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Contribution of the Republic of Bulgaria to the  
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Against the background of economic and technological changes caused by the globalization and the integration process, cities in Europe face the challenge of combining **competitiveness** and **sustainable urban development** simultaneously. Very evidently, this challenge is likely to have an impact on issues of Urban Quality such as housing, economy, culture, social and environmental conditions, and thus to offer citizens better lives.

One of the greatest challenges facing the EU is how best to **design and adapt cities** into smart intelligent and sustainable environments. Smart urban technologies can make a major contribution to tackling many urban challenges. Therefore, cities are key factor in achieving the EU's objectives of 20% energy saving by 2020 and developing a low carbon economy by 2050.

A smart city uses Information and Communication Technologies (ICT) to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption, and to improve contacts between citizens and government.

Information and communication technologies are one of the main drivers for building a competitive economy based on knowledge and innovation. Therefore, the EU and Bulgaria recognize the development of ICT as a priority strategic horizontal policy. The "Digital Bulgaria 2020" National Programme defines the parameters for the development of information society in Bulgaria and aims to support the implementation of European priorities and tasks described in the Digital Agenda of Europe in terms of social and economic potential of information and communication technologies and the Internet by 2020.

The development of the digital single market and the smart cities requires a number of basic premises: Development of ICT infrastructure, availability of skilled workforce and good e-skills and use all possible public and private sources of financial resources to support advanced technical solutions.

### **Development of ICT infrastructure**

The development of a dynamic and innovative digital economy will facilitate growth and productivity, allow the development of new services by generating additional social benefits and increase the number of jobs, all of which require an available ultra-high speed next generation internet access. In this regard, the construction of new broadband infrastructure for next generation access, the facilitation of the use of the radio spectrum, and the promotion of the intensive and efficient use of both form the basis of the priorities set out in the National Broadband Infrastructure Plan for Next Generation Access (adopted with Decision № 435 of 26.06.2014 of the Council of Ministers). Also, a Roadmap was developed in order to implement the priorities of the Plan.

The Plan focuses on the construction of new broadband infrastructure for next-generation access in order to achieve the objectives set out in the Digital Agenda for Europe: 100% coverage of at least 30Mbps for the general population and access to speeds of 100 Mbps and above in for least 50 % of households by 2020.

In the short term (2015-2016) the efforts of Bulgaria will be directed at taking actions to reduce the costs and optimize the processes related to the deployment of high - speed broadband infrastructure, with measures in this regard already at play. Furthermore, it will stimulate the private sector to invest in the construction of such infrastructure by shortening the return period of investments.

The next-generation broadband project (concluded in December 2015) created a safe, secure and reliable broadband infrastructure for e-government needs, while at the same time provided the conditions for the development of broadband services for the citizens and businesses in the economically underdeveloped and remote areas of the country. Public ICT infrastructure built under the project funded by the Operational Programme "Regional Development 2007-2013" will be granted a concession to a private operator by a procedure that is already under way.

This project will be carried over into the 2014-2020 programming period. The intervention will be limited to the construction of broadband infrastructure in the scope of the "middle mile". The aim is to link remote locations so that Internet service providers can build their "last mile" at a price comparable to that of building the same infrastructure in major cities. After finishing construction, the infrastructure will be provided for use and maintenance to a private operator under certain limitations on the provision of retail services and profit control to ensure fair and non-discriminatory terms to all local suppliers. A private operator will manage "the last / first mile" of the network and the state will intervene in the "last mile" only when it comes to the connectivity of public institutions. The network will be open and neutral.)

### **Availability of skilled workforce and good e-skills**

Serious issue related to HR qualifications is the low level of adequate computer and internet skills, which is essential for the widespread use of ICT and ICT-based services and for achieving digital growth. Bulgaria continues to fall behind over the EU average values. Interventions are needed at all levels of the education system and the system of training and retraining of the employed, the unemployed and people and groups at disadvantaged position to enhance the digital competences of the population and prevent the so-called digital exclusion.

The Innovation Strategy for Smart Specialization of the Republic of Bulgaria (adopted with Decision of the Council of Ministers No 857 from 3th November 2015 г.), Chapter 'Digital growth', pays particular attention to the development of a balanced innovative ecosystem in the field of ICT through ICT based infrastructure – technological parks, business incubators, clusters, centers of excellence, e-infrastructure and others. Measures are set out to increase the skills of ICT professionals and the digital competences of the workforce in other sectors, in accordance with the requirements of the labour market, also through the new Strategy for the effective implementation of information and communication technologies in education and science of the Republic of Bulgaria 2014-2020 (adopted in July 2014).

### **eGovernance**

**e-Governance** is considered a central tool in transforming the Government to improve Bulgaria's competitiveness and to enhance citizen and business participation in the knowledge-based economy. The main objective of e-Government is to meet the needs of society by ensuring the quality and accessibility of administrative services. Although, significant progress in the development of e-Government is reported in the last years, there is still much to do for the realization of its full potential.

According to the latest 2014 Report of the Council of Ministers on the state of the administration, only 96 administrations (16.7 %) of 576 provide electronic administrative services – 29 central administrations and 67 local administrations. In 2013 101 (17%) out of

586 administrations provided such services. In 2014 the Bulgarian authorities have provided a total of 2525 electronic services out of which 2 418 are primary, and only 107 are complex services. According to the summarized information in the Report for the state in administration for 2013 the offered services (e-services) by the administration are as follows:

The services of 81 administrations (84% of administrations offering e-administrative services) are accessible on internet portal, developed specially for the relative administration, 10% of the administrations have reported offering services through the Single e-government portal, 7% - through portal, developed for a group of administrations, and 3% - through portal, developed for other administration, 9% reported services offered are accessible on two portals.

In March 2014 the **E-Governance Development Strategy** has been adopted by the Council of Ministries of Bulgaria. The E-Governance Development Strategy has been prepared as part of the country's commitments under the preconditions for EU Funds for the period 2014-2020. The main goal of the Strategy is to outline the framework for all current and new activities of e-governance. The strategy includes:

- Analysis of the current state;
- Vision of e-government in Bulgaria;
- Strategic objectives;
- Sectorial policies for e-governance;
- Activities to achieve the objectives;
- Coordination and management of the strategy;
- Model of e-governance.

In May 2014 a **Roadmap for the Implementation of the E-Governance Development Strategy'2014-2020** was adopted. The Roadmap is a dynamic instrument defining the concrete measures, activities, terms and financial resources, needed to achieve the strategy objectives and the expected results. The Roadmap was updated in late 2015 according to the recommendations of the European Commission (EC) and adopted by the Council for Electronic Governance to the Council of Ministers on 11 12.2015. The first stage of its implementation includes 30 most important projects that have to be completed in the period 2015-2020.

In October 2015 the Council of Ministers put forward to the Parliament a Draft Law on Electronic Identification. The Law settles the public relations, concerning the e-identification of natural persons. The definition of the means of electronic identification is in conformity with the Regulation (EU) no 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC' used to identify natural and legal persons. The electronic identification is defined as process of using data in electronic format for the identification of natural persons. The data used represent the identified person in a unique manner.

In November 2015 the Council for Electronic Governance adopted a **Sectorial Strategy for Electronic Customs** which involves all the measure needed for introducing information technologies in the operation of the Customs Agency in conformity with the requirements of the national E-Governance Development Strategy and the EU initiative "Electronic Customs".

The main goals are to substantially improve the custom control and to provide effective participation of the Bulgarian custom authorities in the respective European structures.

At the end of 2015, three major e-government projects were implemented by the Ministry of Transport, Information Technology, and Communications with the financial support of the Operational Programme “Administrative Capacity” 2007-2013.

With the implementation of the main activities of the project “Development of the electronic administrative services” were achieved substantial results in the area of improving of the legal framework of the provision of electronic administrative services. Draft of a new Law for Electronic Governance was prepared. An electronic access to 34 of the most popular registers and information systems of the public administration was provided. The building of a cloud of central administration including 70 cloud services and of the cloud of the local administration including 50 services was started. The e-Government portal functionalities were improved, and in addition an internal portal for coordinating the work of the state administration was built. Developed and deployed were 10 electronic administrative services for the Municipality of Plovdiv and 10 for the Ministry of Transport, Information Technology and Communications.

The second project “Upgrading of the existing and building of new central e-government systems in order to improve the information and communication environment for delivering better administrative services to citizens and businesses” developed concept and mechanism for e-validation and e-delivery of documents. Conditions for the operation of components for one-time identification, electronic authorisation, and generating and processing of business events were provided. E-validation and e-delivery of documents mechanisms were implemented. A single assess point for e-payments at the central and local administration was created. These processes significantly reduce the time and costs for implementation of the e-services. The implementation of the project will improve public service delivery to citizens and business and will reduce the costs of public administrations, business and citizens. The new central systems and electronic services would save time and resources of citizens and business for communication with the administrations and will enhance their trust in the institutions.

The third project „Improving the qualification of the civil servants in the central administration by enhancing their knowledge and skills for managing software IT projects” had the aim to overwhelm the deficit of qualified specialists dealing with the e-government implementation. The project team carried out the largest up to the moment training programme. 359 civil servant form the central administration, responsible for the development, management and implementation of software projects in the field of e-government were trained in business analytics, software architectures, data bases, cyber security Java programming, system administration, Web portals management and administration, etc.

### **Support for advanced technical solutions for smart cities**

The Innovation Strategy for Smart Specialization of the Republic of Bulgaria pays strong attention on activities related to smart cities and emphasizes the role of the city centers as a main factor for sustainable economic growth. Integrated plans for urban regeneration and development were developed and areas with potential for economic development were defined. The idea is in future these areas to become centers of attraction for foreign investors in industrial development, as well as a basis for innovation clusters and cooperation. Part of

these cities have the potential to become “smart cities” joining the European Innovation Partnership on Smart Cities and Communities (EIP-SCC). The European Innovation Partnership on Smart Cities and Communities (EIP-SCC) brings together cities, industry and citizens to improve urban life through more sustainable integrated solutions.

In addition, the Innovation Strategy for Smart Specialization of Sofia is a document outlining the sectorial specialization of the economy of the capital of innovative potential and priorities in the development of research and innovation. The innovation strategy of Sofia aims to enhance the smart specialization of the capital through promotion of Sofia as a smart city which cultivates an environment with a high quality of life for citizens and good governance, and which stimulates the creation of better conditions for synergy of the major economic sectors in an innovation ecosystem and through the efficient use of ICT.

The Bulgarian Government fully recognizes the potential of the smart cities concept and actively supports the cooperation between the municipalities and business in its implementation. Numerous projects are being supported by the current operational programmes, the municipality budgets and various public-private partnerships in areas as sustainable mobility including advanced smart public transport, intelligent traffic management and congestion avoidance, demand management, information and communication, freight distribution, walking and cycling, energy efficiency of public and private residential buildings, energy efficiency of the heating and cooling systems of the cities, energy efficiency of the lighting systems, public e-services (administrative, e-learning, e-education, e- social care), etc.

*Some of these projects with Bulgarian participants are:*

- ✓ *Horizon 2020: smarter together – Partner cities are Lyon, Munich, Vienna. The capital of Bulgaria – Sofia is one of the three "Follower cities". The Grants Agreement was signed in December 2015.*
- ✓ *Horizon 2020 – Sharing Cities Essentially*

*The ‘Sharing Cities’ programme aims to take a digital first and data driven approach to overcoming some of the key environmental challenges facing Cities. Namely: Carbon emissions from buildings and transport and air quality. The aim is to integrate these issues and interventions, using data from a wide range of sensors and sources, across a platform to better enable their management. In doing so the project will deliver cost savings in terms of energy bills and by tackling and optimising demand will reduce the need to invest in electricity infrastructure. Citizen engagement is at the heart of the project involving the co design of services by residents and a digital bond scheme to ensure their take-up. By taking a collaborative approach across the 3 core cities (London, Lisbon and Milan) to the development of products and services and rolling these out across follower cities the aim is to create the level of certainty and demand that will drive the market. One of the follower cities is Burgas – the fourth-largest city in Bulgaria.*

- ✓ *Two Bulgarian university participate in TeSLA project under H2020-ICT 2015 call. The duration of project is 3 years, starting date – January 2016, budget – 7 million EUR. The TeSLA project provides to educational institutions, an adaptive trust e-assessment system for assuring e-assessment processes in online and blended environments. It will support both continuous and final assessment to improve the trust level across students, teachers and institutions. The system will be developed taking into account quality assurance agencies in education, privacy and ethical issues and educational and technological requirements throughout Europe. It will follow the interoperability standards for integration into different learning*

*environment systems providing a scalable and adaptive solution. The TeSLA system will be developed to reduce the current restrictions of time and physical space in teaching and learning, which opens up new opportunities for learners with physical or mental disabilities as well as respecting social and cultural differences. Given the innovative action of the project, the current gap in e-assessment and the growing number of institutions interested in offering online education, the project will conduct large scale pilots to evaluate and assure the reliability of the TeSLA system. By the nature of the product, dissemination will be performed across schools, higher education institutions and vocational training centres. A free version will be distributed, although a commercial-premium version will be launched on the market.*

- ✓ *3e-Houses project – deals with the integration of the most established ICT technologies in social housing in order to provide an innovative service for energy efficiency:*
  - *Real time monitoring and management of the energy consumption.*
  - *Integration of renewable energies.*
  - *Creating the resources to lower energy consumption.*

*The Project allows tenants to develop or enhance their relationship with the utility, the environment, as the concept, saving energy is saving Carbon dioxide emissions. This would be achieved by piloting in several social housing buildings the interaction between smart devices and the users to create, in a first approach, awareness around their energy consumption and therefore a change in their energy-use patterns. One of the participants in the consortium is the Bulgarian Housing Association.*

- ✓ *Participation in European accelerators FIWARE SpeedUP! Europe, FI-Adopt and Finodex*
- ✓ *SpeedUP! Europe – SmartPlace, aims to create an open, intuitional, allways-ON cloud-based virtual place, where user compose an creative building intelligence by themselves in a LiveLab's BMS environment by means of creation own “what-if” scenarios and remote devices management logical algorithms. The challenge is creation of new segment in building automation intelligence by raising a new concept in Building Management Systems: SPaaS – Smart Place as a Service.*

- ✓ *FP7 ICT “Experiential Living Labs for the Internet Of Things” - ELLIOT Project*

*The project aimed to develop an Internet Of Things (IOT) experiential platform where users/citizens are directly involved in co-creating, exploring and experimenting new ideas, concepts and technological artefacts related to IOT applications and services. ELLIOT allowed studying the potential impact of IOT and the Future Internet in the context of the Open User Centred Innovation paradigm and of the Living Lab approach.*

In conclusion, there is no doubt that the smart cities concept has a huge potential to improve quality of life and economic productivity. It is vital that we realize the concept in a way that involves all interested stakeholders in the process and utilize their resources and experience.