RUGGEDISED
Designing smart,
resilient cities for all

EUROPEAN COMMISSION
Horizon 2020
H2020-SCC-2016
GA No. 731198

Deliverable No.	RUGGEDISED D6.5	
Deliverable Title	Plans for integrating innovation platforms into local innovation processes	
Dissemination level	Public (PU)	
Lead participant	RISE	
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Status	Final	

H2020-SCC-2016 – Grant Agreement number 731198 - RUGGEDISED

Acknowledgement:

The authors would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

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Executive summary

This report is a compilation of plans from each Lighthouse City on how Urban Innovation Platforms (UIP) should be integrated into the local innovations system in each city. The plans will demonstrate how each of the local Urban Innovation Platforms will be sustained after the project. The report begins with summaries of identified critical conditions for each lighthouse city and the result of the scenario analysis for each city. The next part presents a generic model for how to establish an Urban Innovation Platform.

Through this report, we refer to report 6.1 which describes the establishment as collaborative innovative networks as the key to upscaling and diffusion. Such networks can have different degrees of heterogeneity. Report 6.1 also put attention to the positive correlation between heterogeneity and the capability to innovate. On the other hand, a certain degree of homogeneity seems to help the diffusion of innovation through peer-to-peer networks from different perspectives and described it as a tension between creative versus adaptive learning or a tension between innovation and replication.

The further work with WP 6, which ultimately will end up with conclusions and recommendations for how to set up innovation platforms for innovative cities, will focus on these tensions and explore how each Lighthouse City will handle these tensions and develop UIP that support innovations as well as upscaling and replications.

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Figures

1. Three strategies for establishing urban innovation platforms

Urban Innovation Platforms (UIP) could take many shapes, fulfil several roles, and be more and less embedded in a municipality's ordinary organisation. They often harbour one or several Collaborative Innovative Networks (CoIN). In RUGGEDISED, we explore how UIPs could be a tool for upscaling, replication, and diffusion of smart solutions such as the ones implemented in WP2, WP3 and WP4 of the project. There is a tension between innovation and replication. The tension could take different shapes depending on which kind of innovation is upscaled and could be handled in different ways. This is further described in 6.1. p 18ff. The analysis of different UIPs in Europe with focus on their potential to support upscaling shows that successful roll-out, expansion, or replication depend on successful learning processes within CoINs tied to the Urban Innovation Platform. Therefore, the success of RUGGEDISED in the lighthouse depends on the establishment of CoINs, which support learning processes between actors in each city and between cities. Knowledge brokers play an important role initiating and governing these professional learning processes, which can be supported by different strategies within an UIP. Furthermore, multi-stakeholder partnerships in UIP must be built on shared ownership, focusing on facilitating progress.

1.1   A model for mapping different strategies

In Report 6.1, we listed five types of platforms: Global/national platforms, the Network platform, the Supportive/Financing platform, the Collaborative & Strategic platform, and the Co-creation platform. We also gave suggestions for what kind of platform each city seems to strive for. Each Lighthouse City has proposed different strategies for developing UIP that suit their local needs. Each strategy will result in structures probably with both similarities and differences to those five types of platforms listed in report 6.1. This overlap gives an opportunity to compare and describe critical conditions for governance and organisation of innovation platforms with the aim of supporting upscaling and diffusion.

Glasgow has chosen to establish a single governmental structure: Sustainable Glasgow, which will function as a collaborative and strategic platform (see table 1, p. 11 in deliverable 6.1. for definitions and descriptions of different forms of Urban Innovation Platforms) working innovatively with sustainable urban development, e.g. supporting upscaling and further development of smart solutions developed within RUGGEDISED. Sustainable Glasgow will gather actors from several sectors: business, education, housing etc.

Rotterdam will build upon existing structures but add on an arena or network with a specific focus on internal collaboration between city departments. The UIP developed within RUGGEDISED will therefore have an internal focus. During the spring of 2020, three workshops were planned. They were cancelled because of the covid-19 situation, The aim were to bring people from different department in the City of Rotterdam together and begin the work of establishing a local networking platform, that could both expand to a collaborative and strategic platform, and collaborate with such platforms that already exists in Rotterdam (see table 1, p. 11, deliverable 6.1)

Umeå has obtained national funding for establishing a new, city wide innovation platform labelled Social Progress Innovation Sweden, which will be an organisational arena for upscaling and

dissemination of the results from RUGGEDISED. This has been made possible thanks to an unique and tailor-made initiative from the Swedish national innovation agency Vinnova.

In report 6.1, we also argued that *professional learning* should be seen as the starting point for innovations. Professional learning is a cyclic movement between two forms of learning: creative or developmental learning versus adaptive learning (Ellström 2001). Developmental learning is in the focus for any innovative process. But if we strive for upscaling, we must perform adaptive learning. The Urban Innovation Platforms established within RUGGEDISED should support upscaling and dissemination of the smart technical solutions tested in Glasgow, Rotterdam or Umeå. This means that adaptive learning must be the focus.

However, innovative smart solutions could seldom be replicated. In reality, innovative solutions often need to be transformed and adjusted in order to fit in existing large-scale systems. Upscaling is dependent on practice-based innovations, were. This is illustrated in figure 1.
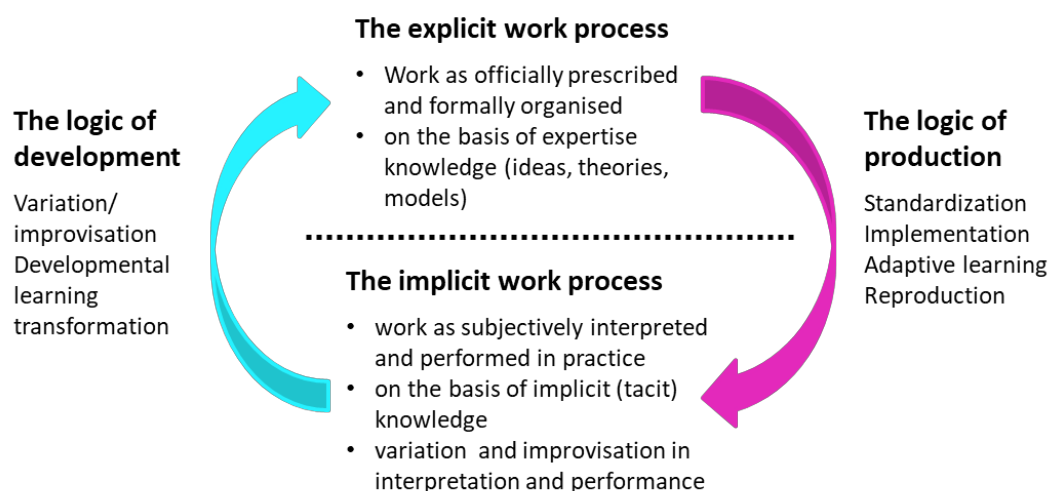
Figure 1: Practice-based innovation as a cyclical process of learning, from Ellström, P. E. (2010). Practice-based innovation: a learning perspective. *Journal of Workplace Learning 22 (1-2)*, 27-40.

The results from the technical test of the solutions – and the solutions itself, e.g. the urban data platforms – are described as models and ideas, in texts, pictures and presentation (explicit processes). But upscaling is to a large extent dependent on the use of the new ideas in day-to-day practices. The innovative solutions must be a natural part of existing implicit work processes e.g. among policymakers, urban developers, constructers and everyone else who work with developing and managing urban infrastructures and urban areas. The core of the Urban Innovation Platforms developed within RUGGEDISED is to support this cyclical process of practise-based innovative learning. The current state for each platform are described below in the part 3 of the report. In the next section, we will describe the strategy of each Light House City in relation to the model in figure 1.

2. Strategies for establishing Urban Innovation Platforms in Glasgow, Rotterdam and Umeå

This section presents how each of the Lighthouse Cities prefer to adapt the proposed UIP to their local needs. The aim is to formulate a starting point for the further work of the establishment of UIP in Umeå, Rotterdam, and Glasgow based on the needs each city identifies. Each city has chosen a different strategy based on both local and national conditions. Each platform initiates and support one or several CoINs, but with different stakeholders.

2.1.   Glasgow: establishing a governance structure.

The chosen strategy for upscaling of the smart solutions in Glasgow, is to build upon and use established structures for sustainable innovation and policy development. This model was described in the report 6.1 (Initial findings from the establishment of Innovation Platforms). The Urban Innovation platform linked to RUGGEDISED would be a part of the council-led initiative Sustainable Glasgow. The figure 2 below illustrates the proposed organisation.

The partnership Sustainable Glasgow was formed ten years ago, as a way of supporting the city's strategic goal to be a world-leading centre for sustainable policy and innovation. Initially, the focus for sustainable Glasgow was to reduce greenhouse gas emissions, but the scope has been broadened over the year to a broader portfolio of policy interests, such as sustainable mobility, sustainable growth and climate change adaptation, energy efficiency and new energy systems, re-cycling and waste. Another important role for the Board is to support the development of circular economy and green economic growth in Glasgow. This process could be achieved through the creation of a Green Glasgow Fund to support sustainability initiatives in the city

Resilient Glasgow is another process that is linked to Sustainable Glasgow in April 2014. Glasgow was named as one of the first 32 members of the Rockefeller Foundation's 100 Resilient Cities (100RC) Network (a $100million initiative). Through the membership, Glasgow is developing a resilience strategy that will act as a roadmap to greater resilience, as we look further into the 21st century. The strategy is being developed with reference to the four essential dimensions of urban resilience: health and wellbeing, economy and society, infrastructure and environment, and leadership and strategy.

The partnership could be described as a "switchboard" that both coordinate and initiate different initiatives and developmental projects and processes related to sustainable development in the Glasgow area. To ensure a strong political commitment, the partnership has been hosted by the Council. The Council leader chairs the Board. So far, the Board functions as an important arena for strategic discussions and knowledge exchange. There is a general expressed ambition to make better use of members' influence and resources and to ensure that they move towards working on specific recommendations to improve sustainability in the city with the assistance of those members. In order to do this, Board members should be senior representatives of their organisations, with decision-making authority, and should aim to attend all meetings in person. In this role, the Board would also be an important actor in processes of upscaling smart solutions developed

The analysis of enablers and barriers presented in deliverable 6.3 highlighted that the many technical solutions tested in RUGGEDISED were both relatively mature technically and well understood by actors in the local innovation system. The main barriers were on structural level, both as material structures, like established systems for energy distribution, as well as institutional structures, like legislation and lack of coordination. New forms of community planning seem to be one key feature for successful upscaling of smart solutions developed in the framework of RUGGEDISED. Here, Sustainable Glasgow could play an important role. An increased use of sustainable design thinking in planning and urban development could support urban transition in community planning and development. A way to do this is to identify key city-wide issues and challenges, against which 'Expert Commissions' groups should be assigned and become responsible for devising recommendations. This structure is illustrated in figure 2 below, were the "T &FG" are the 'Expert Commissions".
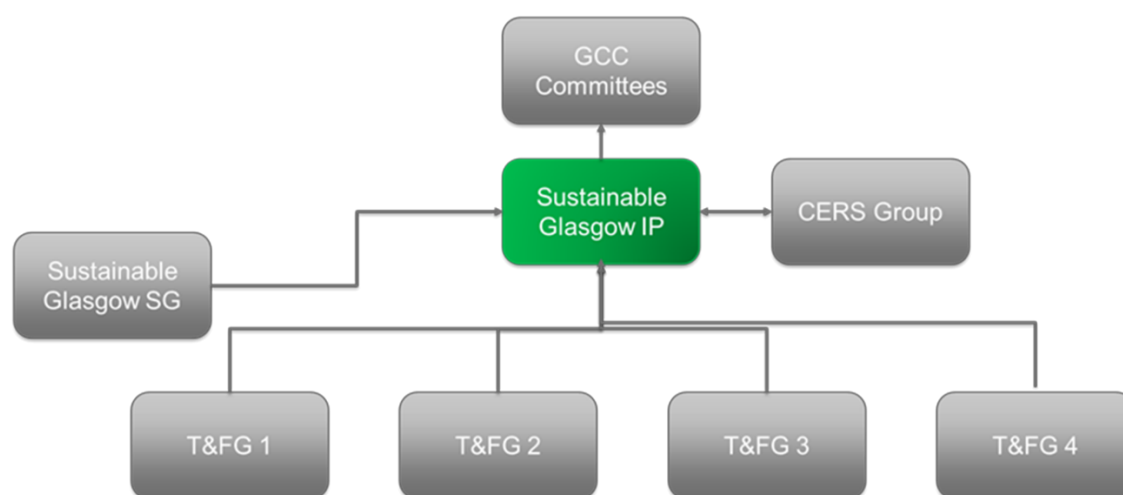
Figure 2: The organisational structure for Sustainable Glasgow

The Sustainable Glasgow Board comprises of partners from both private and public sector responsible for health, mobility and affordable housing: NHS Greater Glasgow & Clyde, Strathclyde Partnership for Transport and Glasgow Housing Association; partners from the educational sector, both Further and Higher Education as well as Skill Development Scotland, and the business sector; Glasgow Chamber of Commerce and Scottish Enterprise. The political level is represented by Glasgow City Council and Scottish Government. Together, those partners have capabilities to support upscaling and dissemination of the smart solutions developed within RUGGEDISED. However, each of the existing partners of Sustainable Glasgow will need to understand and accept their new role within the new structure. This will require more input than has been previously expected from these organisations and they will need to evaluate whether their inclusion in designing innovations for the city is worth the potential resource implications

The partnership is also expected to identify opportunities for larger projects and coordinate applications. The first meeting of the year will be used to determine the year's priorities. For each priority, the Board appoints a person responsible for managing and reporting during the year. The work itself is carried out in a so-called "Task and finish group" (T & FG) which is an expert group. A fictitious example of decision making may be that the Board wishes to prioritise work on

sustainable mobility. The representative is appointed as the representative of Strathclyde Partnership For Transport (which is one of the members of the partnership) who in turn establishes a "task & finish group" to work on the issue during the financial year. How that work is financed varies from case to case and is governed by the size and purpose of the assignment. The expert groups will work quickly and are expected to submit a report with recommendations within six months after they are started. The recommendations can range from concrete actions to policy proposals. The implementation of the proposals is discussed by the Board. An application (or draft of an application) for a larger project can also be a possible delivery from a T&FG. The partnership thus becomes both a place for continuously discussing aspects of sustainable urban development and at the same time a structure for quickly being able to gather power around specific issues by creating temporary expert groups. Figure 3 below presents a model for how Sustainable Glasgow could organise and support processes of upscaling of the smart solutions developed in RUGGEDISED. The model could also function as a generic model for upscaling and dissemination of other innovations.

The explicit work process in RUGGEDISED

- New district heat offerings
- RES + battery storage + Grid services
- EV charging + E-mobility services
- DSM + Grid services
- Data-based decision platforms

The logic of development

Lessons learned from attempt to implement new solutions presented in reports from 'Expert Commissions.

Sustainable Glasgow are the main arena for learning and knowledge exchange, which in turn will evolve to explicit policy recommendations

Implicit work processes were new solutions are tried in practice

- Test run by 'Expert Commissions' groups based on the specific issues comprised of members identified as key-stakeholders for upscaling

The logic of production

From innovation to standard through implementation of smart solutions Adaptive learning among key stakeholders and reproduction of smart innovations.

Organised by Sustainable Glasgow.

Figure 3: A structure for upscaling through practice-based innovation in Glasgow

The explicit work-processes in this case are all lessons learned combined with the measured and collected data from the tests of the five clusters of RUGGEDISED solutions. But, as discussed in the introduction and in report 6.1: innovation and dissemination (upscaling) are two different processes. Dissemination and upscaling are driven by replication and adaptive learning. Here, Sustainable Glasgow could support both forms of learning. The Expert groups (T & FG) has the potential to be the arenas for creative learning (the left arrow). Lessons learned will be returned to the Board, were it could be discussed and further distributed to the participating organisations. However, when new ways of working will be implemented among the members, new process of innovative and implicit learning will likely occur. The figure above helps us to remind that innovation could take place everywhere, not just within an expert group or a developmental project.

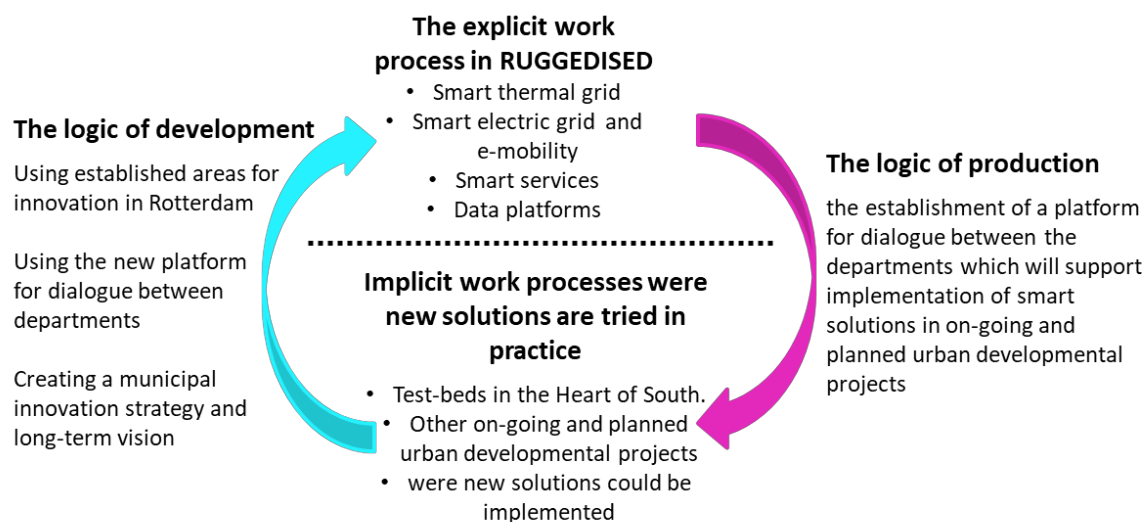## 2.2. Rotterdam: establishing an internal network platform

In Rotterdam, there are several arenas where groups and individuals share information and develop smart solutions, testbeds, and demonstrations for innovations. However, because the city lacks an overall strategy, these innovations are hard to diffuse and upscale. Interviews with

stakeholders identified a need for UIP or CoIN that support organisational learning on a city level. A first step would be the establishment of a network platform a local network platform (see table 1, p. 11 in deliverable 6.1) within the city's administration that helps share lessons learned and could be used for coordinating different initiatives. It is difficult to get an overview over all activities and tests that take place within Rotterdam, because of the size of the city because of the multiplicity of ongoing innovation project. On top of that there is a constant flow of initiatives from external stakeholders, like private companies. An arena for internal dialogue, organised as a local network platform, could create opportunities for better coordination and communication between different parts of the city administration.

Such platforms should be an arena for mutual coaching and motivation. It should also facilitate alignment of ideas, projects, and activities across departments/segments. The platform should also support replicating and upscaling innovations that need broad city support. An innovation platform may benefit if it 'stays focused' and 'on target'. One suggestion is that this platform should be limited to one topic or theme such as the Energy Transition as a first step.

The smart solutions developed in RUGGEDISED are based on a specific geographical place in Rotterdam; the Heart of South. Upscaling depends on the ability to distribute those solutions to other geographical places in the City, which partly is dependent on a on-going adaptation of infrastructure and new way of working. An important function for the network of city administrators is therefore further standardisation of tools and procedures for shaping experiments (e.g., procurements and legal issues). Hence, the local network platform should primarily be a 'club of civil servants' that together are in a position to orchestrate innovation. One argument is that there is a need for meeting points were employees from the city could discuss open and frankly about hindrance for upscaling smart solutions, and together find ways to handle them.

The logic of development

Using established areas for innovation in Rotterdam

Using the new platform for dialogue between departments

Creating a municipal innovation strategy and long-term vision

The explicit work process in RUGGEDISED
- Smart thermal grid
- Smart electric grid and e-mobility
- Smart services
- Data platforms

Implicit work processes were new solutions are tried in practice
- Test-beds in the Heart of South.
- Other on-going and planned urban developmental projects
- were new solutions could be implemented

The logic of production

the establishment of a platform for dialogue between the departments which will support implementation of smart solutions in on-going and planned urban developmental projects

Figure 4: A structure for upscaling through practice-based innovation in Rotterdam

The organisational structure established in Glasgow is less suitable for Rotterdam, primarily due to the lack of a city-wide strategy for innovation. The situation in Rotterdam could rather be understood as an upside-down version of figure 2, with several parallel expert-groups who work with external partners. What is needed is a better horizontal connection between these ongoing projects, and an efficient process for connecting new initiatives. From the interviewees with the

stakeholders and the discussions with the project team for RUGGEDISED in Rotterdam, we have learned that they prefer a bottom-up process, were the final organisation of the local network platform should evolve from the needs among employees within the city.

In order to bridge the gap between different municipal entities and facilitating collaboration between the units, the RUGGEDISED project team in Rotterdam will organise series of workshops to move towards new ways of governing. The starting point is the selection of barriers identified in D6.3. These are the barriers that a broad group of stakeholders identified during one of our workshops in Rotterdam. Those barriers are reformulated and grouped into three/four "challenge areas" within the broader area of sustainability transitions: mobility, energy, digitalisation, other. The participants will have the chance to update the list during the first workshop. Three or four workshops are planned where we use the four challenge groups as a case for a collaboration exercise. During the workshops, the participants will create a joint understanding of what their respective roles are in solving these challenges (e.g. partner, supervisor, provider, regulator), generate ideas on how to work together to solve them (e.g. through different collaboration forms), explore what the critical conditions for a successful collaboration are (Gap analysis) and discuss how to ensure continuity (e.g. through milestones, follow ups and roadmaps)

The first workshop will focus on understanding the challenges, different roles in solving them, and get a better understanding of how different departments from the city could collaborate in order to meet those challenges and overcome barriers for collaborative innovation. The second workshop will focus on potential solutions, exploring different collaboration forms and understanding how they may apply to each challenge. The theme for the third workshop will be critical conditions and barriers for collaboration. The previous workshops lead to a shared understanding and identified potentials for collaboration, which could then be used during the third workshop. Depending on how far we reach during the third workshop, a fourth workshop may be held after the summer of 2020 were a road map for the establishment of a network platform will be formulated. Because of the covid-19 situation, this will be delayed to the fall of 2020 or spring of 2021.

2.3. Umeå – establishing a local platform as part of a national network

In recent years, several innovation processes have been initiated by the municipality of Umeå in cooperation with national and international players. These processes need to be coordinated to create synergies, support upscaling and implementation with the long-term goal of establishing an internationally competitive local innovation system in the long term. This local innovation system, in turn, is an important part of the regional innovation system that is growing ever stronger in northern Sweden. The strategic goal of Umeå Municipality is to grow socially, ecologically, economically and culturally sustainable to 200,000 inhabitants by 2050. To achieve this, new innovative methods and the working method need to be developed and applied.

During the fall of 2019, Umeå were invited by the Swedish national innovation agency – Vinnova – to apply for the establishment of an innovation platform. The invitation was partly a result of the work with RUGGEDISED. The focus of Umeås innovation platform is to establish a strong and sustainable cross-sectoral organisation, which can coordinate ongoing innovation processes, initiate new processes that build on or supplement the processes that exist and serve as a benchmark for new initiatives. The municipality has a leading role in Urban Innovation Platform, "SPIS" –Social Progress Innovation Sweden. An important task for Umeå is to develop and refine
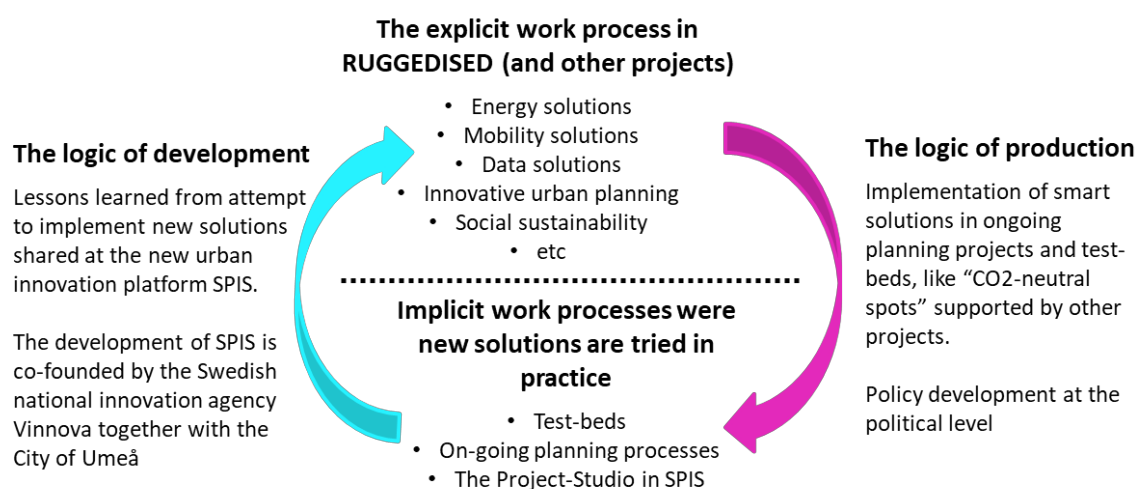
strategic processes and working methods to strengthen the municipality's work with innovation and change. The overarching goal is to create an internal culture of continuous learning and reflection.

The ability of public actors to work innovatively requires the ability to collaborate within their own organisation to meet external parties and work innovatively together. SPIS will work systematically to develop this. In a first step, collaboration will be strengthened between the Social Building and the Social administrations (including integration, labour market, culture, etc.). The goal is to become better at incorporating social perspectives, the "soft issues" into various planning and development processes. In the next step, the forms of collaboration will be developed with business, academia and research institutes as well as with civil society, including through new arenas for dialogue with citizens and civil society organisations.

In these processes, leadership is central, especially a leadership that builds bridges between different parts of Umeå, which requires understanding an issue from the perspectives of different groups. However, this is not enough if you want to increase innovation capacity. It requires managers who could interpret and translate different actors' ways of describing and working with different challenges. Managers who master that ability can help different groups understand each other, which in turn is a prerequisite for collaboration and innovation. Learning at the organisational is crucial for long-term change, dissemination and upscaling of smart solutions. This is achieved through the establishment of new routines and working methods, as well as through clear leadership.

On an overall level, it is easy to agree on the need for innovation. In order to continuously challenge the habits and ensure innovations that create values and have an impact in the public debate, the municipality will cooperate with RISE. Through the working method "prototyping the future", three prototypes will be implemented in Umeå, which meets the municipality's goals. A prototype links different, and sometimes opposing, interests to something more stable. One goal of this is to create clarity for the residents what considerations are needed to achieve social sustainability, and / or climate neutrality. Based on previous prototype experiences, we will, within the framework of SPIS, create a more spatially comprehensive and experience-based lab for the intelligent and sustainable cities of the future.

The explicit work process in RUGGEDISED (and other projects)

- Energy solutions
- Mobility solutions
- Data solutions
- Innovative urban planning
- Social sustainability
- etc

The logic of development

Lessons learned from attempt to implement new solutions shared at the new urban innovation platform SPIS.

The development of SPIS is co-founded by the Swedish national innovation agency Vinnova together with the City of Umeå

Implicit work processes were new solutions are tried in practice

- Test-beds
- On-going planning processes
- The Project-Studio in SPIS

The logic of production

Implementation of smart solutions in ongoing planning projects and test-beds, like "CO2-neutral spots" supported by other projects.

Policy development at the political level

Figure 5: A structure for upscaling through practice-based innovation in Umeå

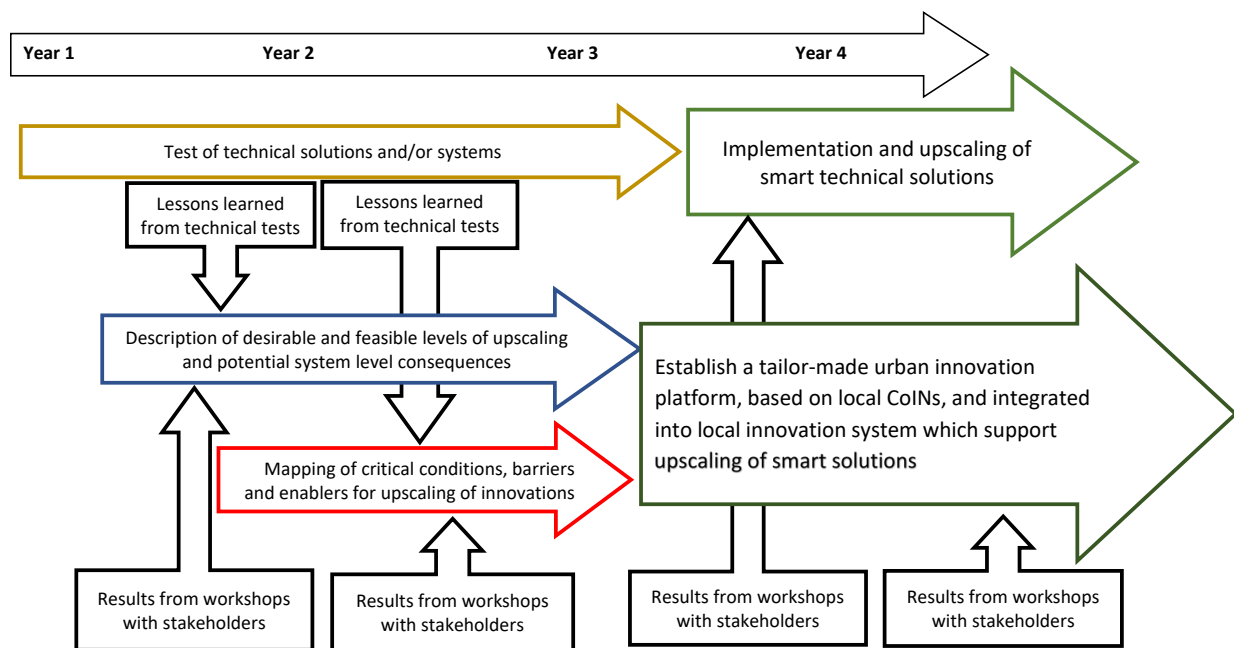# 3. How to establish urban innovation platforms

The three Light House Cities that participate in RUGGEDISED have chosen three different strategies, depending on local and national circumstances. During the final phase of RUGGEDISED, we will begin the evaluation of the pros and cons of each strategy in relation to the potential of supporting upscaling of smart solutions. So far, we could describe a generic path for the establishment of an urban innovation platform with the aim of supporting upscaling of smart technical solutions.

3.1. A generic model for establishment of urban innovation platform for upscaling

The aim with task 6. 1 is establishment of Urban Innovation Platforms, within which the other tasks in WP 6 will be carried out (p 59 of the RUGGEDISED project summary). The establishment is dependent on support and commitment from key participants in each LHC. There is also a need of develop a (or maybe several) model(s) which describe the establishment of UIPs. The contemporary research and existing models (see table 1 in D 6.1.) describes already established platforms, were it is possible to draw conclusions from existing organisational structures and/or way of workings. Here, our ambition is to catch and illustrate a process of establishment of a new form of structure and/or ways of working in an municipality.

Figure 6 presents a generic model for the establishment of an urban innovation platform with the specific purpose of supporting upscaling of smart technical solutions. The model is based on the lessons learned from work package 6 so far. The model illustrates necessary processes and steps that have to be taken if another city would like to repeat the processes carried out in RUGGEDISED. The establishment holds two main processes which intervene with each other. One group stem from the test of technical solutions, described with the two longer arrows in the upper part of the figure. This describe the process were smart technical solutions are developed and tested. The results and lessons learned are then fed in to two parallel processes: the description of feasible levels of upscaling and potential system consequences and the mapping of critical conditions, barriers and enablers for upscaling. These two processes are carried out through data collecting and workshops with stakeholders.

Figure 6 should be read in relation to figure 4 in report D 6.1 (page 18) which describe the three levels of learning in an organisation: individual, groups and organisations. During technical test, learning take place among individuals and groups, which is described with the horizontal arrows from the boxes "Lessons learned from technical tests".

Figure 6: A generic model for the establishment of an urban innovation platform that supports upscaling of smart technical solutions

But, as demonstrated in the figure 4 in D. 6.1: upscaling is also dependent on learning at organizational level which manifests through the establishment of new routines, standards, rules and procedures. This is illustrated in the lower arrows in the figure, which describes the process were participants from technical tests learn what hinders the dissemination of smart technical solutions and what need to be done in order to overcome those obstacles. The broad arrow to the right illustrate the establishment of a Collaborative Innovative Network (COiN), which is the first step in the establishment of an Urban Innovation Platform. This is described I detail in D. 6.1, (p. 9), with references to Torfing 2016.

The first part of the process would normally take between two to two-and a half year, depending on local circumstances and which solutions are tested. The next part is two-fold. One part is the establishment of a local urban innovation platform, based on the descriptions of desirable and feasible levels of upscaling and the mapping of the critical conditions (the broader lower arrow in the figure). The innovation platform will in turn support the second part – the upscaling of one or several of the solutions (the upper thinner arrow in the figure). This process should start after two or two and a half year and would take at least one-and a half year to fulfil. After that, the basic structure of an urban innovation platform should be in place. Here, workshops with stakeholders are crucial for working out the details and develop an organisation that fits local needs and circumstances.

The workshops are the arena were the explicit processes, e.g. technical results from tests and/or policy recommendations meet established communities of practise and practitioners' experiences of "what works". What figure 1 reminds us, is how crucial the combination of adaptive learning and developmental learning are for successful upscaling. Upscaling presumes translations, because lessons learned from a test cannot just be deployed without adaptation. It must be adjusted, transferred and translated. The role of workshops is to support those forms of

translations, through the meetings between technical data and personal experience.

Figure 6 illustrates how upscaling is a process in two steps, were step two is crucial if we want to make sure that the results from experiments and test during step one, will be implemented and in the end become the norm and standard. But figure 1 also remind us that upscaling is an on-going process – a loop was the work of implementation results new lessons learned, that needs to be taken into account, if we want to proceed processes of urban transformations. Sustainable urban development is a never-ending story.

All three urban innovation platforms are now in step two in figure 6. The prototypes have been tried out in all three cities and results have been presented in other reports. What is left is the process of establish urban innovation platforms in Glasgow, Rotterdam and Umeå. Report 6.1. presented some suggestions and proposals. Here follows a short list of recommendations, which also are illustrated in figure 3 (Glasgow), figure 4 (Rotterdam) and figure 5 (Umeå)

- **Glasgow**

The urban innovation platform of Glasgow gathers both municipal and regional stakeholders. The mix of stakeholders make ways for and facilities processes of transformations that are dependent on investment in housing and infrastructure, like public transport. The platform *Sustainable Glasgow* then becomes an arena for strategic discussions and decisions that could be implemented – the right arrow in figure 1. The structure with *Task and Finish Groups* then become a useful way to support development learning and the feed-back loop that is illustrated with the left arrow in figure 1.

The main recommendation is to be continuing the work that has been initiated within Sustainable Glasgow, but with following additional processes:

1) Establish a routine for the feed-back loop from different T & FGs that are based in figure 1.

2) Make sure that results from implicit work process are documented and collected. It is not unusual that experiences from implicit work-processes are expressed as critic and counterargument to new ideas. Be aware of the conservatism and resistance to change also could bear a seed of implicit knowledge base don previous experiences. Here, dialogue is central in order to get a better understanding of which arguments are worth listen to, and which need to be overcome.

3) Six months may be too short for a T & FG-group to really have time for dialogues which maps and understand implicit work processes. Therefore, the time and resources that are allocated to different T & FGs groups should be based on the complexity of the specific task a certain group should work with.

- **Rotterdam**

The City of Rotterdam has already several well-established arenas for innovations. What is still

needed is an arena specific for supporting internal collaborative innovation within and between city departments. These platforms should focus on explore, mapping and discuss the experiences and lessons learned from internal work-processes. One challenges with the well-established network of innovation arenas is that those who works at city departments from time to time becomes overwhelmed of initiatives and projects, which has been started at one or several innovation arenas. There is therefore a need of coordination and prioritisation of initiatives and ideas.

The main recommendation is therefore as follows:

1) Establish an internal arena that will initiate, support and facilitate dialogue and collaborations between city departments.

2) Use this platform for on-going adjusting and discussion about strategic issues. The internal platform could function as a "board" – similar as the board of Sustainable Glasgow – were representatives form city departments could discuss and/or give recommendations of strategic choses. Such board would not of course replace political governance structures, but function as a board of experts that could work with "professional governance" of the development of Rotterdam.

3) An urban innovation arena with a specific internal focus could also be responsible for professional training. Successful upscaling is dependent on professional learning, but such learning must be organised according to figure 1, based on the meeting between implicit and explicit knowledge.

- **Umeå**

Umeå is a much smaller municipality compared to Glasgow and Rotterdam, which affects the choice of strategy. Umeå also has the opportunity to obtain national funding for the establishment of a municipality-based innovation platform: Social Progress Innovation Sweden. This platform will begin as an internal platform, like the one in Rotterdam, but will probably also involve municipality-based companies, like those responsible for public transport in the city or energy production, similar to the organisation of Sustainable Glasgow. In parallel with RUGGEDISED, several other initiatives are up and running, and, like the situation in Rotterdam, there is a need for coordination. Umeå will therefore developed capabilities in the established urban innovation platform that will support upscaling of smart solutions in a way that create synergise with other initiatives. The main recommendations are therefore as follows:

1) Use the opportunities from the national funding to establish an urban innovation platform that could support upscaling of smart solutions together with other activities.

2) Use the platform to coordinate implicit and explicit work processes

3) Make sure that the platform has support and acceptance in the municipal departments.

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