RUGGEDISED

Designing smart, resilient cities for all

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Executive summary

All the large scale Smart City projects funded by the European Union's Horizon 2020 programme belong to the Smart Cities and Communities projects (SCC01). As the same funding call has been annually repeated since 2014, the SCC01 group continues to grow and consists of more than one hundred cities, as well as a wide range of industrial and knowledge partners working in cities across Europe on Smart City solutions.

With the increasing amount of knowledge generated through these projects, strong partnerships and effective collaboration are two key elements for a successful the European Smart City Lighthouse programme. RUGGEDISED recognized this need to work together already in its inception phase and early on identified the need to work with peers around Europe to build a combined knowledge-base and avoid overlap of the communication, dissemination and replication activities.

At the same time, numerous linked European initiatives; most importantly the Smart Cities Marketplace (a merge of the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) and the Smart Cities Information System (SCIS), both of which were independent initiatives in the period covered by this report) and the SCALE Initiative (which inception was supported by RUGGEDISED in the period covered by this report) work to ensure that this expertise is being put to good use, by securing paths either to investment or to knowledge-sharing.

Along with its sister-projects, RUGGEDISED has been involved in the SCC01 initiative right from its beginning and, over the last four years, has been contributing and providing support to the numerous activities proposed and undertaken by the different Task Groups of which the initiative is made up. Moreover, the presence of RUGGEDISED and the participation of the partners in the numerous European Smart Cities events have fostered a climate of cross-learning, mutual knowledge transfer and exchange of experience on the main themes of Smart Cities and it is thanks to this cooperation and to the creation of synergies that it is possible to guarantee and set a process of improvement and enrichment towards a smarter and more sustainable future for our cities.

This report is aimed at showing the level of contribution to the SCC01 initiative from the RUGGEDISED project, such as role and responsibilities within the initiative, actions undertaken to promote knowledge sharing on Smart City topics, involvement in the events, lessons learned and next steps.

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1. Introduction

Strong partnerships and effective collaboration are two key elements for the success of the European Smart City Lighthouse programme. With 17 European Lighthouse projects, European Smart City expertise is expanding by the day. The need to work together was identified both to promote knowledge-exchange between the projects and to avoid overlap of the communication, dissemination and replication activities.

Along with its sister-projects, RUGGEDISED has been involved in the SCC01 cluster[2] right from its beginning and, over the last four years, has been contributing and providing support to the numerous activities proposed and undertaken by the different Task Groups of which the cluster is made up (see Chapter 2). Moreover, the presence of RUGGEDISED and the participation of the partners in the numerous European Smart Cities events have fostered a climate of cross-learning, mutual knowledge transfer and exchange of experience on the main themes of Smart Cities and it is thanks to this cooperation and to the creation of synergies between the different projects that it is possible to guarantee and set a process of improvement and enrichment towards a smarter and more sustainable future for our cities.

This entire set of activities are part of WP8 on "Interaction with other Smart City projects", which was properly structured with the ambition to increase the visibility of the SCC01-supported projects and to enhance synergies among them. Through the interaction with other Smart City Projects in a consolidated network, RUGGEDISED aims to ameliorate the implementation of Smart City solutions and exploit their replication potential, to ensure good practices and to enable future partnerships.

This report is intended to show the level of contribution from RUGGEDISED to the SCC01 initiative, such as role and responsibilities within the initiative, actions undertaken to foster knowledge sharing on Smart City topics, involvement in the events, lessons learned and next steps[3].

The structure of the document is as follows:
- Chapter 2 provides a general overview of the SCC01 coordination initiative;
- Chapter 3 reports the contribution of RUGGEDISED to the SCC01 initiative and gives details of the events and platforms in which the project has participated;
- Finally, Chapter 4 outlines the main findings and conclusions drawn from the cooperation among several cities, projects and partners.
- In the Annexes, more details can be found about EC-funded projects reported in the Smart Cities Information System, events on which RUGGEDISED has taken part over the years and Action Plans of the different Task Groups and the SC001 initiative itself.

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[1] https://eu-smartcities.eu/news/smart-city-projects-strengthen-connections-among-european-initiatives

[2] the SCC01 cluster is the initiative including all the Smart City projects funded by the European Union's Horizon 2020 programme.

[3] Important Note: This report was finalised in September 2020, thus events and status of works in the different task groups as well as in the different platforms and initiatives are referred to the period preceding June 2020.

2. SCC01 coordination initiative

The European Commission set up a framework on SCC projects and initiatives under the umbrella of the European Innovation Partnership on Smart Cities and Communities (EIP-SCC), which was a major market-changing undertaking supported by the European Commission bringing together cities, industries, SMEs, investors, researchers and other Smart City actors and the Smart Cities Information System – two initiatives which in October 2020 merged into the Smart Cities Marketplace[4].

The Smart Cities and Communities Lighthouse projects are funded by the European Commission through the Horizon 2020 research and innovation programme, with the aim of bringing together cities, industry and citizens to demonstrate solutions and business models that can be scaled up and replicated, and that lead to measurable benefits in energy and resource efficiency, new markets and new jobs[5].

The RUGGEDISED project was part of the third call for Smart Cities and, in 2016, joined a group of nine SCC01 projects (Figure 1), also called Lighthouse projects[6], which included a total of 57 cities at the time of its launch. Cooperation among projects had been previously determined as an asset which was worth committing a fair amount of dedicated resources.

Figure 1: All SCC01 projects by year (Source: STARDUST website[7])

In 2017, RUGGEDISED and its sister-projects had the opportunity to help formalize the cooperation. An SCC01 projects coordinator's board (BoC) was formed as well as dedicated task groups (TG) for replication, communication and business models at first; after some time also monitoring & evaluation and data management were set up. This arrangement was formalized through the signature of the Lighthouse Projects Cooperation Manifesto[5] in Nottingham in March 2017.

In light of their commitment to demonstrate sustainable, cost-effective and replicable district-scale solutions involving the energy, transport and ICT sectors, the representatives of the EU Lighthouse projects, now comprising more than 100 cities, acknowledged that the invaluable amount of knowledge generated can pave the way for the

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[4] "The Smart Cities Marketplace is a new platform which was created from a merger of the Marketplace of the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) and the Smart Cities Information System (SCIS). It is a major market-changing undertaking supported by the European Commission bringing together cities, industries, SMEs, investors, researchers and other smart city actors."

https://smart-cities-marketplace.ec.europa.eu/

[5] https://ruggedised.eu/fileadmin/user_upload/LighthouseProjectsCooperationManifesto_signature_2Hi_FINAL.pdf

[6] Lighthouse projects are ambitious demonstrators called like that as they act as beacons for future transformation and development. By bringing together *cities*, industries, citizens, SMEs, investors and researchers, Smart City Lighthouse projects aim at transforming *cities* into smarter and more sustainable places.

[7] https://stardustproject.eu/smart-cities-network/

take-off of the EU market on Smart Solutions and their whole value chain, and recognised the need to learn from each other and gain benefit from jointly spreading the knowledge generated and from cross-project collaboration.

2.1 Objectives and expected outcomes of the SCC01 initiative

Working together in order to deliver higher impacts and benefits to the challenges that EU cities are facing is the basis of the coordination efforts made by all the projects of the initiative. SCC01 cities recognise their difficulties in adjusting to the fast-moving world and the increasing role of partnerships, networks of organizations and cities in dealing with multi-layer challenges (Figure 2: Three-layer model of city functions (Source: SCIS website)) and replicating new solutions. According to the **SCC01 2018 Action Plan** which was jointly developed by the projects (See ANNEX III. ACTION PLANS), and based on the SCC01 Collaboration Framework and the SCC01 Manifesto documents, *"the Lighthouse programme of work is perfectly placed to accelerate collaboration between the projects and cities and make significant progress towards achieving the aims of the EIP-SCC and the Commission."*
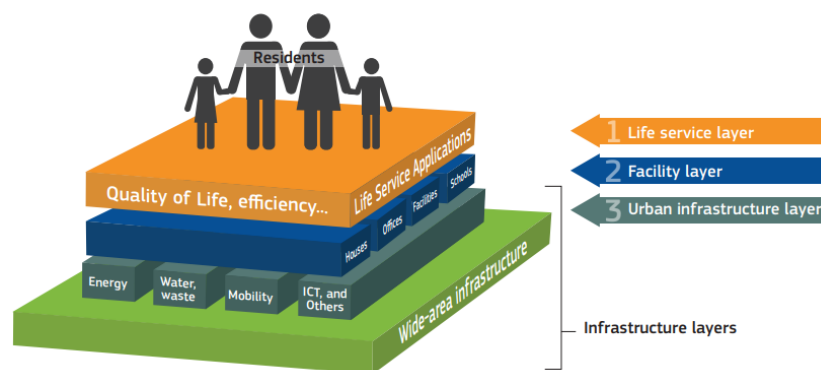
Figure 2: Three-layer model of city functions (Source: SCIS website[8])

Therefore, the strategic targets set-out SCC01 2018 Action Plan take into account that there are different ongoing projects at different stages of implementation and the value of collaboration and joint working between them is appreciated by both the EC and the SCC01s and beneficial for cities, industries, public and private entities.

That being said, collaboration between the SCC01 projects is based on the following pillars:

➢ **Mainstreaming Smart City solutions** – To showcase Smart City solutions to various decision makers in order to shift Smart City tech out of the private and technical sectors into the public mainstream, giving confidence to the market.

➢ **Share learning, and capacity building** – SCC01s will demonstrate to the EC and the broader market the inherent value in shared learning. All SCC01s are conducting similar programmes using similar technologies in similar environments – with similar goals and aims. Instead of operating in isolation, SCC01s will learn from each other and build on that learning – moving forward rather than duplicating and building capacity to enable replication in similar urban environments. This will include alignment with the EIP-SCC and other key EC Smart City projects.

➢ **Find a swifter route to replication, demand aggregation, and mass market adoption** – offering value to cities of all sizes across Europe (and to EU industry in exporting solutions).

➢ **Create value for money** – gaining internal efficiency and maximising value of the funds received by the projects and demonstrating that smart approaches deliver a real external return of investment and can drive the market value.

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[8] https://smartcities-infosystem.eu/sites/default/files/document/the_making_of_a_smart_city_-_replication_and_scale_up_of_innovation_across_europe.pdf

➢ **Policy Insights** – the overall process will provide ideas and evidence to support future policy and regulatory change in the Lighthouse Cities and beyond.

To concretely achieve and pursue the ambitious objectives in the aforementioned pillars the representatives of the EU Lighthouse projects committed to[9]:

- **adopt a cross-project collaboration** framework and a **management structure** to work together to enhance the impacts and benefits achieved through the projects;
- **establish task groups** where needs for collaboration are identified in order **to ensure cross-project cooperation** in an impact-based approach and collaborate with projects funded under previous Research and Innovation Framework Programmes where synergies appear;
- **contribute and collaborate with the European Innovation Partnership on Smart Cities and Communities** (EIP-SCC) as main fora for cities, industries and citizens to improve urban life, to increase the replication potential of the project in other EU cities (See paragraph
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- RUGGEDISED CONTRIBUTION TO the platforms for details);
- **promote and exploit the results** of this cooperation approach through the proper mechanisms and tools;
- **increase the replication potential of the Lighthouse projects** in other European cities by working together;
- **involve the EC** and the Innovation and Networks Executive Agency **(INEA)** in an **observing and advisory role** on the continuous progress in the cooperation activities;
- determine and demonstrate the behaviours expected and actively, **provide constructive challenge, mutual trust, enthusiasm and respect;**
- create a set of **common Smart Cities and Communities tools** that benefit current and future projects and can be **shared across** them;
- **monitor the impacts and effectiveness of the cooperation** activities and improve the working mechanisms when needed;
- **align technical, economic and social monitoring approaches** to enrich the knowledgebase of the Smart Cities Information System (SCIS) (See paragraph
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- RUGGEDISED CONTRIBUTION TO the platforms for details).

2.2 General management structure of the collaboration framework

The management structure[9] involves a strategic level driven by the Board of Coordinators and an operative level composed by a set of Task Groups focused on specific areas of collaboration which are cross-cutting to the SCC01 projects. Task Groups are goal oriented but flexible in scope. This approach is intended to allow for different levels of pace and involvement from each SCC01 consortium. Figure 3 depicts the main management framework of the network:

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[9] The general management structure has been adapted from the document "SCC01 Collaboration Framework" by the European Network of Smart Cities and Communities Lighthouse Projects.

Figure 3: General Management Structure of the collaboration framework (Adapted from SCC01 Collaboration Framework)

2.2.1 Board of Coordinators

The Board of Coordinators (BoC) is the core management body for collaborative working among the SCC01s and is formed by all the coordinators of the ongoing H2020 Lighthouse projects. Through the coordinators, all partners are regularly informed about the latest news and opportunities to collaborate with other projects. The Board leads on the Collaboration Framework and monitors its progress. Some of the main tasks of the Board are:

o **Set the agenda** for ongoing and future SCC01 collaborations.
o **Establish Task Groups** where the need for collaboration is identified by the Board and **end Task Groups** when the aim of the Task Group has been fulfilled.
o **Own, promote and exploit the outputs of the Task Groups**.
o **Ensure cooperation on knowledge transfer** through cross-project working.
o **Increase the replication potential** of the Lighthouse projects in other European cities **by working together**.
o Ensure **alignment between Lighthouse projects and the European Innovation Partnership** (EIP) and other external groups.
o To **involve EC/INEA in an observing role** and to ensure they are included in discussions/meetings and informed of decisions where relevant.
o **Inform their respective consortiums** of the collaboration activities and how they can get involved.

Every year, a plan is adopted with agreed specific targets to be reached in that period (see example in Box 1 below).

Box 1: Targets of Board of Coordinators, 2020

Targets of 2020 (See ANNEX III. ACTION PLANS):
o Guide the process of SCC01 collaboration to achieve the targets and, if necessary, adjust the plans.
o Execute the motto 'Getting better connected' with other existing international networks
o Be more strategic and less operational
o Identify, secure and manage resources for collaboration.
o Identify and agree themes for the year
o Attend one meeting per month either by conference call or linked to a pre-determined event.
o Organize workshops in the coordinator meetings to address specific issues.

o   Represent the Lighthouse Programme at events and in the media.

o   Work jointly with the Commission, EIP and INEA to achieve our common goals

The BoC is an initiative of the coordinators themselves and has become a strong community since its inception. Every six months a chairman and vice-chairman organize regular online meetings and a live event in one of the Lighthouse cities Participation in the BoC is therefore not an obligation of the EC.

Sharing experiences between the SCC01-projects is an important recurring theme and transparency is a keyword within the BoC and, in confirmation of this, SCC01-stakeholders, DG Ener and INEA are always present during the online meetings. The 'older' SCC01-projects are guides towards the 'newer' projects which are fully in line with the SCC01-principles. The social cohesion within the BoC is well developed because all participants of the BoC are normally present during the online meetings and the live events as well.

As the BoC had to start from scratch, it took some time to develop a real own identity. Although the identity is now in place, it remains difficult to create a good agenda that does justice to both operational and strategic issues. This is mainly due to the fact that there are now 17 projects, which differ in the maturity of their implementation projects.

RUGGEDISED contribution to the BoC

Albert Engels, Senior Process Manager in the City of Rotterdam and Coordinator for the RUGGEDISED Project:

> *"Since the beginning of 2017, RUGGEDISED is a permanent member of the BoC and learned a lot from the older projects. Coordinating such large-scale projects is not a daily activity for anyone, therefore it is important to share experiences in order to be able to lead each other through this rollercoaster."*

A good example of the contribution of RUGGEDISED within the BoC is the way in which it was ensured that the GA EIP-SCC could eventually take place in 2019 in Brno, one of the fellow cities of RUGGEDISED. The coordinator of RUGGEDISED (City of Rotterdam) made it clear in the BoC that the city of Brno with their energetic drive could serve as a strategic bridge between the west-European part with the most Lighthouses and central- and eastern European part with the most Fellow Cities.

During the first half of 2020, RUGGEDISED (City of Rotterdam) was chair of the Board of Coordinators and introduced the strategic motto "Getting better connected" (see also section •). This motto was based on the fact that the SCC01 community may be represented in more than 100 European cities, without making it a network. To prevent an extra network from being introduced, it was decided to connect with existing networks, such as OASC and GRCN (former 100RC).

As chair, RUGGEDISED has put extensive energy into this connection during all online meetings, webinars, conference calls, etc. This has resulted in the lines with the EC being shorter and improved, as is the connection with EIP SCC, SCIS, OASC and GRCN.

"Getting better connected" certainly contributed to the fact that the EC involves the BoC through the chair in various questions. This includes for example strategic issues surrounding the new work programme for Horizon Europe.

As well, it is important to mention that RUGGEDISED-partner ICLEI was simultaneously chair of the Task Group Communication during the first half year of 2020.

2.2.2   Task Groups

o   Task Groups are formed when the Board of Coordinators identifies and agrees areas of joint working in order to deliver on specific objectives bound by a target. Each TG consists of representatives of all running Lighthouse projects, chaired by one of them. These Task Groups commit to the following: Contain **at least one person from two or more separate consortiums**

o   Ensure it **links in with the EIP Marketplace** and the **Action Cluster groups**.

o   Be **goal orientated** – have a clear end point set when Group is created

o   Be **lean and agile** in approach – prioritise content and keep process to a minimum

o   Produce **regular simple reports** to the Board

o   Establish **synergies with the other Task Groups** as necessary

Task Groups fall into two broad areas, common and pioneering. **Common Task Groups** involve all the partners on transversal subjects (such as joint communications). **Pioneering Task Groups** involve less projects and work on areas that pave the way for new areas of joint action that others can exploit at a later stage (such as the Task Group on Business Models and Finance).

A Task Group can potentially form around any subject that has a relevance to the work of the SCC01s. This can relate to the work packages, the programme management, cities or to the wider H2020 body of work. It is up to the BoC to decide if a subject is relevant and if there is sufficient interest in it to form a Task Group.

In the following paragraphs, the main Task Groups are shortly described with particular attention to their objectives and action plans. The participation of RUGGEDISED is also mentioned where relevant as well as its specific contribution to activities and events (then further in Chapter 3).

Task Group Replication

TG Replication's mission is to accelerate demand-driven market uptake, scale-up and replication of the Lighthouse projects' solutions in Europe and beyond.

TG Replication meets virtually every month and live twice a year (connected with relevant SCC01 events). It consists of 60 members, mostly R&D institutes, cities, and city networks.

TG Replication manifests the following objectives and actions for 2020[10]:

Objective 1: Knowledge sharing between Lighthouse projects on replication strategies.
Gather in a common repository all Lighthouse project's deliverables on and tools for replication (roadmaps, tool catalogues, toolkits, replication potential assessment tools). Support and promote SCC01 replication events as organized half-yearly by the BoC chair.

Objective 2: Further identification, understanding and uptake of barriers and drivers for replication as encountered in the Lighthouse projects.
Support the production of SCIS Solution Booklets in co-creation with Lighthouse projects. Attribute barriers encountered in Lighthouse projects to governance levels (local, Member State, European Commission), and identify opportunities for, and initiate, collaborative action between Lighthouse projects.

Objective 3: Supporting EU-regional and Member State networks of SCC01 cities, and other European networks, to accelerate scale-up and replication.
Explore how TG Replication can support EU-regional and Member State networks of SCC01 cities to accelerate demand-driven market-uptake, scale-up and replication of knowledge and solutions between SCC01 cities, and engage cities outside the SCC01 network in that region / Member State. Explore how TG Replication can cooperate with other European networks to accelerate demand-driven market-uptake, scale-up and replication of Lighthouse knowledge and solutions.

Objective 4: Collaboration with TG Business Models & Financing.
Once a year invite TG BM&F to present their work and plans in TG Replication, and/or organize a session together.

Objective 5: Cooperation with TG Communication.
Cooperate with TG Communication on (production and) use of SCC01 dissemination materials for, and promote active Lighthouse projects' participation in selected key events for replication.

Objective 6: Cooperation with TG Monitoring.
Contribute to mapping and alignment of KPIs.

RUGGEDISED Contribution to TG Replication

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[10] TG Replication Action Plan 2020.

The RUGGEDISED project is a member of the Task Group Replication and for the past four years has been contributing by participating in the monthly virtual meetings and, whenever possible, in the physical ones. ISINNOVA, as leader of Replication activities in RUGGEDISED, is responsible for this work and takes care of keeping synergies and carrying out continuous cooperation by channelling all the relevant information on other projects results, inspiring replication approaches and tools, workshops, seminars, conferences, fairs, etc. to the members of the consortium with special attention to the involvement of Fellow Cities, which actively contributed and attended several EU events, jointly organised by other SCC01 projects, like Replication Workshops and other events related to these topics (See paragraph 3.2 "RUGGEDISED contributions to events"). A bidirectional flow is ensured and also RUGGEDISED results, events and news are shared and transferred to the TG during the monthly conference calls, e.g. the replication approach adopted in RUGGEDISED and a specific tool developed for assessing the replication potential of smart solutions were presented to the other SCC01 projects during these online events. Moreover, the TG Replication was invited to participate to the RUGGEDISED Replication Workshop in Brno organised during the Smart City Fair of 2019 and some of the projects joined as speakers, presenting their replication approach and sharing their cities' experiences.

Task Group Monitoring and Evaluation

During the face-to-face meeting of BoC in San Sebastián last year (March 2019) it was identified the need to create a specific Task Group for the Monitoring and Evaluation of projects. STARDUST took the lead of the new TG, in collaboration with MATCH UP project. The kick off meeting of this new Task Group took place in Lyon (October 2019) and the Action Plan for 2020 was presented to the SCC Collaboration Network during the Smart City Expo World Congress in Barcelona (November 2019). The preparation group is formed by participants from the projects STARDUST, MATCH UP, +POCITYF, SPARCS, my SMARTLife. At the moment there are representatives of the 17 SCC Projects involved.

One teleconference is organized every month and specific workshops will be held coinciding with the SCC01 Initiative face to face meetings (twice a year).

TG Monitoring and Evaluation manifests the following objectives and actions for 2020[11]:

Objective 1: Common understanding on the scope and meaning of EVALUATION & MONITORING
Develop a word cloud clarifying the terminology and scope of this Task group in relation to other Task groups (Data management, Replication etc.). Common approach for SCC01 projects to evaluation & monitoring: scope, evaluation boundaries, monitoring protocol... SCC01 BASELINE definition methodology. Social evaluation methodology of SCC01 projects (including qualitative methods, learning process etc.)

Objective 2: Mapping of KPIs
Collect KPIs used to evaluate and monitor SCC01 project impacts, as a continuation of Replication TG work. Harmonization of common indicators and alignment with key initiatives and frameworks. Need for new indicators (PED, LCA, social evaluation, air pollution, environmental quality...)

Objective 3: Facilitate SCIS Reporting Methodology
Share experiences with SCIS reporting. Facilitate the interaction between SCIS and SCC01 network to reach more comparable results

Objective 4: Set up a COLLABORATION FRAMEWORK.
Sharing experiences from different projects through concrete examples. Collaborate with other Task groups. Collaborate & Engage with city representatives, and other key stakeholders.

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[11] TG Monitoring and Evaluation Action Plan 2020.

RUGGEDISED Contribution to TG Monitoring and Evaluation

RUGGEDISED project is member of the Task Group Monitoring & Evaluation (TGME). Since that RUGGEDISED has been contributing to the TG activities by participating to the monthly telco. The TGME aims to establish a common understanding for the monitoring and evaluation of integrated smart solutions being realised within the ongoing EC-Lighthouse projects on SCC01. By making use of lessons-learned from the accomplished and running projects the main goals are focused on mapping the KPIs used in SCC01 projects, harmonising the monitoring and evaluation process and establishing a common list of KPIs including the addition of new ones to tackle new challenges like PEDs and providing practical recommendations to assess the sustainable impact of the implemented solutions. In this regard social evaluation methods and associated KPIs for assessing the social impact of SCC01 projects are also in focus. AIT, as leader of Monitoring and Evaluation in RUGGEDISED, contributes to the ongoing activities within the TG and takes care of keeping synergies and carrying out continuous cooperation by channelling all the relevant information on other projects results to the members of the consortium with special attention to monitoring activities at the demo sites of the Lighthouse Cities (LHCs). This includes sharing experiences and lessons-learned on setting up the monitoring infrastructure, the role of involved stakeholders within the LHCs, the monitoring and evaluation process covering data collection, and the processing, visualisation and generation of related KPIs. In favour of mutual learning and harnessing existing synergies a bidirectional flow is ensured where RUGGEDISED results on monitoring and evaluation are shared and transferred to the TG during the monthly teleconferences. The contribution of RUGGEDISED to the TGME is a very useful opportunity to make use of accumulated experience and lessons-learned from already accomplished projects for improving the monitoring and evaluation process of RUGGEDISED. This includes particularly the role of stakeholders within the LHCs, the baseline scenario (or historical data) used as benchmarking for calculating the KPIs, the applied approaches for assurance of plausibility and quality of the collected data and how the generated KPIs can be further feed in in existing platforms like SCIS for the benefit of the whole SCC01. Moreover, the TGME provides valuable insights on how the generated KPIs can be utilised to estimate the overall impacts of rolling out the smart solutions (of building and mobility) at the level of LHCs and FCs and support their future sustainable development plan.

Task Group Business Model and Financing

TG BM&F mission is to collaborate across the portfolio of SCC01s to build tools and capacity that support scale adoption of smart city solutions enabled by the creation of business models and financing mechanisms that justify and attract investment, exploit past and planned Horizon investments, and result in maximised public value and market growth.

This is achieved through four mutually reinforcing activities:

'PACKAGING' OF SCC01 MEASURES:

At the time of writing the focus is on finalising an 'alpha' portfolio of packaged measures, to provide consistent, quality guidance and tools that cities and the broader market can use with confidence
   a. 'Alpha' Measures include: Humble Lamppost; Urban Data Platform, eBike; & Social Housing
   b. Develop 'transition tracks' for each measure to inform cities and speed up-front decision making
   c. Increase the involvement of (older) SCC01s for contribution; and (newer) for testing
   d. Align SCIS smart booklet contributions with the overall 'packaging' approach to strengthen the portfolio
   e. Develop realistic plans for resourcing packaging efforts with DG ENER and INEA; e.g. support contracts (ENER); use of 5% collaboration resource (INEA)
   f. Address the BM&F and governance of Positive Energy Districts (PEDs) to inform packaging plans
   g. Following 'alpha' testing, develop plans to expand and curate the portfolio of materials (e.g. including involvement of standards bodies and the like)

"BM&F TOOLKIT": Compare, contrast, extract best practices from the various SCC01 approaches to produce an initial set of practical tools for:
   a. Map where the SCC01 tool best practices lie
   b. Outline Toolkit purpose; form / structure; initial portfolio & owners

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> c. Undertake a practical focused *joint* business case (e.g. UDP & L'post) to strengthen material available to justify investment / value case, and support capacity building
> d. Produce introductory 'Business Models 101' materials that can help advise the less financially informed communities within the SCC01s, and align around a common suite of approaches and materials (e.g. to support training, workshops, etc)
> e. Develop an initial inventory of approaches and tools
>
> **ALIGN ACROSS TASK GROUPS & SCC01 COMMUNITY** transitioning to a more productive matrix-based cross-SCC01 operating model, sharing lessons, and developing greater commonality of solutions
> a. **BM&F, Replication & Monitoring TGs** – content-based work (e.g. demand; indicators)
> b. **Data TG** – on UDP packaging, and investment justification
> c. **Communications TG** – on market messaging; once compelling messages are clear
> d. **New SCC01s** – engage as proof points for Toolkit; Packaging; Transition Tracks, etc.
>
> **BROADER MARKET ENGAGEMENT**: in collaboration with EIP-SCC Marketplace, Networks, etc.
> a. **Investor** Summit(s) – addressing progressively the different investor types
> b. **Supply** Community – managed engagement with the right agenda / topics for impact
> c. **Networks / Trade Associations** – engagement, with other Task Groups/SCC01s
> d. **Standardisation Bodies** (EU-level) – those that are considering BM&F-related issues
>
> The Task Group, as with all TGs, struggles to mobilise resource to undertake any significant joint 'heavy-lifting' content work beyond initial surveys and fact-finding, as the SCC01s are not set up most effectively as yet for real collaborative joint development activities. This clearly presents an enormous opportunity. That said, the emerging packaging portfolio for the initial measures is significant in form, and the concept is endorsed by the European Commission, and has been built into the new SCC01 support contract. The BM&F Toolkit has been outlined, and some 60+ potential sources of assets have been identified from across the SCC01 community. The 2020 cross-TG review also supports increased collaboration across TGs (item 3). [12]

RUGGEDISED Contribution to TG Business Model and Financing

RUGGEDISED partners have contributed to the TG BM&F throughout the lifetime of the projects. RISE Sweden and Erasmus University are both members of the TG and Erasmus University have published several studies, reports and articles on 'Governance and Businesses Models for Urban Data Platforms'[13] based on a close cooperation with the group. This work on Urban Data Platform has also been done in cooperation with the EIP-SCC and included answers from more than 60 cities involved with a Lighthouse project and serves as a strong example of beneficial cooperation in the SCC01 projects.

Task Group Communications

TG Communications mission is to support the Lighthouse project develop a joint brand, maximise joint impact by joining forces in communication efforts and cooperate with various initiatives, especially the Smart Cities Information System (SCIS) and the EIP-SCC (Now the Smart Cities Marketplace) and other EC Initiatives.

> **TG Communications** has the following objectives:
>
> ***Objective 1: Develop and establish a 'Lighthouse' brand.***
> Setting out the key messages of the Lighthouse programme around market shaping, shared learning and accelerated innovation, the TG has developed marketing materials for the Lighthouse programmes –

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[12] Information on TG Business Model and Financing was provided by Graham Colclough, who collaborates within the European Commission Smart Cities Innovation Partnership (chair for integrated infrastructure and data); UK Smart Cities Forum; 6-Nations Smart City Forum; City Protocol Society; chair of the ISO Smart City Strategic Advisory Group; and an active member of the UK BSI Smart Cities Advisory Group including a number of recent publications. Graham is a regular speaker and chair of conferences a

[13] https://smart-cities-marketplace.ec.europa.eu/news/cities-are-becoming-digital-urban-data-platforms-enable-it

presentations and draft wording for press releases etc; and developed some brand identity – logo and colours etc.

Objective 2: Lead on events planning in order to maximise impact.
Focusing on the pre-defined key events agreed by the Board of Coordinators, most notably, the Smart City Expo in Barcelona, but also Nordic Edge in Stavanger and the URBIS Fair in the Czech Republic RUGGEDISED Fellow City of Brno. The projects have participated in several of these as a joint group.

Objective 3: Feedback to EIP, Commission and SCIS on the experiences of attending events.
To ensure an optimal use of resources, each participation at events have been evaluated afterwards leading to small changes, such as more (or less) dedicated workshops, different planning flows and more cooperation with the EIP-SCC.

RUGGEDISED Contribution to TG Communication
RUGGEDISED partner ICLEI has been a part of this Task Group since its inception and has participated in practically all meetings of the Task Force during its lifetime. ICLEI Europe has contributed to the planning and execution of several joint events, most notably the Smart City Expo World Congress in Barcelona and Nordic Edge in Stavanger. In addition, ICLEI and the City of Rotterdam were among the main initiators of a joint branding exercise for the Lighthouse Projects which included the definition of key messages, the beginning of a visual identity and more. In addition, in 2020 ICLEI led the group and helped arrange joint webinars, recommendations for an upcoming secretariat of all the Lighthouse Projects and helped to launch a joint Social Media campaigns initiated by a group of the projects.

Task Group Data Management
The Task Group Data Management was established in the beginning of 2018. The start of this TG was timely because of the introduction of the rules of GDPR, which had implications for any organization in Europe. Special workshops were organized with help of experts of other SCC01-projects to explore the do's and don't's regarding GDPR.
The city of Rotterdam, coordinator of RUGGEDISED, has been chair of this Task Group since its inception and has participated in practically all meetings during its lifetime.
During the Nordic Edge Conference, a broad session was organized with special attention to the societal aspects of the introduction of GDPR with help of the expertise from the University of Manchester.

TG Data Management has the following objectives:

Objective 1: Collect and disseminate Privacy Impact Assessments
To collect experiences and status within other SCC01-projects of "PIA-Privacy Impact Assessments" and other relevant tasks.

Objective 2: Organise cross-SCC workshops on GDPR
To develop a common set of tools for data privacy and security for the Lighthouse projects.
To use all our experiences on GDPR to combine all information in a body of knowledge that all can use.

Objective 3: Host data science workshops to share learning on the use cases for data
In collaboration with knowledge-institutes and data related networks to support the development of urban data platforms

Objective 4: Collect and examine data management plans to provide recommendations
In collaboration of all SCC01-projects, SCIS and data related networks to get a better overview and to share the gathered information

Objective 5: Share the main insights about the various use cases developed in each project and develop 1 or 2 joint use cases

Supported by all SCC01-projects, this TG created a base for an extensive scientific research project regarding Urban Data Platforms under supervision of Erasmus University Rotterdam. This survey delivered very valuable insights especially in the barriers regarding building and using Urban Data Platforms (see the box below). The recommendations are even used by the officers within EC DG Connect in webinars and other meetings to emphasize the importance of these surveys within the SCC01-community with support and coordination from this TG. At this moment a new chair is needed to proceed this TG and the City of Utrecht is willing to take over the Chair.

Some recommendations from the EUR-survey are as follows:

1. *Think beyond 'open data 'and envision shared data.*

2. *Build digitalization capabilities next to your ICT capabilities.*

3. *Adopt an agile mind set.*

4. *Decide if the UDP is vital infrastructure and be clear about the platform purpose.*

5. *Ensure the right mix and level of capabilities.*

6. *Gain TRUST through 'social innovation'.*

7. *Consider Citizen engagement from the start.*

8. *Regional governments can support municipalities with UDP's.*

9. *Consider data to be a strategic resource.*

10. *Ponder the vitality of UDP's and what they mean for governments in the digital age.*

11. *Steer away from the 'dark side 'of smart*

12. *Leverage the UDP to scale smart city initiatives.*

2.3   Projects of the SCC01 initiative
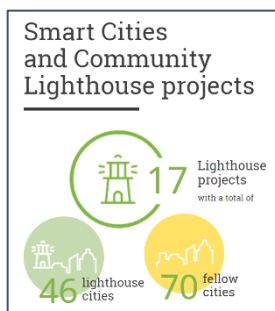
At the time of the completion of this report, 17 Lighthouse projects are ongoing and are part of the SCC01 initiative, involving 46 Lighthouse Cities and 70 Fellows (see Figure 4).

In the following paragraph, all the SCC01 Lighthouse projects, RUGGEDISED excluded, are listed and shortly described (see SCIS website for details)

Figure 4: Lighthouse and Fellow Cities in Europe (Source: GrowSmarter (2019))

2.3.1 EC-funded Lighthouse Projects tracked by the Smart Cities Information System

GrowSmarter **(January 2015 to December 2019)**

GrowSmarter's goal was to stimulate city uptake of smart solutions by using the three Lighthouse Cities Stockholm (Sweden), Cologne (Germany) and Barcelona (Spain) as a way to showcase 12 Smart City solutions: from advanced information and communication technology and better-connected urban mobility, to incorporating renewable energy sources directly into the city's supply network. This provided other cities with valuable insights on how they work in practice and opportunities for replication. The 12 Smart City solutions were split into three areas of action: low energy districts, integrated infrastructures and sustainable urban mobility.

REMOURBAN **(January 2015 to December 2019)**

REMOURBAN ultimate goal was to design and validate an urban regeneration model in the cities of Nottingham (United Kingdom), Valladolid (Spain) and Tepebasi/Eskisehir (Turkey), while maximizing its replication potential in two Fellow Cities, Seraing (Belgium) and Miskolc (Hungary). The model leveraged the convergence between energy, mobility and ICT to improve quality of life, ensure social acceptance and empower citizens. REMOURBAN tested a range of technical innovations and solutions as well as new business models for city renovation and strategies addressing non-technical barriers.

Triangulum **(February 2015 to January 2020)**

The three-point project Triangulum was set to demonstrate, disseminate and replicate solutions and frameworks for Europe's future Smart Cities. The Lighthouse Cities Manchester (United Kingdom), Eindhoven (the Netherlands)

and Stavanger (Norway) served as a testbed for innovative projects focusing on sustainable mobility, energy, ICT and business opportunities. The project consortium combined interdisciplinary experience and expertise of 22 partners from industry, research and municipalities who shared the same objective and commitment to develop and implement smart solutions in order to replicate them in the three Fellow Cities Leipzig (Germany), Prague (Czech Republic) and Sabadell (Spain).

REPLICATE (February 2016 to January 2021)

REPLICATE will generate Smart City business models, and tailor-made solutions in the areas of energy, transport and ICT. There are pilot actions in energy efficiency, efficient and sustainable transport and integrated infrastructures. The key to the project's approach is in recognising the inherent complexity of urban challenges and the distinctiveness of individual cities. San Sebastián (Spain), Florence (Italy) and Bristol (United Kingdom) as Lighthouse Cities, and Essen (Germany), Lausanne (Switzerland) and Nilüfer (Turkey) as the Fellow Cities, reflect different geographical contexts and offer a good distribution of population between 180,000 to 550,000 around this highly representative range.

SHARINGCITIES (January 2016 to December 2020)

The demonstration districts in Lighthouse Cities Lisbon (Portugal), London (United Kingdom) and Milan (Italy) are implementing replicable urban digital solutions and collaboration models. The Royal Borough of Greenwich in London, Porta Romana/Vettabbia in Milan and downtown Lisbon are retrofitting buildings, introducing shared electric mobility services, and installing energy management systems, smart lamp posts and an urban sharing platform through engaging with citizens. Fellow cities Bordeaux (France), Burgas (Bulgaria) and Warsaw (Poland) are co-developing, validating, and implementing these solutions and models.

SmartEnCity (February 2016 to July 2021)

SmartEnCity's vision is to create Smart Zero Carbon Cities that are more sustainable and inclusive, improve citizens' quality of life, create jobs and wealth, and offer equal growth opportunities. SmartEnCity aims to develop a systemic approach for transforming European cities into sustainable, smart and resource-efficient urban environments in Europe in order to reduce energy demand and maximise renewable energy supply. The SmartEnCity concept have been defined, planned and implemented in the three Lighthouse demonstrators Vitoria-Gasteiz (Spain), Tartu (Estonia) and Sonderborg (Denmark), and will be then replicated in the two Fellow Cities of Lecce (Italy) and Asenovgrad (Bulgaria).

[SMARTER TOGETHER](#) **(February 2016 to January 2021)**

The Lighthouse cities Vienna (Austria), Munich (Germany) and Lyon (France), the Fellow Cities Santiago de Compostela (Spain), Sofia (Bulgaria) and Venice (Italy), the observer cities Kiev (Ukraine) and Yokohama (Japan) come together to improve citizens' quality of life. SMARTER TOGETHER is preparing the ground for large-scale replication and ensuring an in-depth knowledge transfer about setting up of Smart City business models and user-centric innovation in order to contribute to positive societal dynamics. Through concrete and co-created replicable integrated smart solutions: living labs for citizen engagement, district heating and renewable energies for low energy district, holistic refurbishment for low energy districts, Smart Data management platform and smart services and E-mobility solutions.

[mySMARTLife](#) **(February 2016 to November 2021)**

The Lighthouse Cities Nantes (France), Hamburg (Germany) and Helsinki (Finland) and three Fellow Cities Bydgoszcz (Poland), Rijeka (Croatia) and Palencia (Spain) come together to combine ICT, e-mobility and energy solutions to create sustainable urban space. mySMARTLife is aimed at supporting EU cities in their transition into more sustainable places. The main instrument will be the definition of the Advanced Urban Planning, consisting of an integrated approach of the planned city interventions on the basis of a rigorous impact assessment, an active citizen engagement in the decision-making process and a structured business approach, from the city business model perspective, to the economic framework for big companies and local SMEs and Start-Ups.

[IRIS](#) **(October 2017 to September 2022)**

IRIS is a collective of seven cities working to make urban environments better places for citizens and the planet. To help cities in Europe and worldwide make a successful transition to more sustainable, healthy and inclusive urban environments, IRIS has identified five key challenges and a pallet of 16 tangible solutions to meet them. The project's five transition tracks are: renewables and energy positive districts, flexible energy management and storage, intelligent mobility solutions, digital transformation and services and citizen engagement and co-creation.
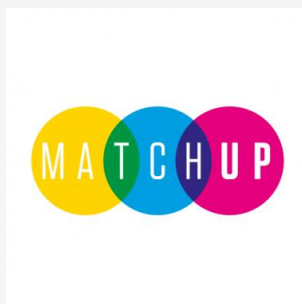
[MAtchUP](#) **(October 2017 to September 2022)**

MAtchUP will deploy large scale demonstration projects in three Lighthouse Cities, Valencia (Spain), Dresden (Germany) and Antalya (Turkey), and support the development of replication and upscaling plans in four Fellow Cities, Ostend (Belgium), Herzliya (Israel), Skopje (North Macedonia) and Kerava (Finland). MAtchUP aims at transforming cities through innovative solutions and technologies. Based on a citizen-centric approach, MAtchUP solutions in the energy, mobility and ICT fields will boost local economies and their quality of

life. Furthermore, they will serve as a model for replication in other cities and will lead to an urban transformation driven by citizens and stakeholders.

STARDUST (October 2017 to September 2022)

STARDUST aims at transforming carbon supplied cities into smart, highly efficient and citizen-oriented cities by developing an integrated approach that will be replicated across the EU. It combines a set of technical green solutions in the energy, mobility and ICT sectors and a series of non-technical solutions grounded on active stakeholder participation including citizen engagement and innovative business models. These actions will be first implemented in all three Lighthouse Cities Pamplona (Spain), Tampere (Finland) and Trento (Italy). The plan will then be replicated and tailored accordingly among the four Fellow Cities Cluj-Napoca (Romania), Derry (United Kingdom), Kozani (Greece), Litoměřice (Czech Republic).

MAKING-CITY (December 2018 to November 2023)

MAKING-CITY is a large-scale demonstration project aiming at the development of new integrated strategies to address the urban energy system transformation towards low carbon cities, with the positive energy district (PED) approach as the core of the urban energy transition pathway. The project will be intensively focused on achieving evidences about the actual potential of the PED concept, as foundation of a high-efficient and sustainable route to progress beyond the current urban transformation roadmaps.

+CityxChange (November 2018 to October 2023)

The +CityxChange vision is to enable the co-creation of the future we want to live in. This will include the development of a framework and supporting tools to enable a common energy market supported by a connected community. This will lead to recommendations for new policy intervention, market (de)regulation and business models that will deliver positive energy communities integrating e-Mobility as a Service (eMaaS). The approach has been developed to enable citizens to invest in their own buildings, which will ultimately contribute to the creation of the Positive Energy Blocks and provide them with the incentives (social, economic, legal and technical) to do so.

ATELIER (November 2019 to October 2024)

ATELIER is a project about citizen driven Smart Cities, aiming to create and replicate Positive Energy Districts (PEDs) within the Lighthouse Cities of Amsterdam (the Netherlands) and Bilbao (Spain) and the Fellow Cities of Bratislava (Slovakia), Budapest (Hungary), Copenhagen (Denmark), Krakow (Poland), Matosinhos (Portugal), and Riga (Latvia). ATELIER will showcase innovative solutions that integrate buildings with smart mobility and technologies to create rather than consume energy Overall, ATELIER will thus

generate an energy surplus of 1340 MWh of primary energy and save 1,7 kt of CO2 and 23 t of NOx-emissions. Citizens will be involved in the Innovation Ateliers to create a maximum impact for the PEDs.

POCITYF (October 2019 to September 2024)

POCITYF is a project delivering Positive Energy Districts (PED) in mixed urban settings and heritage cities.

SPARCS (October 2019 to September 2024)

SPARCS demonstrates and validates technically and socioeconomically viable and replicable, innovative solutions for rolling out smart, integrated positive energy systems for the transition to a citizen centred zero carbon & resource efficient economy.

2.3.2 Other EC-funded projects tracked by the Smart Cities Information System

There are several other Smart City projects funded by the EC that are not part of the SCC01 initiative. For a detailed list see ANNEX I. LIST OF EC-FUNDED PROJECTS TRACKED BY THE SMART CITIES INFORMATION SYSTEM.

3. RUGGEDISED contribution to the SCC01 initiative

Beyond the active involvement of several project partners in the Board of Coordinators and in the different Task Groups, RUGGEDISED also contributes to the SCC01 initiative by supporting several platforms (see section 3.1 below) and by attending and organising a number of events in cooperation with other projects and programmes.

As responsible for the different tasks of WP8, three partners are mainly involved in the coordination of specific activities, in particular:

- **Rotterdam** – is responsible for sharing information on all the platforms with RUGGEDISED partners and for taking decision on the multitouch Screen (see below);
- **ICLEI** – takes care of updating contents and monitoring actions under SCIS public section, monitoring dissemination and communication task group in SCIS private section and make best use of the multitouch Screen;
- **ISINNOVA** – ensures the involvement of the Fellow Cities in platforms and events where relevant and is in charge of coordinating and collecting shared information about RUGGEDISED on the platforms.

3.1   RUGGEDISED contribution to the platforms

Several initiatives are carried out in parallel and in support of SCC01. Some of them rely on different platforms in which RUGGEDISED - as well as the other Lighthouse projects - has been involved to a different extent, as appropriate. Some of the initiatives here described took part, even as organisers, in some of the events reported in the next paragraph.

European Innovation Partnership on Smart Cities and Communities (EIP-SCC)[14]
The European Innovation Partnership on Smart Cities and Communities (EIP-SCC) is a major market-changing undertaking supported by the European Commission bringing together cities, industries, SMEs, investors, researchers and other smart city actors.

The EIP-SCC is structured in six Action Clusters, which are assemblies of partners committing to work on specific issues related to smart cities[15], by sharing the knowledge and expertise with their peers, giving added-value to their national and local experience and identifying gaps that need to be fulfilled at European level. The work of the each Action Clusters is collected under thematic Initiatives that pool the work of the various partners around a particular objective, promoting learning beyond project and geographic borders, and opening the results to the world at large. Links with EU-funded projects allow results to be consumed by the thousands of people active on the EIP-SCC Marketplace network, that is another undertaking promoted by EIP-SCC.

The EIP-SCC Marketplace looks to establish strategic partnerships between industry, research and European cities to develop the urban systems and infrastructures of tomorrow. This network is made up of investors and facilitators who are actively looking for smart city projects and advise any city or project developer to join their Matchmakings seeking to Explore-Shape-Deal on Smart City Solutions. The aim of the EIP-SCC Marketplace is to advance the market for smart and sustainable city solutions while ensuring a mutual level playing field for all smart city stakeholders within the European regulatory framework, the latter also comprising rules on economic competition. The EIP-SCC Marketplace operates in an impartial and transparent fashion[16]. Several Matchmaking events are organised and sponsored by Marketplace, aimed at creating active collaborations between those who have a smart city project to be carried out and the entities able to provide them with the necessary funding. Therefore, cities, companies, public

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[14] Since October 2020, SCIS-EIP became Smart Cities Marketplace. This deliverable reports on events and initiatives until summer 2020, this is the reason why it is mentioned with the old name in the whole document: EIP-SCC

[15] The six Action Clusters are: Citizen Focus; Business Model & Finance; Integrated Infrastructure and Processes; Integrated Planning, Policy & Regulations; Sustainable Districts and Built Environment; Sustainable Urban Mobility.

[16] https://eu-smartcities.eu/sites/eu-smartcities.eu/files/2020-07/Smart%20Cities%20Marketplace%20Charter%20-%20FINAL%20-%202020-07-01.pdf

bodies and key players operating in the field energy efficiency, smart mobility and energy-driven redevelopment of the urban fabric are all involved in this initiative.

> Muriël Pels, Advisor from the City of Utrecht involved in the IRIS Project, and Task Group leader for the Lighthouse projects in their joint efforts to increase Replication of smart solutions, sees many benefits in increasing cooperation[17]:
>
> *"We welcome the EIP-SCC's focus on shaping the right preconditions for replication by linking the Action Clusters addressing barriers with the Lighthouse projects' work to replicate. A stronger link between the financial aspects of the Marketplace with the practical demonstrations done in the projects creates a powerful offer for any city looking to become smarter".*

The Urbis Smart City Fair 2020 in Brno (Czechia) was scheduled to be the scene not only of the EIP-SCC General Assembly, Action Cluster meetings and a Smart Cities Matchmaking event, but also of a joint meeting of all Lighthouse projects. In this way, all major players in the European Smart Cities and Communities field were present to share their experiences. Because of travel restrictions due to COVID-19 pandemic, the whole event included both physical and online sessions so as to allow everyone to actively participate to the different discussions. High level speakers, coming also from the different Lighthouse projects, put a spotlight on the challenges and opportunities facing cities following the COVID-19 experience, discussing European efforts to deliver a sustainable urban transition and continuing a dialogue on the upscaling and replication of Smart City solutions. There were also interactive sessions to support cities and projects working to boost their Smart City implementation, focusing on issues such as citizen engagement, business models, financing, the role of smart energy systems and more. **RUGGEDISED** was jointly involved in the organization of the Brno Smart City Fair 2020 and of the EIP-SCC General Assembly and participated in several workshops introducing its replication approach and experiences and sharing the lessons learned.

In 2019, the EIP-SCC launched the **Smart City Guidance Package (SCGP)** to help towns and cities move towards a sustainable future. The SCGP aims at providing public authorities of cities and communities, as well as non-governmental actors, with the necessary support for planning and managing smart city projects[18]. This "toolbox" is the fruit of many European projects, including **RUGGEDISED**. Indeed, ISINNOVA and the Fellow Cities of Brno and Parma have been involved as testbeds for the SCGP. Besides the testbeds, the SCGP includes also examples of several RUGGEDISED practices from Rotterdam and Brno.

<div align="center">

Box 2: Brno and Parma as testbeds for he SCGP
</div>

> ***RUGGEDISED: Testbed Brno Parma for Smart City Guidance Package (See details in the next chapters and in ANNEX II. LIST OF EVENTS)***
>
> Between November 2018 and February 2019, five testbed workshops were organised in fellow cities from SCC01 projects IRIS, SmarterTogether, and RUGGEDISED: Santa Cruz de Tenerife, Sofia, Vaasa, **Brno and Parma**. During these workshops, participants were invited to propose actions the city and its local ecosystem could take during each particular stage of the roadmap. Evaluation rounds at the end of each testbed session provided invaluable material for improving the SCGP in terms of language and terminology, order of topics, density and comprehensibility of information, and so forth.
>
> On 30 January 2019, the City of Brno served as a testbed for the Smart City Guidance Package, which was developed by the Action Cluster Integrated Planning, Policy and Regulations in the European Innovation Partnership on Smart Cities and Communities. Together with the members of Brno City Ecosystem a lot of topics were discussed. The methodology of the Smart City Guidance Package worked well to connect the dots of Sustainable Energy Action Plan, Sustainable Urban Mobility Plan, #Brno2050 and RUGGEDISED project.

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[17] https://eu-smartcities.eu/news/smart-city-projects-strengthen-connections-among-european-initiatives

[18] https://cor.europa.eu/it/events/Pages/smart-city-guidance-package.aspx

The last testbed of the Smart City Guidance Package was conducted in Parma on 8 February 2019. Light sensors, smart traffic lights, and acoustic sensors for analyzing traffic flows are concrete solutions that can be put in practice by the future Italian city. Thanks to this cooperation between the Action Cluster Integrated Planning and Parma's stakeholders, this last testbed helped the city to brainstorm new ideas for increasing its sustainable innovation development by working on two prior actions identified within the Parma-Futuro Smart plan by Parma stakeholders at the same time: the implementation of the Lighthouse replication programs selected by the municipality and the solutions identified by the city innovation plan.

Smart Cities Information System – SCIS

Launched with the support of the European Commission, the Smart Cities Information System (SCIS) is a knowledge platform to exchange data, experience and know-how and to collaborate on the creation of smart cities. SCIS brings together project developers, cities, research institutions, industry, experts and citizens from across Europe and encompasses data, experiences and stories collected from completed, ongoing and future projects. Focusing on energy, mobility & transport and ICT, SCIS showcases solutions in the fields of energy-efficiency in buildings, energy system integration, sustainable energy solutions on district level, smart cities and communities and strategic sustainable urban planning.

Being the overall goal to foster replication, SCIS analyses project results and experiences to:

- o   Establish best practices which will enable project developers and cities to learn and replicate.
- o   Identify barriers and point out lessons learned, with the purpose of finding better solutions for technology implementations and policy development.
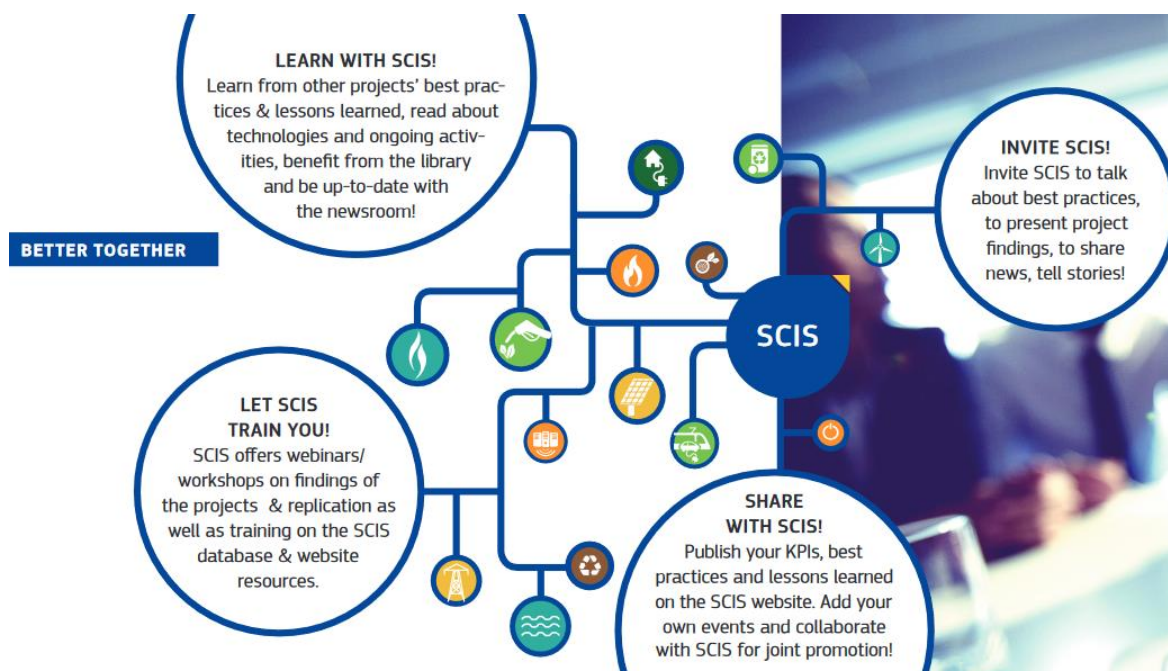- o   Provide recommendations to policy makers and policy actions needed to address market gaps.

Figure 5: SCIS activities[19]

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[19] https://smartcities-infosystem.eu/sites/www.smartcities-infosystem.eu/files/scis_library/2019_scis_broschure.pdf

Moreover, SCIS offers online seminars and workshops on findings of the projects and replication possibilities as well as trainings on the SCIS database and the website's resources. SCIS allows for individual publishing of KPIs, best practices and lessons learned at the SCIS website.

RUGGEDISED plans to establish a tie to SCIS as all SCC01 Lighthouse projects need at the end to feed the generated KPIs within the SCIS Self-Reporting Tool Our plan is to find ways for improving the coordination between the targets of SCIS and our set goals in term of the core list of KPIs, e.g. CO_2-emission reduction per square meter of refurbished areas, CO_2-emission reduction per km of e-mobility. As part of the EIP-SCC General Assembly RUGGEDISED also co-hosted a workshop on replication with SCIS with Brno entitled "From Replicators to Implementers"[20]. RUGGEDISED is also presented on the new website of the Smart Cities Marketplace under the EC.Europa domain.

Replication and Service Platform – BABLE
BABLE is a digital marketplace for Smart Cities. It has been created as service and replication platform under the SCC01 Lighthouse Projects Cooperation Manifesto and has been designed to accelerate and facilitate investments into replication of successful smart city solutions across Europe[21]. Ongoing since June 2017[22], BABLE works as a cloud platform that enables collaboration between companies and cities. Likewise, EIP-SCC, it is a marketplace that connects profiles of cities and companies across all areas of Smart City development.

The main purpose of BABLE is to support the sustainable development of cities in Europe and beyond in order to create liveable, future proof and sustainable cities based on innovation and collaboration. To this end, BABLE has been created to:

- support cities in procuring smart city solutions and planning smart city projects
- provide a platform for companies to sell own products and solutions to smart cities
- help cities and companies to solve urban challenges through innovation

Companies and cities have the possibility to create own profiles on the platform and upload information on their projects, services, challenges and solutions. BABLE is an open platform that is free to use for everyone.

RUGGEDISED is on the BABLE Smart Cities Platform and will upload solutions as they are validated and demonstrated for others to benefit from.

Joint Multitouch Screen
The joint SCC Multitouch Tool is an interactive software for multitouch tables co-developed and co-financed by the SCC01 Smart City Lighthouse projects. The aim of the tool is to jointly showcase and disseminate the knowledge and experience gained through the Lighthouse Projects.

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[20] https://smart-cities-marketplace.ec.europa.eu/news/scis-roadshow-comes-urbis-smart-city-fair-brno

[21] https://www.morgenstadt.de/content/dam/morgenstadt/en/images/solutions/Flyer_BALBE.pdf

[22] BABLE is designed as a Spin-off company of Fraunhofer, Europe's largest organization for applied research.

Figure 6: Demonstration of The Multitouch at the Smart City Expo World Congress in Barcelona (Source: Smart City Expo)

The Multitouch is a useful, interactive tool to display the work done by the EU Horizon 2020 Lighthouse projects at exhibitions and events. The tool contains a comprehensive database of all solutions implemented by the Lighthouse cities. The database of the tool can be updated regularly by all the users through the online platform from Interactive Scape.

Along with other projects, RUGGEDISED contributed to the development and financing of the tool and it has been used at major events, most notable the Smart City Expo World Congress in Barcelona, to highlight the possibilities of the many available Smart City Solutions for any interested outside party, be it cities or private industry. At the time of writing this deliverable, a new secretariat is being established which will lead a process of making the Multitouch tool available for all users online – a development RUGGEDISED has been a key proponent of within in the SCC01 community.

"The Getting Better Connected" approach

During its leadership of the BoC, the City of Rotterdam began reaching out to several other initiatives on behalf of the BoC, most notably the Global Resilient Cities Network and the Open and Agile Smart Cities (OASC). This effort will continue and an initial culmination was a joint webinar looking at the impacts of COVID19 with participation from DG Energy, the City of Rotterdam, Global Resilient Cities Network, OASC and Eurocities.

Figure 7: European network of Smart Cities and Communities (Own source)

Concerning other platforms and initiatives, RUGGEDISED will also publish results on the Horizon Results Platform and RUGGEDISED solutions have already been chosen for the EU's Innovation Radar.

3.2 RUGGEDISED contributions to events

RUGGEDISED has participated in a series of events related to the SCC01 initiative throughout the project's life by means of its partners. The involvement of RUGGEDISED has been made visible by taking the role of contributing to the organization of some of the events. The lists below are not exhaustive but report the most relevant events involving SCC01 Lighthouse projects.

Most important annual events involving SCC01 initiative:
- Barcelona Smart City Expo Congress.
- Brno Urbis Smart City Fair.
- Stavanger Nordic Edge Expo.

Other major international events since 2017:
- October 2017, Budapest, SCIS Conference.
- October 2017, Brussels, General Assembly of the EIP-SCC: "Towards a Joint Investment Programme for Smart Cities".
- January 2018, Brussels, Learning From the Successful - SCC Replication Workshop.
- January 2019, Brno, EIP's Smart City Guidance Package tested in Brno.
- February 2019, Parma, EIP's Smart City Guidance Package tested in Parma.
- May 2019, Brussels, Launch of the Smart City Guidance Package at Committee of the Regions
- May 2019, Brussels, General Assembly of the European Innovation Partnership on Smart Cities and Communities.
- October 2019, Malaysia, APUF-7 | Seventh Asia-Pacific Urban Forum.
- October 2019, Lyon, Smart Cities SCC01.
- November 2019, Rotterdam, RUGGEDISED Congress.
- November 2019, Paris, Data on Board.
- December 2019, Bolzano, 3rd INTERNATIONAL CONFERENCE ON SMART AND SUSTAINABLE PLANNING FOR CITIES AND REGIONS 2019.
- January 2020, Belgium, Connected Smart Cities & Communities 2020.
- February 2020, Brussels, City Representatives meet Investors - Matchmaking Event.

Main and most recent online events (webinars, web conferences etc.)
- May 2020, The Smart City response to COVID-19, EIP-SCC webinar[23].
- June 2020, City Dialogue - Resilient Cities, SCIS web conference[24].
- June 2020, Smart City Deep Dive: Umeå, RUGGEDISED interactive online session[25].
- June 2020, Delivering Smart City Solutions (EIP-SCC webinar).

In the next paragraph, a short description of the above-mentioned events is provided with special attention at the role of RUGGEDISED within each of them.

3.2.1 Most important annual events

Barcelona Smart City Expo World Congress[26] (Every year in November)

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[23] https://eu-smartcities.eu/events/webinar-smart-city-response-covid-19

[24] https://smartcities-infosystem.eu/newsroom/news/register-now-city-dialogue-resilient-cities

[25] https://ruggedised.eu/deepdive/

[26] http://www.smartcityexpo.com/en/home

Smart City Expo World Congress exists in order to empower cities and collectivize urban innovation across the globe. Through promoting social innovation, establishing partnerships and identifying business opportunities, the event is dedicated to creating a better future for cities and their citizens worldwide. As the world's leading event for cities, Smart City Expo World Congress provides a unique meeting point for the whole smart city ecosystem. Corporate leaders, public representatives, entrepreneurs, experts and academics from all around the globe come together to learn from each other, share experiences, talk about best practices, and open new paths for international collaboration.

The event is based around the values of social inclusion, sustainability and empowerment, and is dedicated to promoting awareness, understanding and critical reflection on the smart urban revolution. Every year the organizers run the Towards Zero Waste initiative to reduce waste and increase efficient use of resources across the event. The Towards Inclusivity initiative is intended to ensure the event is accessible and that everyone has a voice, and the Smart City Lab aims to spread and widen the debate on smart cities.

RUGGEDISED
RUGGEDISED was very active at this event and participated to different sessions, in particular:
- November 2017: Alongside the other Lighthouse projects, RUGGEDISED partners joined the common stand sharing the best examples and lessons learnt from the SCC01 community. ICLEI helped facilitate the stand and both Umeå and Rotterdam joined the expo and presented work from the RUGGEDISED project.
- November 2018: the city of Gdansk and other members of RUGGEDISED project were both participants in the Expo exhibition with their own stand (with other City Projects) and participants of Grow Smarter workshops. It was a good opportunity to exchange experiences with other projects. Workshops were a great opportunity to develop and improve our knowledge about smart city solutions. "Learn from each other is the best way to make progress" Joanna Tobolewicz – plenipotentiary of mayor – City of Gdansk.
- November 2019: A large group of RUGGEDISED partners, including ICLEI, Rotterdam, Umeå, Gdansk, Brno, Erasmus University and AIT participated in the expo with the majority joining the joint stand of the SCC01 projects alongside SCIS and the EIP-SCC. Rotterdam, Umeå and Erasmus University also had dedicated workshops based on their work in RUGGEDISED.

Brno URBIS Smart City Fair[27] (Every year in June)
The URBIS Smart City Fair is aimed at sharing the innovative potential of Brno. It is also a place to present technologies, visions and solutions, as well as promote the positive impact these will have on people's lives and those who will make the decisions concerning their implementation. The main goals URBIS Smart City Fair are creating a platform for the exchange of experience and networking and getting a big picture of this set of issues and new trends.

RUGGEDISED
Since June 2019, the city of Brno and RUGGEDISED are involved in the organization of several events held during the fair. In particular
- June 2019: RUGGEDISED organised the Replication workshop "LEARNING FROM THE MOST INNOVATIVE"[28], where other SCC01 projects (Eurocities, Triangulum and SmarterTogether) and external cities were invited to discuss insights on specific smart solutions of energy, e-mobility or ICT. Representatives of Lighthouse projects gave insights into the implementation process as well as into the technical details of their projects. While some round tables were more focused on technical aspects of selected smart solutions, others were devoted to the implementation processes – governance aspects, used business models, public procurement, citizen engagement and data usage.
- September 2020: During the EIP-SCC General Assembly and the URBIS Fair, in collaboration with EIP-SCC and SCIS, RUGGEDISED organised an online and on-site replication workshop with Brno and the Fellow City of Litoměřice from the Stardust Project. RUGGEDSIED (Brno) also joined a group of four Czech Fellow Cities

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[27] https://www.smartcityfair.cz/en/

[28] https://www.smartcityfair.cz/ruggedised/

to share the experience of being in a Horizon Project with participants at the fair. ISINNOVA opened the workshop presenting the Replication Approach adopted in RUGGEDISED project.

Stavanger Nordic Edge Expo[29] (Every year in September)
Nordic Edge is a non-profit organisation owned by private companies working in close cooperation with municipalities and city administrations to promote knowledge exchange and solutions for smarter cities and communities. This important Smart City event in the Nordics gets together many partners from the private sector, public sector, academia and start-up community in order to discuss topics such as Urban Energy, Places and Spaces, Green & Blue Mobility, Active Citizenship & Knowhow, and Smart Health.

RUGGEDISED :
Every year, RUGGEDISED attends the event with one or more project partners, actively involved in different sessions with different roles:
- September 2017: The City of Brno attended the meeting together with other members of the SCC01 initiative. Jaroslav Kacer took part in the debate panel: "What Makes a Good Smart City?" that helped foster the visibility of the project RUGGEDISED among other European partners and Expo attendees.
- September 2018: ISINNOVA, ICLEI and ROTTERDAM joined the event. As leader of Replication activities, ISINNOVA joined the Replication Workshop organised by the project TRIANGULUM as facilitator of a working table on mobility (see report in ANNEX II. LIST OF EVENTS). Rotterdam and ICLEI were also present there and ICLEI played a major role in the preparation of the joint SCC01 attendance.
- September 2019: the SCC01 projects had a joint stand at the Nordic Edge and Rotterdam joined to represent the project.

3.2.2   Other major international events

SCIS Conference[30] (Budapest, October 2017)
This important *conference was aimed to encourage the replication of solutions, good practices and lessons learned among cities and businesses to* drive forward a smart and sustainable vision of Europe.

> According to Usman Haque from Umbrellium – a collective of architects, designers, tactical urbanists and creative technologists based in London – in his keynote at the Empowering smart solutions for better cities conference: "Smart cities are engaged cities". The same engagement goes for events. **2 days. 40 speakers. 150 participants. 150 stories told. 30 successes shared. 15 challenges solved.**

The participation included several SCC01 projects besides RUGGEDISED (GrowSmarter, mySMARTLife, Smarter Together, Replicate, Sharing Cities, Triangulum and Remourban) and experts from the smart city world – technology developers implementing smart solutions across different sectors, urban planners, architects, scientists, city officers, financial experts, strategists, citizen engagers, communication specialists.

Two days were spent in interactive sessions with story-telling on successes and challenges. The participants were in the driver's seat and contributed their ideas, co-created solutions and generated concrete outcomes. 150 people agreed on 13 focus areas and key factors (learning experience, economic benefit, targeted sharing, political will, to adapt, trust, context, interaction, simple, communication, community, engagement, intersectoral cooperation) for successful replication of innovation in each of them. 30 success stories of cities, projects and solutions across Europe were featured in two rounds of parallel sessions[31]. The sessions happened in front of small groups of participants, spread across the room, allowing for in-depth learning, conversations and collaboration. On the panel, deputy

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[29] https://nordicedge.org/expo/

[30] https://smartcities-infosystem.eu/library/scis-coordinators-meetings/2017-scis-conference

[31] https://smartcities-infosystem.eu/newsroom/blog/10-reasons-why-ss4c17-budapest-was-awesome

mayors and city representatives working on smart city and urban planning strategies from Gothenburg, Bilbao, Brno, Warsaw and the host city Budapest discussed what makes a city smart and how to get there.

RUGGEDISED
Brno took part in the panel: "The making of a smart city: what does it entail?" and had the opportunity to promote the city of Brno as one of the leading examples in the Smart Cities development from Central Europe. There were several attendees from RUGGEDISED and some of them were actively involved in the event programme, e.g Rotterdam presented the interoperable 3D Urban Platforms under implementation (find presentation here)

General Assembly of the EIP-SCC: "Towards a Joint Investment Programme for Smart Cities"[32] (Brussels, October 2017)
This General Assembly was held with the purpose of shifting focus towards the scale financing of 'smart-city' solutions through the alignment of the related perspective of cities, industries and investment sectors. Discussions also looked into building on the EC stimulus investment, ongoing activities and making concrete plans for the future in order to increase the extent to which the Marketplace provides an effective matchmaking function - bringing cities, industry, and investors together. The General Assembly played a central role in reinforcing this strategy.

RUGGEDISED
RUGGEDISED, Sharing Cities and Smarter Together were among the 380 attendees to the event with 160 participants from industry, cities, investment communities and 17 themed tables focused to bring some practical initiatives closer to market action. Most table topics were related to the six specific EIP-SCC Action Clusters: Sustainable Urban Mobility (SUM), Sustainable Districts & Built Environment (SD&BE), Integrated Infrastructures & Processes (including Open Data) (II&P), Citizen Focus (C-F), Integrated Planning / Policy & Regulations (IP&P) and Business Models, Finance & Procurement (BM&F).
The City of Brno was actively involved in panel discussion "Seeding the ground for market deployment of SCC solutions" (Jaroslav Kacer, Deputy Mayor of Brno). Moreover, it was a good opportunity for sharing experiences with other SCC01 projects.

Learning from the Successful - SCC Replication Workshop[33] (Brussels, January 2018)
The SCC Replication Workshop held on the 26th of January 2018 at INEA (Innovation and Networks Executive Agency) in the city of Brussels aimed to discuss the topic addressed in the very name of the event. A handful of people from the SCC01 Lighthouse projects and members from the European Commission took part on the event. Different colleagues from several Lighthouse Cities (San Sebastián, Bristol and Florence) and Fellow Cities (Essen, Lausanne and Nilüfer), as well as Oxford representatives from the Replicate project, participated in the workshop. The event included a general presentation of the activities of INEA and its participation and contribution to the H2020 programme, especially in the field of energy, transport and ICT. Then there was a general introduction to the activities of replication presenting also the SCIS platform.

RUGGEDISED
The event's attendees participated in a series of workshops, panels and roundtable discussions led by the Replicate project as well as other SCC01 projects (RUGGEDISED, Triangulum, Growsmarter, Sharingcities, Remourban, mySmartlife, Smartertogether, IRISsmart cities and SMartencity) and platforms (EIP-SCC, SCIS and BABLE). Each of these discussions handled themes of particular interest regarding Low Energy Districts, Integrated Infrastructures and Urban Mobility, from the views of different industrial partners and Lighthouse Cities. Once these discussions were over, key notes were gathered and promptly presented by the moderators during the afternoon, handling topics such as the barriers which have been punctuated in each of these implementations.
ISINNOVA, Rotterdam, Brno, Gdansk and Parma joined the workshop along with 70-80 other participants among which practitioners, industry partners and many research organisations involved in SCC01 projects. The workshop was a good opportunity to network and strengthen cooperation with other similar projects and Fellow cities could

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[32] https://eu-smartcities.eu/sites/default/files/2017-11/EIP-SCC%20GA%202017%20Summary.compressed.pdf

[33] https://replicate-project.eu/event-alert-learning-from-the-successful-scc-replication-workshop/

share their barriers to replicate and implement smart solutions as well as to learn experiences and best practices from other cities

EIP's Smart City Guidance Package tested in Brno[34] (Brno, January 2019)
On 30 January, the City of Brno served as a testbed for the Smart City Guidance Package, which was developed by the Action Cluster Integrated Planning, Policy and Regulations in the European Innovation Partnership on Smart Cities and Communities. The Smart City Guidance Package for Integrated Planning and Management of Smart City projects seeks to provide the necessary support for planning and managing smart city projects by providing examples of good solutions and best practices, pitfalls that can be expected and how to overcome these, e.g. where to find information about financial possibilities and how to engage stakeholders. Interviews with cities and smart city project managers have provided this material. In a couple of steps, cities can use this self-help guide to develop an integrated roadmap in a coherent way going from Vision to Decision, Plan, Do, Check, Act and Replication. Each stage contains checklists of to do's and examples of activities for Brno for these stages.

Together with the members of Brno City Ecosystem a lot of topics were discussed. For instance: What are the steps we can expect when we want to implement the prospective smart city solutions Brno desires in future? Who should be involved in which role? What do we need to do as a city and what with our stakeholders? How can we overcome barriers such as silos?

The first part of the workshop focused on concretization of Brno City's vision and strategy #brno2050 with smart approaches and solutions. The second part focused on to do's for the stages Plan-Do-Check-Act-Replicate, having the future smart district Špitálka in mind as a showcase for other developing districts in Brno. The methodology of the Smart City Guidance Package worked well to connect the dots of Sustainable Energy Action Plan, Sustainable Urban Mobility Plan, #Brno2050 and RUGGEDISED project, although ideally this process takes more time than a one-day workshop.

EIP's Smart City Guidance Package tested in Parma[35] (Parma, February 2019)
The last testbed of the Smart City Guidance Package was conducted in Parma. As a fellow member of the H2020 Ruggedised project, the municipality of Parma was prepared to be the fifth city to do the testbed of the Smart City Guidance Package. Light sensors, smart traffic lights, and acoustic sensors for analyzing traffic flows were concrete solutions put in practice by the Italian city of Parma. "'The methodology tested today within the Smart cities Guidance Package seems an effective tool to innovate the city and get more in touch with stakeholders and citizens, we are happy to have received the feedback from the guidelines that the process launched through PARMA FUTURO SMART is on track and going in the right direction," claimed the Deputy Mayor for sustainability policies Tiziana Benassi during the follow-up debate at the end of the workshop.

The methodology development for the Smart City Guidance Package, led by the initiative leader Judith Borsboom-van Beurden, then senior researcher at Norwegian University of Science and Technology, seeks to provide a managing and planning tool to fellow cities, based on lessons learned from many Lighthouse projects. During the workshop, participants were divided into groups and concretised different topics such as how to create mobility as a service platform and how to put in place smart solutions for a consistent reduction of the number of cars in the city centre. Furthermore, the partnership between industry, research and city of Parma was investigated in the second group, moderated by the energy manager Enzo Bertolotti. Around 20 participants took part in the workshop, including representatives from the private sector, city administration, utilities and the regional government.

Thanks to the cooperation between the Action Cluster Integrated Planning and Parma's stakeholders, this last testbed helped the city to brainstorm new ideas for increasing its sustainable innovation development by working on two prior actions identified within the Parma-Futuro Smart plan by Parma stakeholders at the same time: the implementation of the Lighthouse replication programs selected by the municipality and the solutions identified by

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[34] https://ruggedised.eu/news-events/news/?c=search&uid=6iAtFaoV

[35]   https://cordis.europa.eu/article/id/124816-eip-smart-cities-integrated-planning-policy-and-regulation-action-clustersmart-cities-guidanc

the city innovation plan. During the Smart City Guidance Package testbed on 8 February, a preliminary plan for implementing the vision of the city was drafted, next to related actions to put it in practice (how to move from PLAN to DO phase).

Launch of the Smart City Guidance Package at Committee of the Regions[36] (Brussels, 9 May 2019)
During the event launched by the European Committee of the Regions, the European Innovation Partnership on Smart Cities and Communities launched the 'Smart City Guidance Package' (SCGP) where the key elements of the sustainable city of the future are identified: Energy efficiency and strategic collaboration with local partners, supported by ICT tools to improve the quality of life of European citizens, having a long-term perspective on the built environment in mind.

RUGGEDISED
During this event, Albert Engels, Enzo Bertolotti and Jiri Marek presented RUGGEDISED and participated in a panel discussion led by Simon Costa, Action Cluster Chair for Integrated Planning, Policies and Regulation.

General Assembly of the European Innovation Partnership on Smart Cities and Communities[37] (Brussels, May 2019)
The 2019 General Assembly was held on the 16-17 May in Brussels organized by EIP-SCC and continued the focus on moving to scale adoption of smart city solutions – towards the target of at least € 1 billion and involving 300 cities by the end of 2019. The 2019 General Assembly brought the EIP-SCC community together, with the EU's Horizon 2020 'Lighthouse' (SCC01) programmes, and other relevant EU-funded smart city initiatives. The event continued the progressive support to the "Explore, Shape, Deal" discussions that were introduced in 2018, to help building a pipeline of bankable smart city solutions.
In this context, it featured panel discussions of Cities, Investors, and Industry, to reflect on the suggested 21-point action plan in the "Towards a Joint Investment Programme for EU Smart Cities" white paper, which seeks to support the above-mentioned market uptake. In addition, the event also helped participants familiarise with the very likely City Mission under the forthcoming next EU Framework Programme: Horizon Europe. The EIP-SCC and its partnering initiatives are very well placed to support the achievement of that mission and stakeholders were invited to familiarise with the idea, as firstly expressed in the "*Mazzucato Report*"[38].

RUGGEDISED
On the first day of the meeting, Councillor for Spatial Planning and Development of the City of Brno, RNDr. Filip Chvatal, PhD. had a speech in the panel discussion "*Cities Market Perspectives*". The two-day meeting was a great opportunity to promote and invite participants to the URBIS SMART CITY FAIR 2019 and replication workshop, where particular smart solutions of the partner cities from the RUGGEDISED project were presented.

APUF-7 | Seventh Asia-Pacific Urban Forum[39] (Malaysia, October 2019)
The Seventh Asia-Pacific Urban Forum (APUF-7) was held from 15-17 October 2019 in Penang, Malaysia, to mobilize partners from across the region to focus on accelerating implementation to achieve a sustainable future for cities throughout Asia and the Pacific. Held every 4-5 years since the first APUF was held in Bangkok in 1993, the Forum is the largest regional gathering of urban stakeholders, engaging policymakers from local and national governments, financial institutions, civil society, the academia, the urban training-research community, and private sector to discuss innovative solutions, identify common actions and objectives and strengthen effective partnerships to achieve sustainable urban development.

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[36] https://cordis.europa.eu/article/id/125239-the-smart-city-guidance-package-the-way-forward
[37] https://na.eventscloud.com/ehome/ga2019
[38] https://ec.europa.eu/info/sites/info/files/mazzucato_report_2018.pdf
[39] https://www.apuf7.org/

RUGGEDISED
ICLEI presented RUGGEDISED and the SCC01 to an international audience highlighting the joint European efforts to create sustainable and Smart Cities.

Smart Cities SCC01[40] (Lyon, October 2019)
This event gathered partners involved in the Smart Cities & Communities network (Lighthouse Cities, Fellow Cities, industry, academics and research institutes, associations, consultants), representatives of financial institutions (public and private), members of the Club Cities (led by Energy Cities), many other stakeholders involved in smart city projects. Thus, the whole SCC01 network was invited to a maker event that became a connecting thread. Particularly, the makers' session of the first day was organized around topics and was used as a design thinking methodology.

RUGGEDISED
Rotterdam took part in the event and helped disseminate RUGGEDISED. Moreover, the coordinator Albert Engels, also attended the BoC on the last day of the event, where the agenda for 2020 was discussed and determined. At the same time, this BoC was meant to choose a new chair. RUGGEDISED volunteered to be the new chair there, which was unanimously accepted. The intention was to link the SCC network better with other existing networks. The motto of 2020 would therefore be "getting better connected".

RUGGEDISED Congress[41] (Rotterdam, November 2019)
Participants from all six RUGGEDISED cities met in Rotterdam - at the event centre Ahoy - to discuss how cities best transform into smart cities. In collaboration with companies and research centres, the RUGGEDISED cities showed how ICT, e-mobility and energy solutions can be combined to design smart, resilient cities for everyone. One outcome of the congress was that the human factor is the key factor for the success of a smart city.

> CEO of Rotterdam Ahoy Jolanda Jansen said [42]:
> > *"RUGGEDISED is not only a very innovative way of working together, it also makes a substantial contribution to sustainability. Moreover, it has turned out to be an accelerator in raising awareness about sustainability in general".*

Jacqueline Cramer (University of Utrecht) led a panel discussion with Jolanda Jansen (Rotterdam Ahoy), Jasper Feuth (Eneco), Haydee Sheombar (Erasmus University), Rutger Borst (KPN), Albert Engels (municipality of Rotterdam and Project Coordinator in RUGGEDISED), Maarten Kokshoorn (Hart van Zuid) and Maxine Tillij (TNO). The participants in the discussion agreed that the RUGGEDISED method of making cities more sustainable requires courage and leadership.

Data on Board[43] (Paris, November 2019)
Data on Board was the first summit 100% dedicated to the power of data sharing. Several organizations that drive the digital transformation in France and across the world participated in industry expert presentations, demos, and networking opportunities that captured the full power of data sharing. The summit was also a place to share experiences among entrepreneurs, analysts, data producers, data publishers and data reusers.

RUGGEDISED
Umeå Municipality took part in the panel discussion "The present and future of open data: lessons learned from cities and governments around the world".

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[40]   http://www.sharingcities.eu/sharingcities/news/Smart-Cities-Communities-Lighthouse-network-event-WSWE-BFVDT7

[41]   https://ruggedised.eu/news-events/news/?c=search&uid=vTmbTLX2

[42]   https://www.ruggedised-event.com/files/files/2019/ruggedised_en.pdf

[43]   https://www.opendatasoft.com/data-on-board-2019

3rd INTERNATIONAL CONFERENCE ON SMART AND SUSTAINABLE PLANNING FOR CITIES AND REGIONS 2019[44] (Bolzano/Bozen, December 2019)

This conference was a high-level international communication platform for academics, researchers, professionals, and decision-makers gathering 200 participants from more than 20 countries. Smart and Sustainable Planning for Cities and Regions 2019 (SSPCR 2019) offered a place to turn research into practice and visionary approaches into (planning) policies and tools for local authorities and decision-makers in urban and regional contexts. SSPCR 2019 explored the impact of academic research, the opportunities for scaling-up and replicability of pilot projects, and the added value of local bottom-up initiatives in relation to complex challenges posed by the smart city/region approach.

RUGGEDISED
Parma Municipality participated and contributed with the abstract: "*From Ruggedised to Parma Futuro Smart: how to build the city of the future starting from an EU funded project*".

Connected Smart Cities & Communities 2020[45] (Belgium, January 2020)

This annual conference is organised by the Open & Agile Smart Cities network. A place to share innovation and best practices, CSCC20 connects 500 decision-makers from cities, European institutions, international organisations, research & academia, and businesses. Conference theme Scale With Us reflected global efforts – supported by institutional organisations from the European Commission to the G20 – to scale up urban digital solutions for better quality of life in our cities and communities.

RUGGEDISED
Erasmus University participated on behalf of the City of Rotterdam and the RUGGEDISED project.

City Representatives meet Investors - Matchmaking Event[46] (Brussels, February 2020)

ICLEI Europe joined the Smart Cities matchmaking event 'City representatives meet investors' hosted by the Marketplace of the European Innovation Platform on Smart Cities and Communities (EIP-SCC). Rotterdam and Brno were also at the event to explore the possibility of expanding on their successful Smart City Projects and build synergies with other projects. Meetings were also held throughout the day with investors or possible service providers.

RUGGEDISED
It was a great opportunity to foster the visibility of the project RUGGEDISED among other European partners and to promote and invite participants to the URBIS SMART CITY FAIR 2020, where particular smart solutions of the partner cities from the RUGGEDISED project was presented in September.

For a detailed list of events see ANNEX II. LIST OF EVENTS **and visit** *https://ruggedised.eu/news-events/events/*.

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[44] https://publik.tuwien.ac.at/files/publik_284797.pdf

[45] https://oasc.events.idloom.com/connected-smart-cities-conference-2020

[46] https://iclei-europe.org/news/?c=search&uid=cOnTSL2X

3.2.3 Main and most recent online events

The Smart City response to COVID-19 (May 2020)
European Smart Cities are tackling the COVID-19 pandemic using solutions, tools and lessons from earlier efforts to become more resilient. If short term impacts are already visible, how can smart tech innovation help cities overcome new challenges and address the needs of their citizens over the long run? This EIP-SCC webinar dealt with all these questions. The status of the European Smart Cities and Communities in relation to COVID-19 and how will it influence the future and what actions are taken on a European level were presented by the European Commission.

RUGGEDISED
Together with Matchup and Sharing Cities, RUGGEDISED participated in the debates about global data-sharing platforms to develop a policy framework for smart management of public health emergencies in cities and to channel and organize social energy and civic resilience to the COVID-19 pandemic by providing a civil society response complementary to that of government and essential public services.

City Dialogue - Resilient Cities (June 2020)
'Resilient' and 'smart cities' are inextricably linked, now more than ever. Resilient cities are smarter cities, and smart solutions must be resilient. However, the two have not always come naturally together, at least not with the urgency that is needed. Collaboration between existing smart cities and resilience networks are key in this new (digital) time. This SCIS web conference in the form of a city dialogue explored how these two key elements can come together successfully, to ensure smart, resilient cities of the future.

RUGGEDISED
Albert Engels representing RUGGEDISED on behalf of the Smart Cities and Communities Lighthouse projects was one of the speakers.

Smart City Deep Dive: Umeå (June 2020)
Through the Digital Deep Dive interactive online session, the City of Umeå, Lighthouse city of RUGGEDISED, showcased the smart city solutions being developed there. Umeå partners lifted the lid on their key developments: city's integrated approach to combining their technical solutions and their smart building concept. This includes the use of smart control equipment to control airflow, room climate and presence-activated lighting[47].

A wide range of sensor-data, time-scheduling components and weather station data are aggregated in their Demand Side Management system. This allows the data to shape a more detailed understanding and improved management of energy needs and usage.

Smart city projects IRIS and Sharing Cities as well as a few special guests were also attending to provide perspectives and input from across Europe.

RUGGEDISED
During the Digital Deep Dive two Umeå solutions were presented (Intelligent Control Systems and Demand Side Management) and how they fit in with the wider smart city work in the city. Coordinator Albert Engels of Rotterdam and Carina Aschan, RUGGEDISED project leader in Umeå, were among the organizers.

Delivering Smart City Solutions (EIP-SCC webinar) (June 2020)
Rotterdam joined two different EIP-SCC events to share their innovative work on Data platforms. They joined these sessions alongside other projects of the SCC01's as a chance to urge and motivate other cities to benefit from their experiences. Roland van der Heijden, program manager 'Digital City' of Rotterdam, presented an universal approach on how to develop, procure & deploy IoT in Rotterdam to support other cities in their #Explore or #Shape phase of the Matchmaking of the EIP-SCC Marketplace.

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[47] https://ruggedised.eu/deepdive/

4. Conclusions and next steps

This report shows how, through RUGGEDISED project's life, there has been regular interactions with other **SCC01** projects and cities, as well as cooperation with several European networks such as **EIP-SCC** and **SCIS** (since October 2020 merged in Smart Cities Marketplace). The adoption of this approach and of a proper management structure have led to a **cross-project collaboration framework** aimed at working together to enhance the impacts and benefits achievable through the different projects. These collaborations have been very fruitful and there is the will to follow along this path and to increase the level of **synergies** whenever possible**.**

> Albert Engels, Senior Process Manager in the City of Rotterdam and Coordinator of the RUGGEDISED Project:
> *"Being part of the SCC-community gives an extra dimension in everybody's work. Even more than demonstrating technological innovations, it is about building partnerships that must prove themselves against traditional approaches within both public and private organizations The uniqueness lies mainly in the integrated approach and confirms that the urban challenges are far too complex to do it all. Based on my own experience, I can heartily recommend it to everyone to join this SCC01 community. It's worth it."*

Knowledge sharing and **capacity building** are the focal points of this collaboration. Indeed, since all SCC01 projects are conducting similar programmes using similar technologies in similar environments, they have learnt from each other and built on that learning – moving forward and building capacity to enable **replication** in similar urban environments. In this regard, **dissemination** and **workshops** have proved to be very useful instruments to share knowledge.

Cross-Project Collaboration

> Esben Pejstrup Chair of TG Communications and Communication Leader of RUGGEDISED:
> *"The knowledge generated by the Lighthouse programme is immense and there is no shortness of expertise or smart solutions making cities greener and better. What's needed is for all those solutions and all that knowledge to support the upscaling of Smart City solutions in a coherent and easy-to-use fashion. Combined, the SCC01 cooperation has come a long way in doing so and the Smart Cities and Communities will only strengthen in the future".*

Several tangible results have emerged from the realization of numerous common activities. A **Lighthouse brand** has been established which is leading to a successful **engagement** of the demand side, supply side and investors through engagement activity and the marketplace. The Lighthouse approach of replication has been developed and there is strong collaboration amongst the community with learning and information being exchanged through the selected platforms. Collaboration has also had an impact on **policy** at an **EU, national and city level** while reinforcing cities and citizens as key enablers for triggering the market between SCC01 projects, EC, EIP, SCIS and at a national level.

A central point of the working methodology is the very existence of the Task Groups, where RUGGEDISED project is involved and responsible at different levels for **harmonising processes**, keeping **synergies** and carrying out **continuous cooperation** by channelling to the members of the consortium all the **relevant information** on other

Task Groups

projects **results**, **inspiring** approaches and tools, workshops, **seminars**, conferences, fairs, etc....

A **bidirectional flow** is ensured and also RUGGEDISED results, events and news are shared and transferred to the Task Groups during the monthly conference calls in order to nourish this climate of cooperation, create **opportunities** for further collaboration and disseminate the results and experiences of RUGGEDISED Europe-wide.

With all that in mind, the following aspects are to be considered for the near **future** and have been already addressed to the EC by the Board of Coordinators as main recommendations for Horizon Europe[48]:

- keep ongoing with future SCC01 collaborations
- getting better and explicit connections with EIP-SCC (since October 2020 Smart Cities Marketplace) and other adjoining initiatives
- own, promote and exploit the outputs of the Task Groups
- ensure cooperation on knowledge transfer through cross-project working
- support EIP-SCC: analysis of the influence of local conditions and contexts on the applicability 'Smart City Guidance Package'
- Appoint experts from cities that share similar contexts/solutions to design a common portfolio in order to improve resilience put specific attention to the importance of additional upscaling of successful Smart Cities projects
- consider the added value of content related 'deep dives'
- monitor the impacts and effectiveness of the cooperation activities and improve the working mechanisms when needed

At the same time and to complete the picture, it was found that one of the most critical points arisen from this experience is the need for a more **organised cooperation** with the aim to avoid to schedule too many meetings or interactions, that are not always necessary, in order to make sure that resources in the projects are used in the most **efficient** way, benefitting everyone. Cooperating with others in such a way means that the best of the RUGGEDISED solutions can be shared with a **larger group** of interested people than otherwise possible. Moreover, through good communication practices, it is possible to **involve** any city or professional interested in Smart City work and make it easier to find all the information needed. That means also the need to **promote** and **exploit** the results of cooperation through effective mechanisms and tools, which was one of the main conclusions from the Communications Task Group of the SCC01 Projects, led by RUGGEDISED at the time, for the new Secretariat for the SSC01 Project – SCALE.

Recommendations & Next Steps

> Esben Pejstrup Chair of TG Communications and Communication Leader of RUGGEDISED:
>
> *"With the future Secretariat supporting the projects' cooperation it will be possible to invest even more resources on the capacity building, the media efforts and the innovative ideas that have the potential to reach further outside the Smart City Community and make a larger impact. Hopefully, this new Secretariat will allow the projects to use fewer resources on the formalisation of work and more on the proactive engagement with a wider target audience."*

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[48] Board of coordinators framework (bullet 2.2.1)

ANNEX I. List of EC-funded projects tracked by the Smart Cities Information System

The Smart Cities Information System (SCIS) is a knowledge platform to exchange data, experience and know-how and to collaborate on the creation of smart cities, providing a high quality of life for its citizens in a clean, energy efficient and climate friendly urban environment. SCIS brings together project developers, cities, research institutions, industry, experts and citizens from across Europe. Projects in the scope of SCIS are mostly co-funded by the European Commission, for example, the Horizon 2020 Smart Cities and Communities (SCC01) projects, the 7th Framework Programme projects and the CONCERTO 1, CONCERTO2 and CONCERTO 3 projects.

Act2 aimed to accelerate innovation in renewable energy (RE) solutions and advance energy efficiency (EE) and systems for poly-generation linked together with concepts for eco-buildings. Act2 reflected the motivation of Hannover (Germany) and Nantes (France), the two demonstration communities, and three associated cities – Koszalin (Poland), Malmö (Sweden) and Newcastle upon Tyne (United Kingdom) - to implement an energy policy that matches the scale and urgency of current climate-related issues, building on past experiences - especially the development of the Kronsberg district in Hannover, and inviting stakeholders in their areas to espouse the same proactive policies.

cRRescendo aimed to integrate a major share of sustainability into thousands of homes and their energy infrastructures. This CONCERTO project demonstrated how best to meet citizens' desire to live in comfortable energy-efficient homes in a healthy and clean environment in Almere (the Netherlands), Milton Keynes (United Kingdom), Viladecans (Spain) and Ajaccio (France). At the very heart of the cRRescendo project's objectives was a focus on ways to integrate measures to increase the use of renewable energy sources (RES) with measures for energy efficiency (EE). This aim manifested itself through a number of activities at the community level, which helped contribute to the projects core objectives. Each community participating in the cRRescendo project implemented an integrated strategy towards achieving an increase in the use of renewable energy sources (RES) employing numerous techniques of poly-generation, specific innovation, and technology.

ECOSTILER took a coordinated approach towards achieving energy efficient communities. The common and essential element of the project involved the use of bio-gas and district heating systems. These acted as tools in the reduction of primary fuel consumption and CO_2 emissions in the communities in question. ECOSTILER's approach embraced communities of different sizes, ranging from small to large, from urban to rural, making it a valuable demonstration project in the CONCERTO initiative.

ECO-Life aimed to establish a replicable planning and implementation approach and to demonstrate innovative and integrated energy concepts in supply and demand side in municipalities in Lithuania, Belgium and Denmark to reach the goal of zero CO_2. The local ECO-life projects were integrated in large climate action initiatives in the municipalities. The project used 100% RES. A 'Whole Town Design Approach' was used in all three communities with a focus on achieving goals at affordable costs and on developing new financing tools. The approach included end-user involvement and dissemination.

SESAC was part of the broader CONCERTO initiative and aimed at showing how local economies are able to thrive at the same time as reducing their CO_2 emissions. This was translated into innovative energy measures in both new building development projects and the renovation of existing buildings. These measures focused on heating and cooling from renewables, using available waste heat for heating, using all heat generation for electricity production, and making all new buildings and retrofits energy-optimised. Delft (the Netherlands), Växjö (Sweden) and Grenoble (France) all carried out demonstration projects while Kaunas (Lithuania), Miskolc (Hungary) and Vastseliina (Estonia) gained knowledge and experience through the local energy studies that they performed.

GEOCOM was launched in 2010 with a vision to increase the visibility of direct heat applications of geothermal energy throughout Europe. This 11 million € project, funded under the FP7, demonstrated a wide array of research and demonstration components to provide not only first-hand experience for the communities involved in the project, but also to feed the international scientific community with valuable results related to the currently pressing geothermal matters such as reinjection into sandstone reservoirs and trans-boundary utilisation of geothermal aquifers.

ECO-City aimed to demonstrate innovative integrated supply and demand side energy concepts in three communities in Denmark/Sweden, Spain and Norway: respectively the cross-border community of Helsingør and Helsingborg, and the communities of Tudela and Trondheim.

CLASS1: The Municipality of Egedal (Denmark) decided in 2005 to strengthen the energy requirements for a new settlement called Stenloese South. All the dwellings in in this neighbourhood were to be built with an energy demand corresponding to the Danish low-energy standard referred to as "low-energy class 1" – or lower. This meant that the energy consumption was to be 50% below the Danish BR08 energy regulations. The CLASS 1 project was conceived around this new settlement, adding energy renovation of public buildings, balanced renewable energy supply, R&D activities, training and dissemination.

Concerto AL Piano: The project aimed to implement energy retrofitting at the district level in the Italian city of Alessandria and to mobilise investment in energy conservation in conjunction with building renovation and maintenance. Some of the project's general goals included upgrading the energy standards at the district level, to affect building rehabilitation and reconstruction. In addition, the project strived to allow for a progressive substitution of conventional roofing with newly designed solar roofs and to facilitate the individual fitting of greenhouses when appropriately designed and integrated.

Energy in Minds! was realised over a period of five years in four European communities - Weiz-Gleisdorf (Austria), Falkenberg (Sweden), Zlín (Czech Republic) and Neckarsulm (Germany). The project aimed to reduce the use of fossil energy and CO2 emissions in the building sector by 20 to 30% within a five-year period. To reach this goal a wide range of measures were taken to reduce the energy consumption and increase the use of renewable energy. Energy in Minds! focused on six key actions: making people more energy aware; increasing renewable energy sources; increasing rational use of energy; reducing demand; improving interaction; and dissemination and exploration.

Green Solar Cities offered a policy for cities focusing on a holistic approach, which includes good, energy-efficient construction and buildings installations leading to comfort and a good indoor climate, combined with the use of optimised energy supply systems together with a local contribution from renewable energy sources. Furthermore, Green Solar Cities strategic objectives addressed reducing greenhouse gases and pollution emissions, enhancing competitiveness of the European industry, reducing the environmental impact of associated products and services, improving quality of life and implementing solar cities.

HOLISTIC was based in selected zones in Dundalk, (Ireland), Mödling (Austria) and Neuchâtel (Switzerland), where it aimed to stimulate a paradigm shift in the use of energy within these communities to more sustainable patterns. The project demonstrated how this transformation can be initiated in three typical communities by acting on every aspect of community life - housing, school, hospital, hotel, shops, leisure facilities and industry.

PIME'S: As part of the PIME's project, Salburua in Vitoria (Spain), Dale in Sandnes (Norway) and Szentendre (Hungary) worked together to research, demonstrate and disseminate technologies for the construction of houses that take into account the local climatic conditions, while at the same time reducing the need for heating and cooling. By exchanging experiences, sharing knowledge, developing new technologies to be used in smart and economically-efficient ways, the project aimed to create better living areas for the future. The project was built around some central principles, including the implementation of large scale solar thermal generation with associated heat storage, the application of intelligent energy management through micro-grids and the development of new ESCO models.

POLYCITY dealt with different aspects of urban development: new construction and tr-generation energy supply in Cerdanyola del Vallès at the city edges of Barcelona (Spain); the conversion of an old city quarter in Turin (Italy) with energy distribution based on the heating network and with thermal cooling; and new building constructions on a large former military ground in the town of Ostfildern near Stuttgart (Germany) with biomass heat and electricity supply.

REMINING-LOWEX dealt with the redevelopment of European mining areas into sustainable communities by integrating energy supply and demand, based on low-exergy principles. Heerlen (the Netherlands), Zagorje (Slovenia), Czeladz (Poland) and Cherno More (Bourgas, Bulgaria) demonstrated the use of locally available low-valued renewable energy sources from water in abandoned mines for heating and cooling of buildings, based on low-exergy principles, facilitated by an integrated design of building and energy concepts. The project created two sustainable mining communities (Heerlen and Zagorje) with 50 to 100% CO2 reduction and 60% RES compared with standard national practices. Feasibility studies leading to concrete local sustainable energy plans and implementation were demonstrated in Czeladz, Cherno More, Zagorje and Heerlen.

RENAISSANCE aimed to create sustainable model districts in Lyon (France) and Zaragoza (Spain). The Region of Lombardy (Italy) took part as an observer partner and carried out several research activities on technical, legal and social issues related to wood fuel supply.

SEMS had the intention to promote sustainable and capable energy saving and optimizing projects. The long-term overall objective of the four core communities in Germany, Austria, Luxemburg and Poland is the self-supply of energy from renewable sources. This involved considerably lowering the energy consumption and achieving a renewable energy supply rate of, respectively, 39% to 62% of the remaining end energy in the electricity and heat sector demand within five years. A mix of different energy efficiency and renewable energy sources demonstrations, including refurbishment of old buildings, eco-buildings and polygeneration, all underpinned with complete business plans, were implemented with the aim to reduce end energy from fossil sources.

SERVE implemented a series of actions in the field of sustainable energy with the overarching goal of creating a sustainable energy region in the district of North Tipperary in Ireland. The project actions included energy upgrades for existing dwellings in the region, installation of renewable energy heating systems, construction of an eco-village and the development of a district heating system.

SOLUTION project mobilised public/private resources to build showcases of energy self-sufficient communities in Austria, Croatia, Finland, Switzerland and Slovenia with a strong potential for replication throughout Europe. SOLUTION was designed to respond to the needs of an effective take-off of the European SET-plan by demonstrating novel applications of different energy technologies and techniques integrated in an intelligent way within model areas. Although the individual demonstration projects were independent from each other, being designed to fulfil local energy needs and using local resources, there were many similarities between them.

SORCER was based on energy efficient dwellings with a maximum use of sustainable energy in the communities of Hillerød (Denmark) and Apeldoorn (the Netherlands). As part of the project, Hillerød and Apeldoorn worked on very ambitious developments and their cooperation increased the impact of the demonstration, helping Europe to reduce dependence on energy imports, increase sustainability and stimulate growth and jobs.

STACCATO: With the STACCATO project three European capital districts - Amsterdam-Noord (Amsterdam, the Netherlands), Óbuda (Budapest, Hungary) and Oborishte (Sofia, Bulgaria) - demonstrated sustainable energy concepts in existing representative residential areas. The urban areas all faced technical arrears and a lack of social cohesion. These large-scale demonstration sites, in combination with research and development aimed at innovative and reproducible renovation concepts and approaches, served the purpose to accelerate the transition to a sustainable energy supply in existing housing areas in Western and Eastern Europe.

TetraEner was based on the premise of creating residential communities where external energy dependency is reduced by optimising the supply/demand balance through an improvement in energy efficiency and the use of renewable energy sources, together with demand monitoring and control applications. TETRAENER encompassed two new urban developments in the cities of Donostia/San Sebastián (Spain) and Geneva (Switzerland) and one observer community in Frankfurt (Germany).

BEEM-UP aimed to demonstrate the economic, social and technical feasibility of retrofitting initiatives, drastically reducing energy consumption in existing buildings, and paving the way towards massive market uptake. BEEM-UP involved building owners at three sites in France, Sweden and the Netherlands in implementing an innovative approach, to go beyond a 75% reduction in space heat energy consumption, in addition to reducing total energy consumption. The project demonstrated ambitious energy reduction as the economically most attractive alternative for retrofitting.

BERTIM will develop a prefabricated solution providing the opportunity to renovate buildings, with a view to improving energy performance, air quality, aesthetics, comfort, and property value at the same time, while ensuring low intrusiveness during renovation works. The manufacturing of the solution will be included in a holistic methodology for the renovation project process, from data collecting to installation.

BUILDSMART has the purpose to demonstrate and mainstream cost-effective technologies and methods in the design of buildings with very low energy consumption in different European climates, since energy consumption in buildings varies greatly throughout Europe due to differences in climate, socio-economic factors, building techniques. The project also has a strong focus on energy-related behavioural issues, recognizing the role end-users play on energy use in buildings. All actions implemented were analysed from a systemic perspective, where the whole energy system is included, thereby calculating the primary energy need for different technology choices as well as its life cycle costs.

CELSIUS: To increase energy efficiency in EU, CELSIUS helps cities across Europe to develop secure, affordable and low carbon district heating and cooling solutions that form part of the city's wider energy system. The focus is on maximising the use of waste heat or secondary heat within a city by capturing and using it in the heating system. Participating cities are Gothenburg (Sweden), London (United Kingdom), Rotterdam (the Netherlands), Cologne (Germany) and Genoa (Italy).

CITY-ZEN was a joint project of Amsterdam (the Netherlands), Grenoble (France) and 28 partners that was granted EU-funding to develop and demonstrate energy efficient cities and to build a methodology and tools for cities, industries and citizens to reach the 20-20-20 targets.

CITyFiED aims to develop a replicable, systemic and integrated strategy to adapt European cities and urban ecosystems into the smart city of the future, focusing on reducing the energy demand and GHG emissions and increasing the use of renewable energy sources by developing and implementing innovative technologies and methodologies for building renovation, smart grid and district heating networks and their interfaces with ICTs and Mobility. The project's strategy is based on large scale demonstrations, including three holistic district renovations at Laguna de Duero (Valladolid, Spain), Soma (Turkey) and Lund (Sweden); and the development of better business models to support the strategy for transforming urban areas into Nearly Zero-Energy Districts (NZED);

DIRECTION aimed at demonstrating how the use of very innovative and cost-effective energy efficiency technologies can lead to the achievement of very low energy new buildings. This aim along with the effective adoption of low energy buildings was achieved by switching to a model whereby energy efficiency provides value to the market and represents an attractive asset across the whole of the value chain. Two new buildings were used as pilots - NuOffice in Munich (Germany) and CARTIF III building in Valladolid (Spain) - to deploy a set of innovative measures, constructive elements for energy optimization, high-efficient equipment and advanced energy management.

EE-HIGHRISE had the overall objective of demonstrating and validating new technologies, concepts, and systems used, in order to test and assess the technological and economic feasibility of innovative energy solutions in the high-rise demo buildings in contributing to the EU energy and climate change policy. The Eco Silver House in Ljubljana (Slovenia) was used as a demonstration of the fundamental principles of sustainable development through comprehensive planning of energy efficiency savings, along with renewable energy sources, perfect thermal insulation, wall soundproofing, a high-quality air conditioning system, sun protection, extremely rational air-conditioning appliances, intelligent control and management of electric and mechanical devices, etc.

EU-GUGLE aims to demonstrate the feasibility of nearly-zero energy building renovation models in view of triggering large-scale, Europe-wide replication in smart cities and communities by 2020. To reach this objective, the eight pilot cities will join efforts to combine the latest research results relevant to smart renovation of groups of buildings at district level and use this knowledge to implement a balanced mix of technical, socio-economic and financial solutions adapted to local needs. All aspects of the renovation process will be monitored and evaluated, from the energy performance of the renovated buildings to the financing schemes chosen by the municipalities.

E2REBUILD investigated, promoted, and demonstrated cost-effective and advanced energy-efficient retrofit strategies that create added value for existing residential buildings and endorse end-users to stay and build a dynamic society. The vision of E2ReBuild was to transform the retrofitting construction sector into an innovative, high-tech, energy efficient industrialized sector by implementing research and developing new retrofitting solutions regarding planning, design, technology, construction and operation and use of buildings. The E2ReBuild was realized at seven demonstration sites in Finland, Sweden, the Netherlands, France, Germany and the United Kingdom.

InSMART brought together cities and scientific and industrial organisations in order to implement a comprehensive model addressing a city's current and future energy needs through an integrative and multidisciplinary planning approach which identified the optimum mix of short, medium and long-term measures for a sustainable energy future. This has been tested in Trikala (Greece), Cesena (Italy), Evora (Portugal) and Nottingham (United Kingdom) with the support of technical specialists. The process involved gathering local data, then using it in state-of-the-art computer modelling tools to develop plausible future energy scenarios. The scenarios are tested and refined through a series of carefully weighted criteria to ensure they are economically, environmentally and socially acceptable.

ZENN aims to reduce energy use in existing buildings and neighbourhoods. The project strives to demonstrate the feasibility of innovative low energy renovation processes for buildings at the neighbourhood scale and to develop, improve and launch ambitious replication plans at several scales (local, regional etc.). The three main challenges in connection with the near-zero renovation of existing buildings faced by the ZenN project are: technical challenges, financial challenges and property structure challenges.

NEED4B is a collaborative project that will demonstrate cost-effective and energy efficient technologies and methods for the design and construction of very low-energy new buildings. A series of pilots located in different European climates will show how to achieve a primary energy consumption lower than 60 kWh/m^2/year in the buildings.

NEXT-BUILDINGS focuses on low energy buildings also called active houses, which are active components in the overall integrated energy systems. The target is to demonstrate affordable solutions for social housing and revitalisation of town areas. The solutions will reduce CO2 at no or negative cost seen in a total perspective. Targeted CO2 reduction cost can be minus € 80/tonne taking the benefits of lower energy bills into account, to even better figures when national grants are included. The three demonstrators are Amsterdam (the Netherlands), Lyon (France) and Helsingborg (Sweden) with a total gross floor area of about 50000 m^2.

PLEEC aimed to reduce energy use in Europe, contributing to the EU´s 20-20-20 targets. The project followed a place-based approach to enforce endogenous urban development by considering local conditions in six cities: Eskilstuna (Sweden), Tartu (Estonia), Turku (Finland), Jyväskylä (Finland), Santiago de Compostela (Spain) and Stoke-on-Trent (United Kingdom). Based on the city profiles, technological, structural and behavioural energy efficiency solutions have been elaborated, demonstrating that urban energy efficiency should be seen in the transition to a fully

sustainable urban energy system. The Energy Efficiency Action Plans developed by the cities have integrated the best matching solutions into a strategic approach, guiding the cities on their way to become energy smart.

READY aims to demonstrate how the demand of energy and particularly the needs for fossil fuels and release of CO2 can be considerably reduced to nearly zero, and show a sustainable way to go for other European cities. Demonstration is taking place in two cities: Aarhus (Denmark), which is representative of Northwestern Europe and Växjö (Sweden) - representative of the Baltic Sea region. Both cities have a depth of technical experience and have for years been frontrunners in setting and carrying out ambitious climate and smart city polices. Kaunas (Lithuania) will take part as an observer city in order to bring in Eastern European experience with a most relevant context.

R2CITIES aims to develop and demonstrate an open and easily replicable strategy for designing, constructing, and managing large scale district renovation projects for achieving nearly zero energy cities. For this purpose, it will develop a demonstration and dissemination framework of innovative strategies and solutions for building energy renovation at district level. Three demo sites will be addressed for demonstrating the framework and associated impacts by developing real cases going beyond current market standards but ensuring the replicability of the concepts deployed. The ambitious renovation plan of three residential districts, will involve more than 57.000 m^2, more than 850 dwellings and more than 1500 users, with a potential of energy consumption reduction close to 60%.

RIBuild is an EU research project that will investigate in depth how and under what conditions internal thermal insulation can be employed. Research activities include on-site case studies as well as simulations and laboratory measurements of materials. The RIBuild project will result in comprehensive guidelines on how to install internal thermal insulation in historic buildings. The purpose is to reduce energy consumption in historic buildings in order to meet the EU 2020 climate and energy targets.

SCHOOL OF THE FUTURE had the aim to design, demonstrate, evaluate and communicate shining examples of how to achieve the high-performance building of the future. School buildings and their primary users - pupils - were the focus of the project. Both the energy and indoor environment performance of four demo buildings in four European countries and climates have been greatly improved due to holistic retrofit of the building envelope, the service systems, the integration of renewables and building management systems.

SINFONIA is a five-year initiative to deploy large-scale, integrated and scalable energy solutions in mid-sized European cities. At the heart of the initiative is a unique cooperation between the cities of Bolzano (Italy) and Innsbruck (Austria), working hand in hand to achieve 40% to 50% primary energy savings and increase the share of renewables by 20% in two pioneer districts. This will be done through an integrated set of measures combining the retrofitting of more than 100,000 m² of living surface, optimisation of the electricity grid, and solutions for district heating and cooling.

STEP-UP brought together four European cities – Glasgow (United Kingdom), Ghent (Belgium), Gothenburg (Sweden) and Riga (Latvia), along with research organisations and businesses – with the aim to improve the integration of energy and urban planning, to help cities enhance their Sustainable Energy Action Plans (SEAPs), as developed under the European Commission's Covenant of Mayors initiative, and to develop innovative projects at the intersection of the transport, energy and ICT sectors. STEP-UP took an integrated approach to energy planning, project design and implementation by addressing three themes together: energy and technology, economics, and organisation and stakeholders.

PITAGORAS focuses on the efficient integration of city districts with industrial parks through smart thermal grids. Technologies and concepts for low and medium temperature waste heat recovery, considering as well integration with renewable energy sources (RES), and heat (and power) supply to cities will be developed and demonstrated. As many of the technologies and concepts considered in the PITAGORAS project are not yet widely regarded as a reliable heating energy source, the application of these measures often fails even before cost issues are discussed. To change this negative view, best practice projects are essential. The two demonstration plants that will be built and monitored as part of this project will make a significant contribution towards achieving this goal.

STEEP (Systems Thinking for Comprehensive City Efficient Energy Planning) was an innovative European project delivered in partnership between the cities of Donostia/San Sebastián (Spain), Bristol (United Kingdom) and Florence (Italy). These cities decided to join together adopting a 'systems thinking' methodology in combination with open-data sourcing to improve efficiency along all the key aspects of their energy value chain, by applying smart city concepts in an integrated manner while learning from each other's expertise in applying sustainable practices. Integral to the STEEP project is the concept of open-source information sharing and creation of a methodology that could be utilised and applied by any city.

TRANSFORM was a collaboration involving six European cities – Amsterdam (the Netherlands), Copenhagen (Denmark), Genoa (Italy), Hamburg (Germany), Vienna (Austria) and Lyon (France) – and 13 partners working together to improve their policy and programmes to lower carbon dioxide emissions. The project's integrative approach brought operational plans to a strategic level, including strong stakeholder processes and data analytics, and took into account all relevant energy flows, environmental aspects, urban mobility, and the interrelation of possible measures and their costs. This integration of elements created win-win business models for stakeholders who initially had different interests.

EnerGAware will develop and test, in 100 affordable homes, a serious game that will be linked to the actual energy consumption (smart meter data) of the game user's home and embedded in social media and networking tools. The EnerGAware solution will provide an innovative IT ecosystem in which users can play to learn about the potential energy savings from installing energy-efficiency measures and changing user behaviour. The EnerGAware project will aim to go beyond just testing in an affordable housing pilot, but will seek commercial exploitation of the solution at the end of the project, through our industrial partners, in particular EDF Energy, a global energy provider, with 38 million European energy customers.

ENTROPY aims to design and deploy an innovative IT ecosystem targeted at improving energy efficiency through consumer understanding, engagement and behavioural changes. The focus is on the collection of energy-related information from heterogeneous data sources, the proper analysis of the available data and the provision of interactive services, applications and serious games to end users to stimulate their interest in energy efficient activities, recommending actions for adopting more energy efficient lifestyles and increasing their overall energy consumption awareness.

FLEXYNETS will develop, demonstrate and deploy a new generation of intelligent district heating and cooling (DHC) networks that reduce energy transportation losses by working at "neutral" (15-20°C) temperature levels. Reversible heat pumps will be used to exchange heat with the DHC network on the demand side, providing the necessary cooling and heating for the buildings. Moreover, the heat normally rejected by buildings, will be fed into the network by the heat pumps and recycled by other heat pumps that are producing domestic hot water. In the same way, these networks make it possible to recover and recycle waste heat available along the network path, even at very low temperatures, unlike traditional district heating networks that can harvest thermal energy only at high temperature.

GreenPlay aims to raise awareness among citizens through the implementation of a real time monitoring energy consumption platform and the development of a serious game. This GreenPlay system will monitor energy consumption in real time and give advice and challenges available for users on the platform to reduce consumption. The demonstration of this project will take place in three European cities and reach at least 200 homes.

IMPRESS will leverage on the potential of prefabrication by developing a new range of easy to install panels, which can reduce energy demand while preserving and/or improving building aesthetics. Three prefabricated panels will be developed, both for re-cladding and over-cladding, together with nano/micro particle-based coatings, to achieve anti-corrosion and ageing resistance, improved solar reflectance and anti-vandalism properties. To produce the panels, an innovative manufacturing process will be created that includes Reconfigurable Moulding, 3D laser scanning and 3D printing technologies. A new Iterative Design Methodology will be developed, incorporating all stages of the Design-Construct-Install-Operate process, integrated with a cloud-based BIM database.

MORE-CONNECT tries to offer an integral solution for deep renovation toward nearly zero energy building (nZEB) at reasonable cost by developing prefabricated, multifunctional renovation elements for the total building envelope (façade and roof) and installation/building services. These elements can be combined, selected and configured by the end-user, based on their specific needs. This information can be used as input into advanced Building Information Modelling systems to control and steer the further production process of these elements. The specific scope of MORE-CONNECT is residential buildings and will focus on mass production with a minimum series of one to allow the development of specific solutions, honouring individual customer requirements in five different geo-clusters.

OPTi aspires to create a long-lasting impact by rethinking the way district heating and cooling (DHC) systems are architected and controlled. The overarching goal is to create business benefit for the industry as well as to ensure optimal end-consumer satisfaction. OPTi will deliver methodologies and tools that will enable accurate modelling, analysis and control of current and envisioned DHC systems. This will lead to the most environmentally-friendly way of utilising energy sources, thus reducing the reliance on additional boilers running on oil and/or electricity and overall providing a socio-economically sustainable environment.

OrbEEt aims to introduce an innovative solution to facilitate public and social engagement to action for energy efficiency by providing real-time assessments of energy impact and energy-related organisational behaviour. OrbEEt proposes an ICT-based framework to induce behaviour change toward energy efficiency by transforming energy measurements into personalised feedback delivered through engaging user interfaces. OrbEEt is establishing a holistic organisational energy performance framework that will boost standardised energy performance rating practices by incorporating business and behavioural information.

STORM tackles energy efficiency at district level by developing an innovative district heating & cooling (DHC) network controller. Based on self-learning algorithms, the developed controller will enable to maximize the use of waste heat and renewable energy sources in DHC networks. The controller has been implemented in two demo sites, Mijnwater BV in Heerlen (the Netherlands) and Växjö Energi in Rottne (Sweden), where the resulting energetic, economic and environmental gains are assessed. Through replication, dissemination and education efforts, the project outcomes will be transferred to stakeholders across the EU, and will thus contribute to a wider deployment of DHC networks on EU level.

TRIBE aims to contribute to a change in citizens' behaviour towards energy efficiency in public buildings, through their engagement in the experience of playing a social game, linked by ICT to real time data collected from five pilot buildings hosting around 1300 regular users and 12000 eventual users. As a result of the analysis and developments accomplished using the pilot cases, and in addition to the game that will serve to collect all the relevant information, a whole and very broad number of tools and guidelines, named the TRIBE pack, will be set up to be used by public building tenants and owners. The goal is to foster the spread of the public building users' behavioural change as well as to support the deployment of ICT for energy efficiency among public building owners and operators.

SDE Solar Decathlon is an international student competition that started in the USA in 2000. Universities from all over the world are challenged to design, build and operate solar powered houses. During the competition's final phase, each interdisciplinary team assembles its house in a common Solar Village. The final phase includes a public exhibition, monitoring and 10 contests named a "Decathlon". Since 2010, a European branch of this competition exists: until now, three Solar Decathlon Europe (SDE) competitions have taken place, with a fourth taking place in 2019. Together with three university partners, PNO operates a contract for the European Commission to analyse the results of these four European competitions and (amongst others) feed these results into the SCIS database.

Dr. Bob aims to demonstrate the economic and environmental benefits of demand response in blocks of buildings for the different key actors required to bring it to market. The DR-BOB project will integrate existing technologies to form the DR-BOB Demand Response Energy Management solution for blocks-of buildings with a potential ROI of 5 years or less. The DR-BOB integrated solution will be demonstrated at 4 sites operating under different energy market and climatic conditions in the UK, France, Italy and Romania with blocks-of-buildings covering a total of

274,665 m^2, a total of 47,600 occupants over a period of at least 12 months. The DR-BOB project will engage with 2,000 companies involved in the supply chain for demand response to disseminate the projects goals and findings.

MODER vision is cost-effective, energy-efficient and user-oriented refurbishment of buildings as part of the global energy system. The main objective of MODER is to increase business of engineering companies, energy managers and consultants in supporting municipalities and building owners in European and global markets for the refurbishment of buildings at district level.

HEAT4COOL proposes an innovative, efficient and cost-effective solution to optimize the integration of a set of rehabilitation systems in order to meet the net-zero energy standards. The project develops, integrates and demonstrates an easy to install and highly energy efficient solution for building retrofitting that begins from the Heat4Cool advanced decision-making tool (which addresses the building and district characteristics) and leads to the optimal solution combining (1) gas and solar thermally driven adsorption heat pumps, (2) solar PV assisted DC powered heat pump connected to an advanced modular PCM heat and cold storage system, and (3) energy recovery from sewage water with high performance heat exchangers.

MOEEBIUS introduces a Holistic Energy Performance Optimization Framework that enhances current modelling approaches and delivers innovative simulation tools which (i) deeply grasp and describe real-life building operation complexities in accurate simulation predictions that significantly reduce the "performance gap" and, (ii) enhance multi-fold, continuous optimization of building energy performance as a means to further mitigate and reduce the identified "performance gap" in real-time or through retrofitting.

HIT2GAP aims at linking enabling technologies and approaches used in the commissioning and operation phases of construction to improve the comparative predictions of the models and simulations that drive design and the actual performance of new and retrofitted buildings. The approach taken in HIT2GAP is to build an open, plug and play, application-based platform, which is seen as the effective strategy to cover user requirements in buildings that by their nature (typology, climate, usage) are widely diverse. Furthermore, it allows the platform to evolve and remain up-to-date with new emerging technologies in order to better assess energy use within a building. To evaluate and maximize the impact of the new solution, HIT2GAP will be tested in 4 pilot sites.

IP-SUNTAN: Smart means that innovative technologies will be used (for example ICT and GPS based), and that smart ways to stimulate people to change behavior or adopt technologies will be developed and evaluated. The project considers road transport, cycling and walking, and public transport. It looks at a broad range of tools, including electronic fare cards, real-time public transport information, automated tracking of vehicles, and data from innovative pricing and rewarding experiments. The project brings together research groups, local authorities and case studies from Amsterdam (the Netherlands), Rotterdam (the Netherlands), Stockholm (Sweden), Gothenburg (Sweden) and Vienna (Austria).

CIVIC facilitates the participation of all stakeholders in the evaluation of alternative transport and logistics measures that minimise disruptions and nuisance and improve energy efficiency. Construction is required to create more attractive, sustainable and economically viable cities. This includes the expansion of infrastructure, development of new residential areas and renovation of buildings. However, construction related transport causes negative impacts for people that live, work and/or travel in the vicinity of construction sites. It will increase understanding among stakeholders on improved transport and will generate smart governance strategies to support implementation of the CIVIC approach.

ANNEX II. List of events

Barcelona Smart City Expo 2018

Name	GROW SMARTER workshop and SMART CITY EXPO
Place and date(s)	Barcelona; November 13-16.2018
Organiser	
Other smart city projects involved	GrowSmarter
Smart city platforms involved (if any)	
No. of participants/people outreached by the event	21331 visitors; 844 exhibitors; 400 speakers; 700 cities; 146 countries; 60 side events
Participant(s) from RUGGEDISED	Joanna Tobolewicz (plenipotentiary of mayor, City of Gdansk) Paulina Borysewicz (Gdansk Real Estate)

Objectives
• Smart City Expo World Congress • RUGGEDISED participation in Grow Smarter – Lighthouse Cities - workshops

Agenda
http://www.grow-smarter.eu/home/; 3 workshops topics: Low Energy Districts, Sustainable Urban Mobility, Integrated Infrastructures

Summary of the event
• Smart City Expo World Congress was spectacular. There were so many smart ideas and solutions in one place, plenty of wise people who care about cities and its environment. • Members of RUGGEDISED project were both participants in the Expo exhibition with their own stand (with other City Projects) and participants of Grow Smarter workshops • RUGGEDISED member could take a chance to exchange experiences with other projects. Learn from each other is the best way to make a progress. Workshops was a great opportunity to develop and improve our knowledge about smart city solutions. • *What was particularly useful for your city/organisation? What did your city/organisation learn? What was missing from the event? Is there any topic that was not addressed properly?* – To see new smart solutions on the exhibition, f.ex.: smart building shell refurbishment; smart building logistics; smart energy-saving tenants; smart local electricity management; smart street lightning; smart waste collection; big data management; sustainable delivery; smart traffic management; alternative fuel driven vehicles and smart mobility solutions. To discuss particular questions in building refurbishment, share transport and cooperation with citizens.

General Assembly of the European Innovation Partnership on Smart Cities and Communities 2019

Name	General Assembly of the European Innovation Partnership on Smart Cities and Communities
Place and date(s)	Brussels, May 16-17, 2019
Organiser	EIP-SCC
Other smart city projects involved	
Smart city platforms involved (if any)	EIP
No. of participants/people outreached by the event	80
Participant(s) from RUGGEDISED	Jaroslav Kacer and Filip Chvatal (Brno), Albert Engels (Rotterdam), Sara Baiocco (ISINNOVA), Marco Mordacci (Parma), Joanna Tobolewicz (Gdansk)

Objectives
The 2019 General Assembly brought the EIP-SCC community together, with the EU's Horizon 2020 'Lighthouse' (SCC01) programmes, and other relevant EU-funded smart city initiatives.
The event continued the progressive support to the "Explore, Shape, Deal" discussions that were introduced in 2018, to help building a pipeline of bankable smart city solutions.
At the same time, the meeting served as a meeting platform for consortium in the Horizon 2020 Smart Cities and Communities programme, including the RUGGEDISED consortium.
The attitude of the city of Brno along with suggestions for potential cooperation in partial projects were presented during the panel discussion and direct meetings with participants of the General Assembly of the European Innovation Partnership on Smart Cities and Communities.

Agenda
On the first day of the meeting, councillor for Spatial Planning and Development of the City of Brno, RNDr. Filip Chvatal, PhD. had a speech in the panel discussion "Cities Market Perspectives".
The whole agenda of the event is available here: https://www.eiseverywhere.com/ehome/ga2019

Summary of the event
It fostered the visibility of the project RUGGEDISED among other European partners and General Assembly attendees.
The two-day meeting was a great opportunity to promote and invite participants to the URBIS SMART CITY FAIR 2019 and replication workshop, where particular smart solutions of the partner cities from the RUGGEDISED project would be presented.

Learning from the successful – SCC replication workshop 2018

Name	Learning from the successful – SCC replication workshop
Place and date(s)	INEA, Bruxelles, 26th January 2018
Organiser	INEA
Other smart city projects involved	SCC01 Projects: Triangulum, Growsmarter, Sharingcities, Remourban, Replicate, Mysmartlife, Smartertogether, IRISsmart cities, SMartencity
Smart city platforms involved (if any)	o SCIS o EIP o BABLE replication platform
No. of participants/people outreached by the event	50/80 people: city practitioners, industry partners, research organisations involved in SCC01 projects
Participant(s) from RUGGEDISED	Albert Engels (Rotterdam), Sara Baiocco (ISINNOVA), Marco Mordacci (Parma), Joanna Tobolewicz and Aneta Pierzchała-Tolak (Gdansk), Jaroslav Kacer, Lukáš Grůza and Jan Zvara (Brno)

Objectives
• Present concrete results from the projects, foster knowledge transfer across EU cities, foster take up and replication of solutions by follower cities, strengthen cooperation among SCC projects and EU cities, discuss best practices, barriers and replication strategies • For RUGGEDISED it was a good opportunity to network and strengthen cooperation with other similar projects; Follower cities could share their barriers to replicate and implement smart solutions as well as to learn experiences and best practices from other cities

Agenda
The agenda of the event can be found here: https://ec.europa.eu/inea/sites/inea/files/agenda.pdf

Summary of the event

• The event included a general presentation of the activities of the INEA and its participation and contribution to the H2020 programme, especially in the field of energy, transport and ICT. Then there was a general introduction to the activities of replication presenting also the SCIS platform. Then the roundtables were presented. There were three main topics to group roundtables (see agenda above), to discuss urban plans, business models, citizen empowerment and open data platform that are successful for implementing and replicating smart solutions. Within each roundtable, two/three speakers from Lighthouse cities presented their experience and then the floor was opened to follower cities to ask questions and discuss on the barriers. At the end of the day, the moderators of the three topics summed up what emerged from the discussion (main issues, barriers and best practices) and concluded.
• Follower cities, the coordinator and the replication leader participated in the round table discussions
• It was a very good occasion to learn from other projects as well as to share barriers and opportunities with other smart cities
• Some key messages were that
   – Inclusive urban governance and participatory strategy for urban planning are key methods for replication
   – To facilitate exchange of good practices it is necessary to go beyond the practices and involve politicians in peer to peer meetings, as decisions are often taken at political level
   – Financing, enforcement and acceptability are often the barriers for many different smart solutions
FCs' perspective
   PARMA
   It is always welcome and useful to discuss with other cities how they are handling the same issues we are working on. It really helps fellow cities to grow and improve knowledge and awareness. We learnt

how to set up an open data platform and about the energy refurbishment of residential buildings. We are even more conscious that there some issues that are easy to replicate in every country and others that are extremely linked to the national context. I think it would be useful to go even more into detail, in order to give a full understanding of the procedures and about technical, legal and financial issues of every action.

BRNO
It was very beneficial to hear about concrete projects directly from their leaders and people in charge. Format of the event was well designed. Maybe more rounds tables would be more appreciated (at the expense of general presentations). Also, could be better if attendees could choose before the event directly from specific projects instead of choosing from general topics. This could be clearer for attendees what a discussion during the round tables will be about. Basic information about these projects in advance of the workshop would be also very beneficial for preparation and right selection, which round table to attend. Also, the venue, where the event was held, could be better chosen regarding to the number of participants.

Empowering Smart Solutions for Better Cities 2017

Name	Empowering Smart Solutions for Better Cities
Place and date(s)	Budapest, 2.-3.10.2017
Organiser	EU Smart Cities Information System
Other smart city projects involved	
Smart city platforms involved (if any)	SCIS
No. of participants/people outreached by the event	150
Participant(s) from RUGGEDISED	Jaroslav Kacer (City of Brno)

Objectives
• Of the event: This important conference will seek to encourage the replication of solutions, good practices and lessons learned among cities and businesses to drive forward a smart and sustainable vision of Europe. • For RUGGEDISED participation: To promote the city of Brno as one of the leading examples in the Smart Cities Development form the Central Europe

Agenda
Jaroslav Kacer – took part in the panel: "The making of a smart city: what does it entail?"

Summary of the event
• In general: The event was focused on very important topic of today – sharing knowledge between different actors and by this implement the basic concept of Open Innovation in everyday live • Please illustrate RUGGEDISED contribution to the event: There were several attendees from the project RUGGEDISED and some of them were actively involved in the event programme. • Please explain RUGGEDISED benefits from the event: It fostered the visibility of the project among other European partners.

EIP-SCC General Assembly 2017

Name	General Assembly of the EIP-SCC: "Towards a Joint Investment Programme for Smart Cities"
Place and date(s)	Brussels, 12 October 2017
Organiser	DG Connect, DG Energy
Other smart city projects involved	Sharing cities, SMARTER TOGETHER (not only, probably more)
Smart city platforms involved (if any)	• probably yes (do not have attendance list)
No. of participants/people outreached by the event	380
Participant(s) from RUGGEDISED	Jaroslav Kacer (City of Brno)

Objectives
• Of the event: To stimulate scale deployment of digital solutions in all sectors involved in the Marketplace. 'Pull' the EU market forward. Match-making & Networking among supply/demand/investor communities. Show a clear and realistic path forward, involving resources within the EIP non-funded model. • For RUGGEDISED participation: To promote project RUGGEDISED and the city of Brno as one of the follower city in the project RUGGEDISED. To share experiences with SCC01 program.

Agenda
https://eu-smartcities.eu/content/general-assembly-12-october-2017-1

Summary of the event

• In general:
  Increased the extent to which the Marketplace provides an effective matchmaking function - bringing cities, industry, and investors together. The General Assembly played a central role in reinforcing this strategy.
• RUGGEDISED contribution to the event:
  Active involvement in panel discussion "Seeding the ground for market deployment of SCC solutions" (Jaroslav Kacer, Deputy Mayor of Brno)
• RUGGEDISED benefits from the event:
  It fostered the visibility of the project RUGGEDISED among other European partners.

City Representatives meet Investors - Matchmaking Event 2020

Name	City Representatives meet Investors - Matchmaking Event
Place and date(s)	Brussels, February 20, 2020
Organiser	EIP - SCC
Other smart city projects involved	
Smart city platforms involved (if any)	EIP
No. of participants/people outreached by the event	100
Participant(s) from RUGGEDISED	Esben Pejstrup (ICLEI),Albert Engels (City of Rotterdam) and Jaroslav Kacer (City of Brno)

Objectives
Taking place in Brussels on February 20, 2020 a matchmaking event – promoted by the European Commission under the EIP-SCC Marketplace initiative – brought together city/regional representatives, businesses, and investors.

Agenda
The event served as a meeting point for discussing a collaboration between the URBIS fair and General Assembly of EIP, which will take place in September 2-3 in the City of Brno. The whole agenda of the event is available here: https://eip-smart-cities-and-communities.b2match.io/

Summary of the event
It fostered the visibility of the project RUGGEDISED among other European partners. The event was a great opportunity to promote and invite participants to the URBIS SMART CITY FAIR 2020, where particular smart solutions of the partner cities from the RUGGEDISED project will be presented.

Nordic Edge 2018

Name	Nordic Edge 2018
Place and date(s)	Stavanger, 27-28 September 2018
Organiser	Triangulum project, in collaboration with INEA, EC and SCIS
Other smart city projects involved	Grow Smarter, Triangulum, Smarter Together, Sharing Cities, Replicate, Remo Urban, SmartEnCity, Ruggedised
Smart city platforms involved (if any)	• BABLE replication platform + Morgenstadt • SCIS
No. of participants/people outreached by the event	250
Participant(s) from RUGGEDISED	• Lighthouse and Follower Cities event: Albert Engels (City of Rotterdam), Kelly Cotel (ICLEI), Dr. Marcel von Oosterhout (Business Director Erasmus Centre Future Energy Business, Rotterdam) • SCC01 Replication Workshop: Loriana Paolucci (ISINNOVA)

Objectives
Replication Workshop: Facilitating knowledge sharing among the SCC01 community to enable procurement and implementation of Smart City Solutions.

Agenda

- **Lighthouse and follower cities event:** find the program here
- **Replication Workshop program:**

Time	Session
08:00 –08:30	*Registration*
08:30 –08:35	*Welcome* *DamianWagner, Triangulum and Board of Coordinators for SCC01*
08:35 –08:45	*INEA & EC activities in SCC, Lessons learned and Expectations* *Francesco Liberati, INEA & Jens Bartholmes,DG Energy*
08:45 –08:55	*Introduction to WorkshopFormat*
09:00 –10:30	**Round Table Session 1** *Themes: Urban Mobility, Low Energy Districts, and Integrated Infrastructure* *Each theme has several round tables(listed in next page). You can choose any one round table.*
10:30 –11:00	*Coffee Break*
11 –12:30	**Round Table Session 2** *Theme:Urban Governance* *The theme has 5 round tables and you can choose to participate in any one.*
12:30 –13:00	*Lunch Break*
13:00 –13:30	*FC panel Session lead by Fraunhofer*
13:30 –14:00	*Conclusions by Main Moderators & Triangulum*

Summary of the event

Lighthouse- and follower cities event
During the Lighthouse and Follower cities event, there were public sessions and internal sessions. During the public session anyone interested in the SCC01 ongoing projects was invited to attend. In parallel with that, several internal sessions were organized in order to allow people to meet and discuss on Smart City's themes. Dr. Marcel von Oosterhout, who works in the Ruggedised project with the city of Rotterdam held a session on Urban data platforms.

Replication Workshop

The event was structured with two rounds of round table sessions where municipal representatives and their partners presented best practices for the topic under discussion. The participating cities, who are planning to procure these solutions, had the chance to introduce their plans for implementation of the Solution and explain barriers and challenges they face. The table members will then help the cities with overcoming these challenges by give them suggestions. Each table will have a moderator who helps ensuring that the discussions are focused and productive.

ISINNOVA moderated the round table on Last Mile Delivery. The City of Munich (Smarter Together) presented its pilot: the District Sharing Box. The city of Vienna and the municipality of Sabadell participated to the discussion.

Nordic Edge Expo 2017

Name	Nordic Edge Expo
Place and date(s)	Stavanger, 26.-28. 9. 2017
Organiser	Nordic Edge
Other smart city projects involved	Triangulum
Smart city platforms involved (if any)	- NTNU - Open & Agile Cities - Öresundskraft and Interreg - Smart Innovation Norway - World Greed Design Organisation - Broen.xyz - Norwegian Smart Care Cluster … and much more
No. of participants/people outreached	250
Participant(s) from RUGGEDISED	Jaroslav Kacer (City of Brno), Albert Engels (City of Rotterdam), Kelly Cotel (ICLEI)

Objectives
- Of the event: Bring together the best thinkers and the best doers for ideas exchange, inspiration, insights and action. Cover themes like Mobility, Welfare Technology, EdTech, Energy and Environment, Big and Open Data, Business Models for the Public Sector, Smart Art, Efficiency and Improvement of Municipal Services, Citizen Involvement and much more.   - For RUGGEDISED participation: To promote the city of Brno as one of the leading examples in the Smart Cities Development form the Central Europe.

Agenda
Day 1: Edtech, community, DNB NXT & the Nordic model Day 2: Building the Smart City Day 3: Smart City Business Models   Jaroslav Kacer – took part in the debate panel: "What Makes a Good Smart City?"

Summary of the event
- The event was focused on very important topic of today – sharing knowledge between different actors and by this implement the basic concept of Open Innovation in everyday live   - There were several attendees from the project RRUGGEDISED and some of them were actively involved in the event programme. Connections were made with other SCC01 consortia.   - It fostered the visibility of the project RUGGEDISED among other European partners and Expo attendees.

INDIA ADVANTAGE SUMMIT 2017

Name	INDIA ADVANTAGE SUMMIT 2017
Place and date(s)	Bangalore, India, 21-22 September 2017
Organiser	Integro Infotech & Consulting
Other smart city projects involved	Triangulum
Smart city platforms involved (if any)	Smart Cities Mission – India (http://smartcities.gov.in)
No. of participants/people outreached	150
Participant(s) from RUGGEDISED	Mario Gualdi (ISINNOVA)

Objectives
• BRING TOGETHER KEY STAKEHOLDERS: key government representatives, industry leaders, investors, bankers, global experts, city planners, architects, real-estate development firms & builders and university professors - who work in the domain of 'SMART Cities' • SHARE, DISCUSS, IDEATE AND PARTNER: bring innovative practices, best case studies and globally tried and tested frameworks to India • FOR RUGGEDISED: share the approach to smart cities, the replication process and launch a bridge with India to be consolidated with Mumbai's planned cooperation and with the possible inclusion of other Indian cities in the City Interest Group

Agenda
http://www.tiasummit.com/pdf/TIASummitSchedule.pdf

Summary of the event
• General introduction to the realm of smart city technology and services available today in India, with emphasis on the role of large corporations and start-ups in the development of smart "townships" • RUGGEDISED provided an overview of the underlining considerations that led to the formation of our consortium and the conceptualisation of our project. Emphasis was placed on the leading role of city governments in visioning a smart future and steering the process of attainment together with as large as possible a partnership of local stakeholders. This is a challenge in India giving the prevailing institutional setting and the focus on developing townships or new private rather than the cities in their entirety. • RUGGEDISED offered to cooperate with individual Indian cities, also via inclusion in the City Interest Group, or with group of cities, or with the full Smart Cities Mission – India. The latter appears challenging for it is a vast top-down scheme run by the Indian Government and the Indian States, whilst the previous options may be viable overtime. RUGGEDISED could offer its replication model as a benchmark for knowledge share and smart city strategising. ISINNOVA has leader of WP7 and major contributor to WP8 will follow up on this activity. Cooperation with Mumbai needs to be addressed together with ICLEI to assess possible future synergetic actions.

• Images at https://www.tiasummit.com/summit_17/

EIP's Smart City Guidance Package test in Brno 2019

Name	EIP's Smart City Guidance Package test
Place and date(s)	Brno; January 30, 2019
Organiser	EIP-SCC
Other smart city projects involved	
Smart city platforms involved (if any)	EIP
No. of participants/people outreached by the event	20
Participant(s) from RUGGEDISED	Jiří Marek and Yuliya Ostrenko (City of Brno)

Objectives
- Test the Smart City Guidance Package, which was developed by the Action Cluster Integrated Planning, Policy and Regulations in the European Innovation Partnership on Smart Cities and Communities.   - The Smart City Guidance Package for Integrated Planning and Management of Smart City projects seeks to provide the necessary support for planning and managing smart city projects by providing examples of good solutions and best practices, pitfalls that can be expected and how to overcome these, e.g. where to find information about financial possibilities and how to engage stakeholders

Agenda
Together with the members of Brno City Ecosystem a lot of topics were discussed. For instance: What are the steps we can expect when we want to implement the prospective smart city solutions Brno desires in future? Who should be involved in which role? What do we need to do as a city and what with our stakeholders? How can we overcome barriers such as silo's?

Summary of the event
- The first part of the workshop focused on concretization of Brno City's vision and strategy #brno2050 with smart approaches and solutions.   - The second part focused on to do's for the stages Plan-Do-Check-Act-Replicate, having the future smart district Špitálka in mind as a showcase for other developing districts in Brno.   - The methodology of the Smart City Guidance Package worked well to connect the dots of Sustainable Energy Action Plan, Sustainable Urban Mobility Plan, #Brno2050 and RUGGEDISED project, although ideally this process takes more time than a one day workshop!   - http://www.ruggedised.eu/news-events/news?c=search&uid=6iAtFaoV

EIP's Smart City Guidance Package test in Parma 2019

Name	EIP's Smart City Guidance Package test
Place and date(s)	Parma; February 8, 2019
Organiser	EIP-SCC
Other smart city projects involved	
Smart city platforms involved (if any)	EIP
No. of participants/people outreached by the event	20
Participant(s) from RUGGEDISED	Marco Mordacci and Enzo Bertolotti (City of Parma)

Objectives
• As a fellow member of the H2020 Ruggedised project, the municipality of Parma was prepared to be the fifth city to do the testbed of the Smart City Guidance Package. • The methodology developed by the initiative leader Judith Borsboom-van Beurden, senior researcher at NTNU university, developed in the Smart City Guidance Package, seeks to provide a managing and planning tool to fellow cities, based on lessons learned from many Lighthouse projects.

Agenda
During the workshop, participants were divided into groups and concretised different topics such as how to create mobility as a service platform and how to put in place smart solutions for a consistent reduction of the number of cars in the city centre. Furthermore, the partnership between industry, research and city of Parma was investigated in the second group, moderated by the energy manager Enzo Bertolotti. Around 20 participants took part in the workshop, including representatives from the private sector, city administration, utilities and the regional government.

Summary of the event
• 'The methodology tested today within the Smart cities Guidance Package seems an effective tool to innovate the city and get more in touch with stakeholders and citizens, we are happy to have received the feedback from the guidelines that the process launched through PARMA FUTURO SMART is on track and going in the right direction," claims the Deputy Mayor for sustainability policies Tiziana Benassi during the follow-up debate at the end of the workshop. • Thanks to this cooperation between the Action Cluster Integrated Planning and Parma's stakeholders, this last testbed helped the city to brainstorm new ideas for increasing its sustainable innovation development by working on two prior actions identified within the Parma-Futuro Smart plan by Parma stakeholders at the same time: the implementation of the Lighthouse replication programs selected by the municipality and the solutions identified by the city innovation plan. • The last testbed of the Smart City Guidance Package was successfully conducted in Parma. A preliminary plan for implementing the vision of the city was drafted, next to related actions to put it in practice (how to move from PLAN to DO phase). • https://cordis.europa.eu/news/rcn/130816/en

ANNEX III. Action Plans

Task Group Replication Action Plan 2020
Context: the Board of Lighthouse projects Coordinators and its six Task Groups
The community of selected Lighthouse projects (17 in November 2019) has since 2014 developed a cooperation structure in support of better visibility, more impact, faster scale-up and wider replication of the Lighthouse projects and solutions. This cooperation is coordinated by a Board of Lighthouse projects Coordinators (BoC), and supported by six Task Groups (TGs). Each TG consists of representatives of all running Lighthouse projects, chaired by one Lighthouse project, sometimes supported by one other Lighthouse project. One of these six TGs is the TG Replication.

TG Replication: contacts, organization
Chair: **Muriël Pels** (m.pels@utrecht.nl) with **Mauritz Knuts** (mauritz.knuts@vasek.fi) - IRIS
Vice-chair: **Giulia Carbonari** (giulia.carbonari@r2msolution.com) - +CityxChange
Meetings: virtual every month, live twice a year (October, April: connected with SCC01 event)
Members: approx. 60, mostly R&D institutes, cities, and city networks.

TG Replication: Action Plan 2020
TG Replication's mission is: to accelerate demand-driven market uptake, scale-up and replication of the Lighthouse projects' solutions in Europe and beyond. TG Replication agreed on the following **objectives and actions for 2020**:

Objective 1: Knowledge sharing between Lighthouse projects on replication strategies.

→ Develop TG Replication Action Plan 2020.
→ Gather in the common repository (OneDrive) all Lighthouse project's deliverables on and tools for replication, especially from the first Lighthouse projects. Examples: replication roadmaps, tool catalogues, toolkits, replication potential assessment tools.
→ Support and promote SCC01 replication events as organized half-yearly by the BoC chair.

Objective 2: Further identification, understanding and uptake of barriers and drivers for replication as encountered in the Lighthouse projects.

Building on the 2018 SCIS policy report on barriers and drivers Why may replication (not) be happening? and the 2019 Lighthouse projects policy paper 'From dream to reality: sharing experiences from leading European Smart Cities' published by the first SCC01-projects Triangulum, GrowSmarter and RemoUrban.

→ Support the production of SCIS Solution Booklets in co-creation with Lighthouse projects.
→ Attribute barriers encountered in Lighthouse projects to governance levels (local, Member State, European Commission), and identify opportunities for, and initiate, collaborative action between Lighthouse projects.

Objective 3: Supporting EU-regional and Member State networks of SCC01 cities, and other European networks, to accelerate scale-up and replication.

The emerging regional and national networks in the SCC01 network could play an important role in demand-driven market uptake, scale-up and replication of knowledge and solutions, as cities in the same EU-region or Member State share similar contexts such as legislation, climate, culture, infrastructure typology, and city typology. Working together in regional and national networks also has practical benefits such as same first language and shorter travel to on-site events. This lowers the threshold to work together, and to engage cities outside the SCC01 cities network.
In addition, cooperation with European networks outside SCC01 that support SCC01-type solutions could also accelerate demand-driven market uptake, scale-up and replication of solutions. For example: the EC SET-Plan

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Action 3.2 "Smart Cities and Communities" (June 2018) aims to support replication of 100 'Positive Energy Districts', through the EERa Joint Program Smart Cities & Communities.

→ Explore how TG Replication can support EU-regional and Member State networks of SCC01 cities to accelerate demand-driven market-uptake, scale-up and replication of knowledge and solutions between SCC01 cities, and engage cities outside the SCC01 network in that region / Member State.
→ Explore how TG Replication can cooperate with other European networks to accelerate demand-driven market-uptake, scale-up and replication of Lighthouse knowledge and solutions.

Objective 4: Collaboration with TG Business Models & Financing.

To benefit from their work done in previous years, and to contribute to demand-driven market uptake by supporting and sharing cities' actions towards joint procurement.

→ Sharing agendas for TG meetings.
→ Once yearly invite TG BM&F to present their work and plans in TG Replication, and/or organize a session together.

Objective 5: Cooperation with TG Communication.

For TG Replication to be effective, a clear and long-term **calendar** *of events with strong replication potential is essential. In particular key events in which most Lighthouse projects attend anyway, and many other cities as well, without steep entrance or registration fees. Example are: European Week of Regions and Cities (October, Brussels), European Sustainable Energy Week (June, Brussels).*

→ Sharing agendas for TG meetings.
→ Cooperate with TG Communication on (production and) use of SCC01 dissemination materials for, and promote active Lighthouse projects' participation in selected key events for replication.

Objective 6: Cooperation with TG Monitoring.

To get a clear view on replication potential of the solutions. Exact aim/scope of cooperation to be decided after publication of TG Monitoring Action Plan.

→ Sharing agendas for TG meetings.
→ Contribute to mapping and alignment of KPIs.

Monitoring and Evaluation Task Group Action Plan

Main Objectives	Specific objectives	Actions	Outcomes
Common understanding on the scope and meaning of EVALUATION & MONITORING	* Develop a word cloud clarifying the terminology and scope of this Task group in relation to other Task groups (Data management, Replication etc.) * Common approach forSCC01 projects to evaluation & monitoring: scope, evaluation boundaries, monitoring protocol... * SCC01 BASELINE definition methodology * Social evaluation methodology of SCC01 projects (including qualitative methods, learning process etc.)	* Collaborative work and joint development of documents * Monthly TELCOs * Bi-annual face-to-face meeting in coordination with other SCC01 network TGs * Comparison between LH baseline scenarios	* Survey mapping on dissemination level & timeline of deliverables associated with monitoring and evaluation procedures in SCC01 projects * Journal article on SCC01 evaluation methodologies submitted in 2020 * 2021-2022: another article based on monitoring results from different SCC01 projects
Mapping of KPIs	* Collect KPIs used to evaluate and monitor SCC01 project impacts, as a continuation of Replication TG work * Harmonization of common indicators and alignment with key initiatives and frameworks * Need for new indicators (PED, LCA, social evaluation, air pollution, environmental quality...)	* Discuss specific topics during TELCOs and face-to-face meetings * Reporting conclusions	* Survey mapping KPIs including references and identified gaps
Facilitate SCIS Reporting Methodology	* Share experiences with SCIS reporting * Facilitate the interaction between SCIS and SCC01 network to reach more comparable results	* Invite SCIS representative (currently Rudy Rooth) as external observer to the Task group and/or to a specific SCIS dedicated telco, where they can answer to all at the same time to questions prepared in advance * Share experiences with SCIS reporting in monthly telcos, and if issues, approach SCIS together to find solutions, or provide recommendations * Discuss appropriate data boundaries and scoping for SCIS reporting (only buildings strictly limited to project or wider scale?) to find a common reporting approach for comparable results * Discuss methodological differences in calculation	* FAQ document
Set up a COLLABORATION FRAMEWORK	* Sharing experiences from different projects through	* Examples presented during monthly telcos	* Webinars

	concrete examples, e.g.on Monitoring Protocols * Collaborate with other Task groups (Replication, Data management...), e.g. - Data management task group on their objective "Collect and examine data management plans to provide recommendations" - Replication, Communication & Cities TGs on stakeholder engagement * Collaborate & Engage with city representatives, and other key stakeholders	* Sharing examples from different projects if possible with the aim of achieving common approach, e.g. common template for Monitoring protocols • Creation of a repository where to store Ddeliverables from projects, General useful documentation about monitoring (e.g. reference standards, ...), Documents from the other relevant task groups for easy access (e.g. replication, data), Outcomes of this group	

SCC01 2018 Action Plan

This document provides an action plan for activity for the Lighthouse projects collaboration framework in 2018 and is based on the SCC01 Collaboration Framework and the SCC01 Manifesto documents. These documents contain the benefits of joint working, our strategic aims and the governance structures for collaboration and this Action Plan assumes knowledge of these documents and adheres to their framework.

Once agreed by the Board of Coordinators, this Action Plan should be considered the source document for SCC01 Collaboration work plans in 2018 and is an annex to Section 4 of the Collaboration Framework.

Strategic targets for 2018

Moving forward into 2018, the Lighthouse programme of work is perfectly placed now to accelerate collaboration between the projects and cities and make significant progress towards achieving the aims of the EIP-SCC and the Commission. Particular points to consider include:

- We are now at a stage where we have a spread of programmes across four years, at all the various stages of implementation.
- The value of collaboration and joint working between the programmes is something that both the Commission and the SCC01s have increasingly come to realise. In particular, our target of having a sustained impact on the smart city market place and the realisation of leveraged investment off the back of our programmes. Also, Collaboration together with cities, knowledge institutes and private partners to share learning and build networks that underpin the market place.
- There is increasing movement from the supply side in the smart city marketplace in the form of large investment programmes underpinned by multinational companies, and a new way to intervene with a call for tenders. This may cause the market to blur. The Lighthouse Programme needs to prepare for this and to give more visibility to a demand driven marketplace.
- SCC01 cities acknowledge that they have difficulties in adjusting to the fast-moving world and that partnerships, networks of organizations within cities and networks of cities are playing an increasing role in dealing with multi-layer challenges and replicating new solutions.

In light of this we need to ensure that we make tangible progress against our manifesto in 2018. By the end of 2018 we will have achieved the following outcomes:

- Joint procurement activity is underway on at least one of the smart measures tested in the Lighthouse Programmes, with two or more projects having a discussion about collaboration.
- We have developed a Lighthouse brand
- We have successfully engaged the demand side, supply side and investors through engagement activity and the marketplace
- Learning and information is being exchanged through the selected platforms
- The Lighthouse approach of replication has been developed and there is strong collaboration amongst the community.
- Had an impact on policy at an EU, national and city level
- Cities and citizen (demand side) as a key enabler for triggering the market is widely recognized between SCC 01 projects, EC, EIP Market Platform, SCIS and at a national level.

These outcomes will be overseen by the Board of Coordinators and the outputs and tasks needed to achieve these outcomes will be carried out by the Task Groups. These tasks are as follows:

Board of Coordinators

- Agree targets and adopt plans for 2018
- Guide the process of SCC01 collaboration to achieve the targets and, if necessary, adjust the plans
- Review manifesto and update in order for new projects to sign in Lisbon.
- Identify, secure and manage resources for collaboration
- Identify and agree themes for the year
- Attend one meeting per month either by conference call or linked to a pre-determined event.

- Encourage an increase in information exchange and facilitate technical learning groups across the programmes
- Organize workshops in the coordinator meetings to address specific issues.
- Represent the Lighthouse Programme at events and in the media.
- Work jointly with the Commission, EIP and INEA to achieve our common goals

BM&F Task Group
- Develop joint business models on five areas for proven technology that are ready for adoption. These areas are public housing retrofit, e-buses, ev-charging, smart lampposts and data platforms.
- Support Replication Task Force to activate and aggregate demand in cities.
- Engage with investment community and identify viable sources of funding
- Ensure that pre-procurement activity is underway on at least two joint business models
- Liaise with the EIP Action Cluster and their investment initiatives.

Replication Task Group
- Replication leads collaborate to develop a list of city contacts that can be used by the Lighthouse projects in a way that respects privacy.
- Develop and implement an action plan based on the Follower Cities Workshop findings. Galvanise the demand side by engaging with cities, outside of the demonstration areas, in the technology emerging from the programmes and liaise with the BM TG.
- Work with the BM&F Task Group to map demand in the Lighthouse and follower cities for the measures being developed in the SCC01 programmes, with a focus on the five joint business model areas (above).
- Collect and examine all programme learning strategies in order to develop a calendar of shared learning events and to ensure information is fed into SCIS.
- Improve communication across the SCC01 programmes, including
    - Internal private conversations between coordinators
    - Wider sharing opportunities among Lighthouse cities and follower cities.
    - Supporting the new projects with shared learning
- Establish technical working groups where sufficient demand is identified so that the programmes and cities can learn from each other, and involve external cities and investors.

Accelerate and boost shared learning through SCIS.

Communications Task Group
- Develop and establish a 'Lighthouse' brand. This will involve:
    a. Setting out the key messages of the Lighthouse programme around market shaping, shared learning and accelerated innovation
    b. Develop marketing materials for the Lighthouse programmes – presentations and draft wording for press releases etc
    c. Develop brand identity – logo and colours etc.
- Lead on events planning in order to maximise our impact, focusing on the pre-defined key events agreed by the Board of Coordinators.
- Feed back to EIP, Commission and SCIS our experience of attending events.

Data Management Task Group
- Collect and disseminate Privacy Impact Assessments
- Organise cross-SCC workshops on GDPR
- Host data science workshops to share learning on the use cases for data
- Collect and examine data management plans to provide recommendations
- Share the main insights about the various use cases developed in each project and develop 1 or 2 joint use cases.