my SMART Life

Deliverable due date: M36 – November 2019

D1.4 DELIVERY OF WORKSHOPS FOR CITIZEN ENGAGEMENT

WP1, Task 1.1

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

Project Acronym	mySMARTLife
Project Title	**Transition of EU cities towards a new concept of Smart Life and Economy**
Project Duration	1st December 2016 – 30th November 2021 (60 Months)
Deliverable	D1.4 Delivery of Workshops for citizen engagement
Diss. Level	PU
Status	Working
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	Final version
Due date	30/11/2019
Work Package	WP1
Lead beneficiary	Tecnalia Research & Innovation (TEC)
Contributing beneficiary(ies)	VTT, FVH, NBK, CAR, HCU
Task description	*Subtask 1.1.2:* Organization by TEC, CAR, SEZ, NBK, HCU, FVH and VTT of three workshops in each city for Citizen and local players on energy, mobility and ICTs applied to urban solutions. Workshop 1 to establish objectives for consolidating their participation and defining main challenges for activating engagement in each sector (and related to interventions building retrofitting, renewables in the city, deployment of EVs, etc.). Workshop 2 to identify the critical processes and possible bottlenecks to achieve selected objectives in Workshop 1. Workshop 2 will develop upon solutions and analysis from previous workshops to provide citizen and stakeholder's own strategies and projects. "Ownership" of the project will generate a wider acceptance but specially the engagement of participants in its implementation and deployment. The deliverables related to this task are: D1.3.- Methodology for citizen engagement based on system thinking [TEC] (M9) D1.4.- Delivery of Workshops for citizen engagement [TEC] (M36)

Date	Version	Author	Comment
11/10/2019	0.1	Igone Revilla	First version for the quality review

		Elena Usobiaga (TEC)	
26/11/2019	0.2	Igone Revilla Elena Usobiaga (TEC)	Final reviewed version for submission

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Abbreviations and Acronyms

Acronym	Description
mySMARTLife	Transition of EU cities towards a new concept of Smart Life and Economy
API	Applications Programming Interface
GHG	Greenhouse gas

1. Executive Summary

The aim of this deliverable is to support cities that want to become a Smart Energy City in their transformation process through the involvement of citizens and professionals in their city´s transformation strategy and the generation of a wider acceptance of the implementation and deployment of solutions. This document describes in detail the process of delivering the set of workshops envisaged for this process, the different variations adapted in each of the three lighthouse cities, and how the local strategies and consultation and engagement processes already in place in the local areas, do shape the engagement strategy and the results of the whole process.

Chapter 2 Introduction, introduce the purpose and the target group of the deliverable, the contribution of partners to deliverable development and the relation of the deliverable and other activities of the project.

Chapter 3 Methodology for citizen engagement, briefly describes the initial mySMARTLife Methodology for citizen engagement based on system thinking and the adaptation that was suggested for each of the three lighthouse cities.

Chapter 4 Workshops in the city of Nantes describes in detail the implementation process, including the objectives and expectations, participants, agenda, materials used and conclusions of each of the three workshops delivered in the city of Nantes.

Chapter 5 Workshops in the city of Hamburg describes in detail the implementation process, including the objectives and expectations, participants, agenda, materials used and conclusions of each of the three workshops delivered in the city of Hamburg.

Chapter 6 Workshops in the city of Helsinki describes in detail the implementation process, including the objectives and expectations, participants, agenda, materials used and conclusions of each of the three workshops delivered in the city of Helsinki.

 Chapter 7 "Conclusions" outlines general conclusions related to the process of workshops implementation.

Chapter 8 "References" compiles the bibliography used for the deliverable development.

Chapter 9 "Annexes" includes the design materials and detailed information used in the delivery of the workshops in each of the three cities.

2. Introduction

2.1 Purpose and target group

The aim of this deliverable is to support cities that want to become a Smart Energy City in their transformation process through the involvement of citizens and professionals in their city´s transformation strategy. This deliverable report and analyses the implementation of the methodology designed in D1.3 in the three Lighthouse cities of the project. This implementation serves to test the methodology and its possible adaptations, in order to give concrete examples of application and also extract relevant conclusions and lessons learnt to help other cities interested in follow the same process in the future.

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	Coordination of the deliverable and development of chapters 3 & 7.
VTT, FVH	Workshops implementation & reporting in Helsinki (chapter 6)
NBK, CAR,	Workshops implementation & reporting in Nantes (chapter 4)
HCU	Workshops implementation & reporting in Hamburg (chapter 5)

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
D 1.3	The methodology described in deliverable 1.3 is the one implemented in this deliverable in each of the three lighthouse cities.

3. Methodology for citizen engagement

With the aim of supporting cities that want to become a Smart Energy City in their transformation process through the involvement of citizens and professionals, a methodology for citizen engagement has been developed and adapted for mySMARTLIfe project, which is described in detail in Deliverable D1.3.

This methodology specifically addresses the involvement of citizens in the Urban Transformation Strategy development, specifically related to the set of the objectives for the city transformation strategy, the identification of barriers and the identification of solutions for the achievement of the main Urban Transformation objectives. Citizen engagement includes not only civil society but also professionals from Energy, Mobility and ICT sectors, as well as other professionals from urban related fields, public administration and research and knowledge creation. The aim of this methodology is to take into account all the relevant stakeholders´ interests and perspectives for the design of the strategy, as well as improving its social acceptance during the strategy implementation process.

This methodology was mainly inspired and based on the Energy Master Plan Process Model (Systemic Approach) and the World Café method[1]. As a result of the analysis of these two approaches, mySMARTLife Methodology for citizen engagement based on system thinking was structured in a cascade approach of workshops with the objective of identifying the three key elements included in the city transformation process:

- To identify the main **objectives** to be achieved with the strategy in Energy, Mobility and ICT sectors.
- To detect the main **barriers or bottlenecks** to achieve the objectives identified.
- To define **solutions** to overcome the identified barriers or bottlenecks.

The three workshops which are the main basis of the methodology, are organized with different teams and with separate groups of participants which meet to discuss about the proposed topics and obtain relevant answers to the questions to be dealt with. The results are generated in smaller groups but are also shared during various rounds of conversation with the rest of the groups

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[1] For more detail information refer to chapter 4.2.1 of the mySMARTLife D.1.3

focused on the same questions with the objective of retro-feeding the achieved results. This process serves to manage the interest and expectations from local stakeholders and citizens, and to empower them in taking part in the strategy implementation actions. This will make it easier to obtain citizen support and acceptance during the strategy implementation.

However, the careful analysis of the starting point and different realities in each Lighthouse City, gave us the insight to determine that the methodology should not be rigid. A deep understanding of each city context, participation structure and city transformation strategies and engagement actions, was considered crucial for the methodology adaptation definition in each lighthouse city case.

In Nantes Métropole, the workshops were adapted to a large-scale citizen engagement process already in place in the city, the "Great Debate on energy transition"[2], and the mySMARTLife workshops results will contribute to the process of elaborating and implementing the metropolitan roadmap on energy transition resulting from this main consultation process.

The City of Hamburg considered that the main adaptation of the methodology should aim at raising social awareness and citizen engagement and activating real estate owners, investors and enterprises to cooperate with mySMARTLife partners. Therefore, the three workshops carried out in Hamburg were connected with the purpose of setting up a local innovation network promoting the transformation to a smart city in the borough of Bergedorf

In Helsinki, on the other hand it was considered that three options would be open to implement the workshops in different areas of the city and regarding various key aspects in the project, namely a) Interest for crowdsourcing of renewable energy production unit, b) Energy renaissance and motivation and incentives for energy savings action; and c) Back-up: the autonomous bus. Finally, improving energy efficiency of the existing building stock, that is Energy renaissance, was considered the key aspect to deal with in the workshops since heating of the existing building stock creates more than half of the emissions in Helsinki and that more than half of the buildings are privately owned. This has been identified as one of the most crucial aspects to be solved in order to fulfill the ambitious targets of Helsinki to become carbon neutral in 2035.

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[2] For more information refer to https://www.nantestransitionenergetique.fr/

After this general introduction of the methodology used for citizen engagement, we will show in detail each of the workshops delivered in the three lighthouse cities.

4. Workshops in the city of Nantes

4.1   Introduction

Nantes Métropole has chosen to devote its citizen and stakeholder workshops on the concept of self-data, applied to the energy issuesin the Nantes Métropole area. Self Data[3] is a concept that covers 3 main dimensions, and can be summarized as the possibility for citizens and local stakeholders:

- to recover their personal data from the organizations that hold them (companies, websites, social networks ...)
- to store and manage their personal data on secured digital environments
- to re-use their personal data through new services and applications, in their own interest (reduce their carbon footprint, save money,...).

Thus, Nantes Métropole has launched a series of meetings opened to citizens and local stakeholders, in collaboration with several partners from the energy sector (ENEDIS, GRDF, ENGIE, EDF, ADEME) and with the support of the think tank "FING" specialised in digital transformation.

These workshops are complementary to the civic discussion tools implemented by Nantes Métropole during the great debate on energy transition, which took place from September 2016 to March 2017. They also are in line with the new strategic road map on energy transition adopted by the Nantes Métropole Council on February 16, 2018, which identified appropriation by citizens of data and digital information services as a key factor for the energy transition of the metropole.

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[3] "Self data" consist on make inhabitants actors in the energy transition through their re-appropriation and their use of their own personal data. For more information consult the following link:
https://www.cerema.fr/fr/actualites/mysmartlife-ateliers-concept-du-self-data

The objective of the self-data workshops is to make citizens and local stakeholders aware of this concept. Workshops also aim at thinking of new tools and digital applications that are useful for inhabitants, and at transforming citizens and local stakeholders to actors in the energy transition through their better control and their better uses of their personal data.

Figure 1: Source Nantes Métropole / Fing - support of workshop of November 8, 2018

The process is structured in three main stages, corresponding to the three workshops presented below.

- Workshop 1: exploration and awareness of the self data concept (during 2 sessions)
- Workshop 2: prospective (during 2 sessions)
- Workshop 3: drafting of the roadmap to implement new self-data solutions and services in Nantes

Table 3: Workshops in Nantes

W	Topics addressed	Objective/s of the workshop	Typology of participants *(associations, individual citizens, public bodies, private companies…)*
1st	"Territorial self-data" seminar 8/11/2018	Awareness of concept of "territorial self-data" General presentation of the project Test of the whole method proposed in accelerated Identification of topics to be explored in future workshop	Local stakeholders in the energy sector (production and distribution) Public organizations and associations in the field of energy transition Higher education institution

W	Topics addressed	Objective/s of the workshop	Typology of participants *(associations, individual citizens, public bodies, private companies…)*
	"Datablitz" workshop (mapping of personal datasets) 29/11/2018	Awareness of concept of "territorial self-data" Identification of stakeholders to mobilize For the three selected themes: first brainstorming of the data to be collected	Local stakeholders in the energy sector (production and distribution) Public organizations and associations in the field of energy transition Session opened to other targeted stakeholders
2nd	Use cases research and data governance workshop 2 sessions : "Imagine I" : 24/01/2019 "Imagine II" : 28/02/2019	Research of use cases on the three main themes identified in the previous phase Identification of the governance to implement for personal data adapted to Nantes	The same as the previous workshops + wide opening to the public (volunteer citizens, associations, etc.)
3rd	workshop "implement the self-data" 23/05/2019	Design workshop dedicated to the development of new tools and applications for Nantes	The same as the workshop n°2

The content and proceedings of the 3 workshops have been defined in advance during working meetings with Nantes Métropole and FING. These meetings made it possible to define the progress of each of the workshops and to identify actors and partners to invite in a targeted way, in addition to wider invitations. FING also drafted the documents, tools and animation supports used for the workshops.

4.2 1st workshop: "Territorial Self-data concept" and "Data Blitz – data mapping".

4.2.1 Objective and expectations

The main objectives of this workshop are:

- Raise awareness of the concept of "territorial self-data" and identify possible concerns, questions and opinions about self-data opportunities for energy and environmental transitions;

- Engage project dynamics:

  o Present the territorial self-data project and expected outputs;

    o Mobilize partners and stakeholders to facilitate broad participation in the project and upcoming meetings (Workshop 2 and 3 in particular);

    o Prepare the work for the following two workshops: identify the challenges of the energy transition to which the territorial self-data will answer and list a maximum of relevant personal data.

To achieve these objectives, this first workshop was organized in two stages:

- 8/11/2018: this first session consisted of an awareness seminar on self data concept for partners and stakeholders (energy producers and distributors, public organizations working on energy transition issues, higher education institutions, etc.)
- 29/11/2018: this second session brought together the same audiences as the previous one. This session, called "Data Blitz", aimed to map existing and available personal data sets, useful for developing digital solutions for citizens in the field of energy transition. The workshop also prepared the work of the following workshops dedicated to reflection on the use cases.

The objectives of the first workshop were generally achieved with, in particular, a good involvement of the participants in the proposed works.

4.2.2 Participants

The first session of the workshop (08/11/2018) brought together about 30 people:

- 8 representatives of energy production and distribution companies (EDF, Enedis, Grdf and ENGIE), as partners of the "self data" project
- 2 representatives of public organizations and associations working on the topics of energy transition (ALISEE, CLER)
- 5 representatives of other public institutions in the field of energy and regional planning (Ademe, AURAN, Cerema)

Figure 2: Workshop of November 8, 2018 - Cerema photo credit

- 1 representative of an energy transition consulting firm
- 1 representative of higher education institution of Nantes (IMT - general engineering school)

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- a dozen representatives from different departments of Nantes Métropole
- 4 facilitators, members of the Fing.

<u>The second session of the workshop (29/11/2018)</u> brought together some twenty people:

Figure 3: Workshop of November 29, 2018 - Cerema photo credit

- 4 representatives of energy production and distribution companies (EDF, Enedis, Grdf and ENGIE), as partners of the "self data" project
- 2 representatives of public organizations and associations working on the subjects of the energy transition (ALISEE, CLER)
- 2 representatives of other public institutions in the field of energy and spatial planning (AURAN, Cerema)
- 2 representatives of energy transition consulting firms and other companies
- 1 individual citizen
- 5 representatives from different departments of Nantes Métropole
- 3 facilitators, members of the Fing.

All the organizations or institutions present at the 8 November seminar were also represented at the "Data-blitz" workshop (with the exception of the higher education institution).

The participants mobilized for this phase were invited to participate in the following workshops. (24 Jan, 28 Feb, 23 May), which will be open to broader citizen participation.

4.2.3   Agenda and materials

<u>The seminar of November 8, 2018</u> took place on a day from 10 am to 4 pm as follows:

- Morning: presentation of the self-data concept and of the chosen topic (energy transition) for its declination in Nantes; introduction of the workshops process over the next 6 months

- Afternoon: accelerated test of the whole method planned (uses cases / personal data)

  - collective work: use of a metaplan method to identify topics related to energy transition and personal data

- o in-depth analysis of three specific topics selected from among all previously identified topics (see below).
    - ▪ work in 3 subgroups) based on pre-formatted poster
    - ▪ restitution of the conclusions
- o presentation of the next steps.

The "Data blitz" workshop of November 29, 2018 was held over half a day, from 2 pm to 5 pm according to the following sequence:

- Introduction and presentation of the session's objectives
- Collective brainstorming to identify services or resource persons interesting and / or that can be mobilized within the framework of the project (direct work on a "framadate" document: https://annuel.framapad.org/p/datablitz-nantes)
- Work sequence per subgroup:
    - o a sub-group for each of the 3 challenges identified during the seminar of 8 Nov, based on a pre-formatted restitution document; 4 to 5 people per group
    - o restitution of the conclusions by a member of the Fing, facilitator of the subgroup
- Presentation of the next steps: the "Imagine" workshops.

To facilitate and encourage participation, the facilitator of the 2 sessions of the workshop (member of the Fing) used several tools:

- a collective icebreaker to introduce the subject;
- small and self-managed groups of brainstorming to express what self-data represents for everyone; utilization of different formats for restitution (poem, diagram, word cloud, etc.);
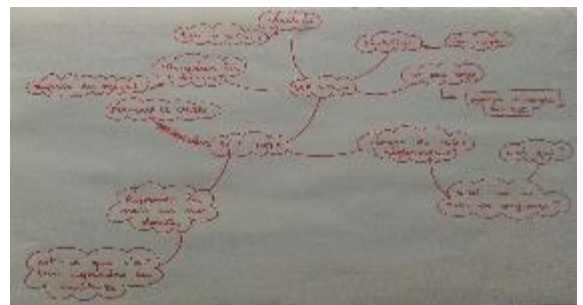
Figure 4: Workshop of November 8, 2018 - Example of a brainstorming result to represent the self data concept - Cerema photo credit

- a brainstorming reflexion in small and self-managed group to express personal perception of self data in terms of risks (bad cop) and opportunities (good cop): this exercise allowed a good sweep of the subject and participants have been attached to find a positive counterpart to the identified risks;

- a brainstorming work in 3 subgroups on the basis of a common thread that integrates all the questions to be dealt with and animated by a member of the Fing, responsible for restitution. This method was

Figure 5: Workshop of November 8, 2018 - Bad Cop / Good Cop – Cerema photo credit

used during the two sessions of the workshop (November 8 and November 29) with different restitution frameworks.

4.2.4   Workshop description & conclusions

The first session (08/11) identified several concrete challenges of the energy transition and to which the "territorial self-data" can contribute to provide an answer:

Figure 6: Example of a collective work support used during the November 29, 2018 workshop – Cerema photo credit

- Challenge 1: Know and act on the impact of my food choices (short circuits, seasonal purchases, zero waste)

- Challenge 2: Calculate and reduce the carbon footprint of my housing / control my consumption (thermal renovation, eco-gestures, equipment, subsidies)

- Challenge 3: Contribute to the production of renewable energies in my neighbourhood / city / self-consumption (Renewable Energies, energy mix, self-consumption, smart grids).

The second session of the workshop allowed to further develop these 3 challenges, and to identify personal data related to these issues: thus, they will be used to build use cases during workshop n ° 2.
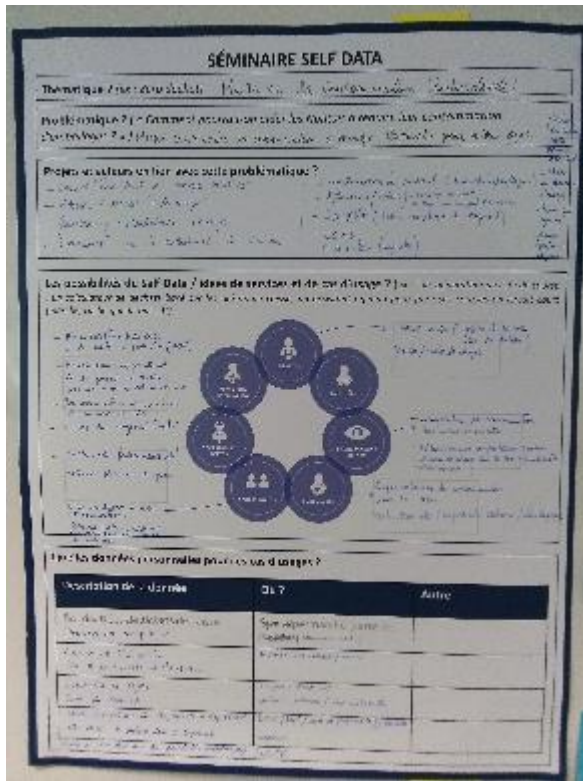
Figure 7: collective production– November 29, 2018 workshop – Cerema photo credit
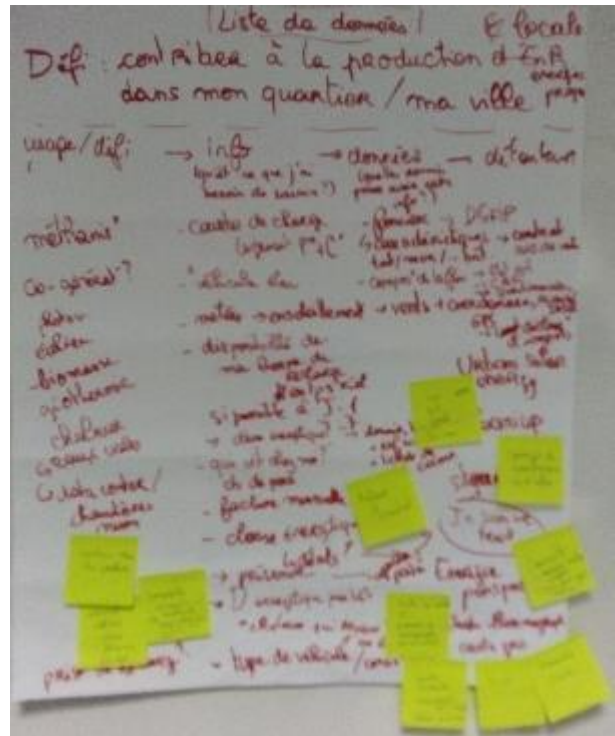
Figure 8: collective production– November 8, 2018 workshop – Cerema photo credit

The data collection (personal or non-personal) that can be mobilised has been organised around the major challenges defined with citizens and local stakeholders, on the energy transition:

- *Calculate and reduce the ecological footprint of my food;*
- *Calculate and reduce the energy consumption of my home;*
- *Support the production of clean energy on my territory.*

Data mapping is available at the following address:

http://mesinfos.fing.org/cartographies/datasdt/

About a hundred data on energy and ecological transition have been identified. Two-thirds of the information listed is of a personal nature.

These include profile data (age, name, address, household composition, etc.), geolocation, consumption (subscriptions, fuel, food, energy), but also preferences (itineraries, food, etc.) and housing characteristics. So much useful information to know what help can be given to install solar

panels, or to make a shopping list at shops that offer local or seasonal products according to the preferences of the household (price, tastes...).

The list of data identified is given in Annex 9.1.1
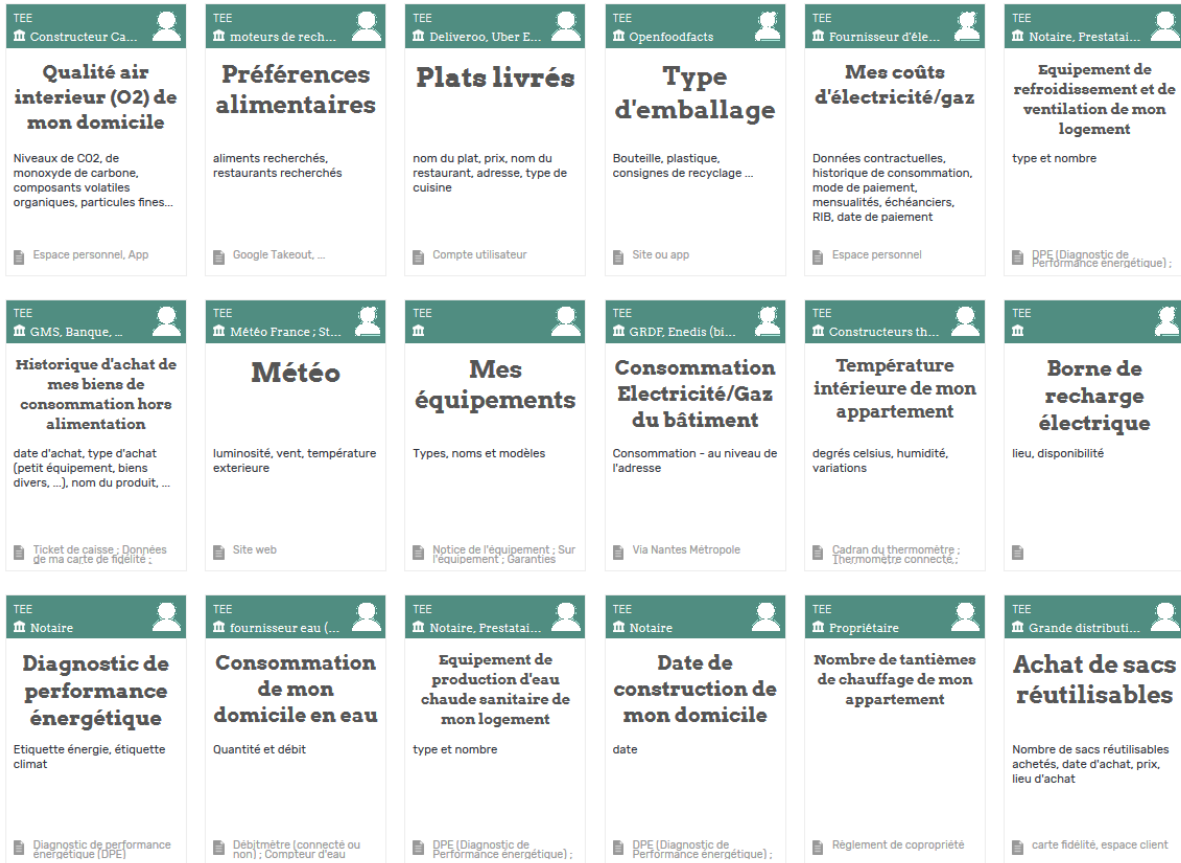
Figure 9: Extract from the data mapping established at the end of the first workshop

Some data can be used for several use cases: for example, the household profile may be relevant to the use case "carbon footprint of my food" and "energy consumption of my home".

This data mapping will be used in the next workshop to build use cases and define the appropriate data governance model.

4.3   2nd workshop: Use cases research and data governance (Imagine I and II)

4.3.1   Objective and expectations

This second workshop corresponds to the prospective phase and the main objectives are:

- design services that are in line with the self-data concept, useful to the inhabitants of Nantes Metropole (corresponding to an explicit or implicit need) in relation to the three challenges identified during Workshop n°1
- embody the use cases and services previously imagined by a more global approach to their governance modalities.

In order to meet its objectives, this second working group was organised in two stages:

- January 24, 2019: propose use cases related to the three challenges identified during the first workshop (3 challenges: knowing and acting on the impact of my food choices, contributing to the production of clean energy in my neighbourhood or city, reducing the carbon footprint of my home and controlling my consumption);
- 28 February 2019: identify the most relevant data governance modes to be associated with the use cases imagined.

The objectives of this second workshop were generally achieved, with a good involvement of the participants and first concrete and varied results.

4.3.2   Participants

The first session of the workshop (24/01/19) brought together more than thirty people:

- 6 representatives of energy production and distribution companies (EDF, Enedis, Grdf, Engie)
- 1 representative of public organisations and associations working on energy transition issues (ALISEE / CLER)
- 5 representatives of other public institutions in the field of energy and spatial planning (Ademe, AURAN, Cerema, SAMOA)
- 3 representatives of consulting firms in energy transition
- 2 representatives of data and digital consulting firms
- 2 representatives of associations (T'cap and Mieux trier in Nantes)
- 1 citizen
- 1 representative of a higher education institution in Nantes (Researcher at Audencia Business School)
- about ten representatives of the various departments of Nantes Métropole
- 3 facilitators, members of the Fing.

The second session of the workshop (28/02/19) brought together 17 people:

- 3 representatives of energy production and distribution companies (Enedis, Grdf, Engie)
- 2 representatives of other public institutions in the field of energy and spatial planning (AURAN, Cerema)
- 1 representative of a higher education institution in Nantes (Researcher at Audencia Business School)
- 5 representatives of the various departments of Nantes Métropole
- 6 members of Fing, including 4 who act as facilitators//animators.

Overall, the participants in the first workshop continued their investment in the process and even participated in large numbers in the session dedicated to the search for use cases.

4.3.3   Agenda and materials

The first session of the workshop, "Imagine I" on 24/01/19, was held over half a day, from 14h to 17h30, according to the following schedule:

- an introduction to recall the Self Data territorial project and the challenges identified at the end of workshop n°1
- a working time per subgroup in self-management (one challenge per group) to formulate, based on the challenges identified in workshop 1, concepts of services for the inhabitants of Nantes Métropole:
    - to bring out ideas for services (all over the place and without censorship)
    - choose from among the proposals made within the group, a service to specify and describe it in relation to personal data (in the introduction to this sequence, Fing presented to the whole room the mapping of the data from the data hunting workshop - workshop n°1
    - from a person distributed by group (according to the rules of service design), tell a possible use scenario, step by step, from the appropriation of the service to its use
    - restitution of the 4 groups by a Fing facilitator.
- Brief presentation of the rest of the work, in particular the Imagine II workshop.

Figure 10 : workshop on January 24th 2019

The second session of workshop n°2, "Imagine II" on 28/02/19, was also held over half a day, from 14h to 17h30, according to the following schedule:

- an introduction recalling the previous steps and in particular the use cases imagined;
- a presentation of five existing data governance models to familiarize participants with existing alternative visions (what models for what use to illustrate the models in a synthetic way and a fact sheet by governance model in the appendix)
- a collective working time (in 4 groups; one group per use case)
    - to create an alternative model adapted to each use case
    - Ensure that the model overcomes at least one obstacle:

Figure 11: workshop on February 28th 2019

To ensure the collective work, the Fing facilitators used the following methods and materials:

- a brainstorming work (with post'it) by small self-managed groups to free the imagination and offer services to the inhabitants of Nantes Métropole to act in favour of energy transition. For the challenge proposed to the group, three questions guided this work: *What services can we*

imagine to meet this challenge? Then for each service imagined, what can it do? What is it (object, application, website, etc.)?

- a work of deepening a service in case of use by self-managed subgroups on the basis of a common framework (illustration to be requested from Manon de la Fing*): name of the service, baseline, challenge, how this service is innovative, target audience, functionalities, user benefits, data used (data type and summary description if possible)*

- a description of the use case by subgroup based on the following persons (one person distributed by group) and according to a common framework to be completed by the group: *detailed use scenario, economic model*

Table 4: User profiles

People	Main characteristics	
Francesca	Medical Secretary, Married and mother of an 8-year-old child, Lives in semi-urban areas, Limited budget	
Antonin	Dad of two children aged 10 and 14, Uses few new technologies, Conscientious on food issues, Head in the air, loves post'it	
Mohamed	Young green activist, social critic, handyman, low tech enthusiast, member of an AMAP (association for the maintenance of peasant agriculture), Owner	
Jean-Marie	Executive Director, Owner has been living with her husband for 18 years, very active, connected to digital devices	

- Sub-group work (one group per use case to build from the governance models presented the data governance adapted to the use case addressed). The work is conducted according to a common framework in the form of an A2 poster with the time spent by the group on each

section of the poster): *reminder of the concept of service and the alternative "basic" model; why is this interesting? (10 min); your model (1 hour): what it implies, how does it work? Stability of the model (15 min) to an obstacle (imposed on the group among the following 4: coup d'état / abusive government; destruction of large data centers following hurricanes and tsunami; situation of generalized monopoly / loss of political, economic and individual power; hacking / data suction); main steps to reach this model (15 min).*
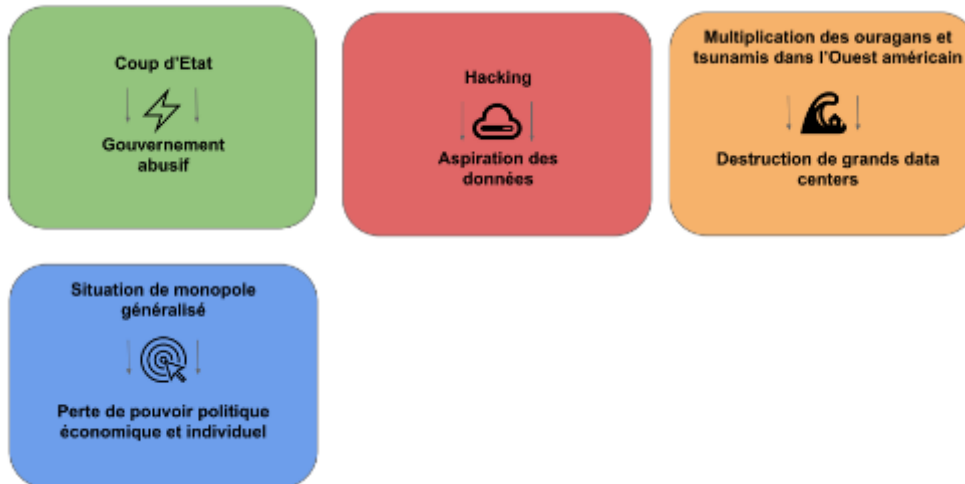
Figure 12: examples of material used during the workshop on February 28th 2019

SELF DATA TERRITORIAL - ATELIER IMAGINE II - MODÈLE ALTERNATIF

Concept : ....

Modèle alternatif : ....

Pourquoi c'est intéressant (10 min) ?
....
....
....

Votre modèle (1h) : Qui implique-t-il ? Comment fonctionne-t-il ?

⇒ Dessinez et décrivez les relations entre acteurs (détenteurs de données, plateforme, réutilisateurs de données, individus, etc) en vous aidant des cartes.
ex : X partage les données à Y, Y traite les données, W stocke les données de telle façon, ...

⇒ Qu'est-ce que ça change pour les acteurs du modèle (ex : Banque X) et pour les acteurs extérieurs (ex : pour les concurrents) si ce modèle devient réalité ?

Stabilité du modèle (15 min)

Nom de l'obstacle : ....
⇒ Que change votre obstacle au modèle imaginé (dans son fonctionnement, dans les relations entre les acteurs (post-it orange) ? ....
....
....

Etapes (15 min)
⇒ Quelles sont les étapes principales pour arriver à votre modèle ?

Modèle une fois l'obstacle surmonté

Figure 13: restitution framework for the collective works of 28 February 2019

4.3.4   Workshop description & conclusions

The "Imagine I" workshop made it possible to imagine and characterize 4 use cases, each associated with a user profile (see Table 4). Each use case was further developed in subgroups. The following table summarizes them. The four detailed use cases are listed in Annex 9.1.2.

During the "Imagine II" workshop, five data governance models were presented to the participants, in order to enable them to understand the different architectures and possible ways of working.

Four subgroups then designed and characterized the most appropriate governance model by applying one or more basic models (the combination of models was possible, if it met a specific need).

At the end of the workshop, a governance model based on use cases was proposed and adapted. The overall result is shown in the table below:

Challenge	Imagined Use Case	Features Contemplated	Main Data to Be Mobilized	Data Governance
Know and act on the impact of my food choices	La Toque Verte	Based on your daily consumption data, La Toque Verte allows you to evaluate your food carbon footprint and benefit from advice to reduce it and avoid waste while making your daily life easier (recipe ideas, shopping lists, etc.) according to your budget	Food purchases (loyalty card, meal vouchers card, etc.); Bank data; ...; Open Data: ecological score at Open Food Facts.	Direct transfer
Contribute to the production of clean energy in my neighbourhood or city	We Mix	We Mix makes it possible to know if there are collectives focused on self-consumption near me, and to simulate the best energy mix based on my profile and my home. The service allows me to make a financial estimate and calculates the overall profitability of the project	Housing characteristics, renewable energy production potential and efficiency, energy classes, available renewable energy subsidies for housing, household practices	Data cooperative
Contribute to the production of clean energy in my neighbourhood or city	Zeus techno	Zeus techno offers you the opportunity to technically and economically simulate your potential as a self-consumer. Depending on your results, Zeus offers you a subscription package and takes care of the installation and maintenance of your clean energy production.	Consumption data/energy profile; Building and neighbourhood characteristics; Public assistance; Facility costs; etc.	Trusted third party platform
Reduce the carbon footprint of my	My Smart Home	My Smart Home allows me to track my consumption to reduce my carbon footprint and invoices, compare myself to	Energy consumption (data from Linky electric meter, gazpar, household	Personal cloud[4]

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[4] **Personal cloud** is the individual's collection of digital content, services and apps which are seamlessly accessible across any device. The personal cloud is not a tangible entity, but rather the realization of four different types of experience in which users store, synchronize, stream and share content on a contextual basis, moving from one platform, screen and location to another. Founded on interconnected services and applications, it both reflects and sets consumers' expectations for how next-generation computing services will work. Source: https://www.gartner.com/en/information-technology/glossary/personal-cloud

my SMART Life

Challenge	Imagined Use Case	Features Contemplated	Main Data to Be Mobilized	Data Governance
home and control my consumption		different meshes and contextualize my consumption.	appliances); Profile data; Bank data; Housing characteristics (notaries, DPE, DGFIP,...); etc.	

The complete use cases associated with the data governance method used are detailed in Appendix 9.1.3.

4.4   3rd workshop: "implement the self data"

4.4.1   Objective and expectations

This third workshop corresponds to the "story building" phase or implementing self data in Nantes Métropole. In other words, it is a question of defining the conduct of the experiment that will be able to be conducted on the territory of Nantes Métropole from September 2019 and to specify the timetable. The objectives of this workshop are to:

- collectively tell each other about the three cases of Self Data use and energy and ecological transition that could be developed for experimentation
- to bring together the interests of (potential) partners in the experiment with those of the community and inhabitants
- describe the Self Data experimentation scenario
- describe the parameters and timing of this experiment.

The objectives were generally achieved by the various exchanges and productions during the session (23/05/2019 from 2pm to 5:30pm).

4.4.2   Participants

This third and final workshop (23/05/19) brought together about twenty people:

- 4 representatives of energy production and distribution companies (EDF, Enedis, Grdf, Engie)
- 1 representative of public organisations and associations working on energy transition issues (ALISEE / CLER)
- 2 representatives of other public institutions in the field of energy and spatial planning (AURAN, Cerema)
- 1 representative of a consulting firm in energy transition

- 1 citizen
- 2 representative of a higher education institution in Nantes (Research Laboratory - Audencia Business School)
- 6 representatives of the various departments of Nantes Metropole
- 5 facilitators, members of the Fing.

Figure 14: workshop on May 23rd 2019

The main partners of the project are still present and there are representatives of the organizations and institutions present at the previous workshops.

4.4.3   Agenda and materials

This third workshop, was held over half a day, on Thursday, May 23rd from 2pm to 5.30pm, according to the following schedule:

- an introduction to recall the territorial Self Data project and the three cases of use selected at the end of workshop n°2
- 30 minutes of work on the expectations of the community and partners: "what we want to learn / what we want to avoid".
- a working time in sub-groups (three sub-groups, one per use case) to describe the experimentation to be carried out in Nantes Métropole.

The first phase of work on the expectations of the community and partners was led by a Fing facilitator in collective brainstorming (post'it and free expression) around three questions:

- What would you like to learn and/or succeed and/or prove from a Self Data experiment on the theme of energy and ecological transition?

- What do you need to validate or be part of this experiment?

Example to give ideas and launch the debate: a legally tied file "where the data go, when, how?

- What do we want to avoid at all costs?

Examples to give ideas and launch the debate: an experiment that only starts in three years? Testers not interested at all?

The second working session was conducted in subgroups led by a Fing facilitator, according to a common framework including the following items:

- o *schedule (recruitment site, animation / research site, services / development site, legal site, data site),*
- o *necessary data (the 2 to 5 data holders essential for the experiment, which data and which API[5]),*
- o *services and uses (which services can be implemented and tested during the experiment? How (development from A to Z, enrichment of existing services, competitions, etc.))*
- o *testers: Who, number, geographical scope? Recruitment, animation? Collection of usage feedback?*
- o *actors: data holders, financial partners, project pilot(s), other partners, test facilitators, researcher(s), community animators (non-exhaustive list to be completed if necessary)*
- o *points of vigilance.*

4.4.4 Workshop description & conclusions

The working time around the expectations of Nantes Metropole and the partners made it possible to draw up a list of the needs for conducting the experiment, the expectations and desired results of the experiment and the pitfalls to avoid. For example, the experiment should make it possible to measure the efficiency of the use of developed services in favour of the energy and ecological transition (effective reduction of energy consumption, definition of indicators to measure the impact

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[5] API is an acronym for Applications Programming Interface. An API is a programming interface that allows you to "connect" to an application to exchange data.

of the service itself on GHG emissions to verify that the service developed does not produce more GHG emissions than it allows to save otherwise, etc.).

At the end of the working group, two experimentation scenarios were constructed and can be summarized as follows:

Expérimentation «Hestia & Zeus»	Expérimentation «La Toque Verte»
Scenario based on two use cases My Smart Home and WeMix redesigned towards building renovation and associated with the "Trusted Third Party Platform" data governance model	Scenario based on the "La Toque Verte" use case associated with the "Direct Transfer" data governance model
Objectives: Assess if the access and the reuse of their consumption data, and combined with others', allow to reduce people's consumption, to be more involved in energy retrofitting initiatives Understand how digital solutions like the Self Data experimentation, can be articulated with targeted citizen challenges solutions for direct support (e.g. positive energy family challenge) and can reach a broader target.	Objectives: Allow to understand the notion of carbon footprint of the food, and to give easy access to the impact of their purchases. Offer the possibility to choose alternatives, more respectful of the environment. Contribute to the creation of common knowledge – allow individuals to share some of their data (anonymity, alias) with the observatory of sustainable nutrition
Main characteristics of the scenario: *100 testers. 50/50 Owners after and before work (+1000 testers without face-to-face support).* *A chosen platform: tool available to retrieve, manage and reuse data (according to partnerships with holders). A two-step service:* *Service layer 1 -- Hestia: visualization/crossover, eco-friendly tips, results* *Service layer 2 -- Zeus: indication on the return on investment of energy renovation works for homeowners*	Main characteristics of the scenario: *100 testers: Customers / with the Trusted map of at least two of the (potential) mass distribution partners* *An application developed for the occasion.* *visualize the carbon footprint of their food; find alternatives for certain purchases* *contribute to the creation of common knowledge - share some of their data with the Sustainable Food Observatory;* *compare themselves with others and share their experiences.*

| (NB: rather enrichment of an existing service - development of connectors) | |

Nantes Métropole is moving towards the implementation of the two experiments: The Hestia-Zeus experiment would be launched in autumn 2019 and the "La Toque Verte" experiment would be refined in autumn with a view to official validation from spring 2020 (after the municipal elections next March).

Nantes Metropole aims at implementing two experimentations, linked to public policies locally supporting the energy and environmental transition (roadmap for energy transition, territorial nutrition project). They would start from spring 2020 (after municipal elections on next march). Until then and from autumn 2019, the partnerships foreseen and hoped for, essential for the success of the experimentation, will be consolidated (for the existing ones like the «énergéticiens») or more deeply analyzed (for the ones to be materialized, like the large retailers). The proceedings will be detailed (calendar, experimentation protocol), in relation to the « implementing Self Data » kit the Fing will disseminate largely in October 2019, to capitalize the works done.

4.5 Conclusions of workshops implementation

Nantes Metropole wished to organize the workshops of the mySMARTLife citizen engagement activities in continuity of the great debate « la transition énergétique c'est nous », which took place in 2016-2017, and taking into account the roadmap « Nantes, métropole en transition » adopted in February 2018 and which built around 15 ambitions and 33 commitments. Commitment n°31 entitled « using smart grids and digital solutions to accelerate the energy transition » aims explicitly at exploring self data with energy stakeholders and groups of citizens supporting energy transition. To avoid soliciting too much the citizens and resulting counter-productive effects on real participation, Nantes Metropole considered the workshops dedicated to territorial self data as the «citizen engagement» part of mySMARTLife project. This way the workshops are integrated into the general strategy for participation of the Métropole and are consistent with the existing initiatives («plan climat», roadmap, etc.).

The Methodology was adapted to Nantes's demonstrator in order to take into account the recent actions lead with the citizens about the energy transition (great debate « la transition énergétique c'est nous » and the roadmap), as explained in the introduction of section 4.1.

The proposed workshops focused on the partners, the stakeholders, and some citizens previously involved. They answered Nantes Metropole's call by participating very actively, constructively and keenly to the proposed work groups.

The rolling-out was in agreement with what was planned in the methodology:

- Raising awareness about self data concept
- Building together:
  - Tools to be proposed (use cases) to support the use of personal data at the benefit of the energy transition.
  - A governance consistent with the data to be implemented.
  - A rolling-out at larger scale, to be defined and detailed (software developments, tests, feedback, etc.).

From the proceedings of the workshops we can note:

- An involvement on the long term of the partners (e.g. energy experts).
- A practical participation of several departments of Nantes Métropole, working on topics linked to the energy transition or its transversal aspects.
- The importance of differentiating the various parts of the general rolling-out, from the awareness raising to the definition of tangible use cases and the corresponding planning of the experiments.
- The need to let an important enough duration between the meetings in order to allow everyone to understand deeply the presented concepts, and to develop more profoundly the topic from one session to another.
- The importance to strengthen the link with the participants to maintain the dynamic of the project and make real progress session after session.
- The importance of working with an external workshop facilitator/leader, knowledgeable about self data and facilitating the production of the collaborative work, able to apply facilitating group work methods.

In terms of results, the workshops allowed:

- To determine two concrete use cases about personal data, and on two different topics (linked to the roadmap objectives about energy transition for Nantes Metropole): know the energy consumption of one's dwelling, and commit to the energy retrofitting; assess the carbon footprint of one's feeding;
- To build collectively the expectations of a successful experiment: whether it allows to reduce the GHG emissions, whether it allows the citizen to master the use of his/her personal data, whether it allows him/her to use this data to support the energy transition (e.g. by crossing information), whether it leads to the definition of an easy to use tool which produces effects on the behaviours (and not only one more additional software tool as any other);
- To confirm the commitment of the partners invited to the initiative (e.g. energy experts) in order to move on practical and concrete experiments;
- To produce useful material to allow the FING, facilitator of the initiative, to develop an implementation kit aimed at any local authority who would decide to get involved in local self data.

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5. Workshops in the city of Hamburg

5.1 Introduction

The three workshops carried out in Hamburg were connected with the purpose of setting up a local innovation network promoting the transformation to a smart city in the borough of Bergedorf. From the perspective of mySMARTLife the objective of a so-called innovation network was to establish a group of stakeholders who are involved or interested parties of innovation and smart technologies and thus might foster and enable the local smart city development. A network is also considered as a useful option to make mySMARTLife solutions in Bergedorf available to a broader audience. As a wide range of stakeholders of the respective sectors from economy, science and public bodies showed interest in being involved in such a network many relevant participants could be gained for the participation in all of the three workshops. The workshop series connected with network meetings moreover provided room for exchange for involved stakeholders and to work together on focus topics. Altogether, the collaborative approach in the workshops and network meetings might further enable the use of potentials and synergies.

The workshops series picked up the basic structures described in D1.3 of mySMARTLife and was complemented and adapted to the local circumstances in Bergedorf and the experiences as well as specific needs in Hamburg. It was quickly recognized that specific thematic fields were of particular importance. Thus, the structure of the workshops was slightly changed: After defining general objectives in the first workshop the second and third workshops followed as focus meetings on sustainable mobility and sustainable energy. The approach of first working out potential bottlenecks and obstacles and then discussing solutions to overcome them was maintained in both focus workshops.

Table 5: Workshops in Hamburg

W	Topics addressed	Objective/s of the workshop	Typology of participants
1st	Smart-development of the borough of Bergedorf	Kick-off workshop: building up an "innovation network" with the aim of bringing together relevant stakeholders, getting to know each other and identifying topics	Stakeholders from public bodies and private companies interested in issues of urban and economic development of Hamburg-Bergedorf

		and objectives for further cooperation	
2nd	Thematic focus on mobility	Focus workshop: Discussing challenges of urban mobility, identifying general barriers and challenges for the implementation of a community car-sharing in Bergedorf	Stakeholders from public bodies and private companies interested in issues of urban and economic development of Hamburg-Bergedorf, experts in mobility and housing companies
3rd	Thematic focus on energy	Focus workshop: Discussing challenges of sustainable energy, developing ideas concerning requirements and individual contributions for future collaborations in Bergedorf with regard to the development of an innovation park	Stakeholders from public bodies and private companies interested in issues of urban and economic development of Hamburg-Bergedorf, experts in energy

Before the workshop series started HAM, KON and HCU had several meetings about the concept, target and implementation. There have been further conversations with the head of the Borough of Bergedorf and the business development department of the borough, about the invitation list and topics, to embed the "innovation network" in the long term development strategy of the borough. It was decided, that the participants should be a group of local stakeholders, innovative companies and experts.

The Energy Campus of the HAW was selected as a well-known address, which is directly situated in the mySMARTLife project area, with an innovative ambiance as a laboratory building. Here the room was prepared with an interactive map of the locations of the companies of the participants, roll-ups and information material of the project, the tables were arranged in a circle, and visual presentations were presented with Powerpoint.

5.2 1st workshop: Kick-off workshop mySMARTLife innovation network Bergedorf

5.2.1   Objective and expectations

The first workshop in Hamburg was carried out on the 7th of September 2017 on the Energy-Campus in the Borough of Bergedorf, which is located in Zone 1 of the demosite Hamburg. More

than 30 people from different sectors participated in the workshop. The workshop simultaneously comprised the kick-off workshop for the foundation of an innovation network.

First of all, the workshop aimed to bring together relevant stakeholders who are either involved in the local development of Bergedorf or deal with technologies and the innovation sector. It was expected that the workshop provides opportunities for getting to know each other, sharing views and ideas as well as exchanging each other's expectations on a possible network for fostering the smart development of Bergedorf. Moreover, it was aimed to identify specific topics for further cooperation and to work out consecutive objectives. It was envisaged that the results of the first workshop would give directions for the conceptions and needs of the following workshops.

5.2.2   Participants

All in all, there were 33 people participating in the first workshop, thereof seven from public bodies, five from research institutions, five from the real estate and construction sector, six from the energy sector, three from the urban planning sector and each one from the sectors of aviation industry, mobility, ICT, biotechnology, composite technology and business development.

Sector	Number of participants
Public bodies	7
Research	5
Real estate and construction	5
Energy	6
Urban planning	3
Aviation industry	1
Mobility	1
ICT	1
Biotechnology	1
Composite technology	1
Business development	1
Total	*33*

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5.2.3   Agenda and materials

The workshop was structured by the following agenda:

- **Welcome** (Arne Dornquast, leader of the Borough of Hamburg-Bergedorf, Margit Bonacker, general manager of konsalt GmbH)
- **Introductory speeches**
  - *Hamburg as metropole of innovation* (Andreas Richter, Departmental Authority for Economic Affairs, Transport and Innovation)
  - *Research and innovation park Bergedorf* (Till Bode, business development of the borough of Bergedorf)
  - *mySMARTLife: Bergedorf on the way to a smart city* (Christoph Lindemann, Department SMART City and Innovation, Borough of Bergedorf)
- **Who participates?** Presentation of all participants, discussion on own expectations of becoming part of the innovation network
- **Summary and outlook**
- **Convivial evening** (guided tour on the Energy Campus by Hans Schäfers from the University of Applied Science Hamburg).

During the workshop a beamer was used for the presentation. Moreover, paper, pens, and partition walls were used during the discussions.

5.2.4   Workshop description & conclusions

The workshop started with an introductory welcome speech of the head of the borough office of Bergedorf and of Margit Bonacker (konsalt GmbH), which focused on the diverse potentials Bergedorf offers to a variety of innovative companies and actors. In order to outline chances, objectives, and framework conditions for an innovation network, the following introductory speeches were given: Andreas Richter from the Departmental Authority for Economic Affairs, Transport and Innovation illustrated the cluster policy and strategy for innovation of Hamburg. The next speaker, Till Bode from the business development of the borough of Bergedorf, explained the role of the borough and the local companies and actors in this strategy. Finally, the mySMARTLife project and its activities and objectives in the fields of mobility, energy and ICT were presented by Christoph Lindemann.

In the following round of introduction all participating actors were asked what innovation means from their point of view. A variety of associated ideas reached from "*international networks*", "*becoming more agile*", "*identifying problems and solutions*", and "*use of synergies*" to "*think outside the box – unconventional approaches*", *"thinking from the end"*, "*thinking for people*", and "*clever ideas for economic solutions*".

The subsequent discussion aimed to collect further ideas for forms of cooperation and objectives for an innovation network in Bergedorf. The workshop participants agreed that an innovation network offers the possibility to try new approaches, to combine diverse experiences and know how as well as to foster exchange. Apart from focusing on the development of technological solutions, social issues and the linkage between different social groups should be considered as well. The participating stakeholders gathered a wide range of connecting topics for an innovation network, such as smart solutions for mobility, energy, and ICT that contribute to positive development of urban quality of life and climate protection. Moreover, planning-concerned, legal, and institutional framework conditions, which foster the implementation of innovation technologies in the borough, were considered as relevant issues for the innovation network.

As a whole, the implementation of the first workshop went very well and was driven bydynamic and fruitful discussions. A variety of common interest, intentions, and objectives of participating stakeholders could be worked out and thematic focusses for the further workshops and network meetings could be defined. Thus, the outcome of the workshop provides a collection of ideas and objectives for the framework of future collaboration in the innovation network. The topics of mobility and energy could be identified as most relevant and will be further considered more in the following workshops. The outcomes of the workshop were fixed in a documentation and sent to the participants to stabilize the network character of the meeting.

5.3   2nd workshop: Focus workshop "mobility"

5.3.1   Objective and expectations

The second workshop in Hamburg was carried out on the 21st of February 2018 on the Energy-Campus in the Borough of Bergedorf. The workshop, in which 17 people participated, was simultaneously the second meeting of the innovation network and had a focus on the topic of sustainable mobility. In general, the workshop aimed for taking up the results of the first meeting and further developing specific issues by focusing on the thematic field of sustainable mobility. The objective was to work out

bottlenecks and specific challenges in the implementation of sustainable mobility. Based on this, possible solutions should be developed.

5.3.2   Participants

There were 17 people participating in the second workshop, thereof six from public bodies, four from the mobility sector, four from the urban planning sector, one from the construction sector, one from an economic association, and one from a research institution.

Sector	Number of participants
Public bodies	6
Mobility	4
Urban planning	4
Construction	1
Economy	1
Research	1
Total	*17*

5.3.3   Agenda and materials

The workshop was structured by the following agenda:

- **Welcome** (Kristian Dahlgaard, konsalt GmbH/Jutta Wolff, Department SMART City and Innovation/ Hans Schäfers, Hamburg University of Applied Sciences). Moderation by konsalt GmbH again.
- **Round of presentation:** "Requirements on sustainable mobility concepts"
- **Introductory speeches**
    o *Overview "Sustainable mobility concepts"* (Konrad Rothfuchs, ARGUS Stadt und Verkehr Partnerschaft mbB
    o *Community car-sharing "project example" (*Christoph Baunack, Volkswagen AG*)*
- **Coffee break**
- **Open thematic tables**
- **Conclusion**

During the workshop, a beamer was used for the presentation. Moreover, paper, pens, and partition walls were used during the discussions.

5.3.4   Workshop description & conclusions

The second workshop started with introduction and welcome speeches of Kristian Dahlgaard (konsalt GmbH), Hans Schäfers (HAW) and Jutta Wolff (Department SMART City and Innovation). In a following presentation round all participants were asked to think about their personal requirements on sustainable mobility. The diverse ideas reached from reducing traffic, more efficiency and integration of mobility in housing projects to connection and availability of different kinds of mobility. Moreover, social aspects regarding social space management and the collaboration between citizens and public administration were mentioned. The differentiated and context related views formed the basis for the discussion on thematic tables at later time. Two following introductory speeches of Konrad Rothfuchs from ARGUS Stadt und Verkehr Partnerschaft mbB and Christoph Braunack from Volkswagen AG presented general frameworks, requirements and options of sustainable mobility and were intended to give impulse to the later discussions.

In the second part of the workshop, discussions were organised on two thematic tables - one for discussing general challenges of implementation of collected ideas on mobility concepts and the other table for discussing bottlenecks of the transition to sustainable mobility and car sharing in Bergedorf. The format of the world coffee method, which means that all participants discuss in all rounds, offered room for discussing and further developing the previously collected conceptual ideas. Regarding the presented concepts and ideas concerning the innovation park of Bergedorf, problems of parking spaces, strengthening of infrastructure and increasing influence of politics as well as the connection to public transport systems were discussed. The other table dealt with challenges of finding operators for new mobility concepts as well as tax and law related obstacles that companies are going to face. Moreover, problems related to ownership issues and the applications of the new act for e-mobility were discussed.

In total, the second workshop and meeting of the innovation network successfully led to extensive discussions on sustainable mobility and a variety of results in terms of identified bottlenecks and possible solutions for the implementation of new sustainable mobility concepts. The relatively small number of participants offered room for both professional and personal networking and exchange. The experiences made in the second workshops will contribute to the next workshop, which will have a focus on sustainable energy. Again, the most important results of the workshop were documented and disseminated to the participants.

5.4 3rd workshop: Focus workshop energy

5.4.1 Objective and expectations

The third workshop in Hamburg and meeting of the innovation network took place on the 26.06.2018 at the project office of mySMARTLife in Hamburg-Bergedorf. A number of 23 people participated in the workshop with the thematic focus on sustainable energy. According to the motto "New energy for the network" the workshop aimed for dealing with questions of future-oriented energy supply of buildings and districts. Moreover the workshop should offer room for exchange and dialogue between the participants from public bodies, science and economy. A further objective of the workshop was to develop ideas and approaches for the development of the research and innovation park in Bergedorf considering sustainability.

5.4.2 Participants

There were 23 people participating in the third workshop, thereof four from public bodies, seven from the energy sector, three from the urban planning sector, two from research institutions, two from the real estate and construction sector, two from the economic sector, and each one from the sectors of consultancy, ICT and biotechnology.

Sector	Number of participants
Public bodies	4
Energy	7
Urban planning	3
Research	2
Real estate and construction	2
Economy	2
Biotechnology	1
ICT	1
Consultancy	1
Total	*23*

5.4.3 Agenda and materials

The workshop was structured by the following agenda:

- **Welcome and introduction** (Margit Bonacker, konsalt GmbH)
- **Introductory speeches**
    - *mySMARTLife: Considering energy from the beginning on* (Christoph Lindemann, Department SMART City and Innovation, Borough of Bergedorf)
    - *Hamburg Invest: The research and innovation park of Bergedorf will be realised* (Birgit Detig, executive director of Hamburg Invest Business Development mbH)
- **Focus Groups** (moderated by konsalt)
    - Expectations on a research and innovation park
    - How can local actors of Bergedorf contribute?
- Examples of best practice in Bergedorf
    - *GALAB Laboratories: Heat storage with ice* (Eckard Jantzen, executive director of GALAB)
    - *HAW Energy Campus: The energy of tomorrow already today* (Hans Schäfers, professor for intelligent energy systems and energy efficiency)
- **Summary** (Margit Bonacker, konsalt GmbH)
- **Outlook** (Christoph Lindemann, Department SMART City and Innovation, Borough of Bergedorf)
- **Convivial evening** Barbeque in the backyard of the mySMARTLife -office

During the workshop a beamer was used for the presentation. Moreover, paper, pens, and partition walls were used during the discussions.

5.4.4 Workshop description & conclusions

The third workshop started with a welcome by Margit Bonacker (konsalt GmbH) giving an introduction to the project area of mySMARTLife and the results of the retrofitting management project in Bergedorf-South, which ran from 2014 to 2017. In the following, Christoph Lindemann from the department SMART City and Innovation and Birgit Detig from Hamburg Invest Business Development mbH gave two following speeches introducing to the topic of sustainable energy.

In the following, the workshop participants formed two focus groups, moderated by konsalt, for discussing the topic of renewable energies considering the development of an innovation park. One group discussed expectations, demands and challenges for the development of the innovation park and the other focus group discussed the options of action and contributions on the part of actors in Bergedorf.

The results included expectations such as further networking activities that foster the collaboration of different sectors and companies. Moreover it was expected that concepts of sustainable mobility need to be developed closely together with a concept for energy. Citizens of Bergedorf should be involved in these processes from the beginning on. The local government and administration of Bergedorf is asked to foster smooth procedures and participation on an early stage. Synergy effects, like a common infrastructure can be promoted due to the development of networks and cooperation over the long term.

In conclusion, Eckard Jantzen from GALAB Laboratories presented the technology of cooling and energy production using an ice storage. He also focused on the importance of collaboration between research institutions and private companies in the development of the innovation park. Hans Schäfers from the Hamburg University of Applied Science (HAW) tied up this issue and presented the research interests of HAW in the fields of wind energy and system integration and the respective institutions on the energy campus in Bergedorf.

In order to conclude the workshop, Margit Bonacker summarised the results worked-out and Christoph Lindemann gave an outlook on further network activities and possible forms of collaboration. The event ended with a barbecue in the backyard of the Bergedorf mySMARTLife -office, where more networking was possible.

5.5   Conclusions of workshops implementation

In conclusion, all of the three workshops went smoothly and to the satisfaction of both organisers and participants. It turned out that the workshops, even with the focus on local stakeholders and experts, brought together a variety of stakeholders, to develop common ideas, and to get an inside view of each other's expectations towards the development of smart technologies and innovation in Bergedorf. In this context, the participants had room for exchange and networking. Many relevant stakeholders from diverse backgrounds could be attracted to participate in the workshops. Some of them attended on all of the three events. Different actors who are involved in the field of

innovative technologies or in the development of Bergedorf presented their work and perspective giving a presentation on the workshop.

The participating stakeholders got informed about the topic of smart city and the objectives and actions planned in Bergedorf. By developing own ideas for the innovation park the stakeholders could get engaged in further defining the transition strategy. In this way, they could support and contribute to the transformation process to a smart city in the borough of Bergedorf.

The workshop and network meetings as a platform for exchange and development of new ideas have acquired a positive reputation beyond the borough of Bergedorf. Furthermore the meetings generated a spirit of optimism and generated a lot of new contacts between the participants or reassured the existing network. Altogether, the workshops were considered as very successful and even though the series of three workshops connected to WP1 of mySMARTLife project has already finished, the meetings of the innovation network will be continued in a similar format in autumn 2018.

6. Workshops in the city of Helsinki

6.1   Introduction

The main theme for Helsinki workshops was finding ways to improve the energy efficiency of the existing building stock. In Helsinki, this process of retrofitting old buildings has been identified as the most essential topic in terms of emission reductions and potential investments on energy efficiency as the heating of the building stock produces 56 % of the greenhouse gas emissions of the city. The emission reduction potential has been identified and explored since 2011 by the city.

mySMARTLife Helsinki pilots a neighborhood level approach to facilitate energy refurbishments of privately owned housing blocks. This pilot involves Zone 1 Lighthouse district of Merihaka and is realized in collaboration with the housing associations of the area. Merihaka district consists of typical residential construction from the 1970s-1980s which represents the vast amount of building stock in Helsinki in need of energy refurbishment. Typical retrofitting actions in the Nordics differ somewhat from Central or Southern European ones and the interventions are focused more on the energy performance than on the building fabric. Demonstration includes installation of smart thermostats for management of apartment level heat demand in the pilot building with 167 flats. The total target area to be impacted consists of 12 buildings of Merihaka. The area is closely connected to the Helsinki Smart City district of Kalasatama.

The customer experience and replication in the focus area as key drivers for lowering emissions needs considerable attention. The general outline of the workshops is to share the experiences from the first pilot and further motivate the uptake of smart energy solutions to the rest of the district. This makes a logical choice of cascading workshops to address the importance and advance the knowledge and collaboration opportunities in retrofitting. The planned activities will essentially support the main objectives of the Carbon Neutral Helsinki 2035 Action Plan.

Initially in D1.3 there were three options for the workshop themes, namely

- Interest for crowdsourcing of renewable energy production unit – practical for a public recreational park the Korkeasaari zoo

- Motivation and incentives for energy savings action. Energy renaissance. Renovations and retrofit for Merihaka and smart meters for Merihaka/Smart Kalasatama

- Back-up: the autonomous bus

From those planned options three workshops about improving energy efficiency of the existing building stock, that is Energy renaissance, were implemented, as mentioned in the first chapter. Heating of the existing building stock creates more than half of the emissions in Helsinki. More than half of the buildings are privately owned. This has identified to be one of the most crucial aspects to be solved in order to fulfill the ambitious targets of Helsinki to become carbon neutral in 2035.

In carbon Neutral Action Plan 2035 the action number 67 is "Forming the energy renaissance program for renovations of suburbs and privately owned building stock in an energy efficient ways." Workshops were part of the formulation of the program and furthermore part of mySMARTLife Helsinki Action 32 "Energy Renaissance program."

Merihaka retrofit work on Actions 1 and 4 are complemented by Action 40 Energy Advisor with Action 39 Living Labs by arranging co-creation sessions with the residents, solution providers from the private sector, public stakeholders and specialists in energy efficiency as well as the ICT sector on open data development. These Actions and Tasks combine work on several objectives in WP4 and represent the project overall targets well.

The final methodology employed in the workshops followed somewhat the original plan. The first workshop in Viikki Environment house was the kick-off for the Energy renaissance program. The second one in Merihaka was for the board members of housing associations of Merihaka about the results of the energy efficiency reports done in the area. The third one was with the service providers presenting solutions based on the energy efficiency reports for the same target group in Merihaka.

Table 6: Workshops in Helsinki

W	Topics addressed	Objective/s of the workshop	Typology of participants
1st	Energy renaissance program	Kick-off of the Energy renaissance program - what, how, who	City officials, private companies, scientific institutions, related associations
2nd	Energy renaissance program, Carbon Neutral Action Plan,	Present the idea of energy renaissance. Review the results of energy efficiency reports and	Housing associations, board members

W	Topics addressed	Objective/s of the workshop	Typology of participants
	energy efficiency reports	how could the city support the implementations of the recommended actions	
3rd	Energy renaissance program, Carbon Neutral Action Plan, results of the energy efficiency reports	Develop the Energy renaissance program further. Present relevant service providers to the stakeholders	Housing associations, board members

Preparatory work included studies and interviews of staff and stakeholders from previous City of Helsinki and partner projects on energy advising of residents, as well as specialists on building energy data, private sector representatives with holistic suburban area retrofit agendas, Ministry of Environment, environment services neighborhood development projects staff on citizen engagement and energy efficiency, the Business Development Unit for the City of Helsinki and the energy efficiency retrofits funding private sector. Following the interviews and national and international benchmarking the structure of the program was laid out.

6.2   1st workshop: Energy Renaissance

6.2.1   Objective and expectations

The first workshop was held in Viikki Environment House on 4.9.2018. It was a kick-off meeting for the work of Energy renaissance program. The objective was to present the Carbon Neutral Helsinki 2035 Action Plan and more specifically Action number 67, Energy Renaissance program. The expectation was to get ideas and perspectives about the initial plan of the program from an extensive number of experts and stakeholders.

6.2.2   Participants

Participants of the first workshop were mostly city officials and representatives. There were also representatives from Ministry of the Environment and Helsinki Region Environmental Services Authority HSY. There were also a broad representation of service providers related to energy efficiency, e.g. Helen Oy, Ensys Oy, Leanheat Oy, Fourdeg Oy, Pilaster Oy, EcoPal Oy, Vahanen Oy, Leasegreen Oy, Salusfin Oy, Sato-Rakennuttajat Oy and Caverion Suomi Oy. Furthermore

the scientific institutions were present, e.g. Aalto University and VTT Technical research Centre of Finland Ltd. Other related associations and institutions were WWF, Green Net Finland, The Finnish Real Estate Federation, Municipality Finance and Smart & Clean Foundation. Altogether there were 41 participants.

6.2.3   Agenda and materials

The agenda of the morning started nine o'clock with coffees and welcoming words from Climate expert Jari Viinanen from the City of Helsinki Environment services. Jari Viinanen presented the relevant parts of Carbon Neutral Action Plan 2035 and the process of producing the plan.

Teemu Kettunen, Energy expert from Helsinki Region Environmental Services Authority HSY gave a presentation titled "Bottlenecks and solutions when working with the housing associations". That presentation guided the participants to think of the problematics of energy efficiency of privately owned buildings. Last presentation was about the Energy renaissance program held by Project planner Kim Huhtanen.

The workshop itself was after these presentations. The technique employed was the Learning café. The participants were divided into four groups. Each group then went through four different tables, which each had a different theme. The themes were

1. How to finance the Energy renaissance?
2. What kind of information is needed to implement the Energy renaissance?
3. Who are the stakeholders and how to engage them?
4. What kind of solutions and services there are to implement the Energy renaissance?

Figure 15. Kick off workshop for Energy renaissance in Viikki Environment House 4.9.2018.

6.2.4 Workshop description & conclusions

Conclusions from the different workshop tables are presented below. Some of the conclusions were repeated in different tables but mentioned only once here.

The first table was on how to finance the Energy renaissance. One suggestion was to lower the real estate taxes or rents when energy savings are done. There is leasing deals for condominiums for example in heat recovery. There should be an ESCO 2.0 (energy service company), where the investor offers the expenses for the housing association and takes responsibilities of the implementation. The utility company Helen and the City of Helsinki should cooperate more together with financing institutions. EU funding should be applied more to get good pilot examples.

The second table addressed communicational matters: What kind of information is needed to implement the Energy renaissance? The general conclusion was that unbiased, science based information is needed about the benefits of energy efficiency measures. The information could be offered in a digital platform for housing associations. There could also be examples of successful

renovations and strategies for housing associations and visualized data of energy consumption in different buildings. Furthermore information could be shared in district level information events or "open door walks". Information should also be transmitted already to the children in day care or schools. Data of energy consumption should be as visible as possible in order for residents to be able to save energy in the right places.

The third table handled issues about stakeholders. First they listed the relevant stakeholders within Energy renaissance. These were service providers, scientific community, real estate managers, municipality, education and schooling (children and youth), housing associations, energy companies, real estate investors, rental companies, social housing companies to name a few.

The mentioned solutions to engage housing associations were for example to increase the value and comfort of the house with the energy renovation. The energy decisions should always be in line with the other renovation needs of the building. Other incentives should be offered also, that is e.g. subsidies in taxation and guidance in financing and providing case examples of successful renovations.

The fourth table was about solutions and services. One interesting suggestion was to arrange a district fairs for renovations where successful case examples could be presented. Hybrid solutions were mentioned as already existing good examples in energy saving. Contracts and agreements of the housing associations are quite complex, there should be lawyers to help them.

Figure 16 and Figure 17: Ideas of the workshop from the solutions and finance tables.

6.3   2nd workshop: Increasing energy efficiency in Merihaka

6.3.1   Objective and expectations

The second workshop was held in Merihaka on 6.11.2018 and the objective of the workshop was to present the Carbon Neutral Action Plan 2035 and more specifically the idea of the Energy renaissance to the housing associations of the Merihaka area. One target was also to present the results of the energy efficiency reports that had been conducted in the area. The workshop session focused on the theme how to increase energy efficiency in Merihaka.

Figure 18: Tuomo Niemelä from Granlund Consulting presenting the findings of the Multi Objective Building Optimization reports done in the Merihaka area.

6.3.2   Participants

Participants in the second workshop were board members of the housing associations of Merihaka. There were also representatives from the City of Helsinki as well as from Helen Oy. Furthermore the representative of Granlund Consulting was presenting the results of the energy efficiency reports.

6.3.3   Agenda and materials

Welcoming words with coffee and sandwiches was given by the Climate expert Sonja-Maria Ignatius from the City of Helsinki Environment Services. She presented also briefly the Carbon Neutral Action Plan 2035 and the work for following up the implementation of the plan. Consultant Tuomo Niemelä from the Granlund Consulting presented the results of the energy efficiency reports done in the area.

6.3.4   Workshop description & conclusions

The workshop was lead by Climate expert Mira Jarkko from the City of Helsinki Environment Services. Participants were divided into three groups based on their interest on the subject of the groups. The themes were

1. Cooperation in energy efficiency matters in the area/district and how to utilise the findings of the energy efficiency reports
2. Follow up of the implementations of the Energy renaissance program
3. Communication and cooperation of the housing associations in the area

The first group about cooperation in energy efficiency stated that the findings of the reports done by Granlund Consulting were clear and can be utilised further in other similar buildings in the area. Interest for the district cooperation among the housing associations were notable. It was stated that cooperation in the Merihaka area is easier than in many other districts in Helsinki, because of common maintenance and management company owned by the housing associations. That being said, it was noted that the City of Helsinki could be the facilitator and motivator to cooperative planning of energy renovations in other areas and districts.

The second group stated that follow up of the development of emission reduction in Helsinki is interesting, but citizens are not aware of how to monitor them. A simple tool in the webpages of the city or Helen was needed. Participants were willing to give the energy consumption figures of their own buildings to the city to use for example in the Energy and Climate Atlas embedded in the 3D city model. Furthermore they were interested to see the figures and comparison data of other similar buildings also and to use a platform where best case examples cold be shown.

The third group discussed solutions to communicate the findings of energy efficiency reports to other housing associations. As already mentioned above the city is seen as an impartial actor to spread the information and to create platforms for open energy data and concrete models and implementations to support the planning. The city could facilitate events where best practices could be shown on the spot as well as on the map based platforms.

Figure 19: Discussions about how to cooperate on energy efficiency renovations and how to communicate it further.

6.4   3rd workshop: Energy evening in Merihaka

6.4.1   Objective and expectations

As mentioned, the buildings in the Merihaka district have been serving as a living lab for different energy refurbishment actions. These have been focusing on different buildings. While some of the actions were expected to provide an instant benefit in terms of energy savings (such as smart thermostats), many of the actions were intended to spark longer-term retrofitting processes for the housing associations to advance on their own. These retrofitting solutions represented options already on the market so that they were a financially plausible for the housing associations to finance themselves. Thus, the second and the third workshop focused on providing the housing associations tailored information and analyses on refurbishment options. In addition, the aim was to facilitate collaboration among the different housing associations. This kind of process of successive steps of knowledge creation, dissemination, facilitation, and collaboration was a first pilot of a neighborhood level engagement of Energy Renaissance.

Another goal of these last two workshops targeted to housing association boards was to get ideas and feedback regarding the Energy Renaissance program from the main stakeholders of the program. For this, during the third workshop, city representatives introduced the actions of the program with the highest relevance to housing associations for feedback.

6.4.2 Participants

Like in the second workshop, the participants were board members of the housing associations of Merihaka. There were also representatives from the City of Helsinki to host the workshop and moderate the discussion. What is more, a consultant from Paloniitty Oy presented commissioned heat images of the buildings. Moreover, two consultants introduced two intelligent central heating control solutions from Helen Oy and Leanheat Oy respectively.

6.4.3 Agenda and materials

The workshop began by welcoming words by project coordinator and Lighthouse lead Marja Vuorinen. After that, the floor was given to the consultants. After each presentation, the audience was able to ask questions and discuss. Finally, the last part of the workshop consisted of a modified learning café with four boards each containing some actions of the Energy Renaissance related to a theme (such as education, for example).

6.4.4 Workshop description & conclusions

In the welcoming words, Marja Vuorinen explained the aim of the meeting and the rationale behind the information that was being provided: intelligent central heating control was the most economically sound solution (when the general heating solution was district heating) recommended by the Granlund MOBO report (see section 6.3 regarding the workshop 2), thus this event was an opportunity to get some examples of the services available. What is more, even if the housing associations had received the heat image reports, this was a chance to hear the expert explain them and ask questions about the somewhat technical reports. Finally, the learning café part was to discuss the Energy Renaissance actions to which the housing associations had themselves contributed by giving ideas during the previous workshop.

The heat image presentation generated a lively discussion and many questions from the audience. The audience could also bring their own local knowledge for interpreting the results of the heat images (for example two identical and same-aged buildings demonstrated very different gable

results in the images: the other had some structural issues while the other did not – this was due to the fact that the other had undergone reparations). In addition, some technical key terms in the report were clarified. What is more, the heat image consultant (among the most long-term experts on the field in Finland) gave his opinion on a service that the Regional Environmental Office (HSY) offers for getting a crude idea on the heat performance of roofs (Kattohukka).

The service introductions by Helen and Leanheat sparked also interest and discussion. The two offerings differ in focus (Helen's product is focused on producing information on which to act, and Leanheat's product offers more comprehensive set of intelligent controls of the heating). The reaction of the audience demonstrated that distinguishing between these services was not simple even when the general idea was clear: to centrally monitor and control the heating process of the building. What is more, a topic emerged that was not addressed in the designed agenda: the problem of too much heat in the summer. The service provider consultants did their best to try to address this concern.

The workshop discussion went on broader lines. The board members present were asked to give their opinion on the actions of the Energy Renaissance most impacting on the housing associations. One theme of actions focused on joining the energy refurbishment to detailed planning and finance. These actions were all welcomed. Critical comments were made regarding the current willingness of the city services to engage in these actions. If the housing association is eager to do infill development on its own site and fund energy refurbishments from the income of this project, the city should support this.

The second theme was services. These were also regarded as positive actions. Some new ideas were provided with respect to the actions proposed.

The third theme was information and education. These actions were generally positively reviewed. One challenge with respect to education was identified as the willingness (typically, housing association board members do not receive a financial reward for their work) and the capacity to absorb the technical knowledge related to energy refurbishments.

The fourth theme was named collaboration. All of these actions were received extremely positively. Local knowledge and collaboration between housing associations, together with expert knowledge support provided with local sensitivities, were thought to be good actions.

All in all, this learning or "feedback" café provided very interesting material to further develop the Energy Renaissance program in the city of Helsinki. This and other collaborative projects with the housing associations and other relevant actors in the scene (central organizations of the housing associations, service providers, public organizations providing information such as HSY) each contribute to a wider network of collaboration.

The session in total may support the conclusion that it is important to share and understand local knowledge while building technical understanding of energy refurbishment methods for all the parties. What the meeting also demonstrated, was that the knowledge needs are great. The board members have a huge responsibility when suggesting energy refurbishments. It is understandable that they want to get all the information that is available to prepare a decision – and still they may be hold negatively responsible if the project fails.

6.5   Conclusions of workshops implementation

With the series of workshops, the City of Helsinki aimed to collaboratively develop and refine the Energy Renaissance program, which is an action in the Carbon Neutral Helsinki 2035 Action Plan and as well a part of mySMARTLife Helsinki Action 32 "Energy Renaissance program". To achieve this, the workshops followed a cascading approach: the first workshop was about knowledge gathering and knowledge creation together with the city's internal and external experts; the second two featured piloting actions and collaborating with the citizens representing housing associations. **The result of the process contributed along with other inputs to a draft of the Energy Renaissance program, grounded in expert and local citizen knowledge. Overall, the process met well the expectation to produce a tentative version of the program.**

The main purpose of the methodology for citizen engagement (see Deliverable 1.3) is to support the transition strategy of a city into a Smart Energy City. The methodology entails the idea that citizens and professionals could be engaged in the creation of a city transformation strategy. The thematic structure proposed in the methodology is to identify the objectives in the first workshop, find the bottlenecks in the second, and come up with solutions in the third. Since in the City of Helsinki, a preliminary concept of Energy Renaissance has already been conceived as a part of the collaboratively produced Helsinki Carbon Neutral Action Plan, this methodology was modified, as described earlier. However, the workshops applied both the general philosophy of involving citizens and professionals, and the facilitation method of world café, which both worked very well. **As a result, we propose that the themes and participants of each workshops should be**

tailored to fit to the context of the case, while applying the philosophy of engaging both experts and citizens and carefully designing the interaction during the workshops to allow each participant effective ways to participate (such as the world café method). Nevertheless, if the objective is to create a completely new strategy in the context of the city, the proposed thematic structure (objective setting, bottleneck finding, solution proposing) may be a good starting point.

Previously (see Deliverable 1.3), it was identified that the actions foreseen in mySMARTLife project are connected to two key initiatives of Helsinki's transformation strategy. These are the climate roadmap, i.e. Helsinki Carbon Neutrality Action Plan, and the "Smart and clean" initiative. The first includes a set of actions that the city takes to reach an ambitious carbon neutrality target (to become carbon neutral by 2035 as a city). The second initiative supports living lab styled research and development, and consequent scaling up of smart and clean solutions. In addition, the global participation model of the city outlines four categories of participation according to focus (see Deliverable 1.3), such as user engagement in the creation of services and facilitation of activities of local communities. **The actions of this series of workshops have contributed to the transformation strategy as planned:** the workshops kickstarted the work for one central action of the Carbon Neutrality Action Plan action, and accelerated the market maturation for smart solutions in energy efficiency. In addition, it applied the city's participation strategy by facilitating a local community (while also developing a replicable model for local community facilitation) and engaging users in development of city's support services to housing associations.

Finally, we can outline some lessons learned that the follower cities may take advantage of. These are related to the workshop format in general, to working with association type citizen entities, to identifying relevant stakeholders with respect to the type of the transition, and to working with different types of knowledge. Firstly, the workshops demonstrated that already during a short period of time, and with a few well planned events, meeting with people face-to-face is conductive to the formation of trust and common understanding of issues. While such type of work requires much resources in relation to the amount of people actively reached (and narrowing down and mobilizing the stakeholders can be a challenge on its own), it is hard to imagine such an impact could be achieved through other methods. Thus, as we proposed, while the exact thematic structure proposed in Deliverable 1.3 is not important, the workshops as a method of working together work. In our case, they facilitated community building of the district, and helped to build relationships between city and the local community, while fostering trust to institutions and offering knowledge about the local level to the institutional level.

Secondly, the topic chosen for the Helsinki workshops (energy retrofitting of existing buildings) meant that the main citizen stakeholders were the housing associations. This necessitated the creation of a new type of relationship between the city as an institution and its citizens. This work does not start completely from scratch (there are already some models of working with citizens as inhabitants of a district) and the work will be still ongoing after the workshops (there are some other ongoing projects towards this aim). In any case, the workshops represented a step on the path of forming a relationship between the city and a housing association, as well as forming a relationship between the city and group of housing associations representing a district. The step taken was both concrete and conceptual: on a concrete level, the city got to know housing associations of the Merihaka district, and on a conceptual level, a model for collaborating with housing associations and districts was developed. Central to this work was to understand the legal and organizational features of housing associations. For example, energy renovations have been of small interest to them in the past, which is at least in part due the scarcity of organizational resources to invest on actions beyond the standard portfolio of maintenance renovations. **Translated to the general level, the lesson here is to understand the contexts of the citizen stakeholders well. These may come up in the workshops, and when they do, they should be treated as valuable information.**

Thirdly, one challenge is to recognize the relevant citizen (and other) stakeholders. In this case, the general identification of housing associations was straightforward. In addition, the district of Merihaka had been identified as an interesting district in terms of energy renovations during project preparation already. What showed to be a challenge already during the two workshops focusing on the housing associations, was to maintain the participation rate. One factor to improve this would have perhaps been to establish a direct link from the city to the stakeholders (now the maintenance company acted as a messenger in communications).

Fourthly, the series of workshops was an example of knowledge co-creative process in which local knowledge on the area and the technical knowledge on energy and building technology were combined. The workshops (especially the second and the third) demonstrated that these two types of knowledge are not necessarily in conflict but, in fact, when combined, can be very effective. We encourage the followers to embrace this possibility to bring these two types of knowledge together through bringing citizens versed with local knowledge together with seasoned experts on the issues at hand with technical knowledge.

7. Conclusions

mySMARTLife project aims at the development of an Urban Transformation Strategy to support cities in the definition of transition models, as a suitable path to reach high level of excellence in its development process, addressing the main city challenges and progressing to smart people and smart economy concepts. The main instrument to achieve this very ambitious strategy will be the definition of the Advanced Urban Planning, consisting of an integrated approach of the planned city interventions on the basis of a rigorous impact assessment, an active citizen engagement in the decision-making process and a structured business approach, from the city business model perspective, to the economic framework for big companies and local SMEs and Start-Ups.

According to this frame, the methodology for citizen engagement based on a system thinking approach was adopted at the earlier stages of the project, considering the adaptation required to be realistic and useful for the reality of each of the Lighthouse cities. This deliverable contributes specifically to the involvement of the citizen engagement in the Urban Transformation Strategy and the generation of a wider acceptance of the implementation and deployment of solutions, as it describes in detail the process of delivering the set of workshops envisaged for this process, the different variations adapted in each of the three lighthouse cities, and how the local strategies and consultation and engagement processes already in place in the local areas, do shape the engagement strategy and the results of the whole process.

Apart from the global contributions of this deliverable to mySMARTLife objectives, some interesting conclusions can be highlighted about the development of the workshops and its applicability to other cities and contexts. The specific conclusions regarding the delivering and implementation of the three workshops in each city are described in detail in chapters 3.5; 4.5 and 5.5 of this document, but as a general conclusion of the process we can conclude that:

- Any methodology for citizen engagement and involvement must be carefully selected and wherever possible be as flexible and adaptable as possible to be included as part of any already existing processes or strategies already in place in the city. This approach prevents from soliciting too much the citizens that in many cases results in a counter-productive effect on real participation.
- The delivery of the workshops also needs to be flexible during the whole process to ensure that from the design stage to the delivery stage, it can be adapted to include and to take into account current actions lead with the citizens about the energy transition of any other issues

related to the final purpose of the strategy. The themes and participants of each workshops should be tailored to fit to the context of the case, while applying the philosophy of engaging both experts and citizens and carefully designing the interaction during the workshops to allow each participant to engage in effective and productive manner.

- For the actual implementation and design of the workshops is very important to include several departments of the city working on topics linked to the energy transition or its transversal aspects and also contractors and long term partners such as energy experts. This involvement of the professional dealing with the actions and solutions can help the citizens and other stakeholders from diverse backgrounds to feel that their participation is valuable and also can help to solve some technical aspects that can arise during the workshop implementation.

- It is also important to allow enough time for all participants to understand the concepts, as some of the concepts regarding the broader energy transition of the city might not be their main concern, and also to plan enough time between the different workshops to ensure the development of the topic from one session to the next, while strengthening the link with the participants to maintain the dynamic of the project and make real progress session after session.

- This methodology of workshops tailored to fit to the context of the city or district has been proofed to be a good example of knowledge co-creative process in which local knowledge on the area and the technical knowledge on energy and building technology were combined. The workshops delivered in the three cities demonstrated that these two types of knowledge are not necessarily in conflict but, in fact, when combined, can be very effective.

- It is an opportunity for participating stakeholders to get together about the topic of smart city and the objectives and actions planned or with potential to be considered in the future. These meetings can act as a starting point and a platform for the developing of potential innovative ideas that could be taken on board in the future, beyond the project. They also can facilitate community building at a smaller scale (district scale) and help to build relationships between city and the local community, while fostering trust to institutions and offering knowledge about the local level to the institutional level.

8. References

[01]   LAZAROUI, G. C., ROSCIA, M., 2012. Definition methodology for the Smart cities model. Energy 47 (2012), pp. 326-332.

[02]   LOKEN, E., 2007. Use of multi-criteria decision analysis methods for energy planning problems. Renewable and Sustainable Energy Reviews 11 (2007), pp. 1584-1595.

9. Annexes

9.1 Annex 1: Designed materials for Nantes workshops

9.1.1 List of the data gathered during the first workshop

Data about the used dwelling/ the building and the energy consumption:

- Dwelling characteristics: date of construction, single or multi-family, surface, number of rooms, orientation, insulation, windows, construction materials, roof type, heating system, DHW system, energy performance certificate.
- Inhabitants profile: number of people, age, address, etc.
- Other systems: domestic devices, hifi, video (energy class, purchase date, etc.)
- Fluids consumption: electricity/gas costs and consumptions, water consumption, BASEMIS® results, heating consumption (volume/weight, price and type of the purchased products: heating oil, wood, chips, date of purchase, etc.)
- Other elements: indoor air quality of the dwelling, HVAC systems, habits (comfort temperature, uses of the devices, number of showers, time of return from work, etc.), real consumption of the systems, uses of the systems (number of hour, frequency, internet data consumption, carbon footprint for digital services uses, electric vehicle consumption.
- Available subsidies for the energy retrofitting, works done (characteristics, types, cost, date)

Food consumption data:

- Food preferences, habits, diets (vegetarian, kosher, no pork, vegan, no gluten, etc.)
- Purchases record and purchased products, orders, loose products, company restaurant meals, other restaurant consumptions, online orders.
- Vegetable garden production, origin of purchased fruit and vegetables (country, city, etc.)
- Other: allergies, food carbon footprint, distance travelled for shopping, local markets timeslots, menus, recipes, sport practices (type of sport, frequency, etc.), nutritional information (nutriscore, etc.), expiry date of the products, composition of the products.
- Waste linked to food purchases: type of packaging, waste sorting recommendations, compost places, weight of the waste.

Data linked to renewable energy production:

- Potential for production: photovoltaics, solar cadastre, waste water heat recovery, wind energy, biomass, and geothermal energy.
- Personal electricity output: PV system efficiency (silicon type, power, geographical situation, solar panel slope and orientation).
- Energy carbon footprint.
- Available subsidies for the installation of renewable energy production.

Other personal data:

- Bank data (income, expenses, etc.).
- Personal agenda.

Other data (open data or not):

- Local weather conditions.
- Charging stations.
- Average electricity consumption of the building, district, etc.
- District characteristics (existence of local shops, typical income, annual production, annual national consumption).
- Land use files (Majic data).
- Eco-behaviours (*éco-gestes*).
- Energy networks infrastructures.

9.1.2 The 4 use cases imagined by local stakeholders for the Nantes Metropole area

Use case "La Toque Verte"
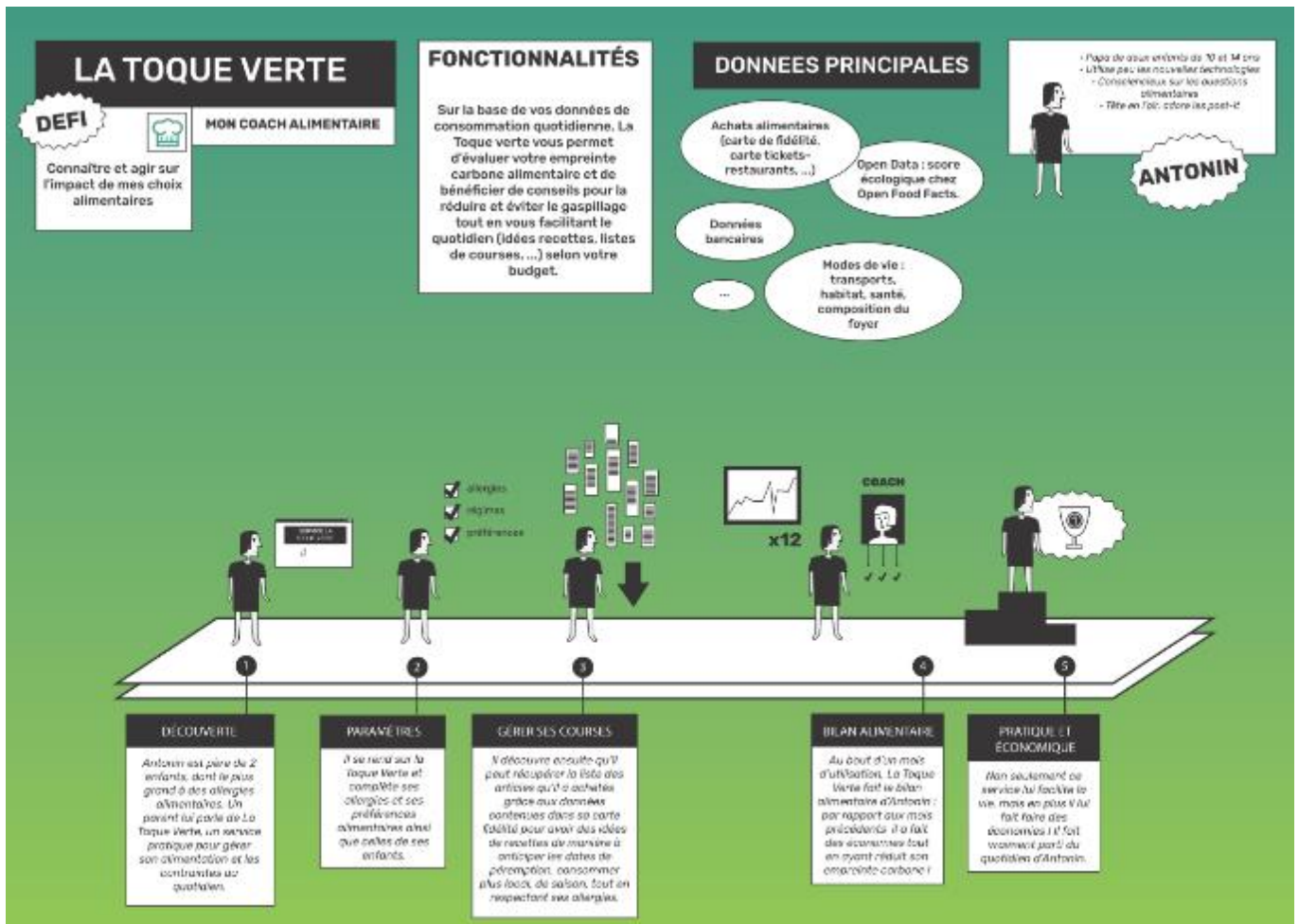
Use case : "We Mix"
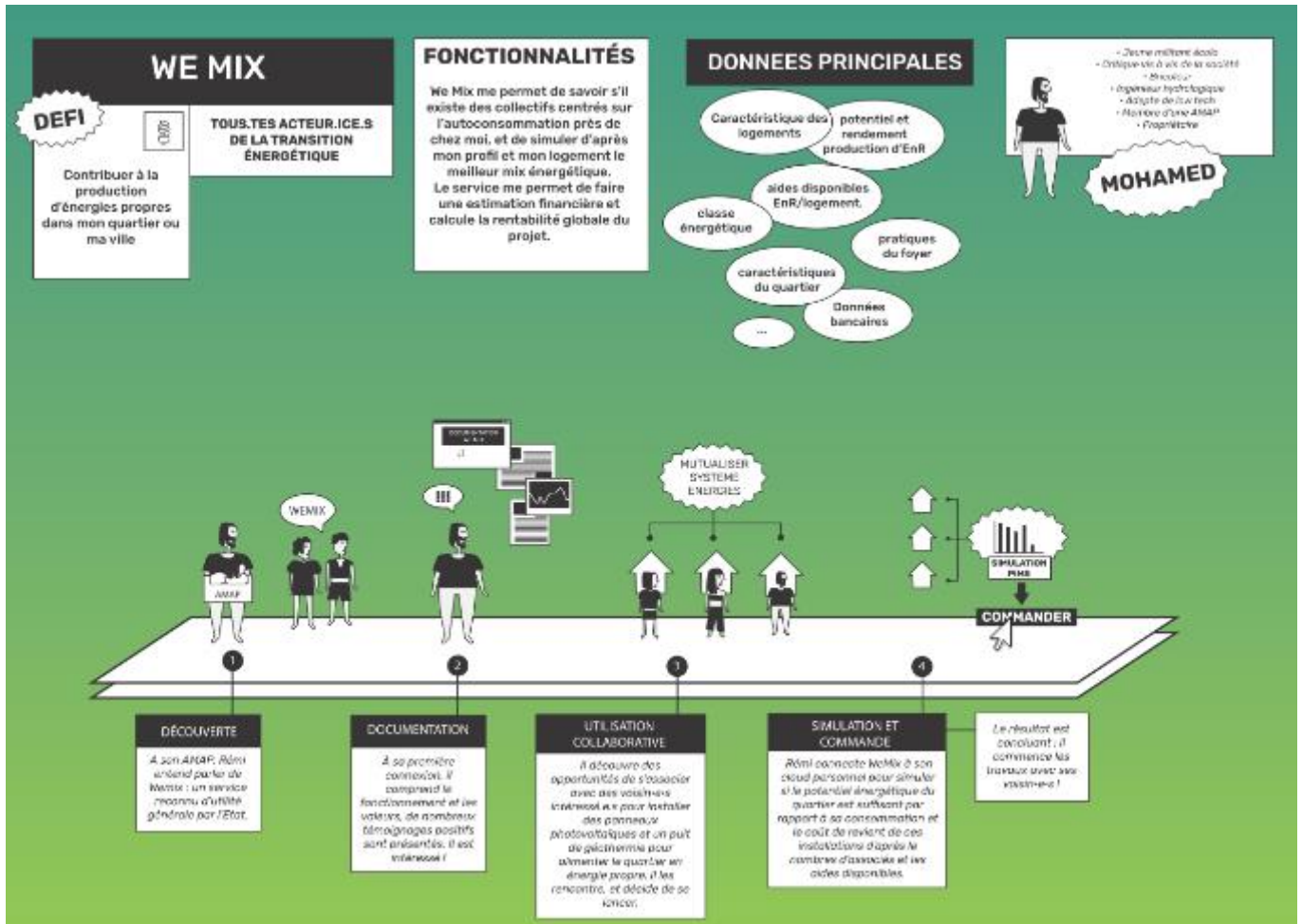
Use case : Zeus Techno
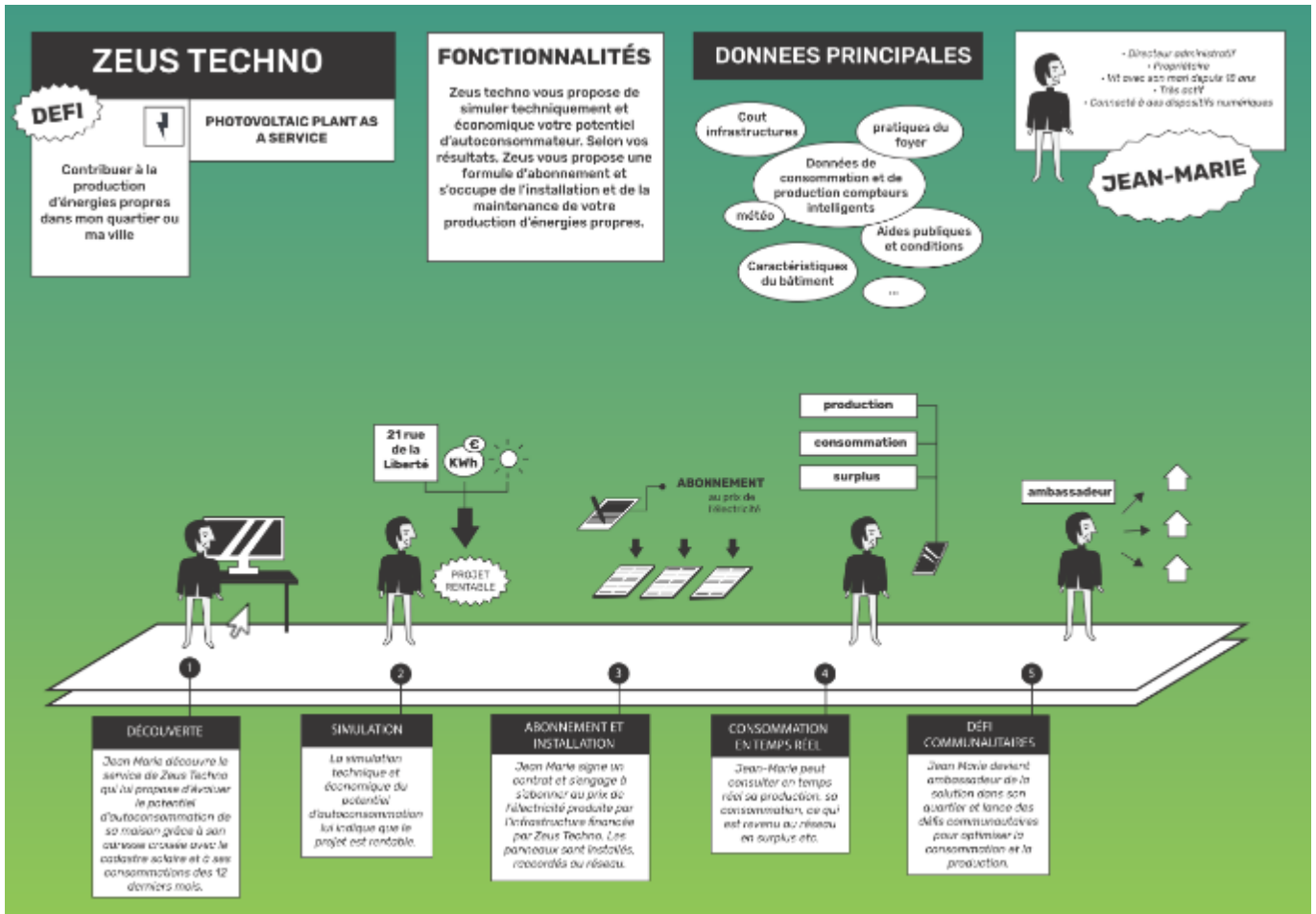
Use case : My Smart Home
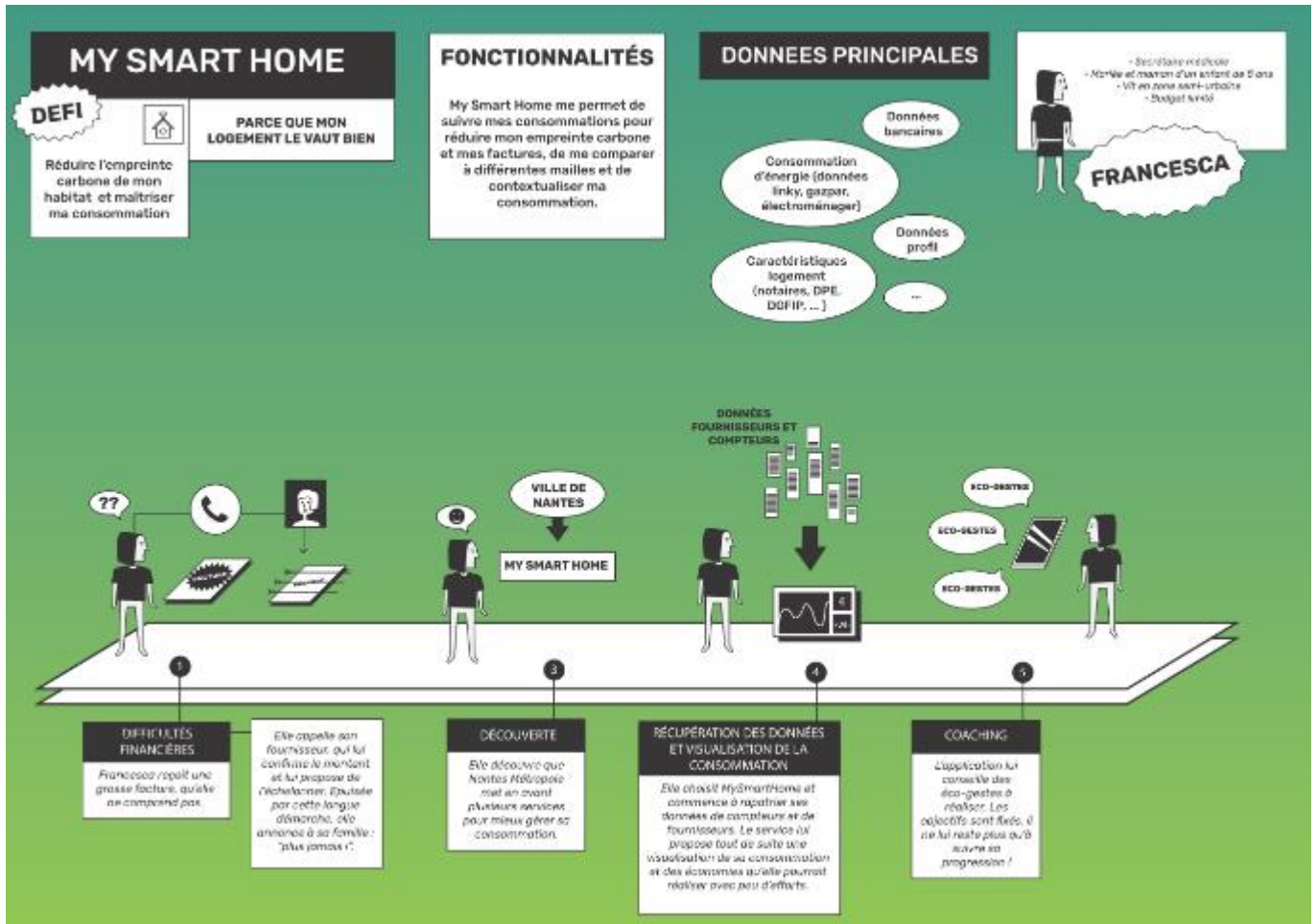
9.1.3   Selected data governance modes for the 4 use cases

Cas d'usage

TRANSFERT DIRECT : LA TOQUE VERTE

LA TOQUE VERTE
Mon coach alimentaire

Sur la base de vos données de consommation quotidienne, La Toque verte vous permet d'évaluer votre empreinte carbone alimentaire et de bénéficier de conseils pour la réduire et éviter le gaspillage tout en vous facilitant le quotidien (idées recettes, listes de courses, ...) selon votre budget.

DONNÉES PRINCIPALES :

Achats alimentaires (carte de fidélité, carte tickets-restaurants, ...) ; Données bancaires ; ... ; Open Data : score écologique chez Open Food Facts.
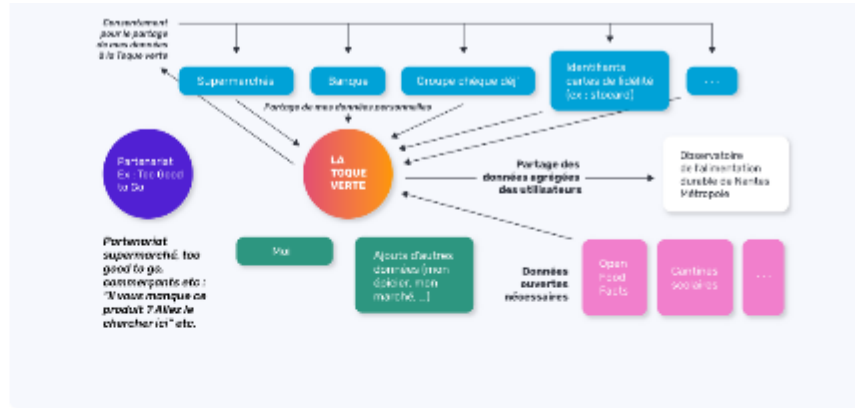
Le cas d'usage La Toque verte se prête ici bien au modèle de "transfert direct". Le service peut en effet être fourni par la Métropole de Nantes avec seulement quelques détenteurs de données qui acceptent de partager avec leurs clients les données qu'ils ont sur eux : grandes surfaces, groupes chèques déjeuner. Le 360° sur ses données n'est donc pas nécessaire et la simplicité du modèle basé sur un consentement précis des individus peut suffire. Dans le cas d'une augmentation du nombre de détenteurs nécessaires pour fournir le service, en particulier les données bancaires, ou les données de santé (allergies alimentaires, etc), le passage au modèle "cloud personnel" serait probablement à préconiser.

Ce cas d'usage peut s'intégrer au PAT de Nantes Métropole pour construire ce service avec les Nantais. L'articulation avec le futur Observatoire de l'Alimentation Durable permet de créer de la connaissance commune au niveau territorial grâce au Self Data et de tirer ensemble de la valeur de nos données personnelles. A envisager : promotion de groupements de commerçants locaux qui signent une charte commune.

Cas d'usage :

COOPÉRATIVE DE DONNÉES : WEMIX

WEMIX
Tous acteurs de la transition énergétique

We Mix me permet de savoir s'il existe des collectifs pour l'autoconsommation près de chez moi, et de simuler d'après mon profil et mon logement le meilleur mix énergétique. Le service me permet de faire une estimation financière et calcule la rentabilité globale du projet.

DONNÉES PRINCIPALES :

Caractéristique des logements ; Aides disponibles EnR/logement ; Profil énergétique, potentiel et rendement production d'EnR ; Données bancaires ; Caractéristiques du quartier...
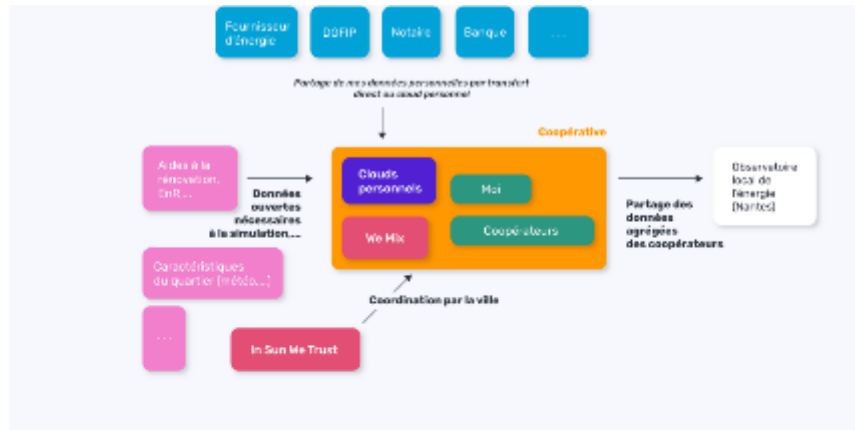
Wemix est une coopérative de donnée qui permet de gérer une coopérative de partage de l'énergie. La coopérative de données permet d'atteindre une masse critique de citoyens se réunissant à l'échelle locale pour bâtir des moyens de production d'énergies propre. Elle est le socle d'une coopérative de production et de consommation d'énergie.

Les coopérateurs décident en commun (et partagent) les coûts de construction, production et maintenance des infrastructures. La gestion de la donnée est centrale pour le diagnostic : connaître le mix énergétique le plus avantageux d'après le profil des coopérateurs, les priorités de leurs logements et les caractéristiques environnementales telles que la météo. Elle l'est aussi pour la gestion du réseau (type Smart Grid). WeMix s'appuiera de préférence sur des logiciels libres. L'objectif est d'atteindre une masse critique pour salarier des personnes s'occupant du réseau électrique. D'autres acteurs du territoire sont mobilisés, comme les FabLabs, qui permettent de construire des mini-éoliennes. La ville a pour rôle d'articuler l'initiative avec d'autres projets (ex : In sun we trust - cadastre solaire).

Cas d'usage :

PLATEFORME "TIERS DE CONFIANCE" : ZEUS TECHNO

ZEUS TECHNO
Photovoltaic plant as a service

Zeus techno vous propose de simuler techniquement et économique votre potentiel d'autoconsommateur. Selon vos résultats, Zeus vous propose une formule d'abonnement et s'occupe de l'installation et de la maintenance de votre production d'énergies propres.

DONNÉES PRINCIPALES :

Données de consommation/ profil énergétique ; Caractéristiques du bâtiment et du quartier ; Aides publiques ; Coûts des installations ; ...

"Zeus techno" c'est :

1) Un opérateur : il installe des panneaux solaires, raccorde au réseau, et propose une formule d'abonnement.

2) Un service qui permet aux individus de :

- Simuler leur potentiel d'autoconsommateur sur la base de leurs données et de proposer une offre "Zeus Techno"
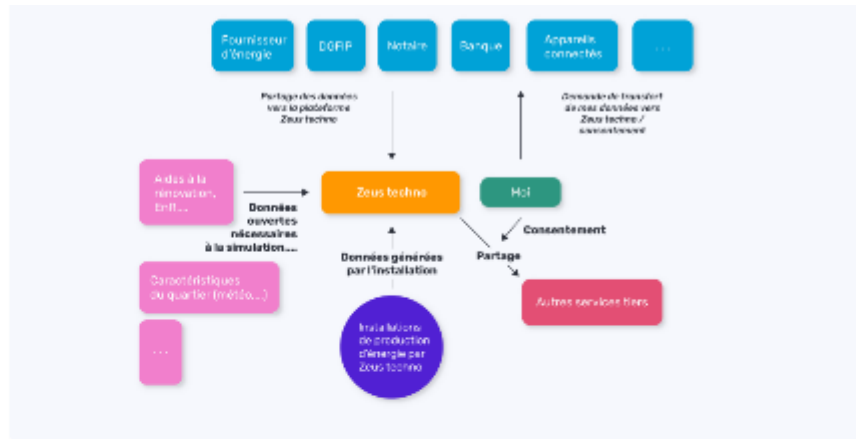- gérer leurs données énergétiques de consommation, mais aussi d'autoproduction et de revente (générées par les installations de Zeus Techno)

3) Une plateforme : Zeus Techno dispose d'une API, permettant aux individus de repartager leurs données avec des services tiers s'ils le souhaitent (par exemple : services dérivés de Zeus Techno : recharge de véhicule électrique, location de voiture, ...)

Cas d'usage :

CLOUD PERSONNEL : MY SMART HOME

MY SMART HOME
Parce que mon logement le vaut bien

My Smart Home me permet de suivre mes consommations pour réduire mon empreinte carbone et mes factures, de me comparer à différentes mailles et de contextualiser ma consommation.
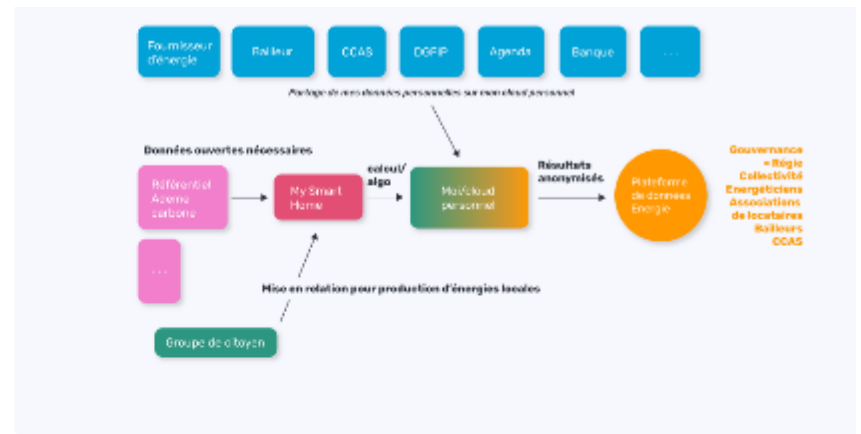
DONNÉES PRINCIPALES :

Consommation d'énergie (données linky, gazpar, électroménager) ; Données de profil ; Données bancaires ; Caractéristiques du logement (notaires, DPE, DGFIP, ...) ; ..

My Smart Home est un service tiers reposant sur le cloud personnel de l'individu. Cependant ces sources de données ont un fort potentiel d'usages collectifs. Pour favoriser une ouverture à l'extérieur sans dénaturer la maîtrise par les individus, le modèle de Régie peut-être envisagé. Il serait ici porté par la collectivité, mais dans une structure de gouvernance mixte (GIP, SPL, Syndicat mixte) dans laquelle la collectivité et d'autres parties prenantes sont présentes (association de locataires, CCAS, ...). Son objectif : garantir un usage ouvert et équitable des données, construire le cadre de confiance sans mélanger les rôles.

L'aspect collectif du service permettant une organisation entre citoyens n'est pas non plus à négliger : on peut bénéficier de conseil, de mise en relation. Cela permettrait par exemple de renforcer le pouvoir des associations de locataires en connaissant mieux les consommations énergétiques. Enfin, le modèle à construire doit aussi favoriser des politiques publiques sociales, comme la lutte contre la précarité énergétique.

9.2   Annex 2: Photos of Hamburg workshops

9.3   Annex 3: Designed materials for Helsinki workshops

9.3.1   HELSINKI-citizen-workshop1-outline

Energiarenessanssi-työpaja 4.9.2018

Ohjelma:

9:00   Aamukahvit

9:30   Jari Viinanen: Mitä tarkoittaa Hiilineutraali Helsinki 2035?
          Teemu Kettunen HSY: Näkökulmia taloyhtiövaikuttamisesta
          Kim Huhtanen: Energiarenessanssin esittely

10:00   Työpaja
          -Kierretään työryhmissä keskustelemassa ja täydentämässä n.15 min per aihe.

11:15   Työpajan päätös ja tulokset
          -Tulosten esittely 15 min

          Energiarenessanssi-ohjelman suunnittelu ja työpaja on osa mySMARTLife-hanketta.

Helsinki

1

my SMART Life

Energiarenessanssi

"Energiarenessanssin toteuttaminen on kaikkien osapuolten vastuulla. Asukkaita on vaikea pakottaa, sen täytyy olla kannustavaa. "

"Kaupunki voisi toimia kokoajana. Fasilitaattorina kaupunki on hyvin luotettava kumppani asukkaille, verrattuna siihen että jokin yritys lähtisi itse toimimaan alueella."

"Sujuva yhteistyö toimijoiden kanssa, joilla on tietoa tämän hetkisistä energiarenessanssin toteutumisen esteistä.
Pilotit ja projektit ovat hirveän tärkeitä, on epäreilua ajatella, että jonkun taloyhtiön rahoilla kokeillaan uusia asioita.
En usko, että menetelmissä on vikaa. Ratkaisuja on. Keissejä esiin!"

"Yritysten pitäisi tehdä hinnoittelumalleja, jotka menevät kuin veitsi voihin, koska ne ovat vaivattomia."
"Tällä hetkellä ei ehkä loppuun asti osata myydä kaikilla muilla hyvillä vaikutuksilla (säästöjen lisäksi) mitä näistä hankkeista syntyy."

Helsinki

2

Työpajan aiheita

Miten eri tahot voivat olla mukana energiarenessanssi-ohjelmassa? (Sonja)

Millaista tietoa tarvitaan energiarenessanssin toteuttamiseksi? (Marja)

**Mitä ratkaisuja energiarenessanssin toteuttamiseksi on?
Mitä vielä tarvitaan?** (Mikko)

Miten energiarenessanssi rahoitetaan? (Petteri)

Helsinki

3

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Mitä seuraavaksi

- Osallistujille yhteenveto työpajoista, sekä avoin tiedosto täydennettäväksi.
- Energiarenessanssi-ohjelmaa valmistellaan syksyn aikana.
    - -Uudet työpajat

- Kiitos!

Helsinki

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6

9.3.2 HELSINKI-citizen-workshop2-preseentation 1

Hiilineutraali Helsinki 2035

Helsinki

**Sonja-Maria Ignatius
Ympäristösuunnittelija
Helsingin kaupunkiympäristö**
#hiilineutraalihelsinki

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Ilmastonmuutos ei odota.

Myös helsinkiläisiä tarvitaan.

Helsinki

Pyrimme tekemään ilmastoystävällisen arjen helpoksi.

= Maailman toimivin kaupunki

Helsinki

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Mistä Helsingin kasvihuonekaasupäästöt syntyvät?
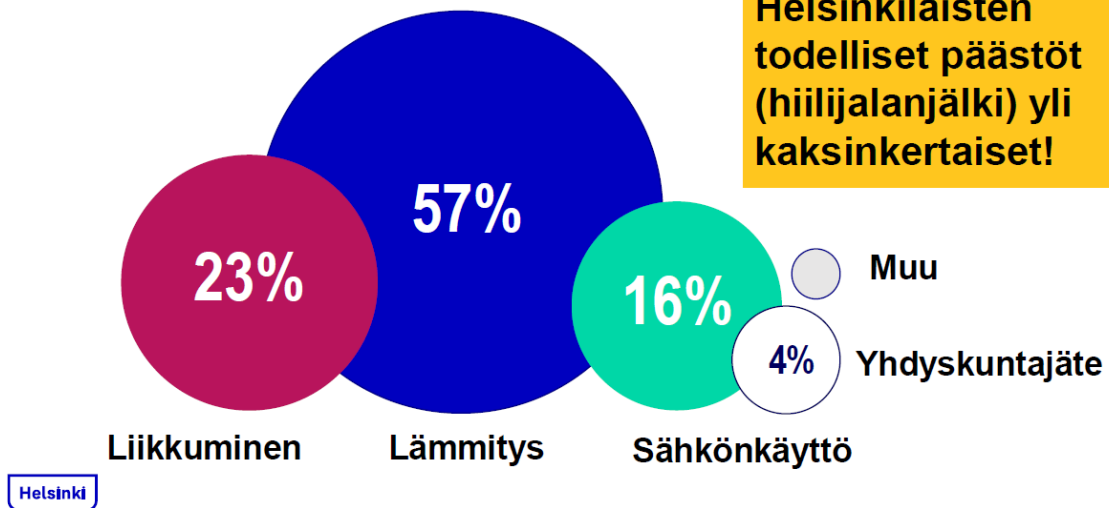
Helsinkiläisten todelliset päästöt (hiilijalanjälki) yli kaksinkertaiset!

57%

23%

16%

Muu

4% Yhdyskuntajäte

Liikkuminen   **Lämmitys**   **Sähkönkäyttö**

Helsinki

Yht.: 2,7 miljoonaa t CO_2-eq. 2016. Lähde: Helsingin ilmastotiekartta ja HSY

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Keiltä Helsingin kasvihuone- kaasupäästöt syntyvät?

12% **Teollisuus**

19% **Palvelut ja työpaikat (pl. kaupungin)**

61% **Kotitaloudet**

8% **Kaupungin kiinteistöt ja julkinen liikenne**

Helsinki

6
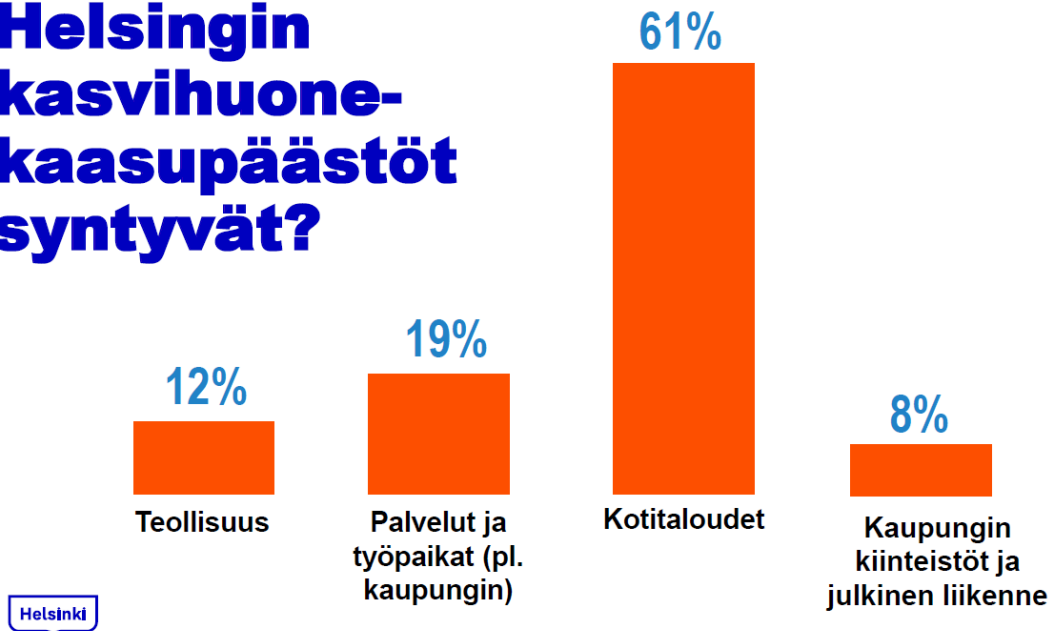
Total: 2,6 million t of CO_2-ekv. in 2015

Tavoite:

Teemme Helsingistä hiilineutraalin vuoteen 2035 mennessä.

Helsinki

Maailman toimivin kaupunki
Helsingin kaupunkistrategia 2017–2021

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Hiilineutraali
= Helsingin toiminta ei vaikuta ilmaston lämpenemiseen

Helsinki

Kasvihuonekaasupäästöjä vähennetään 80 % ja loput 20 % kompensoidaan

= Kasvihuonekaasupäästöt nollaan

Helsinki

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Meillä on suunnitelma.

Helsinki

Hiilineutraali Helsinki tehdään yhdessä.

Helsinki

Puhdas energiantuotanto + kohtuullinen energiankulutus

Helsinki

Energiarenessanssi

= Olemassa olevan rakennuskannan energiatehokkuuden parantaminen ja uusiutuvan energian lisääminen peruskorjausten yhteydessä

Helsinki

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Energiarenessanssi

- Lähes 80 % nykyisestä asuinrakennuskannasta edelleen pystyssä vuonna 2030
- Valtaosa vuosina 1950–1980 rakennetuista kerrostaloista on peruskorjauksen edessä
- Kuinka saada taloyhtiöt tekemään energiatehokkuusinvestoinnit?

Helsinki

Kuva: Antti Pulkkinen, Helsingin kaupunki

Tehokkaimmat toimet päästöjen vähentämisessä:
- Lämmön kulutuksen alentaminen korjausrakentamisen yhteydessä
- Lämmön ja sähkön uusiutuva pientuotanto

Kustannukset
- Valtaosa pitkällä tähtäimellä taloudellisesti kannattavia rakennusten omistajille

Helsinki

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Miten kaupunki voi tukea energiaremontteja?

- Energianeuvontaa ja tietoa?
- Kaupunki tuo oikeat tahot yhteen ja auttaa luomaan yhteisprojekteja?

Energiarenessanssi-ohjelma kokoaa keinot yhteen!

Helsinki

Kiitos!
sonjamaria.ignatius@hel.fi

Hiilineutraali Helsinki 2035
#hiilineutraalihelsinki

Helsinki | my SMART Life

my SMART Life

Kuva: Helsingin kaupunki, Avanto Insight, THL

Ilmastotekojen edistymisen seuranta

- Millä tavalla haluaisit seurata, miten ilmastoteot Helsingissä etenevät?
- Millaista energianeuvontaa pitäisi antaa?
- Miten taloyhtiöpäättäjien energiaosaamista tulisi parantaa?
- Minkälaisia menetelmiä tarvitsisit taloyhtiöiden päätöksen tueksi energiarenessanssissa?
- Millaisia tietoja voisit antaa?
- Millaisia tietoja haluaisit?

Helsinki

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mySMARTLife Merihaassa

Älytermostaatit:

Haapaniemenkatu 12:een asennettu älytermostaatit kaikkiin huoneistoihin (167).

Dynaaminen lämmönsäätö - energiansäästö ja asumismukavuuden lisääminen, lämmön kysyntäjousto

Energianeuvonta ja muu tuleva toiminta alueella:

- Keskustelu taloyhtiöiden puheenjohtajien klubilla
- Energiatehokkuusselvitykset kahteen taloyhtiöön valmisteilla monitavoiteoptimointia käyttäen
- Yhteiskehittämistyöpajat
- Lämpökamerakuvaukset Haapaniemenkatu 12
- Yhteistyö alueen sidosryhmien kanssa: kaupunkisuunnittelu, asukas- ja harrastusyhdistykset, yrittäjät, päiväkoti
- Merihaan Kesäkarnevaalit 25.6., esitellään hankkeen toimintaa

Helsinki   20..8.2018   Jari Viinanen

Merihaan alueelle tyypillisen 70–80-luvun rakennuksen energiatehokkuuden parantamismahdollisuudet ja kustannukset

		Merihaan energiaremonttipaketti			
	Tekninen ratkaisu	Lämpöä säästetty kWh/m²/vuosi	Sähköä säästetty kWh/m²/vuosi	Takaisinmaksu-aika vuosissa, 0% interest	Kustannus €/m²
Ulkovaippa	Ulkoseinien lisälämmöneristys	13		62	48
	Ikkunoiden uusiminen	23		11	15
LVI	Lämmön talteenotto poistoilmasta	25		12	18
	Älytermostaatti	9		4	2
Vesi	Vettä säästävät hanat	6		28	10
	Jäteveden lämmön talteenotto	20		10	13
Sähkö	Aurinkopaneelit katolla		3	13	4
Lämmön kokonaismäärä		96			105
Sähkön kokonaismäärä			3		4
Energian kokonaismäärä		99		17	110
Lämmön kulutus ennen (kWh/m²)		165			
Lämmön kulutus parannuksen jälkeen (kWh/m²)		69			

VTT

Helsinki   20..8.2018   Jari Viinanen

21

9.3.3   HELSINKI -citizen-workshop3-presentation 1

MISTÄ ENERGIA TULEE JA MIHIN SE MENEE

Yläpohja 3-6 %

Ilmanvaihto 25-35 %

Ulkoseinät 10-20 %

Ikkunat ja ovet 15-25 %

Lämmin käyttövesi 15-20 %

Alapohja 4-6 %

Lämmitys 60-70 %

Sähkölaitteet 10-20 %

Aurinko + ihmiset 10-20 %

HELEN

Taloyhtiön energiakirja 2012

2

SISÄILMAN LÄMMITYKSEN TARVE

Talon lämpökonduktanssi	X	Lämpötilaero	=	Tehon tarve
W/°C		°C		W

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SISÄILMAN LÄMMITYKSEN TARVE

$$
\boxed{\begin{array}{c} \text{Talon} \\ \text{lämpökonduktanssi} \\[1em] \text{W/°C} \end{array}} \quad X \quad \boxed{\begin{array}{c} \text{Lämpötilaero} \\[1em] \text{°C} \end{array}} \quad = \quad \boxed{\begin{array}{c} \text{Tehon tarve} \\[1em] \text{W} \end{array}}
$$
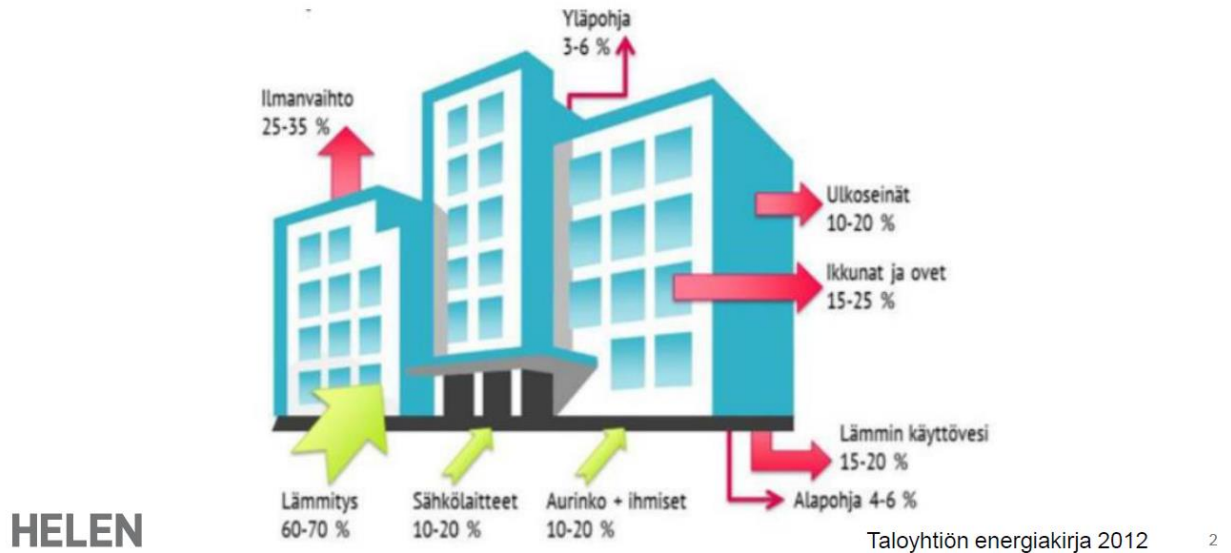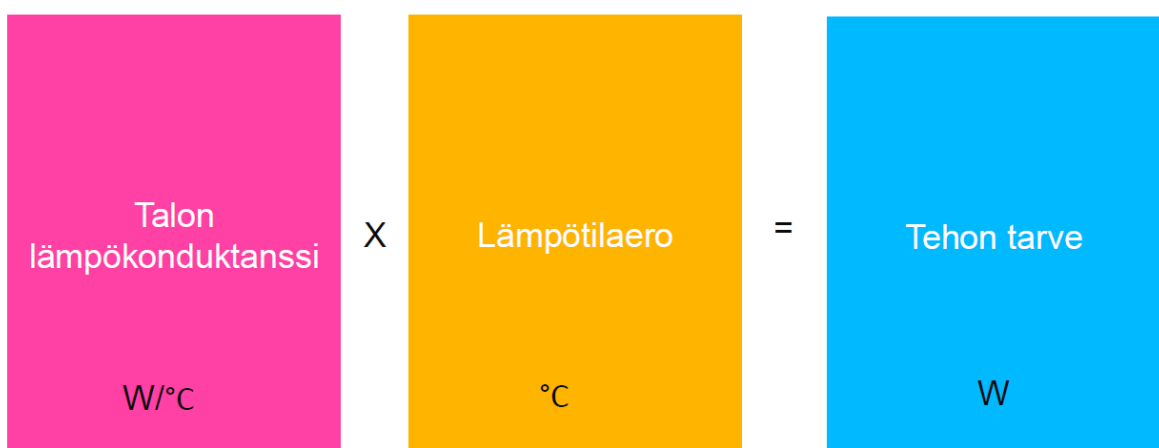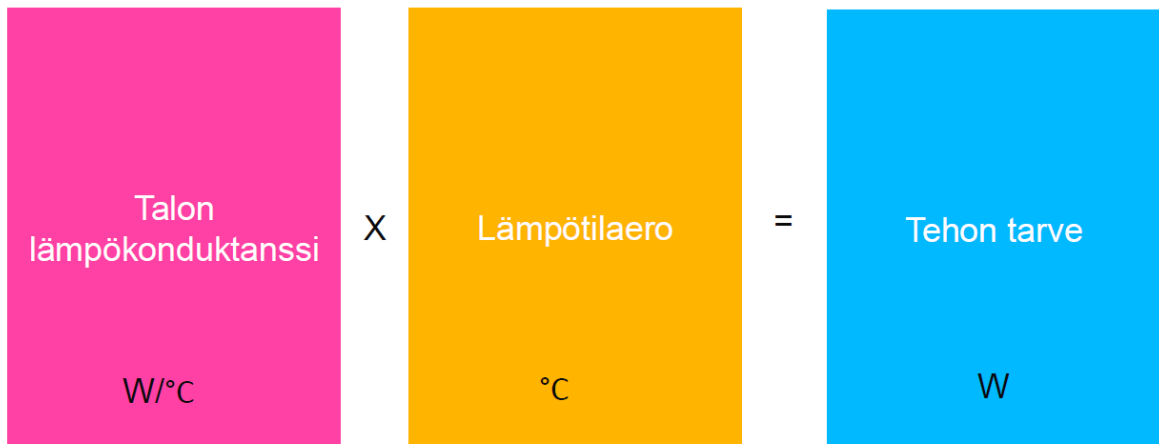
HELEN

SISÄILMAN LÄMMITYKSEN TARVE

Riippuu seuraavista tekijöistä

➢ Talon vaipan lämmöneristekyky (seinät, ikkunat, katto. lattia)
➢ Vuotoilman määrä (ikkunan, ovien välistä)
➢ Ilmanvaihdon määrä

Kutsuttakoon yllä olevia tekijöitä talon *lämpökonduktanssiksi*, jonka yksikkö on W/°C.

Tämän lisäksi talon lämmityksen tarpeeseen vaikuttaa luonnollisesti kerrostalon keskimääräisen sisälämpötilan ja ulkolämpötilan erotus, jonka yksikkö on °C.

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SISÄILMAN LÄMMITYKSEN TARVE

Talon lämpökonduktanssi		Lämpötilaero		Tehon tarve
	X		=	
W/°C		°C		W
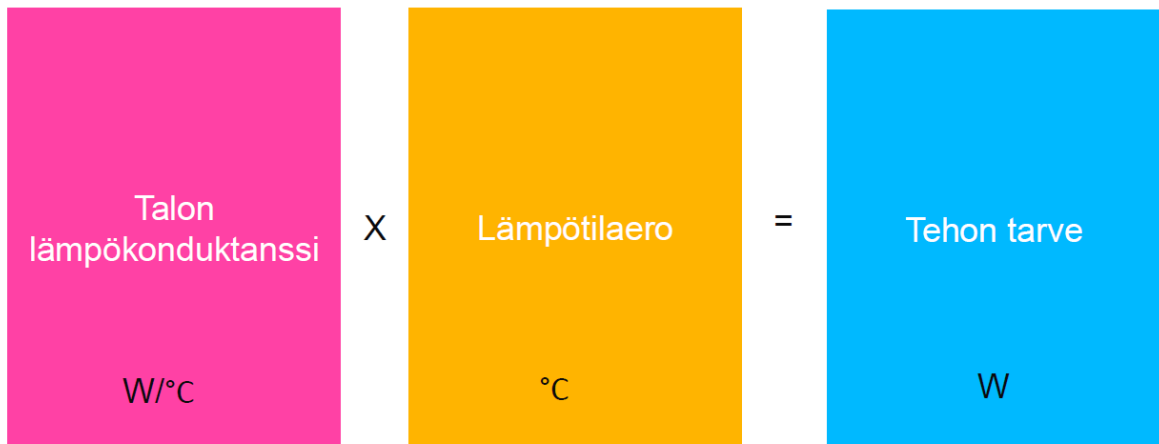
HELEN

MIHIN TALOYHTIÖ VOI VAIKUTTAA

Voiko taloyhtiö vaikuttaa talon konduktanssiin?

> *Voi, mutta vaatii tyypillisesti isoja toimenpiteitä (ikkunoiden uusiminen, lisäeristys, ilmanvaihdon lämmöntalteenoton uusiminen)*

Voiko taloyhtiö vaikuttaa lämpötilaeroon?

> *Ulkolämpötilaan ei voi vaikuttaa.*
> *Keskimääräiseen sisälämpötilaan voi vaikuttaa*

Kuinka keskimääräiseen sisälämpötilaan vaikutetaan?

> *Yhtenä keinona on huolehtia hyvät ja toimivat termostaatit patteriventtiileihin ylilämmön leikkaamiseen.*
> *Toisena keinona on muuttaa menoveden lämpötilaa, joka lähtee lämmönjakohuoneesta kaikille pattereille samassa lämpötilassa.*

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LÄMMITYKSEN TARPEEN MUKAINEN OHJAUS

Edellä kuvatun mukaisesti lämmityksen tarve riippuu ulkolämpötilasta.

Keskitetyssä järjestelmässä kaikkiin pattereihin lähtee lämmönjakohuoneesta saman lämpötilan omaava vesi.

Lämmönjakohuoneesta lähtevän veden lämpötila on oltava riittävän korkea jotta kaikkiin huoneistoihin saadaan kussakin ulkolämpötilassa haluttu sisälämpötila riippumatta

- joihinkin asuntoihin vaikuttavasta auringon paisteesta (etelä puolen asunnot) tai
- joidenkin huoneistojen sisäisestä lämpökuormasta (kodinkoneet, ruoan laitto, ihmisten lkm jne)

Kutsuttakoon kyseistä ohjaustapaa *Lämmityksen tarpeen mukaisella ohjauksella*

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6

MITEN TARPEEN MUKAINEN OHJAUS ON TEHTY

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KIINTEISTÖVAHTI

HELEN

MIKSI HELENIN KIINTEISTÖVAHTI?

1. Parempi asukastyytyväisyys tasaisien olosuhteiden ansiosta
2. Säästöjä lämmityskustannuksista
3. Helpottaa kiinteistöjä ylläpitävien työtä
4. Lämmitysjärjestelmän epätasapainon tunnistaminen
5. Ymmärrys asuntojen olosuhteista ja kyky ennakoida ongelmia
6. Helppo käyttöönotto

helen.fi/kiinteistövahti

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NÄIN PALVELU TOIMII

1 Kiinteistöön asennetaan palvelun kanssa keskustelevat lämpötila- ja kosteusmittarit.

2 Helen kerää, analysoi ja esittää automaattisesti mittareista saatua dataa sekä tuottaa toimenpide-ehdotuksia.

3 Ehdotusten pohjalta energiatehokkuus-toimenpiteitä, seuraa kiinteistöjen olosuhteita ja ymmärtää ongelmatilanteita.

CASE
HELSINGIN
KAUPUNGIN ASUNNOT OY

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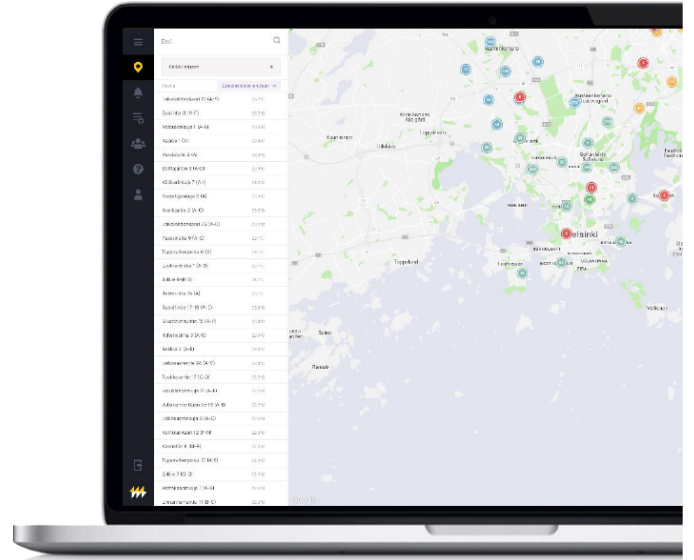
HEKAN KIINTEISTÖT

2000
KIINTEISTÖÄ
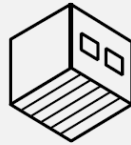
40 000
ASUNTOA
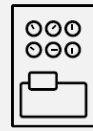
667
LÄMMÖNJAKOKESKUSTA

16 000 000 €
LÄMMITYKSEN KULUT VUODESSA

750 000 €
SAAVUTETTAVISSA OLEVA
SÄÄSTÖ VUODESSA

SÄÄSTÖ KESKIMÄÄRIN 5%

80% säästöistä 0-13 °C ulkolämpötilassa

Säästö prosenteissa

9
6,75
4,5
2,25
0

-24 -23 -22 -21 -20 -19 -18 -17 -16 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13

Ulkolämpötila °C

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9.3.4 HELSINKI-citizen-workshop3-presentation 2

Arvio Merihaan taloyhtiöiden säästöistä lämmityskuluissa

- Ohessa Haapaniemenkatu 12:n lämmönkulutustietojen perusteella laskettu arvio vuotuisesta säästöstä lämpölaskussa eri yhtiöissä

Taloyhtiö	asuntoja	Säästö lämmityskustannuksissa	
As. Oy Helsingin Haapaniemenkatu 12		14188	€/vuosi (sis.alv)
As. Oy Hakaniemenranta 14	78	6587	€/vuosi (sis.alv)
As. Oy Haapaniemenkatu 16	462	39017	€/vuosi (sis.alv)
As. Oy Hakaniemen Rantapuisto	64	5405	€/vuosi (sis.alv)
As. Oy Haapaniemenkatu 20	64	5405	€/vuosi (sis.alv)
As. Oy Merihaan Rantakulma	128	10810	€/vuosi (sis.alv)
As. Oy Merihaan Rantapenger	76	6418	€/vuosi (sis.alv)

- Arvio perustuu tyypilliseen energiansäästöön 70-luvun kerrostalossa, joka sijaitsee pääkaupunkiseudulla, sekä havaintoihin Kojamon omistamista Merihaan kiinteistöistä.

- Palvelu maksaa itsensä takaisin parissa vuodessa tai hankittaessa palveluna, jo alkuvaiheesta lähtien.

Tiivistelmä Leanheatin hyödyistä – fiksu kiinteistön ylläpito

- Energiatehokkuutta ja fiksua kiinteistöjen ylläpitoa modernein keinoin. Hyödyt todennettu laajasti suomalaisissa kerros- ja rivitaloissa. Miltei kaikki asiakkaamme laajentaneet vahvasti käyttöä pilottien jälkeen.

- Noin 10% säästö lämmön kulutukseen ja 20% säästö perusmaksuun
  - Älykäs lämmityksen jatkuva ohjaus ja valvonta
  - Aktiivinen kaukolämmön tehojousto
  - Kevyt kiinteistöjen tasapainotus mittadatan pohjalta

- Alhaisemmat kiinteistöjen ylläpitokulut
  - Vähemmän juoksemista kohteella, enemmän automaatiota työhön
  - Kosteus ja ilmanvaihto valvonnassa, kiinteistöt pysyy hyvässä kunnossa

- Huoneistokohtainen raportointi käytössä laajasti toiminnan tueksi

Leanheat tuo taloihin aiempaa paremmat olosuhteet ja lämpötilat

- Kerros- ja rivitalojen lämmitystä ohjataan **vanhentuneella tekniikalla**, joka ei huomioi sääennustetta tai asuntojen todellisia lämpötiloja. Tämä johtaa usein kasvaviin kuluihin ja lämpötilaongelmiin.

- **Leanheat päivittää tekniikan tähän päivään.** Huoneistoantureihin ja tekoälyyn pohjautuva ohjaus huomioi asuntojen lämpötilat, sääennusteen ja rakennusten ominaisuudet, jolloin sisäolosuhteet ovat aina hyvät ja tasaiset.

Miten tekoäly toimii?

Huima tekninen kehitys on tuonut etäluettavien antureiden hinnat alas. Leanheat puolestaan rakastaa niiden tuottamaa dataa!

Leanheat oppii datasta talon ominaisuudet ja ymmärtää, miten taloa tulee lämmittää, jotta olosuhteet pysyvät aina hyvinä ja tasaisina.

Oppimisvaiheen jälkeen tekoäly tekee joka minuutti päätöksen parhaasta lämmitystavasta. Se osaa lämmittää ennakoivasti kun luvassa on pakkasta. Syksyiset ja keväiset, erittäin vaihtelevatkaan säätilat eivät ole tekoälylle haaste.

Leanheatin tekoälyä voi verrata erittäin fiksuun talonmieheen, jonka ainoa työnkuva on 24 tuntia vuorokaudessa huolehtia sisäolosuhteista – tämä olisi ihmiseltä kokopäiväinen, kolmivuorotyö.

Jatkuva mittaus

Optimaalinen ohjaus

Sääennuste

Kuva 1: Tekoäly pitää asumisolosuhteet tasaisina

Jatkuva mittaus → Tekoäly oppii ja mukautuu → Aina optimoitu lämmityksen säätö → Älykäs olosuhteiden valvonta ja huolto → Jatkuva prosessi tasapainon, kiinteistöjen kunnon ja olosuhteiden parantamiseen

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Leanheat säästää energiakustannuksissa ja CO2-päästöissä

- Tyypillisesti Leanheat **säästää 5-20% rakennusten lämmityskustannuksista** tavoiteltaessa S2-sisäilmastoluokkaa (hyvä sisäilmasto). Leanheat ylläpitää tätä lämpötilaa mahdollisimman energiatehokkaalla tavalla

- Leanheatin tekoäly toimii yhteistyössä kaukolämpöyhtiöiden kanssa. Älykäs ohjaus tekee **kaukolämmön tuottamisesta ekologisempaa**, jolloin esimerkiksi pakkaspiikkien aikana voidaan käyttää puhtaampia polttoaineita.

Miten päästöjä vähennetään?

Energian kulutuksen alentaminen on tapa vähentää päästöjä – mutta ei ainoa. Kaukolämpö-yhtiöiden haaste on esimerkiksi "pakkaspiikit" joiden aikana lämmitystehoa tarvitaan paljon.

Kaukolämmön "perustuotanto" on tyypillisesti ympäristöystävällistä, mutta "piikkitehoa" tuotetaan usein epäekologisesti, kuten öljyllä.

Leanheat lämmittää rakennukset ekologisesti. Esimerkiksi pakkashetkien aikaisia tehopiikkejä saadaan alennettua merkittävästi eli öljyä tarvitaan vähemmän. Olosuhteet pysyvät silti aina hyvinä.

Vältetty piikkiteho

Käyttöveden lämmitys

Tilojen lämmitys

Jatkuva mittaus

Optimaalinen ohjaus

Kaukolämpöyhtiön tuotantosignaali

KL

Kuva 2: Kaukolämpöyhtiö voi osallistua säätöön tarjoamalla signaalin tuotantonsa ekologisuudesta.

Jatkuva mittaus → Tekoäly oppii ja mukautuu → Aina optimoitu lämmityksen säätö → Älykäs olosuhteiden valvonta ja huolto → Jatkuva prosessi tasapainon, kiinteistöjen kunnon ja olosuhteiden parantamiseen

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Huoneistoanturointi ja tekoäly tehostaa myös talon ylläpitoa

- Leanheat päättelee asuntojen lämpötila- ja kosteustiedoista monia asioita talojen kunnosta. Tavallisesta **poikkeavat lukemat ovat merkki ongelmista** lämmitysjärjestelmässä, talon rakenteissa tai esimerkiksi ilmanvaihdossa.

- Isännöitsijä ja huoltoyhtiö pystyvät hyödyntämään Leanheatin työkaluja ja automaattisia hälytyksiä, jotta **talot pysyvät aiempaa paremmassa kunnossa ja pienemmillä ylläpito- ja huoltokustannuksilla.**

Miten ylläpidossa säästetään?

Kiinteistöjen ylläpitoa voidaan kehittää aiempaa ennakoivampaan suuntaan. Epäkohdat talojen tekniikassa ja rakenteissa pystytään tekoälyn avulla havainnoimaan ajoissa ja korjaamaan tehokkaasti ennen kuin viat aiheuttavat todellisia ongelmia, kuten kosteusvaurioita.

Leanheat on estänyt useita laajamittaisia kosteusvaurioita syntymästä – ilman jatkuvaa, automatisoitua valvontaa, poikkeavat olosuhteet ja niiden syyt eivät välttämättä koskaan selviäisi.

Leanheat auttaa monien PTS-urakoiden toteutuksen aiempaa edullisemmin tai paremmin. Esimerkiksi noin 10-20 vuoden välein toteutettavat "patteriverkoston tasapainotukset" pystytään Leanheatin avulla hoitamaan aiempaa tehokkaammin, kun urakoitsijoilla reaaliaikaiset lämpötilamittaukset käytössään. Säästöjä tulee siis hyvin monesta lähteestä.

Jatkuva mittaus · Havainnot ja hälytykset · Optimaalinen ohjaus · Ennakoiva huolto

Kuva 3: Älykkäämpi tekninen huolto tuplaa tyypillisesti Leanheatin hyödyt pelkkään energian säästöön nähden.

| Jatkuva mittaus | Tekoäly oppii ja mukautuu | Aina optimoitu lämmityksen säätö | Älykäs olosuhteiden valvonta ja huolto | Jatkuva prosessi tasapainon, kiinteistöjen kunnon ja olosuhteiden parantamiseen |

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Esimerkkikohteita, yksittäiset kiinteistöt

Tamppikuja (56 asuntoa)	Sompionpolku (31 asuntoa)	Pohtolankatu (49 asuntoa)	Vesirattaanmäki (46 as)	Viittakorpi (68 asuntoa)
Kulutuksen muutos - 6,8 %	Kulutuksen muutos - 11,6 %	Kulutuksen muutos - 13,7 %	Kulutuksen muutos - 14,0 %	Kulutuksen muutos - 20,5 %
Tehotarpeen muutos - 24,3 %	Tehotarpeen muutos - 17,2 %	Tehotarpeen muutos - 25,3 %	Tehotarpeen muutos - 33,6 %	Tehotarpeen muutos - 23,1 %
Hyödyt ja kustannukset	**Hyödyt ja kustannukset**	**Hyödyt ja kustannukset**	**Hyödyt ja kustannukset**	**Hyödyt ja kustannukset**
Säästöt lämmityksessä 6 500 €/v	Säästöt lämmityksessä 5 200 €/v	Säästöt lämmityksessä 8 000 €/v	Säästöt lämmityksessä 4 100 €/v	Säästöt lämmityksessä 13 100 €/v
Leanheat investointi 7 200 €	Leanheat investointi 5 700 €	Leanheat kustannukset 6 800 €	Leanheat kustannukset 7 700 €	Leanheat kustannukset 10 500 €
Takaisinmaksuaika < 2 v	Takaisinmaksuaika < 2 v	Takaisinmaksuaika Noin 1 v	Takaisinmaksuaika < 3 v	Takaisinmaksuaika < 2 v

| Jatkuva mittaus | Tekoäly oppii ja mukautuu | Aina optimoitu lämmityksen säätö | Älykäs olosuhteiden valvonta ja huolto | Jatkuva prosessi tasapainon, kiinteistöjen kunnon ja olosuhteiden parantamiseen |

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Leanheat käyttöönoton sisältö ja toimintamalli

Avaimet käteen toimitus

Käyttöönotto sisältää tyypillisesti seuraavat laitteistot ja palvelut:

- Huoneistoanturointi ja kattavat mittaukset lämmönjakohuoneeseen, tiedonkeruuverkko, Leanheat-yhteensopiva vapaasti ohjelmoitava lämmönsäädin/kiinteistöautomaatioyksikkö, 3G-liittymä.
- Jatkuva tekoälypohjainen lämmönsäätö sovittujen tavoitteiden mukaisesti.
- Jatkuva lämmitystekniikan ja olosuhteiden etävalvontapalvelu (tekoälyn + asiantuntijan voimin).
- Tekoälyä hyödyntävä prosessi ennakoivaan huoltotoimintaan ja kunnossapidon tehostamiseen.
- Käyttöliittymät huoneistokohtaisen datan analysointiin asiakkaan henkilöstölle.

Palvelun käyttö on asiakkaan näkökulmasta vaivatonta:

- Käyttöönottovaiheessa sovitaan yhdessä hyvä ja terveellinen sisäolosuhdetavoite.
- Halutessaan asiakas voi seurata olosuhteita reaaliaikaisesti netin yli ja muuttaa tavoitearvoja. Dedikoitu Leanheat energia-asiantuntija kuitenkin vastaa siitä, että kaikki toimii.
- Tarvittaessa toteutetaan asuntoihin "hienosäätökäyntejä" joko huollon tai Leanheatin toimesta.

Asuntokohtainen mittari
(lämpö, kosteus)

Leanheat-yhteensopiva
lämmönsäädin

| Jatkuva mittaus | → | Tekoäly oppii ja mukautuu | | Aina optimoitu lämmityksen säätö | → | Älykäs olosuhteiden valvonta ja huolto | → | Jatkuva prosessi tasapainon, kiinteistöjen kunnon ja olosuhteiden parantamiseen |

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Esimerkki ennakoivasta huollosta: Homeongelmien ehkäisy Espoon Asuntojen kanssa

- Rakennettiin älykäs kosteusseuranta ja hälytykset

- Otettiin käyttöön 5000 asunnossa → 16 asunnosta heti kriittisen tason kosteushälytys

- 15/16 asunnosta löydettiin selkeä vika, joka korjaamalla todennäköisesti ehkäistiin vakavien homevaurioiden ja terveyshaittojen synty (esim. tukkeutuneet venttiilit tai epäkuntoiset ilmanvaihtokoneet)

Kosteuslisä (g/m³)

■ Kohteen keskiarvo ■ Ongelma-asunto

Tammikuu   Helmikuu   Maaliskuu

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Lisämateriaali 4
Käyttöliittymäkuvia Leanheat-
raportoinnista

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**Lisämateriaali 1
Kiinteistön lämmitys ennen ja jälkeen**
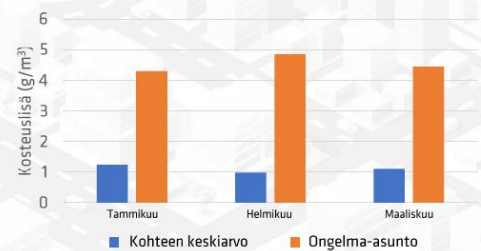
Leanheatin "perustoimitus" teknisestä näkökulmasta

**Ennen
Taulukkosäätö**

Huolto — LJH — Ulkolämpötila

**Jälkeen
Tekoälysäätö**

Huolto — LJH
Leanheat AI
- Asuntoanturit
- Sääennuste
- Kysyntäjousto

Ennen (Taulukkosäätö):
- Lämmitys perustuu vain ulkolämpötilaan
- Lämpötilat poukkoilevat esim. syksyisin – valitukset
- Lämmitys ei huomioi energiayhtiötä aiheuttaen turhia päästöjä
- Säätökäyrää ylläpidettävä manuaalisesti
- Tasapainotus kalliilla perussäädöillä ja rajallinen mittatieto käytössä
- Talotekniikka "tyhmää" – moni asia vain huoltomiesten varassa

Jälkeen (Tekoälysäätö):
- Lämmitys perustuu sisälämpötiloihin, sääennusteeseen ja tarpeeseen
- Sisälämpötilat tasaiset – asukkaat tyytyväisiä
- Lämmitys huomioi kysyntäpiikit – energian tuotanto vihreämpää
- Tekoäly säätää lämmitystä 10 minuutin välein täysin huoltovapaasti
- Tasapainotus hienosäädöillä – tiedon avulla korjataan todelliset ongelmat
- Perussäätöjen tarve vähenee ja niiden toteutus on edullisempaa
- Tekoäly valvoo talotekniikkaa ja kosteusolosuhteita, jolloin talot pysyvät kunnossa ja kulut kurissa – säästöjä tulee myös esim. vakuutuskuluissa

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Leanheatin "perustoimituksen" hyödyt loppuasiakkaalle

Jälkeen
Tekoälysäätö

Asuntoanturit

Sääennuste

Kysyntäjousto

- Lämmitys perustuu sisälämpötiloihin, sääennusteeseen ja tarpeeseen
- Sisälämpötilat tasaiset – asukkaat tyytyväisiä
- Lämmitys huomioi kysyntäpiikit – energian tuotanto vihreämpää
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Korkeat lämmityskulut

Energiamaksu –10%
Perusmaksu –20%

Reaktiivinen huolto
- paljon kohdekäyntejä

Ennakoiva huolto
Automaattinen analytiikka

Epätasaiset sisälämpötilat
- puutteet kalliita korjata

Tasaiset sisäolosuhteet
- toimenpiteet datan pohjalta

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Tietoa yrityksestä

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Leanheatin asiakkaita ja kumppaneita

ASENNETTU JO
100 000
ASUNTOON

Skaalaus
globaalisti
1 000 000

Skaalaus
Suomessa
100 000

Laajentaminen
15 000

Pilotti
2 000

Leanheat-asuntojen
määrä 2014-2022

Jatkuva
mittaus

Tekoäly oppii
ja mukautuu

Aina optimoitu
lämmityksen säätö

Älykäs olosuhteiden
valvonta ja huolto

Jatkuva prosessi tasapainon, kiinteistöjen
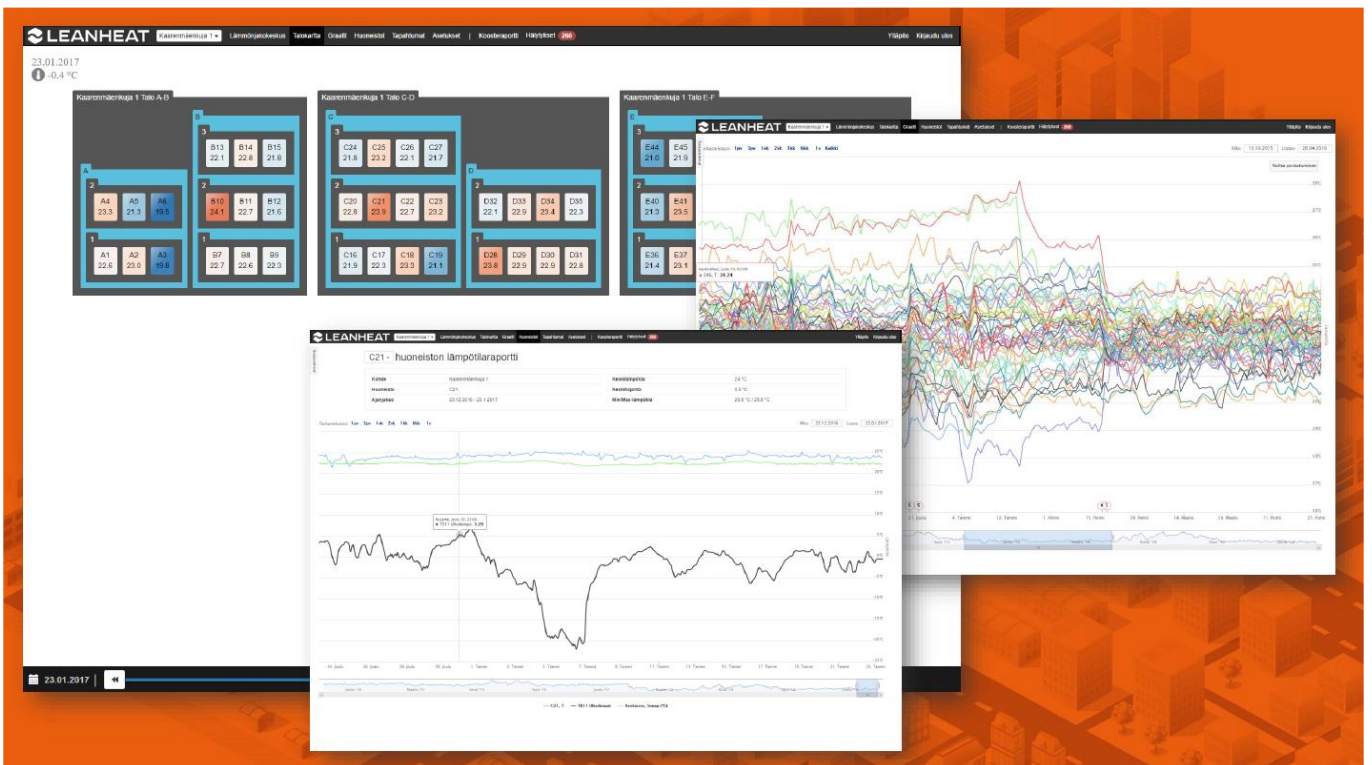kunnon ja olosuhteiden parantamiseen

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Suomalainen kasvava ja kansainvälistyvä teknologiayritys

Osaksi globaalia toimintaa
Vuonna 2019 Leanheat siirtyi
Danfossin omistukseen. Toimintaa jo
kaikissa Pohjoismaissa, useissa Keski-
Euroopan maissa sekä Kiinassa.

Töissä noin 50 henkilöä
Töissä kiinteistö-, ohjelmisto- ja
energia-alan parhaat ammattilaiset.

Liiketoiminta alkoi 2014
Liiketoiminta alkoi osana Pandia
Oy:tä, Leanheat perustettiin 2016.

Miljoona asuntoa vuonna 2022
Tavoitteena ohjata 1 000 000
asunnon lämpötilaa 2022 mennessä.

Liikevaihto 2018 noin 10 m€
Olemme kasvaneet kannattavasti ja
tuplanneet myyntimme vuosittain.

Kohti kansainvälistä kasvua
Kansainvälistymisen tueksi solmimme
strategisen kumppanuuden Danfossin
kanssa. Danfoss tukee kasvua myös
pääomasijoituksen voimin.

ASENNETTU JO
100 000
ASUNTOON

LEANHEAT

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SMART
Life