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European Union funding Research Development and Innovation projects on Smart Cities: the state of the art in 2019

Paola Clerici Maestosi^{a*}, Paolo Civiero^b and Gilda Massa^c

^a ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic Development – Energy Technologies Department, Via Martiri di Monte Sole, 4, 40129 Bologna, Italy

^b IREC Catalonia Institute for Energy Research, Jardins de les Dones de Negre, 1, 08930 Sant Adrià de Besòs, Barcelona, Spain

^c ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic Development – Energy Technologies Department, Piazzale Enrico Fermi, 1, 80055 Portici NA, Italy

ABSTRACT

European cities currently host 72% of the European population, which probably will rise to 80% by 2050.

European Union, Member States, National and Regions Authorities and different type of stakeholders have worked – and keep on doing – together to promote a sustainable urban development and to adapt policies to the needs of cities, thus make visible improvements to the daily lives of people.

According to this approach, many Member States decided to pool resources at European level, achieving more than by acting alone. It is thanks to the coordinated approach of European Union and Member State that Research Development & Innovation boost smart cities and smart specialization strategies as two novelties that have been adopted by policymakers.

Keywords:

Cities in EU policy;
Budget for smart cities;
Demonstration projects;
Positive Energy Districts;

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1. The Smart City concept

Cities and urban areas have been a key issue in EU/ Member State policies and programs, in the light of the fact that over two thirds of the European population live in urban areas and that cities were and will be places where both problems emerge and solutions are found, places which are fertile ground for growth of science and technology, to stimulate culture and innovation, to support individual and collective creativity and where, more than elsewhere, climate change mitigation can be more easily understood. Cities play a crucial role as engines of the economy, places of connectivity, creativity and innovation, as well as centers of services for the surrounding areas. Therefore, cities represent a high

priority for the effective implementation of Europe itself.

Although European cities play a key role in the life of Europeans, it seems almost incongruent and senseless that there is no common definition for “urban” or even for “city”, and that the European Union has no explicit jurisdiction in urban development, as urban planning per se is not a European policy competence even if economic, social and territorial cohesion all have a strong urban dimension. Therefore, even if the “European model of the city” is a fascinating issue, it is clear that there is no need to adopt a single definition. However, it is possible to move towards a shared European vision of urban development, as noted by the paper “Cities of Tomorrow” (DG Regional Policy, 2011) which consider

*Corresponding author e-mail: paola.clerici@enea.it

Acronyms and Abbreviations

DG: Directorate General
EIP: European Industrial Partnership
ERDF: European Regional Development Fund
ESIF: European Structural and Investment Funds
EU: European Union;
H2020 Framework: Horizon 2020 Framework
KPIs: Key Performance Indicators
ICT: information and Communication Technologies

PED/PEN: Positive Energy Districts/Positive Energy Neighborhoods
RD&I: research, Development & Innovation
SCC: Smart Cities and Communities
SDGs: Sustainable Development Goals
SME: Small and medium Enterprise
SUD: Smart Urban Districts

that “there is not a single vision of the European city model but there might be as many visions as there are Europeans. These visions are diverse as they build on different realities, different strengths, weaknesses, opportunities and threats as well as different values”.

This means that Europe can play a role in defining and setting up of the framework and providing guiding principles for the growth of a shared vision of European cities, in which the dimension of a sustainable urban development is taken into account in an integrated way. In general terms, this is what took place with European funding in RD&I: even if EC has no explicit competence in urban development and policies Research Development & Innovation programs have undoubtedly contributed to promote and support a shared European vision for smart cities.

Many of these programs have become EU trademarks and trade names, making the EU visible and recognizable in the daily lives of its citizens.

The idea behind this shared vision is that European cities aspire to be places of green, ecological and environmental regeneration as well as places of advanced social progress, platforms for democracy, cultural dialogue and diversity.

Since 2007 discussions, workshops, white papers, DoW (documents of Work) have been written, created and developed about the future of cities, both at national and European level, as well as glossaries have been prepared according to the idea that in the transition from industrial to knowledge-based societies, the cities in the world are changing their shapes. As a result, new definitions were created such as: healthy citiesⁱ,

ⁱ Cities that, according to WHO, are continually creating and improving physical and social environments and expanding community resources. These efforts enable citizens to mutually support each other in performing all functions of life and developing to their maximum potential. For an increasing number of cities, the healthy city model is seen as particularly valuable because it attracts resourceful citizens; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

slow citiesⁱⁱ, slum citiesⁱⁱⁱ, community cities^{iv}, shrinking cities^v, second cities^{vi}, historical cities^{vii},

ⁱⁱ Cities that respond to the high pulse of the modern metropolis by launching concepts that slow down the pace. These will typically be cities whose layout and amenities support a lifestyle that prioritises recreational activity, the possibility of relaxing and enjoying life. A number of these cities have joined the “Slow City Movement” inaugurated in 1999 in the Italian city of Orvieto. The original incentive for this movement was “slow food”, the wish to increase the knowledge about and demand for this type of cuisine; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

ⁱⁱⁱ Cities that are affected by great poverty. Such cities will typically have districts where the poorest citizens live in miserable conditions with no access to adequate health services, medical and social help, education, work, etc. These harsh conditions often make these districts appear as a threat to their surroundings: the enviroing communities typically react by sealing themselves off from the slum district, Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

^{iv} Cities where citizens experience a special community feeling and interact closely with other people in their neighborhood. These cities create and maintain local values and ensure a sense of security for the individual citizen. They are characterized by strong cohesion that is defined by the citizens’ shared values and local attachment rather than by the functions the city is expected to fulfil; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

^v Cities that are getting smaller in size, thus contradicting global urbanization trends. The decrease in size is often a consequence of a drop in birth rates and/or the closing of larger industrial workplaces that have contributed significantly to the growth of the cities. Many shrinking cities make dedicated efforts to adjust to the demands of the knowledge society, in which the ability to generate growth does not necessarily depends on size; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

^{vi} Cities that stand in the shadow of the most important city in a given country or region. The definition “second city” is increasingly used about cities that have defied their status as “provincial” in recent years, and have managed to assert themselves in the competition for resources and growth, in some regions and countries, the strong first cities feel overtaken and intimidated because the combination of smaller size and independence make second cities move faster than their larger counterparts; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

^{vii} Cities that have made significant historic contributions to urban development. This definition is typically used for cities listed on the UN’s World Heritage List. It is also used to define cities that have historic sites, buildings, landmarks, etc. that have contributed to significant events in the world history, hereby profiling the city to the outside world. The primary challenge for cities in this category is to retain their historic distinction while still meeting the needs of modern citizens; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

and then green cities^{viii}, and - last but not least - quality-of-life cities^{ix}.

Besides all these one has started to prevail: the Smart City paradigm. Maybe because as a huge amount of funding - national, international and EC - has been dedicated to this topic, due to the large number of stakeholders that could be catalyzed in the design, scaling up and replicability of the smart city itself.

It is matter of fact that the definitions of Smart Cities have changed over the years based on aims and goals of different proponents, stakeholders and supporters but, the last definition that have been proposed by EIP in Smart Cities and Communities – Strategic and Implementation Plan, is probably the one which is better to mention here: “Smart cities should be regarded as systems of people interacting with and using flows of energy, materials, services and financing to catalyze sustainable economic development, resilience and high quality of life; these flows and interactions become smart through making strategic use of information and communication infrastructure and services in a process of transparent urban planning and management that is responsive to the social and economic needs of society”.

2. Smart Cities and Smart Cities related topic: state of the art in 2019

2.1. Numbers within the Smart Cities and Smart Cities related projects

Today Europe capitalize on over 30 years of investment in transnational Research and Innovation programmes on sustainable urban development. European Union budget has - indeed - contributed to deploy solutions on the “things that matter” for Europeans such as urban areas, which have been a key issue in European Community funding programmes.

^{viii} Cities that are based on a mindset of sustainability and energy-efficient solutions with a view to reducing CO₂ emission and bringing down the consumption of energy resources. This is seen in different ways, for instance by having a well-functioning public infrastructure that ensures minimal use of cars in the city, and dense building with defined standards for building materials, design, etc. that are as environmentally friendly as possible; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

^{ix} Cities whose primary purpose is to ensure a high quality of life for their citizens. Their efforts range from high health standards to local initiatives that ensure a dignified life for all citizens. The latter is achieved by providing sufficient opportunities for education and work. It requires a balance between public and individual needs. Through their organization and physical layout, these cities wish to guarantee safety and security while ensuring that the individual citizen feels free and content as a member of a larger community; Huset Mandag Morgen, special edition on Futures of cities, may 2007, DK

In the last five years the EC promoted Research Development & Innovation on urban issues providing support through a wide range of funding programs - covering different funding opportunities according to main pillars in H2020 Framework, namely Excellence in Science, Industrial Leadership and Societal Challenges with following distribution [Figure 1]:

- 16 projects under program H2020-EU.3.3.1.3. - Foster European Smart cities and Communities;
- 2 project under program H2020-EU3.3 Societal Challenges - Secure, clean and efficient energy;
- 9 projects under program H2020-EU.2.1.1 Industrial Leadership - leadership in enabling and industrial technologies - Information and Communication technologies (ICT)
- 2 projects under program H2020-EU.2.1.1.7. – ECSEL
- 1 project under the Program H2020-EU.3.4.8.1. - Innovation Program 1 (IP1): Cost-efficient and reliable trains
- 2 project under program H2020-EU.3.4.8.3. - Innovation Program 3: Cost Efficient and Reliable High Capacity Infrastructure
- 1 project under Program H2020-EU.3.4.8.4. - Innovation Programme 4: IT Solutions for attractive railway services
- 1 project under Program H2020-EU.3.3.4. - A single, smart European electricity grid
- 1 project under Program H2020-EU.1.2.2. - FET Proactive
- 2 project under Program H2020-EU.3.3.7. - Market uptake of energy innovation - building on Intelligent Energy Europe

The overall budget related to H2020-EU.3.3.1.3. - Foster European Smart cities and Communities has been 357,675,069.34 with EU contribution for 302,892,122.37, while the overall budget related to the other cited programs has been €133.854.886,79 with EU contribution for €114.112.165,98 [Figure 2]. This data clearly states that if we refer to Smart Cities we automatically refers to H2020 – Foster European Smart Cities and Communities but, even if the amount of additional funded projects related to Smart Cities in different calls is less than the ones in H2020-EU.3.3.1.3., have been funded the same quantity of projects, which means the appealing of smart cities related topics.

Then, if we refer to the type of funded projects it is easy to see that:

37 projects funded cover all the projects type spectrum, as we have 59% of Innovation Actions; 19% of

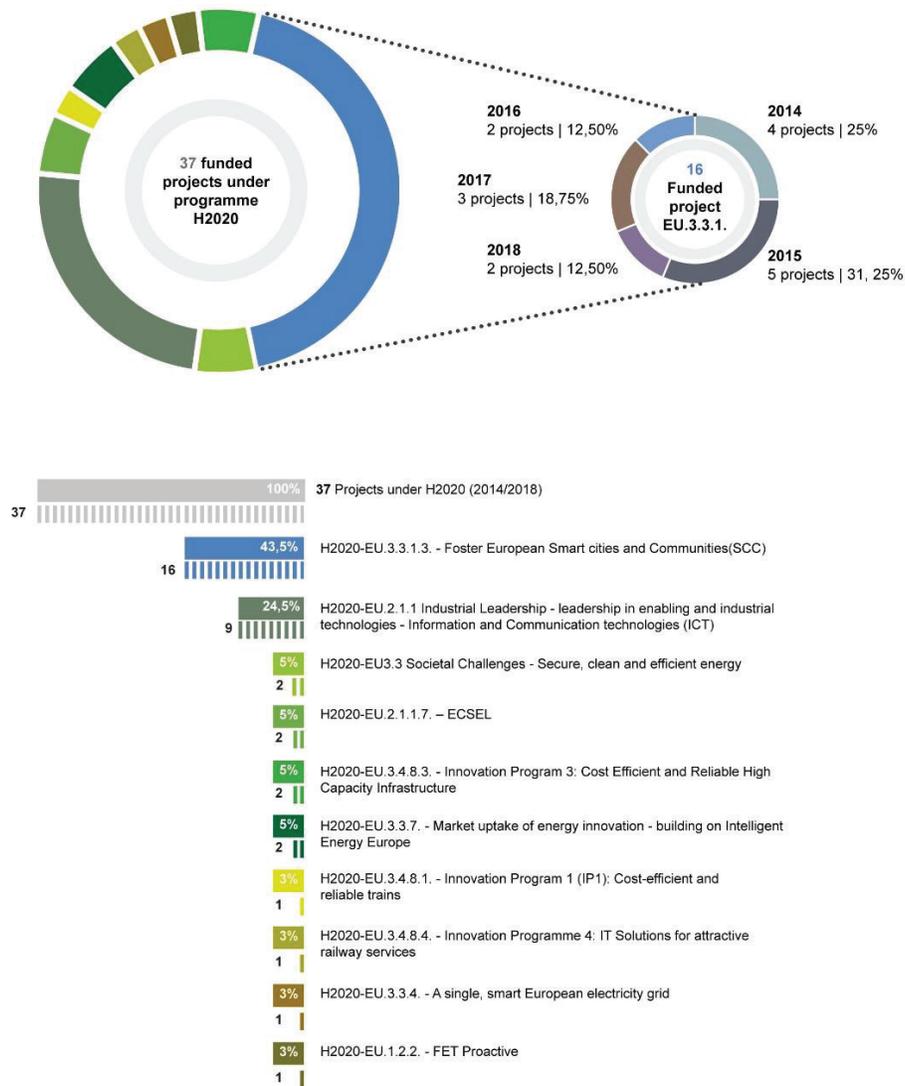


Figure 1: Smart Cities/Smart Cities related topics: project funded in H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

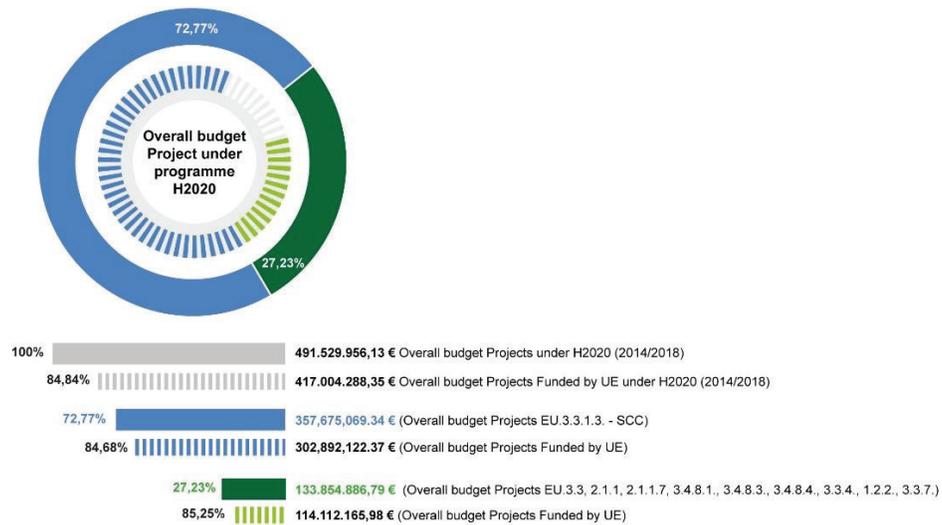


Figure 2: Smart Cities/Smart Cities related topics: overall budget funded in H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

Research and Innovation Actions; 16% of Coordination and support action; 2% of Feasibility studies

Looking at project dimension the Innovation actions have received a funding of €380.081.613,52, the Research and Innovation stands at €30.218.711,83, whilst Coordination and Support Actions together with feasibility studies request an amount of €6.801.051,25 [Figure 3].

This is a clear indicator of the high Technology Redness Level of these project and how near they are to the market uptake.

It is also important to stress the fact that in the period 2014–2020 the urban dimension has been put at the very heart of EC Cohesion Policy, too.

Thanks to European Regional Development Fund (ERDF) and European Structural and Investment Funds (ESIF) Member States funded thematic objectives programmes with a strong focus on 4 key priority areas (Research and Innovation, Digital Economy, SME Competitiveness and Low Carbon Economy took place); so overall budget estimated for the period 2014-2020 has been € 278,942,793,261.00 with an investment on topic related to sustainable urban development such as ICT, renewable energy and energy efficiency of € 2,388,082,326.00. [3]

Thus European Union stimulated, in various and different ways, cities to be actors of Open Innovation in responding to the present environmental, social and economic challenges.

European Union, Member States, National and Regions Authorities and different type of stakeholders have worked - and keep on doing - together to promote a sustainable urban development and to adapt policies to

the needs of cities, thus make visible improvements to the daily lives of people.

As highlighted in EERA JPSC special issue 1|2018 Towards and European vision for the Smart Cities to come “According to this approach, many Member States pooled resources at European level, achieving more than by acting alone. Therefore, together with national budgets and a wide range of legislative and regulatory instruments, the EU budget has allowed to support shared objectives and tackle common challenges including CO₂ reduction in urban areas and a carbon-neutral economy thorough initiatives aimed at implementing the so-called ‘smart cities’. It is thanks to the coordinated EU/Member State approach that RD&I boost smart cities and smart specialization strategies as two novelties that have been quickly adopted by policymakers, then translated into specific policies and initiatives that were mainstreamed into regional policies.”

The EU Research and Innovation policy has been supported - and still it is - by Horizon 2020 Framework Programme, the main instrument in which new research and innovation on sustainable urban development has been designed. The main policy goals have been to spur novel solutions and partnerships to urban challenges and to create an open community of practice.

Thus, Horizon 2020 supported different solution-oriented initiatives to respond to the complexity of Societal Challenges related to cities and urban areas, indeed.

Multiple large scale demonstration projects were launched in the framework of the cross-cutting Focus Area on ‘Smart and Sustainable Cities’, which called for

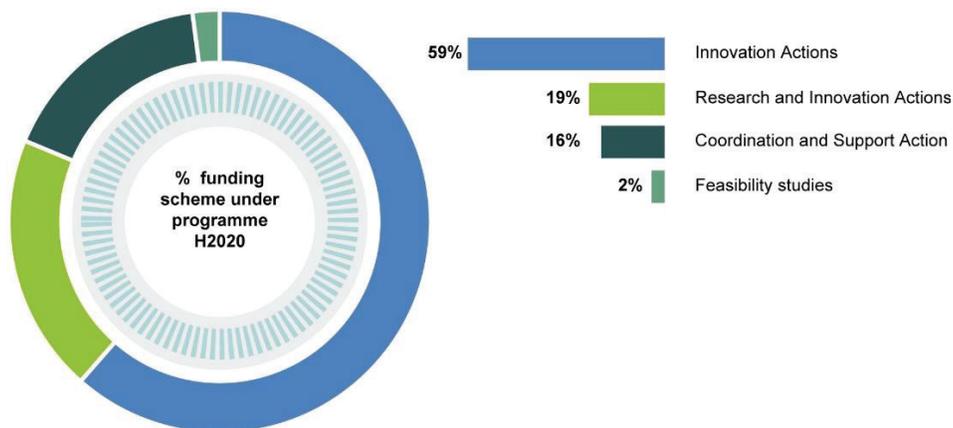


Figure 3: Smart Cities/Smart Cities related topics: type of actions funded in H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

a systemic approach to stimulate sustainable urban development, in which cities act as living labs to create an open innovation ecosystem. “Frontrunner” cities develop and test innovative solutions. These solutions are deployed at a wider scale through peer-learning with dedicated “Follower” cities.

The most of these multiple large scale demonstration projects – supported by H2020 lighthouse call (SCC-2014/2018) are still ongoing (data referred to end 2018) while just CITYKEYS and ESPRESSO have been completed.

Nerveless, some interesting considerations follows:

- 38 cities have been or still are working as Lighthouse SCC pilot cities (Antalya, Bristol, Dresden, Eindhoven, Firenze, Glasgow, Goteborg, Groningen, Hamburg, Helsinki, Leeds, Limerick, Lisbon, London, Lyon, Manchester,

Milano, Munich, Nantes, Nice, Nottingham, Oulu, Pamplona, Rotterdam, San Sebastian, Sondeborg, Stavanger, Tampere, Tartu, Tepebasi/ Eskisehir, Trento, Trondheim, Umea, Utrecht, Valencia, Valladolid, Vienna, Vitoria/Gasteiz), while 30 as Lighthouse SCC follower cities (Asenovgrad, Bordeaux, Brno, Burgas, Bydgoszcz, Cluj-Napoca, Derry, Essen, Gdansk, Herzliya, Kerava, Kozani, Lousanne, Lecce, Leipzig, Litomerice, Miskolc, Nilufer, Ostend, Palencia, Parma, Prague, Rijeka, Sabadell, Santiago de Compostela, Seraing, Skopje, Sofia, Venezia, Warsaw) [Figure 4];

- Project leader in Lighthouse SCC are located in Spain (7), Netherlands and UK (2), Finland, France, Germany, Norway and Sweden (1) [Figure 5];

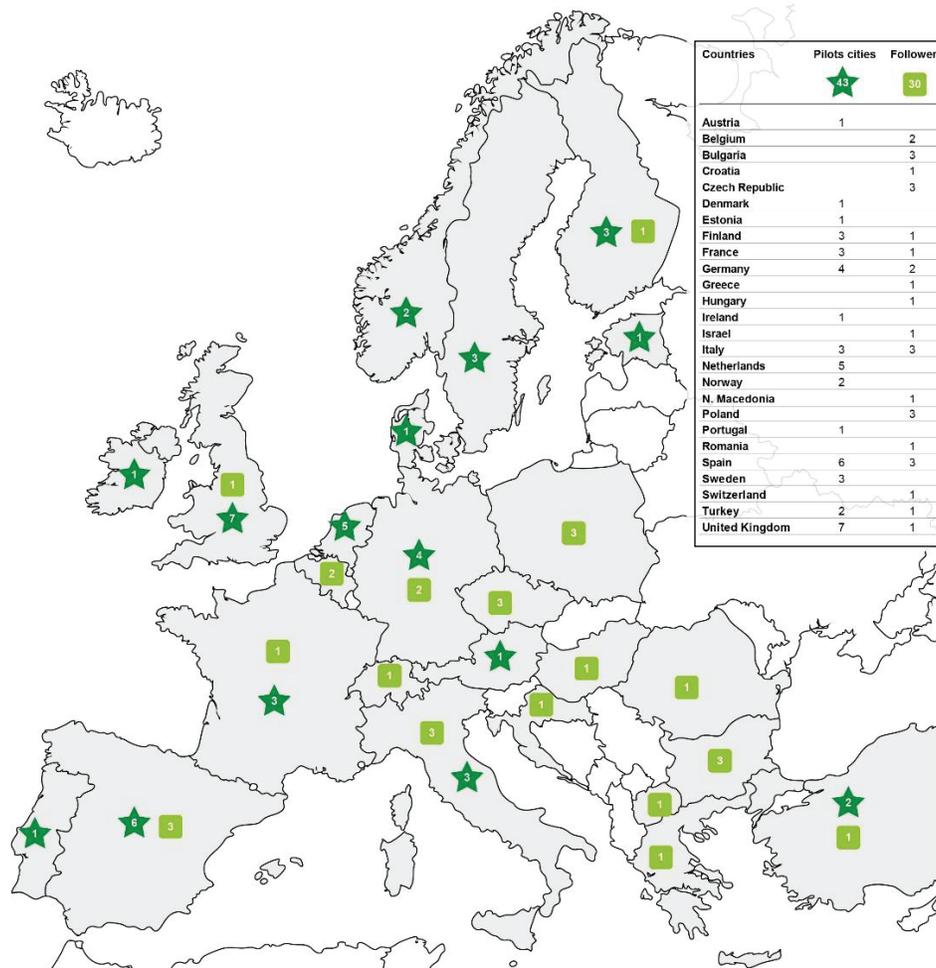


Figure 4: Pilot Cities/Follower Cities in Lighthouse SCC H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

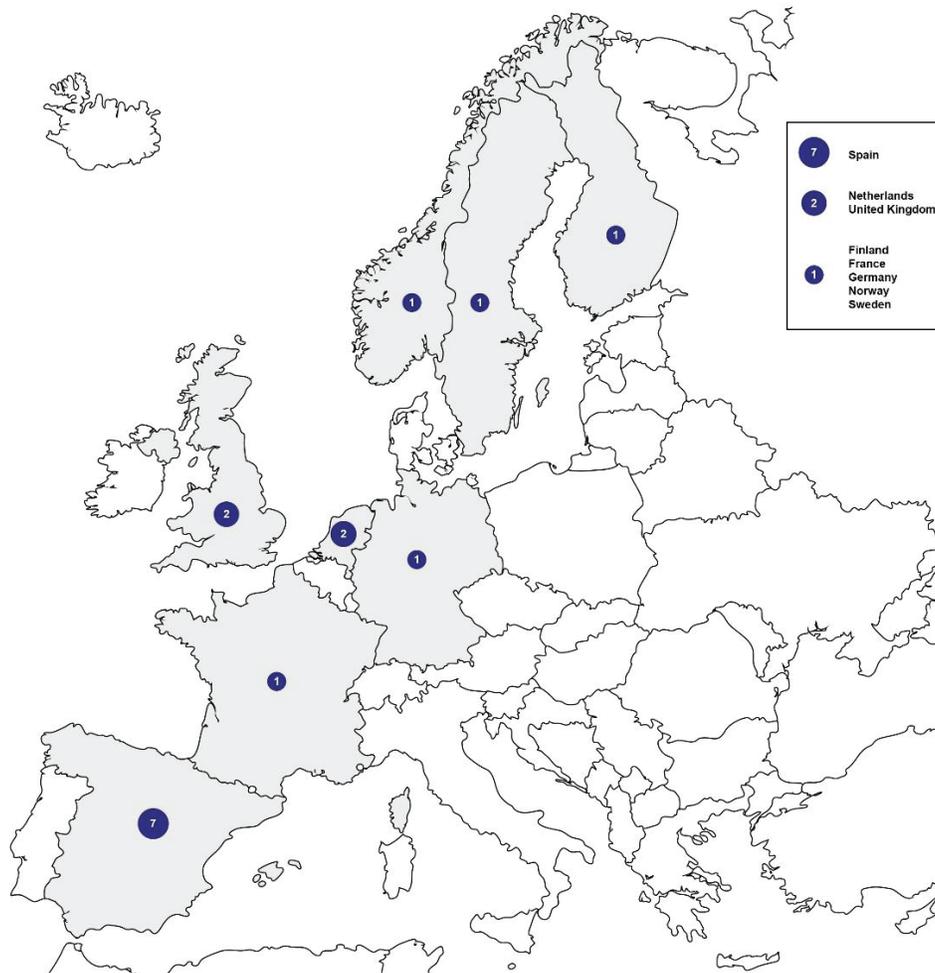


Figure 5: Project leader distribution in Lighthouse SCC H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

- countries participation per projects in Lighthouse SCC is subdivided in Spain (14), Germany and Italy (11), Belgium (8), France Netherlands and UK (7), Bulgaria and Finland (6), Austria, Czech, Poland, Romania, Turkey (4), Denmark, Estonia, Greece, Sweden (3), Croatia, Hungary, Ireland, Norway, Portugal, Switzerland (2), North Macedonia, Israel, Malta, Slovakia (1) [Figure 6];
- participants stakeholders within the country ranks: Spain (88), Germany (48), UK (44), Italy (43), Netherlands (39), France (31), Sweden (29), Finland (28), Norway (16), Turkey (15), Austria (12), Estonia (11), Ireland and Denmark (10), Portugal, Bulgaria and Belgium (9), Poland (7), Romania (6), Greece and Czech (5), Switzerland, Slovakia, Hungary, Croatia (2), Malta, North Macedonia and Israel (1) [Figure 7].

If we consider that is highly desirable, for testing the coverage of Smart Cities concepts in Member State, the participation of Municipalities not only as Lighthouse Cities but also as Follower Cities, we discover that only few Member States (Finland, France, Germany, Italy, Spain, Turkey and United Kingdom) are well positioned; thus this could be indicative of a sort of implicit national roadmap supporting the experimentation and replication of Smart Cities concept. Another surprising data refers to the fact that there is not a direct correspondence among being a Lighthouse Cities and promoting the involvement of may stakeholders. If we refer to the Italian situation we will see that even if there are not Italian lighthouse cities, the number of stakeholders participating in lighthouse projects is significantly high. This again demonstrate how much pervasive the Smart Cities concept has been at a national level.

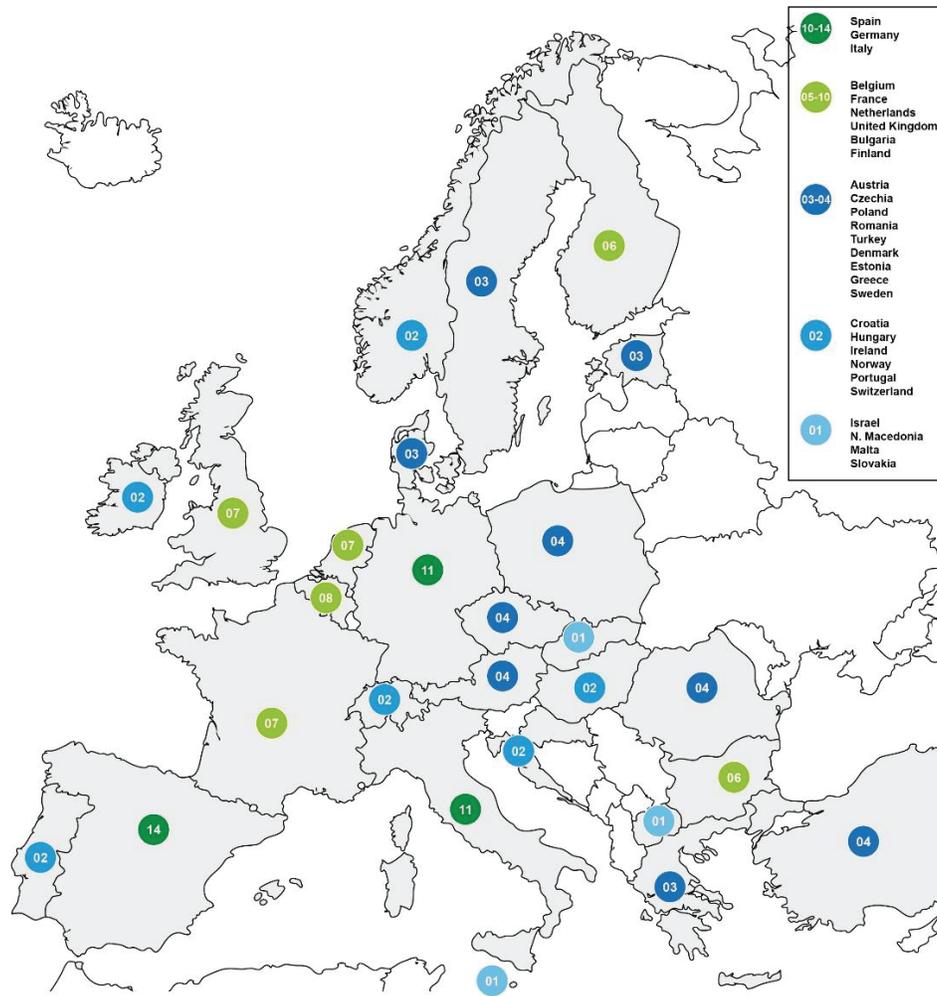


Figure 6: Countries participation in H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

Then if we refer to Smart Cities related topics projects we highlight that we have 367 European partners while the biggest project SinchroniCity involves partners even from Mexico, South Korea and Switzerland with, as clear, no EU contribution.

Looking at data collected we can see that:

- Project leader are located in Spain (4), Germany, UK, Belgium, (2), Austria, Greece, Eire, Italy, Portugal, Denmark, Slovenia (1) [Figure 8];
- countries participation is Spain (71), Germany (49), Italy (36), France (28), Austria (24) UK (22), Greece (16), Belgium and Portugal (14), Switzerland (10), Ireland (8), Norway, Sweden and Slovenia (6), Czechia (5), Denmark and Mexico (4), Luxemburg, South Korea and Serbia (3), Turkey, Israele, Croazia, Bosnia and Herzegovina (2), Poland, Slovakia and Lituania (1) [Figure 9];

According to the data exposed we can express following consideration:

- Smart Cities related topics projects have involved 36 States: 2 extra Europe (Mexico and South Korea) and Switzerland, plus 33 among Member States and Observers.
- top five countries per participation in Smart Cities related project are Spain 19%, Germany 11%, Italy 9%, UK 8% and France 7% [Figure 10]

2.2. Topics within the Smart Cities and Smart Cities related projects

Smart Cities and Smart Cities related projects funded by H2020 lighthouse call (SCC-2014/2018) are focused on specific topics such as:

- Energy Efficiency in Buildings – among which the most successful topics has been Building Integrated

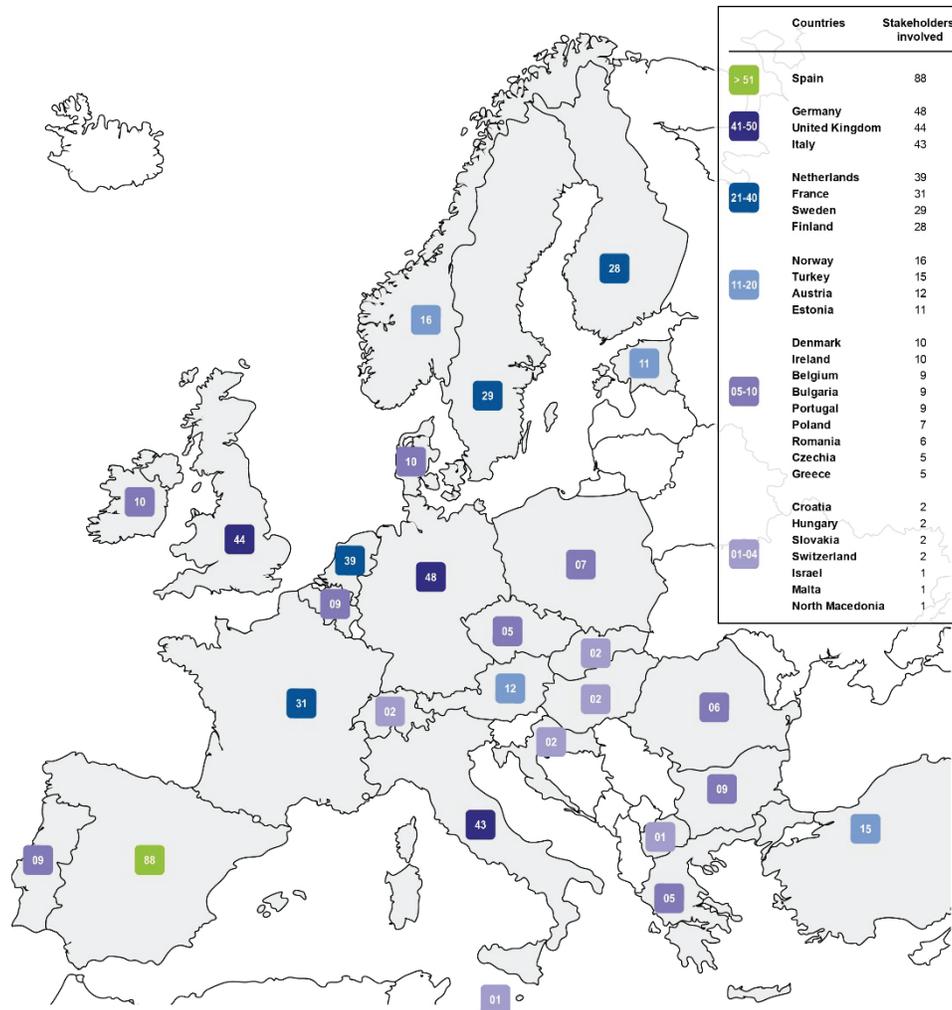


Figure 7: Participants stakeholders per Countries participation in H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

Renewable Energy Sources and additionally Building Envelop retrofitting [Figure 11a];

- Mobility and Transport – among which the most successful topics has been Electric, Hybrid and Clean Vehicles and additionally Clean Fuels and Fueling Infrastructure[Figure 11b];
- ICT - among which the most successful topics has been Building Energy Management System and additionally ICT as Planning Support [Figure 11c];
- Energy System Integration – among which the most successful topics has been Electrical Energy Storage and additionally District heating and Cooling[Figure 11d];
- Others– among which the most successful topics has been Smart Cities and Communities and

additionally Demonstration Projects, and Integration of Energy Systems, ICT and transport in Cities [Figure 11e].

3. 2020 and beyond

The White Paper on the future of Europe and the previous reflection papers showed that the EU27 has faced and still will face a wide range of challenges in the period up to 2025 and beyond. Among these there are current trends that will last relevant for decades to come, such as demographic change e social cohesion, economic convergence, digital revolution, globalization and climate change.

Sustainable development has - for a long time - been a central and core topic of the European project. Today



Figure 8: Project Leaders participating in Smart Cities related topics projects in H2020 (image elaborated by authors on a set of data source period 2014–2018 (end) [1,2,3])

European Member State face many challenges related to sustainability: youth unemployment, ageing population, climate change, pollution, sustainable energy and migration. The 2030 United Nation Agenda for Sustainable Development and the sustainable development goals (SDGs) represent a priority for EU policy, both internally and externally. The economic, social and environmental dimension, which are at the heart of SDGs, have been incorporated in several EU budget and spending programs. They have been central into the Europe 2020 strategy to boost education and innovation (smart), low carbon emissions, climate resilience and environmental protection (sustainable), job creation and poverty reduction (inclusive).

Many of the programs promoted by EU are now a sort of trademarks in the daily livfe of European citizens. Indeed, there is still room to further improve

their performance and increase their impact, avoiding overlap and stimulating combination of instruments thus promoting alignment. The current generation of programs have promoted major reforms providing more funding on key Europeans priorities such as employment, social inclusion, research and innovation skills, energy resource and efficiency. On the other side on the other side policies to manage have become increasingly complex, hampering on-ground implementation and creating delays: layers of controls and bureaucratic complexity make it difficult for beneficiaries to access these funds and deliver projects quickly.

Indeed, urban planning activities have changed thanks to technological development promoted also by Research Development & Innovation programs. The budget constraints and the complexity of urban investments needed

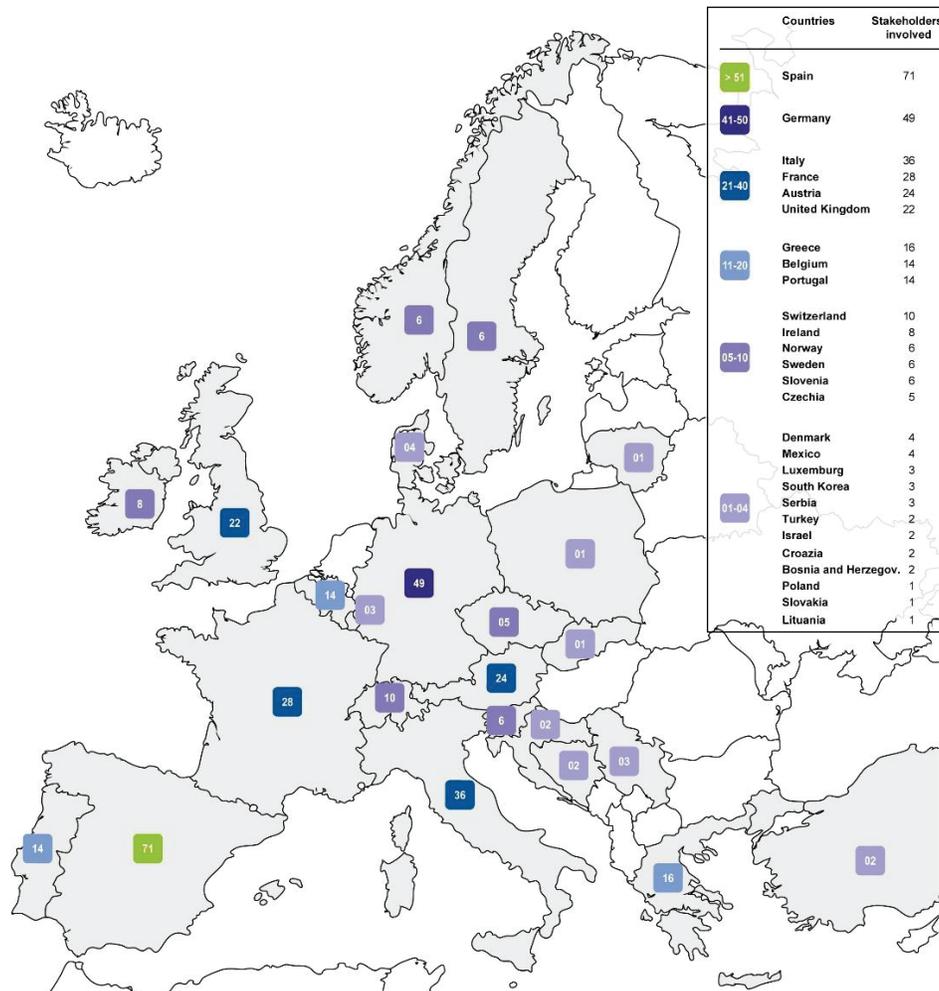


Figure 9: Stakeholders participation per countries in Smart Cities related topics projects in H2020 period 2014–2018 (end) (image elaborated by authors on a set of data source [1,2,3])

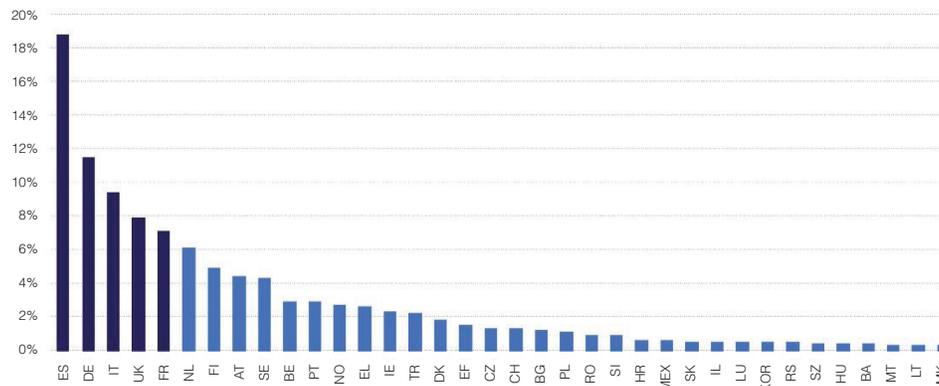


Figure 10: Countries per participation in Smart Cities related project (image elaborated by authors on a set of data source [1,2,3])

for Smart Cities and Communities solutions led city administrations to require the involvement of private players thus adapting the governance of cities in order to

attract them. Therefore, Smart Cities can evolve thanks new modes of value creation through the intermediation of public-private partnerships, cross-sectorial collabora-

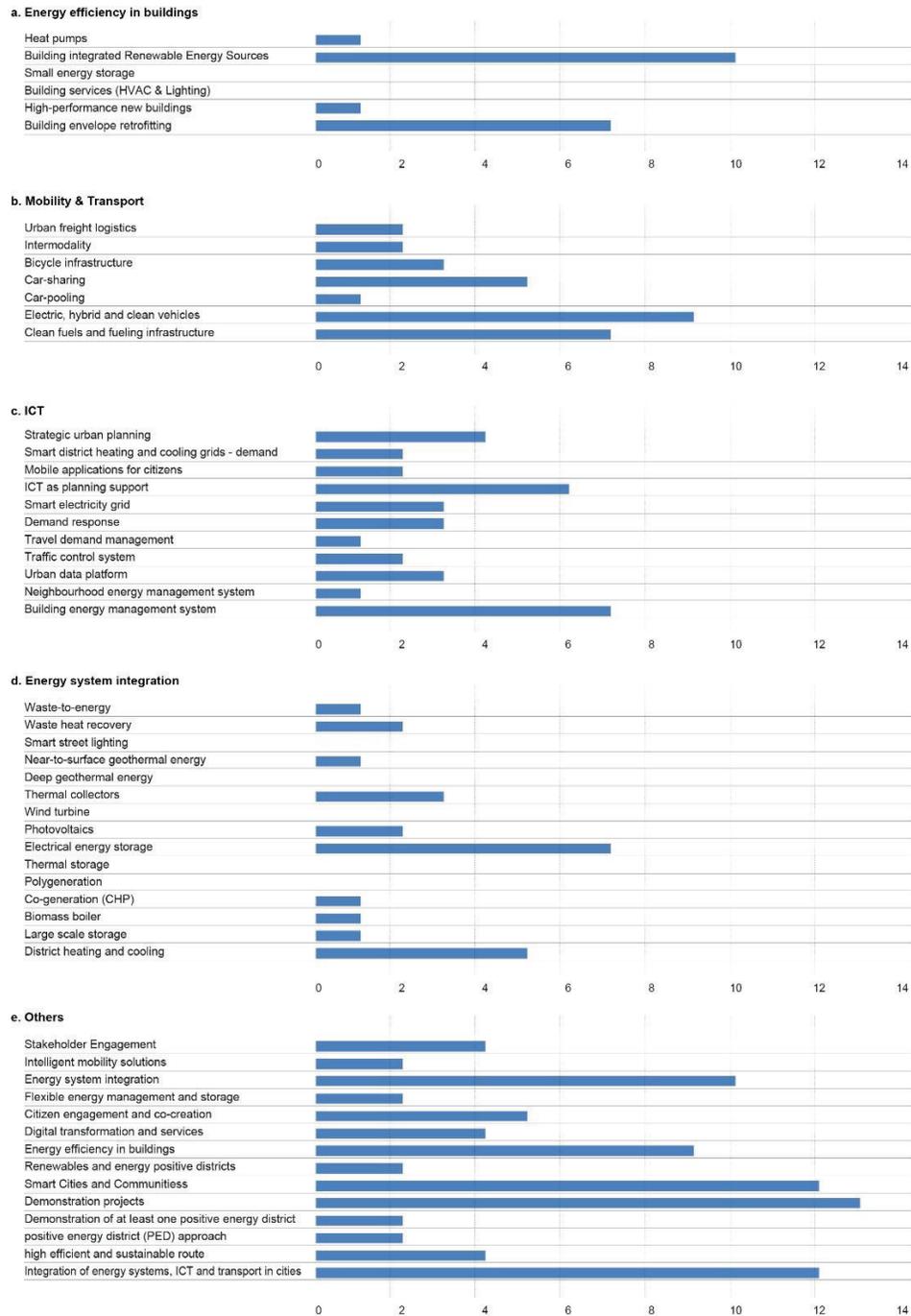


Figure 11: Keywords for specific topics: (a) Energy Efficiency in Buildings, (b) Mobility and Transport, (c) ICT, (d) Energy System Integration, (e) Others. (image elaborated by authors on a set of data source [1,2,3])

tions, city-led “open innovation marketplaces” and other forms of governance.

We assume that there is not a unique way or a single approach to stimulate transitions of a city into a smart city; cities in Europe have adopted different solutions, each of them reflecting specific circumstances.

4. Conclusion

According to above consideration, it appears that three basic elements could best describe the European vision about Smart Cities. The first is that there is not a single vision for the European Smart City, but there have been as many visions as there are Europeans, as social

realities within Europe differ greatly, depending on where people live and work. Then the second is that cities in Europe are and want to be places of advanced social progress, platforms for democracy, cultural dialogue and diversity as well as places of green, ecological and environmental regeneration. Last but not least that Smart cities should be regarded as systems able to catalyze sustainable economic development, resilience and high quality of life making a strategic use of information and communication infrastructure and/or services in a process of transparent urban planning and management.

Therefore if we refer to the European way to promote transition towards Smart Cities we could say that it has been in the last decade that cities started to become smart, not only because of automatic routine functions (serving end-users, traffic system and transport, buildings and/or energy providers) already in place, but moreover because data - deriving from ICT applications - have been used to understand, analyze and, recently, plan the city to improve efficiency, equity and quality of life for citizens.

According to this we believe that the transition process which will pave pathways towards smart cities to come will be mainly focus on setting up, deployment, roll out and scalability on a set of already existing smart solutions

Applying smart cities solutions to limited-scale contexts has certainly enabled the testing of SCC technologies, governance models and citizen involvement; however, what is needed now, in the next future, is to promote scalability and replicability of solutions, bearing in mind that “there is no single element that represents more than others an obstacle or an enabler to the roll-out of SCC solutions”.^x

For the near future, we need to focus on similarities in smart cities Research Development & Innovation projects (i.e. paradigmatic or technological enabling factors on which various solutions are based, ways to integrate single specific technology in a whole ecosystem of interoperable solutions,...). If we consider each SCC solution as a brick of Lego, we understand that while each brick has been made as a separate object, it needs to be assembled and integrated in a more structured system like the one which Smart City paradigm offers.

In next future Smart Cities are approaching a critical phase: behind many theoretical discussions, it is now

necessary to create a realistic pathway of SCC applications/solutions.

This is really the most challenging step of the pathway: it must be more pragmatic, as there will be select only those SCC solutions which have been experimented in the conceptual expansion phase. That's why, in the near future, urban projects requirements will evolve and specifications will be more compelling, allowing no more single, isolated interventions as highly technological islands, but interconnected ones. According to this, pilot RD&I projects will shortly change: not only a demonstration of technological effectiveness in achieving the desired performance or KPIs, but competitive business models with a high level of replicability and scalability, widely accepted by the largest group of stakeholders such as RD&I networks, government, real estate, process management, urban services, design and construction, e-commerce, analyst, ICT and Big data, financial/funding, social/civil society,...).

It is a fact that today we still do not have a smart city, or rather we have a limited-scale smart city context, and we have several SCC (Smart Cities and Communities) solutions where the use of ICT infrastructure promotes a better understanding of success factors for their deployment and roll-out.

Therefore, the next step to move towards a wider European idea of Smart Cities pass through the idea of positive energy district for a sustainable urbanization thanks SCC solutions - already experimented on a limited-scale context; this appears to be the most reliable opportunity.

Highlights about next European Research Development & Implementation programme on Smart Cities and Communities are described in the Implementation Plan SET-Plan Action 3.2 which focus on “Europe to become a global role model in integrated, innovative solutions for the planning, deployment and replication of Positive Energy District”; the aim is to support the 100 Positive Energy District by 2025 for a sustainable urbanization.

The approach to PED will require an open innovation model for planning, deployment and replication, different from the one adopted by the Smart Cities paradigm where tools, technologies and platform have been - mainly - designed among several stakeholders (Governmental, Research and Innovation, Design/Construction, Real Estate, urban Services, Analyst, IT project and Big data, Social/Civil Society, Municipality). In next future Cities and Municipalities will be the stakeholders who need to take a leading role in the integrated

^x Analysing the potential for wide scale roll-out of integrated SCC solution
- Final Report, 2016

and holistic planning of PEDs, aligning it with their long-term urban strategies, while all the others stakeholders (mentioned above) will play the vital role as solutions providers as well as Citizens will take a new role as prosumers with active participation.

Acknowledgement

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