

Deliverable Proof – Reports resulting from the finalisation of a project task, work package, project stage, project as a whole - EIT-BP16

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Supporting documents:

Relevant report

Helsinki Kalasatama - District Challenge 1

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Abstract

In the second half of 2016 Smart Sustainable District executed a District Challenge one project, that has the aim to create relationships between SSD and Helsinki and its stakeholders, as well as identify opportunities that then lead to long-term projects on sustainability and climate change. SSD has successfully, executed this District Challenge, that actually led to an identification of several exciting areas to tackle:

- Develop and implement for the City of Helsinki a framework that will allow to translate long-term targets into short term actions to drive sustainable solution, with related topics on:
 - Creating an Energy Transition Vision and Strategy for Kalasatama
 - Identify co-benefits and co-investment to drive blue and green solutions to tackle climate change issues
 - Identification of viable use cases and business models for the available data

In 2017 SSD will work together with Helsinki to work on these topics and to implement solutions.

Introduction

Finnish context

Finland is one of the Nordic countries with a population of 5,5 million people. The average temperature in Helsinki on the southern coast of Finland is approximately 6°C and the seasons vary from hot summers to cold and snowy winters. The harsh weather conditions have forced us to be innovative in developing smart and resource-efficient solutions. Highly educated people, together with competitive business environment, and access to public research and development funding enhance opportunities for first-class innovations and businesses. Finland is a member of the EU and thus the EU directives are binding in Finland. Finland has approved Kyoto protocol. Finland has at state level approved that human induced greenhouse gases cause global warming.

Mass urbanisation is a global trend for the near future. Smart cities offer huge business opportunities for new solutions. Every year hundreds of billions of euros are invested in built environment, energy systems and traffic, as well as in various infrastructure services. The Finnish state-of-the-art competence can serve as a base for the solutions that are developed for global needs. Finland wants to remain a forerunner in supplying sustainable innovations also in the future. Clean technology in Finland is largely focused on energy efficiency solutions for business. These solutions include using biomass as a renewable energy source and efficient waste management. In addition to large commercial clean technology companies like KONE and Neste Oil, Finland has a thriving start-up culture, featuring a clean technology incubator in downtown Helsinki.

Thus, Helsinki, the capital of Finland, is in a key position to drive sustainable smart services and environment for the future.

Helsinki context

Helsinki is one of the fastest growing metropolitan areas in Europe. Today, there are 630 000 inhabitants in Helsinki, but the capital region expects to house 490 000 more people in the next 35 years. In the forthcoming decades, the city of Helsinki will expand faster than ever before, with the construction of a variety of apartments, offices, kindergartens, schools, parks, streets and recreation areas.

To meet the needs of the growing population, the City of Helsinki aims to build quality neighbourhoods where people can enjoy both work and leisure. The recent construction of a new cargo harbour in the East of the City, some distance away from the city centre, has provided the opportunity to develop several new districts close to the old city centre. To boost new sustainable urban solutions, the Helsinki City Council decided 2013 to make one of the new area construction sites, Kalasatama a model district of Smart City development. Kalasatama is a former harbour and industrial area of approximately 175 hectares of waterfront on the eastern side of the city centre owned by the City of Helsinki. The new Kalasatama area of Helsinki will be the testbed district for this project.

Besides heavy construction also climate change causes major changes in the nature, the built environment and the economy of Helsinki. Climate change should be mitigated by reducing greenhouse gas emissions, and it is necessary to adapt to changes in the climate. Helsinki strives to reduce greenhouse gas emissions by 30 percent by year 2020 and to become carbon neutral by 2050. Furthermore, Helsinki will increase the use of renewable energy by 20 percent and reduce per-capita energy consumption by 20 percent. New climate targets for the year 2030 are under preparation. The City of Helsinki's climate work is detailed on the pages on the city climate. The Helsinki energy company (Helen) has prepared a development programme aimed at increasing the use of renewable energy – "Development programme towards a carbon neutral future 2020+". This programme, which has been approved by Helsinki City Council, includes a plan for concrete action to achieve the 2020 climate goals and envisions guidelines for operations to 2050.

Kalasatama District context

Kalasatama district will offer a home for approximately 25,000 residents and jobs for 10,000 people by 2035. Currently, there are 3,000 people living in the area.

Smart Kalasatama is already a vivid Smart City experimental innovation platform to co-create smart&clean urban infrastructure and services. Smart Kalasatama is developed flexibly and through piloting, in close co-operation with 200 + stakeholders including residents, companies, city officials and researchers. 37 companies, both large and SMEs have signed a partnership agreement with Smart Kalasatama program. Active companies in the district include developer and construction companies, local energy company, ICT and smart city start-ups and consulting companies. Most Helsinki city departments are developing the district including the urban planning, real estate, education and economic development departments. All the universities (4) in the Helsinki region are participating as research partners in the numerous projects on-going in the district.

Smart Kalasatama program is running an ambitious innovation platform, where more than 25 innovative infrastructures and building projects are on-going. In addition to that, Smart Kalasatama is hosting innovative agile experimentation projects, where mainly start-ups co-develop their new smart solution prototypes with the residents in the district. For instance several projects related to smart waste management, smart minigrids and mobility as a service (MaaS) are experimented.

Smart Kalasatama Innovator's Club network meets regularly to offer a platform for matchmaking and sharing for all the active developers in the district. Moreover, the Smart Kalasatama programme hosts weekly co-creation workshops and events to accelerate smart and sustainable urban development in the district.

The City of Helsinki executive office is leading the area construction project in Kalasatama. The Smart Kalasatama programme is governed by the city of Helsinki, the deputy mayor Anni Sinnemäki being the chairman of the board. Smart Kalasatama programme is co-ordinated by 100% City owned Smart City Innovation and development agency Forum Virium Helsinki. As Smart Kalasatama is receiving its main funding through Finnish 6Aika Smart City programme, it is also governed by the Uusimaa Regional Fund responsible of 6Aika ERDF funds.

Individual projects in the district are governed by their owner defined governance structures. The City of Helsinki as a local authority and major land lord, is supervising and inspecting most development taking place in the district.

Kalasatama integrates the urban structure of Helsinki making it more compact. Kalasatama will be a lively district, offering both rental and owner-occupied apartments, as well as housing for students and seniors. A total of 1,000,000 m2 new housing premises will be built to house 25 000 people, along with 390,000 m2 of office premises. Planning aims to create a compact city milieu situated close to maritime nature, with many apartments enjoying a spectacular view over the beautiful archipelago. In Kalasatama, the residential houses extend almost down to the waterfront, and there will also be space reserved for a waterfront route for outdoor activities.

The first services are in place including a day care centre and a "future school" which opened its doors fall 2016. REDI shopping centre located in the heart of the area will house most of the area's commercial services. REDI will consist of a commercial complex and a number of high-rise buildings comprising a hotel tower, and residential towers. The shopping centre is scheduled for completion in 2018 and the rest stepwise by 2023. The tallest of the 20- to 30-storey towers will rise to 132 metres. The Itäväylä access road from eastern Helsinki and the metro line will go through the centre, covered by a green courtyard deck.

Ecological solutions are important in the plans for the Kalasatama area. The Public transportation in Helsinki will be carbon neutral by 2020. Effective public transport, which helps to reduce air pollution, is one of the greatest benefits of Kalasatama. The transport system is based on the development of the metro and other connecting services, including tram lines and bus services. A new mini terminal in the metro station will serve as an intersection of public transport in the future, connecting Kalasatama to the city centre and other parts of the Helsinki metropolitan area. Electric car sharing is already piloted in the district.

The carbon-neutral future of energy services is being built in Kalasatama. In this model, smart-grid area, the user of electricity can also be its producer. Helsingin Energia, Helen Sähköverkko Oy, ABB and Fingrid are

collaborating to pilot future smart energy solutions in Kalasatama. First estates are already connected to smart grid, and all the rest of the are to be built will benefit of the grid enabling real time smart metering, electric vehicles network and new storage solutions for electricity. A solar panel plant already exists in the hood and the whole district is connected to the district heating and cooling grid.

A possible rise in sea level along with unusual weather conditions have been taken into consideration in planning Kalasatama, and they pose no threat to the area. The streets of Kalasatama will be built at least 2.6 meters above sea level, with the lowest floor level to be approximately 3.5 metres above sea level.

The logistics of Kalasatama is eased with an automated vacuum waste collection system. Covering the whole area, the piping connects to the Kalasatama waste collection point, which is located in the centre of the area. Residents carry sorted waste from their domicile to the waste collection point in their yard. Containers are separated for mixed waste, biodegradable waste, paper and carton, with sorted waste automatically suctioned into the pipe work, greatly improving the convenience of waste transportation.

A key ambition of Smart Kalasatama is to turn smart and clean development truly human centric. Thus the vision of Smart Kalasatama takes the resident in the centre and promises that each resident in the district will gain an extra hour of own time every day. So, the district will need to be so resource efficient that new city services save even the most valuable resource of the people: their own time. So the smart and clean innovations need besides being sustainable also to create a firm foundation to manage one's life better. The one hour challenge means excellent mobility and logistic service and possibility to work, live and play in the proximity of one's home.

Further, the one hour challenge should result a wealth of business opportunities. How to create 21st century urban services that enable people to manage their lives better in a sustainable way? Service creation will be supported by digitalization and data. A future vision is to provide an Internet of Things platform, that works as a system for systems service across different industries, enabling data driven services to integrate.

An important ambition of the district is to develop a smart grid of global significance, where the latest technological innovations in energy, information and telecommunications are combined to serve both the (utility) companies and the consumers. This will create a sustainable energy system with services that are also suitable to be scaled elsewhere.

All in all, the Kalasatama smart district aims at being a world class testbed for new smart integrated solutions which could be replicated and scaled up elsewhere. Thus, the new solutions are oriented toward commercialization, looking for first experiences and a reference in Kalasatama. There are already 78 companies actively developing their solutions in the district, so the base for new smart&clean business development is well established.

Purpose of the District Challenge 1 SSD activity

Smart Kalasatama joined the Climate KIC Smart and Sustainable District challenge to take the sustainability work in the district to the next level with help of international experts. The District Challenge 1 is a qualitative single 2 to 3-day workshop that brings together key SSD experts and local district experts. The local district experts are local stakeholders who already work or/and are based in the district, or conduct relevant activities.

BEFORE THE WORKSHOP:

The District Challenge KAM brings stakeholders on board and creates the relationships between them. Potential local stakeholders come from local developers/investors, local authorities, local businesses, residents (or their representation), local champions, utilities, infrastructure providers. Specifically, the local developers and investors play a crucial role as co-funding or collaborating with existing programs allows the biggest impact. At this stage the KAM, together with the buddy KAM, can already identify potential areas of opportunity - though these will have been already highlighted within the district's membership application

AT THE WORKSHOP:

To the workshop itself, a variety of SSD experts come from SSD/CKIC partner institutions (local or international) who have content knowledge as well as are familiar with CKIC's portfolio in the 4 areas of "physical (energy) system solutions", "Implementation expertise", "simulation and modelling" and "Data infrastructure".

The workshop and process is facilitated by SSD integration experts who guide the workshop together with the SSD KAM.

Output: Relationships between SSD and local district. District experts/stakeholder made aware of potential solutions. Identification of Opportunities. Potential design of workgroups to tackle these.

Purpose of the District Challenge 1 Workshop and the Post-processing

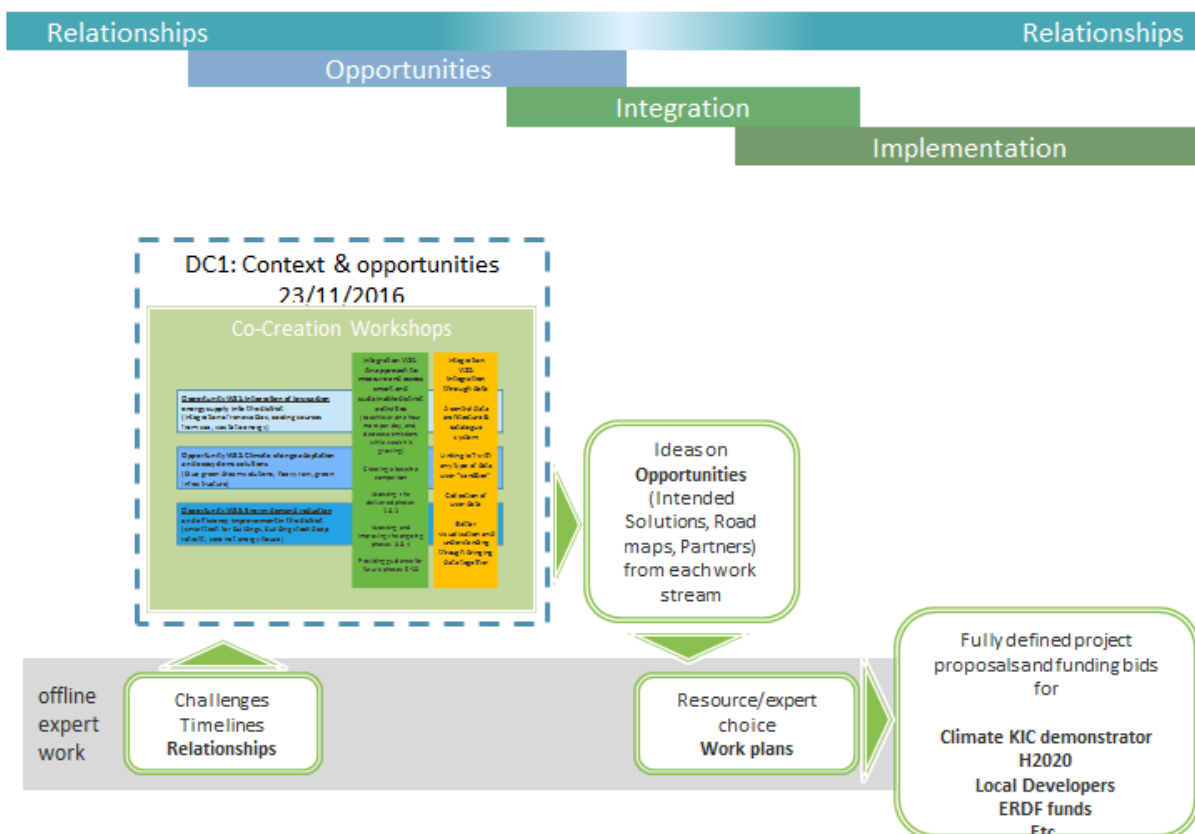


FIGURE 1: DISTRICT CHALLENGE 1 – HELSINKI CASE

AFTER THE WORKSHOP

KAM, buddy KAM, portfolio manager, together with identified work stream experts and leads, and district champions/experts create proposals (with budget and content) for areas of opportunity, with potential SSD content experts.

These can be used for District Challenge 2 or for the collaborative application to other funding programmes, including other Climate KIC funding calls. The proposal can be also made to the local developer/investor showing the value of these activities.

Output: Opportunities for integration. Project/workgroup proposals.

Furthermore, suitable SSD/ CKIC resources that could investigate and work together with local district stakeholder in workgroups around these opportunities are proposed.

Areas of interest

Before starting the SSD challenge, the idea was introduced to the Smart Kalasatama Innovators' club.

The Club is a collaboration network meeting four times a year, helps participants to regularly share news and get information about upcoming events and future projects. Through networking and sharing, the goal is also to speed up innovation by finding new matches for collaboration and projects. The club brings together start-up's, SMEs, NGO's, large companies, researchers, as well as city officials and resident innovators.

The Innovators' Club represents a new kind of district-based co-operation. In Smart Kalasatama, the entire district forms a test environment for new services. A well-functioning collaboration network provides a natural way to introduce new experiments to the area.

On September 15th, the Innovators' Club gathered together to contribute to the planning of the Climate KIC – opportunity identification process. The club members were informed about the EIT Climate KIC Smart Sustainable District –network, and about Kalasatama being part of the initiative that brings funding and expertise to Helsinki to take forward selected actions in Smart Kalasatama development. SSD buddy KAM Chris Mazur and Business developer Dr. Peter Vangbo joined the workshop along with the the core local team to discuss the opportunities within the Climate KIC. In the workshop participants identified some opportunities for in the district, which were on the following day together with the buddy KAM and the core local team cultivated into 3 Opportunities further explained in the following chapter.

Outputs of Innovators forum

The figure provides a summary of the areas of opportunity that had been identified. Below are discussed each identified topic in more detail.

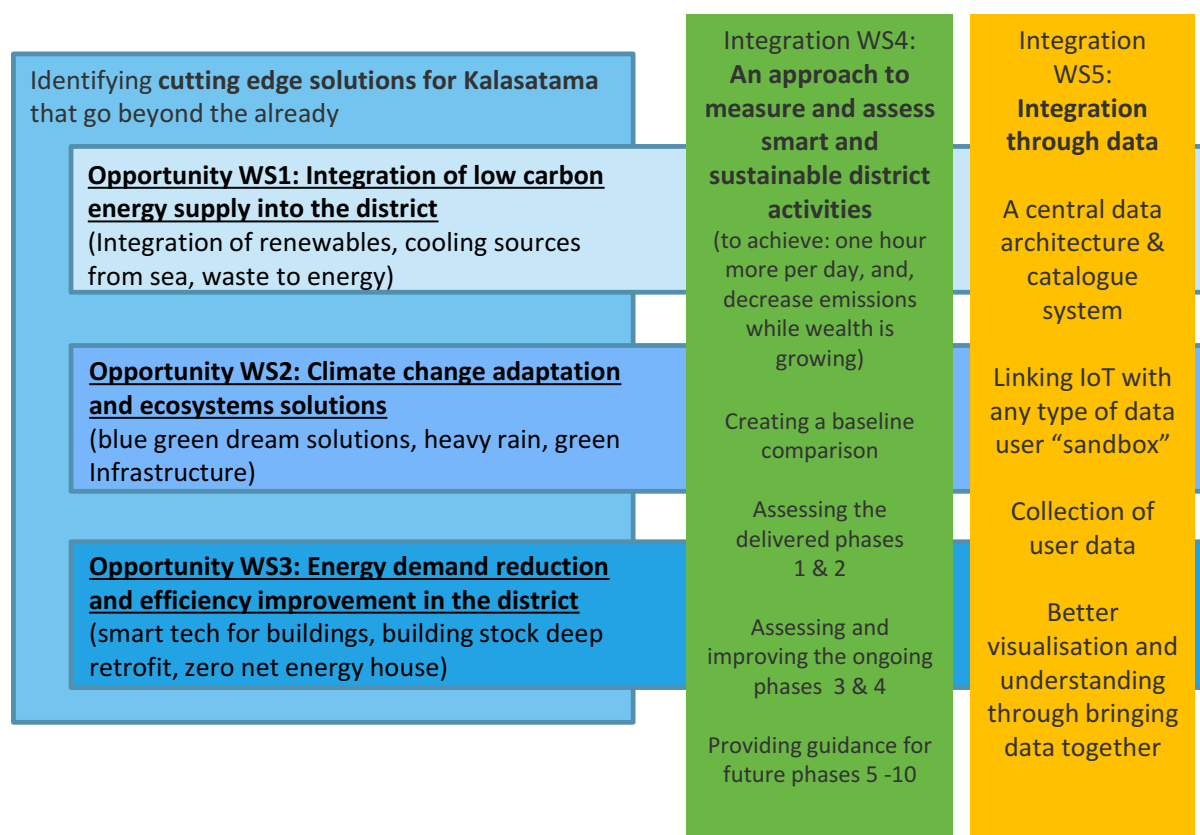


FIGURE 2: IDENTIFIED WORK BY LOCAL STAKEHOLDERS

Integration of low carbon energy supply into the district

Kalasatama district is the testbed of smart energy systems in Helsinki, led by a consortium including Helen, ABB, Fingrid and their network. The city requires all the estates to be part of the smart grid and provide certain smart energy service for the resident. The smart grid system supports local energy production, an opportunity which is little used and planned in the district so far. Thus, the integration of low carbon energy supply into the district was chosen as an important development topic for the SSD workshop.

The topic is timely, as the City of Helsinki aims to achieve carbon-neutral energy production by 2050. For emission neutralization development programme towards a carbon-neutral future has been launched by the utility company. The security of energy supply is based on several production forms, including the fossil fuels natural gas, coal and oil, the renewable bio-, hydro- and wind power, and nuclear power.

Helen, the energy company owned by the City of Helsinki, has several approaches to aim for carbon-neutral energy production.

- developing new innovations to meet the climate challenge.
- introducing biofuels at our power plants.
- increasing the use of wind, hydro and solar power.
- investing in smart energy systems to utilize small-scale production and waste energies.

As Kalasatama is already the lieu of smart energy piloting, having an advanced smart grid infrastructure, it will be a natural step to use the district to champion carbon-neutral energy production.

Climate change adaptation and ecosystem solutions

In general, the goals for sustainability (e.g. for energy efficiency, renewable usage, storm water handling) in Kalasatama are not ambitious and not clearly stated. The progress is not fast enough in order to be a world-famous area of smart&clean solutions. The binding contracts (policy, strategies) with the city and the developers require few things, and developers and constructors don't want to take other extra steps in sustainability. So they merely deliver what the building code and other regulations dictate. A reason behind is that extra steps generally don't give them any benefit in the sale/rent.

Kalasatama district is located by the sea, so the storm water goes to the sea. The rise of a sea level was taken into account when planning, so no other adaptation measures were needed. There are few green roofs, but they were built mostly for other reasons than adaptation.

The city planning department has an environmental action plan with ambitious goals for the climate adaptation, but it is not yet widely applied in the planning process. The Mayor founded a Climate working group last year for preparing a climate adaptation strategy, and this is an ongoing process. Few weeks ago the also a new green roof strategy was approved by the city council.

Climate Change Adaptation challenges: Currently, it seems that there is a lack of green spaces identified in Kalasatama, but there is space for a learning curve since some areas have not been planned yet and there is a chance to establish temporary nature-based solutions for current construction sites. This is a good chance to test climate adaptation measures.

Energy demand reduction and efficiency improvement in the district

Helsinki set high goals in regards climate mitigation, it aims to become a carbon-neutral city by 2050. To meet the goal, it is targeted to decrease greenhouse gas emissions by at least 30 percent by 2020; improve energy efficiency improved by at least 20 percent by 2020 and increase the share of renewable energy of the procurement of electricity, district heating and district cooling by Helen to at least 20 percent by 2020. Currently the thermal energy demand of the district is higher than the electricity demand, however, the cooling demand is growing. The energy demand is satisfied mostly by district heating (CCHP). In some parts of the district, buildings are already connected to a smart grid. Measures have already been implemented to decrease the energy demand of the district, e.g. HIMA Smart Metering, IMU pipeline Waste Collection System, Smart Lightning in a park, Solar park and Electricity Energy Storage. However, a common set of energy efficiency targets is missing from the district and the involvement of an independent and interdisciplinary panel of built environment experts. Setting up a sustainability team who provides a framework for the project and ensures the implementation of design measures from the conceptual phase till the operational phase could ease the process.

The energy norms of buildings in Finland have been tightened in 2010 and from the beginning of 2012. Helsinki aims to be a forerunner in climate change mitigation, so the city wants to tighten the building codes even further to reach its goals.

Helsinki owns itself a major part of the city's building plots, so it can give requirement of the energy norms in those plots. In 2010 the mayor of Helsinki established a working group with energy experts from the city offices to improve the energy efficiency on new construction in Helsinki.

The working group made a proposal for the energy-efficiency requirements in giving out residential city-owned plots. According to the decision made in spring 2011 by Real Estate Committee, a binding requirement in all reservations of residential plots has been that the building must fulfil the requirements of energy efficiency class A (100 kWh/m² for apartment houses). This is quite similar to the low energy construction standards. Due to this decision, from 2011 the most of the new residential buildings will be in practice low energy construction.

When looking at the building permits granted in 2009 and 2010, it is obvious that the energy-efficiency of new buildings in Helsinki improved. In 2010, approximately 23% per cent of the gross floor area in new buildings for

which the Building Regulation Department issued building permits met the requirements of energy-efficiency class A, while in 2009, the share was approximately five percent. Even though the development is supported with outstanding technology the behaviour change does not happen automatically. Rather, it requires heavy engagement of the citizens and availability of attractive services supporting sustainable lifestyles. The Smart Kalasatama project is driving a number of pilots in the district to reach resident and introduces new sustainable solutions. Still, behavioural change is slow and often requires changes in larger entities like the Finnish cultural heritage, the available services and business models and existing regulations and city policies.

An approach to measure and assess smart and sustainable district activities

With regard to the measuring and assessment of smart and sustainable district activities four aspects are of interest for the Kalasatama district.

- Create more ambitious goals
- Measure the impact of solutions
- Target Smart Sustainable instead of Smart vs. Sustainable
- Streamline planning efforts

In the following sections these four areas are explained in a bit more detail.

Create more ambitious goals: in general, the sustainability goals for Kalasatama do not extend much beyond what is legally (e.g. the building code) mandatory. The goals for the district are therefore not very ambitious (e.g. for energy efficiency, renewable usage, storm water handling) and progress towards deep sustainability is not fast enough. There are frameworks (of the city of Helsinki: e.g. the climate goals, energy efficiency goals, renewable energy goals in city level, the green roof strategy or climate adaptation action plan) in place, but it is difficult to incentivize stakeholders to take the extra step.

Measuring impact of solutions: this is twofold. First get the overall goals on a more ambitious local level to stimulate developers, planners, constructors to take larger leaps into sustainability. Second, not only the goal-setting but also impact assessment of solutions should be perceived as important. Because if you can show that measure 'x' (e.g. storm water handling solution or energy efficiency measure) is both sustainable and cost-effective this might induce quicker action. Finally, use data to effectively communicate the status to all stakeholders.

Towards Smart Sustainable: The Kalasatama Steering Group is the strategy and planning board of the district development. The Environmental Department was only involved later in the development phase of Kalasatama. Prior to this the ambition expressed for the district veered mainly to being 'smart' (which was the first vision for the district). However, sustainability is often seen as being embedded in the resource efficiency of "smartness". Still, for sustainability the city has set clear goals, which is not the case of smartness, which one could say is just a vehicle towards different goals. So, it would be valuable to marry the smart means with sustainability ends and keep still "the one more hour" human-centered challenge as the common vision. Streamlining planning efforts: Altogether, there are ten different city detail planners for the area; in the past it has not been easy to have a streamlined discussion on planning efforts. The planners are open-minded in adaptation and mitigation issues if further political pressure is emerging.

The first step to combine the different planning views and provide combined smart&sustainable metrics was carried out by Réka Tóth a Climate KIC pioneer in 2015. She performed a BREEAM Neighbourhood pre-assessment for a Kalasatama block, the Sompasaari area.

Integration through data

In Smart City development and environmental monitoring data plays an important role. In the Kalasatama smart district development, the longer term vision is to provide possibilities to integrate data coming from different services. There is already the most detailed energy and waste data available in the district. New smart services and sensor networks will all yield (hyper local) data.

In smart city services different kinds of data need to be combined: personal data, big data and open data. Often the interplay between hyper local and more general data may provide interesting insights and analysis of e.g. one's consumption patterns or the overall sustainability of the district.

In Finland and its capital region there is an abundance of know-how and data available. People are generating and using vast amounts of data daily in an ever more complex world. Data is like the new oil: it will be the most important resource and the means to create added value. Various actors and different kinds of knowledge are needed to publish, extract, transform, and analyse data, and to provide user experience, support services and consultancy.

Helsinki region is one of the global champions of open data. The city of Helsinki hosts a Helsinki Region Infoshare service, where hundreds of public data sets are available for free use in machine readable format. The open data has generated a number of solutions for example, new smart mobility services. The last couple of years have witnessed the rise of the open data movement, championing collaboration between different sectors of society and availability of free data for everyone. The amount of open data is growing exponentially, as well as ways to utilise it.

With open access to public data, new and more versatile services can be created. What is needed is thoughtful insight into how to turn data into business. A Helsinki-and-Vantaa-based and rapidly expanding Finnish company Vainu – the Finnish word for hunch – is a nice example of the potential that open data has in business-to-business operation. Vainu has found its niche in predictive lead scoring: it combines open data with company databases and helps its customers to find prospective clients.

The Helsinki region is currently investing heavily in open data and focusing on activating companies to utilize open data for business. The regional open data has already been exploited in novel business models. Vantaa is the first Finnish city in the Minecraft game where citizens can now design the city of their dreams in a three-dimensional world based on public maps and GIS data of Vantaa. The Mobility-as-a-Service concept is looking for mobility service operators right now. Or take BlindSquare, a smartphone application that helps blind people navigate the city. In BlindSquare, information derived from Foursquare, mapping tools, GPS, and open data on public transport and services is gracefully put together. The product developed originally in Helsinki now works in dozens of countries and languages.

Helsinki is also a major player in various national and global networks of open data cities, such as the Open Cities network in Europe, or "6Aika", the Six City Strategy in Finland, with various pilot and trial projects.

Sensor technology and crowdsourcing may offer interesting new data in the Kalasatama district. At the moment there are several projects on-going in the district where IoT-platforms are created to host data in secure ways and also many pilots that build sensor networks.

Design of the workshop

This section outlines the design of the workshop. In the morning, the tables (Figure 3) had been designed on the content areas, where local stakeholders, SSD experts and facilitators have developed opportunities – they had been provided with specifically designed templates (Figure 4). In the afternoon session, the experts have been

shuffled and placed into groups (Figure 5) that then worked on integration topics. That way the design of the workshop itself lead to integrative solutions.

Morning session, setup

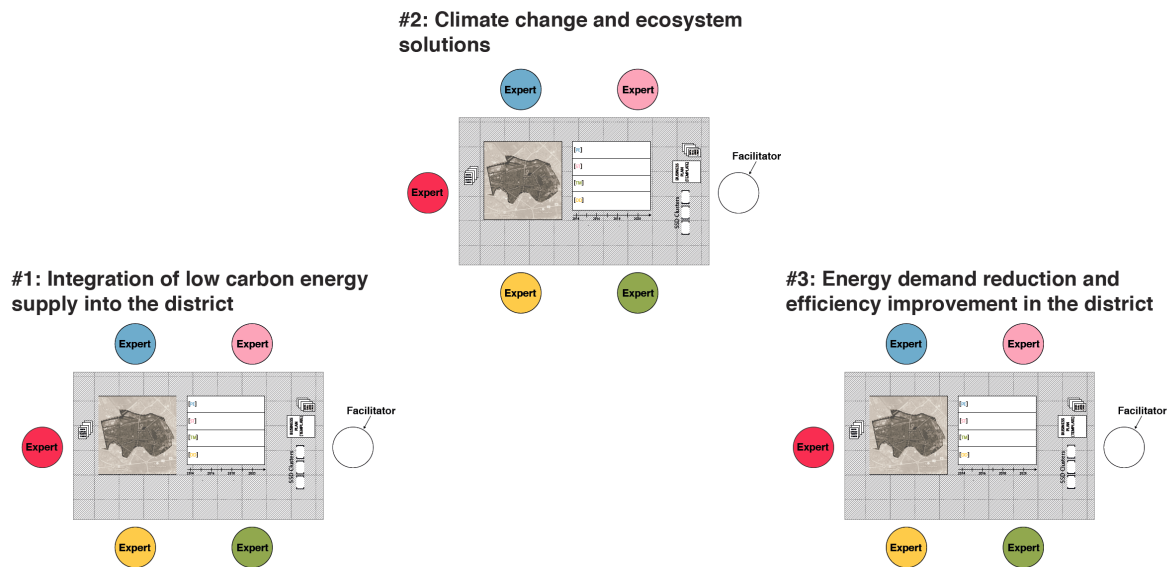


FIGURE 3: MORNING SETUP OF TABLES

Morning session, setup

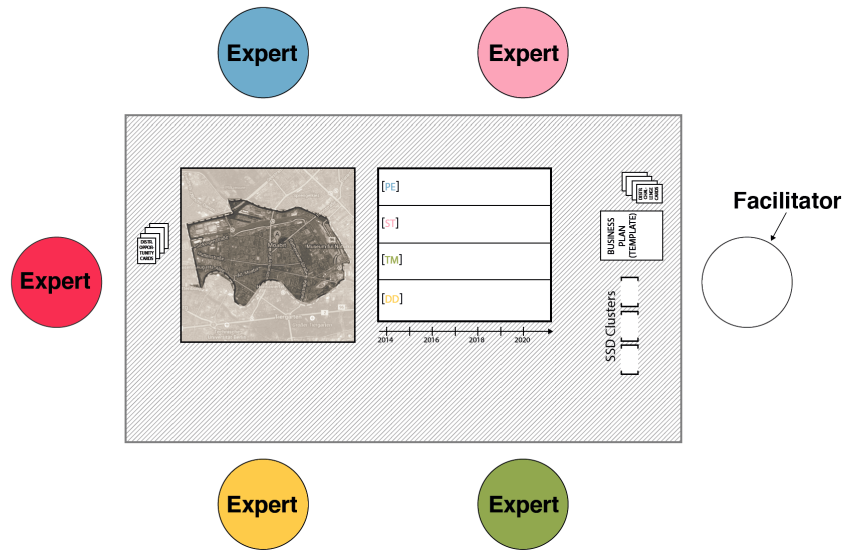
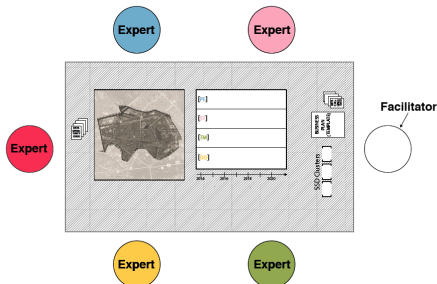


FIGURE 4: TEMPLATES USED DURING THE MORNING SESSION

Afternoon session, setup

#4: Approaches to measure smart and sustainable district activities



#5: Integration through data

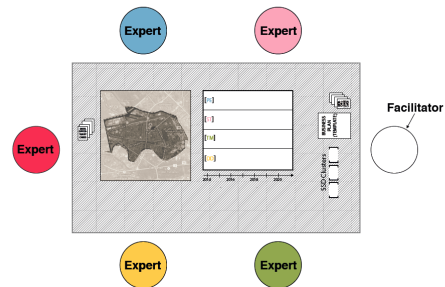


FIGURE 5: AFTERNOON SESSION

Morning session, setup

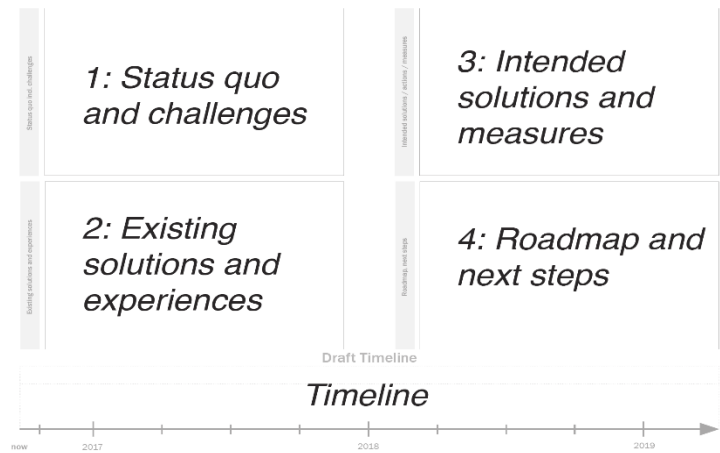


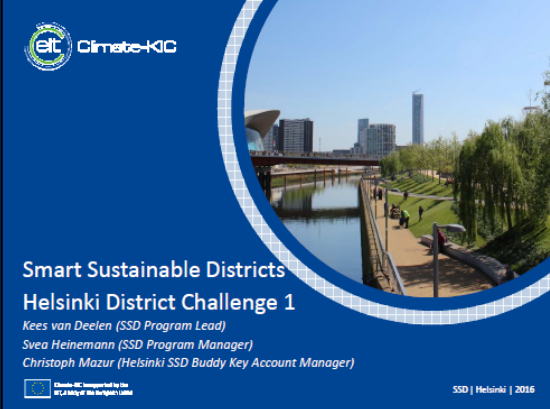
FIGURE 6: TEMPLATE USED IN WORKSHOP

Outcomes from District Challenge 1 Workshop

Introductions


Smart Sustainable Districts presentation summary

To introduce the attendees to the program, the SSD team provided a presentation of the SSD program, the District Challenges, and the day:



Smart Sustainable Districts
Helsinki District Challenge 1
Kees van Deelen (SSD Program Lead)
Svea Heinemann (SSD Program Manager)
Christoph Mazur (Helsinki SSD Buddy Key Account Manager)

SSD | Helsinki | 2016



Climate-KIC started in 2010

Climate-KIC is the EU's largest public private partnership addressing climate change mitigation and adaptation:

- Created in 2010 by the European Institute of Innovation and Technology (EIT)
- Climate-KIC supports the EIT bringing innovation to market quickly by working with partners from across Europe – something they couldn't do on their own



Where we operate

- We work across Europe, with offices in 18 European locations

18 locations



Our mission and vision

- Mission:** we bring together, inspire and empower a dynamic community to build a zero carbon economy and climate resilient society
- Vision:** to enable Europe to lead the global transformation towards sustainability



What we do

We address climate change across four priority themes:

- Urban Transitions
- Sustainable Land Use
- Sustainable Production Systems
- Decision Metrics & Finance

Education



Urban Transitions

Driving the shift towards zero carbon in our cities

- bringing together multiple stakeholders; overcoming barriers to innovation
- encouraging partners to take up the big, scalable ideas that will transform the way we live

Smart Sustainable Districts

- Accelerating transition to **healthier more liveable & resilient low carbon cities**
- Working with **local government & private sector** we help **advance** high profile and aspirational **district-scale developments**



How We Do It - Local Authorities

- Supporting development of local sustainability plans
- Providing access to cutting edge technologies, already tested in other SSD projects

We help with:

- Strategy
- Stakeholder Value Chain Optimisation
- Cutting-Edge Technology
- Community Engagement



How We Do It - Developers & Utilities

- Help coordinate & trial new, integrated solutions
- Disseminate results and replicate solutions

We:

- Work at district scale as an entry point to entire cities
- Co-develop integrated solutions as exemplars for replication and scale-up
- Use international Climate-KIC network to accelerate delivery of innovation in response to district needs



How we do it - Integrating the Market

- Bringing together solution providers & helping them scale up & replicate innovations in new markets

We:

- Bring together leaders and practitioners to deliver solutions, within and beyond the SSD network
- Create market awareness, showcasing a delivered innovation that offers best value solutions to European districts facing public funding squeezes



The SSD Network provides:

- **Opportunities and Resources:** Facilitation, Support, Safe Sharing, Feedback and External Promotion
- **Impact and Integration:** Shared city challenges, Specialist content for non-specialist audiences, Co-creation & incubation, SSD Insights and Shared priorities for support
- **Solutions and Implementation:** Supply side demonstrators, Demand side experiences, Innovation Brokerage



City challenges



Our Approach

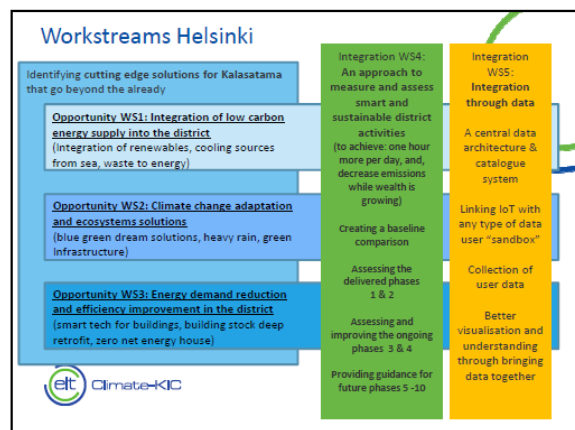
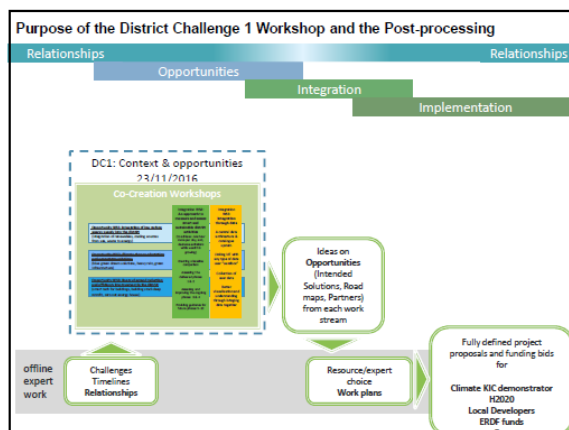
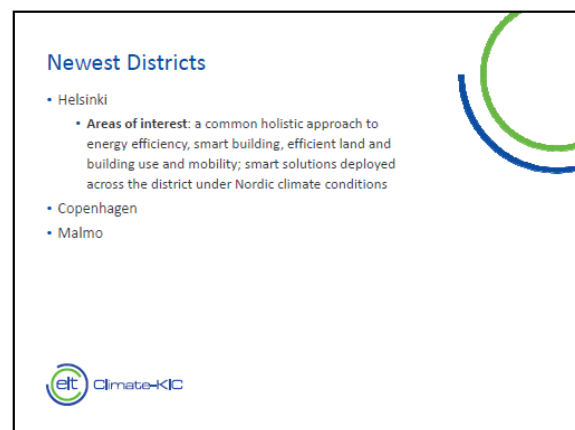


Accelerating transition to healthier more liveable & resilient low carbon cities

By:

- Supporting **Local Authorities** to encourage innovation & deliver change
- Assisting **Developers & Utility Companies** to push boundaries & manage risk
- **Integrating the market** by bringing together leaders and practitioners to deliver cross-cutting solutions





Content Work stream 1: District supply

Attendees

Massnik Roel (Facilitator, TNO, SSD Expert)

Mustonen Veera (Helsinki local lead)

van Dam Koen (SSD Expert, ICL)

Gaziulusoy Idil (Aalto University)

Heinemann Svea (SSD Expert, Programme manager)

Helppolainen Jouni (waste water heating capture, Wasenco Oy)

Huttunen Suvi (Helsinki Planning department)

Ignatius Sonja-Maria (Helsinki Environment centre)

Maura Lars (Siemens)

Miettinen Ville (Smart & Clean Foundation)

Vitikainen Timo (BaseN Oy)

Status quo and existing solutions incl. challenges

Overall aim for Helsinki: carbon neutral in 2050

- Coal power plants will be phased out, replace capacity with renewables where possible
- Decentralised supply of heat and power for Kalasatama
- Challenges:
 - Translating objective for Helsinki to objectives for Kalasatama (e.g. does the district have to be better than carbon-neutral to make up for older districts?)
 - Regulation for connecting distributed generation to the grid
 - Electricity contracts, dynamic prices, service contracts
 - Change of user behaviour; there is no evidence that smart meters in existing development in Kalasatama have had effect

Existing solutions and experiences

Technology:

- Central district heating+cooling systems in Helsinki
- Other cities in the capital region also have their own DH networks, but not connected
- Central solar plant + private PV installations (which only supply to the building they are on)
- There is some electrical storage in the district (1MWh?)
- Bio reactor to process organic waste from food processing industry
- Central waste collection system, waste is processed outside the district now (Vantaa waste incinerator, where energy is used locally not back to Helsinki)

Policy/regulation:

- All buildings have to be energy A level (but that is no longer very ambitious)
- Developers get points for energy efficiency measures in their projects, and can only build if they meet a certain threshold.

Main conclusions

Kalasatama district could take the local energy supply and solution champion role in Helsinki, as the smart grid and related infrastructure sustains new kind of solutions.

Identified opportunities and proposed solutions

Intended solutions/actions/measures

Main focus:

- hybrid heating: centralised generation (from DH network) as well as local generation (e.g. heat pumps)
- hybrid power: power from the national grid, as well as local generation and micro grids

Missing:

- assessment of the potential to generate energy locally given certain designs and scenarios
- analysis of demand profiles under different scenarios (built environment, tech, behaviour)

Examples of technologies/interventions discussed:

- heat recovery from waste water with heat exchanger (shower, condensation etc.) as well as sea water for heat exchange
- opening up heat network to allow DG of heat (e.g. buildings put excess heat into the grid)
- buildings as energy storage (heat and electricity) e.g. thermal inertia, lifts

Services:

- consider focus on services (comfort, light, transport etc.) instead of energy (kWh)
- new business models

Monitoring:

- Design: Assess performance gap design and actual energy efficiency. Use lessons learned for next phase. Adaptable strategy needed.
- Operation: Smart control, demand side management, convenience for users

Roadmaps (of got so far)

Measure first: assessment: demand scenarios supply/generation potential under different designs, technology or behaviour scenario.

Define strategy and ambitions for self-sufficiency, co-development with various local stakeholders. Define what self-sufficiency means.

Evaluate potential for technology, control and other interventions, to meet this ambition and given demand and supply scenarios. Potential interventions include:

- Recycling of heat
- single pipe DH (instead of separate heating and cooling) of 0-15 degrees C
- PV-T (photovoltaic cooled by water to generate warm water)
- Organic Rankin cycle, run on heat to generate electricity
- Buildings as storage and flexible demand, including electric vehicles

Monitoring and evaluation:

- to refine the strategy, and feed into next development phase
- to enable smart control
- New business models and services, e.g. Helen moving away from generation towards trading and facilitating, service contracts for heating homes, etc.

Timeline:

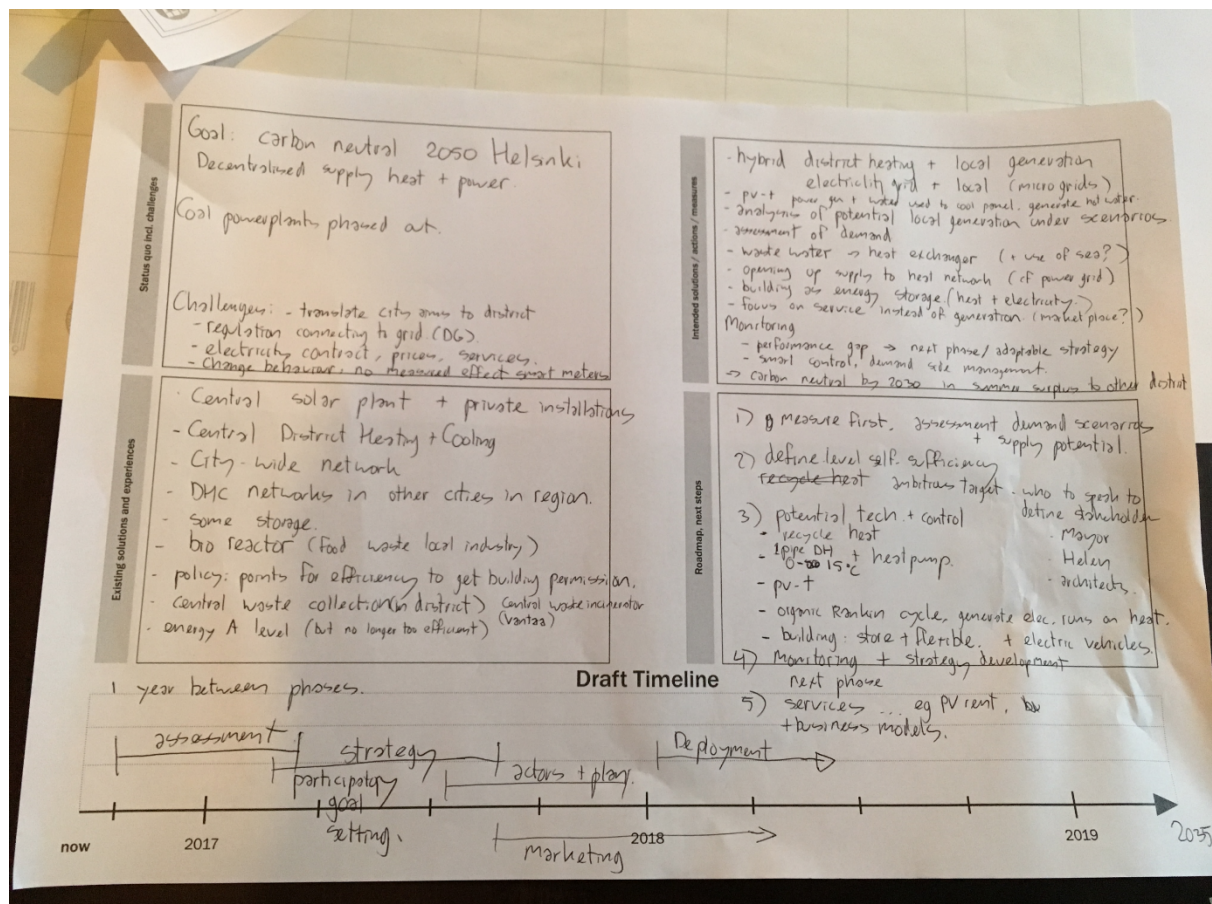
late 2016—early 2017: assessment

early 2017—late 2017: strategy and participatory goal setting

second half of 2017: actor engagement and planning

from late 2017: marketing of the district, engaging future residents

from 2018: Deployment of ambitious plans for Kalasatama, that lead to self-sufficiency (incl possibly supplying to other districts during summer months, with very low demand in winter)



Content Work stream 2: Ecosystem solutions

Attendees

Hubmann Georg (Facilitator)

Jarkko Mira (Local lead, Helsinki Environment Centre)

Bäckman Anni (City of Helsinki Executive office)

Bosch Peter (TNO, SSD Expert)

Deng Ying-Chih (Technical University of Berlin, SSD Expert)

Heinänen Jouni (Helsinki Planning Department)

Rosqvist Kajsa (Helsinki Environment Centre)

Tyynilä Suvi (Helsinki Planning Department)

Van de Ven Frans (Deltares, SSD Expert)

Viinanen Jari (Helsinki Environment Centre)

Status quo and existing solutions incl. challenges

+ Rise of the sea level was taken into account in current built area

+ Central cooling system is in place addressing urban heat island effect

- Storm water goes directly into the sea (it's not a priority of the city)

- drought scenarios not taken into consideration

- More climate change problems expected:
 - o Extreme weather events like no snowfall in winter vs. extreme snowfall (maintenance of roads problematic)
 - o No scenarios for flooding existent
- Adaptation and mitigation measures do not integrate as of yet
- Master plan is set (where is the infrastructure), detailed implementation plan could be still subject to change
- Soil contamination was treated and pipes were installed within the same process
- Advantages of 'Green Factor', rewarding scheme and planning tool for implementing climate change measures discussed for the area → adoption possible and positive but might not be ambitious enough
- One challenge: temporary nature-based solutions for existing area and construction area / involvement of citizens and bottom-up approaches to climate change adaptation
- Existing water surface could be used as the largest solar collector
- Co-housing is a progressive approach but fulfils climate change measures in many cases only accidentally
- IBA (Internationale Bauausstellungen) as a potential role model

Main conclusions

- How to create higher ambitions in climate adaptation measures?
- Traditional Helsinki Scenario: city plans, investors execute → missing dialogue
- Actions are only taken by developers when they are mandatory (and even then, they make an appeal).
- Real estate doesn't see the value in adaptation measures
- Water incl. Circular Economy approach as main challenge

Proposed solutions

Measuring the impacts of the solutions is two-fold: First get the overall goals on a more ambitious level to stimulate. Second, not only the goal-setting but also impact assessment of solutions was perceived as important. Because if you can show that measure 'x' (e.g. storm water handling solution or energy efficiency measure) is both sustainable and cost effective this might induce quicker action. Finally, the use of data and best practices will give stakeholders inspiration to act also.

- Action plan with solutions on short and long term: establishing actions that can be taken on a short term (direct effect) and on a longer-term perspective. The workshop outcome should propose a roadmap with solutions/actions/measures.

Identified opportunities and proposed solutions

Hot topics and vision

1. **New planning model** suggesting more cooperation between urban planning (city departments) and developers; This includes a test area (key is to implement measures in detailed plans), alternative models of financing based on a more diversified business model and participatory elements, potentially green financing leading to price signalling and new incentives for developers, establishing pre-competitive way of working together, integration of participatory processes.
2. **0,0 storm water into the sea**
Taking relevant measures (blue-green solutions) to avoid storm water run-off into the sea
3. **Multiple Functions for rooftops**
Define as requirement; e.g. greening and/or PV panels
4. **Greening on roofs, facades, streets incl. public land use** incl. enablement of participatory processes

5. **Adoption of Standards** E.g. Green Plus Standards for buildings; any other district standards for adaptation measures?

Roadmaps (of got so far)

Approach and suggestion of partners (feel free to add)

1. **Circular economy** (describing technical approach, defining the ambition for the district/for a potential test model area inside Kalasatama)
 - a. Provide an overview of potential adaptation solutions (TNO)
 - i. Explain to developers
 - ii. Start internal learning process
 - b. Screening of existing measures taken and proposals what can still be done to raise ambitions (TUB, Deltares)
 - c. Co-creation process regarding (temporary) nature-based solutions (TUB, Forum Virium and other local stakeholders)
 - d. Adoption of standards, feasibility (Aalto University, Forum Virium)
 - e. Integration with other domains (All)
2. **Co-operation model** (describing processual approach)
 - a. Applied in a pre-defined test area (Forum Virium, City of Helsinki, other local partners)
 - b. Aspirational element important: what has been done elsewhere/in the SSD projects (?)
 - c. Establish connections with international developers and SSD network partners (?)
 - d. Link adaptation with mitigation measures (?)
3. **Green roof discussion**
 - a. Assessment of current situation (TNO, Deltares, data people from Forum Virium, etc., ICL – modelling?)
 - b. Creation of local network (?)
 - c. Scenario development (Deltares, ICL)

Content Work stream 3: Energy efficiency

Attendees

Mazur Christoph (Imperial College London / Facilitator)

Toth Réka (Helsinki / Workstream lead)

Ådahl Maria (Johanneberg Science park Gothenburg / Architect)

Hakala Tuomas (City of Helsinki / Kalasatama Project Manager)

Huuska Petteri (City of Helsinki / Environmental department)

Kallio Atte (Helen / Utility Company)

Miu Lucianna (Imperial College London / Building Expert / Training Trainers)

Reen Natalia (Forum Virium Helsinki)

Rigamonti Dan (Technical University Berlin / Building Expert)

Sahala Sami (Forum Virium Helsinki)

Tani Alpo (City of Helsinki / City Planner)

van Deelen Kees (TNO / Program Board)

Provided content at the workshop

A summary of Smart Kalasatama in regards Energy demand reduction and efficiency improvement has been provided for the SSD experts to have an overview of the current status of the project.

Status quo and existing solutions incl. challenges

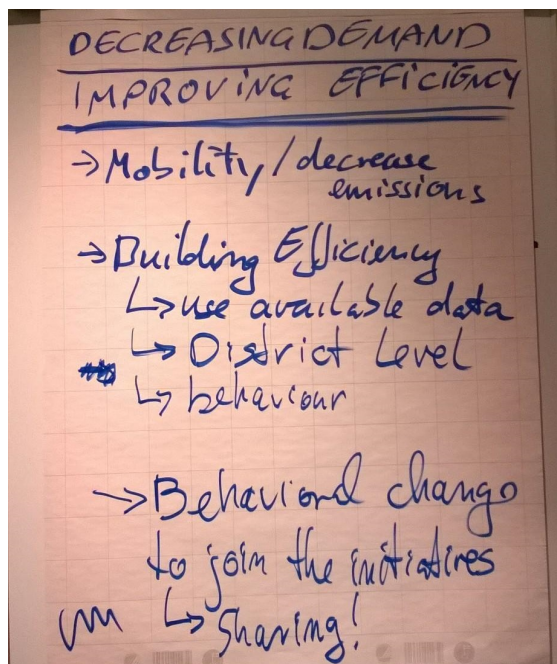
The city itself has high ambitious climate goals and wants to be carbon neutral by 2050. In regards Kalasatama it means a challenge, as it should be carbon positive to help the city meets its targets.

Behaviour change is not happening as fast as it was expected, it can be seen in many fields: e.g. in the field of mobility, in this case people should use the new innovative solutions, however the reality is that car parking is still an issue and rapid charging is not used. Also, the energy efficiency of buildings has been mentioned in regards behavioural change, the low rate of solar panel owners despite the fact of favourable prices. It was commonly agreed that sustainability has its financial impact and in development with so many stakeholders and complexity, innovation and relevant change can occur, if everyone has their benefits. Which is currently not the case. During the workshop, it has been revealed that city planning is slow moving and at the moment it doesn't have the capacity to adapt to any innovation.

Main conclusions and proposed solutions

The main conclusion was that there are already many energy efficiency activities for the new build buildings, however, the promised standards, and aspirations have not been delivered by the developers and building companies. As a result, the table had identified that there was a need for a framework that shall drive the achievement of ambitious sustainability targets. The focus would be put on:

- Mobility and decrease of emissions
- Building efficiency and how to drive it
- To drive behavioural change to join ambitious initiatives



Integration Work stream 4: Measuring and assessing

Attendees

Massnik Roel (Facilitator, TNO, SSD Expert)

Mustonen Veera (Helsinki local lead)

Gaziulusoy Idil (Aalto University)

Helppolainen Jouni (waste water heating capture, Wasenco Oy)

Bäckman Anni (City of Helsinki Executive office)

Bosch Peter (TNO, SSD Expert)

Toth Réka (Helsinki / Workstream lead)

Ådahl Maria (Johanneberg Science park Gothenburg / Architect)

Hakala Tuomas (City of Helsinki / Kalasatama Project Manager)

Huuska Petteri (City of Helsinki / Environmental department)

Miu Lucianna (Imperial College London / Building Expert / Training Trainers)

Rigamonti Dan (Technical University Berlin / Building Expert)

Tani Alpo (City of Helsinki / City Planner)

van Deelen Kees (TNO / Program Board)

Tyynilä Suvi (Helsinki Planning Department)

Hennen Maike (RWTH Aachen University)

Provided content at the workshop

Three presentations were held at the start of the work stream workshop:

- Petteri Huuska from the Environmental Department of the City of Helsinki presented something of the state-of-the-art in measuring and goalsetting at the Kalasatama district.

City of Helsinki

Smart Kalasatama

-measuring and assessing SSD activities



Petteri Huuska
Environmental planner
City of Helsinki

1

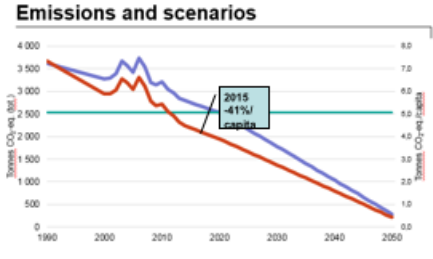
0:15

City of Helsinki

Climate goals of Helsinki

- GHG total emissions -30 % 1990-2020
- Increase energy efficiency by 20 %/capita 2005-2020
- Increase renewable energy in production to 20% by 2020
- Carbon neutral energy production and City by 2050

Emissions and scenarios



— Emissions 1000 t CO₂-eq. (Total) — 30 % emission goal 2020 — Emissions tonnes CO₂-eq./capita

2

0:15

City of Helsinki

State of art 2016 Kalasatama

- **Goals**
 - initial goal (2013) was that it should become the model district for smart living
 - it should incorporate digital services, sensors and IoT in the infrastructure as well as provide a new kind of urban services -> one hour more per day
 - Resource efficiency and energy saving for sustainability have not been key targets in the area
- **Smart city platform**
 - experimenting with different kind of service solution to understand which ones will apply for the future
 - so far biggest technological platform is smart energy system, built on top of the district heating and cooling
 - companies trying out their new solutions, products and services to be able to scale them in the world
- **Developing in co-operation**
 - innovation platform, Living Lab activities and supervising smart city development projects
 - engage the public sector, people, city officials and public funding with private companies (PPP) co-create solutions
 - 3000 citizens living are the pioneers for better services

3

0:15

City of Helsinki

City planning in Kalasatama

- Planning is developing in time so that new technical ideas can be taken into account
- Planning is done gradually and plots are taken into use soon
- Green roofs and solar panels are already in new plans in minor role -> need to be taken into account in building projects
- In some plans centralized cooling demanded (-> district cooling)
- Storm water handling -> directly to Baltic sea (clay soils)
- No extra energy efficiency demands (possible but needs stronger political commitment)
- **Plot assignment stipulations**
 - Smart energy system demand (two way electrical grid)
 - Building code for energy (C-class)
 - Pilot projects so far include architectonic solutions, low construction costs and innovative solutions
 - Negotiation of conditions has become more common

4

0:15

City of Helsinki

Measuring of sustainability, Eco-Viikki

Ecological Building Criteria in Eco-Viikki

Weight		Min.	(-30%)	1st	2nd
10	Pollution				
	CO ₂	kg/m ²	3 200 (-30%)	2 700	2 200
	Waste water	l/m ² /day	125 (-22%)	105	85
	Construction site waste	kg/m ²	18 (-10%)	15	10
	Domestic waste	kg/m ² /year	160 (-20%)	140	120
	Eco labels	materials	none	2	many
8	Natural resources				
	Heating energy	kWh/m ²	995 (-34%)	65	65
	Electric energy	kWh/m ²	45 (-10%)	40	35
	Primary energy	GJ/m ²	30 (-10%)	25	20
	Flexibility, common use		normal	15%	better
6	Health				
	Indoor climate		good		excellent
	Moisture risks		none	better	innovative
	Noise		none	new norm	better
	Wind protection, solar impact		plus		excellent
	Alternative floor plans		normal	15%	30%
4	Biodiversity				
	Plant selection		plus	better	excellent
	Surface water use		plus	better	innovative
2	Food production				
	Planting useful plants		normal	1/3 useful	cultivation
	Topsoil reuse		normal	on site	
	PIMWAG-points total		0		MAX 30


City of Helsinki


Thank you!

More info at www.stadinilmasto.fi/en/
or petteri.huuska@hel.fi.



- Peter Bosch and Dan Rigamonti from the SSD project presented experience with KPI frameworks from the SSD projects in Utrecht and Berlin.

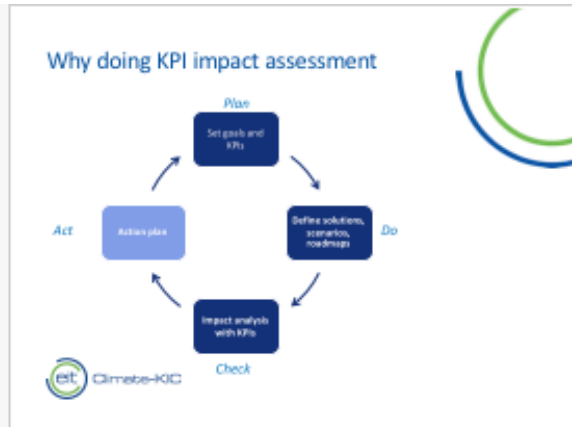
 Climate-KIC



Smart Sustainable Districts
Workshop session 4: 'Approaches to measure and assess smart and sustainable district activities'

 European Union
SSD District Challenge | Helsinki | 23 Nov 2016

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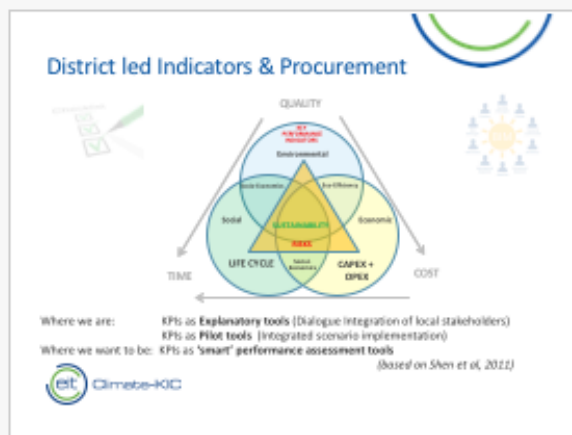
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SSD – KPI frameworks - introductions

Three Statements

- Indicator based reporting depends on the audience
- Indicator based reporting is part of a policy or decision making process
- Indicators need data.
- Smart tools can ease data gathering & automation

 Climate-KIC



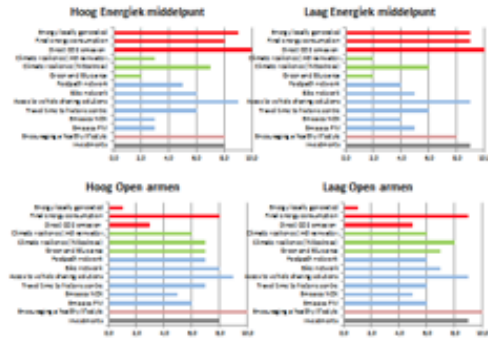
Case #1 SSD Utrecht

- Original aim reporting on impact to the Climate KIC
- Rephrased into comparing the impacts of scenario's for district development
- Indicator proposal amended and agreed upon by the stakeholders



5

Utrecht scenario comparison



6

SSD Utrecht - Observations

- Stakeholders needed explanation: Why we are producing indicators?
- Like all SSD activities, the discussion brought various city departments and stakeholders together
- Internally the indicator exercise streamlined and pushed data gathering

Case #2 Berlin Moabit Data planning Tools





Original Data Base						
KPI Name	Category	Quantification	Baseline	Aspiration	How to measure and track	Owner/Ref to Green-Matrix
	Social	6/10/100 water coverage				
Number of data sets	Economic	Number of data sets	600	600	How many data sets have been	A. Implementation A.1. Annual report A.1.100 participatory B.3. Investigation B.3.1. Regularity & availability

Original Engagement						
KPI Name	Category	Quantification	Baseline	Aspiration	How to measure and track	Owner/Ref to Green-Matrix
Interest in urban development and street management along the subject	Social	Number of visitors in urban management, The first urban management was attended to 10 - 150 visitors	50 - 100 visitors		Implementation of urban engagement along the subject organized by opportunity and social activities, presentations during StreetManagement	A. Implementation A.1. Annual report A.1.100 participatory B.4 Governance B.4.1 Multi-level governance

[illegible]

- Réka Tóth from Climate KIC presented the results from her study on BREAM application in one of the parts of the Kalasatama district.



Opportunity WS3: Energy demand reduction and efficiency improvement in the district Preparation for Helsinki District Challenge



FORUM
VIRIUM
HELSINKI

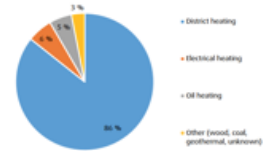
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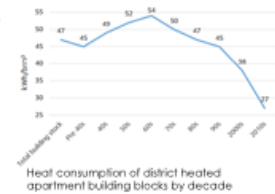
HELSINGIN
ENERGIA

City of Helsinki

- Population 600 000 people
 - Heat market totally ca. 8 000 GWh
 - Thermal energy demand is greater than electricity demand
 - Growing cooling demand despite of relatively cold climate
- Heating connected capacity:
3300 MW
- District cooling connected capacity:
135 MW



Modes of heating in Helsinki 2012



2



3



The City Council and City Board of Helsinki set the following goals:

- Helsinki aims to become a carbon-neutral city by 2050
- Greenhouse gas emissions have decreased by at least **30 percent** by 2020
- Energy efficiency has improved by at least **20 percent** by 2020.
- The share of renewable energy of the procurement of electricity, district heating and district cooling by Helsingin Energia is at least **20 percent** by 2020.

4



Kalasatama in a nutshell:

Construction time: 2009-2030s
21,000 residents
8,000 jobs

Housing: 1,000,000m²
Business premises: 390,000m²
Services: 45,000m²
Travel time to the city centre by metro: 6 minutes



smart services and future solutions that can already be found in the area

- 7. HIMA Smart Metering
- 8. Waste Collection System
- 9. Smart Lighting, Edible Park
- 14. Solar Park, Electricity Energy Storage



Smart Infrastructure

Smart Grid

The smart energy grid supports electric vehicle use, new energy storage facilities, and energy efficient building automation as well as local energy production.

Smart Space Share

The smart space share pilot aims to provide all available room to be utilized by the citizens for work, play and leisure, just as Airbnb does.

Internet of Things & MyData

As part of the EU-supported [BioTape project](#), Kalasatama is also a place to run various Internet of Things trials and pilots.

Agile Piloting

Smart Kalasatama's [Programme for Agile Piloting](#) is buying small pilots that provide new innovative services for residents and can be tested in real life setting.

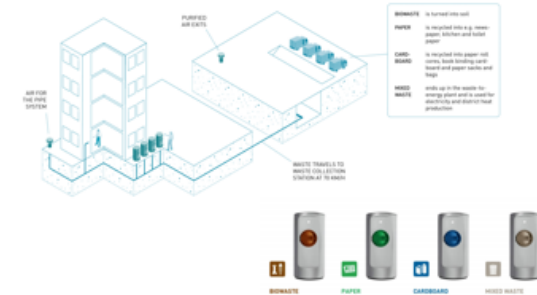
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Nice!



8

IMU KALASATAMA



9

Pre-assessment of Smart Kalasatama



10

Results



RATING: VERY GOOD 63,46%

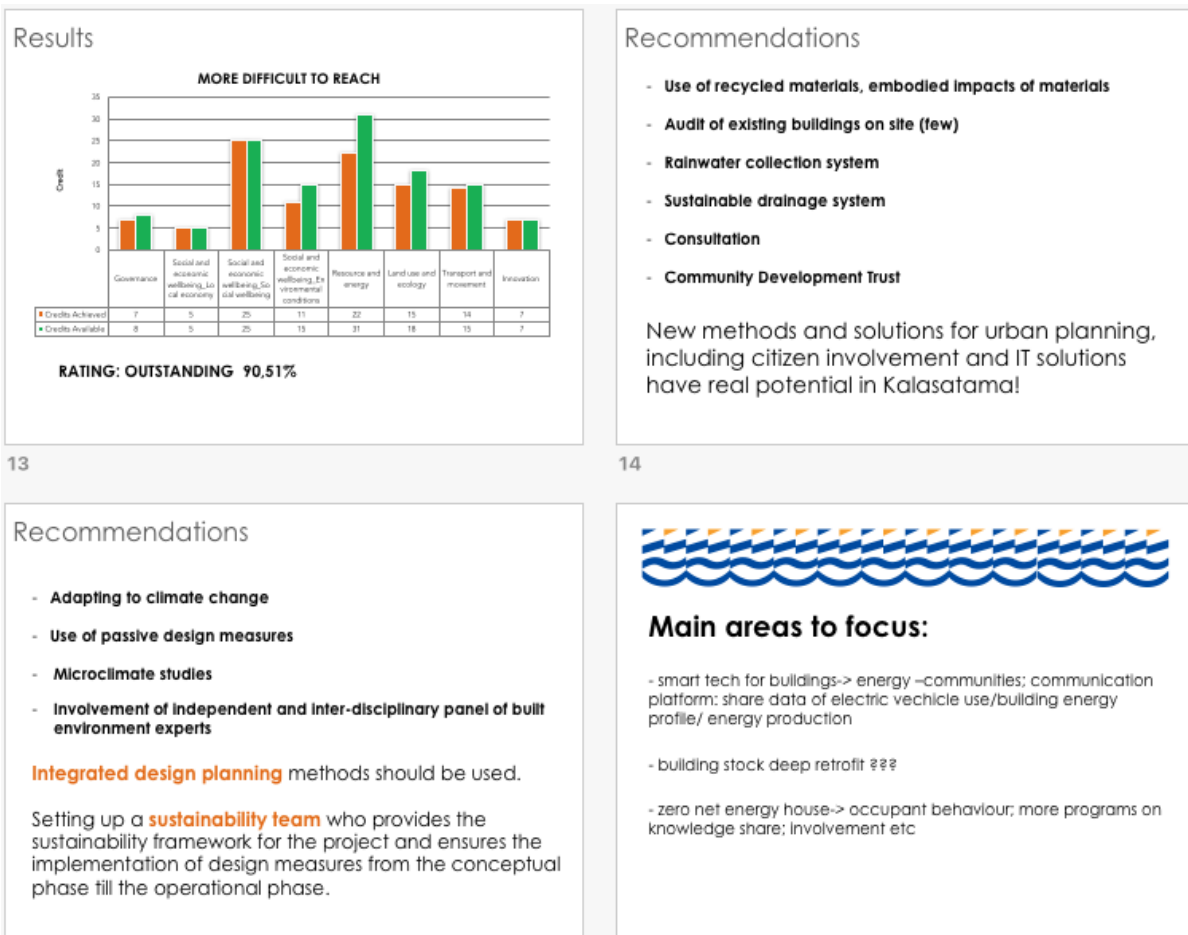
OUTSTANDING FROM 70%

Results



RATING: EXCELLENT- OUTSTANDING 85,59%

OUTSTANDING FROM 85%



13

14

Recommendations

- Adapting to climate change
- Use of passive design measures
- Microclimate studies
- Involvement of independent and inter-disciplinary panel of built environment experts

Integrated design planning methods should be used.

Setting up a **sustainability team** who provides the sustainability framework for the project and ensures the implementation of design measures from the conceptual phase till the operational phase.



Main areas to focus:

- smart tech for buildings-> energy -communities; communication platform: share data of electric vehicle use/building energy profile/ energy production
- building stock deep retrofit ???
- zero net energy house-> occupant behaviour; more programs on knowledge share; involvement etc

Status quo and existing solutions incl. challenges

The status quo and existing solutions including challenges have been taken from the presentation.

Goals

- initial goal (2013) was that it should become the model district for smart living
- it should incorporate digital services, sensors and IoT in the infrastructure as well as provide a new kind of urban services
 - ->one hour more per day
- Resource efficiency and energy saving for sustainability have not been key targets in the area

Smart city platform

- experimenting with different kind of service solution to understand which ones will apply for the future
- so far biggest technological platform is smart energy system, built on top of the district heating and cooling
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Developing in co-operation

- innovation platform, Living Lab activities and supervising smart city development projects
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- 3000 citizens living are the pioneers for better services
- Planning is developing in time so that new technical ideas can be taken into account
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- In some plans, centralized cooling demanded (->district cooling)

- Storm water handling -> directly to Baltic sea (clay soils)
- No extra energy efficiency demands (possible but needs stronger political commitment)

Plot assignment stipulations

- Smart energy system demand (two-way electrical grid)
- Building code for energy (C-class)
- Pilot projects so far include architectonic solutions, low construction costs and innovative solutions
- Negotiation of conditions has become more common

Main conclusions

The work stream session concluded the following.

The City of Helsinki has clear climate ambitions for 2050 to be climate neutral. The operationalization of these goals towards concrete short term targets and actions for the Kalasatama district and plots are deemed useful.

Therefore, it is useful to include a work stream on indicators in the project: it should not focus on indicators for SSD on the impact of the project itself, but on indicators for Kalasatama that operationalize the Climate Neutral overarching goals of the City of Helsinki. Elaborating aims/targets for the (smart/sustainable) development of the district would be important to clarify ambitions. Indicators need to be selected/developed for tracking progress. In the phase of indicator selection due attention is needed for system demarcations, definition of the baseline, data collection procedures.

Apart from the physical indicators the suggestion was made to pay attention to the (monetary) benefits of sustainable development interventions. ["Bring the money in!"] This could take the form of evaluating (integrated) solutions for Kalasatama with regard to the various benefits they bring as far as possible in monetary units. The analysis could include an overview of stakeholders benefitting from the interventions and stakeholders having to pay for/invest in the interventions, as a starting point for discussions between different stakeholder groups.

Identified opportunities and proposed solutions

The work stream session identified the following opportunities and/or solutions to which the SSD project could contribute:

- 1) Develop and implement for the City of Helsinki a framework that will allow to translate long-term targets into short term actions to drive sustainable solution
- 2) Identify co-benefits and co-investment to drive smart and sustainable solutions in Kalasatama

Proposed Partners

A local partner should be included to conduct the process of working with the stakeholders to clarify the chain: City of Helsinki targets > practical smart sustainable Kalasatama targets > indicators for Kalasatama. SSD/TNO could provide overall process support or be more closely involved in the process. If it is decided to work on the monetary (co-)benefits then it is probably advantageous to include a wider range of international partners in the exercise, as we would be able to mobilise quickly the available knowledge. A logical local partner would be a university. High level meetings will be needed for getting local commitment and for follow up.)

Integration Work stream 5 - Data integration

Attendees

Chatzopoulou Maria-Anna (Clean Energy Processes, ICL)

Niemi-Huguerts Hanna (Forum Virium Helsinki, local lead)

van Dam Koen (SSD Expert, ICL)

Heinemann Svea (SSD Expert, Programme manager)

Hubmann Georg (Facilitator)
Huttunen Suvi (Helsinki Planning department)
Ignatius Sonja-Maria (Helsinki Environment centre)
Jarkko Mira (Local lead, Helsinki Environment Centre)
Maura Lars (Siemens)
Miettinen Ville (Smart & Clean Foundation)
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Provided content at the workshop

A summary with regard to the data status in Helsinki and review of the existing open data, services and available online tools and website were provided for the audiences to have an overview of the current status of data part of the project. In addition, the existing challenges concerning data, such as methods of sharing data and its practicality for users were pointed out.

Also, a summary in regard to the SSD work on data named “Smart District Data Infrastructure (SDDI)” was given. The focus of this summary was on the data challenges and requirements explained by the Helsinki partner. This introduction has been done in order to give an overview of the existing solutions in SSD and to prepare and motivate the audiences for a more fruitful discussion.

Status quo and existing solutions incl. challenges

In Helsinki data management is very different from and even more advanced than many other districts we have in SSD. The city tries to make open as much data as possible in order to give free access to everybody to benefit from the various data. To do so, much of the data are provided and offered using open APIs. The metropolitan area runs a common open data clearance service, called Helsinki Region Infoshare, where all available open data can be accessed: <http://www.hri.fi>. This covers a variety of data such as geospatial data to statistical data and some governmental information. One challenge is to find what other sustainable and trustable web services and APIs which are standard and can be used exist by which Interoperability will be guaranteed.

In the past few years there have been questions such as what data should be gathered and offered to different groups of users and how so that they can work with these data and establish their business. In fact, it is not only important for the data to be open, but also to be usable for the users. This can be summarized in one question; how to motivate the users (ranging from developers to simple users) to work with the data. This question covers many aspects such as which data are more interesting and useful, how the data should be collected and offered to the users, etc.

On the other hand, there are also questions about the level of detail in which the data should be accessible whilst the data security and privacy are guaranteed.

Main conclusions

The discussion in this session focused on the existing services and solutions and added some new ideas. These can be listed and concluded as given here:

1. Interoperability as one of the key characteristics: At the moment, there are many Open APIs which have been already implemented and through them users can have access to various data in a standard way. However, there is a need for further development of the APIs. One example could be the dynamic and real time data such as data generated by different sensors.

SSD is well experienced in using different web services developed by different international standard organizations. Such approaches and solutions have already been implemented and are continuing to be implemented in SSD, for instance, QEOP (London) and St. Ouen (Paris).

2. Generating new information through digital platform such as citizen engagement platform: During the discussion, an idea was conceived that those online platforms or applications through which the normal citizens/residents can post information, can be later used for further technical simulation or calibration of analyses.

One example of this idea is the tool, SSD has developed (first prototype is ready) for St. Ouen (Paris). One of the applications of this tool named NUMDocks is "Collaborative map" where users (different groups) can post different information according to the defined categories. As an example, the administrator of this platform can later use the information of specific categories in order to validate the 3D virtual model of the district through time.

3. Quality of the open data: One point was about how the quality and accuracy of data will be guaranteed? Of course, the main idea of using Open APIs and web services is to exchange the data in an interoperable way and have easy access to the data offered by different data providers or data formats. This itself cannot encourage the users and developers to use these data unless the accuracy of the data is ensured. In such a solution, the accuracy is even more critical as the data are accessed through the interfaces and not directly from the data provider.

4. Interesting data to motivate the use of data: The above-mentioned facts are themselves helpful to encourage different groups to work with the data especially for economical purposes. However, it is still a question which data are more useful for such purposes.

SSD has also worked on this side to understand the interests, requirement and potential opportunities to develop new ideas and businesses in the districts. A part of this activity has been done on the data side and as part of the SDD process.

5. Process for generating required information: Kalasatama is a new planned district which means there is a potential for installing new devices which can produce required data. This can be even more interesting when it comes to the discussions about KPIs and how to calculate the performance of the defined indicators.

Status quo and existing solutions incl. challenges

- Existing open data catalogue
 - o Incl. applications, APIs, different services
 - o Goal: connect data more to business environment
 - o Focus: harmonised APIs, benchmarking, interoperability
 - o Permissions for data on existing projects on waste and energy hard to get since strictly personal
- Data requirements from morning session
 - o Energy demand monitoring → 3D modelling incl. testing of scenarios
 - o Blue-Green solutions → GIS information, maintenance data, social data, water drainage monitoring for both storm- and waste water

- **Comparability:** cross-validation of data: what can you get when you combine data sets?
- **Quality of (open) data:** who ensures quality? What mechanisms can be established? What interfaces are necessary?
 - Open source as a potential business model, makes (global) co-working possible

Identified opportunities and proposed solutions

Intended solutions and Roadmap incl. partner proposal

- 1. Harmonisation of data collection**
 - currently, a lot of data will only be published; the idea is to collect data
 - going away from only feedback towards dialogue
 - this includes finding a way to create harmonised sensor data
 - too much on the server, too little data gets effectively used
 - Proposal: data stories – targeting a new audience and explain complex urban situation via infographics and journalistic texts
 - Proposal: platform for reporting on urban issues (partly existing)
 - Proposal: Stronger collaboration with start-ups and similar players
- 2. Which data can be produced?** (in opposition to what data do we need?)
 - Community engagement: production of data for new business cases
 - E-democracy: currently only possible to follow decision-making process, not comment, etc.
 - How to unlock private (personal) data? Disclosed social data is a challenge, even aggregated to one housing unit
- 3. Scenario simulation models of the area and on building scale**
 - What kind of data is needed to convince the council on the implementation of higher ambitions and standards?
 - Proposal: explanatory scenario analysis that feed back into planning process, e.g. model for heavy-rain events addressing urban flooding problems
 - Proposal: Sharing of not only data but also models with wider public
 - Proposal: Awareness creation by using topics related to health

Summary of results

After the workshop, there have been two re-iteration of the work streams and topics:

1. A 2-hour meeting after the workshop of Christoph Mazur (Buddy KAM, Energy Efficiency facilitator, and Integration expert), Roel Massink (WP5, Facilitator of Measuring and Integration work stream, Rotterdam KAM) and Kees van Deelen (Program Board member)
2. Furthermore, the day after, Christoph Mazur and Kees van Deelen have met with the Helsinki KAM (Veera Mustonen and Marja Mattila) and workstream leads (Veera, Reka Toth, Petteri Huuska, Mira Jarkko) and Alpo Tani.

The following Iteration had been presented at the second meeting by the SSD core team:

<p>Develop and implement for the City of Helsinki a framework that will allow to translate long-term targets into short term actions to drive sustainable solution</p> <p>2 Leads: Petteri, Reka</p> <p>Partners: TNO, ICL, TUB, Aalto</p>	<p>Creating a Energy Transition Vision and Strategy for Kalasatama</p> <p>Lead: Veera</p> <p>Partners: TNO, ICL, Aalto, ???</p>
	<p>Identify co-benefits and co-investment to drive blue and green solutions to tackle climate change issues</p> <p>Lead: Mira</p> <p>Partners: Deltares, TNO, Johanneborg, ???</p>
	<p>Identification of viable use cases and business models for the available data</p> <p>Lead: Hanna</p> <p>Partners: TUM, TUB, Baseⁿ, VCS, ???</p>

And the following timelines have been agreed:

- Until 8nd of Dec:
 - First Summary of the workshop (around old work streams)
 - Teams put together around new work streams
- Until 15th of Dec
 - Final summary of workshop

Next steps

For the next year, it is planned to work on a final workplan to take to other institutions to fund these activities:

The workshop produced a set of concrete opportunities that could be translated in concrete action, to be carried out in Kalasatama during the forthcoming years:

- Develop for the City of Helsinki a framework that will allow to translate long-term climate and energy targets into short term actions to drive sustainable solution taken forward in Kalasatama
- Help City of Helsinki to increase their capability to drive sustainable solutions using the many case studies that have already been done across Europe
- Creating an Energy Transition Vision and Strategy for Kalasatama
- Identify co-benefits and co-investment to drive blue and green solutions to tackle climate change issues
- Taking into use a relevant set of metrics and indicators
- Continue work with data, building data platforms and identifying business models to use different kind of data for relevant use cases

