

GREEN  
DIGITAL  
CHARTER



GuiDanCe

Support the coordination of cities' activities  
via the Green Digital Charter

# What cities should know about the Green Digital Landscape

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## What cities should know about the Green Digital Landscape

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## 1 INTRODUCTION

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Smart, digital, green, future, etc. are all words that are being used to define cities that use modern technology to improve the quality of life of the citizens. The digital revolution does not only take place in the personal life of citizens with smart phones, internet television and parking support in the cars, but also in communal services, in public transport or in energy supply. That revolution is sometimes less visible for the citizens but might be much bigger than often realized.

These digital applications can only exist when electric power is available. That is an essential weak point of the digital revolution. During a power blackout, none of the systems we are building now will function. It is obvious that experts are looking at that side of the coin too and try to reduce the demand of and dependency on electric power.

The necessary hardware for the digital revolution asks for new infrastructure that is not always available in existing cities. Smart grids, sensors, glass-fibre cables, transmitters, computer centres, etc. need to be built or adapted. Here lies a challenge for service providers as cities are.

The digital revolution offers an opportunity to make our society greener, and therefore it is too important to leave the revolution only to the experts, the scientists and the industries. Local government, citizens and politicians have a crucial role.

The Knowledge Society Forum of EURO CITIES has identified the following challenges for cities:

- Through Open Data and new forms of citizen participation, Governance systems of cities will change;
- Data are crucial for the digital revolution. Aspects of collection, availability, privacy etc. are emerging;
- Knowledge management within the organisation and between cities is essential;
- Much of ICT developments are driven by businesses. Cities will have to find ways to deal with technical possibilities, procurement and legal aspects.
- Standards are a possible support for cities, but they have to be developed in cooperation with national and international users;
- Access to information and knowledge is important both for cities as for citizens, to avoid that there will be a gap in e-inclusion<sup>1</sup>.

The Green Digital Charter, an initiative of EURO CITIES, offers a platform for European cities and politicians to formulate an ambition and to exchange experiences and opinions on local implications of the digital revolution. Together these cities can use that development for a greener and better city.

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<sup>1</sup> E-Inclusion is a term used to describe the fact that the world can be divided into people who do and people who don't have access to - and the capability to use - modern information technology.

This document is meant for cities that recognise the possibilities of the digital revolution and take their responsibility in steering the changes into a direction that is contributing to a more sustainable city. The main target group for this paper are local authorities, both politicians and officers, who are interested in using the digital possibilities for the best of their citizens, together with other leading cities in Europe.

This paper gives some insight in the options and possibilities for European cities. It explains what the information revolution can mean for citizens and what it can mean for city governments. It gives some insight in the big amount of initiatives that are being developed for cities and for industries. The paper has been written for the interested policy officer and politician, and does not pretend to be comprehensive. It just tries to structure the subject as a basis for policy development within a city.

In the following chapters the term 'Information and Communication Technology' (ICT) is being used. However, ICT has no universal definition, as the concepts, methods and applications involved in ICT are constantly evolving on an almost daily basis. The broadness of ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form, e.g. personal computers, digital television, email, robots, etc. So ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. It is also concerned with the way these different uses can work with each other.

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## 2 ICT AND CITIES

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Cities were always and will always be the centres for innovations and new developments. Information and Communication Technology (ICT) is everywhere in our society and especially in our cities. Because of the many possibilities and the optimism about further developments, ICT-solutions are often considered also as the means to solve cities' sustainability challenges - economic, social and environmental issues. Such solutions range from expensive hardware solutions such as city control centres, smart grids and autonomous vehicles, through to much lower cost solutions such as smartphone apps, online platforms that crowd-source citizens' ideas and low-cost environmental sensors. The availability of 'Big Data'<sup>2</sup> and 'Open Data'<sup>3</sup> are also considered as chances.

The approaches to ICT initiatives in cities can be classified into two main approaches: 'top-down' and 'bottom-up'. Top-down approaches focus on technology, efficiency and master planning, integrating data from different systems into a central operations centre. Bottom-up approaches focus on citizens and how they can use innovative technologies, such as social media, mobile applications and open data to create solutions to issues that matter to them and enable behaviour change.

However using advanced ICT doesn't necessarily contribute to a resilient or sustainable city. Sometimes technology is used for the sake of technology. Such projects are often shaped by large technology companies who want to sell their ICT solutions. Some cities have a belief that ICT-solutions such as smart meters, electric vehicles, a smart grid or city control centre will solve their city challenges automatically and concern themselves with working out where to deploy the new technology. Instead cities should first be clear about its purpose, identify the problem and then consider whether ICT is the right solution.

Bottom line is naturally the development that ICT is becoming undividable part of urban life anyhow, with or without deliberate action of the city administration. It is already changing the way in which we produce, how we trade and consume. And also it changes the way cities communicate with citizens and how strategies and decisions are being made.

ICT delivers new powerful tools for ambitious city governments.

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<sup>2</sup> Big Data is a broad term for data sets so large or complex that traditional data processing applications are inadequate. Challenges include analysis, capture, data curation, search, sharing, storage, transfer, visualization, and information privacy. The term often refers simply to the use of predictive analytics or other certain advanced methods to extract value from data, and seldom to a particular size of data set. Accuracy in big data may lead to more confident decision-making. And better decisions can mean greater operational efficiency, cost reduction and reduced risk. (Wikipedia)

<sup>3</sup> Open Data is information that is free to use, to reuse, and to redistribute – subject only, at most, to the requirement to attribute and/or share-alike. (Wikipedia)

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### 3 ICT AND CITIZENS

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Some technologists and engineers see future cities as places in which our lives are automated in a highly efficient environment. Economic efficiency and automated processes are everywhere. The technical possibilities are leading in implementing solutions for urban problems. But this may not be the type of future city many people would like to live in. They may prefer a city where technology is seen as a tool, not as a goal on itself. Most cities recognise the need to move away from a technology-led approach and towards an approach that is people-centred. In this vision, the city will answer to the needs of citizens and the challenges they face. Technology will then play an enabling role.

Citizens can have a number of different positions regarding ICT use:

- Consumer; Traditionally citizens can be viewed as consumers or users of ICT products and services. For example a citizen, who is using an app designed by an energy supplier to see which appliances are using lots of energy. Or a citizen who uses a route-planner based on GPS. The wide use of smart-phones and so called apps stimulates the role as consumer of ICT.
- Producer; A citizen can also be a producer. This means that a citizen produces data that is used by organisations to develop further services. The production of data can be done deliberately, by filling in questionnaires or by sending own data.
- Prosumer; Very often the production of data is the by-product of consuming. Information can be produced semi-deliberate as a by-product of using ICT applications. Smart energy meters deliver data so the energy company can better plan peak demands. So called-health-apps deliver personal information so it can be benchmarked with other users. A citizen who is both a consumer and producer is called a 'prosumer'. Additionally data about the use of an electric vehicle could be used by the city government to plan where to put vehicle charging points. The separation between producer and 'prosumer' is not always very clear.
- Co-creators; Increasingly cities are talking about citizens as co-creators of ICT services. This is when citizens work together with professionals to co-create smart city products or services. An example is when citizens work with professionals to re-design how telecare<sup>4</sup> services are delivered in their community. Civic hacking (see chapter 4.2.1) is an overall term for the process that citizens use open data to develop or improve public services.

A fundamental change is taking place. Traditionally could be seen as service providers and citizens as consumers of these services. The development and the delivery of services is now more a deliberate or unplanned cooperation process. ICT forces cities to see citizens as co-developers even more.

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<sup>4</sup> Telecare is the term for offering remote care of elderly and physically less able people, providing the care and reassurance needed to allow them to remain living in their own homes.

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## 4 CITY GOVERNMENT AND ICT

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### 4.1 Decision support

More and better data can lead to better planning. Good urban planning is depending on good quality information. As our world becomes more and more complex, the use of information technology is becoming more and more important to finding solutions.

Open Data and Big Data techniques supply more accurate and also new information e.g. on energy use, traffic movements, population development, recreation and shopping behaviour, etc.

In a recent study<sup>5</sup> OECD concludes that Big Data is becoming a core asset in the economy, fostering new industries, processes and products and creating significant competitive advantages. Data exploitation can create value in many sectors, from optimizing business processes to customer insight and creating social value. Smart metering technologies, for example, generate large volumes of data on energy demand and supply that can be used to improve energy efficiency.

The public sector is also an important data user but also a key source of data. Greater access to and more effective use of public-sector information can generate benefits across the economy. Many discussions and decisions in cities become more and more quantified. City initiatives are acquiring and making available an increasing amount of data - data about car traffic, use of public transportation, energy and water consumption, air pollution, and so on. Many of these datasets are collected in real time by sensors.

At the same time, governments will need to anticipate and address the disruptive effects of big data on the economy and overall well-being, as issues as broad as privacy, jobs, intellectual property rights, competition and taxation will be impacted.

### 4.2 Citizen participation

Citizen participation and democratic processes are getting a new dimension when we see the new roles citizens can have as producers, prosumers and co-creators (see chapter 3). Citizens produce data and supply information that is important for urban policies. The new possibilities pose city governments not only for new possibilities but also for big challenges.

#### 4.2.1 Skills

In general smart city initiatives are primarily designed from the top down by a relatively small set of experts. In modern cities citizens need to be able to understand the discussions around smart cities, to critique them and inject their own ideas. Data and their interpretation are getting more important. In the data driven society education on the use

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<sup>5</sup> OECD (2015), Data-Driven Innovation: Big Data for Growth and Well-Being, OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/9789264229358-en>

of data is essential. People need to learn the ability to use data as part of complex reasoning, and also the ability accurately to critique and interpret data in order to ask and answer meaningful questions.

It's a key civic skill that forms the foundation of an innovative knowledge economy. It is the responsibility of city governments to ensure that no citizens are excluded from the benefits of the digital society through lack of access or skills.

#### **4.2.2 Civic hacking**

Governments as major producers of information are in a strong position to stimulate innovation by promoting open government data. Open data is a public good and can lead to extraordinary ideas. The process that externals use open government data for developing new applications is called 'civic hacking'. A civic hacker collaborates with others to create, build, and invent open source solutions using Open Data, code and technology to solve social, economic, and environmental challenges relevant to their neighbourhood, city, state, or country.

Since so much of citizens' lives are about interfacing with the government, much of civic hacking is about improving the use of open data and communication. Civic hacking has implications beyond our experience with government. By empowering citizens to perform their own market oversight, for instance, we reduce the need for regulations and the bureaucracy that regulations create. Often civic hacking involves the use of government data to make governments more accountable, but the goals of civic hacking are much more diverse.

Civic hackers can be programmers, designers, data scientists, good communicators, civic organizers, entrepreneurs, government employees or just motivated individuals.

### **4.3 Leading by example**

The right and energy efficient usage of ICT within the city administration is related to the role model that cities have. Cities that take green ICT seriously can demonstrate their commitment and lead by example with help of their Environmental Management System. Important elements of environmental management systems are transparency, visibility and accountability. The collection and presentation of data is crucial to make a management system work.

Not less important, is the role cities play as big consumers. More use of ICT means a huge investment in hardware. The pallet ranges from computers, via infrastructure, mobile phones, cables, to transmission stations, etc. All these products have environmental consequences during their production process, their lifetime and in the waste stage. Responsible procurement has an enormous effect on the quality of the environment.

ICT-hardware has a relatively short lifetime. Waste electrical and electronic equipment (WEEE) is currently considered to be one of the fastest-growing waste streams. WEEE contains a number of hazardous substances and at the same time valuable materials. The revised EU WEEE Directive (2012/19/EU) sets out measures to reduce generation of WEEE,

and enhance collection, reuse, recycling and recovery, applying producer responsibility as key implementing mechanism.

The total collection rate (including collection both from households and other sources) achieved in EU states so far is around 37 % by weight of amounts put on the market in 2010. The amount of WEEE reused and recycled has increased over time in all countries where data is available. In 2010 already most EEA countries achieved a reuse and recycling rate above 80%.<sup>6</sup>

#### **4.4 Infrastructure**

'Infrastructure' is the term used for the underlying physical and organizational structures and facilities that support city systems and keeps a city functioning. Infrastructure includes roads, buildings, electricity grids and communication networks. Especially the communication infrastructure is under strong development. High-speed Internet access and a wide mobile phones network are preconditions for economic development in cities already. New developments, which will lead to new demands on infrastructure, are to be expected.

But also more traditional infrastructure as for water supply, energy and traffic need adaptation. City infrastructures will need to withstand pressures such as extra stress on the electricity grid resulting from more homes having solar panels, and increasing incidents of extreme weather resulting from climate change such as tornadoes and storm surges.

Cities will need to future-proof their infrastructure. They might have to build new infrastructure or retro-fit existing networks and structures. Data is at the heart of all smart infrastructures. The system can monitor, measure, analyse, communicate and act, based on data collected from sensors. With that cities will be confronted with new problems, like lifetime of infrastructure. Physical infrastructure has a lifetime of often more than 100 years; sensors and communication infrastructure will have different lifetimes. Also the vulnerability of ICT systems that are built in basic city infrastructure can lead to a cascade of system failures.

Cities will need a coordinated, long-term approach to smart infrastructure design, construction and management that brings together expertise from many different partners to address these issues.

#### **4.5 Economic development**

Cities are in many countries the main engines for economic development. Knowledge, markets and finance are concentrated in cities and form a good basis for entrepreneurs. Start-ups and SME's need to understand what new ICT developments are and what additional opportunities a smart city offers. Data and communication are essential elements of possible value chains of new enterprises.

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<sup>6</sup> <http://www.eea.europa.eu/data-and-maps/indicators/waste-electrical-and-electronic-equipment>

A prepared and up-to-date infrastructure is the basis for new companies. But just as important as physical infrastructure also the 'soft' infrastructure is important to support start-ups. Cities that want to stimulate and steer these developments in a green direction, can use knowledge transfer and financial support to create a right environment. Within the city administration the potential of ICT for business development has to be recognised. Cooperation with research institutes and the business community in so-called Triple-Helix programs should be stimulated.

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## 5 WHY SHOULD ICT BE GREEN?

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New ICT developments will not automatically lead to a more sustainable city or a better environment. This chapter describes the relation between ICT and environmental themes.

### 5.1 Energy efficiency and climate policy

ICTs and energy efficiency are related in two ways: 'Greening through ICTs' and 'Greening of ICTs'.

In the first case, ICT-enabled solutions (for example smart grids, smart buildings, smart logistics and industrial processes) are helping to transform the world towards a more sustainable and energy efficient future. This is particularly true in the sectors that are big energy consumers such as transport and electricity generation. ICT in the form of videoconferencing eliminates the need for travel, while so-called intelligent transport (based upon vehicles, roads and traffic control centres equipped with ICT) can not only improve safety, but also cut the use of fuel. And when it comes to electricity supplies, by avoiding wastage and making distribution more efficient, "smart grids" could reduce demand substantially.

These green technologies and processes have the potential to play a significant role in significantly reducing global greenhouse gas emissions. A study of the Global E-Sustainability Initiative concludes that ICT can enable a 20 % reduction of global CO<sub>2</sub> emissions by 2030. To realise this potential lies here a major role for cities, supported by Green Digital Charter.

Although ICT generate emissions in their manufacture, use and disposal, this effect is relatively small compared with their power to cut emissions elsewhere. Due to the fact that ICT is more and more integrated in our society, the energy use of ICT as such is difficult to estimate.

One should take into account the estimated 19 billion<sup>7</sup> edge devices attached to our global ICT infrastructure. Some use relatively little power per unit (mobile phones) while some use much more (DTVs). Together, these billions of devices add up. There are different estimations, with very different outcomes, how much energy global ICT consumes.

A study from the Global e-Sustainability Initiative (GeSI), a strategic partnership of ICT-companies shows that ICT emissions as a percentage of global emissions—and in absolute quantities—will decrease over time. The SMARTer2030 report estimates the ICT emissions "footprint" is expected to decrease to 1.97% of global emissions by 2030 compared to 2.3% forecast by 2020. This would mean an autonomous reduction of about 15%. The Green Digital Charter signatories have committed to a decreasing of ICT direct carbon footprint by 30% within 10 years. Thus despite the good development that ICT as itself becomes more energy efficient, a considerable extra effort has to be made.

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<sup>7</sup> <http://www.vertatique.com/what-attached-our-global-ict-infrastructure>

## 5.2 Resource efficiency

Electrical or electronic goods are a significant source of hazardous waste as they can contain lead, cadmium and brominated flame-retardants. Uncontrolled processing of such waste in developing countries can cause serious health problems and pollution.

Rare earth minerals are used in the production many ICT devices, like mobile phones, PC hard drives, cameras, communication satellites, and electric car batteries. Rare earth elements are a group of chemical elements with unique properties that have enabled the miniaturisation of electronic components. In fact, most rare earth elements are widely distributed in the Earth's crust. Only the "heavy" rare earth elements, such as europium, used to produce colour in TVs and other screens, are actually hard to get. Since the mining of rare earth elements is concentrated in only a few countries, the economical dependency is a relevant aspect too.

But one should not forget that the most of electronic waste contains valuable metals like copper and gold. Waste electrical and electronic equipment (WEEE) is currently considered to be one of the fastest-growing waste streams, and should be recycled as much as possible.

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## 6 WHY CITIES SHOULD TAKE ACTION?

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As mentioned above, ICT developments are moving fast and cause a revolution in the social and economic world, as we know it now. The development has already been labelled as the fourth industrial revolution. The first industrial revolution mobilized the mechanization of production using water and steam power. The second industrial revolution then introduced mass production with the help of electric power, followed by the digital revolution and the use of electronics and ICT to further automate production. In the fourth industrial revolution information technology is making communication and interaction between all elements in the value chain possible. The 'Internet of things and services' makes this possible.

It can be concluded that the development is driven both by big industries, and by individuals and users of ICT. City governments have an essential additional role for the following reasons:

- Developments have to be steered in a social acceptable direction;
- Exclusion of groups of citizens must be avoided;
- ICT can and must be used for integrative solutions;
- Negative environmental consequences must be avoided;
- Energy use and resources loss should be avoided.

In short, cities should safeguard the general interest and stimulate that the developments are being used for the benefit for the city population. There are several challenges for cities that need to be addressed in a systematic way.

- The development of standards for smart and ICT prepared cities, so that solutions can be exchanged and upscaled;
- The use of open data for citizen participation and its privacy and legal issues;
- The development of new business models and innovative public-private relationships;
- Governance models (involving the citizens, collaboration with stakeholders, open/living labs, co-creation, etc.);
- Internal organisation (how a city reforms and reacts to the changing environment, silo breaking, etc.);

All these issues are strongly related and should be addressed not only on a technical level, but also on a political and social level. Cooperation between cities is needed to find answers on the urgent matters that are coming towards the city.

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## 7 WHAT IS THE GREEN DIGITAL CHARTER?

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### 7.1 The Original

The Green Digital Charter is a EUROCITIES initiative, launched at the EUROCITIES annual conference in November 2009, as part of Green Shift Europe, and supported by the European Commission.

The Green Digital Charter is a declaration committing cities to working together to deliver on the EU climate objectives through the use of Information and Communication Technologies (ICT). It therefore promotes progress in tackling climate change through the innovative use of digital technologies in cities.

In addition to a range of statements and aims, the Charter entails three specific commitments:

- To work with Green Digital Charter signatories on ICT & energy efficiency;
- To deploy five large-scale ICT for energy efficiency pilots per city within 5 years from the signature;
- To decrease ICT's direct carbon footprint per city by 30% within 10 years from the signature.

The Charter is currently signed by over 47 major European cities. A full list can be found on [www.greendigitalcharter.eu](http://www.greendigitalcharter.eu).

### 7.2 2016 Update

During 2015 an update of the original charter has been prepared. The rapid developments in ICT and its applications, makes a repositioning of cities necessary. A priority of the new charter is still energy efficiency; both the energy use of ICT systems as the use of ICT solutions to improve energy efficiency in other policy fields. As can be concluded from the chapters above, ICT can and is being used for much more themes related to sustainable development. ICT is a tool that can make a contribution in probably all policy domains of local governments.

ICT can support improvements in conventional systems, processes and operations. Additionally ICT makes completely new activities and innovative concepts possible. For city governments the new possibilities of citizen involvement and participation and the use of open data are extremely relevant. Supporting social cohesion and avoiding exclusion is a precondition for cities in the new Green Digital Charter.

The update of the charter text in 2015 will answer to this wide new spectrum. Energy efficiency stays an important aspect, but the charter is designed to helping cities to identify other ICT uses that contribute to sustainable development.

### **7.3 Are there comparable initiatives?**

There is much debate on how technology can make a city better, and whether the term used is “smart”, “future” or “digital”, the direction of travel is similar. Even standards organisations like the British Standards Institute (BSI) and International Organisation for Standardisation (ISO) are looking at how to “define” a smart city, and it is important that the Green Digital Charter contributes to this evolving domain and maintains a visibility.

Green Digital Charter exists next to other city networks and initiatives covering green, digital, smart and future cities. The Green Digital Charter wants to work with and complement other initiatives. Below are some other city-initiatives described and put in relation to the Green Digital Charter.

#### ***7.3.1 European Innovation Partnership on Smart Cities and Communities***

The European Innovation Partnership on Smart Cities and Communities (EIP-SCC [www.eu-smartcities.eu](http://www.eu-smartcities.eu)) brings together cities, industry and citizens to improve urban life through more sustainable integrated solutions. This includes applied innovation, better planning, a more participatory approach, higher energy efficiency, better transport solutions, intelligent use of ICT, etc.

The network collects projects or project plans (which are called ‘commitments’) and stimulates and supports exchange between the different partners. Although EIP-SCC uses the word ‘commitments’ these are not broad political commitments but specific projects, some big, some very small. A big difference with the Green Digital Charter is the fact that Green Digital Charter is a network of cities and demands a broad political commitment.

#### ***7.3.2 Open and Agile Smart Cities Initiative***

The Open and Agile Smart Cities Initiative (OASC <http://connectedsmartcities.eu/open-and-agile-smart-cities>) was officially launched on March 2015 to accelerate the adoption of common standards for global smart city development. So far, 60 cities from 10 European Countries, Brazil and Australia have joined. OASC is contributing to the need of a common Smart Cities framework to create market. Innovative and replicable solutions increase the competitiveness of businesses and improve services offered by cities.

The cities in the network will also collaborate in the definition of common standard open data models based experiments and actual usage. Standards help to overcome the situation where no system can scale and spread.

Just like in the Green Digital Charter the participating cities make a formal commitment to the network. Standards and projects are actually developed and implemented. A commitment towards a greener or more sustainable city as in the Green Digital Charter is not part of the initiative.

#### ***7.3.3 Smart Cities Information System***

The Smart Cities Information System (SCIS [www.smartcities-infosystem.eu](http://www.smartcities-infosystem.eu)) is an initiative of the European Commission's DG Energy, is a follow-up of the CONCERTO project, which started in 2005. This initiative aims to bring together like-minded interests and individuals

to encourage knowledge sharing and greater collaboration in the goal of improving energy efficiency and energy security, reducing CO<sub>2</sub> emissions and increasing the share of renewable energy. It also focuses on the energy dimension of ICT and transport, and includes city buildings, building clusters and city districts.

In fact the SCIS is an interactive website, supported by a newsletter, and not a network. It targets professionals and encourages them to share knowledge and experiences. In contradiction to the Green Digital Charter no membership of any sort of commitment is required.

#### ***7.3.4 City Protocol***

City Protocol is a collaborative innovation framework that looks for solutions which benefit citizens and their quality of life. It seeks to define a common systems view for cities of any size or type, and then embraces or develops protocols that will help innovators create cross-sectorial solutions. City Protocol aims at working across diverse cities by connecting them and ultimately creating the “Internet of Cities”.

With City Protocol, innovative enterprises can find a market for their solutions more easily. The network is therefore open for cities, commercial and non-profit organizations, universities and research institutions. The network presently connects 80 organisations, 300 experts and 10 city projects. Just as the Open and Agile Cities Initiative the priority lays on the development of standards.

#### ***7.3.5 CITYkeys Project***

The European Commission has developed two parallel approaches to support the implementation of smart urban technologies: the creation of 'lighthouse projects' (large scale demonstration of technology in cities and communities) and 'horizontal activities' to address specific challenges (e.g. regulatory barriers, in standardisation, public procurement and performance monitoring). CITYkeys project ([www.citykeys-project.eu](http://www.citykeys-project.eu)) is within the context of these horizontal activities.

The aim of CITYkeys is to develop and validate key performance indicators and data collection procedures for the common and transparent monitoring as well as the comparability of smart city solutions.

The project is funded by the European Union HORIZON 2020 programme, and is executed by three research institutes and five European cities. Additional cities will contribute to the project in order to gather as much evidence and feedback as possible about the practical use, benefits and challenges of key performance indicators (KPI) and smart city project evaluation frameworks.

The relation to the Green Digital Charter is made through EUROCITIES as city network, represented in both projects. The results of the project will be distributed through Green Digital Charter channels.

#### ***7.3.6 The Covenant of Mayors***

The Covenant of Mayors ([www.covenantofmayors.eu](http://www.covenantofmayors.eu)) is a bottom up policy initiative consisting of the voluntary commitment of over 6500 towns and cities to significantly

exceed the 2020 EU climate objectives as regards the 20% CO<sub>2</sub> reduction target. The signatories of the Covenant of Mayors come from 54 countries and the initiative is being replicated well beyond the EU.

In October 2015, a new Covenant of Mayors was launched. This new Covenant of Mayors:

- Features a new target of at least 40% reduction in CO<sub>2</sub> emissions by 2030;
- Includes both the mitigation and adaptation pillars through the integration of the Covenant of Mayors and Mayors Adapt;
- Will reach a global scope, opening up participation to local authorities worldwide.

Just like the Green Digital Charter the Covenant targets exchange between cities and challenges cities by demanding a political commitment. The Green Digital Charter is on the one hand more specific targeted towards the use of ICT and on the other hand it targets a broader spectrum than energy efficiency and climate policy alone.

### ***7.3.7 European Initiative on Smart Cities***

The European Initiative on Smart Cities (<https://setis.ec.europa.eu/set-plan-implementation/technology-roadmaps/european-initiative-smart-cities>) is a European financial program, which supports cities and regions in taking ambitious and pioneering measures to progress by 2020 towards a 40% reduction of greenhouse gas emissions through sustainable use and production of energy. Next to other approaches, the program also will support 'smart management of supply and demand'. Local authorities are invited to propose and implement holistic problem-solving approaches, integrating the most appropriate technologies and policy measures. This would involve ambitious and pioneer measures in buildings, energy networks and transport.

The Initiative builds on existing EU and national policies and programs, such as CIVITAS, CONCERTO and Intelligent Energy Europe. The local authorities involved in the Covenant of Mayors will be mobilized around this initiative to multiply its impact.

The main goal of this Initiative is energy efficiency. ICT is mentioned as one relevant tool to achieve the formulated climate goals. There is no general commitment towards 'green ICT' mentioned or demanded from the cities.

### ***7.3.8 Code for Europe***

Code for Europe (<http://codeforeurope.net>) is an initiative to solve urban challenges, by enabling flexible temporary teams of developers to create solutions that are easily reusable in other European cities. Cities need to become smarter and the public sector needs to make use of innovation to stay ahead and create sustainable solutions to urban challenges.

By partnering technology experts with city officials Code for Europe hopes to create solutions, using technology and open data to make cities more efficient and sustainable.

The small network of cities, individuals and NGO's promote the release of open data and the sharing of existing code in participating cities. By placing developers within city administrations they enable cities and authorities to become more skilled in technological,

user-driven innovation and bring new approaches to how to tackle civic problems. The initiative is mainly technical driven and is not as wide oriented as the Green Digital Charter.

## **7.4 EUROCITIES Knowledge Society Forum**

The EUROCITIES Knowledge Society Forum supports cities to ensure that all citizens can have access to ICTs and participate in the information and knowledge society and helps public administrations to make the most of the rapid development of new technologies.

For the coming years the KSF has identified the developments that are relevant for cities as described in Chapter 4. To support cities the KSF will concentrate their actions on the following issues.

### **7.4.1 Governance**

Governance is becoming less centralized. Open data will help public administrations, citizens and the business have a common understanding and work together sharing experiences, practices and needs.

Citizens' needs must be placed at the core of decision-making process (co-creation). Assessment should be constant, throughout the process. Social media provide a series of new opportunities to politicians to receive real-time feedback and to engage with citizens in the decision-making process and co-creation of (better/new) services.

### **7.4.2 Data**

A smarter use of data is an opportunity for public administrations. But the opportunity is connected with challenges on data collection, management, usage, ownership, ethical questions as well as data access and openness. Privacy issues play a role when collecting and handling personal data, especially when these data are collected both by public and private initiatives.

Common problems should lead to common solutions, realized by close cooperation and exchange. Cities need to identify the right format of cooperation case by case.

### **7.4.3 Relations with the industry/business**

Technological Innovation takes place mostly in the private sector. Cities need to import technology in order to provide better services to all citizens. In this sense, cooperation and collaboration between cities and industries need to be strengthened especially on procurement related matters.

Procuring services from the private sector has challenges that need to be overcome like:

- Technology lock-in (to be avoid);
- The private sector may be legally obstructed to access public data;
- Budgetary constraints;
- Open dialogue (pre-procurement) - a market research should precede procuring services.

Cities can form consortia to set the criteria and procure the necessary services.

#### **7.4.4 Standards**

For the digital single market to be completed, common standards should be used, providing a common platform for the industry. Cities, in order to procure services, need to secure that they will be interoperable. For that cities can cooperate with international/EU and national standardization bodies. KSF will discuss positioning more on standards (position papers/statements) wherever it is relevant.

#### **7.4.5 Access**

Access to technologies is a pre-condition for e-inclusion. Cities can stimulate e-inclusion with

service design, the availability of infrastructures and the affordability and life long learning.

A separate Working Group within KSF is dedicated to this subject.

#### **7.4.6 Internal organisation**

In many cities, one department is responsible for all the ICT/digital matters (policy and projects). This structure reflects a traditional way of working, prior to the technological innovation, which favours internal silos and prevents knowledge sharing (example: knowledge acquired through EU projects fades out after their completion and is not transferred to other departments/people).

As a necessary precondition, cities need to define their own “smart city” strategy: what they want to reach and their strategic priorities. According to these priorities, guidelines must be addressed to the city’s internal structure. The internal structure must be engaged in the process and internal silos must be encountered. Municipalities can avoid creating new structures but can try connecting their internal departments for example through opening up data and bringing innovation through EU projects. New EU projects must be built on the existing knowledge that has been acquired and cities should take full advantage of the instrument provided instruments provided (Green Digital Charter, Citykeys)

Cities have to restructure internally, innovate, following the digital revolution. The information has to be disseminated throughout the municipal departments working on ICT/digitalisation/smart city projects. ICT should be developed, following the current needs and provide feedback with solutions that optimise functionality. Cities exchange can save resources and help less advanced cities to catch up technologically. Especially smaller cities need to enter EU projects or consortia in order to jointly procure services that can give them the necessary tools.

### **7.5 EU Policy**

It has been stated in this paper already several times that the digital economy is changing the European internal market profoundly. Naturally the EU has a strong position in that

issue. Much of the projects and programs mentioned in chapter 7.3 and the Green Digital Charter as well are being supported or even initiated by the European Commission.

The Union's vision is that of a digital economy that delivers sustainable economic and social benefits based on modern online services and high-speed Internet connections. A high quality digital infrastructure is of strategic importance to social and territorial cohesion because it underpins virtually all sectors of a modern and innovative economy. All citizens as well as the private and public sectors must have the opportunity to be part of that digital economy.

A Communication from the Commission entitled 'The Digital Agenda for Europe – Driving European growth digitally' (<https://ec.europa.eu/digital-agenda/en>), attempts to realise that, by 2020, all Europeans have access to much higher internet speeds of above 30 Mbps and 50 % or more of Union households subscribe to internet connections above 100 Mbps.

Directive 2014/61/EU of 15 May 2014 on 'measures to reduce the cost of deploying high-speed electronic communications networks'<sup>8</sup> supports the wide digitisation of the public sector, facilitating a digital leverage effect on all sectors of the economy, in addition to the reduction in costs for public administrations and increased efficiency of services provided to citizens.

These goals find their reflection in several support programs of the EC like Horizon 2020 and the Investment Plan for Europe, also known as the "Juncker Plan" or the "EU Infrastructure Investment Plan". The last is an ambitious infrastructure investment programme first announced by European Commission President Jean-Claude Juncker in November 2014: it aims at unlocking public and private investments in the "real economy" of at least € 315 billion over a three years fiscal period.

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<sup>8</sup> <http://ec.europa.eu/digital-agenda/en/news/directive-201461eu-european-parliament-and-council>

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## 8 CONCLUSION

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The digital revolution is taking place and is affecting modern life in all aspects. ICT is changing the world. There are hardly comparable developments that have such a big impact on society as a whole. Not only changes it whole economies, as the introduction of the steam engine did; also the way people communicate, as the telephone did; also financial markets or how new products are being developed and implemented, etc. Cities as concentrations of people, activities and infrastructure are affected in an enormous way.

City governments can sit back, wait and see what happens, or they can be proactive and use the opportunities to improve the quality of life for their citizens, use new communication tools for democratic processes, create possibilities for innovative enterprises, etc. New techniques can not only facilitate existing working fields, but also create new urban applications or thematic fields, like the use of Open Data or citizen participation.

Nevertheless like all big changes the digital revolution contains risks. Not all ICT applications will automatically lead to a more sustainable city; more waste and more complex waste-streams, higher energy usage, privacy aspects, etc. are connected to ICT too. Also the developments may not exclude certain groups in society. Cities have the obligation to safeguard social coherency and quality of the environment. Developments in ICT should therefore be steered in the desired direction, and used to make the city more greener, more resilient and more sustainable.

The first step for a city that wants to be proactive is to formulate a common vision regarding 'green ICT'. Only with a broadly accepted vision as basis one can develop a strategy and make optimal use of ICT. From the overview of networks, projects and initiatives (chapter 7.3), it can be learned that the Green Digital Charter is one of the few initiatives that starts with this step.

The Green Digital Charter makes it for individual cities possible to express the vision for green digital revolution in a clear way and create broad acceptance within the population and within the city administration. The Green Digital Charter demands from the participating cities a commitment to use ICT to improve the quality of life of the citizens, to avoid exclusion, to stimulate innovation, and in general use ICT to support sustainable development.

Another aspect of the Green Digital Charter is the voluntary obligation to develop new projects. In this way cities develop knowledge and experience, which will be used to inspire and support colleague cities. The paper describes therefore areas that are relevant for an urban digital strategy, like the development of standards to facilitate cooperation and exchange. Secondly it describes the possibilities of open data, including citizen's participation, new governance models and innovative business models.

A third aspect is the concentration on climate policy and on citizen participation. ICT is depending on energy and it is not more than logic that the most energy efficient ICT tools

are being sought for. A further step, which had the Green Digital Charter already from the beginning, is a targeted use of ICT tools to reduce energy use in other policy fields. In the mean time also other initiatives have followed this example and have put climate policy as main goal for ICT use.

The Green Digital Charter puts the citizens in the centre of its policy and not the technical possibilities. New possibilities and new technologies will specifically be used for a better quality of life for the citizens. This can be in new citizen participation models, but also in more integrative planning models or data collection for a better service delivery.

Finally, this paper tried to give some insight in the world of projects, initiatives and EU-policy that are related to the Green Digital Charter. All initiative may have different accents or priorities, but standardization, exchange and cooperation are important for all. The Green Digital Charter tries to be a platform where this knowledge and experiences can be exchanged on an equal level between proactive cities.