Report on Peer-to-Peer Knowledge Exchange Network and Workshop 2

Deliverable D.2.1.2

Version 1
# Revision Chart and History Log

## Versions

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## Deliverable Quality Review

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Glossary

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EXECUTIVE SUMMARY

Within the HORIZON 2020 Lighthouse Project SMARTER TOGETHER, knowledge exchange and peer-to-peer learning play a key role in order to involve various stakeholders, enable exchange of ideas and best practices and to co-creatively develop solutions to existing challenges. Thus, Work Package 2 (WP2) is dedicated to the co-creation of smart city solutions and Task 2.1 (T2.1) aims at developing a knowledge exchange network as well as an iterative peer-to-peer learning process. The peer-to-peer learning process in SMARTER TOGETHER is defined as a four-step approach and consists of:

- **Common Reporting:**
  Gather relevant information from all implementation projects/solutions at three points in time during the project duration

- **Project Books:**
  Documents all implementation projects/solutions and their development over time; is updated three times based on Common Reporting inputs

- **Knowledge Carrier:**
  Visualises the development of all implementation projects/solutions over time as well as their improvements; is updated three times based on Common Reporting inputs

- **Peer-to-Peer Knowledge Exchange Workshops:**
  Take place three times over the project duration and address the challenges and risks occurring across cities and thematic fields which were identified in the Common Reporting; enable co-creation of solutions

The Deliverable at hand describes the iterative peer-to-peer learning process applied in SMARTER TOGETHER, presents the concept of the Knowledge Carrier in more detail and gives insights into the first and second Common Reporting period as well as the first and second Peer-to-Peer Workshop which took place in Lyon and Munich.
1. Concepts of Knowledge Exchange Network and Peer-to-Peer Learning in SMARTER TOGETHER

The HORIZON 2020 Lighthouse Project SMARTER TOGETHER aims at developing smart, innovative and replicable solutions and methods for tomorrow’s cities which fit the needs of various stakeholders. Therefore, Work Package 2 (WP2) is dedicated to involve those stakeholders, foster systematic knowledge exchange among them and enable a co-creative process to jointly develop solutions.

In Task 2.1 (T2.1), a knowledge exchange network was established to bring all stakeholders – Lighthouse and Follower Cities, research and industrial partners as well as external stakeholders (e.g. citizens) – together, and an iterative peer-to-peer learning process was defined. This learning process aims at:

- Establishing a common ground of information regarding all thematic fields and projects addressed in SMARTER TOGETHER,
- Supporting constant knowledge exchange across cities and thematic fields,
- Stimulating cross-silo-thinking,
- Identifying shared challenges,
- Discussing lessons learned and best practices, and
- Enabling the co-creation of solutions.

In order to meet the targets, a four-step-approach was defined:

- **Common Reporting**
  The Common Reporting builds the back-bone of the peer-to-peer learning process and presents itself as a sophisticated questionnaire addressing the following issues with regard to the respective implementation project:
  - General Information (objectives of the project, project partners)
  - Implementation Status
  - Process Drivers
  - Process Barriers
  - Corrective Actions
  - Risks and Challenges
  - Lessons Learned and Recommendations
The Common Reporting gathers all necessary information for the Work Packages 2, 6 and 10 and is, thus, as streamlined as possible in order to minimise the reporting effort for the project responsible within SMARTER TOGETHER. The Common Reporting is carried out three times during the project duration in the Project Months 16, 21 and 27. Thereby, the city main contacts of each Lighthouse City are asked to compile the requested information along with the person responsible for the implementation project. Approaches on how to exchange knowledge between the city’s main contacts and the person responsible for the implementation project vary from city to city, depending on the resources at hand as well as the project structure. Then, the filled questionnaires are submitted to the project coordination team where the input gets pre-processed for each Work Package (2, 6 and 10). The WP2 related input is forwarded to the WP2 lead partner who conducts a cross-topic analysis to identify common challenges which occur across topics and cities. In addition, the WP2 lead partner compiles an overview of the input for each thematic field and sends the information to the corresponding WP2 task lead. Subsequently, the WP2 task leads analyse the gathered information. In addition to that, the gathered information feeds into the update of the Project Books and in the Knowledge Carrier and builds the basis for the peer-to-peer workshops.

In the Deliverable at hand, the results of the first and second Common Reporting and the output of the first and second Peer-to-Peer workshops are described in chapters 3 to 4. In addition to that, the Common Reporting questionnaire is attached to this document. All questions related to WP2 are marked accordingly.

**Project Books**

The Project Books are a central part of WP2 and provide the knowledge base for the peer-to-peer exchange across cities and thematic fields. For each thematic field (each represented in a WP2 task) there is a respective Project Book providing relevant information (e.g. aim of the solution/project, short description, current status, challenges, lessons learned, etc.) with regard to all projects and solutions implemented in the Lighthouse Cities. The aim of the Project Books is threefold:

- Documentation of all projects and solutions, available to all project partners
- Supporting peer-to-peer learning processes and bringing together experts from different implementation projects and Lighthouse Cities
Helping to understand the applicability of the WP1 best practices and recommendations.

The Project Books are updated based on the information gathered in the Common Reporting in Project Months 18, 24 and 30.

By having a better understanding of single projects and solutions it is easier to find similarities, identify shared challenges, jointly discuss solutions and reflect own projects. The Project Books, thus, support the peer-to-peer learning process very efficiently.

As the Project Books are a central part of the Deliverables corresponding to the Tasks 2.2 to 2.6, the Project Books will not be described in more detail in the Deliverable at hand.

**Knowledge Carrier**

In addition to the Project Books, the Knowledge Carrier is a key tool in WP2, and the technological ‘front-end’ of the peer-to-peer learning process. Fed with information gathered in the Common Reporting and compiled in the Project Books, the Knowledge Carrier enables a three-dimensional visualisation of project specific information:

- **City level:** General information on the concepts, objectives and visions of the Lighthouse Cities
- **Thematic level:** Specific information such as recommendations, challenges or best practices per thematic field (defined in WP1)
- **Solution level:** Presenting the project status over the whole development cycle for all implementation projects

The concept of the Knowledge Carrier as well as its current development status is reported in more detail in Chapter 2 of the Deliverable at hand.
Peer-to-Peer Workshops

During the lifetime of SMARTER TOGETHER, three peer-to-peer workshops will take place, one in each Lighthouse City. The timing of the workshops is aligned with the Common Reporting process to be able to address the identified challenges and risks of the implementation projects during the workshops. The aim of the workshops is to:

- Enable constant knowledge exchange across thematic silos and cities,
- Jointly discuss occurring challenges and risks and co-create solutions for implementation projects,
- Share lessons learned and best practices,
- Transfer knowledge from the Lighthouse Cities to the Follower Cities to support replication of success stories, and
- Learn from each other.

Each workshop takes three days and contains:

- One workshop slot for each thematic field, addressing challenges occurring across cities, plus
- If necessary additional slots to intensify discussions of specific issues and challenges occurring in the respective thematic field,
- One or two workshops for challenges occurring across thematic fields and cities, and
- Site visits at the hosting Lighthouse City corresponding with the identified challenges, providing best practices.

During the workshop slots, risks and challenges identified in the Common Reporting are addressed. If necessary and helpful, external experts can be invited to broaden the minds, provide insights in possible solutions for common challenges and initiate the co-creation of novel solutions for existing challenges.

Together, the Common Reporting, the Project Books, the Knowledge Carrier and the Peer-to-Peer workshops build the iterative learning process in SMARTER TOGETHER. In the picture below and for a better understanding, the most important project meetings and milestones within WP2 are presented on a time axis.
The Deliverable at hand further details the concept of the Knowledge Carrier, its main objectives and development (Chapter 2), provides an overview of the most important results of the first and second Common Reporting period and gives an analysis of the first and second Peer-to-Peer workshops (Chapter 3 to 4).
2. Knowledge Carrier

The Knowledge Carrier provides the knowledge base for a fruitful peer-to-peer knowledge exchange across cities and thematic fields as well as among local stakeholders and experts. The aim of the Knowledge Carrier is to document and visualise the development of the implementation projects over time, beginning with the start of SMARTER TOGETHER, and visualising the progress at predefined points of measurement (Project Months 18, 24 and 30). Thereby, the Knowledge Carrier and its respective content build on the Project Books which are to be updated in the same time steps.

For the frontend development and design, the German provider for 3D spatial data infrastructures virtualcitySYSTEMS was contracted. Therefore, a set of mock-ups was developed to illustrate the concept of the Knowledge Carrier (see Figure 2 below).

Figure 2: Mock-Up of the Knowledge Carrier 1[modified]

https://i.ytimg.com/vi/9NhyDliaXic/maxresdefault.jpg
Based on the identified requirements of the Lighthouse Cities as well as the graphical mock-ups, the web-based interface of the Knowledge Carrier was designed and implemented. This was realised as part of an iterative process in collaboration between GOPA.com, Fraunhofer and virtualcitySYSTEMS.

Figure 3: Exemplary View of the Knowledge Carrier Web Interface for Vienna

The final design of the web interface consists of two main elements: 1) a three-dimensional map of the respective lighthouse city district, allowing for a free movement within the model for the user, and 2) a sidebar consisting of the contextual knowledge collected with the help of the Project Books. With the help of the chosen Story Telling approach, the user can search through the written information while the 3D map is automatically adapted to the content. In addition to that, it is possible to freely navigate through the map and to determine the selected image itself.

The operation of the system is designed to be as easy and intuitive as possible, providing a web-based frontend, allowing for multi-touch navigation and offering multiple languages (German, English, and French). In addition to that, a content management system (CMS) was developed based on the open source CMS DRUPAL. The common reporting provides the structure and feeds the CMS with content, allowing all project partners to use the gathered information for their own

http://www.smarter-together.eu/cities/vienna/
services and needs. The content management system was developed by the project partner GOPA.com.

2.1 Main Objectives

The Knowledge Carrier tries to accomplish the following main objectives:

- Visual documentation for all project partners and local experts: everyone gets to know the other projects and is enabled to understand current challenges and best practices in an illustrative visual form
- Support of peer-to-peer learning processes, which will bring together experts of the different projects in order to work on yet unresolved problems and compare them with similar ones
- Helping understand the three different levels of action (city, thematic field, project) and allowing to track their development over the course of the project

The Knowledge Carrier provides deep insights into the development and implementation processes of innovative city projects, targeting city representatives and experts within SMARTER TOGETHER as well as the outside world, and enables them to understand potential challenges and to identify promising solutions. Therefore, the Knowledge Carrier is an important tool for replication of best practices and successful solutions.

2.2 Development of the Knowledge Carrier

In order to fit the needs of city administrations, both the Lighthouse Cities and as well the Follower Cities were involved in the design of the Knowledge Carrier, bringing in different demands and use-cases. The cities constantly stated their requirements for the Knowledge Carrier before and during the development phase. The deliberative practice with the cities took place through presentations and surveys in meetings and events supported by telephone conferences and firm WP2-arrangements.

Since the beginning of SMARTER TOGETHER, several workshops with the cities have been carried out. In May 2016, a first concept of the Knowledge Carrier was already presented at the WP 1 workshop in Stuttgart. The resulting feedback formed the basis for further development of the concept and laid the foundation for the city’s determination of requirements.
Within the framework of the requirements analysis, the definition of key end-user groups was of utmost importance. Both, Lighthouse as well as Follower Cities named particular experts and city employees as a relevant end-user group. In addition to that, the Lighthouse Cities addressed employees working in the field, being responsible for the implementation of the projects, as a relevant target group as they face the problems of implementation directly and can especially profit from peer-to-peer and cross-city exchange and learning. The Lighthouse Cities, on the other hand, named a more strategical user-group, preparing decisions and proactively preventing possible risks in designing future cities.

This detailed definition of requirements was made separately for the Lighthouse Cities (WP 1 Workshop, October 2016, Vienna) and the Follower Cities (WP 7 Workshop, January 2017, Vienna).

As far as possible, all defined requirements of the Lighthouse and Follower Cities were taken into account during development. Since the start of software development in March 2017, Fraunhofer along with GOPA.com and virtualcitySYSTEMS have developed a broad concept for the Knowledge Carrier.

The first prototype was presented during the Peer-to-Peer Workshop in Lyon in June 2017.

In the ongoing iterative process, city requirements were integrated into the prototype. The completed story telling was presented at the second Peer-to-Peer Workshop at the Fraunhofer headquarters in Munich. During the peer-to-peer meeting, a workshop was held where feedback was collected for adjustments and enhancements, and the next steps beyond story telling were discussed.

In addition to that, the city of Munich commissioned a booth builder with the preparation of a booth to professionally introduce the Knowledge Carrier to the local public.

By the third peer-to-peer workshop, all further steps will be implemented and integrated into the existing web interface. This is done in cooperation between Fraunhofer, GOPA.com, virtualcitySYSTEMS and one responsible for the Knowledge Carrier from each Lighthouse Cities.
Figure 4: Presentation of the Knowledge Carrier at the second Peer-to-Peer Workshop in Munich
3. **1st Peer-to-Peer Workshop in Lyon**

The 1st Peer-to-Peer Workshop took place from the 28th to the 30th of June 2017, in Lyon and built on the findings of the 1st Common Reporting, carried out in the Project Months 15 to 16. The results of the first Common Reporting, the identified challenges to be addressed during the first Peer-to-Peer workshop as well as the summary and outcome of the first Peer-to-Peer workshop is described in deliverable “D.2.1.1 Report on knowledge exchange workshop 1”, which is a product of WP2, and can be downloaded from Smarter Together website.
4. **2nd Peer-to-Peer Workshop in Munich**

The 2nd Peer-to-Peer workshop took place from the 17th to the 19th of January, 2018, in Munich and built on the findings of the 2nd Common Reporting, carried out in the Project Months 20 to 21. In the following, the results of the 2nd Common Reporting and the output of the Peer-to-Peer workshop are presented.

4.1 **Results of 2nd Common Reporting and Input for 2nd Workshop**

Based on the filled questionnaires (one per implementation project), a spreadsheet including all inputs was compiled and the challenges were analysed. The spreadsheet is attached to this Deliverable. It is notable that the commitment to the time schedule was much better than in the first reporting period and, thus, allowed extensive preparation work for the second Peer-to-Peer workshop. Even though the level of details reported varied across cities, it became obvious that only minor changes w. r. t. the main challenges identified in the first reporting period had occurred. This indicates that the co-creation of solutions in the first Peer-to-Peer workshop has not been concluded yet and, therefore, should be further resumed in the second Peer-to-Peer workshop. However, the cross-links between the thematic fields and solutions came even stronger to the fore, emphasizing the relevance of a peer-to-peer learning process which is able to go beyond thematic and city silos.

In the second Common Reporting period, the following challenges occurred across cities in the respective thematic fields:

**Citizen Engagement**

- Lack of public interest (e. g. media)
- Lack of diversity of participants
- Lack of knowledge w. r. t. the needs of citizens
- Lack of manpower to run the labs

**Holistic Refurbishment in Smart Districts**

- Legal challenges:
  - Transfer of funding to third parties
  - Usage of data (e. g. consumption data)
- Convincing and involving private home owners vs. financial challenges for private home owners and insufficient amortization
District Heating & Renewables

- Legal challenges:
  - Usage of data (e.g., production data)
  - Ownership of PV systems
  - Self-consumption
- Convincing and involving private home owners vs. financial challenges for private home owners and insufficient amortization

Data Management Platform & Smart Services

- Convincing and binding users
- Financing smart city apps, developing suitable business models
- Collecting data
- Availability of data sets for testing

E-Mobility Solutions

- Lack of knowledge w.r.t. users’ needs
- Lack of acceptance for solutions

In addition to the challenges occurring across cities in the five thematic fields which already indicate some cross-links, the following shared problems were identified across thematic fields:

- Finding alternative ways of funding for Smart City projects and solutions
- Developing suitable business models
- Quantifying the value-add of innovative Smart City projects and solutions
- Developing alternative cost-benefit models

Based on this analysis, the WP2-Task Leads were asked to identify the most relevant issue to be discussed during the second Peer-to-Peer Workshop, taking place in Munich from the 17th to the 19th of January, 2018. The following challenges were selected to be discussed and co-creatively worked on during the Peer-to-Peer workshop:

- Citizen Engagement: Attracting and involving citizens:
How to attract diverse groups of participants?
How to identify the needs of citizens?
How to convince citizens from the value-add of smart city solutions?

**Holistic Refurbishment in Smart Districts:**
- In search for best practices (I): Implementing PV-systems in refurbished houses
- In search for best practices (II): Connecting low-energy-buildings to the return pipe of district heating

**District Heating & Renewables:**
- (Legal) challenge self-consumption: Scheme for collective self-consumption of PV-systems
- In search for best practices: How to integrate waste heat from data centre?
- Virtual Power Plants

**Data Management Platform & Smart Services:**
- Managing data protection in Smart City projects: The Data Gatekeeper guideline demonstrated by a hands-on example
- Engagement and participation: Avoiding lack of commitment and facilitate a frictionless project implementation by involving project stakeholders and citizens

**E-Mobility Solutions:**
- Electric vehicles and fleets in smart cities: matching actual needs and available solutions,
- Making use of synergies: (How) can electricity from PV-systems be used to charge e-vehicles?

The workshops on Holistic Refurbishment in Smart Districts as well as District Heating & Renewables also provided insights and impulses from external experts and speakers.

In addition to that, a cross-topic workshop was offered, addressing the identified overall challenges - innovative funding, business models and benefit models for Smart City solutions - providing best practices and innovative approaches. Following best practices and insights were presented:
- Best practice (I): Crowdfunding initiative for PV-systems by Etienne Vignali (Lyon Confluence) and Bruno Gaiddon (Hespul)
Best practice (II): Experiences with financing, funding, and alternative cost-benefit-models in Eindhoven by Frank van Swol (City of Eindhoven)

Furthermore, a workshop slot was dedicated both to the challenges of monitoring and replication.

The program of the second Peer-to-Peer workshop was, thus, quite elaborate, aiming at ideally addressing the occurring challenges, providing room for co-creation of solutions and giving impulses in insights from external experts. The full agenda is also attached to this Deliverable.

In the following sub-chapters, a short summary of all workshop slots is provided. The detailed description of the workshop slots within the thematic fields is provided in the corresponding Deliverables.
4.2 Summary of 2nd Peer-to-Peer Workshop

This chapter provides a summary of all thematic and cross-topic workshops of the second Peer-to-Peer workshop. Detailed information regarding the thematic workshop slots is provided in the respective Project Book.

4.2.1 Summary of Peer-to-Peer Workshop “Citizen Engagement”

In the workshop slot on Citizen Engagement, the responsible for “Citizen Engagement” in the Lighthouse Cities, representatives of the Follower Cities, further project partners and related projects were invited to discuss the three identified main challenges and co-creatively develop innovative approaches to “Citizen Engagement”. The workshop slot was moderated by Florian Schmid, task lead of T2.2. The workshop dealt with the challenges how to identify the needs of citizens, how to attract diverse groups of participants and how to convince citizens from the value-add of smart city solutions. In the beginning, each Lighthouse City provided an input statement. After that, a small group setting was chosen to discuss the challenges and to create solutions in small groups.

The output of the workshop slot on Citizen Engagement is described in the deliverable “D2.2.2. Report on current implementation status for City engagement – Innovation Labs”, which is a product of WP2.2, and can be downloaded from Smarter Together website (after approval by INEA).

4.2.2 Summary of Peer-to-Peer Workshop “Holistic Refurbishment”

While the first Peer-to-Peer Workshop on Holistic Refurbishment addressed a strategic level as well as decision-makers in city administrations, the second workshop moved its focus to the operational level and addressed project leaders and brought the fields of e-mobility, renewables and holistic refurbishment together.

The workshop slot was moderated by Daniel Glaser, task lead of T2.2, and built on a comprehensive program:

- Site visit to Munich Freiham:

  The group had the chance to get a guided tour to the “Thermal District Heating Plant” in Munich, where technical details were explained.

- Presentation on Community e-Car Sharing:
Supported by Alexandra Volkwein (task lead of T2.6), a best practice on how to combine Holistic Refurbishment, e-Mobility and renewables was presented and subsequently discussed.

- Introduction of the concept “Mieterstrom” by Polarstern:

A representative of the organization Polarstern was jointly invited by T2.3 and T2.4 to present the business model of Mieterstrom in different legal frameworks. Subsequently, the group discussed the inputs and how to replicate them in their own city and area of expertise.

The detailed outcome of the workshop is described in the deliverable “D2.3.2. Report on current implementation status for Holistic refurbishment in Smart districts” which is a product of WP2.3 and can be downloaded from Smarter Together website, after approval by INEA.

4.2.3 Summary of Peer-to-Peer Workshop "District Heating & Renewables"

The workshop slot on District Heating & Renewables was moderated by Bruno Gaiddon and Etienne Vignali, task lead of T2.4, and provided inputs on various topics. In addition to the joint session on District Heating & Renewables and Holistic Refurbishment, the workshop slot provided insights into the framework for collective self-consumption of PV electricity in France, presented by the Lyon-Confluence and Hespul colleagues. In addition to that, partner SWM presented its experiment to establish a Virtual Power Plant which directly sells energy to the European market and builds a primary reserve to balance the German power system. Further, an external speaker from ZAE Bayem, the Bavarian Centre for Applied Energy Research, presented systems and technologies to recover waste heat from industrial sites. The main challenges and chances of the presented solutions as well as the output of the workshop slot are described in detail in the deliverable “D2.4.2. Report on current implementation status for District Heating and Renewables”, which is a product of WP2.4 and can be downloaded from Smarter Together website (after approval by INEA).
4.2.4 Summary of Peer-to-Peer Workshop “Data Management Platform & Smart Services”

The workshop slot on Data Management Platform & Smart Services was moderated by Stefan Vielguth, task lead of T2.5. At first, the Date Gatekeeper concept, implemented in the Lighthouse City Munich, was presented, providing decision makers and operational staff in city administrations a workflow description on how to transform legal and strategic city requirements into a resilient data processing model. Further, Vienna presented its Energy Management System as well as the Fi-ware based data platform Smart Data Wien. The Lyon colleagues introduced their newly developed Community Management System. Subsequent to the presentations, the group discussed privacy issues and how to handle them professionally. Further details w. r. t. the workshop slot are provided in the deliverable “D2.5.2. Report on current implementation status for Data Management platform & smart services”, which is a product of WP2.5, and can be downloaded from Smarter Together website (after approval by INEA).

4.2.5 Summary of Peer-to-Peer Workshop “E-Mobility Solutions”

The workshop slot, organized and moderated by Alexandra Volkwein, task lead of T2.6, was dedicated to electric vehicles and fleets with a special focus on car sharing fleets. Nowadays, electric cars still differ in terms of charging sockets and charging modes. As this has direct effect on the time and standard a user needs to recharge the e-car, the different modes of charging (fast/normal), sockets (European standard, Japanese standard) and their effect on charging time and the corresponding type of charging station were explained. In addition to that, the challenge of range was discussed and a website was introduced providing information on electric cars (including realistic range) from a manufacturer independent source. Subsequently, all participants were invited to discuss their experiences with e-car sharing and the mobility needs which could be addressed by it. The detailed description of outcomes is provided the deliverable “D2.6.2. Report in current implementation status for e-mobility solutions”, which is a product of WP2.6, and can be downloaded from Smarter Together website (after approval by INEA).

4.2.6 Summary of the Peer-To-Peer Workshop “Replication”

The replication was moderated by Francisco Gonçalves, WP8 lead, and gathered all relevant partners from WP8. The target audience was the Lighthouse Cities of Munich, Vienna and Lyon, the Club of Cities, and the research partners, which have
specific tasks in this work package (standardization and business models). The goal of the session was to extensively analyze and discuss the scope and timeline of the replication framework, namely identifying and discussing the needs of the Lighthouse Cities for their replication activities outside the demonstration areas.

This session brought some important outcomes regarding the activities considered important by the Lighthouse Cities: reassessment of the recommendations from the pre-implementation phase that can now be complemented with the real experience from two years of execution phase and addition of new ones, which resulted from the lessons learned. This adaptation is a natural result of the complexity of cities’ problems, which challenge the traditional vertical and non-collaborative way on how local organizations are used to work. This revision started with the replication framework, which identified the main enablers, obstacles and solutions for replication of smart cities solutions.

Finally, main activities being done within the Lighthouse Cities, mainly in collaboration of other replication partners, were presented and discussed.

The results of this workshop are implemented in the “D8.1.1 Replication framework”, which is a product of WP8, and can be downloaded from Smarter Together website (after approval by INEA).

4.2.7 Summary of the Peer-To-Peer Workshop “Monitoring”

At the second Peer-to-Peer-Workshop, there was also a slot included to address the challenges occurring in the field of Monitoring (WP6). The slot was organized by Florian Judex, WP6 lead, and addressed three challenges by interactively working in small groups:

- Challenge 1: Indicators beyond technical implementation

  The group discussed that it would be desirable to gain a more qualitative and holistic approach to monitor and evaluate implementation projects, which also address social, environmental, and financial effects and also address factors of wellbeing. In some of the fields, KPIs are available (e.g. OECD wellbeing indicators, gross national happiness indicators as in Bhutan, etc.) and should be considered for Smarter Together. However, missing capacity is an issue.

- Challenge 2: Identification of relevant solutions for replication based on data
Within Smarter Together, the replication of solutions in other areas of the Lighthouse Cities as well as in the Follower Cities starts already while the Monitoring work package is still up and running. Thus, the Monitoring work package is not able to provide a consolidated overview as well as strategic recommendations for replication based on the data collected. Therefore, the group decided to discuss the timing of the replication works at the next General Assembly.

- Challenge 3: Identification of services needed by the users of existing services

In order to develop solutions which cater the needs of citizens, not only it is important to analyze the data of existing services and users, but also to gather information of non-users. Usually, non-users have good reason to not use a service. In addition to that, comparable numbers to rank the use of a solution are missing. The group discussed that a Citizen Centered Service Development would be necessary.

At the end of the workshop slot, the group also decided to follow-up on those topics at the next Peer-to-Peer-Workshop and set the agenda:

- Development of holistic indicators
- Citizen Centered Service Development
- Replication

### 4.2.8 Summary of the Cross-Topic Peer-to-Peer Workshop

The goal of this workshop was to achieve a better understanding and provide best practices for innovative funding and business models as well as alternative cost-benefit-models for Smart City solutions. Therefore, two best practices were presented and subsequently discussed in plenum: first, a crowdfunding initiative for PV-systems which was realised in Lyon, and second the experiences with innovative financing and funding approaches as well as alternative cost-benefit-models in Eindhoven.

#### 4.2.8.1 Best practice Lyon: Crowdfunding initiative for PV-systems (presented by Etienne Vignali and Bruno Gaiddon)

The crowdfunding initiative was presented by the Smarter Together colleagues Etienne Vignali (Lyon Confluence) and Bruno Gaiddon (Hespul). Even though they
haven’t initiated the crowdfunding project themselves, they were able to present the best practice undertaken by an energy developer in Lyon.

At first, other funding methods were discussed and their pros and cons outlined. Typically, energy projects are funded with 80% debt and 20% own capital. This financing structure gives control and voting rights to the financier, e.g. the municipality, but, on the other hand, might be a risky investment with long-term returns. An alternative way of financing is through mini-bonds (debt), which insure a short-term return and are at least minimally assured, but the involvement and control is in turn very low. If a city wants to get their citizens involved e.g. in Smart City projects, there are two ways of financing: 1) direct investment by citizens, e.g. a group of motivated citizens invests in a bottom-up citizen project (e.g. http://toitsentransition.weebly.com), or 2) indirect by citizens investing in a fund (e.g. http://energie-partagee.org). The direct investment needs the citizens to take initiative while the indirect way does not provide lots of involvement and doesn’t give the citizens a say.

An alternative and innovative way of funding, which also fosters the empowerment and involvement of citizens, is crowdfunding. In Lyon Confluence, the refurbishment of the King Charles building and its equipment with a 100 kWP PV system was financed via a crowdfunding initiative. The citizens were invited to invest up to 1,000 Euros in a 3-year investment and a yearly return of 5% of interest via the crowdfunding platform lendosquare.com. 100,000 Euros was needed to finance the project. After a very short period of time, 201 people had lent their money for the refurbishment project via the platform and, thereby, successfully financed the project. Even though the crowdfunding initiative was successful, one challenge still occurred: the initiative was not able to get local investors on board. However, future crowdfunding initiatives will first collect money locally.

After the input statement, the plenum discussed how this approach can be replicated in other cities as well as others countries with different legal frameworks. The German partner bettervest for example has a similar approach to sustainably fund energy projects worldwide by involving citizens and private investors. The Lyon colleagues also intend to use the potential of crowdfunding for future projects themselves.
4.2.8.2 Best practice Eindhoven: restructuring city financing, external financing, experimental procurement and alternative cost-benefit-models (presented by Frank van Swol, City of Eindhoven)

In addition to the crowdfunding best practice, an external speaker was invited to provide insights in the innovative administration structures and processes of the City of Eindhoven. Frank van Swol is Head of Program and District Management in Eindhoven and responsible for the programming of the spatial domain of the city. In his presentation, he provided input on four main topics:

▪ Restructuring and re-organizing city financing and financing methods towards a flexible city administration
▪ Using external financing as a catalyst for innovative development projects
▪ Example for experimental procurement: Roadmap Urban Lighting
▪ First idea for a generic cost-benefit-model

The following main points were discussed during the session:

▪ Restructuring and re-organizing city financing and financing methods towards a flexible city administration:
  Until 2015, the City of Eindhoven had a traditional structure with 25+ departments which were thematically organized. The departments managed their budgets and contents themselves and reported to the city councilor. In 2015, the administration was confronted with budget and staff cuts and, with this, with the need to be more effective and efficient. In addition to that, the city had to deal with increasing complexity and technological changes, decentralization, the changing role of municipalities in general and the growing importance of partnerships, and a mismatch of organization and customer demands. This led to a new organizational structure of the municipality with a new strategic orientation to work more content-driven, facilitating external partnerships, and valuing expertise. In the new organizational structure, there are only 4 departments with integrated expertise, 23% less staff and 33% less management personnel. The integrated program and district management now has a budget of 350 Million Euros per year and orders other departments as contractors. With this new structure, overarching themes like smart city, health and social impact as well as innovative Smart City projects can be integrated. Further, the strategic
programming uses cost-benefit analysis as decision support method, fosters external partnerships and joint financing of programs and projects.

Using external financing as a catalyst for innovative development projects: The City of Eindhoven is depending on partnerships and external financing (public-private-partnerships, regional, national, EU funding). However, there is a lack of funding of ‘extra costs’ for innovative projects. The City of Eindhoven sees EC funding as an instrument for “internal lobbying” and as a catalyst for innovative projects. In order to systematically approach EU funds, the city established so called “project/idea meets call” sessions taking place on a regular basis. EU funding can support the visibility of a project, and thus, to gain the commitment of politicians, other departments, partners and stakeholders. Further, a project is an obligation to deliver and a reason to collaborate and can be used to co-finance the extra mile. In addition, the City of Eindhoven decided to go from project to portfolio funding with long term financing strategies, forming long term alliances for the most important challenges.

- Example for experimental procurement: Roadmap Urban Lighting

In 2013, the City of Eindhoven felt the need to develop a Roadmap for Urban Lighting. 21,000 street lights needed replacement, the participation in an INTERREG IVC project demanded a sustainable public lighting strategy and the infrastructure needed to be able to cater the needs and chances provided by current (e-) developments. Thus, it was planned to develop a Roadmap for Urban Lighting, which shall be tested in ten areas in a five years’ program. A tender would need to include maintenance and operation of public lighting, upgrading the infrastructure to a smart grid, developing a feasible business model to exploit a smart grid and respecting the quadruple helix organization in each area, including demand management, knowledge sharing, balancing public and private interests and exploring / developing services. Instead of tendering directly, the City of Eindhoven consulted the market first. In 2013, the city held a public meeting with 41 companies (60 participants in total), conducted a survey whereby 23 companies responded and held one-on-one sessions to exchange opinions with 8 selected companies. As a result of this elaborate approach, the City of Eindhoven decided to tender at a strategic level, minimize risks through piloting at a small scale in living labs and seek risk sharing through long term partnerships.
The procurement strategy of the City of Eindhoven foresees a five-step approach:

1. Early market involvement
2. Procurement strategy
3. Tendering
4. Contracting
5. Execution

By using this kind of strategic approach, following hot issues arise and need to be managed: role division in a co-operation, IP-rights, open standards, open data, accessibility of the grid by third parties, conditions of termination. The tender process for the Roadmap Urban Lighting prepared the City of Eindhoven to start a joint innovation journey with their partners and establish a new mindset with regard to Public-Private-Partnerships. However, the critical success factor is the leadership necessary to activate the innovation potential of the community of citizens, businesses and (own) research.

- First idea for a generic cost-benefit-model:
  The City of Eindhoven is developing a new framework to assess their projects and, thereby, taking the social and spatial domain as well as the economic and the safety cluster into account. The new framework is a first step towards an integrated social cost-benefit analysis and provides criteria in the following categories:
  - Livability in areas
  - Quality of public space
  - Urban densification
  - Climate adaption & health
  - Accessibility
  - Top facilities/amenities
  - Enhance economic strength
  - Prevent social division
  - Participation
  - Enhance self-reliance

The input statement from Frank van Swol was followed by lively discussions in plenum. The workshop participants asked for more details regarding the re-organization of the City of Eindhoven and were quite impressed by the city’s innovative, holistic
approach. The participants also discussed how to replicate the best practices in their municipality and exchanged contacts to further collaborate.

5. Critical Reflection of the Peer-to-Peer-Learning Process in Smarter Together

With more than 60 implementation projects in the three Lighthouse Cities, there is a huge need for systematic learning, peer-to-peer knowledge exchange and transfer of information within and beyond the Smarter Together community. The four-step approach described in the deliverable at hand shall, therefore, provide a structured way of learning and knowledge exchange. However, applying the learning process in Smarter Together also created learning itself.

During the first Common Reporting period, it became obvious that reporting of the implementation projects as detailed as necessary to support real peer-to-peer knowledge exchange and learning is new to the responsible and, in addition, time consuming. As a consequence, the reporting consumed more time than expected and the preparation time for the first Peer-to-Peer workshop was reduced. This posed a problem especially for the acquisition of external experts for the workshop and the general workshop preparation. Further, the workshop slots didn’t provide enough time for in-depth discussion and co-creation of solutions for identified challenges. However, the first Peer-to-Peer workshop was able to promote an open spirit among the participants and fostered honest exchange and communication about success and failures as well as challenges to be overcome.

As a learning of the first period, the second Common Reporting was scheduled with a larger time interval to the next Peer-to-Peer workshop. In addition, two telephone conferences with all task leaders in WP2 were introduced to discuss the outcomes of the second Common Reporting and prepare the Peer-to-Peer workshop jointly and early in the process. Thereby, inviting external experts to share their expertise with the participants and enrich the discussions and creation of solutions was highly encouraged and promoted.

Furthermore, the workshop slots for the respective thematic fields and identified challenges were extended to provide more time for in-depth discussions and the co-creation of solutions. As a result, the workshop slots stood to benefit from the intensified preparation time and process and the inputs provided during the workshop by several external experts who were invited to share their expertise and know-how with regards to the identified challenges. Anyhow, it remained quite a challenge for the participants and workshop hosts to not only discuss challenges, broaden the horizon and collect new ideas, but to co-create solutions for currently
existing challenges. Therefore, the third Peer-to-Peer workshop will be conceptualized even more co-creation oriented, will provide a broader variety of workshop formats and will stress the lessons learned and how-to for replication in Lighthouse Cities and Follower Cities. In addition, a new template will be introduced to the task leaders of WP2 to better structure and systematically support the preparation of the workshop slots.

The third and last deliverable “D.2.1.3 Thematic recommendations and exchange workshop 3” will provide information on the third and last Peer-to-Peer workshop and its outcomes.