Helps visualize different design inputs live during participatory meetings, allowing real-time updates, facilitating stakeholder collaboration, and ensuring that local communities, developers, and government agencies can engage in meaningful discussions about urban design in an understandable way.	How does your solution provide these benefits? - Quickly generate and compare multiple urban design scenarios, assessing impacts on energy consumption, traffic, green space, and more. - Model complex urban systems like solar energy, carbon sequestration, and mobility networks to understand the full impact of design choices on the urban environment. - Transform complex data into easy-to-understand maps, graphs, and charts, making it simple to communicate with non-expert stakeholders. - During community sessions, enable live simulations that reflect real-time feedback, helping stakeholders understand trade-offs and contribute meaningfully to decisions. - Assessments of energy efficiency, solar exposure, and carbon sequestration, allowing planners to focus on strategic decision-making. - Evaluate and balance economic development, social inclusivity, climate resilience, and energy efficiency to optimize urban spaces for multiple goals. - Compare different urban configurations and measure their impacts across multiple domains (e.g., carbon emissions, social equity, energy demand) to find the most comprehensive solutions.

8.5.1.3 IPR Information

Description		Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	Existing Copyright - relies on computer software that needs licensing (Rhinoceros McNeel) - Build in Grasshopper plug-in environment. - Uses range of exclusively open-source libraries for Grasshopper (including Decoding Spaces, as well as environmental analysis tools like Ladybug, Honeybee, and Dragonfly. Additional plugins such as Pufferfish, Fennec, Kangaroo, Human, and Clipper further enriched the design capabilities.)

IPR Foreground	What is the IPR Foreground (Type/Partner)? • What IPR will be generated during the project, and which partner will be the owner? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	We aim for open-source access, but also offer service to operate the tool. Technical knowledge and expertise are required to be able to further develop and operate the tool, even if we shared what it includes and a tutorial. Restrictions or limitations on the use? The tool requires niche knowledge and skills to operate it. Therefore, we offer this as a service.
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8.5.2 KER Exploitation Roadmap

8.5.2.1 Exploitation Activities

	Description	Input (the text in red can be deleted, it's just an example!)
Actions for development	List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	• Conduct other pilot studies, with the aim to optimize and refine the workflow based on the process and feedback • Develop additional functionalities (data visualization dashboards, additional analysis scripts) • Secure additional funding for R&D • Improve the interface of the tool's front-end display - to improve its accessibility and visualization capabilities, while operating the tool live. • Improve the linkages between 3D model, statistical analysis and environmental analysis.
Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• Actively disseminate the solution through networks, webinars, conferences etc. • Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use • Implement a targeted outreach campaign to demonstrate the tool's value for sustainability and resilience goals. Engage city officials, developers, and private sector investors across EU and global markets. • Search and apply for additional funding, such as R&D, EU and similar regional or local funding programs, potentially also to look into start up incubators

Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. Who will be responsible for the exploitation and follow-up actions?	TSPA team is the only partner involved in the development of the tool. We intend to dedicate 2-3 people for further development and adaptation actions. Envisioned roles: technical development expert(s) 1-2 people; Urban Planning and Engagement expert(s)- 1-2 people; Strategic direction and PR – 1-2 people.
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies - Milestone: Completion of additional pilot studies in at least 1 city. - Timeline: Within 1 year of post-project. - Milestone: Establish formal collaboration agreements with at least one key user or institution. - Timeline: Within 1.5 year of post-project. Refinement of Technical Features - Milestone: Refine and integrate the design and analysis scripts – reduce reliance on 3rd party open-source scripts for greater version compatibility and stability. - Timeline: Within 1-year post-project. - KPI: Release of version 2.0 of the solution or methodology. - KPI: Replace 75% of plugin components with native / in-house components. - Milestone: Integrate better front-end visualization. - Timeline: Within 2.5 years post-project. - KPI: Release of version 3.0 of the solution or methodology. Funding for R&D - Milestone: Submission of at least two funding proposals for further research or development. - Timeline: Within 1 year of post-project. For use: Dissemination Efforts - Milestone: Launch outreach campaign with case studies and demonstrations to attract new users. - Timeline: Within 6 months post-project

8.5.2.2 Financial & Sustainability Plan

	Description	Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	- Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies etc.) - Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. - Dissemination, promotion and outreach - Personnel costs for tool refinements and further improvements
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	- Consulting contracts and service – we intend to offer the consulting services to cities and developers who require specific use cases, custom modeling, or in-depth analysis - Partnerships, research and funding programs: we aim to apply for other funding programs aimed at supporting smart cities, sustainable urban development, or climate resilience. - Public-Private Partnerships: Partner with local government bodies, private developers, or research institutions that could benefit from using the tool as part of their scope and projects
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	- TSPA intends to allocate a portion of its internal budget to ensure that the tool continues to operate and refine the product during the early post-project period. - Apply to secure funding from research or local programs aimed at climate adaptation, urban innovation, and sustainability, smart city development. - Explore potential to secure venture capital.

8.5.2.3 Funding Mechanisms

EU	Potentially: European Urban Initiative (EUI) URBACT Programme Horizon Europe LIFE Programme European Investment Bank (EIB)
National	Potentially: KfW Development Bank Programs giz Funding programs Model Projects Smart Cities Städtebauförderung (Urban Development Support)
Regional	Potentially: Berliner Innovationsfachkräfte / Berlin innovation experts Berlin Innovativ PLUS ProNTI Wachstums- & Innovationsförderung Programm für Internationalisierung - Förderung von KMU-Projekten Mikrokreditfonds Deutschland/Mikrokredit aus dem KMU-Fonds GRW - Gemeinschaftsaufgabe "Verbesserung der regionalen Wirtschaftsstruktur"

	IBB - Berliner InvestitionsBONUS IBB - PFI: Grants for cross-border co-operation
Private	Potentially: INVEST – Zuschuss für Wagniskapital / INVEST – Venture capital grant

8.5.2.4 Standardization Roadmap

	Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	Data Protection and Privacy Standards: Standards such as GDPR in the EU dictate how user data will be handled and protected. Data protection is essential for the Spatial Analysis tool to store sensitive urban data such as demographics, or average income. OGC Standards: Open Geospatial Consortium standards, such as the GML, and shapefiles are important to ensure interoperability of Geospatial data. - CityGML – A standard for 3D city models City Scan uses spatial data and could integrate with or export to CityGML for interoperability in urban planning systems. - OGC API – Features & WPS (Web Processing Service) Enables standardized exchange and processing of geospatial data, valuable for embedding City Scan into broader data platforms. ISO 37120 – Sustainable cities and communities – Indicators for city services and quality of life - Relevance: City Scan outputs (e.g., walkability, energy demand, solar potential) can map to this standardized set of urban KPIs. ISO 37123 – Indicators for resilient cities - Relevance: Directly applicable to climate resilience assessments that City Scan supports. ISO 37101 – Management system for sustainable development in communities - Relevance: City Scan aligns with this by helping integrate sustainability in urban design and planning workflows.
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	n/a
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	n/a
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	n/a

Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	n/a
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	n/a
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	n/a
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	n/a

8.6 Climate proofing - BH

8.6.1 KER Characterization

8.6.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The tool analyses climate impacts of new urban development projects and fosters a climate-proof decision-making process in urban development projects. It equally supports climate mitigation and climate adaptation through identifying pathways for climate neutrality and resilience in early planning stages, in order to integrate project specific measures that support a climate sensitive urban development on site. The Climate Proofing Tool aims to integrate climate mitigation with adaptation strategies, allowing for future-proofing and assessments of projects. In UP2030, we develop the tool further, detailing out individual steps across the Climate Proofing process, allowing municipalities to link mitigation and adaptation strategies to their individual planning processes across various departments. Initially focusing on new built projects, through UP2030, an emphasis on existing projects / refurbishments will be added. While originally encompassing a focus on urban development and planning, Climate Proofing methodology will encompass a strong focus on process-oriented outcomes, supporting organisations. While originally focusing solely on planning aspects, through UP2030, a participatory component will be developed, highlighting UP2030's pillar Just Transition.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	The primary users of the Tool should be the Planning Department of a Municipality, as it helps identifying pathways for climate neutrality and resilience in early planning stages. Additionally, the Tool is designed for Architects, Urban Designers, Public Authorities, Climate Units and other Municipality Stakeholders. It targets all the figures who play an active role in decision-making processes within a Municipality or a City.

Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	A possible lack of coordination and communication between different stakeholders and their associated ambitions for a project A possible lack of available project-specific data in early project phases that needs to be overcome;
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	By addressing climate mitigation and adaptation already in early planning stages and delivering project specific results, solutions for a more climate sensitive urban development can be integrated. Our goal is to expand the Climate Proofing methodology approach for straightforward application to different projects and contexts, also with limited data availability. Previously, the approach has been applied mainly in neighborhood development and planning. Currently, the methodology is getting further developed and adjusted to allow supporting various departments of municipalities, to collaborate between individuals that are or are not directly involved in climate mitigation or adaptation projects. The tool is innovative as it equally addresses climate mitigation and climate adaptation. It integrates synergies between mitigation and adaptation measures, aiming that measures on mitigation don't negatively affect adaptation and vice versa.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	By the end of UP2030 all of our results feed into a Methodology handbook, a downloadable document that highlight the step-by-step process of Climate Proofing in municipalities. The handbook will guide the user through each step of the methodology, without additional support needed. Upon closing of UP2030, it is aimed to have achieved the following outputs: - Methodology handbook, highlighting the step-by-step process of Climate Proofing in municipalities - Development of a Climate Proofing Guideline for the City of Münster, applied on their pilot project Frauenstraße. The long-term vision is to translate knowledge and expertise in an online tool for climate just district development and decision-making processes. Overarching results will be Public on Büro Happold Homepage
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The solution and the methodology will be completed within the UP2030 framework. All the deliverables (methodology handbook, Climate Proofing Guideline Münster) can be published by the end of the year 2025. Nevertheless, the realization of an online tool could require more time to be developed.
Exploitation Route	Linked to the "use model", specify the key exploitation route(s) – how the solution will be made available to the target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party).	The tool will be mainly used directly by the Municipalities who want to integrate adaptation and mitigation measures in their planning visions. It can also be used directly by any other users that as an interest on it, for example city's stakeholders or even research projects or educational program.

	**Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs; publications Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	The tool also allows an indirect use and the main application could be the creation of new project's standard based on the Tool's guidelines and principles.
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Environmental: By addressing climate mitigation and adaptation already in early planning stages and delivering project specific results, solutions for a more climate sensitive urban development can be integrated. Especially by calculating expected CO2 emissions and pathways for reduction, a climate neutral urban development can be achieved.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Rotterdam, Munster
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	Since the beginning of UP2030, the Tool has been implemented in the <i>Neue Mitte Tempelhof</i> project.

8.6.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs <i>What tasks are your target users trying to accomplish?</i> - Define project benchmark, visions and ambitions; - Identify available data on the project on climate impacts and risks; - Define reference data where project specific information are not available	Products & Services <i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> - The tool is a methodology to quickly assess an urban development project's potentials towards climate change mitigation and adaptation. - The tool enables quantified high-level recommendations and steps toward climate-neutral and -resilient neighborhood development.
Customer Pains <i>What challenges, risks, or obstacles do your target users face?</i> - A possible lack of coordination and communication between different stakeholders and their associated ambitions for a project - A possible lack of available project-specific data in early project phases that needs to be overcome;	Pain Relievers <i>How does your solution reduce or eliminate target users pains?</i> - Climate proofing offers approaches and methods to respond to a lack of project specific data through the integration of reference data, local policies and targets and existing frameworks; - the method of climate proofing helps in linking different project stakeholders through an integrated approach to the topics of climate mitigation and adaptation - the method specifically targets different stakeholder in local/ municipal authorities in building local capacities in the fields of climate mitigation and adaptation;
Customer Gains <i>What outcomes or benefits do target users expect?</i>	Gain Creators <i>How does your solution provide these benefits?</i>

- Developing baseline and climate mitigation/adaptation scenarios; - Enabling cities to address their emissions and setting a foundation to build local capacities for tackling climate mitigation and adaptation - Early-stage high-level recommendations for potential climate risk reduction and effective climate mitigation that can be integrated into the further development and the following decision-making process	- The methodology offers guidance and advisory on climate mitigation & adaptation assessments to enable the codesign of adaptive pathways for a climate-neutral and climate resilient urban transformation; - the method specifically enables cities and responsible stakeholders to address the associated emissions and climate risks; - Climate proofing enables the setting of a foundation to build local capacities for tackling climate mitigation and adaptation
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8.6.1.3 IPR Information

Description	Input
IPR Background List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	When applying the tool in a quantitative manner (including calculations and simulations), access to software with pre-existing IPRs might be required. This relates to climate risk simulation software and carbon accounting software.
IPR Foreground What is the IPR Foreground (Type/Partner)? • What IPR will be generated during the project, and which partner will be the owner? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	We aim for open-source access of the tool and offer the implementation of the tool as a service. The implementation requires technical knowledge and expertise in the areas of climate mitigation and adaptation. Restrictions or limitations on the use? The tool is a methodology for developing and implementing climate mitigation and resilience on the urban scale and requires knowledge and skills to operate it. Therefore, we offer this as a service. Ownership relates to the methodology of the tool but to software IPRs

8.6.2 KER Exploitation Roadmap

8.6.2.1 Exploitation Activities

Description	Input (<i>the text in red can be deleted, it's just an example!</i>)
Actions for development List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	• Develop additional functionalities like an interactive online Tool. • Implementation actions to disseminate the Tool and to find new application's projects.

Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• <u>Feedback mechanism</u>: collect feedback within a period of time of 12 months after the adoption of the Tool. • <u>Continuous Improvement</u>: Plan for regular updates and improvements based on user feedback and technological advancements. • <u>Spread the Knowledge</u>: actively disseminate solution through networks, conferences, webinars, research papers, etc. • <u>User mapping</u>: internal session on the identification of possible future users • <u>Actively looking for opportunities</u> to identify potential future implementation
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	• Büro Happold (direct responsible as owner of the Tool) • Municipality • City practitioners
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	Expansion of Technical Features • Milestone: Visualization and communication development. • Timeline: Within 12 months post-project. • KPI: Release of version 2.0 of the solution or the Tool, consisting in an online interactive platform. Dissemination Efforts • Milestone: Organize at least three dissemination (events organize conferences, webinars, network participations) and publish papers. • Timeline: Within 6 months post-project • KPI: number of events, attendance rate, participant feedback, follow-up action User mapping and future implementation • Milestone: Establish formal collaboration agreements with at least three key users or institutions. • Timeline: Within 6-12 months post-project. • KPI: assess the strategic value and potential impact of each collaboration, monitor the progress of collaborative initiatives, measure the benefits gained by both parties, collect feedback from key users/institutions

8.6.2.2 Financial & Sustainability Plan

Description	Input
Cost requirements Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	- Operational costs (hosting and maintenance of digital platforms or tool.) - Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. - Dissemination, promotion and outreach
Revenues sources Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	The Tool is designed to operate without cost, making it highly sustainable. The only expense incurred is for the technicians or consultants who will guide the city's practitioners in utilizing the Tool. Therefore, leveraging the stakeholders' market presents a viable opportunity to secure the necessary funding for continuous improvements. Additionally, stakeholders can provide financial support to municipalities that wish to integrate the Tool into their planning processes, ensuring broader adoption and enhanced functionality.
Costs coverage sources Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	Potential funding sources can be: - project grants (State and Regional grants, private foundations, local grants). For example, National funding scheme in acquiring project in the field of mitigation and adaptation and this could be a good opportunity to implement the Tool. - partner's or client's own budget. Municipality itself can provide the necessary funds to support the Tool.

8.6.2.3 Standardization Roadmap

Description	Input
Existing standards Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	Check UCAM Deliverable 3.6 German BSKO Standard (published by the German Environment Agency) - European Standard: ISO 14040 and EN ISO 15804 - Standard for modelling of microclimate including Universal Thermal Climate Index (UTCI) or similar.
Alignment with standards Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	
Standardisation bodies/committees What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	
Engagement with bodies/committees Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	

Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	

8.7 DRAXIS Decision Support System (DSS)

8.7.1 KER Characterization

8.7.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	DRAXIS DSS is a state-of-the-art Geospatial Intelligent Platform with clear vision of providing innovative tools and services to citizens and organizations. The tool offers a complete solution for the collection, processing, analysis and visualization of data via geospatial intelligence and machine learning algorithms in order to produce new information and services that will elevate the municipality, the people and their potential.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Policy and Decision-makers, Urban Planners in any location.
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which your solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Decision-makers and urban planners are trying to develop policies that will guide the development and management of cities. In doing so, they face a few challenges: Limited resources, Rapid urbanization, climate change, Political pressures, Stakeholder engagement, Complex regulations and bureaucracy. Effective and engaging visualization approaches combined with AI based DSS tool will assist decision making processes.
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	DRAXIS DSS offers a powerful collection of tools to the intelligent city of the future that tackles the energy crisis and climate change and enhances the daily lives of citizens. Using modern visualization tools, backed up with AI for decision support, stakeholders can reveal information that is hidden among the variety of city data to assist on a) reduction of the operating costs in areas such as waste management, building and street lighting, energy, water and

		public transport, b) urban planning, c) tackling air pollution and climate change, and d) mobility and parking, e) any other challenge related to spatial planning in urban environments.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	Web-based platform. User support: a service (consulting) will also be provided to cities
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	TRL 9 will be reached by the end of 2025
Exploitation Route	Linked to the "use model", specify here the key exploitation route(s) – how the solution will be made available to the target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Commercialization; Contract research (with external target users); A new research project; Implementation in education programs, publications, etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Commercialization: asset sale, users pay a subscription or licensing fee to access the platform's tools Consulting services: DRAXIS DSS will be complemented by consulting services to assist cities in effectively implementing the platform Technology transfer: licensing
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact/environmental impact etc.	Scientific: DRAXIS DSS can contribute to advancements in data science and urban analytics. It enables researchers to explore new methodologies for analyzing urban environments, leading to improved decision-making frameworks and knowledge creation. Economic: the commercialization of DRAXIS DSS creates new business opportunities and stimulates the urban tech market
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Thessaloniki (Additionally the tool can be easily utilized by any city interested to integrate geospatial information)
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	No

8.7.1.2 Value Proposition Canvas

Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used? DRAXIS DSS is a state-of-the-art Geospatial Intelligent Platform with clear vision of providing innovative tools and services to citizens and organizations. The tool offers a complete solution for the collection, processing, analysis and visualization of data via geospatial intelligence and machine learning algorithms in order to produce new information and services that will elevate the municipality, the people and their potential.

Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Policy and Decision-makers, Urban Planners in any location.
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which your solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Decision-makers and urban planners are trying to develop policies that will guide the development and management of cities. In doing so, they face a few challenges: Limited resources, Rapid urbanization, climate change, Political pressures, Stakeholder engagement, Complex regulations and bureaucracy. Effective and engaging visualization approaches combined with AI based DSS tool will assist decision making processes.
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	DRAXIS DSS offers a powerful collection of tools to the intelligent city of the future that tackles the energy crisis and climate change and enhances the daily lives of citizens. Using modern visualization tools, backed up with AI for decision support, stakeholders can reveal information that is hidden among the variety of city data to assist on a) reduction of the operating costs in areas such as waste management, building and street lighting, energy, water and public transport, b) urban planning, c) tackling air pollution and climate change, and d) mobility and parking, e) any other challenge related to spatial planning in urban environments.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	Web-based platform. User support: a service (consulting) will also be provided to cities
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	TRL 9 will be reached by the end of 2025
Exploitation Route	Linked to the "use model", specify here the key exploitation route(s) – how the solution will be made available to the target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Commercialization; Contract research (with external target users); A new research project; Implementation in education programs, publications, etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Commercialization: asset sale, users pay a subscription or licensing fee to access the platform's tools Consulting services: DRAXIS DSS will be complemented by consulting services to assist cities in effectively implementing the platform Technology transfer: licensing
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact/environmental impact etc.	Scientific: DRAXIS DSS can contribute to advancements in data science and urban analytics. It enables researchers to explore new methodologies for analyzing urban environments, leading to improved decision-making frameworks and knowledge creation.

		Economic: the commercialization of DRAXIS DSS creates new business opportunities and stimulates the urban tech market
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Thessaloniki (Additionally the tool can be easily utilized by any city interested to integrate geospatial information)
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	No

8.7.1.3 Market Analysis

	Description	Input
Market information	Provide information on market: Description; trends; size	Description: urban technology and smart city solutions market. This market addresses the growing need for data-driven decision-making in cities Trends: increasing adoption of geospatial intelligence and AI in urban planning; growth in smart city initiatives driven by government and private investments Size: global smart cities market was valued at approximately \$410 billion in 2022 and is projected to grow at a CAGR of 23% from 2023 to 2030
Competitors	What are your “competitors” (the ones offering “alternative solutions”)?	Siemens Smart Cities Solutions; UrbanFootprint; Esri ArcGIS; GIS Cloud
SWOT	Provide information on - Strengths (internal – innovations, unique value proposition of your solution) - Weaknesses (internal – barriers to entry and adoption) - Opportunities (external – market opportunities, growth potentials potentials) - Threats (external – risks in market, including competitors, regulatory or policy changes, etc.)	S: combines geospatial intelligence and machine learning for advanced urban analytics; all-in-one platform addressing waste management, air pollution, mobility, and resource efficiency; flexible platform that can be adapted to various city sizes and requirements W: high dependency on municipal budgets, which can vary significantly; need for extensive training for users unfamiliar with geospatial analytics; resistance from users accustomed to traditional planning methods O: increasing governmental mandates for data-driven urban development; growth in smart city initiatives driven by government and private investments T: high competition that dominates the market; regulatory or policy changes

8.7.1.4 IPR Information

	Description	Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement	Copyright, owned by DRAXIS
IPR Foreground	What is the IPR Foreground (Type/Partner)? - what IPR will be generated during the project? - Do you foresee a need to sign further agreements, such as joint ownership?	The DSS itself belongs to DRAXIS. However other tools that might intergrade to the DSS belong to the respective providers of the tools. The tools themselves are not directly integrated into the DSS; only their outputs (e.g., processed data) are integrated. Therefore, licensing agreements should focus on ensuring

	**If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/multilateral Memorandum of Understanding agreements should be signed among relevant partners	the outputs comply with the appropriate usage rights rather than obtaining licenses for the tools themselves
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8.7.2 KER Exploitation Roadmap

8.7.2.1 Exploitation Activities

	Description	Input
Actions for development	List and describe the specific actions you will take to finish developing your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	- Develop additional functionalities (data visualization dashboards, etc.) - Secure additional funding for R&D
Actions for adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively - What steps will you take after the project ends to ensure the solution is adopted? - What additional developments or resources will be needed to guarantee that the solution is utilized effectively? - Will you need to secure a budget? - Will additional analysis of market drivers, target users, and business models be required to estimate costs?	- Develop a comprehensive user guide to facilitate adoption - Develop a marketing and sales strategy - Establish dedicated customer support services - Develop partnerships with distribution channels - Offer customized integration services - Organize training workshops for target users to demonstrate use of the solution - Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. Who will be responsible for the exploitation and follow-up actions?	DRAXIS
Milestones	Describe potential KPIs and monitoring parameters within a specific timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies - Milestone: Completion of additional pilot studies in at least one different context. - Timeline: Within 9 months post-project. Refinement of Technical Features - Milestone: Finalization of updated technical specifications and methodologies based on pilot feedback. - Timeline: Within 9 months post-project. - KPI: Release of version 2.0 of the solution or methodology.

		Funding for R&D • Milestone: Submission of at least two funding proposals for further research or development. • Timeline: Within 12 months post-project. For use: Dissemination Efforts • Milestone: Organize or participate in at least three dissemination events (webinars, conferences, or network presentations). • Timeline: Within 9 months post-project
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8.7.2.2 Financial & Sustainability Plan

Description		Input
Costs	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. Outline the necessary expenses and investments to ensure a smooth transition from the project's completion to the next phase. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	• Operational costs: hosting and maintenance of digital platform, software updates. • Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. • Dissemination, promotion and outreach
Revenues	Identify the revenues expected from exploiting or ensuring the use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • How will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?	• Contracts with government and municipal agencies. • Contracts with the private sector.
Other sources of coverage	Define how costs will be managed until a sustainable funding model is secured (i.e., before collecting the first revenue). **Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	• Internal budget • National and European research funds

8.7.2.3 Funding Mechanisms

Description	
EU	EU Research Projects
National	National research projects
Regional	

Private

Contracts in the private sector: Urban planning, architectural/construction firms.

8.7.2.4 Standardization Roadmap

Description		Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	Technical standards related to system interoperability and file formats (e.g., .shp files for geospatial data) are relevant to the solution's application. The DRAXIS DSS is a versatile platform that can be applied across various sectors and domains, meaning that sector-specific standards (e.g., environmental, urban planning, mobility) may be applied depending on the use case.
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	Alignment with technical/interoperability standards.
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	- Open Geospatial Consortium (OGC), - ISO/TC 211 – Geographic Information/Geomatics, - CEN/TC 287 – Geographic information.
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	No. Engagement with standardization efforts may be considered in the future, depending on solution maturity and available resources.
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	No
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	DRAXIS DSS could potentially contribute to future discussions around the practical implementation of spatial data infrastructures and interoperability between smart city tools, depending on the maturity of the solution and the availability of resources. Its modular and scalable design positions it well to inform best practices for integrating heterogeneous environmental and urban data sources.
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	Aligning with technical standards improves data interoperability, scalability, and integration with external systems (e.g., city dashboards, national spatial data infrastructures). Since DRAXIS DSS is a technical solution, alignment with relevant technical standards is, to an extent, mandatory to ensure the usability, reliability, and seamless integration of the platform across diverse contexts and systems. Alignment with organizational, quality, legal and vector-specific standards would facilitate wider adoption by end-users and relevant stakeholders and ensure compatibility with established practices, official guidelines and other tools.
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	Barriers include the cost and time required for formal engagement in standardization activities. However, alignment and adoption of standards remains a priority.

8.7.3 Tools integration – plans for possible joint exploitation

Description		Input
Existing Bundle of tools during the project	Is your solution currently part of a bundle of tools within UP2030? If yes, also specify:	No
	Which other solutions are part of the bundle?	-
	Is your solution being implemented as part of the bundle in any UP2030 cities, or any other cities?	-
	Is the bundle expected to be maintained after the project ends?	-
	How does the bundling of the solutions benefit you as a solution provider?	-
	How does the bundling of the solutions benefit your target users?	-
Potential bundling of tools post-project	Do you envision, or would you be interested in, bundling your solution with any other solution part of the project for collaboration after UP2030? If yes, also specify:	Yes. DRAXIS DSS is designed to easily integrate with other tools and results that include spatio-temporal dimensions or rely on geospatial data and analytics.
	Which solutions would you like to collaborate with?	Solutions related to urban monitoring, scenario simulation and modelling, climate impact assessment, or any data-driven decision-support tools developed within UP2030.
	Why would this collaboration be beneficial (e.g., synergies, shared user base, complementary functions)?	Creation of synergies, and enrichment of data inputs. User groups would benefit from having interoperable solutions in one ecosystem.
	Are there specific urban challenges or end-user needs that you think could be better addressed through bundled solutions?	Urban challenges related to climate adaptation, sustainability, and resilience. These challenges are complex and influenced by a wide range of interdependent parameters. This complexity often makes understanding and addressing such issues difficult when using isolated tools. Bundled solutions allow for the integration of complementary data, perspectives, and functionalities, enabling a more holistic approach.
	Are there barriers (e.g., technical, financial, or IP-related) preventing such collaborations from being pursued?	Potential technical barriers may include interoperability limitations or the need for custom APIs to enable smooth integration between different tools. However, the DRAXIS DSS is specifically designed to easily integrate with diverse solutions, thanks to its modular architecture, support for open standards, and ability to process and visualize data from heterogeneous sources. This, significantly lowers integration barriers and facilitates collaboration with complementary tools and services.

8.7.4 Business Model Canvas (BMC)

Business Model Canvas		
Key Partners - Cities, liaisons, municipalities, public authorities. - Technology providers (data sources, API, IoT platforms). - NGOs focused on sustainable cities. - Regional development agencies.	Key Activities - Requirement gathering and analysis. - Continuous development and improvement. - Integration of multiple data sources. - Tool customization and localization for cities. - Client onboarding, support and training. - Performance monitoring and user feedback. - Participating in research and innovation projects.	Value Proposition - Improved understanding of urban challenges and pattern recognition and enhanced situational awareness through data fusion and visualization - Integrated decision support with focus on urban sustainability. - Improved city resources management. - Support for climate neutrality and climate resilience goals. - Facilitation of stakeholder engagement and transparent policy making.
Customer relationships - Onboarding and training sessions. - Ongoing technical assistance. - Follow-ups and feedback loops. - Customization for city-specific needs.	Customer Segments - Cities and liaisons. - Urban and regional planners - Public agencies. - Policy makes and sustainability officers.	
Key Resources - Data. - Data Management Systems and hardware and software infrastructure. - UI, UX and visualization. - Security and data protection. - Continuous Monitoring and Improvement. - Partner networks.	Channels - Direct B2G sales - EU project collaborations - Workshops, webinars - Pilot showcases	
Cost Structure - Development teams and engineers - Infrastructure and hosting technology. - Customization and integration efforts. - Platform updates and maintenance. - Marketing and outreach.	Revenue Streams - Licensing or subscription fees for the DSS platform. - One-off fees for deployment and customization. - Consulting services for integration and analysis. - (Potential) freemium or open-source base with premium modules.	

8.8 Ecosystem Services Assessment

8.8.1 KER Characterization

8.8.1.1 Overview

Description		Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The tool is open source and serves as a workbench containing over thirty separate modules related to the ecosystem services that are intended to be computed. The proposed solution makes it possible to evaluate the supply

		of ecosystem services, including cultural ones, as well as the traditional ones linked to regulation, provisioning and life support services. Through the tool, the user is able to integrate the assessment of ecosystem services into the decision-making process of urban transition projects. The solution we provide involves delivering output data in a readable and comprehensible format, in the form of an analytical report capable of explicating the results of the assessment.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Urban Planners and Designers – To integrate ecosystem services into land-use planning, zoning, and sustainable urban development strategies. Local and Regional Governments – For informed policy-making, environmental impact assessments, and regulatory compliance in urban growth management. Environmental Agencies and Regulators – To evaluate and enforce environmental policies, biodiversity conservation measures, and climate resilience initiatives. Landscape Architects – To incorporate nature-based solutions in urban green space planning and design. Real Estate Developers – To assess the environmental value of developments, enhance sustainability credentials, and comply with green building standards. Infrastructure and Transportation Planners – To integrate ecosystem services in the planning of roads, public transport, and other urban infrastructure while minimizing ecological impact. Academics and Researchers – To advance knowledge on ecosystem services, urban ecology, and the socio-economic benefits of nature in cities. Non-Governmental Organizations (NGOs) and Advocacy Groups – To promote sustainable urban development, green infrastructure, and environmental justice. Financial Institutions and Investors – To evaluate environmental risks and opportunities associated with urban development projects, particularly in ESG (Environmental, Social, and Governance) investment frameworks. Public Health Authorities – To assess the role of green spaces in improving air quality, reducing urban heat islands, and enhancing public well-being. Community Groups and Citizens – To support participatory decision-making, urban greening initiatives, and community-led sustainability projects. Technology and Smart City Developers – To integrate ecosystem services data into digital platforms, GIS tools, and AI-driven urban planning solutions.
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Subjects such as cities are trying to put attention back to nature at the center of local policies and territorial government actions and planning that is sustainable and resilient to the challenges of climate change. In the technical urban planning and architectural fields it is to be considered fundamental in order to be able to fully exploit the conversion of spaces into environments that generate the

		greatest number of positive externalities understood as environmental, social and economic. Urban planners, policymakers, and developers often struggle with making data-driven decisions due to a lack of comprehensive, real-time insights on ecosystem services. This can lead to urban development that overlooks long-term environmental and social benefits. Additionally, balancing economic growth with sustainability remains a challenge, as decision-makers lack tools to effectively quantify and integrate nature-based solutions. Collaboration is another key issue—planning involves multiple sectors, but fragmented data and differing priorities make coordination difficult. A decision-support tool for ecosystem services can address these challenges by providing clear, actionable insights through geospatial data and predictive models. It helps justify investments in green infrastructure by quantifying benefits like air purification, flood mitigation, and climate resilience. Moreover, its user-friendly interface fosters collaboration, allowing different stakeholders to engage in informed, consensus-driven planning for more sustainable urban development
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	The approach looks to the ecosystemic potential of urban transformations. It enables users to compare and choose the best solution from an ecosystem perspective, while also calculating the Total Economic Value (economic, social, and environmental) of the transformation in a very short time. Through the tool, the user is able to integrate the assessment of ecosystem services into the decision-making process of urban transition projects. Through this integrated tool, the values of improvement in ecosystem performance are calculated. This is crucial for substantiating the project hypothesis and providing greater strength in narrating solutions for adapting to and mitigating the effects of climate change. The tool significantly reduces the user's workload compared to searching and training in the scientific field related to the assessed ecosystem service. Time and manpower hours are greatly reduced through the use of the tool, and even for sourcing data, once the structure is understood, it becomes easy to assess various project scenarios quickly.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	The intended use for the end user is structured around the essential support of the guidance document and report for the management and processing of input data, providing an application case study on the pilot, exemplifying the input data of the models. Furthermore, regarding the software product, it is available in an open format and provided by the organization Natural Capital for any type of user interested in conducting such assessments. The implementation of analyses is intended for users with technical expertise in GIS, capable of bridging the knowledge gap required to perform the evaluations. Our future contribution to technical support could serve as a means to bring our expertise and awareness of the tool's use to the market.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)?	Already implemented

	**The TTM can include post-UP2030 plans	
Exploitation Route	Linked to the “use model”, specify the key exploitation route(s) – how the solution will be made available to target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Training and Support – Webinars, workshops, and online documentation will ensure users can maximize the tool’s potential, fostering widespread adoption across different sectors. GIS Integration – Compatibility with Geographic Information Systems (GIS) like ArcGIS and QGIS, enabling urban planners and environmental agencies to incorporate ecosystem service assessments into their spatial analysis workflows.
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Environmental: enhanced ecosystems management - it supports decision-making to minimize environmental degradation and promote sustainability, identify areas requiring conservation/restoration; support for climate action Societal impact: improved decision-making; reduced barriers to expertise; time and resource efficiency; increased awareness
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Milan
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	no

8.8.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish?	<i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> The tool is open source and serves as a genuine workbench containing over thirty separate modules related to the ecosystem services that are intended to be computed. The solution we provide involves delivering output data in a readable and comprehensible format, in the form of an analytical report capable of explicating the results of the assessment.
Target users Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face?	<i>How does your solution reduce or eliminate target users pains?</i> Reduction the user's workload compared to searching and training in the scientific field related to the assessed ecosystem service. Time and manpower hours are greatly reduced through the use of the tool, and even for sourcing data, once the structure is understood, it becomes easy to assess various project scenarios quickly.

	The technical support and guidance we provide are capable of compensating for the lack of preliminary expertise on the part of the end user. In this way, common errors are highlighted during the explanation and initial usage guidance phase to prevent their repetition in the future, expediting the learning curve of the tool.
Target users Gains	Gain Creators
What outcomes or benefits do target users expect?	How does your solution provide these benefits? The solution enables users to compare and choose the best solution from an ecosystem perspective, while also calculating the Total Economic Value (economic, social, and environmental) of the transformation in a very short time. Through the tool, the user is able to integrate the assessment of ecosystem services into the decision-making process of urban transition projects. Through this integrated tool, the values of improvement in ecosystem performance are calculated

8.8.1.3 IPR Information

Description		Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	Copyright: LINKS Foundation
IPR Foreground	What is the IPR Foreground (Type/Partner)? • What IPR will be generated during the project, and which partner will be the owner? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	

8.8.2 KER Exploitation Roadmap

8.8.2.1 Exploitation Activities

	Description	Input (<i>the text in red can be deleted, it's just an example!</i>)
Actions for development	List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	Solution will be finished by the conclusion of the project
Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	Collaborate with target users to implement solution Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	Milestone 1: Post-Project Technical Roadmap Finalization (Month 1-6) KPI: Defined roadmap outlining key R&D priorities, necessary upgrades, and resource allocation. Monitoring Parameter: Documented technology development plan aligned with TRL advancement targets. Milestone 2: Prototype Optimization & Beta Testing (Month 6-12) KPI: Completion of an improved version with refinements based on feedback from project-phase users. Monitoring Parameter: Successful pilot testing with at least 3-5 early adopters from target sectors.

8.8.2.2 Financial & Sustainability Plan

Description	Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. • Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.

8.8.2.3 Standardization Roadmap

Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.

Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	

8.9 UDCW Methodology & Tools

8.9.1 KER Characterization

8.9.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The UDCW Methodology is offered as a service to support local authorities and practitioners in measuring the effectiveness of different planning and design solutions at quantitative (modelling of environmental indicators) and qualitative level (engagement, co-design, evaluation of co-benefits. It aims to integrate and scale-up climate change mitigation and adaptation in cities through knowledge sharing, collaboration, and action planning. It includes: The UDCW simulation toolkit consists of a set of IT tools (GIS and 3d Modelling Algorithm Aided Design tools) for heat waves and flood impact assessment in relation to climate projections and the effect of urban microclimate (urban morphology, land cover, building and open spaces features, etc.). Depending on available data, typical output include assessment of current conditions and future scenarios based on planning and design inputs at: 1) city/district scale, as GIS maps including the following output data (resolution 250m): <i>Heat Wave Hazard analysis</i> - Mean Radiant Temperature (TMRT) [°C], Universal Thermal Climate Index (UTCI) [°C], Apparent Temperature [°C], Land Surface Temperature [°C]; <i>Heat Wave Impact analysis</i> - Hospitalisation costs [€], Mortality rate [%]; <i>Flood Hazard analysis</i> - Flood probability index [-]; <i>Flood Impact analysis</i> - Building damage (structure and content) [€], Road infrastructure damage (cleaning and repairing) [€]; <i>Energy analysis</i> - Average building energy consumption [kWh/m2y], Renewable energy production potential [kWh/y]; <i>Carbon analysis</i> - Carbon storage potential from vegetation [tCO2/y]; 2) neighbourhood/building scale, as 3D models including the following output data (resolution 5m): <i>Thermal comfort analysis</i> - Mean Radiant Temperature (TMRT) [°C], Universal Thermal Climate Index (UTCI) [°C], Indoor Predicted Mean Vote [PMV]; <i>Energy analysis</i> - Energy consumption [kWh/m2y], Renewable energy production potential [kWh/y]; <i>Carbon analysis</i> - Carbon Footprint of Building Materials [tCO2/ y], Carbon storage potential from vegetation [tCO2/y]. The UDCW Facilitation Toolkit: The toolkit includes a variety of participatory exercises that allow a flexibility of use. The tools can be tailored case by case and they can be implemented according to the aim of the activities and the typology of information required by the design and planning process. It is composed of: 1. Collaborative mapping through analogic (boards/stickers) or digital (PGIS Participatory Geographic Information System) tools (Collaborative mapping with experts and non-experts); 2. City visions and local needs matching (Priority mapping/co-design exercise with non-experts); 3. A day in the life (Visioning exercise with experts and non-experts); 4. 3D neighbourhood configurator tool

		(co-design exercise with experts). UDCW co-design workshop session can host 10-100 people simultaneously. Where needed, workshop involving representatives of local authorities and experts can be conducted separately from those including community members and grassroots organizations. Typical output include: 1) shared knowledge maps (provided through online mapping tools); 2) stakeholders and community priorities mapping (provided as structured set of design input for buildings, open spaces and infrastructure, and visuals showing current conditions vs. desired future)
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Urban planners and designers (from both public and private sector) as Capacity Building program and/or consultancy on a specific project. Graduate students (MSc, PhD level) as Educational program for multidisciplinary classes (architecture, planning, engineering, social sciences, geography, ecology, agroforestry, climate science, computer science)
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Integrated assessment of potential benefits of proposed urban transformations with respect to climate resilience, carbon neutrality and spatial justice; Define a structured process for climate resilient urban design and planning since the early stage of the project; Identify hotspots for climate extremes impacts and main drivers of carbon emissions in the local context; Develop participatory and Community-based processes for adaptation and mitigation delivering tangible input for planning and design; Evaluate the best options for urban transformations at multiple scales through quantitative indicators;
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	Innovative aspects of the UDCW methodology can be recognized in: - provision of a set of designer/planner friendly interoperable tools that are able to assess the climate benefits of different planning and design strategies at different scales both in terms of comfort quantitative indicators and quanti/qualitative co-benefits indicators starting from few input parameters (urban morphology, climate data, land uses, etc.); - understanding of the relation between socio-spatial justice and climate justice providing tools that can spatialize community needs that are often not directly climate related, matching them with climate-resilient design opportunities; - integration of quantitative and qualitative analysis. The management of different types of data in the same working environment is a value proposition related to the potentiality of streamlining the design and planning process basing on the assessment of social, economic, and environmental co-benefits associated with climate-resilient development strategies and on the survey of community-based assets UDCW simulation tools: One of the most innovative aspects of the toolkit certainly lies in its planner/designer-friendliness and the ability of testing the effect of alternative strategies already at a conceptual stage of the development project. UDCW facilitation toolkit: The innovation related to the implementation of the UDCW Facilitation toolkit relies on the understanding of the relation between socio-spatial justice and climate justice providing tools that can spatialize community needs that are often not directly climate related, matching them with climate-resilient design opportunities.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	Provision of a service: depending on the location, the objective, the available resources and participants, different typologies of Urban Design Climate Workshops have been designed: Knowledge Exchange, with panel discussion/post-it session prompted by a pitch from UCCRN facilitators, session or side event within a conference Capacity Building, workshop with multidisciplinary UCCRN experts and local authorities' representatives (experts, scientists, practitioners, local authorities and communities) Design Studio, a workshop with multidisciplinary UCCRN experts and students/practitioners (experts, scientists, students/practitioners, local

		stakeholders and communities), with an opening conference and a final presentation as events involving also external audience The UDCW methodology is supported by the following toolkits: - UDCW Simulation toolkit - UDCW Facilitation toolkit
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The solution is ready for implementation. Major updates to the simulation toolkit are expected by mid-2026, providing new indicators for spatial justice and ecological quality in urban areas.
Exploitation Route	Linked to the “use model”, specify the key exploitation route(s) – how the solution will be made available to the target users: **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs; publications, etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	The UDCW Methodology and Toolkits are made available to target users directly by UCCRN European Hub, with the collaboration of UCCRN Global and UCCRN Regional Hubs. Direct contract or participation to research project are the optimal exploitation routes, which ensure the full support of UCCRN experts in tailoring the UDCW solution to specific user needs. UDCW contracts/agreement can include both the “Capacity Building” and “Educational” formats. UDCW solution include: - Maps and reports about climate and energy assessment at local level (territorial areas to be covered by GIS and 3D simulations are defined within the contract) - Scenario modelling (the number of planning and/or design scenarios to produce are defined within the contract) - Workshops with local stakeholders and communities (the number of workshops to carry out with the support of UCCRN facilitators is defined within the contract) - Report on stakeholders and community engagement process, highlighting their incorporation into scenario modelling process The contract specifies: - the data needed for UDCW implementation through a dedicated “data collection protocol” - the UDCW implementation timeline, depending on user request
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Scientific: the involvement of academics and researchers generates new insights and best practices that break disciplinary silos, fostering multi-disciplinary approaches in the fields of architecture, planning, engineering, social studies, climate science. Society: the incorporation of scientific knowledge in daily activity of urban practitioners (both local authorities and private sector) can accelerate climate resilient urban development implementation.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Thessaloniki, Rio de Janeiro
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	UDCW has been so far only implemented by UCCRN and associated partners in EU funded projects. Relevant project since January 2023 include: - Erasmus+ UCCRN_edu Climate Resilient Design, Planning and Governance of Cities (Educational format) - Climate-KIC Sustainable Cities Mobility Challenge - Cornella de Llobregat Climate Itineraries (Capacity Building format) - Horizon Europe KNOWING project (Capacity Building + Educational format) - Horizon Europe healthRiskADAPT (Capacity Building format)

- Horizon 2020 PROBONO (Capacity Building format, contract in course of definition)

8.9.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish? What problems are they trying to solve? What needs are they trying to satisfy?	What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?
Target Users Pains	Pain Relievers
<i>What challenges, risks, or obstacles do your target users face?</i> Quantification of climate impacts at city, district and building scale Lack of evidences to support decision-making Issues with local stakeholders and community claims Quantification of built environment transformations for climate resilience at city, district and building scale lack of designer friendliness in the majority of environmental simulation tools difficulty in interpreting climate data and performance indicators Feasibility of climate-resilient planning and design	<i>How does your solution reduce or eliminate target users pains?</i> Science-based evidences to support decision-making UDCW simulation tools _Increase in knowledge about climate modelling issues among planners and designers; production of intuitive 2d/3D maps and graphs; Visualization and spatialization of data related to climate risks, micro-climate conditions, energy efficiency, building technologies UDCW-Facilitation Toolkit _Facilitation of participatory processes to promote inclusiveness and collaborative decision-making
Target users Gains	Gain Creators
<i>What outcomes or benefits do target users expect?</i> Prioritization of spatial interventions for climate adaptation and mitigation, risk reduction support in decision making processes related to climate resilient design Recognition of tacit knowledge and systematization of bottom-up information Promotion of participatory procedures through co-design Evaluation of climate priorities in terms of risks Identification of best scenarios for urban design and planning Understanding of local needs user friendly climate modelling Efficiently integrate climate resilient measures in planning and design strategies	<i>How does your solution provide these benefits?</i> · UDCW simulation tools _Link climate benefits (mitigation and adaptation) of proposed plans/projects with social, economic, and environmental co-benefits of climate-resilient developments; Science-based evidences to support decision-making; Integration of climate design principles in city planning, urban and building/open space design UDCW-Facilitation Toolkit _ 1.collaborative mapping_ Geospatialization of community knowledge 2.city visions_Match between climate priorities, adaptation and mitigation options and local needs 3.day in the life_Tailoring and downscaling of adaptation and mitigation options, visioning of daily practices of sustainability 4.Configurator_co-design of solutions and evaluation of co-benefits

8.9.1.3 IPR Information

Description	Input
IPR Background List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	Copyrights: UCCRN
IPR Foreground What is the IPR Foreground (Type/Partner)? - What IPR will be generated during the project, and which partner will be the owner? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	IPR generated during the project belongs to UCCRN only so far. Discussions with partners are ongoing for potential “tool coupling” opportunities. In the case of such eventuality, a joint ownership agreement will be signed between UCCRN and relevant counterparts, detailing terms of exercising ownership and protection of such results in accordance and in proportion with the intellectual contribution to its development.

8.9.2 KER Exploitation Roadmap8.9.2.1 Exploitation Activities

Description	Input (<i>the text in red can be deleted, it's just an example!</i>)
Actions for development List and describe the specific actions you will take to further develop your solution Examples: - Conduct other pilot studies - Refine technical features/methodologies based on user feedback - Develop additional functionalities (data visualization dashboards, etc.) - Secure additional funding for R&D	- Increase reliability and accuracy of the methodology testing it in pilot cities enhancing the consistency of cases (different climate and environmental conditions, characteristics of urban fabric, socio-economic features). Simulation toolkit: - implementing specific simulation modules based on end-users' requirements will be explored. - Further validate the solution and make the toolkit increasingly accurate and reliable

Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively? Examples: • Develop comprehensive user guide and online support materials to facilitate adoption • Actively disseminate solution through networks, webinars, conferences etc. • Organize training workshops for target users to demonstrate use of the solution • Collaborate with target users to implement solution • Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use	• Systematisation of existing implementation of the toolkit (Facilitation+Simulation) in a booklet addressed to decision-makers, experts and no-experts for a comprehensive understanding of the solution and its potential application; • Publishing of technical and research documents to disseminate results among academics, researchers and practitioners; • Development of guidelines to end-users and policy-makers; • Offer a service tailored to specific user needs by combining the UDCW simulation and facilitation tools in connection with the 4-steps UDCW methodology
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	UCCRN is the only responsible partner
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies • Milestone: Completion of additional pilot studies in at least two different contexts or cities. • Timeline: Within 6 months post-project. Refinement of Technical Features • Milestone: Finalization of updated technical specifications and methodologies based on pilot feedback. • Timeline: Within 9 months post-project. • KPI: Release of version 2.0 of the solution or methodology. Funding for R&D • Milestone: Submission of at least three funding proposals for further research or development. • Timeline: Within 6 months post-project.

		For use: Dissemination Efforts • Milestone: Organize at least three dissemination events (webinars, conferences, or network presentations). • Timeline: Within 6 months post-project Collaboration with Target Users • Milestone: Establish formal collaboration agreements with at least three key users or institutions. • Timeline: Within 6 months post-project.
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8.9.2.2 Financial & Sustainability Plan

Description		Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	Operational costs: ≈10k/y Overheads: ≈60k/y (administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc.) Dissemination, promotion and outreach: ≈10k/y
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?	Costs are expected to be fully covered by contracts detailing the application of UDCW methodology and tools to specific Capacity Building and/or Educational activities. Typical cost items detailed in the contract, representing main cost categories are: - Administrative and financial support for contract definition - Project coordination and regular meetings for workshop sessions preparation - Support to data collection process - Data elaboration and modelling preparation - Scenario modelling (current state + n. planning/design scenarios) - Workshops preparation (depending on n. and type) - Workshops implementation (depending on n. and type) - Final report - Dissemination activities (publications, conferences, events)
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented.	Main funding sources will be EU and international project grants

- Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.

8.9.2.3 Funding Mechanisms

EU	Horizon Europe Programme, Erasmus+ Programme
National	Public tenders or direct contracts with National institutions
Regional	Public tenders or direct contracts with Regional institutions
Private	Consultancy contracts

8.10 HydroFlows

8.10.1 KER Characterization

8.10.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	HydroFlows is a library of modular workflows for conducting flood risk assessments in a standardized and reproduceable manner. The workflows include automated setup of physics-based models, statistical analysis, and impact assessments. HydroFlows can use both publicly available, global datasets and locally available, more granular, datasets. The current development utilizes existing modular components that have been developed by Deltares previously. The main objective is to support cities with establishing a rapid assessment of climate risks as a baseline for risk-informed and water-sensitive adaptation planning and design. Key features: • Automated workflow for rapid climate risk assessments. • Customizable features to tailor assessments to specific city contexts and needs. • Utilization of publicly available global and European remote-sensing and socio-economic datasets. • Support for establishing baseline risk assessments and water-sensitive adaptation planning. • Collaboration platform for co-creation with cities and scientific partners. • Access to timely and comprehensive risk assessment reports
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most.	City professionals: technical staff and policy makers at the city's administration; academic researchers and university students; private consultants: engineering and design firms

	**Be specific: try to define the type, size and locations of the users	
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	• Obstacles include the time and resource constraints associated with traditional risk assessment methods. • Challenges in accessing and utilizing comprehensive and up-to-date datasets. • Limited capacity to understand and quantify risk in data-scarce environments. • Inability to act swiftly due to prolonged assessment processes, leading to delays in decision-making. • Technical barriers and complexities in conducting climate risk assessments. • Risk of making uninformed decisions due to incomplete or outdated risk assessments. • Financial costs associated with traditional assessment methods and potential consequences of inadequate risk management.
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	The Rapid CRA will allow to perform fast assessments in data-scarce cities, allowing to understand and quantify risk in contexts where this normally takes a lot of time and resources. This allows decision makers to act faster (investments, planning, etc.). main benefits: • Added value through fast assessment turnaround time, saving time and resources for users. • Customization options allow users to address specific needs and desires effectively. • Enhanced decision-making through access to comprehensive datasets and reduced-physics modeling. • Facilitation of risk-informed planning and water-sensitive design initiatives. • Empowerment of decision-makers with timely and actionable insights. • Promotion of collaboration and knowledge-sharing among stakeholders, fostering innovation and collective problem-solving.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be delivered to target users/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; publications etc.	HydroFlows will be implemented as an automated workflow for rapid climate risk assessments. It consists of two components: 1) a library with building blocks required for building flood risk workflows, and 2) a framework to easily generate workflows from these building blocks that can be executed in different workflow engines Implementation through: - Customization of features for city-specific assessment

		- Utilization of publicly available remote-sensing & socio-economic datasets (global and European open-source datasets) - Support for baseline risk assessment and water-sensitive planning - Collaboration through platform for co-creation with cities and scientific partners - Access to comprehensive risk assessment reports - Integration with FloodAdapt for interactive adaptation planning
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	By the end of the UP2030 project it will be at a TRL level of 5-6. The tool is market-ready post UP2030.
Exploitation Route	Linked to the “use model”, specify the key exploitation route(s) – how the solution will be made available to target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Contract research & consulting Research & development projects Collaboration with cities for real-world application Knowledge sharing, tool dissemination
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Socio-economic: first of all the risk assessment is expressed in economic terms of losses and benefits. We envision developing a broader set of co-benefits in socio-economic terms, ultimately, also including equity, with a focus on vulnerable groups. Scientific: finally, the technical development will also contribute to scientific progress.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Rio de Janeiro
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	

8.10.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish? What problems are they trying to solve? - Conduct rapid climate risk assessments for cities. - Establish baseline assessments for risk-informed and water-sensitive planning and design.	What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems? - Automated workflow for rapid climate risk assessments. - Utilization of publicly available global and European remote-sensing and socio-economic datasets.

- Understand and quantify risk in data-scarce cities efficiently. - Support decision-makers in acting faster by providing timely risk assessments. - Enable cities to co-create and tailor the tool to their specific needs and ambitions.	- Customizable features to tailor assessments to specific city contexts and needs. - Collaboration platform for co-creation with cities and scientific partners. - Support for establishing baseline risk assessments and water-sensitive planning.
Customer Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face? - Obstacles include the time and resource constraints associated with traditional risk assessment methods. - Challenges in accessing and utilizing comprehensive and up-to-date datasets. - Limited capacity to understand and quantify risk in data-scarce environments. - Inability to act swiftly due to prolonged assessment processes, leading to delays in decision-making. - Technical barriers and complexities in conducting climate risk assessments. - Risk of making uninformed decisions due to incomplete or outdated risk assessments. - Financial costs associated with traditional assessment methods and potential consequences of inadequate risk management.	How does your solution reduce or eliminate target user pains? - Address time and resource constraints associated with traditional risk assessment methods by providing an automated workflow. - Mitigate challenges in accessing and utilizing comprehensive datasets by integrating publicly available global and European remote-sensing and socio-economic datasets. - Reduce technical barriers and complexities in conducting climate risk assessments through the use of reduced-physics modeling. - Overcome limitations in understanding and quantifying risk in data-scarce environments by providing tailored solutions and customizable features. - Minimize financial costs associated with traditional assessment methods by offering an efficient and cost-effective solution. - Mitigate risks of making uninformed decisions through comprehensive and up-to-date risk assessments, reducing negative consequences and mistakes.
Customer Gains	Gain Creators
What outcomes or benefits do target users expect? - Accomplishing rapid climate risk assessments efficiently, freeing up time and resources for other tasks. - Positive outcomes such as improved urban planning and design, leading to more resilient cities. - Expectations include streamlined workflows, access to comprehensive datasets, and timely risk assessments. - Exceeding expectations would involve providing customizable solutions that adapt to the unique needs of each city, offering insights beyond traditional risk assessment metrics, and fostering collaboration and knowledge-sharing among stakeholders	How does your solution provide these benefits? - Added value through fast assessment turnaround time, saving time and resources for users. - Customization options allow users to address specific needs and desires effectively. - Enhanced decision-making through access to comprehensive datasets and reduced-physics modeling. - Facilitation of risk-informed planning and water-sensitive design initiatives. - Empowerment of decision-makers with timely and actionable insights. - Promotion of collaboration and knowledge-sharing among stakeholders, fostering innovation and collective problem-solving.

8.10.1.3 IPR Information

Description

Input

IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	Copyright: on Software, Software Models, Data Packages, Guideline Documents, etcetera. The creator of the results becomes the owner of the results (article 8.1 of the DESCA model Consortium Agreement for Horizon Europe). The results are merely protected by Copyrights.
IPR Foreground	What is the IPR Foreground (Type/Partner)? • What IPR will be generated during the project, and which partner will be the owner? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	Access rights to IPR Foreground are granted to consortium partners free of charge needed for implementation of the actions for the project. For the avoidance of doubt any grant of Access Rights to IPR Foreground not covered by the Grant Agreement or the UP2030 Consortium Agreement shall be at the absolute discretion of the owner of the IPR Foreground or IPR Background and subject to such terms and conditions as may be agreed between the owning and receiving Parties.

8.10.2 KER Exploitation Roadmap

8.10.2.1 Exploitation Activities

	Description	Input (the text in red can be deleted, it's just an example!)
Actions for development	List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	• Conduct other pilot studies • Apply the solution in consultancy and advisory projects and assignments • Refine technical features/methodologies based on user feedback • Develop additional functionalities • Secure additional funding for R&D
Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• Further expand on the online support materials to facilitate adoption • Actively disseminate the solution through networks, webinars, conferences etc. • Organize training workshops for target users in projects to demonstrate use of the solution • Collaborate with target users to implement solution in their area of interest • Publish research papers and case studies to showcase benefits, validate solution and encourage use

Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. Who will be responsible for the exploitation and follow-up actions?	Deltares is the partner developing the HydroFlows solution, which makes Deltares responsible for all actions.
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies - Milestone: Completion of additional pilot studies in at least one other context or city. - Timeline: Within 12 months post-project. Application of HydroFlows in projects - Milestone: Completion of application in new project in at least one other context or city. - Timeline: Within 12 months post-project. Additional functionality/Refinement of features - Milestone: Finalization of updated technical specifications and methodologies based on pilot/project experience and feedback. - Timeline: Within 9 months post-project. - KPI: Release of version 2.0 of HydroFlows. Funding for R&D - Milestone: Submission of two funding proposals for further research or development. - Timeline: Within 9 months post-project. For Adoption: Dissemination Efforts - Milestone: Present application of HydroFlows as part of at least three conferences, webinars or technical workshops. - Timeline: Within 9 months post-project Publication in scientific literature - Milestone: Publish at least one paper in a scientific journal. - Timeline: Within 9 months post-project.

8.10.2.2 Financial & Sustainability Plan

	Description	Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends.	- Operational costs: maintenance of digital platforms where HydroFlows is hosted. - Overheads: costs of employing dedicated technical personnel for maintenance, user support, bug fixing, further development, etc.

	**Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	Dissemination, promotion and outreach
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	Revenues must come from research funds (such as EU Horizon and national subsidies), and assignments from national and regional governments, development banks, private sector (e.g. insurance) in which the solution is applied, demonstrated and further developed.
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	Standard internal project administration

8.10.2.3 Funding Mechanisms

EU	EU Horizon Research projects
National	Subsidies and assignments from Dutch Ministries
Regional	Assignments of local and regional governments to assess and reduce climate risks
Private	Typically: (re-)insurance sector, commercial banks, engineering firms

8.10.2.4 Standardization Roadmap

	Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	Flood safety requires design standards for coastal and riverine flood defence systems. Urban storm drainage requires design standards for drainage capacities of urban drainage systems. These standards are typically expressed in terms of return periods of flood events and normally determined by national governments (and for urban drainage sometimes by local governments). These standards may vary greatly between countries, lacking universal guidelines. Global Facility for Disaster Reduction and Recovery (GFDRR) - to make disaster and climate risk data more discoverable, standardized, and usable by a wide range of stakeholders, including governments, development agencies, urban planners, and researchers.
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	

Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	

8.10.3 Tools integration – plans for possible joint exploitation

	Description	Input
Existing Bundle of tools during the project	Is your solution currently part of a bundle of tools within UP2030? If yes, also specify:	Yes
	Which other solutions are part of the bundle?	FloodAdapt, a tool for flood risk reduction by evaluating climate adaption measures
	Is your solution being implemented as part of the bundle in any UP2030 cities, or any other cities?	Yes, in Rio de Janeiro
	Is the bundle expected to be maintained after the project ends?	Yes
	How does the bundling of the solutions benefit you as a solution provider?	HydroFlows (risk assessment) and FloodAdapt (climate adaptation measures) make a very logical and necessary combination needed in flood risk management and enhancing climate resilience
	How does the bundling of the solutions benefit your target users?	Application of this tool bundle enables regional and local governments (city stakeholders) responsible for flood risk management, urban drainage, etc. to identify effective and cost-efficient adaptation strategies to reduce flood risks and enhance urban resilience.
Potential bundling of tools post-project	Do you envision, or would you be interested in, bundling your solution with any other solution part of the project for collaboration after UP2030? If yes, also specify:	Yes, because the module workflow of HydroFlows allows to include components that focus on other climate hazards than flooding, such as water scarcity and heat waves.

	Which solutions would you like to collaborate with?	Solutions capable of computing drought risk and heat risk.
	Why would this collaboration be beneficial (e.g., synergies, shared user base, complementary functions)?	Climate risks should ideally be considered holistically, because they are connected. For example, floods and droughts may occur in the same region. In addition, adaptation strategies must be multifunctional, serving a range of benefits.
	Are there specific urban challenges or end-user needs that you think could be better addressed through bundled solutions?	Combined climate risks of floods, droughts and heat waves
	Are there barriers (e.g., technical, financial, or IP-related) preventing such collaborations from being pursued?	Yes, technical and financial.

8.11 Urban Green Economy Model

8.11.1 KER Characterization

8.11.1.1 Overview

Description		Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The original GEM model was designed explicitly to analyse green economy and low carbon development scenarios on which the Urban GEM (UGEM) is based. GEM is built using the System Dynamics (SD) methodology, serving primarily as a knowledge integrator. SD is a form of computer simulation modelling designed to facilitate policy planning in the medium to long term across key economic sectors and subsectors in the urban downscaled model (energy, industry, waste management, NbS and buildings) not to make precise predictions of the future, or to optimize performance; rather, these models are used to inform policy formulation, forecasting policy outcomes and leading to the creation of a robust and well-balanced strategy.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Primary: Cities pursuing climate neutrality and integrated climate strategies Secondary: Government, decision-makers, urban planners
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	- The need for integrated policy processes to achieve sustainable development. - The challenge of transitioning carbon-intensive sectors to more sustainable practices. - The difficulty in projecting long-term developments due to complex interdependencies

The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	The UGEM is useful to understand the complex interactions between different sectors and their impact on the environment, and identify opportunity for urban transitions while improving resource efficiency. More specifically: • Cross-Sectoral Planning: facilitates medium to long-term planning across key economic sectors (energy, industry, waste, agriculture, LULUCF), avoiding the siloed planning issue. • Customizability: tailored to the specific needs and capacities of countries and cities, providing flexibility that surpasses competing models. • Transparent Cost Benefit Analysis: offers a high-level analysis of emission pathways, supporting informed policy formulation and raising climate ambition across all emitting sectors
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	The use model for UGEM involves: • Open-source software ○ UGEM runs on Vensim, which has both a free version with limited functions, and a paid version with more features ○ While Vensim is open source, UGEM is proprietary and not publicly available • Service provision: GGGI and CERTH offer services to municipalities and organizations that require assistance in running and applying UGEM • Product customization, tailored to the specific needs of each municipality: UGEM can be customized to meet the specific needs of municipalities, adapting its modeling parameters and inputs to fit local contexts. • Licensing to third parties: ○ Municipalities with expertise in system dynamics modeling can license UGEM from GGGI/CERTH for independent use without direct involvement from GGGI/CERTH. ○ Licensing could be paired with optional training, guidelines, and support materials to help municipalities develop the skills to effectively use UGEM and to effectively involve stakeholder engagement in the process.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The GEM is fully developed and has been applied in many countries for various uses, at national level. The GEM is being downscaled to urban use, resulting in the UGEM. The goal is to downscale the model to be applied at urban levels
Exploitation Route	Linked to the “use model”, specify the key exploitation route(s) – how the solution will be made available to the target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs; publications, etc.	Dissemination: publication on the downscaled GEM (UGEM), conferences and different online communication materials. Licensing to third parties

	Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Economic: By this approach the users (target audience) will be able to model and anticipate the future economic, social and environmental impacts of interventions prior to their actual implementation. It will help cities optimize resource allocation. Scientific impact: enhances research on urban sustainability modeling- Societal/environmental: Supports cities in climate neutrality efforts, leading to better policy integration and emission reduction strategies.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Thessaloniki
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	No

8.11.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
<i>What tasks are your target users trying to accomplish?</i> Climate Policy planning in the medium to long term across key economic sectors and subsectors Understanding climate policy impacts in terms of economic, social and environmental outcomes.	<i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> UGEM is built using the System Dynamics (SD) methodology, serving primarily as a knowledge integrator. SD is a form of computer simulation modelling. Services Customization Third-parties licensing
Customer Pains	Pain Relievers
<i>What challenges, risks, or obstacles do your target users face?</i> Need to understand and assess what emission reduction pathways are the most effective and efficient in social, environmental and economic (including employment) terms. Lack of integrated policy processes Complexity in projecting long-term developments	<i>How does your solution reduce or eliminate target users pains?</i> Cost-Benefit transparency: provides an extended high-level Cost-Benefit Analysis of cities' emission pathways and climate ambitions. - Policy support: enables cities and policymakers to explore different emission reduction pathways with clear, transparent data. - Integrated approach: breaks siloed urban planning by considering cross-sectoral impacts.
Customer Gains	Gain Creators
<i>What outcomes or benefits do target users expect?</i> Data-driven, cross-sectoral approach to urban planning Cost-benefit transparency	<i>How does your solution provide these benefits?</i> Forecasts and analysis: It generates forecasts of future developments and provides an integrated analysis of policy

Simplification of long-term scenario planning with customized insights for cities	choices, helping to understand the relationships between social, economic, and environmental indicators. Sectoral integration: UGEM analyses various sectors, such as housing, energy, economy (GDP, employment) and transportation and integrates them to identify green economy opportunities. Policy evaluation: it evaluates the impacts of green economy policies and identifies potential constraints to growth through feedback loops, aiding in better policy design Investment and benefits: the model estimates the investment required for interventions, added benefits, avoided costs, and potential damages, helping to understand the annual cash flow and return on investment
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8.11.1.3 IPR Information

Description		Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	Vensim software: Open-source - All Vensim configurations are available by download and can be upgraded online (there is free version with limited functions) GEM model developed on Vensim not open-source: Developed by GGGI and CERTH, proprietary, and not publicly available.
IPR Foreground	What is the IPR Foreground (Type/Partner)? - What IPR will be generated during the project, and which partner will be the owner? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	Ownership: since GEM is proprietary, it remains under the ownership of GGGI and CERTH. New purchases of Vensim Professional and DSS are available by contacting Ventana Systems but come at a cost (one off costs are estimated around USD 2000) Licensing: to enable third parties (cities) to use the solution without GGGI/CERTH involvement.

8.11.2 KER Exploitation Roadmap

8.11.2.1 Exploitation Activities

Description		Input (<i>the text in red can be deleted, it's just an example!</i>)
Actions for development	List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	- Conduct other pilot studies and test solution in other municipalities. - Refine technical features/methodologies based on user feedback. - Secure additional funding for testing and implementation in other cities, contexts.

Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively	• Develop user guide and online support materials to facilitate adoption. • Actively disseminate solution through networks, webinars, conferences etc. • Organize webinars for target users to demonstrate use of the solution • Collaborate with target users to implement solution. • Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use.
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	Funding for R&D • Milestone: Submission of at least three funding proposals for further development and testing UGEM. • Timeline: Within 12 months post-project. For use: Dissemination Efforts • Milestone: Organize at least two dissemination events (webinars, conferences, or network presentations). • Timeline: Within 6 months post-project Collaboration with Target Users • Milestone: Establish formal collaboration agreements with at least one municipality. • Timeline: Within 2 years months post-project.

8.11.2.2 Financial & Sustainability Plan

Description		Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	• Personnel costs: to actively promote, disseminate and seek funding and implementation opportunities.
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability?	Revenues should cover personnel costs and related overheads for implementation of the UGEM in another context.

	How will you finance the continued use and operation of the solution?	
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	No time needs to be spent on upkeep. Resource mobilization and communication costs will be covered by each organization.

8.11.2.3 Funding Mechanisms

EU	Horizon Europe, LIFE
National	Municipal own source revenue
Regional	
Private	Green climate funds

8.11.2.4 Standardization Roadmap

	Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	1. ISO - ISO 37120, Sustainable cities and communities, Indicators for city services and quality of life - Relevance: UGEM outputs can align with this for standardized sustainability benchmarking. - ISO 14091 – Adaptation to climate change; Guidelines on vulnerability, impacts and risk assessment - Relevance: Provides a standard framework that UGEM models could be calibrated to reflect. - ISO 14080; Greenhouse gas management and related activities – Framework and principles for methodologies on climate actions - Relevance: Could support UGEM in integrating and validating emission pathways. CEN/CENELEC - CEN/TC 465 – Sustainable and smart cities and communities - Active in standardizing frameworks and indicators for smart cities, with potential overlap in UGEM's use for urban policy planning. - CENELEC/TC 205 – Home and Building Electronic Systems - If UGEM extends to building-level data integration, standards here become relevant.

8.12 Neutrality Story Maps

8.12.1 KER Characterization

8.12.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	Neutrality Story Maps (NSM) is a mobile-friendly web platform that serves as a digital tool that: - allows cities to raise awareness about climate change by communicating climate-related challenges and initiatives they have put in place to tackle them and - empowers citizens to express their interests and hopes for their future in their city, stemming from their local lived experience with climate change. The tool is a type of digital storytelling that helps reveal the thoughts, sensations, concerns, issues, and hopes of residents in the UP2030 cities, especially vulnerable groups, through a narrative multimedia format. Starting from the idea that everyone is inherently creative, storyteller-citizens and policymakers are provided tools, templates, tips and tricks – but above all; freedom – to shape their climate stories on the NSM platform in a way that is completely their own and reflects their living world and personal experiences
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Cities, Policymakers and government bodies; citizens
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	- Capturing citizens' lived experiences and future visions with regard to climate change - Reaching more marginalized voices, and making sure that their experiences and needs are also collected - Creating spaces of information co-exchange between different stakeholders, and allow for co-creative decision-making - Addressing participation fatigue
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	It can allow for informative and intimate accounts of citizens' lived experiences, insights, ideas, reflections, sensations and thoughts that would otherwise remain unrevealed and unharnessed. Based on the concepts of digital storytelling, Neutrality Story Maps allow the sharing of experiences, issues, concerns, hopes and needs regarding climate and sustainability in the city through a narrative format. In practical terms, NSM provides a platform for two-way communication, where users can visualise climate data and share local stories in a map-based, multimedia format, including pictures, text, audio, and video. For policy- and decision-makers, NSM is especially useful for identifying areas of concern to anticipate problems and scope future resilience strategies For citizens, NSM offers a space to share stories about how climate change impacts their daily life in their city, what they wish would change, and what lifestyle changes they already adopted. Besides providing policy- and decision-makers with valuable qualitative data, these stories could inspire others to engage with climate neutrality initiatives and/or adopt environmentally friendly habits.

Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	(NSM) is a mobile-friendly web platform that serves as a digital tool. The proposed platform entails an innovative business model, which is a citizen-centric B2G model. The web application (aka NSM Platform) allows cities and citizens to register, create stories, and view them on a timeline and a map. Stories are posts made up of multiple pages, each featuring different formats like images, video, audio, text, or a combination of these. They can also be displayed in full-screen using the 'scrollytelling' technique. Cities can create threads (groups of stories on specific topics) and resources (articles, educational materials, etc.). Users can interact by liking or commenting on stories, and the platform offers cities analytics and customisable settings After the end of the project, the platform will remain available for use for 5 years for free - hosted in their service. However, if a city wishes to continue using the platform beyond that time and requires specific updates, they can establish a contract with CERTH outlining their needs.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	Public launch of the platform in June 2025 (M30).
Exploitation Route	Linked to the "use model", specify here the key exploitation route(s) – how the solution will be made available to the target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Commercialization; Contract research (with external target users); A new research project; Implementation in education programs, publications etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Indirect commercialization: CERTH has a spin-off Publications VUB: Research dissemination CERTH: commercial exploitation
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Social; the social impact of the proposed platform is dual: On the one hand the local authorities will be in possession of a platform that will help them tackle real life, existing, local urban design problems that diminish the living experience of the citizens while creating a unique communication link with concerned citizens. On the other hand, citizens will be able to co-develop urban design solutions for their neighborhoods by providing their feedback and their opinion, and by doing that, improve their quality of life. Scientific: In terms of the scientific impact of the solution, the solution is considered a data asset that is also of interest for the scientific community as it involves several types of data analysis techniques as well. On the technical side, the proposed platform is a digital storytelling platform tool with the ability to provide spatial or non-spatial insights on specific topics at a neighborhood scale by consuming social media data from multiple platforms, storing and analyzing filtered data with AI tools and retrieving and visualizing them in a user-friendly manner. By using predefined keywords, the tool can extract

		relevant information from social media posts and perform analysis that can help local authorities, organizations and individuals make informed decisions about related topics.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	Each of the 10 UP2030 pilot cities. They have their own tailored NSM page, designed through a co-design approach that encourages tool ownership at the local level.
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	-

8.12.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
<i>What tasks are your target users trying to accomplish? What problems are they trying to solve?</i> Capturing citizens' lived experiences and future visions related to climate change. Ensuring marginalized voices are included in public discussions. Facilitating co-creative decision-making between citizens and authorities	<i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> Mobile-friendly web platform for storytelling and citizen engagement. Story creation tools with multimedia upload options (text, images, audio, video). Map and timeline visualization of stories. City dashboards for managing posts, analytics, and topic threads. Customizable settings for cities (branding, topics, resources).
Customer Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face? Existing solutions fail to capture the nuance of citizens' narratives. Lack of tools to bridge the gap between stakeholders in a collaborative manner. Over-reliance on traditional engagement formats, leading to "participation fatigue."	<i>How does your solution reduce or eliminate target users pains?</i> For cities: Easy-to-use platform to collect diverse citizen inputs. Interactive formats to fight participation fatigue (maps, scrollytelling, multimedia). Analytical dashboards providing immediate, visual insights. For citizens: Creative, narrative-driven platform that's simple and welcoming. Multiple format options (text, video, photo, audio) ensuring inclusivity. Co-design features empowering users to shape their city's future.
Customer Gains	Gain Creators
<i>What outcomes or benefits do target users expect?</i> Enhanced civic engagement and representation of diverse perspectives. Better-informed and inclusive urban design solutions. Strengthened trust and communication between citizens and local authorities. Access to AI-driven insights for efficient decision-making.	How does your solution provide these benefits? Offers a platform for storytelling that uncovers rich, lived experiences and insights AI-enhanced tools provide actionable metadata and analytics for authorities Enables authorities to directly engage with citizens, fostering transparency and trust

Encourages co-creation, empowering citizen

8.12.1.3 Market Analysis

Description		Input
Market information	Provide information on market: Description; trends; size	Trends: growth in AI and spatial intelligence, along with increasing demand for participatory, citizen-centric tools for urban planning. Market Size: medium, with 1,000-10,000 potential users, primarily cities, policymakers, and governments.
Competitors	What are your “competitors” (the ones offering “alternative solutions”)?	Mediatoolkit PromptCloud (Social media crawler) Skylens (location based social media intelligence) Sprinklr (location insights platform) Novoville (civic engagement platform) Citizens (civic engagement platform) https://www.climatestoriesproject.org/
SWOT	Provide information on - Strengths (internal – innovations, unique value proposition of your solution) - Weaknesses (internal – barriers to entry and adoption) - Opportunities (external – market opportunities, growth potentials potentials) - Threats (external – risks in market, including competitors, regulatory or policy changes, etc.)	S: Combines AI/ML with spatial and non-spatial data for unique insights. Narrative-driven approach, enhancing engagement and inclusivity. Dual benefits for authorities (policy insights) and citizens (co-creation opportunities). W: Financial barriers, due to limited incentives for social benefit-focused tools Adoption challenges due to app fatigue among users. Dependency on external data sources (e.g., Twitter API) with cost and access constraints. O: growing AI and spatial intelligence markets offer significant revenue potential increased emphasis on participatory urban planning and citizen-driven initiatives. T: Regulatory challenges: privacy and data protection concerns could limit adoption Market competition from established players offering similar functionalities Resource constraints: new Twitter API pricing impacting data access affordabilit

8.12.1.4 IPR Information

Description		Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement	Copyrights: for economic exploitation, approval is granted according to the CA guidelines, art. 8.1 “Ownership of Results: Results are owned by the Party that generates them”. In this case, CERTH holds ownership of the solution. The IPR for retrieval and exploitation results is governed by the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license. This license allows for the sharing and adaptation of the work as long as certain conditions are

		met. Specifically, any individual or organization wishing to use or share the work must give appropriate credit to the original creator, not use the work for commercial purposes, and distribute any derivative works under the same license.
IPR Foreground	What is the IPR Foreground (Type/Partner)? • what IPR will be generated during the project? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/multilateral Memorandum of Understanding agreements should be signed among relevant partners	CERTH and VUB working on defining roles and responsibilities (and exploitation routes) through MoU

8.12.2 KER Exploitation Roadmap

8.12.2.1 Exploitation Activities

	Description	Input
Actions for development	List and describe the specific actions you will take to finish developing your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	In the development of the NSM, VUB and CERTH achieved the following results: • The structure and concept of the tool and a preliminary set of user requirements were defined through discussions between CERTH, VUB, and other partners of the project (incl. Engagement & Visioning Taskforce). • An initial set of user requirements was generated through various data-gathering activities • The development of mock-ups for the main pages of the application (i.e., Stories Timeline, Threads Timeline, Resources Page, Individual Story Builder/Template Page), which were developed based on the requirements collected. • A second set of user requirements were developed through further data gathering activities • First preliminary version of the application, including user registration, page for creating a simple story with one layout option (image and text), a stories timeline page, full-screen story view, and story liking functionality • First version of the application that became available to the cities to use, including the ability for each city to create a homepage, a redesigned and more intuitive story creation page (also used for homepage creation), support for additional layout options and media types (images, videos, and audio), a new scrollytelling format available for both homepages and stories, and a mobile version of the application • VUB and CERTH currently working on the version that will become available to the general public in the next months. • Public launch of the platform in June 2025 (M30).

		Furthermore, needed steps: • Conduct other pilot studies • Refine technical features/methodologies based on user feedback • Develop additional functionalities (data visualization dashboards, etc.) • Secure additional funding for R&D • Develop comprehensive user guide and online support materials to facilitate adoption
Actions for adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively •	• User training and support will be provided • Post-project scaling and commercialization strategy will be developed to expand the reach of our solution to other cities outside of the UP2030 network • Create white paper based on the offerings of our platform or on the outputs of the cases studies that will be implemented during the project as marketing and promotion material • Actively disseminate solution through networks, webinars, conferences etc. • Paper on challenges to co-creating socio-technical solutions with multiple cities
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	To be determined based on MoU
Milestones	Describe potential KPIs and monitoring parameters within a specific timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: Pilot Studies • Milestone: Completion of additional pilot studies in at least two different contexts or cities. • Timeline: Within 6 months post-project. Refinement of Technical Features • Milestone: Finalization of updated technical specifications and methodologies based on pilot feedback. • Timeline: Within 9 months post-project. • KPI: Release of version 2.0 of the solution or methodology. Funding for R&D • Milestone: Submission of at least three funding proposals for further research or development. • Timeline: Within 6 months post-project. For use: Dissemination Efforts

		• Milestone: Organize at least three dissemination events (webinars, conferences, or network presentations). • Timeline: Within 6 months post-project Collaboration with Target Users • Milestone: Establish formal collaboration agreements with at least three key users or institutions. Timeline: Within 6 months post-project
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8.12.2.2 Financial & Sustainability Plan

	Description	Input
Costs	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. Outline the necessary expenses and investments to ensure a smooth transition from the project's completion to the next phase. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	• Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies etc.) • Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. • Dissemination, promotion and outreach
Revenues	Identify the revenues expected from exploiting or ensuring the use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • How will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?	
Other sources of coverage	Define how costs will be managed until a sustainable funding model is secured (i.e., before collecting the first revenue). **Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	

8.12.2.3 Standardization Roadmap

	Description	Input
Existing standards	Are there any existing standards relevant to the solution's field of application? Please specify. ** Including technical (e.g., ISO, IEC) and sector-specific standards	Citizen participation and smart city standards: the following also provide framework for engaging communities (citizens and cities) in sustainability initiatives. • ISO 37101:2016 – sustainable development in communities, management system for sustainable development • ISO 37120:2018 – sustainable cities and communities, indicators for city services and quality of life

		- ISO 37122:2019 – indicators for smart cities Digital content and web accessibility standards - ISO/IEC 40500:2012 – information technology – WEB content accessibility guidelines - EN 301 549 (EU standards) accessibility requirements for ICT products and services Data privacy and security standards -> relevant for ensuring that user-generated content is stored and managed securely - ISO/IEC 27001:2022 – information security management systems
Alignment with standards	Is your solution aligned with any mandatory or voluntary standards (e.g., safety, interoperability, sector-specific)?	
Standardisation bodies/committees	What standardization bodies or committees (e.g., ISO, IEC, CEN, national bodies) are active in this domain? Please specify.	
Engagement with bodies/committees	Have you engaged with any standardization bodies before? If yes, please specify. If not, do you plan to engage with any during or after project?	
Standardization Initiatives	Are there ongoing standardization initiatives or discussions in the field of your solution that you are aware of?	
Contribution to standards	Does your solution introduce new methods or approaches that could contribute to existing standards or inspire new ones? Which aspects of your solution, specifically?	
Benefits of standardization	Could aligning with existing standards improve the adoption, usability, or scalability of your solution?	
Barriers to standardization efforts	Are there specific barriers or challenges (e.g., cost, time, lack of knowledge) that might prevent you from pursuing standardization?	

8.13 UP2030 Service Platform

8.13.1 KER Characterization

8.13.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	"LEGACY PRODUCT OF UP2030": The UP2030 Service Platform serves as a digital hub containing practical instruments, methodologies and cases study that supports cities in developing an upscaling plan for their local context, aligned with their goals on climate neutrality, resilience and just transition. The platform supports cities and communities on taking their project ideas further and address their main challenges in governance, finance and knowledge sharing, ensuring that these project ideas can reach more people and have a wider impact.

		The platform will host different tools: Urban Typologies (developed by GreenAdapt and adelphi), Transformative Governance tool (developed by adelphi), Cost and Benefit Analysis Guide, and Green Finance Guide (developed by GGGI). In addition, the platform offers the 5UP Workbook to help cities navigate through the different 5UP phases. Furthermore, the platform provides details about the upscale methodology developed in UP2030 and how this could be implemented for local projects, by showcasing best practices from UP2030 cities.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Urban planners and municipal administration officers seeking practical tools for climate-neutral, resilient and just urban planning; NGOs and local organisations involved in urban development and community engagement; Private companies interested in contributing to sustainable city solutions; Consultants and advisors working on urban transformation projects; Neighbourhood associations advocating for community-driven changes in their urban spaces; Financing institutions looking to support green projects in cities. Academics and students who want to learn through research-driven methodologies
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Achieve climate neutrality by reducing carbon emissions in urban areas. Ensure spatial justice, creating fair and inclusive urban transformations that benefit all citizens. Develop data-driven, evidence-based policies to support sustainable urban planning. Identify regions in Europe that could benefit from exchanging measures related to climate adaptation and mitigation. Identify and implement scalable best practices for climate action.
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution do better (than the competition)? • What are the benefits of your solution, and how do these benefits align with what your user wants?	The platform is designed to offer comprehensive support to all these stakeholders by providing tailored service packages that address their specific needs. By offering practical tools, the platform empowers cities to align their urban planning processes with climate goals, ensuring that their strategic decisions support sustainable and inclusive urban development. The platform's innovative solutions help cities bridge the gap between climate action and spatial justice, making sure that all citizens benefit from the transition. Moreover, a key feature of the platform is its focus on "up-scaling", ensuring that the solutions implemented in pilot cities can be adapted and expanded to other urban areas.

Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	Open-source platform. To help users make the most of the platform, several resources are provided: • An introductory section that helps user navigate through the different tabs of the platform. • A step-by-step guide that explains how to use the tools of the platform; • Connections with the online learning course "How to build climate-neutral, resilient and just cities", where the user can find videos providing information about key concepts, methodologies, tools and cases studies developed in UP2030.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The Service Platform will be finalised by the end of the UP2030 project (December 2025).
Exploitation Route	Linked to the "use model", specify the key exploitation route(s) – how the solution will be made available to target users? **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs; publications; etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	New research projects: The partners that were involved in the development of the platform will seek for future project proposals and other opportunities where they can continue enriching the platform and its content. The intention is for the platform to continue to be used beyond UP2030. Joint dissemination with NetZeroCities' Portal and Smart Cities Marketplace to relevant Cities Mission audiences (e.g. listing the UP2030 Service Platform on the NetZeroCities Portal to reach a wider audience). Dissemination of the platform at the Smart City Expo World Congress in Barcelona, both at the project stand and at a session organized by the project coordinator. All platform partners are at liberty to promote the platform and tools through their communication channels (websites, social media, etc.), with the objective of reaching a greater audience and increase the number of users of the platform. Open-access legacy resource: post-project, the platform will remain publicly accessible as a non-commercial legacy tool, hosted and maintained by ICLEI. It will serve as a reference point for cities seeking practical, science-based resources on climate neutrality, resilience and just transition.
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Scientific: knowledge advancement in climate-neutral planning, through the dissemination of cutting edge research, methodologies, tools, and best practices. Societal: enhanced spatial justice, by integrating social equity considerations, methodologies, tools into climate action strategies, which also ensure that all communities benefit from urban transitions; also, community empowerment and participation, with neighborhood associations and local NGOs being able to gain access to tools that help them advocate for fairer, greener urban policies. Economic: cost-efficient urban transformations, through streamlining access to best practices and tools.
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	All cities involved in the UP2030 project.

KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	No.
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8.13.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
<i>What tasks are your target users trying to accomplish?</i> Achieve climate neutrality by reducing carbon emissions in urban areas. Ensure spatial justice, creating fair and inclusive urban transformations that benefit all citizens. Develop data-driven, evidence-based policies to support sustainable urban planning. Identify regions in Europe that could benefit from exchanging measures related to climate adaptation and mitigation. Identify and implement scalable best practices for climate action.	<i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> Open-Source Platform: A hub for cities to access scientific tools, case studies, and financial and governance recommendations. Tailored service packages: customized resources that align with city-specific climate and planning needs. User guide & support materials: a section explaining how to navigate through the different tabs of the platform, a step-by-step guides of the tools, and connections with the online learning course “How to build climate-neutral, resilient and just cities”. Scalability Tools: mechanisms for upscaling successful projects from pilot cities/districts to other urban areas.
Customer Pains	Pain Relievers
<i>What challenges, risks, or obstacles do your target users face?</i> Lack of centralized, accessible knowledge on urban climate action strategies. Difficulty in integrating climate and social equity goals within urban planning processes. Limited technical expertise and resources to implement sustainable solutions.	<i>How does your solution reduce or eliminate target users pains?</i> Enhances collaboration: provides guidance on how to foster collaboration between cities and financing institutions, NGOs, and consultants for holistic urban solutions. Saves time & costs: provides ready-to-use, tested methodologies, reducing the trial-and-error approach in planning. Boosts technical capacity: equips city planners with tools to apply cutting-edge climate strategies efficiently.
Customer Gains	Gain Creators
<i>What outcomes or benefits do target users expect?</i> Access to proven, scalable solutions that reduce uncertainty in decision-making. Stronger collaboration between stakeholders More inclusive urban planning that ensures all communities’ benefit. Clearer pathways to climate-neutral, resilient and just planning	<i>How does your solution provide these benefits?</i> Empowers cities to lead in climate action by equipping them with the latest knowledge and best practices. Supports data-driven decision-making, making urban planning more strategic and evidence-based. Ensures inclusive & resilient urban development by integrating climate adaptation and social justice.

8.13.1.3 IPR Information

	Description	Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	The IPR of the results will be managed in line with what is established in the UP2030 Grant Agreement, Annex 5, Article 16.
IPR Foreground	What is the IPR Foreground (Type/Partner)? • What IPR will be generated during the project, and which partner will be the owner? • Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	As stated in the Grant Agreement of the UP2030 project, the results are owned by the beneficiaries that generate them. Therefore, each party retains ownership of their individual tools/methodologies (Foreground IPR). ICLEI is granted a nonexclusive right to host, present, maintain, and promote these works on the platform post-project, in its capacity as the platform host and content integrator. All parties involved in the development of the UP2030 Service Platform (ICLEI, adelphi, GGGI, GreenAdapt, Fraunhofer and R-Cities) have signed a Memorandum of Understanding, which is aligned with the Consortium Agreement and Grant Agreement, and defines the ownership of each party and their roles and responsibilities for future dissemination and exploitation activities.

8.13.2 KER Exploitation Roadmap

8.13.2.1 Exploitation Activities

	Description	Input (<i>the text in red can be deleted, it's just an example!</i>)
Actions for development	List and describe the specific actions you will take to further develop your solution	• Refine technical features, tools and methodologies based on user feedback. • Incorporate lessons from pilot studies within UP2030: transferability packages will inform content of the platform. • Present the platform at the UP2030 Final Event in Barcelona, • Platform testing with UP2030 cities. • Seek for opportunities to update and further develop the platform and its resources in future projects or collaboration opportunities.

Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• Actively disseminate the platform through integration into other marketplaces, repositories and databases such as the UP2030 project website, Smart Cities Marketplace and the NZC portal. • Publish case studies or guidelines to showcase benefits, validate solution and encourage use. • Scientific integration: seek for opportunities to bring the platform to other projects. • Disseminate the platform in the communication channels of the parties involved (website, social media, newsletter, etc.)
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	The roles of partners involved has been defined in the Memorandum of Understanding.
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	<u>For development:</u> Refinement of Technical Features • Milestone: Finalization of updated technical specifications and methodologies based on pilots feedback. • Timeline: before the end of the project, UP2030 pilot studies: • Milestone: integration of UP2030 cities' upscaling experiences, results (transferability packages) as learning lessons • Timeline: before end of the project <u>For use:</u> Dissemination Efforts • Milestone: Integration into marketplace (Smart City) and liaison with NZC (portal). • Timeline: before end of the project Scientific integration; funding • Milestone: integration in at least 1 funding proposal or ongoing project for further research/development • Timeline: within 12 months post-project. •

8.13.2.2 Financial & Sustainability Plan

	Description	Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	- Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies; license renewal, etc.) - Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. - Dissemination, promotion and outreach.
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. - Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? - How will you finance the continued use and operation of the solution?	All parties involved in the development of the platform undertake to actively seek funding opportunities and further collaboration opportunities, so that the actions proposed in the Memorandum of Understanding can be carried out. These actions include working on a proposal under a Horizon call that includes a work package or a task focused on the platform, integrating the platform and/or the tools into existing projects, and so on.
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	For the moment, there is no budget to further develop the Service Platform after the project ends. Partners will look for funding opportunities to continue enhancing the features and tools of the platform.

8.13.2.3 Funding Mechanisms

EU	New international project opportunities (e.g., Horizon Europe calls, etc.) or funding from ongoing projects and initiatives.
National	Research funds
Regional	Regional and local grants and funding schemes, consultancy services
Private	Not expected, but the platform team will seek for open tenders and other funding opportunities from private donors.

8.13.3 Tools integration – plans for possible joint exploitation

	Description	Input
Existing Bundle of tools during the project	Is your solution currently part of a bundle of tools within UP2030? If yes, also specify:	The UP2030 Service Platform hosts different tools that have been created in the project: - Urban Typologies, developed by adelphi and GreenAdapt. - Transformative Governance tool, developed by adelphi. - Cost and Benefit Analysis Guide, developed by GGGI.

		- Green Finance Guide, developed by GGGI. 5UP Workbook, developed by Fraunhofer and R-Cities.
	Which other solutions are part of the bundle?	Please refer to the previous row.
	Is your solution being implemented as part of the bundle in any UP2030 cities, or any other cities?	The tools hosted in the Service Platform will be presented to UP2030 cities at the end of the project.
	Is the bundle expected to be maintained after the project ends?	Yes. Partners that were involved in the development of the platform signed a Memorandum of Understanding that has the objective of maintaining and further developing the platform and its resources after the project ends.
	How does the bundling of the solutions benefit you as a solution provider?	The platform's operation/functionality is entirely dependent on the tools it contains; without them, the platform would not be able to offer all the services it seeks to provide to cities.
	How does the bundling of the solutions benefit your target users?	The targeted users can find the basic resources needed integrating the concepts of climate-neutrality, resilience and just transition in the planning processes, and for designing an upscaling plan for their project ideas.
Potential bundling of tools post-project	Do you envision, or would you be interested in, bundling your solution with any other solution part of the project for collaboration after UP2030? If yes, also specify:	Not for now.
	Which solutions would you like to collaborate with?	
	Why would this collaboration be beneficial (e.g., synergies, shared user base, complementary functions)?	
	Are there specific urban challenges or end-user needs that you think could be better addressed through bundled solutions?	
	Are there barriers (e.g., technical, financial, or IP-related) preventing such collaborations from being pursued?	

8.14 MOOC

8.14.1 KER Characterization

8.14.1.1 Overview

	Description	Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The training program – MOOC - aims to empower city practitioners with comprehensive knowledge, skills, and tools essential for integrating principles of climate neutrality, resilience, and social justice for urban planning practices. Delivered as a massive open online course (MOOC), the training program will consist of highly comprehensive video capsules. Its structure encompasses a methodical curriculum covering theoretical foundations, technical

		aspects, and case studies. While primarily disseminated through the MOOC platform, the videos will also be independently accessible, catering to individuals with specific interests or learning requirements. Structured into 5 modules mirroring the five UPS of the project, the program begins with theoretical knowledge alignment, followed by methodological steps focusing on capacity building and implementation Module 1: UPDATING: Building the Foundation Begin your journey by updating your knowledge. The module introduces you to contemporary city models, essential planning methods, and benchmarking tools to assess urban development in the face of today's pressing challenges. Module 2: UPSKILLING: Building Methodological and Technological Capacity for Transformative Urban Planning Upskill and build your capacity with hands-on tools for planning and designing carbon-neutral, climate-resilient, and spatially just cities. Explore practical strategies for community engagement and learn to lead urban transformation. Module 3: UPGRADING – Applying Knowledge in Real Cities Upgrade your new skills by learning from application on real-world case studies from the ten UP2030 project cities. Discover how these cities are implementing carbon-neutral, climate-resilient, and spatially just solutions, and explore their innovative prototypes. Module 4: UPSCALING – Adapting and Expanding Solutions In this module, you will learn how to adapt and upscale successful prototypes from UP2030 cities to new urban contexts. The focus is on upscaling urban planning strategies by strengthening governance, financial mechanisms, policy development, and decision-making processes. This hybrid module begins with theoretical foundations, clarifying the difference between upscaling and replication, and presenting guidelines for effective upscaling. You will then explore practical tools to facilitate upscaling, followed by in-depth case studies that illustrate these processes in action. Module 5: UPTAKING – Consolidating and Sharing Your Impact Consolidate your knowledge and skills through a comprehensive assessment. Reflect on your learning journey, engage in peer discussions, and prepare to champion urban transformation in your own context.
Main Target Users	Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	Type • Cities' practitioners • Cities' municipalities - Urban practitioners • Consultant • Architects • Urban Planners • Town Planners • Regional Planners • Long-range Planners • Transportation Planners • Infrastructure Planners • Environmental Planners • Parks Planners

		• Planning Analysts • Urban Designers • Community Development Directors • Economic Development Specialists • Landscape Architects • Civil Engineers (with urban specialization) • City Managers • Policy Makers • Sustainability Officers • Environmental Consultants • Masterplanners • Urban Design Firms • Research Institutes (urban/municipal focus) • Local Government Officials • Urban Development Agencies • Regeneration Consultants • Surveyors with urban expertise • Citizen Engagement Specialists • Participatory Planning Facilitators • NGOs focused on urban issues • Civic Activists • Real Estate Developers (urban focus) • Public Space Managers and Coordinators • Infrastructure and Utility Specialists Locations: UE Countries mainly and more
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	City practitioners face several challenges, including limited time for professional development, rapidly evolving urban issues, and the need to balance multiple responsibilities Consultants need to stay informed about the latest trends, tools, and methodologies to provide relevant and effective guidance
The Unique Value Proposition	Describe the innovative aspects of your solutions. • What does your solution	The training program bridges the gap between academic advancements and practical urban planning. First, it empowers city practitioners with comprehensive knowledge, skills, and tools to be integrated into their practices.

	do better (than the competition)? What are the benefits of your solution, and how do these benefits align with what your user wants?	The program is highly actionable and hyper accessible (free, flexible, in depth but synthetic and complete modules, available in different languages,...), providing content that makes complex concepts and tools easy to understand and implement, ensuring that practitioners can readily apply what they learn to real-world urban planning challenges. In terms of content, the program aims to provide more detailed content on underrepresented topics such as social justice in urban planning, equitable climate action, and inclusive resilience strategies. It also offers training that prepares practitioners to recognize and avoid undesirable effects such as greenwashing, maladaptation, gentrification, and other unintended consequences. The second module revolves around the tools developed and partner of UP2030 and serves as a catalogue for the practitioners, municipalities and consultants.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; publications etc.	Open source MOOC hosted an internal platform provided by UIC University. It will include: - Theoretical courses videos - Technical videos and tutorials about the tools - Case study videos and examples - Links to additional resources - Quizzes and tests - Certification option - Discussion section - Infographics
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	First draft due on November 4th Second draft due on November 17th Launch of the MOOC expected in November the 28th 2025
Exploitation Route	Linked to the "use model", specify the key exploitation route(s) – how the solution will be made available to target users **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs, etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Dissemination through UP2030 platforms, networks, and partners. Integration within URnet's learning platform alongside other future courses, ensuring continuous visibility and promotion. This integration guarantees sustained support and management from UIC, leveraging their established infrastructure and expertise. Other ways of dissemination are the UP2030 conference, social media campaign, bootcamps organized for practitioners.

Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Scientific: enhanced the capacity of city practitioners and consultants, equipping them with actionable knowledge on climate neutrality, resilience, and social justice. Its widespread adoption will lead to more evidence-based urban policies, reducing risks like greenwashing and maladaptation. Environmental/societal: by mainstreaming important research into practice, the program will contribute to more equitable and sustainable urban transformations across multiple cities
KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	-
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	-

8.14.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs	Products & Services
What tasks are your target users trying to accomplish? Stay updated on latest methodologies, tools and theories in urban planning for climate neutrality and resilience Develop actionable strategies for municipalities Gain practical skills to apply in practices	What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems? Open-source MOOC hosted an internal platform provided by UIC It will include: • Theoretical courses videos • Technical videos and tutorials about the tools • Case study videos and examples • Links to additional resources • Quizzes and tests • Certification option • Discussion section • Infographics
Customer Pains	Pain Relievers
What challenges, risks, or obstacles do your target users face? Limited time for professional development Need to balance multiple responsibilities Proliferation of online learning courses, which can lead to confusion and counterproductivity – and often these courses target students rather than practitioners Educational silos, and lack of integration of topics. MOOCs are observed as introductory materials rather than in depth collection	How does your solution reduce or eliminate target users' pains? The training provides essential and complete information in a time-efficient manner suitable for enhancing focus and learning capacities. Cohesive learning experience by providing a clear, comprehensive program that covers essential topics under one umbrella Design concise and clear courses that emphasize practical skills and real-world applications, rather than purely theoretical knowledge Based on the identified gaps and opportunities, this course has been designed to maximize the integration between carbon

	neutrality, resilience, and social justice, addressing the issue of educational silos.
Customer Gains	Gain Creators
What outcomes or benefits do target users expect? Avoid common and often overlooked urban planning pitfalls, such as greenwashing and maladaptation	How does your solution provide these benefits? Practical relevance: emphasis on actionable knowledge and skills that can be directly applied to urban planning projects. Holistic approach: comprehensive content that addresses the interconnected aspects of climate neutrality, resilience, and social justice. Accessibility: training is accessible to a wide audience through multiple languages and user-friendly platforms. It caters to individuals with diverse backgrounds and varying levels of expertise. Peer-to-peer learning is encouraged. This approach enables practitioners to share insights, seek advice, and collaborate on projects, enhancing the overall learning experience and fostering a sense of community within the field of urban planning.

8.14.1.3 IPR Information

Description		Input
IPR Background	List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	UP2030 partners: Module 1: UIC, URnet, TuDELFT, TSPA, UCAM Tools providers: Aquatec, Buro Happold, CERTH, Circe, Deltares, DesignClips, DRAXIS, ETH, GUNAM, ISOCARP, LINKS foundation, LNEC, Maggioli, Mapping for Change, METU, Resilient Cities Network, TSPA, UCAM, UCCRN, VUB. Upscaling: ICLEI, GGGI, Adelphi
IPR Foreground	What is the IPR Foreground (Type/Partner)? - What IPR will be generated during the project, and which partner will be the owner? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	Copyrights is Joint ownership for the content (videos produced by partners) The primary owner of the IPR will be UIC University, as the host of the MOOC platform and the key partner responsible for content dissemination and long-term accessibility. Fee's for certification options are currently explored

8.14.2 KER Exploitation Roadmap

8.14.2.1 Exploitation Activities

	Description	Input (the text in red can be deleted, it's just an example!)
Actions for development	List and describe the specific actions you will take to further develop your solution (<i>skip this section if your solution will be finished by the conclusion of the project</i>)	• Enrich the Course with new TOOLS and materials. • Update resources and existent tools. • Upgrade the overall platform according to users' feedback.
Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• Develop a comprehensive user guide and online support materials to facilitate adoption. • Actively disseminate the course through networks, webinars, conferences etc. • Collaborate with target users to enhance the MOOC. • Collaborate with existing and future partners to enhance and upgrade the technical solutions (tools) • Lead research to update continuously the theory and current trends. • Encourage the users to form a community through forums.
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	Exploitation and follow-up actions, Update of the information and dissemination: (UIC) Update of the content and maintenance of the platform : UIC Tools update: Aquatec, Buro Happold, CERTH, Circe, Deltares, DesignClips, DRAXIS, ETH, GUNAM, ISOCARP, LINKS foundation, LNEC, Maggioli, Mapping for Change, METU, Resilient Cities Network, TSPA, UCAM, UCCRN, VUB.
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	For development: • KPI: Percentage of course modules completed and reviewed for quality Milestone: Update content according to current trend and updates for tools. (continuous) • KPI: number of updates per year • KPI: User satisfaction with course improvements (via surveys) Milestone: Completion of user feedback surveys on new content Timing: 1 month after each update Funding for R&D • KPI: Amount of additional funding secured for MOOC R&D Milestone: Successful grant or sponsorship acquisition Timing: Within 6 months post-project • KPI: Research papers or reports published on MOOC enhancements Milestone: Publication of at least one research output

		Timing: Within 12 months post-project - KPI: Number of pilot tests or experimental features launched Milestone: Launch of R&D pilots for new MOOC capabilities Timing: Within 9 months post-project For use: - KPI: Number of active learners enrolled and retained Milestone: Achieving target learner enrolment thresholds (e.g., 1000+) Timing: Quarterly reviews post-project - KPI: Completion rates of courses offered Milestone: Achieving established course completion rate targets (e.g., 40%-60%) Timing: Quarterly reviews - KPI: Learner engagement metrics (forum participation, quiz completions) Milestone: Monitoring and reporting of engagement metrics Timing: Monthly monitoring Dissemination Efforts - KPI: Number of dissemination events or presentations delivered Milestone: Hosting or participating in conferences, webinars, or workshops Timing: At least 2 per year post-project - KPI: Volume of social media and online promotional activities Milestone: Regular communication campaigns (monthly posts, newsletters) Timing: Ongoing throughout the year - KPI: Number of partnerships established with educational institutions or platforms Milestone: Formal agreements with 2+ partners for MOOC promotion or integration Timing: Within 12 months post-project
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8.14.2.2 Financial & Sustainability Plan

Description		Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal training expenses, consultant fees, and costs for ongoing R&D.	- Operational costs (hosting and maintenance of digital platforms or tools; utilities and supplies etc.) - Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc. - Dissemination, promotion and outreach
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues	Two potential funding sources are considered:

	provide the cash flow necessary to ensure its continued use sustainable over time. • Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?	• Certificate of fee: Charging a fee for the optional certificate of completion, providing a revenue stream without compromising free access to the core content. • Event participation fees: Implementing fees for participation in special events, workshops, or webinars related to the MOOC's content. These events could offer additional value and services, helping to cover any incidental management costs.
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. • Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	

8.15 5UP Approach

8.15.1 KER Characterization

8.15.1.1 Overview

Description		Input
KER description	Describe the main features of the solution: what does it look like & how can it be used?	The 5UP Approach is a framework to guide cities and urban practitioners in the process of driving the socio-technical transitions necessary for achieving climate neutrality, resilience, and spatial justice. Designed for the UP2030 project, it aims for a strategic operationalization of actions across five interlinked dimensions ensuring a holistic view towards systemic change that drifts apart from project-by-project approach and instead shifts towards a strategy-based model anchored to supportive processes, policies and stakeholders The 5UPs are a series of interlinked actions: • Updating: Reviewing and revising planning and design approaches, standards, codes, and policies to better align with contemporary urban transformation goals, particularly those related to climate neutrality. • Upskilling: Strengthening the capabilities of city stakeholders through training and collaborative exercises to co-develop planning and design strategies that enable transformation and address current socio-technical challenges • Upgrading: Implementing built and natural environment prototypes, as well as supportive model and tools, to enhance our neighbourhoods. This involves tangible interventions in urban spaces that serve as examples of sustainable and just development. • Upscaling: Establishing and refining governance arrangements, financial mechanisms, policy development, and decision-making processes to foster city-wide impacts and align urban planning efforts with broader sustainability and justice goals. • Uptaking: Conducting activities to raise awareness and facilitate the exchange of knowledge and experiences across cities creating a ripple effect.
Main Users	Target Who are the main users or "early adopters" of your solution? This refers to the users you are planning to address first. They are	<u>Municipal authorities</u> : especially those committed to climate neutrality under initiatives like the EU Mission for 100 climate-neutral and smart cities by 2030.

	usually the ones that "feel" the problem most. **Be specific: try to define the type, size and locations of the users	These users include local government officials and city planners from medium to large municipalities, particularly those with populations over 100,000. Focusing on municipalities of this size is strategic, as they typically have more financial and human resources, allowing them to invest in innovative solutions and initiatives like the 5UP approach. Additionally, larger municipalities often face complex urban challenges that require systemic transformation, and implementing effective solutions can lead to significant improvements in sustainability and quality of life for a larger number of residents. They also serve as models for smaller communities, creating a ripple effect that can inspire neighbouring areas to adopt similar strategies. These municipalities generally have established networks of stakeholders, including government agencies, businesses, and community organizations, which can facilitate collaboration and enhance the effectiveness of the 5UP model. <u>Urban practitioners:</u> This group consists of urban designers, sustainability consultants, and community engagement specialists working in small to medium-sized firms or organizations with a strong emphasis on sustainable development and systemic transformation. These users are highly motivated to address urban challenges, particularly those related to climate change and systemic inefficiencies, making them ideal early adopters of the 5UP approach.
Problems of Target Users	Describe the challenges and problems your target users face (2-3 problems), which solution will address. **Identifying a set of priority problems is key to ensuring that the results are relevant and used	Fragmented planning systems hinder the development of cohesive climate-neutral urban strategies. Municipal authorities often operate within siloed departments, leading to disjointed efforts that fail to address the interconnected nature of urban challenges. This fragmentation makes it difficult to create comprehensive climate-neutral strategies that consider various factors, such as transportation, housing, and energy use. Insufficient internal capacity and cross-departmental collaboration limit the ability to innovate or scale successful practices. Many municipalities struggle with limited resources and expertise, which restricts their ability to experiment with and implement innovative solutions. Additionally, a lack of collaboration between departments can stifle knowledge sharing and prevent the scaling of successful initiatives, resulting in missed opportunities for systemic change. Lack of clear implementation pathways and strategic governance mechanisms to align stakeholders and finance urban transitions effectively. Municipal authorities often face challenges in establishing effective governance structures that facilitate stakeholder engagement and ensure financial resources are allocated efficiently. Without clear pathways for implementation, it becomes difficult to mobilize support from various stakeholders, including government agencies, private sector partners, and the community, which are crucial for driving urban transitions.
The Unique Value Proposition	Describe the innovative aspects of your solutions. - What does your solution do better (than the competition)? - What are the benefits of your solution, and how do these benefits align with what your user wants?	The 5UP approach offers a holistic, flexible, and replicable model that helps cities operationalize systemic transformation. Innovative Aspects: <u>Integrated Framework:</u> Combines various stages of work, fostering collaboration among stakeholders for a unified approach to urban challenges. <u>Adaptability:</u> Easily tailored to fit the specific needs and contexts of different cities, ensuring relevance and effectiveness. <u>Evidence-based Insights:</u> Utilizes learning from each 5UP and analysis of current status to inform decision-making, enabling cities to make informed choices that build on their experience. Competitive Advantages: <u>Comprehensive Solutions:</u> The 5UP approach addresses multiple facets of urban transformation simultaneously, rather than in isolation.

		Stakeholder Engagement: Prioritizes community involvement, ensuring that solutions are not only effective but also widely accepted and supported to enable the systemic change towards climate neutrality. Benefits Aligned with User Needs: Systemic Change: Users seek sustainable and impactful transformations; 5UP's model promotes long-term change rather than short-term fixes. Enhanced Collaboration: By fostering partnerships, the solution aligns with users' desires for a cooperative approach to urban planning.
Products or service offerings – Use Model	Explain your "use model" – how will this solution be used/implemented? **Examples: open-source software/platform, provision of a service; technical support or consulting; technology transfer; etc.	Excel based toolkit and PDF workbook available for download. The 5UP approach will be implemented through an Excel-based toolkit that provides municipalities with a step-by-step method of applying the 5Ups, some tools that can be used, and examples from the 11 cities that were part of the UP2030 project. Additionally a PDF workbook is also available which also provides a step-by-step guidance which can be used when access to Excel is not available. Additionally, upon a fee, technical support and consulting services can be available to help municipalities effectively utilize the toolkit, addressing challenges like fragmented planning and insufficient collaboration (see 3.2, revenue). This combined resource empowers local authorities to implement the 5UP model and drive systemic urban transformation.
Use Model - Timing	When will the solution be ready for implementation? What is its Time to Market (TTM)? **The TTM can include post-UP2030 plans	The final version of the tool and the workbook will be ready before the end of the project
Exploitation Route	Linked to the "use model", specify the key exploitation route(s) – how the solution will be made available to target users? **Note that any KER can be exploited directly (by the project partner) or indirectly (by a third party). **Examples: Direct use: Contract research (with external target users); A new research project; Implementation in education programs; publications; etc. Indirect use: Assignment of the IPR; Licensing of the IPR; Development of new legislation/standard; Spin-off	Scientific dissemination: publications in peer-review journals; conference presentations; policy briefs to raise awareness among researchers and policymakers Academic dissemination: inclusion in education and training materials (eg. MOOC) for urban practitioners and future urban planners (or related professionals) on systemic transformation principles Integration into new research projects: approach included in new (Horizon) project proposals for further development and broader impact Direct use: The toolkit and workbook will be available for municipalities to implement independently. Indirect use: IP protected and ownership of the partners developing the tool as stated in the CA. Ownership details is included in the workbook with the corresponding authorship and contribution.
Impact 3-year time	Describe the impact of the implementation/use of your solution. **This can be in terms of scientific impact/society impact/economic impact etc.	Scientific: enhanced urban transformation frameworks with co-design and socio-technical integration. Societal: greater spatial justice, climate resilience, and empowered citizens in pilot cities. Economic: streamlined public investment, scalable urban interventions, and improved efficiency from strategic alignment. Environmental: Support improvement of environmental sustainability in urban areas, helping cities adapt to climate change.

KER implementation in UP2030	Where is your solution (which UP2030 city) being implemented as part of the project?	All UP2030 pilot cities
KER Uptake Monitoring	Since the beginning of UP2030, has the solution been implemented by other researchers or in other projects? If so, specify	No, it has been exclusively implemented in the UP2030 project. However, some cities have adopted the approach and use it for other initiatives within the city (e.g. Milan).

8.15.1.2 Value Proposition Canvas

Customer Segment	Value Proposition
Customer Jobs <i>What tasks are your target users trying to accomplish?</i> Design and implement city-wide strategies aligned with climate and equity goals, integrating sustainability and spatial justice into urban policies. Engage diverse stakeholders in participatory planning processes, fostering collaboration among community members and organisations. Develop, test, and scale urban transformation interventions. Pilot solutions and assess effectiveness for upscaling implementation across the cities and beyond.	Products & Services <i>What solutions (products/services) do you offer to help target users achieve their tasks or solve their problems?</i> Open-access toolkit, workbook. Includes step-by-step methodology, templates, and case studies for effective implementation.
Customer Pains <i>What challenges, risks, or obstacles do your target users face?</i> Fragmented planning efforts lacking strategic alignment, leading to inefficiencies and missed opportunities for collaboration. Difficulty in building capacity across city stakeholders to co-develop and implement transformation strategies due to limited resources and expertise that hinder effective participation. Need for tools and frameworks to replicate and scale successful interventions city-wide. Current resources are often inadequate for comprehensive implementation.	Pain Relievers <i>How does your solution reduce or eliminate target users pains?</i> Offers a clear 5-step framework linking strategy to execution through policy updates, capacity, piloting, governance structuring, and knowledge transfer. This enhances clarity and alignment in planning efforts. Provides ready-to-use resources (workbook, toolkit) and participatory formats to support stakeholder upskilling. These resources simplify training and foster collaboration among city stakeholders. The reflective nature of the SUP approach allows for replication of successful results in a higher scale, it also provide guidelines on governance and financial mechanisms that are key when it comes to replication or upscaling. This way, the 5-UP approach supports the UP2030 replication packages and open-access tools for scaling and adoption in new cities. This enables efficient transfer of lessons learnt and best practices and broadens the solution's impact
Customer Gains <i>What outcomes or benefits do target users expect?</i> A coherent, strategic transition pathway from vision-setting to implementation, providing useful information, guidelines and direction for achieving urban transformation goals Empowered city teams and communities capable of designing and piloting innovative solutions, leading to	Gain Creators <i>How does your solution provide these benefits?</i> Ensures an integrated approach - policy, governance, capacity, prototypes, and knowledge uptake - that can be localized across cities. This facilitates creating tailored solutions that are aligned with the local contexts and needs, maximizing effectiveness and relevance.

increased local ownership and engagement in the transformation process.

Ability to replicate and adapt tested methodologies in diverse contexts, supported by open-access materials, facilitating broader application and maximising the impact of successful strategies across urban settings.

8.15.1.3 IPR Information

Description	Input
IPR Background List the pre-existing IPR (type/partner) that you brought into the project. **Consider what was included in the Consortium Agreement (UP2030 Consortium Agreement fully signed.pdf)	None.
IPR Foreground What is the IPR Foreground (Type/Partner)? - What IPR will be generated during the project, and which partner will be the owner? - Do you foresee a need to sign further agreements, such as joint ownership? **If the KER will be jointly exploited by two or more partners, joint owners of KER must agree upon the detailed terms of exercising ownership and protection of such results in accordance and in proportion with the agreed intellectual contribution to its development. **If relevant, bilateral/ multilateral Memorandum of Understanding agreements should be signed among relevant partners.	IP distribution among the partners with their role (included in the SUP booklet indicating each partners authorship): Fraunhofer, RCITIES: Methodology owner and main content curator) Developed and refined the methodology presented in the document. Curated the content and defined the inclusions for the methodology. UIC: Conceptualization Initiator Initiated the conceptual framework for the document. USTUTT: SUP-Tool Developer Developed the tool that supports the methodology outlined in the document. Partners contributors (e.g. Mapping for change, TUD..): Input Contributor Provided valuable insights and input throughout the process. Cities: Validation Partner Assisted in validating the methodology in their respective cities. It was discussed with the main partners that the ownership and contribution will be included in the contribution and acknowledgment part of the workbook, so that it can be referenced appropriately. There are no further agreements foreseen for this result.

8.15.2 KER Exploitation Roadmap

8.15.2.1 Exploitation Activities

Description	Input (the text in red can be deleted, it's just an example!)
Actions for development List and describe the specific actions you will take to further develop your solution	- Refine Workbook: update content and methodology - Incorporate lessons from pilot studies within UP2030 - Approach testing with UP2030 cities - Creation of an Excel based tool - Embed the tool into the UP2030 service platform - Incorporation into the NZC platform

Actions for Adoption	List and describe specific actions to ensure the adoption and ongoing use of the KER during the first 6 (or 12) months after the project ends. Please be specific and consider all necessary actions to organize and ensure the solution is implemented and used effectively • What steps will you take after the project ends to ensure the solution is adopted? • What additional developments or resources will be needed to guarantee that the solution is utilized effectively?	• Disseminate approach through seminars, workshops, conferences • Publish research papers, case studies or guidelines to showcase benefits, validate solution and encourage use • Scientific integration: integrate approach in other projects proposals
Roles of Partners involved	Describe the roles of the responsible partner for each action outlined, focusing on responsibilities after the project ends. • Who will be responsible for the exploitation and follow-up actions?	Fraunhofer and RCITIES with the support of DreVen will disseminate the results, ensuring that the workbook and toolkit are effectively communicated to target users. Fraunhofer will manage the integration into the NetZeroCities platform and the upscaling platform from ICLEI (also part of UP2030). Integration also with the efforts of the Smart City Marketplace will be also explored by UP2030 partners (Fraunhofer, ICLEI).
Milestones	Describe potential KPIs and monitoring parameters within a specified timeframe. Ensure that the milestones align with the activities identified. **Focus on the milestones required to track progress in the implementation of exploitation actions. **Focus on both milestones related to actions for further development and for use after the project **Include timing or deadlines for each milestone, if possible.	<u>For development:</u> • Milestone: Finalization of updated versions after prototypes are finalized. <u>For use:</u> Dissemination Efforts • Milestone: liaison with NZC (portal) • Timeline: before end of the project • Publication of SUP paper methodology in a journal Scientific integration; funding • Milestone: integration in at least 1 funding proposal for further research • Timeline: within 6 months post-project

8.15.2.2 Financial & Sustainability Plan

	Description	Input
Cost requirements	Identify the anticipated costs for sustaining and supporting the KER after the project concludes. **Costs should reflect the actions required to ensure the solution continues to be used after the project ends. **Consider additional factors such as overheads, operational costs, internal	• Overheads: administrative costs to oversee solution implementation; costs of employing dedicated personnel, etc.

	training expenses, consultant fees, and costs for ongoing R&D.	
Revenues sources	Outline the revenues you expect to collect by exploiting and continued use of the solution. These revenues provide the cash flow necessary to ensure its continued use sustainable over time. • Even if the solution is not intended for commercial use, how will you cover its costs (if there are any), and how will you ensure its ongoing financial sustainability? • How will you finance the continued use and operation of the solution?	Even if the solution is not intended for commercial use, revenue can be generated through workshops, training sessions, and consultancy services. These will provide cash flow necessary for ongoing operations. Partnerships with municipalities and organizations may also yield funding opportunities for future implementations.
Costs coverage sources	Define how costs will be managed until a sustainable funding model is secured. This refers to the financial resources needed to cover costs incurred before the solution is finalized and fully implemented. • Potential funding sources may include the partner's own budget, other project grants, national or regional incentives, loans, etc.	Potential funding sources may include: the partner's own budget, project grants, national or regional incentives, loans, and Horizon projects 1-to-1 consultancy to cities will also serve as a revenue-generating mechanism to support costs during the transition to a sustainable model.

8.15.2.3 Funding Mechanisms

EU	Horizon Europe, LIFE Program, EU structural funds
National	National Innovation Funds, Sustainable Urban Development Grands
Regional	Regional Development Funds, Partnerships with Regional Authorities
Private	Public-Private-Partnerships, Consulting Services and Training

9 Annex 2 – Pilot’s summaries & sustainability

	A	B	C	D	E	F	G
1	Prototypes' Journey & Sustainability						
2	Prototype Vision & Action						
3	Pilot City	Prototype	Scale	Vision - objective pilot	Tools	Steps for completion	Prototype status (Sept. 2025)
4	Belfast	Net Zero Neighbourhood Framework (NZNF), document that will include an outline of the process, methodology, stakeholder engagement process and toolkit for achieving a net zero neighbourhood. It focuses on: active travel, retrofit of buildings and city greening	The geographical focus is on the southern section of Belfast's city centre which contains a mix of functions and land uses including residential, tourism, commercial, office, hospitality and transport.	Belfast will be a city re-imagined and resurgent. A great place to live and work for everyone.	UCAM: Provides quantification tools for achieving net zero, including carbon and cost analysis. Design Clips: Develops tailored toolkits (a range of tools and activities as well as campaign material) to support Safe Routes to School initiatives, such as the Walking Bus, aiming to raise children's awareness and engagement in active school travel projects. --> The tailored toolkit was co-developed with Belfast City Council and has already been applied to promote their Walking Bus pilot. The materials were used to engage schools across the project area, while collecting feedback that will inform future implementation. Neutrality Story Maps: An engagement tool to visualise climate change impacts and net zero solutions.	Finalise prototype framework and toolkit. Conduct additional pilot tests and evaluations. Integrate further tools and services. Scale up the approach for city-wide adoption --> Development of adaptable, flexible solutions for different urban contexts. Agree Council approach for post-project dissemination and upscaling	Currently in the Action Phase with following outputs: Executive Summary and sections 1-3; Pilot testing; Community engagement methodology MFC: Community Maps has been actively implemented as a central engagement tool in Belfast. The Walking Bus initiative has been piloted with selected schools, supported by toolkits and participatory activities - The school did not have the capacity to run the Walking Bus programme UCAM: Developed and implemented within the pilot.
5	Milan	Ecosystem Services Assessment (ESA) and Methodology – based on InVEST tool. The purpose of to evaluate the ecosystem services provided by urban green areas (urban cooling effect and carbon storage and sequestration) thanks to the open-source tool InVEST. It will unfold not only into an analysis of ecosystem services at the 3 different scales (urban, district, street/square), but also and most importantly into a methodology adapted to the municipal context, for it to be easily assimilated and replicated by the municipal staff for urban and policy design: 1. Maps with biophysical and economic values of the ESS 2. Report: with explanation inputs used of analysis and outputs for municipality 3. Handbook with guidelines for future implementation and replicability of tool by city.	neighborhood area of the Milan municipality	Create districts where urban green spaces are designed to maximize their environmental, economic and social benefits, serving as resilient buffers against the impacts of climate change, to turn challenges into opportunities for a more liveable and fairer city for all.	LINKS: liaison and tool provider. Provides and powers the open-source tool InVEST -InVEST is a tool that provides a quantitative assessment, both biophysical and economic, of the ecosystem services provided in urban environments. -InVEST was applied in the prototype to evaluate the ecosystem services provided by urban green areas (urban cooling effect and carbon storage and sequestration), and to measure the environmental and economic impacts of urban interventions at different scales (urban, neighbourhood, public square).	As of today, it is still necessary to refine the methodology of InVEST to make sure that the outputs are reliable and usable for the Municipality: there are still several questions to be solved regarding the input data to use, the parameters to implement, the most relevant scale to be chosen for each ecosystem service, the relevancy of the economic assessment of the "Urban Cooling" Ecosystem service. Dissemination of the knowledge on ESA and methodology inside the Municipality, in relation with the citizens in the framework of events and conferences, etc... Next steps: -Final completion of the prototype through an iterative dialogue between Resilient Cities Network and the Municipality.	LINKS: Key tasks completed include the biophysical and economic assessment of "urban cooling" and "carbon stock and storage" ecosystem services at three different spatial scales (urban, neighbourhood and plot level) with the related maps and report sections. Moreover, it was produced a handbook to guide technical officers in replicating all the process. The results have been presented to the Milan Learning and Action Alliance, while further applications of the tool will continue to be discussed within the municipality alongside communication and dissemination activities

	A	B	C	D	E	F	G
6	Mialn 2	Integrating resilience principles into planning projects and initiatives - methodology based on the City Resilience Framework (CRF) by Resilient Cities Network The purpose of Prototype n°2 is to support the municipality of Milan in advancing a methodological approach that can enhance future planning and project design endeavors as well as the overall city's resilient approach with a structured narrative and governance framework. Therefore, Prototype n°2 takes form into a document which serves different purposes: -Constitute a qualitative checklist for the Urban Resilience Department to assess the resilience of planning projects and initiatives, with particular attention to expanding and improving green spaces as a means to improve resilience -Constitute the first infrastructure of a legacy document that consolidates achievements to date and provides a comprehensive overview of the work accomplished, even outside the municipality's direct purview		Prototype n°2 supports Milan's vision to create districts where urban green spaces are designed to maximize their environmental, economic and social benefits, serving as resilient buffers against the impacts of climate change, to turn challenges into opportunities for a more liveable and fairer city for all.	Resilient Cities Network provides the City Resilience Framework, which is the reference methodology used for the development of Prototype n°2. In the case of Milan, the CRF has been tailored to the local context and needs of the Municipality and the UP2030 context: A focus has been made on the climatic dimension of resilience, allowing for the analysis of 8 core goals.	The final outcome of Prototype n°2 consists in accompanying the Municipality into building a holistic and easy-to-use methodology to better integrate resilience in its projects and initiatives while supporting the Urban Resilience Department's efforts to structure a narrative and governance framework, in view of developing a strategic legacy document for the Department. To move from the current state to the final Prototype, next steps include: The finetuning of the checklist through an iterative dialogue between Resilient Cities Network and the Municipality. The development of the first infrastructure of the legacy document for the Urban Resilience Department.	Preliminary work between Resilience Cities Network and the Urban Resilience Department to define the scope and objectives of Prototype n°2 through an iterative work to best adapt the City Resilience Framework to the context of Milan. Identification of Milan's resilience objectives and their governance through an in-person workshop with the Urban Resilience Department, the Green Department and AMAT (in-house agency providing strategic and technical support). This workshop took place on December the 3rd, 2024. Based on the outputs of the in-person workshop, development of the first version of the checklist.
7	Budapest	Budapest Healthy Streets Knowledge Center (KC). The KC consists of a coalition of experts tasked with promoting the development of healthy, climate-neutral, resilient, and equitable urban spaces in Budapest. It also includes a platform to support knowledge sharing. The online platform serves as the city's prototype output and key dissemination medium, functioning as an integrated knowledge base and knowledge sharing tool. The KC supports the dissemination and adaptation of the Healthy Streets principles and methodology while fostering professional dialogue in the field of sustainable urban planning. The KC facilitates knowledge sharing and capacity building for professional communities in urban development.		Its goal is to promote the development of healthy, climate-neutral, resilient, and equitable urban spaces in Budapest through practical support, training, and broad accessibility of the methodology, as well as by encouraging expert collaborations.	The city of Budapest is leading the development of the KC (including the platform) together with GGGI. The city collaborates with the following partners: City Liaison: GGGI Local LAA: BKK, BFVT, Járókelő Tool providers: The city of Budapest has selected its tools for the primary objective of stakeholder engagement. All tools intend to strengthen the city's - and its urban - professionals' skills and practices in involving local citizens in planning and decision making. All tools will be part of the KC's knowledge database, either in the form of a guide (Neutrality Story Maps, or Youth and Child-Friendly Workshops), best practice (Citizens' Storytelling tool), or a practical service for collecting feedback and opinions (Community Maps). Mapping for Change (MfC): MfC developed a localised Community Map for Budapest (collecting feedbacks, and to be available in platform) ISOCARP Institute: support stakeholder engagement in relation to HS dev	Further development plans to the Knowledge center: Development of a strategy and workplan for KC Organise a conference about the Knowledge Center and Healthy Streets proposals (in coordination with another HS project ongoing in parallel)other, HS project ongoing in parallel) Finalisation and of tools and solutions provided by UP2030 partners and integration into the KC platform Further improvements and additions expected to the platform Design clips: Once the local branding of the Healthy Streets Knowledge Hub is completed (expected by the City), the toolkit will be adapted to it and will be	While the Knowledge Centre is/will be published on Budapest's website for public access, the following improvements and additions are expected in the coming months: Collect ing the relevant events and put them into a calendar Upload the UP2030 tools: MfC, DC and ISOCARP ATO add NSM as a subpage, describing the importance of the HS methodology and giving an overview picture of , how the climate has changed in Budapest during the past few years. MfC: The Community Maps platform has been fully implemented in Budapest. A localised Hungarian version was developed in collaboration with the municipality's Green Infrastructure Development Unit and the Department of Climate and Environment. The tool was deployed to collect citizen proposals and visualize existing green infrastructure plans.

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8	Munster	Roadmap for climate-friendly neighbourhood development in existing buildings: enhances municipal cooperation by providing clear steps for achieving climate-neutral and adapted neighborhoods. It guides municipal staff through planning instruments, measures, databases, funding opportunities, and participation approaches essential for sustainable development. the roadmap will address the linkage between various planning phases and measures and suggest appropriate content for integrated neighbourhood concepts. The final roadmap will be an interactive pdf.		Focus on the neighborhood level as a key area for municipal climate measures and to integrate social, ecological and economic concerns at the same time. This makes the approach of climate-friendly neighborhoods, regarding climate mitigation and adaptation The prototype actively contributes to the following objectives set by Münster: - the coordination between mitigation and adaptation measures - the exploration of data availability and requirements related to climate action - the internal department cooperation - the harmonised use of technical tools and planning instruments between departments - the co-creation of a neighbourhood level roadmap for climate strategies	Buro Happold (Climate Proofing Method): application of the comprehensive approach to climate mitigation and adaption within the Climate Proofing Tool University of Cambridge (Carbon Mapping): supported in the mapping of quality carbon emission information across various administrative departments in the city of Muenster. The output of the mapping is planned to be integrated in the roadmap prepared by Buro Happold. Imec – SMIT, Vrije Universiteit Brussel (Neutrality Story Maps) Imap (Concept for Climate Trainings in the Neighborhood) :	The content of the "Guideline for Climate-Just Transition of Existing Urban Districts" has been finalized. Only minor changes are still to be expected. An external design agency is currently working on a Münster-Corporate Design version of the document. This should further increase the attractiveness of the guideline and make it more user-friendly. The implementation of the tool in Muenster is completed with the finalization and distribution of the Guideline for Climate Friendly District Developments.	The content for the following chapters is in progress: - Introduction - Climate protection and climate adaptation in the municipal context - Development process for climate-friendly neighbourhoods in Münster
9	Rio de Janeiro	Urban Design Climate Workshop - collaboration between the technical partner (UCCRN), the liaison (TUD), and Rio's municipality. Activity 1 – Urban Design Climate Workshop (UDCW) Activity 2 – Science-based Support for Rio's Resilience Center Activity 3 – Public Event: The Climate Hub Rio G20/U20 Conference on Sustainable Corridors Building on the outcomes of Phase 1 (completed in the UDCW in 2024), the objective of UDCW São Cristóvão Phase 2 is to develop an urban planning and design portfolio that leverages climate data to enhance Rio's resilience capacity. This process will involve collaboration with city stakeholders and the local community, utilising the Urban Design Climate Workshop (UDCW) as a methodological tool to integrate and apply Rio's existing GIS database.	Pilot area of Sao Cristovao currently subject to a number of redevelopment projects, including the construction of the new stadium for the Flamengo football team, the redevelopment of the waterfront and the Porto Maravilla project, the establishment of a large multimodal hub and a mixed-use redevelopment project in the Leopoldina station area.	Plan for Sustainable Development and Climate Action of the City of Rio de Janeiro - The PDS Vision 2050 is structured into five major transversal themes 1. Cooperation and Peace 2. equality and equity 3. longevity and well-being 4. climate change and resilience 5. governance The City of Rio, through the PDS, aims to guide urban development across three strategic areas: -Mitigation: Achieving carbon neutrality by 2050 - Adaptation: Enhancing resilience and reducing climate risks via green and blue infrastructure and ecosystem services. - Inclusivity and Equity: Expanding access to urban services, supporting vulnerable groups, and creating economic opportunities.	The UDCW supports vision and prototype by providing climate scenarios that: -Identify risks and impacts within the Pilot area of Sao Cristovao. -Evaluate urban design interventions for both adaptation and mitigation. -Propose socio-spatial solutions that promote equity and justice. The UDCW toolkit aids in prototyping urban design solutions by: - Assessing design interventions at urban and neighbourhood scales to identify optimal scenarios for 2050 regarding ecosystem services, outdoor comfort, energy consumption and carbon emission reduction. - Simulating climate hazards, including heatwaves and pluvial floods, taking into account local microclimate variations induced by urban morphology, surface material and green and blue infrastructure. - Supporting co-design processes with local stakeholders to evaluate socio-ecological measures that integrate justice considerations at the community level.	In June 2025, a series of capacity-building workshops will be held in person in Rio de Janeiro, facilitated by the UCCRN team and aimed at improving the uptake by the city's technical departments of the simulation results and background data included in the UDCW report, with a specific focus with IPP on GIS database handling to support UDCW service implementation in other areas of the city, and climate resilient urban design concepts at the neighbourhood scales supported by 3D simulations. The possible integration of the UDCW Facilitation tool through a co-design workshop with the Leopoldina community is subject to further discussion with city stakeholders.	UCCRN: The UDCW methodology is being partially implemented in Rio de Janeiro, with the full application of the UDCW simulation and the partial application of the UDCW facilitation. The UDCW is being applied to down scale the Sustainable Development and Climate Action Plan of Rio de Janeiro (PDS). the prototype is almost completed; for the finalization is pending an exchange with stakeholders not yet planned due to several constraints at local level. The finalization is foreseen for the end of November.

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10	Rio de Janeiro 2	Rapid and continuous flood risk assessment and adaptation planning for Rio de Janeiro - Prototype 1 (Deltares/Rio Aguas) focuses on urban flooding in the Acari River Basin. This area is highly vulnerable due to rapid urbanization, poor drainage, and recurring floods. The prototype applies HydroFlows and FloodAdapt, two tools developed by Deltares, to: Conduct rapid and continuous flood risk assessments. Improve urban drainage master planning. Strengthen flood resilience through adaptation planning. -->Prototype focuses specifically on addressing the natural hazard of urban flooding The prototype follows a methodological approach to urban flooding, integrating newly developed tools to enhance flood resilience in the Acari River basin, with the potential for city-wide scalability.	Acari River Basin. This area is highly vulnerable due to rapid urbanization, poor drainage, and recurring floods	Plan for Sustainable Development and Climate Action of the City of Rio de Janeiro - The PDS Vision 2050 is structured into five major transversal themes 1. Cooperation and Peace 2. equality and equity 3. longevity and well-being 4. climate change and resilience 5. governance The City of Rio, through the PDS, aims to guide urban development across three strategic areas: -Mitigation - Adaptation - Inclusivity and Equity By integrating data-driven assessments and adaptive planning, this prototype directly supports the vision outlined in the Plan for Sustainable Development and Climate Action (PDS).	The prototype applies HydroFlows and FloodAdapt, two tools developed by Deltares, to: Conduct rapid and continuous flood risk assessments. Improve urban drainage master planning. Strengthen flood resilience through adaptation planning. These tools provide a data-driven, adaptable framework for flood risk management, aligning with Rio de Janeiro's broader urban resilience strategies.	We also plan to demonstrate the use of the tools in other UP2030 cities to evaluate the usefulness and grow experience before reaching the final outcome.	Completed Activities: Development of HydroFlows for automated flood risk modeling. Creation of FloodAdapt for evaluating adaptation strategies. Data compilation on past floods, drainage capacity, and urbanization trends. Stakeholder engagement through 12 online workshops. Deltares: We finished tool implementation. Over a period of around 18 months we collaborated with RioAguas and COR, two departments in Rio de Janeiro responsible for urban drainage and early warning, in developing the tool and applying it to the Acari River basin in Rio. Tool implementation was concluded in a training workshop in April 2025, when the tools were handed over and training was provided in flood risk management and the use of the tools. Currently, RioAguas is in the process of internalizing the tools in their work. We are in contact and support where necessary.
11	Zagreb	Modular Urban Farm: Green Techniques Curriculum Methodology Every school has a document – the school curriculum, which represents the legislative framework for determining the work program. If one wants to introduce green change into the everyday activities of children, it is necessary to create a green curriculum and incorporate it into the official school program through official channels. The Methodology for Green Curriculum Development will be shaped into one comprehensive digital brochure, which consists of a group of small brochures (so-called „knowledge nuggets“) Components: -Develop a green curriculum that will incorporate the activities of the UP2030 project into the regular teaching program - Design educational programs (in accordance with the green curriculum), which will educate children as ambassadors of green changes, and through them, other members of the local community - Design practical activities (in accordance with the green curriculum), in which teachers, children and members of the local community will participate, and master skills according to the principle of "learning by doing"	Elementary School Luka Sesvete, Zagreb	Prototype n°1 supports Zagreb's vision to redefine urban agriculture to be more sustainable and resilient to climate changes as well as to raise citizen participation in development of green politics.	Curriculum and Educational Material Development Service - Vesela Motika d.o.o., Zagreb --> because it fulfils the preconditions for working with the school and in the school premises. Service for Developing And Implementing Solutions Based On Green Technologies - Vesela Motika d.o.o., Zagreb --> because it fulfils the preconditions for testing indoor and outdoor growth, which will finally provide data for shaping the prototype methodology. Thermal Environmental Imaging Service - Vesela Motika d.o.o., Zagreb --> In the Zagreb pilot project, this service is used to compare environmental conditions (especially the temperature of objects and the environment) recorded before and after green interventions. Data Analyses Tool - University of Cambridge --> because it helps to shape a credible prototype methodology (include a scientific analysis of all currently available databases on the state and quality of the environment, the level of pollution by harmful emissions'	Given that all the technical preconditions for testing the effectiveness of the methodology have been carried out in a timely manner, the only thing left for us is, conceptually speaking: - "watching how plants grow" - "monitoring how children react in real life to the acquired knowledge and skills". The planned period for concluding the implementation activities is 08/2025, so that with the results obtained by the end of 09/2025, Prototype n°1 could be produced in its final form as an established methodology for replication.	

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12	Lisbon	StepUP_LxALL prototype enables the city of Lisbon to become more sustainable, resilient, inclusive and climate-neutral by 2030, reinforcing its climate leadership position at European and global level. These tools contribute to sustainable mobility, energy efficiency, resilience of the infrastructures, also promoting regenerative agriculture. The prototype also promotes active inclusion of the population in implementing climate policies and in reinforcing partnerships between stakeholders.	Lisbon prototype has two main scales: the parish and the facility levels. The latter is implemented in four facilities, namely, 1) the São Miguel Rugby Club, 2) the Coruchéus Library, 3) the Alvalade Market, and 4) the National Laboratory of Civil Engineering.	A sustainable, resilient and inclusive city that anticipates climate neutrality by 2030 - vision and ambition to become a sustainable, resilient, inclusive and climate-neutral city by 2030, reinforcing its climate leadership position at European and global level.	Alvalade Neutral Neighbourhood walking route “Here we go to Alvalade” - CML Climate neutrality 2030 Factsheet - CML Promotion of sustainable events - CML Continuous monitoring of consumption (water & electricity) - Lisboa E-Nova Assessment of solar energy production potential and installation of photovoltaic system in the roof - Lisboa E-Nova Climate ready certification - ADENE Hydraulic modelling - LNEC Tools for measurements in the urban water cycle analysis of rainfall data - LNEC RAF ICARIA – Resilience Assessment Framework tool - LNEC B-WaterSmart - LNEC Circular urban planning tool - ETH Zurich	In order to complete the prototype, the tools must be fully applied at the parish/ pilots levels. No additional tools or services are foreseen to be implemented at the parish or pilot scale. The most significant challenge is related to financing the proposed interventions, which are mostly not covered by the project.	ETH: The tool implementation on the pilot city is still in progress. The application to the city data is done, we just need a discussion with the city representatives to have feedbacks. The implementation in the pilot city will be finished by beginning of November. LNEC: Completed. The application is at Alvalade Parish and at the São Miguel Rugby Club facilities scales.
13	Rotterdam	Resilient District Toolkit - will be an interactive PDF, where you can click on a map and switch to different pages with the different lessons/interventions/ case studies from the BoTu 2028 program. There will be an introduction and an explanation on how to use the toolkit and to give a brief background on the BoTu program. The climate storymap of BoTu will be featured within the toolkit as well.	Leverage the lessons learned from the Resilient BoTu 2028 program to achieve broader city goals on climate neutrality, energy transition, resilience and just transition. The Resilient District Toolkit is a tool that the municipality can integrate in its way of working and leverage the lessons learned from the Resilient BoTu 2028 program to achieve broader city goals on climate neutrality, energy transition, resilience and just transition. To ensure that the lessons are taken up and upscaled, it is crucial that the toolkit is robust , accessible and allows for practitioners from different backgrounds to contextualize and replicate it in their own work.	We are also working with the VUB and CETH for the development of the NSM. At the moment, the NSM will be integrated into the prototype of Rotterdam. In addition, the city has engaged with the Spatial Justice Framework in parallel to this prototype. No other tools are expected to be integrated into the prototype. There is no direct matching with UP2030 tools for the prototype with the exception of the NSM. Since the toolkit largely relies on internal city processes & existing tools, the focus is mostly on ensuring that the existing diversity of resources is captured first.	Assignment of Toolkit allocated to Municipal research group (March 2025) Development of content for the toolkit in collaboration with R-Cities (March – July 2025) Alignment with KPIs associated with the District Hub which will deliver the next phase of the Resilient BoTu program (July 2025) Finalization of the Toolkit (September 2025)	Content and layout for the toolkit being finalized Draft structure of the toolkit has been presented to several teams both within and outside of the municipality (including LAA members) for feedback and streamlining Final version in Dutch to be delivered on 3rd October English translation for broader dissemination by mid-October	

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14	Thessaloniki	The prototype is a District Climate Action Plan (DCAP), designed for the Dioikitirion neighborhood of Thessaloniki. It is structured as a comprehensive planning and policy document integrating climate mitigation and adaptation strategies, developed through participatory processes and technical analysis. The final format will be a methodological guide and policy roadmap, accompanied by geospatial visualizations, co-created actions, and integrated simulation tool outputs.	Dioikitirion Pilot Area (district/neighborhood level)	Becoming a sustainable, thriving and climate-resilient mixed use neighborhood. The transformation is guided by three core pillars: carbon neutrality, resilience, just transition. This will be done through increased use of renewable energy sources, a focus on climate resilience (addressed through urban mobility and environmental quality), and improved recycling efficiency/circularity. It also operationalised Thessaloniki's 2030 vision at the district scale.	UCCRN European Hub provides services to support the prototyping phase through the UDCW methodology, applying UDCW Simulation and Facilitation Toolkits. Vrije Universiteit Brussel (VUB) and CERN offer Neutrality Story Maps (NSMs), a mobile-friendly web platform designed to raise awareness about climate change and empower citizens to express their interests regarding the future of their city. GGGI and CERN developed the Green Economy Model (GEM) to analyze green economy and low-carbon development scenarios by simulating the dynamics of various urban systems, including the economy, housing, and energy. DRAXIS provides the DRAXIS Smart City DSS, a geospatial intelligence platform that offers innovative tools and services to citizens and organizations, enabling them to integrate and analyze data from multiple sources.	Integration of final technical tools & outputs; refinement of action framework; pfinal participatory validation; monitoring and evaluation framework; alignment and governance; financing and scalability	UCCRN: The UDCW methodology is being fully implemented in Thessaloniki, with the application of UDCW facilitation and UDCW simulation to the Dioikitirion district. The UDCW contributed to the Dioikitirion Climate Action Plan. Draxis: The UP2030 Smart DSS has been fully deployed in Thessaloniki Municipality. All core functionalities have been implemented, and the final updates, including integration of environmental, climate, socio-economic, and urban planning strategies related datasets, have been completed. The tool is fully operational and accessible to pilot stakeholders through the digital environment.
15	Granollers	pilot to develop a set of guidelines for a future climate neutral, resilient and fair neighbourhood -- the prototype is thought of as a guide of standards in urban planning to be scaled to other medium and small cities, providing decision makers and planners with a usable criteria and toolbox of resources/strategies to develop new liveable urban areas (decarbonisation, climate-resilience of infrastructures/services, and social cohesion)	neighborhoods in small/medium sized cities	Resilient and sustainable neighbourhoods. The city of Granollers wants to move forward in a healthy and sustainable urban model that puts people at the centre. The local government is committed to integrating green spaces, mobility and digital infrastructures to foster communities that are connected and respectful of nature and planetary boundaries. Through initiatives such as a citizen laboratory, mobility as a service (MaaS) and sustainable energy and circular economy solutions, it is proposed to improve the quality of life in Granollers. At the same time, these initiatives are contributing to reducing emissions and adapting the city to its main climate vulnerabilities, basically caused by floods and high temperatures. This approach also includes the promotion of mixed-uses in the new city developments, and the affordable housing and the universal accessibility to ensure that all residents benefit from a culturally rich, equitable and adaptable urban environment. This vision integrates the objectives and actions necessary to create a prosperous city with opportunities for everyone.	Aquatec (Developing and implementing RESCCUE tool in the frame of La Bòbila sector in Granollers) TSPA, (Developing and implementing City Scan tool in the frame of La Bòbila sector in Granollers): The tool enabled the modeling of four distinct urban design scenarios based on parameters such as walkability, density, solar energy potential, and carbon sequestration. These scenarios directly informed the development of a prototype - 'Set of Guidelines for a Greener City with Opportunities for Everyone'. The City Scan Tool played an important role in identifying suitable spatial strategies for achieving net-zero emissions, balancing grey and blue/green infrastructure and more. VUB, Vrije Universiteit Brussel (Developing and Implementing Neutrality Story Maps) URLAB, Urban Resilience Lab Barcelona (Assessing the developing of urban planning contents for the Granollers' prototype) UCCRN, Urban Climate Change Research Network for Higher Education, had developed Climate Resilient Multi-Scale Design Studio Intensive Week Report Integrating Climate Resilience into Urban	The final prototype will be a digital document designed to be accessible and to compile the content obtained during the co-creation process. It is expected to be a useful tool not only for the technicians of the Granollers City Council but also for professionals from other municipalities of similar size, supralocal administration technicians, and other experts related to the subject.	September 2025 will be delivered a final document, usable in the process of setting up new urban developments in the city. Aquatec: The RESCCUE database and tool, supported by the modelling software Infoworks ICM was implemented in the Granollers' pilot in order to support the development of its prototype, consisting on a set of guidelines for a greener city with opportunities for everyone. The implementation of the tool was performed from April 2024 to October 2024, so that this phase is fully completed. TSPA: While the City Scan Tool has already been applied to model urban design scenarios and inform strategic guidelines, the prototype itself—built on these outcomes—is still undergoing final development. A refined version will be delivered by June 2025, with final approval and completion scheduled for September 2025.

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16	Istanbul	Integrated Digital Twin Framework including: (a) MIRA Digital Twins Platforms (MAGGLIOLI), (b) BIM module & building life cycle assessment (LCA) module (CIRCE), (c) UBEM/UBTEM: AI-powered decision-making tool for decarbonization (METU and ODTU-GUNAM).	city-level	As a signatory of the C40 "Deadline 2020" initiative, Istanbul is committed to achieving carbon neutrality by 2050. The city's 2021 C40 Climate Action Plan outlines ambitious greenhouse gas emission reduction targets, addressing key challenges such as high emissions from buildings and transportation, poor air quality, and an energy-inefficient building stock that lacks climate resilience. Additionally, traffic congestion and overcrowded public transportation pose significant barriers to sustainable urban mobility. Through this prototype, Istanbul aims to tackle these challenges by integrating the digital twin framework tool into its climate strategy. By evaluating renovation scenarios to enhance building energy efficiency, optimizing PV integration, and supporting PV-powered e-mobility, the tool will provide data-driven insights for decarbonizing both the building and transportation (e-mobility) sectors. This approach will contribute to comprehensively analyzing (i) existing building performance, (ii) the impact of various renovation strategies on building energy performance and indoor	ODTU-GUNAM – responsible partner for developing UBEM/UBTEM: AI-powered decision-making tool. The tool has been developed for the selected pilot area in Istanbul (Kadikoy neighborhood), and the web-based interface has been fully implemented. Decision makers can now analyze and evaluate various building energy renovation scenarios within an interactive web-based environment, considering multiple key performance metrics (environmental, economic, and thermal comfort) and long-term variables such as climate change and grid carbon intensity. CIRCE - responsible partner for calculating GHG emissions through life cycle of energy efficiency interventions: LCA Module. This tool module is being implemented, its receiving building energy demand predictions and utilizing data on current construction characteristics and implemented technologies to assess environmental impacts and determine the emission balance for various integration scenarios, such as photovoltaic deployment and building renovations. MAGGLIOLI - responsible for developing MIRA digital twin platform, the part of the prototype that addresses visualization of data	User feedback is expected in order to decide on potential improvements of the tools. Each module of the Framework might be affected from the aforementioned user feedback. METU and ODTU-GUNAM will revise the AI-Powered decision-making tool for decarbonization in terms of data and procedures. Possible changes may affect the data sets used and therefore an update process for the other modules in the framework will be initiated. CIRCE will revise the BIM and building LCA module. If changes in datasets occur an update process for the data ingested in MIRA digital twin platform will be initiated. We expect the database to be completed/updated by mid to late October of this year	ODTU-GUNAM: In the most recent Upscaling workshop, a demonstration of the tool was given to a diverse group of participants selected by the Istanbul Metropolitan Municipality, and feedback was collected to inform further improvements. Maggioli: The development of the tool has been finalized. Minor improvements are expected until the end of the project. Istanbul, the pilot city, has been presented with an early version of the tool, without the complete data ingested. Istanbul personnel are expected to work with the finalized tool in the following months.
17	Istanbul 2	PV-integrated urban furniture for public awareness and sustainable energy	urban public spaces	Istanbul aims to integrate clean energy solutions not only within buildings but actively throughout public spaces that citizens interact with daily. Urban spaces, specifically urban furniture, occupy significant areas within cities, and many people regularly spend time in these spaces for various activities such as sitting, picnics, or waiting. Due to their size and visibility, these areas become key attraction points in urban environments. Integrating PV technologies to urban furniture that is used daily by people allows clean energy to become an active part of urban life, encouraging people to engage more closely with renewable energy solutions aligning with Istanbul's vision.	ODTÜ-GÜNAM – PV technology development, production of urban furniture, and testing ISTON – Production of urban furniture (3D concrete bank part) METU – Design of urban furniture	furniture prototype and key components such as the energy monitoring system ready for deployment, the installation could be commissioned in mid-April in the worst-case scenario. The integration of solar panels, structural anchors and real-time energy monitoring aims to create a fully functional, self-sustaining urban furniture unit. Once the prototype is installed, it will be introduced to citizens at an event organized by IMM, aiming to raise awareness of the importance of PV use in line with the UP2030 goals. There are several critical steps on the way to completion. First, when weather conditions permit, excavation and anchoring will be completed to secure the structure. This will be followed by the transportation and installation of the PV-integrated street furniture and the 3D printed concrete bench. The energy monitoring system will then be	PV-integrated urban furniture for public awareness and sustainable energy : Kadikoy - Moda Coastal Park was selected as the pilot site due to its dynamic urban environment that attracts a variety of visitors from all over Istanbul; A comprehensive site analysis was conducted to ensure the feasibility of the installation, considering the environmental conditions such as the canopy design and the proximity of the site to the sea. All static calculations, especially wind load analysis, were performed to assess the structural integrity; Although the installation was initially designed to be fully portable, safety concerns required fixing this street furniture to the ground. Therefore, the ground had to be excavated, but excavation work was temporarily postponed due to adverse weather conditions. Simultaneously, the production of the PV-integrated street furniture was completed with the successful production and testing of the solar panels and once the site is ready, it will be transported to the site and the installation will be completed.
18	All cities				Neutrality Story Maps - VUB		VUB: We are aiming to launch the tool to the public in October, and we will organize a final feedback moment in September 2025. The feedback moment will help cities make the necessary adjustments and finalize their NSMs.
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1	Prototypes' Journey & Sustainability					
2	Prototype	Prototype Upscale & Sustainability				
3	Pilot City	Sustainability/Upscale objectives	Next Steps & Responsibilities (activities will take place within end of project and beyond)	Impact (achieved & future)	Governance sust.	Finance sust.
4	Belfast	>The aim is that the NZNF can be scaled across the city and beyond. The geographical focus is for now on the southern section of Belfast's city centre which contains a mix of functions and land uses including residential, tourism, commercial, office, hospitality and transport. Specifically: Agree Council approach for post-project dissemination and upscaling Further develop the actor / stakeholder relationships Align with city and regional strategies Develop adaptable, flexible solutions for different urban contexts Explore the current finance and governance arrangements for each of the three sectors (residential, public buildings, and commercial), and see what would be required in terms of finance and governance arrangements for upscaling.	Consider cross tenure model led by NIHE and Retrofit Hub and discuss further -6 months (framework will include high-level overview of a cross-tenure model) -BCC Climate Team & Belfast Retrofit Hub Speak to energy suppliers (through retrofit hub) to understand Energy Company Obligation-funding opportunities -6 months -BCC Climate Team; through retrofit hub Produce first carbon baseline for Belfast City Council. This will inform identification of carbon reduction programmes and target setting. This is likely to be replicated by all larger public bodies. -6 m -BCC climate Enquire about LPS data and DfE's energy mapping to establish baseline of energy performance of commercial and public sector stock in city -6 m -BCC data scientist Consider who could lobby for financial intervention from UK Gov outside of block grant (additional funding as well as isolation of dedicated funding for retrofit within the grant) -6m -BCC CRD/Place partnership Explore finance models as suggested by GGGI		Embed governance and accountability: Introduce clear targets, data collection, and top-down commitment across public and private sectors. Utilise public bodies duty reporting as an incentive for immediate action, laying out the stepping stones/roadmap for an organisational approach. Need for strategic oversight and coordination across sectors and departments Consider a long-term plan to decar+P4bonise building stock - identify projects that provide financial savings, particularly the quick wins such as solar PV where the financial saving could be realised in 5-8 years, and building on this to deliver larger interventions. EBIS loan models can be explored to cover the upfront investment costs. Need for policy clarity (e.g. minimum energy efficiency standards and the timelines of when these will be implemented), emphasising the importance of clear, committed policies to drive investment	Financial incentives (and disincentives?) are required to kick start action and mobilise sectors Establish sustainable funding models: develop grant schemes and financial mechanisms similar to those in GB and RoI, including low-cost loans and revolving funds. Making a case for an 'invest to save' model across public sector building stock. QUB was cited as a good example of how an initial £250k investment in a revolving fund has yielded £10m
5	Milan	Goal is to make sure that the methodologies developed are integrated and continued to be used by the municipality after the end of the project - in support to internal decision-making processes and specifically in the design and assessment of urban transformation projects and plans. This means that: 1) the methodologies developed fill in needs and methodological gaps of the Municipal staff involved in priority processes (for instance, planning and monitoring of plans).; 2) the methodologies can be complementary with other methodologies and tools already in use or future ones; 3) the methodologies are solid and reliable scientifically speaking, and data-wise speaking. 4) the Municipal staff have been trained and upskilled to use these methodologies after the project.	Next steps include: Application of InVEST methodology in support of the future Urban Green Plan, to guide decisions. Integration of InVEST in existing ecosystem service methods used within the Municipality, creating a comprehensive methodology for future plans and monitoring activities. Development of new projects funded by the EU Commission for further enhancement of the tools and their adaptation to the specif context and needs of the City. Internal training session to review the InVEST handbook and make sure it is integrated by the Municipal staff – LINKED TO OBJECTIVE 1, 3, 4 - Urban resilience department and LINKS (until end project) More departments from the Green Department have been involved and the next steps will be to understand how other departments can use the prototype and align the use of methodologies in the green department of the city of Milan. The objective is to use the tool as part of other project and initiatives from the Green Department in the city of Milan. Dissemination of the knowledge on ESA and methodology inside the Municipality, in relation with the citizens in the framework of events and conferences, etc... Future meetings to further explore the complementary between the	As for now: The prototype, with its analysis of ESS but most importantly the methodology (InVEST), has been adapted to the municipal context, and now assimilated and replicated by municipal staff for urban and policy design. -ex uptake: Contribution of the assessment of the "Urban Cooling" Ecosystem Service to the monitoring activities of the Air and Climate Plan of the Municipality: the ESA conducted by LINKS helped to define the quantity of green spaces that needs to be developed by 2050 in order to contain local temperature's increase under the 2 degrees threshold set in the Air and Climate Plan (PAC). The following barriers will be overcome: Fragmentation of methods and data used by the municipality to assess ecosystem services. Lack of methods for assessing certain ecosystem services adapted to the urban context (needs, available data, etc.).	To make sure the prototypes have an impact, the key aspect is their integration in the decision making and planning processes of the Municipality: making sure they are supporting ongoing and future Municipal plans or processes; ensuring they complement the other tools used by the Municipality, by enhancing their different technical aspects and possible uses; making sure all the conditions are met for the technical staff to use the methodologies developed. A good integration of the prototypes is the result of continuous efforts led to building solid internal governance (transversal working group inside the municipality) and external governance (LAA) at every step of the project. Milan does not plan to use the governance tool by Adelphi in the future.	InVEST, used for the assessment of ecosystem services, is an open-source tool that does not require the payment of licences. Therefore, the only costs to be incurred for its replicability will be any personnel costs for obtaining technical support for its future use, and it will be managed by the Municipal staff, using its own resources (personnel). Same applies for the City Resilient Framework. Future opportunities are still to be confirmed, as synergies with some EU projects for the further application of tools to new case studies. The financial tool provided by GGGI will not have immediate application within the project but may be used in the future to identify funding opportunities that will allow for the further development of the methodologies tested within UP2030. The Municipality of Milan will probably use the tool to identify funding that will enable the design and implementation of NBS that can effectively increase the ecosystem services provided by green spaces and urban resilience. The finance by GGGI tool could be used for the implementation of future projects, not for upscaling or developing the methodology per se
6	Mialn 2	Integration resilience in its projects and initiatives while supporting the Urban Resilience Department's efforts to structure a narrative and governance framework	Further developments of the legacy document will be conducted after the closure of the UP2030 project as a strategic and transversal activity of the Urban Resilience Department.			

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7	Budapest	Sustainability of the platform is the goal. To operationalize and make sure the KC remains relevant, active and operational beyond the UP2030 project. specific objectives: Scale-up communication and involving of district municipalities, decision-makers, and urban planners in the adaptation and implementation of Healthy Streets (HS) methodology, through active dissemination of the methodology, the Knowledge Center (KC) and knowledge-sharing. Ensure operationability and sustainability of KC, including operational framework, ensuring the necessary financial and capacity needs are estimated and met for the successful continuation of the implementation of the KC's objectives beyond UP2030.	A 12-month action plan was drafted to ensure that the responsibilities and next steps for the sustainability of the KC that was established. Knowledge management and KC platform development. This includes the maintenance and upkeep of the platform, as well as upgrading with the addition of new resources and methodologies. Training programs and capacity building (long-term plans) Integration of Healthy Streets and climate aspects into regulations: In 2026 (BFFH Várostervezés) Encouraging the participation of other municipalities: Start in 08-2025 and continue in 2026. (BFFH Várostervezés, BFFH Klíma) Building and coordinating an expert network, including the organisation of a yearly conference and fostering collaboration with national and international partners. Establishing the operational framework: Start now and continue in 2026 (BFFH Várostervezés, BFVT) Provide recommendations to urban planners and decision-makers, so that the methodology developed can be applied to urban planning activities and projects. Communication and dissemination of the Healthy Streets KC, and promotion of community participation in planning.	The following barriers will be overcome: Difficulties for ensuring a continued operation of the Knowledge Centre Laying down key terms of operations and key indicators for monitoring the tasks and goals of the KC Limited access to professional knowledge and best practices on HS and guidance on how to develop sustainable and liveable urban spaces Weak collaboration between local governments Lack of policy and regulatory support Unclear and unsustainable financing beyond the project	Key suggestions to enhance governance: Expand userbase and strengthen dissemination Establish mechanisms to update and adapt KC Events: Conduct regular community building events and meetings; Events and conferences for capacity building and dissemination Define clear roles and responsibilities for KC maintenance and expansion. In line with this develop a high-level roadmap for the KC (tasks, goals) Explore funding needs and opportunities Clarify regulatory questions in terms of making Healthy Streets urban design methodology mandatory when designing and upgrading public spaces across the city	Estimated costs (per year): HR costs: to be estimated, around 1 FTE is planned Events and conferences: around 2 planned per year, estimated costs: 2 500 000 Ft (6,200 EUR) Potential sources of finance (short-medium term maintenance, development): Municipal budget (to cover HR costs of municipal staff & events) Own budgets of participating members (to cover HR costs of KC member times) Include KC in upcoming Horizon Europe calls Potential sources of finance (longer-term expansion): User fees: if KC expands member base (once benefits of KC can be "quantified") Conference fees: asking for payments when members attend conferences Explore other funds and sources: e.g., European City Facility, philanthropies
8	Münster	Münster has been working on a roadmap for climate friendly neighbourhoods, which offers guidance through the different steps that need to be taken for a climate neutral and adapted neighbourhood development. The final roadmap will be an interactive pdf that will guide municipal staff through planning instruments, measures, databases, funding opportunities and participation approaches essential for sustainable development. These are the specific objectives that the city of Münster has for the upscaling phase: Creation of working structures for the ongoing updating of the guideline Integration of the guideline into the "Climate City Process" Utilization of synergies with the "Guideline for climate-friendly development of New Development Areas" Prospective expansion of the guideline so that it can also be used by planners, architects (and possibly the public)	Test the guidelines in other neighbourhoods or project areas, in existing areas of the city. Digital tool from another department for the development of new areas – urban regeneration and renovations. Align the two tools for a comprehensive approach in existing and newly developed urban areas. Define the ownership of the guidelines developed in the departments. Plan within the city on how to develop a legally binding document for these guidelines, to ease implementation and adoption of the document. Based on the guideline to specify the needs of data per department. Specifically: -Establishment of a Jour Fixe on the topic of climate-friendly neighborhoods -Creation of institutional commitments for the use of the guideline	Structural improvements: Establishment of a task force for urban planning processes to reduce informal planning (= Climate Office) Strengthening the role of the Climate Protection Staff Unit, as it currently has no formal decision-making authority Resolution of contradictory and conflict-generating administrative structures Technical solutions: Linking the guideline with the municipal "Data Wiki" and "KomMonitor" (to identify relevant indicators) Prospective further development of the PDF-based guideline into an online tool (like the Guideline for climate-friendly development of New Development Areas") à Examination of synergies with the "Digital Guidelines for Climate-Friendly Urban Development" regarding joint technical solutions	Creation of institutional commitments for the use of the guideline Integration of the guideline into the "Climate City Process" The fact that all administrative departments are connected to the climate-just transformation of urban districts is beneficial for the decision-making processes: Citeq (IT Department), Smart City Münster, Department of City Planning, Department of Mobility and Civil Engineering, Münster Marketing, Department of Culture, Department of Social Affairs, Department of Human & Animal Health, Climate office, Department of Property Management, Department of green spaces, environment and sustainability +K8	The city of Münster has already set up and established a climate protection and climate adaptation controlling system, including a financial climate budget, which is used to monitor key measures for achieving the city's climate targets.
9	Rio de Janeiro	Ensuring that the project's methodology and tools can be adapted to different urban contexts and scales.	It is planned a series of capacity-building workshops will be held in person in Rio de Janeiro, facilitated by the UCCRN team and aimed at improving the uptake by the city's technical departments of the simulation results and background data included in the UDCW report. Continued communication, including virtual meetings.			
10	Rio de Janeiro 2					
11	Zagreb	Replication is the objective	design a proposal for a universal generic curriculum that is not "site-specific" but is adapted for replication and application in all types of educational institutions that have an interest and the possibility of applying the "green curriculum"			

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12	Lisbon	Share, implement and replicate technological and innovative solutions/ideas for action "StepUPLXALL Towards Climate Neutrality and Improving the Quality of Life in the Neighborhood" Align projects, interventions and good practices with the Lisbon's Climate City Contract 2030, combining neighborhood parish, municipal sales Particularly: Reinforce coordinated interventions Ensure continuity respond to the population needs Strengthen budget by combining different sources of funding Commit and hold everyone accountable without exception for a better future Upscale solutions Respond to the goals defined in the CCC	Continuation of meetings with the parish and pilots identification of enabling services to facilitate the implementation of solutions identified as relevant Redesign solutions to the problems identified Integration of intelligent decision support systems (prototype) develop a catalogue/portfolio of solutions and other products monitor benefits of green initiatives, interventions (KPIs) inclusion of this strategy as a priority action in the main actions of the municipal Plan 2026/30	Budget reinforcement Conclude procurement procedures Planting trees felled with the storm Martinho, on March 20, 2025 and reinforcement of the green structure Portfolio design extend pilots to other collective facilities: cemeteries and hospitals extend pilots to other areas of the city and other cities/regions valuing co-benefits with emphasis on the adaptation sector (biodiversity, air quality, noise, pests) aligned with mitigation and social inclusion /justice strengthen synergies between public and private, technical expertise and the scientific community promote alignment between projects and the municipal strategy implement Lisbon CCC 2030 actions at Alvalade	because of the occurrence of a disruptive climate event, Temporal Martinho (March 20), it was possible to value and prioritize intervention and finance the climate resilience and carbon neutrality actions	Strengthening the budget with equity and other sources of financing For the CCC we use the tools given by NZC and we could use other tools as well. We have other tools in the municipality. The tool on finance developed by GGI was useful for brainstorming on different actions that we could conduct, but we cannot guarantee to use them in the future.
13	Rotterdam	Specific upscale goal: test the toolkit contents and get feedback on how to ensure the content is relevant and useful. The broader aim is to ensure that the toolkit gets a place in the city's policy structure and can be positioned as the essential resource for putting the neighborhood resilience approach into action. Upscale on the policy level and replication of the interventions on other projects - opportunity: -Replication of activities in Bospolderplein - Upscaling lessons from 1 public square (Driehoeksplein) to another square (Bospolderplein) within the same neighbourhood Align the Resilience Toolkit with the municipality's integrated neighborhood development approach. Ensure findings can directly inform and support municipal processes already underway. Bring together practitioners from different departments (mobility, biodiversity, climate adaptation, etc.) to explore how resilience can be mainstreamed across policy domains. Build a shared understanding of resilience as a cross-cutting principle. Prototype the use of the Resilience Toolkit in the local context. Assess how it supports integrated neighborhood development and identify areas for refinement.	Further develop the toolkit and organize workshops for using the toolkit and building capacity on accessing and using it. Communicate the lessons learned to other groups Train the municipality workers to continue developing the toolkit Create a program of activities and events that could support the upscaling -->The toolkit is not comparable to anything that the municipality already has. It can give an added value to the resources that are already existing.	New way of evaluating the project impact by engaging with the users (citizens and local stakeholders) Focus more on the social transition Collaboration with the Transition Academy: Transition academy is a learning environment within the municipality to better integrate silo's and improve collaboration and prepare for social and physical transitions that demand another way of working, the objectives fit the UP2030 goals.	Lessons learned from the policy perspective to be transferred in other policy cycles and sectors	C40 heat tool, focusing on the heat stress
14	Thessaloniki	Tow main objectives: exploring how the District Climate Action Plan (DCAP) can be embedded within the municipality's existing strategic planning frameworks. The upscale phase focuses on assessing the targeted actions identified during the Action Phase Workshop, clarifying the challenges, evaluating their feasibility, assigning responsibilities to the relevant municipal departments or partners, outlining concrete implementation pathways, and defining a realistic timeline for delivery. This process also includes the identification and mobilization of appropriate funding mechanisms, such as EU structural funds and municipal or regional budgets. extending the implementation of the prototype to additional districts and neighborhoods across the metropolitan area, with particular emphasis on areas that face higher environmental vulnerability, social inequality, and limited access to green infrastructure. This strategic expansion aims to embed climate resilience and sustainability more deeply into the fabric of the city by tailoring actions to local needs, promoting community engagement, and integrating nature-based and low-carbon solutions at the neighborhood level.	Thessaloniki will need mainly to: 1. DCAP actions, related to urban planning and "physical" interventions 2. Establishment of collaborations with different municipal departments and stakeholders Beyond that, focus also on: Address the fragmentation of climate action by promoting integrated, cross-departmental coordination and ensuring institutional continuity beyond isolated pilot efforts. Align climate actions with existing municipal strategies like SUMP and SECAP, reducing policy redundancy and increasing coherence. Correct spatial inequalities in access to green infrastructure and resilience me+G14+114	Municipal staff, city council members, and local communities have shown strong support for climate and environmental agendas. This growing awareness and readiness for action at both the political and social levels offer a solid foundation for the successful scaling up of DCAP. The upscaling of the DCAP will provide an opportunity to embed climate actions into the city's strategic and operational planning frameworks (operational plan, SUMP, SECAP, etc.), ensuring continuity, institutional ownership and long-term impact. Stakeholders involved actively in the DCAP process can benefit from capacity building, knowledge exchange, and access to tools and data (e.g. vulnerability maps, spatial assessments) that can improve planning and decision-making in their own departments.	Actions that need to be taken in Thessaloniki: Institutional alignment with broader governance frameworks, such as the city's resilience, climate, and development strategies. Clear identification of the municipal departments responsible for implementation. Integration of DCAP activities into official structures and planning documents is essential.	The CBA Guide can be embedded into the city's planning procedures to evaluate climate actions under the DCAP. By using the CBA methods recommended, Thessaloniki can: Quantify the economic, environmental, and social benefits of interventions such as green roofs, energy retrofitting, or microclimate mitigation. Compare investment scenarios across focus areas (e.g., Lachanagora, XII Apostoloi, Antigoniou Square) to prioritize actions with the greatest net benefit. Present evidence-based justifications to municipal authorities and external investors for resource allocation.

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15	Granollers	The "set of guidelines" of the Granollers' prototype is an upscaling by itself of the results from the co-creation process implemented in Granollers (5 workshops on Needs-Challenges-Vision-Adaptive Pathways-Action), and also from the outcomes obtained by RESCUE and City Scan tools, applied in La Bòbila sector (new neighborhood to be developed in Granollers). For further sustainability, the primary goal is to adapt the prototype to the specific context and needs of Granollers, ensuring its viability and usability as a "style guide" or "resource kit" for the Territory & Sustainability area team. This will serve as a practical reference throughout the various phases of new urban development plans, projects, and technical solutions. Additionally, there is the transferability of this "style guide" to other similar cities and institutions, to pave the way to climate neutrality, climate resilience and social justice in planning.	Hyperdocument publication of "Set of guidelines for a greener city with opportunities for everyone" (in Catalan and English), accessible from the UP2030 website and the Granollers and Participa webpages. To publish a post and distribute it on Sostenible newsletter (Barcelona Provincial Council. Potentially reaching more than 300 municipalities). To present the Granollers' guidelines at CONAMA Local 2025 in Viladecans (continuing the collaboration initiated during the WS-Upscaling, 22th May 2025). To edit a poster and a postcard/leaflet (with a QR code linking to the hyperdocument) to be disseminated at the UP2030 final event on 3rd November 2025 in Barcelona. From December 2025 to June 2026, we are planning to focus on the implementation of the transferability package. Before 2027, end of the political legislature, we would like to approve the guidelines and upload as a style guide into the "estrated?"	Barriers that will be overcome are the following: Facilitate the integration of applied research and innovative solutions within the local context to ensure both their relevance and practical effectiveness. Enhance knowledge dissemination and foster greater acceptance among primary key target groups of the prototype — municipal technicians, urban planners, planners and decision policy-makers—who will engage with the prototype. Emphasize the inclusion of financial considerations as a core recommendation in the style guide, enabling an initial appraisal of the feasibility and implementation potential of the proposed measures.	Identify external stakeholders who can contribute to the process and define their roles. Establish alliances with ongoing projects and maintain engagement with key stakeholders such as LAA participants. Integrate the guide's recommendations into public tenders, ensuring that the established criteria are effectively applied. Disseminate knowledge through participatory bodies and citizen governance spaces Showcase real-life applications of the guide's recommendations through practical examples. Overcome language barriers by adopting communication strategies.	Identification of Institutional Funding Programs: Resources from the Government of Catalonia for sustainable and inclusive urban projects. Financial and technical support from the Barcelona Provincial Council for local strategies and planning Funding from the Catalan Water Agency (ACA) for climate adaptation and water management projects Climate Funds from the Government of Catalonia to support climate mitigation initiatives Align Municipal Budget and Fiscal Strategies. Promote Collaborative and Participatory Funding. European Grants and Programs. Drive Investments and Economic Revitalization.
16	Istanbul	The city-specific objective for Istanbul is to assess how the developed tools and practices could be adapted to different local contexts in Istanbul. The focus was on four specific districts: Beşiktaş, Ataşehir, Eyüpsultan, and the Princes' Islands (Adalar). More specifically, goal is: -to expand the implementation of the UBEM tool and solar-powered urban furniture across various districts to support a city-wide transition to energy-efficient, low-carbon urban living. This includes integrating digital twin technologies and renewable energy solutions into urban planning processes, increasing data standardisation, and encouraging citizen engagement. A core objective is to empower local authorities and citizens with digital tools that enhance decision-making via comparative scenario analysis considering the long-term future variables (2025-2050) and different performance indicators (energy consumption, thermal comfort, CO2 reduction, cost-related features), improve energy efficiency, and ensure equitable access to clean energy in public spaces. For this reason, we consider it important to include employees from different departments of the local government in our workshops. It is expected that the results obtained with the UBEM tool will be of interest after the completion of the project. In addition, we gathered the ideas and opinions of the participants in order to promote the opening of the city furniture as a public event.	Develop district-specific local action plans Provide capacity-building training for municipalities and technical staff Expand financial incentives for rooftop systems and mobile solutions Integrate digital twin technology into decision making processes	The prototype itself has following impact, regardless of the local context for upscaling: New Business Fields: PV companies, energy consultants Aesthetics + Sustainability: Visibility through PV-integrated furniture Participation: Digital twin interface allows non-technical users to engage Education: Innovative awareness programs for youth Tourism: Scalable models in areas like Adalar		Workshop discussions aligned with the financial sources highlighted in the technical presentations: EU Funds: Horizon Europe, Green Deal, IPA National Sources: Municipal and ministry budgets Private Sector: Urban furniture production and sponsorship Carbon Credits: Green building certificates, tax incentives
17	Istanbul 2					
18	All cities					
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	A	B	C	D	E	F	G	H
1	Prototypes' Journey & Sustainability							
2	Upscale & Sustainability: Tools' contribution and post-project use							
3	Pilot City Belfast	tools' contribution and post-project use The Safe Routes, Healthy Places Belfast Toolkit - Design Clips: By providing adaptable resources, practical guidance and capacity-building opportunities, the toolkit ensures that the pilots' initial objectives can be expanded, replicated, and embedded into city-wide strategies, supporting lasting social, environmental, and governance impacts. The toolkit was initially developed for a pilot initiative. However, Belfast City Council has the intention to continue using the materials to promote the Walking Bus during the next academic year. In addition, the participatory methods can be adapted to support further active school travel initiatives in the future, guided by a matrix demonstrating how to combine the different tools for upscaling. Community Maps - Mapping for Change : Community Maps will continue to be used for participatory planning and engagement, particularly in visualizing environmental and social data. The Walking Bus toolkit is designed for self-implementation and may be adopted by schools through existing programs such as Eco-Schools. Urban Regeneration Carbon Accounting and Management - University of Cambridge: It has been designed to be scaled up and applied to other regeneration projects within the city - enabling Belfast City Council to conduct small scale carbon accounting.	Tools' integration/embeddement Design Clips: The toolkit is aligned with the city's Net Zero Framework and supports the Walking Bus initiative. Its flexibility, combined with a matrix to guide the city on how to combine the different tools for upscaling, allows it to be integrated into future school projects and local mobility strategies. MIC: Community Maps enables integration into planning workflows and supports collaboration with diverse stakeholders. The Walking Bus toolkit is scalable and can be embedded in school programs and citywide initiatives. Community Maps outputs are being integrated into framework documents and policy recommendations. The Walking Bus is featured in project communications and highlighted as a case study in planning materials. UCSM: It is included within Belfast's regeneration framework.	Tools' operational sustainability (local capacity, hosting, etc.) Design Clips: local stakeholders have been actively involved in the co-development of the toolkits, ensuring ownership and long-term usability. The toolkits include a variety of practical materials (such as project roadmaps, campaign templates, and participatory tools with detailed instructions) that build local capacity and enable independent application beyond the project. In Belfast, a matrix has been developed to help local enablers adapt the resources to different project scales, offering options for applying the toolkit according to available resources and objectives. Together, these measures contribute to capacity building at the municipal level and embed the knowledge needed for the continued and long-term use of the toolkit after the project ends. MIC: Community Maps is designed for ease of use and can be maintained by trained staff. The Walking Bus toolkit is self-implementable by schools. LF and NM have led efforts to update maps, integrate feedback, and coordinate with technical partners. Materials and support have been provided to stakeholders. Community Maps requires hosting and occasional technical support. These costs could be sustained through integration into city programs or external funding. The Walking Bus toolkit does not require ongoing costs. Support will be available for hosting, updates, and training as needed. The team is committed to ensuring open access and usability of resources.	Tools' Long-term impact in the pilot Design Clips: The toolkit contributes to the pilot's long-term vision by embedding child- and youth-friendly perspectives into active travel and urban design initiatives. It supports the continuation and scaling of the Walking Bus, aligning with the city's Net Zero Framework by promoting healthier, low-carbon school travel. Applied long-term, the toolkit first generates social impact by raising awareness of active travel and climate change within schools and the wider community. This awareness can, in turn, drive community support and demand for changes in the street environment, informed by children's experiences and reflections, to make their streets safer and greener, towards healthier and climate-neutral, resilient, and equitable urban spaces. At the governance level, the toolkit provides municipalities with ready-to-use resources, including roadmaps and engagement strategies, enabling them to save time, reduce reliance on external expertise, and follow clear milestones for effective community engagement. In this way, the tool strengthens both community awareness and engagement, and builds institutional capacity, ensuring sustained environmental and social impact beyond the project. MIC:Community Maps supports co-design and adaptive planning aligned with Belfast's neutrality and sustainability goals. The Walking Bus promotes active travel and community cohesion, addressing transport and health equity. Environmental: Supports greening and active travel, contributing to climate resilience. Social: Enhances community engagement, equity, and awareness of local issues. Economic: Informs cost-effective interventions and promotes healthier transport options UCAM: It is designed to enable the city council to estimate the carbon emission impacts of urban regeneration, so there are environmental benefits. Supporting the development of carbon neutral neighbourhoods.	Tools' impact monitoring Design Clips: We have developed an evaluation questionnaire for schools' feedback, and it has been delivered to both Belfast and Budapest. Its purpose is to gather feedback, better understand schools' needs and resources, and improve the engagement process. Each city may use the questionnaire during the project or after its completion.	Risks & Challenges for sustainability Design Clips: A key barrier to the continued use of the toolkit is the initiation and coordination of active school travel or urban regeneration projects that engage children and young people, as these create the opportunities for applying the tools and materials provided. In addition, the level of interest and resources available within schools or youth groups may vary, potentially affecting the scale of usability. However, these risks are mitigated through the supporting materials included in the toolkits, such as project roadmaps with clear milestones and community engagement tips, campaign materials that highlight the value of such initiatives, child-friendly participatory tools with detailed instructions on how to use them, and a variety of implementation scenarios that can be adapted to different resources and contexts. MIC: Limited school capacity and competing priorities Lack of dedicated staff for ongoing delivery Ensuring accessibility and avoiding participant fatigue Technical limitations and data completeness for mapping UCAM: Lack of updated data sets. Lack of time and capacity within the city council to find updated data.	Uptake & replicability outside UP2030 Design Clips: The toolkits are designed to be adaptable and scalable across different cities and contexts. Its structure, based on the Child and Youth-friendly Urban Design (CYFUD) wheel, allows materials to be customized to local priorities, resources, and cultural settings. We are participating as part of a wider consortium in the Climaborough public procurement for Lot 3 in Pilsen. Having successfully completed phases 1 and 2, we have been invited to submit our final technical and financial offer for the last phase of the procurement MIC: Yes. Community Maps has been used in multiple cities and continues to attract interest for participatory planning. The Walking Bus concept is relevant to many urban contexts and has potential for replication.
4	Milan	Milan will continue collaborating with LINKS, not only on the InVEST tool but in other things as well. Milan is planning to explore further opportunities (EU projects) to continue developing the methodology. For the city it was important that the tool was an open-source tool, so that they could continue using it after the project ended. LINKS: It is expected that the implemented tool will continue to be used after the project has concluded to support technical staff in developing plans, also in combination with other methodologies already in use. It has already supported the Air and Climate Plan by quantifying future green space needs and will further contribute through integration in municipal planning workflows, training of staff, and applications in upcoming EU projects.	LINKS: Currently, the results for "urban cooling" service, have been used to inform the Air and Climate Plan on the amount of green surfaces that should be implemented by 2030 to keep the temperature within 2°C. As an open-source and fully adapted methodology, it can be integrated into city workflows, complement existing municipal tools, and be maintained with internal resources, while also facilitating collaboration across departments and enabling future city-wide applications.	LINKS: The choice of InVEST was made because it is open-source and user-friendly, requiring only basic GIS skills. This allows municipal staff and other stakeholders to maintain and operate the tool independently, ensuring its long-term usability beyond the project. A dedicated handbook has been prepared to support local stakeholders in replicating the methodology, using the data and applications developed for the City of Milan, so that municipal staff can continue applying the tool beyond the project.	LINKS: The tool contributes to Milan's long-term vision by providing an open-source methodology (InVEST) that municipal staff can continue to improve and apply for planning green infrastructure. By integrating ecosystem service assessments into decision-making processes (e.g., the Air and Climate Plan, the future Urban Green Plan), it ensures that urban transformations maximize environmental, economic, and social benefits, while strengthening internal capacities and enabling future replication and upscaling beyond the project.		LINKS: The main barrier to the continued use of the tool is the regular update and processing of input data, which is essential to ensure reliable and relevant outputs.	LINKS: the city of Turin (outside UP2030) shown interest in adopting the tool.
5								
6	Milan 2							
7	Budapest	UP2030 Resources: Community Maps (MIC), Citizens' storytelling tool (ISOCARP), Workshops for children (DC), Neutrality Story Maps (VUB and CERTH) Design clips: he tailored toolkit was co-developed with BKK, the Budapest Transport Centre. It has been piloted in a workshop with a school preparing to test a School Street closure in autumn, and BKK plans to expand its use to more schools in the new academic year. The toolkit will also be uploaded to Budapest's Healthy Streets Knowledge Hub to support future projects involving children and young people in urban design initiatives. MIC: In terms of upscaling, the tool has already supported upscaling by enabling city-wide engagement and data collection. Nine districts have expressed interest in deploying Community Maps to support local outreach and planning. The platform will continue to be used to support the Healthy Streets initiative and future participatory mapping projects. It will serve as a resource for district municipalities to engage residents in urban planning and green infrastructure development.	Design Clips: The toolkit has been introduced to support BKK's School Street pilot within the broader context of Budapest Healthy Streets. The capacity-building training session equipped local enablers with methods and resources that can be incorporated into wider urban mobility and child-friendly city initiatives. Additionally, uploading the toolkit to the Healthy Streets Knowledge Hub ensures that these resources will remain accessible for future projects, integration into the city's Healthy Streets Knowledge Hub ensures accessibility for future initiatives and facilitates collaboration across districts. MIC: The tool has been embedded into Budapest's updated Green Infrastructure Strategy and is part of the Healthy Streets Knowledge Centre. It supports the city's "Concrete and Asphalt for Green Surfaces" programme and the pilot sponge city initiative.	Design Clips: local stakeholders have been actively involved in the co-development of the toolkits, ensuring ownership and long-term usability. The toolkits include a variety of practical materials (such as project roadmaps, campaign templates, and participatory tools with detailed instructions) that build local capacity and enable independent application beyond the project. In Budapest, a dedicated training session was delivered to BKK staff to strengthen their skills and confidence in applying the methods in future projects. MIC: Training and capacity-building sessions were held with municipal staff to ensure they can maintain and update the platform. Ongoing technical support and updates are planned to ensure sustainability. Hosting and technical support incur costs. These could be sustained through municipal budgets or external funding aligned with green infrastructure and citizen engagement initiatives. In terms of support post project, Mapping for Change will continue to offer hosting, updates, and training as needed. Support packages can be tailored to the city's requirements. opportunities have also been identified that could support continued use: include EU urban development funds, climate adaptation grants, and participatory budgeting initiatives.	Design clips: The toolkit contributes to the pilot's long-term vision by embedding child- and youth-friendly perspectives into active travel and urban design initiatives. In Budapest, it strengthens the School Street approach by equipping BKK with practical tools and training to involve children and young people in the design of safer, more child-friendly streets. MIC: It aligns with Budapest's vision of a liveable, people-centered city by integrating community input into planning. It supports sustainable mobility, green space development, and climate adaptation strategies. Environmental: Supports green infrastructure planning and climate resilience. Social: Enhances public participation and civic engagement. Economic: Enables cost-effective planning by identifying high-impact, community-supported interventions.	Design clips: We have developed an evaluation questionnaire for schools' feedback, and it has been delivered to both Belfast and Budapest. Its purpose is to gather feedback, better understand schools' needs and resources, and improve the engagement process. Each city may use the questionnaire during the project or after its completion.	Design clips: A key barrier to the continued use of the toolkit is the initiation and coordination of active school travel or urban regeneration projects that engage children and young people, as these create the opportunities for applying the tools and materials provided. In addition, the level of interest and resources available within schools or youth groups may vary, potentially affecting the scale of usability. However, these risks are mitigated through the supporting materials included in the toolkits, such as project roadmaps with clear milestones and community engagement tips, campaign materials that highlight the value of such initiatives, child-friendly participatory tools with detailed instructions on how to use them, and a variety of implementation scenarios that can be adapted to different resources and contexts. MIC: Securing long-term funding for hosting and support ; Ensuring continued political and institutional commitment ; Maintaining community engagement over time	Design Clips: We are participating as part of a wider consortium in the Climaborough public procurement for Lot 3 in Pilsen. Having successfully completed phases 1 and 2, we have been invited to submit our final technical and financial offer for the last phase of the procurement MIC: Several cities within and beyond UP2030 have expressed interest, particularly those focusing on participatory planning and green infrastructure. Discussions are ongoing with several municipalities. Formal agreements are expected as part of future participatory mapping and sustainability initiatives.

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8	Munster	Climate Proofing Method – Büro Happold. We anticipate that the city of Munster will continue to use the tool after the project concludes. The Guideline for climate-friendly neighborhood development enhances municipal cooperation by providing clear steps for achieving climate-neutral and adapted neighborhoods. It guides municipal staff through planning instruments, measures, databases, funding opportunities, and participation approaches essential for sustainable development, therefore it is intended to be used also beyond the project. The guideline was set up for the ownership of the tool to be transferred to the city's climate unit. BH will facilitate a final feedback session with the city to consolidate input. The guideline is intended to be a living document, regularly updated and refined, with the climate unit responsible for organizing and coordinating this ongoing process	BH: The tool has been integrated into strategic guidelines for the development of existing districts. The guideline document, developed in collaboration with the municipality, supports the municipal departments by offering a general procedure for creating climate-friendly urban districts and assembling all relevant data and information sources. To ensure effective implementation and integration of the guidelines, it is recommended to pilot test them in additional neighborhoods or project areas, including existing urban zones, to assess their adaptability and effectiveness beyond the initial scope. The next required steps are listed below: -Coordination with the department responsible for digital tools used in urban regeneration and new area development is essential -Clear ownership and responsibilities for the guidelines should be defined within relevant municipal departments to guarantee accountability and long-term commitment. -A city-wide strategy should be developed to transform the guidelines into a legally binding document -To foster cross-departmental collaboration and continuous improvement, a regular coordination meeting focused on climate-friendly neighborhood development should be established -Finally, it is important to secure formal commitments	BH: the tool is accompanied by a guideline document designed to facilitate its implementation by local authorities and stakeholders in a clear and accessible way. During the UP2030 project, BH organized three workshops with the municipality, collaboratively developing the tool. As a result, municipal staff received sufficient training and supporting materials to ensure effective implementation. The Tool is designed to operate without cost, making it highly sustainable. The only expense is for the technicians or consultants who will guide the city's practitioners in utilizing the Tool. Following the completion of the project, BH will organize a final workshop to gather feedback from the various municipal units. After this session, BH's role will shift to providing support only upon request, specifically in cases of questions or uncertainties regarding the methodology. No further workshops, training sessions, or updates are planned.	BH: The toll generates several impacts that can be here summarized: by pilot testing the guidelines in different neighborhoods and urban areas, the city can ensure that climate strategies are adaptable and effective in various contexts, leading to more resilient and sustainable urban development (social impact) aligning digital tools across departments fosters a more coordinated and efficient approach, reducing duplication of efforts and ensuring that all urban regeneration and development projects are guided by the same climate principles clarifying ownership and responsibilities within municipal departments increases accountability and helps maintain long-term commitment to climate goals Transforming the guidelines into a legally binding document ensures their consistent application, making climate considerations a formal part of planning and decision-making processes using the guidelines to define departmental data requirements improves the quality and relevance of information used in climate-related decisions, leading to better outcomes regular coordination meetings encourage cross-departmental collaboration, knowledge sharing, and continuous improvement, while formal institutional commitments embed climate-friendly practices into the city's culture and operations. Overall, these actions can lead to more effective climate mitigation and adaptation, stronger institutional collaboration, and a more sustainable urban environment for residents (environmental impact).	BH: BH will facilitate a final feedback session with the city to consolidate input. The guideline is intended to be a living document, regularly updated and refined, with the climate unit responsible for organizing and coordinating this ongoing process. However, after this session, BH's role will shift to providing support only upon request, specifically in cases of questions or uncertainties regarding the methodology. No further workshops, training sessions, or updates are planned	BH: The main challenges are represented by a possible lack of coordination and communication between different stakeholders and their associated ambitions for a project and a possible lack of available project-specific data in early project phases that need to be overcome.	BH: as part of further public tenders, we are actively working with cities and further municipalities (e.g. Berlin and Munich) in applying the climate proofing tool. Since the beginning of the project we have implemented the tool in a project for delivering climate districts in Hessen and a district redevelopment in Berlin.
9	Rio de Janeiro	The UDCW is a flexible methodology with an adaptable approach that would fit in a pilot for a different area of the city. UCCRN: The UDCW, in particular the Simulation toolkit can be integrated in the current cityworkflows for processing GIS data and utilising them for city planning. Due to the presence of UCCRN Latin America Hub in Rio, and the collaboration between UCCRN experts and the municipality the UDCW methodological tool for climate analysis can be further applied in other Rio districts and Brazilian cities.	UCCRN: The UDCW downscaled the strategic actions of the Plan for Sustainable Development and Climate Action of the City of Rio de Janeiro, individuating potential design interventions for adaptation in the Sao Cristovao district. The UDCW implemented the concept of the corridors articulated in the POS and their thematic characteristics to structure the adaptation measures contextualizing them to the urban fabric of Sao Cristovao, considering socio-spatial dynamics, on-going initiatives, community assets, mobility and urban connectivity. The multi-actorial dialogue triggered by the UDCW implementation with several municipality departments created an opportunity for synergies with other on-going actions at city level for climate actions, and the conceptual framework of corridors operate as structuring elements that transcend traditional sectoral interventions. The prototype contains in depth analysis of the context and how it intersects climate issues and articulates policy recommendations for the downscaling of the corridors for the potential replicability of the UDCW process in the other districts. -->the potential integration of UDCW simulations in the cityworkflows will be explored through the collaboration between UCCRN European Hub and Latin America Hub, Pontificia Universidad Catolica de Rio de Janeiro, Columbia University and Instituto Pereira Passos IPP.	UCCRN: Training, technical support and capacity building activities are foreseen in the long-term collaboration between these actors. Rio has been included as pilot case of a Horizon Proposal dedicated to coastal cities in which UCCRN is partner and the UDCW is a tool to be applied in several cases. Support can be provided upon request to address specific issues or questions. In the case of Rio de Janeiro, long-term activities developed through synergies between the UCCRN European Hub and the Latin America Hub will create further opportunities for UDCW implementation. For example, Rio will continue to serve as a case study for educational and training activities at the University of Naples Federico II, the New York Institute of Technology, and the Pontifical Catholic University of Rio de Janeiro	UCCRN: Rio de Janeiro's long-term vision, as articulated in its POS strategy, is built on three pillars: achieving carbon neutrality by 2050, strengthening resilience and reducing climate risks through green and blue infrastructure, and advancing inclusivity by expanding access to services and opportunities for vulnerable communities. The São Cristóvão prototype provides a district-level entry point for advancing this vision. The UDCW contributes by providing: Risk-informed planning: The UDCW generates climate scenarios for the São Cristóvão pilot area, assessing risks and impacts and identifying adaptation and mitigation opportunities. Integrated urban design: It evaluates interventions that balance resilience, mobility, equity, and cultural heritage, supporting socio-spatial solutions that promote inclusivity. Scenario-based strategy: By testing three development paths (Current State, Business as Usual, Best Practice), the tool strengthens decision-making and ensures that proposed interventions comply with city planning instruments. Policy alignment: The tool embeds the prototype into Rio's broader framework by linking it with the City Masterplan (Plano Diretor) and its implementation tools, such as: Consortium Urban Operation (OUC); enabling urban restructuring and socio-cultural protection; Areas of Special Interest: protecting vulnerable groups, cultural heritage, and local identity; Urban Structuring Projects (PEU): translating city-wide principles into neighborhood-level rules. Legacy and continuity: The prototype reinforces PEU objectives, including accessibility, sustainable mobility, cultural asset protection, and social housing regularization. Its influence sustains debates on balancing heritage conservation, economic revitalization, and inclusion of long-standing low-income communities.		UCCRN: The main challenge lies in transferring the knowledge required to fully apply and further develop the UDCW methodology, as it has so far been delivered as a service by UCCRN. Both toolkits—the Simulation and the Facilitation components—may face technical barriers due to the advanced skills needed for their use. These include in particular, for the Simulation toolkit, the proficiency in 3D modeling, understanding of microclimate science, and the ability to work with indicators and parameters. Such expertise is specialized and requires targeted training to ensure continuity. Another barrier concerns the prototypes themselves. While they serve as strategic lines of action, the specific design proposals developed through the tool require binding mechanisms and adequate financial resources for implementation. To move from strategy to execution, further in-depth architectural and executive project development will also be necessary. Without these steps, the potential of the prototypes to regenerate the built environment could remain unrealized.	UCCRN: Yes, we have on-going requests to adapt and test the tool in different cities and regional contexts (in particular Latin America, South Europe and North Europe). Seven project proposals (even not yet funded) include the test of the UDCW in more than 10 pilot cases in EU, Canada, Brasil, India. Submitted proposals include EU and extra EU funds. - opportunities are explored: Municipality or local authorities can provide budget to contract UCCRN as service provider to support the continuous use of the tool Projects grants (transnational, national, regional, local or private foundations) HORIZON Proposals have been submitted (Rio de Janeiro as pilot case and Thessaloniki Metropolitan Region as follower case)
10	Rio de Janeiro 2	DeItares: RioAgua's will be able to continue to use the tools to prepare the policy decisions that feed into the Urban Drainage Masterplan. RioAgua can use the tools for other areas of the city.	DeItares: Not yet. The work we have done in the Acari River basin will be used to inform the Urban Drainage Masterplan.					
11	Zagreb			VUB: We have trained city officials and municipal staff present at the Zagreb general assembly to use the tool and provided an online step by step manual.				
12	Lisbon	ETH: We hope the tool will be used to direct policies regarding circularity in the built environment. Indeed, when more refined data will be available, the tool will be able to provide precise guidelines. LNEC: The work that has been done provides an analysis of the effects of measures implemented in the pilot and the results support the potential replication in other Parishes or facilities in the future. not yet decided if more actions post-project will be pursued.	ETH: It has not. LNEC: is one of the studies available to the city for their decision-making processes.	ETH: It is a standalone plugin in QGIS so can be used independently. However, some modifications to certain case studies might necessitate some changes that would require knowledge in coding or LCA. Technical support of the tool is envisioned. It is envisioned to answer questions if any by the tool users. LNEC: since the tool is quite straightforward to use, if required data is available, since the tool use is costless. The tool is designed in a way that local authorities can operate it alone, and local stakeholders also have received sufficient training or materials to continue using the tool. On request, after the project short courses are easily organized to support the use.	ETH: the tool promotes circularity in built environment through implementation of material reuse strategies at urban scales. This leads to diminution in GHG emissions for the built environment and develop a sustainable market for reuse. If applied long term, the tool will have environmental and economic impacts. Indeed, its purpose is to enhance the reuse of building elements for the refurbishment and construction. So environmentally, it will allow to reduce GHG emissions as well as resource consumption. From an economic point of view, the tool provides guidelines on which materials should be focused on to develop an efficient circular economy. Hence, it shows which supply chains are the most interesting to develop in the futures and on which economic stakeholders should focus. LNEC: Can support better decision-making by providing relevant information on effect of measures in climate resilience, using a set of purpose made indicators. RAF App contributes to the pilot vision by: • Providing objective information on the current resilience • Reinforcing the support to a decision system already used by the city • Better analyzing the contributions of the existing nature-based solutions • Better knowing the effects on resilience of the identified measures • Moving forward towards a more climate resilient and adaptive city • Facilitating communication among stakeholders	ETH: we plan to monitor it, we will ask for stakeholders to provide updates on the tool usage.	ETH: The tool relies on data from the cities which are not necessarily available The Life Cycle Assessment databases need to be contextual too meaning it necessitates experts to function. LNEC: Collaborating with Lisbon team enhanced the importance of collaborative working with the city, parish and facilities' managers for: •Bringing their background work, experience and knowledge of the city, parish and facility •Involving them in the identification of key aspects, assessments, data provision and verification of results •Reference values to classify resilience development levels should result from the agreement between the city partners	LNEC: another EU funded project and invitation to continue to collaborate in a Master Course at UIC, Spain.
13	Rotterdam	No dependencies on the tools. Trying to find the linkages with the Climate Story Maps.						

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	Thessaloniki	DRAXIS Decision Support System (DSS): The DSS developed by DRAXIS is not an open platform, but the data will be open and accessible to everybody, so that students, citizens or different municipal representatives can see the work we have done. The DSS will continue to be used by Thessaloniki Municipality to support sustainable urban planning, scenario evaluation, and decision-making processes. It will continue to be an operational platform for monitoring urban indicators, assessing policy impacts, and facilitating participatory planning beyond the UP2030 project. Urban Green Economy Model (CERTH & GGIG) Neutrality Story Maps (NSM): Thessaloniki would also like to continue the collaboration with VUB regarding the Neutrality Story Maps. The NSM is an open platform. UDCW Simulation and Facilitation Toolkit (UCCRN) : UDCW Toolkit Application: With UCCRN, Thessaloniki is exploring how the methodology that they have used in the simulation and facilitation toolkit could be replicated in other neighbourhoods in the city. It is not an open tool. Thessaloniki is exploring with UCCRN for opportunities for collaboration on a new project (nothing confirmed yet).	UCCRN: The UDCW contributed to the development of the Diotikion Climate Action Plan, to deliver a participatory process coupled with technical analysis. The UDCW integrates climate mitigation and adaptation to define priority actions to be included in the DCAP as a comprehensive planning and policy document. The UDCW designed solutions according to four lines of interventions: green and blue, proximity and mobility, climate-responsive and energy. The tool delivered geospatial visualizations, co-created actions, and integrated simulation tool outputs, providing science-based evidence for assessing heat stress and adaptation and mitigation design interventions Draxis: Not formally embedded yet, but the tool supports Thessaloniki's Smart City strategy and complements the municipality's ongoing digital transformation and climate neutrality goals. It can help on the Climate Neutrality Action Plan and can be integrated into internal workflows for evidence-based decision-making.	UCCRN: the tool cannot be maintained or operated independently. It is a service provided by UCCRN experts. Potentially can be used if the local planning office is in-depth trained and there are technical skills available. UDCW Simulation toolkit is based on GIS tools freeware license while 3D Modelling AAD tools need paid licenses. Technical training is essential for the use of the toolkit. UDCW Facilitation toolkit doesn't require any license, and it can be replicated based on internal availability of personnel with skills in facilitation, graphic and architecture Support can be provided upon request to address specific issues or questions Draxis: DRAXIS will provide technical support and guidance to municipal staff to ensure smooth operation and potential data updates. Training materials have been provided, while the platform's architecture allows for straightforward integration of new data as municipal needs evolve. Video training material has been developed and will be available to support future training needs and ensure continued use of the tool beyond the project. The DSS uses open-source technologies. Hosting and maintenance can be sustained either through municipal IT infrastructure or continued collaboration with DRAXIS under a lightweight service agreement if needed. DRAXIS will also provide optional post-project support for hosting and system/data updates. Continued collaboration	UCCRN: The long-term vision for Thessaloniki is to become a sustainable, thriving, and climate-resilient mixed-use neighborhood, guided by the pillars of carbon neutrality, resilience, and just transition. This means expanding renewable energy, improving environmental quality and mobility, and advancing circularity while ensuring fairness and inclusivity. The prototype plays a key role in operationalizing the city's 2030 vision at the district scale. The UDCW Toolkit supports this vision beyond the project by providing: Multi-scale analysis: The UDCW Toolkit enables climate and energy simulations for the Division District, assessing heatwave vulnerability, energy consumption, and renewable potential. Spatial prioritization: It identifies priority areas for greening and public space interventions, producing an urban transformation strategy aligned with 2030 and 2050 milestones. Participatory planning: Facilitation tools support co-design workshops and generate a solution matrix linking spatial actions to the city's climate objectives. Policy integration: The prototype embeds interventions into Thessaloniki's planning instruments (Operational Plan, Green Infrastructure, Sustainable Mobility, Urban Development). This ensures institutional continuity and strategic alignment with SUMP and SECAP. Actionable outcomes: The selection of four focus areas, backed by micro-climate assessments, provides tangible pathways for upscaling. These include urban greening (green schoolyards, pocket parks), mobility improvements (pedestrianization, bike lanes, public transport expansion), adaptive shading (planted canopies at Agios Dimitrios Square), and reuse of vacant spaces (e.g., Lachanagora market area). Implementation readiness: The DCAP outcomes are under discussion for real implementation, bridging the gap between vision and practice	Draxis: DRAXIS and the Thessaloniki Municipality will jointly monitor tool usage, data updates, and user engagement through platform analytics and periodic reviews. Future assessments may focus on how the tool informs decision-making and contributes to progress toward the city's sustainability targets.	UCCRN: The main challenge lies in transferring the knowledge required to fully apply and further develop the UDCW methodology, as it has so far been delivered as a service by UCCRN. Both toolkits – the Simulation and the Facilitation components – may face technical barriers due to the advanced skills needed for their use. These include in particular, for the Simulation toolkit, the proficiency in 3D modeling, understanding of microclimate science, and the ability to work with indicators and parameters. Such expertise is specialized and requires targeted training to ensure continuity. Another barrier concerns the prototypes themselves. While they serve as strategic lines of action, the specific design proposals developed through the tool require binding mechanisms and adequate financial resources for implementation. To move from strategy to execution, further in-depth architectural and executive project development will also be necessary. Without these steps, the potential of the prototypes to regenerate the built environment could remain unrealized. Draxis: The main challenges could involve ensuring continued operational support and prioritization of the tool within the municipality after the project. Long-term use will depend on maintaining interest, technical	UCCRN: Beyond UP2030, testing have been developed in the last three years for educational and research scope in Naples, Cornelia de Llobregat, Dublin, Charleroi, Rotterdam, Durban, Barcellona, Aalborg. -HORIZON Proposals have been submitted (Rio de Janeiro as pilot case and Thessaloniki Municipality Regio as follow case)x we have on-going requests to adapt and test the tool in different cities and regional contexts (in particular Latin America, South Europe and North Europe). Seven project proposals (even not yet funded) include the test of the UDCW in more than 10 pilot cases in EU, Canada, Brasil, India. Submitted proposals include EU and extra EU funds. -we have finalized two contracts for UDCW implementation: UDCW for prototyping of a climate itinerary, Municipality of Cornelia de Llobregat (Spain) for Climate KIC project 'Climate Itineraries' UCCRN for Provision of Services for Climate Modelling Dún Laoghaire Rathdown County Council (Ireland). Draxis: Discussions have taken place with regional and municipal stakeholders outside the project, who have responded positively, recognizing the DSS as a valuable enabler of integrated urban planning and resilience assessment.
14	Granollers	Aquatec: Iason and RESCUE tool developers and application in the frame of the Granollers pilot (future neighborhood of La Bòbila). Results of this exercise have allowed to extract some guidelines and recommendations related to the promotion of nature-based solutions (sustainable urban drainage systems) as a cost-efficient measure to: manage stormwater in a decentralized way, increase pervious surfaces and green areas and improve urban resilience to flooding episodes. Since the developed guidelines (prototype) are intended to be applied in the development of new liveable urban areas, this can be considered as an upscaling exercise itself or an upscaling of results. The refined results have been upscalled and used to develop the Granollers' prototype. TSPA: City Scan tool developers and application in the frame of the Granollers pilot (future neighborhood of La Bòbila). The refined results have been upscalled and used to develop the Granollers' prototype. While the City Scan Tool itself is not necessarily expected to be used directly by the City of Granollers beyond the end of the UP2030 project, the outputs generated by the tool –specifically the four design scenarios and their comparative analysis for the La Bòbila sector –have been integrated into the city's planning process.	Aquatec: Not the tool itself, but the results of its implementation have contributed to the development of the Granollers' prototype consisting of a set of guidelines for a greener city with opportunities for everyone. TSPA: the outputs generated by the tool –specifically the four design scenarios and their comparative analysis for the La Bòbila sector –have been integrated into the city's planning process. The outputs were used to inform the Set of Guidelines for a Greener City with Opportunities for Everyone, which serves as the city's main prototype. The guidelines consolidate lessons from the tool's application and are intended to guide future urban development strategies. In this way, the City Scan Tool contributes indirectly to long-term planning through its scenario-based insights, even if the tool itself is not reused operationally by the city. These guidelines are aimed at becoming a regulatory document subject to formal adoption by the municipal council. It will serve as a reference for urban planning processes and development of new urban sectors citywide.	Aquatec: The technicians from Granollers involved in UP2030 project know all the functionalities of the tool. The tool can be used any time the city has to decide about alternative climate change adaptation measures (at different scales) and to prioritize them according to a cost-benefit or multicriteria analysis. The municipality has at its disposal all the tutorials being developed in the framework of UP2030 project. TSPA: Technically it is open source tool. However, while the tool is highly adaptable and responsive to urban planning needs, it currently requires specific technical expertise to operate, particularly in scenario modeling and parameter customization. Therefore, it is not designed for direct, independent operation by municipalities without external support: the city was not trained to use the tool itself. Instead, TSPA worked closely with the city to define planning objectives, model four urban design scenarios, and deliver comparative outputs. These results were discussed collaboratively and used to inform the guidelines - city's prototype. The collaboration focused on delivering actionable, transferable outputs rather than enabling direct tool uptake by the city. Continued use of the tool (e.g. for scenario updates or new applications) would require: - Technical operation by TSPA or similarly qualified experts. - IT infrastructure - computer powerful to support Rhinos 3D and grasshopper, and computational commands	Aquatec: The tool is supporting decision-making processes, saving time to urban planners and other decision-makers willing to increase the resilience of urban areas to climate change. The implementation of the adaptation measures or strategies suggested by the tool will imply environmental, social and economic impact and benefits to these urban areas. Pilot's vision is based on 3 pillar objectives for new developments: climate neutrality, climate resilience and social justice. The implementation of the tool has specifically contributed to the second pillar of climate resilience both in the short term (development of the prototype) and the medium-term (implementation of the prototype). TSPA: Environmental impact: The tool promotes data-informed climate resilient and carbon neutral urban planning. It supports planning of compact, walkable, and green infrastructure-oriented development patterns that reduce emissions, enhance urban biodiversity, and support nature-based solutions. Social impact: The tool contributed to scenarios that embed accessibility, inclusion, and mixed-use development, supporting a more equitable distribution of public space, amenities, and economic opportunities. Economic impact: Through optimized land use and scenario testing, the tool supports more cost-efficient infrastructure investments, encourages adaptive reuse, and strengthens climate resilience—reducing long-term costs related to climate risks.	Aquatec: No, monitoring and evaluation after the project is not currently planned. However, they could be considered in the future if new opportunities or collaborations arise ODTU-GUNAM: we do not plan to monitor the tool after the project ends. However, we do plan to evaluate its use and effect in collaboration with Istanbul Metropolitan Municipality. We are currently seeking for research funding that can help us further develop the tool, where the tool further developed to include new analytical functions, user interfaces and data integration with other tools. This will allow us to assess its effectiveness in supporting renovation decision-making, its impact on prioritising strategies, and its contribution to the city's long-term decarbonisation objectives. Maggioli: In the long term, MIRA can help Istanbul meet its climate neutrality and smart city targets by continuously tracking and reducing energy use and GHG emissions. It enables evidence-based urban planning aligned with the city's sustainability roadmap. Operational savings free resources for further green infrastructure investments.	ODTU-GUNAM: The main challenge for the continued use of the tool in the pilot city after the project ends is its data dependency. The UBEHMA has been developed using the specific datasets of the pilot district. If the tool is to be transferred or applied in another district, it would need to be redeveloped and calibrated with that district's own data. This requirement for context-specific datasets may create barriers in terms of data availability, accessibility, and quality, which are critical for ensuring accurate and reliable results. Maggioli: The lack of reliable data for expanding to a full-scale pilot.	CIRCE: We have researched projects in Istanbul related to our tool that can be used for scaling in the pilot city in a future. An example would be BuildGreenIST, it's a Horizon Europe-supported pilot project initiated in June 2023 that aims to develop a transition guide to ensure that buildings renovated under Istanbul's urban transformation program are green and carbon-neutral, but no other cities have shown interest in our tool as for now, but we do intend to continue improving the tool beyond the project, either through a new project or as part of our internal development.
15	Istanbul	UBEM/UBITEM: AI-Powered Decisionmaking Tool for Decarbonization (METU and ODTU-GUNAM) : we envision the tool being used by the pilot city beyond the end of the project. Under the UP2030, our UBEM tool is developed for selected neighbourhood of Istanbul; however, it can be redeveloped for any city, provided that data is available. This ensures that the tool is not static but evolves with each city's own dataset and priorities. In practice, decision-makers can continue to use the tool to evaluate and compare renovation strategies for decarbonization from different perspectives including ecological, economic and thermal comfort. The tool calculates key performance metrics (environmental, economic and thermal comfort indicators), which are then transferred to CIRCE to enable Life Cycle Assessment (LCA) calculations. These results, together with the UBEM outputs, are subsequently integrated into Maggioli's MIRA digital platform, where they are presented in a holistic way to decision-makers. This workflow ensures that the tool does not remain a standalone prototype but becomes part of a comprehensive digital twin platform thereby supporting the scaling-up of renovation strategies and enabling informed, multi-criteria decision-making for cities. BIM Module and Building LCA Module (CIRCE) - by updating the actual database we will provide solid base	CIRCE: the tool has not yet been embedded into the official plans, scenarios, or procedures of the pilot city. But the data received from the pilot can be integrated into broader datasets for data driven decisions in the future for the public stakeholders in Istanbul. ODTU-GUNAM: No, the tool has not yet been embedded into any official plans, strategies, or procedures of the pilot city. However, during the recent upscaling workshop, the Istanbul Metropolitan Municipality outlined several commitments aimed at ensuring the tool's role in supporting decision-making beyond the project. These include developing district-specific local action plans, providing capacity-building training for municipalities and technical staff, and integrating digital twin technology into decision-making processes. Yet, by grounding decisions in data and providing a comprehensive analysis to balance competing priorities, the tool can become a long-term decision-support mechanism for cities committed to achieving their carbon neutrality targets	CIRCE: once access to the MIRA digital platform is requested, stakeholders will be able to operate it autonomously. Local stakeholders haven't received any training. In terms of hosting, the costs can be sustained post-project by migrating the host to a local server already in use from any of the city stakeholders. But providing direct support after the project is not currently planned ODTU-GUNAM: some follow-up actions are foreseen to support the continuation of the tool's use in the pilot city. IBB plans to implement improvements such as making the tool easier to use and ensuring more appropriate preparation of datasets, which will be essential to facilitate its application in other districts. Also, our UBEM tool has been designed in both a standalone web-based interface, ensuring flexibility in its use and replication. The tool is web-based, and once the access key is provided, all decision-makers can directly access the interface developed for the pilot area. They can independently operate it. The tool's functionalities and applications were presented to municipal representatives during upscaling workshop. If the municipal department wishes to extend its use to other internal units, a short briefing session can be organised to ensure they can use the tool effectively. Yes, the tool requires hosting and ongoing technical support, but these will be provided by the university. As such, no additional paid licenses are needed, and the sustainability of these costs post-project will be ensured	CIRCE: Applied in the long term, the tool generates environmental, economic, and social benefits that support sustainable urban development and accelerate progress toward Net-Zero goals Economic Impact: In the long term, households and municipalities benefit from lower energy costs thanks to optimized building envelopes and energy systems. The tool also enables more efficient investments by identifying which renovations deliver the best returns. Environmental Impact: The tool significantly reduces CO₂ emissions by lowering the energy demand for heating and cooling. This translates into a direct progress toward climate neutrality targets. Social Impact: Residents' comfort improves as extreme indoor temperature fluctuations are reduced. Reduced temperature fluctuations lead to a reduced bill in the resident's household. ODTU-GUNAM: The tool supports the long-term vision and objectives of the Istanbul pilot by addressing the core challenge identified at the project's beginning: the prevalence of an aging and energy-inefficient building stock. Beyond the end of the project, the UBEM tool provides a data-driven, scalable, and context-specific platform that allows the decisionmakers to assess building energy renovation strategies for these inefficient buildings. By quantifying impacts in terms of energy performance, carbon reduction, costs, and indoor comfort, the tool equips decision-makers with the means to prioritise strategies that have the highest cost-effectiveness. In this way, the tool supports Istanbul's broader decarbonisation goals, enabling the city to plan and implement renovation strategies across its building stock, monitor progress over time, and align with national and EU climate commitments Maggioli: In the long term, MIRA can help Istanbul meet its climate neutrality and smart city targets by continuously tracking and reducing energy use and GHG emissions. It enables evidence-based urban planning aligned with the city's sustainability roadmap. Operational savings free resources for further green infrastructure investments.	CIRCE: No, monitoring and evaluation after the project is not currently planned. However, they could be considered in the future if new opportunities or collaborations arise ODTU-GUNAM: we do not plan to monitor the tool after the project ends. However, we do plan to evaluate its use and effect in collaboration with Istanbul Metropolitan Municipality. We are currently seeking for research funding that can help us further develop the tool, where the tool further developed to include new analytical functions, user interfaces and data integration with other tools. This will allow us to assess its effectiveness in supporting renovation decision-making, its impact on prioritising strategies, and its contribution to the city's long-term decarbonisation objectives. Maggioli: In the long term, MIRA can help Istanbul meet its climate neutrality and smart city targets by continuously tracking and reducing energy use and GHG emissions. It enables evidence-based urban planning aligned with the city's sustainability roadmap. Operational savings free resources for further green infrastructure investments.	CIRCE: The main risks are linked to maintaining data quality, funding, trained staff, and political commitment. At the same time, because its use is not mandatory in most planning processes, it is frequently treated as an optional add-on rather than a decisive element in urban decision-making. ODTU-GUNAM: The main challenge for the continued use of the tool in the pilot city after the project ends is its data dependency. The UBEMMA has been developed using the specific datasets of the pilot district. If the tool is to be transferred or applied in another district, it would need to be redeveloped and calibrated with that district's own data. This requirement for context-specific datasets may create barriers in terms of data availability, accessibility, and quality, which are critical for ensuring accurate and reliable results. Maggioli: The lack of reliable data for expanding to a full-scale pilot.	CIRCE: We have researched projects in Istanbul related to our tool that can be used for scaling in the pilot city in a future. An example would be BuildGreenIST, it's a Horizon Europe-supported pilot project initiated in June 2023 that aims to develop a transition guide to ensure that buildings renovated under Istanbul's urban transformation program are green and carbon-neutral, but no other cities have shown interest in our tool as for now, but we do intend to continue improving the tool beyond the project, either through a new project or as part of our internal development.
16	Istanbul 2	All cities VUB: So far, the cities expressed interest in using the platform for the 5 years they get it for free after the project ends but not beyond that. By showcasing the prototype of each pilot city that includes success stories, lessons learned, and future strategies, NSM helps with encouraging the uptake of successful strategies and approaches in other cities.	VUB: It has been embedded in the communication strategy for the project by the pilot cities. The pilots are using the tool to communicate their activities in UP2030 to the public in an accessible multimedia narrative format.	VUB: Cities can use and add/edit content on the tool independently. For technical adjustments, adding features, fixing bugs and so on, they will have to contact CERTH.	VUB: By showcasing the work of the pilots and their prototypes in an accessible format on the tool, NSM allows other neighbourhoods in the city to learn and adopt similar climate neutrality strategies and approaches. It will be hosted by CERTH for the first 5 years. After that, the cities will need to draft a bilateral contract with CERTH should they want to keep using it or add features, and adapt it for other contexts or purposes.		VUB: time and resources	VUB: We (VUB and CERTH) are in the process of drafting a joint ownership agreement in order to use the tool in other projects, cities and contexts.
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