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Smart Cities Guidance Package:
implementation, scaling up and replicability of smart city projects

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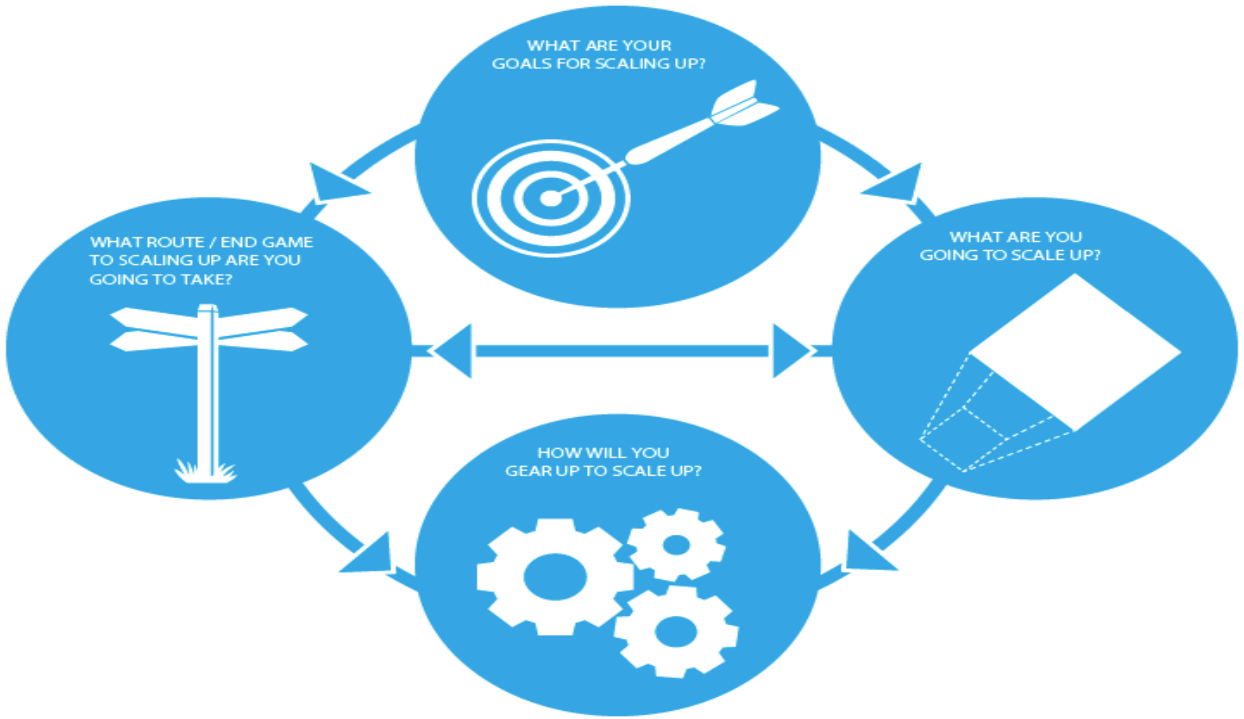
Nordic Edge
Smart City Transformation Pathways

Smart City Guidance Package (SCGP)

- Initiative: ‘From Planning and Implementation to Scaling up of Smart City Projects’
- The goal of this initiative is to co-create a **Smart City Guidance Package (SCGP)**
  - Support and guidance
  - Bundling of experiences
  - Learning and sharing
  - Evaluation and KPIs
  - Replication and Upscaling



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What has been done so far?

- Bundling of experiences, obstacles, and best practices in a draft Smart City Guidance Package (SCGP), focusing on implementation and replication
- About 15 cities and several EU Smart City FP 7 projects committed (La Spezia, San Sebastian, Scottish Smart Cities, CELSIUS, TRANSFORM)
  - Several cities and projects contacted and interviewed - additional cities and projects to be included in next version
  - 17 additional medium-sized Smart Cities are involved, funded by ERANET and JPI Urban Europe
- Several workshops and webinars have been organized in 2016 and 2017
  - within the context of the EIP SCC, REMOURBAN study tour, JPI Urban Europe and network Norwegian Smart Cities
- Desk research on implementation phases, obstacles and solutions
- Collaboration with “Tools for Decision Making, Management, and Benchmarking” (Bernard Gindroz) and “Scaling up & Replication of Smart City Plans” (Margit Noll and Johannes Riegler)

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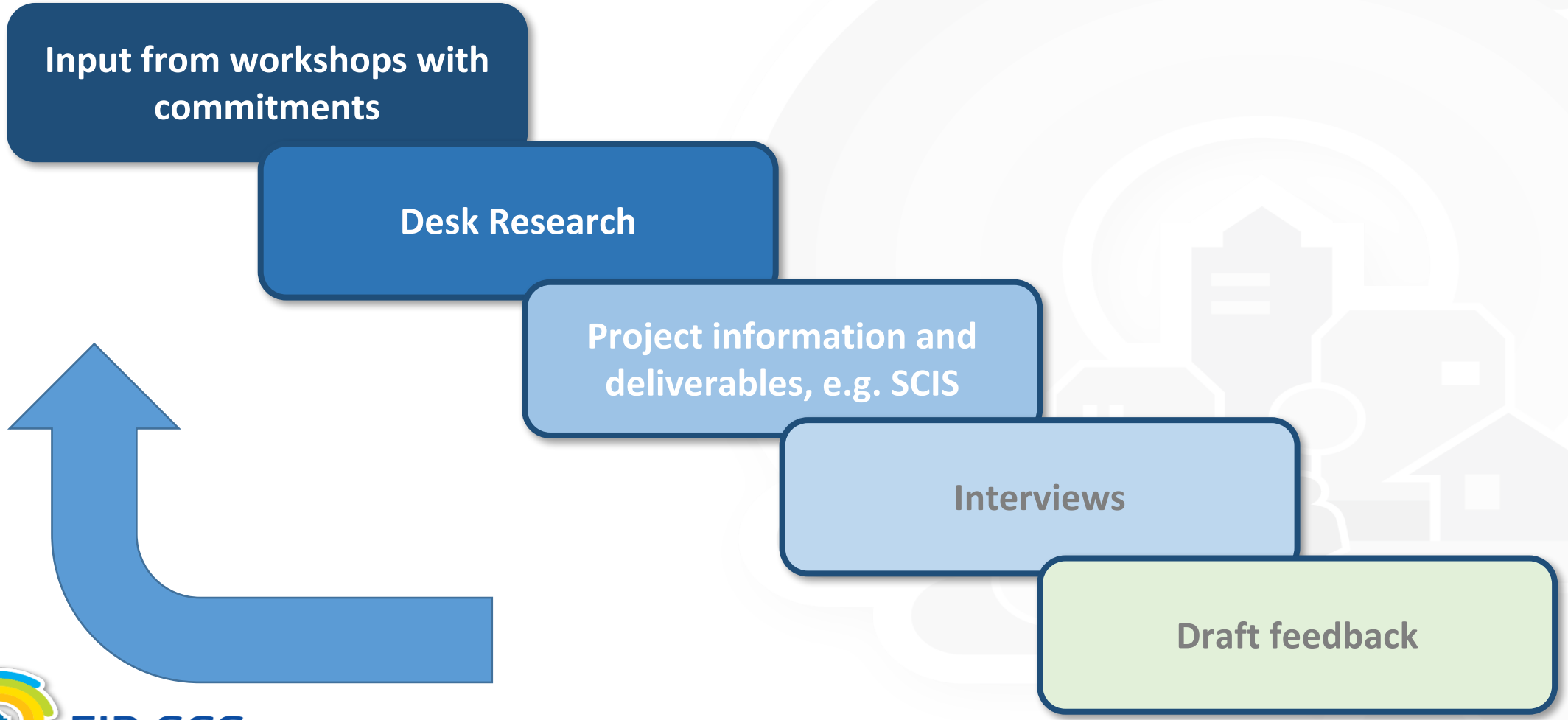
Methodology



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Smart City Guidance Package: Content

- Smart City strategies, plans, and projects
  - Smart City plans
  - Ways to develop Smart City strategies and plans
  - Phases of implementation
  - Visualisation of implementation phases
- Stakeholders, roles and networks
  - Smart City stakeholders
  - Roles of actors
- Challenges, solutions and workarounds
  - Methodology
  - Categories
- Monitoring, KPIs, and tooling
  - Monitoring
  - KPIs
  - Benchmarking
  - Standardisation development
- Replication and upscaling

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Smart City Project Plans

Scope and source of Smart City projects

- Smart city strategy
- Strategic energy action plan
- Sustainability or environmental plan
- Energy vision, energy plan
- Urban restructuring, rehabilitation
- Master plan and zoning plans for areas
- Refurbishment or renovation plan for buildings and urban infrastructures as
- Real estate project development
- Transport and mobility plan
- Lighthouse project plan
- Maintenance plan for utilities
- But also:
  - bottom-up initiatives,
  - Investment plans of private equity, pension funds and insurance companies
  - ICT plans
  - ……..

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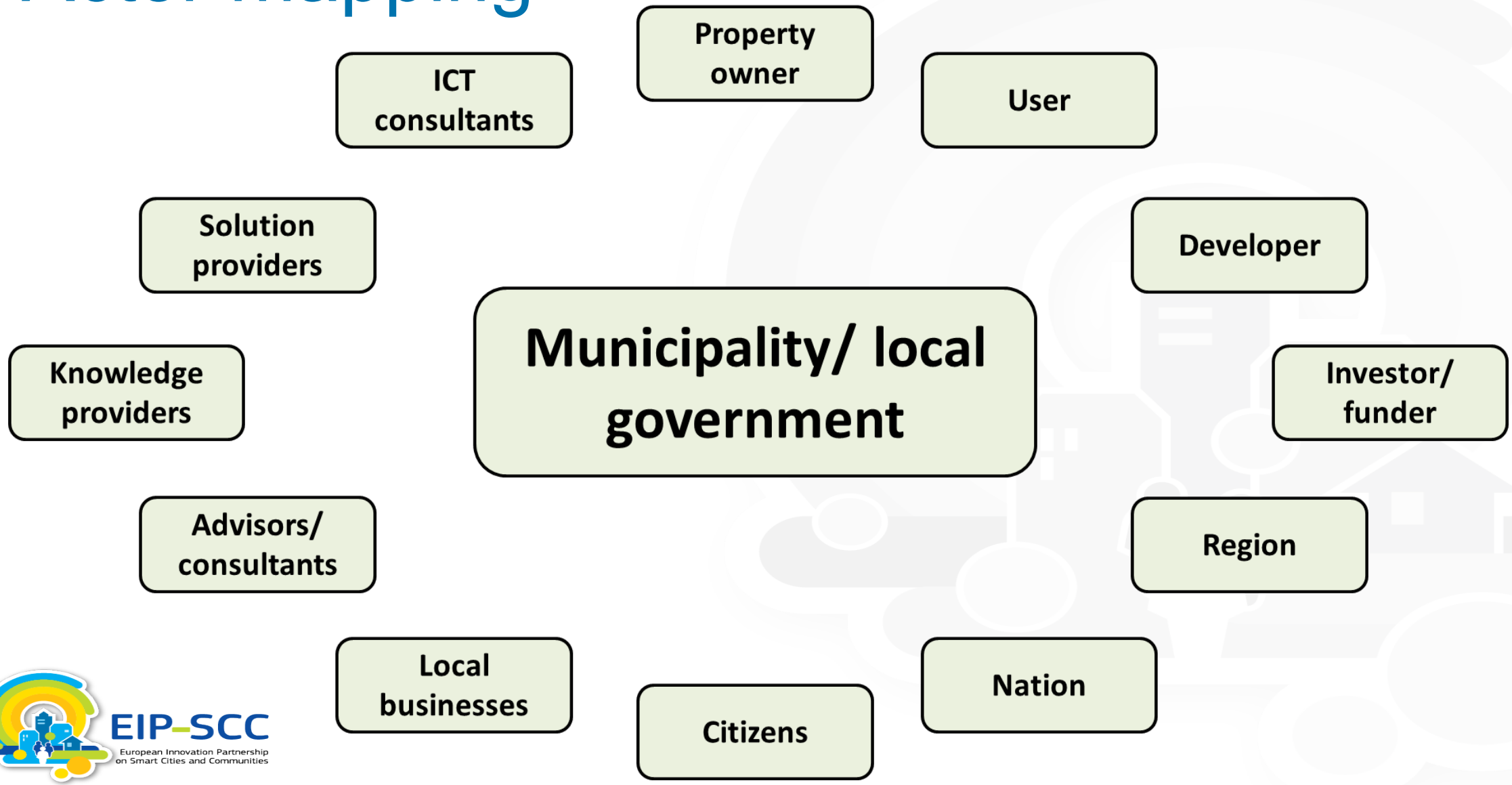
Actor mapping



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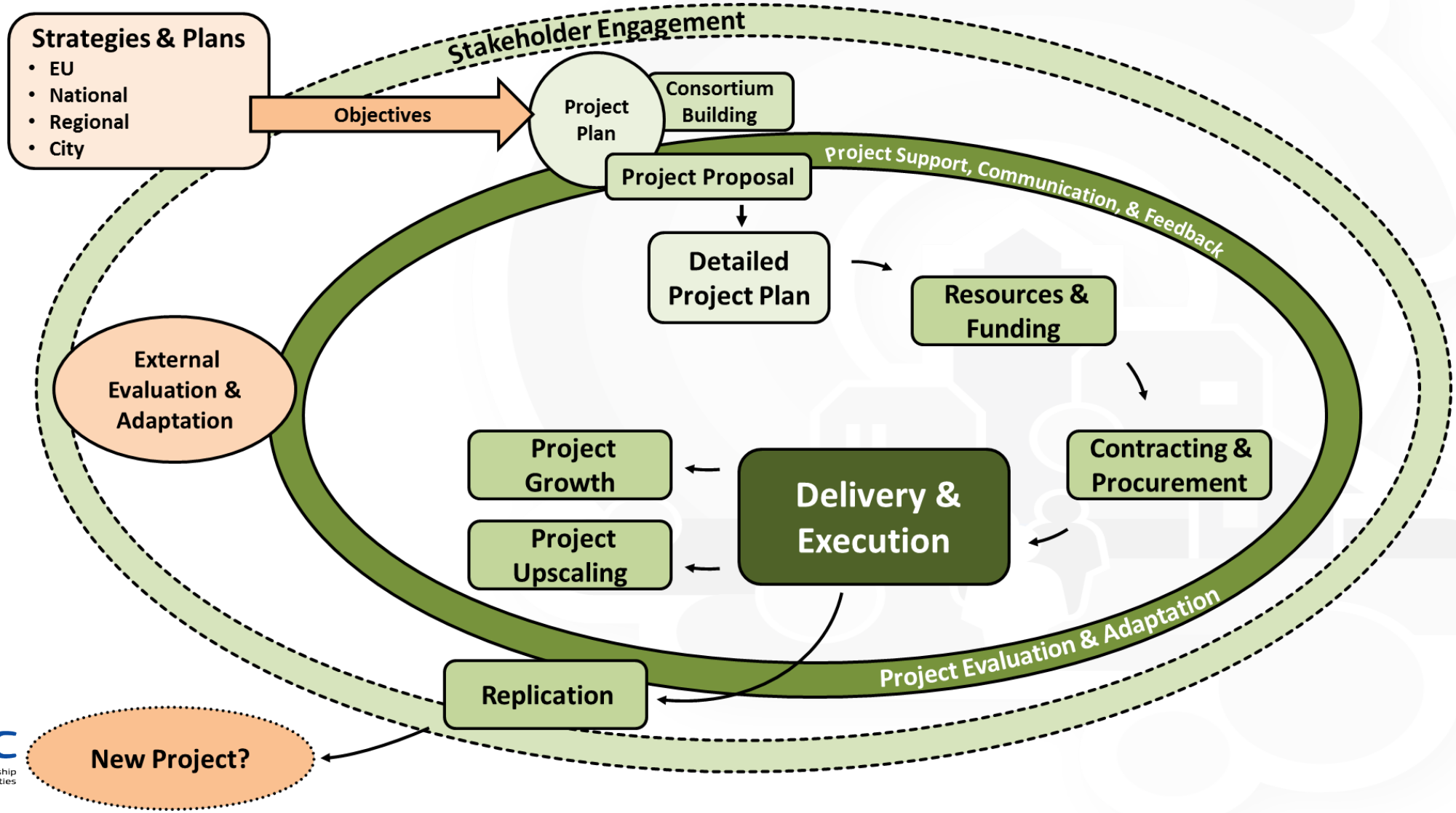
Phases in implementation



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Clustering of obstacles

- Financial
  - High initial costs & questionable profitability
  - Perception of innovative solutions as too risky
  - Lack of incentives or the existence of disincentives
  - Split incentives
- Governance and Administration
  - Silos: Lack of inter-departmental coordination and communication
  - Incompatibility with public procurement policies
  - Regulations limiting implementation
  - Legislative or political instability
  - Insufficient political will or commitment
  - Administrative conflicts and cultural differences
- Technical
  - Lack of staff capacity
  - Data privacy
  - Data availability, sharing, and interoperability
- Social
  - High investment costs and payback times
  - Lack of awareness of financing opportunities
  - Organizing collective agreement and action
  - Lack of motivation – consumer priorities, attitude, and behaviour

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Perception of innovative solutions as too risky

4.3.2 Perception of innovative solutions as too risky

SUMMARY

New or innovative solutions are unproven by definition. These potential solutions are therefore considered to carry with them a higher implicit risk, leading to apprehension from many stakeholders, including public entities, private enterprise, the public, and financial lenders.

Why a problem?

New or innovative solutions are generally unproven and unfamiliar, and often considered to incorporate more implicit risk. This risk can manifest itself in apprehension from public entities to support innovative projects, hesitation from private enterprise to get involved in projects where they lack experience, unwillingness for public consumers (end-users) to support unproven projects, and increased costs (or outright refusal) for funders to back innovative projects. Innovative processes are inherently unproven and generally do involve increased risk of failure; especially compared to the existing approach or business as usual.

Public entities have several concerns, including fear of making a bad decision with public money [1], lack of experience combined with risk-aversion [2], fears owing to lack of clear knowledge on costs and benefits [1], and the fear of unforeseen or long-term risks emerging after project conclusion, which may trigger a loss of confidence and backlash against innovative projects [2].

Private enterprise, including private partners in PPP, cite the public lack of demand and lack of internal awareness (esp. among architects and engineers) of innovative solutions [1,2].

Public consumers: The public may be reluctant to adopt, convert to, or invest in more innovative solutions due to scepticism, unfamiliarity, expectations of unpredictability, and concern over the reliability of new technologies [2–6]. They may also lack willingness to try new things, or be comfortable in their routines and unwilling to behave differently or have to learn new skills.

Financial lenders: With increasing risks come increasing costs, and an increasing difficulty to secure funding. Much of this is due to the larger uncertainty inherent to the approach, leading to difficulty in properly characterizing the financial situation within an acceptable range of certainty. Banks may be unwilling to finance innovative projects due to lack of knowledge and lack of experience" [1,2,5].

[1] A. Rivada, E. Hoyos, E. Demir, M. Aksu, A. Stacey, B. Yorston, J. Shawyer, C. Degard, P. Compere, I. Nagy, Report on non-technical barrier and legal and normative issues, Horizon 2020 Framework Programme - REMOURBAN - REgeneration MOdel for accelerating the smart URBAN transformation, 2016. www.remourban.eu/Technical-Insights/Deliverables/Reports/Downloadable-Deliverables.kl.

[2] EASEE, Identification of barriers and bottlenecks, 7th Framework Programme - EASEE: Envelope Approach to improve Sustainability and Energy efficiency in Existing multi-storey multi-owner residential buildings, 2012.

[3] HERON, Energy Efficiency Barriers in Buildings and Transport: 8 National Cases, Horizon 2020 Framework Programme - HERON: Forward-looking socio-economic research on Energy Efficiency in EU countries, 2016. heron-project.eu/index.php/publications/deliverables-list (accessed February 9, 2017).

[4] MEnS, Training Market Barriers Report, Horizon 2020 Framework Programme - MEnS - Meeting of Energy Professional Skills, 2015. www.mens-nzeb.eu/en/information/expocenter/publications/635864688505150156/ (accessed November 8, 2016).

[5] BEEM-UP, Final version of the exploitation and market deployment plan, 7th Framework Programme - BEEM-UP: Building Energy Efficiency for Massive market UPtake, 2014. www.beem-up.eu/publications.html (accessed February 7, 2017).

[6] HERON, Synthesis Report on the Outcomes of the Questionnaire Survey, Horizon 2020 Framework Programme - HERON: Forward-looking socio-economic research on Energy Efficiency in EU countries, 2016. heron-project.eu/index.php/publications/deliverables-list (accessed February 9, 2017).

Perception of innovative solutions as too risky

SOLUTION AND WORKAROUNDS

Small-scale demonstration projects and living labs can help reduce some of the stakeholder issues regarding the implementation of innovative projects. Small-scale projects can provide a low-risk way for public entities to support test-beds for innovation; raise familiarity and skill levels by involving local partners in the project; reduce apprehension by verifying and validating the project claims; and alleviate unfamiliarity through public exposure and participation.

EXAMPLE

"The art of good innovation is spreading quickly with a growing number of 'Chief Innovation Officers' in cities throughout the county. This presents a strong opportunity to unite sustainability managers and innovation officers to advance the smart cities market. For example, the Environment Department in Boston works regularly with their new Office of Urban Mechanics – a joint venture in Boston and Philadelphia to create 'innovation incubators.' The offices focus on 'fail fast' innovation where new ideas are tested quickly to enable faster learning and therefore result in more robust solutions. The city has already made progress on using technology to increase citizen participation, building energy efficiency and boosting educational outcomes" [1].

[1] E. Bent, M. Crowley, M. Nutter, C. Wheeler, Getting Smart About Smart Cities, Nutter Consulting and the Institute for Sustainable Communities (ISC) for the Urban Sustainability Directors Network (USDN), 2017. us.iscvt.org/wp-content/uploads/2017/01/Smart-Cities-RG.pdf.

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Silos

4.4 Governance and Administration

4.4.1 Silos: Lack of inter-departmental coordination and communication

SUMMARY

Smart city projects are often managed by vertically structured departments (silos) in the local government. Other project stakeholders, including local businesses, solution providers, and universities, are often siloed as well. Since no single department has the full mandate (or ability) to implement a holistically designed project, this can lead to long negotiations, and delays or postponement of implementation of the project.

Elaboration

This "policy gap occurs when ministries, public agencies, authorities, departments work in silos without co-ordination mechanisms, and roles and responsibilities are not clearly allocated across levels of government" [1].
The lack of horizontal coordination, cooperation, collaboration, or acceptance between vertical departments is a well-known issue in organizations and projects, and a common problem in the implementation of smart city projects [2–6]. During implementation of integrated strategies and plans in siloed organisations, no department generally has full mandate for achieving the targets. This can lead to long negotiations, delays or even postponement of the implementation of the project.
Siloed organizational structures can involve many issues that complicate the implementation process: information islands, the lack of an overall strategic vision, task fragmentation, and overlapping or blurred responsibilities. All of these can be a direct result of a lack of coordination and communication between departments.

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[1] OECD, Water Governance in Cities, Organisation for Economic Co-operation and Development (OECD), Paris, France, 2016. www.oecd-ilibrary.org/governance/water-governance-in-cities_9789264251090-en (accessed March 19, 2017).

[2] BEEM-UP, Final version of the exploitation and market deployment plan, 7th Framework Programme - BEEM-UP: Building Energy Efficiency for Massive market UPtake, 2014. www.beem-up.eu/publications.html (accessed February 7, 2017).

[3] R2CITIES, D2.1 Report on architectural barriers for green energy technologies, 7th Framework Programme - R2CITIES: Renovation of Residential urban spaces: Towards nearly zero energy CITIES, 2014. smartcities-infosystem.eu/sites/default/files/r2cities_report_on_architectural_barriers_for_green_energy_technologies.pdf (accessed February 7, 2017).

[4] A. Rivada, E. Hoyos, E. Demir, M. Aksu, A. Stacey, B. Yorston, J. Shawyer, C. Degard, P. Compere, I. Nagy, Report on non-technical barrier and legal and normative issues, Horizon 2020 Framework Programme - REMOURBAN - REgeneration MOdel for accelerating the smart URBAN transformation, 2016. www.remourban.eu/Technical-Insights/Deliverables/Reports/Downloadable-Deliverables.kl.

[5] ECOSOC, Smart cities and infrastructure, Commission on Science and Technology for Development (CTSD), United Nations Economic and Social Council (ECOSOC), Geneva, CH, 2016. unctad.org/en/Pages/MeetingDetails.aspx?meetingid=1048.

[6] A. Stacey, J. Sawyer, M. Aksu, B. Yenilmez, E.H. Santamaria, E. Demir, B. Kuban, C. Degard, I. Nagy, Methodological guide on the development of urban integrated plans, Horizon 2020 Framework Programme - REMOURBAN - REgeneration MOdel for accelerating the smart URBAN transformation, 2016. www.remourban.eu/Technical-Insights/Deliverables/Reports/Downloadable-Deliverables.kl.

Next page

[1] A. von Radecki, S. Singh, Holistic Value Model for Smart Cities, in: T.M. Vinod Kumar (Ed.), Smart Economy in Smart Cities, Springer Singapore, 2017: pp. 295–316. doi:10.1007/978-981-10-1610-3_13.

[2] ECOSOC, Smart cities and infrastructure, Commission on Science and Technology for Development (CTSD), United Nations Economic and Social Council (ECOSOC), Geneva, CH, 2016. unctad.org/en/Pages/MeetingDetails.aspx?meetingid=1048.

[3] D. Pringle, Time to replace silos with smart city strategists, RCR Wireless News. (2016). www.rcrwireless.com/20160617/internet-of-things/time-replace-silos-smart-city-strategists-tag28 (accessed May 24, 2017).

[4] J. Gibson, M. Robinson, S. Cain, CITIE: A resource for city leadership, CITIE (City Initiatives for Technology, Innovation and Entrepreneurship): a joint project of Nesta, Accenture, Future Cities Catapult and CITIE.Index, 2015. citie.org/reports/ (accessed May 14, 2017).

SOLUTION AND WORKAROUNDS

Solution/Workaround

The issue of silos can be resolved by the clear definition of a person or entity (a system integrator) in charge of horizontal coordination with sufficient responsibilities and mandate. Successful coordination would require the establishment of truly multi- or inter-disciplinary teams. This approach will need to be adapted for each instance, as there is no standardized organizational structure for municipalities or their agencies.
Some approaches to overcoming siloes initiated by cities include:

- installing cross-sector departments (New York City)
- creating "special staff units" (Ludwigsburg)
- installing informal interdepartmental working groups (Freiburg)
- outsourcing the duty to quasi- independent project management companies (Vienna) [1]

Another approach is to collect and aggregate the different city infrastructure data streams and control operations in a single structure - an operations centre. Co-located services and employees from different departments, working together, may act as a "nerve centre" to facilitate coordination and communication, breaking down some of the walls of administrative silos [2].

EXAMPLE

"Bristol in the U.K." has "given senior executives a broad smart city mandate. Bristol is also breaking down silos between different departments in the municipality. To save money on real estate and improve coordination, the local authority is planning to co-locate nine teams in one space, which should help the city adopt new sensing technologies on a citywide scale. Bristol is also making sure it has high-level expertise in-house, primarily to ensure it doesn't become heavily reliant on a single vendor or systems integrator. 'The local authority has been astute enough to hire people with quite sophisticated technology and procurement backgrounds,' said Paul Wilson, managing director of Bristol Is Open, the smart city unit for Bristol. 'We know our strategy and we will go to vendors to fulfill aspects of our strategy. We have the intelligence to know what our plan is and we are in charge. That is very important for a city or it will be blown around in the wind of vendor games.'" [3].
"In March 2014, Amsterdam created the role of chief technology officer (CTO). The role is responsible for breaking down silos across the city government, setting overall strategic direction, providing a consistent face to external stakeholders and helping to navigate a complex political landscape" [4].

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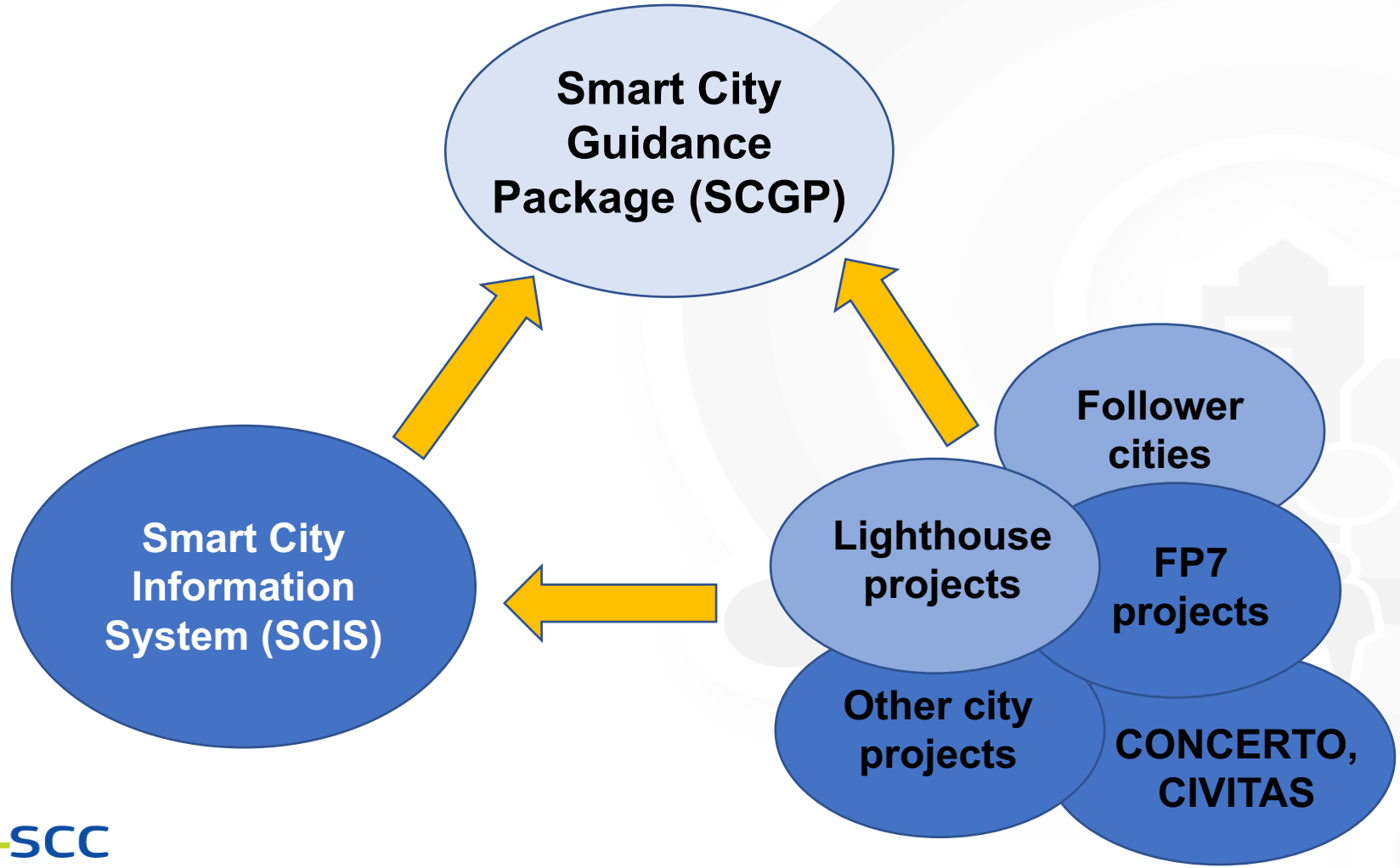
Relation with SCIS and lighthouse projects



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Current status and next steps

1. Intermediate version released June 2017, final version May 2018
   - Mining of collected material
   - Gather more input on specific obstacles
   - Find more solid examples of solutions and best practices
   - Verify existing content and format
   - Validate utility
   - Request feedback
2. Improvement of information in all parts of the SCGP through more (desk) research and interviews, webinars and workshops
3. Questionnaire on impact of specific preconditions on obstacles and solutions
4. Active collaboration with other Action Clusters and SCIS, in particular on obstacles and solutions, for instance business models
5. In-depth analysis of needs of urban actors working on planning and implementation, and gearing the content and style of communication of the SCGP towards that

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Thank You!

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