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Societal Challenges..... 3

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Societal Challenges

Horizon 2020 Pillar:	Societal Challenges
Programme:	Climate action, environment, resource efficiency and raw materials
Call Title:	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
Call Identifier:	H2020-LC-CLA-2018-2019-2020
Topic Title:	Human dynamics of climate change
Topic Identifier:	LC-CLA-05-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	19-02-2019, 04-09-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-cla-05-2019.html>

Specific Challenges: As climatic changes increasingly place populations under pressure, human beings are already adapting. However, **less developed countries** – particularly in Africa – are often less resilient to climate change and require the deployment of appropriate support to adaptation, including in the form of bespoke climate services tailored to users' needs. There is some evidence that climate change may already be playing a role in shaping population migration patterns around the world (e.g. Africa to Europe). It is important to make use of the wealth of available socio-economic and geophysical data to better understand these patterns in order to develop appropriate policy responses.

Scope:

Actions should address only one of the following sub-topics:

- a. Climate services for Africa: Actions should exploit new, relevant climate data made available by Copernicus and other relevant sources (such as **GEOS**) and create dedicated climate services for Africa for at least two of the following sectors: water, energy, food security, land use^[1], health and infrastructure. Actions should develop and deliver tools/applications which demonstrate clear end-user engagement, consultation and participation, and which enhance planning and implementation of climate adaptation strategies in Africa. Actions should consider activities addressed by other initiatives such as the Global Framework for Climate Services (GFCS), Copernicus, and development cooperation activities, and provide added value. Actions should further consider the EU-Africa Research and Innovation Partnership on Climate Change and Sustainable Energy^[2].

- b. Climate and human migration: Actions should identify and analyse drivers relating to climate change that may affect human migration and displacement patterns. Actions should – using a multidisciplinary approach – identify and describe climate parameters, develop analytical methodologies, and demonstrate how these relate to human migration patterns, including the probability of migration/forced displacement and design adaptation solutions that may help in alleviating migration pressures at the source. They should also provide guidelines and policy recommendations for the European Agenda on Migration. Actions may also harness local knowledge and information by engaging with civil society organisations and citizen groups.

For both of the sub-topics, in line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged^[3].

The participation of social sciences and humanities disciplines is encouraged to address the complex challenges of this topic, including challenges associated with relevant gender issues.

The Commission considers that proposals requesting a contribution from the EU of between EUR 5 million and EUR 7 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:

The project results are expected to contribute to:

- better policy making for climate adaptation in partner countries and Europe;
- supporting international scientific assessments such as the IPCC Assessment Reports;
- stronger adaptive capacity and climate resilience.

Cross-cutting Priorities: International cooperation, Gender, RRI, Socio-economic science and humanities, Open Innovation

^[1] Links may be established with the project(s) resulting from topic SFS-43-2017: Earth observation services for the monitoring of agricultural production in Africa.

^[2] COM (2017) 17 final: Joint Communication to the European Parliament and the Council for a renewed impetus of the Africa-EU Partnership: see <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017JC0017&from=EN>

^[3] Proposals should pay attention to the special call conditions for this topic.

Horizon 2020 Pillar: Societal Challenges

Programme: Secure, clean and efficient energy

Call Title: BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE:
SECURE, CLEAN AND EFFICIENT ENERGY

Call Identifier: H2020-LC-SC3-2018-2019-2020

Topic Title: Market Uptake support

Topic Identifier: LC-SC3-RES-28-2018-2019-2020

Type of Action: CSA Coordination and support action

Deadline(s): 11-12-2018 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-sc3-res-28-2018-2019-2020.html>

Specific Challenges: Since the adoption of RES Directive in 2009, most Member States have experienced significant growth in renewable energy production and consumption, and both the EU and a large majority of Member States are on track towards the 2020 RES targets. The "Clean Energy for all Europeans" package adopted at the end of 2016 introduces further targets towards 2030 and introduces modifications in the energy market design that will empower individuals or communities to participate actively to the energy system transformation. Renewable energy technologies have the opportunity to play a crucial role in this transition, leading to an increased share of renewable energy consumed in the EU and to a more active role for the consumers. However, introducing and deploying at large scale new and improved technologies entails a number of challenges, notably as regards their initial high cost, the consumer acceptance and the legal and financial barriers arising from bringing novel solutions to a technical environment with already reliable solutions in place.

Scope: The proposal will develop solutions which can be easily implemented for overcoming barriers to the broad deployment of renewable energy solutions. In particular, the proposal will address one or more of the following issues:

- Recommendation for harmonisation of regulations, life cycle assessment approaches, environmental impact methodologies of renewable energy solutions;
- Development of additional features for RES to be compliant with the electricity market requirements, making them "market fit", such as developing the possibility to provide additional services to the grid such as peak power and having an active role in electricity balancing/reserve market;

- Support sharing of best practice between public funding bodies for the cross-border participation in RES electricity support schemes, increasing the use of the "RES co-operation mechanisms" foreseen in the legislation;
- Development of insurance schemes to be available to developers in Europe and worldwide to mitigate risks, such as in geothermal drilling and offshore installation;
- Development of innovative financing mechanisms, schemes and sharing of best practices for cost-effective support for uptake of renewable sources, such as through the use of Public Procurement of Innovative Solutions instrument or smartly designed tenders;
- Development of support tools to facilitate export markets, especially for technologies where export market potential is much higher than internal market e.g. for hydropower. The focus will be on capacity building for market activities in **developing and emerging countries**, including identifying research needs, within the objectives of developing country- specific technologies and solutions, and/or adapting existing ones, taking into account local aspects of social, economic and environmental sustainability. Participation of **developing and emerging countries** is encouraged, in particular if these countries have identified energy as a priority area for their development and whenever common interest and mutual benefits are clearly identified.
- Development of tools (methods and models) for environmental impact assessments of renewable energy projects;
- Development of tools or services using global earth observation data, (such as those available through COPERNICUS), to support development and deployment of renewable energy sources;
- Determining conditions and defining options for retrofitting existing energy and industrial installations (first generation biofuels, pulp and paper, fossil refineries, fossil firing power and Combined Heat and Power (CHP) plants) for the complete or partial integration of bioenergy, with concrete proposals for such retrofitting for the different cases of bioethanol, biodiesel, bio-kerosene, intermediate bioenergy carriers and other advanced biofuels and renewable fuels and biomass based heat and power generation, on the basis of the assessment of the capital expenditure (CAPEX) reduction and market benefit;
- Development of optimisation strategies regarding cost, energy-performance and LCA for bioenergy and sustainable renewable fuels in upgraded energy and industrial installations;
- Development of cost-effective logistics, feedstock mobilisation strategies and trade-centres for intermediate bioenergy carriers.

For all actions, the consortia have to involve and/or engage relevant stakeholders and market actors who are committed to adopting/implementing the results. The complexity of these challenges and of the related market uptake barriers calls for multi-disciplinary research designs, which should include contributions also from the social sciences and humanities. Where relevant, regional specificities, socio-economic, spatial and environmental aspects from a life-cycle perspective will be considered. Where relevant, proposals are expected to also critically evaluate the legal, institutional and political frameworks at local,

national and European level and how, why and under what conditions these (could) act as a barrier or an enabling element.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 to 3 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:

It is expected that the solution proposed will contribute to:

- Facilitate the introduction of these technologies and increase the share of renewable energy in the final energy consumption;
- Lead to substantial and measurable reductions for project developments, whilst still fully addressing the needs for environmental impact assessments and public engagement;
- Develop more informed policy, market support and financial frameworks, notably at national, regional and local level, leading to more cost effective support schemes and lower financing costs for RES facilities.

Delegation Exception Footnote: It is expected that this topic will continue in 2020.

Cross-cutting Priorities: Clean Energy, Open Innovation, International cooperation, RRI, Socio-economic science and humanities

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	2018-2020 Mobility for Growth
Call Identifier:	H2020-MG-2018-2019-2020
Topic Title:	InCo Flagship on Integrated multimodal, low-emission freight transport systems and logistics
Topic Identifier:	MG-2-9-2019
Type of Action:	RIA Research and Innovation action
Deadline(s):	16-01-2019, 12-09-2019 (two-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/mg-2-9-2019.html>

Specific Challenges: Global as well as regional and local freight transport is massively changing due to accelerating technological changes, the establishment of new players in global trade, the rise of protectionism, and the slowing down of economic growth of important partners such as China. New logistics concepts (such as the Physical Internet) and new disruptive technologies, such as Blockchain, Industry 4.0, vehicle automation and truck platooning or new business models, like 'crowdshipping' and the circular economy models will have an impact on global freight transport, its optimisation and its environmental footprint that needs to be better understood and assessed. Furthermore new trade routes from and to Europe will probably change the traditional pattern of freight movement and will need new connections with European corridors and hubs at a time of budget limitation on investment for transport infrastructure.

Sustainable integrated multimodal freight transport is particularly important for the development of countries in special situations – **least developed countries**, landlocked **developing countries**, and small island states and outermost regions - which face common problems resulting from the under-resourcing of transport infrastructure and services, traffic-related air pollution and high accident levels, but also diverse geopolitical and trade situations. These countries/regions also have an enormous potential for sustainable development. International cooperation can support their economies both domestically and globally for a global benefit and ensuring better integration of these regions into the world economic landscape.

Scope:

Proposals should address one or more of the following aspects:

- Understanding how new concepts in logistics, in combination with new national strategies to organize freight flows in ports and airports have an impact on global freight transport, and on related greenhouse gas emissions. Multimodal transfer zones from ports and airports from long-haul to last mile logistics need to be better analysed in order to find appropriate measures and for ensuring seamless door-to-door transport, exploiting the full potential of modularization and other innovative logistics concepts. International cooperation with major trade partner countries is essential to ensure the smooth transfer at all levels of the transport chain. Proposals should also address solutions that enable peripheral regions and landlocked **Developing Countries** to have proper accessibility to international trade.
- Speed up the process and transition towards the Physical Internet paradigm, demonstrating how different technologies, business cases and standards come together in real-world applications, and are able to deliver added value to the users and have positive impacts in terms of emissions and energy consumption. Priority partners should be USA, Canada, China, Japan. Demonstrations of satellite-based applications using EGNOS and Galileo are also suggested.
- Research the range of new issues and questions emerging with the new trade routes to and from Europe, such as the Northern Sea Route (across an ice-free Arctic in summer months) or the new Silk Road routes and the Chinese One Belt One Road strategy; the effect of the development of these new routes on trans-continental freight modal split; the additional interfaces needed between the new overland routes and the EU internal transport networks / corridors. Priority partners are those along the routes. The geopolitical and trade aspects of these developments, in particular on countries affected by these developments, should be considered.
- Understand new disruptive trends emerging as on-demand logistics solutions such as crowd-sourcing of deliveries (or 'crowdshipping') which have the potential to be a logistics 'game-changer', evidencing different impacts in both emerging and industrialized countries, including the possible integration of passengers and freight flows. Research on the crowd-sourcing of logistics would benefit from international collaboration, partly to compare the development of the phenomenon in different markets, but also to explore whether it can be extended to long-haul / cross border freight delivery, taking in consideration economic, regulatory and security constraints.
- Assess the impact of emerging technologies in other sectors than freight transport (e.g. Blockchain, Industry 4.0, 5G, 3D printing, unmanned aerial vehicles (UAV's)) on the logistics operational system, and identify the potential development paths that lead to the optimal exploitation of their positive effect.
- Collect best case models and develop decision support systems aimed at helping public authorities and private companies to determine the most likely scenarios and to promote a higher level of collaboration between the different stakeholders, including new emerging ones.

- Consideration of aspects of governance, privacy and cybersecurity of and with regard to cargo.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

In line with the Union's strategy for international cooperation in research and innovation^[1], international cooperation is encouraged. In particular proposals should consider cooperation with projects or partners from the US, Japan, Canada, China, Latin America.

In particular, proposals should foresee twinning with entities participating in projects funded by US DOT to exchange knowledge and experience and exploit synergies.

Expected Impact: Main impact from the R&I activities should be the improved integration of the European transport network (both hard – TEN-T – and soft – logistics and IT) with the global network, through the sustainable development of the transport nodes likely to benefit from the emergence of new trade routes and harmonised platforms and new and revised 'nodes', also in support of the sustainable development of new logistics routes and their link with national/regional markets. Better understanding of the impact of emerging technologies on freight flow and subsequent guidelines to optimize vehicle, infrastructure and operation accordingly. Facilitate the development of disadvantaged regions and their inclusion into the international trading system. Better understanding of links between technological development, trade and geopolitics. Research should be validated in a selected number of case studies through pilot demonstration, trials and testing involving service providers and end-users.

Cross-cutting Priorities: International cooperation

^[1] (COM(2012)497)

Horizon 2020 Pillar:	Societal Challenges
Programme:	Smart, green and integrated transport
Call Title:	Building a low-carbon, climate resilient future: Green Vehicles
Call Identifier:	H2020-LC-GV-2018-2019-2020
Topic Title:	InCo flagship on “Urban mobility and sustainable electrification in large urban areas in developing and emerging economies”
Topic Identifier:	LC-GV-05-2019
Type of Action:	IA Innovation action
Deadline(s):	25-04-2019 (single-stage)

Participant Portal Weblink:

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/lc-gv-05-2019.html>

Specific Challenges: Climate change, energy security and local air pollution are some of the key questions for the 21st century. Urban areas in **developing and emerging countries** are major driving factors in growing global energy demand and Greenhouse Gas emissions.

Although cities cover only 2% of the earth's surface, 50% of the world's population lives in cities, but they are responsible for three-quarters of the global energy consumption as well as approximately 80% of the global greenhouse gas emissions. While the trend towards urbanisation and the associated increase of personal and freight transport creates massive challenges, in particular in **developing and emerging economies**, it also offers the unique opportunity to shape energy use especially in the transport and urban form towards a low carbon pathway. Moving towards sustainable mobility will also help addressing urban congestion, access to jobs and public services, and local air pollution.

This is why urbanisation requires integrated mobility solutions that bring together technology opportunities with local and national policy, including land use and mobility planning. Efficient transport and mobility, based on a balanced mix of public and private transport and dependent on the characteristics of each city, is and will continue to be the backbone of cities' growth and competitiveness.

Whereas environmental issues are very high on urban mobility agendas, the importance of transport in urban social and economic structures is often neglected in discussions. All three aspects of urban sustainability must be treated with equal importance and have to be examined in parallel.

Scope: Actions should bring together European, Asian (e.g. China), CELAC (Community of Latin American and Caribbean States) and African research partners, government agencies and urban authorities, private sector and civil society with relevant expertise and competence within the corresponding cooperation framework and foster participatory engagement in urban electrification in order to reduce air pollution and CO2 emissions. All types of vehicle are considered under this topic (powered 2 wheelers, cars, buses, trucks and LDV).

Proposals should address all of the following activities:

- Development of a toolbox for advanced management strategies towards a more efficient private and public electric mobility: E-mobility management strategies, focusing on smart deployment and operation of vehicles, in particular electrified vehicle, to increase mobility and energy efficiency, emission reduction and user acceptance of electrified vehicles
 - A smart and cooperative management of the vehicle in urban operation, (intermodal route planning, ecorouting eco-driving charging and parking infrastructure availability...).
 - Deployment and operation of infrastructure use charging infrastructure (conventional and wireless) and network, availability of parking places. Adaptation and integration of existing/ adapted vehicles of different types if necessary.
 - Efficient integration of the operations of different electrified road public transport, from e-bike to bus rapid transit (e- BRT) including mini-buses, taxi and mobility services on demand through smart navigation and routing, coordinated traffic management, demand-responsive service and dispatching
- Comparative demonstrations activities and pilots in cities will include at least one demonstrator in the following regions: Europe, Asia, Africa and CELAC (leading to a minimum of 4 city demonstrators). Demonstrations will involve local partners. Innovative concepts for electrified road public transport (passenger and freight), jointly designed through International Partnerships as a contribution to a wider sustainable mobility concept, from the perspective of a seamless mobility, taking in account the acceptance of users (travellers or freight operator).
- Implementation concepts to scale up the demonstration activities. Evaluation of the relative outputs and accordingly the development of implementation concepts to scale up the demonstration activities and exploration of the sustainable mobility planning in the city transformation process :
 - Sustainable planning of city and transportation infrastructure: link city planning with policy discussion and implementation solutions and city goals and with any Air Quality Plans
 - Dedicated plans for financing solutions, including public and private operations.
 - Regional and international replication conditions to reach out to a larger number of cities and countries

Cooperation and synergies with ongoing activities undertaken with international initiatives such as Decarbonising Transport (International Transport Forum) and

the Urban Electric Mobility Initiative (UN-Habitat) and other joint initiatives of European Member States international cooperation initiatives and the European Commission (e.g. Mobilise Your City) should be sought where appropriate.

In line with the strategy for EU international cooperation in research and innovation^[1], international cooperation is encouraged.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 15 and 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:

Proposals are expected to contribute to:

- Capability to quantify the potential reduction of greenhouse gas and pollutant emissions as well as traffic congestion, by demonstrating improvements that can be achieved with new urban mobility systems and electrification, for each stakeholder in the value chain (in line with the objectives set by the COP21 and the New Urban Agenda)
- UN's Sustainable Development Goals 11 "Sustainable cities and communities" and 13 "Climate Action"
- Reference models of the mobility system to provide a basis in order to assess the ability to replicate sustainable concepts by demonstrating the short- and long-term benefit for the stakeholders involved, and especially considering the relevant boundary conditions (i.e infrastructure, vehicle, usage needs and patterns, governance, financing schemes, urban organisation, etc) and how the result contributes to key EU policy goals (including climate goals and competitiveness of European industry)
- A basis for strengthening the collaboration of the European Union with Asia (e.g. China, India, etc), Latin America (CELAC) and Africa, which also offers both a common starting point for common future legislative efforts, as well a favourable setting for new business opportunities for innovative local and European entrepreneurs.

Cross-cutting Priorities: Open Innovation, Clean Energy, Contractual Public-Private Partnerships (cPPPs), EGVI, RRI, Socio-economic science and humanities, International cooperation

^[1] (COM (2012) 497)