

European Innovation Partnership on Smart cities and communities

Strategic Implementation Plan

Summary

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Aim and Structure of the European Innovation Partnership for Smart Cities and Communities

Cities are engines of human and economic development. At the same time, most greenhouse gas emissions are produced in cities. Building solutions with the evolving needs and nature of citizens at the heart – and driving this change - will create an adaptable foundation on which to shape the future of cities. Smart cities acting as catalysers of the foreseen energy, environmental and social revolution are expected to play a key role in order to achieve the new European objectives by 2020 and beyond, by planning, promoting partnerships among the sectors and between industrial, research and local actors, coordinating stakeholders.

Following this vision the European Innovation Partnership for Smart Cities and Communities combines Information and Communication Technologies (ICT), energy and transport to support the wide-scale use of innovative solutions to the major environmental, societal and health challenges facing European cities and communities today. The partnership was launched in July 2012¹ and its overarching goal is to achieve:

Significant improvement of EU citizens' quality of life and increased competitiveness of Europe through the wide reaching roll out of integrated, scalable, transferable, sustainable and innovative Smart City solutions – specifically in areas where energy production, distribution and use; mobility and transport; and ICT are intimately linked – which contribute to the EU's 20/20/20 climate action goals² by improving energy efficiency, increasing the use of renewable energy sources, and reducing energy consumption, green-house-gas emissions, bad air quality and congestion of roads.

The Partnership aims to overcome bottlenecks impeding the changeover to smart cities and to help coordinate existing city initiatives and projects, by pooling its resources together. It looks to establish strategic partnerships between industry, European cities and other parties to develop the urban systems and infrastructures of tomorrow and to achieve widespread roll out of the relevant smart city solutions.

The Partnership produced the present Strategic Implementation Plan (SIP) which is a result of the work of a High-Level Group³, their supporting Sherpa group⁴ and contributions from the Smart Cities stakeholder platform⁵. This Strategic Implementation Plan outlines the priorities and proposes implementation actions for the widespread deployment of smart city concepts. It sets the right boundary conditions by triggering the work on regulatory issues, standards, business models and public procurement schemes. In general implementation in EIP SCC is expected to be in three parts:

- A European-level programme of horizontal enabling actions, some need to start immediately to lay the foundation for the Lighthouse and replication programmes, others to support the Lighthouse projects and take-up programme.
- High-impact Lighthouse projects in a small number of towns/cities/regions, each working towards a common work plan and (across all projects of the EIP) addressing the main goals
- A programme to facilitate take-up and to provide a platform for exchange on appropriate solutions, proven to be effective at full city-scale in Lighthouse projects, in every town/city/region across Europe

¹"Smart Cities and Communities - European Innovation Partnership" [COM(2012)4701]

²"An Energy Policy for Europe" [COM(2007) 1 final]

³High level representatives from industry, research and cities, which are appointed by the European Commission in their personal capacity http://ec.europa.eu/eip/smartcities/whos-who/index_en.htm

⁴http://ec.europa.eu/eip/smartcities/whos-who/index_en.htm#sherpa

⁵Smart Cities Stakeholder Platform: a collaborative, networking and knowledge sharing tool in the domain of Smart Cities and Communities.– <http://eu-smartcities.eu>

Moreover, the SIP focuses on three specific domains for implementation (Figure 1):

- *Sustainable Urban Mobility;*
- *Sustainable districts and Built Environment;*
- *Integrated Infrastructures and processes across Energy, ICT and Transport*

and puts forward nine key 'enablers' covering broadly the areas of:

- *Insight & Governance:* Citizen focus, Integrated planning & management, Knowledge Sharing
- *Funding & Finance:* Procurement & Financing and Business Models
- *Information & Decision:* Open data governance, Standards, Baselines, Performance Indicators and Metrics, Policy and regulation

Following a thorough analysis of the main challenges and bottlenecks for smart cities in Europe, the Strategic Implementation Plan proposes high priority actions which were identified in a common approach that brought together the experience and knowledge of experts from industry, cities, and research with the ultimate goal to improve the life of the European citizen.

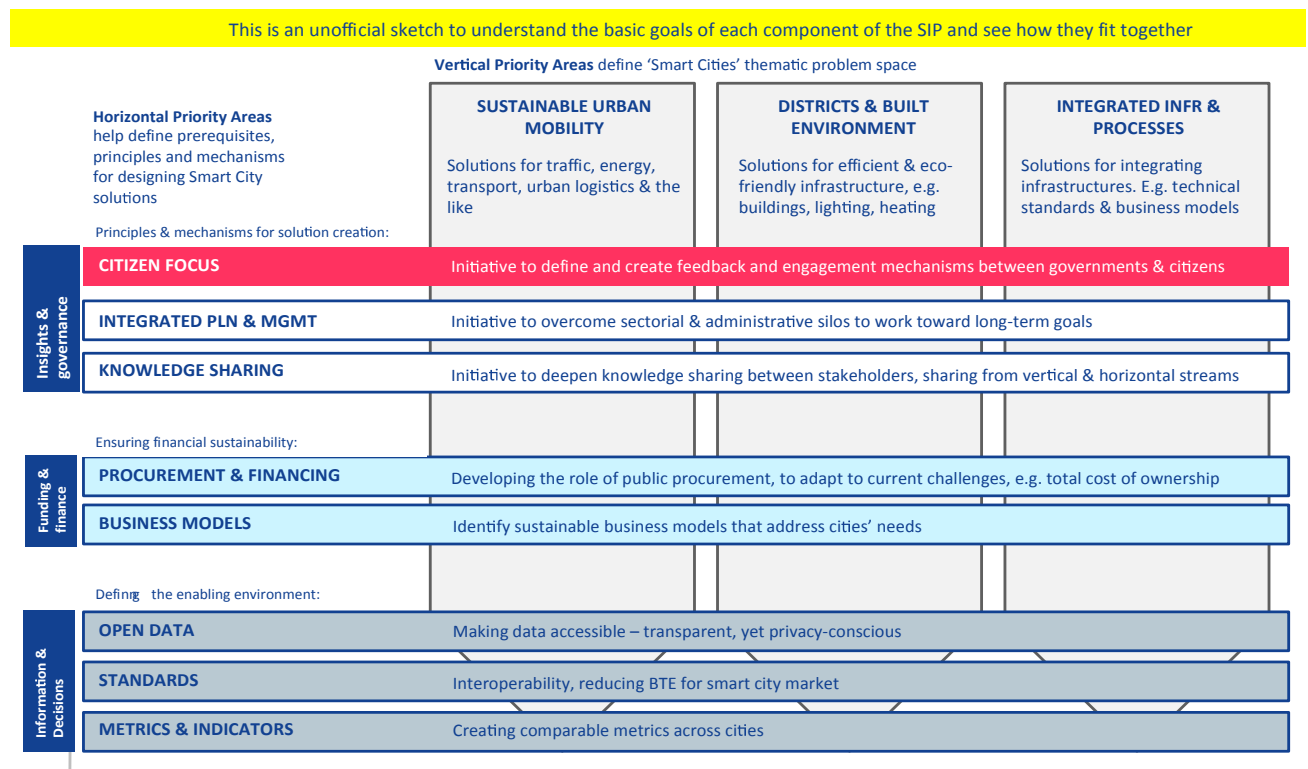


Figure 1 Overview EIP SCC

To move forward at accelerated pace in such a heterogeneous and complex landscape requires clarity of actors and roles. Stakeholders in the EIP SCC are therefore the European Commission / European Institutions, National Governments, Member State Cities, Industry (large & SME), City Associations, Research Organisations.

Several funding sources currently exist that support collaborative developments across European cities, and we would foresee all these as being sources by which potential actions could access funds. They include Horizon 2020 project funds from the sponsor DGs, DG Research funds, DG Regio structural & societal cohesion funds accessed by city-regions, Industry investment: RD&I and product /

marketing funds or Financial Institutions (incl EIB; investment banks; pension funds etc.). Cities are anticipated to co-finance all potential projects to some degree to demonstrate their commitment.

In the following the three specific domains and the eight key 'enablers' mentioned above are described in more detail and first potential actions as a result of first discussions are described.

Sustainable Urban Mobility

European cities need to develop new, more sustainable forms of transport and mobility to continue to be drivers of growth. Mobility is an essential aspect of life in the city. It has a major effect on the quality of life and is key to the economic health of cities. But mobility systems in European cities are under strain. The Working Group on Sustainable Urban Mobility believes that application of innovative technologies, ICTs in particular, and citizens' involvement can help Europe's towns, cities and regions to achieve, - even to out-perform - these targets for the transport and mobility sector. For, if the EIP can to succeed, it needs to mobilise new partnerships amongst people, institutions and businesses.

First actions for implementation which are under discussion are e.g.:

- Provide a European framework to recommend or enforce the provision of an adequate energy supply infrastructure facilitated by ICT solutions (smart grid) for the mass take-up of zero or low-carbon vehicles
- Design and implement an Integrated Mobility Information and Services Platform for all Lighthouse and follower cities, with a focus to make collective transport more attractive to car drivers
- Establish an SCC Innovation Community, with central guidance, sponsorship and funding and local chapters in each Lighthouse and follower city
- Create a shared web portal for individuals, communities and cities to see and compare their performance in terms of programme
- Develop rules & handbook for city candidates to be selected as Lighthouse project

Sustainable Districts and Built Environment

The main needs in sustainable development of urban areas and their functional regions are related to

- integrated urban planning, including implementation and deployment of effective and user-friendly technologies and services⁶;
- identifying, integrating and optimising different energy, transport and data flows in city planning and city management;
- transformation of districts towards smart low carbon and zero/plus energy/climate neutral districts by implementing and optimising local renewable energies with existing energy production (smart energy networks, virtual power plants).

First actions for implementation which are under discussion are e.g.:

- Increase the development and deployment of zero /plus energy buildings
- Upgrading of existing building stock (current building stock consumes 40% of all energy in Europe)
- City/district level energy management and trading

⁶ Digital Agenda, COM(2010) 245 final/2

Integrated Infrastructures and processes across Energy, ICT and Transport

Rather than having dedicated sectorial infrastructures there are huge synergy potentials in integrating active and passive infrastructures across the sectors of ICT, energy and transport and mobility to deliver on multiple uses. The challenge is to integrate the planning, develop joint business models and agree on common technical standards. An example that could show the way forward is the systematic exploitation of synergies between requirements for smart grids and broadband infrastructure including the sharing engineering works, reusing passive infrastructures, communications networks, data centres as well as services. Key challenges for the integration of infrastructures is the change of governance mechanisms within public and city agencies (fragmentation) and between public agencies and private providers. Moreover, the frugal and wise use of constrained funds to develop and apply innovative approaches to keep our cities modern will present on-going challenges. Additionally, much of the investment is also very concentrated on a few cities, a spreading to second tier cities is desired. New technologies interface with city information platforms that help connect across systems / domains and devices are essential for the future integration of infrastructure.

First actions for implementation which are under discussion are e.g.:

- Select and apply new business models for integrating existing infrastructure operations including both public and private sector infrastructures
- Stimulate a cross-sector call for innovative ways to integrate “existing infrastructure” while maintaining local responsibilities
- Stimulate the establishment of urban platforms in 20% of all cities in Europe by 2020 EU-action Provide / allow crowd financing and other business models making integrated infrastructures an attractive business
- Call for open standards to be deployed and populated as part of the best practice

Citizen focus

Technology can only achieve so much; smart city technology solutions will accompany behavioural change on the part of the citizen to fully realise their potentials. Technology vendors (both SMEs and multinationals), service provider companies (utilities and others) and city governments should find ways to foster greater engagement and already take citizens' needs into account when designing new technology and services solutions or making planning decisions.

First actions for implementation which are under discussion are e.g.:

- Set up a platform consisting of relevant stakeholders such as companies, cities, local governments and respected individuals to give feedback and organize mentoring for new companies and organizations
- Standardize methodology for user research to develop EU database of citizen behaviour and attitudes toward implementation of tech and energy solutions
- Collaboration between local governments and industry to enable citizens to reach a goal – like neutral impact - and competition between neighbourhoods

Integrated planning & management

Implementing a renewable and efficient energy system at city level requires planning and decision making processes which are cross-sectorial and multi-stakeholder. Cities and private sector need to have an understanding of the city systems, including socio-economic aspects, to successfully develop Smart City solutions and enabling long-term objectives and commitment to secure funding. These issues can be mitigated through the adoption of scalable solutions that take advantage of information and communications technology to increase efficiencies, reduce costs and enhance quality of life. To

foster take up of Smart City-approaches, scalability and replicability of the integrated planning & management strategies need to be addressed. Clear guidance to enable cities to develop their planning, setting a clear reference baseline and indicators for monitoring progress are needed.

First actions for implementation which are under discussion are e.g.:

- Develop a decent monitoring methodology with respective baselines, metrics and indicators, including the harmonisation on European level, a structure for collection and dissemination on city level, use of big data
- Policies for integrated planning & management, including the development of an Integrated Action Plans at city level, involvement of private sector and citizens in planning Smart Cities, enable collaboration and coherence between multi-level governance and City/province/region/State
- Platforms and models for integrated planning & management

Knowledge Sharing

Knowledge sharing processes must be facilitated and take place at all levels to maximise the benefits of the EIP on Smart Cities and the lighthouse projects, ensure a broad engagement and the uptake of good practices. This spans from European level down to city level where the ever closer integration of city departments (such as those dealing with energy, housing, procurement, finance, transport, ICT) create a need for capacity-building and skills development in cities to ensure they can build the smart capacity needed in-house. A lot of good practice and established methodologies on knowledge sharing already exist and can be applied to different policy areas, governance levels and organisations.

First actions for implementation which are under discussion are e.g.:

- Study tours to give cities the opportunity to undertake mutual learning activities in another city
- Mobility Scheme for city employees to facilitate a transfer of expertise by observing first-hand how things are done elsewhere, thus, providing inspiration and new ideas of working methods
- Mentoring and Partnerships to allow a host city (the mentee) to receive advice on a specific project, initiative particular challenge during a visit by one or more other cities (the mentors)
- Peer reviews to visit a city (host) to evaluate the host city's projects and/or policies in a specific field as a "critical friend"
- Technical support for capacity building, communication and knowledge transfer in city administrations to ensure adequate capacity to promote smart city developments within city administrations

Procurement & Financing and Business Models

The Smart city market is both local and European. Striving for broad uptake across Europe of smart cities solutions requires in most cases new investments in combination with a more efficient use of the currently available resources in cities. Citizens' support is important to get the needed initiatives going and accepted. The right business framework will create market pull through Smart cities investments and market push via innovation through the stimulation of the industrial value chains (e.g. from production of new materials to new ICT systems solutions or systems to store energy). An important lever in this context is the role of public procurement and how it can be better adapted to current challenges so to reflect better total cost of ownership. Procurement procedures are tending to isolated, short term buying of proven technology for specific questions. Challenges are to stimulate cities to participate in local governance entities with joint ventures and joint investments; Cooperation between cities and aggregating targets and requirements across Europe; Focus on long-term impact (e.g. life-cycle efficiency and sustainability) or on long-term certainty (e.g. innovation implies risk-taking); Stimulate systematic dialogue between solutions suppliers and cities as customers or as co-investors; In addition SMEs/Innovation companies may not have a financial track record and this would exclude them from traditional procurement routes.

Open data governance

Rolling out smart city solutions creates an enormous amount of data in the public as well as private sector. This data can be of high value not only for better understanding the dynamics in a city, but also for developing applications that directly reach out to the citizen. The challenge is to make this data accessible in a transparent way whilst fully respecting privacy and security. Access to more and open data will allow the development of new families of value-added services. For instance, "Smart Buildings" or "Smart Grids" frequently report a lack of buildings' energy consumptions datasets. Those data are useful for energy auditing & benchmarking purposes, for fine-tuning simulation results, for validating new products or services, etc.

First actions for implementation which are under discussion are e.g.:

- Promote a swift implementation of the revised Public Sector Information directive across all member states and promote accompanying member state open data strategies that promote and enable open data activities
- Create simplified interoperability scheme by developing standards in information of energy, transport, building automation and safety data
- Create a standard for requirements of data quality especially for domains in energy, building automation, traffic. Focus on interoperability of data
- Specialised Open Data datawarehouses, interconnected with data collectors / information systems in cities – potentially implemented through cloud technologies - where anyone interested can access those data through a web service and use it for instance for district- or city-level benchmarking and performance evaluation purposes

Standards

Data is the right level at which interoperability of systems can be assured so to render systems more adaptable and reduce entry barriers to the smart city market such as vendor lock-ins. Open (non-proprietary) Standards for Smart Cities and Communities solutions are needed and should cover platform standards for data, transport information, energy management, building construction, exchanging location, etc. Standards are also needed for metrics and indicators to help to compare different cities and the improvement made in a city over time.

First actions for implementation which are under discussion are e.g.:

- Identify Smart City data that will be transported across an Machine to Machine (M2M) platform and agree requirements specification, develop transport protocols based on requirements specification
- Create standards to support smart building service solutions
- Create standards for assessing quality of life in cities and communities

Baselines, Performance Indicators and Metrics

To create transparency and quantify progress all actions need to be measurable against clear baselines to be comparable across cities. Best-of-breed solutions can thus be identified. This means having metrics in place to capture pertinent data so to observe trends and quantify progress. Such a set of smart city indicators should rest on two columns.

- 1) It shall indicate the progress of cities towards and beyond the “20-20-20 goals” in terms of CO2 reduction, use of renewable energy and energy efficiency.
- 2) It shall reflect innovation, i.e. learning, setting up pilot projects and implementing innovative technology.

For each of the above mentioned themes Key Performance Indicators (KPIs) should be developed to monitor and evaluate progress.

Policy and regulation

Cities need an adequate policy in order to be able to become smart. Policies and corresponding regulations in many cases build the framework for future development of in the area of energy, transport and information and communication (regulation and access to networks, standards). Attractive policies can boost an effective and efficient transition towards smart cities. What makes policies for smart cities a rather complex endeavour is the integration of several policy fields which are organised by different forms of multi-level governance. Policies for Smart Cities is an emerging policy field with increasing complexity of strategies and policy actions as it cuts across several previously rather isolated policy fields. As a result of the governance structure, a Smart City strategy and implementation plan must rely on the integration and coordination to make it a reliable and long-term framework for investors and stakeholders:

- (1) vertical policy coordination at different spatial levels (urban, national, European, global)
- (2) horizontal policy coordination between different policy fields typically associated with different ministries and institutions (research, innovation, energy, transport, communication, economic issues, international collaboration, education)

First actions for implementation which are under discussion are e.g.:

- Supporting pro-active and integrated Smart City Strategy and its implementation plan, integrating relevant policy fields and connect to national, European and global level
- Funding Strategy for Smart Cities including an intelligent combination of funding instruments and funding commitments to enable long-term planning of project-bundles / infrastructure investments along the innovation chain.
- National Policy support for Smart Cities to provide national framework for Smart Cities
- Identifying hindering factors determined by regulations (legal, financial), norms and standards (e.g. fossil fuels, carbon prices and feed-in tariffs)
- Develop new approach to create incentives for European Cities to align specific policy regulations and technical standards
- Education and training for employees of cities and national ministries to increase demand competence in Smart City approach
- Introduction of Master and PhD courses integrating the Smart City idea (inter- and transdisciplinary approach)
- Raising the awareness in the population for necessary adaptation of social practice, consumer behaviour and as citizens