Call - SMART AND SUSTAINABLE CITIES

H2020-SCC-2016/2017

INTRODUCTION

European cities are forerunners in the transition towards a low carbon and resource efficient economy. A fast growing percentage (currently 72%) of the EU population lives in urban areas, using 70% of our energy. Quality of city life and the attractiveness of cities as environments for learning, innovation, doing business and job creation are now key parameters for success in the global competition for talent, growth and investments.

Key challenges for Smart and Sustainable Cities are to provide solutions to significantly increase cities' overall energy and resource efficiency through actions addressing the building stock, energy systems, mobility, climate change, water and air quality. Such actions should bring profound economic, social and environmental impacts, resulting in a better quality of life (including health and social cohesion), competitiveness, jobs and growth.

This new "Smart and Sustainable Cities" cross-cutting focus area has a clear aim: Calls will bring together cities, industry and citizens to demonstrate solutions and business models that can be scaled up and replicated, and that lead to measurable benefits in energy and resource efficiency, new markets and new jobs. The scope will include the creation of urban spaces powered by secure, affordable and clean energy, smart electro-mobility, smart tools and services, innovative nature-based solutions and showcasing economic viability.

Particular focus will be on creating the right enabling frameworks for large-scale innovation at urban scale, including the development and testing of new business, financing and governance models that allow for quick replication at scale.

This cross-cutting call on Smart and Sustainable Cities comprises two distinct but mutually reinforcing calls.

Smart Cities and Communities (SSC1) focusses on demonstrating sustainable, cost-effective and replicable district-scale solutions at the intersection of energy, transport enabled by ICT. They should integrate smart homes, energy efficiency measures, very high shares of renewables, smart grids, energy storage, electric vehicles and smart charging infrastructures, using latest generation ICT platforms (and infrastructure) based on open specifications. This should in turn help to manage a successful transformation towards intelligent, user-driven and demand-oriented city infrastructure and services.

This call continues with the 'lighthouse project' approach of the Smart Cities calls since 2014. The 2020 goal is to have a significant number of new lighthouse cities of all sizes all over Europe, in a very large number of Member States with various, climatic and economical positions.

Sustainable cities though Nature-based solutions (SSC2-4) focusses on providing evidence that re-naturing of cities through the deployment of innovative, locally adapted, systemic solutions - that are inspired and supported by nature - can be a cost-effective and economically viable way to make cities more sustainable, resilient, greener, and healthier. This will also help to increase their attractiveness for citizens, new economic activities and investments.

The replication of successfully demonstrated solutions of both calls can be further spread by the European Innovation Partnership on Smart Cities and Communities.

A novelty in Horizon 2020 is the Pilot on Open Research Data which aims to improve and maximise access to and re-use of research data generated by projects. Projects funded under the call 'Smart and Sustainable Cities' will by default participate in the Pilot on Open Research Data in Horizon 2020[45]

SMART CITIES AND COMMUNITIES

SCC-1-2016-2017: Smart Cities and Communities lighthouse projects

Specific Challenge: To demonstrate solutions at district scale integrating smart homes, smart grids (electricity, district heating, telecom, water, etc.), energy storage, electric vehicles and smart charging infrastructures, using the latest generation ICT platforms (and infrastructure) based on open specifications. This should in turn help to manage a successful transformation towards intelligent, user-driven and demand-oriented city infrastructures and services.

This should be accompanied by energy efficiency measures and the use of very high shares of renewables at the level of districts.

Scope: Lighthouse cities develop and test integrated innovative solutions at large scale (at least district size). These lighthouse cities should become the most advanced cities in Europe and act as exemplars for their region by paving the way for replication of these solutions, adapted to different sizes and local conditions. They are fully committed to implement their Sustainable Energy Actions Plans approved by the Covenant of Mayors initiative. Links with the broader Sustainable and Integrated Urban Development Strategies in the framework of the

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[45] Projects funded under the other parts of this Work Programme may participate in the Open Research Data Pilot in Horizon 2020 on a voluntary basis. Projects have the possibility to opt out of the Pilot. Participation in the Pilot is not taken into account during the evaluation procedure. Proposals will not be evaluated favourably because they are part of the Pilot and will not be penalised for opting out of the Pilot. A further new element in Horizon 2020 is the use of Data Management Plans (DMPs) detailing what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved. The use of a DMP is required for projects participating in the Open Research Data Pilot. Other projects are invited to submit a DMP if relevant for their planned research. Only funded projects are required to submit a DMP.

European Structural and Investment Funds should be sought as well as the funds available for the upscaling and replication of the projects (in particular ESIF). A city can be funded as a lighthouse city only once under Horizon2020.

Technologies should exist already or be very near-to-market (technological readiness levels TRL 7 and more, see part G of the General Annexes). The innovation is in the advanced combination of these technologies and the accompanying business models that enable deployment at large scale.

An important focus of this call is on replication of solutions: Follower cities are defined as cities that have not yet acquired the full technical competence to become a lighthouse city; however they shall be fully involved in the project from the beginning and have within the project enough committed resources to deliver a replication plan of most (if not all) the solutions developed within the project. Proof of long term commitment of follower cities to replicate validated solutions will be part of the evaluation. They shall replicate relevant measures within a few years after the end of the project (to do so they could use ESIF).

Follower cities shall study the lighthouse cities' solutions and – as part of the project and in a clearly structured and budgeted work plan – plan how best to implement the successfully demonstrated solutions in their city. Replication can also benefit from active knowledge transfer through e.g. active mentoring or staff exchange between cities.

The proposals should address a well-balanced combination of smart homes, smart energy and ICT systems and electric vehicles. The projects should cover:

1. A larger district of buildings (old or new or mixed and ideally nearly zero or low energy). These districts shall be adapted to the different sizes of the cities and the local conditions. Each building shall become smart, i.e. featuring the latest generation ICT, smart meters, smart appliances, smart energy management, smart use of the thermal mass; smart management of cooling (where applicable) etc. and capitalizing also on synergies between these single components). A larger number of smart buildings shall create a smarter district through intensive interaction between the buildings for increased synergies and decreased costs.

2. Smart interaction of different energy systems at districts level going far beyond classical electricity grids management only: smart management of electricity, heat, cold, gas or other grid systems (including water) with smart solutions for storage including the intelligent use of the thermal mass of buildings that exploit synergies between these urban grids in order to increase efficiency and reduce energy costs.

3. Integration with and/or consolidation of low carbon ICT systems at district level (communication networks, computing facilities, data centres).

4. Electromobility (in line with Directive 2014/94): smart EV charging (grid to vehicle and vehicle to grid) while ensuring a positive impact on the whole energy system from a

technical and economic point of view. Attention should be given to locally weak or old grids.

Each lighthouse city should:

- Significantly improve energy efficiency: Innovative integration of existing buildings with new buildings (especially in areas of mixed use such as university campuses, innovation districts, etc.).

- Incorporate RES based to a large degree on a high level of local resources (including waste heat, electricity and/or heat storage), high shares of self-consumption. The active participation of consumers (e.g. use of aggregators) must be demonstrated.

- Integrate electricity fuelling infrastructure for electric vehicle fleets for public transport or private transport or logistics or freight distribution. The positive/negative impact of the deployment of high numbers of vehicles on the electricity grid must be assessed (costs of the recharging infrastructure and the vehicles are not eligible).

- ICT solutions for improved planning management, control and maintenance of physical urban infrastructures and operational technologies in buildings, energy and transport, and that enable better services for individuals and businesses.

- Prove interoperability between software modules to allow an effective management of components and information flows. To this end, and to ensure adaptability as new user requirements and technologies evolve, urban ICT platforms must be non-proprietary and based on open specifications, including the data structures and APIs. Concerns about security, privacy and confidentiality need to be tackled.

- Develop innovative Business Models to demonstrate that both technical and financial risks are low enough for large scale investments in all cities: large or small, rich or poor, and irrespective of location. Deployment plans for the lighthouse cities and quick replication in the follower cities and potentially other cities shall be submitted (and will be part of the evaluation).

Each project should:

- Address concrete urban challenges identified by the respective urban authorities.

- Include partners from industry, public authorities, research communities and small and medium-sized enterprises.

- Have a performance monitoring which lasts for a period of at least 2 years.

- Have a convincing replication and investment plan for each lighthouse city and each follower city that describes (a)what the partners in each city will do in order to ensure a large scale replication in their city after the successful end of the project and (b) where the funding will come from (in particular whether ESIF would be used). The replication

plans are compulsory and are part of the evaluation. The investment plans shall show that after successful demonstration private capital can take over further investments at low technical and financial risks so that the economically weakest regions and cities of all sizes become attractive for investors.

- Have a consortium with clearly defined structure roles and responsibilities for all involved entities. The different actions in each city and between all cities (6 or more) must show excellent synergies. The added value of this cooperation versus each city alone must be clearly described.

- Have a well-balanced geographical coverage between lighthouse and follower cities.

- Commit to scientific and technical requirements to support reliability and sustainability: Open data and interoperability are necessary conditions to allow for ease of innovation for improved replicability and economies of scale, and so that solutions can be extended and lock-in of customers to specific solutions and/or vendors can be avoided.

- Contribute to common long term data collection systems, measurement and disclosure methodology, in order to facilitate a common footprint calculation methodology and other metrics (especially for energy saving; CO_2 reductions, financial savings, number of jobs created, environmental impact etc.). All projects will foresee a work package for cooperation with other selected projects on business models and legal, regulatory and other market barriers (foresee about 2 % to 3% of the requested funds for inter-project cooperation).

- Incorporate all performance data into the Smart Cities Information System database (SCIS)[46] and cooperate with CITYKEYS, the support action selected in the 2014 call for performance measurement across sectors.

- Use a robust and viable monitoring protocol, also valid after the end of the project so that future data can easily be introduced into the SCIS.

Each project must:

- Be realised in 3 new lighthouse cities that are situated in different EU Member states or associated countries.

- Involve at least 3 follower cities from at least 3 different EU Member states or associated countries (that are different also from the countries of the lighthouse cities of the project).

Each lighthouse city must:

- Have Sustainable Energy Action Plan (SEAP), positively evaluated by the Covenant of Mayors (please attach proof in Annex).

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[46] http://www.smartcities-infosystem.eu/

Non-eligible costs:

The costs of construction (including scale of unit costs), the costs of retrofitting (including scale of unit costs), the full cost of purchasing of electric vehicles, the costs of acquisition of standard ICT tools, conventional RES and their mounting are not eligible. Insulation of the building envelope, good windows; heat pumps, and other appliances are not eligible costs.

Eligible costs:

Eligible costs cover all those innovative aspects that transform the city into a smart city, such as for example:

- Integration of storage with all grids (across electricity, telecom, heating, cooling, gas, water, etc.).

- Smart building management incorporating smart appliances, smart meters, domotics, of which only the smart/innovative part that is leading to a deep integration with the local energy system (electricity, telecom, heating and cooling, gas) is eligible.

- Smart integration of the electricity grid with RES, with electricity storage and heat storage (or cold storage for air conditioning or cooling or freezing, etc.) at the district level; the smart use of the existing thermal mass for better building management and the integration with good HVAC is recommended and eligible.

- Only the innovative parts of RES, suited for smart integration of PV modules, wind turbines, innovative integration of heat pumps or CHP combined with smart management of heat and electricity are eligible.

- Proposals should focus on the development of integrated approaches and testing of "business" models for the local production and distribution of electricity together with electric vehicle fleets, to create the conditions for market take up in urban and sub-urban areas.

- Smart electricity, heat or cold storage and its management for maximising self-consumption is eligible.

- ICT: only platforms based on open specifications with open APIs, and that cater for data security and cyber-security are eligible.

- Economic research and development of new business models that avoid lock-in situations and that lead to reduction of the energy bills for citizens is eligible as well as the development of new templates for easy understanding and transparency of the energy bills.

- Replication plans have to be submitted with the initial proposal; further refinements and creating more ambitious targets during the project are eligible.

- Training and education within and between cities is compulsory and thus eligible.

- Including additional cities in the training and education (if the benefit is clearly stated) is eligible.

The Commission considers that proposals requesting a contribution from the EU of between EUR 12 to 18 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Each project shall significantly contribute to the impacts described below:

- Put in practice a solution for a challenge identified by the city;

- Increase the energy efficiency on district scale at least;

- Increase significantly the share of renewable energies, their integration into the energy system, stimulate self-consumption, reduce curtailment to the minimum;

- Increase local air quality;

- Reduce the technical and financial risks in order to give confidence to investors for investing in large scale replication

- Make the local energy system more secure, more stable and cheaper for the citizens and public authorities;

- Ensure the roll-out of electric vehicles in cities while containing the need for excessive upgrading of the electricity grid);

- Reduce transport based CO_2 emissions , on the basis of CO_2 intensity of the European electricity grid of 540 CO_2/kWh (coherent with TEST format);

- Create stronger links and active cooperation between cities in a large number of Member States with a large coverage of cities with different size, geography, climatic zones and economical situations.

Type of Action: Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

SUSTAINABLE CITIES THROUGH NATURE-BASED SOLUTIONS

The objective of this part of the call is to position Europe as world leader in innovating with nature to address urban societal challenges and thus support transition pathways towards sustainable urbanisation. Nature-based solutions, such as well-connected green and blue

infrastructure and green and unsealed surfaces in cities, green roofs, natural water retention measures, and salt marshes and dunes for coastal protection, are inspired and supported by nature and simultaneously provide environmental, social, cultural and economic benefits. They use the properties and functions of ecosystems to provide water regulation, flood risk protection, climate change adaptation, etc. They are designed to bring more nature and natural features and processes into cities, landscapes and seascapes, through locally adapted and systemic interventions. They are locally attuned, resource efficient, multi-purpose, multi-functional and multi-beneficial[47]. These key features of nature-based solutions make them different from 'grey' infrastructure, such as artificial river banks, dikes, etc. The analysis of the proposals submitted to the call for ideas launched by the European Commission in December 2014 showed a strong support for greening/renaturing cities as solutions for urban regeneration and change of lifestyles in Europe. Stakeholders supported green development initiatives, enhancement of urban social, cultural and economic resilience and climate change adaptation particularly with respect to flooding and heat stress. The outcomes of the Horizon 2020 Expert Group on nature-based solutions[48] have largely been taken into account in prioritising the challenges identified in this call to be addressed through the deployment of nature-based solutions and the knowledge gaps for which further evidence is necessary. EU-wide evidence and a European reference framework about the cost-effectiveness and longer-term social, economic, cultural and ecological benefits of these solutions to address societal challenges would contribute to create a global market, supporting both supply and demand, mobilise new investment strategies and promote their large-scale deployment.

SCC-02-2016-2017: Demonstrating innovative nature-based solutions in cities

Specific Challenge: Mass urbanisation presents one of the most urgent challenges of the 21st century. Rapidly developing and changing industrial activities, uncontrolled urban sprawl, large, concentrated and often culturally diverse populations have created numerous complex social and health problems. Cities and urban communities have to cope with challenges related poor air quality, heat island effects, increased flood risks, increased frequency/severity of extreme events (floods, droughts, storms, heat waves, etc.), derelict industrial sites, dis-functioning urban areas, increased criminality, social exclusion, inequalities, marginalisation, poverty and degraded urban environments. These challenges have serious impacts on human health, quality of life, well-being and security of citizens, particularly among the less privileged social classes.

 Cities accounting for 72% of the European population are major contributors to climate change consuming 75% of global energy and emitting 80% of greenhouse gas generated by human activity. Growing urban populations, pollution and economic activities also place water resources under severe stress, exacerbating demand whilst affecting the quality and

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[47] For instance, green roofs retain rainwater and thus reduce run off from storm water and thus decrease stress on sewer systems during peak periods. At the same time they increase the aesthetic value of the buildings and contribute to their natural cooling and heating and thus enhance the energy efficiency of the building and the city.

[48] http://ec.europa.eu/research/environment/index_en.cfm?pg=nature-based-solutions

quantity of supply. Climate change mitigation and adaptation and the sustainable management of water resources are therefore key challenges for the cities in Europe and beyond.

There is convincing but fragmented evidence that nature-based solutions can significantly enhance the climate and water resilience of cities. Furthermore nature-based solutions, by reshaping the built environment, can enhance the inclusivity, equitability and liveability of the cities, regenerate deprived districts, improve mental and physical health and quality of life for the citizens, reduce urban violence, and decrease social tensions through better social cohesion particularly for the most vulnerable groups e.g. children, elderly and people of low socioeconomic status.

The challenge is therefore to provide a robust, EU-wide evidence base and develop a European reference framework on nature-based solutions for regional and local city authorities, communities, enterprises and other stakeholders about the benefits, co-benefits, cost-effectiveness and economic viability of these solutions to enhance on the one hand climate and water resilience in cities and on the other hand to address inclusive urban regeneration in cities and thus promote their large scale deployment and the creation of a global market.

Scope: Projects should adopt a 'front-runner' and 'follower' cities approach, as described in more detail below, to facilitate the rapid exploitation, replication and up-scaling of the solutions and via large-scale demonstrations should aim to:

- develop, deploy at an appropriate scale of intervention[49] and demonstrate in 'front-runner' cities as 'living laboratories' innovative, replicable and locally attuned nature-based solutions, with a systemic impact at the scale of intervention, to address the challenges specified below. Solutions should be co-designed, co-developed and co-implemented in a trans-disciplinary, multi-stakeholder and participatory context and systemically embedded in an integrated urban and land use planning;

- assist 'follower' cities that commit to proactively seek advice, expertise, assistance, capacity building (e.g. through staff exchanges) and mentoring from the 'front-runners' and develop, within the duration of the project, a sustainable urban planning that systemically replicates, embeds and integrates the demonstrated nature-based solutions 'customised' to their particular context to successfully address the challenges specified below. This urban plan is a contractual obligation and should be delivered by the end of the project. 'Followers' should have privileged contacts with the project partners and access to the know-how and outcomes of the project and should participate in the definition of user requirements and the design of the methodology for replicating and transferring solutions, data, etc.;

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[49] The scale of intervention proposed should be chosen in order to maximize both the size of the impact that it will make with respect to the overall urban context and the potential for up scaling/replicating at larger scales the tested nature-based solutions and the associated context allowing for their systemic, participatory, trans-disciplinary and multi-stakeholder design, development and deployment.

- engage the 'front-runner' cities (as 'coaching cities') in further networking and knowledge-sharing efforts with cities beyond those directly involved in the project to maximise the benefits of the project for a broader community beyond the limits of the project;

- set up a robust monitoring scheme to monitor, for a period of at least 2 years within the life of the project, the performance and assess the impact of the deployed solutions in an as quantifiable way as possible against a well-defined baseline regarding the challenges in the participating cities at the time of the proposal. Longer term commitment to monitoring and systematic documentation beyond the end of the project will give an added value to the proposal; develop methodologies to assess the efficacy, performance and cost-effectiveness of the solutions compared to alternative options, considering benefits, co-benefits (such as carbon sequestration, mitigation of heat island effects, natural cooling and heating, recreation due to dual use spaces, mitigation of soil sealing effects, enhanced soil, reduction of noise and air pollution, flood prevention/protection, enhancement of biodiversity and natural capital, human well-being and health, reduction of noise and air pollution, improvement of water quality etc., where these are not the primary objectives) and negative impacts that their deployment could entail when addressing the challenges specified below;

- develop methodologies for replication and up-scaling in different contexts of the solutions deployed in the 'front-runner' cities, including investment strategies, governance and business models and approaches for their systemic integration in the urban and land use planning;

- identify and assess potential regulatory, economic, social (such as gender, age, disability and culture) and technical barriers of relevance to these solutions and propose ways to overcome them;

- establish long-term sustainable data platforms to systematically document information and provide evidence on practices and lessons learnt regarding the deployment, cost-effectiveness (including benefits and co-benefits) and performance of nature-based solutions. deploy appropriate state-of-the-art digital technologies, ICT and innovative communication strategies and tools securing open access and interoperability along data infrastructures and a continuous building up of the 'knowledge portfolio' through future activities under Horizon 2020 and beyond.

Proposals shall address **all** of the above points. The involvement of social sciences and humanities in the project will be required to properly address these complex challenges.

Consortia should involve competent local, city and regional authorities, community groups, enterprises, academics and local communities in a clear structure with well-defined roles and responsibilities for all involved parties.

To maximise benefits at European level, each project shall involve at least 2 'front-runner' cities and 3 'follower' cities from different Member States and/or Associated Countries.

In addition to the coverage of the points mentioned above, the success potential of the proposal will be assessed according to the innovative character, the replicability and market potential of the nature-based solutions and of the systemic processes envisaged for their co-designing, co-developing and co-implementation, the long-term commitment, both political and financial, of the competent authorities that would guarantee the project implementation independently of possible changes in the urban political context during the project and the sustainability of financing, through mobilisation and leveraging of investments.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged. To this end, participation of 'follower' cities from non-EU countries would enhance the potential for international replication, including in the context of, but not limited to, the EU-China Sustainable Urbanisation Partnership and the EU-China Innovation Dialogue. This would contribute to the creation of a global market for nature-based solutions.

Resources should be envisaged for clustering with other projects financed under the "Nature-based solutions for territorial resilience" part of the call for Societal Challenge 5 ' Climate action, environment, resource efficiency and raw materials', namely topics SC5-08-2017, SC5-09-2016 and SC5-10-2016, to optimise collaboration, synergies, interactions and mutual support to the achievement their corresponding objectives and, if possible, under other relevant parts of Horizon 2020.

Because of the substantial investments that might be necessary for implementing the nature-based solutions, additional and/or follow-up funding (private or public) should be sought, be it private or public, relevant regional/national schemes under the European Structural and Investment Funds (ESIF) and/or the European Regional Development Fund (ERDF), or other relevant funds such as the Instrument for Pre-accession Assistance (IPA II). In these cases, contacts could be established with the funds managing body during the duration of the projects. In case of relevance for the Research and Innovation Smart Specialisation Strategies (RIS3) the project proposals could already indicate which interested regions/countries or other partners have been pre-identified. Please note, however, that reference to such additional or follow-up funding will not lead automatically to a higher score in the evaluation of the proposal.

As illustrated by proposals responding to the call for ideas, the Commission considers that proposals requesting a contribution from the EU of at least EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Proposals shall address **one** of the following issues:

a) Demonstrating innovative nature-based solutions for climate and water resilience in cities (2016)

Actions should aim to improve urban resilience to climate change (mitigation and adaptation) and enhance water resources management sustainability through deployment of nature-based solutions, or an optimal combination of nature-based solutions and other technologies. Trans-disciplinary and community-based approaches including social sciences and humanities in the co-designing, co-development and co-implementation of the solutions is considered necessary.

b) Nature-based solutions for inclusive urban regeneration (2017)

Actions should address nature-based solutions for inclusive urban regeneration – including regeneration of deprived districts, or neglected or abandoned areas[50]. They should also test to what extent nature-based solutions can reduce crime and security costs, and enhance human health, wellbeing and social cohesion.

The role of social innovation, and hence the participation of social sciences and humanities disciplines such as law, economics, political science, architecture or design studies, is particularly important to properly address these complex challenges.

Expected Impact: Projects are expected to contribute to:

- in the mid-term, the creation of an European reference framework and the establishment of EU leadership in a new global market (offer and demand) for nature-based solutions, new economic opportunities, new products, services, protocols and standards, leverage of investments, reduced regulative and administrative barriers, and new local green jobs;

- increased awareness of the benefits of re-naturing cities, creation of 'communities of practice', more effective policy making and better informed decision making across Europe based on an EU-wide evidence base regarding efficacy, efficiency and comparative advantages of a range of tested, well documented, up-scalable and marketable nature-based solutions;

- enhanced stakeholder and citizen ownership of the solutions through their effective and systematic involvement in participatory, trans-disciplinary and multi-stakeholder consultation processes for co-design, co-development and co-implementation of visionary urban planning;

- increased international cooperation and global market opportunities through replication of approaches and solutions in non-EU countries, including in the context of the EU-China platform;

- enhanced implementation of EU environmental policies, such as the EU Water Framework Directive, the 7th Environment Action Programme, the EU Biodiversity

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[50] The scale of intervention proposed should be chosen in order to maximize both the size of the impact that it will make with respect to the overall urban context and the potential for up scaling/replicating at larger scales the tested nature-based solutions and the associated context allowing for their systemic, participatory, trans-disciplinary and multi-stakeholder design, development and deployment

Strategy to 2020, the EU Climate Change Adaptation Strategy, the 'Blueprint to safeguard Europe's waters' and the 'Communication on Green Infrastructures', and of the Sustainable Development Goals and UN conventions in the fields of biodiversity, soil and land management, disaster risk reduction.

In addition, **projects addressing part a)** are expected to contribute to:

- creating by 2020 healthier and greener European cities, with increased resilience to climate change (e.g. reduced flood risks, mitigated heat stress) and water-related challenges thanks to the implementation of nature-based solutions, with better living conditions for all, increased green infrastructure and biodiversity, improved air and water quality, reduced noise and health costs, improved mobility conditions, opportunities for urban farming[51] and increased social cohesion.

In addition, **projects addressing part b)** are expected to contribute to:

- creating by 2020, through the implementation of nature-based solutions, healthier, culturally diverse and greener regenerated (including deprived districts and neglected or abandoned areas) European cities, with better living conditions for all, reduced crime and security costs, increased green infrastructure and biodiversity, improved air and water quality, enhanced human health and wellbeing, reduced health costs, improved mobility conditions, opportunities for urban farming and increased social cohesion.

Type of Action: Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

SCC-03-2016: New governance, business, financing models and economic impact assessment tools for sustainable cities with nature-based solutions (urban re-naturing)

Specific Challenge: Re-naturing cities can provide solutions to the multitude of challenges that cities are facing because nature-based solutions have proven to be multi-purpose and multi-beneficial. To enable the systemic integration of these solutions into a sustainable urban planning, new governance, business, financing models and partnerships are needed allowing for their co-designing, co-development and co-implementation by all stakeholders and societal actors, and leveraging of investments and synergies between private and public action.

Scope: Actions should:

- map and analyse existing experiences and practices and recommend innovative business models, financing mechanisms (e.g. crowd funding) and governance arrangements to develop socially acceptable urban 're-naturing' planning through participatory, multi-

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[51] Urban farming is dealt with under the topic "SFS-48-2017: Resource-efficient urban agriculture for multiple benefits – Contribution to the EU-China Urbanisation Partnership"

stakeholder and trans-disciplinary way, involving also local communities, empowering citizens and allowing for an equitable distribution of costs and benefits (including co-benefits) at different scales and trade-offs resolution models, new forms of partnerships (e.g. public-private) and strategies for mobilising new investments and creating new business opportunities;

- develop and validate analytical frameworks and methodologies, tools, protocols, standards, indicators and matrixes to: characterize nature-based solutions; assess their cost-effectiveness (accounting for both benefits, co-benefits and possible negative impacts) as compared to alternative combinations of green/grey/hybrid solutions; identify their limits under different conditions and assess confidence intervals, performance thresholds and corresponding uncertainties;

- develop and validate decision-support tools, models, management strategies, guidelines and recommendations to assist the urban re-naturing design process and enable the systemic integration of these solutions into a sustainable urban planning, replicability and scalability;

- identify cultural, social, economic, institutional, legal, regulatory and administrative barriers, incentives/disincentives fostering/discouraging the implementation of nature-based solutions and bottlenecks at city, regional, national and EU level, including aspects such as citizens' perceptions, consumer behaviour and willingness to pay to conserve/enhance urban green space, for re-naturing cities to enhance their economic, social, cultural and environmental resilience, and recommend ways to overcome them.

Proposals shall address **all** of the above points.

The role of social innovation, and the participation of social sciences and humanities, is particularly important to properly address the complex challenges of this topic. Resources should be envisaged for clustering the projects financed under the Nature-based solutions for territorial resilience" part of the call for Societal Challenge 5 ' Climate action, environment, resource efficiency and raw materials', namely topics SC5-08-2016-2017, SC5-09-2016, and SC5-10-2016, to optimise collaboration, synergies, interactions and mutual support to the achievement of their corresponding objectives and – if possible – under other parts of Horizon 2020.

The Commission considers that proposals requesting a contribution from the EU of around EUR 7.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Projects are expected to contribute to:

- develop enhanced strategies, new institutional and governance arrangements and new finance and business models, fostering multi-stakeholder involvement, citizens'

engagement and empowerment, leveraging both public and private funding of nature-based solutions in cities;

- kick-start of a collective learning process to foster creative and visionary urban design in re-naturing cities, securing an equitable distribution of the multiple benefits that city re-naturing entails to various stakeholders and citizens at different scales;

- develop an integrated evidence base and a European reference framework on nature-based solutions, in order to create a global market; new business opportunities, growth and jobs, and a green economy;

- optimise the policy and regulatory and administrative frameworks;

- shift in public and private investments from conventional to nature-based or effective combinations of nature/grey/hybrid solutions to urban challenges.

Type of Action: Research and Innovation action

The conditions related to this topic are provided at the end of this call and in the General Annexes.

SCC-04-2016: Sustainable urbanisation

Specific Challenge: In a globalised world, cities all over the world are facing broadly similar challenges. Finding solutions and defining optimal pathways towards sustainable urbanisation receives high priority in the Research and Innovation (R&I) policy of the majority of the countries worldwide. In this context, aligning R&I agendas to underpin sustainable urbanisation and implementing them through international collaboration will promote synergies, and thus an optimal use of the available expertise, capacity and resources, avoid duplication and ensure robust outcomes of global relevance. The opening of JPI Urban Europe to third country partners is increasingly finding interest among its members and among third countries. The Belmont Forum provides an excellent platform for international collaboration in the area of sustainable urbanisation.

Scope: Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing a joint call for proposals resulting in grants to third parties with EU co-funding in this area. Proposers are encouraged to include other joint activities including additional joint calls without EU co-funding. Actions should build on the international strategy of the JPI Urban Europe and launch in collaboration with the Belmont Forum at least one international call on sustainable urbanisation.

Participation of legal entities from international partner countries and/or regions, in particular with countries participating in the Belmont Forum, is encouraged in the joint call as well as in other joint activities including additional joint calls without EU co-funding. Participants from

countries which are not automatically eligible for funding[52] may nonetheless request a Union contribution (on the basis of the ERA-NET unit cost) for the co-ordination costs of additional activities.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact: Actions are expected to lead to:

- the alignment of research and innovation agendas in the area of sustainable urbanisation and co-ordinated streamlining of the implementation of the respective calls;

- enhanced excellence and global relevance of research and innovation activities on sustainable urbanisation and increased visibility at international level;

- strong and lasting alliance with the funding agencies of key international partners for research and innovation actions on sustainable urbanisation (e.g China, Japan, Brazil, Mexico, USA etc.);

- linking of possible European and international demonstration actions on re-naturing cities to induce a wider, worldwide application of nature-based solutions.

Type of Action: ERA-NET Cofund

The conditions related to this topic are provided at the end of this call and in the General Annexes.

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[52] http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm

Conditions for the Call - SMART AND SUSTAINABLE CITIES

Opening date(s), deadline(s), indicative budget(s):[53]

Topics (Type of Action)	Budgets (EUR million)		Deadlines
	2016	2017	
Opening: 10 Nov 2015			
SCC-02-2016-2017 (IA)	40.00 [54]		08 Mar 2016 (First stage) 06 Sep 2016 (Second stage)
SCC-03-2016 (RIA)	15.00 [55]		08 Mar 2016
SCC-04-2016 (ERA-NET-Cofund)	5.00 [56]		
Opening: 08 Dec 2015			
SCC-1-2016-2017 (IA)	60.00 [57]		05 Apr 2016
Opening: 04 Oct 2016			
SCC-1-2016-2017 (IA)		71.50 [58]	14 Feb 2017
Opening: 08 Nov 2016			

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[53] The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

All deadlines are at 17.00.00 Brussels local time.

The Director-General responsible may delay the deadline(s) by up to two months.

The deadline(s) in 2017 are indicative and subject to a separate financing decision for 2017.

The budget amounts for the 2016 budget are subject to the availability of the appropriations provided for in the draft budget for 2016 after the adoption of the budget 2016 by the budgetary authority or, if the budget is not adopted, as provided for in the system of provisional twelfths.

The budget amounts for the 2017 budget are indicative and will be subject to a separate financing decision to cover the amounts to be allocated for 2017.

[54] of which EUR 40.00 million from 'Climate action, environment, resource efficiency and raw materials'.

[55] of which EUR 15.00 million from 'Climate action, environment, resource efficiency and raw materials'.

[56] of which EUR 5.00 million from 'Climate action, environment, resource efficiency and raw materials'.

[57] of which EUR 60.00 million from "Secure, Clean and Efficient Energy".

[58] of which EUR 71.50 million from "Secure, Clean and Efficient Energy".

SCC-02-2016-2017 (IA)		40.00 [59]	07 Mar 2017 (First stage)
			05 Sep 2017 (Second stage)
Overall indicative budget	120.00	111.50	

Indicative timetable for evaluation and grant agreement signature:

For single stage procedure:

- Information on the outcome of the evaluation: Maximum 5 months from the final date for submission; and

- Indicative date for the signing of grant agreements: Maximum 8 months from the final date for submission.

For two stage procedure:

- Information on the outcome of the evaluation: Maximum 3 months from the final date for submission for the first stage and maximum 5 months from the final date for submission for the second stage; and

- Indicative date for the signing of grant agreements: Maximum 8 months from the final date for submission of the second stage.

Eligibility and admissibility conditions: The conditions are described in parts B and C of the General Annexes to the work programme with the following exceptions:

| SCC-02-2016-2017 | Each project shall involve at least 2 'front-runner' cities and 3 'follower' cities, as defined in the topic text, from different Member States and/or Associated Countries, due to the nature and objectives of the action and in order to maximise benefits at EU level. |
| SCC-1-2016-2017 | Each project must:

 • Be realised in 3 new lighthouse cities that are situated in different EU Member states or associated countries.

 • Involve at least 3 follower cities from different EU Member states or associated countries (that are different also from the countries of the lighthouse cities of the project). |

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[59] of which EUR 40.00 million from 'Climate action, environment, resource efficiency and raw materials'.

	Each lighthouse city <u>must</u>: • Have Sustainable Energy Action Plan (SEAP), positively evaluated by the Covenant of Mayors (please attach proof in Annex)

<u>Evaluation criteria, scoring and threshold</u>: The criteria, scoring and threshold are described in part H of the General Annexes to the work programme.

<u>Evaluation Procedure</u>: The procedure for setting a priority order for proposals with the same score is given in part H of the General Annexes.

The full evaluation procedure is described in the relevant guide published on the Participant Portal.

<u>Consortium agreement</u>: Members of consortium are required to conclude a consortium agreement, in principle prior to the signature of the grant agreement.

Budget[60]

	Budget line(s)	2016 Budget (EUR million)	2017 Budget (EUR million)
Calls			
H2020-IND-CE-2016/17		See footnote[61]	See footnote[62]
H2020-IOT-2016-2017		See footnote[63]	See footnote[64]
H2020-SCC-2016/2017		See footnote[65]	See footnote[66]
Estimated total budget		**577.50**	**462.50**

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[60] The budget figures given in this table are rounded to two decimal places.

 The budget amounts for the 2016 budget are subject to the availability of the appropriations provided for in the draft budget for 2016 after the adoption of the budget 2016 by the budgetary authority or, if the budget is not adopted, as provided for in the system of provisional twelfths.

 The budget amounts for the 2017 budget are indicative and will be subject to a separate financing decision to cover the amounts to be allocated for 2017.

[61] To which EUR 183.00 million from part 5.ii (budget line 08.020201) and EUR 3.00 million from part 9 (budget line 08.020302) and EUR 84.50 million from part 12 (budget line 08.020305) and EUR 83.00 million from part 5.i (budget line 09.040201) will be added making a total of EUR 353.50 million for this call

[62] To which EUR 213.00 million from part 5.ii (budget line 08.020201) and EUR 70.00 million from part 12 (budget line 08.020305) and EUR 33.00 million from part 5.i (budget line 09.040201) will be added making a total of EUR 316.00 million for this call

[63] To which EUR 15.00 million from part 9 (budget line 05.090301) and EUR 79.00 million from part 5.i (budget line 09.040201) and EUR 10.00 million from part 8 (budget line 09.040301) will be added making a total of EUR 104.00 million for this call

[64] To which EUR 35.00 million from part 5.i (budget line 09.040201) and will be added making a total of EUR 35.00 million for this call

[65] To which EUR 60.00 million from part 12 (budget line 08.020305) and EUR 60.00 million from part 10 (budget line 32.040301) will be added making a total of EUR 120.00 million for this call

[66] To which EUR 40.00 million from part 12 (budget line 08.020305) and EUR 71.50 million from part 10 (budget line 32.040301) will be added making a total of EUR 111.50 million for this call