

IRIS Integrated and Replicable Solutions for Co-Creation in Sustainable Cities

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Establish & operate IRIS European smart cities network with 7 European level regional arrangements

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Executive Summary

The present document is the deliverable **D8.13** titled as **Establish & operate IRIS European smart cities network with 7 European level regional arrangements** for the IRIS project.

The report presents IRIS's role in activating cities in Europe and the rest of the world into smart city networks. IRIS has influenced outside cities in many capacities, for instance, inspiring others to follow its footsteps, demonstrating ways to achieve desired outcomes, contributing to the knowledge and knowhow around the smart cities and enhancing an overall understanding of how the replication process can be carried out in an efficient and effective manner. The lighthouse (LHs) and fellow cities (FCs) have been active in larger European, national and regional events and networks to activate new cities into the smart cities network. IRIS has used a two-tier system (Tier-1¹ and Tier-2²) to report and document the level of interaction and engagement with the cities. Altogether, over 150 cities have been activated (93 cities through tier-1 communication and 58 cities through tier-2).

The deliverable also aims to highlight the existing network and initiatives within the realm of smart cities, explain what these networks can bring, and how they can add value to the cities in their quest to become smart cities. The report also sheds light on the challenges the diverse and fragmented network of actions and initiatives brings. Lastly, the report presents some suggestions and measures to address the challenges and to improve the efficiency of these initiatives.

This deliverable is related to the task **T8.7 European scale-up activities** that aims to activate a minimum of 80 cities into existing European cities networks. The document's scope and context primarily revolve around the activities undertaken during the runtime of the IRIS project with other smart cities networks and initiatives. The document presents how IRIS has contributed to disseminating knowledge on the subject matter and assisted in fostering replication outside the project network. The report also presents an overview of the work IRIS has done with smart cities networks to activate new cities into them, and therefore, should be read as such.

Input for the deliverable comes mostly from **D8.1 A Roadmap for replication of activities** and **D8.3 Replication tool box** in WP8 where the smart cities networks are mentioned and briefly explained. Input is also taken from **WP2 EU wide cooperation with ongoing projects, initiatives and communities** and **WP3 Development of Bankable Business Models and Exploitation Activities**. WP8 is working closely with WP2 and WP3 when it comes to smart cities networks and other initiatives outside of the project.

¹ Tier-1 is defined as one-way communication where the IRIS city has presented smart city solutions and smart city networks at an event or a meeting, mostly disseminating information regarding these and how to get started if interested.

² Tier-2 was defined as two-way communication where more active work has been undertaken to activate the participating cities in connecting to the networks or help them with smart city solutions.



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List of Abbreviations and Acronyms

Abbreviation	Definition
EU	European Union
WP	Work Package
LH	Lighthouse cities
FC	Fellow city
SCC	Smart Cities and Communities
SCMP	Smart Cities Market Place
EIP-SCC	European Innovation Platform – Smart Cities and Communities
SCIS	Smart Cities Information System
SET Plan	European Strategic Energy Technology Plan
ICT	Information and Communication Technology
CIP	City Innovation Platform
EERA	European Energy Research Alliance
JPSC	Joint Programme Smart Cities
SET	Strategic Energy Technology
GA	Grant Agreement
EC	Euro Cities
SC	Scalable Cities
BoC	Board of Coordinators



SCG	City Coordinator Group
EG	Expert Group
AG	Action Grant
TG	Task Group
CINEA	Climate, Infrastructure and Environment Executive Agency
P2P	Peer to Peer
CIP	City Innovation Platform
UMS	Urban Monitoring Services

Appendix

Appendix 1: List of smart cities related initiatives



1 Introduction

This deliverable is part of **WP8: Replication by Lighthouse regions, Follower cities, and European market uptake** in the IRIS project.

The objectives of WP 8 are to design & implement replication plans for the Lighthouse (LHs) regions and Fellow cities (FCs) that are scalable to other EU markets and cities through the creation of a tool box for capacity building, training, active mentoring & knowledge transfer. All LHs and FCs have been involved in developing a roadmap (and business/financing plan) to replicate activities based on their expertise and best practices. A strong emphasis is given to active mentoring by LHs to the FCs. The replication plan has been implemented through a combination of solutions already available during the project or within a few years after the end of the project depending on the expertise and suitability of each FC.

This deliverable is related to the task **T8.7 European scale-up activities** that aimed to scale-up existing European Smart Cities Networks. The milestone-goal has been to engage with a minimum of 80 active cities (local authorities) through activities co-organized by IRIS in collaboration with the various existing Smart Cities Networks and Initiatives (such as the joint-SCC -01 Lighthouse projects group, the Smart Cities Marketplace, Scalable Cities, SCC task group replication and others). IRIS has organized activities and produced content for an "activity line" in cooperation with the chosen European smart cities' networks (SCC-01 Lighthouse and Fellow City group, SCIS, EIP-SCC Marketplace). A number of activities have been carried out to reach the ambitious goal of activating at least 80 cities. The activities ranged from sharing knowledge and understanding in different networks, groups and events, presenting IRIS smart city solutions, assisting interested cities in their quest of embarking on the smart city journey and offering an opportunity to experience IRIS demonstration solutions.

The objective of task **T8.7** was changed from the original objective stated in the grant agreement, this change of activities was accepted by the project officer during a meeting held on 27.03.2020 together with the project coordinator.

The deliverable is also related to the project milestone **MS16 IRIS innovative solutions planned for replication and deployment in other cities**.

Deliverable **D8.13: Establish & operate IRIS European smart cities network with 7 European level regional arrangements** highlights how IRIS has remained active in activating a number of cities within Europe and outside by enhancing their understanding, knowledge sharing and providing assistance in their quest to becoming smart cities.

1.1 Scope, objectives and expected impact

As stated, the objective of this task was changed from the original objective stated in the grant agreement. Instead of establishing and operating a separate IRIS European smart cities network with 80 active cities as members, the project combined efforts with other SCC-01 lighthouse projects and relevant EU service



contracts to set up one networking community through which IRIS reaches out to 80 cities. One of the primary purposes of this deliverable is to document how IRIS has achieved the objective of activating other cities. The expected impact of this deliverable comes by giving a good overview of how the IRIS has been active in the ongoing European-level work regarding smart cities actions and the vision of activating more cities in Europe to start smart city actions by benefiting from the existing European smart city networks.

This deliverable is based on the contribution, results and experiences of all horizontal partners in the IRIS project.

Another important foundation for the deliverable is the contribution, results and experiences of the networks, organizations and initiatives that the IRIS project has worked with during this time.

1.2 Relation to other activities

This deliverable has its strongest relations to the other horizontal work packages of the project. The relation of this deliverable to other tasks and deliverables are the following:

WP2 EU wide cooperation with ongoing projects, initiatives and communities

Input from WP2

The work in WP2 has been of great value to the task **T8.7 European scale-up activities**, as it has clarified the 'how' of the task through the cooperation with other Lighthouse projects and smart city networks and initiatives. The leaders of WP2 and WP8 were co-chairing the SCC Task Group Replication.

WP3 Development of Bankable Business Models and Exploitation Activities

Input from WP3

Valuable input was received from deliverable D3.9 IRIS Beyond Business Plan that has had some similar targets with WP 8 regarding reaching cities outside the IRIS project.

WP10 Communication and Dissemination

Input from WP10

Communication is vital when it comes to European level replication actions and how to activate new cities into smart city networks, and all communicative actions within the project serve as tools for the set goals.



1.3 Structure of the deliverable

This deliverable is comprised of nine chapters. The following provides a brief overview of each chapter and the content covered.

2. Methodology

Provides information on two fronts, i) presents details of the methodology adopted by IRIS to activate cities, and ii) an overview of how the work in this deliverable has been carried out to present findings and conclusions.

3. Understanding European-level Smart City related networks and initiatives

Aims to provide an overview and analysis of European-level smart city related networks and initiatives. The chapter also outlines the benefits and challenges related to these networks and gives suggestions to improve their overall functioning.

4. SCC Task Group Replication

Presents the role of SCC Task Group Replication, its background, associated organizations, plans and actions. The chapter also explains how IRIS has worked with SCC Task Group Replication during the runtime.

5. Smart Cities Marketplace (SCMP)

Provides details on Smart Cities Marketplace's key activities and initiatives. The section also presents how IRIS has collaborated with SCMP.

6. Scalable cities

Provides details on scalable cities' mandate, organizations, subgroups and actions associated with it. The section also presents how IRIS have interacted with SCs.

7. IRIS role in activating minimum 80 cities into smart city networks

Highlights the set of activities and initiatives IRIS has undertaken to activate minimum 80 cities into smart cities networks.

8. Exploitation and scaleup

Presents measures and actions undertaken by the IRIS to facilitate the exploitation and scaleup of technologies and solutions.

9. Conclusions

Offers an overview of the activities, challenges and suggestions to improve the overall state of affairs.



2 Methodology

- All LHs and FCs in the IRIS project have worked towards activating cities in Europe and beyond (outside of the project network) to engage them in European smart city networks and smart city activities:
 - The actions undertaken were divided into two different categories, or tiers (more details on this is presented in chapter 7)
 - Tier 1 (one-way communication, information on IRIS replication results)
 - Tier 2 (two-way communication, exchange on experiences regarding replication results)
- **Interviews**. To understand the complexity and gain insights on the current state of affairs, a number of interviews with key actors and stakeholders, involved with different actions, initiatives and projects under the European Commission were carried out. The deliverable is based on the insights of the IRIS work and interaction with different organizations.
- **Documenting the role** the IRIS project had in European smart city networks and initiatives.
- **Reviewing materials and publications** from other projects, networks and initiatives.
- Arranging and attending events with other projects, networks and initiatives.



3 Understanding European level Smart City related networks and initiatives

The transition towards a sustainable future requires cities to transform almost every facet of their functioning. In order to facilitate and foster the creation of sustainable cities, Europe Commission has initiated a number of actions, initiatives and calls to assist cities and towns in their ambition of becoming smart and carbon-neutral. The Smart Cities Marketplace (SCMP) is one such platform that aims to offer comprehensive information on the measures taken in different lighthouse projects, technologies, and solutions and provides an opportunity to interact with different actors and stakeholders involved in the realm of smart cities. Scalable Cities (SCs) is also one comprehensive initiative that promotes solutions that can be replicated across Europe. Likewise, Euro Cities (ECs) offer an excellent place for cities to embark on and progress their smart city journey. The ECs enjoy a wide network of member cities connected to it. ECs, among other things, works on facilitating replication and acts as a partner in several lighthouse projects. The ECs can offer valuable information to the cities.

The SCMP, SC and ECs are just three examples of such networks and initiatives. There are a number of other networks and initiatives operating with diverse mandates (a detailed list is attached in the appendix). These networks bring value to the cities by finding information on funding, new calls for proposals, and the possibility to attend meetings around specific calls which can help collaboration and finding partners. The networks also offer an opportunity to connect with other cities and develop relationships to get assistance in the project and development work. Moreover, these projects and initiatives have experts and focus groups in different domains e.g. e-mobility, digital twins etc. Cities can get a direct link and access to the network of experts in their area of interest. These networks and connections can offer valuable insights that can foster cities journey of becoming a smart city. However, a number of challenges exists when it comes to the whole landscape and diversity of these initiatives. Some of these organizations and initiatives overlap with others, making it complicated for the outside cities to fully comprehend which network they should connect to get the needed information. The following shed light on the challenges:

Identifying the right networks or initiatives

Currently, one of the biggest challenges a city faces when wanting to find a suitable network or initiative to link to is which network they should be part of to get the needed information to become a smart city. Having numerous initiatives and network pose challenges for the cities to identify the most suitable one and keep up with all the activities and happenings in the other networks. The cities, in general, are often short of resources, and it may be difficult for them to follow multiple networks or join them. This multiplicity often poses a challenge for the cities to allocate resources to keep abreast with all the networks and initiatives. It is, therefore important for cities to get clear information on what is out there and which could be the most valuable networks for them to follow or connect to.



Complexities emerging from the structure

The other challenge concerns the prevailing operating structure on which the commission operates. The existing approach has played a role in maintaining this fragmented and scattered landscape of smart cities networks and initiatives. Currently, the commission allocates the budget to projects or service contracts to achieve an objective. These initiatives receive funding from the commission to carry out activities and actions. Once an initiative comes to an end, its funding gets stopped, and the commission launches new measures on a similar or diverse line of action. The old initiatives are then either abandoned or merged with the newer ones if they align with commission's vision and strategic objectives. The supportive infrastructure for the more recent initiatives, combined with the previous ones, often makes the whole landscape fragmented and challenging to identify and follow for cities, especially for those that are relatively new to this domain.

Another structural challenge is linked to replication. The demonstration works in projects are often carried out at the later stages of a project. A demonstration shows the potential of the technology or a solution and informs on how it may be replicated. The projects have started to realize that it is often challenging to think about the replication at the beginning of the demonstration because the demonstration tells us what works and what does not, and the underlying reasons behind these. These revelations often develop in the later parts of the projects. But then, in practice, the project comes to an end, and the funding for the work finishes, and with no funding, the work or activities can no longer be carried out. This highlights the need for the older projects to get a role and a budget in TG replication, new projects, service contracts and all other institutions and organizations created for replication. These finished projects are the ones that have the most valuable input and lessons that can help others understand what has worked in the past and what could be the way forward. Therefore, in order to fully understand the replication, it is important to have a look at the overall set of projects and the work carried out in the scope of different projects. It is thus suggested that initiatives should be launched to fully utilize the existing knowledge and benefit from the insights, understanding and the expertise developed during the lifetime of completed project.

Likewise, there are specific challenges that are linked to financing matters. For instance, in the case of replication, the projects usually have between zero to five percent of funding dedicated to the replication. Though, the projects have a budget to work on replication. Still, it seems as if it is often lower than what is needed to answer the complex questions that the project or the commission has on replication e.g. the usual questions on 'how's and whys of replications' (what replication means in practice, what works and what does not and why). It is, therefore, important that the projects and the commission allocate enough funding that can further facilitate replication activities.



4 SCC Task Group Replication

The following section explains SCC task group replication in detail and highlights how IRIS has worked with it.

4.1 About Task Group Replication

The Scalable Cities Task Group Replication engage with cities, key actors and stakeholders to facilitate the widespread adoption and use of technologies and solutions across Scalable Cities (SC). The smart cities project aims to develop innovative technologies and solutions that can help address challenges the cities are facing to accelerate their transition towards a sustainable future. The objective can only be materialized if the created solutions are shared and can be implemented across cities to get the maximum benefit. This requires a formal collaborative structure that brings together the cities with other actors and stakeholders interested in the topic to share their knowledge and understanding on multiple fronts. The exchange of knowledge can facilitate the flow of information and essential learnings from one demonstration project to others.

The TG replication was created with the purpose of developing a collaborative structure to ensure better visibility, enhanced impact, faster and smoother scaleup and widespread replication of the technologies and solutions. The Board of Coordinators (BoC) oversees the work of the Task Group, which consists of five individual task groups. Each task group consists of a representative of all lighthouse projects, chaired by one lighthouse project. TG replication is currently chaired by Muriel Pels (IRIS) with co-chair Mauritz Knuts (IRIS), who became chair in early 2019 when a previous lighthouse project (Grow Smarter) was coming to an end. Chairing the TG replication has been of great importance promoting to reach the goals of this deliverable.

The TG replication's main objective and line of action have been to be more active on (a) knowledge sharing between Lighthouse projects on replication strategies, (b) knowledge sharing on barriers and drivers and (c) collaboration with European networks to accelerate scale-up and replication. The knowledge sharing aspect of the TG replication focuses on sharing lighthouse project replication approaches, developing a repository of lighthouse project deliverables and tools, supporting and promoting the TG communication calendar and providing support for the TG monitoring and replication. The barrier and driver discussion focuses on sharing replication experiences, identifying barriers at the European and national levels, and supporting the production of solution booklets in co-creation and lighthouse projects. The collaboration with the European networks covered cooperation with different platforms and initiatives such as European Strategic Energy Technology, European Energy Research Alliance, a joint program on smart cities and similar initiatives.

The TG replication work has evolved over the years, and the lessons learned from the number of lighthouse projects have informed how replication work should optimally be carried out. The lighthouse project demonstration and replication activities have shown that implementing a particular solution in a new setting is a complex and multifarious process. A solution that works in one place cannot simply be copy-pasted in the new setting and generate desired results. Replication managers need to understand that it is not simply the cloning of the solution. Instead, it has to be customized according to the local



situation. The change in approach actually means moving from the drivers and barriers approach alone to more towards sharing replication approaches and experiences. An effective replication warrants managers to follow a more flexible and localized approach while replicating a solution.

This customization to the local setting has given the replication a different meaning. TG now aims to help cities navigate the scattered landscape of smart city networks. It is more like understanding who can help us find what we need as a city, who have the information on technical, political or social issues, and how to collaborate with key actor and stakeholders to achieve desired objectives.

4.2 How SCC TG replication collaborated with IRIS

The current TG replication chairs, Muriel Pels and Mauritz Knuts are from the IRIS Smart Cities project, and they have chaired the TG replication since 2019, which strongly links the IRIS Smart Cities project to the TG replication activities and initiatives.

IRIS has been active in sharing information across lighthouse projects on various project demonstration sites and insights emerging from the replication activities. IRIS has also used TG replication platform to get to know more about how replication work is carried out in other lighthouse projects, what works and what does not, what kind of changes IRIS need to make in its implementation strategy, what kind of networks and collaborations could be of benefit to the IRIS etc. The TG replication arena has also served as a good point of interaction for different smart city project experts. It has provided IRIS with an opportunity to discuss with colleagues to exchange information and knowledge on the pressing issues and different initiatives.



5 Smart Cities Marketplace

The following section briefly explains the smart cities marketplace and presents how IRIS has worked with it.

5.1 About Smart Cities Marketplace

The Smart Cities Marketplace (SCMP) is a central market-shaping mechanism supported by the European Commission devised to bring cities, industries, investors, researchers and other smart cities actors together. The SCMP seeks to provide vital knowledge and support to facilitate the development of ambitious smart cities project forwards. The marketplace offers services and events for cities and investors to identify and develop suitable smart cities proposals by publishing calls for proposals and engaging investors' networks. The SCMP also offers insights into European smart cities good practices that can help explore the solutions and approaches to match other smart city project needs. Moreover, the SCMP represents a community of experts that can offer insights and knowledge critical for shaping new smart city projects. The readily available expert advice can help develop the plan and prepare the business case, which could then be presented to potential investors for financing.

The SCMP was formed by combining two former Commission projects, namely, "Marketplace of the European Innovation Partnership on Smart Cities and Communities (EIP-SCC)" and "the Smart Cities Information System (SCIS). The underlying reason behind the merger has been to develop a one-shop place where cities and towns of all sizes can get the necessary information to explore, share and set up successful smart cities projects, which can ultimately foster the development of a sustainable urban environment. The SCMP is followed by thousands of followers from within and outside of Europe, many of which have also signed up as a member. An overwhelming majority of such cities seek to get ideas and inspiration from the SCMP to build an understanding on improving citizens' quality of life, increase the competitiveness of the cities and industries, and transform the energy infrastructure to reach the energy and climate challenges. The SCMP, in practice, works on three fronts: (i) to explore (see and learn about the possibilities), (ii) to shape (develop and transform projects and action plans), and (iii) to make a deal (create relations and opportunities to reach the stated targets). To this end, the smart cities marketplace has received 127 bankable project proposals and matched these with € 616.3 million in funding. Figure 1 presents smart cities key activities.



Figure 1: Smart cities marketplace key activities

5.1.1 Explore

The Smart City Market Place offers key knowledge and insights that can support cities in accelerating their smart city ambitions. The SCMP offers practical cases as examples from over 80 successful European projects implemented in small, medium-sized and large metropolitan city settings. The projects also provide a possibility to feed the core data into a 'Self Reporting Tool', which can then be developed into bankable solutions.

5.1.1.1 The Self-Reporting Tool

The Self Reporting Tool (SRT) is an instrument for funded smart city projects to report their output and insights. The personnel from the project can feed in the key information, such as the interventions carried out in the project. The information may be in the form of the refurbishment of a building to make it energy-positive, implementing e-mobility or digitalization solution, or a transition towards cleaner sources of energy consumption. The readily available information from the actual projects offers real-life data, from monitoring to demonstrating, projecting a good account of how the solution works in practice and getting relevant knowhow on how others can benefit from the solutions in their local contexts.

5.1.2 Shape

The SCMP aims to provide useful information and insights that can accelerate the transformation of an idea into an actual project. The objective is achieved through a variety of solution booklets, policy papers, smart cities guidance packages, storytelling videos, storytelling podcasts and a combination of action clusters and initiatives.



5.1.2.1 Solution booklets

The leading smart cities experts have worked on a number of solutions booklets to explain the technology, a concept or its potential for application in a city or community. The booklets offer an interesting account of an overview of the state of affairs and how the solutions could be beneficial for another town, city or community. The booklets contain information on all practical fronts ranging from hardcore technical things such as technologies, e.g. district heating and cooling networks, e-busses to softer issues like how to engage citizens in the process to enhance its acceptability and other conditions necessary to implement sustainable and smart cities strategies. The booklets present relevant examples, descriptions of cases and useful references.

5.1.2.2 Policy papers

Implementing a smart city project in the practical setting often leads to a number of policy implications and insights that pose a challenge in implementation or upscaling. Based on the extensive analysis of smart cites projects and relevant literature, important challenges are identified and examined in detail to develop insight and report the novel findings in the thematic papers to create knowledge on the subject matters. The recommendations help policymakers and other key actors and stakeholders when it comes to implementing smart cities projects in their local context.

5.1.2.3 The Smart City Guidance Package

The smart city guidance package offers a compressive roadmap with key financial aspects on different steps and stages. The package seeks to foster the development of viable projects to ensure the process is carried out in an integrated and inclusive manner. The checklist and the advice on different phases help address the challenges and facilitate the development of the solution to ensure the scaling and replication of the solutions is possible in the local context.

5.1.2.4 Storytelling videos and podcasts

Storytelling videos and podcasts aim to give voice to people that have been part of smart city projects. The initiative offers an opportunity to share stories in the form of videos and podcasts to shed light on the development practices, challenges, key learnings and other relevant information that could be helpful to others to experience how the process has been carried out and what learning can be drawn from the implementation of these smart city projects.

5.1.2.5 Action clusters and initiatives

The smart city marketplace maintains stakeholders' run action clusters and related initiatives. The objective is to bring together the experts to facilitate the interaction and exchange of valuable knowledge among each other and the commission. The interaction is expected to result in useful advice, sharing of best practices, and perspective plans on smart city-related topics.



5.1.3 Deal

In addition to sharing information and offering possibilities for mutual learning and development, the SCMP also offers matchmaking services and events for both businesses and the cities to materialize bankable smart cities projects through a call of the proposal. The proposals are fine-tuned with the help of experts and are linked to the interest of investors. The action carried out may result in the successful collaboration of the project with the investors.

Smart cities marketplace investor network facilitates the financing of smart city projects, accelerating the transition towards a low-carbon, resource-efficient and competitive economy. Cities, project developers, and smart city actors who are interested in seeking financing can submit their ideas in the call for projects. The smart cities market team works on improving the concept and seeks to make a match between the investors and the project ideas.

5.2 How Smart Cities Marketplace collaborated with IRIS

The smart cities marketplace has interacted with IRIS in two main capacities, (a) to gain insights on different issues to benefit from learning originated from the IRIS, and (b) to utilize the activities carried out in the IRIS to further the development of smart cities marketplace. As an example of the former, the IRIS has provided input and consultation to the smart cities marketplace staff on the preparation of the recent 'systemic governance paper'. The IRIS lighthouse city personnel worked in different brainstorming and discussion sessions, contributing to the work's progression. The said paper has also benefited from some of the practical examples of the work carried out in the IRIS project. The examples highlight the value of the local innovation ecosystem and how having the right supporting infrastructure can help the rapid development of sustainable smart cities initiatives. Likewise, the SCMP has interacted with Task Group replication to hear more about how the replication work in IRIS is progressing and how it could be used in the smart cities marketplace.

IRIS has also arranged a number of activities that has contributed to the development of the SCMP. For instance, a pilot workshop was arranged in Vaasa 4.12.2018 with a smart cities guidance package that led to many new ideas and relations that later assisted in the development process. Likewise, the 'Cost Action' collaboration helped to ground more academic thinking. The process, at the least, helped in understanding the complexities and preparing how things might work in practice. These activities instigated SCMP to get back to the drawing board to work and plan things on the cost action.



6 Scalable cities

The following section briefly explains scalable cities and how IRIS interacted with it.

6.1 About Scalable Cities



Figure 2: Scalable Cities

The scalable cities (SC) initiative aims to identify and promote solutions and business models that can be scaled up and replicated across Europe to achieve measurable outcomes, which may be in the form of new jobs, energy savings, or other initiatives to foster sustainable development. Scalable cities represent 120 cities involved in 18 smart cities and communities projects funded by Horizon 2020 with around EUR 345 million. These 120 cities represented in SCs include 48 Lighthouse cities (LHs) and 72 Fellow cities (FCs). The lighthouse cities pilot and deploy innovative and novel solutions, while fellow cities follow the lead of lighthouse cities with an intention to replicate these already demonstrated solutions in their local contexts. The initiatives are undertaken in consortiums of various actors and stakeholders from industry, associations, consultants and academics. The collaboration resulted in over 550 demonstrations of technological and social innovations in the domain of mobility and logistics, buildings, urban data and ICT infrastructure, citizen engagement and urban governance.





Figure 3: Scalable cities map

The integrative and collaborative nature of scalable cities initiatives warrants collaboration and input from a number of different organizations to ensure efficient functioning. The following organizations and initiatives: the Board of Coordinators (BoC), the City Coordinator Group (CCG), the Expert Group (EG), the Action Grant (AG), and the Roadshow (RS) are the main pillars of SCs.

The scalable cities aim to foster cross-collaboration between stakeholders across Europe to practically demonstrate how smart actions can help achieve the objective of achieving climate-neutral cities. The following sections briefly shed light on the critical tasks of different actors linked to SCs.

6.1.1 Board of Coordinators

The board of coordinators (BoC) carries out the main coordinating work of scalable cities. The BoC consists of representatives of ongoing smart cities and communities - projects. The BoC meets on a monthly basis to discuss key issues, discuss strategic direction and outline priorities and targets for scalable cities. The BoC also facilitates the process of joint collaboration, adjusts strategic plans, reviews manifestos and interacts with the European Commission and other actors to achieve stated objectives. The decisions made by the BoC are implemented through individual Task Groups.

Task Groups

Task groups (TGs) are working groups that implement measures identified by the board of coordinators. There are currently five TGs that are in operation.



i) *The TG Replication* engages with the cities, relevant actors and stakeholders from outside the demonstration/pilot areas to promote and share technologies and solutions across scalable cities.

ii) *The TG communication and dissemination* is responsible for handling a joint brand, communication and dissemination strategy, promotional tools kits, joint event strategy, participation and common agenda for the key events. This TG aims to identify key messages and disseminate results and data.

iii) *The TG Business Model and Financing* facilitates the adoption and diffusion of proven technological solutions by developing and promoting business models. This TG closely interacts with the investment community to procure needed financing to scale up the demonstrated solutions.

iv) *The TG Data Management* collects and examines data management plans to provide recommendations and main insights about the cases developed in each project. The TG is also responsible for accumulating and disseminating Privacy Impact Assessments.

v) The TG Monitoring and Evaluation works with gathering practical data, monitoring and reporting processes, developing tools, preparing impact methodologies and providing an exchange of data collections, interfacing control systems and databases, algorithms for data set cleaning, and dissemination tools and related issues. It also engages in the peer to peer learning and collaborates with external experts.

6.1.2 The scalable cities Secretariat

The Scalable city secretariat works as an administrative support unit to ensure scalable cities get assistance in the form of stable governance, logistics and organizational structures and can disseminate results originating from smart cities and communities projects.

6.1.3 Scalable Cities Expert Group

The scalable cities expert group is an online networking and co-working community of experienced and motivated smart cities experts. The expert group is formed to provide technical assistance and support to the Scalable Cities and the European Commission. The expert group works on the following fronts: a) to participate and contribute to the work of task groups established under the SCs to provide assistance in specific smart city related themes, b) to offer expertise on different activities such as replication, dissemination and topic report on novel technologies and trends, and c) to be active in facilitating peer-to-peer learning by monitoring activities and supporting the upscaling at the P2P level.

6.1.4 Scalable City Action Grant

The scalable cities action grant is a financing mechanism that financially supports cities, and ad-hoc partnerships to replicate measures that are already successfully tested in other smart cities and community projects. This action grant is implemented in collaboration with the European Commission and Climate, Infrastructure and Environment Executive Agency (CINEA). The action grant facilitates the EC commission's objective for scalable cities to deploy widescale innovative, replicable and integrated energy, transport and ICT solutions to prompt large-scale investments with a vision to transform the market.



6.1.5 City Coordinators Group

The city coordinators group (CCG) seeks to gather all coordinators from the scalable cities projects to facilitate their functioning by addressing any specific challenges they face and to create a space for the co-design of the shared approaches. The CCG aims to achieve these objectives through a) facilitating knowledge sharing and knowledge exchange in partnership with cities, expert groups and task groups, b) facilitating networking and cooperation among lighthouse, fellow cities and other similar initiatives, projects, as well as other cities interested in replication of scalable cities measures, and c) benefiting from the joint work to put forward the advocacy actions at the European level.

The CCG regularly arranges networking, knowledge sharing, co-creation and advocacy meetings. The networking and knowledge-sharing meetings are usually part of the larger events (like Joint Scalable Cities Event, Smart City Expo etc.) organized to promote intuitional networking among participants of groups and external experts. The co-creation meetings focus on arranging practical workshops to discuss new project ideas, develop new partnerships and co-design new common guidelines. The advocacy meetings seek to prepare documents for the EC to underline cities' primary needs and challenges.

6.1.6 Scalable Cities Roadshow

The Roadshow is a meeting space for cities to interact and meet with the group of investors chosen by the scalable cities group. The initiative aims to bring together investors and cities to interact effectively to create opportunities for collaboration and partnership. The Roadshow demonstrates effective smart cities solutions, offers an opportunity for the investors to get to know about the solutions, and renders a possibility for cities to put forward their business plans and boosts up the scaling of the Smart City Market. These meetings are organized at the European level together with the smart cities marketplace or at the macro-regional level. The initial set of meetings primarily encompasses those scalable cities which are funded by the commission. This allows the lighthouse and fellow cities to go beyond the first implemented investment plans and materialize the full completion of the global intervention and replication actions.

6.1.7 Scalable Cities Library

In order to reach the target of making Europe carbon neutral by 2050, it is of immense importance to communicate and disseminate the efforts to a broader audience and the general public. To make these materials accessible, the SCs have developed informative visual materials and infographics to demonstrate the joint climate and energy impacts of the horizon 2020 SCC1 projects. These documents are collected under the Scalable cities library and are openly available to anyone interested.

6.1.8 Scalable Cities P2P Learning Programme

The P2P learning programme aims to provide cities with an opportunity to build capacity in public administration and knowledge building. The knowledge exchange often happens around the good and the bad practices, including the lessons learnt and offering expertise to replicate successful demonstrations. The learning is facilitated by means of expert reviews, expert missions and site visits.



6.2 How IRIS work with Scalable Cities

IRIS has worked with scalable cities through TG replication and BoC (chair, co-chair, chair of BoC). IRIS has a strong representation in TG Replication and BoC, where representatives from IRIS's Lighthouse and Fellow cities serve in different capacities. The collaborative nature of the Scalable Cities, and an aim to promote collaboration among cities to facilitate the replication and upscaling of initiatives, SC has actively been collaborating with IRIS in different capacities to achieve common goals. A recent example of the collaboration has been materializing the work on 'Systemic Changes in Governance'. The topic has gained a lot of attention in different conversations with the cities, City Coordinator Group, Board of Coordinators and people from the mission on Climate Neutral and Smart Cities. The decision was then made to address this, through an inclusive approach, by involving cities to get their input on how cities are experiencing a systematic change in governance, what are the key enablers that support this transformation, and what are the barriers hindering the process. Through TG replication, experts in different domains were engaged to ensure collaboration and engagement of key actors and stakeholders is available to provide input on the issue. Likewise, the chair of the Board of Coordinators, who presents the coordinators of the 18 lighthouse projects, comes from one IRIS lighthouse city. The support for chair, along with the representative of the head of different activities under the scalable cities and smart city market place participated in the BoC to identify and discuss the needs of the cities and to explore how collaboration between the cities can be effectively materialized. IRIS provided substantial input from the light house cities perspective and has facilitated the development in the form of speakers and experts in several capacities.



7 IRIS's actions to activate minimum 80 cities into smart city networks

All the LHs and FCs of the IRIS project worked with activating other cities in Europe into joining European smart city networks and starting smart city actions in their cities.

This was done by participating in the identified European smart city networks that have been presented in this deliverable, but also through participating in other smart city events, meetings and networks as well as arranging or co-arranging events were IRIS Smart cities solutions have been presented. All IRIS cities have presented the IRIS projects, smart city solutions and networks in a wide range of events and meetings.



Figure 4: Presentation by Mauritz Knuts March 2022 in Vaasa at the International annual "Energy week" event'.

The networks that the IRIS LHs and FCs are a part of is presented in the table below (Table 1).



Table 1: Network and initiatives where IRIS participated

Initiative/network	Utrecht	Gothenburg	Nice	Vaasa	Tenerife	Alexandroupolis	Focsani
EU Mission "100 Climate Neutral and Smart Cities"	Х	Х					
18 Lighthouse Projects' Task Replication Group	Х	Х		Х			
Scalable Cities Secretariat	Х	Х	Х	Х			Х
NetZeroCities	Х	Х					
Smart City Marketplace	Х	Х		Х			
ICLEI	Х						Х
Viable Cities		Х					
Eurocities	Х	Х	Х				
UN-Habitat	Х						

The IRIS cities have been active both in larger European events and networks, like the European Week of Regions and Cities, but also in many national and regional events and networks. Regional and national networks have been important when reaching cities outside the IRIS project, as these cities often have the most in common regarding national legislation, solution providers and climate circumstances.



Figure 5: Positive energy district and innovation ecosystem session



When documenting the cities that the IRIS project has activated a 2-tier system was used, where cities were divided into two different categories, Tier-1 and Tier-2, depending on the level of engagement that was done between the IRIS city and the activated city. Tier-1 was defined as one-way communication, where the IRIS city has presented smart city solutions and smart city networks at an event or a meeting, mostly disseminating information regarding these and how to get started if interested. The cities in Tier-1 are often cities that have recently started looking into what it means to be a smart city and what kind of solutions are defined as smart city solutions, listening in to presentations from other cities with experiences of these. Tier-2 was defined as two-way communication, where there was more active work in activating the participating cities into networks or helping them with smart city solutions. The Tier-2 events were usually workshops, smaller seminars with Q&As, smaller meetings between two or more cities and visits. The cities in Tier-2 are often cities that have made decisions on some level to start working towards becoming a smart city or to implement smart city solutions. Often the Tier-2 cities were cites located close to an IRIS-city.

Altogether, over 150 cities have been activated for European smart city networks (93 cities through tier-1 communication and 58 cities through tier-2 communication). The smart city actions are presented in the table below (Table 2), sorted according to Tier-1 and Tier-2.

Lighthouse Cities			Fellow Cities			
Utrecht	Nice	Gothenburg	Vaasa	Alexandroupolis	Santa Cruz De Tenerife	Focsani
	Tie	er 1 (one-way o	communicatio	on, information on IR	IS replication results)	
Valencia (ES)		Barcelona (ESP)	Tallinn (ES)	Drama (GR)	San Cristóbal de La Laguna, Tenerife (ES)	Cernauti (UA)
Stavanger (NO)		Athens (EL)	Raseborg (FI)	Kavala (GR)	Adeje, Tenerife (ES)	Majdanpek (SRB)
London (UK)		Stockholm (SE)	Leuven(BE)	Veria (GR)	El Rosario, Tenerife (ES)	Bucuresti - Sector 3 (RO)
Muenchen (DE)		Alingsås (SE)	Ostrava(CZ)	Xanthi (GR)	Candelaria ,Tenerife (ES)	Adjud (RO)
Skopje (MK Macedonia)		Amersfoort (NL)	Nykarleby (FI)	Komotini (GR)	Potenza (IT)	Marasesti (RO)
Miskolc (HU)		Mechelen (BE)	Stockholm (SE)	Mykonos (GR)	Dijon (FR)	Panciu (RO)
Limerick (El Irland)		West Suffolk Council (UK)	Seinäjoki (Fl)	Haskovo (BG)	Teror, Gran Canaria (ES)	Odobesti (RO)
Lyon (FR)		Sevilla (ES)	Jakobstad (FI)	Sofia (BG)	Bremen (DE)	
Leiptzig (DE)		Novi Sad (SRP)	Espoo(FI)	Samsun (TR)	Valencia (ES)	

Table 2: European smart cities network and smart cities action



Oostende (BE)	Stavanger (NO)	Kajaani(FI)	Orestiada (GR)	Zurich (SW)	
Rotterdam (NL)	Umeå (SE)	Ikaalinen(FI)	Soufli (GR)	Cáceres (ES)	
(11-)	011104 (02)	indumen(i i)		La Matanza, Tenerife	
	Graz (AT)	Nokia(FI)	Didymoteicho (GR)	(ES)	
	Zagreb (HR)	Limhamn (SE)	Samothraki (GR)	Málaga (ES)	
	Rijeka (HR)	München (DE)	Paggaio (GR)		
	Dublin (IE)	Paris (FR)			
	Vilnius (LV)	Umeå (SE)			
	Madrid (ES)	Hyvinkää (FI)			
	Hengelo (NL)	Jyväskylä (FI)			
	Asterdam (NL)	Kokkola (FI)			
		Klaukkala (FI)			
		Larsmo (FI)			
		Forssa (FI)			
		Jokela (FI)			
Tier 2 (two	-way commun	nication, excha	ange on experiences	regarding replication re	esults)
Amsterdam		Tampere			
		rampere			
(NL)	Örebro (SE)	(FI)	Orestiada (GR)	Adeje (Tenerife)	Braila (RO)
(NL) Rotterdam	Örebro (SE) Mölndal	(FI)	Orestiada (GR)	Adeje (Tenerife)	Braila (RO)
(NL) Rotterdam (NL)	Örebro (SE) Mölndal (SE)	(FI) Helsinki (FI)	Orestiada (GR) Soufli (GR)	Adeje (Tenerife) El Rosario (Tenerife)	Braila (RO) Galati (RO)
(NL) Rotterdam (NL) Groningen	Örebro (SE) Mölndal (SE)	(FI) Helsinki (FI)	Orestiada (GR) Soufli (GR)	Adeje (Tenerife) El Rosario (Tenerife)	Braila (RO) Galati (RO) Tulcoa (RO)
(NL) Rotterdam (NL) Groningen (NL) Alkmaar	Örebro (SE) Mölndal (SE) Malmö (SE)	(FI) Helsinki (FI) Oulu (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT)	Braila (RO) Galati (RO) Tulcea (RO)
(NL) Rotterdam (NL) Groningen (NL) Alkmaar (NL)	Örebro (SE) Mölndal (SE) Malmö (SE)	(FI) Helsinki (FI) Oulu (FI) Espoo (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR) Samothraki (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT) Diion (FR)	Braila (RO) Galati (RO) Tulcea (RO) Buzau (RO)
(NL) Rotterdam (NL) Groningen (NL) Alkmaar (NL) Limerick	Örebro (SE) Mölndal (SE) Malmö (SE) Lund (SE)	(FI) Helsinki (FI) Oulu (FI) Espoo (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR) Samothraki (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT) Dijon (FR)	Braila (RO) Galati (RO) Tulcea (RO) Buzau (RO) Constanta
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(NL) Rotterdam (NL) Groningen (NL) Alkmaar (NL) Limerick (EI; Irland) Pamplona (ES) Vittoria- Gasteiz (ES)	Örebro (SE) Mölndal (SE) Malmö (SE) Lund (SE) Vasa (FI) Ängelholm (SE) Härryda (SE)	(FI) Helsinki (FI) Oulu (FI) Espoo (FI) Turku (FI) Kerava (FI) Korsholm (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR) Samothraki (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT) Dijon (FR) La Matanza (Tenerife)	Braila (RO) Galati (RO) Tulcea (RO) Buzau (RO) Constanta (RO) Stefan cel Mare (MD)
(NL)Rotterdam(NL)Groningen(NL)Alkmaar(NL)Limerick(EI; Irland)Pamplona(ES)Vittoria-Gasteiz (ES)Valencia(ES)	Örebro (SE) Mölndal (SE) Malmö (SE) Lund (SE) Vasa (FI) Ängelholm (SE) Härryda (SE)	(FI) Helsinki (FI) Oulu (FI) Espoo (FI) Turku (FI) Kerava (FI) Korsholm (FI) Malax (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR) Samothraki (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT) Dijon (FR) La Matanza (Tenerife)	Braila (RO) Galati (RO) Tulcea (RO) Buzau (RO) Constanta (RO) Stefan cel Mare (MD)
(NL)Rotterdam(NL)Groningen(NL)Alkmaar(NL)Limerick(EI; Irland)Pamplona(ES)Vittoria-Gasteiz (ES)Valencia(ES)SanSebastian	Örebro (SE) Mölndal (SE) Malmö (SE) Lund (SE) Vasa (FI) Ängelholm (SE) Härryda (SE)	(FI) Helsinki (FI) Oulu (FI) Espoo (FI) Turku (FI) Kerava (FI) Korsholm (FI) Malax (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR) Samothraki (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT) Dijon (FR) La Matanza (Tenerife)	Braila (RO) Galati (RO) Tulcea (RO) Buzau (RO) Constanta (RO) Stefan cel Mare (MD)
(NL)Rotterdam(NL)Groningen(NL)Alkmaar(NL)Limerick(EI; Irland)Pamplona(ES)Vittoria-Gasteiz (ES)Valencia(ES)SanSebastian(ES)	Örebro (SE) Mölndal (SE) Malmö (SE) Lund (SE) Vasa (FI) Ängelholm (SE) Härryda (SE)	(FI) Helsinki (FI) Oulu (FI) Espoo (FI) Turku (FI) Kerava (FI) Korsholm (FI) Malax (FI) Korsnäs (FI)	Orestiada (GR) Soufli (GR) Paggaio (GR) Samothraki (GR)	Adeje (Tenerife) El Rosario (Tenerife) Potenza (IT) Dijon (FR) La Matanza (Tenerife)	Braila (RO) Galati (RO) Tulcea (RO) Buzau (RO) Constanta (RO) Stefan cel Mare (MD)



Sonderborg (DK)	lsokyrö (FI)
Lecce (IT)	Laihia (FI)
Sofia (BU)	Skellefteå (SE)
Elva (EE)	Boden (SE)
	Dingelstädt (DE)
	Eigersund (NO)
	Groningen (NL)
	Leuven (BE)
	Luleå (SE)
	Umeå (SE)
	Växjö (SE)
	Roeselare (BE)



8 Exploitation and scale-up

IRIS aimed to foster the development and adoption of smart city solutions for fellow cities, European cities within and outside the existing network, and cities beyond Europe. To ensure the work carried out in IRIS is accessible to the outside parties and serves as a good point of information, the project has developed its own website, a separate showcase website and social media channels (Linked In, Twitter and YouTube). The showcase website will remain accessible even after the project ends to serve as a common platform to demonstrate all the activities carried out in the project and provide an important point of contact if needed. The showcase website presents valuable information on the solutions such as 'why this solution is needed', 'why to use in a city', and 'what impact it had' etc. The portal aims to answer critical questions and present information on different exploitable results that can help other cities to replicate similar solutions in their local context. Example of these includes CIM (City Information Model), CIP (City Innovation Platform), CIP Marketplace (3rd party apps), Urban Monitoring Services (UMS), City Management and Planning Services (CMPS), Mobility Services, Grid flexibility services, Storage solutions (2nd life batteries and thermal storage), IRIS replication tools (roadmaps, replication wizards, training etc.) and IRIS business model tools. Table 3 briefly explains these initiatives. Table 3 briefly presents details on these initiatives.

Table 3: List of initiatives

Initiatives	Details
City Information Model (CIM)	Aims to contribute to improved planning, management, control and maintenance of energy, transport and related services
City Innovation Platform (CIP) and CIP Market place (3rd party apps)	Is a data platform that can host different static and dynamic data, and assists in developing integrated data services (information services for e-mobility, connectivity, sensor services on street lighting, and pollution sensors etc.)
Urban Monitoring Services (UMS)	The network of microsensors collects air quality, noise, water, energy, waste management data, and more. The gained insights are utilized to improve the services offered and can contribute to an overall improvement in living standards
City management & planning services	Open data collaboration platform allows city workers, construction companies, transport providers and other actors to consult, collaborate and plan interventions together. It can contribute to increasing efficiency, reducing waste, minimizing costs and disruptions
Mobility services	Real-time data services integrating multiple modes and opportunities to provide a practical travel substitute for car ownership



Grid flexibility services	Multiple applications and real-time analysis of energy production and consumption (from monitoring grid flexibility to smart street lights systems and visual displays for consumers fighting energy poverty)
Storage solutions (2nd life batteries, thermal storage)	Accommodating charging needs and energy consumption of a growing number of electric vehicles using flexible grid technology and harnessing solar power. It also aims to benefit from the recondition of the old batteries
IRIS Replication tools (roadmap, replication wizard, training etc.)	Replication tools that can assist in the task of replication, e.g. assistance in creating a replication plan for the actions
IRIS business model tools	For communication, policies and regulation to implement a market design that supports the new integrated solutions to overcoming transformation barriers

In addition, the project aims to also publish a magazine, as a digital booklet, in the project's final phase. The magazine will highlight key aspects of IRIS and offer practical insights to professionals with an interest in transition and smart cities development.

Information for external organizations and other cities

IRIS has actively been part of different organizations, EU-supported projects and service contracts, different EU and UN support programs and membership-based network organizations of local governments and cities. The aim has been to be active in the group of 18 lighthouse projects and associated networks and initiatives to share the wealth of experience, knowledge and expertise developed during the project lifetime with others. Examples of some of these initiatives include i) EU 100 Climate Neutral and Smart Cities, ii) the Task Groups in support of the 18 Lighthouse projects, e.g. TG Replication and TG Monitoring, iii) The Scalable Cities Secretariat service contract (notably the City Coordinators Group), iv) The NetZero Cities project, v) Smart Cities Market Place. Further to these initiatives, IRIS has also been an active part of other networks supporting the cities' mission of carbon neutrality. These networks include i) Local Governments for Sustainability (ICLEI) ii) Variable cities, iii) Eurocities, and iv) UN-Habitat.

Cities outside of Europe

During the project's runtime, IRIS lighthouse cities have also interacted with cities outside of Europe through study visits and external organizations and networks to facilitate knowledge sharing. The interaction has been to discuss the technological solutions and framework that can help cities in becoming smart and sustainable. Following is the list of some of the cities that have interacted with IRIS: Santiago (Chile), Fujisawa (Japan), Beijing, Jiading (China), Namyangju (South Korea), Seoul (South Korea), Jakarta (Indonesia), Pittsburgh (United States of America), Thailand, Laos, Malaysia, Philippines, Vietnam and Turkey among others.



9 Conclusions

A transition from a conventional city to a smart city is often a complex process influenced by a number of factors ranging from a city's vision and mission, city strategy and political commitment, in-house resources, knowledge base, ability to learn and adapt, availability of the technologies and solutions, access to information, network and a number of other internal and external factors. IRIS have taken an active role in activating cities and regions in to smart cities network. Through the actions of lighthouse and fellow cities, IRIS have activated over 150 cities through various actions and measures. Acknowledging the complexity and multiplicity of the issue, European Commission has initiated a number of calls, projects, initiatives and a set of actions to help facilitate the development and growth of smart cities. These measures include financing technologies and solutions, supportive infrastructure and mechanisms to foster mutual learning between cities initiatives across multiple cities and towns necessitates that collaborative and interactive mechanisms should be set in place to facilitate the exchange of information between cities to ensure synergies and mutual learning. The synergies can be drawn through the exchange of information, knowledge transfer, learning from each other and developing mechanisms that can foster the development and minimize barriers.

EC has set up a number of networks and initiatives such as SCMP, SC, EC, Netzero Cities etc with an aim to facilitate the development of smart cities solutions by offering possibilities to learn and network with the group of people having knowledge and expertise in the area. The diversity of initiatives and networks offers a possibility for a city to become part of a suitable initiative and benefit from the services offered. However, the multiplicity of the network also poses challenges for cities, especially which are relatively in earlier phases of embarking on becoming smart cities. It often becomes challenging for the cities to figure out which networks are suitable for them to join and how to efficiently benefit from these. Cities often have limited resources available at their disposal. This makes it difficult for them to keep up-to-date with all the initiatives and follow what is happening on the other networks. Therefore, it is important to frame the structure in a manner that makes it easier for the cities to follow and connect to the right networks.

Likewise, it is also important that the replication activities are better planned. Currently, a small percentage of the project funding is allocated for the replication activities, and the demonstration works is often scheduled at a rather early phase of the project. This poses two challenges. One, the existing level of funding for replication is often not enough, considering the challenges involved in the process. Previously, replication has been conceived more or less as an application of demonstrated solution at a new location. However, activities carried out in the set of lighthouse projects have shown that replication is more than application. Replication is rather customization and localization of solutions in accordance with the local context and settings. This, in practice, means a lot more work and careful attention to socio-economic, regularity and contextual conditions. Likewise, it is also important that work on a project should not fully end with the closure of a project. These completed projects. There should be some sort of funding instrument/support to ensure the work carried out can be replicated and the knowledge developed can be transferred to other cities and networks. Carrying out activities in such a manner will likely foster the replication and implementation of smart cities solutions in other cities within and beyond Europe.





Appendix

Appendix 1: List of major networks

Network	How it supports SCC01 replication and implementation
SCC01 Task Group Replication	Dissemination of SCC01 knowledge on replication between SCC01 projects, and with networks outside SCC01, by monthly meetings with all SCC01 replication managers and representatives of SCC01-related networks outside SCC01.
SCMP Smart Cities Market Place	Matchmaking between cities and market parties for implementation and replication, e.g. by standardization, joint procurement, and communication and dissemination of financing solutions.
SCALE support project (same website as SCMP, incl SCIS)	Communication & dissemination on SCC01 implementation and replication, e.g. website with all SCC01 information (a.o. solution booklets), roadshows, expert meetings, and funding of replication activities additional to LHPs.
EERA JPSC European Energy Research Alliance Joint Program Smart Cities	aims to resolve global urban challenges with the ambition to develop a European research and innovation hub on urban matters to create European solutions. It emphasizes research to help cities implement PEDs within and outside SCC01, e.g. how to work across silos, organize public-private partnerships, deal with risk management, and make information available understandably for stakeholders.
JPI Urban Europe Joint Programming Initiative Urban Europe	Executes EU SET (Strategic Energy Technology) Plan Action 3.2: PEDs and neighbourhoods for sustainable urban development. This PED Program aims to exchange knowledge and experiences between European cities within and outside SCC01 (coordinated by Viable Cities), and has funding for this. Talks with TG Replication (Muriel).
COST Actions European Cooperation in Science and Technology, network of 240 running Actions, a.o. on PEDs (CA 19126 PED-EU-Net)	Funding organization for research and innovation networks. It aims to create a knowledge and evidence repository for PED development. COST has funding for doing this. Is talking to JPI Urban Europe's PED programme (see above) regarding the mapping of knowledge and evidence for the repository, and with TG Replication (Muriel): how can we make something that can cover the interest of the different platforms?
HorizonEurope Mission Climate-neutral & Smart Cities	Showcase, promote and co-funding 100 European cities in their systemic transformation towards climate neutrality by 2030 through Climate City Contracts.



Covenant of Mayors - Europe network of cities for climate and energy	Bring thousands of local governments to voluntarily commit to implementing Eu climate and energy initiatives.
ICLEI Europe global network of local governments for sustainability	is a global network of over 2500 local and regional governments dedicated to sustainable urban development. Operating in more than 125 countries, ICLEI aims to influence sustainability policy and promote local actions for low- emission, natural-based, equitable, resilient and circular development.
EUROCITIES network of 139, mostly European cities	It empowers cities and citizens to shape and transition to future-proof cities. Eurocities showcase concrete alternative solutions implemented by the cities and propose future-proof political and economic governance alternative structures to foster a transition towards a sustainable future. Eurocities also facilitate the exchange of knowledge, experience and good practices between (member) cities to scale up urban solutions.
IEA EBC Annex 83 International Energy Agency, Energy in Buildings & Communities programme	The aim of Annex 83 is to develop an in-depth definition of PED and the technologies, planning tools and planning, and decision-making process related to positive energy districts. Experience and data will be gained from demonstration cases.
Bridge	BRIDGE is a European Commission initiative that combines Horizon 2020 and Horizon Europe smart grid, Energy storage, Islands, and Digitalisation projects to develop a coherent understanding of cross-cutting issues that can play a role in decelerating the diffusion of innovative solutions in that domain.
BUILD UP The European portal for energy efficiency in Buildings	is an environment for building professionals, local authorities and building occupants created to promote the exchange of best practices carried out in Europe to facilitate the development of energy savings in buildings.
CIVITAS Sustainable and smart mobility for all	is a network of cities focused towards cleaner and improved transportation in Europe and outside. It aims to help EC to achieve the objectives concerning mobility and transportation and convert these into European Green Deal.
Clean energy For EU Islands Secretariat	serves as a one-stop shop for Europe's island communities aiming to transition towards clean energies. It facilitates networking with other island communities and technical experts and provides assistance in project preparations and related practical issues.
EIT Urban Mobility	is a co-funded EC initiative of the European Institute of Innovation and Technology (EIT). It aims to bring positive changes in the way people move around cities to make them sustainable places to live.
Eltis	aims to make it easier to collaborate and exchange knowledge and experience within the realm of sustainable urban mobility in Europe.



The urban mobility observatory

Energy Cities European Association of cities in energy transition	is a European association of local authorities in energy transition, representing over 1000 cities and towns in approximately 30 countries. It aims to strengthen cities' role and skills within the domain of sustainable energy. It facilitates an exchange of knowledge, expertise, and knowhow and offers an opportunity to work on joint projects.
European Urban Knowledge Network	it is a network of national governments and knowledge institutes involved in EU policy-making. Its work emphasizes generating a professional community that shares knowledge and best policy practices to inspire policymakers, practitioners and researchers to influence sustainable urban development
Intelligent cities challenge	is a European Commission initiative that supports 136 cities in using state-of- the-art technologies to lead intelligent, green and socially responsible recovery (of economy, creating new jobs, and strengthening citizen participation and well-being) with the assistance of the local ecosystem.
Living-in.EU	aims to facilitate employment and use digital solutions to help assist cities and communities in transforming urban living and boosting sustainability
POLIS Network Cities and regions for transport innovation	is a leading network of European cities and regions collaborating to create innovative technologies and policies for local transport.
URBACT driving change for better cities	aims to assist cities in working together and developing integrated solutions to urban challenges through collaborating, sharing knowledge and experiences and learning lessons and good practices to improve urban policies.