



GREEN DIGITAL CHARTER



COLLECTION OF CASE STUDIES 2017

European smart cities using ICT





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ABOUT THE GREEN DIGITAL CHARTER

The Green Digital Charter aims to improve the quality of life in cities through the use of digital solutions. Launched in 2009 by EUROCITIES, it is a strategic initiative supported by the GuiDanCe project in its current phase. In addition to a range of statements and objectives, the charter sets out four specific commitments.

Signatory cities agree to:

- work with other Green Digital Charter signatories to promote the best application and results of ICT solutions
- establish local partnerships to implement the Green Digital Charter's commitments, and to make these central elements of the cities' wider strategies
- deploy five large-scale and replicable ICT pilots per city within five years and communicate the impact of these to citizens and local stakeholders
- decrease the direct carbon footprint of the ICT sector by 30% per city within ten years

Already signed by 51 major European cities, the charter is open to local authorities regardless of the stage of implementation of their energy and climate policies. For more information on the Green Digital Charter, please visit www.greendigitalcharter.eu

ABOUT GUIDANCE

Funded by the European Commission's Horizon 2020 research and innovation programme, GuiDanCe aims to support the coordination and further development of the Green Digital Charter.

GuiDanCe aims in particular to:

- strengthen the engagement of GDC signatories to create a club of cities that work together towards their GDC commitments
- improve existing tools and services and their impact on GDC signatories
- promote GDC signatories' activities within and outside the EU

PURPOSE OF THE CATALOGUE AND HOW TO USE IT

This catalogue includes case studies and projects at the inception phase prepared by the GDC signatories within the framework of their ICT for energy efficiency commitments. 'Case studies' are implemented actions associated with green digital development, while 'projects' include planned actions in key policy domains.

These studies are presented in the following categories of green digital activity:

- **Cross-domain** - activities that cut across two or more application areas
- **Buildings** - activities that encompass measures taken in municipal buildings and facilities, tertiary (non-municipal) buildings and facilities as well as residential buildings
- **Energy** - activities in energy include measures relating to energy and electricity production and distribution
- **Transport** - activities in transportation encompass soft (non-motorised) modes, public and motorised private transportation, mobility management, and logistics and freight
- **E-participation** - activities supporting citizen engagement by making city decisions accessible in open data format and by developing tools of environmental or social value
- **Green ICT** - activities focusing on sustainable and environmentally-friendly ICT equipment and technology
- **Waste management** - methods to manage paper resources and intelligent waste collection systems

Each city profile includes relevant web links and contact information to help you plan and organise your own study tour.

DISCLAIMER

The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained herein.

The background is a solid teal color with a subtle geometric pattern of thin, light teal lines forming various-sized triangles and polygons across the entire surface.

CROSS-DOMAIN

THE REPLICATE PROJECT

Bristol is a lead city in REPLICATE, a Horizon 2020 smart city 'lighthouse' project. The city will deploy a number of integrated energy, mobility and connected infrastructure solutions in one of its districts to help tackle inequalities, such as fuel poverty, and to progress towards decarbonising the energy and transport sectors. Citizens are at the centre of Bristol's approach.

The core innovation in Bristol is the development of an energy demand management system that can holistically monitor and control energy use in order to level out peak demand. The system will be piloted through 150 'smart homes', which will have the opportunity to trial connected or 'smart appliances'.

A number of other measures will be deployed that aim to link into this system including:

- Energy efficient retrofit of 240 homes
- Development of local renewable energy sources (district heating, community solar panels)
- Electric vehicles and charging infrastructure
- Travel planning and parking apps
- Development of a smart city platform

Through these interventions, the Bristol pilot intends to explore how new technologies could help to:

- Reduce the cost and amount of energy consumed to tackle fuel poverty
- Use more energy from local renewable sources to increase local resilience
- Enable greater sustainable mobility
- Encourage citizens to change their energy consumption and travel patterns
- Contribute to a significant reduction in CO₂ emissions



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GENOVA, ITALY

CROSS-DOMAIN

PURE COSMOS

The inter-regional cooperation project focuses on the role public authorities can play in enhancing the competitiveness and growth of SMEs by making the business climate more transparent and reliable, supporting the needs of SMEs, promoting administrative modernisation of public services, improving the effectiveness of public-sector support and decreasing the administrative burdens through selected policy instruments.

Regional policies will be improved through the involvement of stakeholders and regional experts to share common solutions, identify innovative new projects and enhance governance. This will be done by analysing partners' plans through peer reviews and identifying good practises that will improve these plans, exploring them further through study visits and importing them via special workshops and regional action plans.

It is expected that the project will advance services for SMEs, such as e-payment tools, one stop shops, 'digital by default' models, and digital-skill support. Governance will be also improved through IT administrative solutions, regional legislation review, simplifying and launching of new business calls.



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SMARTER TOGETHER

SMARTER TOGETHER is a smart urban renewal project, equally building on modern technologies and constant innovation as key ingredients at the service of people, societal development and economic transformation. The project focuses on finding the right balance between ICT technologies, citizen engagement and institutional governance to deliver smart and inclusive solutions.

Munich, Lyon and Vienna - the three lighthouse cities - are implementing the main demonstration activities in specific districts, monitoring the results and upscaling solutions at city level. Santiago de Compostela, Sofia and Venice - the three follower cities - will replicate the key findings from lighthouse cities in targeted areas, implementing them in different urban and institutional environments.

In Vienna, this has lead to various activities:

- Three residential neighbourhoods with 1,300 inhabitants will get a smart refurbishment, this corresponds to a total floor surface of 63,000 m²
- New annex building for the secondary schools NMS Enkplatz and zero-energy gyms
- First mobility point for new mobility services
- E-Bike sharing and e-car sharing for all citizens
- E-logistics with e-vans and e-forklifts
- E-cargo-bike for the quarter, walking to school
- Co-Design, co-creation and information for over 2,000 citizens per year using the newly developed SIMmobil



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LYON, FRANCE

CROSS-DOMAIN

SMARTER TOGETHER

24 million euros of European funding have been made available to a consortium of 30 public and private partners (cities, research centres, associations, industries etc.) including the three cities through the Horizon 2020 - Smart Cities and Communities programme. 7 million euros have been earmarked for Lyon, with the Lyon Confluence district recognised as the pilot site. Partners in Lyon include Lyon Métropole, SPL Lyon Confluence, Enedis, Toshiba, Hespul and Enertech.

Through this project, partners in Lyon will be able to:

- Consolidate expertise in the eco-renovation of existing buildings
- Develop innovative mobility solutions that provide both greater protection of the environment and easier travel
- Develop renewable energy production and promote the use of green energies (heat, electricity)
- Experiment with solutions that can be deployed over the entire metropolitan area
- Encourage synergies and propose new market opportunities
- Develop a data management system (energy and mobility) based on the city platform

Smarter Together was launched in February 2016 for a five year period, and divided into two parts: three years for development and two years for observation.



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TALLINN CITY REPAIR, MAINTENANCE AND LANDSCAPING INFORMATION SYSTEM

Tallinn Municipal Engineering Department together with Tallinn City IT Office, Tallinn Environmental Department and Tallinn City Districts are implementing a project 'Tallinn City Repair, Maintenance and Landscaping Information System'. 85% of the project cost is funded through the ERDF financial instrument 'Improvement of Public Services' and has to be implemented before August 2019.

Main objectives are:

- To simplify the process of maintenance, landscaping and repair in Tallinn, including relevant public procurement procedures
- To collect necessary data about the objects/areas under maintenance
- To inform citizens about the on-going and future maintenance and landscaping works
- To create a common platform for managing maintenance issues raised by the public

The information system will be integrating necessary data about the maintenance or repair objects and making it available for all stakeholders simultaneously, keeping records of the execution of works and providing easy surveillance opportunities. The system is cost-efficient as it will reduce duplication of similar activities and is cheaper than managing and housing different information systems.

The system will improve the transparency of public services by giving citizens a possibility to observe and give feedback. As many activities as possible will be digital for data cross- and re-usage.

The developer of the main scope of the system will be found through public procurement.



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VALLADOLID, SPAIN

CROSS-DOMAIN

REGENERATION MODEL FOR ACCELERATING THE SMART URBAN TRANSFORMATION

REMOURBAN (H2020-SCC1-2014) a project selected under the EU's Lighthouse project scheme whose guiding principles are impact and replicability. REMOURBAN is a 22-strong European partnership whose ultimate goal is to drive forward urban regeneration in towns and cities to ensure social progress and environmental sustainability. To achieve this, the project has set up pioneering solutions from energy, ICT, and mobility sectors using three lighthouse cities as demonstrators, and two follower cities as replicators. Valladolid is a lighthouse city along with Tepebasi/ Eskisehir (Turkey) and Nottingham (UK). The follower cities are Seraing (Belgium), and Miskolc (Hungary).

The REMOURBAN model aims to improve quality of life for people living in the area, improve environmental sustainability, develop new business and funding models for city regeneration and ensure that the solution is welcomed by the local community by fitting it to the citizens.

Citizens are the cornerstones of REMOURBAN. They will be the common thread throughout each participating city, some will benefit directly through improved housing and transport options and the replicability of the model will be a benefit to all.

The REMOURBAN model will develop a system for analysis, diagnosis and decision making in the field of the urban regeneration. It will include a decision support tool to facilitate the selection of the best solutions for improving the key parameters that define urban sustainability and smartness. These decisions will identify the appropriate technologies and the least risky and the most efficient business plans aimed at creating local value.



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BUILDINGS

HIEDANRANTA, SUSTAINABLE AND SMART ENERGY SOLUTIONS

Hiedanranta is a future city district which is being developed with a new concept in collaboration with city residents, businesses and organizations. The plan is to build homes for 25,000 residents and facilities for 10,000 jobs. The construction of the area begins in 2020-2021.

In the future, Hiedanranta will be a district that produces more resources than it consumes. The area will serve as a development platform for smart and sustainable solutions and new technologies. The first circular economy experiments have already started; there are currently about 20 different development projects ongoing in Hiedanranta.

The former Lielahdi industrial area was opened to the public in 2016. The City is enabling various events and activities in the area for example, by renting out facilities for temporary use and supporting the organization of events.

Hiedanranta is already being used as a development platform for circular economy solutions. The new cultural space, Kuivaamo, uses a dry toilet system for its sanitation. The Tampere University of Technology is researching the potential to utilize the urine collected from dry toilets as fertilizer for growing algae. Research is being conducted in laboratory conditions. The construction of an algae growing facility was completed in the Summer of 2017. The facility researches the farming of microalgae in arctic conditions, the use of algae in wastewater treatment, and the exploitation of microalgae for use as bio-based products, fertilizer, energy, and even as nutrition. A closed-cycle plan factory, where strawberries are grown without the use of sunlight, also operates in the area.



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TURIN, ITALY

BUILDINGS

FACTOTUM

The City is designing a platform based on Archibus software.

Every information on the heritage (about 800 buildings) of the City that is now stored on one of the old 16 databases owned by the City has been transferred to the platform. Other data that's never been gathered before, as energy consumptions, are going to be collected from many sources (bills, data coming from distributors, data from sensors installed in the buildings of the heritage etc.) and stored on Archibus.

Another software, able to analyze the consumptions data and to create dashboards and future scenarios, is going to be connected to Archibus in order to give a great support to the Energy Office and to the decisions maker of the City.

What are the main goals of this project? The first one is to centralize every information about the buildings stock of the City in order to obtain every kind of information in a unique repository. The second one is to increase the knowledge about the energy behaviour of the buildings in order to low the electric and gas consumptions, the pollution and also the sustained by the City.



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IN SUN WE TRUST: AN ONLINE TOOL THAT ENABLES INHABITANTS TO SIMULATE THEIR ROOF'S POTENTIAL FOR SOLAR PANELS

Nantes Metropole's objectives in energy transition are ambitious: to double its renewable energy production by 2020 and triple it by 2030.

In this framework, Nantes Metropole has been the first French local authority to support and use the online simulator for solar production developed by the French start-up company 'In Sun We Trust' through a R&D partnership.

Based on geo-data from the National Institute for Geographical Information (www.ign.fr) and an innovative algorithm, the simulator estimates a roof's potential for solar energy production. From a home address, the simulator automatically detects the roof orientation and slope as well as the shading from the surrounding buildings and trees.

The simulator provides the inhabitants with a swift response on the benefits of installing solar panels on their roofs, the optimal number, the savings to be expected. The tool also provides responses through a dialogue box and contact details of local craftsmen labelled for installing solar panels.

Following Nantes Metropole, the Principality of Monaco has selected this 'solar cadastre' as a digital solution that helps to reduce the greenhouse gas emissions and achieve carbon neutrality by 2050.



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The image features a dark blue background composed of numerous triangles of varying sizes, creating a low-poly or crystalline geometric pattern. The triangles are separated by thin, slightly lighter blue lines. In the middle-right portion of the image, the word "ENERGY" is written in a clean, white, sans-serif, all-caps font.

ENERGY

CITYZEN - VIRTUAL POWER PLANT

City-zen partners Alliander, Energy Exchange Enablers (EXE) and Greenspread have set up and are testing a so-called virtual power plant in the Amsterdam Nieuw-West district.

A virtual power plant is an online ICT-platform which aggregates people's production and consumption of solar energy and stores the surplus locally. Due to this aggregation it's possible to trade energy on the wholesale markets: the use of a home battery lets you store energy when electricity prices are low and discharge the battery when there are high.

The virtual power plant is also be connected to Alliander's smart grid. Thereby we examine if the batteries are able to support the local grid network during peak moments. The combination of trading on the energy markets and supporting the local grid with battery systems installed at households in one individual neighbourhood is new.

Currently there are more than 40 batteries installed in Amsterdam Nieuw-West district and the first results of the project are achieved.



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TRIANGULUM CENTRAL CONTROLLER

Funded by the EC Horizon 2020 project 'Triangulum', the Central Controller is an energy management platform designed and implemented by Siemens. The platform connects to the estates of key project stakeholders - Manchester City Council, Manchester Metropolitan University and The University of Manchester - using predominantly Building Management Systems, alongside available Distributed Energy Resource (DER) within each stakeholder estate. Such DER includes Solar PV, Electrical Energy Storage, CHP plants and DSR load reduction solutions. These assets can be managed independently or in coordination, at a building, campus or city level to address alternate value propositions within each.

The Controller aims to demonstrate how a centralised control platform can derive additional value for the city when applying optimised control interventions to coordinate the operation of connected energy assets, facilitating the creation of a multi-owner energy portfolio as a result.

This highly replicable system can support stakeholders in providing energy asset visibility and awareness, non-commodity energy cost reduction, generation offsetting and balancing, peak shaving and network support, and environmental optimisation with emissions reduction. Each of these components assists with a wider ambition to increase the energy and carbon literacy of city stakeholders.



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FIBRE OPTIC - SUBSOIL ENERGY MONITORING (FOME-BES)

In Utrecht, innovative DTS fibre-optic monitoring is being used in the research project FOME-BES to improve the performance of cold and heat storage systems. Three-dimensional underground fibre-optic networks are installed at three different locations in the city of Utrecht, providing for data on the variations in temperature profiles around cold and heat storage systems during eight seasons. This will offer new insights on how to optimize the subsoil energy balance of cold and heat storage systems and by that, on how to optimize the energy and cost effectiveness of cold and heat storage systems as a whole.

In the future, this monitoring technique can also be used for the detection of salinization, subsidence and presence of chemicals. By demonstrating and testing these techniques, Utrecht realizes regional sustainability ambitions and provides a launching customer for this innovative solution as well.



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ENTROPY PROJECT

The ENTROPY project is about designing an innovative energy-aware IT ecosystem for motivating behavioural changes towards the adoption of energy efficient lifestyle.

This initiative, launched within Murcia municipality, is analysing how energy aware IT ecosystems can be used for motivating end-users' behavioural changes to reduce their energy consumption based on the adoption of energy efficient techniques and active engagement.

To achieve this goal, a series of tools have been considered namely:

- The Internet of Things provides the capacity for interconnecting numerous devices and applying energy-efficient communication protocols.
- Evolvement of advanced Data Modelling and Analysis techniques support the realization of semantic models and knowledge extraction mechanisms.
- The Recommendation and Gamification framework can trigger interaction with relevant users in social networks. They can increase end users' awareness with regards to ways to achieve energy consumption savings in their daily activities and adopt energy efficient lifestyles as well as provide a set of energy efficient recommendations and motives.



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TRANSPORT

SMART SOLAR CHARGING

The world's first Smart Solar Charging station with vehicle-2-grid system was installed in the Utrecht district Lombok in 2015. This innovation enables the storage of solar energy in electric cars via bi-directional charging.

The surplus of solar energy is charged in V2G car batteries during the day, and discharged and consumed during the evening.

It is a big step forward in the transition to sustainable energy as it allows grid balancing and energy management at district scale. Within the next few years 1,000 smart solar chargers will be installed in the Utrecht region, supported by research on smart energy management and solar energy at Utrecht University.



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BARCELONA, SPAIN

TRANSPORT

SMART BIKING

The concept of 'Smart Biking' consists on travelling through the city by bike without having to worry about where and how to park the bike safely and correctly. Our solution is based on a service of parking for bicycles spread all around an urban area to solve the need of safe parking places for bicycles.

This solution is already available in Barcelona thanks to the international contest 'Barcelona Open Challenge', and consists on a pilot managed by the City Council with 150 parking lot in 14 stations.

Moreover, our project has recently received funds by the European Commission in H2020 SME as it tackles some of the main European challenges regarding mobility in urban areas: mainly congestion and pollution. These funds are going to add in 2018, 500 more parking lot in Barcelona from different owners (universities, transport operators, etc.) and create shared integrated networks, so that all parties benefit from belonging to a larger network than their own.

Implement 'Smart Biking' will increase the number of users of bicycle and will allow managing and sorting the mobility, for the benefit of citizens, cyclists, administrations, other means of transport, companies from the world of cycling and environment.



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PRAGUE, CZECH REPUBLIC

TRANSPORT

DIGITAL TRANSPORT CARD 'LÍTAČKA': MULTICHANNEL CHECK-IN SYSTEM FOR PUBLIC TRANSPORT

Lítačka is a card for travelling by all public transport in Prague - the travellers can use it for metro, bus, tram and even the funicular. It holds electronic tickets that may be bought in Transport Company centres or via website. Moreover, Lítačka may be used as a library card for Prague Municipal Library.

Lítačka is one of the first steps in establishing the new platforms of a Smart Prague. By the summer 2018, Lítačka and its system will be developed in complex modern system for payments in public transport. The new digital system will enable downloading public transport ticket onto passengers' payment card, a mobile application or another medium suitable for a traveller. Lítačka is principally the start in establishing a new communication platform within Prague and its surroundings (Central Bohemia) where a modern, energy-saving city with its residents living comfortable lives is the target.

The new system will bring a range of benefits such as increased comfort for passengers using public transport, faster and more comfortable payment of tickets, new check-in and ticket management options, introduction of unified check-in rules in Prague and the Central Bohemia Region, new user-friendly e-shop for purchase and administration of tickets without the necessity to go to a contact point.



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PRAGUE, CZECH REPUBLIC

TRANSPORT

MOBILE APP 'PRAGUE ON BIKE'

As a complement to traditional cycling promotion measures, Prague introduced in 2017 a new mobile app Prague on Bike to its residents and visitors. To get more people cycling, it employs both of the core psychological principles of behaviour change, facilitation and motivation.

To facilitate cycling, Prague on Bike provides personalized advice on how and where to cycle in the city, including intermodality with public transport where possible. Unique safety-optimized turn-by-turn navigation with contextual urban cycling tips eliminate the fear of unknown that stops people from cycling and help cyclists of all experience levels ride around the city in a safe and enjoyable way.

To motivate cycling, Prague on Bike leverages smart campaigning features enabled by highly customizable system of badges and leaderboards. Personalized, interactive and social, campaigns delivered through Prague on Bike are more than campaigns delivered through traditional channels.

During its first season, the app has attracted around 10 thousand users and achieved the excellent average user rating of 4.7 on Google Play. Around half of the surveyed users stated that the app increased their rate of cycling.

These functions are supplemented by statistical functions that helps authorities to better understand the needs of cyclists.



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E-PARTICIPATION

ISCAPE - IMPROVING THE SMART CONTROL OF AIR POLLUTION IN EUROPE

The iSCAPE project works on integrating and advancing the control of air quality and carbon emissions in European cities in the context of climate change through the development of sustainable and passive air pollution remediation strategies, policy interventions and behavioural change initiatives.

It tackles the problem of reducing air pollution impacts, focusing on the use of 'Passive Control Systems' in urban spaces, on policy intervention and behavioural changes of citizens lifestyle. Projections and real-world physical interventions will be applied on the urban tissue in the selected cities assessed for future climate change scenarios and representative of different cultural & lifestyles in Europe.

Through the approach of Living Labs the team will deploy a network of air quality and meteorological sensors and evaluate the benefits expected from the interventions on a neighbourhood and city-wide scale, ranging from quantification of pollutant concentration to exposure.

iSCAPE encapsulates the concept of smart cities by promoting the use of low-cost sensors and engaging citizens in the use of alternative solution processes to environmental problems.

The project will support sustainable urban development by sharing the results with policy-makers and planners using local test-cases, and providing scientific evidence ready-to-use solutions potentially leading to real-time operational interventions.



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GUIMARAES, PORTUGAL

E-PARTICIPATION

GUIMARAES MORE THAN GREEN

Guimaraes is a smart and liveable city that uses available technology, partnering with the University and in which citizens have a high quality of life, good environmental education and a perfect combination of cultural and natural heritage. Guimaraes was awarded best digital municipality of the country. Guimaraes was EU Capital of Culture, EU City of Sport and most sustainable national city.

Through a strategy that combines digital tools with citizens' engagement, Guimaraes is answering to new challenges.

The Platform Guimaraes mais Verde includes a comprehensive process of managing information, communication and dissemination flows of all the above activities.

Mobile apps such as Biodiversity GO! And Mobitur were developed as essential tools to valorize cultural and natural heritage. MyCity app is an example of a participatory approach aiming at committing citizens in the improvement of their quality of life.

The City Hall launched a car-pooling platform, Guimaraes à Boleia.

At educational level, Guimaraes is supporting some digital solutions to promote students' performance such as +Cidadania and Hyptiamat.



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L.I.V.E : LIEU POUR IMAGINER LA VILLE EN MIEUX (PLACE (S) TO IMAGINE A BETTER CITY)

L.I.V.E is a laboratory of digital uses initiated by the cities of Roubaix, Tourcoing and Marcq-en-Baroeul, supported by the territorial community 'Hauts de France', 'European Metropol of Lille' and FEDER program.

It is a space to design the Tomorrow's City 'Sustainable and Smart' through the expression of collective intelligence, based on the principles of sharing, open data, co-design and experimentation with users and the project leaders, for the collective research - Analysis and consultation of companies and dissemination in Living Lab mode to test life-size services, tools or new uses, in cooperation with companies, research laboratories, local authorities as well as users.

As part of our zero-waste approach, the dematerialization component is a strong focus for city and citizen administrative support. The expected overall result is the increase and the improvement of the offer of shared digital public services and services for all.

The specific results are:

- To Increase the number of digital public service users
- To associate the inhabitants with the design of these new tools
- To introduce and to train territorial officers for digital uses
- To raise citizens' awareness
- Positioning communities as actors in the development of the digital sector



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ZARAGOZA, SPAIN

E-PARTICIPATION

100 IDEAS ZARAGOZA

100ideasZGZ is the civic innovation program aiming to connect bottom-up ideas with the city itself. As a whole, the program represents 'a zero waste of ideas paradigm', in which good ideas are identified, filtered, evolved through crowd-wisdom, and transformed into real pilots whose impact is disseminated back to the community through the power of artistic representation of urban data, fostering a cultural shift in citizens towards city making. 100IdeasZGZ connects bottom-up ideas from the civic communities with the technical skills of local geeks.

An essential part of 100IdeasZGZ is 'CrowdfundingZGZ', which allows the funding of projects at the prototype stage.



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GREEN ICT

FOLLOWME-PRINTING JOINT PROCUREMENT

The nine municipalities of the Tampere City Region make joint solutions, for example in support services related to ICT and office equipment. The aim is to have smooth and digitized service chains, a renewed way of doing things, improved efficiency, and savings in energy and costs.

With the optimization of equipment and the introduction of FollowMe-printing, our collaboration area in the neighbouring cities of Tampere (Hämeenkyrö, Kangasala, Lempäälä, Orivesi, Pirkkala, Nokia, Vesilahti and Ylöjärvi) has been able to reduce its yearly use of printed paper from 24 million pages to under 20 million pages. As a result of the modernized equipment technology, the CO₂ emissions have gone down by 68,000 kg per year compared to the 2013 levels. The TEC-levels of energy consumption have gone down from 8.2 to 1.5, when measuring the average of the used equipment. The aforementioned eight cities began modernizing their printing and copying services already in 2009.

The City of Tampere has begun a similar modernization process in January 2017. The goal is to achieve equivalent savings which would lower the TEC-level to 1.4. The estimated reduction of the CO₂ emissions is approximately 100,000 kg per year. With FollowMe -secure printing, the number of pages printed is predicted to decrease by up to 5 million pages per year.

The project will be implemented by Canon Inc Tampere.



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JOINT PROCUREMENT OF ICT INFRASTRUCTURE AND DEVICES

The city of Tampere with its eight neighbouring municipalities procure all their ICT infrastructure and devices jointly, fostering a culture change within the public sector when it comes to its environmental impact.

All parties have agreed that the properties of the devices should fulfill at least the minimum requirements of environmental standards. At the end of their lifespan, the devices are recycled; either to be reused, or to be sold to the raw materials market in accordance with the standards for sustainable use. All users will be given uniform instructions on how to use the devices in an energy efficient manner. Electronic meeting practices (e.g. Skype for Business) and tele-working from home for example, have already been implemented.

Our municipal cooperation area has around 360,000 inhabitants and around 25,000 people who work in our municipalities. The vast majority of them use ICT-devices in their daily work. In addition to this, our schools have around 15,000 workstation ICT-devices for student use.

The procurement of the web hosting required for ICT has been centralized, and the energy needs of the datacentre have been optimised. For example, part of the heat energy produced by the devices is harnessed and used for heating of buildings.



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WASTE MANAGEMENT

SMART WASTE SENSORS IN ON-STREET LITTER BINS

Edinburgh is deploying smart waste sensors to better understand patterns of litter across the city. An initial project focused on on-street litter bins, and looked to improve the placement and number of bins, and improve routing efficiency.

This would help reduce fuel consumption, as drivers stopped making unnecessary trips to bins that did not need emptying, as well as raising awareness of waste volumes produced in Edinburgh to provide useful data for strategic decision making about waste management in the city.

Edinburgh is currently expanding this smart approach to investigate the potential benefits of upscaling to city scale, and potentially to other waste types.



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GuiDanCe

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