

GREEN DIGITAL CHARTER



MONITORING REPORT

Overview of signatory
cities' steps towards
meeting GDC objectives

FEBRUARY 2016



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List of abbreviations

GDC	Green Digital Charter
ICT	Information and communication technologies
ITS	Intelligent transport system
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
SEAP	Sustainable Energy Action Plan
SUMP	Sustainable Urban Mobility Plan

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EXECUTIVE SUMMARY

This publication is the first in a planned series of Green Digital Charter monitoring reports. It is intended to provide an overview of the signatory cities' progress towards their Green Digital Charter commitments to:

- work with other Green Digital Charter signatories on ICT and energy efficiency
- deploy five large-scale pilot projects per city within five years from the charter's signature to demonstrate the energy efficiency benefits ICT can bring
- decrease ICT's direct carbon footprint per city by 30% within ten years from signature

The report confirms that the cities use the Green Digital Charter to promote their green ICT objectives and to support local development efforts towards a smarter city.

By and large, the signatory cities are on track to meeting their GDC commitments, although a few challenges remain. These fall into one or more of three main categories: funding; governance; and data, standards and interoperability.

The GuiDanCe project, which supports the implementation of the Green Digital Charter, is working closely with the signatory cities to help them overcome these challenges and plan their future activities.

The survey has confirmed that the policy changes at regional and national levels greatly determine the way cities develop their smart city and digital city concepts and strategies. The cities are increasingly inclined to adopt ICT as an integral part of their general development strategies and the Green Digital Charter can help them identify effective and efficient practices, solutions and project ideas.

These local development plans tend to emphasise sustainability and the need for low-carbon solutions. They also identify smart governance, economic development, health and public safety and intelligent transportation as priority areas.

The signatory cities consider the Green Digital Charter a key European initiative that guides their sustainable urban development planning process at local level.

Overall, the cities are keen to participate - or even take the lead - in the adoption, design and implementation of innovation-related projects. They recognise that innovation can generate jobs and foster economic development opportunities. Citing concrete examples, the cities confirm that they intend to:

- become platforms for innovation through digital planning and new digital infrastructures and services
- ensure that their ICT infrastructure and digital services have the smallest possible environmental impact and carbon footprint
- create new partnerships by connecting leaders and stakeholders in order to implement a new green digital agenda
- promote an integrated approach to and solutions for improving the transparent measurement of energy use
- support open innovation through R&D activities and/or the implementation of projects in user-driven, open environments
- implement a strategy to promote the green network of connected cities, making the most effective use of ICT to increase the economic, social and environmental wellbeing of all citizens
- work for the improvement of the quality of life of their citizens
- ensure that ICT-enabled climate change initiatives will go hand in hand with work to promote social cohesion
- promote ICT innovation for climate change mitigation to maximise the benefits for local communities and businesses

SIGNATORY CITIES

• REYKJAVIK

• OULU

• HELSINKI

• TALLINN

• STOCKHOLM

• LINKÖPING

• GÖTHEBURG

• Malmö

• GDYNIA

• RIGA

• VILNIUS

• GLASGOW

• EDINBURGH

• BELFAST

• SUNDERLAND

• DUBLIN

• MANCHESTER

• BIRMINGHAM

• MILTON KEYNES

• BRISTOL

• AMSTERDAM
• THE HAGUE
• UTRECHT
• EINDHOVEN

• ROUBAIX • GHENT

• RENNES

• NANTES

• NUREMBERG

• PRAGUE

• VIENNA

• BORDEAUX

• ZAGREB

• TURIN • PADUA • VENICE

• GENOA • BOLOGNA • RIJEKA

• NICE

• NAPLES

• BARI

• SKOPJE

• BURGAS

• ZARAGOZA

• BARCELONA

• VALENCIA

• MURCIA

• MÁLAGA

• LISBON

BACKGROUND AND METHODOLOGY

About the Green Digital Charter

The Green Digital Charter is a declaration committing cities to working together to deliver on the EU climate objectives through the use of ICT.

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

- to work with Green Digital Charter signatories on ICT and energy efficiency
- to deploy five large-scale pilot projects per city within five years from its signature to demonstrate the energy efficiency benefits ICT can bring
- to decrease ICT's direct carbon footprint per city by 30% within ten years from its signature

The charter has already been signed by 50 major European cities and is open to local authorities regardless of the stage of implementation of their energy and climate policies.

The Green Digital Charter is a EUROCITIES initiative, started by Manchester City Council and Clicks and Links Ltd and supported by the European Commission.

Methodology

This is the first edition of the Green Digital Charter monitoring report, which provides a snapshot of the trends and developments in the use of ICT solutions by Europe's cities, and also of their digital and smart city strategies.

Its main conclusions are based on evidence collected through the Green Digital Charter survey, which was developed under the Horizon 2020-funded GuiDanCe¹ project.

The survey collected evidence-based self-assessments of progress on the GDC commitments. The signatories were asked whether their city meets the commitments contained in the declaration fully, partly or not at all. They were also requested to provide evidence for their assessment.

A total of 18 Green Digital Charter signatory cities participated in the survey, providing a wealth of information on ICT-related developments and the evolution of their sustainability and smart city strategies at local and national levels.

Responses were received from: Bordeaux², Burgas, Edinburgh, Gdynia, Genoa, Glasgow, Malmö, Manchester, Murcia, Naples, Oulu, Prague, Riga, Roubaix, Skopje, Valencia, Zagreb and Zaragoza.

The present report does not aim to provide a complete overview of all digital developments and projects taking place at local level in Europe. It only analyses the responses provided by the participants in this survey.

SECTION I

POLICY TRENDS AND DEVELOPMENTS

Finland, FYR Macedonia, Italy, Spain, Sweden and the United Kingdom have national policies dedicated to digital services and the application of ICT to smart cities. These policies have a significant impact on the GDC signatory cities' broader policy approaches and actions, and they also affect the levels of funding available

THE NATIONAL CONTEXT

The policy changes taking place at regional and national levels have a major impact on the way European cities develop their digital and smart city concepts and strategies. For example, Bulgaria, Croatia, Finland, Italy, Spain, Sweden and the United Kingdom have all drawn up national strategies to guide their steps in these fields.

These national strategies have a major impact on the way the cities formulate their policies and decide on their actions, and also on how local development projects are funded.

Interesting examples for such an impact are provided by Glasgow, Edinburgh and Manchester in the [United Kingdom](#).

The Future City Glasgow (FCG) initiative is a £24 million (€32 million) programme financed by Innovate UK, an executive non-departmental public body sponsored by the National Department for Business, Innovation and Skills. Since 2013, the department has been investigating the role technology, data and connected assets play in making life in the city smarter, safer and more sustainable. One of the principal goals of FCG is to promote and support smart city ambitions across Scotland. Glasgow currently collaborates with six other cities in Scotland, supported by the Scottish government and the Scottish Cities Alliance.

Another example is the UK government's SuperConnected Cities Programme³, which offers free wifi in 70 public buildings in 22 cities across the UK (including in GDC signatory Edinburgh). The programme facilitates remote communication and access to services, and thereby helps save travel time and costs.

Manchester has recently won a £10 million (€13 million) government-funded technology competition with an innovation project aimed at providing improved services to its residents. The CityVerve project⁴ seeks to test innovative services using Internet of Things (IoT) technology.

[Spain](#) has an ambitious digital agenda⁵, which influences policy development in signatory cities Murcia, Valencia and Zaragoza. It includes the Plan Nacional de Ciudades Inteligentes⁶ (National Plan for Smart Cities). In this plan, the ministry of industry, energy and tourism commits to supporting local authorities in Spain in their efforts to make their cities smarter by making available €188 million and by setting up the Smart Cities Advisory Group to coordinate, improve communication and adopt recommendations.

Skopje's⁷ development of ICT solutions is connected to the [FYR Macedonia's National](#) ICT Strategy for 2016-2017 and its implementation plan⁸.

[Italy](#) is developing a series of initiatives at national level in order to reinforce the smart city approach, targeting especially Genoa and Naples.

The National Operational Programme on Metropolitan Cities 2014-2020 (PON METRO⁹), funded by the ERDF and ESF, is dedicated to helping cities draw up urban development plans and actions inspired by the smart city concept and embracing social inclusion, with particular emphasis on the digital agenda, energy efficiency, sustainable mobility, social housing, inclusion and innovation.

The Italian government's Digital Agenda¹⁰ is defined in the framework of the Digital Agenda for Europe. Its main priorities include the provision of innovative digital services to citizens, public administrations, and the education and health systems, as well as the development of ultra broadband access, the introduction and promotion of electronic billing and payment systems and the improvement of the digital justice system. Most of these tasks have a strong impact at the urban level and are funded through local, national or EU sources.

In **Sweden**, the Digitalisation Commission¹¹ was established in 2012 to analyse and monitor progress in terms of meeting the ambitious national ICT policy goal for the country to become the best in the world at exploiting the opportunities of digitalisation. The commission is also tasked with presenting proposals for new policy actions, highlighting the benefits associated with the digital transformation and sharing best practices.

Other national strategies promoting ICT development often form an integral part of the national framework for sustainable development (as in the Czech Republic¹²) or of the Action Plan for Green Public Procurement¹³ (in Croatia).

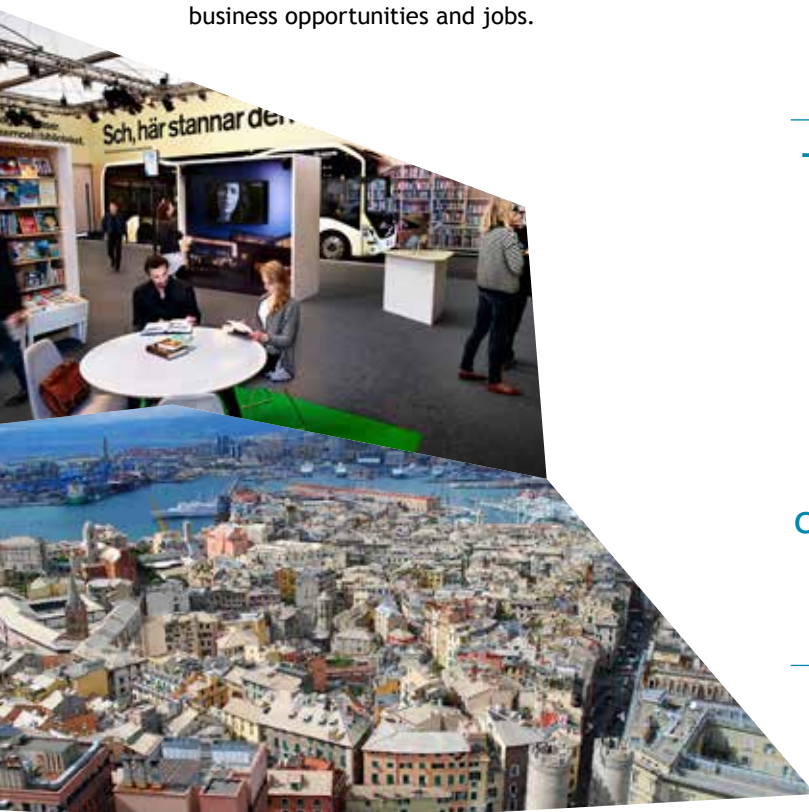
Italy's Italia Sicura (Safe Italy) project focuses on risk prevention and climate change adaptation. In Genoa, the programme seeks to aid the completion of major ICT-related infrastructure projects to control and reduce the risks and impacts of floods and landslides.

The national associations of local authorities also play a role in promoting the definition and sharing of best practices. This is the case in Spain, Sweden and Finland.

The Spanish Network of Intelligent Cities¹⁴ (RECI), founded in 2012, brings together 60 municipalities. The country has other networks to promote ICT policies and projects: the Mediterranean Network for Urban Sustainable Development, the Spanish Network of Cities for Climate, the Spanish Network of Accessible Cities and the Spanish Healthy Cities Network.

The Swedish Association of Local Authorities and Regions¹⁵ (SALAR) is both an employers' organisation and one that represents and advocates for local government in Sweden.

In Finland, the Six City Strategy - Open and Smart Services¹⁶ aims to promote sustainable and smart urban development in the country's six largest cities: Helsinki, Espoo, Vantaa, Tampere, Turku and Oulu. The strategy covers the period between 2014 and 2020 and seeks to generate new know-how, business opportunities and jobs.



The cities strive to improve their residents' quality of life and increase their satisfaction with the municipal services. Citizen participation is the key to prioritising and solving common problems, and also to identifying the projects the city must invest in

MAIN URBAN STRATEGIES AND PRIORITIES

Table 1: ICT-related smart city strategies or ones with an impact on these policies

BURGAS	<ul style="list-style-type: none"> • Municipal development plan for 2014-2020¹⁷ • Sustainable Urban Mobility Plan for 2014-2020¹⁸
EDINBURGH	<ul style="list-style-type: none"> • ICT & Digital Strategy¹⁹
GDYNIA	<ul style="list-style-type: none"> • Low Carbon Emission Plan (updated version of SEAP²⁰) • Sustainable Urban Mobility Plan 2016-2020
GENOA	<ul style="list-style-type: none"> • SEAP²¹ • Transformation Agenda (part of the EU-funded TRANSFORM project²²)
GLASGOW	<ul style="list-style-type: none"> • Future City Glasgow (FCG) initiative²³
MALMO	<ul style="list-style-type: none"> • 2009-2020 Environmental Programme²⁴ • Updated version (2015-2018) of the environmental programme²⁵
MANCHESTER	<ul style="list-style-type: none"> • Smarter City Programme²⁶ • Manchester: A Certain Future²⁷
MURCIA	<ul style="list-style-type: none"> • 2020 Murcia City Strategy (under development)
OULU	<ul style="list-style-type: none"> • Oulu City Strategy 2020²⁸
PRAGUE	<ul style="list-style-type: none"> • Smart Prague 2014-2020 (concept approved in April 2014) • Prague City Council Board's Programme Declaration for 2014-2018 • Strategic Plan of the City of Prague • Digital Strategy of the City of Prague (September 2015) • Territorial Energy Concept of the City of Prague • Integrated Regional Programme for Pollutants Emissions Reduction and on Air Quality Improvement on the Territory of the City of Prague Agglomeration • Clean Energy Programme Prague - promoting the conversion of heating systems and the use of renewable energy in flats and family houses • Strategy for Air Quality Improvement (started) • Sustainable Urban Mobility Plan (started)
RIGA	<ul style="list-style-type: none"> • Sustainable Development Strategy of Riga until 2030 • Development Programme of Riga for 2014-2020²⁹ • Riga Smart City Sustainable Energy Action for 2014-2020³⁰
ROUBAIX	<ul style="list-style-type: none"> • Smart City Plan³¹ (under development)
SKOPJE	<ul style="list-style-type: none"> • Sustainable Energy Action Plan of the City of Skopje (SEAP) 2012-2020³² • Sustainable Urban Mobility Plan (SUMP) • ICT Strategy 2010-2015
VALENCIA	<ul style="list-style-type: none"> • Smart City Strategy³³ • Technological Modernisation Plan of Valencia City Council, 2007 • Director Plan of Electronic Administration, 2008 • Master Plan for Information Systems, 2008-2013 • General Ordinance eGovernment, 2010
ZAGREB	<ul style="list-style-type: none"> • ZagrebPlan - Development Strategy
ZARAGOZA	<ul style="list-style-type: none"> • Open Government Strategy in the Digital City³⁴

The projects and policy development plans of the cities that participated in the survey put a strong focus on sustainability and low-carbon activities at local level. They all aim to use a **green ICT approach** to maximise efficiency, minimise environmental impact and become smarter cities.

The local sustainability targets for 2020 - or beyond - presuppose the use of ICT solutions at local level. The Covenant of Mayors and the Green Digital Charter are often referred to by cities as defining their key role in reaching those ambitious climate targets.

The table lists the strategies that are currently in place in European cities³⁵ that aim to implement ICT solutions in their quest to become smart cities.

These strategies highlight the following priority work areas:

1. Smart governance

- customer oriented approach
- e-democracy/e-administration
- intelligent services and digital content
- open, interactive city
- wifi hotspots

2. Economic development

- new entrepreneurship
- skilled workers
- culture and creative industries
- promotion of tourism

3. Health and public safety

- ICT and healthcare (e-health)
- city resilience
- intelligent street lighting

4. Intelligent transportation

- energy efficiency
- active travel
- integrated social transport
- bike and vehicle-sharing

The signatory cities consider the Green Digital Charter a major European initiative that guides their sustainable urban development planning process at local level

DIALOGUE AT LOCAL LEVEL

One commonly reported trend at local level is to organise roundtables and public consultations in order to identify and assess smart urban solutions and green technologies with the involvement of citizens and stakeholders. The definition of ‘smart city’ is still under debate: certain cities have yet to address this question, while others have already settled on a definition that they aim to use when developing their policies.

In the past, a city was considered ‘smart’ if it supported ICT development especially in the energy and transport sectors. In addition to these, the smart city strategies now encompass the social, cultural and business dimensions and recognise the empowerment of citizens.

The cities strive to improve their residents’ quality of life and increase their satisfaction with the municipal services. Citizen participation is the key to prioritising and solving common problems, and also to identifying the projects the city must invest in.

Municipal administrations involve universities, local industries and citizens in the assessment of:

- e-government and related services relevant to citizens
- the city’s climate change objectives, highlighting the important role digital infrastructure plays in bringing about behaviour change, reducing energy use and limiting CO₂ emissions
- the level of cooperation with local stakeholders in developing international projects, promoting interregional cooperation and implementing innovative solutions
- priority investments in the neighbourhoods

Participation in international and EU-funded projects is often essential to promoting cooperation among stakeholders at local and European levels and facilitating the exchange of ideas between local administrations and actors throughout Europe.

BENEFITS OF THE GREEN DIGITAL CHARTER

The signatory cities consider the Green Digital Charter a major European initiative that guides their sustainable urban development planning process at local level.

The signatories – especially the new ones – are particularly interested in getting involved in the training activities offered by the Green Digital Charter’s supporting NiCE and GuiDanCe³⁶ projects. Participation in these training activities is expected to help them develop further their digital and smart city strategies.

The cities also appreciate the dissemination and networking opportunities, which enable them to reach other European stakeholders, promote their local achievements and the results of their European projects, exchange best practices and attend international events. Manchester mentioned the added value it gains from its involvement in the GDC when interacting with local authorities in China.

The Green Digital Charter signatories also find it easier to connect with partners in their quest to develop European projects and to compare notes with local stakeholders on sustainable development objectives. The cities mention their GDC commitments in their environmental plans and in the procurement bids for new IT providers (Edinburgh is an example).

Some of the respondents are relatively new signatories of the Green Digital Charter (Burgas, Prague, Roubaix, Skopje and Valencia) and have not yet had a chance to take full advantage of the opportunities offered by the supporting projects.

Remarkably, several signatories mentioned the need – or the intention if they are new – to be more deeply involved in the events and trainings and to pay more attention to the information provided by the GDC’s supporting projects.

The involvement of certain cities in the Green Digital Charter has fallen victim to political changes, while in some cases cities could not dedicate enough resources to the initiative or there was no officially appointed contact person for a long time. In some cases it hinges on the goodwill of certain officials to involve the city in the activities of the GDC’s supporting projects.

The active members of the EUROCITIES Knowledge Society Forum find it easier to get involved in the initiative. These cities have already allocated time for their officials to participate in and keep informed of GDC-related developments. The other cities that are not part of this network (such as Valencia, Naples or Gdynia) can also attend the project’s events and trainings, but they need to allocate resources (money and staff) on a case-by-case basis.

SECTION II CITIES INNOVATE AND IMPLEMENT

Most of the respondents said they were satisfied with their cities' ability to promote innovation through digital planning and new digital infrastructures

SECTION II - CITIES INNOVATE AND IMPLEMENT

The following sections are devoted to the analysis of the self-assessments submitted by the signatory cities. Supporting examples have been added to provide further details on their projects and activities.

GDC objective: develop cities as platforms for innovation through digital planning and new digital infrastructures and services

Most of the respondents (12) said they were satisfied with their cities' track record in delivering on this objective. They said that their cities promote innovation through digital planning and new digital infrastructures.

Specifically, the cities focus on providing multifunctional e-government services to the citizens primarily in the area of smart transportation.

- **Burgas** has recently launched an intermodal journey planner service³⁷ and many of their services targeting citizens are now available online.
- **Gdynia** has completed the Tristar programme³⁸, whose aim was to optimise road traffic flow in the Tricity conurbation of Gdynia, Sopot and Gdansk. The city has installed screens to inform drivers and passengers of traffic conditions ahead, along with estimated travel times and the availability of free parking spaces.
- **Edinburgh** Council's 'channel shift' programme seeks to move customers to the most efficient and suitable channel for their needs, give them greater flexibility and encourage them to carry out their transactions with the council online.
- The smart cards project³⁹ in **Riga** focuses on developing an innovative and easy-to-use electronic payment card. This multifunctional card can be used to pay public transport fares, register for different social services (e.g. school catering), pay for parking or access different kinds of discounts offered to certain social groups.
- The Future City **Glasgow** programme uses data and technology to address four key areas - health, public safety, transport and sustainable energy - alongside other aspects of urban life. Glasgow has also been shortlisted for the European Capital of Innovation Awards 2016.
- **Manchester** City Council has recently upgraded its servers, launched a new website and inaugurated its new customer service centre in an effort to improve overall customer experience.
- The city of **Zaragoza** has developed two new application programme interfaces (APIs): one that provides information in open data format API, and a human API called Open Urban Lab. The former promotes the reuse of city data by third parties, while the latter seeks to enable third parties to collaborate in the development of smart city applications and technologies.
- In **Valencia**, the Integrated Platform of Electronic Administration (PIAE) is meant to provide citizen-centric digital public services. Within a year of its launch, the city has digitised over 1.8 million files, cutting the need for paperwork by 70%. PIAE has thus helped the city save €170 million.

GDC objective: ensure that the city's own ICT infrastructure and digital services have the smallest possible carbon footprint

Most cities admitted that this objective had only been partially met: certain measures had been implemented, but additional efforts and investments are required.

- The installation of new and more energy efficient data centres will be treated as a priority in future projects and green public procurement will be defined in compliance with ISO requirements, as in **Burgas** and **Edinburgh**.
- **Glasgow** City Council's Carbon Management Plan⁴⁰ outlines the actions aimed at reducing the local authority's carbon emissions. It highlights the role of data collection and the automatic reading of meters in public facilities.

Several cities - Murcia, Valencia, Riga and Malmo among them - reported progress in reducing carbon emissions from their ICT infrastructures.

- According to the Covenant of Mayors' Sustainable Energy Action Plan (SEAP) implementation reports for 2011 and 2012⁴¹, **Riga** had already met its carbon reduction target for 2020, as by 2011 it had already cut emissions by 50.69%. In line with the European Commission's European Innovation Partnership on Smart Cities and Communities initiative, Riga aims to attain the status of smart city by integrating innovative ICT solutions into its energy and transportation systems.
- **Malmo** undertook two external green ICT audits in 2010 and 2011. The findings prompted the city to rework its plans to build a data centre, launch a website to let citizens see Malmo's environmental impact and further develop its e-services. In the last audit, Malmo scored 857 out of a maximum of 1,000. The city has also won CIO's Sustainable Project of the Year Award⁴² for its innovative work in the field of sustainable IT procurement.

At local level, the cities often find it difficult to engage stakeholders and citizens. In the international arena, participation tends to be hampered by difficulties in involving the city's various departments

GDC objective: create new partnerships by connecting leaders and stakeholders for implementing a new green digital agenda

This self-assessment produced mixed results. Only a few cities have forged strong partnerships at local or regional level or become actively involved in international initiatives due to the Green Digital Charter. In many cities this is the result of existing links with other well-established national and European initiatives (e.g. Covenant of Mayors, national energy efficiency plans and strategies).

At local level, the cities often find it difficult to engage stakeholders and citizens. In the European arena, although signatories collaborate with national and European partners and share best practices to ensure that their solutions are replicable, participation tends to be hampered by difficulties in involving the city's various departments (departmentalisation, but also lack of adequate resources).

In this context, the respondents highlighted the valuable contribution of international organisations and initiatives, such as EUROCITIES, Energy Cities, CIVITAS/CIVINET, Covenant of Mayors, Compact of Mayors, European Innovation Partnership on Smart Cities and Communities (EIP-SCC), Climate KIC Community and other EU-funded or driven projects.

Roundtables and stakeholder platforms have been organised at local level as well.

- The **Edinburgh** Living Lab is a new collaborative initiative between researchers, the public sector and industry. The aim is to strengthen innovation capability in areas such as health and wellbeing, transportation and community development, education, economic development, waste management, energy, tourism and culture.
- **Genoa** is developing a virtual and a physical platform to connect the city's researchers, entrepreneurs and officials. Via this integrated framework, the stakeholders can share their data, exchange information and collaborate in order to explore investment opportunities and boost entrepreneurship.
- **Valencia** considers networking a priority, especially in the field of public-private partnerships. The Local Innovation Pact initiative seeks to promote cooperation and coordination between key local experts in research and development (universities, research centres, business associations, chamber of commerce, etc.).
- The Sustainable **Glasgow** and Future City Glasgow projects aim to make the city one of the greenest and technologically advanced in Europe. The project's board brings together experts from a variety of sectors, who share a common interest in attaining this goal.
- **Murcia's** 2020 Strategic Plan was drafted on the basis of conclusions on public participation in six sectoral working groups (municipal officials, stakeholders and citizens).
- **Skopje** has signed a memorandum of cooperation with the local Faculty of Computer Science and Engineering (FINKI) and created a stakeholder platform on electromobility.
- In 2014, **Zaragoza** implemented its new green 2020 Strategy on Sustainable Energy Management, which entailed digital measures. One of its specific ambitions was to promote partnerships between all relevant stakeholders in the metropolitan area.

GDC objective: promote integrated approaches and solutions for improving the measurement, transparency and visibility of energy use

Half of the respondents reported progress toward this objective. They highlighted measures such as the installation of smart electricity meters and gas data loggers, as well as the promotion of renewable energy sources and energy efficiency investments such as power conditioning. Solutions like these are essential to enable the development of smart buildings in new city districts.

- In **Malmo**, the Mobile Services for Energy Efficiency in Existing Buildings (ELIS) project⁴³ aimed to explore the potential of mobile device services to promote energy efficiency. The project's main ambition was to optimise and maximise the use of existing hardware and infrastructure.
- **Glasgow** City Council has been exploring alternative approaches to improving the way energy consumption is measured. For example, different groups of senior civil servants and elected officials have been assigned the task of monitoring and managing local energy use and carbon emission. Glasgow has also adopted an Open Manifesto in order to unlock the potential of open data, and has pledged to make all non-personal and non-commercially sensitive data freely and openly available through its city data hub.
- **Valencia** is the first city in Europe to collect all municipal information on a single platform based on the FI-WARE standard⁴⁴. The software collects real-time data from 350 sensors on a range of services, including traffic, street lighting, gardens, local police, pollution, cleaning, waste collection and weather. The platform also monitors energy efficiency, energy storage, energy consumption and the quality of air. Over 100 open data sources are now available through Valencia's Transparency and Open Data Portal⁴⁵.

GDC objective: support open innovation through R&D activities and/or deployment of projects in user-driven, open innovation environments

The majority of respondents said that they were lagging behind in meeting this commitment, adding that they saw the need for further action in this area.

Those cities that reported progress on this commitment (**Manchester**, **Malmo**, **Riga**, **Valencia** and **Zaragoza**) have made it a priority to develop an open data portal, which contributes to the creation of an open environment for innovation and meets the requirements of the Internet of Things (IoT) technology.

The cities are also promoting the end user-centric and open innovation-based living lab methodology. They offer incentives to individuals, entrepreneurs and companies to develop new products and services for the city. While this is a boost for local businesses, the cities can also improve the innovation ecosystem in the region.

Certain cities also emphasised the need for EU funds and other innovative measures to motivate businesses, such as tax reliefs, industrial parks developed and equipped to meet international requirements or business incubators for the development of viable and competitive small and medium-sized enterprises.

GDC objective: implement a strategy to promote green connected cities, making the most effective use of ICT as a platform for the economic, social and environmental wellbeing of all citizens

All the GDC signatory cities with the exception of Naples have developed and/or implemented a strategy that integrates ICT tools (see section Main Urban Debates and Priorities).

The cities identified the following ICT implementation work streams:

- broadband infrastructure
- urban wireless
- digital participation
- training, skills and employment
- digital public services
- SMEs and e-commerce
- innovation and incubation
- benchmarking

Glasgow and **Riga** have both invested in providing free public wifi access for residents, visitors and businesses alike. **Riga** has the largest number of free wifi hotspots per square kilometre in Europe, which is why, in the summer of 2014, it became the European Capital of Free Wifi⁴⁶.

Several cities opt for ICT solutions that aim to improve urban sustainability and make life better for the citizens. The areas covered range from mobility to waste collection and noise reduction. An example is the **Recycling Edinburgh** app, which helps residents locate recycling banks in and around the city.

The cities are also promoting the end user-centric and open innovation-based living lab methodology. They offer incentives to individuals, entrepreneurs and companies to develop new products and services for the city. While this is a boost for local businesses, the cities can also improve the innovation ecosystem in the region



GDC objective: promote sustainability by engaging all members of the community, as well as households and SMEs

Half of the cities said they were confident that their local digital and smart city strategies were aimed at promoting sustainability in an inclusive way. They cited the different partnerships in place at local level, the use of ICT solutions and the local development targets to support their argument.

The cities' ICT-related activities, as well as the steps they take toward implementing their digital and smart city strategies, serve the long-term goal of improving the socio-economic environment in their neighbourhoods. More specifically:

- Riga has involved the community in its Air Quality Improvement Action Programme 2011-2015⁴⁷
- Oulu has engaged members of its community in the design and implementation of its Environment Programme
- Sustainable Glasgow is both the local authority team promoting sustainability in the city and also an overarching citywide partnership that aims to take forward sustainability and sustainable development initiatives. Sustainable Glasgow is overseen by a board that brings together housing experts, businesses and university representatives⁴⁸.

Some of the local strategies specifically recognise the role of ICT in enabling cities to develop industries and services in a sustainable manner, shielding them against the negative economic effects of climate change and the potential disruptions to the global trading system



GDC objective: ensure that the ICT-enabled climate change initiatives go hand in hand with work to promote social cohesion

The majority of cities use a participative approach to guarantee that all their climate-related policies are in line with the citizens' needs.

A few cities ([Burgas](#), [Genoa](#), [Glasgow](#) and [Edinburgh](#)) said that they had worked together with their citizens to prepare their respective resilience and climate adaptation strategies and action plans.

Some of these plans specifically recognise the role of ICT in enabling cities to develop industries and services in a sustainable manner, shielding them against the negative economic effects of climate change and potential disruptions to the global trading system.

The cities also consider ICT solutions when drafting policies addressing social cohesion, particularly in the fields of:

- health-related risks, as in [Riga's](#) inclusive social programme Healthy Rigan - Healthy Riga⁴⁹
- the Green Employment Initiative, to help ensure that local universities and businesses are responsive to future 'green workforce' requirements (e.g. in [Glasgow](#))
- initiatives targeting energy poverty. [Edinburgh](#) is preparing to install solar panels in schools and other public buildings across the city as part of the largest community-owned urban renewable energy project in the UK. In [Zaragoza](#), the public company Vivienda⁵⁰ (Zaragoza Housing Authority) has undertaken an advanced rehabilitation programme to foster social inclusion and fight energy poverty

The cities' own initiatives are reinforced by their participation in broader national and international climate change-related initiatives, such as the Covenant of Mayors for Climate & Energy, the Green Digital Charter and the Compact of Mayors.

GDC objective: promote ICT innovation for climate change mitigation, which maximises the benefits for local communities and businesses

The majority of respondents said that they had met this commitment only "partly".

Through their participation in local or international projects, often in collaboration with local stakeholders, the municipalities aim to bring benefits to the local communities by helping citizens better understand and adapt to climate change effects and by creating business opportunities for local companies. For instance:

- [Genoa](#) collaborates with large local enterprises to develop a replicable technological framework for a 'resilience district', where companies can test and develop new and innovative methods to improve their disaster resilience and to simultaneously create job opportunities for companies active in this field
- [Glasgow](#) chose to focus its plans on climate change resilience solutions⁵¹
- Every year, [Riga](#) organises various events and exhibitions to involve SMEs and the broader community in cooperation projects based on the triple helix model (e.g. the Trans-European Transport Network days⁵² or the Riga Energy Days⁵³)

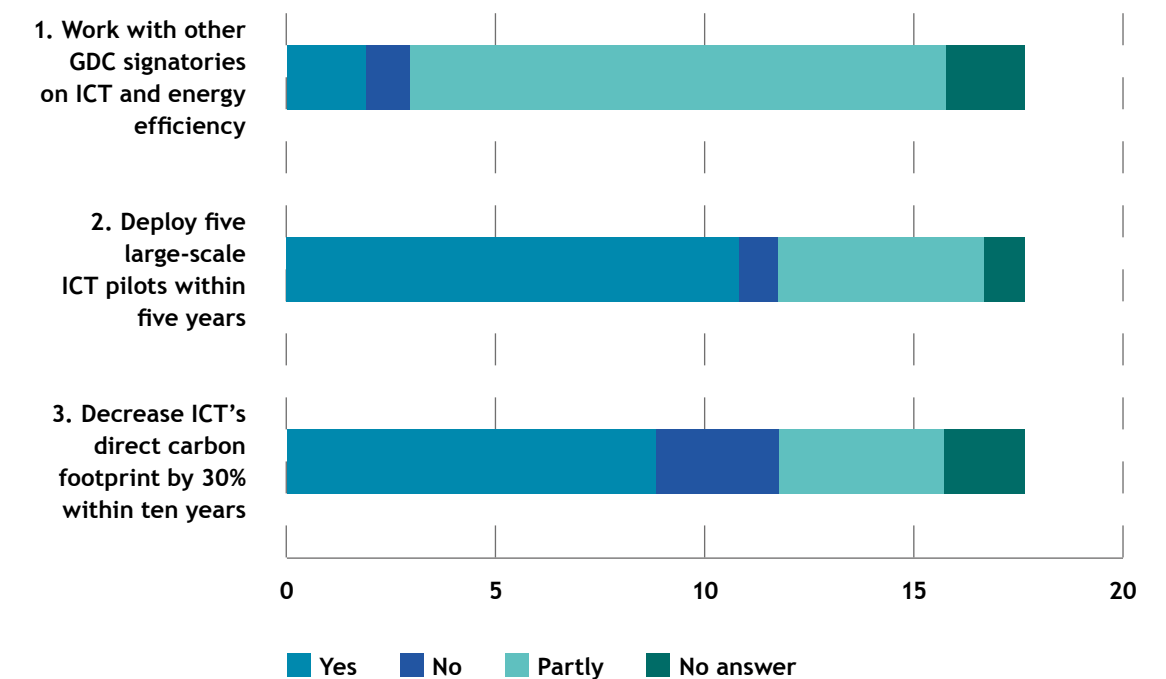
SECTION III MONITORING OBSERVANCE OF CHARTER COMMITMENTS

Measuring the carbon footprint of the ICT sector remains a challenging task due to the different tools and methodologies available to cities

SECTION III - MONITORING OBSERVANCE OF CHARTER COMMITMENTS

In this section we sum up the cities' self-assessments of their observance of the Green Digital Charter's three main commitments.

Does your city meet this GDC commitment?



FIRST COMMITMENT: WORK WITH OTHER GDC SIGNATORIES ON ICT AND ENERGY EFFICIENCY

Most signatories collaborate with national and European partners in order to share best practices and to ensure that their solutions are replicable. They also highlight their involvement in EU-funded projects. Participation in such projects results in worthwhile contacts with experts, strengthens political engagement and helps dedicate resources.

In addition, they said that they had already benefited from contacts made in the context of the Green Digital Charter. In particular:

- Valencia is participating, together with Bordeaux, in Interbio and TRANSBIO projects, Malmo in Light2Cat, and Murcia and Zaragoza in the Spanish Smart City Network (RECI)
- Zaragoza is actively engaged in green and digital projects with Bristol (IES_CITIES project), Vienna and Zagreb (CITYkeys H2020 project)
- Burgas is a partner in the FIESTA project along with Zaragoza

SECOND COMMITMENT: DEPLOY FIVE LARGE-SCALE ICT PILOTS WITHIN FIVE YEARS

Sixty-one percent of the cities said that they had already implemented at least five large-scale ICT pilot projects, while 28% said they were on track to achieving this objective. In this context, the respondents highlighted their achievements in EU-funded projects and initiatives.

The ICT pilots identified were as follows:

- smart electricity meters and other data collection sensors (monitoring traffic or air quality)
- intelligent street lighting
- broadband access
- creation or upgrading of data centres
- e-governance and creation of apps delivering services to citizens
- acquisition of green ICT products
- workplace flexibility programmes to reduce need to travel
- ITS-related projects (smart ticketing, bike-sharing, parking guidance apps, etc.)

Section II of this report provides an overview of the types of projects the signatory cities are engaged in. See also the collection of Green Digital Charter case studies available on the GDC website⁵⁴.



THIRD COMMITMENT: DECREASE ICT'S DIRECT CARBON FOOTPRINT BY 30% WITHIN TEN YEARS

This is the most problematic commitment, because measuring the carbon footprint of the ICT sector remains a challenging task due to the different tools and methodologies available.

Thirteen cities said they had managed to “partly” comply with this commitment, and only two reported success.

Some cities have already started to introduce ICT solutions and can thus measure their impact on emissions, while others cited estimates and projections only.

CO₂ emissions are often measured by third parties (either private companies or regional/national agencies).

Only two cities were confident that they had already achieved, or are on track to achieving, their ICT CO₂ emission reduction targets:

- **Riga** reduced its CO₂ emissions by 54.5% in 2014. It aims to cut emissions by 60-65% by 2025, in all cases including the respective ICT emissions reduction target of 20%
- **Manchester** has already reduced its ICT emissions by 20%. The target is 41%

Certain cities mentioned the need for the GDC secretariat to clarify “how to measure and what to measure”, i.e. what should the baseline value be and what equipment should be included.



SECTION IV CHALLENGES

Lack or shortage of funding, governance issues, as well as problems related to cooperation and data collection and use were the main challenges and obstacles identified by the GDC signatories

In the survey, the cities were also asked to identify the challenges and obstacles at local, national or European level that may prevent them from meeting their GDC commitments.

Their responses fell into three main categories:

1. FUNDING

The majority of cities mentioned the lack of funding needed to introduce ICT solutions at local level. This is due to:

- high market costs
- different priority lines in the municipal budget and irregular access to government funding schemes
- no consensus on how best to 'spend to save' or what 'whole life costing' should encompass
- difficulties in the procurement of innovation

2. GOVERNANCE

The situation on the ground often prevents cities from developing ambitious digital and smart cities strategies. The respondents highlighted the:

- absence of qualified human resources and recurring changes in city management
- lack of a clear division of competences at city/regional/national level and among the different city departments
- cooperation problems at local level (SMEs, research centres, universities, industry actors)
- absence of active citizens and a high proportion of elderly people, which determine attitudes towards new technologies and hamper culture change needed for a smart city project to succeed

3. DATA, STANDARDS AND INTEROPERABILITY

The respondents found it necessary to improve the data collection processes, develop common standards and ensure the interoperability of IT systems used by the cities. They also mentioned problems with the availability of data and noted the fragmented approach to, and inappropriate tools used for, data collection. Confidentiality and data protection rules were also cited by some as obstacles. By using data in a 'smarter' manner, public administrations could indeed provide better and cheaper services.

The cities confirmed their intention to continue to invest in data-sharing platforms and in the development of state-of-the-art Internet of Things infrastructure in order to make the most of the data collected at local level. Further work on standards and on procurement of innovation was also considered necessary to reduce the cost of ICT solutions.

CONCLUSIONS AND NEXT STEPS

By and large, the cities are on track to meeting their GDC commitments, although a few challenges remain. The GuiDanCe activities aim to tackle these challenges by supporting the GDC signatory cities

This first monitoring report focuses on the implementation of the Green Digital Charter, highlights the general trends and observations found in the signatory cities' self-assessments and cites concrete examples of how they develop ICT solutions for energy efficiency.

By and large, the cities are on track to meeting their GDC commitments, although a few challenges remain. The activities foreseen in GuiDanCe - the project that supports the Green Digital Charter - aim to tackle these challenges by supporting the signatory cities.

Charter update

The Green Digital Charter aims to be a 'live' initiative that adapts to contemporary developments and in particular to the impact of information and communication technologies on the lives and needs of citizens. For this reason, the Green Digital Charter has been updated.

The updated charter commits cities to working together to deliver on the EU's objective of expanding the use of digital technologies in a way that improves the life of their citizens and addresses the challenges of growth, sustainability and resilience.

At the same time, the GDC reflects the main policy and technology developments taking place at local, national and European level.

Funding, training and networking

EUROCITIES and the GDC contact point will continue to provide information on EU funding opportunities and will organise annual brokerage events dedicated to the subject of smart cities. Further contacts with the European Investment Bank will also be made in an attempt to establish loan schemes supporting ICT and smart city solutions.

On-site trainings and online webinars are being planned throughout 2016 and 2017. The topics will reflect the challenges faced by the signatory cities: drafting digital strategies, developing urban platforms and defining key performance indicators, standards and metrics.

Work shadowing events will pair up cities that face similar challenges but are at different stages of implementation. These events will aim to improve the implementation of local ICT and smart city-related policies.

Finally, the GuiDanCe project will continue to update and inspire cities on the best practices of the other signatories (collections of case studies, online toolkit, roadshow and Green Digital Charter Award).

Synergies

The Green Digital Charter will continue to work with the existing initiatives and relevant stakeholders and projects which bring added value to the training and networking opportunities offered by the GuiDanCe project.

These include:

- the Urban Platform Initiative⁵⁵
- the European Innovation Partnership for Smart Cities and Communities
- the new integrated Covenant of Mayors⁵⁶
- the EU-funded CITYkeys project⁵⁷, which defines key performance indicators and data collection procedures for the common and transparent monitoring of smart city solutions
- the recently started ICT footprint.eu project, which aims to raise awareness in a consolidated manner at European level on metrics, methodologies and best practices in measuring the energy and environmental efficiency of the ICT sector in order to facilitate their broad deployment and uptake
- the European Assistance for Innovation Procurement initiative⁵⁸
- the European standardisation organisations CEN/CENELEC/ETSI⁵⁹



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