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Deliverable due date: M18 – May 2018

D1.10 Urban Coaching: Description of coached areas and their selection for Mentoring

WP1, Task 1.3

Transition of EU cities towards a new concept of Smart Life and Economy

Project Acronym	mySMARTLife
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Task description	*Task 1.3 Capacity Building: Coaching & Mentoring* is a task led by Cartif (CAR) where an innovative methodology is defined to ease the access to cooperation in common matters linked to the sustainable urban development. The task proposes an open innovative urban coaching-mentoring process to let cities have an assessment of their transformation and producing a self-analysis to understand and detect the most replicable solutions. Main subtasks are: ST1.3.1) Selection of areas of interest and coaching process for each city. Coaches are selected within the consortium by (TEC, CAR, NBK and VTT), considering areas of interest and expertise. Coached assessment by topic through meetings, interviews, workshops, etc. ST1.3.2) Benchmarking of areas and selection of Mentoring city: A number of good practices are selected for mentoring purposes and several partners/cities from lighthouse and follower cities are selected as mentors to do an assessment of their transformation and producing a self-analysis to understand and detect the most replicable solutions. Mentors lead this task addressed to cities (lighthouses, followers and Cities 'Network). ST 1.3.3) Mentor cities will organize study visits to present their projects. This subtask aims to exchange information and foster collaboration. ST1.3.4) Staff Exchange: in this subtask participating cities will define an adequate framework to promote knowledge transfer between cities. Staff will move through the mentoring activity to gain experience, share knowledge and foster collaboration. These experiences will lead to analyze in depth the replicability potential of solutions. The deliverables related to this task are: D1.10.- Urban coaching: Description of coached areas and their selection for Mentoring [TEC] (M18) D1.11.- Urban Mentoring: Experiences of Mentor Cities and replication possibilities [TEC] (M36)

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Table of Content

Table of Figures

Table of Tables

Abbreviations and Acronyms

Acronym	Description
mySMARTLife, mSL	Transition of EU cities towards a new concept of Smart Life and Economy
CAR	Fundación Cartif
LHC	Lighthouse Cities
FC	Follower Cities
HAM	Freie und Hansestadt Hamburg
HEL	Helsingin Kaupunki
NAN	Nantes Métropole
D	Deliverable
SCC	Smart Cities & Communities
RES	Renewable Energy Systems
ESCO	Energy Service Companies

1 Executive Summary

The aim of this deliverable is to describe the coaching activity and the selection of topics for the capacity building activity. The concept of the SCC1 (Smart Cities & Communities) call was thought for making possible a quick replication from lighthouse to follower cities. Similarly, many ongoing actions in the SCC1 Lighthouse Network are focus in trying to replicate interventions by providing information, exchanging experiences, etc. However, it is difficult to measure the success of these actions. In mySMARTLife project a different approach has been used based on an innovative urban coaching-mentoring activity. This document presents an introduction to this methodology presenting which are the key aspects to be considered, and the first phase of its implementation: the coaching activity. By this activity a first selection of topics and projects has been elaborated as a common area of interest for a possible replication. This is understood to be the basis for capacity building and staff exchange. In brief, and by chapter, follows up the description of the content of this deliverable:

Chapter 2 "Introduction", explains the purpose and the target group of the activity, the contribution of partners to activity development and the relation of the deliverable with other activities of the project. It contextualizes the activity and its purpose within the project.

Chapter 3 "Description of the proposed methodology" includes an explanation of the urban coaching-mentoring methodology (key aspects) as well as the steps for its implementation. There is also a reference to the coached topics or areas and the criteria use for the evaluation of projects. These are the key factors for developing an objective selection of projects of interest. The chapter ends with the selection of coachers within the consortium to assess cities and evaluation.

Chapter 4 "Analized and selected projects" describes the projects presented by the cities and the evaluation activity for their selection. Although each case has been different all have shared methodology and evaluation criteria. As part of the selection process the workshops with Cities' Network are described as well. This is the core of the activity.

Chapter 5 "Proposed mentoring activity" presents a preliminary draft of the mentoring activity that will be implemented by M36 (Nov 2019). Grouping of projects by topics was already agreed but the specific content of the study visit, participants, etc. will be determined later.

Chapter 6 "Conclusions" outlines main conclusions related to the methodology implementation in the coaching phase for the self-analysis process, the selection and evaluation of projects and the assessment of how to group projects by topic for delivering workshops of interest that can foster capacity building and staff exchange during the mentoring activity and beyond the lifetime of the project.

Chapter 7 "Annexes" includes the template for submitting projects and all projects submitted. They have been included as a possible reference for other cities.

2 Introduction

2.1 Purpose and target group

The aim of this deliverable is to present the open innovative urban coaching and mentoring methodology to foster the collaboration between participating cities in the project. Transferability of best practices, technical solutions and business models, is connected with a self-analysis through the evaluation and selection of the projects of interest. Cities determine the interventions and projects that are more suitable for replication out of their experience in their deployment and coachers help them with the definition and selection process.

Promoting staff exchange is a complex task that due to linguistic barriers, timings, silos between and within departments, etc. usually ends up in nothing of interest for the cities. And the goal of the staff exchange must be clear, beyond a mere exchange for relational purpose. The approach of the task presented in this deliverable is a methodology to ease the cooperation and exchange in common matters linked to the sustainable urban development. And the framework for the exchange process is defined out of the topics and projects of interest of participating cities. Therefore, it is adapted very much to the areas of interest while being aligned with the mySMARTLife project's urban transformation strategy.

The knowledge exchange is implemented through the mentoring activity where selected cities present their projects. This would not be new without previous knowledge of the project by participants, ad-hoc study visits and specific workshops with room for discussion and getting into the details of these projects. Therefore, the activity is prepared for providing answers in addition to facilitate a first contact between interested parties. It can be considered one step further to a mere staff exchange and closer to a capacity building activity.

The main target group is the cities participating in the project (both lighthouse and follower cities) but technical partners can participate as well. The activity will also be opened to other SCC1 projects and cities that belong to the Cities Network.

2.2 Contributions of partners

The following Table 1 depicts the main contributions from participant partners in the development of this deliverable.

Table 1: Contribution of partners

Participant short name	Contributions
TEC	Deliverable leader, coordination of deliverable, delivery of workshops.
CAR	Lead partner of task T1.3

HAM, HEL, NAN, BYG, PAL, RIJ	Selection of topics, projects and evaluation
TEC, CAR, NBK, VTT	Coachers: evaluation of projects and dynamization of workshops by topics.
SEZ	Preparation of workshop with Cities Network

2.3   Relation to other activities in the project

The following Table 2 depicts the main relationship of this deliverable to other activities (or deliverables) developed within the mySMARTLife project and that should be considered along with this document for further understanding of its contents.

Table 2: Relation to other activities in the project

Deliverable Number	Contributions
D1.11	This deliverable will explain the mentoring activity and staff exchange promoted based on the coaching activity developed and described in D1.10.
D6.7, D6.8, D6.9, D6.10, D6.11	Participation of follower cities in the coaching and mentoring activity guarantees an early stage involvement in the project for sharing best practices and projects. This is an input to the selection of interventions for the techno-economic analysis and for their replication plans.
D6.14, D6.15	The participation of the Cities Network in the coaching and mentoring task is one core activity for their involvement.
D 7.1	Study visits and prepared material can be shared with Lighthouse Project Network
D8.7	Mentoring activities and staff mobility will enrich the communication and dissemination messages of the project

3 Description of the proposed methodology

3.1 General purpose

The general purpose of the activity is to facilitate capacity building and staff exchange in the project. But behind this purpose lies the aim of fostering better replication and scalability actions. Exchange should drive the enhancement of more common deployments taking advantage of synergies and experiences. But legal frameworks, strategy approaches and even needs in the cities are different and this final aim becomes difficult to be achieved in a direct way.

Capacity building and staff exchange allow information flows and personal knowledge that ease cooperation. This is a good way to overcome barriers in the replication process. However, there are some important factors to be taken into account:

- **Selection of topics/projects of interest**: There are general topics of interest in urban transformation strategies. Most of them are common to all cities: energy, mobility, etc. However, these are wide topics with interesting learnings but difficult to transform in projects. Sharing them is helpful at strategy level but gets difficult at intervention level. Our approach considers most effective to focus on projects selected by the cities based on their replicability potential, efficiency and innovation. Besides, previous work in the selection and evaluation of projects brings higher interest for selected choices and implementation can be closer to each reality.

- *Selection of people that participate in the process*: Many times, cities participate in workshops and seminars about different topics. Usually attended by project managers or politicians with a wide perspective of possibilities but limited technical knowledge. Through the proposed methodology mySMARTLife intends to mobilize technical people who can discuss more effectively about the barriers (legal, technical, economic, etc.) and possibilities out of presented themes. The discussion and information exchange will be more effective if during the mentoring activity participants are also grouped by their expertise and responsibilities within their municipality. The manager or the Maintenance chief of the Municipal Bus company will feel more comfortable confronting his problems and exchanging solutions with similar ranked people from other cities. And the results will probably be more interesting for everybody.

- *Attractiveness of the methodology that is proposed*: The preparation of the mentoring activity requires prior work with mentor cities or stakeholders. The mentoring activity must be of interest and this should be prepared from the point of view of participants and what they would like to know and understand about a project. This point is very important to drag the interest of the right participants. Without a good approach the engagement will be difficult.

All three points are obviously interconnected. The study visits or workshops will only be attractive if they are prepared carefully after a precise selection of areas or projects of interest. With these two ingredients participants can be charmed by the activity and participate.

3.2   Steps for its deployment

The proposed methodology is based in three main steps:

3.2.1   Selection of projects by each participating city (From April 2017 to October 2017).

Cities are requested to select reference projects that have been successful in their cities somehow. This is a self-learning process in which, and based on provided criteria, cities analyze their projects. This is useful to brainstorm internally about which projects are most suitable of being showcased and prepared for mentoring.

The most important criterion is related to their replicability potential. Although this is something difficult to measure the methodology proposes to consider in first place whether a project would be replicable someplace else. At least consider if there would be any chance for its scalability within their own city as replicability potential.

Both lighthouse and follower cities are requested to select, by area of interest, at least, one example of intervention/project developed in their own city. The areas of interest are defined trying to find an alignment with mySMARTLife project's interventions. However, the topics are generic enough so that all cities will be able to find a suitable project within each area of interest:

The topics for selection of projects are:

- **Efficient buildings**: Projects with a focus in achieving really efficient buildings in energy terms. New and refurbished buildings can be considered and the topics can be related to: integration of RES (Renewable Energy Systems), refurbishment, use of energy storage, domotics & smart controls, etc.

- **City Infrastructure**: These are projects related to the development of a more efficient infrastructure in energy terms. Topics within this area can be: smart grids, district heating, public lighting, urban RES, thermal and electric storage, etc.

- **Mobility**: Probably transportation is the sector with highest emissions in all cities. Projects and interventions that have been able to contribute to its reduction can be considered. Among others: Deployment of private and public EV's fleet, charging stations, management of urban freights, etc.

- **Non-Technical Actions**: Within this area, projects related to the development and deployment of services related to ICT infrastructure can be included. Also, projects fostering citizen engagement

and participation. Topics can be related to: urban planning, citizen engagement, smart services, social innovation, etc.

For gathering the information in a homogeneous way, a project template was prepared[1]. The template serves to get basic information about each project considering not only a general description but also what are the barriers, impacts, cost, etc. Thus, providing a good first insight on what was developed and its replicability and innovation potential. The collection of the information also serves the purpose of presenting the information in a fiche format so that can be shared not only with potential evaluator but also with anybody interested in the activity and potentially in the mentoring phase.

3.2.2 Coaching by (TEC, CAR, VTT and NBK (From October 2017 to February 2018):

The aim of the coaching activity is to evaluate proposed projects so that only those with higher replicability potential and interests are selected. With provided information coachers make a selection of good references in each topic. But their knowledge and experiences should be aligned with the potential participants, i.e. cities. Therefore, the coaching activity also looks out for their involvement and feedback. Cities are requested to participate directly in the evaluation process.

The evaluation is done based on three criteria:

- Replicability potential: Measuring the feasibility of replication of the project in other cities or in your own city.

- Innovation level: Evaluating if the project provides a new solution to a problem (different technical or business model approach for instance).

- Efficiency: In terms of cost by the energy savings that generates. A specific calculation is not requested, just an evaluation. In the case of Non-Technical actions this point is evaluated in terms of efficiency in providing a solution to the problem. For instance, in case of citizen engagement the number of people that participate should be taken into account.

The criteria are identical for coachers and cities. During this phase coachers get in touch with cities for requesting more info, place questions or try to understand the replicability potential.

3.2.3 Mentoring (From April 2018 to September 2019):

Coachers will contact the reference projects/cities to organize a study tour to which the other cities and participants in mySMARTLife project will be invited. Although attendance is voluntary it is expected that cities, at least, will participate in the study tour. The study tours will be organised under the umbrella of Task 1.3 and Task 6.5: mySMARTLife Cities Network, more precisely, Subtask 6.5.2: mySMARTLife Cities Network replication activities, where these study tours will be opened to the Lighthouse, Followers and the cities of mySMARTLife network. It will be evaluated as well if these tours can be open to other

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[1] Please see Annex 1 for the template

interested cities, from the other SCC1 calls for instance, but of course this decision will depend on the interest of the mentor city in each case. This is an interesting way to promote the mentor city as well as the project.

The study tour can be complemented by presentations from other cities, so that the exchange can be more effective. There will also be specific workshops for fostering discussion, exchange of opinions, etc. and avoid unilateral presentations. The mentoring activity will be prepared as dynamic as possible to guarantee a participatory scenario for all participants.

Follow up to the activity will be done by sending evaluation questionnaires so that feedback from participants can be gathered. The aim will be to evaluate the interest for further exchange within or beyond the project. In any case the activity is prepared to, at least, activate municipal staff exchange by presenting projects of interest and requesting the involvement of the municipal technicians since the evaluation phase. Their participation in the mentoring activity will guarantee a first phase that can lead to further exchanges once there is better knowledge among cities.

3.3 Selection of coachers:

Out of participating partners, and considering that there was enough expertise within the consortium, each topic was named with a coach. Their role was defined for providing a more independent point of view in the evaluation of projects and because their participation in many other European projects give them an overview of market and State of the Art of these topics that is necessary for the evaluation. They will also play an important role in the definition of the mentoring process by indicating how to prepare the study visits, workshops and dynamics for staff exchange. Follows up selected coacher per topic:

Table 3: Coachers participating in the project per topic

Topic	Coacher
Efficient buildings: Projects with a focus in achieving really efficient buildings in energy terms. New and refurbished buildings can be considered and the topics can be related to: integration of RES, refurbishment, use of energy storage, domotics & smart controls, etc.	**Dr. Aurélien Henon** Graduated as engineer from the Ecole Centrale de Nantes (ECN, France) in 2005 and obtained his PhD in energetics from ECN in 2008. From 2005 to 2010 he specialized in the fields of thermos-radiative modelling and building energetics, developing several innovative methods and tools. After participating in national and European research projects, he joined **NOBATEK** in 2011. He is in charge of projects related to energy performance of buildings, thermal dynamical simulation and the development of decision-making tools to help in the choice of energy efficient solutions.

City Infrastructure: These are projects related to the development of a more efficient infrastructure in energy terms. Topics within this area can be: smart grids, district heating, public lighting, urban RES, thermal and electric storage, etc.		**Eduardo Miera** Senior Project Manager at **TECNALIA** in the Energy Efficiency Area. He has been involved in many international and European projects related to urban management and renovation of urban degraded areas. Background in public private partnerships and in the management of consortiums and clusters, He is Msc in International Trade and graduated at the University of the Basque Country in Business Administration.
Mobility: Probably transportation is the sector with highest emissions in all cities. Projects and interventions that have been able to contribute to its reduction can be considered. Among others: Deployment of private and public EV's fleet, charging stations, management of urban freights, etc		**Mª Ángeles Gallego de Santiago** She is a researcher and senior project manager at the Energy Division, in **CARTIF** Technology Center. She has a wide experience participating in European and national research and development projects related to transport and urban mobility. She holds an MEng in Industrial Engineering from Valladolid University. She is currently working in the field of electric mobility, with a strong focus on Smart Cities and urban mobility.
Non-Technical Actions: Within this area please consider other projects of impact in your city including the development and deployment of ICT infrastructure and services. Topics can be related to: urban planning, citizen engagement, smart services, social innovation, etc.		**Esa Nykänen** He works as Senior Scientist in **VTT** Technical Research Centre of Finland having background of Civil Engineer. His recent activities are connected to user needs, services, energy use and ICT. He has coordinated and participated in several EU projects, for instance HosPilot about intelligent energy use in Hospitals and EEBERS about ICT in Energy Efficiency. These activities are connected to both technology in buildings and cities as well as the human aspect of technology.

my SMART Life

4 Analyzed and Selected Projects

As explained in the methodology, each city[2] was requested to select, at least, one project per topic based on the criterion of replicability. For each city the selection process has been different depending on their size, involvement in the project, stakeholders participating in mySMARTLife. Mostly, decisions were shared by more than one department which gives a consensus value to provided selection. Furthermore, it must be noted that in all cases apart from presenting projects with a good replication potential their impact and innovation was considered as well. Therefore, the selection represents quite well the typology of projects that can be replicable in these topics. This is also an interesting learning for replication actions within SCC1 projects.

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[2] All lighthouse and follower cities participated providing projects except for Varna

4.1   Selected projects[3]

Table 4: Selected projects per city and topic

City	Sector	Project
Bydgoszcz (Poland)	Efficient Buildings (Energy)	Demonstration Center of Renewable Energy Sources
Bydgoszcz (Poland)	Mobility	Intelligent Transportation Systems in Bydgoszcz (ITS)
Bydgoszcz (Poland)	Non-Technical Actions	Bydgoszcz Participatory Budget Initiative (BPB)
Bydgoszcz (Poland)	City Infrastructure	Modernization of street lighting in City of Bydgoszcz
Hamburgo (Germany)	City Infrastructure	Urban Data Hub Hamburg (UD-HUB)
Hamburgo (Germany)	Efficient Buildings (Energy)	Energy Campus of the University of Applied Sciences
Hamburgo (Germany)	Mobility	Electrification of E-Buses
Hamburgo (Germany)	Non-Technical Actions	Stadtwerkstatt (Participation of citizen in urban development processes)
Hamburgo (Germany)	Non-Technical Actions	City Science Lab
Hamburgo (Germany)	Mobility	Smile (Smart Last Mile Logistics)
Hamburgo (Germany)	Mobility	Switchh (Car sharing)
Hamburgo (Germany)	Efficient Buildings (Energy)	International Building Exhibition
Hamburgo (Germany)	Efficient Buildings (Energy)	Local Heating Networks and Energy Cooperatives
Helsinki (Finland)	Mobility	ePELI (E-Buses)
Helsinki (Finland)	City Infrastructure	INDIGO (Assessing feasibility and benefits of District Cooling)
Helsinki (Finland)	Efficient Buildings (Energy)	Vikki Environmental House - Energy Efficient office with RES and storage
Helsinki (Finland)	Efficient Buildings (Energy)	Renovation of 70's apartment building into a Passive building
Helsinki (Finland)	Non-Technical Actions	Climate Street (citizen engagement in energy efficiency)
Helsinki (Finland)	Non-Technical Actions	Agile Pilots Smart Kalasatama (Smart Services)
Nantes (France)	Efficient Buildings (Energy)	Digital boiler in Social Housing Building
Nantes (France)	Mobility	Nantes Bussway (24m E-Busses)
Nantes (France)	Non-Technical Actions	Nantes Citizen Engagement: great debate on energy transition
Nantes (France)	City Infrastructure	Public Lightning Renovation
Palencia (Spain)	City Infrastructure	ESCO in the Public Lightning
Palencia (Spain)	Mobility	EV car Sharing
Palencia (Spain)	Efficient Buildings (Energy)	"El Carmen" District, Building retrofitting Project
Palencia (Spain)	Non-Technical Actions	Munipal Digital Service Website
Rijeka (Croatia)	City Infrastructure	Efficient Public Lighting System
Rijeka (Croatia)	Efficient Buildings (Energy)	Efficient Buildings - Smarthomes
Rijeka (Croatia)	Mobility	Electric charging stations
Rijeka (Croatia)	Non-Technical Actions	E-gov web portal

As it can be seen in the table, some cities provided more than one project in each topic (cases of Hamburg and Helsinki) for a total number of 31 projects. By topic, the number of projects presented are: 9 in Efficient Building (Energy), 6 in City Infrastructure, 8 in Mobility and 8 in Non-Technical Actions.

For some cases the allocation of the topic was not very clear as there were projects that could belong to more than just one topic. But initial distribution has been preserved for evaluation purpose.

4.2   Evaluation of projects

The purpose of the evaluation was to find the most interesting projects from the replicability, innovation and efficiency point of view. Establishing three criteria provided the process with an objective measurement system over the interest of the projects avoiding a too subjective evaluation. But participants of the mentoring activity are the cities and therefore their involvement was also requested in

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[3] All projects are included in Annex

my SMART Life

the evaluation process. The steps followed considered the point of view of cities for the evaluation and selection of projects and not only the coachers' interest and point of view.

4.2.1   Evaluation of projects by each city:

All participating cities were requested to name, at least, an evaluator per topic. The purpose was, first to identify potential technicians that could further participate in the mentoring and staff exchange activity. And second to get the feedback of all cities for each project using the same general criteria. This way evaluators knew the interest that each project has for participating cities. The exercise also let cities to get acquainted with the projects under evaluation and compare them with their own. This is part of the self-evaluation methodology to let cities develop a more critical thinking on their projects.

For the evaluation cities were provided with a template where in addition to grading the project they could include specific comments per each type of criterion.

Name of the Good Practice (insert the name of the project)	
Name of the City (and Country)	**Topic** (Efficient buildings, mobility, non-technical actions, …)
REPLICABILITY	**Score:** Grade between 1-10 **Comments:** ………………………………………. ………………………………………………………
INNOVATION	**Score:** Grade between 1-10 **Comments:** ………………………………………. ………………………………………………………
EFFICIENCY	**Score:** Grade between 1-10 **Comments:** ………………………………………. ………………………………………………………
General Comments: Please indicate any comments related to the project	

Figure 1:Template for evaluation

The summary of the evaluation provided by the cities was gathered and distributed to coachers so that this feedback could be taken into account in their selection. Provided individual grades for each project in each criterion was not considered as important as the fact of revealing a general position of interest from the cities towards projects in terms of their replicability potential, innovation level and efficiency. Therefore, this evaluation must be accepted as a guide for the general evaluation process.

City	Sector	Project	Bydgoszcz				Hamburgo				Helsinki				Nantes				Rijeka				Palencia			
			Rep	Inov	Effi	Total	Rep	Inov	Effi	Total	Rep	Inov	Effi	Total	Rep	Inov	Effi	Total	Rep	Inov	Effi	Total	Rep	Inov	Effi	Total
Palencia (Spain)	City Infrastructure	ESCO in the Public Lightning	6	8	9	23	9	5	8	22	5	3	4	12	6	6	8	20	10	9	10	29	9	7	5	21
Bydgoszcz (Polan	Efficient Buildings	Demonstration Center of Renewable Energy Sources				0	6	6	7	19	7	9	9	25	8	5	7	20	10	7	8	25	9	7	7	23
Bydgoszcz (Polan	Mobility	Intelligent Transportation Systems in Byd	8	5	5	18	8	6	7	21	8	9	8	25	7	7	7	21	10	7	10	27	8	5	5	18
Bydgoszcz (Polan	Non-Technical Act	Bydgoszcz Participatory Budget Initiative (BPB)				0	10	4	5	19	7	7	8	22	6	6	7	19	10	8	10	28	10	6	9	25
Hamburgo (Germ	City Infrastructure	Urban Data Hub Hamburg (UD-HUB)	7	5	5	17				0				0	7	7	7	21	10	10	10	30	8	10	9	27
Hamburgo (Germ	Efficient Buildings	Energy Campus of the University of Applie	5	9	6	20	6	10	10	26	8	10	8	26	3	7	5	15	7	8	8	23	6	9	7	22
Hamburgo (Germ	Mobility	Electrification of E-Buses	3	7	7	17				0	8	7	9	24	8	6	8	22	10	10	10	30	6	10	7	23
Hamburgo (Germ	Non-Technical Act	Stadtwerkstatt (Participation of citizen in	8	8	N/A	16	8	6	7	21	6	8	9	23	9	8	8	25	10	9	10	29	7	9	7	23
Hamburgo (Germ	Non-Technical Act	City Science Lab	6	10	N/A	16	9	10	10	29	8	8	8	24	5	8	6	19	8	10	10	28	5	10	8	23
Hamburgo (Germ	Mobility	Smile (Smart Last Mile Logistics)	6	7	8	21	8	10	8	26				0	7	9	9	25	10	10	10	30	5	10	5	20
Hamburgo (Germ	Mobility	Switchh (Car sharing)	4	7	8	19	8	8	8	24				0	7	9	9	25	10	10	10	30	10	10	7	27
Hamburgo (Germ	Efficient Buildings	International Building Exhibition	9	7	6	22	8	9	7	24	7	8	8	23	6	5	4	15				0	8	8	8	24
Hamburgo (Germ	Efficient Buildings	Local Heating Networks and Energy Coope	6	5	7	18	8	5	8	21	8	3	8	19	9	4	8	21				0	10	8	8	26
Helsinki (Finland)	Mobility	ePELI (E-Buses)	4	7	7	18	8	10	8	26	9	7	9	25	8	7	7	22	10	10	10	30	6	10	7	23
Helsinki (Finland)	City Infrastructure	INDIGO (Assessing feasibility and benefit	4	8	7	19	9	7	7	23				0	9	8	9	26	10	10	10	30	9	9	9	27
Helsinki (Finland)	Efficient Buildings	Vikki Environmental House - Energy Effici	9	7	7	23	6	10	10	26	10	9	N/A	19	8	8	7	23	8	10	10	28	9	8	9	26
Helsinki (Finland)	Efficient Buildings	Renovation of 70's apartment building int	8	7	8	23	10	8	6	24	8	8	10	26	8	8	8	24	10	7	10	27	9	7	8	24
Helsinki (Finland)	Non-Technical Act	Climate Street (citizen engagement in ene	10	8	8	26	9	6	8	23	8	9	9	26	8	8	8	24	10	10	10	30	9	8	9	26
Helsinki (Finland)	Non-Technical Act	Agile Pilots Smart Kalasatama (Smart Serv	10	6	8	24	6	9	7	22	8	10	9	27	10	8	8	26	10	10	10	30	6	10	7	23
Nantes (France)	Efficient Buildings	Digital boiler in Social Housing Building	9	5	6	20	9	8	8	25	3	10	9	22				0	10	10	10	30	9	9	7	25
Bydgoszcz (Polan	City Infrastructure	Modernization of street lighting in City of	8	6	5	19	8	6	9	23	7	6	6	19	6	6	4	16	10	8	10	28	9	7	8	24
Nantes (France)	Mobility	Nantes Bussway (24m E-Busses)	4	6	8	18	7	10	8	25	8	7	9	24					7	9	10	26	6	10	7	23
Nantes (France)	Non-Technical Act	Nantes Citizen Engagement: great debate	8	4	10	22	9	7	9	25	8	7	8	23				0	10	10	10	30	7	6	9	22
Palencia (Spain)	Mobility	EV car Sharing	7	5	7	19	7	6	7	20	8	8	6	22	6	5	7	18	10	9	10	29	9	10	5	24
Palencia (Spain)	Efficient Buildings	"El Carmen" District, Building retrofitting	5	3	2	10	7	6	6	19	7	9	8	24	6	7	8	21	10	5	10	25	9	5	8	22
Rijeka (Croatia)	City Infrastructure	Efficient Public Lighting System	8	9	8	25	9	2	8	19	3	2	3	8	9	5	8	22	10	7	10	27	9	7	8	24
Palencia (Spain)	Non-Technical Act	Munipal Digital Service Website	6	4	10	20	10	8	10	28	8	5	8	21	5	4	7	16	10	7	9	26	8	6	7	21
Nantes (France)	City Infrastructure	Public Lightning Renovation	7	8	6	21	5	8	N/A	13	4	5	2	11				0	10	10	10	30	9	7	8	24
Rijeka (Croatia)	Efficient Buildings	Efficient Buildings - Smarthomes	9	4	4	17	8	8	8	21	8	8	8	24	10	8	N/A	18	10	7	8	25	9	8	9	26
Rijeka (Croatia)	Mobility	Electric charging stations	8	5	6	19	7	5	6	18	7	5	6	18	6	4	5	15	10	7	10	27	10	5	5	20
Rijeka (Croatia)	Non-Technical Act	E-gov web portal	6	4	8	18	10	9	9	28	9	8	8	25	7	6	7	20	10	8	10	28	9	8	6	23

Figure 2: Evaluation of projects by city

For the evaluation purpose the rating of own projects was disregarded (painted in yellow). In red evaluations not received on time that, as it can be seen in the table, were for very few projects. It must be noted that for some projects the evaluation of efficiency criterion was difficult and some evaluations have not provided any grade (appear as N/A).

4.2.2 Workshop: Dynamics for evaluation

As part of the First Cities Network Workshop held in Helsinki City Council on February 14th, 2018 several activities were prepared to let cities know about the projects and the urban coaching-mentoring activity. The purpose was to also get a quick feedback about their potential interest over the different projects and specially to understand better the barriers and opportunities that some preselected projects might have. This is particularly interesting to evaluate the replicability potential. With these two goals in mind and in view of the number of cities that participated in the event the activities were arranged.

In the session more than twenty cities participated representing 11 EU countries plus Colombia and Turkey. Participants came with different backgrounds and a mix of functions from politics to technical fields (mobility, city infrastructure, energy, smartcities, etc.). We included in the session lighthouse and follower cities from the project so that the discussion could be more interesting as these cities could bring their own experiences in first hand. Their knowledge of the coaching and mentoring activity was a plus for the preparation of the whole activity.

The first activity was related to the presentation of all projects in the urban coaching-mentoring task. All projects were presented by mySMARTLife cities representatives. Given the high number of projects the activity was prepared as a pitch presentation of no more than 2-3 slides per project where they were

presenting the problems or situations and the solutions provided. Thus, in a simple way all cities could get a quick overview about the projects and evaluate their interest and grade as well each project by the three same criteria: replicability, innovation and efficiency. The exercise was meant to get a quick feedback over all projects and to find out potential interest for the mentoring activity. Each city was provided with a template where they could grade the project and express their interest. All these evaluation sheets were collected and will be used for the mentoring activity, inviting cities to participate in the projects of their interest.

Table 5: Participants in the session

City	Name	Position	Country
Nantes (mySMARTLife LHC)	Mr. Benoit Cuvelier Mr. Damien Garrigue	mySMARTLife Nantes project leader	France
Hamburg (mySMARTLife LHC)	Mr. Johannes Mielchen Ms. Jutta Wolff	Borough of Bergedorf, Department Smart City & Innovation	Germany
Helsinki (mySMARTLife LHC)	Mr. Mikko Martikka Ms.- Mira Jarkko Ms. Marja Vuorinen	City of Helsinki Environment Department	Finland
Bydgoszcz (mySMARTLife FC)	Mrs. B. Katarzyna Napierala Mr. Tomasz Bondos Mr. Grzegorz Boron	City Hall of Bydgoszcz, Department of Integrated Development & Energy Management Office	Poland
Rijeka (mySMARTLife FC)	Ms. Suzana Belošević Romac Ms. Tina Raguzin Ms. Iva Ribaric	Mayor's senior adviser – European project specialist	Croatia
Palencia (mySMARTLife FC)	Mr. Gabriel Rubi	Head of Environment Department Palencia City Council	Spain
Varna (mySMARTLife FC)	Ms. Bilyana Raeva	Representative of Varna City in Brussels	Bulgary
Rome	Mr. Franco La Torre	Head of Internal Auditing Office	Italy
Kartal	Mr. Eray Emiralioğlu Mrs. Bilge Yanilmaz Çetin	Municipality's Parks and Recreation Department & Strategical Development Department	Turkey
Medellín	Mr. Alejandro Delgado	Project Leader Ruta N Medellín	Colombia
Joensuu	Mr. Sami Ruotsalainen Ms. Janna Puumalainen	Development manager & Director of Strategy	Finland
Murcia	Ms. Sofia Lorenz	Climate Change Responsible	Spain
Alba Iulia	Mr. Nicolaie Moldovan	City Manager Alba Iulia	Romania
Málaga	Mr. Diego Gil	Head of Smart Cities Andalucía (on	Spain

		behalf of Málaga)	
Funchal	Ms. Lívia Silva	Head of the Mobility and Traffic Division	Portugal
Almería	Ms. María Angeles Galván Ms. Ana Martínez Labella Mr. Manuel Guzman de la Roza	Head of European Projects Management and Smart City; Public Works Councilor, Security, mobility and strategic planning Councilor	Spain
Kragujevac	Ms. Natasa Pesic Mr. Vladimir Maksimovic	Sustainable and Balanced Development Administration. Head of Project Management & Public utility services	Serbia
Szczecin	Mr. Łukasz Kosmala	Senior Strategy & Development Officer Szczecin Local Government	Poland
Čačak	Mr Vladimir Grujović	Head of the City administration	Serbia
Lappeenranta	Mr. Markku Mäki-Hokkonen Mr. Ilkka Rasanen	Development Manager & Environmental Manager	Finland

The second activity was a roundtable session. Four different tables were organized with cities representatives with the aim of discussing preselected projects by coachers. Instead of giving participants the chance to choose a topic to work with, the dynamic was thought to make all of them participate in all topics. This way the number of tables was selected based on the number of coachers and topics that they had been working with. Instead of moving participants coachers were moving from one table to another ensuring that everyone participated in the four topics. These were the topic distribution and the main conclusions from the roundtables:

Topic 1.- Mobility (Mª Angeles Gallego de Santiago – CARTIF)

Discussion in the different tables was over the interest of cities regarding e-mobility (e-buses, public and private e-cars fleets with their related charging infrastructure, traffic management, etc). All three Lighthouse Cities in mySMARTLife can provide a very good guidance on how to successfully implement solutions under any of these topics as they have previous experience and have already identified barriers (socio-technical and economic). E-buses fleets, in particular, take a long preparatory process to ensure all stakeholders are actively involved and the right ecosystem is in place. All participating cities described similar problems and interest.

Topic 2.- Urban Infrastructure (Eduardo Miera – TECNALIA)

In the case of urban infrastructure there were two main topics or type of projects under discussion: the first one related to Smart Lighting. In almost all cases cities described on-going renovation of their lighting systems. In some cases extended to the whole city and in some cases at pilot level yet. The biggest difference was over the business models used for the renovation and over the use of the grid for extra services (wifi, sensors, etc.). These two aspects were under discussion particularly how to finance the renovation. The second topic was very much related to cities' platforms and ICT services. A miscellaneous

and very heterogeneous situation appeared in the discussion. Few cities with deployed urban platforms offering different level and type of services and most of the cities with projects under implementation for the development of some services (traffic, open data, e-gov, etc.).

Topic 3.- Energy -Efficient Buildings (Aurélien Henon – NOBATEK)

Being such a broad topic, the discussion was led to retrofitting actions, ICT solutions for energy management and increasing local energy production through renewables and/or waste heat recovery. All cities agreed that this was a very interesting topic and that learnings are very interesting to avoid overcosts or even not worth projects. One of the main barriers discussed was funding and business models. There is a strong perception of difficulties to find interesting business models for ESCOs (Energy Service Companies) and cities do not have enough funds for these types of projects without jeopardizing their budgets. Projects from mySMARTLife consortium can be interesting as long as their business models are also replicable.

Topic 4.- Non-Technical actions (Esa Nykänen – VTT)

Preselected projects from this topic were discussed in all tables and were evaluated more in depth after the discussion considering their replicability potential, innovation and efficiency. This was an exercise to complement the evaluation process of the non-technical actions. Most of the grades were in accordance with the evaluation and only in few cases there were differences although not significant in any case. Therefore, previous evaluation was corroborated.
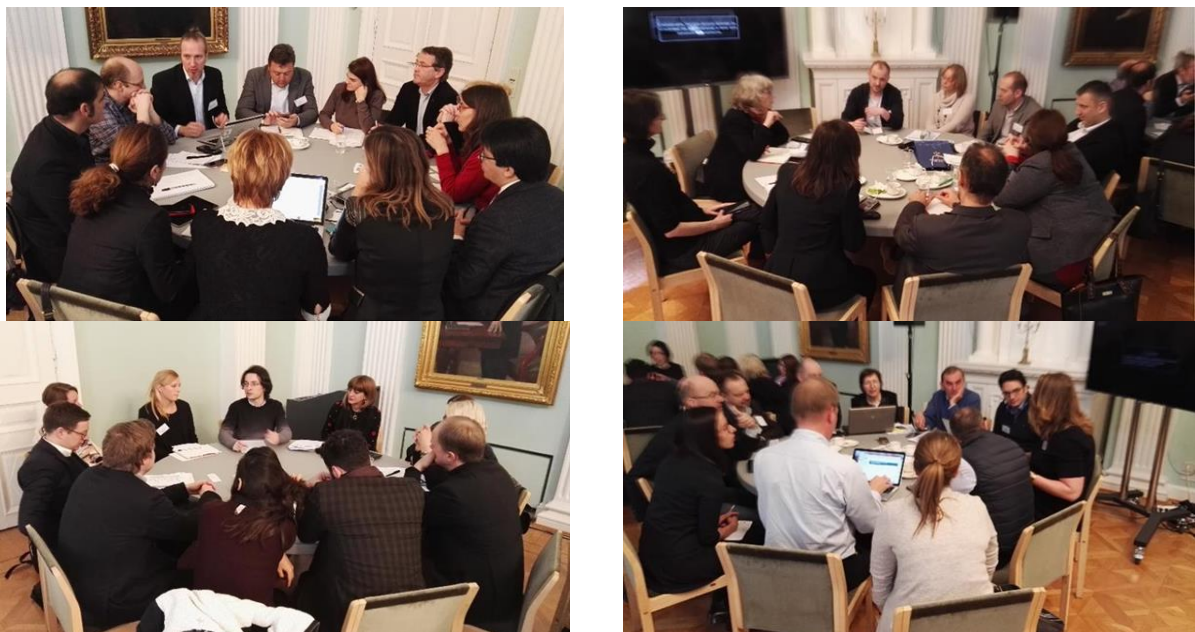

Figure 3: The four roundtables

4.3   Selection of projects

With all the information generated, evaluators had the chance to review their first evaluation and consider whether some projects deserved more attention. As in the case of the non-technical actions, most of evaluations were very much aligned with the comments and perceptions from the cities. But there were some cases that the feedback suggested to change slightly the first evaluation. At least, from the point of view of the value of these projects for the mentoring activity. For instance, in the case of smart lighting 4 different projects were submitted in the same topic. Evaluation of one over the other three is more related to the fact that presents something innovative in terms of business model or services out of the renovation of the lights. However, these features are not so replicable many times and therefore can also be considered as barriers. In this case the evaluation suggested that one city could act as host but there could be a specific discussion in this issue to evaluate these barriers and determine the best solution from the point of view of efficiency. Something similar happens with the projects related to the deployment of e-mobility through electrification of the public bus fleet. Differences are not as important as the fact that going through similar implementations can enrich the exchange and discussion with cities interested in going forward for a similar intervention.

Based on this the final selection per topic has been:

Non-Technical Projects (Esa Nykäken-VTT):

- ***Participatory Budget Initiative (City of Bygdoscz):***

  Since 2012 several initiatives of this project have been engaging higher number of citizens. The city council provides the opportunity to participate in the selection of projects for a limited amount of budget. Being part of the decision making process let citizen to decide some investments and gave them the opportunity to evaluate projects. Some examples of decisions are: construction of playground, sport field, skate park, revitalisation of park/fountain, etc.

- ***Stadtwerskstatt (City of Hamburg):***

  The motivation of this project is the fact that formal participation processes prescribed by the German Building Code are often not sufficient and therefore other type of involvement from citizen must be sought. The project foresees the participation in the urban planning projects to decide what to implement in the city. This participation allows raising social awareness and acceptance.

- ***Climate Street (City of Helsinki):***

  Environmental concern provides wellbeing and even personal savings (e.g. energy consumption reduction). However, unless people understand what and why they need to do this or that improvements are not easily achieved. This project delivers information on projects related to

energy retrofitting, heat recovery, etc. that can easily be understood and used by citizen for their benefit (not only economic).

Mobility Projects (Mª Ángeles Gallego de Santiago-Cartif):

- ***e-buses (one out of projects presented by Hamburg, Helsinki and Nantes):***

  All three lighthouse cities presented their electromobility transition projects based on renovation of their public bus fleet. Projects are very similar as in the three cases there is a public decision behind. But there are differences in the number of buses and therefore investment foreseen for the project. Any of them would be of interest for the study visit and what makes more sense is a discussion to identify common barriers, problems, etc. in the deployment of these interventions.

- **One out of SMILE or SWITCH (City of Hamburg). Preferably the second one.**

  The city of Hamburg presented two interesting mobility projects: SMILE is a good example of a more sustainable Last Mile delivery system. And SWITCH is an example of car sharing by creating a multimodal transportation platform to reduce the use of private cars. Therefore, both projects were selected together in a complementary way considering that they could be a good choice for replication.

- **Intelligent Transport System (City of Bydgoszcz):**

  Access to downtown in Bydgoszcz was difficult because traffic lights were not coordinated and tram transport system did not have any priority. This project brought coordination and priority to the public transportation system avoiding delays and reducing traffic jams. This is a good example of how a smart solution can help achieving sustainable goals.

Energy Projects (Aurélien Henon-Nobatek):

- ***Renovation of 70's apartment building in Riihinaki (City of Helsinki):***

  In this project a building was renovated into a Passive House building. The goal was to achieve an energy efficiency renovation and reduce the energy consumption of the building. Several elements needed to be renovated and prefabricated façade elements were used for a faster renovation. These elements also reduced disturbance for residents so that they could be able to stay in the building during the work.

- ***Digital boilers (City of Nantes):***

  There is a growing energy demand at datacenters where they also need energy not only to run but to also cool down. This project recovers the waste heat from computer servers to heat the

sanitary water used in the building while cooling down the servers. Therefore, there is a double benefit. The project is highly replicable in other datacenters.

- **Smarthomes – ICT energy control systems (City of Rijeka):**

The goal in the project was to achieve a reduction of energy consumption of 40% by year 2030. Aligned with sustainable goals in the city the project implemented a number of actions or interventions in different fields: retrofitting of public and private buildings, photovoltaic power station installed in public buildings, over 200 energy audits, smart meters and smart thermostats, etc. The projects represents an action plan and can be a good example from the point of view of replication.

Urban Infrastructures Projects (Eduardo Miera-Tecnalia):

- **Smart Lighting (City of Bydgoszcz) but other cities can also be selected:**

Four cities presented projects in the area of smart lighting. Differences were related to the business models and the implemented services over the grid. Beyond the renovation level of the lighting system it was interesting to find common issues related to barriers for a full deployment of the solution and specially its replication.

- **INDIGO (City of Helsinki), energy planning tool:**

This is a tool developed for providing guidance in district cooling solutions. The tools assess feasibility and benefits as well as comparison between building/space specific cooling systems and district cooling systems.

- **Urban Data Hub (City of Hamburg)**

The main objective in this project is to connect present and future IT systems and IT services beyond just knowing each other and the bilateral data exchange. The Urban Platform will enable Hamburg to maximize value from city data providing a better management of the current explosion in volumes of city data.

5 Proposed Mentoring Activity

Once projects have been selected mentoring activity must be prepared. By the time of writing this deliverable the activity is being agreed with cities and participants. But so far, we can present a tentative schedule of the planned study visits. Of course, the specific contents of the visits and workshops will be decided later and their implementation reported under D1.11 in M36.

Preliminary schedule is based on a reasonable number of events and the way most of selected projects can be grouped. For each topic there is a "preferred" project and rest of projects have been accommodated somehow around this initial core visit. The proposal looks as follows:

1.- Mobility Topic: City of Hamburg

Can include presentations from SMILE and SWITCH projects, plus presentation of the Intelligent Transport System of the city of Bydgoszcz. This would give a complementary information of activities in the mobility field.

The focus of the study visit would be the e-buses. A roundtable about the benefits and barriers that cities are facing in the implementation of the electro-mobility can be prepared. Involving people from the municipal transport companies that are implementing these interventions in the cities would make it very interesting.

2.- Energy topic: City of Nantes

The project selected is Digital boilers that can be the basis for the study visit. How it was prepared, how it works, which problems, funding scheme, replication potential, etc. This is the kind of project that is quite innovative and with high replication potential.

There could be room for presenting other energy related projects (perhaps some part of mySMARTLife). There is a strong local consortium in the energy field that can help presenting different type of interventions (retrofitting, district heating, etc.)

3.- Non-Technical Topic: City of Helsinki

The most "visual" project in this topic is Climate Street and it has been selected for being the core of the study visit. It is interesting from the point of view of engaging citizen as users of services to understand how they can benefit from some services. In any case the three projects selected for this topic can be presented and discussed.

There could be room for a roundtable about citizen engagement or exploring the key features to foster citizen engagement and social awareness. This is also a topic that is being analyzed in the project and some conclusions can be discussed during this workshop.

4.- ICT Topic: City of Rijeka

It was not considered as topic, but there are some projects that can be grouped in this topic: Urban Data Hub (HAM), INDIGO (HEL) and SmartHomes (RIJ). The three of them can be connected and it seems that the SmartHomes project can be more visual from the point of view of the study visit. We will need to organize this topic considering that ICT and Energy are combined.

Participants will limit this possibility according to their interest as sometimes interests for ICT platforms (architecture, data governance, etc.) is far from the interest in specific services.

5.- Smart Lighting Topic: City of Bydgoszcz

As in the case of the e-buses a number of projects related to this topic were presented by partner cities. Perhaps it is worth to organize a roundtable where the specialist and municipal technicians can discuss about the different approaches (only lighting, sensors, etc.). Some of the cities have commented that they would be interested in discussing about this topic in particular.

The draft of the calendar would be (considering the status of projects):

- Sept-Oct 2018 (BYG)
- Nov-Dec 2018 (RIJ)
- Feb-Mar 2019 (NAN)
- May-June 2019 (HEL)
- Sept-Oct 2019 (HAM)

6 Conclusions

The innovative urban coaching-mentoring activity proposed in mySMARTLife project seeks to establish a confidence relationship between not only cities but specially technicians from these cities. The project builds upon good references based on their replicability potential to establish information exchange and working spaces where they also get to know each other. The success of the methodology is based on finding common areas of interest, mobilizing right people and providing dynamic sessions that would be attractive for participation. This is a first phase of the staff exchange that can trigger longer term exchanges beyond the project.

However, the activity is not free of problems and selecting the right projects and finding the areas of interest is a difficult task. During the coaching part of the activity these areas have been explored and, through a self-analysis methodology, cities have provided references based on their replicability potential. This exercise gives them the possibility of analysing the scalability potential of their own projects and determine whether they can be exhibited and "judged". This is interesting from the point of view of stopping to evaluate own's projects and their impacts at city level and start evaluating in a more global scope.

But the coaching activity also requested to cities to evaluate rest of projects presented by the other cities. For doing so, they were requested to select "in-house" evaluators for each field. This is a first step to determine the people that can probably participate later in the mentoring activity. Through the evaluation these technicians learned about other projects and started to identify potential interest for their cities.

At the same time the coaching phase opened a collaboration opportunity to the Cities' Network by giving them the chance to know these projects and express their initial interest in getting more in-depth information. Roundtables also provided interesting feedback about barriers and problems for replicating some type of projects. Although very interesting if replication is not possible the project would not be selected. This is a must to compound attractive study visits that can satisfy the expectations of participants.

Out of the evaluation some similar references have been detected in some topics. For instance, in the case of mobility the electromobility transition is clear. Specially changing the public bus fleet into ebuses. Being cities under SCC1 call this common effort can be understood. However, it must be pointed out that this was also the kind of interest expressed by the Cities' Network and therefore it can be concluded that this is a general aim and understanding problems and barriers replication can go faster. In the case of Smart Lighting also several projects were presented. This is an area where cities find quick savings (environmental and economical) but the use of the grid for other type of services remain problematic. Lighting is very sensitive and for the infrastructure or maintenance department the value of using the grid beyond the lighting service is not very clear. Therefore, "experiments" take place in limited areas. These

are the kind of common issues that can also be discussed and most effective ways to renovate the systems can be determined.

This coaching activity concluded providing a preliminary version of the mentoring activity. Considering the selection of projects topics have been grouped so that areas of interest are clearly identified. In the mentoring phase the challenge of mobilizing the right people and preparing dynamic and attractive sessions will need to be achieved. In the first case a preliminary selection of people in each city was implemented during the coaching part. It is expected their involvement not only as participants but in many cases as host or mentors as well. Getting their involvement from the beginning of the task is positive to be able to make an allured mentoring phase.

7 Annex 1: Selection Template

Name of the Good Practice	
Name of the City (and Country)	**Topic** (Efficient buildings, mobility, non-technical actions, …)
Promoter & Developer (It can be different)	**Key Players** (who)

Introduction [Approximately 50 WORDS]
Describe the situation before. What major problems and issues needed to be addressed in the area?

FORMULATION OF OBJECTIVES [Approximately 100 WORDS]
Provide a summary of the main objectives and strategies of the initiative/project, how they were established and by whom. Include how financial, technical and human resources were mobilized and where they came from.

PROCESS [Approximately 250 WORDS]
Describe the problems faced in implementing the initiative, how were they overcome, and the problems that remain to be solved. Provide a summary of tools, methods, and/or benchmarks that were used for assessing performance

RESULTS ACHIEVED [Approximately 100 WORDS]
Describe to what extent the objectives listed above were achieved, how the impact was measured, quantitatively and qualitatively, who benefited and how.

LESSONS LEARNT [Approximately 100 WORDS]
Describe the three or four most important lessons learnt and how these lessons have been or are being incorporated in your city. Describe any lessons learned from other initiatives that were incorporated into your project. Describe how these lessons have been or are being taken into consideration in determining ongoing or future policies, strategies and action plans for example, what would you do differently or avoid doing in scaling up or transferring your experience?

REPLICATION [Approximately 100 WORDS]
In this section, please describe how your project has benefited from the experience or expertise of other practices. Describe how your initiative could be replicated. If the process of replication has commenced, please indicate when and by whom.

REFERENCE MATERIAL
Include a short description of any material that could be used as reference: links to reports, news, presentations, etc.

8 Annex 2: Projects

8.1   Projects presented by Hamburg

8.1.1   Urban Data Hub in Hamburg

Urban Data Hub in Hamburg	
Name of the City (and Country) Hamburg, Germany	**Topic** Technical Actions (ICT)
Promoter & Developer State Agency for Geoinformation and Surveying, Urban Data Hub	**Key Players** State Agency for Geoinformation and Surveying, Urban Data Hub

Introduction

City data holds vast untapped value. Most of the city data are retained in silos which are not connected to each other. In addition, the amount of data is growing exponentially. This leaves the city with capability gaps and without the feature of using their data in applications that speed up processes and save resources. Furthermore, there is no standard implemented yet to provide real time data as open data.

FORMULATION OF OBJECTIVES

The main objective is to connect present and future IT-systems and IT-services beyond just knowing each other and the bilateral data exchange. Subsequently using their logical and analytical capabilities in interactive processes to inform, prepare decisions, and assist or be active for decision-making. The Urban Platform will enable Hamburg to maximize value from city data providing a better management of the current explosion in volumes of city data. Furthermore, it shall allow sharing more easily the city data between city services in order to improve outcomes for society.

Therefore, the UP has to provide scalable IT solutions to fulfill the needs of a smart city by exploiting modern technologies (IoT/sensors, cloud, mobile, analytics). This is needed i.e. for real time data as open data with minimal latency.

In short, the Urban platform will provide the building blocks that enable cities to rapidly shift from fragmented operations to include predictive effective operations, and novel ways of engaging and serving city stakeholders.

The Urban Data Hub Hamburg (UD-HUB) is based at the State Agency for Geoinformation and Surveying. It is the vital provider for developing and operating the UP Hamburg. The UD-HUB is the one basic institution for connecting silos to the Urban Platform in a consultant way.

PROCESS

Silo owner need to be convinced that open data yields in a higher benefit for everybody and will reduce hidden costs. Therefore, good examples from different domains show the potential of using city data in a smart and open way.

RESULTS ACHIEVED

More than 3300 data sets are already provided in an open catalogue via the Urban Platform. The datasets cover a

my SMART Life

wide range of urban data. These services are provided using standard APIs and data models usually based on specifications of the OGC i.e. WFS (Web Feature Service), WMS (Web Map Service), GML (Geographic Markup Language), etc. The urban platform also started to provide near real time data e.g. occupation of charging stations for electro mobility, availability of city bikes at the specific bike stations, and availability of parking slots on parking decks as static services.
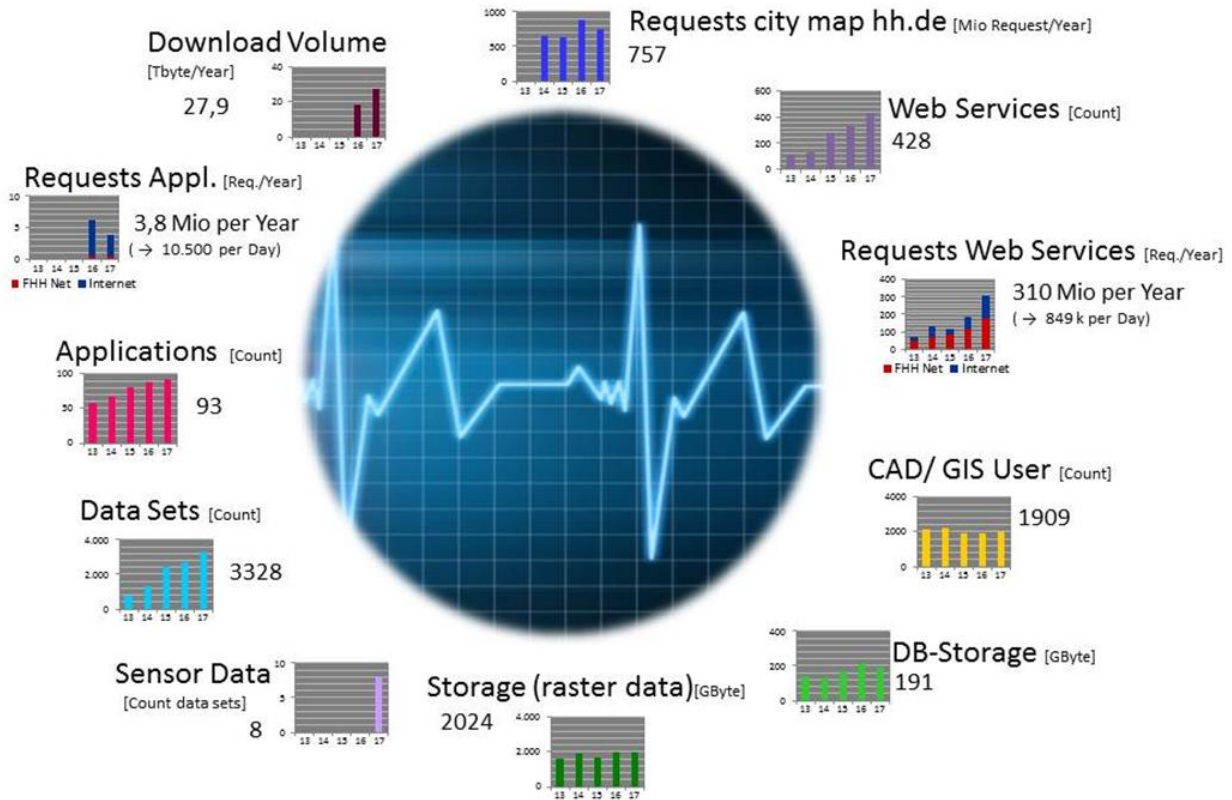
LESSONS LEARNT

Tbd

- legal regulations
- transparency portal
- spatial data infrastructure as core
- citizen involvement

REPLICATION

We benefited from our experience with the geo spatial infrastructure within the agency. In addition we used the outcomes of other European initiatives such as EIP-SCC and the H2020 project Espresso.

Tbd

REFERENCE MATERIAL

N/A

8.1.2   Energy Campus of the University of Applied Sciences

Energy Campus of the University of Applied Sciences	
Name of the City Hamburg, Germany	**Topic** Efficient Buildings
Promoter & Developer University of Applied Sciences	**Key Players** University of Applied Sciences

Introduction

(taken from their website)

In the last few years, renewable energy has developed into an important element in economic policy with great momentum. The energy transition and the development of renewable energy offer huge economic potential that must be harnessed even better in future with HAW Hamburg's new technology centre "Energy-Campus". It includes a wind laboratory and a smart grid laboratory. Moreover, a wind farm was built in direct proximity for research purposes.

FORMULATION OF OBJECTIVES

(taken from their website)

KNOWLEDGE: FOCUS Exploration of the technology transfer, consolidation of Hamburg as a center of science and research, strengthening of the increasing cluster of renewable energies.

CITIZEN FOCUS: Transferring knowledge and information, creating acceptance of the energy transition among the citizens as well as developing strategies for sustainability.

ENTERPRISE FOCUS: Stimulation of locating enterprises within the renewable energy sector as well as their research projects, business start-ups, further education and qualification of skilled labor.

PROCESS (taken from their website)

(taken from their website)

WINDFARM

The Curslack wind farm with five wind turbines of two to three megawatt class is being developed approximately one kilometer from the Technology Center Energy-Campus. Up to 15,000 households can be provided with environmentally friendly electricity from this wind farm. By means of the integrated network of the institutions with the real wind farm, numerous research projects as well as synergy potential are to be created. Examples are the study of the integration of wind power into the electricity grid and the enabling of the balancing out of fluctuations through load management and storage components.

SMART GRID

In the smart grid laboratory, efficient and intelligent solutions in the interaction between energy generation, consumption and storage are developed and tested.

Demand side integration: Flexibilization of the demand side in order to cope with the fluctuating feed character of renewable energies and to reduce the strain on the power grid. In addition to the electricity generators – one photovoltaic generator and one block-type thermal power plant – various flexible electricity consumers will be integrated at the Technology Center for this purpose. The interaction of these components with the various system elements of a smart grid can then be examined. All the components will be integrated into the normal operation of the building.

Grid-conducive heat production: Variable heat production for the building with coordinated operation of heating cartridges, heat pumps and a block-type thermal power plant as well as heat and cold reservoirs. Depending on the situation in the power grid, the building can cover its heating and cooling needs with simultaneous electricity consumption or generation.

Energy storage: Development and testing of storage concepts. Battery storage, storage capacity for hydrogen and methane as well as heat and cold reservoirs are installed at the Technology Center for this purpose.   Building technology: Optimization of energy efficiency by means of an intelligent and variable control and regulation concept.
RESULTS ACHIEVED   tbd
LESSONS LEARNT   tbd
REPLICATION   tbd
REFERENCE MATERIAL   https://www.haw-hamburg.de/cc4e/energie-campus.html (German website, but videos)   https://www.haw-hamburg.de/english/research/energy-sustainability/cc4e/energy-campus.html (English website)   https://www.haw-hamburg.de/fileadmin/user_upload/Forschung/CC4E/pdf/ENGL_CC4E_E-Campus-Broschuere_web.pdf (English brochure)   For study tour: visit possible

8.1.3   Electrification of public bus fleet

Electrification of public bus fleet	
Name of the City (and Country) Hamburg, Germany	**Topic** Public transport -E-Buses
Promoter & Developer City of Hamburg Public transport authorities Public transport operators	**Key Players** Verkehrsbetriebe Hamburg-Holstein GmbH Hochbahn AG Hysolutions

Introduction
Today, local public transport is mainly performed by electric subways, suburban trains and conventional buses. As the Mayor of Hamburg declared in 2013, the public transport should be organized emission-free by 2020. Operators have to adapt their fleet and operation.

FORMULATION OF OBJECTIVES
Transformation of bus procurement until 2020 towards 100% emission-free transport. Tests of different bus and charging technologies to guarantee a functional transformation in 2020. Modification of bus depots and garages to operate and maintain the new vehicles. Training of driver for efficient driving and in the use of e-buses. Optimization of bus operation and routing.

PROCESS
The time for changing a bus fleet towards 100% emission-free vehicles is short and the technology is not completely developed yet. To gain experience in this field, the e-bus fleet is stepwise supplemented by different e-bus types. Until 2020 one bus depot out of eleven should be prepared for the operation of e-buses. This includes a new garage for maintenance work on the e-buses. Additionally, the drivers have to be trained.

RESULTS ACHIEVED

In 2013 the first two electric buses have been installed and are operating on a 5 km round circle in Hamburg Blankenese. The buses are charged overnight as well as at the terminal stops via fast charging. In 2016 the next two electric articulated buses are commissioned. In 2017 the tendering process for the next ten e-buses has been completed. At the same time the planning process of the charging infrastructure and the construction of a new garage building in Bergedorf have been started. In 2018 over 14 e-buses will be in operation and the infrastructure is planned to be ready for operation. The e-bus fleet is used for tests and driver training.

LESSONS LEARNT

The three most important lessons learnt:

-setting up local initiative for knowledge sharing has been very valuable in the project

-Experience with new technologies gained

-Biweekly exchange with different stakeholders keeps the project on track and avoids unnecessary work

REPLICATION

In Europe there are several cities where e-buses are in operation. Study trips and knowledge sharing helped to improve the commissioning process. At the same time Hamburg stands for a lighthouse city in Germany in the case of emission-free public transport. Consequently, our experiences can be transferred to other cities in Germany and Europe.

REFERENCE MATERIAL

https://vhhbus.de/e-bus/elektromobilitaet/

8.1.4   Stadtwerkstatt (citizen participation)

Stadtwerkstatt (citizen participation)	
City: Hamburg/Germany	**Topic** Non-Technical Actions: Participation of citizens in urban development processes
Promoter & Developer Stadtwerkstatt Free and Hanseatic City of Hamburg and its authority for urban planning and housing	**Key Players** Stadtwerkstatt Free and Hanseatic City of Hamburg and its authority for urban planning and housing

Introduction

Stadtwerkstatt is a public institution carrying out participation processes in Hamburg. Regarding their organizational belonging they are part of the authority for urban planning and housing.

FORMULATION OF OBJECTIVES

As formal participation processes prescribed by the German Building Code are often not sufficient the Free and Hanseatic City of Hamburg has introduced the Stadtwerkstatt as an institution carrying out additional informal participation and information processes for citizens in the context of urban development.

PROCESS

Stadtwerkstatt is implementing events and processes for citizen participation and information for different urban planning projects. Depending on the spatial scale and planning subject Stadtwerkstatt applies suitable formats and methodologies for specific frameworks. It is an especially big challenge for Stadtwerkstatt to activate and involve citizens from different social backgrounds.

Altogether, Stadtwerkstatt forms the roof for informal citizen participation.

RESULTS ACHIEVED

Since 2012 Stadtwerkstatt successfully implemented a great number of different participation processes and gained wide knowledge and experiences concerning the local conditions for citizen engagement in Hamburg. With support of the state agency for geo data Stadtwerkstatt can use a digital interactive table for participation processes.

LESSONS LEARNT

The work of Stadtwerkstatt has shown that engaging citizens in different ways in urban development projects produces new ideas and promotes a wider acceptance of new planning concepts.

REPLICATION

Stadtwerkstatt is not a project but an enduring institution. Thus, replication is part of the process.

REFERENCE MATERIAL

http://www.hamburg.de/stadtwerkstatt/

For study tours: presentation of projects and tools are possible.

8.1.5   City Science Lab

CityScienceLab	
City: Hamburg/Germany	**Topic** Non-Technical Actions: Interaction of city and digitalization
Promoter & Developer HafenCity University in cooperation with the MIT Media Lab	**Key Players** HafenCity University

Introduction

The CityScienceLab (CSL) is an institution of the HafenCity University of Hamburg. Since 2015 the CSL conducts research and realizes projects at the interface between digital technologies, cities and society. The CSL runs in cooperation between HCU Hamburg and the Media Lab of the Massachusetts Institute of Technology in Cambridge (USA).

FORMULATION OF OBJECTIVES

The research of the CSL focuses on the structural changes in cities due to progressing digitalization and the dissemination of digital technologies. In general, the CSL aims to analyze processes of change, particularly in Hamburg, and shape them in a constructive way. For the CSL it is especially interesting to consider the social added values of digital technologies and the impact of digitalization on society.

PROCESS

The CSL uses models and visualizations of urban future scenarios for the development of participatory processes. On this occasion, data is considered as a public good. Taking up different scientific perspectives and pursuing a transformative claim the CSL works in a trans- and interdisciplinary way. The work of the CSL moreover initiates dialogues between science, politics, civil society and business by discussing current urban challenges with experts as well as citizens.

RESULTS ACHIEVED

Since 2015 the CSL implemented several projects, entered partnerships with other research institutions and is member of different professional networks. Especially the project "Finding Places" from 2015, in which citizens could discuss new places for refugee homes in Hamburg using an interactive city model, was especially successful.

LESSONS LEARNT

Lessons learnt were made from a technological perspective, using different kinds of interaction technologies. In addition, different projects provided experiences in different stakeholder environments, specific contents etc.

REPLICATION

The CSL benefits on the one hand from exchange with and technical expertise from the MIT Media Lab. On the other hand, CSL cooperates with other departments of HCU and fosters regular exchange with other research projects and stakeholders in Hamburg.

REFERENCE MATERIAL

Website english: https://www.hcu-hamburg.de/en/research/citysciencelab/

Projects since 2015:

- Digital Platform (since 2017)

- Smart Square (since 2017)

- CityScope Further Development (since 2016)

- Finding Places (terminated)

For study tours: presentation of projects and tools are possible in the CSL.

8.1.6   SMILE (Smart Last Mile Logistics)

SMILE: Smart Last Mile Logistics	
City: Hamburg/Germany	**Topic:** Mobility
Promoter: & Developer City of Hamburg Logistics Initiative Hamburg	**Key Players** City of Hamburg Logistics Initiative Hamburg Parcel service providers Several companies offering technical solutions for parcel delivery

Introduction

E-commerce rapidly increased in recent years. Parcel delivery in cities in particular for private households leads to a noticeable amount of additional transportation. Very often parcels are not delivered by the first contact to the customer and a second or third trail is needed. Temporary parked vehicles (often on the streets due to the lack of parking zones) cause congestion. Moreover, delivery vehicles quite often have a diesel engine and lead to air pollutant emissions in residential areas.

FORMULATION OF OBJECTIVES

By the project it is aimed to develop ideas and to start pilot projects that are dealing with the initial problems described above.

In particular it is aimed

- to reduce required transportation by improving the delivery process

- to improve the environmental performance of delivery,

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- to make use of innovative solutions to reach these goals.

An overarching goal is to bundle several projects, startups and initiatives dealing with last mile logistics in a public-private-partnership.

PROCESS
The process includes the following:
- Regular meetings and elaboration of common goals, projects etc.
- Testing new technical solutions (such as parcel lockers, or parcel robots → see picture in shz.de (newsportal)-hyperlink in pilot projects,
- Testing alternative vehicles (such as cargo bikes, parcel robots) for delivery
- Evaluating alternative propulsion technology for delivery vehicles (such as e-mobility, LNG)

RESULTS ACHIEVED
The project is not finished yet and results need to be determined.

LESSONS LEARNT
The most important lessons learnt are the following:
- Setting up such a working group/ public-private-partnership
- Impact of necessary improvements on regulation
- Experiences with technological solutions

REPLICATION
There were several projects before SMILE in Hamburg dealing with this issue that were taken as a basis.

REFERENCE MATERIAL (German only, but some pictures included)
https://www.shz.de/regionales/hamburg/smile-ideen-fuer-die-paket-zustellung-der-zukunft-id15448721.html
http://www.hamburg-logistik.net/veranstaltungen-und-projekte/projekte/laufend/smile-smart-last-mile-logistics
http://www.hybrilog.de/details/hamburg-goes-smart-in-paket-zustellung.html
For tours: Presentations are possible and visiting solutions in action such as the cargo-bikes, delivery robot

8.1.7   SWITCHH (Car Sharing))

Switchh	
City: Hamburg/Germany	**Topic:** Mobility
Promoter & Developer Hamburger Verkehrsverbund (HVV) Free and Hanseatic City of Hamburg	**Key Players** Hamburger Verkehrsverbund (HVV) Free and Hanseatic City of Hamburg Stadtrad Hamburg Car sharing companies
Introduction A multimodal transportation platform was wanted and needed.	

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FORMULATION OF OBJECTIVES

The Hamburg transportation network (HVV) operates together with a group of car sharing companies and "StadtRAD" Hamburg a multimodal traffic platform called "switchh". The objective is to give citizens the opportunity to decrease their use of private cars but still being mobile and flexible.

PROCESS

Therefore, in the timetable app of the Hamburg transportation network, not only the best connections with the public transport are indicated, but also alternative routes with hired car, taxi or bicycle are suggested. With a "switchh" account it is possible to reserve the vehicles of a group of car-sharing companies (Europcar, car2go, DriveNow, Cambio) directly. At 14 strategic rapid transport and underground stations in Hamburg so-called switchh points were created, which offer car sharing and city bikes at the same station. There is also one switchh point at the station in Bergedorf, positioned at a parking space.

RESULTS ACHIEVED

See above

LESSONS LEARNT

Lessons learnt are in the mobility service that is offered as described above. Moreover, experiences were made in the network building that is required to bundle mobility services and in the field of ICT services behind.

REPLICATION

Currently it is planned to set up more 50 mini-switchh points in the next year(s). They are not offering the full range of mobility services but adapted to the needs of surrounding areas.

REFERENCE MATERIAL

Website (German only):

https://www.switchh.de/hochbahn/hamburg/switchh/homepage

For study tours: presentations and visit of switch points are possible.

8.1.8 International Building Exhibition

International Building Exhibition Hamburg (2007-2013)	
City: Hamburg/Germany	**Topic**: efficient buildings, energy
Promoter & Developer Free and Hanseatic City of Hamburg IBA Hamburg GmbH	**Key Players** Free and Hanseatic City of Hamburg IBA Hamburg GmbH Project partners

Introduction

(taken from their website):

One of the largest urban development projects in Europe has been carried out in response to the needs of citizens. In the middle of Hamburg, the International Building Exhibition IBA Hamburg has sought to find answers to the most pressing issues facing modern cities. Seventy projects have been implemented in Wilhelmsburg, Europe's largest populated river island, Veddel, and "Harburg Upriver Port", up to 2013 and beyond.

After the great storm surge of 1962 claimed the lives of hundreds of people from Wilhelmsburg, many residents left the devastated islands. In subsequent years Wilhelmsburg and Veddel became "problem areas" and a source of negative headlines. Committed Wilhelmsburg residents became proactive and in 2001 received funding from the Hamburg authorities for a Wilhelmsburg Future Conference. More than one hundred citizens worked in

conjunction with the authorities on creating a vision of the outlook for Wilhelmsburg, and in 2002 produced a White Paper that called for better schools and prospects for children and young people, high quality and family friendly new residential buildings, the relocation of the Reichsstrasse, the elimination of brownfield sites, and improved transport connections.

As a result, in 2004 the City of Hamburg outlined its "Leap across the Elbe", and in 2005 drafted the Memorandum for the International Building Exhibition Hamburg 2013. The southern areas of the city were to be developed and used to boost the growth of the booming metropolis. This would be aided by two instruments: the international garden show Hamburg 2013 (igs) and the International Building Exhibition IBA Hamburg.

FORMULATION OF OBJECTIVES

(taken from their website):

For more than one hundred years, the letters 'IBA' have stood for 'Internationale Bauausstellung', international building exhibition. This is actually a misleading title. A building exhibition is much more than a mere exhibition. It is an instrument of visionary urban development. Visitors do not only see buildings. At an IBA, people are researching and developing live, just like in a lab, within a given time frame. Only that this lab is an entire area of the city. In case of the IBA Hamburg, this have been the Elbe islands between 'HafenCity' and 'Harburg'.

The research assignment was: Developing the city of tomorrow. Where and how do we live, work, study and where will we be in 20 years' time? How will the cities face the impact of climate change? It has taken seven years of researching and developing in Hamburg, from the IBA opening year to the interim presentation in 2010 until the current presentation in 2013.

Every IBA exhibition carried out so far has been significant and forward-looking, offering a lot of inspiration and innovation. The first building exhibitions were presentations of modern architecture, but their aim was not only to present new architecture but also a new life style. Today's building exhibitions are kind of 'workshops' which can cover several years. Apart from the presentation of new architecture, the focus is now on social, economic and cultural matters. The IBA Hamburg has been concentrating on the vital questions concerning metropolitan development such as the living together of different cultures or reasonable and healthy ways for a city to grow. Continuing the tradition of the former building exhibitions, model houses for future building construction were of course also shown.

There is one thing that all building exhibitions up to now have in common: Far beyond the scope and the immediate exhibition area, they have all given impetus to future urban life. Officially, the IBA Hamburg ends in 2013, but the initiated process of urban development is going on. Some of the projects are still being realised and have to be completed. And action groups such as the Education Drive or the 'Renewable Wilhelmsburg' Climate Protection Concept are continuing their work.

PROCESS

The IBA included a complex and long program covering many projects. In particular interesting are

- the energy hill Georgswerder (http://www.iba-hamburg.de/en/projects/energieberg-georgswerder/projekt/energy-hill-georgswerder.html),

- the energy bunker (http://www.iba-hamburg.de/en/projects/energiebunker/projekt/energy-bunker.html),

- and housing (http://www.iba-hamburg.de/en/projects/wilhelmsburg-central/the-building-exhibition-within-the-building-exhibition/projekt/the-building-exhibition-within-the-building-exhibition-1.html).

RESULTS ACHIEVED

Results are summarised in manifold reports and publications. For the purpose of this project template it will be

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interesting to explore results from (taken from their website):

- Housing: These are

  - Smart Material Houses demonstrate building using innovative construction materials.

  - Smart Price Houses set out cost-effective, inner-city building solutions.

  - Hybrid Houses, which are adapted to the needs of the residents.

- Energy hill Georgswerder: From toxic waste dump to prime example of renewable energy generation: the Georgswerder landfill site has been transformed into a renewable energy hill as part of the Internationale Bauausstellung IBA Hamburg (International Building Exhibition). It supplies around 4000 households with electricity using wind power and solar energy alone, and is being made accessible to the public as a view point.

- Energy bunker: Wilhelmsburg's former air raid bunker has been transformed into a symbol of the "Renewable Wilhelmsburg" Climate Protection Concept. Having languished almost unused since the end of World War II, the monument has now been renovated during the IBA Hamburg and converted into a power plant using renewable forms of energy, with a large heat reservoir. This supplies the Reiherstieg district with climate-friendly heat, while feeding renewable power into the Hamburg distribution grid.

LESSONS LEARNT
Manifold, tbd
REPLICATION
Manifold, tbd
REFERENCE MATERIAL
See links above

8.1.9 Local heating network between hotel, culture center and residential buildings

Local heating network between hotel, culture center and residential buildings	
City: Hamburg/Germany	**Topic** Efficient buildings
Promoter & Developer Promoter: Borough of Bergedorf Developer: Sprinkenhof AG, H4-Hotels	**Key Players** Project mySMARTLive: Borough of Bergedorf, Energienetz Hamburg eG H4-Hotels, Sprinkenhof AG, Diffee, Megatop Solutions, Körber Stiftung
Introduction In the retrofitting area in Bergedorf Süd, there should be replaced an existing heating system in a hotel building	

and replace it with a block heat and power plant. As a result, it is possible to provide a new cultural centre and surrounding residential buildings with heat as well. In addition, the roof of the hotel will be used for PV.

FORMULATION OF OBJECTIVES

Main objective is to build a local heating network in a retrofitting area combined with energy from PV. It will be financed by the owners of the hotel, residential buildings and culture centre. The Borough of Bergedorf will accompany the development.

PROCESS

The process was initiated by the Borough of Bergedorf as a part of the mySMARTLife project. The district is responsible for city planning in Hamburg and is therefore familiar with all new building plans. The situation was used to connect the different actors and establish a positive development for everyone. Main challenges are on contractual arrangements about the heat and energy delivery and minor structural measures.

RESULTS ACHIEVED

Ongoing action as part of mySMARTLife.

LESSONS LEARNT

So far are the most important lessons are the networking and address of local stakeholder and the new role of the administration (town planning) as initiator of innovative processes and developer of innovative infrastructure. The so called "heating island" should be replicate in further building or infrastructure renovations.

REPLICATION

The heating network has been benefited from a previous federal retrofitting project called "EnSam", the contact to the stakeholder was generate by these projects. The experience will be used in future town planning processes.

REFERENCE MATERIAL

So far no material

For study tour: presentation and visit possible

8.2 Projects presented by Helsinki

8.2.1 ePELI (s-Buses)

ePELI project	
Name of the City (and Country) Helsinki, Finland	**Topic** Mobility
Promoter & Developer Helsinki Region Transport (local PTA)	**Key Players** VTT, Helsinki City Transport, Local PTO's, charging service operators and energy companies

Introduction

Helsinki Region Transport (the regional PTA) is preparing for the procurement of electric bus operation utilizing opportunity charging. It has been identified in previous projects that a careful planning is required for successful operation, and for that, a pre-commercial pilot project to build a necessary ecosystem for opportunity charged electric bus operation was initiated.

FORMULATION OF OBJECTIVES

The main driver behind the project is HSL (Helsinki Region Transport), who has set a goal of having 30% of the bus fleet in the HSL region as electric by 2025. The decision done in earlier projects to utilize opportunity charged electric buses requires a well-defined and established ecosystem supporting the operation, before it can be launched for full production. **The main objective of ePELI is to prepare the Helsinki region's key players for the commercially procured electric bus service**.

Funding for the project has been partly from the participating partners and partly from Tekes and the Finnish Ministry of Economic Affairs and Employment (capital costs; vehicle leasing and charging infrastructure).

PROCESS

As part of the pilot project, HSL has directly procured 12 full electric buses from Linkker, that are being lent to the PTO's. Cities of Helsinki and Espoo are investing in the charging infrastructure, which will be common for the bus network. The billing of electricity is handled by a charging service operator, and the operators in the region have been involved in the process. Currently, the maintenance scheme for the charging infrastructure and the fault management process are being prepared.

Because the project has been preceded by several earlier pilot projects (eBus and eBusSystem), where the groundwork had been laid, the project itself has been running relatively smoothly, and engaging the key players in the project has been effective. During the project, the ecosystem building has faced challenges related to the co-operation, communication and definition of roles for the ecosystem partners.

For measuring the performance of the project, a set of KPI's have been established, which are now being followed, as the first pilot production bus lines are operating. The results are disseminated in a common forum, which is regularly gathering all of the key players and the related interest groups together in the same table to discuss the open issues and resolutions. Three different geographical areas in Finland are participating in the common forum (Helsinki region, Turku and Tampere), and the results between the cities are benchmarked against each other. The successes and challenges are shared, and also common problems can be solved in collaboration with the partners and the suppliers for the project.

The initial ecosystem is now established, but there still remains work related to the charging operation, especially in the charging system reliability, billing of electricity and contracts between the key players. The monitoring of the KPI's is established, but all data is not yet available, and requires more co-operation with the charging system partners and PTO's.

RESULTS ACHIEVED

The project is still running, and the final measurement of the project impact and results is yet to be performed, but it is fair to say that the project is reaching its goals within the project period, by being able to establish a network of key players that constitute an electric bus ecosystem utilizing opportunity charging. The first actual commercial procurements start in 2018. The ecosystem and the process to build it has a good replication potential in cities utilizing the opportunity charging.

Beneficiaries in the project are all of the key players - the Helsinki Region Transport is able to shift into commercially procured electric bus service with much less initial risks and problems than without the project, the PTO's have been able to test the bus system with a minimal risk, and the charging service operator and Helsinki City Transport have been able to develop the charging system and the charging services in a collaborative environment, solving the problems together with the project partners, simultaneously creating new offering for the electric bus market.

LESSONS LEARNT

1. With technological paradigm shifts like the opportunity charged electric bus, it is very important to start building the new ecosystems early before the production is planned. This was identified in the inception phase of the ePELI project, and has been a key success factor in Helsinki.
2. Market dialogue is important to have all of the key players engaged fully in the execution of the project. This is executed in the project in many areas and levels, and it requires an active project coordinator.
3. Process and interface definitions need to be clear and identification of required processes should be done early. An important lesson learned happened when one of the chargers broke, and an open gap in the fault management process was discovered. Should this have happened in production environment, it would have caused a long downtime for the e-bus line.

REPLICATION

The groundwork for the project had been laid already in the preceding eBus, eBusSystem and ECV projects, where the vehicles were piloted in select bus routes, and the operation was analyzed. Based on the results, the formation of the ePELI goals was performed, and the selection of opportunity charging as the bases of operation was done.

The ePELI project is well replicable in large scale, but it of course depends on the boundaries set by each operating environment. The replication of the ecosystem building process is applicable to a majority of the cities planning for a similar charging strategy.

A study of a potential replication process is currently ongoing in the city of Santiago, Chile, where the prework is being performed to analyze the utilization of ePELI principles in the electric bus roll-out in the city.

REFERENCE MATERIAL

Pre-work of ePELI:

http://www.vtt.fi/inf/julkaisut/muut/2014/OA-Fully-Electric.pdf

http://www.transsmart.fi/files/231/EVS28_Electric_city_bus_and_infrastructure_demonstration_environment_in_Espoo_Finland.pdf

Presentation of ePELI at ECV seminar:

https://ecv-fi-bin.directo.fi/@Bin/d95c469f9db52372a33b33b6b9e180bc/1507877362/application/pdf/215342/38_16_NEBI2_Session9_M%C3%A4kinen_HSL.pdf

Analysis of key performance indicators of electric bus systems in Helsinki and comparison to simulated results, EVS 30, http://papers.evs30.org/dasessiond.php?sessID=42

8.2.2 INDIGO (Assessing feasibility and benefits of District Cooling)

INDIGO - Assessing feasibility and benefits of district cooling	
Name of the City (and Country) Helsinki (Finland)	**Topic** City infrastructure
Promoter & Developer EU H2020 project INDIGO contact: VTT / Miika Rämä	**Key Players** Decision-makers within the city and local utility

Introduction

Benefits of district cooling are less known by cities and local utilities. Due to large infrastructure investment involved in developing such a system, clearly formulated and practical comparisons between building/space specific cooling systems and district cooling systems are essential to support decision-making.

FORMULATION OF OBJECTIVES

The project focuses on development of more efficient, intelligent economic district cooling systems by improving planning, control and management of the systems. The improvement in planning includes the development of an open-source, tool aiming to support community-level planning by evaluating system performance from technical, economic and climate impact viewpoints and comparing the results of the evaluation with alternative cooling supply, i.e. building or space-specific cooling systems.

The rational for the project is the rapidly growing global demand for cooling, and a clear need to make reasonable long-term decision on cooling supply. Cities are key players in this.

PROCESS

The process of developing the planning tool began in definition of the system boundaries and mapping of alternative solutions. After the system definition, methods for meaningful comparisons were developed as well as representative key performance indicators for each type of analyses including comparative and combination indicators, e.g. cost of emission or energy savings. This work also produced a defined set of input parameters required for the analysis. The planning of presentation and visualization of the results was one of the main challenges in the development process. As the analysis is carried out from three, interlinked viewpoints (energy efficiency, economic feasibility, climate impact), there will be an option to define weight factors for each of these due to needs of decision-making also in practice.

During the implementation phase of the planning tool, development team, the project ground as well as external reviewers will be used to refine the usability of the tool as well as the presentation of the analysis results.

RESULTS ACHIEVED

Although the project and development of the tool is still ongoing, the first phase (specification of the tool) is now completed. As a result, the plans for the implementation of the tool are ready. The specification effort already revealed many significant aspects that have an impact on system performance. It is now clearer than ever that the tool being developed addresses a practical and definite need within cities and communities.

LESSONS LEARNT

The most important lesson within the process by far has been the recognition of the importance of system definition and finding of the most relevant components within a system through a systematic analysis. The

my SMART Life

second revelation has been how this systematic analysis can sometimes produce unexpected results, thus making it very relevant for decision-making. Uninformed decisions on long-term infrastructure can be especially harmful in development of an energy system within a city. Understanding the impact of the cooling systems, whether they are district solutions or building/space specific systems is important. Improving the clarity and usefulness in presentation of results has also been found out to be a key aspect.

REPLICATION

The use of this tool is highly replicable and analysis can be considered universal. The aim is to make it powerful enough, but also as general as possible to enable application for different countries and regions. As an open-source tool, it will be freely available thus enhancing the replicability potential. During the project, the use of the tool will be demonstrated for predefined case systems in Spain and Italy with additional case systems being considered.

REFERENCE MATERIAL

More information is available from the project web site at http://www.indigo-project.eu . The web site also includes details from other tasks within the project such as control and management systems aiming to improve the operation of a district cooling system.

8.2.3 Vikki Environmental House – Energy Efficient office with RES and storage

Viikki Environmental House - Energy efficient office with RES and storage	
Name of the City (and Country) Helsinki (Finland)	**Topic** Highly energy efficient office building
Promoter & Developer City of Helsinki VTT, Fourdeg, HELEN	**Key Players** City of Helsinki (as the user of the facility) System providers and integrator

Introduction

Environment House building shows the best energy performance of an office building ever built in Finland. Completed in September 2011, the energy-efficient office building is used by the City of Helsinki Environment Centre and the University of Helsinki. Environment House improves its efficiency by combining several different energy saving solutions.

FORMULATION OF OBJECTIVES

It has an energy efficiency goal of 70kWh/m2 year. This rate is half of what the 2012 Finnish regulations for new buildings require. A typical office building's energy efficiency rate is approximately 150kWh/m2. Measured total primary energy use of 85 kWh/m2 year including small power loads is expected to comply with future nearly zero energy building (nZEB) requirements.

PROCESS

Low energy consumption is implemented mainly by means of commonly-used technical solutions. For example: The structures are energy-efficient; Bedrock-based cooling is used to cool the premises; The south façade has been designed for the efficient utilization of solar panels, which also shade the façade to prevent an excessive heat load in the summer: Natural daylight is utilized by means of, for example, light shafts.

The energy efficiency objectives of the new buildings are ambitious and the starting point of the planning is to define solutions that are environmental friendly, sustainable and cost efficient. The main objective of Environment House building demonstrations is to find out the cost-efficient solutions for the New building's energy production system, define the right technical dimension as well ensure the system integration of the technical administration and maintenance. The automation can use both temperature and human comfort set point values (HTM). The advantage in human comfort set point values is that it takes into account adaptive comfort aspect increasing users wellbeing and making possible to save energy. Together with HTM also predictive algorithms are used for optimized energy and peak power use.

RESULTS ACHIEVED

The main outcome of the demonstrations will be technical solutions with verified performance and cost data for all important nZEB technology areas such as HVAC, passive solutions and renewable energy production, and methods and tools needed in the decision making, design and performance verification of nZEB buildings

LESSONS LEARNT

The office is already very energy efficient and provides a high-quality example of an office building in a Nordic climate. It already combines many efficient RES and smart building solutions. It will be further enhanced by smart thermal radiators control solution by Fourged, and these are also used to demonstrate heat demand response with the city's district heating network operated by HELEN.

So far, the lessons learned include, what kind of systems, wlan and gateways are needed for integrating and enabling the installation of new smart solutions, and what kind of systems need to be procured. Technical meeting discussions have also included topics about the roles for different stakeholders, control algorithms and other system integration issues. Furthermore, one of the discussion points have been, how these findings and gained knowledge should be replicated in the planning of new buildings.

REPLICATION

Environment House will be a regional "showcase", complementing existing solutions with the new mySMARTLife Actions, and project experiences will be exploited for the planning of new buildings in Helsinki. The first of these is the City's Technical Departments new headquarters building at Zone 2 that will be completed 2020. The Environment House already serves annually thousands of people with professional excursions.

REFERENCE MATERIAL

MySMARTLife deliverables D4.1 and D4.2

8.2.4 Renovation of 70's apartment building into a Passive House building (Innova Project)

Renovating a 70s apartment building into a passive building	
Name of the City (and Country) Riihimäki (Finland)	**Topic** Energy efficient renovation quickly for 70's apartment building
Promoter & Developer VTT	**Key Players**

Introduction

Innova-project started in the beginning of year 2010. The aim of the project was to encourage housing companies to increase the energy-efficiency of their building. The project searched for innovative methods and solutions for energy renovation of old apartment buildings.

FORMULATION OF OBJECTIVES

How to renovate a building from a typical 70s apartment building into a passive energy building. And how to do it as quickly as possible by using prefabricated elements.

PROCESS

A 38-flat apartment building built on 1975 in Riihimäki was selected for the case study of the Innova project in August 2010. The original walls of the apartment building were concrete sandwich elements typical for the surrounding area.

New doors, windows, balconies, PAROC-stone wool insulation and a new ventilation system with a heat recovery were installed in the renovation. The outer walls were measured utilizing laser scanning and the new elements were dimensioned according to the scanning results. The outer concrete shell and the old insulation layer were pulled down and replaced with vertical wooden frame facade elements. The ventilation ducts, windows, balcony doors as well as the outer rendering layer had been pre-assembled to the elements already at the element factory. The elements were delivered to the site in horizontal position and redirected using a crane. An exemplary element was manufactured and tested at the factory before starting the manufacturing or the other elements.

RESULTS ACHIEVED

This new renovation method speeds up the construction process on the construction site. The time for the completion is only five months, which is half of the time needed for completing a traditional renovation. The new method also enables modernization of the building architecture.

LESSONS LEARNT

Various lessons learned from the practical design, process and technical implementation as well as users' guidance and users' important role in realizing the energy savings.

REPLICATION

Replicable, aim was to give support for implementing such renovations and the renovation process in Finland.

REFERENCE MATERIAL

Report available in Finnish: http://www.vtt.fi/inf/pdf/technology/2014/T193.pdf

8.2.5   Climate Street (citizen engagement in energy efficiency)

CLIMATE STREET	
Name of the City (and Country) Helsinki (Finland)	**Topic (Non-Technical Actions)** Citizen engagement, energy advising and collaborative work for building's energy efficiency and area green profile
Promoter & Developer City of Helsinki (coordinator), Helsinki Region Environmental Services Authority HSY, Green Building Council Finland, City of Vantaa, Aalto University. 6 Cities Network, European Regional Development Fund	**Key Players** Projects staff and colleagues including numerous specialists in buildings energy efficiency, LCA, green business sector, local residents, real estate owners, tenants, shop owners, neighborhood association, local media, NGOs, civil society organizations

Introduction

Pedestrian street of Iso Roobertinkatu represents historic city district. This project presents an overall climate smartness as an enabler to improve the attractiveness, safety and comfort of the area and to have a real street scale reference for innovative actions needed to be addressed. Several models for climate smart activity were constructed and adopted to city practices and developed for guidelines.

FORMULATION OF OBJECTIVES

Climate Street of Iso Roobertinkatu was chosen as a testbed in transforming cities to low carbon future adapted to climate change. Major changes are needed for the already built urban environments to slice greenhouse gas emissions. The solutions need to be developed and tested in cooperation between the city, local businesses, real estate owners, residents and solutions providers.

Major tasks were to promote, motivate and facilitate energy efficiency measures in buildings as well as every day choices, green business and development for safe and sensible amenity geared for climate smartness. Work was led by 5 project partners over two years funded by ERDF and Helsinki City Innovation Fund.

PROCESS

Energy renovations is the main challenge and at the same time the most energy intensive one. Various methods for energy advising were tested however the argumentation must be done extremely carefully and coming in from the "owner's" point of view to find common interests and topics worth concentrating on. Commitment and convincing are reached via peer experiences and genuine local ownership and promoter sharing approach. Studies and numbers in energy consumption are not interesting, ready-made solutions for improvement and further benefits are of interest.

Green business is generally well understood in tackling global challenges, however practical means for genuine change are not often a priority for many, particularly in the case of local SME's. Short summaries of suggested actions with straightforward step by step procedures and turnkey solutions are appreciated in local businesses and measures must be easy to grab on to.

Projects and their objectives cannot be brought top-down but incentives can. This is reached through phases where active dialogue exists. Local community events, open and consistent communication on essential work, early adopters and their networks are key in getting topics introduced and acquainted and decisions made.

Quick and easy guidelines, cohesive main message and joint development with stakeholders are essential. Clear engagement methods, active presence and strong facilitative role bring mutual trust and drive change.

Benchmarks for the concept are similar (not same) projects in Amsterdam and Cologne (Utrechtstraat Climate Street, Smart City Amsterdam; Klimatstraat, Mülheim Energy District and Grow Smarter, Cologne).

RESULTS ACHIEVED
Performance was assessed with emissions reduced, costs saved, climate smart actions taken / planned for near future by the locals E.g. building energy renovations (2), heat recovery (1), smart lighting (2), renewable energy (several), green urban yards (2), services e.g. shared waste management (3), climate smart business choices (shop space and products, 5), new climate smart businesses entering the area (2), eco-efficient restaurant terrace (1). Actions included building CO_2 studies (9) energy audits (8), solar electricity studies (12). For local business sector individual pilots were carried out and measures taken by the businesses as well as startup agile pilots (3). See REFERENCE MATERIAL for links.

LESSONS LEARNT
Collaborative planning and participation in decision making processes are important. Example of this activity is the founding of a ´Chairpersons Club´ in the area for shared investments planning and experiences which proved to be very successful.
Activity through different channels incorporating all stakeholders provides better suitability as each case, composition and location has unique characteristics. Example: advanced energy advising, discussions, co-creation events and peer knowledge sharing.
Agile Pilots programme concept from Smart Kalasatama project was successfully implemented on climate themes. Piloting activities have been recognised on city level to quickly improve and give valuable lessons on testing and implementing measures.

REPLICATION
Thorough local background study and inclusion, strong networks of cities and similar projects with experts in several fields helps in carrying out pilots and testing. City administrative office and city of Helsinki flexibility for collaboration between branches helped tremendously in developing cross disciplinary understanding.
Climate Street Helsinki can be replicated on several levels as actions are carefully tailored for selected target groups and tasks carried out accordingly. Concept is built with a flexible modular method. Step by step how-to-do-it guidelines exist for example to apartment buildings for how to 1. make a green urban yard, 2. install solar electricity, 3. implement smart lighting.
Project has been benchmarked by Bologna, Italy and was shortlisted by Eurocities among top three in Europe with Zaragoza and Nice for best practices work in 2016. Individual piloted services (E.g. energy map) are further developed in Helsinki and Tampere.

REFERENCE MATERIAL
Reports and project data, map of completed activities.
www.ilmastokatu.fi/en
www.ilmastokatu.fi/en/media
www.ilmastokatu.fi/en/media
www.ilmastokatu.fi/helsingin-ilmastokatu
Facebook, Twitter, Youtube, Instagram
Online articles in English
Earth Hour shuts lights off – WWF Earth Hour 2016 Climate Street Helsinki
A better city is built one street at a time – Helsinki Smart Region
Climate Street – My Helsinki

8.2.6   Agile Pilots Smart Kalasatama

AGILE PILOTS SMART KALASATAMA	
Name of the City (and Country) Helsinki (Finland)	**Topic (Non-Technical Actions)** Quick piloting of smart services and products for further developing business models
Promoter & Developer Forum Virium Helsinki, 6 Cities Network, European Regional Development Fund	**Key Players** Forum Virium Helsinki, Aalto University & Mindustry research for agile pilots coaching, several stakeholders for each piloting theme (E.g. project facilitator staff, area residents and local organisations, NGO's etc., companies' representatives that could assist in expanding the service)

Introduction

Kalasatama district is an old port that is being transformed into a vibrant new residential area with smart services. When new areas are built it is of utmost importance to plan and create suitable innovative services together with the local residents and stakeholders to ensure practical and functional approach.

FORMULATION OF OBJECTIVES

The Programme for Agile Piloting accelerates Smart City innovation by procuring prototypes to real city environments to be co-created with citizens. Procurement of fast (up to 6 months) experimentation tackles real city challenges. Solutions are tested in real life setting. The aim is to accelerate new concepts into service prototypes and new business, and to learn by practice. Calls are open for a few weeks and selection is based on clear criteria including categories in innovation, scalability, resources and smartness, agility and user centric approach. The objective of the pilots is to get a fast learning curve and all are run with strong focus on citizen engagement.

PROCESS

Carrying out an Agile Pilot requires careful consideration in setting the scene and starting by choosing a topic or topics by background knowledge of tasks to do or challenges encountered. The ultimate goal of a particular pilot does not need to follow strong assumptions on what to expect whereas determination and agility during the piloting period is the key. Networks and active facilitation is essential so that the piloting crews are able to concentrate on the task at hand and deliver results. Financial, technical and human resources mobilized must be acknowledged solid from the start and the existing contacts for assistance are necessary to have at hand for those doing the experiments. Mindset and understanding the differences in building a robust business model to doing an agile pilot and continuing from that is important. Challenges may be human resources or mismatch with process and individual expectations. This is where agility and on the other hand strong supportive facilitation are needed to be able to proceed. The Programme has built-in tools to assist in the process which include kick-off for thorough in-depth view of the nature of Agile Piloting, coffee sessions after the start to ensure smooth process and tweak minor details if needed, co-creation workshop to engage citizens and matchmaking with stakeholders, user feedback, frequent communication and end reporting. In the first rounds it also advised to have a tertiary party to help with the principles and to assess performance.

RESULTS ACHIEVED

There have been so far four rounds of open calls with 16 Agile Pilots carried out and selected from 150 applications. The citizen engagement and co-creation is considerable and in many cases the experiments have

been able to be continued either in business model development or gaining useful market references or to expand their services in other locations. The successful Agile Pilots have benefited both the communities and their residents or local businesses and the service providers – this is the one of the core objectives of the programme.

LESSONS LEARNT

Clear focus on topics and boundaries and the extent allowed by inspiration is very important. This requires to actively engage possible stakeholders already in the planning phase of the sketched themes and development steps that they need. Criteria and quick and easy to adopt guidelines have been brought to the city agenda which also helps considerably when funding possibilities are searched. Multidisciplinary stakeholder engagement and streamlining matching plans for development provide more solid ground to pursue and continue with developing the piloting plans and making progress viable.

REPLICATION

Strong networks are the key is replication of piloting work. The guidelines and adopted principles can be introduced into any environment where innovative and engaging ideas are needed. There are capable and inventive people full of ideas in every city and purchasing quick pilots can help develop the communities and areas more liveable and convenient for the citizens and at the same time create new innovative services and business and jobs. City units promoting this activity gain a lot of knowledge and new networks in facilitating the change. Stakeholders are willing to participate in funding when the objectives have matching interests – this is the perfect platform for open discussion and creating the projects.

REFERENCE MATERIAL

Smart Kalasatama and Climate Street Helsinki projects with their Agile Pilot blogs and related social media and websites have detailed information on the procedures and experiences. Smart Kalasatama Cookbook of Agile Pilots is at the moment in Finnish but several of the elements and their basic layout can also be provided also in English.

https://fiksukalasatama.fi/en/agile-piloting/
https://fiksukalasatama.fi/en/helsinki-smart-city-evolves-climate-positive-pilots/
http://ilmastokatu.fi/en/agile-piloting/

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8.3   Projects presented by Nantes

8.3.1   Digital boiler in Social Housing Building

Digital boiler in social housing builbing	
Name of the City (and Country) Nantes Métropole - France	**Topic** Efficient Buiding
Promoter & Developer Nantes Metropole Habitat	**Key Players** Social Housing Company Start up -Stimergy
Introduction With a 25 % data flows increase each year, datacentres and their energy consumption are major ecological challenges. By reusing the produced energy for hot sanitary water for instance, digital boilers contribute to the emergence of a smart society where economic growth and respect for the environment can coexist without compromises. This will contribute to reduce the impact of energy consumption of buildings	
FORMULATION OF OBJECTIVES The major issue is to test new ways of saving and producing renewable energy in buildings. The project aims to produce energy by data center instead of gas energy to heat sanitary water	
PROCESS The digital boiler is a datacenter made of ecoresponsible computing servers used for storage and data computing. These servers produce heat while operating, and this heat is then used by the boiler for the building it is in. The heat produced is used to heat the hot sanitary water of the buildings it is set up in, reducing significantly the energy consumed by the building. And then, this produced energy being used again, there is no need anymore for a cooling system.	
RESULTS ACHIEVED The energy consumed by these data centers is used twice: one for the computer servers and once for the heating of the water. The installation of energy meters at the entrance and exit of the boiler system makes it possible to measure consumption of energy. A digital platform makes it possible to follow consumption every day.	
LESSONS LEARNT The first digital boiler for housing is performing in Nantes social housing since 2016. The experience is positive with 40% savings.	
REPLICATION The installation of a digital boiler in a building boiler room needs place for a second hot water tank. If the surface allows it, the digital boiler should be installed anywhere. Replication in buildings should be easy.	
REFERENCE MATERIAL Press kit Press report : http://france3-regions.francetvinfo.fr/pays-de-la-loire/emissions/jt-1920-pays-loire	

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Website (in English) - https://stimergy.com/en/
news bulletin .

8.3.2   Public lighting renovation

Name of the Good Practice	
Name of the City (and Country) Nantes Métropole	**Topic** / Eclairage Public
Promoter & Developer Interactiv Data Light CAMEON / Lampanantes Engie	**Key Players** : Dany JOLY

Introduction

The electricity consumption of the public lighting on Nantes Métropole's territory is an important issue: 95 000 light points, 45 Gwh per year, 6 M € / year of electric bill. The maintenance and exploitation costs are of the order of 4 M€/year. The budget allocated for the renovation is around 4.5 M€/year. The optimization of public lighting is therefore necessary.

FORMULATION OF OBJECTIVES

To reduce the costs of public lighting, it is necessary to be able to influence the design of the installations, their operation and their maintenance. We apply the leitmotif "appropriate lighting": when is it necessary? Where is it needed? Is the lighting adequate?

When it is necessary: Lampanantes experimentation is a centralized command control solution that uses the RDS

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channel of an FM frequency of a local radio station, which allows to switch on and off the lighting according to the local real luminosity. This system also makes it possible to program each control box individually. The experimentation is funded by CAMEON / Nantes Métropole / BPI

Interactiv Data Light: intelligent lighting experiment with environmental analysis (10 masts) with data capture (citizens data/ users data / date on environment like noise and pollution), data production and dashboard, cross processing of data. Experimentation funded by BPI, the public investment bank.

Project Lighting mySMARTLife Engie: LED lighting with remote light management, Experimentation funded by MySmartlife / Engie

PROCESS

Several problems were faced:

 - the mature expression of needs: the co-design allowed to share the expected functionalities

- the mobilization of the local authority resources to validate and lead the experimentation projects: the project was led by an entity dedicated to innovation then by the citylab created at Nantes Métropole which legitimate the experimentation process

- the financing of the experimentations: the knowledge regarding the functioning of collaborative project shared among the partners made it possible to solicit financing from the BPI (Lampanantes and IDL)

- the French code of public procurements: even if the code evolves to facilitate innovations, the subject needs expert advises to be secured.

RESULTS ACHIEVED

Project Lampanantes: the experiment consisted of equipping 10 control cabinet of lighting located on Nantes Métropole's territory with the RDS Light system, and to set up 2 luminosity sensors connected to the IP network of the collectivity. The 10 cabinets are in service since early October 2017. No major concerns raised. The WEB interface works well and allows remote programming of the operating instructions of each equipped cabinet.

Interactiv Data Light Project (IDL): The 10 luminaires are currently being manufactured and should be installed mid-December and will be in operation in early January providing actionable data

Project Lighting mySMARTLife / Engie: the implementation of LED lighting and remote management should intervene between the end of December and early 2018.

LESSONS LEARNT

On Project Lampanantes, one lesson that could be retain is the unlikely encounter between a municipality service that expressed a need and a company that usually does not contract with local authorities. The other lesson concerns the co-design of the solution with the end users, the team of the local authority.

On the Interactiv Data Light project, the lesson to be learned is the guarantee given to the project leaders to allow exploration of the full potential of the capture based on the vision, and to cross analyse the data produced by the equipments and those produced by the electricity distributor.

Regarding the project MySmartLife, it is planned to install a remote management with individual control of each light and a data platform fed with data from the municipality supervision tools.

REPLICATION

Project Lampanantes: The project leader carried out a benchmark on the public lighting control system, and analyzed the advantages and disadvantages of the solutions. By drawing on its expertise in radio networks, it has been able to propose a concept adapted to the expressed needs. This solution is replicable wherever FM networks are active. Experiments are also carried out in a neighboring municipality of Nantes, and a POC is planned on Montpellier.

Project Interactiv Data Light: The experiment is not advanced enough to consider replication. However,

applications seem promising in terms of environmental captioning and cross-referencing;
Project MySmartLife: the implementation of remote management and Leds luminaires demonstrates the gain in energy and operating costs.

REFERENCE MATERIAL
Project Lampanantes : https://www.nantesmetropole.fr/actualite/l-actualite-thematique/nantes-city-lab-le-laboratoire-de-toutes-les-innovations-nantaises-emploi-economie-92892.kjsp

Project Interactiv Data Light : http://www.lejournaldesentreprises.com/editions/44/industrie/energie/nantes-comment-enedis-ouvre-ses-donnees-aux-entreprises-08-09-2017-332339.php

MySmartLife :

8.3.3 Nantes Bussway (24m e-Busses)

24m electric busway

Name of the City (and Country)	**Topic**
Nantes	Mobility

Promoter & Developer	**Key Players**
Nantes Métropole, Semitan	Nantes Métropole, Semitan, Enedis, Hess, ABB

Introduction
Launching of a BRT line in 2006 called Busway ; victim of its own success, the line transports 40 000 passengers a day, with an increasing demand Natural gas-powered buses were considered, especially to minimize local pollution, but are noisy (especially at night) and generate GHG. Decision was made to upgrade the bus line with the first of its kind in Europe 24 m full electric bus.

FORMULATION OF OBJECTIVES
The project aims to replace the 18m articulated gas-powered vehicles with twenty 24 m bi-articulated electric powered vehicles to meet the following objectives: increase the capacity of the line and reflect the ambitious policy regarding energy transition. The decision was made and financed by Nantes Métropole; the project is implemented jointly by Nantes Métropole and SEMITAN (agent on behalf of Nantes Métropole but also transport operator).

PROCESS
The staff started a benchmark on the electric buses in 2013 which guaranteed the feasibility of the operation (busworld fair of Courtrai, visits at Barcelona, London, Geneva, Berlin, Paris, Munster, ..). A strong document of specifications has been set up, mentioning also the operating conditions since the new system must not impact them.
Discussions are still ongoing to find innovative solutions for the optimization of existing electric infrastructures and the management of the energy consumption.

RESULTS ACHIEVED

The bus and the charging system has been chosen and will enter into service end of 2018 with a progressive deployment until 2019. The new buses with increased capacity will allow more than 50 000 passengers to travel per day. The e-powered buses will considerably reduce noise pollution. New uses of electric solutions will be developed along the line with a follow up through a centralized platform.

LESSONS LEARNT

You can be inspired by existing solutions but you will always need to adapt them to local context.
Lessons learnt from other projets
Project ZeEUS (Zero Emission Urban Bus System http://zeeus.eu/) allowed the team at Nantes Métropole to extend the initial planned benchmark and exchanges with European colleagues.
Lessons learnt in the bus provider selection process
The strong technical research and the expertise of the local team was appreciated by the suppliers and allowed constructive dialogue and negotiations. The presentation of the vehicles of the suppliers, as requested from the beginning in the launch for tenders, allowed the teams to co-construct a tailored vehicle adapted to the local needs.
Lessons learnt in designing this kind of innovative solutions
Anticipation from the beginning is difficult with innovative solutions. It is an ongoing learning process. Each step implies potential new developments. For example, once the choice of the vehicle is made, new issues raised on the management of the electrical grid along the bus route.

REPLICATION

The project was inspired by the demonstrator in Geneva (Hess and ABB – project TOSA) but the team at Nantes Métropole defined very precisely the local needs to find a tailored solution. During the study visit, we will present the different aspects of designing and implementing this kind of innovative solution (process, materials chosen, energy system management, difficulties…). The chosen method and the type of solution chosen are replicable, but not directly: they will need to be adapted to the local context.

REFERENCE MATERIAL

8.3.4 Great debate on Energy Transition (Citizen Engagement)

Grreat debate on Energy Transition	
Name of the City (and Country) Nantes Metropole - France	**Topic** Citizen engagement: Great debate on energy transition
Promoter & Developer Nantes Metropole	**Key Players** Citizens local associations, companies, Nantes Metropole

Introduction

The climate challenge is so urgent that it requires a stronger commitment and renewed ambition from all stakeholders. The major issue was how to engage a large number of citizen in an efficient citizen engagement process.

FORMULATION OF OBJECTIVES

The Great Debate on Energy Transition aims at enabling the collective identification (together with citizens and stakeholders) of new actions which will enable the territory to achieve the energy transition objectives set for 2030. It will be the starting point for the co construction of a Metropolitan shared multi actor roadmap on energy transition.

PROCESS

All citizens, associations and companies from the 24 municipalities of Nantes Métropole were invited from September 2016 to the end of March 2017 to contribute to the challenge of the energy transition around four main lines: lifestyles, landscapes and new uses, production and energy consumption, economy and innovation. This Debate has been very innovative in terms of scale, depth of participation and methodology:

Phase 1: Time for public debate (Sept. 2016 – March 2017)
· Collection of a maximum of contributions with a plurality of points of view (actors, civil society, academics, citizens ...)
· The debate on "to do": to launch individual and collective experiments

Phase 2: Analysis and recommendations - Synthetic report (April – September 2017)
· April-June 2017: analysis of the material produced by the debate and drafting of the final report by the Citizens' Commission of the Debate
· September 2017: Presentation of the Commission's Final Report to Metropolitan Representatives

Phase 3: Shared roadmap and renewed governance (October 2017– February 2018)
· October-February 2018: Concerted elaboration of a **"multi-actor" shared roadmap for the territory,** taking into account the commitments that will be taken by the actors, citizens, associations, cities, Nantes Metropole, etc. to accelerate the short / medium / long term energy transition
· February 2018: Adoption by Nantes Metropole Council of the commitments made by the Metropole

Phase 4: Implementation, follow-up and completion of the shared road map resulting from the Great Debate (From February 2018...)

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The shared roadmap will constitute the renewed strategic orientation (mitigation component) of the Climate Plan (PCAET) of Nantes Metropole. This roadmap will bring together the visions and commitments of the partners (including those of Nantes Metropole) in the short (by 2020), the medium (2020-2030) and the long term (> 2030).

RESULTS ACHIEVED

So far, the results in terms of participation in a few figures are: 200 days of debate, 53,000 participants (physical or virtual through digital participation), including 11,000 contributors involved (having participated in local initiatives, filed individual contributions, worked in a booklet of actors or in one of the 6 communities), 80 labelled events bringing together close to 7000 people, 1000 contributions including 160 workbooks, 270 participating organizations, 650 people in the neighbourhood meetings, 42,500 visits to the website and 4,500 account subscribers Twitter / Facebook / Instagram.

The main figures illustrating the "do it" part of the debate are: more than 500 citizens involved in the communities, 2000 donors for participatory financing projects with nearly 100,000 euros raised and 1,500 students from schools participating in the Class'Energie challenge.

A final report from the Citizen Commission has been published (see material below). The Metropolitan shared multi actor roadmap on energy transition is being co constructed

LESSONS LEARNT

A few lessons from the 3 "big debates" organized:

1. An opportunity for Nantes Metropole to innovate, to experiment in its modes of doing: notably through the "to do" debate (crowdfunding, citizen evaluation, ...), the follow-up of the commitments by a panel of the civil society (ex: "Loire Permanent Conference", "energy transition follow up mechanism", La Loire and us "'

2. An opportunity to share a prospective vision shared with the local stakeholders / citizens and also in the concrete implementation of a roadmap (co-responsibility).

3. The Great Debates are demanding in its principles (in particular transparency, visibility) thus guaranteeing a debate of quality and concrete results

4. A managerial support to be maintained throughout the process: support to the work of instruction until the achievement of actions. This presupposes a change in agents' practices: transversality, active mobilization both during the debate and follow-up activities of both external and internal actors.

5. "Big Debates" require resources, team's mobilization as well as for the Independent Commission to conduct its mission.

REPLICATION

The Great Debate on energy transition has built on a long experience of citizen engagement: Today, 250 participatory approaches (variable according to the intensity of participation) are carried out on a city or metropolitan scale. Creative and innovative methods are used to work in large or small groups: World café (Nantes 2030), World Wide View (Grand Débat Loire: 260 citizens on 5 sites of the agglomeration), theatre forum (Dialogue pour tous, Voices of the voiceless "), consensus conference (antenna relay), urban walks (landscape and heritage plan), digital cartoparty, kamashibai (children's point of view, evaluation of school rhythm reforms) …

In particular, this project has benefitted from two other experiences of "Great debates" 1. **Nantes 2030 – prospective vision** (12 000 participants, 2012); 2. **River Loire** (45,000 participants, 2014-2015)

We want to exchange with participants of the study visits about our processes, methodologies, successes and difficulties linked to the organization of citizen engagement in particular in large citizen engagement processes and learn from participants experiences so that citizen engagement processes can be more easily developed and be more efficient.
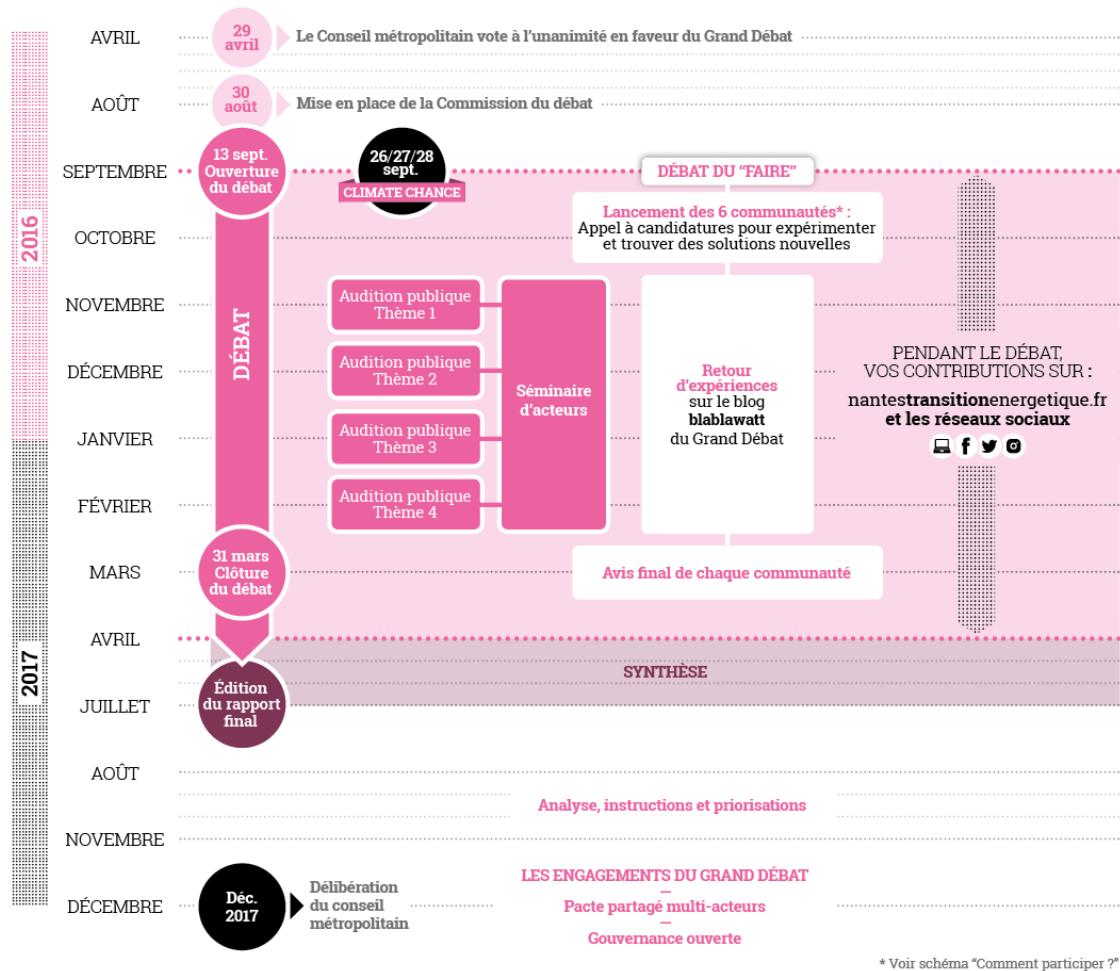
REFERENCE MATERIAL

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Great debate on energy transition website: https://www.nantestransitionenergetique.fr/
Final report of citizen Commission: https://fr.calameo.com/read/004590458f2015f1aa5e6
Nantes citizen engagement process: see scheme below

7 MOIS DE DÉBAT

Retrouvez l'**agenda des évènements labellisés Grand Débat**
par communes, quartiers, acteurs de la métropole
sur le site du Grand Débat.

2016

AVRIL — **29 avril** ▸ Le Conseil métropolitain vote à l'unanimité en faveur du Grand Débat

AOÛT — **30 août** ▸ Mise en place de la Commission du débat

SEPTEMBRE — **13 sept. Ouverture du débat**

26/27/28 sept. CLIMATE CHANCE

DÉBAT DU "FAIRE"

Lancement des 6 communautés* :
Appel à candidatures pour expérimenter
et trouver des solutions nouvelles

OCTOBRE

NOVEMBRE — Audition publique Thème 1

DÉCEMBRE — Audition publique Thème 2

Séminaire d'acteurs

Retour d'expériences sur le blog **blablawatt** du Grand Débat

PENDANT LE DÉBAT,
VOS CONTRIBUTIONS SUR :
nantestransitionenergetique.fr et les réseaux sociaux

JANVIER — Audition publique Thème 3

DÉBAT

FÉVRIER — Audition publique Thème 4

MARS — **31 mars Clôture du débat**

Avis final de chaque communauté

2017

AVRIL

SYNTHÈSE

JUILLET — **Édition du rapport final**

AOÛT

Analyse, instructions et priorisations

NOVEMBRE

DÉCEMBRE — **Déc. 2017** ▸ Délibération du conseil métropolitain

LES ENGAGEMENTS DU GRAND DÉBAT
—
Pacte partagé multi-acteurs
—
Gouvernance ouverte

* Voir schéma "Comment participer ?"

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8.4 Projects presented by Bydgoszcz

8.4.1 Modernization of street lighting

Modernization of Street Lighting	
Name of the City (and Country) Bydgoszcz (Poland)	**Topic** - City Infrastructure – Public lighting
Promoter & Developer	**Key Players** Realization: ENERGA Oświetlenie Project initiation: Mayor of City of Bydgoszcz Project creation and management: The Municipal Roads and Public Transportation Authority in Bydgoszcz Development of technical project: ESCO PROJEKT Roman Dębowski

Introduction

Background

In city of Bydgoszcz there were ab. 30 000 lamps, in this:

- 60% belonged to external company ENEA. They have ab. 17 000 lamps of which 6 000 were energy intensive mercury-vapor lamps, only 140 LED (light-emitting diodes), rest of them were sodium vapor lamps

- 40% of the lamps belonging to Bydgoszcz were sodium vapor lamps

Modernization of street lighting in Bydgoszcz was necessary to reduce high costs of energy bills and adjust standard of lamps to present requirements. The power consumption of sodium lamps belonging to City was too high according to Polish standard and at the same time energy efficiency was low in comparison to new, modern lamps. In analysed areas there were no intelligent control systems that would enable reduction of power of individual lamps.

Therefore, the City Mayor decided to apply in April 2013 in the contest organised by National Water Management Funds with a project called: "Modernization of street lighting in City of Bydgoszcz".

FORMULATION OF OBJECTIVES

At that time, modernisation of lighting system in Bydgoszcz was foreseen in Bydgoszcz Mitigation and Adaptation Plan and SEAP.

The Municipal Roads and Public Transportation Authority in Bydgoszcz was responsible for project preparation, establishing objectives and managing its implementation.

Aims of the project:

Reduction of carbon emission, energy consumption and maintenance costs

New lamps are much more energy efficient than old ones. This should enable reduction of energy consumption by 63%. Moreover, street lights will be equipped with (intelligent) control devices and reduction of power from 10 pm till 6 am, that enable decrease of energy consumption by additional 10%.

Project covered:

- Modernization of city lighting (on more than 400 roads)
- Replacement of 7309 old sodium-vapor lamps for LED energy efficient lamps (different power)
- Replacement of 164 lighting cabinets
- Implementation of Street Lighting Control system
  - The system performs remote operations of all installed drivers

- The system allows remote control of entire group or individual luminaires
- The system allows to define users and register their activities
- The system memorizes changes
- It has the ppossibility to export data to excel
- The system also generates alerts through the network, sms and e-mail application
- All parameters of the lighting network are registered
- We can access and check each of our lamps

Human resources:

Realization: ENERGA Oświetlenie

Project creation and management: The Municipal Roads and Public Transportation Authority in Bydgoszcz

Development of technical project: ESCO PROJEKT Roman Dębowski

Financial resources:

Total cost of the project: 20 140 170,82 PLN

55% Bydgoszcz (loan)

45% grant paid by the government (National Fund for Environmental Protection and Water Management) within GIS - Green Investment Scheme program called „SOWA" - Energy-efficient street lighting

Project implementation: 07.01.2015 – 25.09.2015

PROCESS

Problems:

- carrying out further modernisation of part of city lighting system with energy-intensive street lamps due to the fact, that these lamps (lighting cabinets) belong to ENEA. Solution: this part of the lighting system should be disconnected from ENEA, new lighting cabinets should be built. The best way is to purchase it, however it is problematic to do so.

- selection of proper lamps to be installed on the existing lighting system, that would meet requirements of lighting standard and at the same time condition for reduction of energy consumption. Lamps were chosen in relation to different power, after calculation.

RESULTS ACHIEVED

Results:

Energy savings of 685 MWh (610 Mg CO_2/year) in comparison to energy consumption in September – November 2014 and September – November 2015 after the modernization.

Estimateed savings, benefits:

- Electricity savings – 2752 MWh/year
- Installed power – 646,36 kW
- CO_2 emission – 2449 Mg CO_2/year
- Savings about 1 mlll PLN/year (the amount of savings depends of the energy price)
- Lower maintenance cost – technical support always knows where exactly the lighting failure happened. Thanks to this information they can plan their route. They can also recognize what might have caused the system failure without going to the site.
- Citizens do not have to report lighting failure because it is always visible in the system which means faster reaction time for technical support.
- Energy consumption will decrease by 60% (reduction of CO_2 emission)

LESSONS LEARNT

City of Bydgoszcz, thanks to implementation of so large project is recognised as a leader in this area.

Due to realisation of this project we have changed the designing principles of street lighting with application of LED lamps, taking into account lighting bicycle paths, sidewalks, pedestrian crossings, effective design of lighting roundabouts. These principles are used successfully in new street lighting projects in Bydgoszcz.

REPLICATION

Employees of Municipal Roads and Transportation Authority in Bydgoszcz participated in meetings with e.g. manufacturers of control systems and good quality lamps to find out solutions, that would be suitable for Bydgoszcz specific conditions. They participated in trade fairs, conferences – to learn about other projects and solutions.

On the other hand, some other Cities contacted the Authority in order to gather information on Bydgoszcz project.

Moreover, project was presented e.g. during conference organised for cities and communities by APANET, producer of lighting control system, in 2016 in Bydgoszcz.

Project was acknowledged with second place award in the contest related to green public procurement Green ProcA, in category of cities above 100,000 inhabitants, in 2016. Submitted proposals were evaluated according to criteria such as: reduction of CO_2 emission, repeatability of public tenders, innovation, social criteria, activity and policy of city in the area of energy efficiency.

In 2017 City of Bydgoszcz was acknowledged with a distinction in the international contest "Smart Sustainable City Awards" organized by World e-Governments Organization of Cities and Local Governments (WeGO) for presenting its achievements in the area of smart city solutions in transportation (modernization of street lighting included) http://awards.we-gov.org/3rd-wego-awards-winners/

Solutions used in above mentioned project are being applied in other new investments that are currently in the initial stage of implementation, such as e.g.: extention of Grunwaldzka Street, reconstruction of Kujawska Street and Kujawskie roundabout.

Further modernization of street lighting system is foreseen in The Update of Action Plan for Sustainable Energy - Low Carbon Economy Plan for Bydgoszcz for 2014-2020+ (SEAP/PGN).

REFERENCE MATERIAL

Information on investment project

http://www.bydgoszcz.pl/rozwoj/smart-city/modernizacja-oswietlenia-ulicznego/

http://www.zdmikp.bydgoszcz.pl/index.php/pl/inwestycje-i-projekty/2296-rusza-wielka-wymiana-starych-lamp-ulicznych

http://www.zdmikp.bydgoszcz.pl/index.php/pl/inwestycje-i-projekty/1968-niedlugo-ruszy-wielka-wymiana-starych-lamp-ulicznych

https://kujawsko-pomorskie.onet.pl/bydgoszcz-nowoczesny-system-oswietlenia-ulic-daje-oszczednosci/tbyhf4 - podaje inne dane dot. ilości lamp

Information on contest ProcA – second place

http://gpp-proca.eu/pl/2016/05/10/konkurs-na-najlepsze-zielone-zamowienia-publiczne-edycja-polska-rozstrzygnieta/

http://gpp-proca.eu/pl/bestpractice/bydgoszcz-odnowa-oswietlenia-ulicznego/

8.4.2 Demonstration Center of Renewable Energy Sources

Demonstration Center of Renewable Energy sources	
Name of the City (and Country) Bydgoszcz (Poland)	**Topic** Efficient buildings
Promoter & Developer City of Bydgoszcz	**Key Players** Local public administration (City Hall - Department of Infrastructure) Local authorities (City Mayor) Headmasters, teachers, students of Mechanical School, inhabitants

Introduction

Problems

The need to comply with new rigid standards of buildings required by EU regulation due to implementation of Energy Performance of Buildings Directive in near future by public administration.

The EPBD requires all new buildings to be nearly zero-energy by the end of 2020. All new public buildings must be nearly zero-energy by 2018. Nearly zero-energy buildings are objects with very high energy performance, consuming a very small amount of external energy and using renewable energy sources to balance the demand for it.

Low knowledge of society reg. energy efficient buildings

Low awareness of local authorities, decision makers, employees of Investment Departments on benefits reg. energy efficient (EE) buildings and usage of renewable sources (RES), new EE technologies and construction of buildings in new standard

Lack of complex information about such buildings available for citizens in City Hall

Expensive solutions, lack of specialized staff in public administration and SME

- lack of good practices in Bydgoszcz public stock regarding EE buildings, use of RES to be shared with residents. In 2011 in Poland there were few examples of EE buildings and use of RES in public buildings. Therefore, City of Bydgoszcz decided to participate in CEC5 project (Demonstration of Energy Efficiency and Utilization of Renewable Energy Sources through Public Building), co-financed from Central Europe Program, in a restricted call for Strategic Projects, where Demonstration Center of RES (called Demonstration Building-DB) was constructed on the premises of Mechanical School. It was designed as a passive building, which serves as an example of model solutions for energy efficient public buildings and the use of CESBA as a tool for its evaluation.

FORMULATION OF OBJECTIVES

Goals:

The main goal is practical demonstration of current passive housing solutions, promotion of the energy efficient construction and applications of renewable energy sources in public buildings

- increase of awareness of public administration and society reg. EE buildings and use of renewable energy sources

- reduction of GHG emission in order to comply with City of Bydgoszcz obligation according to participation in Covenant of Mayors,

- providing measures that allow decision-makers to see if it is worthwhile to build energy-efficient high-quality buildings – introduction of building certification by CESBA (Common European Sustainable Building Assessment)

- helping local authorities to make public buildings function as role models, - changing public perception of public buildings that are considered Europe-wide worst examples regarding energy efficiency

Goals were established during preparation of Application Form by project consortium.

Financial resources:
Total cost of investment: 962.364,25 EUR (higher financial engagement of City of Bydgoszcz that planned), costs planned according to application form: 386 000 EUR (in this 85% co-financing)

Technical:
The DB contains many innovative solutions corresponding with its construction and in order to fulfil the passive building standards (primary energy consumption less than 120 kWh/m^2/year and heat energy demand less than 15 kWh/m^2/year) and demonstrate RES.

Human resources:
Beneficiary: City of Bydgoszcz (departments involved directly: Investment Dept., Department of Environmental Protection – responsible for CEC5 project management, Public Procurement Dept.)
Project documentation: Biuro Studiów i Projektów Synergia, Tomasz Mielczyński
Contractor: Przedsiębiorstwo Wielobranżowe PUBR Sp. z o.o. w Bydgoszczy
Mechanical School Complex – headmasters, teachers, pupils
Cooperation with energy agencies - KAPE (national energy conservation agency) and PRAZE
Inhabitants of Bydgoszcz, schools (local, regional, national, international), preschools, universities, SME, other local authorities, City Council

Investment phase duration: September 2011 - April 2014, June 2014 – official opening

PROCESS
Problems:
igh level of the underground water on planned location of DB – change of DB location to another site on school premises, in order to avoid high costs and to use ground heat exchanger
osts of investment much higher than budget planned. City Mayor – analysed costs, benefits and agreed with realisation of investment
- leaking from the roof – some of the tunnel skylights on the roof were too low, mounting technology was not very efficient – some of them had to be removed
the building designing phase the meeting of architect and school representatives should be organized in order to secure all needs of school – lack of technical room for cleaning staff, not solved issue with watering plants on the green roof
ability of utilisation of hot water produced – in the building only small amount is need. Building was developed for demonstration purposes not for utility purposes
- construction companies, public administration, architects – not too interested in trainings related to used technologies, and assessment/certification method

RESULTS ACHIEVED
General information about DB:
- The year of design completion is: 2012
- The year of the building completion is: 2014
- the floor area: 367.26 m^2,
- building area: 431.12 m^2,
- gross cubic: 2 149.44 m^3
- demonstration laboratory room (25 people), an auditorium hall (35 people)
- didactic and demonstration facility, open to public

Solutions employed:
- heat pump as energy source for heating: 2 pumps
- photovoltaic panels: 100 cells x 100 W
- external hybrid lighting
- wind turbine: 3 kW, horizontal axis, rotor diameter 400 cm
- vacuum solar panels: 1 installation (3 pieces)
- mechanical ventilation and heat recovery
- ground-coupled heat exchanger to ventilation system
- triple-glazed external windows
- tunnel skylights on the roof
- reinforced concrete structural walls (without plaster) and brick (plastered)
- green roof
- insulation of exterior walls with cellulose fibre
- monitoring system

DB - a model public low-energy building for demonstration and education using to the maximum extent renewable energy sources and very high-performance energy efficiency for promotional and utility at the same time.

The design process was preceded by analysis with CESBA tool (Common European Sustainable Building Assessment), which is a comprehensive assessment of the building according to environment, energy and social criteria that include life cycle of building from planning, realization, usage and utilization. CESBA can be used to compare facilities in Europe, harmonization of standards in the planning process and in implementation of public investment. Building assessment criteria are divided into five groups of various weight (quality of location and equipment, process and planning quality, energy demand and supplies, health and comfort, building materials and construction) in which you can get the appropriate number of points, (including a maximum of 1000 points).

The DB has the demonstration and training functions therefore many construction solutions, the installations and the saving-energy technologies remain exposed to the visitors. Guests have a chance to see the elements of walls and ceilings, mechanical ventilation and heat recovery, air condition and solar installations. Effects are shown at the visualizations and measured installations.

Benefits:
- building is open for visitors. Study visits are organised for iinhabitants, pupils of the RES class, other pupils of Mechanical School, preschools, other schools in Bydgoszcz, in Poland and abroad, universities, local authorities, business – to present incorporated solutions for multiplication
- sustainable construction is promoted, school cooperates with universities, specialists – site visits, conferences/workshops on the spot
- for demonstration purposes exhibition was created and located in DB (information on pilot projects in CEC5 project, CESBA tool etc.)
- training of different stakeholder groups on sustainable construction, RES, assessment methods was provided (pupils of the school, teachers, architects, construction industry, Energy Agencies)

LESSONS LEARNT
Tips:
- good preparation of technical staff responsible for carrying out such project e.g. Investment Department (participation in seminars, workshops, conferences, external expert support) will secure the proper realisation of the investment
- introduction of different means of spreading information to society (organisation of information

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meetings/workshops, study visits, information on project webpage, exhibition) – will enhance reaching broader audience
- providing transparent information on costs/benefits of EE buildings and RES for residents
- training of staff to be involved in future in presenting DB during study visits in order to equip them with necessary knowledge on technology, tools, equipment used
- involvement of pupils during each investment phase – they learned on materials/ technology used
- better, in depth calculation of investment costs – to avoid problem with financing
- external experts support to technical staff of public authority – should be maintained from the designing stage to the end of investment
- employees of Investment Department, contractor's company – they learnt by doing on every step of realisation of investment starting with designing e.g. insulation methods, leak proof test and building certification methods
- complex management of municipal energy, water, gas supply and demand – at present Energy Management Office develops database – it is needed for better planning and savings
Lesson learnt from the CEC5 project, especially DB reg. introduction of RES to public buildings is at present a reality. City of Bydgoszcz implements 1 project co-financed from the Regional Operational Program that aim in construction of the micro-sources of RES (pV) on public buildings, moreover other 3 projects are waiting for assessment including implementation of pV on schools, animal shelter and modernisation of Ecological Center (pV and heat pump). Total power – 378,18 kWp.

REPLICATION
In order to learn from experience of other practices our employees of Investment Department participated in study visits e.g. to the passive sport hall in Slomniki, to private passive house in Smolec (with passive house certificate from Passivhaus Institut Darmstadt) and also conferences and fairs (eg. Poznań International Fair of Civil Construction and Architecture).
The goal of the creation of DB was to demonstrate EE buildings, used technologies, materials, tools to society. Building is open for public, staff is trained to present used solutions, school developed the Dissemination Plan to share their life-laboratory broadly. Solutions used in the DB (technology of passive building, utilisation of RES) could be applied in public buildings as well as in private houses. If the goal is to serve demonstration purposes, it is very important to consider its proper localization that would ensure highest visibility when the building is highly exploited. In case of our DB is was located on the premises of Mechanical School due to the fact that school has just opened new class to train in the field of RES. Our new investment increased the didactic base of school and allowed to check in practice the gained knowledge. The building also is used for training other groups of pupils, students from the city, region, country and is also available for foreign visitors interested in these practical installations.
Approximately 5.000 people visited DB.
Besides the general study visits for schools, universities, preschools and other public and private institutions, there were also organised for specific institutions that wanted to learn from our practical experience – in order to use that knowledge in construction of their buildings eg. visits of Higher Vocational State School in Wloclawek or Community of Biale Blota.

REFERENCE MATERIAL
Presentation of CEC5 project and DB in national contests, winning the awards as follows:
Zielone Miasta – w stronę przyszłości" organised by Ministry of Environment. Main award in the category of energy efficiency in construction,
p://forumopolskiegobiznesu.pl/poznalismy-laureatow-konkursu-zielone-miasta-w-strone-przyszlosci/
„Ekolaury PIE" organised by Polska Izba Ekologii. Award in category "ecological education",
http://www.pie.pl/aktualnosci/gala-13-edycji-konkursu-ekolaury-pie-2014.html

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ECO-MIASTO 2014" organized by Embassy of France, National Fund for Environmental Protection and Water Management, Renault Polska, KAPE. City of Bydgoszcz received distinction in category "energy efficiency of buildings",

p://www.francuskie.pl/konkurs-eco-miasto-2014-rozstrzygniety/

award „Kryształ Przetargów Publicznych 2014", http://www.nagroda.przetargipubliczne.pl/poprzednie-edycje/krysztaly-przetargow-publicznych-2014/

General information on CEC5 project, DB and CESBA

http://www.projectcec5.eu/strona-31-pilot_investment_in_the_city_of.html
http://www.bydgoszcz.pl/rozwoj/projekty-miedzynarodowe/cec5/
http://pl-wiki.cesba.eu/wiki/Strona_g%C5%82%C3%B3wna

8.4.3   Intelligent Transportation System (ITS)

Intelligent Transportation System (ITS)	
Name of the City (and Country) **Bydgoszcz (Poland)**	**Topic** Mobility
Promoter & Developer Responsible for execution of investment: Municipal Roads and Public Transportation Authority in Bydgoszcz	**Key Players** Local public administration (City Hall) Local authorities (City Mayor)

Introduction

Before implementation of ITS system, City of Bydgoszcz had a problem with traffic on main streets leading to downtown and streets of transit characteristics. Traffic lights which have been installed on these streets were not coordinated (not connected and were not cooperating together). This made traffic flow worse. Moreover, public tram transport did not have any priority. This resulted in extension of tram travel time in morning and afternoon rush hours, and caused big delays.

FORMULATION OF OBJECTIVES

Aim of the implementation of the system, the expected benefits

The primary objective of the system is to reduce the travel time of public trams by about 8% and of motor vehicles by about 6%.

In addition, implementation of the system should result in:

- the increased flow capacity of the road networks,
- reduction of travel time,
- improved environment quality by exhaust reduction
- better passenger comfort and traffic conditions for drivers and pedestrians,
- better comfort and efficiency of public transport journey,
- road fleet management costs reduction,
- reduction of costs associated with the maintenance and renovation of roads

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Financial resources - the costs of the project:
The total cost of the task is: PLN 53 870 390.00 gross, i.e.:
- 85 % of the European Union co-financing: PLN 45 789 831.50 gross,
- 15 % of the Bydgoszcz City budget: PLN 8 080 558.50 gross.

Technical resources:
The system was implemented in the framework of Infrastructure and Environment Operational Programme.
ITS is a telematics project, which utilizes data from various types of equipment, road sensors and public transport tracking devices for optimization of traffic and transport management in Bydgoszcz. Data is transmitted to the central database located in the Traffic and Transport Management Center, where it is immediately processed in order to distribute commands for individual subsystems supervising such divisions as traffic control, priorities of rail vehicle travel, dynamic passenger information, parking information, messages for drivers on variable message signs, weather warnings and Internet portal. The Bydgoszcz ITS System is one of the first investment tasks of this type in Poland, which employs components improving public transport, upgrading the conditions of vehicular traffic at crossings, optimizing utilization of parking spaces in the downtown area. It also designed for drivers great accessibility to information displayed on variable message signs, starting from automatic information on the current traffic conditions, giving average travel time on weather and text information. The entire ITS consists of 4 subsystems (implemented in April 2015):
-    control of movement with video monitoring/surveillance
-    public transport management with dynamic stop information,
-    parking information
-    guiding vehicles to alternative roads

Project timeframe:
01.2013 to 01.2015 (24 months)

Human resources:
Municipal Roads and Public Transportation Authority in Bydgoszcz - initiated the project and was responsible for its managing and implementation
Beneficiary - City of Bydgoszcz
Contractor: Sprint S.A.
Cooperation with University of Life Sciences and Technology in Bydgoszcz

PROCESS
-    technical problems with implementing fiber optic network (poorly maintained manholes, problems with network operators)
-    -problems with calibration of system (e.g. new traffic lights software installation on one of main city intersections)
-    -technical problem with supplied equipment (RKZ radio with tram on-board computer connection problem)
-    -social issues (unfavorable opinions about implemented project high cost)
-    -intersection calibration equipped with traffic lights required construction of suitable data base containing statistic information about city traffic. Based on it particular programs of traffic lights were optimized. Data have been collected for at least 1 year to indicate city traffic needs properly.

RESULTS ACHIEVED

Basic project objectives have been reached. Time of travel by motor vehicles has been shortened in selected transport corridors (average time saving is about 32%). Time of travel by public tram transport on selected transport corridor has been shortened also (average time saving is about 12%). Shorter tram travel time resulted in correction of tram time table/schedule and reduction of number of tram cars. There is also motor vehicle and public transport constant monitoring system managed by Center for Traffic and Transportation Management. Thanks to results of these actions motor vehicle drivers and passengers benefited from saving time and money for car exploitation.

LESSONS LEARNT

ITS in Bydgoszcz, just like other similar projects in Poland, was built based on experience in other Polish and European cities. Exchange of experiences is possible by participating in conferences, industry congresses about ITS. Good example of industry event is annual ITS Congress organized by "Polish ITS Association" which is main organization in Poland involved in ITS subject. This association unites best specialists in field of transport engineering and contractors realizing projects in practice. Exchange of experience between self-government institutions - users of these systems allows to avoid certain technical or even formal mistakes. A good example is subsystem for guiding vehicles to alternative roads and information shown on VMS billboards with variable content/messages. Each city deals with it in different manner, but the goal is one – information has to reach the driver in the shortest time and the message should be clear.

Practices of other cities in this matter show which solutions should be avoided. Schemes shown on information boards should be simple and understandable for all traffic users especially for residents.

ITS should be created according to each city's individual needs, depending on development of infrastructure and public transport. Of course, some of the solutions can be repeatable and used everywhere with difference only in technology used.

REPLICATION

Traffic control applied in Bydgoszcz is based on coordinated adaptive traffic system SCATS – a platform developed in Sydney, Australia (used successfully in many cities of the world).

ITS project in Bydgoszcz consists of basic elements that are used in all other projects of this type in Poland. However, Bydgoszcz project was first one that included different areas of urban infrastructure (individual transport, public transport, parking issues, video surveillance).

All functionality of Bydgoszcz ITS and its specific solutions were initiated by Municipal Roads and Public Transportation Authority in Bydgoszcz, institution responsible for managing project implementation.

Results of project were presented during local, national, international conferences, workshops, congresses and contests – to share our experience with others, e.g...:

- during Smart City Forum 15.09.2016 in Warsaw - event devoted to smart city idea. In conference participated 655 guests, in these representatives of presidents of Polish cities, regional Marshall Offices, local administration and business (http://edroga.pl/mobilnosc/iv-smart-city-forum-juz-za-nami-190913140)

- in 2017 City of Bydgoszcz was acknowledged with a distinction in the international contest "Smart Sustainable City Awards" organized by World e-Governments Organization of Cities and Local Governments (WeGO) for presenting its achievements in the area of smart city solutions in transportation (included ITS) http://awards.we-gov.org/3rd-wego-awards-winners/

Project is applicable to many urban centres, but it would be more effective for cities where individual transit is relatively high. Project is also highly recommended for cities characterized by high population densities, heavy traffic and strong dependence on private cars. It could reverse this trend and make remarkable improvements in the city's traffic situations. The replication of project could be

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recommended to those cities that would like to make their mass transit systems more convenient, healthy and safer for their citizens.

REFERENCE MATERIAL
http://www.its.bydgoszcz.pl/
http://www.zdmikp.bydgoszcz.pl/index.php/pl/inwestycje-i-projekty/2305-o-systemie-its
http://www.bydgoszcz.pl/rozwoj/smart-city/inteligentne-systemy-transportowe/
http://www.radiopik.pl/2,29275,zalety-i-wady-its-w-bydgoszczy&s=1&si=1&sp=1

8.4.4   Bydgoszcz Participatory Budget Initiative

Bydgoszcz Participatory Budget initiative	
Name of the City (and Country) **Bydgoszcz (Poland)**	**Topic** Non-Technical Actions
Promoter & Developer City of Bydgoszcz	**Key Players** Local public administration (City Hall and city's companies) Local authorities (City Mayor) Inhabitants, District Councils

Introduction
Problems
- engagement of Bydgoszcz inhabitants in the decision process of the city was very low
- inhabitants felt that they don't have influence on decision making reg. investments being carried out in the city
- - investment carried out by the City does not comply with needs of residents

FORMULATION OF OBJECTIVES
Goal:
- increase of influence/engagement of residents in decision making process regarding investments in their districts
Project timeframe:
BPB was introduced for the first time in 2012 and since that is a part of City budget every year.
Financial and technical resources
Every year the amount of ab. 5 million PLN is assigned from City budget to the BPB for realisation of investments proposed by inhabitants (but in 2018 City budget, this amount increased to ab. 10 million PLN). This amount is divided according to number of residents living in each district. Decision on realisation of investments in each district is made by inhabitants by voting.
Every inhabitant of Bydgoszcz (16 years old and up) has a right to vote. In 2018 edition residents may vote for projects/investments, up to the amount which is defined for the specific district.
The investments, that receive the highest number of votes, within the budget specified for each district, are planned for realisation.
Stages:
- proposal of investments by inhabitants.
Examples of interventions with preliminary costs are presented on the program webpage, eg. construction of

playground, sport field, skate park, revitalisation of park/fountain, extension of public lighting/ monitoring system, construction of local street, sidewalk, outdoor fitness, elevator in public building, outdoor benches

- opinions of District Councils on proposed projects
- verification of proposed projects (legal, financial etc)
- voting on accepted projects (e.g. in 2018 edition 500 projects were submitted, but 274 accepted for voting). Interventions which have the highest support of residents, and comply with limits assigned for each district, will be introduced to city budget for 2018.
- announcement of selected interventions
- realisation

Human resources:
Inhabitants of Bydgoszcz – proposals of interventions, voting
District Councils – opinion on proposed interventions
Departments of City Hall and organisational units – organising meetings/workshops for residents on preparation of investment proposals, verification of proposed interventions
City Mayor – encouraging citizens to vote

PROCESS
Problems:
- calculation of formula for budget division for each district based on number of inhabitants per district.
Main problem, addressed by inhabitants of low populated districts. Less populated districts may have investment only for a few dozen thousand PLN. With such a low budget for interventions bigger investments are nearly impossible. This problem will be slightly eliminated, because this year edition of the program (city budget for 2018) forecasts double increase of financing for investment within participatory budget.
- selection of investments proposed by inhabitants was done by the District Councils
Inhabitants wanted to have direct influence. At present selection of investment projects is done by voting of inhabitants, and District Council role is to provide their opinion on investment proposals.
- lack of confidence in results of voting (counting of votes on paper) in the first years of this initiative
When electronic application was set up, this problem has been eliminated. At present even votes presented on paper are included in the electronic system.

RESULTS ACHIEVED
There were 6 editions of the initiative of Bydgoszcz Participatory Budget.
From year to year the interest of citizens is increasing in co-decision process in realisation of investments in their districts, eg.:
- 2015 (3rd edition) - 20.021 votes
- 2016 (4rd edition) – 22.241 votes
- 2017 edition – 30.161 votes
- 2018 edition – votes are being counted
Till now about 273 investments have been executed for appr. 25 million PLN.
Citizens gain the confidence in City Hall – seeing that their winning projects are being successfully introduced/carried out for the society.

LESSONS LEARNT
BPB was one of the first such initiatives in Poland, therefore we have learned by doing.
Tips:
- organisation of information meetings/workshops for potential authors of the projects
- introduction of new forms of communication with inhabitants (webpage, Facebook, newsletter, application)

- providing transparent decision making process - that builds confidence of residents
- introduction of electronic system of voting (application) to encourage higher residents' participation.
- introduction of modifications, eg.: longer time for submitting projects, lack of limit regarding number of proposed projects per person, possibility of voting up to the amount allocated to the specific district (before inhabitant might select just 1 project for realisation).

REPLICATION

For the first-time participatory budget in Poland was introduced in 2011 in Sopot. At present it is created in many cities, usually on the level of city budget e.g. in Bydgoszcz, Poznan, Łodz, Tarnow, Krakow, Wroclaw, Elblag, Gdansk, Kielce or on the level of budget of districts in Warsaw.

This initiative might be introduced to other self-governments, schools, universities, and social housing or cultural institutions.

We are looking constantly for new ideas that might be included in our BPB, therefore we are in contact with other cities carrying out such initiative. Moreover we are sharing our methods and best practices with others, providing information via phone or during workshops - e.g. with Association of Bydgoszcz metropolis that brings together 21 members (cities, towns, communities, counties) http://www.metropoliabydgoszcz.pl/2017/06/czonkowie-stowarzyszenia-metropolia.html

Bydgoszcz initiative was presented for public self-government institutions during meeting of Union of Polish Metropolises in Bydgoszcz in 2014.

In 2017 one of the projects executed within BBO won an award for the most interesting solutions that made our City Island accessible for disabled (blind) http://www.bdgbo.pl/2017/05/wyspa-mynska-bez-progow-i-barier.html

REFERENCE MATERIAL

http://www.bydgoszcz.pl/inwestycje/bydgoski-budzet-obywatelski/
http://bydgoszczinwestuje.pl/ (virtual map of investments)
http://www.bdgbo.pl/
https://www.facebook.com/bdgbo/
https://www.facebook.com/bydgoszczpl
http://budzetyobywatelskie.pl/szczegoly/?rok=2014&id=13&Bydgoszcz

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8.5   Projects presented by Palencia

8.5.1   EV car sharing

EV Car sharing project	
Name of the City (and Country) Palencia, Spain	**Topic** Mobility
Promoter & Developer Municipality of Palencia	**Key Players** City of Palencia, Dornier, Respiro, Renault.

Introduction

Palencia is aware of the important role the Electric Vehicles (EV) will take place in the city´s mobility. In fact there is a strategic Plan to promote the development of the EV in the city. One of the actions included in the plan is to develop a car sharing with Electric Vehicles (EV). The city council has profited the tender process like parking meters control services to develop a car sharing system.

FORMULATION OF OBJECTIVES

The main objective is to promote the use of electric vehicles inside the city, in order to reduce the emissions and to develop another more efficient type of mobility.

Also, in Palencia and Valladolid there are two Renault factories where the Twizzy is manufactured, also the company helps the city to promote these vehicles.

The objective will be to buy new electric vehicles inside the municipal fleet and to deploy EV public chargers.

Funding for the project has been partly from the company who has awarded the parking meters control service, Dornier, and the city council. (capital costs; vehicle leasing and charging infrastructure).

PROCESS

As part of the pilot project, Dornier has directly signed a contract with car sharing company Respiro which works in Madrid and Barcelona, who operates the service.

It has been procured 3 Renault full electric vehicles, with the correspondent electric charges in the public street.

The billing of electricity is handled by the municipality, and the vehicles maintenance scheme for the charging infrastructure and the fault management process are being managed by Dornier.

During the project, the system building has faced challenges related to the co-operation, communication and definition of roles for the system partners.

For measuring the performance of the project, a set of KPI's have been established, which are now being followed, as the first EV car sharing are operating.

As the initial system is established, still remains some work related to the charging operation, especially in the charging system reliability, billing of electricity and contracts between the key players.

The monitoring of the KPI's is established, but all data is not yet available, and requires more co-operation with the charging system.

RESULTS ACHIEVED

As the car-sharing is running, the city considers the project is slowly reaching its goals, it is establishing a network of users that constitute an electric vehicles ecosystem promoting its use. The next commercial procurements will start in 2018. The ecosystem and the process to build it has a good replication potential in cities utilizing the opportunity charging.

Beneficiaries in the project are all of the citizens. The city has been able to test the car-sharing system with a minimal risk, and the charging service.

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The data acquisition will be very useful for the electric vehicle development, as well as encouraging the use among citizens.

It is important to take into account the carsharing solution should be beneficial for all actors. To get this term, it is important to modify the user´s behaviour to increase the car-sharing use.

LESSONS LEARNT
1. The system is a service designed especially for users of the high-speed trains, which would complement other tour packages designed specifically for them, although the offer will not be restricted and will be open to any citizen wishing to rent one of these vehicles.
2. It is attractive for those customers who want to make occasional use of a vehicle as well as for others who want timely access to a different type of car than they use every day. The organization of a 'carsharing' can be carried out, not only by a company, but also by a group of users that form an association.
3. This initiative is part of the actions that the City Council of Palencia has been developing in recent years within the framework of the 'Smart city' project that it is developing together with the city of Valladolid. This project allowed to weave an initial grid of recharge stations for electric vehicles that make it easier for any user to move within both cities.

REPLICATION
To develop a car sharing system in middle-sized cities, the most important factor is to make the system profitable. That is why it is not as common as in large cities where there is sufficient critical mass.

The car sharing system carried out in Palencia, aims to eliminate barriers to its development, and allows to have information and data on the maturity of the population in this type of initiatives.

It also aims for developing the electric car-sharing system in cities such as A Coruña.

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8.5.2 "El Carmen" District, Building Retrofitting

"El Carmen" District, building retrofitting project	
Name of the City (and Country) Palencia, Spain	**Topic** Efficient buildings
Promoter & Developer Municipality of Palencia	**Key Players** City of Palencia, Junta de Castilla y León, Central Government, Carmen neighborhood Association.

Introduction

In April 2007, The City Council of Palencia, the Ministry of Development of the Junta de Castilla y León (JCyL) and the Ministry of Housing signed the agreement that made possible the comprehensive retrofitting of part of the Palencia´s district called "El Carmen".

The overall investment in this Urban Recovery Area (ARU in Spanish) amounts to 9,080,287 euros for the retrofitting of 510 homes and the urbanization of the urban environment. Of the global investment, the JCyL contributes with 2,295,000 euros, the Ministry of Development finances 3,486,692 euros, the City Hall 2,932,500 euros and private neighborhood contributes the rest.

The total area occupied by the area to be retrofitted is 43,347 square meters.

The action will be completely managed by the association of neighbors, who were in charge of the tender, and the management of the funds. In this case the municipality was responsible only for financing and giving the necessary technical and legal support to the association.

FORMULATION OF OBJECTIVES

The ARU has two objectives, "energy efficiency and accessibility", so the actions will be directed to install elevators, rehabilitate the roofs and the facades, fix the electrical network, channeling and burying cables in the air, as well as the decrease of the humidity in the low ones, the rehabilitation of the arches of the square, since they were very deteriorated and of the church and in addition the placement of the supply of natural gas.

The co-financed actions completely changed the physiognomy of the homes promoted by the Home Labor Union in the mid-1940s.

The intervention area consists of 18 blocks, in which nearly 1,000 people live, many of them belonging to an aging population group and immigrants with few economic resources.

PROCESS

The actions to be carried out in the buildings included in the scope of the area are directed to the following types of actions:

- Adaptation of covers.
- Adaptation of facades.
- Adaptation of housing habitability.

The actions are subject to the provisions of the applicable urban planning, to the motivated determinations of the technicians of the Office of the ARU. and, where applicable, the authorization of the Territorial Commission for Cultural Heritage.

A. Suitability of covers.

Included all works aimed at achieving waterproofing, sealing against rain and water evacuation, as well as performances in eaves, cornices and other types of auctions and specific works in skylights and emerging elements such as chimneys and others for the same purpose. It includes the improvement of thermal insulation conditions.

B. Adequacy of facades and exterior configuration.

It includes the restoration of affected facades in the area: These actions were based on the rehabilitation of the coating material and finishes, repairing injuries such as humidity, landslides and dirt and the placement of new carpentry adapted to the aesthetic conditions, insulation and tightness necessary, as well as the arrangement of locksmith and balcony materials, elimination of aerial wiring, etc.

C. Adaptation of housing habitability:

It is intended to improve the conditions of habitability and use as well as accessibility or adequacy to specific needs of people over 65 or disabled, adequacy of health services and kitchens or ensure the proper functioning of facilities (electrical, sanitation, plumbing, heating, extraction of smoke and ventilation) or the elimination of substandard living conditions, achieving an adequate interior distribution, with illuminated and ventilated spaces.

Each neighbor wanted a tailor-made suit and their suggestions and alternatives to the initial project were totally democratic, after a neighborhood architecture studio offered to modify it.

359 neighbors of the 510 owners voted, taking into account that ten percent of the houses are for rent.

The 70.39 percent of the owners responded to the survey and 87.74 percent said yes to what was raised, 10.86 percent answered no, and 1.34 percent indicated the box of does not know or not answers.

RESULTS ACHIEVED

The rehabilitation of 510 homes within the public ARU in the district "El Carmen" of Palencia, in a unique management model in Spain that has been run by the neighbors themselves.

This very ambitious project has improved the quality of life of 510 families and it had the peculiarity that the neighbors themselves were in charge of managing the project, awarding the works and monitoring them.

An intense and planned work has been done with the neighbors through surveys to give a new image to the neighborhood without losing its essence and identity.

The intervention in accessibility was also important, and consisted in providing 30 buildings with a lift, through a constructive solution that allows direct access to the houses. This entails the complete demolition of all the stairs of the building, replacing them with new stairs joined to the elevator tower. This solution makes the building accesible for the disabled and wheelchairs.

For this project the constructive solution was proposed that replaces the sections of 8 steps plus intermediate landings, by sections of 15 steps with walkways of direct access to the floors, supporting all the set of stairs in the structure of the elevator.

It was sought that the work of replacement of stairs is done with minimum impact and inconvenience for neighbors. For this, a commercial product was adapted, consisting of a complete structural solution that combines the mixed metallic structure (structural tube and folded sheet) screwed, for the elevator tower plus metal set of plateaus, walkways and stairs, with the same industrial technical solution that the structure of the elevator.

For the Aru, an enclosure of the sandwich structural panel was chosen, which also guaranteed the energy efficiency pursued by the project as a whole.

LESSONS LEARNT

This project has highlighted the "great maturity" demonstrated by all the neighbors, who have been "the culprits" that this district will improve their energy efficiency and mobility and change the image of this area of the city.

This allows a greater role for the neighborhood movements, able to provide ideas, knowledge and work and take forward projects such as the ARU "Barrio del Carmen" that "will mark a before and after in the neighborhood movement.

This type of actions of regeneration and urban rehabilitation constitute an important source of employment, since they contribute to the sustainability of companies and jobs, especially in the rural world.

On the other hand, it is important that all public policies on cities and towns are oriented towards urban regeneration. To this end, the new regulations should promote coordination between cities and their surroundings, the integration

of the urban environment and the surrounding natural environment and the promotion of a model of sustainable development that avoids duplication, that develops an urbanism of proximity and that facilitates efficiency. of public transport.

It is important to carry out the works of urbanization of the environments of the affected blocks, modifying the electrical network and adapting it to the new power requirements. It is also necessary to take into account the gas connections and other telecommunications services, as well as provide underground channels for other public services.

REPLICATION

This is the first time that the neighbors, who have participated in the decision-making of the project, were involved in the management and development of the ARU program, which allowed for the complete reform of 510 homes, some built 64 years ago.

Although the project is original for its time, it is currently carrying out numerous reforms of this type, in different cities, for example, in Laguna de Duero, where a similar reform is being carried out, to which a district heating system has been added.

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8.5.3 ESCO in the public lighting

ESCO IN THE PUBLIC LIGHTING	
Name of the City (and Country) PALENCIA (SPAIN)	**Topic** City Infrastructure
Promoter & Developer Municipality of Palencia	**Key Players** Municipality of Palencia.

Introduction

In 2012, the public lighting technology in Palencia city was based on HPS (High Pressure Sodium) lamps. There were 11.000 luminaires distributed in 145 control panels. Mainly controlled with local astronomical clock control circuit that sets a fixed curfew control cycle. The light levels in all the city were higher than suggested associated light levels.

The city ´s economic situation was very difficult and the public lighting cost 1,2 M€ for the municipal budget.

For the Major, it was necessary to find a way to decrease the public lighting costs without reducing the quality the

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citizens perceived.

FORMULATION OF OBJECTIVES

In 2009 the LED lighting market was at its first steps, and, the municipality of Palencia was aware that it was important to find a technical solution without taking the risk to fail in the citizen´s needs.

LED can be considered to perform well in comparison to discharge lamp technologies, with efficacies of 100-175 lm/W for lamps and 100-140 lm/W when considering control gear and optical losses. However, there were also poor examples of LED lamps on the market where the luminous efficacy was as low as 50 lm/W.

There were several different control systems available for dimming controls which could be linked to communication systems. The objective was that dimming controls and two-way communication were linked to other sensors at the individual luminary level could play a vital role in intelligent lighting systems as part of smart city networks

The fact was, the city council had limited budget to defray the investment cost. So it was decided to start a public procurement to provide an ESCO who financed the project and took all the risks, not only economical but also technical risks.

Once the decision was made by the major and his councilors, the technical team wrote all the Contract Performance Clauses.

PROCESS

At the design

A previous auditory of the public lighting was used to choose among the electric panels more inefficient, to carry out the project.

With the aid of the Spanish Institute for Energy Diversification and Saving (IDAE), who showed us three different pilots projects that they were developing in three Spanish cities related with public lighting. Also they showed us the possibility to develop a Private-public partnership (PPP) procurement system.

Which luminaries to change.

Also, it was considered too risky to change all the lighting into LED at the same time, as costs were reducing and technologies were developing very quickly

A previous auditory of the public lighting was used to choose among the electric panels more inefficient, to carry out the project.

Which public procurement to choose

It was considered the PPP system would delay the development of the project so, it was decided to define by municipal technicians the contract performance clause of the public lighting to take out a mixed procurement based not only on supply of LED luminaries, but also maintenance and guarantee period.

Which public procurement criteria to choose

Technical specifications and award criteria were defined under the contract, as well as penalties and bonuses, in order to ensure compliance of the clauses.

Furthermore, this criterion requested evidence to prove that the tenderer would meet clear minimum requirements, which will help to ensure that they have the required know-how and range of competencies to successfully design a new or renovated lighting system, a good understanding of the planning and approval processes of outdoor lighting installations.

At the installation

The ESCO started to change luminaries, but while checking the new installation, we realized that the ESCO was not meeting the control dimming requirements. That meant a delay in the certificate of delivery, but, the contrary as it is supposed, this delay meant that all the savings in the meanwhile were benefited by the city.

RESULTS ACHIEVED

This change has allowed a reduction in consumption of more than 75% with respect to the previous installation, from 3,035,027 kwh / year to 715,585 kwh / year; without at any time penalizing lighting levels that, on the contrary, have improved significantly both in quantity and quality. Without forgetting, of course, the almost 871 tons of CO_2 that are no longer emitted into the atmosphere thanks to the use of LED technology.

At the economic level, resorting to an ESCO to make the change of luminaries has meant to the city a saving of more than two million euros that was required as an investment to renew the 3,139 lighting points and update or install the new control systems. In addition, it is guaranteed that the lamps destined for exterior lighting and their maintenance of the new light points will not change in the twelve years that the ESCO will take care of them.

At street level the new installation translates into a remarkable improvement in the quality of lighting and light, which improves its color rendering index to almost 70 and provides a color temperature similar to that of natural light, creating a more comfortable environment for the inhabitants of Palencia than the previous one, based on the yellow dominant color temperature of the high pressure lamps.

LESSONS LEARNT

The implementation strategy of LED lighting in Palencia can be considered successful having considered:

Prioritization: Of all the luminaries, we have chosen the facilities where there will be a more immediate benefit. Likewise, LED is implemented in all the new infrastructure projects: Jardines Street, Camino de Collantes, Avda Viñalta.

Balance of benefits: The lighting and luminaries design has been chosen, which solves the specific lighting task more effectively: the balance between functionality, aesthetics, efficiency and savings has been achieved. In such a way that investment is relatively small, and good lighting is achieved, it can have a significant impact on the well-being of citizens and improve their cultural perceptions.

Solutions well adapted to the citizen´s needs: The local lighting model has been adapted to satisfy the leisure activities of the citizens and the needs of the companies.

Care has been taken to improve lighting to encourage greater citizen use of non-motorized transport through providing attractive, well-lit corridors and bike lanes.

REPLICATION

It is known that the IDAE is using our Contract Performance Clauses (CPC), in other Green Public Procurement procedures.

Here it is a link to different projects related with Palencia Procurement model:

http://www.idae.es/ayudas-y-financiacion/receptores-de-la-financiacion-del-fondo-fidae-hasta-la-fecha

After the success of this experience City of Palencia is continuing in changing the rest of the lighting system, but this time, the economical situation has improved, and the procurement system will be different, it will be a direct investment, without the aid of an ESCO, which means that all the savings will be directly applied to the city's budget.

Through these actions described, Palencia is recognized as a reference in the application of new measures of intelligent lighting, so it has recently been integrated into the Alliance LightScape Cities, formed by the municipalities of Ávila, Córdoba, Palencia, Logroño, Plasencia and Valladolid. Its objective is to enhance its tourism resources through a lighting strategy that improves its night image and, in turn, contributes to energy savings and efficiency.

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8.5.4   Municipal Digital Service Website

Municipally digital service web site	
Name of the City (and Country) PALENCIA (SPAIN)	**Topic:** Non-technical actions,
Promoter & Developer Municipality of Palencia	**KeyPlayers:** Municipality of Palencia.

Introduction

In 2012, information and communication technologies made it possible to bring the Administration closer to the citizens' living room or to the offices and offices of companies and professionals. The TIC allowed to relate to the Administration without queues or waiting. And even receive services and information unrelated to administrative intervention activities or authorization; information and services not related to limiting actions, but on the contrary enlarging their possibilities. These conditions also allowed citizens to see the Administration as an entity at their service and not as a heavy bureaucracy that requires, to begin with, the sacrifice of time and displacement imposed by the space that separates the domicile of citizens and businesses from public offices. But, in addition to that, new information technologies facilitate, above all, access to public services to those who previously had great difficulty in reaching public offices, for reasons of geographical location, physical mobility conditions or other conditions, and that can be overcome by the use of new technologies.

The city council of Palencia understood that this was a transcendental step to facilitate, in equal conditions, the full integration of citizens in public, social, labor and cultural life, and comply with Law 11/2007 on Electronic Access of Citizens to Public Services that gave the necessary institutional support. In 2012 the city of Palencia could implement an electronic site where its main objective was to allow citizens to make requests through the Internet, know the status of their requests and receive the answer and information from the town hall.

The promotion of an electronic administration also meant responding to the EU commitments and European initiatives launched from the European Council in Lisbon, continued with successive actions until the communication of the Commission "i2010: A European Information Society for the growth and employment ". On December 12, 2006, and in order to advance in achieving the objective set by the Lisbon European Council, Directive 2006/123 / EC, on services in the internal market, was approved.

FORMULATION OF OBJECTIVES

In November 2011, the city council of Palencia met the representatives of the city's stakeholders, representatives of the municipal government and local administration coordinated with a consulting company that helped or

carried out the city's strategic plan, to analyze the weaknesses, threats, strengths and opportunities that the city of Palencia had and characterize it in the reality of that moment. This study lasted approximately one year and it was concluded that Palencia had few homes with Internet access and the municipality had a low ICT development. Palencia did not have an ADSL and Fiber Optic network in the city to cover the demand for new user services. And as an advantage, the city council had financial solvency, the city had large production and transformation companies, and the opportunity to build infrastructure for the promotion of innovation thanks to government intervention and aid employment with telecommunications operating companies.

Within the framework of this strategic plan of the city, the municipality of Palencia defined as a strategic objective to increase the collective intelligence of the city, opening new channels of citizen participation in public policy decisions (e-Government) and improving the management efficient public services (e-Administration), while stimulating the use of ICT and the digital capabilities of the population.

And as a specific objective to establish a structure and administrative, rational and efficient procedures based on new information and communication technologies, what is called Administration 2.0 and a municipal management based on citizen participation.

To meet the objectives set, the following actions were planned:
-   Streamlining and simplification of the administrative structure.
-   Simplification of administrative procedures.
-   Improve the municipal web portal to allow the Total Electronic Administration, bringing together under one portal all the municipal services offered in the different areas of the City Council.
-   Integration of the business single window in the local digital administration.
-   Integration of a section on citizen participation in the municipal website and its promotion through social networks.
-   Creation of a section or digital bulletin board, where different associations or citizens can share their activities

These actions had a budget of approximately € 750,000, financed by European funds Feder and the city of Palencia. This amount was used to invest in new equipment for the municipal data processing center and public employees, creation of new website and creation of content. Also, the management in the reorganization and training of public employees in the new administrative procedures

PROCESS

In 2011 as part of the political commitments of the municipal government and in compliance with Law 11/2007, of June 22, on Electronic Access of Citizens to Public Services, Palencia City Council took the initiative to promote a digital tool of relationship between the municipal admission and the citizen.

The strategic plan of the city was the method used to collect experiences and data that the working groups in which were the representatives of Universities, Companies, stakeholders, contributed to analyze and propose strategic and precise objectives to create headquarters electronics.

To this end, an international consultancy firm was contracted to define the minimum services that the digital page should have, the necessary support that the service should have, as well as the network architecture that had to be configured between the venues and buildings of the city hall. in the city.

Palencia City Council invested in a computerized and communications solution adapted to the defined needs: UPS UPS systems, fire prevention systems, refrigeration systems, communications racks, routers, swiches, fiber optic link equipment, access points Wi-Fi, both in the main office and in the back office. With a logical architecture comprised of firewalls and security, networking equipment, Vmare servers, backup services, where BBDD and applications are stored and management and maintenance carried out by municipal officials. The rest of the

municipal offices were intercommunicated through a dedicated service. of a telecommunications operator with ADSL support, coax or dedicated fiber.

Once the structure was built and the web site of the electronic headquarters was created, a menu of administrative services and procedures was implemented between the citizen and companies and the city council. To which was added to facilitate the citizen's expression of a board of complaints and suggestions.

After six months of service Palencia City Council website had already exceeded 110,400 visits, which gives an average of more than 600 daily, a very important fact if we consider that it is an institutional page, which meant that Palencia experiment very important jump in terms of transparency and modernization, taking advantage of the application of new technologies

RESULTS ACHIEVED

The smart city model that the Government Team implemented in June 2011, and which was reinforced in 2015, has allowed Palencia to become today a more dynamic, strong, investing, integrating and innovative city.

Among all the advantages of e-Administration, the following can be listed:

Availability of the Administration 24 hours a day, 365 days a year.

Ease of access for the completion of procedures. These can be done without the need to travel to a specific place.

Saving of the duration of the negotiations, since displacements and unnecessary waiting time are avoided.

Increased security of sensitive data. These remain in data centers, which will be more easily retrievable.

Flexibility. It allows choosing between the different channels that are offered for the resolution of administrative procedures.

Optimization of costs associated with the maintenance of jobs, increasing productivity.

Granting great advantages for people with reduced mobility, since they will be able to carry out remote procedures.

Eco-responsibility the use of Information and Communication Technologies allows to save energy resources, emissions of greenhouse gases by displacements, paper consumption, packaging.

According to the parameters assessed by the Standard Cost Model (SCM), an international model for measuring costs and administrative savings applied by the Spanish Administration, the savings for a City Council such as Palencia, thanks to the Electronic Office, can be more than 400,000 euros, considering among others the costs saved on paper, mail expenses and notifications, printing of documents or time spent by municipal staff.

The institutional website of the City of Palencia exceeded one million page views when 15 months after its launch, which is about 2,500 a day, a more than important figure that confirms the fact of having achieved the goal with the one that began its journey, "to turn it into the window through which to interact in a fluid and cordial way with all citizens.

In addition to the convenience and speed involved in electronic processing, the savings that occur, both for the municipality as for citizens and businesses, are considerable, "they continue, supporting in this case in the figures of the SCM and that would indicate savings of more than 500,000 Euros considering aspects such as the money left to enter for lost work hours to go personally to perform the procedures or travel expenses.

Another area in which Palencia has benefited from technological innovation started in 2011, is that Palencia is considered an Intelligent City or Smart City, "since we have not only reinforced our identity as one of the leading cities in the application of new technologies to municipal services, but we have achieved, thanks to the work deployed since 2011 in this area, an investment that approaches 22 million euros to implement it in city projects until 2022 through EDUSI and DIGIPAL, with the that goals that were marked in 2012 in the Strategic Plan will be achieved ".

LESSONS LEARNT

The implementation strategy of municipally digital service web site in Palencia can be considered successful

having   considered:
Prioritization: All the administrative procedures with the city council have been included in the municipal Website and in addition it has been related to other services of other administrations with what has been extended to the possibility of processing between citizen and administration and the procedure between the administration has been added local and regional administrations, deputation and central, company concessionaires of services.
Balance of benefits: In two years the headquarters was used in more than two million, the city has saved more than 400,000 € in paper and administrative staff time. Citizens have saved travel and waiting periods, companies have saved productive time valued at € 500,000 approximately. The security and reliability in the transmission and management is in continuous development and guaranteed by law.
Solutions well adapted to the citizen's needs: municipal digital service web site offers the possibility of carrying out all the administrative procedures remotely obtaining the digital municipal certification in the document, being able to print it for presentation *in situ* if necessary. These operations are open 24 hours a day, 365 a year. In continuous development of both security in documents and data transmitted and stored as to streamline and simplify the operation.

REPLICATION
It is known that the Spanish Federation of Municipalities (FEM) is using a catalog of services to promote these measures and synergies.
Here it is a link to different projects related with Palencia Procurement model:
http://femp.femp.es/files/566-1263-archivo/Servicios%20y%20Aplicaciones%20del%20MINHAP.pdf

After the success of this experience City of Palencia is continuing to change the web site including new options such as mobile applications to improve and increase the number of citizens that communicate with the municipality, including an interactive portal with municipal services with the goal to save travel expenses, be more effective in the management and increase the confidence and participation of the citizen in the government of the municipality.
Through these actions described, Palencia is considered an Intelligent City since Palencia has not only reinforced our identity as one of the leading cities in the application of new technologies to municipal services.

REFERENCE MATERIAL

8.6 Projects presented by Rijeka

8.6.1 Efficient Public Lighting System

Efficient public lighting system	
Name of the City (and Country) City of Rijeka Republic of Croatia	**Topic** City infrastructure
Promoter & Developer Energo d.o.o. City of Rijeka Fund for environment protection and energy efficiency	**Key Players** Energo d.o.o. City of Rijeka

Introduction

The city of Rijeka`s public lighting system had undergone major reconstruction starting in the year 2008. The project was carried out on selected areas that were dominated by deteriorate lamps with inefficient optics, often with a yellowed glass at the end of their life span. Because of the inadequate or nonexistent optics, their lighting effect was below the standard of today`s lamps.

FORMULATION OF OBJECTIVES

Since developing the sustainable energy efficiency plan for the City of Rijeka, the first objective was to reduce energy consumption by 30% until the year 2020. After the first results of energy efficient behavior, the bar was set at a 40% reduction until 2030. The activities covered different sectors, one of which was the public lighting system, which had lots of room for improvements.

The first activities started with the project Bulb and were co-financed by the program NPP Adriatic 2000-2006/PHARE 2006, and was carried out until the end of 2009. One of the activities was the demonstration of energy efficient public lighting on a pilot street with inefficient lighting- Marin Jakominić street in Rijeka where the existing lamps were replaced with 50 energy efficient and ecological lamps powered by high pressure sodium light sources. All public lighting infrastructure is owned by the City of Rijeka and the municipal company Energo is in charge of the management. The plan consisted of installing new lamps with a two-step regulation – in late night hours, when the intensity of traffic lowers down, the power of lamps is reduced. The objective of the project was to reduce electricity consumption, increase brightness of the street and the safety of all participants in traffic.

PROCESS

The project Bulb pilot in Marin Jakominić street in Rijeka was a start of activities which would demonstrate the efficiency of the modernization of public lighting. The medium brightness of the street before the reconstruction was 7,3 lux, and after the reconstruction, 41,6 lux. Electricity consumption was reduced by more than 50%, that is 40.793 kWh, and CO_2 emissions were reduced, amounting 11,29 t/year. With the consumption showing that energy and emissions were significantly reduced and the brightness is indeed efficient, the City of Rijeka and Energo started planning new projects to improve public lighting on other locations with inadequate lighting. The issue was, as always, the modality of financing.

A study analysis was carried out for determining the state of existing lighting locations which should be a priority in the next actions which were to be divided in stages for easier financing. The first opportunity came in 2009. when new activities could have been financed by the Fund for environment protection and energy efficiency. The project energy efficient public lighting was divided in 2 phases – the first from 2009-2010., and the second in 2014. During the course of 2 years, 1100 lamps were replaced in the first phase. 426 of them with the possibility of brightness regulation. In the second phase in 2014., on selected streets, 151 lamps were replaced with LED lamps with the nominal power of a 134W and two-step regulation, and 26 LED lamps with the nominal power of 93W. The 93W lamps and the ones on junctions have no regulation. On all poles, the junction box was replaced as

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well as the climbing line. The results were visible one year after the installation of new lamps, in 2016, after collecting the electricity bills for public lighting and comparing them to the ones from the year before. The reduction amounted to 589,55 MWh of electricity, and 194,55 tCO2 less emitted. The reduction of emissions amounted to more than 22% since the starting point in 2008.

RESULTS ACHIEVED

The emissions in the public lighting system were reduced by 22% until the end of 2016., on the modernized locations. By comparing the infrastructure before and after the modernization, we can clearly see the justification for the activities carried out. The power installed before the modernization amounted to 47,437 kW that used 194.493 kWh/year, After the modernization, the installed power was 19.209 kW, and using 65.373 kWh/year. The calculation of consumption for the lamps that have the possibility of regulation taken in account the factor r=0,72, which implies a 50% reduction of power from 23pm to 6 am. 129.120,234 kWh were reduced in a year which equals 48.549,21 t CO2/year.

There were a lot of those who benefited from these actions. First the participants in everyday traffic which can have a better brightness on the roads, pavements, junctions and pedestrian crossings. This increases safety in traffic for drivers and pedestrians. The pollution in the city was reduced on more levels, because the energy efficient lighting provides the right amount of light needed in night hours, providing better conditions for sleeping. The company in charge of the public lighting system had reduced costs for maintenance and repairing malfunctioned equipment, for which it was very difficult to find new parts. Lastly, the city benefited from reducing its electricity bills, and contributing to making the city healthier for the citizens of Rijeka.

LESSONS LEARNT

The strategic development of the City of Rijeka is in line with the Sustainable energy action plan in which sectors were determined which have much room for improvement in the area of energy efficiency. Energy efficiency is a constant activity and everyone can, in fact, contribute to making their environment a healthier place to live. This ongoing project showed the continuous necessity for cooperation between the city departments and companies in charge of other sectors. The project involves the city of Rijeka as the owner of public lighting, the company provider of electricity that is HEP, the company in charge of the public lighting system management Energo and others dealing with infrastructure and traffic. When assessing the situation in the field, not only were some lamps inefficient, covered with overgrown tree branches, but some were found that were with mercury and held a possible threat for passing citizens. A system will be efficient only if it has proper and efficient management, and efficient management lies on careful planning and good organization of activities.

REPLICATION

These activities can easily be replicated in different cities. All cities have room for improvements on the public lighting system, and new technologies are constantly developed. The need for efficient public lighting and the models of lamps best fitted for the surrounding, depend on different city`s requirements.

REFERENCE MATERIAL

http://energo.hr/index.php/projekti/energetska-ucinkovitost-javne-rasvjete-rijeka/
http://energo.hr/index.php/projekti/bulb/

8.6.2   Energy Efficient Building- Smarthomes

Energy efficient buildings- Smarthomes	
Name of the City (and Country) City of Rijeka	**Topic** Efficient buildings
Promoter & Developer the City of Rijeka Energo	**Key Players** The City of Rijeka Energo

Introduction

Since joining the Covenant of Mayors initiative in 2008., the City of Rijeka started developing major plans directed at energy efficiency and energy management. These topics were included in the Rijeka SEAP and the Rijeka strategy of development. The city of Rijeka has since then, joined EU funded projects to work on and promote energy efficiency. One of those projects was iURBAN which was awarded the Green digital charter GDC Award.

FORMULATION OF OBJECTIVES

The project`s objective was to promote energy efficiency in city and to develop a ICT solution, a tool which would help the City of Rijeka behave in a more energy efficient manner, and for energy providers, to optimize tariff policies towards their consumers and more efficiently supply on resources.

The City of Rijeka was joined on this project by the municipal company Energo, the provider of heat, lighting and gas in the city. The project was funded by the FP7 program and the city`s budget was approximately 325.000€. The project activities included installation of smart meters on 26 buildings owned by the City of Rijeka that measure the energy consumption of: electricity, gas, heat energy and water. The collected data is then sent to a central database, processed and analyzed, and based on the immediate consumption of each energy source, enable long-term rational use of energy for an individual building or for the whole city.

PROCESS

The installation of smart meters on city owned buildings was not a problem itself and the results which can be aggregated on a daily, weekly, or year period are available immediately. This was a very useful project in controlling energy use on selected buildings. The meters were installed on the buildings of the city theatre, sports facilities, government buildings, and kindergartens. The managers of these facilities were instantly enabled to plan costs for the following periods and to calculate how much to spend. The project also enabled them to find the points of excessive energy consumption and to optimize their consumption.

The problem however, lies in the promotion of energy efficiency behavior for private citizens which, although, reduces utility bills, is very expensive to integrate in everyday life. This is because energy efficiency is closely connected to the infrastructure, or the state of someone`s household (façade, roof, window joinery, available heating resources etc.). The end result of energy efficient behavior, however, always results in the reduction of energy use, or optimal energy use. The good opportunity for helping the financing issues are EU funds and projects, and the worldwide promotion of energy efficiency which the EU joined.

The company Energo installed 8 smart meters in private citizen`s homes – "smarthome" equipment to monitor the use of electricity and heating energy of its consumers. They also developed a smartphone application for their consumers so they could monitor their energy consumption. The energy efficient behavior and achieved reductions by private consumers were awarded for the purpose of promoting energy efficient behavior. Not only were energy bills lower in amount, the consumers were awarded with gift coupons for enjoying city`s cultural and sport offers, such as the city pools, free visits to the Rijeka Astronomy center etc.

my SMART Life

RESULTS ACHIEVED

The buildings on which the smart meters were installed are now able to monitor their energy consumption regarding heat energy, water, electricity and gas. They are able to better plan costs and optimize their energy consumption. The energy provider Energo was able to finance activities which led to the improvement of services for their consumers, and to develop a smartphone application for the use of its consumers, who were then given the opportunity to monitor their energy consumption. The project went perfectly in line with the objectives of the energy efficiency plan in the city and contributed to the cause of reduction of energy consumption by 40% by the year 2030. In the building sector.

The project was so successful that it resulted in 9 scientific papers, the establishment of an expert group on energy efficiency "smart city advisory group" and a publication of a book. Multiple workshops were organized in the city of Rijeka for private citizens to promote and educate on energy efficient behaviour, and to indicate on the direct benefits of such actions.

LESSONS LEARNT

The need for energy efficient behavior has been promoted widely in the last decade regarding the preservation of our planet from harmful emissions. We started working tirelessly on creating a healthier environment for our citizens, but we`ve also learnt that we have much planning to do in fulfilling our obligations. We need to build capacities for developing innovations and implementing existing good practices, we need to plan financial possibilities for implementation, and we need to change our behavior towards the environment. We know that all citizens would like to live in a healthier environment, to have lower costs of energy bills and to live in an energy efficient home. However, what needs to be invested in, isn`t only energy efficient behavior, because citizens usually save energy to reduce bills. The thing that not all citizens can change is the problem of energy loss. In the situation of poor infrastructure heating energy can be lost, electricity overspent by inefficient house appliances, improper use of appliances and the inability to change these consumers with new energy efficient devices because of the cost.

Citizens however, use every promotion activity and action for purchasing such devices with a funded discount and the same goes on subsidies for refurbishments. The same positive response from citizens was obtained with another project that the city of Rijeka implemented – FIESTA, Families intelligent energy saving targeted action which focused on optimization of cooling and heating systems. The city must continue with promotional activities and the country leveraging resources to fund special offers to help their citizens in energy efficient behavior.

REPLICATION

As mentioned above, the City of Rijeka has set goals to reduce energy consumption by 40% until the year 2030. The city has since then joined different EU projects to promote energy efficiency, such as iURBAN or FIESTA and to learn more on new technologies and build capacities. The competent authorities and companies are interested in implementing new technologies and welcome projects which can co-fund their efforts. The City of Rijeka`s implementation was awarded best GDC smart city project on "Promoting open and interoperable solutions". The Green Digital Charter (GDC) Awards recognize outstanding achievements by GDC signatory cities in their use of ICT solutions to become smarter and greener. The Intelligent urban energy tool that Rijeka implemented directly addresses market demand for cheaper and cleaner energy services and was able to directly involve local residents, energy providers and the public authority.

In terms of „dissemination and exploitation ", numerous workshops were organized for citizens, the project was introduced on relevant conferences and fairs and resulted in 9 scientific papers, an expert group and a publication of a book.

my SMART Life

8.6.3   EV charging stations

Electric charging stations	
Name of the City (and Country) The city of Rijeka, Republic of Croatia	**Topic** Mobility
Promoter & Developer The City of Rijeka Rijeka promet	**Key Players** Rijeka promet HEP

Introduction

Before 2015., there were no possibilities for charging private electric vehicles in the City of Rijeka area. This changed when electric vehicles started getting more promotion and the trends in the automobile world started directing towards new technologies in the light of electric power. The City of Rijeka, as the generator of promoting new possibilities for citizens began planning for construction of an electric filling station to encourage eco-friendly driving.

FORMULATION OF OBJECTIVES

The municipal company Rijeka Promet developed the project, acquired necessary licenses and financing for the station, which was to be located in the public garage owned by the city of Rijeka, Zagrad B. The project included procurement of 2 vehicles on pure or combined electro-motor power for road maintenance which have distinctive markings promoting that they run on electricity and for increasing awareness about the need for elevating the number of vehicles which run on alternative fuels. The construction of such a charging station would mark the beginning of the use of electric vehicles in Rijeka.

The objectives of this project were to create the first charging point for charging electric vehicles in the City of Rijeka, to enable the functioning of electric vehicles in the city, to encourage citizens to use renewable sources of energy, to test in practice the organization, functionality, and work technology of an electric charging station in a public garage, and to expand and improve the service level that Rijeka Promet provides for the users of the public garage. Rijeka Promet planned to equip several public parking lots under their management with electric charging stations.

PROCESS

The first electric charging station was installed on the entry level of the public garage Zagrad B, with the capacity to simultaneously charge 4 electric automobiles and 2 electric mopeds/bicycles in the duration of 30-120 minutes for the charging level of 30-80% of the battery. Supplying the station with power is carried out by the main junction box of the garage – GRG 0,6/1,0 kV, by energy cables in PEHD/PVC tubes in the concrete board to the

my SMART Life

position of the charging point. The charging station have an output power of AC 1x22 kW, and 1x22kW and 1x3,6 kW, respectively. The chargers are equipped with an RFID card reader for authorization, while the charging stations installed on the wall have a PIN code keyboard on a touchscreen that connects to the vehicle.

It is expected that the number of electric vehicles will rise in the city of Rijeka. The vehicles themselves are yet to expensive for everyday citizens to purchase, so the government even provided subsidies and benefits for people who buy such vehicles. The benefits included lower cost of registration, lower excise duties and so on.

The project was well planned and there were no obstacles in the implementation. By 2016, the national electricity provider HEP, in a bid to promote renewable energy source use, proposed installation of 2 more charging stations which would be constructed by their own cost, and charging would be free.

RESULTS ACHIEVED

By 2017, there are now 4 electric charging locations in the City of Rijeka, used for charging private cars and public ones. Since installing charging stations, the city of Rijeka procured utility vehicles for maintenance purposes which run on electricity. 3 of the charging stations are installed on the property owned by the City of Rijeka, with the national provider of electricity, HEP, paying all costs of installation, as well as not charging for the electricity used. The charging of electric vehicles is completely free. Not only is the filling free of charge, but the city obliged to adopt a decision for freeing owners of electric vehicles of paying parking fees on all public parking lots and garages in their ownership.

The assessment of expected results in the field of cleaner transport in Rijeka has shown that the number of electric vehicles will increase from the 2 that were registered in 2015. The assessment is that in the period of 2015-2020, the CO_2 emission will be reduced by 104.160 CO_2 kg/year. The probability is that the number of electric vehicles will progress even faster than the initial presumption, and this is not taking into account the number of tourists that visit the area yearly and who travel with electric vehicles.

LESSONS LEARNT

The route chosen for public transportation is that the public transportation buses will run on CNG, and in the future, even more vehicles will be driven on this type of fuel. The future of private automobiles is however, directed on electricity, and new technologies are leading development into this direction. The cost of buying an electric vehicle is still too expensive for an average car owner, or the ones from the higher middle class in fact. The electric charging station network is being developed and there are parts of the country which are not, and will not be soon equipped with electric charging stations. This however, is the situation now, and the future is very clear. We need to work on developing infrastructure which will follow new technologies and be compatible in the future. As the cost of buying electric vehicles is high, we need to conduct promotional activities even more, and to award the car owners who purchase e-vehicles. Free parking in the city of Rijeka public parking lots, and not charging electricity from the national electricity provider are a good start at cleaning out cities from transport`s harmful emissions which are the biggest daily pollutant in our cities.

REPLICATION

Electric charging stations are not a smart innovation, but simply following world trends which promote driving vehicles on alternative fuels, and applying existing and necessary new technologies in the urban eco-system. The fact is however, that purchasing an electric vehicle, or a hybrid one for that matter, is very expensive when taking into account that this is not a mainstream action – charging stations are limited, as is the range of the vehicle, which needs trip planning. On the other hand, for citizens who depend on their vehicles for daily commuting and are "city drivers", this is a good alternative to usual fuel powered vehicles. The city of Rijeka has realized the importance of a healthier environment and the fact that tourist need such infrastructure when visiting the area. The city has thus, in agreement with the national electricity provider HEP, given free of charge city property suited

my SMART Life

for e-charging stations, located on city parking grounds. HEP, on the other hand, agreed to install the equipment at their own expense, and provide free charging for consumers. To further promote alternative fueled vehicles, the city agreed to provide other benefits for private e-vehicles in the sense of free parking on all public parking grounds managed by the competent city company.

Because e-vehicles are an expensive purchase, not only in the Republic of Croatia, cities can do their maximum in providing such benefits, as the City of Rijeka, so that owners of electric vehicles can get their investment back sooner and be awarded for clean transport. Today, there are 10 charging points in the city of Rijeka, and more in the surrounding area thanks to such collaborations.

REFERENCE MATERIAL
https://chargemap.com/cities/rijeka-HR
https://www.plugshare.com/?location=109633

8.6.4 E-gov web portal

E-gov web portal	
Name of the City (and Country) The City of Rijeka, Republic of Croatia	**Topic** Non – technical actions
Promoter & Developer City of Rijeka partner on project Egov4u	**Key Players** City Milton Keynes (LP) Egov4u; local: city of Rijeka, Astoria – algebra center, Center of technical Culture Rijeka and the Center for youth Rijeka

Introduction

The City of Rijeka, together with several other European cities, was a partner in the project 'E-government for you' worth EUR 4.8 million, co-financed by the EU. The project aimed at speeding up e-service delivery to the socially disadvantaged categories of citizens, removing the barriers that prevent access to the internet and e-services and providing information technology at home and in the communities of the socially disadvantaged. The project particularly focuses on citizens who are in some way socially excluded from the possibility to use IT achievements due to their social, health or another status.

FORMULATION OF OBJECTIVES

Information and communications technology (ICT) is an unavoidable part of everyday life, therefore it should be available to all citizens. The E-government for you (EGOV4U) project was based on the wish that Internet and E-government services be more available to socially disadvantaged people, those who are most in need of public services and social equality.

The project was run by the City of Rijeka Information Technology Department and included as partners the Astora-algebra center, the Center for technical culture Rijeka and the Center for youth Rijeka. The value of this project, at Rijeka level, amounted to EUR 537,450.00, out of which EUR 268,725.00 was provided by the European Union, while the remaining amount is provided by the City of Rijeka. The project began in September 2010, and lasted by September 2013.

PROCESS

The target groups of the project included third agers, unemployed women, people with special needs and pensioned Homeland War veterans. The main challenge was how to approach these target groups and educate them on using new technologies for them and achieve digital inclusion. One of the issues was demonstrating that they would actually benefit from this education, not only in being able to use e-services provided in the City of Rijeka, but to achieve digital literacy.

The City of Rijeka Information Technology Department carries out the activities relating to planning, projecting, developing and establishing IT systems, geo-information systems (GIS), integrating alphanumeric and graphic data, the City's websites and two-way communication systems, as well as citizen on-line services within the development of e-Government. The NGOs organized educational workshops for each of the target groups, and while educating, listened closely to their needs and issues, ensuring a service they would actually use after the project. For example, in addition to the http://gov.rijeka.hr/ portal which implements or cooperates implements on EU and international projects, projects relating to eServices, it introduces and takes care of the Intranet and other collaborative surroundings, social media application and other WEB 2.0 tools and manages projects relating to inclusion and education for targeted citizens' groups, the pensioners decided that they would like to enjoy their own website containing local information and events appropriate for them, with special features to help their web surfing http://penzici.rijeka.hr/.

RESULTS ACHIEVED

Within the project, the strategic e-inclusion document of the City of Rijeka was adopted; the utilization of information and communication technologies (ICT) aiming to increase the efficiency of the Department of Health and Social Welfare and intermediary structures in offering social security was improved; access to the internet and e-services of the City of Rijeka, on the basis of best EU practices (extending the free wireless internet zone, establishing a pilot relating to PC leasing services, establishing digital centers in the territories of the local boards and associations) was improved and provided; personalized and adjusted multi-channel e-service for disadvantaged groups was enabled; basic and advanced IT courses for the targeted groups were organized; campaigns intended to raise the citizens' awareness about the advantages of the internet and ICT were carried out, as well as the rights to e-inclusion and prevent digital exclusion.

LESSONS LEARNT

The project enabled the achievement of equality for all citizens on the way of channeling the city`s development into the smart city. Promoting and educating on the importance of inclusion is a requirement in meeting the smart city standards, and the inclusion of each and every target group enables their acceptance of modern technologies. Otherwise, innovation projects would be perceived as money wasted on things citizens don`t understand or have the need for, and we are trying to set new standards for all citizens. Another thing learnt, is that the city government must be the trailblazer in promoting new ideas useful for its citizens. The citizens have very high expectations from their governments and little tolerance for issues, so the city must be the generator and continuously build capacities for improving services for its citizens. The city government has to be the generator of actions in the urban eco-system because it has the best overview and capacities for reaching different target groups and providing financing solutions for urban innovations.

REPLICATION

The e-services platform was developed as the result of the project Egov4u. The transition towards smart cities entails planning in all sectors of the city and continuous upgrading of projects. Another service developed in the City of Rijeka is the RCC card – Rijeka City Card. Rijeka City Card (RCC), operational since 2014, enables citizens of Rijeka to easier, faster and cheaper use of city services. Rijeka City Card can be used as a ticket in public buses,

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for payment of parking lots, and as a City Library card. In addition, the Rijeka City Card has a platinum functionality, so it can be used as a means of payment at the Diners Club sales points. The design of the system enables additional services to be seamlessly incorporated into the Smart City Card system. Further plans include adding more city services as well as improving the whole card management system which must meet any operational demand. The RCC Data Centre needs to be highly efficient, handling multiple users. It should cope with a high rate of mass data transmission and processing, ensuring routine and seamless system operation and data security mechanism.

The City of Rijeka municipality via Open Data Portal http://data.rijeka.hr/ allows access to municipal databases that are not of a confidential nature. The open data environment enables the public and app developers to make use of data. Making data available online is the most efficient way to exploit it. As the RCC system collects large amount of data, further plans include opening of RCC data following the same principles of security and privacy protection.

This project of the RCC card demonstrated that the citizens are willing to participate in an action if they can see the benefit for themselves and if, in everyday life, it is faster, easier and cheaper to use.

The city of Rijeka never forgets its more vulnerable citizen groups and is always developing new ways of collaboration on new projects. The e-gov website enables access to all services provided by the city, its institutions, city companies, and the central government website for issuing personal documentation etc. in one place and the instructions for usage, as well as important links to useful information. The development of such services can be easily replicated but the most important feature has to be the usefulness of data provided and listening to the needs of citizens.

REFERENCE MATERIAL
http://www.rijekacitycard.hr/Naslovna.html
http://gov.rijeka.hr/