

D9.1: Framework for intra-project collaboration

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Executive summary

In this report (Deliverable 9.1), we describe a learning framework, based on open innovation, to foster a collaborative approach among +CityxChange partners and with external stakeholders. The report is structured in three main thematic chapters:

- Open Innovation Framework for the +CityxChange project
- Methods and Tools
- Ex-Ante and Ex-Post Evaluation Framework

The report includes an overview of the main elements of the learning framework, and how it connects to other tasks, partners and stakeholders in the project. The learning framework will include study visits to the lighthouse cities as well as peer-to-peer workshops using participatory design methods, co-creation, forecasting, mock-ups, storyboards, future workshops, brainstorming and experience prototyping, and opportunities to build on experiences from the +CityxChange Innovation Playgrounds.

The report includes an ex-ante and ex-post evaluation framework of cross-cutting issues in clean energy, open innovation, gender, socio-economic science and humanities, that will enable us to document whether the transfer of knowledge and experiences among project partners and with external stakeholders led to better project results, and, if so, under which conditions this was achieved.

The report forms part of +CityxChange Work Package 9 “Inter-Project Collaboration and Clustering”, dedicated to the transfer of knowledge and experiences between cities and solutions providers within the project, and with external stakeholders. This Work Package will facilitate regular meetings, workshops and brainstorming sessions between the cities, industry partners, local stakeholders and other interested parties. These activities will help identify and address the needs of the participating cities and solution providers in an effective manner, align goals and priorities, promote cross-cultural communication, understanding and collaboration between the partners, and speed up the learning process and iteration of results across the value chain.

The activities created within Work Package 9 will draw upon the experiences made by all partners across all tasks. In the +CityxChange project, the Follower Cities (FCs) will watch and learn from the Lighthouse Cities (LHC) how demonstrations have been applied, understand what has or has not been successful, identify which demonstrations would have optimal impact within their local context and create detailed replication plans for their deployment. The FCs will also themselves deploy the bold city vision, community engagement and playground demonstrations, perform feasibility studies and identify investment pipelines for their planned Positive Energy Blocks.

1 Introduction

In this report (Deliverable 9.1), we describe a learning framework, based on open innovation, to foster a collaborative approach among +CityxChange partners and with external stakeholders. The Deliverable is part of Task 9.1 “Intra-Project LHC and FC Cooperation” and is linked with Task 9.2 “Extra-Project Cooperation with existing LHCs and FCs through clustering events run by existing SCC-01 projects, EIP SCC, SCIS, and other EU Platforms”. It also links to Work Package 10 on Communication. Some content from the Grant Agreement and the Description of Action (DoA) is reiterated here.

During the proposal stage, the +CityxChange consortium adopted an Open Innovation 2.0 framework (Curley and Salmelin, 2018) to secure involvement and co-creation of partners and stakeholders in different sectors for a joint and integrated project approach, including cities, citizens, industry partners, academia. The framework will be continued and further developed in the operational activities of +CityxChange.

Open Innovation 2.0 is based on the principles of “integrated collaboration, co-created shared value, cultivated innovation ecosystems, unleashed exponential technologies, and rapid adoption due to network effects” (Curley and Salmelin, 2018, p.1). It is used by the European Commission, amongst others, as a policy for the digital single market.

The report includes an overview of the main elements of the learning framework, and how it connects to other tasks, partners and stakeholders in the project. The learning framework will include study visits to the lighthouse cities as well as peer-to-peer workshops using participatory design methods, co-creation, forecasting, mock-ups, storyboards, future workshops, brainstorming and experience prototyping, and opportunities to build on experiences from the +CityxChange Innovation Playgrounds.

The report also includes an ex-ante and ex-post evaluation framework of cross-cutting issues within clean energy, open innovation, gender, socio-economic science and humanities, that will enable us to document, during the course of the +CityxChange project, whether the transfer of knowledge and experiences among project partners and with external stakeholders in fact led to better project results, and if so, under which framework conditions this was achieved.

The report forms part of +CityxChange Work Package 9 “Inter-Project Collaboration and Clustering”, a Work Package dedicated to the transfer of knowledge and experiences between cities and solutions providers within the project, and with external stakeholders. This Work Package will facilitate regular meetings, workshops and brainstorming sessions between the cities, industry partners, local stakeholders and other interested parties. These activities will help identify and address the needs of the participating cities and solution providers in an effective manner, align goals and

priorities, promote cross-cultural communication, understanding and collaboration between the partners, and speed up the learning process and iteration of results across the value chain.

The activities created within Work Package 9 will draw upon the experiences made by all partners across all tasks. In +CityxChange, the Follower Cities (FCs) will watch and learn from the Lighthouse Cities (LHC) how demonstrations have been applied, understand what has been successful and what has not, identify which demonstrations would have optimal impact within their local context and create detailed replication plans for their deployment. The FCs will also themselves deploy their bold city vision, community engagement and playground demonstrations, perform feasibility studies and identify investment pipelines for their planned DPEBs.

The two universities for the LHCs play a key role in the project with respect to ensuring an open innovation 2.0 framework in which the excellence and ambition of the solutions go beyond the state of the art. Also included are European expert organisations in bringing innovation to the market to ensure jobs, growth and investment in Europe and ensuring replication in the Follower Cities.

To facilitate dissemination and replication, the project assumes an “open by default” approach in line with the Open Innovation ambition. Almost all Deliverables are public and as much material and data as possible will be made available through respective channels (See D11.5 on Data Management and WP10 on Dissemination for details).

The Solution Providers have agreed to open data models and API specifications to fulfil semantic interoperability, not only for the internal purpose of the project, also for replicability and portability of the services beyond the project. Using an API approach will enable background IP to be protected as well as any potential foreground IP, and will ensure both interoperability and independence between existing solutions. This decision makes the +CityxChange solution as vendor-agnostic, modular, and replicable as possible, with special consideration given to data security and privacy at all network levels such as vulnerability of the physical grid infrastructure and sensitive information on the energy behaviour of individual users (for more information, see D11.5 Data Management Plan and ongoing work in Tasks 1.1 and 1.2 on ICT Ecosystem Architecture and Data Integration).

2 Open Innovation Framework

This section describes the +CityxChange open innovation framework facilitating interaction to better align goals and priorities; promote cross-cultural communication, understanding and collaboration between the partners; and speed up the learning process and iteration of results.

2.1 Multi-Actor Collaboration Frameworks

Successful development and roll-out of Positive Energy Blocks/Districts (PEB/Ds) requires open innovation, combining knowledge and experience of different actors in a quadruple helix ecosystem. In addition to generic stakeholder groupings such as building owners, architects, contractors and building occupants, the complex business models required to deliver PEB/Ds will involve a varying constellation of stakeholders such as public authorities, housing associations, cooperatives, utility companies, network operators, regulatory bodies and different types of investors. Moreover, the neighbourhood scale of such projects means residents associations, local businesses, commercial associations, voluntary and community groups and local politicians, among others, in the wider district, must all be included in the solution. This holds true for individual cities in their own constellations and for larger collaboration, which needs to understand these characteristics to successfully learn from other actors and replicate.

Managing complex PED and/or smart cities projects requires new and innovative forms of governance with the involvement and collaboration of various actors. Fragmentation of responsibilities across multiple institutions makes the situation complex, causing a variety of conflicting political interests, strategies, perspectives and power relations. Despite the initial common goal of the actors to become "smart", their different perspectives, strategies, knowledge and capacities can undermine the process of planning and decision-making, rather than facilitating it. Furthermore, the multiplicity of actors and hidden or informal exercise of power to protect special interest can exacerbate the political and managerial complexity, ambiguity and uncertainty. They can lead to prolongation, recurring controversies, stagnation, and unwilling adaptations, and challenge transparency, accountability and legitimacy.

It is important to identify the preconditions for an efficient multi-actor collaboration network. However, the understanding of the features and dynamics of smart innovation governance networks or Public-Private-People Partnerships and Procurement (5P), i.e. mechanisms of sharing different resources, governing co-development processes and fostering knowledge flows within innovation projects, is still limited. The question is which governance process or collaborative approach is needed for shaping the innovation ecosystem based on sustainable partnerships among the main stakeholders

involved in smart sustainable urban development. Innovative solutions to modern challenges can be effectively developed, promoted and maintained through multi-actor collaborative structures that enable public, private and civil society actors to interact in a complementary and synergistic way in joint innovation processes. However, there is a lack of empirical study to understand how this may happen.

2.2 Open Innovation

+CityxChange has chosen open innovation as a relevant pathway for cities to become smarter, solve various societal challenges and improve the quality of life of its citizens by stimulating and facilitating the synergistic contribution and participation of business, university, public sector, non-for-profit partners and citizens to innovation processes.

In +CityxChange, the term “open innovation” is used as defined by Chesbrough (2006): “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology” (p.vii). The main principles of open innovation, as compared to closed innovation, are displayed in the following table:

Closed Innovation Principles	Open Innovation Principles
The smart people in the field work for us.	Not all the smart people work for us, so we must find and tap into the knowledge and expertise of bright individuals outside our company.
To profit from R&D, we must discover it, develop it, and ship it ourselves.	External R&D can create significant value: internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to the market first.	We don't have to originate the research to profit from it.
The company that gets an innovation to the market first will win.	Building a better business model is better than getting to the market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our intellectual property (IP) so that our competitors don't profit from our ideas	We should profit from others' use of our IP, and we should buy others' IP whenever it advances our business model.

Table: Open innovation principles, adapted from Chesbrough (2003)

Open Innovation is usually considered as the standard of innovation management in the private sector, hence we have yet little knowledge on how it can be applied to the public sector. However, the relational configuration of open innovation ecosystems can widely vary depending on the actors involved, their role, their impact and the degree of (in)formality of relationships among them. Further, it is subject to change during the networks' lifecycle, which can be described in terms of the three main phases of initiation, emergence and wider implementation or uptake.

2.3 Open Innovation 2.0

Technological innovation is a necessary condition to make a city smart. However, the challenge of smart city innovation is not primarily on technology, but on service transformation, integration, and improvement. In order to improve service quality, a strong involvement of citizens and non-governmental associations, and the diffusion of innovative models of cooperation and social relationships are necessary. This necessity implies a need for a more comprehensive view of innovation that focuses on the non-technological human, organizational and political changes and socially innovative solutions to urban problems.

To achieve desired impact in and by the +CityxChange project, at different stages of planning to create the PEDs and in interaction with the diverse stakeholders mentioned above, project coordination and knowledge exchange will be based on the framework of Open Innovation 2.0. Open Innovation 2.0, as proposed by Curley and Salmelin (2018), is based on the principles of "integrated collaboration, co-created shared value, cultivated innovation ecosystems, unleashed exponential technologies, and rapid adoption due to network effects" (p.1).

The Open Innovation 2.0 paradigm informs the European Commission policy on a digital single market, with five key elements¹

- Networking;
- Collaboration: involving partners, competitors, universities, and users;
- Corporate Entrepreneurship: enhancing corporate venturing, start-ups and spin-offs;
- Proactive Intellectual Property Management: creating new markets for technology;
- Research and Development (R&D): achieving competitive advantages in the market.

¹ <https://ec.europa.eu/digital-single-market/en/open-innovation-20>

All of these five points have been integrated as key elements in the +CityxChange project. In addition, +CityxChange is centred around agile, rapid and multidisciplinary experimentation by a quadruple helix ecosystem of partners and stakeholders from four areas: public and private sector, academia, and civil society. This type of experimentation is also firmly embedded within Open Innovation 2.0 (see Table below).

How innovation modes have evolved		
Closed Innovation	Open Innovation	Open Innovation 2.0
Dependency	Independency	Interdependency
Subcontracting	Cross-licensing	Cross-fertilisation
Solo	Bilateral	Ecosystem
Linear	Linear, leaking	Nonlinear mash-up
Linear subcontracts	Bilateral	Triple or quadruple helix
Planning	Validation, pilots	Experimentation
Control	Management	Orchestration
Win – lose game	Win – win game	Win more – win more
Box thinking	Out of the box	No boxes!
Single entity	Single discipline	Interdisciplinary
Value chain	Value network	Value constellation

Table: How innovation modes have evolved towards Open Innovation 2.0 (adapted from Curley & Salmelin 2018, p.7)

2.4 Explorative and Exploitative Innovation

The +CityxChange project will need to create a balance between exploratory and exploitative innovation in its operations (Jansen, Van Den Bosch, & Volberda 2006). Exploitative innovation typically builds on existing knowledge and activities, such as the delivery of the +CityxChange project as agreed upon by the beneficiaries in the Description of Action. Explorative innovation, on the other hand, drives the project partners and stakeholders to keep developing new ideas and news ways of delivery – similar to the innovation processes that took place during the development of the project proposal.

Exploitative innovation is supported by formalised and centralised procedures, as one typically would find in H2020-funded projects with Grant Agreements, Consortium

Agreements, and detailed Descriptions of Action. In order to promote exploratory innovation to take place during the project, space needs to be created for decentralised activities and elements of serendipity. This is vital in such a long-running project in a fast changing environment to keep open to new solutions.

2.5 Learning Taxonomy

Experiential learning processes (see Table below) can be divided into six consecutive cognitive processes; in rising order of complexity: remember, understand, apply, analyse, evaluate, and create. These processes can be related to four types of knowledge: factual, conceptual, procedural, and meta-cognitive (i.e., knowledge and awareness of one’s own cognition) (Anderson and Krathwohl, 2001). The learning framework for the +CityxChange project needs to cover these aspects in order to be successful.

The knowledge dimension	The cognitive process dimension					
	Remember	Understand	Apply	Analyse	Evaluate	Create
Factual knowledge						
Conceptual knowledge						
Procedural knowledge						
Meta-cognitive knowledge						

Table: Bloom’s revised taxonomy of educational objectives (adapted from Anderson & Krathwohl 2001)

2.6 Extra-Project Collaboration

In the Open Innovation 2.0 paradigm, “it is no longer how good an individual company or organization is but the strength of the ecosystem, in which they participate in is often the differentiating factor for great success, mediocrity, or even failure.” (Curley and Salmelin, 2018, p.12).

In a project that includes a fair share of IP restrictions, how can glorious failures and best practices be shared in the most advantageous manner between project beneficiaries and external stakeholders? Collaborative project activities will need to create a balance between working within the project and engaging with external stakeholders. Inter-project activities will help to increase interaction and connections between partners, which is important for building common ground, generating trust, and increasing the likeliness to take risks together. Interaction and connections between the project and external stakeholders, will help gain larger influence and buy-

in for the project's innovations and allow each partner to tap into experiences far beyond their ordinary networks (Leonardi and Contractor, 2018).

Cooperation and knowledge exchange with external stakeholders needs to be framed carefully in order to be successful. Cities indeed can learn a lot by investigating how other cities are dealing with similar challenges, or have dealt with them in the past (Marsden & Stead, 2011). In addition, learning from other cities' success stories and in particular of their failures, will help cities to save time and resources by adopting solutions already successfully tested by others, either as replication or inspiration.

However, what worked in one city might not necessarily work in another, even within the same project. According to Dolowitz and Marsh (2000), transfer could include direct copying of a solution or process, transferring the ideas and intentions behind the solution with local adaptation, gaining inspiration from other organisations that will help generate new ideas for own local solutions and processes – or a hybrid of these. However, cities have also been found to participate in knowledge exchange exercises to find evidence in favour of their already ongoing practices (Marsden and Stead, referring to Betsill and Bulkeley, 2004), as a form of post-hoc legitimisation (Marsden and Stead, referring to Lodge, 2003).

Therefore, to better facilitate exchanges, the +CityxChange project will create replication profiles for the individual innovations, solutions, and demo projects (Task 8.1) which will be featured in the learning (Task 9.1) and storytelling (Task 9.3) workshops.

The relevance of knowledge transfer to and from external stakeholders will further be influenced by anchoring, relevance and availability (Tversky and Kahneman, 1974, referred to by Thaler & Sunstein 2008), three rules of thumb on which people typically base their decisions:

- When making a decision, people start from something they know, and adjust this “anchor” in a direction they think is appropriate in the given context. Thaler and Sunstein argue that by suggesting a starting point for people's thoughts, it is possible to direct their decisions in a desirable direction.
- A second factor guiding people's choices is representativeness: is the situation and context representative of what one has experienced or thinks is relevant?
- The third factor, availability, is related to the ease with which people come up with relevant examples. The more readily available relevant examples are, the more likely these will influence people's decision making – for better or worse.

In order for interaction with other European cities, projects, and networks to be relevant, we need to ensure that the three elements are present.

3 Methods and Tools

This section describes the methods and tools of the +CityxChange intra- and extra-project collaboration framework.

3.1 Learning Workshops

In the +CityxChange project, we will organise annual face-to-face learning workshops to promote collective learning from the Innovation Playgrounds and CommunityxChange experimentation, and to support value creation through collaboration, connectivity and interdependencies across the project beneficiaries and external stakeholders of public and private sector and academia.

The learning workshops will support and document open innovation through interviews, mock-ups, forecasting, participatory design methods, storyboards, future workshops, brainstorming and experience prototyping, building on the innovation playground frameworks established in the Lighthouse and Follower Cities in Work Packages 3 to 6 along with community-based open innovation, citizen observatories, and bold city visions.

The workshops will take place in addition to annual partner meeting, making sure that the cities can meet face-to-face at least every half year. This is of particular importance as the partners cooperate remotely for most of the time, in various cities across Europe. The learning workshops and partner meetings fulfill a brokerage position in the project: they support partners to establish common ground, expose misalignments and build an effective human ecosystem across organisational, sectoral and geographical boundaries.

During the face-to-face meetings, partners will be encouraged to challenge each others' existing procedures, synthesise their ideas with those of partners, co-create new practices and drive real change in the +CityxChange project and its beneficiaries.

In order to structure the interaction, the workshops will consist of intra- and extra-project elements:

1. Presentation and discussion of upcoming deliverables and ongoing demo projects with and by +CityxChange partners. Some tasks and demo projects are long-standing and only have one deliverable at the end; in order to secure learning throughout the entire process, there is a need to present and discuss these on a regular basis with similar stakeholders between the cities and partners;

2. Local field/site visits and first-hand learning of local demonstration experiences in the Follower and Lighthouse cities or other relevant locations, as well as interaction with National Advisory Teams. During the site visit, the cities and solution providers can showcase practice examples, ask questions and learn from their peers. They will also be introduced to and interact with the National Advisory Team of the hosting city, that supports and guides the development of the +CityxChange demonstrations in alignment with the city's long term Bold City Vision;
3. Participation in workshops with other SCC01 projects and other European networks and events to share experiences and approaches across projects;
4. Inviting members of the External Expert Advisory Board (EEAB) or other external stakeholders to share their experiences in inspirational storytelling workshops. These workshops will amongst others support Work Package 8 "Scaling-Up, Replication and Exploitation" to identify inspirational replication examples.

At the end of learning workshop, the participants will be asked to develop an action plan on how they plan to follow-up within their city. A researcher will follow up the participants with interviews to track reflections throughout the project, based on ongoing activities within the cities (within or outside of the +CityxChange project) and new experiences due to the interaction with peers in similar projects and networks. These interviews will, in turn, inform the organisation of learning activities within +CityxChange.

The learning workshops will be organised about one month before the delivery deadline for SCIS reporting (i.e. in M5, 11, 17, 23...), as an opportunity to discuss the outcomes of the past six months face-to-face before submitting the semi-annual report including lessons learned to SCIS.

The transformation of the participating cities and solution providers is not a one-off process but rather a constant cycle of supply and demand of information, between the visionary level and the work grounded in daily reality. Bringing partners together in face-to-face learning workshops will enable them to present, discuss and combine their experiences, acquire new information and experiment with diverse strategies.

During each partner meeting, learning workshop and similar activities, the programme needs to include activities that stress the importance of the project for and its integration in each partner organisation. In order to support continuous engagement, the partner meetings, learning workshops and similar activities should always be framed in term of the project's vision and mission, not just the current activity at hand.

In order to be successful, the learning workshops need to provide the participants with the opportunity to take a step back from their daily working activities and gain perspective on the overall progress and ambitions of the project. They intend to support the participants to create new hybrid combinations of contributions presented by themselves and others.

The workshops will challenge the partners to overcome potential biases and “functional fixedness” (i.e., exploitative innovation) that hinder their productivity and creativity, towards buildings scenarios around questions such as “why not” and “what if”, with fast learning, quick iterations, and potential for changes in direction (i.e., explorative innovation) (Bouquet, Barsoux, & Wade, 2018, p.109). In this manner, the workshops will contribute to making process improvements stick, and making sure the efforts and engagement will be upheld over time (Holweg, Staats, & Upton, 2018, pp.17-18).

3.2 Learning from failure

Open innovation would typically see a 90-95% failure rate, while many smart city presentations deal with best practices and self-promoted success stories. How can we promote faster cycles of policy innovation that reward the right kind of failure (i.e. the kind we learn from, rather than continually repeat) and steer past obstacles.

Back-to-back with learning workshops and partner meetings, we will test how to include the role of failure in policy and planning innovation. This may be implemented in a meeting with Chatham house rules, with peers from similar projects, in which participants openly share their project failures. This type of interaction will allow the participants to gain information that we could not harvest in any other matter, while sharing the experience that failures happen in every project, and there is always a manner in which to solve them.

3.3 Innovation Playgrounds, CommunityxChange, and Bold City Vision

In the +CityxChange project, Open Innovation 2.0 non-linear experimentation and innovation (see Figure below) will be represented, amongst others, by citizen observatories, community-driven innovation tasks, and Innovation Playgrounds, in each Lighthouse and Follower City. The +CityxChange playgrounds will facilitate experimentation, with multiple entry points, allowing beneficiaries to incorporate new findings that might lead us to improve, pivot or reboot, and multiple pathways, enabling beneficiaries to switch pathways, step back and prototype when required (Bouquet, Barsoux, & Wade, 2018).

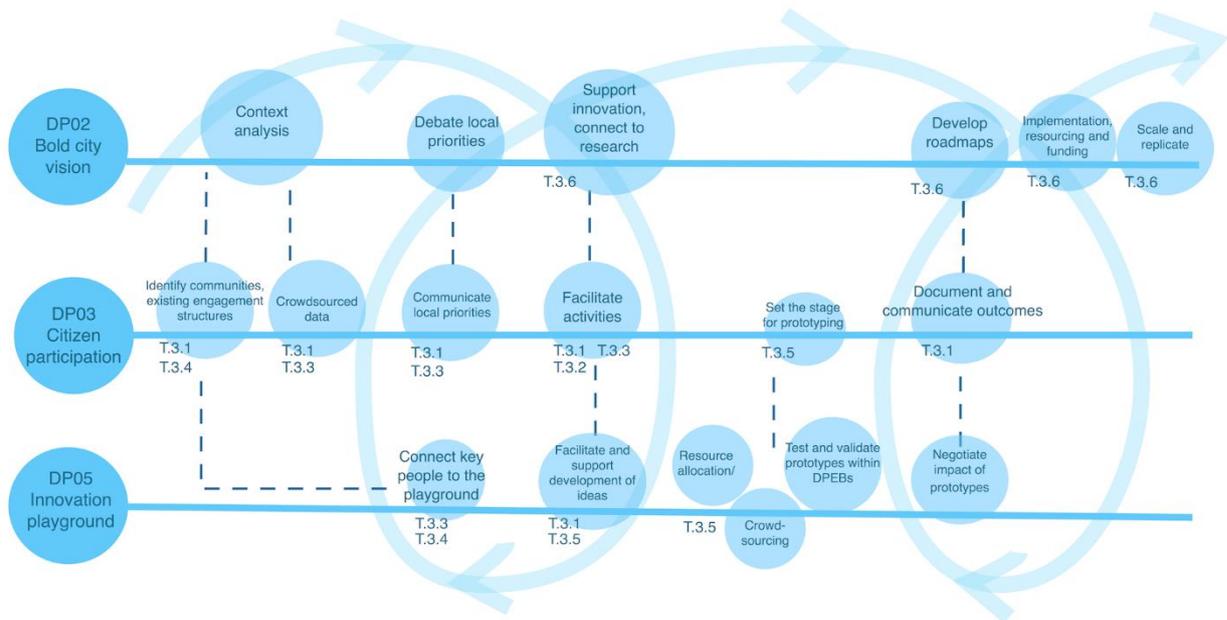


Figure: Non-linear experimentation and innovation in between the Innovation Playgrounds, Citizen Participation and Bold City Visions

In the Innovation Playgrounds, citizens, local companies and other stakeholders can connect with each other, ideate, develop and test urban prototypes and beta projects, get help to nurture their ideas into maturity through crowd-solving, crowd-funding and match-funding, and receive mentoring to develop business models to bring their ideas to the DPEBs and the broader market.

Similar to Urban Living Labs, the Innovation Playgrounds will be “sites devised to design, test and learn from social and technical innovation in real time” with “intentional collaborative experimentation of researchers, citizens, companies and local governments” (McCormick and Hartmann, p.4). The Innovation Playgrounds will be based on co-creation of knowledge by stakeholders from a quadruple helix, and will require flexibility in terms of direction and format to allow the stakeholders to engage.

From a community exchange perspective, the +CityxChange Innovation Playgrounds will be used as a “means through which new communities of practice with shared goals can be brought together, developing social networks and visions for urban futures.” (McCormick and Hartmann, p.5). In this manner, the +CityxChange project will act as orchestrator of community-based innovation and co-creation. The Innovation Playgrounds will be supported by CommunityxChange activities targeting a broad spectrum of citizens and make them key contributors to the development of Positive Energy Blocks and Districts, and their results integrated in Bold City Visions of each Lighthouse and Follower City. These results will also create case studies of success, which will lead to replication in other PEBs and business growth for the innovative companies and overall market expansion.

The Innovation Playgrounds and CommunityxChange activities will form the background of +CityxChange seminars open to the public, organised back-to-back with learning workshops, partner meetings and other project activities. Regular breakfast or lunch seminars will be organised among partners across tasks, or open to the public.

3.4 External Expert Advisory Board and National Advisory Teams

The +CityxChange project has two formal external advisory bodies.

The External Expert Advisory Board (EEAB) will be made up of experts proposed by the partners and liaise with the Executive Board to advise on the scientific progress of the project, potential dissemination routes. It will offer advice on what could be achieved on the demonstration sites, as well as the potential exploitation strategies and routes to market, which could be employed. The EEAB will be presided by the Project Coordinator and will officially meet at the timings to coincide with the General Assembly. The EEAB will also continuously be kept up to date with respect to project progress as it occurs.

Each city will have a National Advisory Team (NAT), which will be made up of city representatives, academics, industry experts, regulatory bodies, citizens, business and public authorities. The NAT will provide guidance for the city and ensure that the project outcomes are in-line with the city's needs and what is achievable for the project and beyond. The NATs will engage with the City Coordinators for each city.

To the extent possible, the EEAB and NATs will be involved in the learning and open innovation framework of +CityxChange, both to give advice to the project, and to help the project exchange knowledge with other external stakeholders. In this manner, the EEAB and NATs will act as liaisons and enablers of open innovation in +CityxChange.

3.5 Extra-Project Collaboration and Storytelling Workshops

The +CityxChange project will actively pursue synergies with other relevant EU platforms and projects, and enhance existing initiatives by facilitating collaboration and exchange of good practices with the +CityxChange cities. Within the +CityxChange project, we aim to collaborate with other SCC01 and related projects, activities initiated by INEA, activities initiated within Strategic Energy Technology Plan (SET-Plan) Action 3.2 on Smart Cities, as well as the European Innovation Partnership on Smart Cities and Communities (EIP SCC). This will include contributing to or even leading events within these fora, as well as inviting key representatives to join +CityxChange events.

There are strong links on the regulatory and dissemination side as well. The European and national/local regulatory landscape around creation of PEBs/PEDs will be examined in Task 2.1 and regulatory sandboxes will be pursued in the cities in WPs4-6, while the underlying European policies also inform the possible dissemination pathways in WP10.

The European Strategic Energy Technology Plan (SET-Plan) Action 3.2 on Smart Cities and Communities, has the ambition to “enhance capacities of cities, industry and research to make Europe a global role model and market leader in technology integration for and deployment of Positive Energy Districts taking into account aspects of inclusiveness with the aim by 2025 to have at least 100 successful Positive Energy Districts synergistically connected to the energy system in Europe and with a strong export of related technologies”. This ambition was described in the Implementation Plan of the Smart Cities Working Group of the European SET-Plan, and approved by the SET-Plan Steering Group on 13 June 2018². The programme is coordinated by Joint Programming Initiative Urban Europe.

The two SCC01 lighthouse projects funded in 2018, +CityxChange and MAKING-CITY, have a key role to play in this ambition, as role models, as demonstrators and in enabling potential replication across Europe.

To support this effort, the Joint Programme on Smart Cities of the European Energy Research Alliance (EERA JPSC) is developing a research and innovation (R&I) programme that will support the development of 100 PEDs in Europe, in close cooperation with other European platforms such as the Smart Cities Information System (SCIS), the European Regions Research and Innovation Network (ERRIN), EUROCITIES, the European Construction Technology Platform (ECTP), the Urban Europe Research Alliance (UERA), the European University Association Energy and Environment Platform (EUA-EPUE), the Association of European Renewable Energy Research Centres (EUREC), the Covenant of Mayors, and others.

The R&I programme will include, amongst others:

- What are PEDs? Propose & validate PED definition(s), KPIs & boundary conditions;
- What are PED Labs? Protocols for testing, monitoring and evaluating PED Labs;
- How do we create, manage & fund them? Develop a toolbox of planning instruments for PEDs, including data and metrics, planning and design, and investment and business models;
- How do we monitor them? Create, collect, qualify, compare & analyse data from the 100 European PEDs;

² https://setis.ec.europa.eu/system/files/setplan_smartcities_implementationplan.pdf

- Why aren't there more PEDs already? Identify & document barriers, challenges & opportunities in existing PED projects;
- What are the main causal mechanisms that either enable or inhibit successful diffusion of PED innovation, systems, or policies;
- How can PED innovations be scaled up both within the EU and beyond?

EERA JPSC regularly organises interaction with SCC01 projects for mutual learning, and this will include interaction with +CityxChange.

+CityxChange will also participate actively to the EIP SCC:

- To get an overview of what already has been done by others when starting the detailed implementation of the demonstration projects and use this information to adjust the detail plans accordingly, if needed, for example from Action Cluster Positive Energy Blocks (WP2);
- To use methods and solutions which have proven to be successful, for example as shared by the Action Cluster Citizen Focus on engagement of citizens (WP3);
- To contribute to and learn from the Smart City Guidance Package, by developing tailor made Bold City Vision roadmaps for implementation (WP3);
- To participate in the "Small Giant" initiative (WP4-5-6);
- To disseminate +CityxChange results to interested cities and stakeholders, for example at the EIP SCC General Assembly, by organizing joint workshops with EIP SCC Action Clusters, in the Newsletter and on the website (WP9-10).

In addition, +CityxChange will contribute to updating the Smart City Information System (WP7) and participating in the INEA led group of all SCC01 projects and the Small Giants. The SCC01 projects meet regularly, with online and face-to-face meetings of the Board of Coordinators as well as Task Groups on replication, business models and finance, communication and others. The SCC01 projects also organise cross-project meetings, amongst others during the Nordic Edge Expo in Stavanger and the Smart City Expo in Barcelona. In these events, the SCC01 projects tend to host a booth together with EIP SCC and SCIS. +CityxChange partners will actively engage in these activities.

+CityxChange will also organise storytelling workshops where existing and aspiring LHCs and FCs can exchange trial-and-error experiences on how to create support among politicians and stakeholders, create justifiable impacts, manage complex projects across divergent interests, build targeted networks locally and internationally, support capacity and assess strengths and weaknesses, mobilize demonstration and research partners, develop IPR agreements, distribute responsibilities, create the right storyline, vision and profile for their city, and arrange successful partner workshops. The workshops will contribute to creating the replication profiles that will be established in T8.1 (month 37-54).

4 Ex-Ante and Ex-Post Evaluation Framework

In order to enable knowledge transfer and learning between these topics and the partners that work with them, ex-ante and ex-post evaluation of the +CityxChange activities and their outcomes will be crucial. It will enable learning across partners and work packages, to use these experiences to predict near-future performance of the project, to update targets according to corrective feedback where necessary, and to enable uptake of the learnings into broader operations of the beneficiaries and external stakeholders.

In the +CityxChange project, we will address the gender dimension across all aspects of the project, understanding the different behaviours and attitudes of men and women and how this impacts the creation of Positive Energy Blocks/Districts. The project's demonstrations will contribute to create clean energy through the improvement of the existing building stock and associated energy system infrastructure and the creation of Positive Energy Blocks/Districts.

We will also ensure that socio-economic science and humanities are core to the project through citizen participation and awareness, urban prototyping and innovation playgrounds, crowdfunding and participatory budgeting, and modelling and decision support tools, which also account for the impact to the citizen. All of these ambitions will be integrated in an open innovation framework as described in the previous sections.

In order to facilitate ex-ante and ex-post assessment, a multi-dimensional framework for exploring the drivers, features, dynamics and outcomes of "smart public private people network innovations" will be developed, with a focus on the interface between ex-ante and ex-post evaluation and the contribution of such evaluations to policy learning for open innovation.

A similar methodology of ex-ante and ex-post measurement will be developed, first to understand the expectations and the objectives of the stakeholders, mainly the citizens/users, at the beginning of the project and then later to investigate whether they are met. Even though the effort is to apply the same ex-ante and ex-post evaluation to increase the likelihood of a successful project outcome, the initial plan might be altered as result of subsequent analysis, assessment, negotiation, positioning, and the exercise of power.

Accordingly, any kind of evaluation should give response to the challenges that each of the seven participating cities is facing. Thus, in-depth multiple case study analysis is expected to shed light on the similar and different features and patterns of open

innovation in these seven cities and allow the identification of factors influencing their success, in terms of short-term and long-term innovation outcomes.

In Task 9.1, we will create an evaluation framework in close alignment with Tasks 7.3-7.4 and the semi-annual reporting to SCIS, the replication profiles collected in Task 8.1, the replication to be performed in Task 8.2, and the storytelling workshops in Task 9.3.

The learning workshops (1/year back-to-back with consortium meetings, and 1/year free-standing) will provide an opportunity to discuss face-to-face among the partners, and learn from the data reported to SCIS and the project's status in terms of reaching its KPIs regarding the Common Energy Market, Integrated Planning and Design, and CommunityxChange. The learning workshops will be complemented with interviews of the project partners to provide comprehensive qualitative data regarding the experiences of the partners throughout the five years of the project and the various demonstration phases.

We will create summaries of good practices, challenges and potential solutions, based on study visits, interviews, feedback from webinars and workshops, cooperation plans, and performance monitoring. These experience data will be included in the semi-annual reporting to SCIS through the newly developed "Lessons" category, which includes best practices, policy recommendations, and stories. They will also be used to inform the practical recommendations and guideline reports to be developed in Task 7.4.

5 Conclusions

In this report (Deliverable 9.1), we described a learning framework, based on open innovation, to foster a collaborative approach among +CityxChange partners and with external stakeholders.

The main learning activities are summarised in the table below:

Collaborative Activities	Participants	Frequency
Learning workshops	+CityxChange partners	1 per year, Spring
Partner meetings	+CityxChange partners	1 per year, Autumn
Site visits	+CityxChange partners and external stakeholders	Back-to-back with learning workshops or partner meetings
Failure nights	+CityxChange partners	Back-to-back with learning workshops or partner meetings
+CityxChange Days	General public	Voluntary, back-to-back with learning workshops or partner meetings
Interviews and ex-ante/ex-post assessment	+CityxChange partners	Back-to-back with learning workshops and partner meetings
Informal lunch and breakfast meetings	+CityxChange partners and local stakeholders	Voluntary, every 2-4 weeks
+CityxChange Playgrounds	+CityxChange partners and local stakeholders	Continuous
Expert Workshops to dive deep into detail	+CityxChange topical experts and invited experts	Voluntary, variable
Stakeholder Workshops	+CityxChange partners, local and international stakeholders	Voluntary, variable
SCC01 cross-project meetings	Selected +CityxChange partners	Around 4-5 times per year, including attendance with booths or similar at Nordic Edge Expo Stavanger and Smart City Expo Barcelona; participation or

		(co)hosting of workshops; possible links with learning workshops
SET-Plan Action 3.2 meetings	Selected +CityxChange partners	2-3 times per year, organised by JPI Urban Europe
INEA events	Selected +CityxChange partners	Upon invitation by INEA
EERA JPSC, UERA, EIP SCC, other EU fora	Selected +CityxChange partners	2-3 times per year, per forum

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